

Mitsubishi Electric Programmable Controller

Upgrade Tool

Conversion Adapter

Model
ERNT-2AR62DD

User's Manual



50CM-D180353-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 MELSEC-AnS 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 MELSEC-AnS 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 MELSEC-AnS 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-2AR62DD). The conversion adapter is a product that converts the differences in MELSEC-AnS series and MELSEC iQ-R series pin assignments.

When replacing the MELSEC-AnS 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	Product	Shape	Quantity
Conversion adapter		1	Terminal block cover		1
Mounting bracket		1	Short bar (spare parts)		1
Mounting bracket fixing screw (M2.6x4)		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: 5 to 8.4Hz, 9.8m/s ² , 3.5mm, 10 times each in X, Y, Z directions Under continuous vibration: 5 to 8.4Hz, 4.9m/s ² , 1.75mm, -
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s ² , 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.

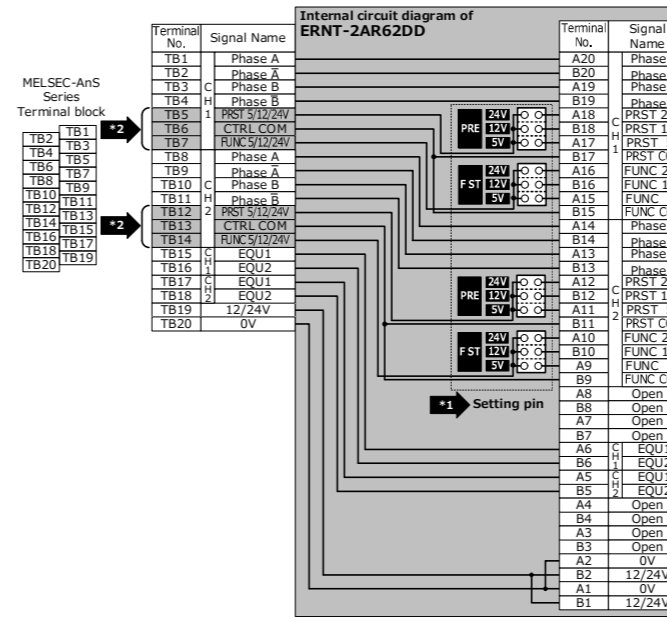
2.2 Hardware Specifications

Item	Specifications
Rated voltage / current	5-24VDC(+25%/-50%), 0.5A/Point, 2A/Common

3. Product Specifications

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

Conversion Adapter Model	MELSEC-AnS Series Model	No of channels	MELSEC iQ-R Series Model	Conversion Adapter Weight (g)
ERNT-2AR62DD	A1SD62D	2 channels	RD62D2	90

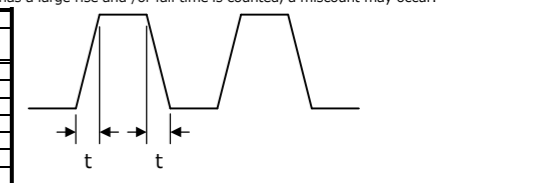


Specification comparison

Specification	MELSEC-AnS Series		MELSEC iQ-R Series									
	A1SD62D		RD62D2									
Counting speed switch settings	Switch with the setting pins		Switch with the basic setting of an engineering tool									
	200k	10k	In multiple of 1	—	—	2Mpps (1M to 2Mpps)	1Mpps (500k to 1Mpps)	500kpps (200k to 500kpps)	200kpps (100k to 200kpps)	100kpps (10k to 100kpps)	10kpps (10kpps or less)	
			In multiple of 2	—	—	4Mpps(2M to 4Mpps)	—	—	—	—	—	
Number of channels	1-phase input		2 channels									
	2-phase input		1-phase input (multiple of 1/ multiples of 2), 2-phase input (multiple of 1/multiples of 2/multiples of 4), CW/CCW input									
Signal level (µA,µB)	EIA Standard RS-422-A		Differential type line driver level (AM26LS31 (manufactured by Texas Instruments) or equivalent)									
	Counting speed (max)	200kPPS	10kPPS	*1	8Mpps	4Mpps	2Mpps	1Mpps	500kpps	200kpps	100kpps	10kpps
Counting range	24-bit binary (0 to 16777215)		32-bit signed binary (-2147483648 to 2147483647)									
Counter	Minimum count pulse width (Duty ratio 50%)	UP/DOWN Preset counter + Ring counter function										
		1-phase input mode	Waveform(in up count, Duty ratio: 50%)	Minimum count pulse cycle, T, and phase difference, t (µs), at each counting speed								
		1-phase multiple of 1		—	—	T=0.5	T=1	T=2	T=5	T=10	T=100	
		1-phase multiple of 2		—	T=0.5	T=1	T=2	T=4	T=10	T=20	T=200	
		CW /CCW		—	—	T=0.5	T=1	T=2	T=5	T=10	T=100	
		2-phase multiple of 1		—	—	T=0.5	T=1	T=2	T=5	T=10	T=100	
		2-phase multiple of 2		—	T=0.5	T=1	T=2	T=4	T=10	T=20	T=50	
		2-phase multiple of 4		T=0.5	T=1	T=2	T=4	T=8	T=20	T=40	T=100	
Coincidence output	Comparison range	24-bit binary		32-bit signed binary								
External input	Comparison result	Set value < Count value, Set value = Count value, Set value > Count value										
External output	Function start	5/12/24VDC 2 to 5mA		5/12/24VDC 7 to 10mA (EIA Standard RS-422-A Differential Line Driver can be connected)								
I/O occupied points	Coincidence output	32 points		Transistor (sink type) output 2points/channel 12/24VDC 0.5A/point 2A/common								
Wiring connection system		20 point terminal block		16 points								
Internal current consumption(SVDC)		0.25A		40-pin connector 0.17A								

