

## MELSEC iQ-F FX5UJ CPU Module Hardware Manual



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Revision	F
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Thank you for purchasing the Mitsubishi Electric MELSEC iQ-F series programmable controller.

This manual describes the part names, dimensions, installation, cabling and specifications for the product. This manual is extracted from MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware). Refer to MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware) for more details. Before use, read MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware) and manuals of relevant products fully to acquire proficiency in the handling and operating the product. Make sure to learn all the product information, safety information, and precautions. And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

Registration:  
The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies. In some cases, trademark symbols such as "™" or "®" are not specified in this manual.  
Specifications in this manual are subject to change without notice.

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### SAFETY PRECAUTIONS

(Read these precautions before using the product.)  
If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.  
In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚡ CAUTION".

<b>⚠ WARNING</b>	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
<b>⚡ CAUTION</b>	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.  
Observe the precautions of both levels because they are important for personal and system safety.

### [STARTUP AND MAINTENANCE PRECAUTIONS]

#### ⚠ WARNING

- Do not touch any terminal while the PLC's power is on. Doing so may cause electric shock or malfunctions.
- Before cleaning or retightening terminals, cut off all phases of the power supply externally. Failure to do so in the power ON status may cause electric shock.
- Before modifying the program in operation, forcing output, running or stopping the PLC, read through this manual carefully, and ensure complete safety. An operation error may damage the machinery or cause accidents.
- Do not change the program in the PLC from two or more peripheral equipment devices at the same time. (i.e. from an engineering tool and a GOT)  
Doing so may cause destruction or malfunction of the PLC program.

### [STARTUP AND MAINTENANCE PRECAUTIONS]

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### [STARTUP AND MAINTENANCE PRECAUTIONS]

#### ⚠ CAUTION

- Do not disassemble or modify the PLC. Doing so may cause fire, equipment failures, or malfunctions. For repair, contact your local Mitsubishi Electric representative.
- Turn off the power to the PLC before connecting or disconnecting any extension cable. Failure to do so may cause equipment failures or malfunctions.
- Turn off the power to the PLC before attaching or detaching the following devices. Failure to do so may cause equipment failures or malfunctions.
  - Peripheral devices, expansion board, expansion adapter, and connector conversion adapter
  - Extension modules
- Do not use the chemicals for cleaning.
- If there is the possibility of touching the PLC inside a control panel in maintenance, make sure to discharge to avoid the influence of static electricity.
- Since there are risks such as burn injuries, please do not touch the surface of the equipment with bare hands when it is operating in an environment which exceeds ambient temperature of 50°C.

### [DISPOSAL PRECAUTIONS]

#### ⚠ CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

### [TRANSPORTATION PRECAUTIONS]

#### ⚠ CAUTION

- The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications (Section 2.1) by using dedicated packaging boxes and shock-absorbing pallets. Failure to do so may cause failures in the PLC. After transportation, verify operation of the PLC and check for damage of the mounting part, etc.

## RELEVANT MANUALS

### Relevant manuals

Safety Guidelines is included with the FX5UJ CPU module.  
For a detailed explanation of the FX5UJ CPU module hardware and information on instructions for PLC programming and intelligent function module, refer to the relevant documents.

Manual name	Manual number	Description
MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)	SH-082452ENG	Performance specifications, wiring, installation, and maintenance of hardware of the CPU module
MELSEC iQ-F FX5 User's Manual (Communication)	SH-082625ENG	Describes the communication function of the CPU module built-in and the Ethernet module.

### How to obtain manuals

For the necessary product manuals or documents, consult with your local Mitsubishi Electric representative.

## Compliance with EU DIRECTIVES (CE MARKING)

This product complies with the EU Directives, however, this document does not guarantee that a mechanical system including this product will comply with the EU Directives.

Compliance with the EMC Directives and the Low Voltage Directives of the entire mechanical system should be checked by the user/manufacturer. For more details please contact the local Mitsubishi Electric sales site.  
For the caution for compliance with the EU Directives, refer to MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

### Caution for compliance with the LVD

- To an external connection port other than AC power supply terminal and AC input/output terminal, connect the circuit separated from a dangerous voltage by a double/reinforced insulation.
- Between the commons having the adjacent relay output terminals, if an external power supply is higher than 120VAC, the insulation is basic. Therefore, when using 120VAC or higher external power supply and 30VDC/AC or lower external power supply between the adjacent commons, do not handle 30VDC/AC or lower external power supply as a touchable part. (When handling 30VDC/AC or lower external power supply as a touchable part, add a basic insulation.)
- For the external power supply, use a power supply that complies with the SELV defined by EN IEC61010-2-201.

