

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

Please forward this Safety Guideline to the end user.

Model	FR-E800-E GAIYOU SETUMEI EIBUN
Model code	1AJ033

IB-0600860ENG-J(2405)MEE

INVERTER SAFETY GUIDELINE FR-E820-0008(0.1K) to 0900(22K)E FR-E840-0016(0.4K) to 0440(22K)E

FR-E820S-0008(0.1K) to 0110(2.2K)E

FR-E810W-0008(0.1K) to 0050(0.75K)E

MITSUBISHI ELECTRIC CORPORATION

Related manuals

Manual name	Manual number	Model code	Details
FR-E800 Instruction Manual (Connection)	IB-0600865ENG	1AJ048	$\label{thm:manuals} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
FR-E800 Instruction Manual (Function)	IB-0600868ENG	1AJ045	Manual describing details of the functions.
FR-E800 Instruction Manual (Communication)	IB-0600871ENG	1AJ051	Manual describing details of the communications.
FR-E800 Instruction Manual (Maintenance)	IB-0600874ENG	1AJ054	Manual describing how to identify causes of faults and warnings.
FR-E800 Instruction Manual (Functional Safety)	BCN-A23488-000	1AJ030	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.
<u>-</u>	•	•	

Do not attempt to install, operate, maintain or inspect this product until you have read through this Safety Guideline and supplementary document carefully to use the equipment correctly. Do not use the product until you have full knowledge of the product mechanism, safety information and nstallation, operation, maintenance and inspection must be performed by qualified personnel. Here, qualified personnel means a person who meets a

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 Mitsubishi 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"

↑CAUTION

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

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

Note that even the CAUTION level may lead to a serious consequence depending on conditions. Be sure to follow the instructions of both

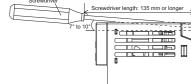
Read this Guideline before use. In addition, scan the 2D code below to download the FR-E800 Instruction Manual (Connection) and read "Safety Instructions" The PDF manual can also be downloaded from the Mitsubishi Electric FA Global Website.



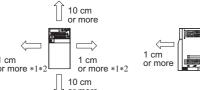
INVERTER INSTALLATION AND PRECAUTIONS

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
- 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)
- or lower, FR-E810W-0030(0.4K) or lower).



Allow clearance



When using the inverters at the surrounding air temperature of 40°C or less, the inverters can be installed closely attached (0 cm clearance). For the FR-E820-0470(ItK) or higher and FR-E840-0420(ItK) or higher, allow 5 cm

2 INSTALLATION AND WIRING

Removal and reinstallation of covers

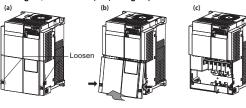
(a) Loosen the mounting screws of the cover. (These screws cannot be

(b) Pull out the cover using its lower side as a support.

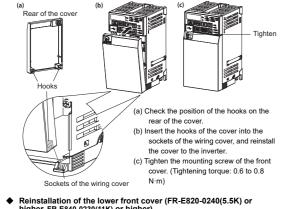
the plug-in option can be installed.

With the cover removed, the control circuit terminals can be wired and

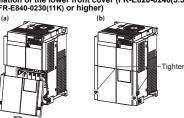
♦ Removal of the lower front cover (FR-E820-0240(5.5K) or higher, FR-E840-0230(11K) or higher)



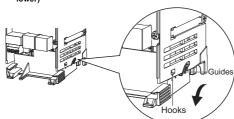
- (b) While holding the areas around the installation hooks on the sides of the (b) Tighten the screws on the lower part of the lower front cover lower front cover, pull out the cover using its upper side as a support. (c) With the lower front cover removed, wiring of the main circuit terminals and control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



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



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



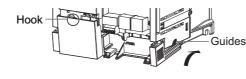
Reinstallation of the wiring cover (FR-E820-0050(0.75K) or lower, FR-E820S-0030(0.4K) or lower, FR-E810W-0030(0.4K) or lower)

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), FR-E820S-0050(0.75K) or higher, FR-E810W-



Reinstallation 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), FR-E820S-0050(0.75K) or higher, FR-E810W-0.75K(0050))



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



(b) Pull out the cover along the guides in the direction shown by the arrow in the figure above.



