

INVERTER

E800



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

Please forward this Safety Guideline to the end user.

INVERTER SAFETY GUIDELINE

FR-E820-0008(0.1K) to 0900(22K) FR-E840-0016(0.4K) to 0440(22K) FR-E820S-0008(0.1K) to 0110(2.2K) FR-E810W-0008(0.1K) to 0050(0.75K)

For more information on the product

IB-0600857ENG-H(2312)MEE

MITSUBISHI ELECTRIC CORPORATION

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Manual name	Manual number	Details
FR-E800 Instruction Manual (Connection)	IB-0600865ENG	Manuals describing installation, wiring, specifications, outline dimensions, standards, and how to connect options.
FR-E800 Instruction Manual (Function)	IB-0600868ENG	Manual describing details of the functions.
FR-E800 Instruction Manual (Communication)	IB-0600871ENG	Manual describing details of the communications.
FR-E800 Instruction Manual (Maintenance)	IB-0600874ENG	Manual describing how to identify causes of faults and warnings.
FR-E800 Instruction Manual (Functional Safety)	BCN-A23488-000	Manual describing the functional safety.
FR Configurator2 Instruction Manual	IB-0600516ENG	Manual describing details of the software used to set inverter parameters using a personal computer.
PLC Function Programming Manual	IB-0600492ENG	Manual describing details of the PLC function.

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

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

∴ CAUTION

levels as they are critical to personnel safety Read this Guideline before use. In addition, scan the 2D code below to download the FR-E800 Instruction Manual (Connection) and read "Safety Instructions".

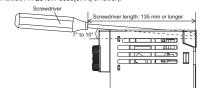


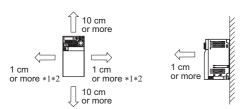
INVERTER INSTALLATION AND PRECAUTIONS

When installing the inverter on the enclosure surface, remove the front cover and wiring cover to fix the inverter.

- · Install the inverter on a strong surface securely with screws Leave enough clearances and take cooling measures.
- Avoid places where the inverter is subjected to direct sunlight, high temperature and high humidity.

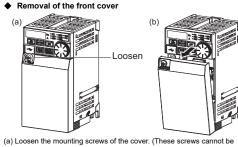
 Install the inverter on a nonflammable wall surface.
- When tightening screws into the upper mounting holes, tilt the screwdriver seven to ten degrees (FR-E820-0050(0.75K) or lower, FR-E820S-0030(0.4K)





2 INSTALLATION AND WIRING

Removal and reinstallation of covers

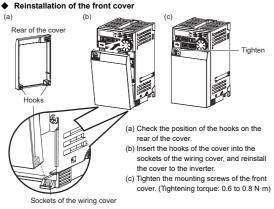


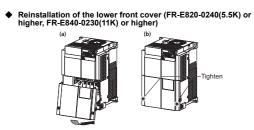
(b) Pull out the cover using its lower side as a support With the cover removed, the control circuit terminals can be wired and the plug-in option can be installed.

Removal of the lower front cover (FR-E820-0240(5.5K) or higher, FR-E840-0230(11K) or higher)



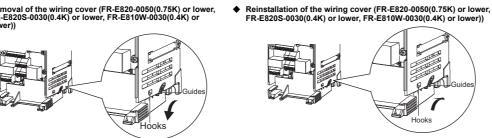
- (b) While holding the areas around the installation hooks on the sides of the (b) Tighten the screws on the lower part of the lower front cover. lower front cover, pull out the cover using its upper side as a support.
- (c) With the lower front cover removed, wiring of the main circuit terminals and control circuit terminals can be performed





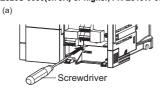
- (a) Install the lower front cover by inserting the upper hooks into the sockets on the

Removal of the wiring cover (FR-E820-0050(0.75K) or lower, FR-E820S-0030(0.4K) or lower, FR-E810W-0030(0.4K) or

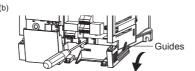


Pull out the cover along the guides in the direction shown by the arrow in the Fit the cover to the inverter along the guides

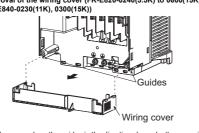
Removal of the wiring cover (FR-E820-0080(1.5K)) to FR-E820-0175(3.7K), FR-E840-0016(0.4K) to FR-E840-0095(3.7K),



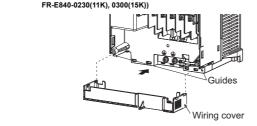




- (a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the stopper behind the wiring
- cover approx. 3 mm. (b) Pull out the cover along the guides in the direction shown by the arrow in
- ♦ Removal of the wiring cover (FR-E820-0240(5.5K) to 0600(15K), FR-E840-0230(11K), 0300(15K))



Reinstallation of the wiring cover (FR-E820-0240(5.5K) to 0600(15K), FR-E840-0230(11K), 0300(15K))



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.

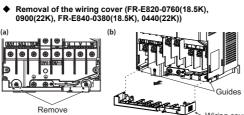


(b)

◆ Removal of the wiring cover (FR-E840-0120(5.5K), 0170(7.5K)) ◆ Reinstallation of the wiring cover (FR-E840-0120(5.5K), 0170(7.5K)) mation of the wiring cover (FR-E440-12



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

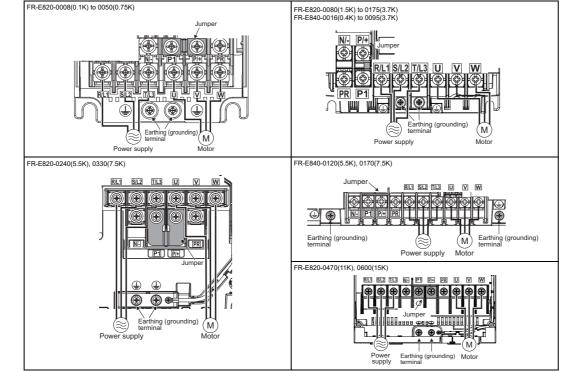


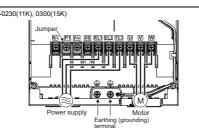
♦ Reinstallation of the wiring cover (FR-E820-0760(18.5K), 0900(22K), FR-E840-0380(18.5K), 0440(22K))

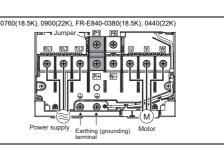
(b) Pull out the cover along the guides in the direction shown by the arrow in (b) Tighten the mounting screws of the wiring cover (tightening torque: 0.6 to 0.8

(a) Fit the cover to the inverter along the guides (a) Remove the mounting screws of the wiring cover