## Compliance with UL and cUL standards

### Certification of UL and cUL standards

Please consult with Mitsubishi Electric for information on UL, cUL standard practices and the corresponding types of equipment.

### Requirements for compliance with UL and cUL standards

Requirements for compliance with UL and cUL standards are the same as those described in [Caution for compliance with the LVD] for the EU Directives (CE marking).

## Compliance with UKCA MARKING

The requirements for compliance with UKCA marking are the same as that with the EU Directives (CE marking).

### 1. Overview

#### 1.1 Included items

Check if the following product and items are included in the package.  
• CPU module

Model name	Included Items	Quantity
FX5UJ-DMR/ES, FX5UJ-DMT/ES, FX5UJ-DMT/ESS, FX5UJ-DMR/DS, FX5UJ-DMT/DS, FX5UJ-DMT/DSS (□. 24, 40, 60)	Product Dust proof protection sheet Safety Guidelines	1 1 1

#### • I/O module

Model name	Included Items	Quantity
FX5-CDE/ES, FX5-CDEYR/ES, FX5-CDEY/ES, FX5-CDEYT/ESS, FX5-16ER/ES, FX5-16ET/ES, FX5-16ET/ESS (□. 8, 16)	Product Dust proof protection sheet	1 1

Model name	Included Items	Quantity
FX5-CDE/DS, FX5-C16EYR/D-TS, FX5-CDEYT/D, FX5-CDEYT/DSS, FX5-C32EX/DS-TS, FX5-C32EY/D-TS, FX5-C32EY/DSS-TS, FX5-C32ET/DS-TS, FX5-C32ET/DSS, FX5-C32ET/DSS-TS (□. 16, 32)	Product	1

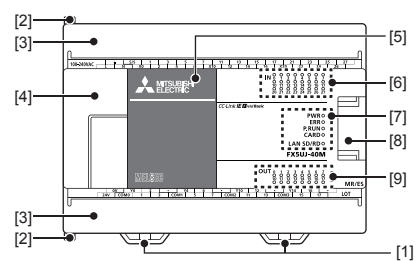
Model name	Included Items	Quantity
FX5-CDE/DS, FX5-C32ET/D (□. 16, 32)	Product FX2NC-10BPB1 [0.1 m, double-ended]	1 1

Model name	Included Items	Quantity
FX5-32ER/ES, FX5-32ET/ES, FX5-32ET/ESS, FX5-32ER/DS, FX5-32ET/DS, FX5-32ET/DSS	Product Dust proof protection sheet Extension cable	1 1 1

#### • Connector conversion module

Model name	Included Items	Quantity
FX5-CNV-IF	Product Extension cable	1 1

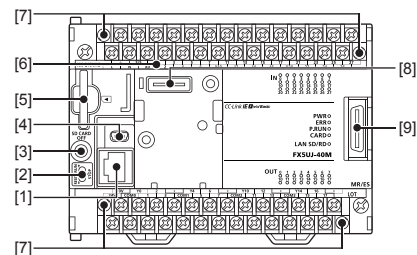
### 1.2 Part names



No.	Name
[1]	DIN rail mounting hooks
[2]	Expansion adapter connecting hooks
[3]	Terminal block covers
[4]	Peripheral device connecting connector cover
[5]	Expansion board connector cover
[6]	Input display LEDs (Green)
[7]	Operation status display LEDs
PWR	Green On while the programmable controller is powered.
ERR <sup>1</sup>	Red Turns on/flashes when an error occurs.
P.RUN	Green On while the programmable controller is running.
CARD	Green Lit when the SD memory card is inserted.
LAN SD/RD	Green Lit when data is sent or received through communication via built-in Ethernet.
[8]	Extension connector cover
[9]	Output display LEDs (Green)

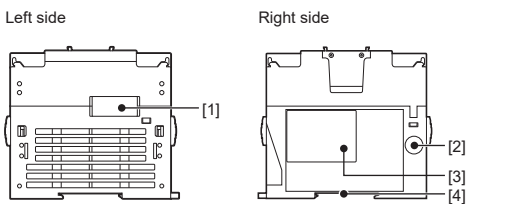
<sup>1</sup> When powered on in the factory default state, ERR LED starts flashing because there is no program. For details, refer to the following manual.  
LJ MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

### With cover open



No.	Name
[1]	Built-in Ethernet communication connector
[2]	RUN/STOP/RESET switch
[3]	SD memory card disable switch
[4]	Built-in USB communication connector
[5]	SD memory card slot
[6]	Terminal names □ shows a function grounding terminal.
[7]	Terminal block mounting screws
[8]	Expansion board connector
[9]	Extension connector

