

INVERTER E800

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)

800

instructions



IB-0600857ENG-J(2405)MEE Specifications subject to change without notice.

MITSUBISHI ELECTRIC CORPORATION

Thank you for choosing Mitsubishi Electric inverter. This Inverter

use of this product. Do not use this product until you have full

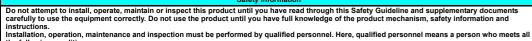
knowledge of the product mechanism, safety information and

Please forward this Safety Guideline to the end user.

Safety Guideline provides handling information and precautions for

Related manuals

Manual name	Manual number	Model code	Details
FR-E800 Instruction Manual (Connection)	IB-0600865ENG	1AJ048	Manuals describing installation, wiring, specifications, outline dimensions, standards, and how to connect options.
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.



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. 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. A WARNING

andling may cause hazardous conditions, resulting in medium or slight injury, or may cause only material

CAUTION level may lead to a serious consequence depending on conditions. Be sure to follow the instructions of both Note that even the 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". The PDF manual can also be downloaded from the Mitsubishi Electric FA Global Website



Allow clearance

inverter

Sockets of the wiring cover

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

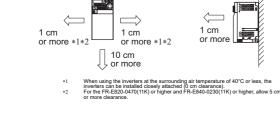
(a) Install the lower front cover by inserting the upper hooks into the sockets on the

INVERTER INSTALLATION AND PRECAUTIONS 1

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





(a) Check the position of the hooks on the

sockets of the wiring cover, and reinstall

cover. (Tightening torque: 0.6 to 0.8 $\textrm{N}{\cdot}\textrm{m})$

(b) Insert the hooks of the cover into the

(c) Tighten the mounting screws of the front

the cover to the inverter

rear of the cover.

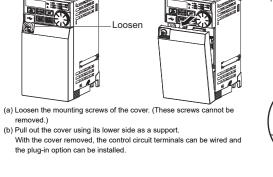
10 cm

or more

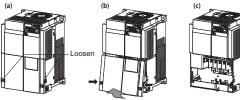
2 INSTALLATION AND WIRING

Removal and reinstallation of covers 2.1

oval of the front cove



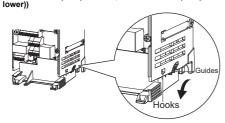
Removal of the lower front cover (FR-E820-0240(5.5K) or higher, FR-E840-0230(11K) or higher)



(a) Loosen the screws on the lower front cover. (These screws cannot be removed.)

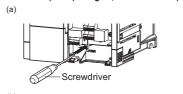
(b) While holding the areas around the installation hooks on the sides of the (b) Tighten the screws on the lower part of the lower front cover. lower front cover, pull out the cover using its upper side as a support. (c) With the lower front cover removed, wiring of the main circuit terminals and control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

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

figure above. 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),

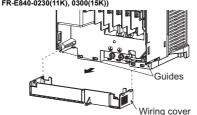




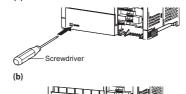
"PUSH" mark on the wiring cover to push the stopper behind the wiring cover approx. 3 mm.

(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-E820-0240(5.5K) to 0600(15K), FR-E840-0230(11K), 0300(15K))



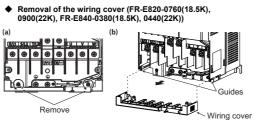
Pull out the cover along the guides in the direction shown by the arrow in the Fit the cover to the inverter along the guides. figure abov





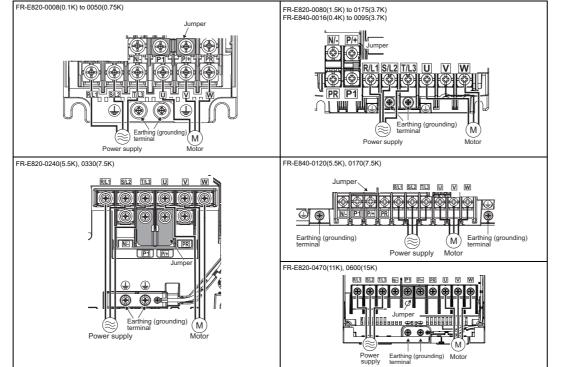
(a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the stopper behind the wiring cover approx. 3 mm. (b) Pull out the cover along the guides in the direction shown by the arrow in

the figure above

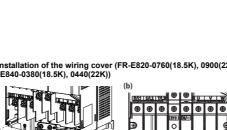


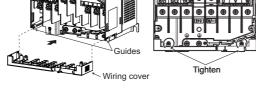
(a) Remove the mounting screws of the wiring cover the figure above.

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









(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 (b) Tighten the mounting screws of the wiring cover (tightening torque: 0.6 to 0.8 N·m).

