

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 instructions. Please forward this Safety Guideline to the end user.

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

For more information on the product



IB-0600857ENG-H(2312)MEE
 Specifications subject to change without notice.

MITSUBISHI ELECTRIC CORPORATION
 HEAD OFFICE: TOKYO BUILDING 2-7-3, MARUNOUCHI, CHYODOKU, TOKYO 100-8310, JAPAN

◆ Related manuals

Manual name	Manual number	Details
FR-E800 Instruction Manual (Connection)	IB-060086SENG	Manuals describing installation, wiring, specifications, outline dimensions, standards, and how to connect options.
FR-E800 Instruction Manual (Function)	IB-060086BENG	Manual describing details of the functions.
FR-E800 Instruction Manual (Communication)	IB-0600871ENG	Manual describing details of the communications.
FR-E800 Instruction Manual (Maintenance)	IB-0600874ENG	Manual describing how to identify causes of faults and warnings.
FR-E800 Instruction Manual (Functional Safety)	BCN-A23488-000	Manual describing the functional safety.
FR Configurator2 Instruction Manual	IB-0600516ENG	Manual describing details of the software used to set inverter parameters using a personal computer.
PLC Function Programming Manual	IB-0600492ENG	Manual describing details of the PLC function.

Safety information
 Do not attempt to install, operate, maintain or inspect this product until you have read through this Safety Guideline and supplementary documents carefully to use the equipment correctly. Do not use the product until you have full knowledge of the product mechanism, safety information and instructions.
 Installation, operation, maintenance and inspection must be performed by qualified personnel. Here, qualified personnel means a person who meets all the following conditions:
 • A person who possesses a certification in regard with electric appliance handling, or person took a proper engineering training. Such training may be available at your local 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".

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

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

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

For more information on the product

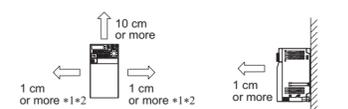


1 INVERTER INSTALLATION AND PRECAUTIONS

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).

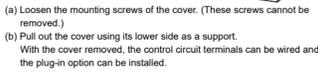
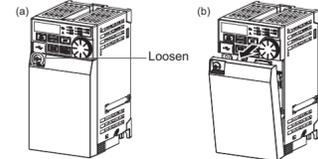
Allow clearance



2 INSTALLATION AND WIRING

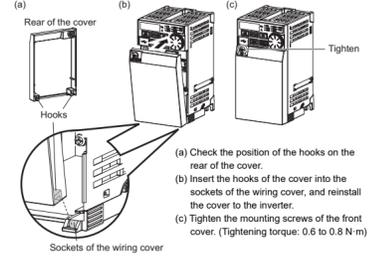
2.1 Removal and reinstallation of covers

◆ Removal of the front cover



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

◆ Reinstallation of the front cover



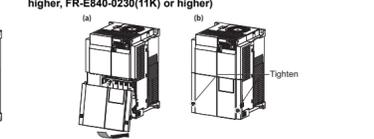
(a) Check the position of the hooks on the rear of the cover.
 (b) Insert the hooks of the cover into the sockets of the wiring cover, and reinstall the cover to the inverter.
 (c) Tighten the mounting screws of the front cover. (Tightening torque: 0.6 to 0.8 N·m)

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



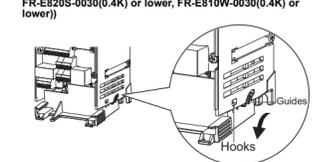
(a) Loosen the screws on the lower front cover. (These screws cannot be removed.)
 (b) While holding the areas around the installation hooks on the sides of the lower front cover, pull out the cover using its upper side as a support.
 (c) With the lower front cover removed, wiring of the main circuit terminals and control circuit terminals can be performed.

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



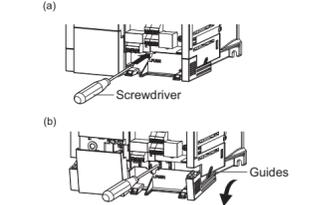
(a) Install the lower front cover by inserting the upper hooks into the sockets on the inverter.
 (b) Tighten the screws on the lower part of the lower front cover.

