

Mitsubishi **General-Purpose** Programmable Controller Renewal Tool

Conversion Adapter Model

ERNT-ASQT68TD-H01
ERNT-ASQT68TD-H02

User's Manual



50CM-D180124-D(1604)

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 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 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, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter 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.

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.
- When energizing the Products or putting them into operation after the completion of installation or wiring work, always have a cover placed over the terminal block. Without the cover placed in position, electric shock can result.

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, 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 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: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

1. Overview

This manual provides information about the Conversion Adapter "ERNT-ASQT68TD-H01, ERNT-ASQT68TD-H02" 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
Fixture installation screw (M3×8)	1
Terminal block cover	1

2. 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	<table border="1"> <thead> <tr> <th>Compliant with JIS B 3502 and IEC 61131-2</th> <th>Frequency</th> <th>Constant acceleration</th> <th>Half amplitude</th> <th>Sweep count</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Under intermittent vibration</td> <td>5 to 8.4Hz</td> <td>—</td> <td>3.5mm</td> <td rowspan="4">10 times each in X, Y, Z directions</td> </tr> <tr> <td>8.4 to 150Hz</td> <td>9.8m/s²</td> <td>—</td> </tr> <tr> <td rowspan="2">Under continuous vibration</td> <td>5 to 8.4Hz</td> <td>—</td> <td>1.75mm</td> </tr> <tr> <td>8.4 to 150Hz</td> <td>4.9m/s²</td> <td>—</td> </tr> </tbody> </table>	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/s ²	—	Under continuous vibration	5 to 8.4Hz	—	1.75mm	8.4 to 150Hz	4.9m/s ²	—
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/s ²	—																		
Under continuous vibration	5 to 8.4Hz	—	1.75mm																		
	8.4 to 150Hz	4.9m/s ²	—																		
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/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																				
Overvoltage category *2	II or less																				
Pollution degree *3	2																				

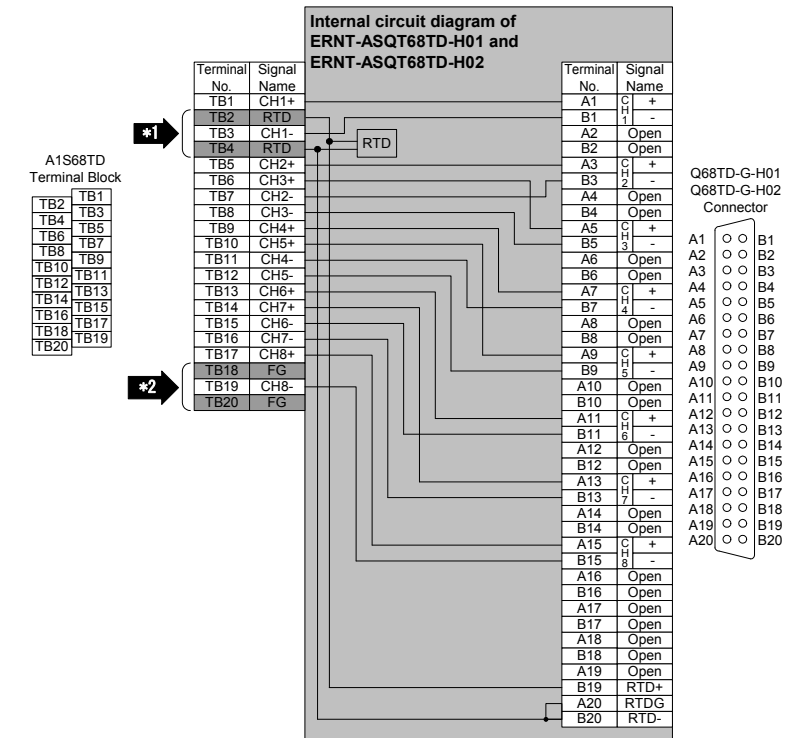
*1 : Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.
*2 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies 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-ASQT68TD-H01	A1S68TD	8 channels	Q68TD-G-H01	100
ERNT-ASQT68TD-H02			Q68TD-G-H02	110



Precautions for wiring

*1 A cold junction compensating resistor (RTD) is built in the Conversion Adapter; therefore, always remove the cold junction compensating resistor (RTD) connected to the A1S68TD terminal block (TB2, TB4).

The cold junction compensating resistor included with the A1S68TD

The temperature cannot be correctly measured with the wiring connected.

*2 Wiring to connect the FG terminals (TB18 and TB20) on the A1S68TD is not required because there is no FG terminals on the Q68TD-G-H01 and Q68TD-G-H02 side. Note, however, that leaving the FG terminal connected will not cause a problem because the wire is not connected inside of the Conversion Adapter.

