This manual classifies the safety precautions into two categories:

1. Safety Precaution (Read these precautions before use.)
2. Maintenance Precaution (Proceed after reading these precautions.)

And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always follow it to the end.

When transporting lithium batteries, follow required transportation regulations. (For details on the regulated products, refer to the MELSEC iQ-F FX5U User’s Manual (Hardware).)

Precautions for Compliance with the EC Directive

- 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 cables.
- Failure to do so may cause equipment failures or malfunctions.
- Turn off the PLC power if the PLC cover is detached or the nameplate is missing.
- Failure to do so may cause equipment failures or malfunctions.
- Peripheral devices, expansion board, expansion adapter, and connector conversion adapter
- Extension modules, two conversion modules, and battery
- 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 disable to avoid the influence of static electricity.

SAFETY PRECAUTIONS

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.
- When disposing of batteries, separate them from other waste according to local regulations.

1.1 Part names

- CPU module
- SD module
- Extension modules, bus conversion module, and battery connector conversion adapter
- Resin label
- Terminals of power supply
- Terminal block covers
- Expansion board connector
- Expansion adapter connecting hooks
- RUN/STOP/RESET switch
- Power terminal block
- Communication terminal block
- Independent power terminal block

2. Installation, wiring, and maintenance

- For a detailed explanation of the FX5U CPU module hardware and information on instructions for the programming and intelligent function module, refer to the relevant documents.

3. SD module

- SD Green Lit when data is sent through communication via built-in RS-485.
- SD/RD Green Lit when data is received through communication via built-in Ethernet.

4. Extension connector cover

- Ethernet expansion connector cover

- SD memory card slot disable switch

- SD memory card slot

- Expansion board connector

- Battery holder

- Battery connector

- Terminal block mounting screws

- Extension connector

- Power terminal block

- Expansion adapter connecting hooks

- Extension board connector

- Expansion board connector

- Power terminal block

- Terminal block mounting screws

- Expansion board connector

- Battery holder

- Battery connector

- Terminal block mounting screws

- Expansion board connector

- Battery holder

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- Battery connector
2. Installation (general specifications)

As for installation of the I/O modules, expansion adapters and expansion boards, refer to MELSEC-Q F FX5U User's Manual (Hardware).

**installation PRECAUTIONS**

- Use the product within the general environment specifications described in section 2-1 of this manual. If the product is used in areas with excessive dust, oil smoke, conductive dusts, corrosive gas (salt air, C2H2, SO2 or NO2), flammable gas, vibration, impact, or if it is exposed 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.

**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 do not enter the ventilation slits of the PLC.

- For the product supplied together with a dust proof sheet, the sheet should be affixed to the ventilation slits before installation and wiring work is completed.

- Be sure to remove the dust proof sheet when the installation and wiring work is completed.

- Make sure to wire the screw terminal block in accordance with the specifications. The temperature rating of the cable should be 80°C or less.

- Make sure to attach the terminal cover, provided as an accessory, before turning on the power or initiating operation after installation or wiring work.

- For output signals that may lead to serious accidents, external circuits and mechanisms should be designed to ensure safe machinery operation in such cases.

- Construct an interlock circuit in the program so that the whole system always monitors and controls the PLC, using both the PLC and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The failure of a PLC may cause serious accidents.

**Electrical connections**

- For output signals that may lead to serious accidents, external circuits and mechanisms should be designed to ensure safe machinery operation in such cases.

- For wiring, refer to MELSEC-Q F FX5U User's Manual (Hardware).

**Terminals**

- The terminal enclosures for the PLC modules are plastic, not metal.

**Installation**

- When installing the PLC in an environment conforming to the general specifications (Section 2.1), installation precautions.

**Location**

- Extension devices can be connected on the left and right sides of the CPU module.

- Be sure to remove the dust proof sheet when the installation and wiring work is completed.

**Procedures for installing and detaching from DIN rail**

- The products can be installed on a DIN42277 rail (35 mm wide). This section explains the installations of the CPU modules.

**1.** Connect the expansion boards and expansion adapters to the CPU module.

**2.** Push out DIN mounting hooks (right fig. A).

**3.** Fit the upper edge of the DIN rail mounting groove (right fig. B) onto the DIN rail.

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

**2.4.2 Installation**

- The FX5U-64M is used as the CPU module in this example.

**1.** Make mounting holes in the mounting surface referring to the external dimensions (Section 1.2).

**2.** Fit the CPU module (right fig. A), including expansion adapters, with M4 screws (right fig. B). (In the case of FX5U-48M, there are four screw holes.)

**3. Specifications and examples of external wiring**

As for the details of the power supply wiring and input/output wiring, refer to MELSEC-Q F FX5U User's Manual (Hardware).
When using a wire ferrule with an insulating sleeve, choose a wire with proper cable sheath referring to Table 3.2.1. Failure to do so may cause equipment failures or malfunctions.

