

# Quick start guide for FR-E800

# **Frequency inverter**

Art. No.: 573554 UK, Version A, 09112020



CAUTION: There is a risk to the life and health of the user if appropriate precautionary measures are not taken. The precautions can be found in the instruction man ual of the frequency inverter FR-E800. These and other manuals are available free of charge on the Internet. (https://eu/aamisubishielectric.com)

#### **Further information**

If you have any questions about the installation, programming and operation of the frequency inverter, please do not hesitate to contact your sales office or one of your sales partners. You can reach our technical support at the following number: +49 (0) 2102 103 7914

#### Wiring of power supply and motor

Terminal	Power supply	Motor connection	Earth	DC link choke, brake resistor, brake unit
200 V, 1~	8 8 L1 N		<b>®</b>	8 8 # 8 8 P1 + PR N/-
200 V, 3~ 400 V, 3~			<b>8</b>	88 8 # 8 -8 P1 P/+ PR N/-

#### Wiring of the main circuit

Use insulated blade terminals to connect the power supply and the motor.

Terminal	Description
R/L1, S/L2, T/L3 ①	Power supply connection
U, V, W	Motor connection
P/+, PR	Connection for external brake resistor
P/+, N/-	Connection for external brake unit
P/+, P1	Connection for DC link choke
Ŧ	Earth (ground)

 $^{\textcircled{0}}$  Terminal T/L3 is not available for the single-phase power input model.

# Wiring (Standard model)



## Wiring method

# Power supply connection

- Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may
  occur with neighboring wires. If the length is too short, wires might come off.
  - Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it Cable sheath stripping length





# Crimp the blade terminal.

Insert wires to a blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve. Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.



Blade terminals commercially available (as of February 2017)

# Wiring of the control circuit

Recommended cable gauge: 0.3 to 0.75 mm<sup>2</sup>



 $^{(1)}$  Terminal FM is available for the FM type inverter. Terminal AM is available for the AM type inverter.  $^{(2)}$  Terminal SD is available for the FM type inverter. Terminal 5 is available for the AM type inverter.

#### Input signals

Use a wire end ferrule and a cable for the connection to the terminals where the end is striped appropriately. Single-core cables can be connected directly to the terminals after removing the insulation.

Terminal	Description		
STF	Forward rotation start signal		
STR	Reverse rotation start signal		
RH, RM, RL	Multi-speed selection		
MRS	Output stop		
RES	Reset		
SD	Common terminal for the contact input terminal (sink logic). Common terminal (0 V) for the 24 V DC power supply (terminal PC). External transistor common (source).		
PC	24 V DC output and common terminal for control circuit inputs in source logic. External transistor common (sink). Safety stop input terminal common.		

Terminal	Туре	Description		
10	Frequency setting power supply	Used as the power supply for an external device such as a fre- quency setting potentiometer or digital panel meter.		
2	Frequency setting (voltage)	Inputting 0 to 5 V DC (or 0 to 10 V DC) provides the maximum output frequency at 5 V (or 10 V) and makes input and output proportional.		
4	Frequency setting (current)	Inputting 4 to 20 mA DC (or 0 to 5 V, 0 to 10 V) provides the maximum output frequency at 20 mA and makes input and output proportional. This input signal is valid oN (terminal 2 input is invalid).		
5	Frequency setting and analog outputs common	Terminal 5 represents the reference point (0 V) for all analog set- point values and for the analog output signal AM (voltage). The terminal is isolated from the reference potential of the digital cir- cuit (SD).		

#### **Output signals**

Terminal	Туре	Description
A, B, C	Relay output	A changeover contact output that indicates that an inverter's pro- tective function has been activated and the outputs are stopped.
RUN	Open collector For meter Analog voltage output	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.
FU		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.
SE		Common terminal for terminals RUN and FU
FM		Among sougral monitor items such as output frequency select
AM		one to output it via these terminals.
RS-485	PU interface	The PU connector supports the RS-485 communication.
USB	USB B connector	Mini B connector (receptacle).