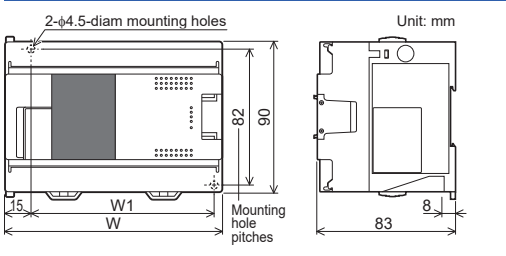
### Sides



No.	Name
[1]	Expansion adapter connector cover
[2]	Genuine product certification label <sup>1</sup>
[3]	Nameplate <sup>1</sup> ⚠ is a mark that instructs the use of a copper wire with an appropriate temperature rating (80°C or more) for wiring.
[4]	DIN rail mounting groove

<sup>1</sup> Products that do not have the genuine product certification label or nameplate are not covered by the warranty.

### 1.3 External dimensions and weight



Model name	W: mm	W1: mm	MASS (Weight): kg
FX5UJ-24MD	95	76	Approx. 0.55
FX5UJ-40MD	130	111	Approx. 0.65
FX5UJ-60MD	175	156	Approx. 0.80

Outer paint color Body: Munsell 0 6B7 6/0.2

### 2. Installation (General specifications)

For the installation of the I/O modules, the expansion adapters and expansion boards, refer to MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

### [INSTALLATION PRECAUTIONS]

#### ⚠ WARNING

- Use the product within the generic environment specifications described in section 2.1 of this manual. Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub>, or NO<sub>2</sub>), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind.
- If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.

### [INSTALLATION PRECAUTIONS]

#### ⚠ CAUTION

- Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits of the PLC. Failure to do so may cause fire, equipment failures or malfunctions.
- For the product supplied together with a dust proof sheet, the sheet should be affixed to the ventilation slits before installation and wiring work to prevent foreign objects such as cutting and wiring debris. However, when the installation work is completed, make sure to remove the sheet to provide adequate ventilation. Failure to do so may cause fire, equipment failures or malfunctions.
- Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- Install the product securely using a DIN rail or mounting screws.
- Connect the extension cables, peripheral device cables and input/output cables connecting cable securely to their designated connectors. Loose connections may cause malfunctions.
- Turn off the power to the PLC before attaching or detaching the following devices. Failure to do so may cause equipment failures or malfunctions.
  - Peripheral devices, expansion board, expansion adapter, and connector conversion adapter
  - Extension modules

### 2.1 General specifications

Item	Specifications
Operating ambient temperature <sup>1</sup>	0 to 55°C (32 to 131°F), non-freezing
Storage ambient temperature	-25 to 75°C (-13 to 167°F), non-freezing
Operating ambient humidity	5 to 95%RH, non-condensing <sup>2</sup>
Storage ambient humidity	5 to 95%RH, non-condensing
Vibration resistance <sup>3,4</sup>	Frequency (Hz) Acceleration (m/s <sup>2</sup> ) Half amplitude (mm) Sweep count
Installed on DIN rail	5 to 8.4 — 1.75 10 times each in X, Y, Z directions (80 min in each direction)
Installed directly	5 to 8.4 — 3.5 —
Shock resistance <sup>5</sup>	147 m/s <sup>2</sup> Acceleration, Action time: 11ms, 3 times by half-sine pulse in each direction X, Y, and Z
Noise durability	By noise simulator of 1000 Vp-p noise voltage, 1 μs noise width and 30 to 100 Hz noise frequency
Dielectric withstand voltage <sup>6</sup>	1.5kVAC for 1 minute or 500VAC for 1 minute
Insulation resistance <sup>6</sup>	10MΩ or higher by 500VDC insulation resistance tester
Grounding	Class D grounding (Grounding resistance: 100Ω or less) <Common grounding with a heavy electrical system is not allowed.> <sup>6</sup>
Working atmosphere	Free from corrosive or flammable gas and excessive conductive dusts
Operating altitude	0 to 2000m
Installation location	Inside a control panel <sup>8</sup>
Overvoltage category <sup>7</sup>	II or less
Pollution degree <sup>10</sup>	2 or less

<sup>1</sup> There is input/output derating. For details, refer to MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).  
<sup>2</sup> When used in a low-temperature environment, use in an environment with no sudden temperature changes. If there are sudden temperature changes because of opening/closing of the control panel or other reasons, condensation may occur, which may cause a fire, fault, or malfunction. Furthermore, use an air conditioner in dehumidifier mode to prevent condensation.  
<sup>3</sup> The criterion is shown in IEC 61131-2.  
<sup>4</sup> When the system has equipment which specification values are lower than above mentioned vibration resistance specification values, the vibration resistance specification of the whole system is corresponding to the lower specification.  
<sup>5</sup> Dielectric withstand voltage and insulation resistance are shown in the following table.

