Mitsubishi General-Purpose Programmable Controller Renewal Tool

Conversion Adapter
Model
ERNT-ASQT63ADA

User's Manual

50CM-D180120-C(1409)

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
HEAD OFFICE:Hulic KUDAN BLDG.1-13-5, KUDANKITA CHIYODA-KU, TOKYO 102-0073, JAPAN
NAGOYA ENGINEERING OFFICE:139 SHIMOYASHIKICHO-SHIMOYASHIKI, KASUGAI, AICHI 486-0906, JAPAN

● 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 the user's manual of the MELSEC-Q series CPU module to be used.
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 from the MELSEC-AnS Series to the MELSEC-Q Series, be sure to consult user's manual supplied with individual module under the MELSEC-Q Series to confirm differences in various aspects including performance, function, CPU input/output signals and buffer memory addresses between the two series.

[Installation Precautions]

⚠ CAUTION

- Use the Conversion Adapter in the environmental conditions that are specified in the general specification. If the Products are used in any environment beyond the bounds of the general specification, electric shock, fire, malfunction, or damage to or degradation of the Products will result.
- Do not directly touch any conductive parts of Conversion Adapter. Contact will cause malfunction or failure in the system.
- 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, Conversion Adapter, Mounting Bracket, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
- Always check for correct match between MELSEC-Q Series and the Conversion Adapter. Incorrect match can cause damage to the MELSEC-Q Series Module.
- When installing the Conversion Adapter, take care not to get your hand snagged on the Mounting Bracket or the like. Injury may result.
- When installing or removing the MELSEC-Q Series Module complete with a Converter Adapter, be sure to hold it with both hands. Dropping may lead to breakage.

[Wiring Precautions]

⚠ WARNING

- 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.
- 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.

[Wiring Precautions]

⚠ CAUTION

- Carry out wiring for the Conversion Adapter correctly after checking the specification and terminal arrangement for the module used. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Tighten the MELSEC-AnS Series 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.
- Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.

[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch live terminals. There is a danger of electric shock or malfunction.
- Shut off the external power supply for the system in all phases before cleaning or retightening the terminal screws. Failure to do so may result in electric shock or cause the MELSEC-Q Series module to fail or malfunction. Loose screws can lead to dropping, shorting, and malfunction. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter, Mounting Bracket, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.

⚠ CAUTION

- Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause 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 BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

1. Overview

This manual provides information about the Conversion Adapter "ERNT-ASQT63ADA" available as Renewal Tools for the Mitsubishi General-Purpose Programmable Controller.
The Conversion Adapter is a product for effecting conversion to transcend difference in pin assignment between the MELSEC-AnS Series and the MELSEC-Q Series.
Before attempting to make a switch from MELSEC-AnS Series to MELSEC-Q 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	Quantity
Conversion Adapter	1
Mounting bracket	1
Mounting bracket fixing screw (M3.5×6)	2
Terminal block cover	1

2. General Specifications

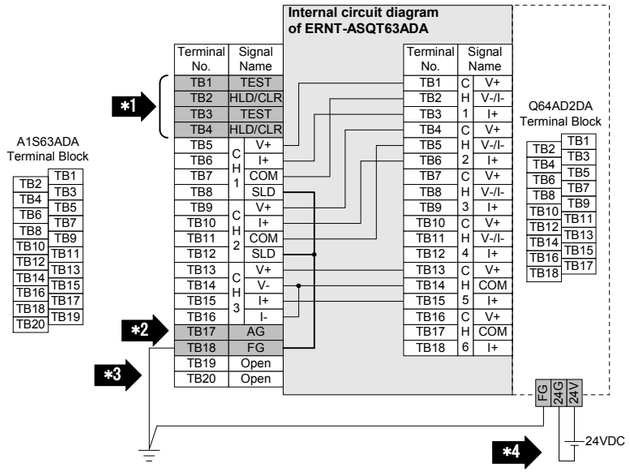
Item	Specifications					
Operating ambient temperature	0 to 55℃(Maximum surrounding air temperature 55℃)					
Storage ambient temperature	-25 to 75℃					
Operating ambient humidity	5 to 95%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant acceleration	Half amplitude	Sweep count
		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 (147 m/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					
Overvoltage category *2	II or less					
Pollution degree *3	2					

*1 : Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.
*2 : 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.
*3 : 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. 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-Q Series module you use. Those parts of the specification that differ between the MELSEC-AnS Series and the MELSEC-Q Series are where a switch from the first series to the second is subjected to specification-related restrictions. Check the specification of the devices to be connected for more details.
Furthermore, it is recommended to refer to the "Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Intelligent Function Modules): L (NA)-08220ENG" issued by Mitsubishi Electric.