◆ 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 lower)



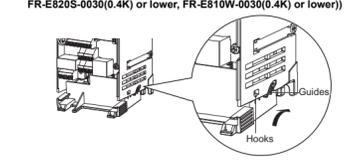
Pull out the cover along the guides in the direction shown by the arrow in the figure above.

◆ Removal of the wiring cover (FR-E820-0080(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-0050(0.75K)



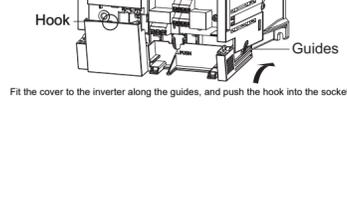
(a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the stopper behind the wiring cover approx. 3 mm.
 (b) Pull out the cover along the guides in the direction shown by the arrow in the figure above.

◆ 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)



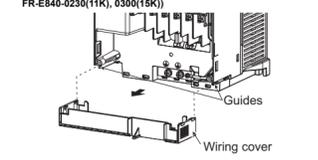
Fit the cover to the inverter along the guides.

◆ 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-0050(0.75K)



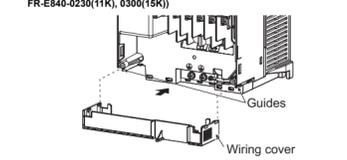
Fit the cover to the inverter along the guides, and push the hook into the socket.

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



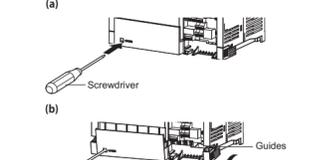
Pull out the cover along the guides in the direction shown by the arrow in the figure above.

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



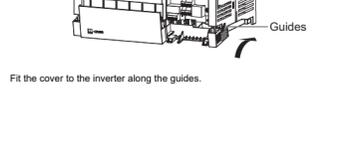
Fit the cover to the inverter along the guides.

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



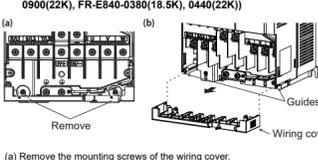
(a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the stopper behind the wiring cover approx. 3 mm.
 (b) Pull out the cover along the guides in the direction shown by the arrow in the figure above.

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



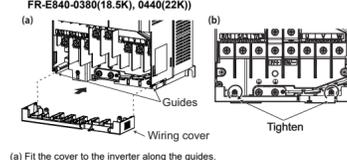
Fit the cover to the inverter along the guides.

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



(a) Remove the mounting screws of the wiring cover.
 (b) Pull out the cover along the guides in the direction shown by the arrow in the figure above.

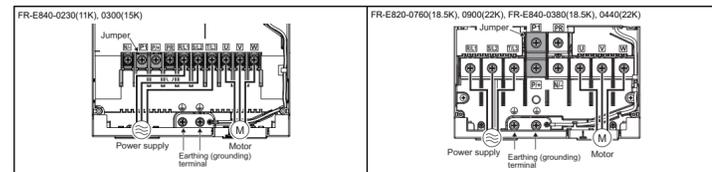
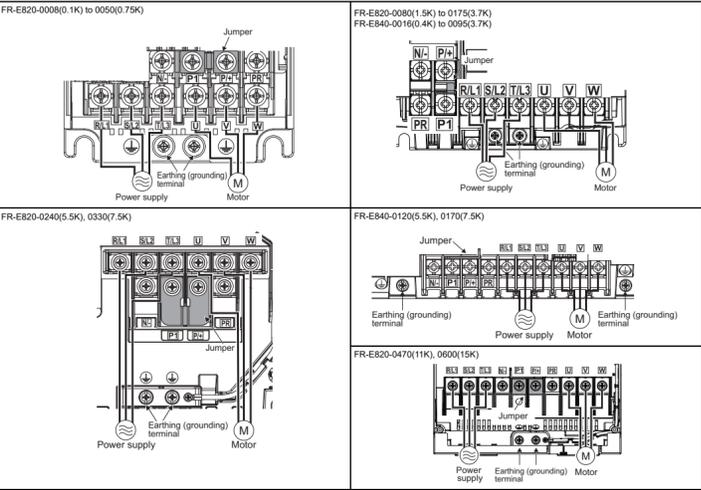
◆ Reinstallation of the wiring cover (FR-E820-0760(18.5K), 0900(22K), FR-E840-0380(18.5K), 0440(22K)



