



Japanese English

Programmable Controller

FX3U-1PSU-5V

INSTALLATION MANUAL



Manual Number	JY997D22501
Revision	H
Date	October 2022

This manual describes the part names, dimensions, installation, wiring and specifications of the product. Before use, read this manual and manuals of relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions.

Store this manual in a safe place so that it can be taken out and read whenever necessary. Always forward it to the end user.

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Effective October 2022 Specifications are subject to change without notice.

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Safety Precautions (Read these precautions before use.)

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. This manual classifies the safety precautions into two categories:

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 medium or slight personal injury or physical damage.

Depending on the circumstances, procedures indicated by CAUTION may also cause severe injury. It is important to follow all precautions for personal safety.

Associated Manuals

Manual name	Manual No.	Description
FX3G Series User's Manual - Hardware Edition	JY997D31301 MODEL CODE: 09R521	Explains FX3G Series PLC specification details for I/O, wiring, installation, and maintenance.
FX3U Series User's Manual - Hardware Edition	JY997D16501 MODEL CODE: 09R516	Explains FX3U Series PLC specification details for I/O, wiring, installation, and maintenance.
MELSEC IQ-F FX5S/ FX5U/ FX5UC User's Manual (Hardware)	SH-082452ENG MODEL CODE: 09R584	Describes the details of hardware of the FX5 CPU module, including performance specifications, wiring, installation, and maintenance.

**How to obtain manuals** For the necessary product manuals or documents, consult with the Mitsubishi Electric dealer from where you purchase your product.

**Certification of UL, cUL standards** FX3U-1PSU-5V units comply with the UL standards (UL, cUL)

**UL, cUL registration number: E95239** Regarding the standards that comply with the main unit, please refer to either the FX series product catalog or consult with your nearest Mitsubishi product provider.

**Compliance with EC directive (CE Marking)** This product complies with EC directive, however, this document does not guarantee that a mechanical system including this product will comply with EC directive.

Compliance to EMC directive and LVD directive for the entire mechanical module should be checked by the user / manufacturer. For more information please consult with your nearest Mitsubishi product provider. Regarding the standards that comply with the main unit, please refer to either the FX-series product catalog or consult with your nearest Mitsubishi product provider.

Caution for compliance with EC Directive

- Please use the FX3U-1PSU-5V while installed in conductive shielded control panels under a general industrial environment.
- Programmable controllers are open-type devices that must be installed and used within conductive control panels. Please secure the control box lid to the control box (for conduction). Installation within a control box greatly affects the safety of the system and aids in shielding noise from the programmable controller.
- For the control panel, use the product having sufficient strength, fire protectiveness and shielding property to an installation environment.

Caution for compliance with the LVD directive (EN61010-2-201:2013)\*1

- 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.
- Do not wire two or more crimp terminals to one terminal. (If the wiring with two or more wires is needed, take an appropriate action such as adding an external terminal.)
- For crimp terminals to be used for the wiring applied with 30V AC or higher, use the products with insulating sleeves.
- Cutoff device such as a breaker or a circuit protector should be installed in accordance with the following precautions.
  - Use EN60947-1 or EN60947-3 standards.
  - Place the cutoff device so that it can be operated easily.
  - Specify that the cutoff device is for this equipment.

\*1 For the time of compliance with the LVD directive (EN61010-2-201:2013), refer to the manual of the PLC to be connected.

Compliance with UKCA marking

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

1. Introduction

When the FX3G, FX3U internal power supplied from the FX3G, FX3U, FX5U PLC (AC power supply type) is insufficient for powering the output extension blocks or special function blocks, the FX3U-1PSU-5V (extension power supply unit) is available. Up to two FX3U-1PSU-5V units may be connected to a FX3U, FX5U PLC system. Only one FX3U-1PSU-5V unit may be connected to a FX3G PLC system. Connect extension equipment to the FX3U-1PSU-5V according to the configuration specification limits described in the following manuals.

For details on installation and wiring, and system configuration including the FX3U-1PSU-5V, refer to the following manuals.