Terminal	Dielectric strength	Insulation resistance
CPU modules, I/O modules		
Between power supply terminal (AC power) and ground terminal	1.5kVAC for 1 minute	10MΩ or higher by 500 VDC insulation resistance tester
Between power supply terminal (DC power) and ground terminal	500VAC for 1 minute	
Between 24VDC service power supply connected to input terminal (24VDC) and ground terminal	500VAC for 1 minute	
Between output terminal (relay) and ground terminal	1.5kVAC for 1 minute	
Between output terminal (transistor) and ground terminal	500VAC for 1 minute	
Expansion boards, expansion adapters, intelligent function module		
Between terminal of expansion board and ground terminal	Not allowed	Not allowed
Between terminal of expansion board and ground terminal	500VAC for 1 minute	10MΩ or higher by 500 VDC insulation resistance tester
Intelligent function module	Each manual	

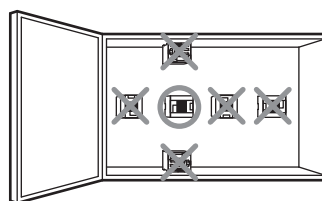
For dielectric withstand voltage test and insulation resistance test of each product, refer to the following manual.  
LJ MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)  
<sup>6</sup> For grounding, refer to Section 3.3.  
<sup>7</sup> The programmable controller cannot be used at a pressure higher than the atmospheric pressure to avoid damage.  
<sup>8</sup> The programmable controller is assumed to be installed in an environment equivalent to indoor.  
<sup>9</sup> This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

\*10 This index indicates the degree to which conductive material is generated in the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. Temporary conductivity caused by condensation must be expected occasionally.

### 2.2 Installation location

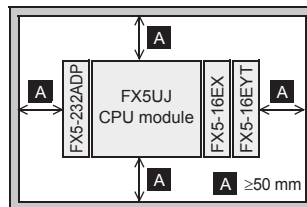
Install the programmable controller in an environment conforming to the general specifications (Section 2.1) and installation precautions.

### Installation location in enclosure



### Space in enclosure

Extension devices can be connected on the left and right sides of the CPU module. If you intend to add extension devices in the future, keep necessary spaces on the left and right sides.



### Affixing the dust proof sheet

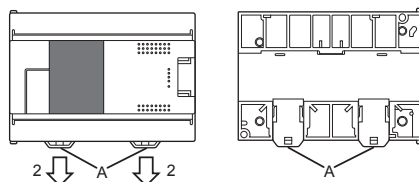
The dust proof sheet should be affixed to the ventilation port before beginning the installation and wiring work.  
For the affixing procedure, refer to the instructions on the dust proof sheet.  
Be sure to remove the dust proof sheet when the installation and wiring work is completed.

### 2.3 Procedures for installing to and detaching from DIN rail

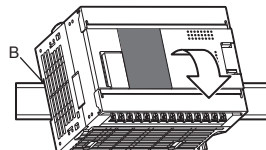
The products can be installed on a DIN46277 rail [35 mm wide]. This section explains the installations of the CPU modules.

### Installation

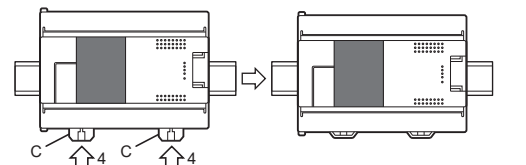
- Connect the expansion boards and expansion adapters to the CPU module.
- Push out all DIN rail mounting hooks (below fig. A)



- Fit the upper edge of the DIN rail mounting groove (below fig. B) onto the DIN rail.



- Lock the DIN rail mounting hooks (below fig. C) while pressing the PLC against the DIN rail.



### 2.4 Procedures for installing directly (with M4 screws)

The product can be installed directly on the panel (with screws). This section explains the installation of the CPU modules.

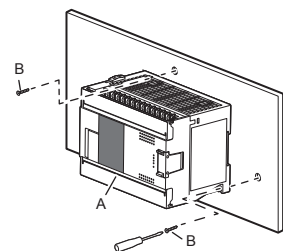
### Mounting hole pitches

Refer to the External Dimensions (Section 1.3) for the product's mounting hole pitch information.