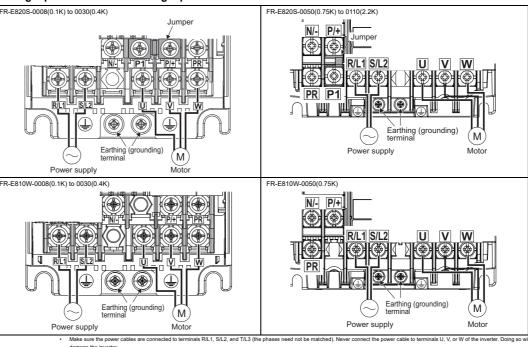
2.2 Main circuit terminal layout and wiring to power supply and motor ♦ Three-phase 200/400 V class







♦ Single-phase 200 V class / Single-phase 100 V class



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	erminal	HIV c	ables, etc	c. (mm²) *1	AW	G *2	PVC (cables, et	tc. (mm²) *3
model	screw torque size *4 N·m		R/L1, S/L2, T/L3*5	U, V, W	R/L1, S/L2, T/L3*5	u, v, w	Earthing (grounding) cable	R/L1, S/L2, T/L3*5	U, V, W	R/L1, S/L2, T/L3*5	U, V, W	Earthing (grounding) cable
R-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
R-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
R-E820-0175(3.7K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4
R-E820-0240(5.5K)	M5	2.5	5.5-5	5.5-5	5.5	5.5	5.5	10	10	6	6	6
R-E820-0330(7.5K)	M5	2.5	14-5	8-5	14	8	5.5	6	8	16	10	6
R-E820-0470(11K)	M5	2.5	14-5	14-5	14	14	8	6	6	16	16	16
R-E820-0600(15K)	M6(M5)	4.4	22-6	22-6	22	22	14	4	4	25	25	16
R-E820-0760(18.5K)	M8(M6)	7.8	38-8	22-8	38	22	14	2	4	35	25	25
R-E820-0900(22K)	M8(M6)	7.8	38-8	38-8	38	38	22	2	2	35	35	25
R-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
R-E840-0120(5.5K)	M4	1.5	5.5-4	2-4	3.5	2	3.5	12	14	4	2.5	4
R-E840-0170(7.5K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4
R-E840-0230(11K)	M4	1.5	5.5-4	5.5-4	5.5	5.5	5.5	10	10	6	6	10
R-E840-0300(15K)	M5	2.5	8-5	8-5	8	8	5.5	8	8	10	10	10
R-E840-0380(18.5K)	M6	4.4	14-6	8-6	14	8	8	6	8	16	10	16
R-E840-0440(22K)	M6	4.4	14-6	14-6	14	14	14	6	6	16	16	16
R-E820S-0008(0.1K) to 0030(0.4K)	M3.5	1.2	2-3.5	2-3.5	2	2	2	14	14	2.5	2.5	2.5
R-E820S-0050(0.75K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5
R-E820S-0080(1.5K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5
R-E820S-0110(2.2K)	M4	1.5	5.5-4	2-4	3.5	2	2	12	14	4	2.5	2.5
R-E810W-0008(0.1K) to 0030(0.4K)	M3.5	1.2	2-3.5	2-3.5	2	2	2	14	14	2.5	2.5	2.5
R-E810W-0050(0.75K)	M4	1.5	5.5-4	2-4	3.5	2	2	14	14	2.5	2.5	2.5

- 50°C or less and the wiring distance of 20 m or shorter.

 THHW cable with a continuous maximum permissible temperature of 75°C. It is assumed that the cables will be used in a surrounding air temperature of 40°C or less and the wiring distance of 20 m or shorter. (For use in the United States or Canada, refer to the section 7.2 "instructions for UL and cUL".)

 PUC cable with continuous maximum permissible temperature of 70°C. It is assumed that the cables will be used in a surrounding air temperature of 40°C or less and the wiring distance of 20 m or PUC cable with continuous maximum permissible temperature of 70°C. It is assumed that the cables will be used in a surrounding air temperature of 40°C or less and the wiring distance of 20 m or PUC cable with continuous maximum permissible temperature of 70°C. It is assumed that the cables will be used in a surrounding air temperature of 40°C or less and the wiring distance of 20 m or PUC cable with occitions are continuous maximum permissible temperature of 70°C. It is assumed that the cables will be used in a surrounding air temperature of 40°C or less and the wiring distance of 20 m or PUC cable with occitions are continuous maximum permissible with the second of 20°C or less and the wiring distance of 20°C or less and the wiring distance of 20°C or less and the wiring distance of 20°C or less are continuous maximum permissible to the second of 20°C or less are continuous maximum permissible to the second of 20°C or less are continuous maximum permissible to 20°

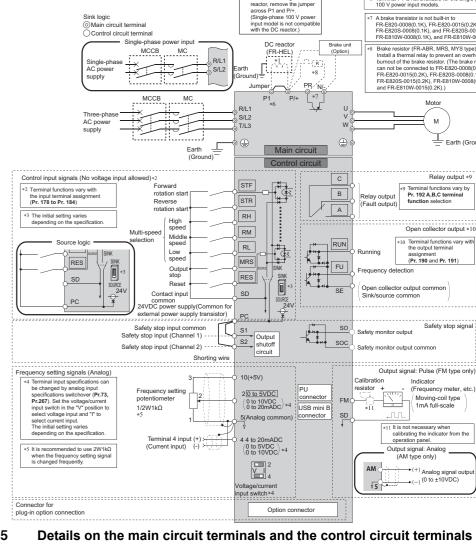
- Line voltage drop [V] = $\sqrt{3}$ × wire resistance [m Ω /m] × wiring distance [m] × current [A] / 1000 Use a larger diameter cable when the wiring distance is long or when it is desired to decrease the voltage drop (torque reduction) in the low speed range

Cable type	Pr.72 setting (carrier frequency)	Voltage class	0.1K	0.2K	0.4K	0.75K	1.5K	2.2K	3.7K or higher
	1 (1 kHz) or lower	100 V, 200 V	50 m (200 m)	50 m (200 m)	75 m (300 m)	100 m (500 m)			
Shielded *1		400 V	_	_	50 m (200m)	50 m (200m)	75 m (300m)	100 m (500m)	100 m (500m)
Snielded *1	2 (2 kHz) or higher	100 V, 200 V	10 m (30 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)
	. , ,	400 V	_	_	10 m (30 m)	25 m (100 m)	50 m (200 m)	75 m (300 m)	100 m (500 m

*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 m.

