

# Mitsubishi Electric Programmable Controller

## Upgrade Tool

## Conversion Adapter

Model  
**ERNT-1CR121X221Y**

## User's Manual



**50CM-D180371-A(1811)**

### MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED

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### SAFETY PRECAUTIONS

(Always read these precautions prior to use.)

Before using this product, please read this manual carefully and pay full attention to safety to ensure that the product is used correctly. The precautions presented in this manual are concerned with this product only. For Programmable Controller system safety precautions, refer to "Safety Guidelines" for MELSEC iQ-R Series Modules. 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 ranked as "WARNING" and "CAUTION."



**WARNING** Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



**CAUTION** Indicates that incorrect handling may cause hazardous conditions, resulting in medium or minor injury and/or property damage.

Note that failure to observe the CAUTION level instructions may lead to a serious consequence according to the circumstances. Always follow the precautions of both levels because they are important to personal safety. Please keep this manual in an easy-to-access location for future reference, and be sure to provide the manual to the end user.

### [Precautions before using]

#### CAUTION

- When replacing the SYSMAC C Series with the MELSEC iQ-R Series, be sure to refer to the Programmable Controller Module manuals to check the differences in performance, functionality, CPU input/output signals, buffer memory addresses and the like.

### [Installation Precautions]

#### CAUTION

- Use the conversion adapter and conversion adapter anchor base in the environment conditions described in the general specifications in "Safety Guidelines" for MELSEC iQ-R Series Modules. Failure to do so could lead to electric shock, fire, malfunction or product failure or deterioration.
- Do not come in direct contact with the conductive area of the conversion adapter. Doing so could lead to system malfunction or failure.
- Fully secure the conversion adapter and conversion adapter anchor base using the installation screws, and tighten the installation screws securely within the specified torque range. Failure to do so could cause the conversion adapter and anchor base to fall, resulting in conversion adapter and conversion adapter anchor base damage.
- Always check for correct match between MELSEC iQ-R Series and the conversion adapter. Incorrect match can cause damage to the MELSEC iQ-R Series module.

### [Wiring Precautions]

#### WARNING

- Be sure to shut off all phases of the external power supply before performing installation or wiring work. Failure to do so could result in electric shock or product damage.
- If you want to energize and run the unit after completing the installation and wiring work, be sure to close the terminal block cover attached to the SYSMAC C series terminal block. Failure to do so could result in electric shock.

#### CAUTION

- Properly wire the conversion adapter after verifying the specifications and terminal layout of the module to be used. Connecting a power supply with a different rating or improper wiring could lead to fire or product failure.
- Securely tighten the conversion adapter installation screws, conversion adapter anchor base installation screws and SYSMAC C series terminal block installation screws within the specified torque range. A loose screw may result in a short circuit, fire or malfunction. An excessively tightened screw may result in screw or conversion adapter damage, causing the conversion adapter to fall, a short circuit or product malfunction.
- Do not allow foreign matter such as cuttings or wiring shavings to enter the conversion adapter or module. Doing so could lead to fire, failure or malfunction.

### [Startup and Maintenance Precautions]

#### WARNING

- Do not touch the terminals during energization. Doing so could result in electric shock or malfunction.
- Be sure to shut off all phases of the external power supply before cleaning and retightening the terminal screws. Failure to do so could lead to electric shock. Excessively tightened screws could result in conversion adapter or input/output module damage, causing the conversion adapter to fall, a short circuit or product malfunction.

CAUTION	
●	Do not disassemble or modify the conversion adapter. Doing so could lead to failure, malfunction, injury or fire.
●	The conversion adapter case is made of resin. Do not drop or apply excessive impact to the case. Doing so could lead to conversion adapter damage.

### [Disposal Precautions]

CAUTION	
●	When disposing of the product, treat it as industrial waste.

### EMC AND LOW VOLTAGE DIRECTIVES

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997. Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to declare that print a "CE mark" on their products.

