

MITSUBISHI ELECTRIC

INVERTER

E800-E

INVERTER SAFETY GUIDELINE

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

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.



IB-0600860ENG-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-060086ENG	Manuals describing installation, wiring, specifications, outline dimensions, standards, and how to connect options.
FR-E800 Instruction Manual (Function)	IB-060086ENG	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:

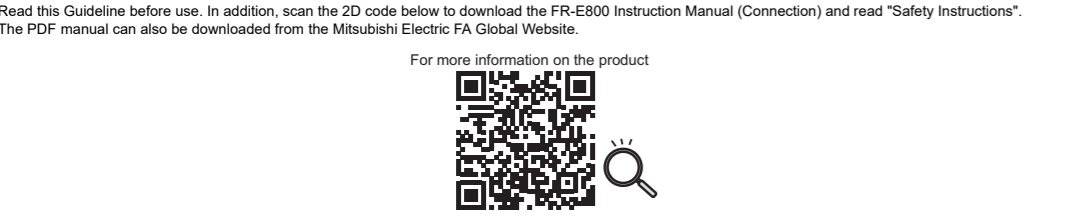
- A person who possesses a certification in regard with electric appliances handling, or person took a proper engineering training. Such training may be available at your local Mitsubishi Electric office. Contact your local sales office for schedules and locations.
- A person who can access operating 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.



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 on 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

1 cm or more +1/2
1 cm or more +1/2
10 cm or more
10 cm or more

1. When using the inverters at the surrounding air temperature of 40°C or less, the inverters can be installed closely attached (5 cm clearance).
2. For the FR-E820-0470(1K) or higher and FR-E840-0230(1K) or higher, allow 5 cm or more 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.
(c) 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 screw 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(1K) 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(1K) 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)

◆ 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)

Remove the wiring cover by pulling it out along the guides in the direction shown by the arrow in the figure above.

Fit the cover to the inverter along the guides.

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

◆ 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))

Remove the wiring cover by pulling it out along the guides in the direction shown by the arrow in the figure above.

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(1K), 0300(15K))

◆ Reinstallation of the wiring cover (FR-E820-0240(5.5K) to 0600(15K), FR-E840-0230(1K), 0300(15K))

Remove the wiring cover by pulling it out along the guides in the direction shown by the arrow in the figure above.

Fit the cover to the inverter along the guides.

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

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

Remove the wiring cover by pulling it out along the guides in the direction shown by the arrow in the figure above.

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))

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

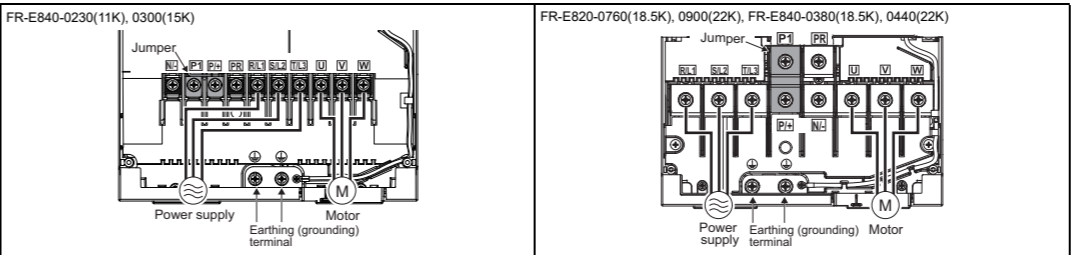
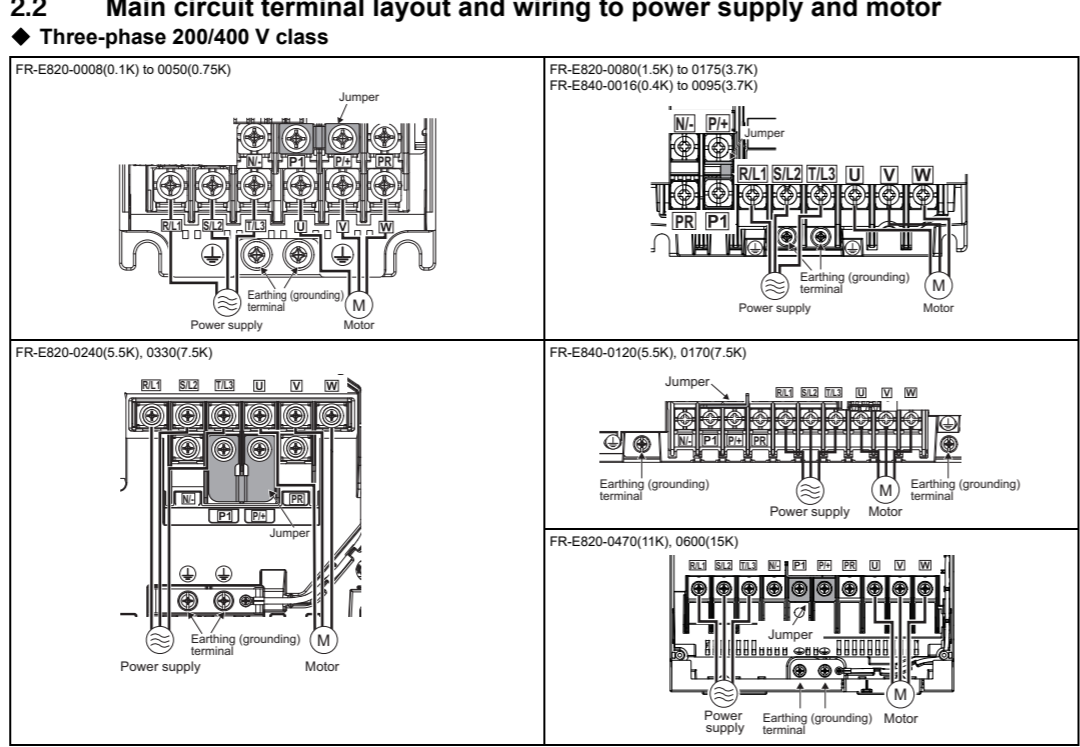
Remove the wiring cover by pulling it out along the guides in the direction shown by the arrow in the figure above.