Terminal connection diagram



Тур	Symbol	Common	Terminal name		inal function description					
	R/L1, S/ L2, T/L3*1	_	AC power input	Connected to the commercial power supply. Defactor converter (FR-HC2) or the multifunction						
	U, V, W	_	Inverter output	Connected to a three-phase squirrel cage moti	or or a PM motor.	•				
cnit	P/+, PR	_	Brake resistor connection	Connect an optional brake transistor (MRS, M' E820-0008(0.1K), FR-E820-0015(0.2K), FR-E8 FR-E810W-0015(0.2K).)	320S-0008(0.1K), FR-E820S-00	15(0.2K), FR-E810W-0008(0.1K), and				
Main circuit	P/+, N/-	_	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU, or BI converter (FR-HC2) to these terminals.	J), multifunction regeneration co	nverter (FR-XC), or high power factor				
Ž	P/+, P1*2	_	DC reactor connection	Remove the jumper across terminals P/+ and I the single-phase 100 V power input models.) V and P1 should not be removed.						
		_	Earth (ground)	For earthing (grounding) the inverter chassis. It	earthing (grounding) the inverter chassis. Be sure to earth (ground) the in					
	STF*3		Forward rotation start	Turn ON the STF signal to start forward rotation and turn it OFF to stop.	When the STF and STR signals are turned ON					
	STR*3	SD (sink	Reverse rotation start	Turn ON the STR signal to start reverse rotation and turn it OFF to stop.	simultaneously, the stop command is given.					
±	RH, RM, RL*3	(negative common))	Multi-speed selection	Multi-speed can be selected according to the o signals.	combination of RH, RM and RL	Input resistance: 4.7 kΩ Voltage when contacts are open:				
i tootao		PC (source (positive	Output stop	Turn ON the MRS signal (5 ms or more) to sto Use this signal to shut off the inverter output w electromagnetic brake.		21 to 26 VDC Current when contacts are short- circuited: 4 to 6 mADC				
nal	RES*3	common))	Reset	Use this signal to reset a fault output provided activated. Turn ON the RES signal for 0.1 second in the initial setting, reset is always enabled. Benabled only at an inverter fault occurrence. To second after reset.	ond or longer, then turn it OFF. y setting Pr.75 , reset can be	4 WOUNDE				
Input signa	10	5	Power supply for a frequency setting potentiometer	Used as the power supply for an external frequence potentiometer.	uency setting (speed setting)	5 ±0.5 VDC, Permissible load current: 10 mA				
ini pui#ee	2	5	Frequency setting (voltage)	Inputting 0 to 5 VDC (or 0 to 10 VDC) provides at 5 V (or 10 V) and makes input and output pr among input 0 to 5 VDC (initial setting), 0 to 11 The initial setting varies depending on the sper Set the voltage/current input switch to the "Position	oportional. Use Pr.73 to switch 0 VDC, and 0 to 20 mA. cification.	For voltage input, Input resistance: 10 to 11 kΩ				
o washed		5	Frequency setting (current)	Inputting 4 to 20 mADC (or 0 to 5 VDC, 0 to 10 output frequency at 20 mA and makes input at input signal is valid only when the AU signal is To use the terminal 4 (current input at initial se parameter from Pr.178 to Pr.184 (Input termit turning ON the AU signal. The initial setting varies depending on the speuse Pr.267 to switch among input 4 to 20 mA in the AU signal.	initial setting varies depending on the specification. • Pr.267 to switch among input 4 to 20 mA (initial setting), 0 to 5 VDC, and 10 VDC. Set the voltage/current input switch in the "V" position to select					
200	A, B, C	_	Relay output (fault output)	changeover contact output indicates that the activated and the outputs are stopped. Fault: discontinuity across B and C (continuity)	changeover contact output indicates that the inverter protective function has					
tput signal	RUN	SE	Inverter running	The output is in LOW state when the inverter of higher than the starting frequency (initial values state during stop or DC injection brake operation	0.5 Hz). The output is in HIGH on. *4	Permissible load: 24 VDC (maximum 27 VDC) 0.1 A				
⊒ L		SE	Frequency detection	The output is in LOW state when the inverter of higher than the preset detection frequency, and than the preset detection frequency. *4	output frequency is equal to or I is in HIGH state when it is less	(The voltage drop is 3.4 V at maximum while the signal is ON.)				
٥	FM*5	SD	For indication on external meters	Among several monitor items such as output frequency, select one to output it via these terminals.	Permissible load current: 1 mA 1440 pulses/s at 60 Hz					
S C C C C C C C C C C C C C C C C C C C	AM*5	5	Analog voltage output	(The signal is not output during an inverter reset.) The size of output signal is proportional to the magnitude of the corresponding monitor item.	Output item: Output frequency (initial setting)	Output signal: 0 ±10 VDC, permissible load current: 1 mA (load impedance 10 kΩ or more), resolution: 12 bits				
	S1	PC	Safety stop input (Channel 1)	Use terminals S1 and S2 to receive the safety selay module. Terminals S1 and S2 can be use		Input resistance: 4.7 kΩ				
Safety stop function	S2	PC	Safety stop input (Channel 2)	Inverter judges the condition of the internal saf (shorted/opened) between terminals S1 and P When the status is opened, the inverter output In the initial status, terminal S1 and S2 are sho shorting wires. Remove the shorting wires and module when using the safety stop function.	ety circuit from the status C, or between S2 and PC. is shut off. orted with terminal PC by	Voltage when contacts are open: 21 to 26 VDC Current when contacts are short- circuited: 4 to 6 mADC				
Safety sto	so	soc	Safety monitor output (open collector output)	The output slatus varies depending on the input. The output is in HIGH state during occurrence fault. The output is in LOW state otherwise. (The open collector transistor is ON (conductiv is OFF (not conductive) in HIGH state.) Refer to the F.R-E800 Instruction Manual (Fundon), when the signal is switched to HIGH while open. (Please contact your sales representative.)	of the internal safety circuit e) in LOW state. The transistor ctional Safety) (BCN-A23488- e both terminals S1 and S2 are	Permissible load: 24 VDC (27 VDC at maximum), 0.1A (The voltage drop is 3.4 V at maximum while the signal is ON.)				
			Contact input common (sink (negative common))	Common terminal for the contact input terminal	I (sink logic) and terminal FM.					
	SD	_	External transistor common (source (positive common))	Connect this terminal to the power supply common as a programmable controller, in the source log						
			24 VDC power supply	Common output terminal for 24 VDC 0.1 A pov						
inal			External transistor common (sink (negative common))	output (open collector output) device, such as	nnect this terminal to the power supply common terminal of a transistor put (open collector output) device, such as a programmable controller, in sink logic to avoid malfunction by undesirable current.					
Common terminal	PC	Safety stop input terminal common Common terminal for safety stop input terminals		Power supply voltage range: 22 to 26.5 VDC						
ommo	1	Contact input common Common terminal for the contact input terminal (course logic)			Permissible load current: 100 mA					
ŏ	(source (positive common)) SD 24 VDC power supply Cap be used as a 24 VDC 0.1 A power supply									
	5		common Frequency setting common	Common terminal for the frequency setting sig		h (ground).				
	SE	_	Open collector output common	Common terminal for terminals RUN and FU.	, , , , , , , , , , , , , , , , , , , ,	*				
	soc	_	Safety monitor output	Common terminal for terminal SO.						
	1000		terminal common							