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

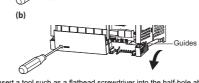
Wiring cover

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-E840-0120(5.5K), 0170(7.5K))

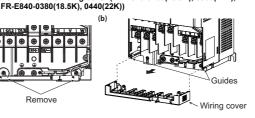
 Reinstallation of the wiring cover (FR-E840-0120(5.5K), 0170(7.5K))

Fit the cover to the inverter along the guides



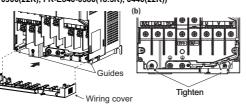
- (a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the stopper behind the wiring cover approx. 3 mm.
- (b) Pull out the cover along the guides in the direction shown by the arrow in the figure above.

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



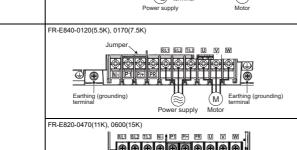
(a) Remove the mounting screws of the wiring cover.

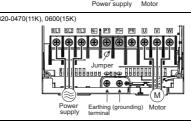
♦ Reinstallation of the wiring cover (FR-E820-0760(18.5K), 0900(22K), FR-E840-0380(18.5K), 0440(22K))

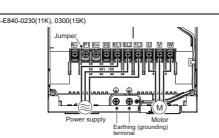


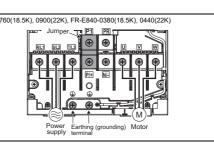
(a) Fit the cover to the inverter along the guides. (b) Pull out the cover along the guides in the direction shown by the arrow in the figure above. (b) Tighten the mounting screws of the wiring cover (tightening torque: 0.6 to 0.8 N·m).

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

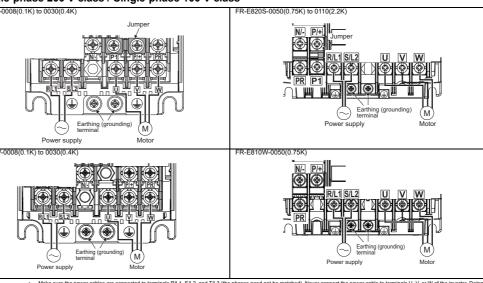








♦ Single-phase 200 V class / Single-phase 100 V class



Applicable cables and wiring length mended 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

			0-1					Cubic	guuge			
Applicable Inverter	Terminal	Tightening	Crimp	Crimp terminal		ables, etc	. (mm²) *1	AW	G *2	PVC c	ables, etc	c. (mm²) *3
model	screw size *4	torque 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
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
R-E820-0470(11K)	M5	2.5	14-5	14-5	14	14	8	6	6	16	16	16
FR-E820-0600(15K)	M6(M5)	4.4	22-6	22-6	22	22	14	4	4	25	25	16
FR-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
FR-E840-0230(11K)	M4	1.5	5.5-4	5.5-4	5.5	5.5	5.5	10	10	6	6	10
FR-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
FR-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
FR-E810W-0050(0.75K)	M4	1.5	5.5-4	2-4	3.5	2	2	14	14	2.5	2.5	2.5

ant PVC insulated wire) with a continuous maximum permissible temperature of 75°C. It is assumed that the cables will be used in a surrounding air temperature of 20 m or phaster.

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 imperatured or 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 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 to the section 7.2 "Instructions for UL and CUL".)

shorter (selection example mainly for use in Europe).

The screw size for terminals R/L1, S/L2, T/L3, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) te terminals R/L1, S/L2, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) terminal is shown. For the terminals R/L1, S/L2, U, V, W, PK, P/+, Nr., anu r r , and une subsequence (PR, Pf., and Nf. and Nf. and the earthing (grounding) terminal is shown. The screw size fit When using a single-phase power input model, terminals are R/L1 and S/L2.