#### Authorized representative in Europe

Authorized representative in Europe is shown below.  
Name: Mitsubishi Electric Europe B.V.  
Address: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

## 1. Overview

This manual describes the Mitsubishi Electric Programmable Controller Upgrade Tool conversion adapter (ERNT-1CR121X221Y). The conversion adapter is a product that converts the differences in SYSMAC C series and MELSEC iQ-R series pin assignments. When replacing the SYSMAC C Series with the MELSEC iQ-R Series, be sure to refer to the Programmable Controller Module manuals to check the differences in performance, functionality, CPU input/output signals, buffer memory addresses and the like. Once you have opened the packaging, verify that it contains the following products.

Product	Shape	Quantity
Conversion adapter		1
Mounting bracket		1
Mounting bracket fixing screw (M3.5 x 6)		2
This manual	-	1

## 2. Specifications

### 2.1 General Specifications

Item	Specifications	
Operating ambient temperature	0 to 55°C (Maximum surrounding air temperature 55°C)	
Storage ambient temperature	-25 to 75°C	
Operating ambient humidity	5 to 95%RH, non-condensing	
Storage ambient humidity		
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	
	Under intermittent vibration	Frequency 5 to 8.4Hz Constant acceleration 8.4 to 150Hz 9.8m/s <sup>2</sup> Half amplitude 3.5mm
	Under continuous vibration	Frequency 5 to 8.4Hz Constant acceleration 8.4 to 150Hz 4.9m/s <sup>2</sup> Half amplitude 1.75mm
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s <sup>2</sup> , 3 times each in 3 directions X, Y, Z)	
Operating atmosphere	No corrosive gases	
Operating altitude *1	0 to 2000m	
Installation location	Inside a control panel *2	
Overvoltage category *3	II or less	
Pollution degree *4	2	

- \*1: Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.  
\*2: The enclosure is suitably designed for those specific environmental conditions, as applicable, and enclosure rate meets IP20 and minimum type 1 of UL 50.  
\*3: 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.  
\*4: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

### 2.2 Hardware Specifications

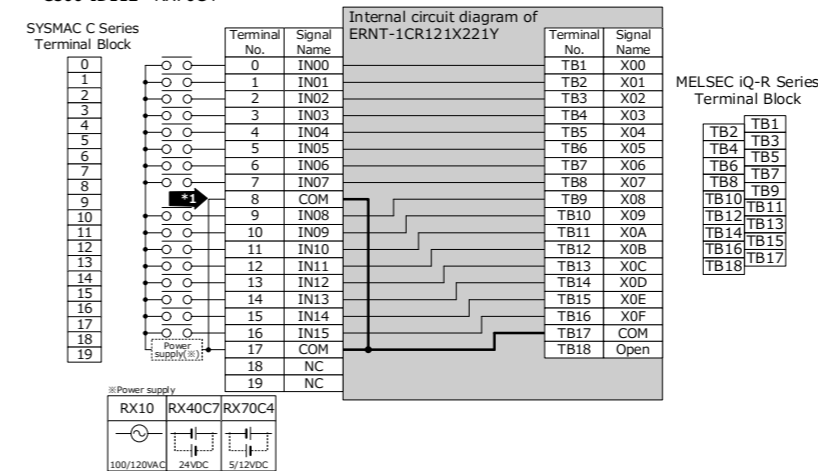
Item	Specifications
Rated voltage / current	5-24VDC/100-240VAC(+10/-15%), 2A/point, 8A/common

## 3. Conversion Adapter Product Specifications

For detail specifications which do not appear in the specification comparison charts contained herein, see the user's manual supplied with the MELSEC iQ-R Series module you use. Also, check that the specifications of the connected devices meet the specifications of the MELSEC iQ-R Series Module.