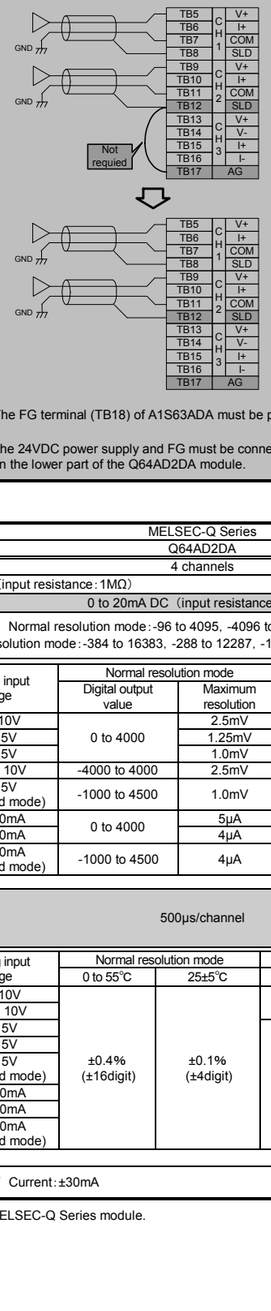
Conversion Adapter Model	MELSEC-AnS Series Model	No. of channels	MELSEC-Q Series Model	Conversion Adapter Weight (g)
ERNT-ASQT63ADA	A1S63ADA	Input : 2 channels Output : 1 channel	Q64AD2DA	80



Precautions for wiring

*1 Q64AD2DA is not provided with a terminal for Offset/Gain setting or Output Hold/Clear setting purposes.
Make Output Hold/Clear setting by choosing an appropriate Q64AD2DA intelligent function module switch setting.
For more details about the Offset/Gain setting and Output Hold/Clear setting, see the Q64AD2DA User's Manual.

*2 Wiring to connect the SLD terminal (TB12) and AG terminal (TB17) on the A1S63ADA side is not required because there is no AG terminal on the Q64AD2DA side. Note, however, that leaving the AG terminal connected will not cause a problem because the wire is not connected inside of the Conversion Adapter.



*3 The FG terminal (TB18) of A1S63ADA must be properly grounded.

*4 The 24VDC power supply and FG must be connected to the external power supply connector on the lower part of the Q64AD2DA module.

