Mitsubishi General-Purpose Programmable Controller

Renewal Tool

Conversion Adapter

Models:

ERNT-ASQT64AD

ERNT-ASQT68AD

User's Manual

ERNT-ASQT64AD
ERNT-ASQT68AD

50CM-D180089-C (1409)

● SAFETY INSTRUCTIONS ●

(Always read these precautions prior to use.)

Before attempting to use the Conversion Adapter (or the Products), read all instructions contained in this manual carefully to ensure safe and correct operation.

The safety instructions appearing in this manual are limited to those that apply to the Products. For safety instructions to be heeded in regard to your programmable controller system as a whole, refer to the user's manual supplied with the MELSEC-Q Series CPU module you use.

In this manual, the safety precautions are ranked as "Warning" and "Caution".

⚠ WARNING — Indicates an immediately hazardous situation which, if not properly dealt with, will result in death or serious injury.

⚠ CAUTION — Indicates a hazardous situation which, if not properly deal with, will result in moderate or mild injury, or property damage alone.

Even a safety instruction marked with "⚠ Caution" could have serious consequences under certain conditions. All the safety instructions, regardless of their classification of criticality, carry important points to be noted. Observe them without fail.

Save this manual for reference when needed while at the same time ensuring that it is always passed on to the ultimate user.

[Precautions: Prior to use]

⚠ 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 and function 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 touch live uninsulated part directly. Contact will cause malfunction or failure in the system.
- Fasten the Conversion Adapter and the Fittings securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the converter adapter or fittings, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, converter adapter, fittings 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.

[Installation Precautions]

⚠ CAUTION

- When installing the converter adapter, take care not to get your hand snagged on the fittings or the like. Injury may result.
- There is an FG terminal at the bottom of the ERNT-ASQT68AD converter adapter. During installation, avoid getting your hand or others snagged on the terminal. 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.
- 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 for the MELSEC-AnS Series components. Without the cover placed in position, electric shock can result.

⚠ CAUTION

- Ground the FG terminals to the protective ground conductor dedicated to the programmable controller. Failure to do so may result in electric shock or malfunction.
- 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 attaching screws and terminal screw secirely 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, converter adapter, fittings, 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.
- The Conversion Adapter comes in a resin case. Do not drop the Adapter or give a strong impact to it. This will cause damage to the Adapter.

[Disposal Precautions]

⚠ CAUTION

- When you dispose of the Products, handle them 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

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REVISION HISTORY

Date of print	Number of User's Manual	Description
Apr. 2011	50CM-D180089-A	The first version is printed.
Apr. 2014	50CM-D180089-B	Description of Base adapter deleted Correction SAFETY INSTRUCTIONS, Chapter 3, 4, 5, 6 Addition Chapter 2
September 2014	50CM-D180089-C	Correction Section 2.

TABLE OF CONTENTS

1. General Description

This manual provides information about the Conversion Adapter (ERNT-ASQT64AD/-ASQT68AD) 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.

Upon unpacking your Adapters, check to see that the following items are included in their shipping carton.

Item name	Quantity
Adapter	1
Fittings	1
Fittings attaching screws (M3.5 x 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/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.

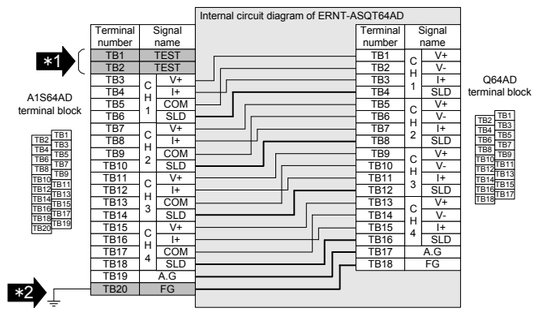
*2 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.

*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.

Conversion Adapter model name	MELSEC-AnS Series	Number of analog input points	MELSEC-Q Series	Mass of Conversion Adapter (g)
ERNT-ASQT64AD	A1S64AD	4	Q64AD	75



POINT

***1 Q64AD is not provided with a terminal for Offset/Gain setting purposes. For more details about the Offset/Gain setting, see the Q64AD User's Manual.**