Total wirin nect one or n

Cable type

2.3

Manual (Connection

Applicab mod

-0080(1.5K

-0175(3.7K

0330(7.5K

20-0760(18.5k

00(22K))-0016(0.4K

120(5.5K)

)-0170(7.5K

R-E840-0230(11K)

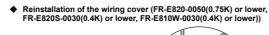
FR-E820S-0050(0 75 FR-E820S-0080(1.5

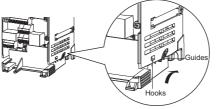
FR-E820S-0110(2.2k

FR-E810W-0008(0.1

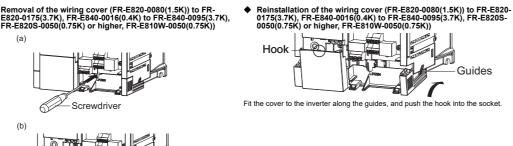
840-0300(15K)

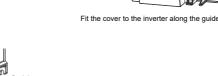
840-0380(18.5k





Guides

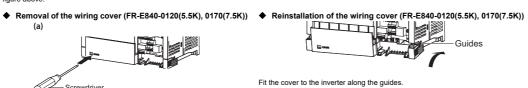


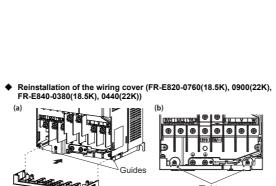


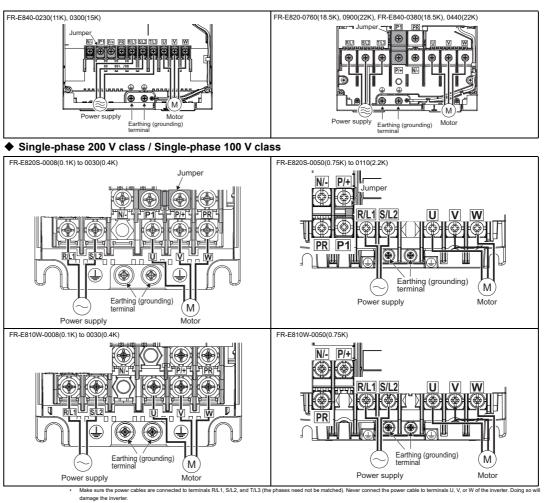




Wiring cover







he motor to terminals U, V, and W. The motor rotates counterclockwise when viewed from the motor load side when the forward rotation switch (signal) turns

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

			Orim		Cable gauge								
Inverter	Terminal	Tightening	Crimp terminal		HIV c	ables, etc	. (mm²) *1	AW	G *2	PVC cables, etc. (mm ²) *3			
lel	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	
) 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	
), 0110(2.2K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5	
)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4	
)	M5	2.5	5.5-5	5.5-5	5.5	5.5	5.5	10	10	6	6	6	
)	M5	2.5	14-5	8-5	14	8	5.5	6	8	16	10	6	
	M5	2.5	14-5	14-5	14	14	8	6	6	16	16	16	
	M6(M5)	4.4	22-6	22-6	22	22	14	4	4	25	25	16	
<)	M8(M6)	7.8	38-8	22-8	38	22	14	2	4	35	25	25	
	M8(M6)	7.8	38-8	38-8	38	38	22	2	2	35	35	25	
to 0095(3.7K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5	
)	M4	1.5	5.5-4	2-4	3.5	2	3.5	12	14	4	2.5	4	
)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4	
	M4	1.5	5.5-4	5.5-4	5.5	5.5	5.5	10	10	6	6	10	
	M5	2.5	8-5	8-5	8	8	5.5	8	8	10	10	10	
<)	M6	4.4	14-6	8-6	14	8	8	6	8	16	10	16	
	M6	4.4	14-6	14-6	14	14	14	6	6	16	16	16	
K) 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	
5K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5	
K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5	
<)	M4	1.5	5.5-4	2-4	3.5	2	2	12	14	4	2.5	2.5	
K) 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	
'5K)	M4	1.5	5.5-4	2-4	3.5	2	2	14	14	2.5	2.5	2.5	

sible temperature of 75°C. It is assumed that the cables will be used in a sur 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".) PVC cable with 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 PVC 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 PVC 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 blow win commotos inaximum permissione emperate of n 0 c. Its assumed into the codes win or used on a sonrounding an emperature on 0 c. Its estimate of 20 m of (election campute) from any for use in Europe). rew size for ferminals R(1, S12, T13, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) terminal is shown. For the single-phase 200 V power input models, the screw size for terminals R(1, S12, T13, U, V, W, PR, P/+, 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(1, S12, U, V, W, PR, P/+, 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(1, S12, U, V, W, +, and N/-, and the arthing (grounding) terminal is shown. To the single-phase 100 V power input models, the screw size for terminals R(1, S12, U, V, W, +, and N/-, and the arthing (grounding) terminal is shown. For the single-phase 100 V power input models, the screw size for the earthing (grounding) terminal is near the screw size for terminals R(1, S12, U, V, W, +, and N/-, and the R(1, and R(1, S12, U, V, W)) and the screw screent scre shorter The scr

