Mitsubishi Electric Programmable Controller
Upgrade Tool

Conversion Adapter

Model
ERNT-1AR38TB

User's Manual

50CM-D180419-A(1811)

● 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 making a switch to the MELSEC iQ-R Series, be sure to consult user's manual supplied with individual module under the MELSEC iQ-R Series to confirm differences in various aspects including performance, function, CPU input/output signals between the two modules.

[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 conversion adapter 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.
● After installation and wiring, close the terminal block cover before turning on the module for operation. Failure to do so may 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.
● Tighten the terminal installation screws and terminal screw securely by applying torque within the specified limits. Loose screws will cause short circuit, fire or malfunction. Excessive tightening will damage the screws or the Conversion Adapter which in turn will cause dropping of parts, short circuit or 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.

⚠ WARNING
● 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-1AR38TB).
Before attempting to make a switch to MELSEC iQ-R Series in your installation, consult the user's manual supplied with individual module under the latter series to learn about how they differ in various aspects including performance and function.
Once you have opened the packaging, verify that it contains the following products.

Product	Shape	Qty	Product	Shape	Qty
Conversion adapter Mounting bracket		1	Mounting bracket fixing screw (M2.6x4)		2
Mounting bracket		1	Terminal block		1
			This manual	–	1

2. Specifications

2.1 General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55℃ (Maximum surrounding air temperature 55℃)				
Storage ambient temperature	-25 to 75℃				
Operating ambient humidity	5 to 95%RH, non-condensing				
Storage ambient humidity					
			Frequency	Constant acceleration	Half amplitude	Sweep count
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	5 to 8.4Hz	–	3.5mm	10 times each in X, Y, Z directions
			8.4 to 150Hz	9.8m/s²	–	
		Under continuous vibration	5 to 8.4Hz	–	1.75mm	–
			8.4 to 150Hz	4.9m/s²	–	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s², 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.

3. Conversion Adapter Product Specifications

For the details of specifications of the MELSEC iQ-R series modules not described herein, refer to the user's manual of the applicable MELSEC iQ-R series module. Also, check that the specifications of the connected devices meet the specifications of the MELSEC iQ-R series module.
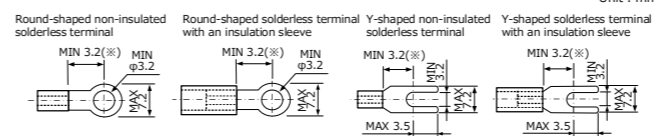
(1) MELSEC iQ-R Series module

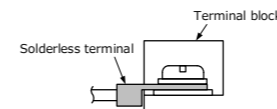The conversion adapter can be used in combination with the following MELSEC iQ-R series modules.

Input / Output	MELSEC iQ-R Series module model			
Input	RX41C4	RX41C6HS	RX61C6HS	RX71C4
Output	RY41NT2P	RY41PT1P	RY41NT2H	RY41PT2H

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(2) Specifications of the terminal block (conversion adapter accessory)

● Applicable solderless terminal

Unit : mm

Round-shaped non-insulated solderless terminal / Round-shaped solderless terminal with an insulation sleeve / Y-shaped non-insulated solderless terminal / Y-shaped solderless terminal with an insulation sleeve
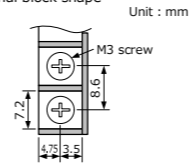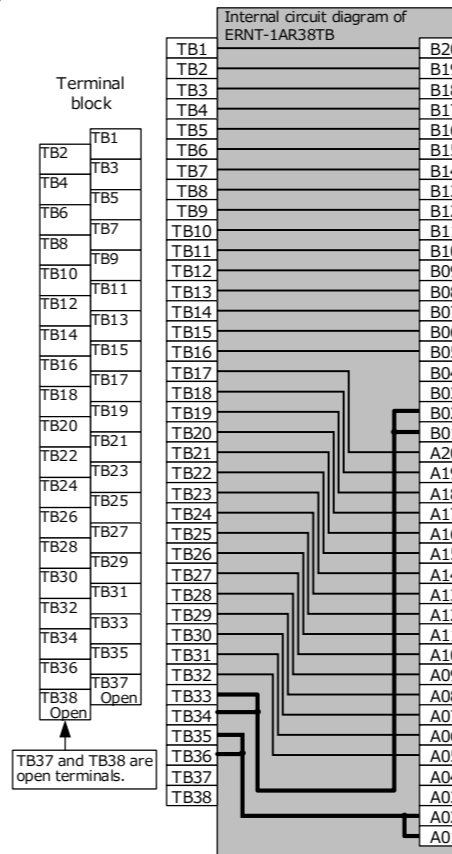
※The minimum length is 4.75 when the solderless terminal is attached up side down as shown below.

