



INVERTER

E806-SCE

INVERTER SAFETY GUIDELINE

FR-E846-0026(0.75K) to 0095(3.7K)SCE



IB-0600984ENG-B(2405)MEE
Specifications subject to change without notice.

◆ Related manuals

Manual name	Manual number	Model code	Details
FR-E800 Instruction Manual (Connection)	IB-060086SENG	1AJ048	Manual describing installation, wiring, specifications, outline dimensions, standards, and how to connect options.
FR-E800 Instruction Manual (Function)	IB-060086BENG	1AJ045	Manual describing details of the functions.
FR-E800 Instruction Manual (Communication)	IB-0600891ENG	1AJ051	Manual describing details of the communications.
FR-E800 Instruction Manual (Maintenance)	IB-0600874ENG	1AJ054	Manual describing how to identify causes of faults and warnings.
FR-E800-SCE Instruction Manual (Functional safety)	BCN-A23488-004	1AJ036	Manual describing details of the safety communication parameters.
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-0600482ENG	—	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.

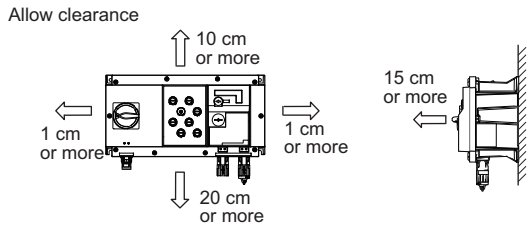
Read this Guideline before use. In addition, scan the 2D code below to download the FR-E800 Instruction Manual (Connection) and read "Safety Instructions". The PDF manual can also be downloaded from the Mitsubishi Electric FA Global Website. To order the non-free printed manual, please contact your sales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

For more information on the product

1 INVERTER INSTALLATION AND PRECAUTIONS

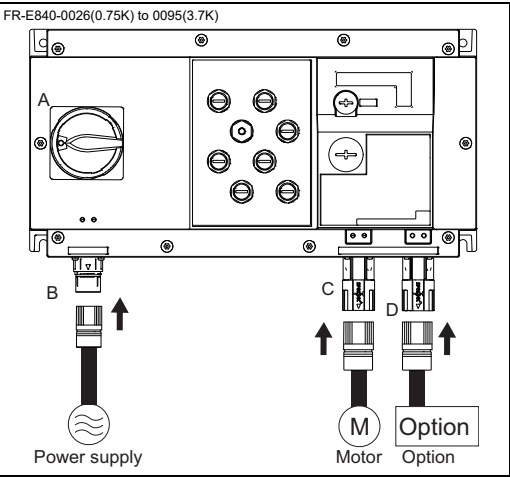
The front cover cannot be removed. If removed, it will not meet IP66/IP67.

- 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.



2 INSTALLATION AND WIRING

2.1 Wiring of the power supply and the motor, the option



Symbol	Name	Description
A	Power ON/OFF switch	Clockwise: ON (I) Counterclockwise: OFF(-)

Symbol	Connector	Terminal symbol	Symbol	Connector	Terminal symbol
B	M23, 6-pole (male)	1	C	M23, 6-pole (female)	1
		2			2
		3			3
		4			4
		5			5
		6			6
D	M23, 6-pole (female)	1			1
		2			2
		3			3
		4			4
		5			5
		6			6

◆ **Wiring method**
Prepare cables with connectors suitable for applicable connector types shown in the table above for main circuit terminals on the inverter. To meet the UL/cUL standards, purchase cables shown in the following table.
Manufacturer: Tyco Electronics.

Cable type	Cable length	Model
M23, 6-pole (female) for power supply	5 m	1-2391589-1
	10 m	2-2391589-1
	20 m	3-2391589-1
	5 m	1-2391589-2
	10 m	2-2391589-2
	20 m	3-2391589-2
M23, 6-pole (male) for motor	5 m	1-2391590-1
	10 m	2-2391590-1
	20 m	3-2391590-1
	5 m	1-2391590-2
	10 m	2-2391590-2
	20 m	3-2391590-2
M23, 6-pole (male) for option	5 m	1-2391600-1
	10 m	2-2391600-1
	20 m	3-2391600-1
	5 m	1-2391600-2
	10 m	2-2391600-2
	20 m	3-2391600-2

If you need a cable whose length is not listed in the table, please contact Tyco Electronics.