Туре	Terminal symbol	Common	Terminal name	Terminal function description
ication		l	PU connector	With the PU connector, communication can be made through RS-485 Conforming standard: EIA-485 (RS-485): Transmission format: Multidrop link Communication speed: 300 to 115200 bps- Overall length: 500 m
Commun		_		Use the USB connector to communicate with a personal computer. Setting and monitoring of the inverter is enabled using FR Configurator2. Interface: conforms to USB 1.1· Transmission speed: 12 Mbps Connector: USB mini B connector (receptacle mini B type)

is not available for the single-phase power input modes.
not available for the single-phase 10 V power input models.
ons can be selected using Pr.178 to Pr.184 (input terminal function selection). (Refer to the FR-E800 Instruction Manual (Function).)
rich translation 5 oN (conductive) in LOW state. The translation is OFF (not conductive) in HIGH state. M type inverter. Terminal AM is available for the AM type inverter. '
ilable. The maximum SCCR is 500 mA. A PU connector cannot be used during USB bus power connection.

Control circuit terminal layout ◆FM type inverter S1 S2 PC RUN FU SE RL RM RH SD MRS RES SD STF STR A B C ◆AM type inverter S1 S2 PC RUN FU SE RL RM RH SD MRS RES SD STF STR

A B C

Wiring method

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. SOISOC FM SD • Crimp terminals commercially available (as of April 2023.)

10 2 5 4 Phoenix Contact Co., Ltd.

	Phoenix Contact	Co., Ltd.			
		Fe	Crimping		
	Wire gauge (mm ²)	With insulation sleeve	Without insulation sleeve	For UL wire*1	tool model No.
	0.3	AI 0,34-10TQ	I	ı	
]	0.5	AI 0,5-10WH	I	AI 0,5-10WH-GB	
J	0.75	AI 0,75-10GY	A 0,75-10	AI 0,75-10GY-GB	CRIMPFOX 6
	1	AI 1-10RD	A 1-10	AI 1-10RD/1000GB	CKIMPFOX
	1.25, 1.5	AI 1, 5-10BK	A 1,5-10	AI 1,5-10BK/1000GB*2	
	0.75 (for 2 wires)	AI-TWIN 2×0,75-10GY	1	-	

A ferrule terminal with an insulation sleeve compatible with the MTW wire which has wire insulation.

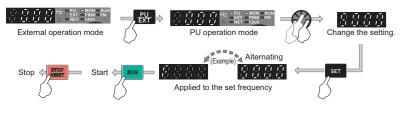
Applicable for terminals A, B, C.

BASIC OPERATION

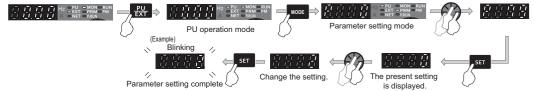
Components of the operation panel

The operation panel cannot be removed from the inverter.	-	
	Name	Description
- BU - MON BUILD	PU/EXT key	Switches between the PU operation mode, the PUJOG operation mode, and the External operation mode.
Hz - PU - MON - RUN	MODE key	Switches the operation panel to a different mode.
A - NET - PRUN	SET key	Used to confirm each selection. Switches the monitor screen in the monitor mode.
PU MODE SET	RUN key	Start command The direction of motor rotation depends on the Pr.40 setting.
RUN STOP	STOP/RESET key	Used to stop operation commands. Used to reset the inverter when the protective function is activated.
RESET	Setting dial	The setting dial of the Mitsubishi Electric inverters. Turn the setting dial to change the setting of frequency or parameter.

◆Starting/stopping the inverter on the operation panel



◆Parameter setting



4 PARAMETERS

5 LIST OF FAULT DISPLAYS 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

Website.



0008 0015 0030 0050 0080 0110 0175 0240 0330 0470 0600 0760 0900

6 SPECIFICATIONS

Model FR-F820-II

6.1 Inverter rating

◆ Three-phase 200 V class

	Wodel FR-	-E02U-[]		0.1K	0.2K	0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K	18.5K	22K
Annlic	able motor capa	city (kW/)*1	LD	0.2	0.4	0.75	1.1	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0
Applica	able illotor capa	City (KVV)	ND	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0
	Rated capac	ity (k\/A*2	LD	0.5	8.0	1.4	2.4	3.8	4.8	7.8	12.0	15.9	22.3	27.5	35.1	45.8
	Rateu capac	ity (KVA) Z	ND	0.3	0.6	1.2	2.0	3.2	4.4	7.0	9.6	13.1	18.7	23.9	30.3	35.9
	Rated current (A)*7				2.0 (1.7)	3.5 (3.0)	6.0 (5.1)	9.6 (8.2)	12.0 (10.2)	19.6 (16.7)	30.0 (25.5)	40.0 (34.0)	56.0 (47.6)	69.0 (58.7)	88.0 (74.8)	115.0 (97.8)
	ND				1.5 (1.4)	3.0 (2.5)	5.0 (4.1)	(7.0) (10.0) (16.5) (23.0) (31.0) (44.0) (57.0) (72.0) (86.0)							90.0 (86.0)	
Output	Overload curr	ont rating*3	LD	120% 60	s, 150%	3 s (invers	se-time ch	aracteristi	cs) at surr	ounding a	ir tempera	ture of 50	°C			
	Overious curi	chi ruting o	ND	150% 60	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C											
	V	oltage*4		Three-pl	Three-phase 200 to 240 V											
		sistor	Not insta	illed	Built-in											
	Regenerative braking Maximum brake torque (ND reference)*5			150%		100%		50%	20%							
	Rated input AC (DC) voltage/ frequency				nase 200 t	o 240 V 5	0/60 Hz (2	283 to 339	VDC *9)							
		e AC (DC) vol	tage	170 to 2	64 V, 50/6	0 Hz (240	to 373 VE	C *9)								
	Permissible fr	equency fluc	tuation	±5%												
		Without	LD	1.9	3.0	5.1	8.2	12.5	16.1	25.5	37.1	48.6	74.3	90.5	112.9	139.5
Power	Rated input	DC reactor	ND	1.4	2.3	4.5	7.0	10.7	15.0	23.1	30.5	41.0	63.6	79.9	99.0	114.3
supply	current (A)*8	With DC	LD	1.3	2.0	3.5	6.0	9.6	12.0	20.0	30.0	40.0	56.0	69.0	88.0	115.0
		reactor	ND	0.8	1.5	3.0	5.0	8.0	11.0	17.5	24.0	33.0	47.0	60.0	76.0	90.0
	١	Without	LD	0.7	1.1	1.9	3.1	4.8	6.2	9.7	15.0	19.0	29.0	35.0	43.0	54.0
	Power supply capacity	DC reactor	ND	0.5	0.9	1.7	2.7	4.1	5.7	8.8	12.0	16.0	25.0	31.0	38.0	44.0
	(kVA)*6 With DC LD				8.0	1.3	2.3	3.7	4.6	7.5	11.0	15.0	21.0	26.0	34.0	44.0
	reactor ND				0.6	1.1	1.9	3.0	4.2	6.7	9.1	13.0	18.0	23.0	29.0	34.0
Pi	rotective structu	9)		oe (IP20)												
	Cooling s		Natural				Forced a									
Approx. mass (kg) 0.5 0.5 0.7 1.0							1.0	1.4	1.4	1.8	3.3	3.3	5.4	5.6	11.0	11.0