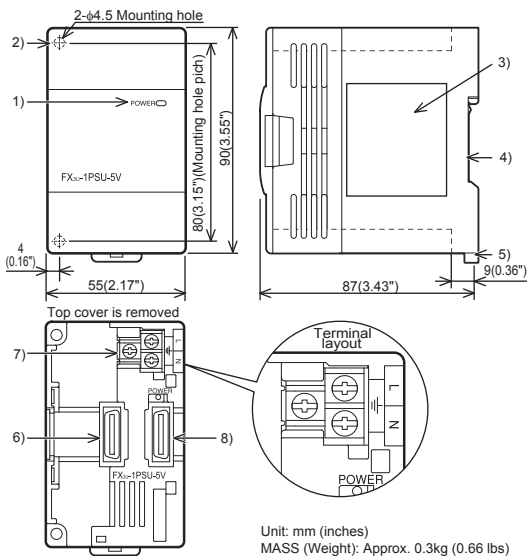
- FX3G Series User's Manual - Hardware Edition
- FX3U Series User's Manual - Hardware Edition
- MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

1.1 Incorporated Items

Check that the following product and items are included in the package:

Product	Accessories
FX3U-1PSU-5V extension power supply unit	Dust proof protection sheet Extension cable Installation manual (This manual)

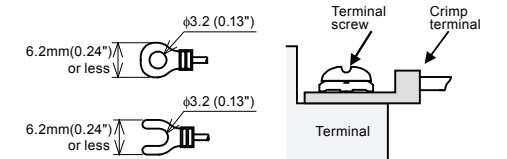
1.2 External Dimensions and Part Names



3.1 Applicable Cable and Terminal Tightening Torque

The size of the terminal screws is M3. The end disposal of the cable shows below. Tighten the terminal to a torque of 0.5N•m to 0.8N•m. Do not tighten terminal screws exceeding the specified torque. Failure to do so may cause equipment failures or malfunctions.

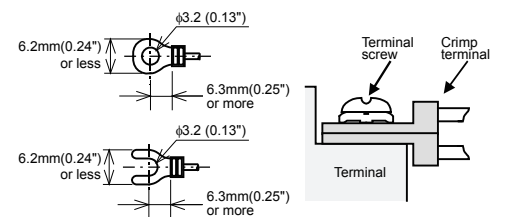
- When one wire is connected to one terminal



<Reference>

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\*1



<Reference>

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.)

\*1 To adapt the LVD directive (EN61010-2-201:2013) of the EC directive, avoid the wiring with two wires to the built-in terminal, and take an appropriate action such as adding an external terminal. For the time of compliance with the LVD directive (EN61010-2-201:2013), refer to the manual of the PLC to be connected.

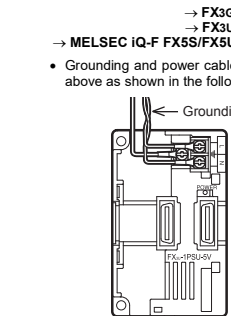
3.2 Power Supply Wiring

For the power supply wiring, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition

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

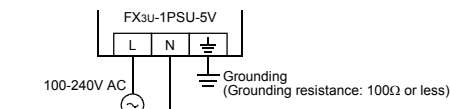
- The FX3U-1PSU-5V power supply should be turned ON simultaneously or before the PLC main unit. Before turning the power OFF, ensure the safety of the system and then simultaneously turn the main unit, FX3U-1PSU-5V, and other extension equipment (the special extension equipment is included) OFF. For details, refer to the following PLC manual → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition
- MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)
- Grounding and power cables should be positioned to exit the unit from above as shown in the following figure.

Grounding cable and power cable



- When connecting an input (only) extension block and an input/output extension block (e.g. FX2N-8ER) to the FX3U-1PSU-5V, supply the power of input circuit for them from the 24V DC service power supply of the nearest preceding main unit or powered extension unit. For details, refer to the following PLC manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition
- MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

Power supply wiring

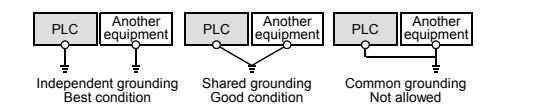


3.3 Grounding

Grounding should be performed as stated below.

- The grounding resistance should be 100Ω or less.
- Independent grounding should be performed for best results. When independent grounding is not performed, perform "shared grounding" of the following figure. For details, refer to the following manual.

→ FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)



- Use ground wires thicker than AWG14 (2 mm<sup>2</sup>).
- The grounding point should be close to the PLC, and all grounding wire should be as short as possible.

4. Specification

DESIGN PRECAUTIONS WARNING

- Provide a safety circuit on the outside of the PLC so that the whole system operates to ensure the safety even when external power supply trouble or PLC failure occurs. Otherwise, malfunctions or output failures may result in an accident.
- 1) An emergency stop circuit, a protection circuit, an interlock circuit for opposite movements, such as normal and reverse rotations, and an interlock circuit for preventing damage to the machine at the upper and lower positioning limits should be configured on the outside of the PLC.
- 2) When the PLC CPU detects an error, such as a watch dog timer error, during self-diagnosis, all outputs are turned off. When an error that cannot be detected by the PLC CPU occurs in an input/output control block, output control may be disabled. Design external circuits and mechanisms to ensure safe operations of the machine in such a case.
- 3) When some sort of error occurs in a relay, triac or transistor of the output unit/block, output may be kept on or off. For output signals that may lead to serious accidents, design external circuits and mechanisms to ensure safe operations of the machine.