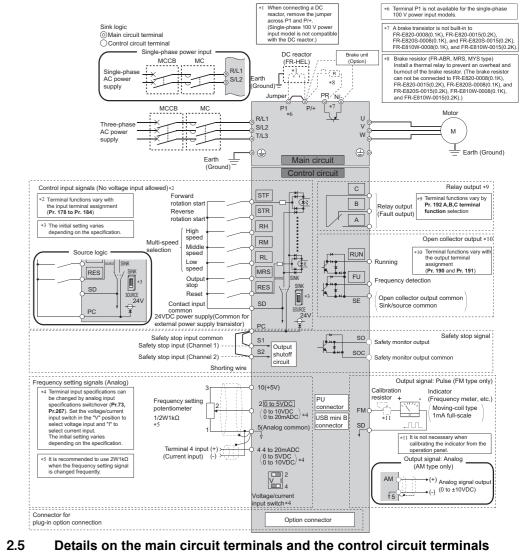
The line voltage drop can be calculated by the following formula

Line voltage drop [V] = $\sqrt{3}$ × wire resistance [mΩ/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

I length ore motors within the total wiring length (sum of the wiring lengths of the motor and the inverter) shown in the following table. Pr.72 setting (carrier frequency) Voltage class 0.1K 0.2K 0.4K 0.75K 1.5K 2.2K 3.7K or higher 100 V, toto V 50 m (200 m) 50 m (200 m) 75 m (300 m) 100 m (500 m) 100 m (500 m) 100 m (500 m)								
		0.1K	0.2K	0.4K	0.75K	1.5K	2.2K	
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 (200m)	50 m (200m)	75 m (300m)	100 m (500m)	100 m (500m)	
	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)	
The value in the parentheses is the total wiring length when unshielded cables are used.										

In the value in the parelinneses is the load wing engine when unsmeded causes are used.
When driving a 400 V class motor by the inverter, surge voltages attributable to the wining 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 to 100 m, or "2 kHz or less" when the wiring length is 10 ng r than 100 m.



2.4

Terminal connection diagram

Tree -	Terminal								
Туре	symbol	Common	Terminal name		inal function description				
	R/L1, S/ L2, T/L3*1		AC power input	Connected to the commercial power supply. Do factor converter (FR-HC2) or the multifunction					
	U, V, W	_	Inverter output	Connected to a three-phase squirrel cage moto		D/4 and DP. (Not available for CD.			
ouit	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 BU converter (FR-HC2) to these terminals.					
-	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.	Be sure to earth (ground) the inv	erter.			
Τ	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.				
input	RH, RM, RL*3	(negative common))	Multi-speed selection	Multi-speed can be selected according to the c signals.	combination of RH, RM and RL	Input resistance: 4.7 kΩ Voltage when contacts are open: 21 to 26 VDC			
Contact i	MRS*3	PC (source (positive	Output stop		the MRS signal (5 ms or more) to stop the inverter output. signal to shut off the inverter output when stopping the motor with an agnetic brake.				
	RES*3	common))	Reset	Use this signal to reset a fault output provided activated. Turn ON the RES signal for 0.1 seco In the initial setting, reset is always enabled. B enabled only at an inverter fault occurrence. Ti second after reset.	ond or longer, then turn it OFF. y setting Pr.75 , reset can be	4 to 6 mADC			
Input signa	10	5	Power supply for a frequency setting potentiometer	Used as the power supply for an external frequ potentiometer.	uency setting (speed setting)	5 ±0.5 VDC, Permissible load current: 10 mA			
setting	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 10 The initial setting varies depending on the spee Set the voltage/current input switch to the "I" position	oportional. Use Pr.73 to switch) VDC, and 0 to 20 mA. cification.	For voltage input,			
Frequency se	4	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 a 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 termin turning ON the AU signal. The initial setting varies depending on the spec Use Pr.267 to switch among input 4 to 20 mÅ (0 to 10 VDC. Set the voltage/current input swit voltage input (0 to 5 V/ 0 to 10 V).	 Input resistance: 10 to 11 kΩ Maximum permissible voltage: 2 VDC For current input, Input resistance: 245 ±5 Ω Permissible maximum current: 3 mA 				
Relay	A, B, C	_	Relay output (fault output)	1 changeover contact output indicates that the activated and the outputs are stopped. Fault: discontinuity across B and C (continuity continuity across B and C (discontinuity across	across A and C), Normal:	240 VAC 2 A (power factor = 0.4) c 30 VDC 1 A			
tput signal Open collector	RUN	SE	Inverter running	The output is in LOW state when the inverter on higher than the starting frequency (initial value: state during stop or DC injection brake operation	Permissible load: 24 VDC (maximum 27 VDC) 0.1 A				
Output signal Open colle	FU	SE	Frequency detection	The output is in LOW state when the inverter on higher than the preset detection frequency, and than the preset detection frequency. *4	(The voltage drop is 3.4 V at maximum while the signal is ON.)				
Pulse	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			
Analog	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 k Ω or more), resolution: 12 bits			
-	S1	PC	Safety stop input (Channel 1)	Use terminals S1 and S2 to receive the safety s		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 PI 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.	relay module. Terminals S1 and S2 can be used at a time (dual channel). The Inverter judges the condition of the internal safety circuit from the status (shorted/opened) between terminals S1 and PC, or between S2 and PC. When the status is opened, the inverter output is shut off. In the initial status, terminal S1 and S2 are shorted with terminal PC by shorting wires. Remove the shorting wires and connect the safety relay				
Safety	so	SOC	Safety monitor output (open collector output)	The output status varies depending on the input: The output is in HIGH state during occurrence fault. The output is in LOW state otherwise. ⁴ 4 Refer to the FR-E800 Instruction Manual (Fund 000) when the signal is switched to HIGH while open. (Please contact your sales representativ	of the internal safety circuit 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 termina	l (sink logic) and terminal FM.				
	SD	-	External transistor common (source (positive common))	Connect this terminal to the power supply comr as a programmable controller, in the source log					
			24 VDC power supply common	Common output terminal for 24 VDC 0.1 A pov					
nal			External transistor common (sink (negative common))	Connect this terminal to the power supply com output (open collector output) device, such as	a programmable controller, in				
Common terminal		_	Safety stop input terminal	the sink logic to avoid malfunction by undesiral Common terminal for safety stop input termina		Power supply voltage range:			
ommo	PC		common Contact input common (source (positive common))	Common terminal for the contact input termina		22 to 26.5 VDC Permissible load current: 100 mA			
O		SD	24 VDC power supply	Can be used as a 24 VDC 0.1 A power supply.		1			
	5	_	common Frequency setting common	Common terminal for the frequency setting sign		h (around)			
	SE		Open collector	Common terminal for the frequency setting signature for the frequency setting sett	nar terminar 2 of 4). Do not eart	n (ground).			
			output common Safety monitor output	Common terminal for terminal SO.					
	SOC	-	I-						