♦ Three-phase 400 V class

	Model FR-		0016	0026	0040	0060	0095	0120	0170	0230	0300	0380	0440		
	Wodel FK-	E840-[]		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K	18.5K	22K	
Annline	able motor capa	aits /IdA/*4	LD	0.75	1.5	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	
Applica	able illotor capa	City (KVV)"I	ND	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	
	Rated capaci	tu (b\/A\ *2	LD	1.6	2.7	4.2	5.3	8.5	13.3	17.5	26.7	31.2	34.3	45.7	
	Kateu capaci	ty (KVA) Z	ND	1.2	2.0	3.0	4.6	7.2	9.1	13.0	17.5	22.9	29.0	33.5	
	Rated cur	rent (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)	23.0 (19.6)	35.0 (29.8)	41.0 (34.9)	45.0 (38.3)	60.0 (51.0)	
	*7	ND	1.6 (1.4)	2.6 (2.2)	4.0 (3.8)	6.0 (5.4)	9.5 (8.7)	12.0	17.0	23.0	30.0	38.0	44.0		
Output	Overload curre	ant rating *3	LD	120% 60	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C										
	ND ND			150% 60	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C										
	Voltage *4 Brake transistor			Three-ph	Three-phase 380 to 480 V										
		sistor	Built-in	ruilt-in											
	Regenerative braking	Maximum torqu (ND refere	е	100%		50%	20%								
		AC (DC) vol	tage/	Three-ph	ase 380 to	480 V 50/	60 Hz (537	to 679VD	C *9)						
		AC (DC) vol	tage	323 to 528 V, 50/60 Hz (457 to 740VDC *9)											
	Permissible fr	equency fluc	tuation	±5%											
		Without	LD	3.3	6.0	8.9	10.7	16.2	24.9	32.4	46.7	54.2	59.1	75.6	
Power	Rated input	DC reactor	ND	2.7	4.4	6.7	9.5	14.1	17.8	24.7	32.1	41.0	50.8	57.3	
supply	current (A) *8	With DC	LD	2.1	3.5	5.5	6.9	11.0	18.0	23.0	35.0	41.0	45.0	60.0	
		reactor	ND	1.6	2.6	4.0	6.0	9.5	12.0	17.0	23.0	30.0	38.0	44.0	
	_	Without	LD	2.5	4.5	6.8	8.2	12.4	19.0	25.0	36.0	42.0	45.0	58.0	
	Power supply capacity	DC reactor	ND	2.1	3.4	5.1	7.2	10.8	14.0	19.0	25.0	32.0	39.0	44.0	
	(kVA) *6	With DC	LD	1.6	2.7	4.2	5.3	8.5	13.0	18.0	27.0	31.0	34.0	46.0	
	, ,	reactor	ND	1.2	2.0	3.0	4.6	7.2	9.1	13.0	18.0	23.0	29.0	34.0	
Pr	Protective structure (IEC 60529)				Open type (IP20)										
	Cooling system					Forced a	ir								
	Approx. mass (kg)				1.2	1.4	1.8	1.8	2.4	2.4	4.8	4.9	11.0	11.0	

♦ Single-phase 200 V class

	Model FR-E	:020C II		8000	0015	0030	0050	0800	0110		
	Wiodel FR-E	:0203-[]		0.1K	0.2K	0.4K	0.75K	1.5K	2.2K		
Applica	able motor capa	city (kW)*1	ND	0.1	0.2	0.4	0.75	1.5	2.2		
	Rated capaci	ty (kVA)*2	ND	0.3	0.6	1.2	3.2	4.4			
	Rated curre	ent (A)*7	ND	0.8 (0.8)	1.5 (1.4)	3.0 (2.5)	5.0 (4.1)	8.0 (7.0)	11.0 (10.0)		
	Overload curre	ent rating*3	ND		s, 200% 3 ing air tem		time chara f 50°C	acteristics)	at		
Output	Vo	oltage*4		Three-ph	ase 200 to	240 V					
		Brake tran	sistor	Not insta	lled	Built-in					
	Regenerative braking	brake e nce)*5	150%		100%		50%	20%			
	Rated input AC voltage/frequency				nase 200 to	240 V 50	/60 Hz				
	Permissible A	C voltage fluo	tuation	170 to 26	4 V, 50/60	Hz					
	Permissible fr	equency fluc	tuation	±5%							
Power	Rated input	Without DC reactor	ND	2.3	4.1	7.9	11.2	17.9	25.0		
supply	current (A)*8	With DC reactor	מא	1.4	2.6	5.2	8.7	13.9	19.1		
	Power supply	Without DC reactor	ND	0.5	0.9	1.7	2.5	3.9	5.5		
	capacity (kVA)*6 With DC reactor				0.6	1.1	1.9	3.0	4.2		
Pr	rotective structu	re (IEC 6052	9)	Open typ	e (IP20)	-	-	-			
	Cooling s	ystem		Natural Forced air							
	Approx. ma		0.5	0.5	0.8	1.3	1.4	1.9			

Single-phase 100 V class

	Madal ED E	04004/ []		8000	0015	0030	0050	
	Model FR-E	810W-[]	0.1K	0.2K	0.4K	0.75K		
Applica	ble motor capa	city (kW)*1	0.1	0.2	0.4	0.75		
	Rated capaci	ty (kVA)*2	ND	0.3	0.6	1.2	2.0	
	Rated curre	ent (A)*7	ND	0.8 (0.8)	1.5 (1.4)	3.0 (2.5)	5.0 (4.1)	
Output	Overload curre	ent rating*3	ND	character	s, 200% 3 istics) at source of 50°C			
	Volt		Three-ph	Three-phase 200 to 240 V				
	Brake transisto		sistor	Not instal	led	Built-in		
	Regenerative braking	Maximum torqu (ND refere	е	150%		100%		
	Rated input A	C voltage/fre	quency	Single-phase 100 to 120 V 50/60 Hz				
Power	Permissible A	voltage fluc	tuation	90 to 132	V, 50/60 F	łz		
supply	Permissible fr	equency fluc	tuation	±5%				
	Rated input cu	rrent (A) *8	ND	3.7	6.8	12.4	19.6	
Pr	otective structu	re (IEC 60529	9)	Open typ	e (IP20)			
	Cooling s		Natural					
	Approx. ma	ass (kg)		0.5	0.6	8.0	1.4	

- The maximum output violage does not exceed the power supply votage, it is maximum output side of the inverter is approximately the power supply votage multiplied by 7.5.