# Wiring (Ethernet model)



## NOTES

• To prevent a malfunction due to noise, keep the signal cables 10 cm or more away from the power cables. Also, keep the cables of the main circuit for input and output separated.

• After wiring, wire offcuts must not be left in the inverter.

• Wire offcuts can cause a fault, failure or malfunction. Always keep the inverter clean.

• When drilling mounting holes in an enclosure etc., take caution not to allow chips and other foreign

matter to enter the inverter.

Set the switches of the voltage/current input selection switch assembly correctly. Incorrect setting

may cause a fault, failure or malfunction. • The output of the single-phase power input model is three-phase 200 V.

#### Wiring method

For details concerning the wiring method please refer to page 1

## **Wiring of the control circuit** Recommended cable gauge: 0.3 to 0.75 mm<sup>2</sup>



#### Input signals

#### Use a wire end ferrule and a cable for the connection to the terminals where the end is striped appropriately. Single-core cables can be connected directly to the terminals after removing the insulation.

Terminal	Description
D10	Forward rotation start signal
DI1	Reverse rotation start signal
SD	Common terminal for the contact input terminal (sink logic). Common terminal (0 V) for the 24 V DC power supply (terminal PC). External transistor common (source).
PC	24 V DC output and common terminal for control circuit inputs in source logic. External transistor common (sink). Safety stop input terminal common.

Terminal	Туре	Description
10	Frequency setting power supply	Used as the power supply for an external device such as a fre- quency setting potentiometer or digital panel meter.
2	Frequency setting (voltage)	Inputting 0 to 5 V DC (or 0 to 10 V DC) provides the maximum output frequency at 5 V (or 10 V) and makes input and output proportional.
4	Frequency setting (current)	Inputting 4 to 20 mA DC (or 0 to 5 V, 0 to 10 V) provides the maximum output frequency at 20 mA and makes input and output proportional. This input signal is valid oN (terminal 2 input is invalid).
5	Frequency setting and analog outputs common	Terminal 5 represents the reference point (0 V) for all analog set- point values and for the analog output signal AM (voltage). The terminal is isolated from the reference potential of the digital cir- cuit (SD).

#### Output signals

Terminal	Туре	Description
А, В, С	Relay output	A changeover contact output that indicates that an inverter's pro- tective function has been activated and the outputs are stopped.
Ethernet	Ethernet connector	Communication can be made via Ethernet
USB	USB B connector	Mini B connector (receptacle).

# Wiring method

## Power supply connection

Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may
occur with neighboring wires. If the length is too short, wires might come off.
 Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it





# (2) Crimp the blade terminal.

Insert wires to a blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve. Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.



Blade terminals commercially available (as of February 2017)

# Wiring (Safety connection model)



# Wiring method

For details concerning the wiring method please refer to page 1

# **Wiring of the control circuit** Recommended cable gauge: 0.3 to 0.75 mm<sup>2</sup>



#### Input signals

Use a wire end ferrule and a cable for the connection to the terminals where the end is striped appropriately. Single-core cables can be connected directly to the terminals after removing the insulation.

Terminal	Description
SD	Common terminal for the contact input terminal (sink logic). Common terminal (0 V) for the 24 V DC power supply (terminal PC). External transistor common (source).
PC	24 V DC output and common terminal for control circuit inputs in source logic. External transistor common (sink). Safety stop input terminal common.

Terminal	Туре	Description
10	Frequency setting power supply	Used as the power supply for an external device such as a fre- quency setting potentiometer or digital panel meter.
2	Frequency setting (voltage)	Inputting 0 to 5 V DC (or 0 to 10 V DC) provides the maximum output frequency at 5 V (or 10 V) and makes input and output proportional.
4	Frequency setting (current)	Inputting 4 to 20 mA DC (or 0 to 5 V, 0 to 10 V) provides the maximum output frequency at 20 mA and makes input and output proportional. This input signal is valid oN (terminal 2 input is invalid).
5	Frequency setting and analog outputs common	Terminal 5 represents the reference point (0V) for all analog set- point values and for the analog output signal AM (voltage). The terminal is isolated from the reference potential of the digital cir- cuit (SD).

