Mitsubishi Electric Programmable Controller **Upgrade Tool**

Conversion Adapter

Model

ERNT-2AR64TT ERNT-2AR64TT1BW



User's Manual

50CM-D180361-A(1811)

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



(Always read these precautions prior to use.)

Before using this product, please read this manual carefully and pay full attention to safety to ensure that the product is used correctly.

The precautions presented in this manual are concerned with this product only. For Programmable Controller system safety precautions, refer to "Safety Guidelines" for MELSEC iQ-R Series Modules

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In this manual, the safety precautions are ranked as "WARNING" and "CAUTION."

<u></u> **MARNING ∴** CAUTION

Indicates that incorrect handling may cause hazardous ${\bf I}$ conditions, resulting in death or severe injury.

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 use

[Precautions before using]

♠ CAUTION

 When replacing the MELSEC-AnS Series with the MELSEC iQ-R Series, be sure to refer to the Programmable Controller Module manuals to check the differences in performance, functionality, CPU input/output signals, buffer memory addresses and

[Installation Precautions]

♠ CAUTION

- Use the conversion adapter and conversion adapter anchor base in the environment conditions described in the general specifications in "Safety Guidelines" for MELSEC iQ-R Series Modules. Failure to do so could lead to electric shock, fire, malfunction or product failure or deterioration.
- Do not come in direct contact with the conductive area of the conversion adapter Doing so could lead to system malfunction or failure.
- Fully secure the conversion adapter and conversion adapter anchor base using the installation screws, and tighten the installation screws securely within the specified torque range. Failure to do so could cause the conversion adapter and anchor base to fall, resulting in conversion adapter and conversion adapter anchor base damage.
- Always check for correct match between MELSEC iO-R Series and the conversion adapter. Incorrect match can cause damage to the MELSEC iQ-R Series module

[Wiring Precautions]

↑ WARNING

- Be sure to shut off all phases of the external power supply before performi installation or wiring work. Failure to do so could result in electric shock or product
- If you want to energize and run the unit after completing the installation and wiring work, be sure to close the terminal block cover attached to the MELSEC-AnS series terminal block. Failure to do so could result in electric shock

- Properly wire the conversion adapter after verifying the specifications and termina layout of the module to be used. Connecting a power supply with a different rating or mproper wiring could lead to fire or product failure.
- Securely tighten the conversion adapter installation screws, conversion adapter anchor base installation screws and MELSEC-AnS series terminal block installation screws within the specified torque range. A loose screw may result in a short circuit, fire or malfunction. An excessively tightened screw may result in screw or conversion adapter damage, causing the conversion adapter to fall, a short circuit or product malfunction.
- Do not allow foreign matter such as cuttings or wiring shavings to enter the conversion adapter or module. Doing so could lead to fire, failure or malfunction

[Startup and Maintenance Precautions]

↑ WARNING

- Do not touch the terminals during energization. Doing so could result in electric shock
- Be sure to shut off all phases of the external power supply before cleaning and retightening the terminal screws. Failure to do so could lead to electric shock. Excessively tightened screws could result in conversion adapter or input/output module damage, causing the conversion adapter to fall, a short circuit or product

- Do not disassemble or modify the conversion adapter. Doing so could lead to failure, malfunction, injur
 - The conversion adapter case is made of resin. Do not drop or apply excessive impact to the case. Doin so could lead to conversion adapter damage.

[Disposal Precautions]

♠ CAUTION

When disposing of the product, treat it as industrial waste

EMC AND LOW VOLTAGE DIRECTIVES

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997.

Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to declare that print a "CE mark" on their products.

Authorized representative in Europe

- Authorized representative in Europe is shown below Name: Mitsubishi Electric Europe B.V.
- Address: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

1. Overview

This manual describes the Mitsubishi Electric Programmable Controller Upgrade Tool conversion adapter (ERNT-2AR64TT, ERNT-2AR64TT1BW). The conversion adapter is a product that converts the differences in MELSEC-AnS series and MELSEC iO-R series pin

When replacing the MELSEC-AnS Series with the MELSEC iQ-R Series, be sure to refer to the Programmable Controller Module manuals to check the differences in performance, functionality, CPU input/output signals, buffer memory addresses and the like.