2.2 Recommended 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 the recommended cable size for cables that are 20 m in length at the ND rating. When using the inverter with the LD rating, refer to the FR-E800 Instruction Manual (Connection).)

Applicable inverter model	Cable gauge					
	HIV cables, etc. (mm ²)*1		AWG *2		PVC cables, etc. (mm ²)*3	
	R/L1, S/L2, T/L3	U, V, W	R/L1, S/L2, T/L3	U, V, W	R/L1, S/L2, T/L3	U, V, W
FR-E846-0026(0.75K) to 0095(3.7K)	2	2	14	14	2.5	2.5

- *1 The cable size is that of the HIV cable (900 V grade heat-resistant PVC insulated wire) etc. with continuous maximum permissible temperature of 75°C. It assumes a surrounding air temperature of 50°C or lower and the cable size is that of the THHN 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 shorter. (For use in the United States or Canada, refer to the section 6.2 "Precautions for UL and cUL".)
- *2 The cable size is that of the PVC cable with continuous maximum permissible temperature of 70°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or shorter (selection example equally for use in Europe).
- *3 The cable size is that of the PVC cable with continuous maximum permissible temperature of 70°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or shorter (selection example equally for use in Europe).

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

Line voltage drop [V] = $\sqrt{3}$ × wire resistance [mΩ/m] × wiring distance [m] × current [A] / 1000

Use a larger diameter cable when the wiring distance is long or when the voltage drop (torque reduction) in the low speed range needs to be reduced.