### Installation

The FX5UJ-40MD is used as the CPU module in this example.

- Make mounting holes in the mounting surface referring to the external dimensions diagram.
- Fit the CPU module (below fig. A) based on the holes, and secure it with M4 screws (below fig. B).



### 3. Specifications and examples of external wiring

As for the details of the power supply wiring and input/output wiring, refer to MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

### [DESIGN PRECAUTIONS]

#### ⚠ WARNING

- Make sure to set up the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure. Otherwise, malfunctions may cause serious accidents.
  - Most importantly, set up the following: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
  - Note that when the CPU module detects an error, such as a watchdog timer error, during self-diagnosis, all outputs are turned off. Also, when an error that cannot be detected by the CPU module occurs in an input/output control block, output control may be disabled. External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
  - Note that the output current of the 24 V DC service power supply varies depending on the model and the absence/presence of extension modules. If an overload occurs, the voltage automatically drops, inputs in the PLC are disabled, and all outputs are turned off. External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
  - Note that when an error occurs in a relay or transistor of an output circuit, the output might stay on or off. For output signals that may lead to serious accidents, external circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
- Construct an interlock circuit in the program so that the whole system always operates on the safe side before executing the control (for data change) of the PLC in operation. Read the manual thoroughly and ensure complete safety before executing other controls (for program change, parameter change, forcible output and operation status change) of the PLC in operation. Otherwise, the machine may be damaged and accidents may occur due to erroneous operations.

### [DESIGN PRECAUTIONS]

#### ⚠ CAUTION

- Simultaneously turn on and off the power supplies of the CPU module and extension modules.

## WIRING PRECAUTIONS

### WARNING

- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work.
- Failure to do so may cause electric shock or damage to the product.
- Make sure to attach the terminal cover, provided as an accessory, before turning on the power or initiating operation after installation or wiring work.
- Failure to do so may cause electric shock.
- The temperature rating of the cable should be 80°C or more.
- Make sure to wire the screw terminal block in accordance with the following precautions.
- Failure to do so may cause electric shock, equipment failures, a short-circuit, wire breakage, malfunctions, or damage to the product.
  - The disposal size of the cable end should follow the dimensions described in the manual.
  - Tightening torque should follow the specifications in the manual.
  - Tighten the screws using a Phillips-head screwdriver No.2 (shaft diameter 6 mm or less). Make sure that the screwdriver does not touch the partition part of the terminal block.

## WIRING PRECAUTIONS

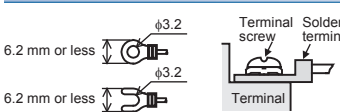
### CAUTION

- Perform class D grounding (grounding resistance: 100Ω or less) of the grounding terminal on the CPU module and extension modules with a wire 2 mm<sup>2</sup> or thicker. Do not use common grounding with heavy electrical systems (refer to section 3.3).
- Connect the power supply wiring to the dedicated terminals described in this manual. If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the programmable controller will burn out.
- Do not wire vacant terminals externally. Doing so may damage the product.
- Make sure to observe the following precautions in order to prevent any damage to the machinery or accidents due to malfunction of the programmable controller caused by abnormal data written to the programmable controller due to the effects of noise.
  - Do not bundle the power line, control line and communication cables together with or lay them close to the main circuit, high-voltage line, load line or power line. As a guideline, lay the power line, control line and communication cables at least 100 mm away from the main circuit, high-voltage line, load line or power line.
  - Ground the shield of the shielded wire or shielded cable at one point on the programmable controller. However, do not use common grounding with heavy electrical systems.

## 3.1 Cable end treatment and tightening torque

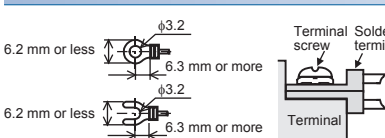
For the terminals of FX5UJ CPU module and I/O module, M3 screws are used. The electric wire ends should be treated as shown below. Tighten the screws to a torque of 0.5 to 0.8 N·m. Do not tighten terminal screws with a torque outside the above-mentioned range. Failure to do so may cause equipment failures or malfunctions.

### When one wire is connected to one terminal



Terminal manufacturer	Type No.	Applicable cable	Certification	Pressure bonding tool
J.S.T.MFG.CO., LTD.	FV1.25-B3A	AWG22 to 16	UL Listed	YA-1 (J.S.T.MFG.CO.,LTD.)
	FV2-MS3	AWG16 to 14		

### When two wires are connected to one terminal



Terminal manufacturer	Type No.	Applicable cable	Certification	Pressure bonding tool
J.S.T.MFG.CO., LTD.	FV1.25-B3A	AWG22 to 16	UL Listed	YA-1 (J.S.T.MFG.CO.,LTD.)