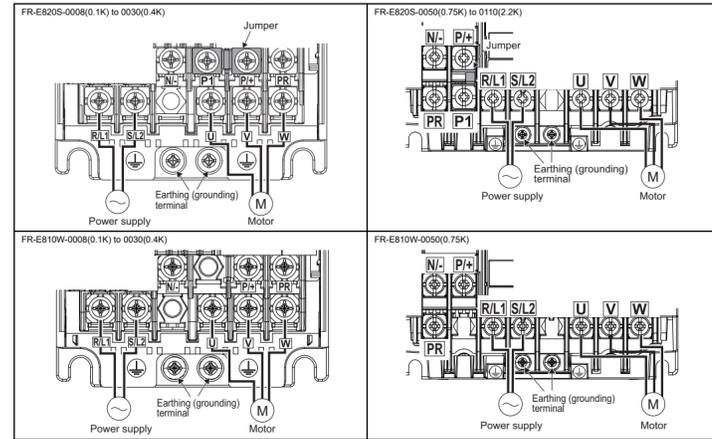
(a) Fit the cover to the inverter along the guides.
 (b) Tighten the mounting screws of the wiring cover (tightening torque: 0.6 to 0.8 N·m).

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

◆ Three-phase 200/400 V class



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



• Make sure the power cables are connected to terminals R/L1, S/L2, and T/L3 (the phases need not be matched). Never connect the power cable to terminals U, V, or W of the inverter. Doing so will damage the inverter.
 • Connect the 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 ON.

2.3 Applicable cables and wiring length

Select cables of recommended gauge size to ensure that the voltage drop is 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 model	Terminal screw size *1	Tightening torque N·m	Crimp terminal		Cable gauge							
			R/L1, S/L2, T/L3	U, V, W	HV cables, etc. (mm²) *1	AWG *2	PVC cables, etc. (mm²) *3	Earthing (grounding) cable	R/L1, S/L2, T/L3	U, V, W	Earthing (grounding) cable	
FR-E820-0008(0.1K) to 0050(0.75K)	M3.5	1.2	2-3.5	2-3.5	2	2	2	14	14	2.5	2.5	2.5
FR-E820-0080(1.5K), 0110(2.2K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5
FR-E820-0175(3.7K)	M4	1.5	5-5.4	5-5.4	3.5	3.5	3.5	12	12	4	4	4
FR-E820-0240(5.5K)	M5	2.5	5-5.5	5-5.5	5.5	5.5	5.5	10	10	6	6	6
FR-E820-0300(7.5K)	M5	2.5	14-5	8-5	14	8	5.5	6	6	16	10	10
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	22	2	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	3.5	3.5	3.5	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	6	16	10	16
FR-E840-0440(22K)	M6	4.4	14-6	14-6	14	14	8	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	3.5	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	3.5	14	14	2.5	2.5	2.5

- *1 HV cable (600 V grade heat-resistant PVC insulated wire) with a continuous maximum permissible temperature of 75°C. It is assumed that the cables will be used in a surrounding air temperature of 50°C or less and the wiring distance of 20 m or shorter.
- *2 HV 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 and Canada, refer to the section "2 Instructions for UL and cUL")
- *3 PVC 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 and Canada, refer to the section "2 Instructions for UL and cUL")
- *4 The screw size for terminals R/L1, S/L2, T/L3, U, V, W, PR, P+, N-, and P1, and the earthing (grounding) terminal is shown. For the single-phase 200 V power input models, the screw size for terminals R/L1, S/L2, 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/L1, S/L2, U, V, W, PR, P+, and N-, 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 when using a single-phase power input model, terminals are R/L1 and S/L2.

The line voltage drop can be calculated by the following formula:
 Line voltage drop [V] = $\sqrt{3} \times$ wire resistance [mΩ/m] \times wiring distance [m] \times current [A] / 1000
 Use a larger diameter cable when the wiring distance is long or when it is desired to decrease the voltage drop (torque reduction) in the low speed range.