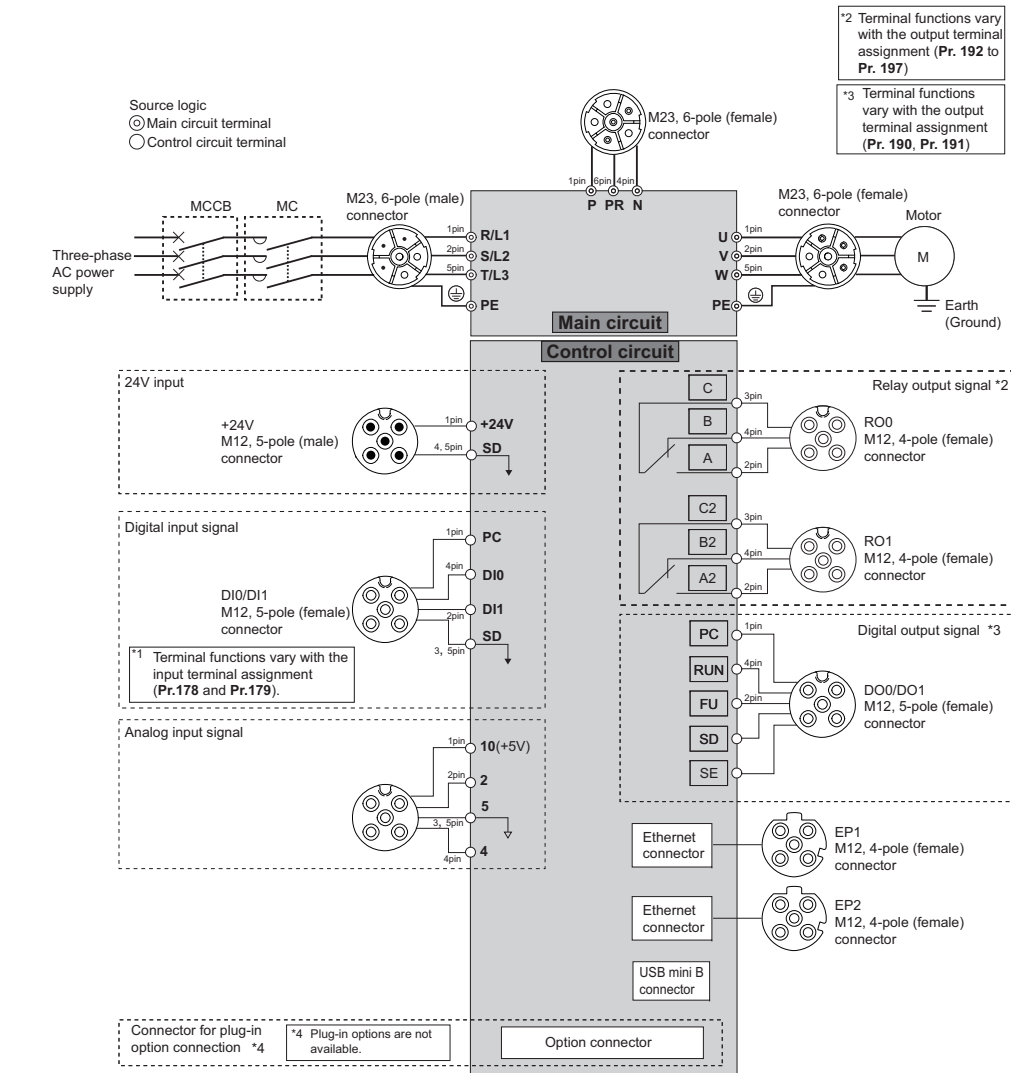
◆ Total wiring length

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. The value in the parentheses is the total wiring length when unshielded cables are used.

Pr.72 setting (carrier frequency)	Voltage class	0.75K	1.5K	2.2K	3.7K
1 (1 kHz) or lower	400 V	50 m(200 m)	75 m(300 m)	100 m(500 m)	100 m(500 m)
2 (2 kHz) or higher	400 V	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.

2.3 Terminal connection diagram



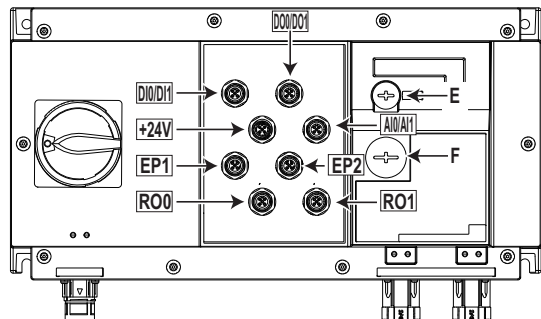
2.4 Details on the main circuit terminals and the control circuit terminals

Type	Terminal symbol	Common	Terminal name	Terminal function description
Main circuit	R/L1, S/L2, T/L3	—	AC power input	Connected to the commercial power supply.
	PE	—	Earth (ground)	For earthing (grounding) the inverter chassis. Be sure to earth (ground) the inverter.
	U, V, W	—	Inverter output	Connected to a three-phase squirrel cage motor or a PM motor.
	PE	—	Earth (ground)	For earthing (grounding) the inverter chassis. Be sure to earth (ground) the inverter.
Option	P, PR	—	Brake resistor connection	Connect an optional brake transistor (MRS, MYS, FR-ABR) between terminal P and PR. The option is not compatible with IP67. Install the option in the appropriate enclosure.
	P, N	—	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU, or BU). The protective structure of the option is not compatible with IP67. Install the option in the appropriate enclosure.
	+24	SD	24 V external power supply input	Use the 24 V external power supply to turn ON/OFF I/O terminals, keep the operation panel ON, and carry out communication during communication operation even at power-OFF state of inverter's main circuit power supply. Turning ON the main circuit power during the 24 V external power supply operation switches the operation to the normal operation. Before the operation is switched, a reset is performed in the inverter.
	SD	—	24 VDC power supply common	Common output terminal for 24 VDC 0.1 A power supply (terminal +24). Isolated from terminal 5.

