Mitsubishi General-Purpose Programmable Controller Renewal Tool

Conversion Adapter
Model
ERNT-ASQT68AD-G

User's Manual

50CM-D180119-D(1604)

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 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.
- 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, 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-ASQT68AD-G" 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
Short bar (spare parts)	1

2. General Specifications

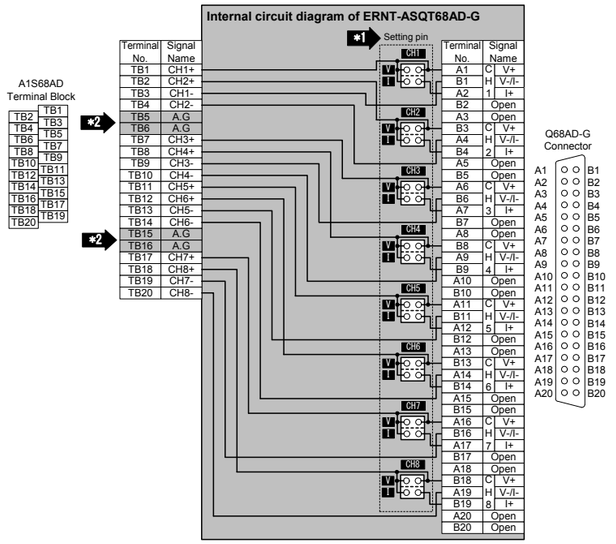
Item	Specifications					
Operating ambient temperature	0 to 55℃(Maximum surrounding air temperature 55℃)					
Storage ambient temperature	-25 to 75℃					
Operating ambient humidity	5 to 95%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		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.
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.

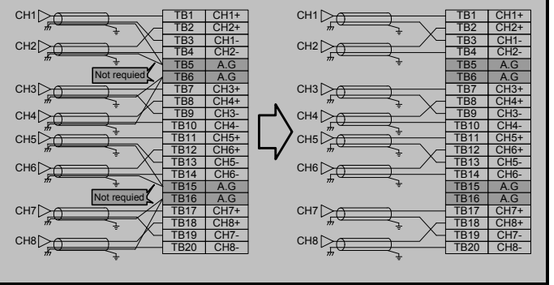
Conversion Adapter Model	MELSEC-AnS Series Model	No. of channels	MELSEC-Q Series Model	Conversion Adapter Weight (g)
ERNT-ASQT68AD-G	A1S68AD	8 channels	Q68AD−G	100



Precautions for wiring

*1 Set the pins of each channel (CH1 to CH8) according to the input.
The default settings for all channels are voltage input (V side)
Voltage input : set to V side
Current input : set to I side

*2 Wiring to connect the AG terminal (TB5, TB6, TB15, TB16) on the A1S68AD side is not required because there is no AG terminal on the Q68AD-G 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.



< Specification comparison >

Specification \ Model		MELSEC-AnS Series A1S68AD	MELSEC-Q Series Q68AD-G
Analog input	Voltage	-10 to 0 to +10VDC (Input resistance:1MΩ or more)	
	Current	0 to +20mA (Input resistance:250Ω)	
Digital output		16-bit signed binary	16-bit signed binary (Normal resolution mode:-4096 to 4095; High resolution mode:-12288 to 12287, -16384 to 16383)
Using scaling function		—	16-bit signed binary (-32768 to 32767)
I/O characteristics		Analog input range: 0 to 10V, -10 to 10V, 0 to 5V or 0 to 20mA, 1 to 5V or 4 to 20mA → Digital output: 0 to 4000, -2000 to 2000, 0 to 4000, 0 to 4000	Input: Voltage — Analog input range: 0 to 10V → Normal resolution mode: Digital output value 0 to 4000, Resolution 2.5mV → High resolution mode: Digital output value 0 to 16000, Resolution 0.625mV; 0 to 5V → Normal: 1.25mV → High: 0 to 12000, 0.416mV; 1 to 5V → Normal: 1.0mV → High: 0 to 12000, 0.333mV; 1 to 5V (Extended mode) → Normal: -1000 to 4500, 1.0mV → High: -3000 to 13500, 0.333mV; -10 to 10V → Normal: -4000 to 4000, 2.5mV → High: -16000 to 16000, 0.625mV; Users range setting → Normal: -4000 to 4000, 0.375mV → High: -12000 to 12000, 0.333mV. Input: Current — 0 to 20mA → Normal: 0 to 4000, 5μA → High: 0 to 12000, 1.66μA; 4 to 20mA → Normal: 0 to 4000, 4μA → High: 0 to 12000, 1.33μA; 4 to 20mA (Extended mode) → Normal: -1000 to 4500, 4μA → High: -3000 to 13500, 1.33μA; Users range setting → Normal: -4000 to 4000, 1.37μA → High: -12000 to 12000, 1.33μA
Maximum resolution		Analog input range: 0 to 10V, -10 to 10V, 0 to 5V, 1 to 5V, 0 to 20mA, 4 to 20mA → Resolution: 2.5mV, 5mV, 1.25mV, 1mV, 5μA, 4μA	
Overall accuracy	Reference accuracy *1	±1% (Digital output value:±40)	±0.1% (Normal resolution mode:±4digit *2; High resolution mode (0 to 10V, -10 to 10V):±16digit *2; High resolution mode (Other than the above ranges):±12digit *2)
	Temperature coefficient *3	—	±71.4ppm/℃(0.00714%/℃)
Maximum conversion speed (Sampling cycle *4)		0.5ms/channel *5	10ms/channel
Response time *6		—	20ms
Absolute maximum input		Voltage:±35V Current:±30mA	Voltage:±15V Current:±30mA
Analog input points		8 channels/module	
Isolation method	Between input terminal and programmable controller power supply	Photocoupler isolation	Transfomer isolation
	Between analog input and channels	Non-isolated	Transfomer 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)		0.4A	0.46A