Terminal	◆ Three-phase 400 V class
Terminal symbol Common Terminal name Terminal function description With the PU connector, communication can be made through RS-485 Option function Option function	Model FR-E840-[] 0016 0026 0040 0060 0095 0120 0170 0230 0300 0380 0440 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 0.4K 0.75K 1.5K 2.2K
PU connector Conforming standard: EIA-485 (RS-485): Transmission format: Multidrop link Communication speed: 300 to 115200 bps: Overall length: 500 m Use the USB connector to communicate with a personal computer. Setting and monitoring of the inverter is enabled	Applicable motor capacity (kW)*1 LD 0.75 1.5 2.2 3.7 5.5 7.5 11.0 15.0 18.5 22.0 MD 0.4 0.75 1.5 2.2 3.7 5.5 7.5 11.0 15.0 18.5 22.0
USB connector*6 USB connector*6 USB connector*6 Connector USB mini B connector (receptacle mini B type)	Rated capacity (kVA) *2 ID 1.6 2.7 4.2 5.3 8.5 13.3 17.5 26.7 31.2 34.3 45.7 ND 1.2 2.0 3.0 4.6 7.2 9.1 13.0 17.5 22.9 29.0 33.5
 Torminal T1.3 is not available for the single-phase power input models. Torminal T4: In and available for the single-phase power input models. Terminal functions can be selected using Pr.178 to Pr.164 (input terminal function selection). (Refer to the FR-E800 Instruction Manual (Function).) Terminal functions can be selected using Pr.178 to Pr.164 (input terminal function selection). Terminal functions can be selected using Pr.178 to Pr.164 (input terminal function selection). (Refer to the FR-E800 Instruction Manual (Function).) Terminal functions can be selected using Pr.178 to Pr.164 (input terminal function selection). 	Rated current (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)
 *5 Terminal FM is available for the FM type inverter. Terminal AM is available for the AM type inverter. *6 USB bus power connection is available. The maximum SCCR is 500 mA. A PU connector cannot be used during USB bus power connection. 	*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 Output Dutput
Control circuit terminal layout FM type inverter Wiring method Use crimp terminals and stripped wire for the control circuit wiring. If only a single wire is	Overload current rating *3 ND 150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C Voltage *4 Three-phase 380 to 480 V
S1 S2 PCRUNFU SE RL RMRH SDMRSRESSD STFSTR Connect the end of wires (crimp terminal or stranded wire) to the terminal block.	Brake transistor Built-in Regenerative Maximum brake
SO[SOCF FM] SD] Crimp terminals commercially available (as of April 2023.) 10 2 5 4 Phoenix Contact Co., Ltd. Phoenix Contact Co., Ltd. Phoenix Contact Co., Ltd.	braking torque 100% 50% 20%
A B C Wire gauge (mm ²) With insulation Without With insulation For UL wire '1 No. Crimping tool model No.	Rated input AC (DC) voltage/ frequency Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC *9) Permissible AC (DC) voltage Doe to 500 Hz (47 to 740 PDC 10)
AM type inverter (mm ²) With insulation insulation sleeve insulation sleeve For UL wire*1 No. No.	Permissible Ac (DC) Voidage fluctuation 323 to 528 V, 50/60 Hz (457 to 740VDC *9) Permissible frequency fluctuation ±5%
SO[SOC[AM] 5 0.5 AI 0,5-10WH — AI 0,5-10WH-GB	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 Action of the construction of the con
Image: State of the s	Supply current (Å) *8 With DC reactor LD 2.1 3.5 5.5 6.9 11.0 18.0 23.0 35.0 41.0 45.0 60.0 ND 1.6 2.6 4.0 6.0 9.5 12.0 17.0 23.0 30.0 38.0 44.0
0.75 (for 2 wires) AI-TWIN 2×0,75-10GY — —	Without capacity LD 2.5 4.5 6.8 8.2 12.4 19.0 25.0 36.0 42.0 45.0 58.0
 *1 A ferrule terminal with an insulation sleeve compatible with the MTW wire which has a thick wire insulation. *2 Applicable for terminals A, B, C. 	(kVA) *6 With DC reactor LD 1.6 2.7 4.2 5.3 8.5 13.0 18.0 27.0 31.0 34.0 46.0 no 1.2 2.0 3.0 4.6 7.2 9.1 13.0 18.0 23.0 29.0 34.0
BASIC OPERATION	Protective structure Open type (IP20 for IEC 60529 only) Cooling system Natural Forced air
Components of the operation panel ration panel cannot be removed from the inverter.	Approx. mass (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 1.2 1.4 1.8 1.8 2.4 2.4 4.8 4.9 11.0 11.0
Name Description DUEXT key Switches between the PU operation mode, the PUJOG operation mode, and the	Model FR-E820S-[] 0008 0015 0030 0050 0080 0110 0.1K 0.2K 0.4K 0.75K 1.5K 2.2K
PUEAT Rey External operation mode. PUEAT Rey External operation mode. MODE key Switches the operation panel to a different mode.	Applicable motor capacity (kW)*1 ND 0.1 0.2 0.4 0.75 1.5 2.2 Rated capacity (kVA)*2 ND 0.3 0.6 1.2 2.0 3.2 4.4
SET key Switches the monitor screen in the monitor mode.	Rated current (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)