● Terminal block shape   Unit : mm

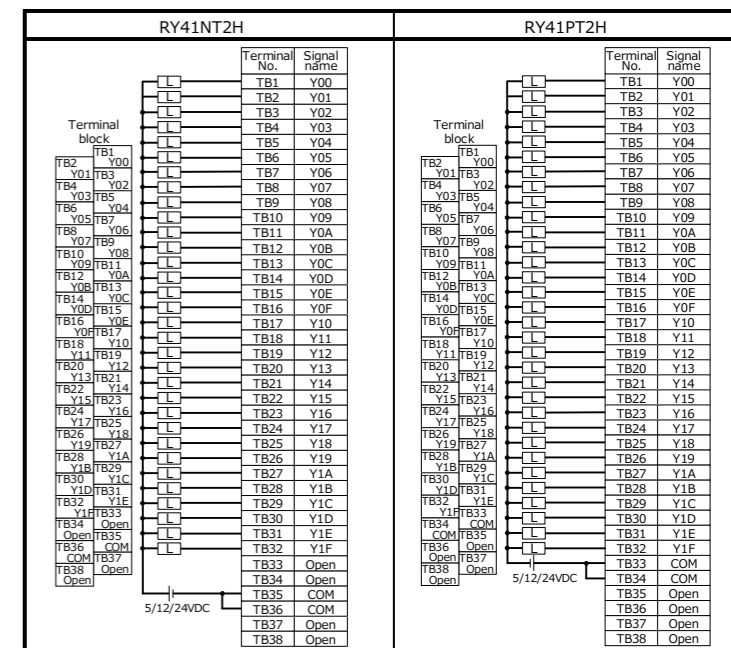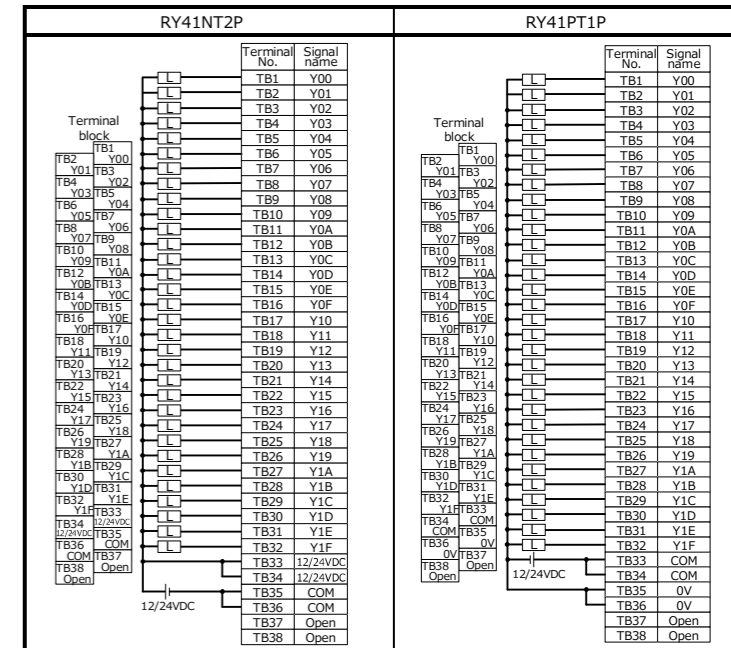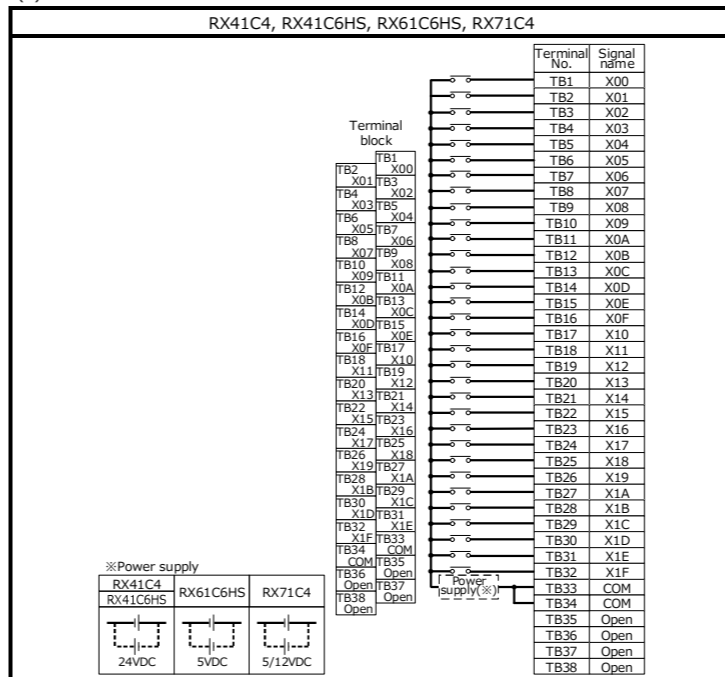### (3) Internal connection