***2 Be sure to establish a ground for the FG terminal (TB18) of Q64AD using the FG terminal (TB20) of A1S64AD.**

<Specification Comparison Chart>

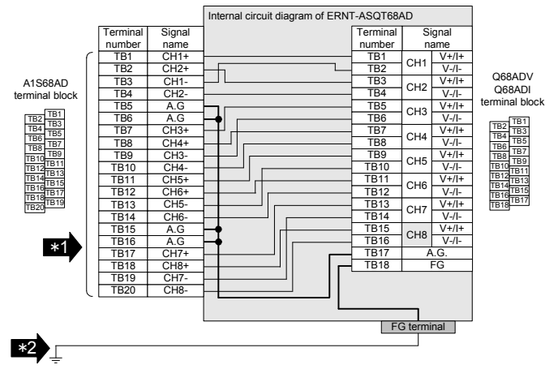
Item		A1S64AD	Q64AD
Analog input	Voltage	-10 to 0 to 10VDC (Input resistance : 1MΩ) Selectable by input terminals	-10 to 10VDC (Input resistance : 1MΩ)
	Current	-20 to 0 to +20mA (Input resistance : 250Ω)	0 to 20mA DC (Input resistance : 250Ω)
Digital output		Signed 16-bit binary 1/4000 setting: -4096 to 4095 1/8000 setting: -8192 to 8191 1/12000 setting: -12288 to 12287	Signed 16-bit binary normal resolution mode : -4096 to 4095 high resolution mode : -12288 to 12287, -16384 to 16383
I/O characteristics		Analog input: +10V / 5V or 20mA / 0V or 0mA / -5V or -20mA / -10V Digital output (1/4000): +4000 / +2000 / 0 / -2000 / -4000 Digital output (1/8000): +8000 / +4000 / 0 / -4000 / -8000 Digital output (1/12000): +12000 / +6000 / 0 / -6000 / -12000 * Gain : 5V/20mA,Offset : 0V/0mA	Normal resolution mode: Digital output value 0 to 4000; Maximum resolution: Voltage 0 to 10V 2.5mV, 0 to 5V 1.25mV, 1 to 5V 1.0mV, -10 to 10V 2.5mV, Users range setting 0.375mV; Current 0 to 20mA 5μA, 4 to 20mA 4μA, Users range setting 1.37μA High resolution mode: Digital output value Voltage 0 to 16000 -16000 to 16000 -12000 to 12000, Current 0 to 12000 -12000 to 12000; Maximum resolution: Voltage 0.625mV 0.416mV 0.333mV 0.625mV 0.333mV, Current 1.66μA 1.33μA 1.33μA
Maximum resolution		Analog input: Voltage input 2.5mV / Current input 10μA Digital output (1/4000): 2.5mV 10μA Digital output (1/8000): 1.25mV 5μA Digital output (1/12000): 0.83mV 3.33μA	
Overall accuracy		Analog input: Within ±1% Digital output (1/4000): ±40 Digital output (1/8000): ±80 Digital output (1/12000): ±120 * Gain : 5V/20mA,Offset : 0V/0mA	Normal resolution mode: Ambient temperature 0 to 55℃ (With temperature drift correction ±0.3% (±12digit); Without temperature drift correction ±0.4% (±16digit)); Ambient temperature 25±5℃ ±0.1% (±4digit) High resolution mode: Ambient temperature 0 to 55℃ (With temperature drift correction Voltage ±0.3% (±48digit), Current ±0.3% (±36digit); Without temperature drift correction Voltage ±0.4% (±64digit), Current ±0.4% (±48digit)); Ambient temperature 25±5℃ Voltage ±0.1% (±16digit), Current ±0.1% (±12digit)
Maximum conversion time		20 ms/channel	80 μs/channel (When there is temperature drift, the time calculated by adding 160μs will be used regardless of the number of channels used)
Absolute maximum input	Voltage	±15V	±15V
	Current	±30mA	±30mA
Analog input points		4 channels/module	4 channels/module
Insulation method	Between the I/O terminal and programmable controller power supply	Photocoupler insulation	Photocoupler insulation
	Between channels	Non-insulation	Non-insulation
No. of occupied points		32 points	16 points
Connected terminal block		20-points terminal block	18-points terminal block
Current consumption		0.4 A	0.63 A

POINT

1. Q64AD has a greater conversion speed as compared with A1S64AD. This can make it possible for Q64AD to pick up noise, which A1S64AD would not, as an analog signal. In such case, eliminate the effects of noise by using the average processing function that is provided.

2. A1S64AD and Q64AD 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.

Conversion Adapter model name	MELSEC-AnS Series	Number of analog input points	MELSEC-Q Series	Mass of Conversion Adapter (g)
ERNT-ASQT68AD	A1S68AD (voltage input)	8	Q68ADV	80
	A1S68AD (current input)	8	Q68ADI	