Conversion Adapter Model	SYSMAC C Series Module Model	Number of output/input points	MELSEC iQ-R Series Module Model	Conversion Adapter Weight (g)
ERNT-1CR121X221Y	C500-IA121	16 points	RX10	160
	C500-ID213 C500-IM211	16 points	RX40C7 RX70C4	
	C500-ID112	16 points	RX70C4	
	C500-OC221	16 points	RY10R2	
	C500-OA121 C500-OA222 C500-OA226	16 points	RY20S6	

- (1) With C500-IA121→RX10  
C500-ID213/C500-IM211→RX40C7 / RX70C4  
C500-ID112→RX70C4



### <Specification Comparison Chart>

Specifications	Model	SYSMAC C Series	MELSEC iQ-R Series
		C500-IA121	RX10
Number of input points		16 points	16 points
Rated input voltage		100 to 120VAC (+10%/-15%) 50/60Hz	100 to 120VAC (+10%/-15%) 50/60Hz(±3Hz)
Rated input current		10mA TYP. (100VAC)	8.2mA (100VAC, 60Hz) 6.8mA (100VAC, 50Hz)
inrush current		—	200mA maximum, within 1ms
ON voltage/ON current		60VAC or higher	80VAC or higher / 5mA or higher(50Hz, 60Hz)
OFF voltage/OFF current		20VAC or lower	30VAC or lower / 1.7mA or lower(50Hz, 60Hz)
input impedance		9.7kΩ (50Hz) 8kΩ (60Hz)	14.6kΩ (50Hz) 12.2kΩ (60Hz)
Response time	OFF to ON	35ms or less	15ms or less (100VAC 50Hz, 60Hz)
	ON to OFF	55ms or less	20ms or less (100VAC 50Hz, 60Hz)
Internal current consumption		180mA or lower	110mA (TYP. All points ON)
Wiring method for common		8 points/common (2 circuits)	16 points/common
External connection system		20-point terminal block	18-point terminal block

Make sure the section of the above table meets the specification of the machines and equipment connected to the MELSEC iQ-R Series module.

### Precautions for wiring

- \*1 A wiring change is required if the SYSMAC C series terminal numbers 8, 17 have been separated due to a change in the number of points per common from 8 points (2 circuits) to 16 points.

Specifications	Model	SYSMAC C Series		MELSEC iQ-R Series	
		C500-ID213 (Sink Type)	C500-IM211 (AC/DC)	RX40C7 (Positive/Negative Common Shared Type)	RX70C4 (Positive/Negative Common Shared Type)
Number of input points		16 points	16 points	16 points	16 points
Rated input voltage *1		12 to 24VDC (+10%/-15%)	12 to 24VAC/DC (+10%/-15%, 50/60Hz)	24VDC(20.4 to 28.8VDC)	5VDC(4.25 to 6VDC) 12VDC(10.2 to 14.4VDC)
Rated input current		10mA TYP. (24VDC)	10mA TYP. (24VDC)	7.0mA TYP. (24VDC)	1.7mA TYP. (5VDC) 4.8mA TYP. (12VDC)
ON voltage/ON current		10.2V or higher	10.2V or higher	15V or higher/4mA or higher	3.5V or higher/1mA or higher
OFF voltage/OFF current		3.0V or lower	3.0V or lower	8V or lower /2mA or lower	1V or lower/0.1mA or lower
Input resistance		2.2kΩ	1.8kΩ	3.3kΩ	2.3kΩ
Response time	OFF to ON	1.5ms or less	15ms or less	0.1/0.2/0.4/0.6/1/5/10/20/70ms or less	0.2/0.3/0.4/0.5/1/5/10/20/70ms or less
	ON to OFF	1.5ms or less	15ms or less	0.35/0.4/0.5/0.7/1/5/10/20/70ms or less	0.41/0.5/0.6/0.7/1/5/10/20/70ms or less
Internal current consumption		20mA or lower	10mA or lower	110mA (TYP. All points ON)	100mA (TYP. All points ON)
Wiring method for common		8 points/common (2 circuits)	8 points/common (2 circuits)	16 points/common	16 points/common
External connection system		20-point Terminal block	20-point Terminal block	18-point Terminal block	18-point Terminal block