*1: Counting speed is affected by pulse rise and fall time. Possible counting speeds are shown in the following table. Note that if a pulse that has a large rise and/or fall time is counted, a miscount may occur.

Rise/fall time	Both 1-phase and 2-phase input						
	8Mpps/4Mpps/2Mpps	1Mpps	500kpps	200kpps	100kpps	10kpps	10kpps
t = 0.125µs or less	2Mpps	1Mpps	500kpps	200kpps	100kpps	10kpps	10kpps
t = 0.25µs or less	1Mpps	1Mpps	500kpps	200kpps	100kpps	10kpps	10kpps
t = 0.5µs or less	—	500kpps	500kpps	200kpps	100kpps	10kpps	10kpps
t = 1.25µs or less	—	—	200kpps	200kpps	100kpps	10kpps	10kpps
t = 2.5µs or less	—	—	—	100kpps	100kpps	10kpps	10kpps
t = 25µs or less	—	—	—	—	10kpps	10kpps	10kpps
t = 500µs or less	—	—	—	—	—	500pps	—



Precautions for wiring

*1 Set the pins of each signal (PRE, F ST) according to the input voltage.
The default input voltage for all signals is 24V (24V side).
24V Input: set to 24V side
12V Input: set to 12V side
5V Input: set to 5V side
Inputting a voltage higher than the one set using the setting pins may cause a failure in the MELSEC iQ-R Series module.

*2 In the case of use, it is necessary to change the CTRL COM terminal (TB6, TB13) of the A1SD62D terminal block in negative common by a sink load type.

Precautions for programming

- (1) A1SD62D and RD62D2 differ from each other in the way input/output signals (X, Y) and buffer memory addresses are allocated. Therefore, you need make necessary changes to the sequence program that is used.
- (2) The counting speed setting which is switched with the setting pin for the A1SD62D is switched using the parameter setting (basic setting) of an engineering tool for the RD62D2.

4. Mounting and Installation

4.1 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 Adaptor directly. Contact will cause malfunction or failure in the system.
- (5) The protective wrap is used to protect your hands from touching the conductive part in the pin-setting process. Peel it off after finishing the settings. In addition, make sure to peel it off before installing a MELSEC-AnS Series terminal block.
- (6) Fasten the Conversion Adapter and the Mounting bracket securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter, or Mounting bracket, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Converter Adapter, Mounting bracket or MELSEC iQ-R Series Module, possibly causing the dropping, shorting, and malfunction thereof.
- (7) 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.
- (8) Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause damage.
- (9) Conversion Adapter is intended for indoor use only.

4.2 Use Precautions

Item	Use Precautions
Width dimension of module	<p>Because the module is reduced in width dimension (34.5mm→27.8mm) and thus in area available for wiring, check dimensional data before installing the module.</p> <p><MELSEC-AnS Series> <MELSEC iQ-R Series></p>
Depth and Height dimension	<p>Installation with the Base Adapter</p> <p>Because the module is increased in depth dimension, check dimensional data before installing the module.</p> <p>Installation with the DIN rail</p> <p>Because the module is increased in depth and height dimension, check dimensional data before installing the module.</p>
Terminal block cover	<p>The terminal block cover for MELSEC-AnS Series is bigger than the width of the MELSEC iQ-R Series Module. Therefore, it is necessary to replace it with the terminal block cover supplied with the converter adapter.</p> <p><MELSEC-AnS Series> <MELSEC iQ-R Series></p>