Type	Terminal symbol	Common	Terminal name	Terminal function description
Digital input signal	DIO	PC (source (positive common))	Forward rotation start	Turn ON the STF signal to start forward rotation and turn it OFF to stop.
	DI1	—	Reverse rotation start	Turn ON the STR signal to start reverse rotation and turn it OFF to stop.
	SD	—	24 VDC power supply common	Common output terminal for 24 VDC 0.1A power supply (terminal PC). Isolated from terminal 5.
	SD	—	External transistor common (source (positive common))	Connect this terminal to the power supply common terminal of a transistor output (open collector output) device, such as a programmable controller, to avoid malfunction by undesirable current.
Analog input signal	PC	SD	Contact input common (source (positive common))	Common terminal for contact input terminal (source logic).
	—	—	24 VDC power supply	Can be used as a 24 VDC 0.1 A power supply.
	10	5	Power supply for a frequency setting potentiometer	Used as the power supply for an external frequency setting (speed setting) potentiometer.
	2	5	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 0 to 5 VDC (initial setting), 0 to 10 VDC.
Relay output signal	A, B, C	—	Relay output 1 (fault output)	1 changeover contact output that indicates that an inverter's protective function has been 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).
	A2, B2, C2	—	Relay output 2	The function of these terminals can be changed using the Pr.197 ABC2 terminal function selection.
	FU	SE	Frequency detection	The output is in LOW state when the inverter output frequency is equal to or higher than the preset detection frequency, and is in HIGH state when it is less than the preset detection frequency.
	RUN	SE	Inverter running	The output is in LOW state when the inverter output frequency is equal to or higher than the starting frequency (initial value: 0.5 Hz). The output is in HIGH state during stop or DC injection brake operation.
Open collector	SE	—	Open collector output common	Common terminal for terminals RUN and FU.
	—	—	Ethernet connector (2 ports)	Communication can be made via Ethernet. Category: 100BASE-TX/10BASE-T Data transmission speed: 100 Mbps (100BASE-TX) / 10 Mbps (10BASE-T) Maximum segment length: 100 m between the hub and the inverter. Interface: Interface: M12 round D coding connector conforming to IEC 61075-2-101 Commercially available connectors (as of November 2022): T411150104 1-000 manufactured by TE Connectivity To meet the UL standard, refer to the FR-E800 Instruction Manual (Connection). Number of cascade connection stages: Up to 2 (100BASE-TX) / up to 4 (10BASE-T) Number of interfaces available: 2. IP version: IPv4 By connecting an inverter to the personal computer through USB, FR Configurator2 can be used for setting the inverter and monitoring the operation. Interface: conforms to USB 1.1 Transmission speed: 12 Mbps Connector: USB mini B connector (receptacle mini B type)
	—	—	USB connector*1	
	—	—	—	

- *1 USB bus power connection is available. The maximum SCOR is 500 mA.

2.5 Control circuit terminals (connector) layout



Connector	Pin number	Terminal symbol	Connector	Pin number	Terminal symbol
DIO/DI1	1	PC	M12, 5-pole (female)	1	PC
	2	DI1		2	FU
	3	SD		3	SE
	4	DI0		4	RUN
	5	SD		5	SD
+24 V	1	+24 V	M12, 5-pole (female)	1	10
	2	NC		2	2
	3	NC		3	5
	4	SD		4	4
	5	SD		5	5
EP1	1	SDA	M12, 4-pole (female)	1	SDA
	2	RDA		2	RDA
	3	SDB		3	SDB
	4	RDB		4	RDB
	5	SD		5	SD
RO0	1	NC	M12, 4-pole (female)	1	NC
	2	A		2	A2
	3	C		3	C2
	4	B		4	B2
	5	SD		5	SD

Symbol	Connector	Description
E	USB connector (mini-B)	Used to connect the inverter to a personal computer (FR Configurator2). The protective structure is IP00 when the cap is removed. After using the USB connector, always install the cap. (Tightening torque: 1 N·m)
F	Large resin cap	Not used. Do not remove the large resin cap. If the cap is removed, reinstall the cap. (Tightening torque: 1.5 N·m)

◆ **Wiring method**
Prepare cables with connectors suitable for applicable connector types shown in the table above for control circuit terminals on the inverter. To meet the UL/cUL standards, purchase cables shown in the following table.
Manufacturer: Tyco Electronics.