DESIGN PRECAUTIONS CAUTION

- Make sure to observe the precautions below in order to prevent any damage to a machine or any wires accident which might be caused by abnormal data written in the PLC due to the influence of noise:
  - Do not lay close or bundle the control line with the main circuit, high-voltage power line, or load line. Otherwise effects of noise or surge induction are likely to take place. Keep a safe distance of more than 100 mm (3.94") from the above when wiring.
  - Ground the shield wire or shield of a shielded cable at one point on the PLC. However, do not ground at the same point as high voltage lines.

STARTUP AND MAINTENANCE PRECAUTIONS CAUTION

- Do not disassemble or modify the PLC. Doing so may cause failure, malfunction or fire. For repair, contact your local Mitsubishi Electric representative.
- Do not drop the product or do not exert strong impact, doing so may cause damage.
- 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.

DISPOSAL PRECAUTIONS CAUTION

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

- POWER LED (green)
- Direct mounting hole: 2 holes of φ4.5 (0.18") (mounting screw: M4 screw)
- Name plate\*1
- DIN rail mounting groove (DIN rail: DIN46277)
- DIN rail mounting hook
- Extension connector for preceding unit/block
- Power supply terminal block
  - ⊕ shows a function grounding terminal.
  - Extension connector for next unit/block
- \*1 Δ is a mark that instructs to use the cable with an appropriate temperature rating (80°C or more) for wiring.

2. Installation

INSTALLATION PRECAUTIONS WARNING

- Cut off all phases of the power source externally before starting the installation work, thus avoiding electric shock or damages to the product.

INSTALLATION PRECAUTIONS CAUTION

- Use the product in the environment within the general specifications described in the PLC main unit manual (Hardware Edition). Never use the product in areas with 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>x</sub>), flammable gas, vibrations or impacts, or expose it to high temperature, condensation, or wind and rain. If the product is used in such a place described above, electrical shock, fire, malfunction, damage, or deterioration may be caused.
- Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
- Install the product securely using the DIN rail or screws.
- Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PCB board, thereby causing nonconformity.
- 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.
- Be sure to remove the dust proof sheet from the PLC's ventilation slits when installation work is completed.
- Failure to do so could cause fires, equipment failures, and malfunctions.
- Fit the extension cables and communication cables securely to the designated connectors. Contact failures may cause malfunctions.

Notes

- When a dust proof sheet is supplied with an unit, keep the sheet applied to the ventilation slits during installation and wiring work.
- To prevent temperature rise, do not install the PLC on a floor, a ceiling or a vertical surface. Install it horizontally on a wall.
- Keep a space of 50mm (1.97") or more between the unit main body and another device or structure. Install the unit as far away as possible from high-voltage lines, high-voltage devices and power equipment. Failure to do so may cause fire, equipment failures or malfunctions.

2.1 Arrangements

The product connects on the right side of a PLC main unit, input/output extension unit/block or special function unit/block.

For further information of installation arrangements, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

2.2 Mounting

The product is mounted by the following method.

- Direct mounting
- DIN rail mounting

2.2.1 Direct Mounting

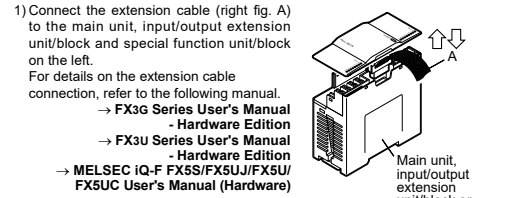
The product can be mounted with M4 screws by using the direct mounting holes. Refer to the External Dimensions (section 1.2) for the product's mounting hole pitch information.

An internal space between each unit of 1 to 2 mm (0.04" to 0.08") is necessary. For further information on direct installation, also refer to the following manual.

→ FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

2.2.2 DIN Rail Mounting

The product can be mounted on a DIN rail (DIN46227, 35mm width).



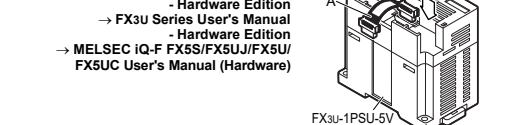
For details on the extension cable connection, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

- 1) Connect the extension cable (right figure A) to the main unit, input/output extension unit/block and special function unit/block on the left.
- 2) Fit the upper edge of the DIN rail mounting groove (right figure B) onto the DIN rail.
- 3) Press the product against the DIN rail.



- 4) Connect the extension cable (right figure A) connected in the procedure 1) to FX3U-1PSU-5V.