< Specification comparison >

Specification \ Model			MELSEC-AnS Series A1S63ADA	MELSEC-Q Series Q64AD2DA
A/D conversion	Analog input points		2 channels	4 channels
	Analog input	Voltage		-10 to 0 to 10VDC (input resistance : 1MΩ)
		Current	-20 to 0 to 20mA DC (input resistance : 250Ω)	0 to 20mA DC (input resistance : 250Ω)
	Digital output		-4096 to 4095 (at 1/4000 resolution setting) -8192 to 8191 (at 1/8000 resolution setting) -12288 to 12287 (at 1/12000 resolution setting)	Normal resolution mode : -96 to 4095, -4096 to 4095, -1096 to 4595 High resolution mode : -384 to 16383, -288 to 12287, -16384 to 16383, -3288 to 13787
	I/O characteristics		Analog input: 10V, 5V or 20mA, 0V or 4mA, -5V or -12mA, -10V Digital output value 1/4000: 4000, 2000, 0, -2000, -4000 1/8000: 8000, 4000, 0, -4000, -8000 1/12000: 12000, 6000, 0, -6000, -12000	Input: Voltage (0 to 10V, 0 to 5V, 1 to 5V, -10 to 10V, 1 to 5V (Extended mode)), Current (0 to 20mA, 4 to 20mA, 4 to 20mA (Extended mode)) Analog input range: 0 to 4000 / -4000 to 4000 / -1000 to 4500; 0 to 12000 / -16000 to 16000 / -3000 to 13500 Normal resolution mode: Digital output value: 0 to 4000 / -1000 to 4500; Maximum resolution: 2.5mV, 1.25mV, 1.0mV, 5μA, 4μA High resolution mode: Digital output value: 0 to 12000 / -3000 to 13500; Maximum resolution: 0.416mV, 0.333mV, 0.625mV, 1.66μA, 1.33μA
	Maximum resolution		Voltage: 1/4000 2.5mV, 1/8000 1.25mV, 1/12000 0.83mV Current: 1/4000 10μA, 1/8000 5μA, 1/12000 3.33μA	
	Conversion speed		1ms (at 1/4000 resolution setting) 2ms (at 1/8000 resolution setting) 3ms (at 1/12000 resolution setting)	500μs/channel
	Overall accuracy		±1% (±40 (at 1/4000 resolution setting) ±80 (at 1/8000 resolution setting) ±120 (at 1/12000 resolution setting))	Input: Voltage (0 to 10V, -10 to 10V, 0 to 5V, 1 to 5V, 1 to 5V (Extended mode)), Current (0 to 20mA, 4 to 20mA, 4 to 20mA (Extended mode)) Analog input range: 0 to 4000 / -4000 to 4000 / -1000 to 4500; 0 to 12000 / -16000 to 16000 / -3000 to 13500 Normal resolution mode: 0 to 55℃: ±0.4% (±16digit), ±0.4% (±48digit); 25±5℃: ±0.1% (±4digit) High resolution mode: 0 to 55℃: ±0.4% (±64digit), ±0.4% (±48digit); 25±5℃: ±0.1% (±16digit), ±0.1% (±12digit)
	Absolute maximum input		Voltage : ±15V Current : ±30mA	

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

< Specification comparison (continued) >

Specification \ Model		MELSEC-AnS Series A1S63ADA	MELSEC-Q Series Q64AD2DA
D/A Conversion	Analog output points	1 channel	2 channels
	Digital input	Voltage output / Current output at 1/4000 resolution setting: -4000 to 4000 / 0 to 4000 at 1/8000 resolution setting: -8000 to 8000 / 0 to 8000 at 1/12000 resolution setting: -12000 to 12000 / 0 to 12000	Normal resolution mode : -96 to 4095, -4096 to 4095 High resolution mode : -288 to 12287, -16384 to 16383
	Analog output: Voltage	-10 to 10VDC (external load resistance: 2kΩ to 1MΩ)	-10 to 10VDC (external load resistance: 1kΩ to 1MΩ)
	Analog output: Current	0 to 20mA DC (external load resistance: 0Ω to 600Ω)	
	I/O characteristics	1/4000 / 1/8000 / 1/12000: Analog output value 4000 / 8000 / 12000: Voltage output 10V, Current output 20mA 2000 / 4000 / 6000: 5V, 12mA 0 / 0 / 0: 0V, 4mA -2000 / -4000 / -6000: -5V, — -4000 / -8000 / -12000: -10V, —	Output: 0 to 5V, 1 to 5V, -10 to 10V, 0 to 20mA, 4 to 20mA Analog output range: 0 to 4000 / -4000 to 4000 / 0 to 4000 Normal resolution mode: Digital input value: 0 to 4000 / -4000 to 4000 / 0 to 4000; Maximum resolution: 1.25mV / 1.0mV / 2.5mV / 5μA / 4μA High resolution mode: Digital input value: 0 to 12000 / -16000 to 16000 / 0 to 12000; Maximum resolution: 0.416mV / 0.333mV / 0.625mV / 1.66μA / 1.33μA
	Maximum resolution	Voltage output / Current output at 1/4000 resolution setting: 2.5mV / 5μA at 1/8000 resolution setting: 1.25mV / 2.5μA at 1/12000 resolution setting: 0.83mV / 1.7μA	
	Conversion speed	1ms (at 1/4000 resolution setting) 2ms (at 1/8000 resolution setting) 3ms (at 1/12000 resolution setting)	500μs/cannel
	Overall accuracy	±1% (Voltage output: ±0.1V Current output: ±0.2mA)	Analog input range / Normal resolution mode (0 to 55℃) / High resolution mode (25±5℃) Voltage: 0 to 5V, 1 to 5V: ±0.3% (±30mV) / ±0.1% (±10mV) Voltage: -10 to 10V: ±0.3% (±30mV) / ±0.1% (±10mV) Current: 0 to 20mA, 4 to 20mA: ±0.3% (±60μA) / ±0.1% (±20μA)
	Absolute maximum output	Voltage: ±12V Current: +28mA	Voltage: ±12V Current: +21mA
	Output shorting protection	Available	
Isolation method	Between input terminal and programmable controller power supply	Photocoupler isolation	
	Between input/output channels	Non-isolated	
	Between external power supply and analog input/output	—	Non-isolated
External power supply	Voltage	—	24VDC ±15%
	Inrush current	—	2.5A 150μs or less
	Current consumption	—	0.19A
Number of I/O occupied points		32 points	16 points
Wiring connection system		20 point terminal block	18 point terminal block
Internal current consumption (5VDC)		0.8A	0.17A