PODE SET RUN key Start command The direction of motor rotation depends on the Pr.40 setting. Start compared to solve operation commands.	Output Overload current rating*3 ND 150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C Voltage*4 Three-phase 200 to 240 V
Stoppices 1 key Used to reset the inverter when the protective function is activated. Setting dial The setting dial of the Mitsubishi Electric inverters. Turn the setting dial to change	Brake transistor Not installed Built-in Regenerative Maximum brake Image: Comparison of the state o
arting/stopping the inverter on the operation panel	braking torque (ND reference)*5 150% 100% 50% 20% Rated input AC voltage/frequency Single-phase 200 to 240 V 50/60 Hz
	Permissible AC voltage fluctuation Isngle-phase 200 to 240 V Sured Hz Permissible AC voltage fluctuation 170 to 264 V, 50/60 Hz
tternal operation mode PU operation mode PU operation mode	Rated input DC reactor ND 2.3 4.1 7.9 11.2 17.9 25.0
Alternating	supply current (A)*8 With DC reactor 1.4 2.6 5.2 8.7 13.9 19.1
top	Power supply Creator ND Creator ND 0.5 0.9 1.7 2.5 3.9 5.5
Applied to the set frequency	(kVA)*6 With Dc reactor 0.3 0.6 1.1 1.9 3.0 4.2 Protective structure Open type (IP20 for IEC 60529 only) Open type (IP20 for IEC 60529 only) IEC 60529 only)
Parameter setting	Cooling system Natural Forced air Approx. mass (kg) 0.5 0.5 0.8 1.3 1.4 1.9
	◆ Single-phase 100 V class
(Example) Blinking	Model FR-E810W-[] 0006 0030 0030 Applicable motor capacity (kW)*1 ND 0.1 0.2 0.4 0.75
	Rated capacity (kVA)*2 ND 0.3 0.6 1.2 2.0
Parameter setting complete Change the setting.	Kated current (A)*7 ND (0.8) (1.4) (2.5) (4.1) 150% 60 s, 200% 3 s (inverse-time
PARAMETERS 5 LIST OF FAULT DISPLAYS	Output Overload current rating*3 ND characteristics) at surrounding air temperature of 50°C Voltage*10*11 Three-phase 200 to 240 V
etails, refer to the FR-E800 Instruction Manual (Function). For details, refer to the FR-E800 Instruction Manual (Maintenance). PDF manual can also be downloaded from the Mitsubishi Electric FA Global ite. Website.	Brake transistor Not installed Built-in Regenerative Maximum brake Enter the second s
For more information on the product For more information on the product	braking torque 150% 100% (ND reference)*5
	Rated input AC voltage/frequency Single-phase 100 to 120 V 50/60 Hz Permissible AC voltage fluctuation 90 to 132 V, 50/60 Hz Power Permissible frequency fluctuation ±5%
Ö. Ö	supply Rated input current (A) *8 ND 3.7 6.8 12.4 19.6
	Protective structure ND 0.5 0.9 1.5 2.5 Protective structure Open type (IP20 for IEC 60529 only)
SPECIFICATIONS	Cooling system Natural Approx. mass (kg) 0.5 0.6 0.8 1.4
Inverter rating hree-phase 200 V class	 The applicable motor capacity indicated is the maximum capacity applicable for use of the Misubials Electric 4-pole standard efficiency motor. To drive a Misubial Electric hyberphormance energy-saving motor, use the 200 V class of 15K inverter for a 1 kW motor or 200400 V class 2.2K inverter for a 3 kW motor. The rated output capacity assumes that the output voltage is 230 V for three-phase 200 V class and single-phase 2001/00 V class, and 440 V for three-phase 400 V class. The pretenting of the overback current rating is the ratio of the overback current to the inverter's rated output current. For prepared duty, allow time for the inverter and motor to return to or below the
Model FR-E820-[] 0008 0015 0030 0050 0080 0110 0175 0240 0330 0470 0600 0760 0900 0.1K 0.2K 0.4K 0.75K 1.5K 2.2K 3.7K 5.5K 7.5K 11K 15K 18.5K 22K	temperatures under 100% load. In a single-phase 200 V class inverter with the automatic restart after the instantaneous power failure (Pc-ST) and the power failure stop (Pc-ST) indicons are set valid a voltage drop at the power supply and a large bad amy bring down the bus voltage to the level recognized as a power failure, (absing the inverter to drive a load 100% or higher. *4 The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the output side of the inverter is approximately the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the output side of the inverter is approximately the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the output side of the inverter is approximately the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the output side of the inverter is approximately the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the output side of the inverter is approximately the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the power supply voltage. The maximum power supply voltage
LD 0.2 0.4 0.75 1.1 2.2 3.0 5.5 7.5 11.0 18.5 22.0 30.0 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 30.0	*5 The amount of braking torque is the average short-term torque (which varies depending on motor loss) that is generated when a motor decelerates in the shortest time by itself from 60 Hz. It is not continuous regenerative torque. The average deceleration torque becomes lower when a motor decelerates from a frequency higher than the base frequency. The inverter is not equipped with a buil in brake resistor. Use an option brake resistor for an operation with large regenerative power (Not available for FR-E820-0008(0.1K), FR-E820-0008(0.1