To adapt the Low Voltage Directive of the EU Directives or UL and cUL standards, avoid the wiring with two wires to the built-in terminal, and take an appropriate action such as adding an external terminal block.

For the time of compliance with the Low Voltage Directive, refer to MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

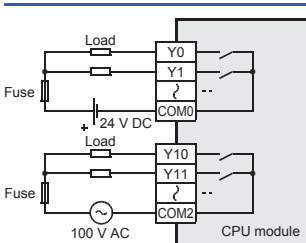
## 3.5 Relay output specifications and external wiring

### Relay output specifications

Item	Specifications
External power supply	30VDC or less 240VAC or less (*250 V AC or less* if not a CE, UL, cUL compliant item)
Maximum load	2A/point <sup>1</sup>
Minimum load	5VDC 2mA (reference value)
Open circuit leakage current	—
Response time	Off ↔ On: Approx. 10ms
Output operation display	LED on the panel turns on when output turns on.

- \*1 The total load current of resistance loads per common terminal should be the following value.
  - 3 output points/common terminal: 6A or less
  - 4 output points/common terminal: 8A or less
- As for the number of outputs per common terminal, refer to Interpretation of partition (section 4.1) and the following manual.
  - MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

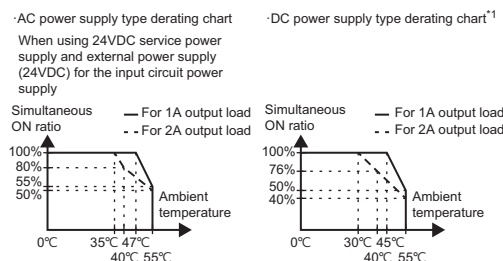
### Example of relay output wiring



### Input/output derating curve

The derating curve below shows the simultaneous ON ratio of available programmable controller inputs or outputs with respect to the ambient temperature. Use the programmable controller within the simultaneous input or output ON ratio range shown in the figure.

The simultaneous ON ratio indicates how many points of the inputs and outputs of each module can be simultaneously turned on. For the FX5UJ-24MR/DS with the simultaneous ON ratio 40%, 40% or less of the 14 points of the inputs (five points) and 40% or less of the 10 points of the outputs (four points) can be simultaneously turned on.



\*1 To adapt UL and cUL standards, the simultaneous ON ratio must be 76% or less for 2A output load.

## 3.2 Power supply specifications and external wiring

### Power supply specifications [CPU module, FX5-32E□]

Item	Specifications
Rated voltage	100 to 240VAC
Voltage fluctuation range	-15%, +10%
Frequency rating	50/60Hz
Allowable instantaneous power failure time	Operation can be continued upon occurrence of instantaneous power failure for 10 ms or less. <sup>1</sup>
Power fuse	250V 3.15A time-lag Fuse
Inrush current	25A max. 5ms or less/100VAC 50A max. 5ms or less/200VAC
Power consumption <sup>2</sup>	30W 32W 35W 25W
24VDC service power supply capacity <sup>3</sup>	400mA (460mA) <sup>4</sup> 400mA (500mA) <sup>4</sup> 400mA (550mA) <sup>4</sup> 250mA (310mA) <sup>4</sup>
5VDC built-in power supply capacity <sup>5</sup>	965mA

- \*1 When the power supply voltage is 200VAC or more, the time can be changed to 10 to 100 ms by using the user program.
- \*2 The value when all the 24VDC service power supplies are used in the maximum configuration connectable to the CPU module.
- \*3 When I/O modules are connected, they consume current from the power supply.
- \*4 The value when the 24VDC service power supply is used for the input circuit. The value in ( ) is when an external power supply is used for the input circuit.
- \*5 The power capacity which is supplied to I/O modules and intelligent function modules. For details, refer to MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

### DC power

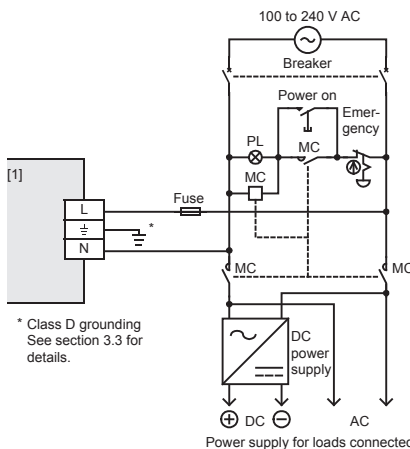
Item	Specifications
Rated voltage	24VDC
Voltage fluctuation range	-30%, +20%
Frequency rating	—
Allowable instantaneous power failure time	Operation can be continued upon occurrence of instantaneous power failure for 5ms or less.
Power fuse	250V 5A time-lag fuse
Inrush current	33A max. 6.8ms or less/24VDC
Power consumption <sup>1</sup>	34W 35W 36W 25W
24VDC built-in power supply capacity	460mA 500mA 550mA 310mA
5VDC built-in power supply capacity <sup>2</sup>	965mA

- \*1 The value when all the power supplies are used in the maximum configuration connectable to the CPU module.
- \*2 The power capacity which is supplied to I/O modules and intelligent function modules. For details, refer to MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).