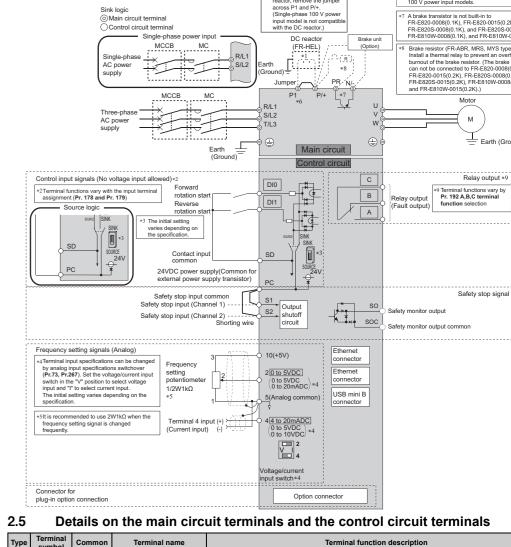
The line voltage drop can be calculated by the following formula:

- 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 Willing let	igui											
Connect one or more	onnect 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.											
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			
Shielded *1	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)						
		400 V	_	_	50 m (200 m)	50 m (200 m)	75 m (300 m)	100 m (500 m)	100 m (500 m)			
	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)			
	- (- 1112) - 111g	400 V	_	_	10 m (30 m)	25 m (100 m)	50 m (200 m)	75 m (300 m)	100 m (500 m)			

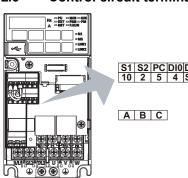
when the wiring length is 50 m or shorter, "8 kHz or less" when the wiring length is from 50 m to 100 m, or "2 kHz or less" when the wiring length is longer than 100 m.

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" Terminal connection diagram