Fit the cover to the inverter along the guides.

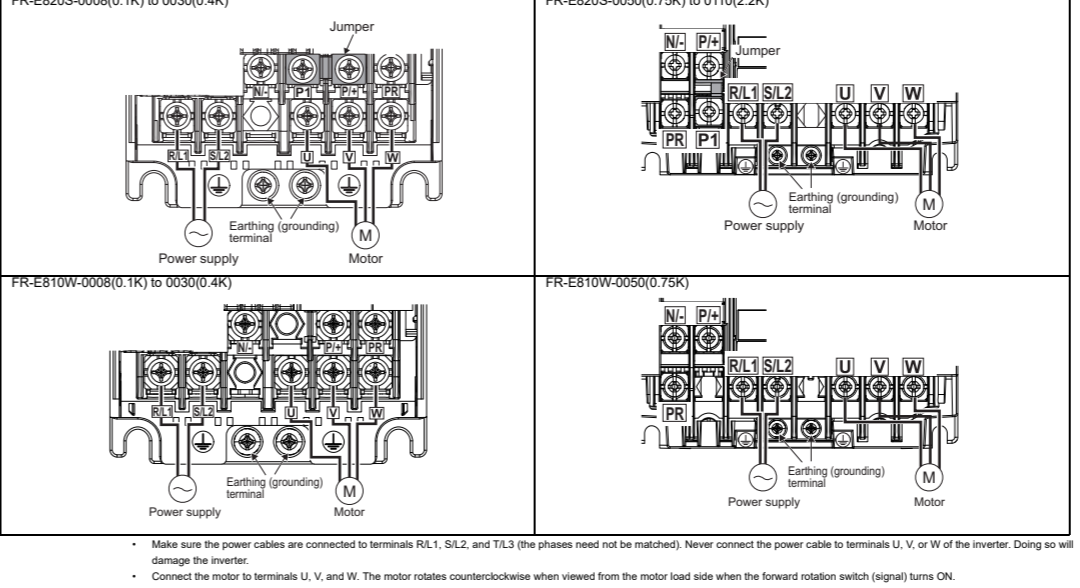
2.2 Main circuit terminal layout and wiring to power supply and motor