Not required

Specification comparison

Specification	Model	MELSEC-AnS Series	MELSEC-Q Series
		A1S68TD	Q68TD-G-H02 Q68TD-G-H01
Temperature sensor input		0 to 1700°C	-270 to 1820°C
Output	Temperature conversion value	16-bit signed binary (0 to 17000: Value to the first decimal place ×10)	16-bit signed binary (-2700 to 18200: Value to the first decimal place ×10)
	Scaling value	16-bit signed binary (0 to 2000)	16-bit signed binary
Thermocouple compliance standards		JIS C1602-1981	JIS C1602-1995, IEC 60584-1(1995), IEC 60584-2(1982)
Applicable thermocouple and conversion accuracy		Refer to the table on the back	
Cold junction compensation accuracy		±1.0°C	
Overall accuracy		(conversion accuracy) + (temperature characteristic) × (operating ambient temperature variation) + (cold junction compensation accuracy)	
Resolution		B,R,S :0.3°C K,E,J,T:0.1°C	B,R,S,N:0.3°C K,E,J,T:0.1°C
Conversion speed		400ms/8 channels	640ms/8 channels 320ms/8 channels
Number of analog input points		8 channels + cold junction compensation channel / module	
Disconnection detection		Available	Available (each channel respectively) Not available (*1)
Isolation method	Between thermocouple input channel and programmable controller power supply	Transfer isolation	
	Between thermocouple input channels	Transfer isolation	
	Between cold junction compensation channel and programmable controller power supply	No isolation	
Number of I/O occupied points		32 points	16 points
Wiring connection system		20 point terminal block	40-pin connector
Internal current consumption (5VDC)		0.32A	0.65A 0.49A

*1: Q68TD-G-H01 has the line disconnection monitoring function.

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

- A1S68TD and Q68TD-G-H02/Q68TD-G-H01 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.
- Q68TD-G-H01 has a greater conversion speed as compared with A1S68TD. This can make it possible for Q68TD-G-H01 to pick up noise, which A1S68TD would not, as an analog signal. In such case, eliminate the effects of noise by using the average processing function that is provided.
- Set the thermocouple type using the intelligent function module switch setting in the Q68TD-G-H01 and Q68TD-G-H02 instead of DIP switches that are used in the A1S68TD.

POINT

When an error occurs in the measured temperature, the error can be corrected using the offset/gain setting in the Q68TD-G-H01 and Q68TD-G-H02.

Thermocouple type	A1S68TD			Q68TD-G-H02 Q68TD-G-H01			
	Measured temperature range	Conversion accuracy (At operating ambient temperature 25±5°C)	Temperature characteristic (Per operating ambient temperature variation of 1°C)	Measured temperature range *2	Conversion accuracy (At operating ambient temperature 25±5°C)	Temperature characteristic (Per operating ambient temperature variation of 1°C)	Max. temperature error at ambient temperature 55°C
B	—	—	—	0 to 600°C	*3	*3	*3
	800 to 1700°C	±2.5°C	±0.4°C	600 to 800°C	±3.0°C	±0.4°C	±13.0°C
	—	—	—	800 to 1700°C	±2.5°C	±0.4°C	±12.5°C
R	—	—	—	1700 to 1820°C	*3	*3	*3
	300 to 1600°C	±2°C	±0.3°C	-50 to 0°C	*3	*3	*3
	—	—	—	0 to 300°C	±2.5°C	±0.4°C	±12.5°C
S	—	—	—	300 to 1600°C	±2.0°C	±0.3°C	±9.5°C
	300 to 1600°C	±2°C	±0.3°C	1600 to 1760°C	*3	*3	*3
	—	—	—	0 to 300°C	±2.5°C	±0.4°C	±12.5°C
K	—	—	—	300 to 1600°C	±2.0°C	±0.3°C	±9.5°C
	—	—	—	1600 to 1760°C	*3	*3	*3
	0 to 1200°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.07°C and ±0.02% of measured temperature	-270 to -200°C	*3	*3	*3
E	—	—	—	-200 to 0°C	Larger value of ±0.5°C and ±0.5% of measured temperature	Larger value of ±0.06°C and ±0.15% of measured temperature	±11.0°C
	0 to 800°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.07°C and ±0.02% of measured temperature	0 to 900°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.06°C and ±0.02% of measured temperature	±9.0°C
	—	—	—	1200 to 1370°C	*3	*3	*3
J	—	—	—	-270 to -200°C	*3	*3	*3
	0 to 750°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.07°C and ±0.02% of measured temperature	-200 to 0°C	Larger value of ±0.5°C and ±0.5% of measured temperature	Larger value of ±0.06°C and ±0.15% of measured temperature	±8.5°C
	—	—	—	0 to 900°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.06°C and ±0.02% of measured temperature	±6.75°C
T	—	—	—	900 to 1000°C	*3	*3	*3
	0 to 350°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.07°C and ±0.02% of measured temperature	-210 to -40°C	*3	*3	*3
	—	—	—	-40 to 750°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.06°C and ±0.02% of measured temperature	±5.625°C
N	—	—	—	750 to 1200°C	*3	*3	*3
	—	—	—	-270 to -200°C	*3	*3	*3
	—	—	—	-200 to 0°C	Larger value of ±0.5°C and ±0.5% of measured temperature	Larger value of ±0.06°C and ±0.1% of measured temperature	±6.0°C
N	—	—	—	0 to 350°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.06°C and ±0.02% of measured temperature	±2.625°C
	—	—	—	350 to 400°C	*3	*3	*3
	—	—	—	0 to 1250°C	Larger value of ±0.5°C and ±0.25% of measured temperature	Larger value of ±0.06°C and ±0.02% of measured temperature	±9.375°C
N	—	—	—	1250 to 1300°C	*3	*3	*3
	—	Unavailable	—	—	—	—	—