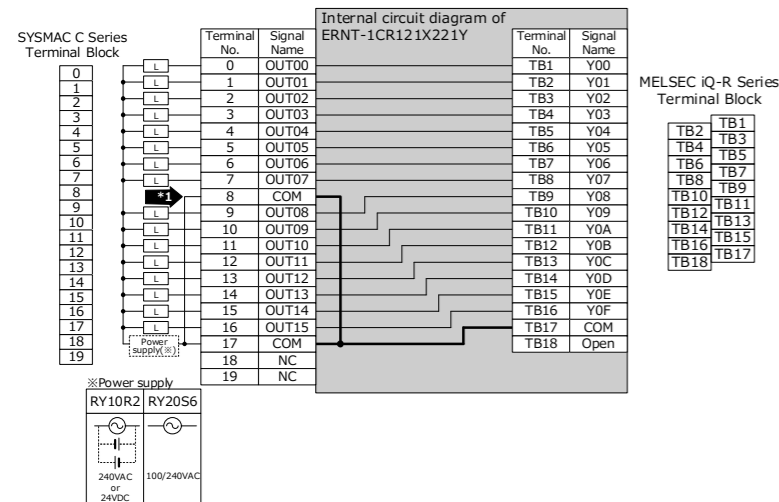
Make sure the section of the above table meets the specification of the machines and equipment connected to the MELSEC iQ-R Series module.

- \*1: When the SYSMAC C Series Module uses the rated input voltage of 12VAC or 24VAC, the voltage must be changed to 12VDC or 24VDC.

Specifications	Model	SYSMAC C Series	MELSEC iQ-R Series
		C500-ID112 (Sink Type)	RX70C4 (Positive/Negative Common Shared Type)
Number of input points		16 points	16 points
Rated input voltage		5 to 12VDC (+10%/-15%)	5VDC(4.25 to 6VDC) 12VDC(10.2 to 14.4VDC)
Rated input current		16mA TYP. (12VDC)	1.7mA TYP. (5VDC) 4.8mA TYP. (12VDC)
ON voltage/ON current		4.0V or higher	3.5V or higher/1mA or higher
OFF voltage/OFF current		1.5V or lower	1V or lower/0.1mA or lower
Input resistance		560Ω	2.3kΩ
Response time	OFF to ON	1.5ms or less	0.2/0.3/0.4/0.5/1/5/10/20/70ms or less
	ON to OFF	1.5ms or less	0.41/0.5/0.6/0.7/1/5/10/20/70ms or less
Internal current consumption		10mA or lower	100mA (TYP. All points ON)
Wiring method for common		8 points/common (2 circuits)	16 points/common
External connection system		20-point Terminal block	18-point Terminal block

Make sure the section of the above table meets the specification of the machines and equipment connected to the MELSEC iQ-R Series module.

(2) With C500-OC221→RY10R2  
C500-OA121/C500-OA222/C500-OA226→RY20S6



<Specification Comparison Chart>

Model	SYSMAC C Series	MELSEC iQ-R Series
Specifications	C500-OC221	RY10R2
Number of output points	16 points	16 points
Rated switching voltage, current	250VAC 2A/point(COSφ=1) 250VAC 0.5A/point(COSφ=0.4) 24VDC 2A/point 8A/common 16A/module	240VAC 2A/point(COSφ=1) 24VDC 2A/point(resistance load) 8A/common
Minimum switching load	5VDC 10mA	5VDC 1mA
Maximum switching voltage	-	264VAC 125VDC
Response time	OFF to ON ON to OFF	15ms or less 10ms or less
Surge killer	None	None
Fuse	None	None
Internal current consumption	100mA or lower	450mA (TYP. All points ON)
Wiring method for common	8 points/common 2 circuit	16 points/common
External connection system	20-point terminal block	18-point terminal block

Make sure the [ ] section of the above table meets the specification of the machines and equipment connected to the MELSEC iQ-R Series module.

**Precautions for wiring**

\*1 A wiring change is required if the SYSMAC C series terminal numbers 8, 17 have been separated due to a change in the number of points per common from 8 points (2 circuits) to 16 points.