*1 : Accuracy of offset/gain setting at ambient temperature
*2 : "digit" indicates a digital value
*3 : Accuracy per temperature change of 1℃
*4 : The cycle in which A/D conversion values are updated
*5 : The maximum conversion speed is 1 ms/channel on all channels if averaging processing is set even for only one channel.
*6 : The time required for an input signal to reach the A/D converter inside the Q68AD-G.

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. A1S68AD and Q68AD-G 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. Set the input range using the intelligent function module switch setting in the Q68AD-G instead of the DIP switches that are used in the A1S68AD.

POINT

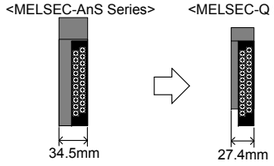
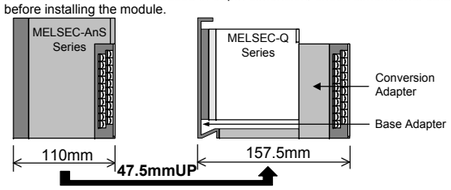
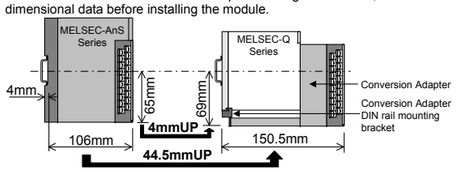
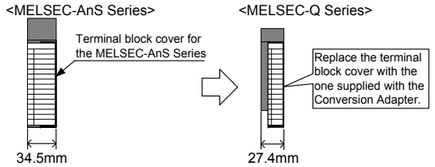
1. When an error occurs in the digital output value, the error can be corrected using the offset/gain setting in the Q68AD-G.

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) 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, 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.
(7) 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.
(8) 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. <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> 

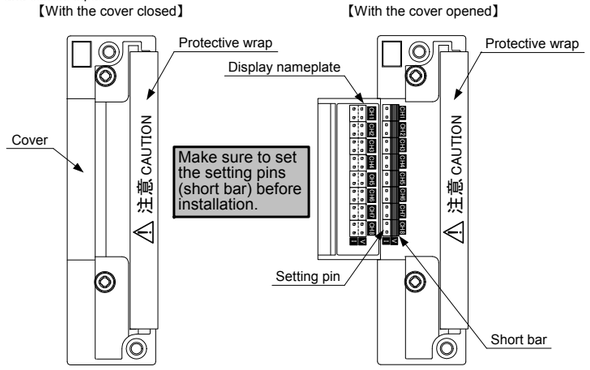
4.3 Installation Environment

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

5. 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 voltage input and current input.



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.

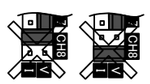
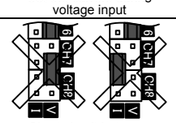
5.2 How to set the setting pins

Set the voltage input (V side) or current input (I side) for each channel using the short bar.
The short bar can be installed from any direction.