◆ Three-phase 200/400 V class

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



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



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	Cable gauge							
			Crimp terminal		HIV cables, etc. (mm ²)*1		PVC cables, etc. (mm ²)*3			
			R/L1, S/L2, T/L3 +1,2	U, V, W	Earthing (grounding) terminal	R/L1, S/L2, T/L3 +1,2	U, V, W	Earthing (grounding) terminal		
FR-E820-0080(0.1K) to 0050(0.75K)	M3.5	1.2	2.3-5	2-3.5	2	2	14	14	2.5	2.5
FR-E820-0080(1.5K), 0110(2.2K)	M4	1.5	2.4	2-4	2	2	14	14	2.5	2.5
FR-E820-0175(3.7K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	12	12	4	4
FR-E820-0240(5.5K)	M5	2.5	5.5-5	5.5-5	5.5	5.5	10	10	6	6
FR-E820-0300(9.5K)	M5	2.5	14-5	14-5	14	14	8	8	16	16
FR-E820-0470(11K)	M5	2.5	14-5	14-5	14	14	8	8	16	16
FR-E820-0600(15K)	M6(M5)	4.4	22-6	22-6	22	22	14	14	25	25
FR-E820-0760(18.5K)	M6(M6)	7.8	38-8	38-8	38	38	22	22	35	35
FR-E820-0900(22K)	M8(M6)	7.8	38-8	38-8	38	38	22	22	35	35
FR-E840-0016(0.4K) to 0095(3.7K)	M4	1.5	2-4	2-4	2	2	14	14	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
FR-E840-0170(7.5K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4
FR-E840-0230(11K)	M4	1.5	5.5-4	5.5-4	5.5	5.5	10	10	6	10
FR-E840-0300(15K)	M5	2.5	8-5	8-5	8	8	8	8	10	10
FR-E840-0380(18.5K)	M6	4.4	14-6	8-6	14	8	8	8	16	16
FR-E840-0440(22K)	M6	4.4	14-6	14-6	14	14	8	8	16	16
FR-E820S-0080(0.1K) to 0030(0.4K)	M3.5	1.2	2.3-5	2-3.5	2	2	14	14	2.5	2.5