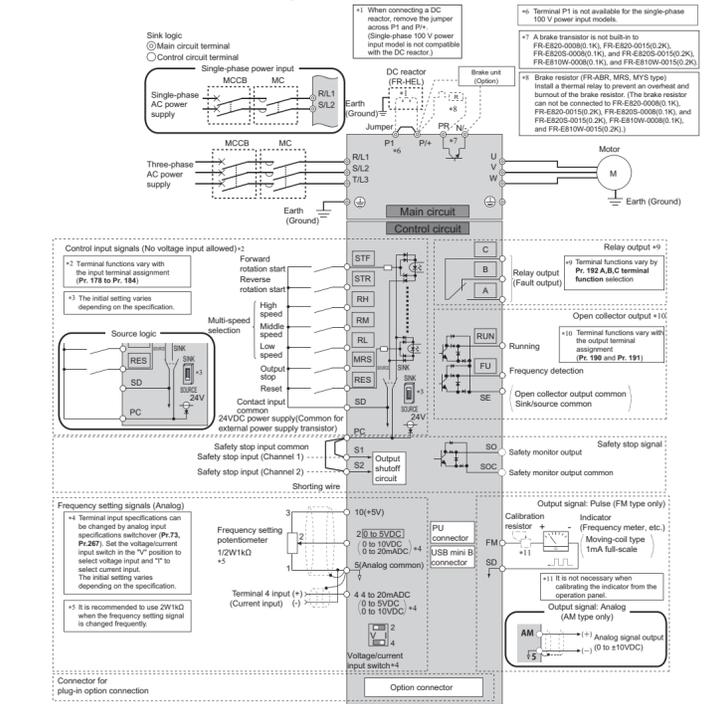
◆ Total wiring length

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

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

*1 The value in the parentheses is the total wiring length when unshielded cables are used.
 When driving a 400 V class motor by the inverter, surge voltages attributable to the wiring constants may occur at the motor terminals, deteriorating the insulation of the motor. In this case, use a "400 V class inverter-driven insulation-enhanced motor" and set Pr.72 PWM frequency selection according to the wiring length: "1.5 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.

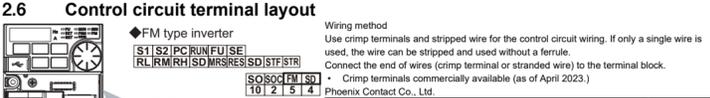
2.4 Terminal connection diagram



2.5 Details on the main circuit terminals and the control circuit terminals

Type	Terminal symbol	Common	Terminal name	Terminal function description
Main circuit	R/L1, S/L2, T/L3*1	—	AC power input	Connected to the commercial power supply. Do not connect anything to these terminals when using the high power factor converter (FR-HC) or the multifunction regeneration converter (FR-XC) in common bus regeneration mode.
	U, V, W	—	Inverter output	Connected to a three-phase squirrel cage motor or a PIM motor.
Main circuit	P+, PR	—	Brake resistor connection	Connect an optional brake transistor (MRS, MYS, FR-ABR) between terminal P+ and PR. (Not available for FR-E820-0008(0.1K), FR-E820-0016(0.4K), FR-E820-0050(0.75K), FR-E820S-0008(0.1K), and FR-E810W-0016(0.4K).)
	P+, N-	—	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU, or BU), multifunction regeneration converter (FR-XC), or high power factor converter (FR-HC2) to these terminals.
Main circuit	P+, P1*2	—	DC reactor connection	Remove the jumper across terminals P+ and P1, and connect a DC reactor. A DC reactor cannot be connected to the single-phase 100 V power input models. When a DC reactor is not connected, the jumper across terminals P+ and P1 should not be removed.
	Earth (ground)	—	Earth (ground)	For earthing (grounding) the inverter chassis. Be sure to earth (ground) the inverter.
Control input	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 simultaneously, the stop command is given.
	STR*3	—	Reverse rotation start	Turn ON the STR signal to start reverse rotation and turn it OFF to stop.
Control input	RH, RM, RL	—	Multi-speed selection	Multi-speed can be selected according to the combination of RH, RM and RL signals.
	MRS*3	PC (source positive common)	Output stop	Turn ON the MRS signal (5 ms or more) to stop the inverter output. Use this signal to reset a fault output provided when a protective function is activated. Turn ON the RES signal for 0.1 second or longer, then turn it OFF. In the initial setting, reset is always enabled. By setting Pr.75, reset can be enabled only at an inverter fault occurrence. The inverter will restart about 1 second after reset.
Control input	RES*3	—	Reset	Use this signal to reset a fault output provided when a protective function is activated. Turn ON the RES signal for 0.1 second or longer, then turn it OFF. In the initial setting, reset is always enabled. By setting Pr.75, reset can be enabled only at an inverter fault occurrence. The inverter will restart about 1 second after reset.
	10	5	Power supply for a frequency setting potentiometer	Use as the power supply for an external frequency setting (speed setting) potentiometer.
Frequency setting	2	5	Frequency setting (voltage)	Inputting 0 to 5 VDC (