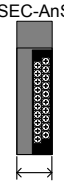

*2 If a value entered from the thermocouple is outside the measured temperature range given in the table, it is handled as the maximum/minimum value of the measured temperature range.
*3 Temperature measurement can be executed, but accuracy is guaranteed.

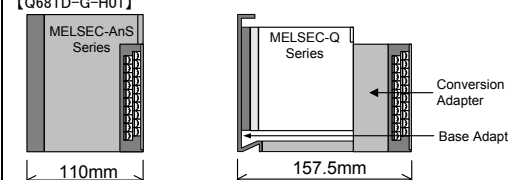
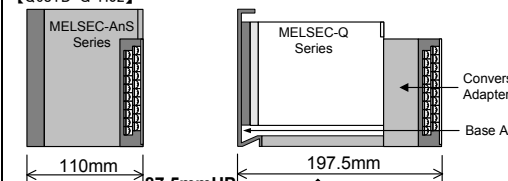
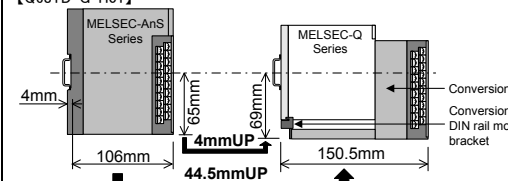
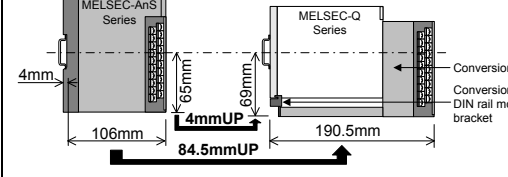
4. Mounting and Installation

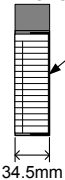
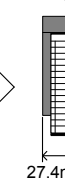
4.1 Handling Precautions

- 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.
- Do not touch live terminals. There is a danger of electric shock or malfunction.
- Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- Do not touch the energized part of the Conversion Adapter directly. Contact will cause malfunction or failure in the system.
- Fasten the Conversion Adapter, 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, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Converter Adapter, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
- 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.
- Do not drop the Conversion Adapter 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. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p><MELSEC-AnS Series></p>  <p>34.5mm</p> </div> <div style="text-align: center;"> <p><MELSEC-Q Series></p>  <p>27.4mm</p> </div> </div>

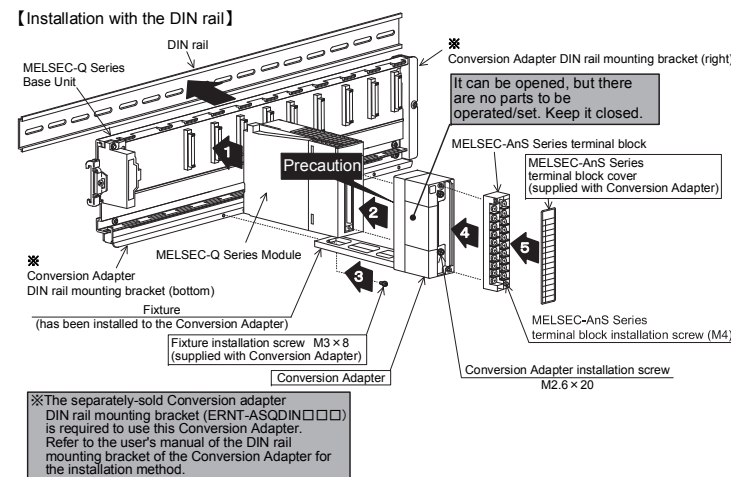
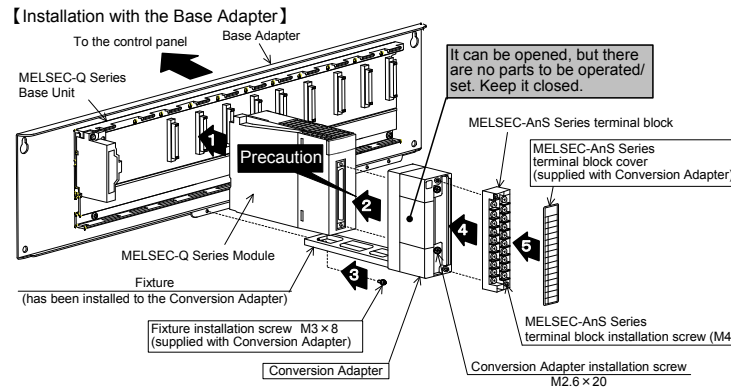
Item	Use Precautions
Depth and Height dimension	Installation with the Base Adapter Because the module is increased in depth dimension, check dimensional data before installing the module. 【Q68TD-G-H01】 
	【Q68TD-G-H02】 
	Installation with the DIN rail Because the module is increased in depth and height dimension, check dimensional data before installing the module. 【Q68TD-G-H01】 
【Q68TD-G-H02】 	