Internal circuit diagram of ERNT-1AR38TB

TB37 and TB38 are open terminals.

MELSEC iQ-R Series module

(4) External connection

RX41C4, RX41C6HS, RX61C6HS, RX71C4

RY41NT2P

RY41PT1P

RY41NT2H

RY41PT2H

(5) MELSEC iQ-R Series module specification

① Input module

Specification \ Model	RX41C4 (Positive/Negative Common Shared Type)	RX41C6HS (Positive/Negative Common Shared Type)	RX61C6HS (Positive/Negative Common Shared Type)	RX71C4 (Positive/Negative Common Shared Type)
Number of input points	32 points	32 points	32 points	32 points
Rated input voltage	24VDC (20.4 to 28.8VDC)	24VDC (20.4 to 28.8VDC)	5VDC (4.25 to 6VDC)	5VDC (4.25 to 6VDC) 12VDC (10.2 to 14.4VDC)
Rated input current	4.0mA TYP. (at 24VDC)	6.0mA TYP. (at 24VDC)	6.0mA TYP. (at 5VDC)	1.7mA TYP. (5VDC) 4.8mA TYP. (12VDC)
ON voltage/ON current	19V or higher/3mA or higher	19V or higher/4mA or higher	3.5V or higher/3mA or higher	3.5V or higher/1mA or higher
OFF voltage/OFF current	6V or lower/1.0mA or lower	6V or lower/1.7mA or lower	1V or lower/1mA or lower	1V or lower/0.1mA or lower
Input impedance	5.3kΩ	4kΩ	600Ω	2.3kΩ
Response time OFF to ON	0.1/0.2/0.4/0.6/ 1/5/10/20/70ms or less	1/10/20/50μs 0.1/0.2/0.4/0.6/ 1/5/10/20/70ms or less	1/10/20/50μs 0.1/0.2/0.4/0.6/ 1/5/10/20/70ms or less	0.2/0.3/0.5/0.6/ 1/5/10/20/70ms or less
Response time ON to OFF	0.2/0.3/0.5/0.7/ 1/5/10/20/70ms or less	1/10/20/50μs 0.1/0.2/0.4/0.6/ 1/5/10/20/70ms or less	1/10/20/50μs 0.1/0.2/0.4/0.6/ 1/5/10/20/70ms or less	0.21/0.3/0.5/0.6/ 1/5/10/20/70ms or less
Internal current consumption (5VDC)	150mA(TYP. All points ON)	150mA(TYP. All points ON)	150mA (TYP. All points ON)	140mA (TYP. All points ON)
Wiring method for common	32 points/common	32 points/common	32 points/common	32 points/common

② Output module

Specification \ Model	RY41NT2P (Sink type)	RY41PT1P (Source type)	RY41NT2H (Sink type)	RY41PT2H (Source type)
Number of output points	32 points	32 points	32 points	32 points
Rated load voltage	12/24VDC (10.2 to 28.8VDC)	12/24VDC (10.2 to 28.8VDC)	5/12/24VDC (4.25 to 28.8VDC)	5/12/24VDC (4.25 to 28.8VDC)
Maximum load current	0.2A/point, Pilot Duty, 2A/common	0.1A/point, Pilot Duty, 2A/common	0.2A/point, 2A/common	0.2A/point, 2A/common
Maximum load current	Current is to be limited by the overload protection function.	Current is to be limited by the overload protection function.	0.7A 10ms or less	0.7A 10ms or less
OFF leakage current	0.1mA or lower	0.1mA or lower	0.1mA or lower	0.1mA or lower
Maximum voltage drop at power-ON	0.2VDC (TYP.) 0.2A, 0.3VDC (MAX.) 0.2A	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	0.1VDC (TYP.) 0.2A, 0.2VDC (MAX.) 0.2A	0.1VDC (TYP.) 0.2A, 0.2VDC (MAX.) 0.2A
Response time OFF to ON	0.5ms or less	0.5ms or less	1μs or less	1μs or less
Response time ON to OFF	1ms or less (rated load and resistance load)	1ms or less (rated load and resistance load)	2μs or less (rated load and resistance load)	2μs or less (rated load and resistance load)
Surge killer	Zener diode	Zener diode	Zener diode	Zener diode
Fuse	None	None	None	None
Internal current consumption (5VDC)	180mA(TYP. All points ON)	190mA(TYP. All points ON)	420mA(TYP. All points ON)	410mA(TYP. All points ON)
Wiring method for common	32 points/common	32 points/common	32 points/common	32 points/common

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. One anchor base is required per base unit.