#### Safety input/output signal

Terminal	Туре	Description
SX1	Safety input 1	Terminal functions can be selected using Pr.S051 SX1/SX2
SX2	Safety input 2	terminal function selection.
SY1	Safety output 1	Terminal functions can be selected using Pr.S055 SY1/SY2
SY2	Safety output 2	terminal function selection.
SC1	Safety output	Among several monitor items such as output frequency, select
SC2	common	one to output it via these terminals.

# Wiring method

## Power supply connection

Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may
occur with neighboring wires. If the length is too short, wires might come off.
 Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it





# ② Crimp the blade terminal.

Insert wires to a blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve. Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.



Blade terminals commercially available (as of February 2017)

# **Components of the operation panel**



Ethernet model and safety communication model

Appearance	Name	Description
8.8.8.8.	Monitor (4-digit LED)	Shows a numeric value (readout) of a monitor item such as the frequency or a parameter number.
Hz A	Unit indication	Hz: The actual frequency is monitored. (Blinks when the set frequency is mon- itored.) A: The current is monitored
PU EXT NET	Inverter oper- ation mode LED indicator	PU: Inverter is in the PU operation mode. EXT: Inverter is in the External operation mode. NET: Inverter is in the Network operation mode. PU and EXT: Inverter is in the External/PU combined operation mode.
MON PRM	Operation panel mode LED indicator	MON: ON or blinks only when the first, second, or third monitor is displayed. PRM: ON when the operation panel is in the parameter setting mode. The indicator blinks when the inverter is in the easy setting mode.
RUN	Operating status indicator	ON or blinks during inverter running.
PM	Controlled motor type LED indicator	ON when the inverter is set to control the PM motor.
P.RUN	PLC function LED indicator	ON when the PLC function of the inverter is valid.
	Setting dial	Turn the setting dial to change the setting of frequency or parameter, etc. Press the setting dial to change the display. (Standard model only)
<b>PU</b> EXT	PU/EXT key	Switches between the PU operation mode, the PUJOG operation mode, and the External operation mode.
MODE	MODE key	Switches the operation panel to a different mode.
SET	SET key	Confirms each selection. When this key is pressed during inverter operation, the monitor item changes. Initial setting in monitor mode
RUN	RUN key	Start command
STOP RESET	STOP/ RESET key	Stops the operation commands.
$\uparrow$ $\downarrow$	UP/ DOWN key	Used to change the setting of frequency or parameter. (Ethernet model and safety communication model only)

**Basic operation (standard model)** 



 $^{\textcircled{1}}$  Not displayed for the 575 V class.

Basic operation (Ethernet and safety communication model)



<sup>(1)</sup> Not displayed for the 575 V class.

## NOTE

 If a parameter write condition is not satisfied, a parameter write error appears on the LCD display.
 When Pr.77 Parameter write selection = "0 (initial value)", the parameter setting change is available only while the inverter is stopped and under the PU operation mode. To enable the parameter setting change while the inverter is running or under the operation mode other than PU operation mode, change the Pr.77 setting.