 The amount of braking torque is the average short-term forque (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 regionerative 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 bull-total continuous region of the region of

6.2 Inverter installation environment

iteiii	Description	
Surrounding air temperature *1	-20°C to +60°C (The rated current must be reduced at a temperature above 50°C. For details, refer to the FR-E800 Instruction Manual (Connection). 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 60721-3-3:1994 3C2 compatible)) 90% RH or less (non-condensing) (Without circuit board coating)	Inverter Measurement position 5 cm 5 cm
Storage temperature	-40°C to +70°C	Measurement 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 in the	rated current per 500 m increase in altitude.)
*1	Surrounding air temperature is a temperature measured at a measurement position in an enclosure. Ambient temperature is a temperature or	utside an enclosure.

7 APPENDIX

For information on other applicable standards not found in this document, refer to the FR-E800 Instruction Manual (Connection).

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

♦ EMC Directive

- 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 (Category "C3" / Second 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 measure and ensure the conformity of the inverter used in the residential area. Radio frequency interference is expected if used on such a network
- Notes

 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 and controller cable found in the EMC Installation Guidelines (BCN-A21041-204) and Technical News (MF-S-175 and 176) 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
- · 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)
- Wire the earth terminal independently. (Do not connect two or more cables to one terminal.)
- Select appropriate wire according to EN 60204-1 or IEC 60364-5-52. (Refer to the selection examples of cable sizes in 2.3 Applicable cables and wiring length.)

 Use a timed (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 cables.
- Use PVC cables for I/O wiring.

 Use the molded case circuit breaker and magnetic contactor which conform to the EN or IEC 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 for protection against electric shock and fire.

Attach the fan cover to the fan with the fan cover fixing screws enclosed with the inverter. FR-E820-0080(1.5K) to 0330(7.5K) Fan cover FR-E840-0040(1.5K) to 0170(7.5K) FR-E840-0040(1.5K) to 0170(7.5K) FR-E840-0040(1.5K) to 170(7.5K) FR-E840-0230(11K) or higher FR-E840-0330(11K) or higher FR-E840-0440(11K) or higher FR-E840(11K) or highe Fan cover fixing screws FR-E820S-0080(1.5K) or higher Fan cover

♦ Fuse selection for branch circuit protection

Inverter model	Cat. No	Manufacturer	Rating	Inverter model	Cat. No	Manufacturer	Rating
FR-E820-0008(0.1K), 0015(0.2K)	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A	FR-E840-0095(3.7K)	170M1414, 170M1314 or 170M1364	Bussmann	700 V, 50 A
FR-E820-0030(0.4K)	170M1409, 170M1309 or 170M1359	Bussmann	700 V, 16 A	FR-E840-0120(5.5K), 0170(7.5K)	170M1416, 170M1316 or 170M1366	Bussmann	700 V, 80 A
FR-E820-0050(0.75K)	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A	FR-E840-0230(11K)	170M1419, 170M1319 or 170M1469	Bussmann	700 V, 160 A
FR-E820-0080(1.5K)	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A	FR-E840-0300(15K)	170M1419, 170M1319 or 170M1469	Bussmann	700 V, 160 A
FR-E820-0110(2.2K)	170M1414, 170M1314 or 170M1364	Bussmann	700 V, 50 A	FR-E840-0380(18.5K)	170M1420, 170M1320 or 170M1370	Bussmann	700 V, 200 A
FR-E820-0175(3.7K)	170M1416, 170M1316 or 170M1366	Bussmann	700 V, 80 A	FR-E840-0440(22K)	170M1421, 170M1321 or 170M1471	Bussmann	700 V, 250 A
FR-E820-0240(5.5K)	170M1418, 170M1318 or 170M1368	Bussmann	700 V, 125 A	FR-E820S-0008(0.1K)	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A
FR-E820-0330(7.5K)	170M1419, 170M1319 or 170M1369	Bussmann	700 V, 160 A	FR-E820S-0015(0.2K)	170M1409, 170M1309 or 170M1359	Bussmann	700 V, 16 A
FR-E820-0470(11K)	170M1420, 170M1320 or 170M1370	Bussmann	700 V, 200 A	FR-E820S-0030(0.4K)	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A
FR-E820-0600(15K)	170M1421, 170M1321 or 170M1471	Bussmann	700 V, 250 A	FR-E820S-0050(0.75K)	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A
FR-E820-0760(18.5K)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A	FR-E820S-0080(1.5K)	170M1415, 170M1315 or 170M1365	Bussmann	700 V, 63 A
FR-E820-0900(22K)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A	FR-E820S-0110(2.2K)	170M1417, 170M1317 or 170M1367	Bussmann	700 V, 100 A
FR-E840-0016(0.4K)	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A	FR-E810W-0008(0.1K)	170M1409, 170M1309 or 170M1359	Bussmann	700 V, 16 A
FR-E840-0026(0.75K)	170M1410, 170M1310 or 170M1360	Bussmann	700 V, 20 A	FR-E810W-0015(0.2K)	170M1410, 170M1310 or 170M1360	Bussmann	700 V, 20 A
FR-E840-0040(1.5K)	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A	FR-E810W-0030(0.4K)	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A
FR-E840-0060(2.2K)	170M1312, 170M1362 or 170M1412	Bussmann	700 V, 32 A	FR-E810W-0050(0.75K)	170M1415, 170M1315 or 170M1365	Bussmann	700 V, 63 A

For details, refer to 7.2 Instructions for UL and cUL: Motor overload protection.