		R/L1, S/L2, T/L3*1	_	AC power input	Connected to the commercial power supply. factor converter (FR-HC2) or the multifunction		
		U, V, W	_	Inverter output	Connected to a three-phase squirrel cage	motor or a PM motor.	
	'n	P/+, PR	_	Brake resistor connection	Connect an optional brake transistor (MRS E820-0008(0.1K), FR-E820-0015(0.2K), F 0008(0.1K), and FR-E810W-0015(0.2K).)	R-E820S-0008(0.1K), and FR-E820S-	
	Main circuit	P/+, N/-	_	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU, factor converter (FR-HC2) to these termin		verter (FR-XC), or high power
:	ž	P/+, P1*2	_	DC reactor connection	Remove the jumper across terminals P/+ at the single-phase 100 V power input mode + and P1 should not be removed.		
			_	Earth (ground)	For earthing (grounding) the inverter chas	sis. Be sure to earth (ground) the inver	ter.
	t input	DI0*3	SD (sink (negative common))	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
	Contact	DI1*3	PC (source (positive common))	Reverse rotation start	Turn ON the DI1 signal to start reverse rotation and turn it OFF to stop.	turned ON simultaneously, the stop command is given.	Current when contacts are short-circuited: 4 to 6 mADC
		10	5	Power supply for a frequency setting potentiometer	Used as the power supply for an external potentiometer.	frequency setting (speed setting)	5 ±0.5 VDC, Permissible load current: 10 mA
Input signal	setting	2	5	Frequency setting (voltage)	Inputting 0 to 5 VDC (or 0 to 10 VDC) prov 5 V (or 10 V) and makes input and output among input 0 to 5 VDC (initial setting), 0 setting varies depending on the specificati Set the voltage/current input switch to the 20 mA).	proportional. Use Pr.73 to switch to 10 VDC, and 0 to 20 mA. The initial ion.	For voltage input, Input resistance: 10 to 11 kΩ
	Frequency setting	4	5	Frequency setting (current)	Inputting 4 to 20 mADC (or 0 to 5 VDC, 0 output frequency at 20 mA and makes inp signal is valid only when the AU signal is to the terminal 4 (current input at initial settin (Input terminal function selection) befor setting varies depending on the specifical Use Pr.267 to switch among input 4 to 20 to 10 VDC. Set the voltage/current input s voltage input (0 to 5 V / 0 to 10 V).	ut and output proportional. This input DN (terminal 2 input is invalid). To use ig), assign "4" to Pr.178 or Pr.179 turning ON the AU signal. The initial ion A (initial setting), 0 to 5 VDC, and 0	Maximum permissible voltage: 20 VDC For current input, Input resistance: 245 ±5 Ω Permissible maximum current: 30 mA
Output signal	Relay	A, B, C	_	Relay output (fault output)	1 changeover contact output indicates tha activated and the outputs are stopped. Fault: discontinuity across B and C (contin- continuity across B and C (discontinuity across B)	nuity across A and C), Normal:	Contact capacity: 240 VAC 2A (power factor = 0.4) or 30 VDC 1 A
		S1	PC	Safety stop input (Channel 1)	Use terminals S1 and S2 to receive the sa		Input resistance: 4.7 kΩ
:	Safety stop function	S2	PC	Safety stop input (Channel 2)	relay module. Terminals S1 and S2 can b Inverter judges the condition of the interns (shorted/opened) between terminals S1 at the status is opened, the inverter output is in the initial status, terminal S1 and S2 are wires. Remove the shorting wires and con using the safety stop function.	al safety circuit from the status nd PC, or between S2 and PC. When shut off. e shorted with terminal PC by shorting	Voltage when contacts are open: 21 to 26 VDC Current when contacts are short-circuited: 4 to 6 mADC
	Safety st	so	SOC	Safety monitor output (open collector output)	The output status varies depending on the The output is in HIGH state during occurre The output is in LOW state otherwise. '6 Refer to the FR-E800 Instruction Manual (I when the signal is switched to HIGH while (Please contact your sales representative	ence of the internal safety circuit fault. Functional Safety) (BCN-A23488-000) both terminals S1 and S2 are open.	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 ten	minal (sink logic).	
		SD	_	External transistor common (source (positive common))	Connect this terminal to the power supply such as a programmable controller, in the		
				24 VDC power supply common	Common output terminal for 24 VDC 0.1 A	A power supply (terminal PC). Isolated	from terminals 5 and SE.
	Common terminal			External transistor common (sink (negative common))	Connect this terminal to the power supply (open collector output) device, such as a plogic to avoid malfunction by undesirable (programmable controller, in the sink	
	nomm	PC	_	Safety stop input terminal common	Common terminal for safety stop input ten	minals	Power supply voltage range 22 to 26.5 VDC Permissible load current: 100
1	ŏ			Contact input common (source (positive common))	Common terminal for the contact input ten	minal (source logic).	mA
			SD	24 VDC power supply common	Can be used as a 24 VDC 0.1 A power su		
		5	_	Frequency setting common	Common terminal for the frequency setting	g signal (terminal 2 or 4). Do not earth	(ground).
		soc	-	Safety monitor output terminal common	Common terminal for terminal SO.		_
:	Communication	_	_	Ethernet connector (2 ports)*4	Communication can be made via Ethernel Category: 100BASE-TV10BASE-T Trat Data transmission speed: 100 Mbps (100 Maximum segment length: 100 m betwee Number of cascade connection stages: U Number of interfaces available: 1 · IP ver	nsmission method: Baseband DBASE-TX) / 10 Mbps (10BASE-T) en the hub and the inverter Interface: I Jp to 2 (100BASE-TX) / up to 4 (10BAS sion: IPv4	SE-T)
(Com	_	_	USB connector*5	Use the USB connector to communicate v enabled using FR Configurator2. · Interface: conforms to USB 1.1· Transmi · Connector: USB mini B connector (recep	ssion speed: 12 Mbps	nonitoring of the inverter is
		*1 *2 *3	Terminal T/L3 Terminal P1 i Terminal fund	is not available for the single-phase pour s not available for the single-phase 100 vitions can be selected using Pr 178 and	wer input models. V power input models. Pr.179 (Input terminal function selection). (Refer to	the FR-E800 Instruction Manual (Function))	