## Example of external wiring

### AC power

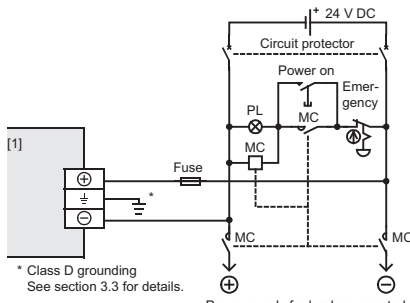
100 to 240VAC power is supplied to the CPU module and FX5-32E□. For the details of wiring work, refer to Section 3.1.



[1]: CPU module, FX5-32E□

### DC power

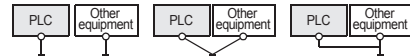
24 V DC power is supplied to the CPU module and FX5-32E□. For the details of wiring work, refer to Section 3.1.



[1]: CPU module, FX5-32E□

## 3.3 Grounding

- Ground the programmable controller as stated below.
  - Perform class D grounding. (Grounding resistance: 100 W or less)
  - Ground the PLC independently if possible.
  - If it cannot be grounded independently, ground it jointly as shown below.



- Use ground wires thicker than AWG14 (2mm<sup>2</sup>).
- Bring the grounding point close to the programmable controller as much as possible so that the ground cable can be shortened.

## 3.4 Input specifications and external wiring

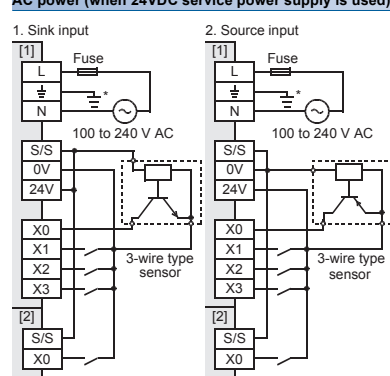
### Input specifications (24VDC input type)

Item	Specifications
Input signal voltage	24VDC (+20%, -15%)
Input impedance	CPU module: X0 to X7: 4.3kΩ I/O module <sup>1</sup> : X10 and subsequent: 5.6kΩ
Input signal current	CPU module: X0 to X7: 5.3mA/24VDC I/O module <sup>1</sup> : X10 and subsequent: 4.0mA/24VDC
ON input sensitivity current	CPU module: X0 to X7: 3.5mA or higher I/O module <sup>1</sup> : X10 and subsequent: 3.0mA or higher
OFF input sensitivity current	1.5mA or less
Input response time	Refer to MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware).
Input signal form (Input sensor form)	Sink input: No-voltage contact input Source input: PNP open collector transistor
Input operation display	LED on the panel turns on when input turns on.

\*1 Excluding the high-speed pulse input/output module

### Examples of input wiring

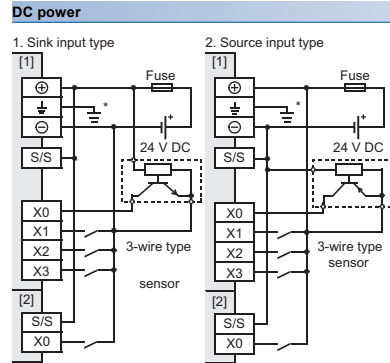
#### AC power (when 24VDC service power supply is used)



[1]: CPU module, FX5-32E□

[2]: Input module

### DC power



[1]: CPU module, FX5-32E□

[2]: Input module

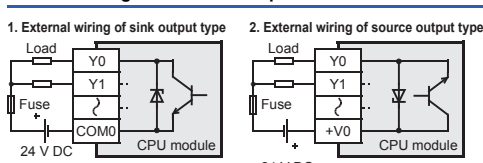
## 3.6 Transistor output specifications and external wiring

### Transistor output specifications

Item	Specifications
Output form	Transistor (Sink)
External power supply	5 to 30VDC
Maximum load	0.5A/point <sup>1</sup>
Minimum load	—
Open circuit leakage current	0.1mA or less/30VDC
ON voltage	CPU module: Y0 to Y2: 1.0V or less Y3 and subsequent: 1.5V or less I/O module: Y0 to Y2: 1.5V or less Y3 and subsequent: 2.5V or less/10mA or more (5 to 24VDC) 0.2ms or less/200mA or more (24VDC)
Response time	Off ↔ On: CPU module: Y0 to Y2: 2.5μs or less/10mA or more (5 to 24VDC) Y3 and subsequent: 0.2ms or less/200mA or more (24VDC) I/O module: 0.2ms or less/200mA or more (24VDC)
Output operation display	LED on the panel turns on when output turns on.

