

# JY997D29701A

**MITSUBISHI** *Changes for the Better*

PROGRAMMABLE CONTROLLERS  
MELSEC-F

**FX3UC-□□MT/D**

**SUPPLEMENTARY MANUAL**

Manual Number	JY997D29701
Revision	A
Date	September 2007

This manual supplements the contents of the FX3UC (D.DSS) Series Hardware Manual (Manual Number: JY997D28601A). For details, refer to FX3UC SERIES USER'S MANUAL - Hardware Edition (Manual number: JY997D28701). Before use, read this manual and the manuals of all 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 September 2007  
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## Safety Precaution (Read these precautions before use.)

This manual classifies the safety precautions into two categories:

**⚠ DANGER** and **⚠ CAUTION**.

<b>⚠ DANGER</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
FX3UC (D.DSS) Series Hardware Manual	JY997D28601	Extractions of descriptions of input/output specifications, wiring and installation of FX3UC-□□MT/D, FX3UC-□□MT/DSS from FX3UC Series User's Manual - Hardware Edition. For the detailed explanation, refer to the FX3UC Series User's Manual - Hardware Edition.
FX3UC Series User's Manual - Hardware Edition	JY997D28701 MODEL CODE: 09R519	Explains the FX3UC Series PLC specifications for I/O, wiring, installation, and maintenance.

## How to obtain manuals

For product manuals or documents, consult with the Mitsubishi Electric dealer from where you purchase your product.

**DESIGN PRECAUTIONS** **⚠ DANGER**

- Make sure to have the following safety circuits outside of the PLC to ensure safe system operation even during extension power supply unit or PLC failure. Otherwise, malfunctions may cause serious accidents.

1) Most importantly, have 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).

**DESIGN PRECAUTIONS** **⚠ DANGER**

2) Note that when the PLC CPU 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 PLC CPU 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.

3) Note that when an error occurs in a relay, triac or transistor output device, the output could be held either 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.

## 1. Introduction

This manual supplements the contents of the FX3UC (D.DSS) Series Hardware Manual (Manual Number: JY997D28601A). This manual covers basic hardware details for the following FX2NC Series Extension Block. For details, refer to FX3UC SERIES USER'S MANUAL - Hardware Edition (Manual number: JY997D28701).

MODEL	INPUT		OUTPUT			MASS Kg (lbs)
	QTY	TYPE	QTY	DEVICE	TYPE	
FX2NC-16EX	16	24V DC Sink	-	-	-	0.15(0.33)
FX2NC-32EX	32	-	-	-	-	0.2(0.44)
FX2NC-16EYT	-	-	16	Transistor	Sink	0.15(0.33)
FX2NC-32EYT	-	-	32	Transistor	Sink	0.2(0.44)
FX2NC-16EX-T	16	24V DC Sink	-	-	-	0.15(0.33)
FX2NC-16EYR-T	-	-	16	Relay	-	0.2(0.44)

## 2. Specifications

### 2.1 General Specifications

The general specifications are equivalent to the PLC main unit. For the general specifications, refer to the FX3UC (D.DSS) Series Hardware Manual.

### 2.2 Input Specifications

		FX2NC-16EX, FX2NC-32EX, FX2NC-16EX-T
Input voltage		24V DC +20%, -15%
Input current		24V DC, 5mA
Input switching current	OFF → ON	>3.5mA
	ON → OFF	<1.5mA
Response time		10ms
Circuit isolation		Photocoupler
Operation indication		LED is lit

### 2.3 Output Specifications

#### 2.3.1 Transistor Output Specifications

		FX2NC-16EYT, FX2NC-32EYT
Switched voltage (resistive load)		5 - 30V DC
Rated current / N points		0.1A/1point Make sure that the total load current of the 8 resistance load points is 0.8 A or less.
Max. Inductive load		2.4W/24V DC
Response time (approx.)	OFF → ON	<0.2ms (100mA/24V DC),
	ON → OFF	<0.2ms (100mA/24V DC),
Open circuit current leakage		0.1mA/30V DC
Circuit isolation		Photocoupler
Operation indication		LED is lit when photocoupler is driven

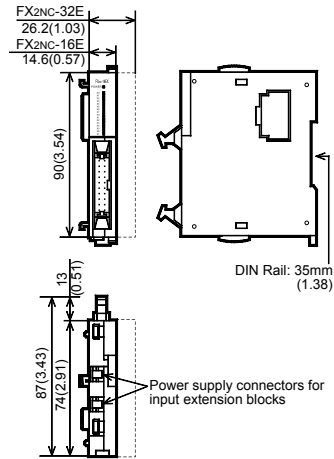
### 2.3.2 Relay Output Specifications

		FX2NC-16EYR-T
Switched voltage (resistive load)		≤ 240V AC, ≤ 30V DC (250V AC or less when the unit does not comply with CE, UL or cUL standards)
Rated current / N points		2A/1point If one COM is used, make sure that the total load current of the 8 resistance load points is 4 A or less. When connecting two COM (number) terminals externally, the total load current for 8 resistance load points is 8A.
Max. Inductive load		80VA*1
Minimum load		When supply voltage < 24V DC allow at least 5mA flow
Response time (approx.)	OFF → ON	10ms
	ON → OFF	10ms
Circuit isolation		by relay
Operation indication		LED is lit when coil is energized

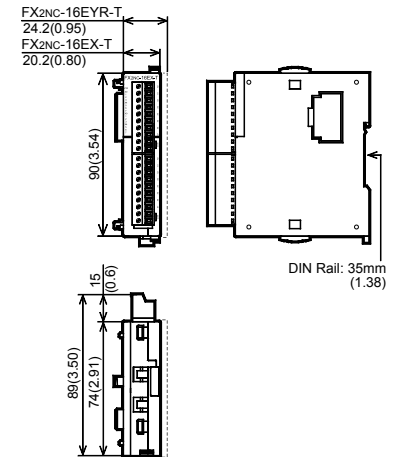
\*1 For the product life of relay contacts, refer to the FX3UC Series User's Manual - Hardware Edition.