2.6 Control circuit terminal layout



Use crimp terminals and stripped wire for the control circuit wiring. If only a single wire is used

Connect the end of wires (crimp terminal or stranded wire) to the terminal block

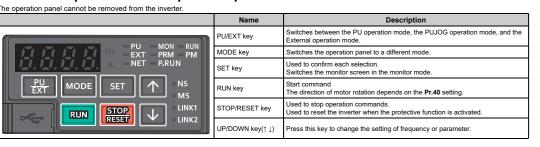
| S1 | S2 | PC | DI0 | DI1 | SD | Crimp terminals commercially available (as of April 2023.) | 10 | 2 | 5 | 4 | SO | SOC | Phoenix Contact Co. Ltd.

		Ferrule part No		Crimmina
Wire gauge (mm ²)	With insulation sleeve	Without insulation sleeve	For UL wire*1	Crimping tool model No.
0.3	AI 0,34-10TQ	_	_	
0.5	AI 0,5-10WH	_	AI 0,5-10WH-GB	
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	CRIMPFOX 6
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	_	_	

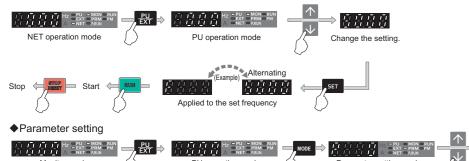
A ferrule terminal with an insulation sleeve compatible with the MTW wire which has a thick wire insulation. Applicable for terminals A, B, C.

3 BASIC OPERATION

Components of the operation panel



◆Starting/stopping the inverter on the operation panel



Parameter setting complete Change the setting. Parameter setting complete Change the setting. 4 PARAMETERS