4.3 Installation Environment

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

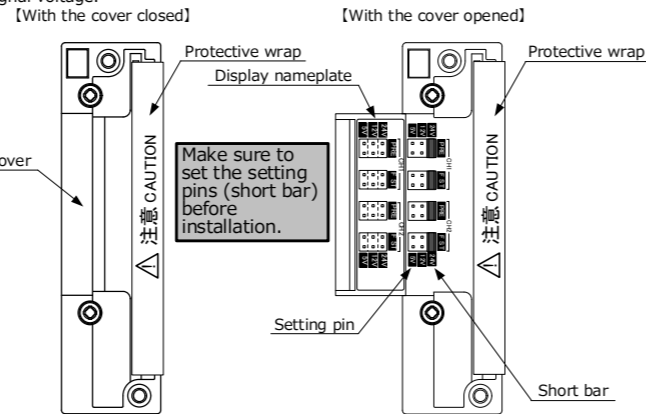
4.4 Wiring module power source

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.

5. Preparation before Installation

5.1 Position of the setting pins

Open the cover of the Conversion Adapter, and you will find the setting pins to switch the input signal voltage.



Setting pin	Description	Factory setting	
CH1	PRE	Set the input voltage for Preset input of CH1.	24V
	F ST	Set the input voltage for Function start input of CH1.	
CH2	PRE	Set the input voltage for Preset input of CH2.	
	F ST	Set the input voltage for Function start input of CH2.	

About the protective wrap

It is used to protect your hands from touching the conductive part in the pin-setting process.

- (1) Peel it off after finishing the settings.
- (2) Make sure to peel it off before installing a MELSEC-AnS Series terminal block.

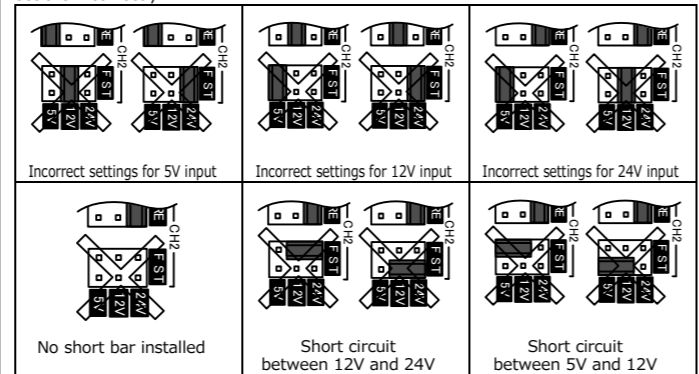
5.2 How to set the setting pins

Set the input voltage for each signal by the short bar. The short bar can be installed from any direction.

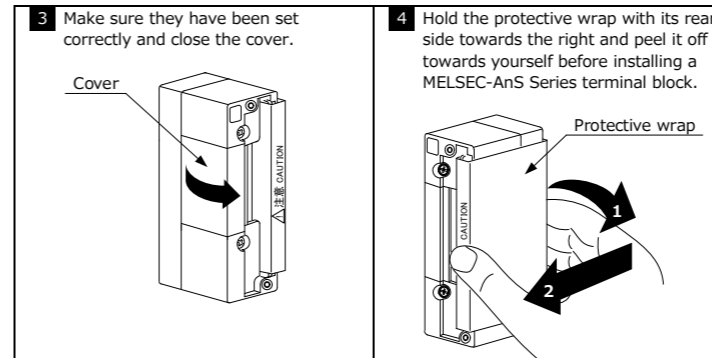
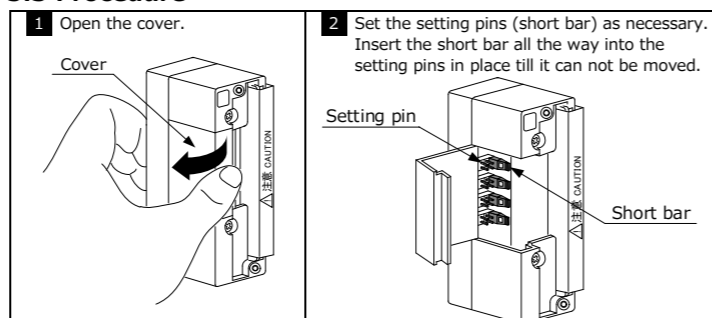
Signal	Voltage	24V (Factory setting)		
		5V	12V	24V
CH1	PRE	PRE 5V	PRE 12V	PRE 24V
	F ST	F ST 5V	F ST 12V	F ST 24V
CH2	PRE	PRE 5V	PRE 12V	PRE 24V
	F ST	F ST 5V	F ST 12V	F ST 24V

Notice

Incorrectly setting the setting pins will cause a failure and malfunction. Make sure to set them correctly.

