

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.

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

INVERTER SAFETY GUIDELINE FR-E820-0008(0.1K) to 0900(22K)E



IB-0600860ENG-G(2305)IP

Related manuals

MITSUBISHI ELECTRIC CORPORATION

FR-E800 Instruction Manual (Connection) IB-0600865ENG 1A2-P89 Manual describing details of the functions IB-0600871ENG Manual describing details of the comm IB-0600874ENG Manual describing the functional safety. R Configurator2 Instruction Manual IB-0600516ENG

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

- erson who meets
- 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". 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

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.

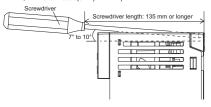


INVERTER INSTALLATION AND PRECAUTIONS

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 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)



or more

2 INSTALLATION AND WIRING

Removal and reinstallation of covers

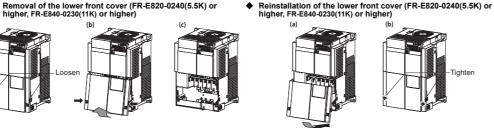
(a) Loosen the mounting screws of the cover. (These screws cannot be

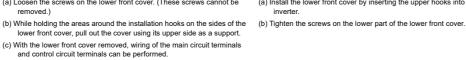
(b) Pull out the cover using its lower side as a support With the cover removed, the control circuit terminals can be wired and

the plug-in option can be installed.

rear of the cover. (b) Insert the hooks of the cover into the sockets of the wiring cover, and reinstall the cover to the inverter. (c) Tighten the mounting screw of the front cover. (Tightening torque: 0.6 to 0.8 Sockets of the wiring cover

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





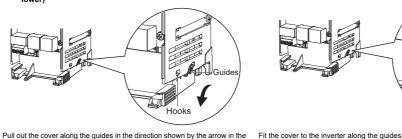


Reinstallation of the wiring cover (FR-E820-0050(0.75K) or lower,

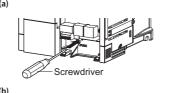
FR-E820S-0030(0.4K) or lower, FR-E810W-0030(0.4K) or lower)

higher, FR-E840-0230(11K) or higher

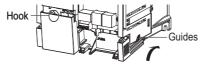
Removal of the wiring cover (FR-E820-0050(0.75K) or lower. FR-E820S-0030(0.4K) or lower, FR-E810W-0030(0.4K) or



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-



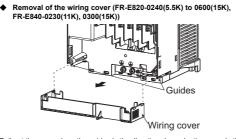
Reinstallation of the wiring cover (FR-E820-0080(1.5K) to FR-E820-0175(3.7K), FR-E840-0016(0.4K) to FR-E840-0095(3.7K), FR-E820S-0050(0.75K) or higher, FR-E810W-0.75K(0050)



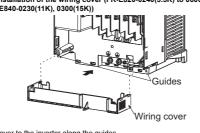
Fit the cover to the inverter along the guides, and push the hook into the socket

(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.

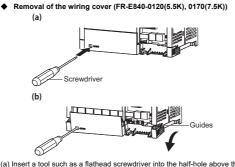
(b) Pull out the cover along the guides in the direction shown by the arrow in



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



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

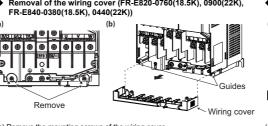


Reinstallation of the wiring cover (FR-E840-0120(5.5K), 0170(7.5K))

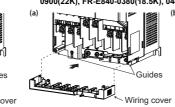
Fit the cover to the inverter along the guides

(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))



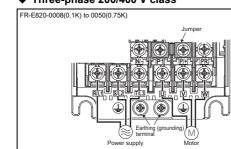
 Reinstallation of the wiring cover (FR-E820-0760(18.5K), 0900(22K), FR-E840-0380(18.5K), 0440(22K))