Specifications	Model	SYSMAC C Series			MELSEC iQ-R Series
		C500-OA121(Triac output)	C500-OA222(Triac output)	C500-OA226(Triac output)	RY20S6(Triac output)
Number of output points		16 points	16 points	16 points	16 points
Rated load voltage		132VAC 50/60Hz	250VAC 50/60Hz	250VAC 50/60Hz	100 to 240VAC 50/60Hz
Maximum load current		1A/point 4A/common 5A/module	1A/point 4A/common 5A/module	1.2A/point 4A/common 5A/module	0.6A/point 4.8A/common
Minimum load voltage/current		10VAC 10mA(resistance load) 40mA(inductive load)	10VAC 10mA(resistance load) 40mA(inductive load)	10VAC 100mA 24VAC 50mA 100VAC 10mA 240VAC 10mA	24VAC 100mA 100VAC 25mA 240VAC 25mA
Maximum inrush current		-	-	-	20A 1 cycles or lower
OFF leakage current		3mA(100VAC) or lower	3mA(100VAC) or lower 6mA(200VAC) or lower	1.5mA(120VAC 60Hz) or lower 3.0mA(240VAC 60Hz) or lower	1.5mA or lower (120V 60Hz) 3mA or lower (240V 60Hz)
Maximum voltage drop at power-ON		1.2V or lower	1.2V or lower	1.5VAC or lower (100 to 600mA) 1.5VAC or lower (50 to 100mA) 5.0VAC or lower (10 to 50mA)	1.5V or lower (at load current of 0.6A)
Response time	OFF to ON ON to OFF	1ms or less 1/2 of load frequency or less	1ms or less 1/2 of load frequency or less	1ms or less 1/2 of load frequency or less + 1ms or less	1ms+0.5 cycles or less 1ms+0.5 cycles or less (rated load and resistance load)
Surge killer		None	None	None	CR absorber
Fuse		250V 5A/common(two fuses)	250V 5A/common(two fuses)	250V 5A/common(two fuses)	None (It is recommended that a fuse be installed on the external wiring)
Internal current consumption		300mA or lower	300mA or lower	450mA or lower	280mA (TYP. All points ON)
Wiring method for common		8 points/common (2 circuits)	8 points/common (2 circuits)	8 points/common (2 circuits)	16 points/common
External connection system		20-point terminal block	20-point terminal block	20-point terminal block	18-point terminal block

Make sure the [ ] section of the above table meets the specification of the machines and equipment connected to the MELSEC iQ-R Series module.

**4. Products Required by the Conversion Adapter**

(1) Conversion Adapter Anchor Base (Sold Separately)

The conversion adapter anchor base secures the bottom of the conversion adapter and is required for conversion adapter use. One anchor base is required per base.

Conversion Adapter Anchor Base Model	Specifications	
	Type	Weight (g)
ERNT-1CR12F	12-slot conversion adapter anchor base	785
ERNT-1CR8F	8-slot conversion adapter anchor base	545
ERNT-1AR5F	5-slot conversion adapter anchor base	365

(2) Base Adapter (Sold Separately)

The base adapter enables MELSEC iQ-R series installation using the installation holes of the SYSMAC C series base unit. (Additional hole machining not required)