3.2 Power supply specifications and external wiring

3.2.1 Power supply specifications [CPU module, FX5-32E/62E]

<table>
<thead>
<tr>
<th>Term</th>
<th>AC power type</th>
<th>DC power type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>100 to 240 V AC</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Voltage fluctuation range</td>
<td>15% ±10%</td>
<td>30% ±5%</td>
</tr>
<tr>
<td>Frequency rating</td>
<td>50/60 Hz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>AC power type</th>
<th>DC power type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable instantaneous power failure time</td>
<td>Operation can be continued upon occurrence of instantaneous power failure for 5 ms or less.</td>
<td>Operation can be continued upon occurrence of instantaneous power failure for 5 ms or less.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>AC power type</th>
<th>DC power type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power fuse</td>
<td>FX5U-32ME/FX5U-32E</td>
<td>250 V 5 A Time-lag Fuse</td>
</tr>
<tr>
<td>FX5U-32ME/FX5U-32E</td>
<td>250 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
<tr>
<td>FX5U-60ME/FX5U-60E</td>
<td>300 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
<tr>
<td>RX building block</td>
<td>250 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
<tr>
<td>FX5U-32ME/FX5U-32E</td>
<td>250 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
<tr>
<td>FX5U-60ME/FX5U-60E</td>
<td>300 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
<tr>
<td>RX building block</td>
<td>250 V 5 A Time-lag Fuse</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Example of external wiring [DC power type]

3.3.1 Grounding

1) Sink input type
2) Source input type
3) Class D grounding

3.3.2 Example of input wiring (DC power type) (when 24 V DC service power supply is used)

1) Sink input type
2) Source input type
3) Class D grounding

3.4 Input specifications and external wiring

3.4.1 Input specifications [24 V DC input type]

<table>
<thead>
<tr>
<th>Term</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>24 V DC ±20%, 100 ±5%</td>
</tr>
<tr>
<td>Input impedance</td>
<td>CPU module X0 to X17</td>
</tr>
<tr>
<td>FX5 I/O module</td>
<td>X0 to X17</td>
</tr>
</tbody>
</table>

3.5 Relay output specifications and external wiring

3.5.1 Relay output specifications

<table>
<thead>
<tr>
<th>Term</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>External power supply</td>
<td>24 VA or less (250 V DC or less)</td>
</tr>
</tbody>
</table>

* Class D grounding See section 3.3 for details.

* Power is supplied to I/O modules, intelligent function modules, expansion adaptation and expansion boards.

The following manual shows further information.

* Refer to MELSEC iQ-F FX5U User’s Manual (Hardware).
3.6 Transistor output specifications and external wiring

For the details on the built-in analog input/output specifications and external wiring, refer to the MELSEC iQ-F FX5U User’s Manual (Hardware).

3.6.1 Analog input specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load</td>
<td>2 A point*1</td>
</tr>
<tr>
<td>Min. load</td>
<td>0.25 A point</td>
</tr>
</tbody>
</table>

3.6.2 Analog output specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load</td>
<td>2 A point</td>
</tr>
<tr>
<td>Min. load</td>
<td>0.25 A point</td>
</tr>
</tbody>
</table>

3.7 Built-in analog input/output specifications and external wiring

As for the details on the built-in analog input/output specifications and external wiring, refer to the MELSEC iQ-F FX5U User’s Manual (Hardware).

3.7.1 Analog input specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog input points</td>
<td>2 points (2 channels)</td>
</tr>
<tr>
<td>Analog input range</td>
<td>0.0 V DC to input resistance: 115.7 kΩ</td>
</tr>
</tbody>
</table>

3.7.5 Terminal block layouts

The terminals of the built-in analog input/output are arranged as follows:

3.8 Built-in Ethernet communication specifications and external wiring

As for the details on the built-in Ethernet communication specifications and external wiring, refer to the following manual:

- Refer to MELSEC iQ-F FX5U User’s Manual (Ethernet Communication).
- Refer to MELSEC iQ-F FX5U User’s Manual (MODBUS Communication).

3.8.3 Pin Configuration

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

4. Terminal block layouts

For details on the terminal block layout, refer to the following manual:

- Refer to MELSEC iQ-F FX5U User’s Manual (Hardware).

Interpretation of partition:

The partition of the output terminals (see figure) indicates the range of the output terminal number from the same connection.

Example: FX5U-32MT/ES

<table>
<thead>
<tr>
<th>Y0</th>
<th>Y1</th>
<th>2</th>
<th>Y4</th>
<th>Y5</th>
<th>10BASE-TX</th>
<th>10BASE-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 V AC</td>
<td>100 V AC</td>
<td>24 V DC</td>
<td>24 V DC</td>
<td>24 V DC</td>
<td>24 V DC</td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

For safe use:

- This product has been manufactured as a general-purpose part for general industrial use, and has been designed and manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric appliances, medical devices, automatic transaction machinery, vehicle, etc., consult with Mitsubishi Electric.
- 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 fail-safe functions in the system.