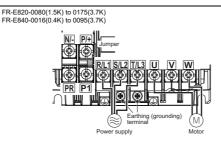


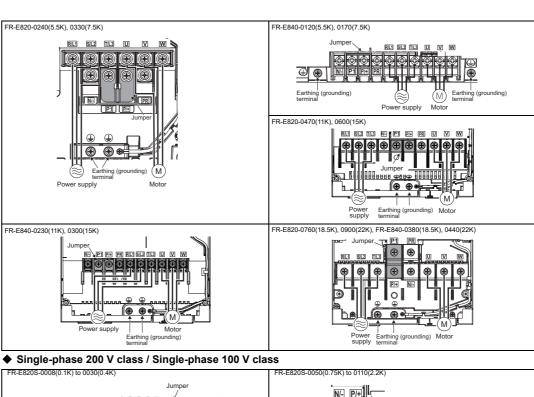
(a) Fit the cover to the inverter along the guides.

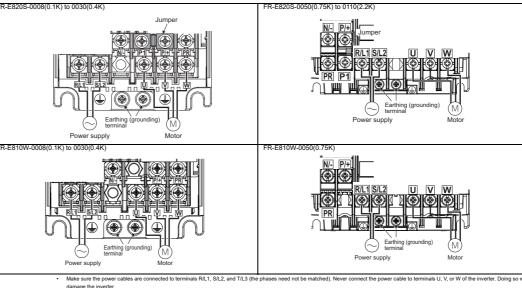
(b) Pull out the cover along the guides in the direction shown by the arrow in the figure above. (b) Tighten the mounting screws of the wiring cover (tightening torque: 0.6 to 0.8 N·m).

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









Applicable cables and wiring length

Select cables of recommended gauge size to ensure that the voltage drop will be 2% or less.

If the wiring distance is long between the inverter and motor, the voltage drop in the main circuit will cause the motor torque to decrease especially at a low speed. The following table shows a selection example for the wiring length of 20 m at the ND rating. When using the inverter with the LD rating, refer to the FR-E800 Instruction Manual (Connection)

Applicable Inverter	Terminal	Tightening torque N·m	Crimp terminal		HIV cables, etc. (mm ²) *1			AWG *2		PVC cables, etc. (mm ²) *3		
model	screw size *4		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
FR-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
FR-E820-0900(22K)	M8(M6)	7.8	38-8	38-8	38	38	22	2	2	35	35	25
FR-E840-0016(0.4K) to 0095(3.7K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5
FR-E840-0120(5.5K)	M4	1.5	5.5-4	2-4	3.5	2	3.5	12	14	4	2.5	4
FR-E840-0170(7.5K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4
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
FR-E840-0380(18.5K)	M6	4.4	14-6	8-6	14	8	8	6	8	16	10	16
FR-E840-0440(22K)	M6	4.4	14-6	14-6	14	14	14	6	6	16	16	16
FR-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
FR-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
FR-E820S-0110(2.2K)	M4	1.5	5.5-4	2-4	3.5	2	2	12	14	4	2.5	2.5
FR-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

- tance of 20 m or shorter.

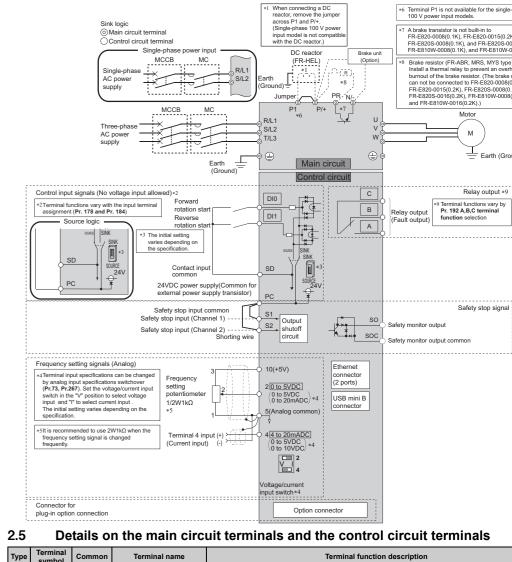
 Wh Cable with continuous maximum permissible temperature of 75°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or states or Canada, refer to the section 7.2 "instructions for UL and cult.")
 Cable with continuous maximum emrissible temperature of 70°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or Cable with continuous maximum emrissible temperature of 70°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or Cable with continuous maximum emrissible temperature of 70°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or 0.00 m or
- he 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.