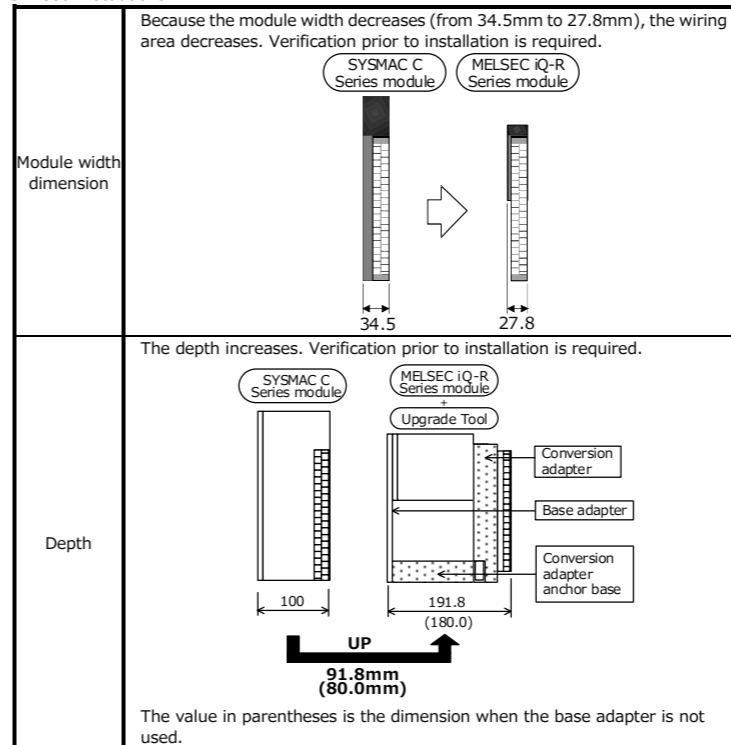
Base Adapter Model	Specifications			
	SYSMAC C Series Compliant Module	MELSEC iQ-R Series Compliant Module	Conversion Adapter Anchor Base	Weight (g)
ERNT-CQB081N	C500-BC081/082 C500-BC091 C2000-BC061	R312B R38B	ERNT-1CR12F ERNT-1CR8F	892
	C500-BI081 C2000-BI083	R612B R68B	ERNT-1CR12F ERNT-1CR8F	
	C500-BC051/052 C500-BC061	R38B R35B	ERNT-1CR8F ERNT-1AR5F	
ERNT-CQB051N	C500-BC051/052 C500-BC061	R38B R35B	ERNT-1CR8F ERNT-1AR5F	710
	C500-BI051	R68B	ERNT-1CR8F ERNT-1AR5F	
	C500-BC031	R65B R35B	ERNT-1AR5F ERNT-1AR5F	

**5. Mounting and Installation**

5.1 Handling Precautions

- Do not touch the terminals during energization. Doing so could result in electric shock or malfunction.
- Do not disassemble or modify the conversion adapter. Doing so could result in failure, malfunction, injury or fire.
- Do not come in direct contact with the conductive area of the conversion adapter. Doing so could result in system malfunction or failure.
- Fully secure the conversion adapter and conversion adapter anchor base using the installation screws, and securely tighten the screws within the specified torque range. Failure to do so could cause the conversion adapter and anchor base to fall, resulting in conversion adapter and conversion adapter anchor base damage.
- Conversion Adapter is intended for indoor use only.

5.2 Use Precautions



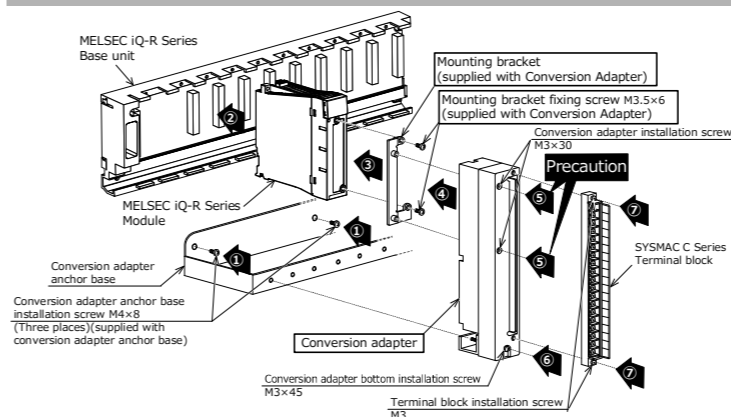
5.3 Installation Environment

Refer to "Safety Guidelines" for MELSEC iQ-R Series Modules.

5.4 Wiring module power source

External connection to 24VDC power supply circuit of Conversion Adapter must be powered from approved source that meets of SELV/PELV, Class 2, and limited energy according to UL 61010-2-201.

**6. Part Names and Installation Method**



6.1 Installation Method

- Secure the conversion adapter anchor base to the base adapter or control panel using the conversion adapter anchor base installation screws (M4 x 8; 2 locations at both sides, 1 location at the center) provided as an accessory.
- Mount the MELSEC iQ-R Series module to the MELSEC iQ-R Series Base Unit. In addition, remove the terminal block attached with the MELSEC iQ-R Series module after loosening the terminal block installation screws (2 places up and down).
- Secure the mounting bracket to the Programmable Controller Module using the mounting bracket fixing screws (M3.5 x 6; 2 upper/lower locations).
- Mount the conversion adapter onto the mounting bracket.
- Secure the conversion adapter using the conversion adapter installation screws (M3 x 30; 2 locations).