# **Basic parameters**

Pr.	Description		Minimum setting increment	Initial value	Setting range
0	Torque boost		0.1 %	6/5/4/3/2%①	0-30 %
1	Maximum frequency		0.01 Hz	120 Hz	0 12011-
2	Minimum frequency		0.01 Hz	0 Hz	0-120 HZ
3	Base frequency		0.01 Hz	60/50 Hz 🛈	0-400 Hz
4		RH	0.01 Hz	60/50 Hz ①	0-400 Hz
5	Multi-speed setting	RM		30 Hz	
6		RL		10 Hz	
7	Acceleration time		0.1	5/10 s <sup>①</sup>	0-3600 s
8	Deceleration time				
9	Electronic thermal O/L relay		0.01A	Inverter rated current	0–500 A
79	Operation mode selection		1	0	0/1/2/3/4/6/7
125	Frequency setting gain frequency	Terminal 2	0.01 Hz	60/50 Hz <sup>①</sup>	0–590 Hz
126	Junited action	Terminal 4			

**Overview of the error messages** 

If a protective function has been activated, eliminate the cause of the error and then reset the frequency inverter. It is imperative that you follow the procedure in the instruction manual for the FR-E800 frequency inverter. You can reset the frequency inverter by pressing the STOP/RESET button on the operation panel (only after a serious error), by switching the power supply off and on again, or by switching the RES signal.

Error indication	Description
Er I	Parameter write error
8-2	Write error during operation
Er 3	Calibration error
Егч	Mode designation error

operation	anei muicati	011	Truthe 1		
	HOLd	HOLD	Operation panel lock		
	6303	LOCD	Password locked		
Error	Er 1	504 504	Parameter write error		
messages	Er 4	ER1-ER4			
	Err.	Err.	Error		
	oll	OL	Stall prevention (overcurrent)		
	olu	oL	Stall prevention (overvoltage)		
	rb	RB	Regenerative brake pre-alarm		
Warning	£B.	тн	Electronic thermal O/L relay prealarm		
messages	<i>PS</i>	PS	PU stop		
	nr	MT	Maintenance timer		
	SR -	SA	Safety stop		
	LdF	LDF	Load fault warning		
611 J .	7 B	iH	Inrush current limit resistor overheat		
Slight error	En	FN	Faulty fan		
	E.0C 1	E.OC1	Overcurrent trip during acceleration		
	5003	E.OC2	Overcurrent trip during constant speed		
	8.003	E.OC3	Overcurrent trip during deceleration or stop		
	E.ou 1	E.OV1	Regenerative overvoltage trip during acceleration		
	5002	E.OV2	Regenerative overvoltage trip during constant speed		
	8.003	E.OV3	Regenerative overvoltage trip during deceleration or stop		
	EFHF	E.THT	Inverter overload trip (electronic thermal O/L		
	ел на	E.THM	Motor overload trip (electronic thermal O/L		
	6.F1 n	E.FIN	Heatsink overheat		
	10U.S	E.UVT	Undervoltage		
	ELLE	EJLF	Input phase loss		
	E.ot F	E.OLT	Stall prevention stop		
	E.Sof	E.SOT	Loss of synchronism detection		
	ELUP	E.LUP	Upper limit fault detection		
Serious	Eldo	E.LDN	Lower limit fault detection		
enor	E. GF	E.GF	Output side earth (ground)fault overcurrent		
	ELF	E.LF	Output phase loss		
	E.oHF	E.OHT	External thermal relay operation		
	E.oPF	E.OPT	Option fault		
	E.0P 1	E.OP1	Communication option fault		
	E.P.E	E.PE	Parameter storage device fault		
	ЕРИЕ	E.PUE	PU disconnection		
	ErEF	E.RET	Retry count excess		
	5393	E.PE2	Parameter storage device fault (main circuit board)		
	E.C.PU	E.CPU	CPU fault		
	6.C.do	E.CDO	Abnormal output current detection		
	Er off	E.IOH	Inrush current limit circuit fault		
	E.R. E	E.AIE	Analog input fault		
	E 10	E. 10	Inverter output fault		

 $^{\textcircled{0}}$  The factory setting depends on the performance class of the frequency inverter.

# Control logic (sink/source) change (Standard model/Ethernet model)

The control logic of input signals can be switched as necessary for the standard model and the Ethernet model. To change the control logic, change the DIP switch position on the control circuit board. The initial setting of the control logic differs depending on the specification.



NOTE				
Never change the control logic while power is ON.				