◆ EU RoHS Directive e declared that our inverters are compliant to the EU RoHS Directive and affix the CE marking on the inverters

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

7.2 Instructions for UL and cUL

(Standard to comply with: UL 61800-5-1, CSA C22.2 No. 274)

♦ 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. -AVERTISSEMENT-

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 Veuilles troccestre les recourses de la connexion destiné à être utilisé avec ce produit Veuilles troccestre les recourses de la connexion destiné à être utilisé avec ce produit Veuilles troccestre les recourses de la connexion destiné à être utilisé avec ce produit veuilles troccestre les recourses de la connexion destiné à être utilisé avec ce produit veuilles troccestres de la connexion destiné à être utilisé avec ce produit veuilles troccestres de la connexion de la Directive de sécurité et le Manuel d'instructions (connexion) destiné à être utilisé avec ce produit veuilles troccestres de la connexion de la Directive de sécurité et le Manuel d'instructions (connexion) destiné à être utilisé avec ce produit veuilles troccestres de la connexion de la connexion de la connexion de la connexion destiné à être utilisé avec ce produit veuille processité de la connexion destiné à être utilisé avec ce produit veuille de la connexion d L'unisation de produit l'écressite des instituctions derainées d'instructions (Connexion) destiné à être utilisé avec ce produit. Veuillez transmettre les manuels correspondants à l'utilisateur final. Les manuels peuvent é 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, use the branch circuit protection equipment specified in Technical News MF-S-187, in accordance with the National Electrical Code and any applicable local codes.

For installation in Canada, use the branch circuit protection equipment specified in Technical News MF-S-187, in accordance with the Canadian Electrical Code and

Early application control colors.

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 additional local codes.

The installation/operation manual is available via the internet at https://www.mitsubishielectric.com/fa/products/drv/inv/support/e800/e800.html.

A hard copy of this information may be ordered at +1 (847) 478-2100 (Mitsubishi Electric Automation, Inc. in USA).

• 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).

♦ 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 power OFF, and it is dangerous. ATTENTION - Risque de choc électrique -

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 (R/L1, 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.

ne following table shows examples when the inverter rating is 125% of the LD rating, when the cable is the THHW cable with continuous m temperature of 75°C, when the surrounding air temperature is 40°C or less, and when the wiring length is 20 m or shorter.

		l	Crimp termi	inal	AWG		
Applicable inverter model	Terminal screw size	(N·m)	Crimp terms	iiiai			
		(,	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-NK4	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-E820-0470(11K)	M5	2.5	38-S5	22-5	3	4	
FR-E820-0600(15K)	M6(M5)	4.4	38-S6	38-S6	2	3	
FR-E820-0760(18.5K)	M8(M6)	7.8	60-8	38-8	1/0	2	
FR-E820-0900(22K)	M8(M6)	7.8	60-8	60-8	1/0×2	1/0	
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-NK4	5.5-4	8	10	
FR-E840-0230(11K)	M4	1.5	14-4	8-4	6	8	
FR-E840-0300(15K)	M5	2.5	22-S5	14-5	4	6	
FR-E840-0380(18.5K)	M6	4.4	22-6	14-6	4	6	
FR-E840-0440(22K)	M6	4.4	38-6	22-6	3	4	

*1 The screw size for terminals RL1, SL2, TL3, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) terminal is shown. The screw size for the earthing (grounding) terminal is shown. The screw size for the earthing (grounding) terminal is shown.

The following table shows examples when the inverter rating is 125% of the ND rating, when the cable is the THHW cable with continuous maximum per temperature of 75°C, when the surrounding air temperature is 40°C or less, and when the wiring length is 20 m or shorter.

			Crimp terminal		Cable gauge AWG		
Applicable inverter model	Terminal screw size	Tightening torque (N·m)					
	· ·	(14 111)	R/L1, S/L2	U, V, W	R/L1, S/L2	U, V, W	
FR-E820S-0008(0.1K) to 0030(0.4K)	M3.5	1.2	2-3.5	2-3.5	14	14	
FR-E820S-0050(0.75K)	M4	1.5	2-4	2-4	14	14	
FR-E820S-0080(1.5K)	M4	1.5	5.5-4	2-4	10	14	
FR-E820S-0110(2.2K)	M4	1.5	8-NK4	2-4	8	14	
FR-E810W-0008(0.1K), 0015(0.2K)	M3.5	1.2	2-3.5	2-3.5	14	14	
FR-E810W-0030(0.4K)	M3.5	1.2	5.5-S3	2-3.5	12	14	
FR-E810W-0050(0.75K)	M4	1.5	5.5-4	2-4	10	14	

For the single-phase 200 V power input models, the screw size for terminals R/I, S/I, 2, I, V, W, PR, Pt, N, and P1, and the earthing (grounding) terminal is shown. For the single-phase 100 V power input models, the screw size for terminals R/I, I, S/I, Z, I, V, W, PR, Pt, and N+, and the earthing (grounding) terminal is shown.

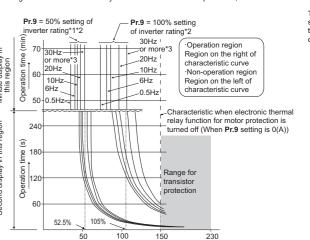
- Short circuit ratings

 100 V class: Suitable for use in a circuit capable of delivering not more than 65 kA rms symmetrical amperes, 120 V maximum.

 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. When using the electronic thermal relay function as motor overload protection, set the rated motor current in Pr.9 Electronic thermal O/L relay.



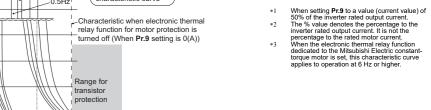
This function detects the overload (overheat) of the motor and shut off the inverter output by stopping the operation of the transistor at the inverter output side. (The operation characteristic is shown on the left.)

• When using the Mitsubishi Electric constant-torque mote

1) Set one of "10, 13, 15, 16, 50, 53, 70, 73, 1800, or

1803" in Pr.71. (This setting enables the 100%

- constant-torque characteristic in the low-speed range.) Set the rated motor current in Pr.9.



 The internal accumulated 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-OFF.

Install an external thermal relay (OCR) between the inverter and motors to operate several motors, a multi-pole motor or a dedicated motor with one inverte When configuring an external thermal relay, note that the current indicated on the motor rating plate is affected by the line-to-line leakage 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 inverter and motor capacities is large and the set value is small, the protective characteristics of the electronic thermal relay function will be deteriorated. Use an external thermal relay in such cases.

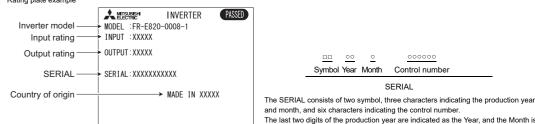
The cooling effect of the motor drops during low-speed operation. Use a motor with built-in thermal protector.
 A dedicated motor cannot be protected by the electronic thermal relay. Use an external thermal relay.

When using a Vector-control-dedicated motor (SF-V5RU) with built-in thermal protector, set Pr.9 = "0" if another thermal protector is connected.

Motor over temperature sensing is not provided by the drive. The electronic thermal memory retention function is not provided by the drive.

7.3 SERIAL number check

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





and month, and six characters indicating the control number.