Cable type	Cable length	Model
M12, 4-pole (male) for terminals RO0 and RO1	5 m	1-2421478-1
	10 m	2-2421478-1
	20 m	3-2421478-1
	5 m	1-2421478-2
	10 m	2-2421478-2
	20 m	3-2421478-2
M12, 5-pole (male) for terminals DI0 and DI1	5 m	1-2421479-1
	10 m	2-2421479-1
	20 m	3-2421479-1
	5 m	1-2421479-2
	10 m	2-2421479-2
	20 m	3-2421479-2
M12, 5-pole (male) for terminals DO0 and DO1	5 m	1-2421479-1
	10 m	2-2421479-1
	20 m	3-2421479-1
	5 m	1-2421479-2
	10 m	2-2421479-2
	20 m	3-2421479-2
M12, 5-pole (male) for terminals AI0 and AI1	5 m	1-2421480-1
	10 m	2-2421480-1
	20 m	3-2421480-1
	5 m	1-2421480-2
	10 m	2-2421480-2
	20 m	3-2421480-2
M12, 4-pole (male) for terminals EP1 and EP2	5 m	1-2421480-1
	10 m	2-2421480-1
	20 m	3-2421480-1
	5 m	1-2421480-2
	10 m	2-2421480-2
	20 m	3-2421480-2
M12, 5-pole (female) for terminal +24V	5 m	1-2421481-1
	10 m	2-2421481-1
	20 m	3-2421481-1
	5 m	1-2421481-2
	10 m	2-2421481-2
	20 m	3-2421481-2

If you need a cable whose length is not listed in the table, please contact Tyco Electronics.

3 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.



4 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.



5 SPECIFICATIONS

5.1 Inverter installation environment

Item	Description
Surrounding air temperature*1	-20°C to +50°C (The rated current must be reduced at a temperature above 40°C.)
Ambient humidity	95% RH or less (non-condensing) (With circuit board coating (IEC 60721-3-3:1994 3C2 compatible))
Storage temperature	-40°C to +70°C
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.)

- *1 Surrounding air temperature is a temperature measured at a measurement position in an enclosure. Ambient temperature is a temperature outside an enclosure.

5.2 Inverter rating

Model FR-E846-J			0026	0040	0060	0095	
			0.75K	1.5K	2.2K	3.7K	
Applicable motor capacity (kW)*1			LD	1.5	2.2	3.0	5.5
			ND	0.75	1.5	2.2	3.7
Output	Rated capacity (kVA)*2	LD	2.7	4.2	5.3	8.5	
		ND	2.0	3.0	4.6	7.2	
	Rated current (A)*7	LD	3.5 (3.0)	5.5 (4.7)	6.9 (5.9)	11.1 (9.4)	
		ND	2.6 (2.2)	4.0 (3.8)	6.0 (5.4)	9.5 (8.7)	
		Overload current rating*3	LD	120% 60 s, 150% 3 s (reverse-time characteristics) at surrounding air temperature of 40°C			
			ND	150% 60 s, 200% 3 s (reverse-time characteristics) at surrounding air temperature of 40°C			
	Voltage*4		Three-phase 380 to 480 V				
	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			
Permissible AC (DC) voltage fluctuation			±23 to 528 V, 50/60 Hz				
Power supply	Permissible frequency fluctuation		±5%				
	Rated input current (A)*8	Without DC reactor	LD	6.0	8.9	10.7	16.2
		With DC reactor	ND	4.4	6.7	9.5	14.1
	Power supply capacity (kVA)*6	Without DC reactor	LD	4.5	6.8	8.2	12.4
		With DC reactor	ND	3.4	5.1	7.2	10.8
Protective structure (IEC 60529 / UL 50 / IEC 50 LE)			Enclosed type (IP66/IP67, UL Type 4X Indoor Use Only)				
Cooling system			Forced air				
Approx. mass (kg)	Power ON / OFF switch	With	5.9	5.9	5.9	5.9	
		Without	5.7	5.7	5.7	5.7	

6 APPENDIX

For information on other applicable standards not found in this document, refer to the FR-E800 Instruction Manual (Connection).

6.1 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: IEC61800-3 category C2, 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 measures and ensure the conformity of the inverter used in the residential area.
 - Radio frequency interference is expected if used on such a network.