FR-E820S-0080(1.5K)	M4	1.5	2.4	2-4	2	2	14	14	2.5	2.5
FR-E820S-0110(2.2K)	M4	1.5	5.5-4	2-4	3.5	2	12	14	4	2.5
FR-E820S-0050(0.75K)	M4	1.5	2.4	2-4	2	2	14	14	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	14	14	2.5	2.5
FR-E810W-0050(0.75K)	M4	1.5	5.5-4	2-4	3.5	2	14	14	2.5	2.5

*1 HIV cable (90°C grade heat-resistant PVC insulated wire) with a continuous maximum permissible temperature of 70°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 THW 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 greater. (For use in the United States or Canada, refer to the section "2. Instructions for U.S. and CUL.")
*3 PVC cable with a 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 shorter (shorter insulation example refers to IEC 60332-1-2).
*4 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/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. When using a single-phase power input model, terminals are R/L1 and S/L2.
*5 The value in the parentheses is the total wiring length when unshielded cables are used.

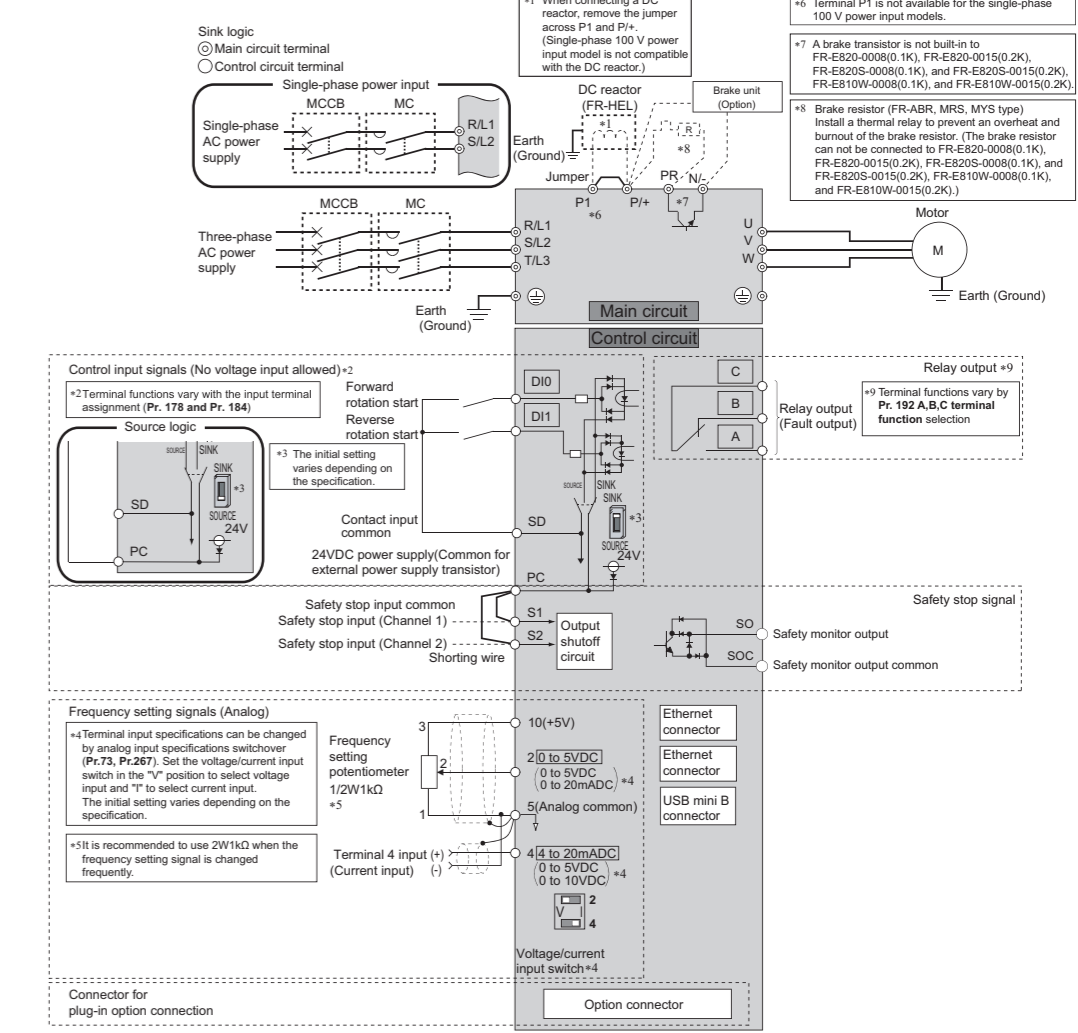
The line voltage drop can be calculated by the following formula:
Line voltage drop [V] = $\sqrt{3} \times$ wire resistance [mΩ/km] \times wiring distance [m] \times current [A] / 1000
Use a larger diameter cable when the wiring distance is long or when it is desired to decrease the voltage drop (torque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