### 2.4 External Dimensions

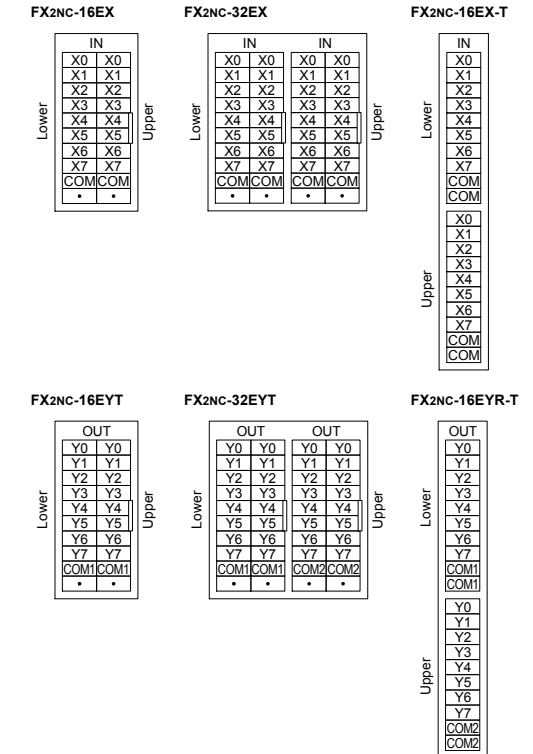
#### 2.4.1 FX2NC-16EX, FX2NC-32EX, FX2NC-16EYT, FX2NC-32EYT



#### 2.4.2 FX2NC-16EX-T, FX2NC-16EYR-T



### 2.5 Terminal Layouts



### 3. Installation

The extension block can be installed on a DIN46277 rail (35 mm (1.38") wide).  
(Cannot be installed directly in the enclosure.)

For details, refer to the FX3UC Series User's Manual - Hardware Edition.

#### INSTALLATION PRECAUTIONS **CAUTION**

- Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition).  
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 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.
- 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.
- Use screwdrivers carefully when performing installation work, thus avoiding accident or product damage.
- When drilling screw holes or wiring, make sure cutting or wire debris does not enter the ventilation slits.  
Failure to do so may cause fire, equipment failures or malfunctions.

### 4. Example Wiring

#### WIRING PRECAUTIONS **DANGER**

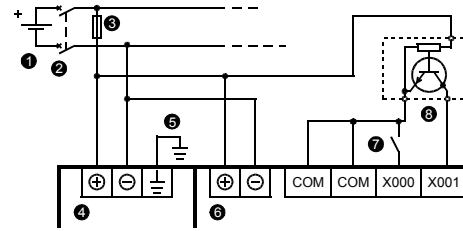
- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work.  
Failure to do so may cause electric shock or damage to the product.

#### WIRING PRECAUTIONS **CAUTION**

- Connect the DC power supply wiring to the dedicated terminals specified in this manual. If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Connect the AC power supply wiring to the dedicated terminals specified in this manual. If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Do not wire vacant terminals externally.  
Doing so may damage the product.
- Perform class D grounding (grounding resistance: 100Ω or less) to the grounding terminal on the main unit.  
Do not use common grounding with heavy electrical systems (refer to the manual of the PLC main unit).
- When drilling screw holes or wiring, make sure cutting or wire debris does not enter the ventilation slits.  
Failure to do so may cause fire, equipment failures or malfunctions.

For details, refer to the FX3UC Series User's Manual - Hardware Edition.

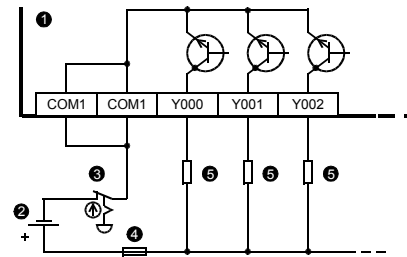
#### 4.1 Input



No.	Description
1	External power supply 24V DC +20% -15%
2	Breaker, Circuit protector, Fuse etc.
3	Fuse
4	MPU main processing unit (main unit)
5	Class D grounding (grounding resistor 100Ω or less)
6	FX2NC Extension block
7	Contact
8	Three wire sensor

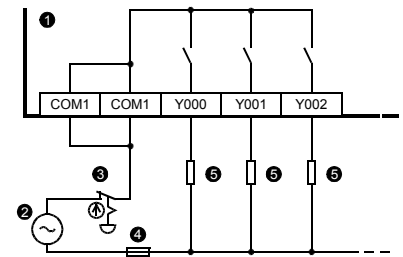
#### 4.2 Output

##### 4.2.1 Transistor Output Type



No.	Description
1	FX2NC Extension block
2	DC power supply
3	Emergency stop
4	Fuse
5	Load

##### 4.2.2 Relay Output Type



No.	Description
1	FX2NC Extension block
2	AC power supply
3	Emergency stop
4	Fuse
5	Load

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

#### Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

#### **!** For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or 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 power, aerospace, medicine or passenger movement vehicles, 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 failsafe functions in the system.

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