POINT

***1 With Q68ADV/Q68ADI analog input, voltage input and current input cannot be used together in a single module.**

***2 Be sure to establish a ground for the FG terminal located at the bottom of the converter adapter.**

<Specification Comparison Chart>

Item		A1S68AD	Q68ADV	Q68ADI
Analog input	Voltage	-10 to 0 to 10VDC (Input resistance : 1MΩ)	-10 to 10V DC (Input resistance : 1MΩ)	–
	Current	0 to +20mA (Input resistance : 250Ω)	–	0 to +20mA (Input resistance : 250Ω)
		Selectable by switch setting		
Digital output		Signed 16-bit binary	Signed 16-bit binary normal resolution mode : -4096 to 4095 high resolution mode : -12288 to 12287, -16384 to 16383	

I/O characteristics

Analog input	Digital output
0 to +10V	0 to +4000
-10 to 10V	-2000 to +2000
0 to 5V or 0 to 20mA	0 to +4000
1 to 5V or 4 to 20mA	0 to +4000

Analog input range			Normal resolution mode: Digital output value	Normal resolution mode: Maximum resolution	High resolution mode: Digital output value	High resolution mode: Maximum resolution
Voltage	0 to 10V		0 to 4000	2.5mV	0 to 16000	0.625mV
	0 to 5V			1.25mV	0 to 12000	0.416mV
	1 to 5V			1.0mV		0.333mV
	-10 to 10V			2.5mV	-16000 to 16000	0.625mV
	Users range setting	-4000 to 4000		0.375mV	-12000 to 12000	0.333mV
Current	0 to 20mA		0 to 4000	5μA	0 to 12000	1.66μA
	4 to 20mA			4μA		1.33μA
	Users range setting	-4000 to 4000		1.37μA	-12000 to 12000	1.33μA

Maximum resolution

Analog input	Digital output
0 to +10V	2.5mV
-10 to 10V	5mV
0 to 5V	1.25mV
1 to 5V	1.0mV
0 to 20mA	5uA
4 to 20mA	4μA

Overall accuracy

Analog input range			Normal resolution mode: Ambient temperature 0 to 55°C: With temperature drift correction	Normal resolution mode: Ambient temperature 0 to 55°C: Without temperature drift correction	Normal resolution mode: Ambient temperature 25±5°C	High resolution mode: Ambient temperature 0 to 55°C: With temperature drift correction	High resolution mode: Ambient temperature 0 to 55°C: Without temperature drift correction	High resolution mode: Ambient temperature 25±5°C
Voltage	0 to 10V		±0.3% (±12digit)	±0.4% (±16digit)	±0.1% (±4digit)	±0.3% (±48digit)	±0.4% (±64digit)	±0.1% (±16digit)
	-10 to 10V							
	0 to 5V							
	1 to 5V							
	Users range setting							
Current	0 to 20mA					±0.3% (±36digit)	±0.4% (±48digit)	±0.1% (±12digit)
	4 to 20mA							
	Users range setting							

Item		A1S68AD	Q68ADV	Q68ADI
Overall accuracy		±1 % (Digital output value ±40)		
Maximum conversion time		0.5 ms/channel	80 μs/channel (When there is temperature drift, the time calculated by adding 160μs will be used regardless of the number of channels used)	
Absolute maximum input	Voltage	±35 V	±15 V	
	Current	±30 mA	±30 mA	
Analog input points		8 channels/module	8 channels/module	
Insulation method	Between the I/O terminal and programmable controller	Photocoupler insulation	Photocoupler insulation	
	Between channels	Non-insulation	Non-insulation	
No. of occupied points		32 points	16 points	
Connected terminal block		20-points terminal block	18-points terminal block	
Current consumption		0.4 A	0.64 A	

POINT

1. Q68ADV/Q68ADI has a greater conversion speed as compared with A1S68AD. This can make it possible for Q68ADV/Q68ADI to pick up noise, which A1S68AD would not, as an analog signal. In such case, eliminate the effects of noise by using the average processing function that is provided.

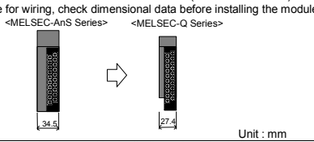
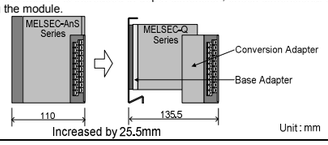
2. A1S68AD and Q68ADV/Q68ADI differ from each other in the way input/output signals (X, Y) and buffer memory addresses are allocated. Therefore, you need make necessary changes to the sequence program that is used.

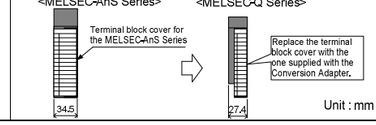
4. Mounting and Installation

4.1 Handling Instructions

(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 Fittings securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the converter adapter, or fittings, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, converter adapter, fittings, 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 the Fittings, and avoid giving a strong impact to them. Otherwise, breakage will result.
(8) If the existing system is installed on a DIN rail, the Base Adaptor is not necessary. The MELSEC-Q Series Base Module you use can be mounted onto the DIN rail.