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

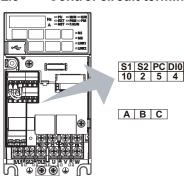
When driving a 400 V class motor by the inverter, surge voltages attributable to the wiring constants may occur at the motor terminals, deteriorating the insulation of the motor. In this case, use a "400 V class inverter-driven insulation-enhanced motor" and set Pr.72 PWM frequency selection according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

Terminal connection diagram



	-	symbol					
	٦	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.	
	i i	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-0016(0.2K).)		
	Main circuit	P/+, N/-	_	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU, factor converter (FR-HC2) to these termina	als.	
-	2	P/+, P1*2	_	DC reactor connection	Remove the jumper across terminals P/+ a the single-phase 100 V power input model + and P1 should not be removed.		
			_	Earth (ground)	For earthing (grounding) the inverter chase	sis. Be sure to earth (ground) the inver	ter.
	ct 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 turned ON simultaneously, the stop	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.	command is given.	Current when contacts are short-circuited: 4 to 6 mADC
	Ш	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) provi 5 V (or 10 V) and makes input and output among input 0 to 5 VDC (initial setting), 0 is 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 on.	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 of the terminal 4 (current input at initial settin (Input terminal function selection) befor setting varies depending on the specificati Use Pr.267 to switch among input 4 to 20 to 10 VDC. Set the voltage/current input svoltage input (0 to 5 V / 0 to 10 V)C.	ut and output proportional. This input DN (terminal 2 input is invalid). To use g), assign "4" to Pr.178 or Pr.179 e turning ON the AU signal. The initial on mA (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 that activated and the outputs are stopped. Fault: discontinuity across B and C (continuontinuity across B and C (discontinuity across B and C (disc	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
	p rangaon	S2	PC	Safety stop input (Channel 2)	relay module. Terminals S1 and S2 can be hiverter judges the condition of the interna (shorted/opened) between terminals S1 and 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 and PC, or between S2 and PC. When shut off.	Voltage when contacts are open: 21 to 26 VDC Current when contacts are short-circuited: 4 to 6 mADC
1	Salety stop turiction	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. (The open collector transistor is ON (cond OFF (not conductive) in HIGH state.) Refer to the FR-E800 Instruction Manual (I when the signal is switched to HIGH while (Please contact your sales representative	unce of the internal safety circuit fault. uctive) in LOW state. The transistor is 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 term	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 to	from terminals 5 and SE.
-	e e			External transistor common (sink (negative common))	Connect this terminal to the power supply of (open collector output) device, such as a particular to avoid malfunction by undesirable of the contraction of the con	programmable controller, in the sink	
		PC	_	Safety stop input terminal common	Common terminal for safety stop input terr	minals	Power supply voltage range 22 to 26.5 VDC Permissible load current: 100
'	3			Contact input common (source (positive common))	Common terminal for the contact input terminal for the contact	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 Safety monitor output terminal	Common terminal for the frequency setting	g signal (terminal 2 or 4). Do not earth	(ground).
		SOC	=	common	Common terminal for terminal SO. Communication can be made via Ethernet		_
1	Communication	_	_	Ethernet connector (2 ports)*4	Communication can be made via Emerried Category: 100BASE-TX/10BASE-T- Trar Data transmission speed: 100 Mbps (100 Maximum segment length: 100 m betwee Number of cascade connection stages: Number of interfaces available: 1	nsmission method: Baseband DBASE-TX) / 10 Mbps (10BASE-T) en the hub and the inverter· Interface: In Jp to 2 (100BASE-TX) / up to 4 (10BAS	
	5	_	_	USB connector*5	Use the USB connector to communicate we enabled using FR Configurator2. Interface: conforms to USB 1.1. Transmit Connector: USB mini B connector (receptions)	ssion speed: 12 Mbps	nonitoring of the inverter is