5 LIST OF FAULT DISPLAYS

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

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

	Model 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
Applies	ble motor capa	oity (k\M\) *4	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	bie illotor capat	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 capaci	6v (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
	Kateu Capaci	ty (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 curr	rent (A)	LD	1.3 (1.1)	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)
	*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)	17.5 (16.5)	24.0 (23.0)	33.0 (31.0)	47.0 (44.0)	60.0 (57.0)	76.0 (72.0)	90.0 (86.0)
Output	Overload curre	ne vetine *2	LD	120% 60	s, 150%	3 s (invers	e-time ch	aracteristi	cs) at surr	ounding a	ir tempera	ture of 50	°C			
	Overload curre	ent rating "s	ND	150% 60	s, 200%	3 s (invers	e-time ch	aracteristi	cs) at surr	ounding a	ir tempera	ture of 50	°C			
	Vo	Itage *4		Three-ph	nase 200 t	o 240 V										
		Brake tran	sistor	Not insta	lled	Built-in										
	Regenerative braking Maximum brake torque (ND reference) *5					100%		50% 20%								
		AC (DC) vol	tage/	Three-ph	nase 200 t	o 240 V 5	0/60 Hz (2	83 to 339	VDC *9)							
		AC (DC) vol	tage	170 to 26	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
		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						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 0.5 0.8 1.3 2.3						2.3	3.7	4.6	7.5	11.0	15.0	21.0	26.0	34.0	44.0	
	reactor ND 0.3 0.6 1.1 1.9						1.9	3.0	4.2	6.7	9.1	13.0	18.0	23.0	29.0	34.0
	Protective s	tructure		Open typ	e (IP20 fo	r IEC 605	29 only)									
	Cooling s	ystem		Natural				Forced a	iir							
	Approx. ma	ass (kg)		0.5	0.5	0.7	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-	E040 II		0016	0026	0040	0060	0095	0120	0170	0230	0300	0380	0440
	Wodel FK-	⊏040-[]		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K	18.5K	22K
Annlica	able motor capa	city (kW/) *1	LD	0.75	1.5	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0
Applica	ible illotor capat	city (KVV)	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	tv (kVΔ) *2	LD	1.6	2.7	4.2	5.3	8.5	13.3	17.5	26.7	31.2	34.3	45.7
	rtatea capaci	ty (KVA) 2	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	ont rating *2	LD	120% 60	s, 150% 3	s (inverse	time chara	acteristics)	at surroun	ding air ter	mperature	of 50°C		
	Overload curre	ant rating 3	ND	150% 60	s, 200% 3	s (inverse	time chara	acteristics)	at surroun	ding air tei	mperature	of 50°C		
	Vo	oltage *4		Three-ph	ase 380 to	480 V								
		Brake tran	sistor	Built-in										
	Regenerative braking	Maximum												
	braking	(ND refere		100%		50%	20%							
		AC (DC) volt	age/	Three-ph	ase 380 to	480 V 50/	60 Hz (537	to 679VD	C *9)					
		AC (DC) vol	tage	323 to 52	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
	Protective s				e (IP20 for									
	Cooling s	ystem		Natural		Forced a					_			
	Approx. ma	ass (kg)		1.2	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	8205-11		8000	0015	0030	0050	0800	0110
	Wiodel I IV-L	.0200-[]		0.1K	0.2K	0.4K	0.75K	1.5K	2.2K
Applica	ble 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	2.0	3.2	4.4
	Rated cur	rent (A)	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)
Output	Overload curre	ent rating *3	ND		s, 200% 3 ing air tem		racteristics) at		
Output	Vo	ltage *4		Three-ph	ase 200 to	240 V			
		Brake tran	sistor	Not instal	led	Built-in		•	
	Regenerative braking Maximum brake torque (ND reference) *5			150% 100%				50%	20%
	Rated input A	C voltage/fre	quency	Single-ph	ase 200 to	240 V 50/	60 Hz		
	Permissible A0	C voltage fluo	uctuation 170 to 264 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	ND	1.4	2.6	5.2	8.7	13.9	19.1
	Power supply capacity	Without DC reactor	ND	0.5	0.9	1.7	2.5	3.9	5.5
	(kVA) *6	With DC reactor	140	0.3	0.6	1.1	1.9	3.0	4.2
	Protective s		Open typ	e (IP20 for	IEC 60529	only)			
	Cooling s	ystem		Natural	,	•	,	Forced a	ir
	Approx. ma	ass (kg)	·	0.5	0.5	0.8	1.3	1.4	1.9

♦ Single-phase 100 V class

	Model FR-E	04014/ [7]		8000	0015	0030	0050	
	Wodel FK-E	O I U WY-[]		0.1K	0.2K	0.4K	0.75k	
Applica	able motor capa	city (kW)*1	ND	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 so ure of 50°C	urrounding		
•	Volta	age*10*11		Three-ph	Three-phase 200 to 240 V			
		Brake tran	sistor	Not installed		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 H				
	Permissible A0	voltage fluc	tuation	90 to 132 V, 50/60 Hz				
Power	Permissible from	equency fluc	tuation	±5%				
supply	Rated input cu	rrent (A) *8	ND	3.7	6.8	12.4	19.6	
	Power supply (kVA)		ND	0.5	0.9	1.5	2.5	
	Protective s	tructure		Open typ	e (IP20 for	IEC 6052	9 only)	
	Cooling s	ystem		Natural				
	Approx. ma	iss (kg)		0.5	0.6	0.8	1.4	

- The amount of a language by the service of the serv
- in Pr.12 PWM frequency selection.

 The rated input current is the value at a railed output current. The input power impedances (including those of the input reactor and cables) affect the value.