4.2 Instructions for Use

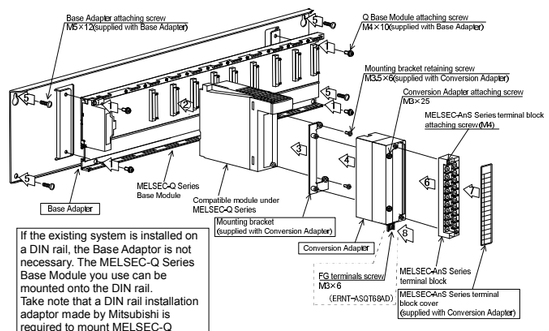
Item	Description
Width dimension of module	Because the module is reduced in width dimension (34.5mm→27.4mm) and thus in area available for wiring, check dimensional data before installing the module. 
Depth dimension of module	Because the module is increased in depth dimension, check dimensional data before installing the module. 

Item	Description
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. 

4.3 Installation Environment

For detail information, see the user's manual furnished with the MELSEC-Q Series CPU module you use.

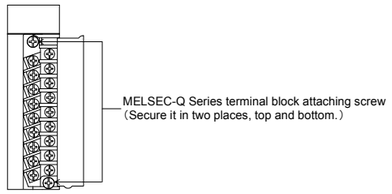
5. Part Names and Installation Procedure



If the existing system is installed on a DIN rail, the Base Adaptor is not necessary. The MELSEC-Q Series Base Module you use can be mounted onto the DIN rail.
Take note that a DIN rail installation adaptor made by Mitsubishi is required to mount MELSEC-Q Series Base Module onto a 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 module.

5.1 Installation Procedure

[1] Secure the MELSEC-Q Series Base Module to the Base Adapter with the supplied attaching screws (M4 x 10). (Secure it in four places.)
[2] Mount a compatible module under the MELSEC-Q Series onto the MELSEC-Q Series Base Module.
Also, remove the terminal block installed to the MELSEC-Q Series Module by undoing the terminal block attaching screws (one at the top and the other at the bottom).



[3] Secure the mounting bracket to a compatible module under the MELSEC-Q Series with retaining screws (M3.5 x 6). (Secure it in two places, top and bottom.)
[4] Mount the Conversion Adapter onto the mounting bracket and secure it with the Conversion Adapter attaching screws (M3 x 25). (Secure it in two places, top and bottom.)

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.

[5] Secure the Base Adapter to the panel with the supplied attaching screws (M5 x 12). (Secure it in four places.)
[6] Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied attaching screws (M4).
[7] 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.
[8] Secure the FG wire in place with the FG terminal screws (M3 x 6).

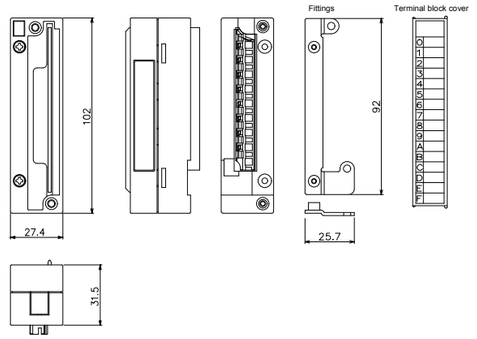
5.2 Tightening Torque

Tighten the module attaching screws by applying torque listed in the table blow. Application of improper tightening torque will cause dropping, short-circuit, failure, or malfunction.

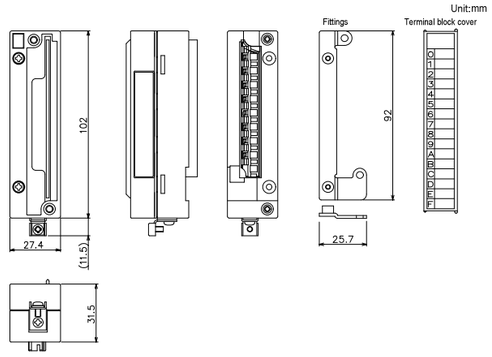
Component attached with screw	Range of tightening torque
Base Adaptor attaching screw (M5)	2.75 to 3.63N·m
Q Series module attaching screw (M4)	1.39 to 1.89N·m
Mounting bracket securing screw (M3.5)	0.68 to 0.92N·m
Conversion Adaptor attaching screw (M3)	0.43 to 0.57N·m
MELSEC-AnS Series terminal block attaching screw (M4)	0.78 to 1.18N·m
FG terminal screw (M3)	0.42 to 0.58N·m

6. Dimensional Outline Drawing

(1) ERNT-ASQT64AD



(2) ERNT-ASQT68AD



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-D180089-C