Type	Terminal symbol	Common	Terminal name	Terminal function description
Communication	---	---	PU connector	With the PU connector, communication can be made through RS-485 - Conforming standard: EIA-485 (RS-485) Transmission format: Multi-drop link - Communication speed: 300 to 115200 bps - Overall length: 500 m
	---	---	USB connector*6	Use the USB connector to communicate with a personal computer. Setting and monitoring of the inverter is enabled using FR Configurator2. * Interface: conforms to USB 1.1 Transmission speed: 12 Mbps Connector: USB mini B connector (receptacle mini B type)



Wire gauge (mm²)	With insulation sleeve	Without insulation sleeve	For UL wire*1	Crimping tool model No.
0.3	AI 0.34-10T0	---	---	CRIMPFOX 6
0.5	AI 0.5-10W	---	AI 0.5-10W4-GB	
0.75	AI 0.75-10GY	A0.75-10	AI 0.75-10GY-GB	
1.0	AI 1-10RD	A1-10	AI 1-10RD/100GB	
1.25, 1.5	AI 1.5-10BK	A1.5-10	AI 1.5-10BK/100GB*2	
0.75 (for 2 wires)	AI-TWIN 2x0.75-10GY	---	---	

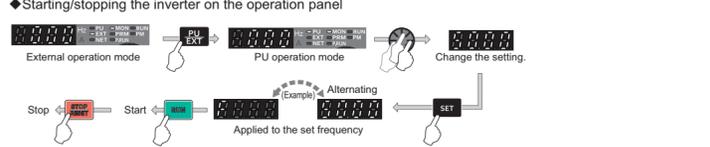
*1 Ferrule terminal with an insulation sleeve compatible with the MTWV wire which has a thick wire insulation.
*2 Applicable for terminals A, B, C.