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

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

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.

2.4 Terminal connection diagram

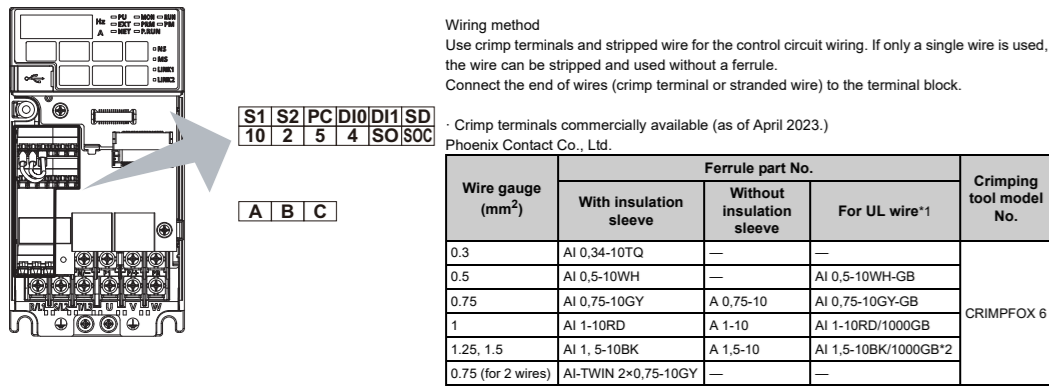


2.5 Details on the main circuit terminals and the control circuit terminals

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-FC) or the multifunction regeneration converter (FR-XC) in common bus regeneration mode.
	U, V, W	—	Inverter output	Connect an optional brake transistor (MRS, MYS, FR-ABR) between terminal P+ and PR. Not available for FR-E820-0080(0.1K), FR-E820-0015(0.2K), FR-E820S-0008(0.1K), and FR-E820S-0015(0.2K). FR-E810W-0008(0.1K) and FR-E810W-0015(0.2K).
	P+ / PR	—	Brake resistor connection	Connect the brake unit (FR-ABR, FR-ABR) or a resistor between terminal P+ and PR. Not available for FR-E820-0080(0.1K), FR-E820-0015(0.2K), FR-E820S-0008(0.1K), and FR-E820S-0015(0.2K). FR-E810W-0008(0.1K) and FR-E810W-0015(0.2K).
	P+ / N+	—	Brake unit connection	Remove the jumper across terminals P+ and P1, and connect a DC reactor (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.
	P+ / P1*2	—	DC reactor connection	Remove the jumper across terminals P+ and P1, and connect a DC reactor (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)	For earthing (grounding) the inverter chassis. Be sure to earth (ground) the inverter.
	—	—	—	—
Control input	DIO*3	—	Forward rotation start	Turn ON the DIO signal to start forward rotation and turn it OFF to stop. When the DIO and DI1 signals are turned ON simultaneously, the stop command is given.
	DI*3	—	Reverse rotation start	Turn ON the DI1 signal to start reverse rotation and turn it OFF to stop.
	10	s	Power supply for a frequency setting potentiometer	Used as the power supply for an external frequency setting (speed setting) potentiometer. * s: 5 to 5 VDC, Permissible load current: 10 mA
Input signal	2	s	Frequency setting (voltage)	Inputting 0 to 5 VDC (or 0 to 10 VDC) provides the maximum output frequency at 5 V (or 10 V) and makes input and output proportional. Use Pr.73 to switch among input to 5 VDC (initial setting), 0 to 10 VDC, and 0 to 20 mV. The initial setting varies depending on the specification. * s: 5 to 5 VDC, Permissible load current: 10 mA
	4	s	Frequency setting (current)	Inputting 4 to 20 mA (or 0 to 5 VDC, 0 to 10 VDC) provides the maximum output frequency at 20 mA (or 0 to 5 VDC, 0 to 10 VDC) and makes input and output proportional. This input signal is valid only when the AU signal is ON (terminal C input is invalid). To use the terminal 4 (current input at initial setting), assign "4" to Pr.178 or Pr.179. (Input terminal function selection) before turning ON the AU signal. The initial setting varies depending on the specification. Use Pr.267 to switch among input 4 to 20 mA (initial setting), 0 to 5 VDC, and 0 to 10 VDC. Set the voltage/current input switch in the "V" position to select voltage input (0 to 5 V or 0 to 10 V).
Output/Relay	A, B, C	—	Relay output (fault output)	1 changeover contact output indicates that the inverter protective function has activated and the outputs are stopped. Fault: discontinuity across B and C (continuity across A and C). Normal: continuity across B and C (discontinuity across A and C). Contact capacity: 240 VAC 2A (power factor = 0.4) or 30 VDC 1A
	S1	PC	Safety stop input (Channel 1)	Use terminals S1 and S2 to receive the safety stop signal input from the safety relay module. Terminals S1 and S2 can be used at a time (latched 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. When the status is shorted, terminal S1 and S2 are shorted with terminal PC by shorting wires. Remove the shorting wires and connect the safety relay module when using the safety stop function.
Safety stop function	S2	PC	Safety stop input (Channel 2)	The output status varies depending on the input status of the safety stop signals. The output is in HIGH state during occurrence of the internal safety circuit fault. The output is in LOW state otherwise. (The open collector transistor is ON (conductive) in LOW state. The transistor is OFF (not conductive) in HIGH state.) Refer to the FR-E800 Instruction Manual (Functional Safety) (BCN-A23488-000) when the signal is switched to HIGH while both terminals S1 and S2 are open. (Please contact your sales representative for the manual.)
	SO	SOC	Safety monitor output (open collector output)	Permissible load: 24 VDC (Z7 VDC at maximum), 0.1 A (The voltage drop is 3.4 V at maximum while the signal is ON.)
Common terminal	SD	—	Contact input common (sink (negative common))	Common terminal for the contact input terminal (sink logic).
	—	—	External transistor common (sink (negative common))	Connect this terminal to the power supply common terminal of a transistor output (open collector output) device, such as a programmable controller, in the sink logic to avoid malfunction by undesirable current.
	PC	—	Safety stop input terminal common (source (positive common))	Common terminal for safety stop input terminals. Common terminal for the contact input terminal (source logic).
Communication	5	—	24 VDC power supply common	Can be used as a 24 VDC 0.1 A power supply.
	SOC	—	Frequency setting common	Common terminal for the frequency setting signal (terminal 2 or 4). Do not earth (ground).
Communication	—	—	Ethernet connector (2 ports)*4	Communication can be made via Ethernet. Category: 100BASE-TX/10BASE-T. Transmission method: Baseband. Data transmission speed: 100 Mbps (100BASE-TX) / 10 Mbps (10BASE-T). Maximum segment length: 100 m between the hub and the inverter. Interface: RJ-45. Number of cascade connection stages: Up to 2 (100BASE-TX) / up to 4 (10BASE-T). Number of interfaces available: 1 - IP version: IPv4.
	—	—	USB connector*5	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 (receipt type mini B type).