Rated capacity (kVA)*2 LD 0.5 0.8 1.4 2.4 3.8 4.8 7.8 12.0 15.9 22.3 27.5 35.1 45.8 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	 The value in partitises is the rated output current when helps power impedance (including used of the importance) and bases). The value in partitises is the rated output current when helps accoustic noise operation is performed with the surrounding air temperature exceeding 40°C while 2 kHz or higher value is selected in Pr.72 PVM frequency selection. The rated imput current is the value at a rated 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 P/+ and Nk. Connect the positive terminal of the power supply to terminal P/+ and the negative terminal to terminal Nk. When the energy is regenerated from the motor, the values are there terminals P/+ and Nk. may temperating vise to 415 V core for the 400 V class). Use a DC power supply
Rated current (A)*7 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 (34.6) 56.0 (58.7) 68.0 (58.7) 115.0 (74.8) up 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	resistant to the regenerative voltage/energy. When a power supply that cannot resist the regenerative voltage/energy is used, connect a reverse current prevention diode in series. • Powering ON produces up to four times as large current as the inverter rated current. Prepare a DC power supply resistant to the inrush current at power ON, although an inrush current limit circu is provided in the FR-E800 series inverter.
ND (0.8) (1.4) (2.5) (4.1) (7.0) (10.0) (16.5) (23.0) (31.0) (44.0) (57.0) (72.0) (86.0)	 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 bruce the amount of the power supply voltage. For the single-phase 100 V power input models, output voltage decreases by applying motor load, and output current increases compared to the three-phase power input models. The load must be reduced so that output current loads not exceed the rated motor current.
Overload current rating*3 Db Devices and current rating at the perturbation of the pertur	6.2 Inverter installation environment
Brake transistor Not installed Built-in Maximum brake Maximum brake Loop Loo	Item Description Surrounding air -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 Enclosure
braking torque (ND reference)*5 150% 100% 50% 20% Rated input AC (DC) voltage/ Three shares 200 to 240 V/50/50 Hz (282 to 230 V/DC 10) Three shares 200 to 240 V/50/50 Hz (282 to 230 V/DC 10) Three shares 200 to 240 V/50/50 Hz (282 to 230 V/DC 10)	Interpretative Manual (Connection). To meet the UL/EN standards, use the product at temperatures from -20°C to 50°C.) Ambient humidity 95% RH or less (non-condensing) (With circuit board coating (IEC 60721-3-3:1994 3C2 compatible)) Inverter Measurement position
frequency	y 90% RH or less (non-condensing) (Without circuit board coating) 5 cm → 5 cm
fluctuation 170 05 264 V, 50/60 H2 (240 05 37 VDC 9) Permissible frequency fluctuation ±5%	Storage temperature -40°C to +70°C Measurement + 0 C m position
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 Pr 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	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.
Up current (Å)*8 With DC reactor 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 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	*1 Surrounding air temperature is a temperature measured at a measurement position in an enclosure. Ambient temperature is a temperature outside an enclosure.
Without capacity 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 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	7 APPENDIX For information on other applicable standards not found in this document, refer to the FR-E800 Instruction Manual (Connection).
(kVA)*6 With DC LD 0.5 0.8 1.3 2.3 3.7 4.6 7.5 11.0 15.0 21.0 26.0 34.0 44.0	7.1 Instructions for compliance with the EU Directives
reactor ND 0.3 0.6 1.1 1.9 3.0 4.2 6.7 9.1 13.0 18.0 23.0 29.0 34.0	
reactor ND 0.3 0.6 1.1 1.9 3.0 4.2 6.7 9.1 13.0 18.0 23.0 29.0 34.0 Protective structure Open type (IP20 for IEC 60529 only) Forced air	The authorized representative in the EU The authorized representative in the EU is shown below. Name: Mitsubise Ilectric Europe B.V.
reactor ND 0.3 0.6 1.1 1.9 3.0 4.2 6.7 9.1 13.0 18.0 23.0 29.0 34.0	
ND 0.3 0.6 1.1 1.9 3.0 4.2 6.7 9.1 13.0 18.0 23.0 29.0 34.0 Protective structure Open type (IP20 for IEC 60529 only) Forced air	The authorized representative in the EU is shown below. Name: Mitsubishi Electric Europe B.V.