 **Connect the DC power supply to the inverter terminals Pi+ and N.*. Connect the positive terminal of the power supply to terminal Pi+ and the negative terminal N When the energy is regenerated from the motor, the voltage between terminals Pi+ and N*- may temporary rise to 4.15 V or more (810 V or more to fit to 400 V class.) Use a DC power supply "New the pit of the voltage between terminals Pi+ and N*- may temporary rise to 4.15 V or more (810 V or more to fit to 400 V class.) Use a DC power supply "New the pit of the voltage between terminals Pi+ and N*- may temporary rise to 4.15 V or more (810 V or more to fit to 400 V class.) Use a DC power supply "New temporary to the voltage between terminals Pi+ and N*- may temporary rise to 4.15 V or more (810 V or more to fit to 400 V class.) Use a DC power supply "New temporary tem
- is provised in the FK-EBUS series inverter.

 The power capacity depends on the output impedance of the power supply. Select a power capacity around the AC power supply capacity. For the single-phase 100 V power input models, the maximum output voltage is twice the amount of the power supply voltage. For the single-phase 100 V power input models, update voltage for cereases by applying motor load, and output current increases compared to

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. 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
Storage temperature	-40°C to +70°C	5 cm → 5 cm Measurement yosition
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.

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 measures and ensure the conformity of the inverter used in the residential area Radio frequency interference is expected if used on such a network
- 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 compilant 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)
- securely.

 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 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 cables.

- 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-8 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 m 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-E840-0230(11K) or higher FR-E840-0230(11K) or higher FR-E840-0230(11K) or higher FR-E840-0230(11K) or higher Fan cover FR-E820S-0080(1.5K) or higher

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

When using the relay output terminals A, B, and C with voltage of 230 VAC, use a power supply classified as overvoltage category II specified in IEC 60664

♦ Fuse selection for branch circuit protection Use the following semiconductor fuses 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

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

♦ EU RoHS Directive
We have 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.

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 égalemen 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

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

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/e800e.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).

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.

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.

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

Applicable inverter model	L		Crimp terminal		Cable gauge AWG	
	Terminal screw size	(N·m)				
	· ·	(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-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 RiL1, SiL2, TiL3, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) terminal is shown. The screw size for the earthing (grounding) terminal on FR-E820-0600(15K) to FR-E820-0900(22K) is indicated in parentheses.

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.

Applicable inverter model	Terminal screw size		Crimp terminal		Cable gauge	
		Tightening torque (N·m)			AWG	
		(,	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

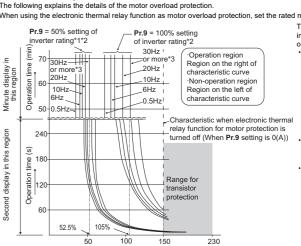
1 For the single-phase 200 V power input models, the screw size for terminals RL1, Sl.2, U, V, W, PR, Pt, N-1, and P1, and the earthing (grounding) terminal is shown. For the single-phase 100 V power input models, the screw size for terminals RL1, Sl.2, U, V, W, PR, Pt, + and N+, and the earthing (grounding) 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

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 motor

- 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 charact the low-speed range.)
- Set the rated motor current in Pr.9.
- When setting Pr3 to a value (current value) of 50% of the inverter rated output current.
 The % value denotes the percentage to the inverter rated output current.
 It is not the percentage to the rated motor current.
 When the electronic thermal relay function declared to the Mitsubishi Electric constant-torque motor is set, this characteristic curve applies to operation at 6 Hz or higher.
- 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 inverted 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
- 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.
- The electronic thermal relay function is not a speed sensing function.

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

ALTECHASH INVERTER PASSED MODEL :FR-E820-0008EPA Inverter model -Output rating — → OUTPUT:XXXXX → SERIAL:XXXXXXXXXXXXX → MADE IN XXXXX Country of origin

SERIAL number check

7.3

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)

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 kW $\leq Pn \leq 1000$ kW.

Model name	Rated Apparent power (kVA)	Stand 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

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

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