3 BASIC OPERATION

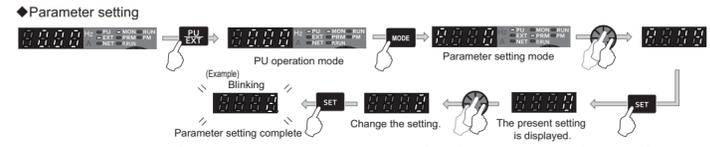
3.1 Components of the operation panel

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

Starting/stopping the inverter on the operation panel



Parameter setting



4 PARAMETERS

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

5 LIST OF FAULT DISPLAYS

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



6 SPECIFICATIONS

6.1 Inverter rating

Three-phase 200 V class

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		16K		18.5K		22K																											
Applicable motor capacity (kW)*1	LD	0.2	0.4	0.75	1.1	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	40.0	55.0	75.0	110.0	150.0	220.0	300.0	400.0	550.0	750.0	1100.0	1500.0	2200.0	3000.0																								
	ND	0.1	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	40.0	55.0	75.0	110.0	150.0	220.0	300.0	400.0	550.0	750.0	1100.0	1500.0	2200.0	3000.0																							
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	61.5	81.0	110.0	150.0	220.0	300.0	400.0	550.0	750.0	1100.0	1500.0	2200.0	3000.0	4000.0																								
	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	47.5	63.0	85.0	115.0	160.0	220.0	300.0	400.0	550.0	750.0	1100.0	1500.0	2200.0	3000.0	4000.0																							
Rated current (A)*7	LD	1.3	2.0	3.5	6.0	9.6	12.0	19.6	30.0	40.0	56.0	69.0	86.0	115.0	150.0	200.0	270.0	360.0	500.0	670.0	900.0	1200.0	1650.0	2250.0	3000.0	4000.0	5500.0	7500.0	10000.0																							
	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	120.0	160.0	220.0	300.0	400.0	550.0	750.0	1000.0	1350.0	1800.0	2400.0	3300.0	4500.0	6000.0	8000.0																							
Overload current rating*3	LD	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C																																																		
	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																																																			
	Three-phase 380 to 480 V																																																			
Regenerative braking	Brake transistor		Not installed																																																	
	Maximum brake torque (ND reference)*5		150%		100%				50%				20%																																							
Rated input AC (DC) voltage/frequency	Three-phase 200 to 240 V 50/60 Hz (283 to 339 VDC*9)																																																			
	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC*9)																																																			
Permissible AC (DC) voltage fluctuation	170 to 264 V, 50/60 Hz (240 to 373 VDC*9)																																																			
	±5%																																																			
Permissible frequency fluctuation	±5%																																																			
	±5%																																																			
Rated input current (A)*8	Without 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	
	With DC reactor		ND																								1.4		2.3		4.5		7.0		10.7		15.0		23.1		30.5		41.0		53.6		69.9		90.0		114.3	
Power supply capacity (kVA)*6	Without DC reactor		LD																								1.3		2.0		3.5		6.0		9.6		12.0		19.6		30.0		40.0		56.0		69.0		86.0		115.0	
	With DC reactor		ND																								0.5		0.9		1.7		2.7		4.1		6.1		8.8		12.0		16.0		21.0		26.0		34.0		44.0	
Protective structure (IEC 60529)	Open type (IP20)																																																			
	Natural																																																			
Cooling system	Natural																																																			
	Forced air																																																			
Approx. mass (kg)	0.5		0.5		0.7		1.0		1.4		1.4		1.8		3.3		3.3		5.4		5.6		11.0		11.0		11.0		11.0																							

Three-phase 400 V class

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																											
Applicable motor capacity (kW)*1	LD	0.75	1.5	2.2	3.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	40.0	55.0	75.0	110.0	150.0	220.0	300.0	400.0	550.0	750.0																										
	ND	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	30.0	40.0	55.0	75.0	110.0	150.0	220.0	300.0	400.0	550.0																										
Rated capacity (kVA)*2	LD	1.8	2.7	4.2	5.3	8.5	13.3	17.5	26.7	31.2	34.3	45.7	61.5	81.0	110.0	150.0	220.0	300.0	400.0	550.0	750.0	1100.0																										
	ND	1.2	2.0	3.0	4.4	7.2	9.1	13.0	17.5	22.9	29.0	33.5	44.0	58.0	78.0	105.0	140.0	190.0	250.0	330.0	450.0	600.0																										
Rated current (A)*7	LD	2.1	3.5	5.5	6.9	11.1	17.5	23.0	35.0	41.0	45.0	60.0	80.0	105.0	140.0	190.0	250.0	330.0	450.0	600.0	800.0	1100.0																										
	ND	1.8	3.0	4.7	6.9	10.4	14.9	19.6	29.0	34.0	38.0	51.0	67.0	90.0	120.0	165.0	220.0	290.0	390.0	510.0	670.0	900.0																										
Overload current rating*3	LD	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C																																														
	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																																															
	Built-in																																															
Regenerative braking	Brake transistor		Built-in																																													
	Maximum brake torque (ND reference)*5		100%		50%				20%																																							
Rated input AC (DC) voltage/frequency	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC*9)																																															
	323 to 528 V, 50/60 Hz (457 to 740VDC*9)																																															
Permissible AC (DC) voltage fluctuation	±5%																																															
	±5%																																															
Permissible frequency fluctuation	±5%																																															
	±5%																																															
Rated input current (A)*8	Without DC reactor		LD																								2.7		4.4		6.7		9.5		14.1		17.8		24.7		32.1		41.0		50.8		57.3	
	With DC reactor		ND																								2.1		3.5		5.5		7.9		11.0		18.0		23.0		30.0		38.0		44.0			
Power supply capacity (kVA)*6	Without DC reactor		LD																								2.5		4.5		6.8		10.2		14.9		20.0		26.0		34.0		42.0		51.0		58.0	
	With 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	
Protective structure (IEC 60529)	Open type (IP20)																																															
	Natural																																															
Cooling system	Natural																																															
	Forced air																																															
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		11.0		11.0		11.0																					