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

Precautions for the program

1. A1S63ADA and Q64AD2DA 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 analog output CH3 of A1S63ADA should use CH5 of Q64AD2DA.
3. Q64AD2DA has a greater conversion speed as compared with A1S63ADA. This can make it possible for Q64AD2DA to pick up noise, which A1S63ADA would not, as an analog signal. In such case, eliminate the effects of noise by using the average processing function that is provided.

POINT

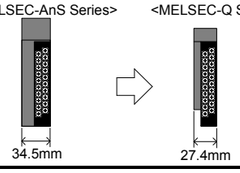
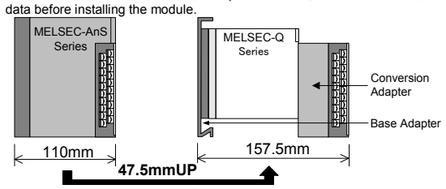
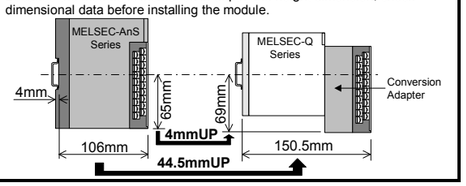
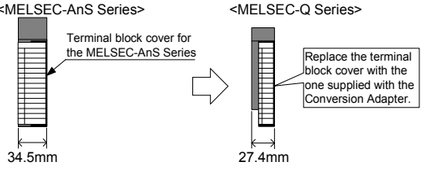
1. When an error occurs in the digital output value or analog output value, the error can be corrected using the offset/gain (shift function and scaling function) of the Q64AD2DA.
2. If the offset/gain setting has been configured in the A1S63ADA, configure the offset/gain setting (shift function and scaling function) in the Q64AD2DA as well.

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 Adapter directly. Contact will cause malfunction or failure in the system.
(5) 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-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
(6) Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.
(7) Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause damage.

4.2 Use Precautions

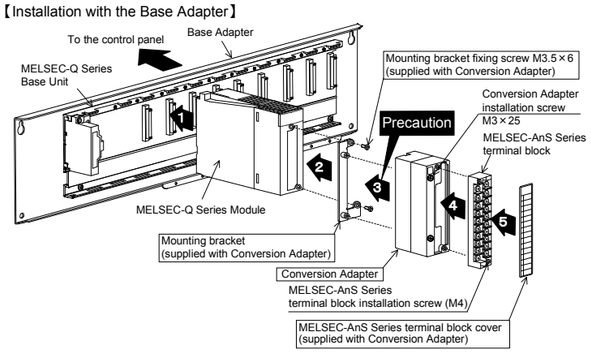
Item	Use Precautions
Width dimension of module	Because the module is reduced in width dimension (34.5mm→27.4mm) and thus in area available for wiring, check dimensional data before installing the module. <MELSEC-AnS Series> <MELSEC-Q Series> 
Depth and Height dimension	Installation with the Base Adapter Because the module is increased in depth dimension, check dimensional data before installing the module.  Installation with the DIN rail Because the module is increased in depth and height dimension, check dimensional data before installing the module. 
Terminal block cover	The terminal block cover for MELSEC-AnS Series is bigger than the width of the MELSEC-Q Series Module. Therefore, it is necessary to replace it with the terminal block cover supplied with the converter adapter. <MELSEC-AnS Series> <MELSEC-Q Series> 