This inverter is not intended to be used on a low-voltage public network which su 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.

Set the EMC Directive compliant EMC line to the inverter. Insert the noise lines and lerite 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

Standard: EN 61800-5-1 Outline of instructions

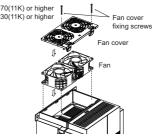
Do not use an earth leakage circuit breaker as an electric shock protector without connecting the equipment to the earth. Connect the equipment to the earth (ground)

- 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.
- 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-E820-0470(11K) or higher

 FR-E840-0040(1.5K) to 0170(7.5K)
 Fan cover
 FR-E840-0230(11K) or higher

 FR-E840-0040(1.5K) to 0170(7.5K)
 FR-E840-0230(11K) or higher
 FR-E840-0230(11K) or higher
 - 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 over oltage category II specified in IEC 60664.

Fuse selection for branch circuit protection ircuit protection

semic	onductor fuses for branch	n circuit protection	1.					
el	Cat. No	Manufacturer	Rating	L .	Inverter model	Cat. No	Manufacturer	Rating
<),	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A		FR-E840-0095(3.7K)	170M1414, 170M1314 or 170M1364	Bussmann	700 V, 50 A
()	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
iK)	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A	1	FR-E840-0230(11K)	170M1419, 170M1319 or 170M1469	Bussmann	700 V, 160 A
()	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A		FR-E840-0300(15K)	170M1419, 170M1319 or 170M1469	Bussmann	700 V, 160 A
()	170M1414, 170M1314 or 170M1364	Bussmann	700 V, 50 A	1	FR-E840-0380(18.5K)	170M1420, 170M1320 or 170M1370	Bussmann	700 V, 200 A
()	170M1416, 170M1316 or 170M1366	Bussmann	700 V, 80 A]	FR-E840-0440(22K)	170M1421, 170M1321 or 170M1471	Bussmann	700 V, 250 A
()	170M1418, 170M1318 or 170M1368	Bussmann	700 V, 125 A]	FR-E820S-0008(0.1K)	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A
()	170M1419, 170M1319 or 170M1369	Bussmann	700 V, 160 A	1	FR-E820S-0015(0.2K)	170M1409, 170M1309 or 170M1359	Bussmann	700 V, 16 A
)	170M1420, 170M1320 or 170M1370	Bussmann	700 V, 200 A	1	FR-E820S-0030(0.4K)	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A
)	170M1421, 170M1321 or 170M1471	Bussmann	700 V, 250 A		FR-E820S-0050(0.75K)	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A
iK)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A	1	FR-E820S-0080(1.5K)	170M1415, 170M1315 or 170M1365	Bussmann	700 V, 63 A
)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A]	FR-E820S-0110(2.2K)	170M1417, 170M1317 or 170M1367	Bussmann	700 V, 100 A
()	170M1408, 170M1308 or 170M1358	Bussmann	700 V, 10 A]	FR-E810W-0008(0.1K)	170M1409, 170M1309 or 170M1359	Bussmann	700 V, 16 A
iK)	170M1410, 170M1310 or 170M1360	Bussmann	700 V, 20 A]	FR-E810W-0015(0.2K)	170M1410, 170M1310 or 170M1360	Bussmann	700 V, 20 A
()	170M1411, 170M1311 or 170M1361	Bussmann	700 V, 25 A		FR-E810W-0030(0.4K)	170M1413, 170M1313 or 170M1363	Bussmann	700 V, 40 A
()	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

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

or 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) nended 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.