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

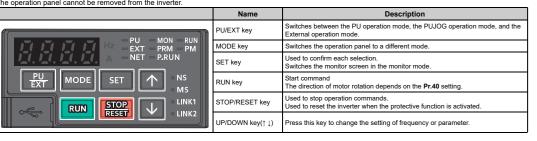
| S1 | S2 | PC | D10 | D11 | SD | Crimp terminals commercially available (as of October 2020.) | 10 | 2 | 5 | 4 | SO | S0C | Phoenix Contact Co. Ltd.

		0-11		
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
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	_	_	

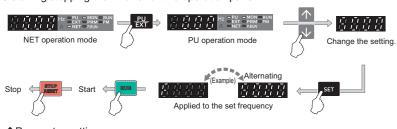
insulation. Applicable for terminals A1, B1, C1, A2, B2, C2.

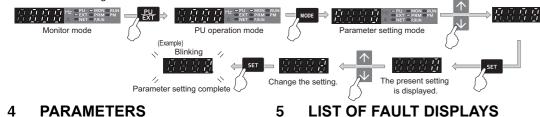
BASIC OPERATION

Components of the operation panel



◆Starting/stopping the inverter on the operation panel





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

For details, refer to the FR-E800 Instruction Manual (Maintenance).





SPECIFICATIONS

Inverter installation environment

Item	Description	
Surrounding air temperature *1	-20°C to +60°C (The rated current must be reduced at a temperature above 50°C. To meet the UL/EN standards, use the product at temperatures from -20°C to 50°C.)	Enclosure
Ambient humidity	95% RH or less (non-condensing) (With circuit board coating (IEC 60721-3-3:1994 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 x → 5 cm position
Atmosphere	Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt)	
Altitude/vibration	Maximum 3000 m, 5.9 m/s ² or less (For installation at an altitude above 1000 m, consider a 3% reduction in the	rated current per 500 m increase in altitude.)

6.2 Inverter rating ◆ Three-phase 200 V class

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 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 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 Applicable motor capacity (kW) *1 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 LD 1.3 2.0 3.5 6.0 9.6 12.0 19.6 30.0 40.0 56.0 69.0 88.0 115.0 (1.1) (1.7) (3.0) (5.1) (8.2) (10.2) (16.7) (25.5) (34.0) (47.6) (58.7) (74.8) (97.8) 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 (96.0) (7.0) (10.0) (16.5) (23.0) (31.0) (44.0) (57.0) (72.0) (86.0) LD 120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C Overload current rating *3 ND 150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C Three-phase 200 to 240 V Not installed Built-in Maximum brake torque (ND reference) *5 Rated input AC (DC) voltage/ "hree-phase 200 to 240 V 50/60 Hz (283 to 339 VDC *9) Permissible AC (DC) voltage 170 to 264 V, 50/60 Hz (240 to 373 VDC *9) Permissible frequency fluctuation With DC reactor 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 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 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 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 DC reactor 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 MC reactor ND 0.5 0.9 1.7 2.7 4.1 5.7 8.8 12.0 16.0 25.0 31.0 38.0 44.0 With DC reactor 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 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 (IEC 60529) Open type (IP20) 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 Approx. mass (kg)