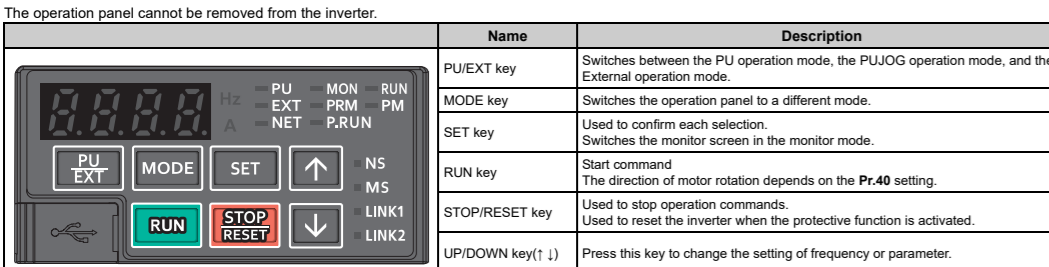
*1 Terminal T/L3 is not available for the single-phase power input models.
*2 Terminal P1 is not available for the single-phase power input models.
*3 Terminal functions can be selected using Pr.178 and Pr.179 (input terminal function selection). (Refer to the FR-E800 Instruction Manual (Function).)
*4 Do not connect the parameter unit. The inverter may be damaged.
*5 USB bus power connector is available. The maximum SCRR is 500 mA.

2.6 Control circuit terminal layout

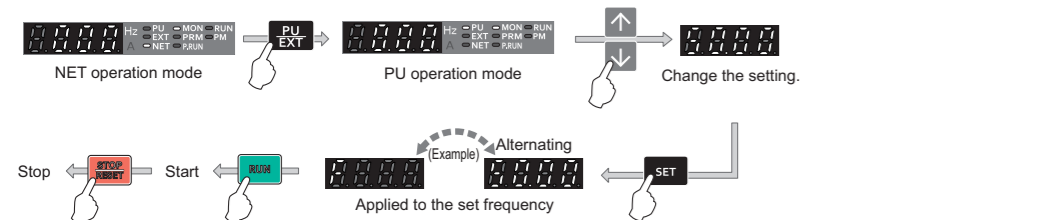


3 BASIC OPERATION

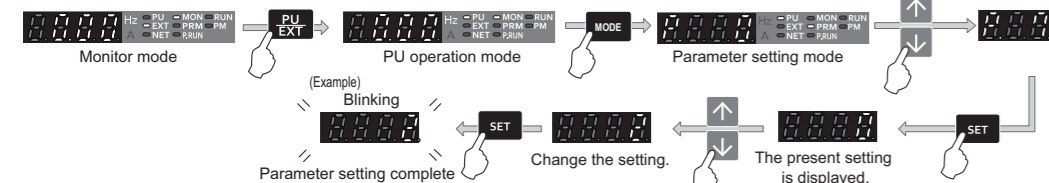
3.1 Components of the operation panel



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-□	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	
	ND 0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	
Rated capacity (kVA) *2	LD 1.0	2.0	3.0	4.0	7.2	10.5	15.0	20.7	27.0	33.0	45.0	
	ND 1.2	2.0	3.0	4.0	7.2	10.5	15.0	20.7	27.0	33.0	45.0	
Rated current (A)	LD 2.1	3.5	5.0	6.9	11.1	17.5	23.0	35.0	41.0	45.0	60.0	
	ND 1.8	(3.0)	(4.7)	(6.9)	(9.4)	(14.9)	(19.6)	(29.8)	(34.9)	(38.3)	(51.0)	
Overload current rating *3	LD 1.6	2.6	4.0	6.0	9.5	12.0	17.0	23.0	30.0	38.0	44.0	
	ND 1.4	(2.2)	(3.8)	(5.4)	(8.7)	(11.2)	(16.0)	(21.5)	(26.0)	(30.0)	(38.0)	
Output	Three-phase 380 to 480 V											
Regenerative braking	Built-in											
Maximum brake torque (ND reference) *5	100%											
Rated input AC (DC) voltage/frequency	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC *9)											
Permissible AC (DC) voltage fluctuation	±5%											
Power supply	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC *9)											
Rated input current (A) *8	LD 3.3	6.0	8.9	10.7	16.2	24.9	32.4	46.7	54.2	59.1	75.6	
	ND 2.7	4.4	6.7	9.5	14.1	17.8	24.7	32.1	41.0	50.8	57.3	
Power supply capacity (kVA) *6	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	
Protective structure (IEC 60529)	Open type (IP20)											
Cooling system	Natural											
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	