'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 'instructions (Connexion) destiné à être utilisé avec ce produit. Veuillez transmettre les manuels correspondants à l'utilisateur final. Les manuels peuvent écalement l'unisation de ce produit necessite des instantationes d'instantation et d'unisation nomines dans le present document document de la Diecuve de securit l'instructions (Connexion) destiné à être utilisé avec ce produit. Veuillez transmettre les manuels correspondants à l'utilisateur final. Les manuels peuvent ég 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 nd any applicable local codes. or installation in Canada, use the branch circuit protection equipment specified in Technical News MF-S-187, in accordance with the Canadian Electrical Code and ny applicable local codes.

any applicative local codes. 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 th thtps://www.mitsubishielectric.com/fa/products/drv/inv/suppor 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).

-AVERTISSEMENT-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 -

Sefore 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 onger 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.

TTENTION - Risque de choc électrique -

FR-E840-0380(18.5k FR-E840-0440(22K)

Vant 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 Notice power suppy and the income 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 (RL1, 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 con emperature of 75°C, when the surrounding air temperature is 40°C or less, and when the wiring length is 20 m or shorter.

			Original terms		Cable gauge		
Applicable inverter model	Terminal screw size	Tightening torque (N·m)	Crimp termi	inai	AWG		
		(R III)	R/L1, S/L2, T/L3	U, V, W	R/L1, S/L2, T/L3	U, V, W	
0-0008(0.1K) to 0050(0.75K)	M3.5	1.2	2-3.5	2-3.5	14	14	
0-0080(1.5K)	M4	1.5	3.5-4	2-4	12	14	
0-0110(2.2K)	M4	1.5	5.5-4	2-4	10	14	
20-0175(3.7K)	M4	1.5	8-NK4	5.5-4	8	10	
20-0240(5.5K)	M5	2.5	8-5	8-5	8	8	
0-0330(7.5K)	M5	2.5	14-5	8-5	6	8	
0-0470(11K)	M5	2.5	38-S5	22-5	3	4	
0-0600(15K)	M6(M5)	4.4	38-S6	38-S6	2	3	
0-0760(18.5K)	M8(M6)	7.8	60-8	38-8	1/0	2	
0-0900(22K)	M8(M6)	7.8	60-8	60-8	1/0×2	1/0	
0-0016(0.4K) to 0060(2.2K)	M4	1.5	2-4	2-4	14	14	
0-0095(3.7K)	M4	1.5	5.5-4	2-4	10	14	
0-0120(5.5K), 0170(7.5K)	M4	1.5	8-NK4	5.5-4	8	10	
0-0230(11K)	M4	1.5	14-4	8-4	6	8	
0-0300(15K)	M5	2.5	22-S5	14-5	4	6	
0-0380(18.5K)	M6	4.4	22-6	14-6	4	6	
0-0440(22K)	M6	4.4	38-6	22-6	3	4	

*1 The screw size for terminals RL1, 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 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.

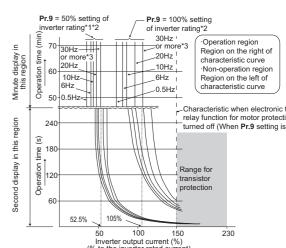
			Onimum to any	la el	Cable gauge AWG		
Applicable inverter model	Terminal screw size	Tightening torque (N·m)	Crimp term	inai			
		(R III)	R/L1, S/L2	U, V, W	R/L1, S/L2	U, V, W	
FR-E820S-0008(0.1K) to 0030(0.4K)	M3.5	1.2	2-3.5	2-3.5	14	14	
FR-E820S-0050(0.75K)	M4	1.5	2-4	2-4	14	14	
FR-E820S-0080(1.5K)	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 RL1, S12, U, V, W, PR, PH, NJ, and Pi, and the earthing (grounding) terminal is shown. For the single-phase 100 V power input models, the screw size for terminals RL1, S12, U, V, W, PR, 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

*2

*3

- Characteristic is shown on the left.)
 When using the Mitsubishi Electric constant-torque mote

 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.)
- 2) Set the rated motor current in **Pr.9**. When setting **Pr.9** 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 dedicated to the Mitsubishi Electric constant-torque motor is set, this characteristic curve applies to operation at 6 Hz or higher.
- Characteristic when electronic thermal relay function for motor protection is turned off (When **Pr.9** setting is 0(A)) 100 150 Inverter output current (%) (% to the inverter rated current
 - 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 inverter 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 The electronic thermal relay function is not a speed sensing function

7.3 SERIAL number check

The SERIAL number can be checked on the inverter rating plate or package Rating plate example INVERTER PASSED Inverter model Input rating INPUT :XXXX

Output rating	> OUTPUT : XXXXX			00	0	000000
SERIAL	► SERIAL:XXXXXXXXXX		Symbol	Year	Month	Control number
Country of origin ——	→ MADE IN XXXXX	and month, a The last two	and six cha digits of th	iracter e prod	symbol, t s indicati luction ye	SERIAL hree characters indicating the production year ng the control number. sar are indicated as the Year, and the Month is svember), 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 $0.12 \text{ kW} \le Pn \le 1000 \text{ kW}$. (LD rated / ND rated)

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 8

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.