- Notes**
 - The EMC Directive compliant noise filter is built in the inverter. Insert line noise filters and ferrite cores to the power and control cables as required.
 - Connect the inverter to an earthed power supply.
 - Install the motor and controller cable found in the EMC Installation Guidelines (BCN-A21041-204) and Technical News (MF-S-191) according to the instructions. (Contact your sales representative for the manual.)
 - To make full use of the EMC Directive compliant noise filter, motor cable lengths should not exceed 20 m.
 - Ensure that the finalized system which includes an inverter complies with the EMC Directive.

- Low Voltage Directive**
We have self-confirmed our inverters as products compliant to the Low Voltage Directive and affix the CE marking on the inverters.
 - Low Voltage Directive: 2014/35/EU
 - Standard: EN 61800-5-1

- Outline of instructions**
 - Do not use an earth leakage circuit breaker as an electric shock protector without connecting the equipment to the earth. Connect the equipment to the earth (ground) securely.
 - Select appropriate wire according to EN 60204-1 or IEC 60364-5-52. (Refer to the selection examples of cable sizes in 2.2 Recommended cables and wiring length.)
 - Use PVC cables for I/O wiring.
 - Use the molded case circuit breaker and magnetic contactor which conform to the EN or IEC Standard.
 - If an earth leakage circuit breaker is required, use a type-B earth leakage circuit breaker (AC/DC detection compatible).
 - Use the inverter under the conditions of overvoltage category III specified in IEC 60664.
 - When using the relay output terminals A, B, C, AZ, BZ, and CZ with voltage of 230 VAC, use a power supply classified as overvoltage category II specified in IEC 60664.

- Fuse selection for branch circuit protection**
For details, refer to 6.2 Instructions for UL and cUL: Fuse selection.

- Motor overload protection**
For details, refer to 6.2 Instructions for UL and cUL: Motor overload protection.

- EU RoHS Directive**
We have declared that our inverters are compliant to the EU RoHS Directive and affix the CE marking on the inverters.

For other information, refer to the FR-E800 Instruction Manual (Connection).

6.2 Instructions for UL and cUL

(Standard to comply with: UL 61800-5-1, CSA C22.2 No. 274)

These devices are intended only for installation on industrial machines in accordance with the "Electrical Standard for Industrial Machinery" (NFPA79). Due to the nature of these devices they may not be suitable for installation in accordance with the "National Electrical Code" (NFPA70).

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

-AVERTISSEMENT-
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 local codes. For installation in Canada, branch circuit protection must be provided in accordance with the Canadian Electrical Code and any applicable local codes. Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any 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 down the input side of this product, check for wiring faults (such as short circuits). Identify and remove the cause of melting down or the trip before replacing the fuse or resetting the tripped breaker (or before applying the power to the inverter again).

-AVERTISSEMENT-
Si le fusible fond ou si le disjoncteur se déclenche du côté entrée de ce produit, vérifiez 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).

- Fuse selection**
Fuses are selected based on IEC/EN/UL 61800-5-1 and CSA C22.2 No. 274.
For installation in the United States, the semiconductor fuses shown in the following table must be provided, in accordance with the National Electrical Code and any applicable local codes. For installation in Canada, the semiconductor fuses shown in the following table must be provided, in accordance with the Canadian Electrical Code and any applicable local codes. Always install the following semiconductor fuses for branch circuit protection.

Inverter model	Cat. No	Manufacturer	Rating	Inverter model	Cat. No	Manufacturer	Rating
FR-E846-0026(0.75K)	170M1410	Bussmann	700 V, 20 A	FR-E846-0060(2.2K)	170M1412	Bussmann	700 V, 32 A
FR-E846-0040(1.5K)	170M1411	Bussmann	700 V, 25 A	FR-E846-0095(3.7K)	170M1414	Bussmann	700 V, 50 A

- Capacitor discharge time / Temps de décharge du condensateur**
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.