Conversion Adapter Anchor Base Model	Specification Type	Weight(g)
ERNT-1AR12F	12-slot conversion adapter anchor base	775
ERNT-1AR8F	8-slot conversion adapter anchor base	540
ERNT-1AR5F	5-slot conversion adapter anchor base	360

(2) Base Adapter (Sold Separately)
Both the MELSEC iQ-R series base unit and the conversion adapter anchor base can be installed on the base adapter without drilling screw holes.
However, drilling screw holes (M5 screws) is required to install the base adapter to the panel surface.
For the base unit models marked with *1 to *3, two or more base adapter models are applicable. Select the most suitable base adapter according to the product dimensions.
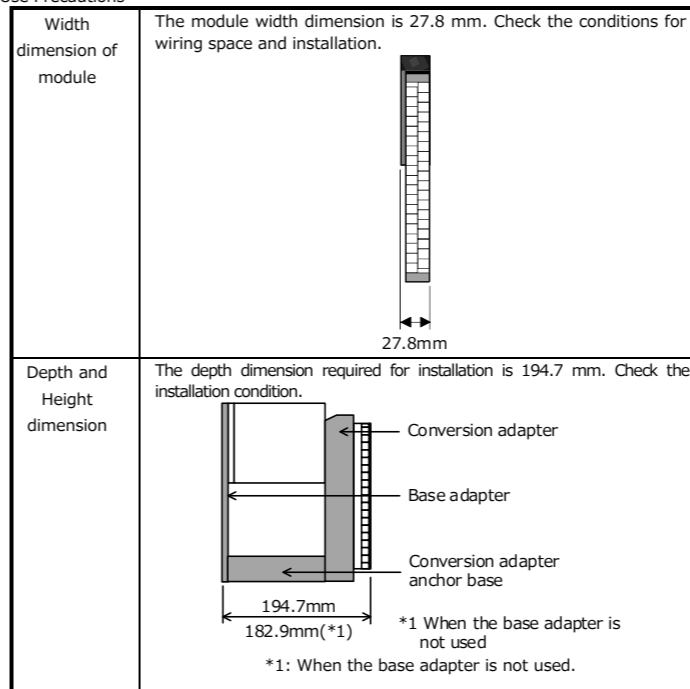
Base adapter Model	Installable MELSEC iQ-R Series Base Unit 12 slots	8 slots	5 slots	Conversion Adapter Anchor Base	Product dimensions Width×Height (mm)	Weight (g)
ERNT-AQB38N	R312B	R38B(*1)		ERNT-1AR12F ERNT-1AR8F	480×240	970
ERNT-AQB35N		R38B(*1)	R35B	ERNT-1AR8F ERNT-1AR5F	382×240	795
ERNT-AQB68N	R612B	R68B(*2)		ERNT-1AR12F ERNT-1AR8F	466×240	930
ERNT-AQB65N		R68B(*2)	R65B(*3)	ERNT-1AR8F ERNT-1AR5F	352×240	790
ERNT-AQB58N		R68B(*2)		ERNT-1AR8F	411×240	870
ERNT-AQB55N			R65B(*3)	ERNT-1AR5F	297×240	655

5. Mounting and Installation

5.1 Handling Precautions
(1) Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
(2) Do not touch live terminals. There is a danger of electric shock or malfunction.
(3) Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
(4) Do not touch the energized part of the Conversion Adapter directly. Contact will cause malfunction or failure in the system.
(5) 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.
(6) Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC iQ-R Series Module. These will be cause for fire, failure or malfunction.
(7) Do not drop the Conversion Adapter or do not give a strong impact to it. This will cause damage.
(8) Conversion Adapter is intended for indoor use only.

5.2 Use Precautions

Width dimension of module	The module width dimension is 27.8 mm. Check the conditions for wiring space and installation. 27.8mm
Depth and Height dimension	The depth dimension required for installation is 194.7 mm. Check the installation condition. Conversion adapter / Base adapter / Conversion adapter anchor base 194.7mm 182.9mm(*1) *1 When the base adapter is not used *1: When the base adapter is not used.