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
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
	ND 0.1	0.2	0.4	0.75	1.1	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0
Rated capacity (kVA) *2	LD 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
	ND 0.3	0.6	1.2	2.0	3.2	4.4	7.0	9.6	13.1	18.7	23.9	30.3	35.9
Rated current (A)	LD 1.3	2.0	3.0	4.0	6.6	9.0	15.0	20.0	27.0	36.0	48.0	60.0	80.0
	ND 1.1	(1.7)	(3.0)	(5.1)	(8.2)	(10.2)	(16.7)	(22.5)	(30.0)	(40.0)	(52.0)	(64.0)	(86.0)
Overload current rating *3	LD 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
	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)
Output	Single-phase 100 to 120 V 50/60 Hz												
Regenerative braking	Not installed												
Maximum brake torque (ND reference) *5	100%												
Rated input AC (DC) voltage/frequency	Single-phase 200 to 240 V 50/60 Hz												
Permissible AC (DC) voltage fluctuation	±5%												
Power supply	Single-phase 200 to 240 V 50/60 Hz												
Rated input current (A) *8	LD 2.3	4.1	7.9	11.2	17.9	25.0							
	ND 1.4	2.6	5.2	8.7	13.9	19.1							
Power supply capacity (kVA) *6	LD 0.5	0.9	1.7	2.5	3.9	5.5							
	ND 0.3	0.6	1.1	1.9	3.0	4.2							
Protective structure (IEC 60529)	Open type (IP20)												
Cooling system	Natural												
Approx. mass (kg)	0.5	0.5	0.8	1.3	1.4	1.9							

*1 The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard efficiency motor.
*2 The rated output capacity assumes that the output voltage is 230 V for three-phase 200 V class and single-phase 200/100 V class, and 440 V for three-phase 400 V class.
*3 The overload current for the inverter is based on the rated output current for the inverter's rated output current. It is required to stop the inverter and motor to return to or below the temperature under 100% load in a single-phase 200 V class inverter with the automatic restart after the instantaneous power failure (Pr.87) and the power failure stop (Pr.261) functions are set. The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum part of the voltage waveform at the output of the inverter is based on the rated output current when the low inrush current operation is performed with the surrounding air temperature exceeding 40°C while 2 Hz or higher is selected.
*4 The amount of braking torque is the average short-term torque (which varies depending on motor type) that is generated when a motor decelerates in the shortest time by itself from 60 Hz. It is not applicable to the inverter with the built-in brake. The braking torque becomes lower when a motor decelerates from a frequency higher than the base frequency. The inverter is not equipped with a built-in brake resistor. Use an option brake resistor for an operation with large regenerative power (that available for FR-E820-0006(0.1K), FR-E820-0170(2.2K), FR-E820-0008(0.1K), FR-E820-0015(0.2K), FR-E820-0030(0.4K), FR-E820-0050(0.75K), FR-E820-0080(1.1K), FR-E820-0110(1.75K), FR-E820-0175(3.7K), FR-E820-0240(5.5K), FR-E820-0330(7.5K), FR-E820-0470(11K), FR-E820-0600(15K), FR-E820-0760(18.5K), FR-E820-0900(22K)).
*5 The power supply capacity varies with the value of the input power impedance (including those of the input reactor and cables).
*6 The rated power is based on the rated output current when the low inrush current operation is performed with the surrounding air temperature exceeding 40°C while 2 Hz or higher is selected.
*7 The rated power is based on the rated output current when the low inrush current operation is performed with the surrounding air temperature exceeding 40°C while 2 Hz or higher is selected.
*8 The power capacity depends on the output impedance of the power supply. Select a power capacity according to the AC power supply capacity.
*9 For the single-phase 100 V power input mode, the maximum output current is limited to the rated output current of the power supply. The load must be reduced so that output current does not exceed the rated motor current.