♦ Three-phase 400 V class

	Madel 50	E040 II		0016	0026	0040	0060	0095	0120	0170	0230	0300	0380	0440	
	Model FR-	E840-[]		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K	18.5K	22K	
			LD	0.75	1.5	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	
Applica	ble motor capa	city (KW) *1	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	6. /L\/A\ *2	LD	1.6	2.7	4.2	5.3	8.5	13.3	17.5	26.7	31.2	34.3	45.7	
	Rateu Capaci	ty (KVA) "Z	ND	1.2	2.0	3.0	4.6	7.2	9.1	13.0	17.5	22.9	29.0	33.5	
	Rated cur	rent (A)	LD	2.1 (1.8)	3.5 (3.0)	5.5 (4.7)	6.9 (5.9)	11.1 (9.4)	17.5 (14.9)	23.0 (19.6)	35.0 (29.8)	41.0 (34.9)	45.0 (38.3)	60.0 (51.0)	
	*7		ND	1.6 (1.4)	2.6 (2.2)	4.0 (3.8)	6.0 (5.4)	9.5 (8.7)	12.0	17.0	23.0	30.0	38.0	44.0	
Output	Overload curre	ont rating *2	LD	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C											
	Overioau curre	ant rating "3	ND	150% 60	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C										
	Vo	oltage *4		Three-ph	Three-phase 380 to 480 V										
	Regenerative braking		sistor	Built-in											
			100%		50%	20%									
		Rated input AC (DC) voltage/ frequency			ase 380 to	480 V 50/	60 Hz (537	to 679VD	C *9)						
	Permissible AC (DC) voltage fluctuation		323 to 52	28 V, 50/60	Hz (457 to	740VDC	*9)								
	Permissible fr	equency fluc	tuation	±5%											
		Without	LD	3.3	6.0	8.9	10.7	16.2	24.9	32.4	46.7	54.2	59.1	75.6	
Power	Rated input	DC reactor	ND	2.7	4.4	6.7	9.5	14.1	17.8	24.7	32.1	41.0	50.8	57.3	
supply	current (A) *8	With DC	LD	2.1	3.5	5.5	6.9	11.0	18.0	23.0	35.0	41.0	45.0	60.0	
		reactor	ND	1.6	2.6	4.0	6.0	9.5	12.0	17.0	23.0	30.0	38.0	44.0	
		Without	LD	2.5	4.5	6.8	8.2	12.4	19.0	25.0	36.0	42.0	45.0	58.0	
	Power supply capacity	DC reactor	ND	2.1	3.4	5.1	7.2	10.8	14.0	19.0	25.0	32.0	39.0	44.0	
	(kVA) *6	With DC	LD	1.6	2.7	4.2	5.3	8.5	13.0	18.0	27.0	31.0	34.0	46.0	
		reactor	ND	1.2	2.0	3.0	4.6	7.2	9.1	13.0	18.0	23.0	29.0	34.0	
Pr	otective structu	re (IEC 60529	9)	Open typ	e (IP20)										
	Cooling s	ystem		Natural		Forced a	ir								
	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	:020C II		0008	0015	0030	0050	0080	0110		
	Wodel FK-E	:0203-[]		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 2. 4.4 0.0) 11.0 0) (10.0) istics) at 20%		
	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)			
Outnut	Overload curre	ent rating *3	ND		s, 200% 3 ing air tem			acteristics)	at		
Output	Vo	ltage *4		Three-phase 200 to 240 V							
		Brake tran	nsistor	Not instal	led	Built-in					
	Regenerative braking Maximum brake torque (ND reference) *5			150%		100%		50%	20%		
	Rated input A	Single-ph	ase 200 to	240 V 50	60 Hz						
	Permissible A	170 to 26	4 V, 50/60	Hz							
	Permissible fr	equency fluc	tuation	±5%							
Power	Rated input	Without DC reactor	ND	2.3	4.1	7.9	11.2	17.9	25.0		
Output F Power supply	current (A) *8	With DC reactor	שא	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	שא	0.3	0.6	1.1	1.9	3.0	4.2		
Pr	rotective structu	re (IEC 6052	9)	Open typ	e (IP20)	<u> </u>		<u> </u>			
	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/ []		8000	0015	0030	0050	
	WIOUEI FK-E	.01044-[]		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 s (inverse-time ristics) at surrounding air ure of 50°C			
	Voltage*10*11			Three-ph	ase 200 to	240 V		
		Brake tran			led	Built-in		
	Regenerative braking	e	150%	150% 100%				
	Rated input A	current rating*3 ND characteristics) temperature of oltage*10*11 Three-phase 20 Brake transistor Not installed 150% (ND reference)*5 AC voltage/frequency Single-phase 10 AC voltage fluctuation 90 to 132 V, 50 Grequency fluctuation 50% (Current (A) *8 ND 3.7 6.8 (Curre (IEC 60529) Open type (IP2	ase 100 to	120 V 50/	60 Hz			
Power	Permissible A	C voltage fluo	ctuation	90 to 132	V, 50/60 H	łz		
Power supply	Permissible fr	equency fluc	tuation	±5%				
	Rated input cu	rrent (A) *8	ND	3.7	6.8	12.4	19.6	
Pı	rotective structu	re (IEC 6052	9)	Open typ	e (IP20)	-	-	
	Cooling s	ystem		Natural				
	Approx. ma	ass (kg)		0.5	0.6	0.8	1.4	
	Approx. ma	ass (kg)		0.5	0.6	8.0	1.4	