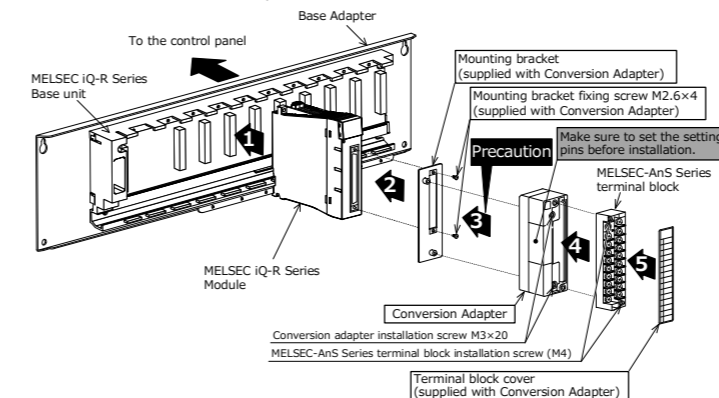


5.3 Procedure

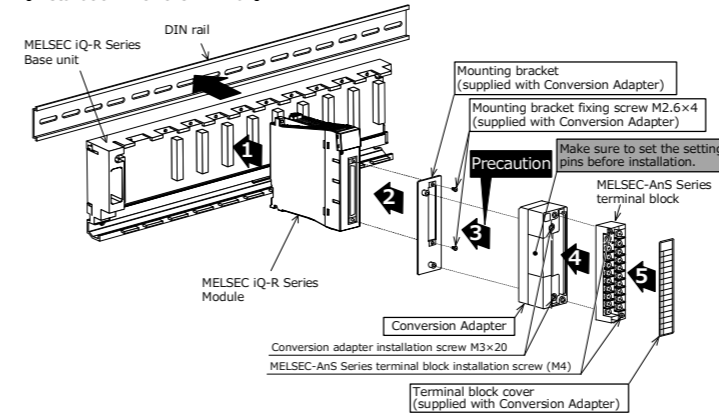


6. Part Names and Installation Method

[Installation with the Base Adapter]



[Installation with the DIN rail]



6.1 Installation Method

Installation with the Base Adapter

Mount the MELSEC iQ-R Series Base Unit to the Base Adapter. Refer to the Base Adapter's manual for how to install them to the control panel.

Installation with the DIN rail

Mount the DIN rail mounting adapter manufactured by Mitsubishi Electric to the MELSEC iQ-R Series Base Unit. For how to install the Base Unit on the DIN rail, refer to the MELSEC iQ-R Module Configuration Manual.

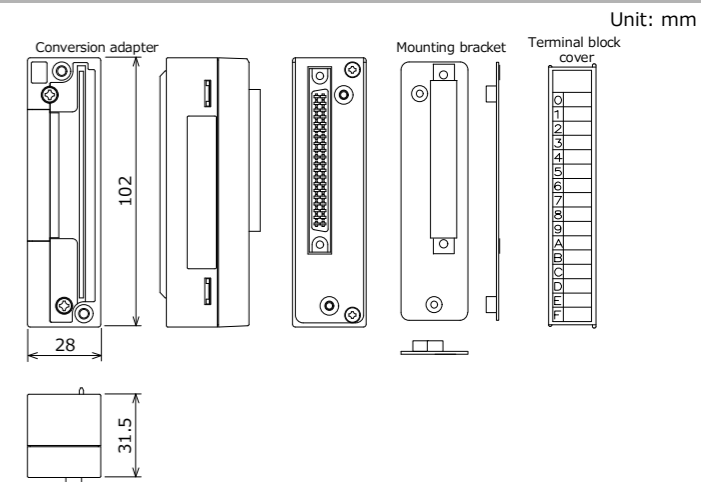
- 1 Mount the MELSEC iQ-R Series module to the MELSEC iQ-R Series Base Unit.
 - 2 Secure the Mounting Bracket to a compatible module under the MELSEC iQ-R Series with Mounting Bracket fixing screws (M2.6 x 4). (2 places)
 - 3 Install the Conversion Adapter to the MELSEC iQ-R Series module, and secure it with the Conversion Adapter installation screws (M3x20). (2 places)
- Precaution**
Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the MELSEC iQ-R Series module. Tightening the screws in floating-off state or tilting state will damage the Conversion Adapter installation screws and the mounting bracket.
- 4 Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied attaching screws (M4). (2 places, top and bottom.)
 - 5 Remove the terminal block cover from the MELSEC-AnS Series terminal block and fit the terminal block cover supplied with the Conversion Adapter in place.

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
Mounting bracket fixing screw (M2.6x4)	0.20 to 0.29N·m
Conversion Adapter installation screw (M3x20)	0.43 to 0.57N·m
MELSEC-AnS Series terminal block installation screw (M4 screw)	0.78 to 1.18N·m

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

(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.

Developed November 2018
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