For details on the extension cable connection, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)



3. Wiring

WIRING PRECAUTIONS WARNING

- Connect the AC 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 PLC will be burnt out.
- Cut off all phases of the power source externally before starting the wiring work, thus avoiding electric shock or damages to the product.
- Ensure the top cover is attached to the product before turning on the power or starting the operation after wiring work. Failure to do so may cause electric shock.
- The temperature rating of the cable should be 80°C or more.

WIRING PRECAUTIONS CAUTION

- Perform class D grounding (grounding resistance: 100Ω or less) to the grounding terminal in the main unit and extension units with a 2mm<sup>2</sup> or thicker wire. Do not connect the grounding terminal at the same point as a heavy electrical system (refer to section 3.3).
- When drilling screw holes or wiring, cutting chips or wire chips should not enter ventilation slits. This may cause fire, failures, or malfunctions.
- Properly perform wiring to the 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.
  - Termination of the wire should follow the dimensions described in the manual.
  - Tightening torque should be the specifications in the manual.

TRANSPORT AND STORAGE PRECAUTIONS CAUTION

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

4.1 Applicable PLC

Model name	Applicability
FX3U Series PLC	From the first product
FX3G Series PLC	From the first product
FX5U PLC*1	From the first product

The version number can be checked by monitoring D8001 as the last three digits indicate it.

\*1 An FX5-CNV-BUS or FX5-CNV-BUSC is necessary to connect the FX3U-1PSU-5V with the FX5U PLC.

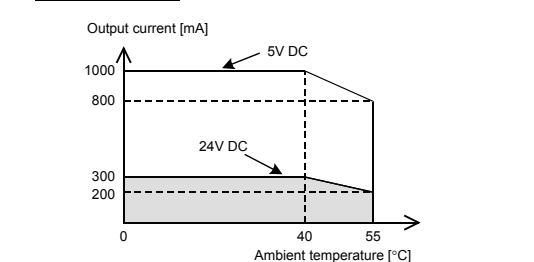
4.2 General Specifications

The items other than the following are equivalent to those of the PLC main unit. For the general specification, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

4.3 Power Supply Specifications

Items	Specifications
Supply voltage	100 to 240V AC
Voltage fluctuation range	-15%, +10%
Rated frequency	50/60Hz
Allowable momentary power failure time	The allowable momentary power failure time depends on the power supply used. <ul style="list-style-type: none"> <li>100V AC power supply system: The operation is continued to the momentary power failure for 10 or less ms.</li> <li>200V AC power supply system: The operation is continued to the momentary power failure for 100 or less ms.</li> </ul>
In-rush current	30A Max. 5 ms or less/100V AC 65A Max. 5 ms or less/200V AC
Power consumption	20W Max.
Output current (Internal for supply)	24V DC: 300mA <sup>*1</sup> 5V DC: 1000mA <sup>*1</sup>

\*1 The output current is proportional to the ambient temperature as shown by the derating curve below. FX3U-1PSU-5V should be used in the range of the output current according to this derating curve.



Note for system configuration

For further details on system configuration, refer to the following manual. → FX3G Series User's Manual - Hardware Edition → FX3U Series User's Manual - Hardware Edition → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

- When connected to the FX3U/FX3G PLC
- Up to two FX3U-1PSU-5V units may be connected to a FX3U PLC system. Only one FX3U-1PSU-5V unit may be connected to a FX3G PLC system.
- The total number of I/O occupied points of the input/output extension block connected to FX3U-1PSU-5V should be the 32 or less points.
- The total of the consumed current of the extension equipment connected to FX3U-1PSU-5V should be the output current capacity or less. However, when connecting an input (only) extension block and an input/output extension block (e.g. FX2N-8ER) to the FX3U-1PSU-5V, supply the power of input circuit for them from the 24V DC service power supply of the nearest preceding main unit or powered extension unit.

output extension block (e.g. FX2N-8ER) to the FX3U-1PSU-5V, supply the power of input circuit for them from the 24V DC service power supply of the nearest preceding main unit or powered extension unit.

- Do not use FX3U-1PSU-5V combining the DC-power-supply type main unit.
- Up to one extension cable (FX0N-65EC, FX0N-30EC) may be connected in one system.
- When connected to the FX5U PLC
- Refer to the following manual. → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

When connected to the FX5U PLC → Refer to the following manual. → MELSEC IQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

「电器电子产品有害物质限制使用标识要求」的表示方式



Note: This symbol mark is for China only.

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部件名称	有害物质的名称及含量					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
可编程控制器	○	○	○	○	○	○
外壳	○	○	○	○	○	○
印刷基板	×	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。

○: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。  
×: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

基于中国标准法的参考规格: GB/T15969.2

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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:  
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(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.  
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