- The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard efficiency motor.

 To drive a Mitsubishi Electric high-performance energy-saving motor, use the 200 V class 0.75K inverter for a 1.1 kW motor, or 200400 V class 2.2 K inverter for a 3 kW motor.

 The raided output capacity indicated assumes that the output voltage is 250 V for three-phase 200 V to Class and 440 V for Use-phase 400 V class.

 The raided output capacity indicated assumes that the output voltage is 250 V for three-phase 200 V for Class and 440 V for Class and 440

- In evalue in patentnesses is the fated output current winn the low acoustic noise operation is performed with the surrounding air temperature exceeding 40°C while 2 ket 20 ringingle value is selected in 14.72 and 14.72 the property of the current the impedance at the power supply side (including those of the input reactor and cables) affects the rated input current.

 Connect the DC power supply to the inverter terminals Pi¹ and Ni.. Connect the positive terminal of the power supply to terminal Pi² and Pi

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 61800-32017 (Category "C3" / Second environment) 2017 (category C3, 2nd environment)

 This inverter is not intended to be used on a low-voltage public network which supplies domestic premises. When using the inverter in a residential area, take appropriate measure
- and ensure the conformity of the inverter used in the residential area. Radio frequency interference is expected if used on such a network
- The installer shall provide a guide for installation and use, including reco
- Notes
 Set the EMC Directive compliant EMC filter to the inverter. Insert line noise filters and ferrite cores to the power and control cables as required.
 Connect the inverter to an earthed power supply.
 Install the motor, EU Directive compliant EMC filter, and controller cable found in the EMC Installation Guidelines (BCN-A21041-204) according to the instructions. (Contact your sales representative for the manual.)
 To make full use of the EMC Directive compliant noise filter, motor cable lengths should not exceed 20 m.
- Ensure that the finalized system which includes an inverter complies with the EMC Directive

Low Voltage Directive

- Low Voltage Directive and affix the CE marking on the inverters.

 Low Voltage Directive and affix the CE marking on the inverters.

 Low Voltage Directive: 2014/35/EU
- Standard: EN 61800-5-1:2007
- Outline of instructions
- Do not use an earth leakage circuit breaker as an electric shock protector without connecting the equipment to the earth. Connect the equipment to the earth (ground)
- Wire the earth terminal independently. (Do not connect two or more cables to one terminal.
- When the earth terminal independently, (Do not connect two or more capies to one terminal).

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

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

 Use a tinned (plating should not include zinc) crimping terminal to connect the earth (ground) cable. When tightening the screw, be careful not to damage the threads. For use

- is 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-B earth leakage circuit breaker (AC/DC detection)

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

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

 Attach the fan cover to the fan with the fan cover fixing screws enclosed with the inverter. FR-E820S-0080(1.5K) or higher Fan cover
- 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 o select fuses for branch circuit protection, refer to ◆ Fuse selection in 7.2 Instructions for UL and cUL.