Channel	Current input	Voltage input (Factory setting)
CH1		
CH2		
CH3		
CH4		
CH5		
CH6		
CH7		
CH8		

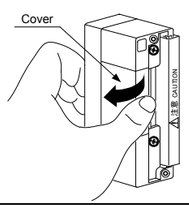
Notice

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

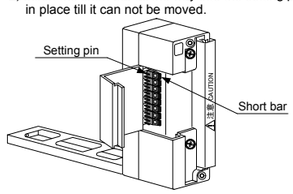
 Set the voltage during current input	 Set the current during voltage input	 No short bar installed
 Short circuit between I and V	 Short circuit between channels	

5.3 Procedure

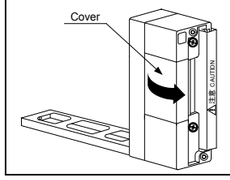
1 Open the cover.



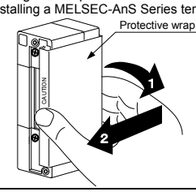
2 Set the setting pins (short bar) as necessary.
1) Set the pins in order from one side (CH1 or CH8) to avoid the incorrect setting.
2) Insert the short bar all the way into the setting pins in place till it can not be moved.



3 Make sure they have been set correctly and close the cover.

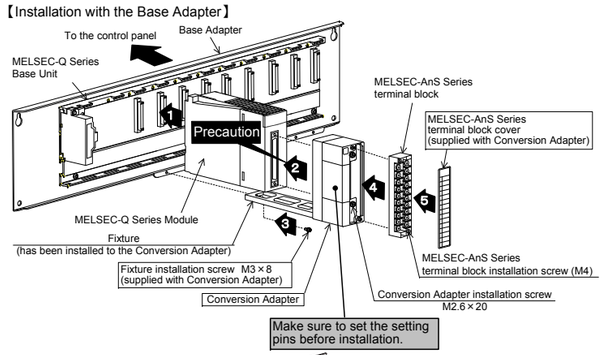


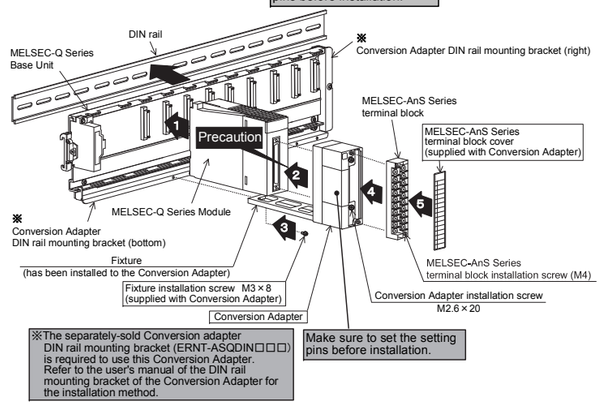
4 Hold the protective wrap with its rear side towards the right and peel it off towards yourself before installing a MELSEC-AnS Series terminal block.



6. Part Names and Installation Method

【Installation with the Base Adapter】





6.1 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.

1 Mount the MELSEC-Q Series module to the MELSEC-Q Series Base Unit.
2 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.

3 Secure the fixture to the Base Adapter or Conversion Adapter DIN rail mounting bracket (bottom) of the Conversion Adapter with fixture installation screws (M3 x 8). (1 place)
4 Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied terminal block installation screw (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 Adaptor in place.

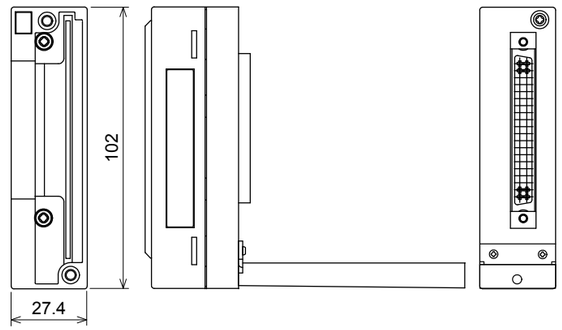
6.2 Tightening Torque

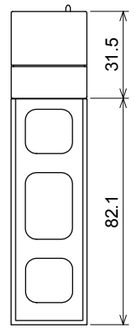
Tighten the module installation screws to the specified torque below. An inappropriate tightening torque could cause the product to fall or result in a short circuit, product failure or malfunction.

Screw Location	Tightening Torque Range
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

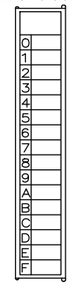
7. External Dimensions

Unit:mm





Terminal block cover



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 April 2016. Specifications are subject to change without notice.

Developed April 2016
50CM-D180119-D