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

7.4 EU ErP Directive (Ecodesign Directive)

The following table shows the power loss data according to Ecodesign Directive. The regulation covers 3-phase variable speed drives from $0.12~\text{kW} \le Pn \le 1~000~\text{kW}$. (LD rated / ND rated)

Model name	Apparent power (kVA)	by loss (W)	load point 1 (90;100) (%)	load point 2 (50;100) (%)	load point 3 (0;100) (%)	load point 4 (90;50) (%)	load point 5 (50;50) (%)	load point 6 (0;50) (%)	load point 7 (50;25) (%)	load point 8 (0;25) (%)	IE class
FR-E820-0015(0.2K)	0.8 / 0.6	5.1	3.1 / 3.2	3.1 / 3.2	3.1 / 3.3	2.6 / 2.8	2.6 / 2.8	2.6 / 2.8	2.5 / 2.7	2.5 / 2.8	IE2
FR-E820-0030(0.4K)	1.4 / 1.2	5.1	2.9 / 2.9	2.9 / 2.9	3.0 / 2.9	2.3 / 2.3	2.3 / 2.3	2.4 / 2.4	2.3 / 2.3	2.3 / 2.3	IE2
FR-E820-0050(0.75K)	2.4 / 2	5.1	2.7 / 2.6	2.7 / 2.6	2.7 / 2.7	1.8 / 1.8	1.8 / 1.8	1.8 / 1.8	1.5 / 1.5	1.5 / 1.5	IE2
FR-E820-0080(1.5K)	3.8 / 3.2	9.2	2.7 / 2.6	2.7 / 2.6	2.7 / 2.7	1.8 / 1.8	1.8 / 1.8	1.9 / 1.9	1.5 / 1.5	1.5 / 1.5	IE2
FR-E820-0110(2.2K)	4.8 / 4.4	9.2	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	1.7 / 1.7	1.7 / 1.7	1.7 / 1.7	1.4 / 1.4	1.4 / 1.4	IE2
FR-E820-0175(3.7K)	7.8 / 7	10.2	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	1.7 / 1.7	1.7 / 1.7	1.7 / 1.7	1.4 / 1.3	1.4 / 1.4	IE2
FR-E820-0240(5.5K)	12 / 9.6	16.9	2.4 / 2.3	2.4 / 2.3	2.4 / 2.3	1.3 / 1.3	1.3 / 1.3	1.3 / 1.3	1.0 / 1.0	1.0 / 1.0	IE2
FR-E820-0330(7.5K)	15.9 / 13.1	16.9	2.4 / 2.3	2.4 / 2.3	2.4 / 2.3	1.3 / 1.3	1.3 / 1.3	1.3 / 1.3	0.9 / 0.9	0.9 / 0.9	IE2
FR-E820-0470(11K)	22.3 / 18.7	28.9	2.2 / 2.2	2.2 / 2.2	2.2 / 2.2	1.2 / 1.2	1.2 / 1.2	1.2 / 1.2	0.9 / 0.9	0.9 / 0.9	IE2
FR-E820-0600(15K)	27.5 / 23.9	28.9	2.3 / 2.2	2.3 / 2.2	2.3 / 2.2	1.2 / 1.2	1.2 / 1.2	1.2 / 1.2	0.9 / 0.9	0.9 / 0.9	IE2
FR-E820-0760(18.5K)	35.1 / 30.3	23.0	2.3 / 2.3	2.3 / 2.2	2.3 / 2.2	1.2 / 1.2	1.2 / 1.2	1.2 / 1.2	0.9 / 0.9	0.9 / 0.9	IE2
FR-E820-0900(22K)	45.8 / 35.9	23.0	2.5 / 2.3	2.5 / 2.3	2.5 / 2.3	1.3 / 1.2	1.3 / 1.2	1.3 / 1.2	0.9 / 0.9	0.9 / 0.9	IE2
FR-E840-0016(0.4K)	1.6 / 1.2	5.7	2.2 / 2.2	2.1 / 2.2	2.2 / 2.2	1.8 / 1.9	1.8 / 1.9	1.8 / 1.9	1.7 / 1.8	1.8 / 1.9	IE2
FR-E840-0026(0.75K)	2.7 / 2	5.7	2.2 / 2.0	2.1 / 2.0	2.2 / 2.0	1.4 / 1.5	1.4 / 1.4	1.4 / 1.5	1.2 / 1.2	1.2 / 1.2	IE2
FR-E840-0040(1.5K)	4.2 / 3	9.7	2.1 / 2.0	2.1 / 2.0	2.1 / 2.0	1.4 / 1.4	1.4 / 1.4	1.4 / 1.4	1.2 / 1.2	1.2 / 1.2	IE2
FR-E840-0060(2.2K)	5.3 / 4.6	9.8	1.8 / 1.8	1.8 / 1.8	1.8 / 1.8	1.3 / 1.3	1.3 / 1.3	1.3 / 1.3	1.1 / 1.1	1.1 / 1.1	IE2
FR-E840-0095(3.7K)	8.5 / 7.2	9.8	1.7 / 1.7	1.7 / 1.7	1.7 / 1.7	1.2 / 1.2	1.2 / 1.2	1.2 / 1.2	1.0 / 1.1	1.0 / 1.1	IE2
FR-E840-0120(5.5K)	13.3 / 9.1	14.5	1.7 / 1.6	1.6 / 1.6	1.7 / 1.6	0.9 / 0.9	0.9 / 0.9	0.9 / 0.9	0.7 / 0.7	0.7 / 0.7	IE2
FR-E840-0170(7.5K)	17.5 / 13	14.5	1.7 / 1.6	1.7 / 1.6	1.7 / 1.6	0.9 / 0.9	0.9 / 0.9	0.9 / 0.9	0.7 / 0.7	0.7 / 0.7	IE2
FR-E840-0230(11K)	26.7 / 17.5	26.5	1.7 / 1.6	1.7 / 1.6	1.7 / 1.6	0.9 / 0.9	0.9 / 0.9	0.9 / 0.9	0.7 / 0.7	0.7 / 0.7	IE2
FR-E840-0300(15K)	31.2 / 22.9	26.5	1.7 / 1.6	1.7 / 1.6	1.7 / 1.6	0.9 / 0.9	0.9 / 0.9	0.9 / 0.9	0.7 / 0.7	0.7 / 0.7	IE2
FR-E840-0380(18.5K)	34.3 / 29	26.5	1.6 / 1.2	1.6 / 1.2	1.6 / 1.2	0.9 / 0.7	0.9 / 0.7	0.9 / 0.7	0.7 / 0.5	0.7 / 0.5	IE2
FR-E840-0440(22K)	45.7 / 33.5	26.5	1.3 / 1.2	1.3 / 1.2	1.3 / 1.2	0.7 / 0.7	0.7 / 0.7	0.7 / 0.7	0.5 / 0.5	0.5 / 0.5	IE2

8 WARRANTY

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

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.