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

♦ 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)

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

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

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

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

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

	nstall the following semicono					l	
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	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	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	Bussmann	700V, 10A
FR-E820-0330(7.5K)	170M1419, 170M1319 or 170M1369	Bussmann	700 V, 160 A	FR-E820S-0015(0.2K)	170M1409	Bussmann	700V, 16A
FR-E820-0470(11K)	170M1420, 170M1320 or 170M1370	Bussmann	700 V, 200 A	FR-E820S-0030(0.4K)	170M1411	Bussmann	700V, 25A
FR-E820-0600(15K)	170M1421, 170M1321 or 170M1471	Bussmann	700 V, 250 A	FR-E820S-0050(0.75K)	170M1413	Bussmann	700V, 40A
FR-E820-0760(18.5K)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A	FR-E820S-0080(1.5K)	170M1415	Bussmann	700V, 63A
FR-E820-0900(22K)	170M1422, 170M1322 or 170M1472	Bussmann	700 V, 315 A	FR-E820S-0110(2.2K)	170M1417	Bussmann	700V, 100A
FR-E840-0016(0.4K)	170M1408	Bussmann	700 V, 10 A	FR-E810W-0008(0.1K)	170M1409, 170M1309 or 170M1359	Bussmann	700V, 16A
FR-E840-0026(0.75K)	170M1410	Bussmann	700 V, 20 A	FR-E810W-0015(0.2K)	170M1410, 170M1310 or 170M1360	Bussmann	700V, 20A
FR-E840-0040(1.5K)	170M1411	Bussmann	700 V, 25 A	FR-E810W-0030(0.4K)	170M1413, 170M1313 or 170M1363	Bussmann	700V, 40A
FR-E840-0060(2.2K)	170M1412	Bussmann	700 V, 32 A	FR-E810W-0050(0.75K)	170M1415, 170M1315 or 170M1365	Bussmann	700V, 63A

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

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

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

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 310). 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

Applicable inverter model					Cable gau	ge
Applicable inverter model	Terminal screw size	Tightening torque (N·m)	Crimp term	inai	AWG	
		(14 111)	R/L1, S/L2, T/L3	U, V, W	R/L1, S/L2, T/L3	U, V, W
FR-E820-0008(0.1K) to 0050(0.75K)	M3.5	1.2	2-3.5	2-3.5	14	14
FR-E820-0080(1.5K)	M4	1.5	3.5-4	2-4	12	14
FR-E820-0110(2.2K)	M4	1.5	5.5-4	2-4	10	14
FR-E820-0175(3.7K)	M4	1.5	8-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 Rl.1, Sl.2, T/L3, 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(27K) is indicated in namentheese

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 petemperature of 75°C, when the surrounding air temperature is 40°C or less, and when the wiring length is 20 m or shorter.

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

For the single-phase 200 V power input models, the screw size for terminals RL1, Sll.2, U, V, W, PR, Pt, N, and P1, and the earthing (grounding) terminal is shown. For the single-phase 100 V power input models, the screw size for terminals RL1, Sll.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, 240 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.

___ Pr.9 = 100% setting of inverter rating*1*2 __10Hz Non-operation range Range on the left of __0.5Hz1 turned off (When Pr.9 setting is 0(A))

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
- Set one of "10, 13, 15, 16, 50, 53, 70, 73, 1800, or
- 1803" in **Pr.71**. (This setting enables the 100% constant-to characteristic in 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 declarated 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 lowspeed 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.

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

	MITSUBISH	INVERTER	PASS
Inverter model ———	MODEL :FR-E820	-0008EPA	
Input rating	INPUT :XXXXX		
Output rating	OUTPUT:XXXXX		
SERIAL	SERIAL: XXXXXXX	XXXX	
Country of origin —	<u> </u>	MADE IN XXXX	Χ

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

indicated by 1 to 9, X (October), Y (November), or Z (December)

The last two digits of the production year is indicated as the Year, and the Month is

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

WARRANTY

Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products. (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than

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