Item	Use Precautions
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>  34.5mm <MELSEC-Q Series>  27.4mm Replace the terminal block cover with the one supplied with the Conversion Adapter.

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



5.1 Installation Method

Installation with the Base Adapter	Installation with the DIN rail
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.	Mount the MELSEC-Q Series Base Unit to the DIN rail mounting bracket of the Conversion Adapter and the adapters for DIN rail installation manufactured by Mitsubishi Electric. For how to mount them to the DIN rail, refer to the user's manual of the Conversion Adapter DIN rail mounting bracket and QCPU.

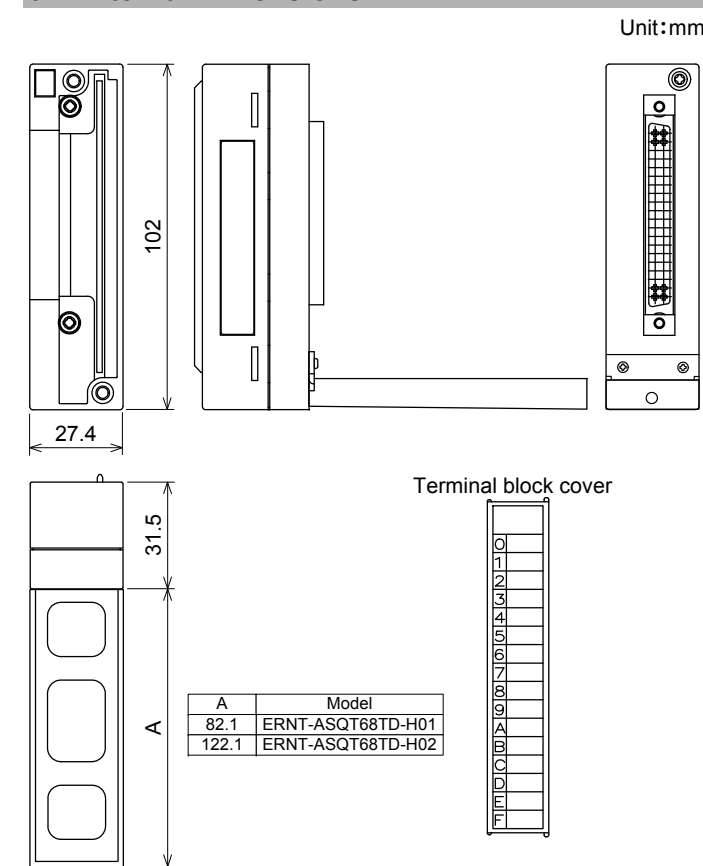
- Mount the MELSEC-Q Series module to the MELSEC-Q Series Base Unit.
- Install the Conversion Adapter to the MELSEC-Q Series module, and secure it with the Conversion Adapter installation screws (M2.6×20). (2 places)
Precaution
 Before tightening the installation screws, check that the Conversion Adapter 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 MELSEC-Q Series module.
- Secure the fixture to the Base Adapter or Conversion Adapter DIN rail mounting bracket (bottom) of the Conversion Adapter with fixture installation screws (M3×8). (1 place)
- Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied terminal block installation screw (M4). (2 places, top and bottom.)
- 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.

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
Conversion Adapter installation screw (M2.6×20)	0.20 to 0.29N·m
Fixture installation screw (M3×8)	0.61 to 0.82N·m
MELSEC-AnS Series terminal block installation screw (M4 screw)	0.78 to 1.18N·m

6. External Dimensions



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 April 2016. Specifications are subject to change without notice.