Single-phase 200 V class

Model FR-E820S-[]	0008 0015 0030 0050 0080 0110																							
	0.1K		0.2K		0.4K		0.75K		1.5K		2.2K													
Applicable motor capacity (kW)*1	LD	0.1	0.2	0.4	0.75	1.5	2.2	3.0	4.8	7.5	11.0	15.0												
	ND	0.1	0.2	0.4	0.75	1.5	2.2	3.0	4.8	7.5	11.0	15.0												
Rated capacity (kVA)*2	LD	0.3	0.6	1.2	2.0	3.2	4.4	6.6	10.0	15.0	22.0	30.0												
	ND	0.3	0.6	1.2	2.0	3.0	4.0	6.0	9.0	13.0	18.0	24.0												
Rated current (A)*7	LD	0.8	1.5	3.0	5.0	8.0	11.0	17.0	27.0	42.0	63.0	86.0												
	ND	0.8	1.5	3.0	5.0	8.0	11.0	17.0	27.0	42.0	63.0	86.0												
Overload current rating*3	LD	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C																						
	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																							
	Not installed																							
Regenerative braking	Brake transistor		Built-in																					
	Maximum brake torque (ND reference)*5		150%		100%				50%				20%											
Rated input AC voltage/frequency	Single-phase 200 to 240 V 50/60 Hz																							
	170 to 264 V, 50/60 Hz																							
Permissible AC voltage fluctuation	±5%																							
	±5%																							
Rated input current (A)*8	Without DC reactor		LD										2.3		4.1		7.9		11.2		17.9		25.0	
	With DC reactor		ND										1.4		2.6		5.2		8.7		13.9		19.1	
Power supply capacity (kVA)*6	Without DC reactor		LD										0.5		0.9		1.7		2.5		3.9		5.5	
	With DC reactor		ND										0.3		0.6		1.1		1.9		3.0		4.2	
Protective structure (IEC 60529)	Open type (IP20)																							
	Natural																							
Cooling system	Natural																							
	Forced air																							
Approx. mass (kg)	0.5		0.5		0.8		1.3		1.4		1.9		1.9											

Single-phase 100 V class

Model FR-E810W-[]	0008 0015 0030 0050							
	0.1K		0.2K		0.4K		0.75K	
Applicable motor capacity (kW)*1	LD	0.1	0.2	0.4	0.75	1.5	2.2	3.0
	ND	0.1	0.2	0.4	0.75	1.5	2.2	3.0
Rated capacity (kVA)*2	LD	0.3	0.6	1.2	2.0	3.2	4.4	6.6
	ND	0.3	0.6	1.2	2.0	3.0	4.0	6.0
Rated current (A)*7	LD	0.8	1.5	3.0	5.0	8.0	11.0	17.0
	ND	0.8	1.5	3.0	5.0	8.0	11.0	17.0
Overload current rating*3	LD	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C						
	ND	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C						
Voltage*10*11	Three-phase 200 to 240 V							
	Not installed							
Regenerative braking	Brake transistor		Built-in					
	Maximum brake torque (ND reference)*5		150%		100%			
Rated input AC voltage/frequency	Single-phase 100 to 120 V 50/60 Hz							
	90 to 132 V, 50/60 Hz							
Permissible AC voltage fluctuation	±5%							
	±5%							
Permissible frequency fluctuation	±5%							
	±5%							