◆ 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	
	ND 0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	
Rated capacity (kVA) *2	LD 1.0	2.0	3.0	4.0	7.2	10.5	15.0	20.7	27.0	33.0	45.0	
	ND 1.2	2.0	3.0	4.0	7.2	10.5	15.0	20.7	27.0	33.0	45.0	
Rated current (A)	LD 2.1	3.5	5.0	6.9	11.1	17.5	23.0	35.0	41.0	45.0	60.0	
	ND 1.8	(3.0)	(4.7)	(6.9)	(9.4)	(14.9)	(19.6)	(29.8)	(34.9)	(38.3)	(51.0)	
Overload current rating *3	LD 1.6	2.6	4.0	6.0	9.5	12.0	17.0	23.0	30.0	38.0	44.0	
	ND 1.4	(2.2)	(3.8)	(5.4)	(8.7)	(11.2)	(16.0)	(21.5)	(26.0)	(30.0)	(38.0)	
Output	Three-phase 380 to 480 V											
Regenerative braking	Built-in											
Maximum brake torque (ND reference) *5	100%											
Rated input AC (DC) voltage/frequency	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC *9)											
Permissible AC (DC) voltage fluctuation	±5%											
Power supply	Three-phase 380 to 480 V 50/60 Hz (537 to 679VDC *9)											
Rated input current (A) *8	LD 3.3	6.0	8.9	10.7	16.2	24.9	32.4	46.7	54.2	59.1	75.6	
	ND 2.7	4.4	6.7	9.5	14.1	17.8	24.7	32.1	41.0	50.8	57.3	
Power supply capacity (kVA) *6	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	
Protective structure (IEC 60529)	Open type (IP20)											
Cooling system	Natural											
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

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
	ND 0.3	0.6	1.2	2.0	3.2	4.4
Rated capacity (kVA) *2	LD 0.3	0.6	1.2	2.0	3.2	4.4
	ND 0.3	0.6	1.2	2.0	3.2	4.4
Rated current (A)	LD 1.3	2.0	3.0	4.0	6.6	9.0
	ND 1.1	(1.7)	(3.0)	(5.1)	(8.2)	(10.2)
Overload current rating *3	LD 0.8	1.5	3.0	5.0	8.0	11.0
	ND 0.8	(1.4)	(2.5)	(4.1)	(7.0)	(10.0)
Output	Single-phase 100 to 120 V 50/60 Hz					
Regenerative braking	Not installed					
Maximum brake torque (ND reference) *5	100%					
Rated input AC voltage/frequency	Single-phase 200 to 240 V 50/60 Hz					
Permissible AC voltage fluctuation	±5%					
Power supply	Single-phase 200 to 240 V 50/60 Hz					
Rated input current (A) *8	LD 2.3	4.1	7.9	11.2	17.9	25.0
	ND 1.4	2.6	5.2	8.7	13.9	19.1
Power supply capacity (kVA) *6	LD 0.5	0.9	1.7	2.5	3.9	5.5
	ND 0.3	0.6	1.1	1.9	3.0	4.2
Protective structure (IEC 60529)	Open type (IP20)					
Cooling system	Natural					
Approx. mass (kg)	0.5	0.5	0.8	1.3	1.4	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
	ND 0.3	0.6	1.2	2.0
Rated capacity (kVA) *2	LD 0.3	0.6	1.2	2.0
	ND 0.3	0.6	1.2	2.0
Rated current (A) *7	LD 1.3	2.0	3.0	4.0
	ND 1.1	(1.7)	(3.0)	(5.1)
Overload current rating *3	LD 0.8	1.5	3.0	5.0
	ND 0.8	(1.4)	(2.5)	(4.1)
Output	Single-phase 100 to 120 V 50/60 Hz			
Regenerative braking	Not installed			
Maximum brake torque (ND reference) *5	100%			
Rated input AC voltage/frequency	Single-phase 200 to 240 V 50/60 Hz			
Permissible AC voltage fluctuation	±5%			
Power supply	Single-phase 200 to 240 V 50/60 Hz			
Rated input current (A) *8	LD 3.7	5.8	12.4	19.6
	ND 3.7	5.8	12.4	19.6
Protective structure (IEC 60529)	Open type (IP20)			
Cooling system	Natural			
Approx. mass (kg)	0.5	0.6	0.8	1.4

*1 The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard efficiency motor.
*2 The rated output capacity assumes that the output voltage is 230 V for three-phase 200 V class and single-phase 200/100 V class, and 440 V for three-phase 400 V class.
*3 The overload current for the inverter is based on the rated output current for the inverter's rated output current. It is required to stop the inverter and motor to return to or below the temperature under 100% load in a single-phase 200 V class inverter with the automatic restart after the instantaneous power failure (Pr.87) and the power failure stop (Pr.261) functions are set. The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum part of the voltage waveform at the output of the inverter is based on the rated output current when the low inrush current operation is performed with the surrounding air temperature exceeding 40°C while 2 Hz or higher is selected.
*4 The amount of braking torque is the average short-term torque (which varies depending on motor type) that is generated when a motor decelerates in the shortest time by itself from 60 Hz. It is not applicable to the inverter with the built-in brake. The braking torque becomes lower when a motor decelerates from a frequency