- \*1 The total load current of resistance loads per common terminal should be the following value.
  - 3 output point/common terminal: 0.6A or less
  - 4 output point/common terminal: 0.8A or less
  - 8 output point/common terminal: 1.6A or less
- As for the number of outputs per common terminal, refer to Interpretation of partition (section 4.1) and the following manual.
  - MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

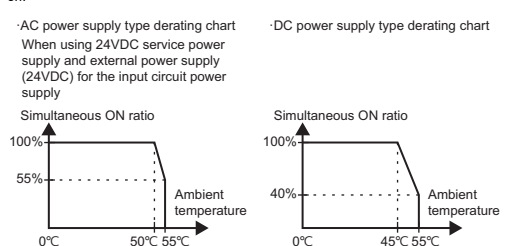
### External wiring of transistor output



### Input/output derating curve

The derating curve below shows the simultaneous ON ratio of available programmable controller inputs or outputs with respect to the ambient temperature. Use the programmable controller within the simultaneous input or output ON ratio range shown in the figure.

The simultaneous ON ratio indicates how many points of the inputs and outputs of each module can be simultaneously turned on. For the FX5UJ-24MT/DS with the simultaneous ON ratio 40%, 40% or less of the 14 points of the inputs (five points) and 40% or less of the 10 points of the outputs (four points) can be simultaneously turned on.



\*1 To adapt UL and cUL standards, the simultaneous ON ratio must be 76% or less for 2A output load.

## Communication specifications

Item	Specifications
Data transmission speed	100/10Mbps
Communication mode	Full-duplex (FDX)/Half-duplex (HDX) <sup>1</sup>
Interface	RJ45 connector
Transmission method	Base band
Maximum segment length (The distance between hub and node)	100m
Cascade connection	100BASE-TX: Maximum 2 stages <sup>2</sup> 10BASE-T: Maximum 4 stages <sup>2</sup>
Protocol type	— <sup>3</sup>
Number of connections	Total of 8 connections <sup>3</sup>
Hub <sup>1</sup>	Hubs with 100BASE-TX or 10BASE-T ports can be used.
Insulation method	Pulse transformer
IP address	Initial value: 192.168.3.250

- \*1 IEEE802.3x flow control is not supported.
- \*2 The value indicates the number of connectable stages when a repeater hub is used. Contact the manufacturer of the switching hub for the number of connectable stages when using a switching hub.
- \*3 For details, refer to the following.
  - MELSEC IQ-F FX5 User's Manual (Communication)

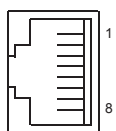
### Wiring

For the wiring, refer to the following.
 

- MELSEC IQ-F FX5 User's Manual (Communication)

### Pin configuration

The connector of the built-in Ethernet communication are arranged as follows:



Pin No.	Signal	Contents
1	TXD+	Transmit data (+)
2	TXD-	Transmit data (-)
3	RXD+	Receive data (+)
4	Not used	—
5	Not used	—
6	RXD-	Receive data (-)
7	Not used	—
8	Not used	—

### Applicable cable

Purpose	Specifications
For 10BASE-T connection	Cable conforming to Ethernet standard practice: Category 3 or higher (STP cable)
For 100BASE-TX connection	Cable conforming to Ethernet standard practice: Category 5 or higher (STP cable)

A straight cable is used. A cross cable can also be used when using direct connection between a personal computer and the CPU module.

## 3.8 Built-in USB communication specifications

Item	Specifications
Data transmission speed	Full speed (maximum 12Mbps)
Interface	Mini-B

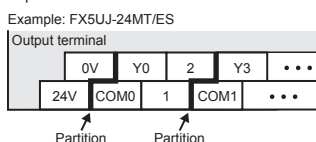
## 4. Terminal layout

For the terminal layout, refer to the following.
 

- MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

### 4.1 Interpretation of partition

The partition of the output terminals (see following figure) indicates the range of the output connected to the same common.



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- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.