**Precaution**

Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the Programmable Controller Module. Tightening the screws in floating-off state or tilting state will damage the Conversion Adapter installation screws and the mounting bracket.

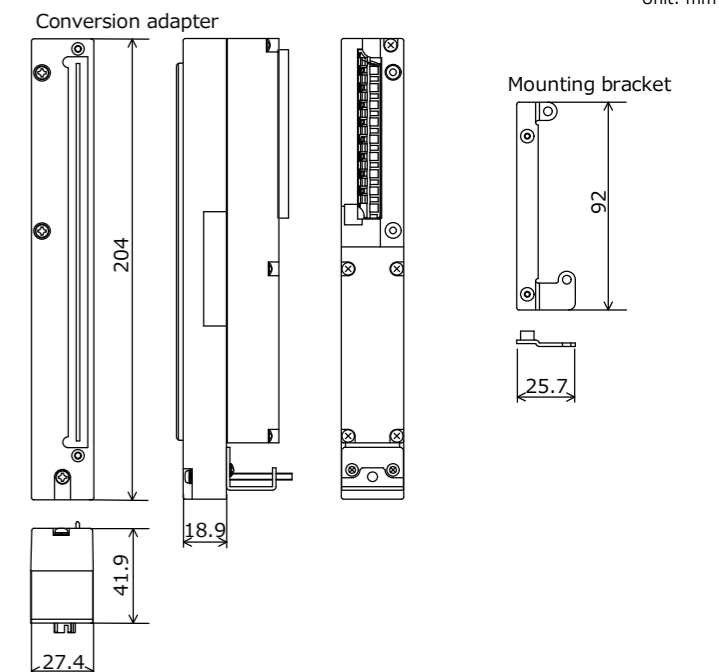
- Secure the conversion adapter using the conversion adapter bottom installation screw (M3 x 45; 1 location).
- Secure the SYSMAC C series terminal block to the conversion adapter using the terminal block installation screws (M3; two upper/lower locations).

6.2 Tightening Torque

Tighten the module installation screws to the specified torque below. An inappropriate tightening torque could cause the product to fall or result in a short circuit, product failure or malfunction.

Screw Location	Tightening Torque Range
Conversion adapter anchor base installation screw (M4x8)	1.39 to 1.89 N·m
Mounting bracket fixing screw (M3.5x6)	0.68 to 0.92 N·m
Conversion adapter installation screw (M3x30)	0.43 to 0.57 N·m
Conversion adapter bottom installation screw (M3x45)	
SYSMAC C series terminal block installation screw (M3)	

**7. External Dimensions**



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**Product Warranty Details**

Please confirm the following product warranty details prior to product use.

**Gratis Warranty Terms and Gratis Warranty Range**

If any fault or defect (hereinafter referred to as "Failure") attributable to Mitsubishi Electric Engineering Company Limited (hereinafter referred to as "MEE") should occur within the gratis warranty period, MEE shall repair the product free of charge via the distributor from whom you made your purchase.

**Gratis Warranty Period**

The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place. Note that after manufacture and shipment from MEE, the maximum distribution period shall be six (6) months, and the gratis warranty period after manufacturing shall be limited to eighteen (18) months. In addition, the gratis warranty period for repaired products shall not exceed the gratis warranty period established prior to repair.

**Gratis Warranty Range**

The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

**Warranty Period after Discontinuation of Production**

- MEE shall offer product repair services (fee applied) for seven (7) years after production of the product has been discontinued. Discontinuation of production shall be reported via distributors.
- Product supply (including spare parts) is not possible after production has been discontinued.

**Exclusion of Opportunity Loss and Secondary Loss from Warranty Liability**

Regardless of the gratis warranty period, MEE shall not be liable for compensation for damages arising from causes not attributable to MEE, opportunity losses or lost profits incurred by the user due to Failures of MEE products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by MEE, compensation for accidents, compensation for damages to products other than MEE products, or compensation for other work carried out by the user.

**Changes in Product Specifications**

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

This document is a new publication, effective November 2018. Specifications are subject to change without notice.