5.3 Installation Environment
Refer to "Safety Guidelines" for iQ-R Series Modules.

6. Part Names and Installation Method
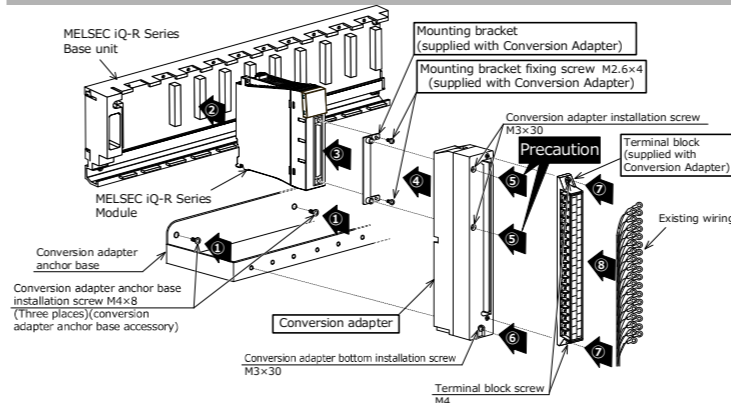
6.1 Installation Method
[1] Secure the conversion adapter anchor base to the base adapter or control panel using the conversion adapter anchor base installation screws (M4 x 8; 2 locations at both sides, 1 location at the center) provided as an accessory.
[2] Mount the MELSEC iQ-R Series module to the MELSEC iQ-R Series Base Unit.
[3] Secure the mounting bracket to the Programmable Controller Module using the mounting bracket fixing screws (M2.6 × 4; 2 upper/lower locations).
[4] Mount the conversion adapter onto the mounting bracket.
[5] 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.

[6] Secure the conversion adapter using the conversion adapter bottom installation screw (M3 x 30; 1 location).
[7] Secure the terminal block to the conversion adapter using the terminal block installation screws (M4; two upper/lower locations).
[8] Connect the existing wiring to the terminal block. When any wires are left unconnected, connect them to open terminals or insulate them.

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 (M4 screw)	1.39 to 1.89 N·m
Mounting bracket fixing screw (M2.6 screw)	0.20 to 0.29 N·m
Conversion adapter bottom installation screw (M3 screw)	0.43 to 0.57 N·m
Conversion adapter installation screw (M3 screw)	
Terminal block installation screw(M4 screw)	1.02 to 1.38 N·m
Terminal block screw (M3 screw)	0.43 to 0.57 N·m

7. External Dimensions
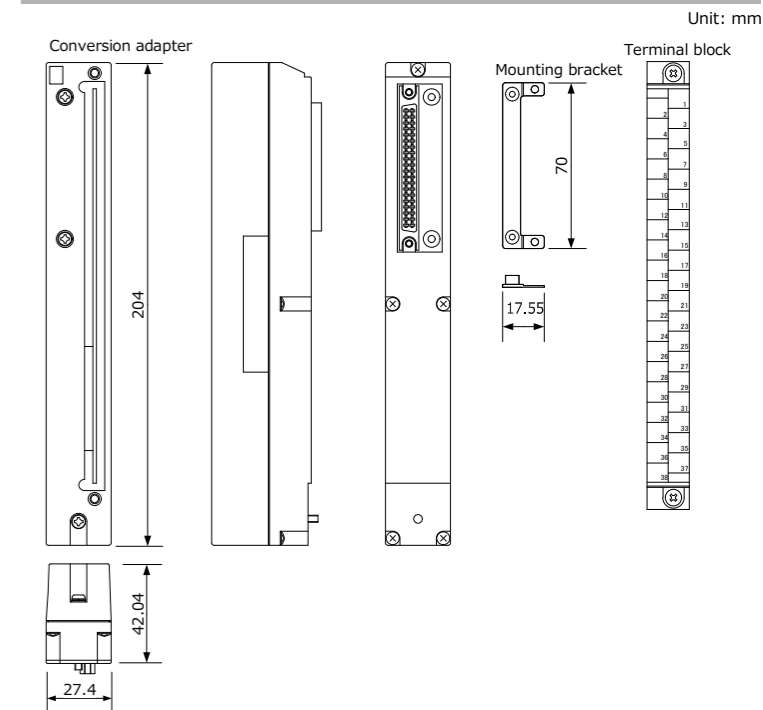
Unit: mm

Weight: 255g

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

(1) 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.
(2) 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.