4.3 Installation Environment

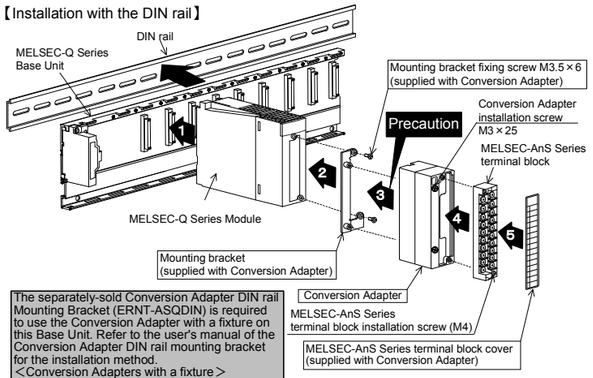
For details of the installation environment, refer to the user's manual of the MELSEC-Q series CPU module to be used.

5. Part Names and Installation Method

【Installation with the Base Adapter】



【Installation with the DIN rail】



The separately-sold Conversion Adapter DIN rail Mounting Bracket (ERNT-ASQDIN) is required to use the Conversion Adapter with a fixture on this Base Unit. Refer to the user's manual of the Conversion Adapter DIN rail mounting bracket for the installation method.
<Conversion Adapters with a fixture>
・ERNT-ASQT68AD-G
・ERNT-ASQT68TD-H01
・ERNT-ASQT68TD-H02
・ERNT-ASQTD61
・ERNT-ASQTD62
・ERNT-ASQTD62D

5.1 Installation Method

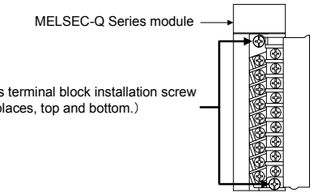
Installation with the Base Adapter

Mount the MELSEC-Q 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-Q Series Base Unit.
For how to install the adapter to the MELSEC-Q Series Base Unit, refer to the QCPU User's Manual.

1 Install the MELSEC-Q Series module to the MELSEC-Q Series Base Unit. In addition, remove the terminal block attached with the MELSEC-Q Series module after loosening the terminal block installation screws (2 places up and down).



2 Secure the mounting bracket to the MELSEC-Q Series module using the mounting bracket fixing screws (M3.5 × 6). (2 places)

3 Install the Conversion Adapter to the mounting bracket, and secure it using the Conversion Adapter installation screws (M3 × 25). (2 places)

Precaution

Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the MELSEC-Q 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 terminal block installation screw (M4). (Secure it in two 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 Adaptor in place.

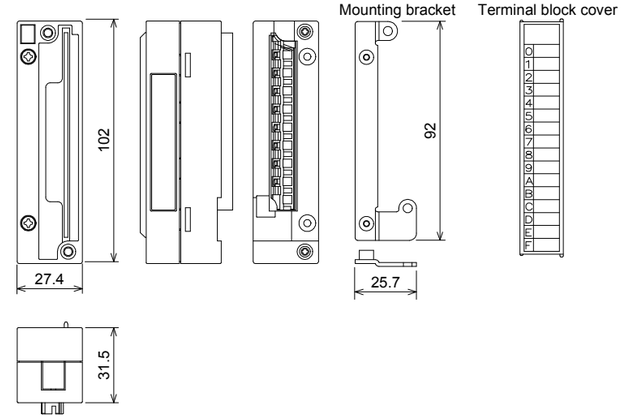
5.2 Tightening Torque

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 (M3.5×6)	0.68 to 0.92N·m
Conversion Adapter installation screw (M3×25)	0.43 to 0.57N·m
MELSEC-AnS Series terminal block installation screw (M4 screw)	0.78 to 1.18N·m

6. External Dimensions

Unit:mm



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 September 2014. Specifications are subject to change without notice.

Developed September 2014
50CM-D180120-C