ATTENTION - Risque de choc électrique -
Avant le câblage ou l'inspection, vérifier que le témoin LED s'éteint. Toute personne impliquée dans le câblage ou l'inspection doit attendre 10 minutes ou plus après la mise hors tension et vérifier l'absence de tension résiduelle à l'aide d'un multimètre numérique ou similaire. Le condensateur est chargé avec une haute tension pendant un certain temps après la mise hors tension, ce qui est dangereux. Précautions pour ouvrir le dispositif de protection du circuit de dérivation

- Wiring method**
To meet the UL/cUL standards, use option cables shown in the following table.
TE Connectivity

Cable type	Cable length		Model
M23, 6-pole (female) for power supply	5 m	Unshielded	1-2391589-1
	10 m		2-2391589-1
	20 m		3-2391589-1
	5 m	Shielded	1-2391589-2
	10 m		2-2391589-2
	20 m		3-2391589-2
M23, 6-pole (male) for motor	5 m	Unshielded	1-2391590-1
	10 m		2-2391590-1
	20 m		3-2391590-1
	5 m	Shielded	1-2391590-2
	10 m		2-2391590-2
	20 m		3-2391590-2
M23, 6-pole (male) for option	5 m	Unshielded	1-2391600-1
	10 m		2-2391600-1
	20 m		3-2391600-1
	5 m	Shielded	1-2391600-2
	10 m		2-2391600-2
	20 m		3-2391600-2

- Short circuit ratings**
 - 400 V class: Suitable for use in a circuit capable of delivering not more than 50 kA rms symmetrical amperes, 480 V / 277 V maximum.

- Motor overload protection**
The following explains the details of the motor overload protection.
When using the electronic thermal relay function as motor overload protection, set the rated motor current in **Pr.9 Electronic thermal O/L relay**.
This function detects the overload (overheat) of the motor and shut off the inverter output by stopping the operation of the transistor at the inverter output side. (The operation characteristic is shown on the left.)
 - When using the Mitsubishi Electric constant-torque motor
 - 1) Set one of *10, 13, 15, 16, 50, 53, 70, 73, 1800, or 1803* in **Pr.71**. (This setting enables the 100% constant-torque characteristic in the low-speed range.)
 - 2) Set the rated motor current in **Pr.9**.
 - *1 When setting **Pr.9** to a value (current value) of 50% of the inverter rated output current.
 - *2 The % value denotes the percentage to the inverter rated output current. It is not the percentage to the rated motor current.
 - *3 When the electronic thermal relay function dedicated to the Mitsubishi Electric constant-torque motor is set, this characteristic curve applies to operation at 0 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 inverter. When configuring an external thermal relay, note that the current indicated on the motor rating plate is affected by the line-to-line leakage current. (Refer to the Instruction Manual (Function).) The cooling effect of the motor drops during low-speed operation. Use a motor with built-in thermal protector. When the difference between the inverter and motor capacities is large and the set value is small, the protective characteristics of the electronic thermal relay function will be deteriorated. Use an external thermal relay in such cases.
- The cooling effect of the motor drops during low-speed operation. Use a motor with built-in thermal protector.
- A dedicated motor cannot be protected by the electronic thermal relay. Use an external thermal relay.
- 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.

6.3 SERIAL number check

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

Rating plate example

INVERTER

MODEL : FR-E846-00026SCEPA

INPUT : XXXXX

OUTPUT : XXXXX

SERIAL : XXXXXXXXXXXX

MADE IN XXXXX

Symbol

Year

Month

Control number

The SERIAL consists of two symbol, three characters indicating the production year and month, and six characters indicating the control number.
The last two digits of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).

6.4 EU ErP Directive (Ecodesign Directive)

Based on the EU ErP Directive (Ecodesign Directive), the efficiency data of the inverters are shown in the following table. The three-phase 0.12kW to 1000kW inverters are subject to the Directive.

Model name	Rated Apparent power (kVA)	Stand by loss (W)	load point 1 (90:100) (%)	load point 2 (50:100) (%)	load point 3 (0:100) (%)	load point 4 (90:50) (%)	load point 5 (50:50) (%)	load point 6 (0:50) (%)	load point 7 (50:25) (%)	load point 8 (0:25) (%)	IE class
FR-E846-0026(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-E846-0040(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-E846-0060(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-E846-0095(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

7 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.