Once you have opened the packaging, verify that it contains the following products.								
		Quantity						
Product	Shape	ERNT-2AR	ERNT-2AR					
	-5	64TT	64TT1BW (*1)					
Conversion Adapter (ERNT-2AR64TT)		1	1					
Mounting bracket		1	1					
Mounting bracket (M3.5×6)	(()	2	2					
Terminal block cover		1	1					
Disconnection detector connector conversion cable		-	1					
Disconnection detector connector conversion cable installation screw (M3x8)	90	-	2					
This manual		1	1					

*1: ERNT-2AR64TT1BW is a model (product) name of a set of ERNT-2AR64TT conversion

2. Specifications

2.1 General Specifications

Item	Specifications								
Operating ambient temperature	0 to 55℃ (Maximum surrounding air temperature 55℃)								
Storage ambient temperature		-25 to 75℃							
Operating ambient humidity	E to OFR/ DIL non condensing								
Storage ambient humidity	5 to 95%RH, non-condensing								
	Compliant		Frequency	Constant acceleration	Half amplitude	Sweep count			
	Compliant with	Under	5 to 8.4Hz	-	3.5mm	10 times each in			
Vibration resistance	JIS B 3502 and IEC 61131-2	intermittent vibration	8.4 to 150Hz	9.8m/s ²	-	X, Y, Z directions			
		Under	5 to 8.4Hz	-	1.75mm				
	ILC 01151-2	continuous vibration	8.4 to 150Hz	4.9m/s ²	-	-			
Shock resistance		Compliant with JIS B 3502 and IEC 61131-2 (147m/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 *2							
Overvoltage category *3	II or less								
Pollution degree *4	2								

- *1: Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.
 *2: The enclosure is suitably designed for those specific environmental conditions, as applicable, and enclosure
- rate meets IP20 and minimum type 1 of UL 50.
- *3: This indicates the section of the power supply to which the equipment is assumed to be connected between
 the public electrical power distribution network and the machinery within premises.
 Category II applies to equipment for which electrical power is supplied from fixed facilities.
 *4: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
- Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally
- 2.2 Hardware Specifications

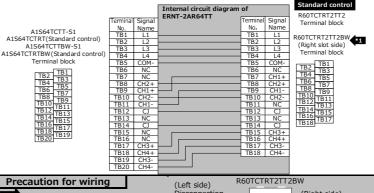
Item	Specifications
Rated voltage / current	24VDC(+25/-20%), 0.1A/Point, 0.4A/Common

3. Product Specifications

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

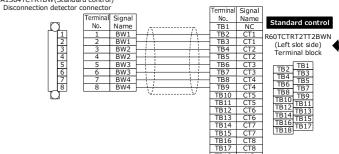
specifications of the conflected devices ffleet the specifications of the IQ-R Series Module.									
Conversion Adapter Model MELSEC-AnS Series Model		No. of channels	MELSEC iQ-R Series Model	Conversion Adapter Weight (g)					
	A1S64TCTT-S1			85					
ERNT-2AR64TT	A1S64TCTRT(Standard control, thermocouple)	4 channels	R60TCTRT2TT2						
FDAIT CARCATTARIA	A1S64TCTTBW-S1	4.1	DC0TCTDT2TT2DW	100					
ERNT-2AR64TT1BW	A1S64TCTRTBW(Standard control, thermocouple)	4 channels	R60TCTRT2TT2BW	180					

« Conversion adapter »



« Disconnection detector connector conversion cable »

A1S64TCTTBW-S1 A1S64TCTRTBW(Standard control)



*1 When using ERNT-2AR64TT1BW, always install the disconnection detector connector conversion cable to the left side, and the side. Installing them the other way

conversion cable adapter

	MELSEC iQ-R	series module.											
<sp∈< td=""><td>ecification con</td><td>nparison></td><td></td><td></td><td></td><td></td><td></td><td></td></sp∈<>	ecification con	nparison>											
	_	Madal		MELSEC-Ar	nS Series			MELSEC iQ-R Series					
Model		A1S64TCTT-S1 A1S64TCTTBW-S1		A1S64TCTRT A1S64TCTRTBW (Standard control, thermocouple) (Standard control, thermocouple)		R60TCTRT2TT2	R60TCTRT2TT2BW						
Contr	rol output					Transistor output							
	ber of temperature	input points	4 channels / module										
	orted thermocouple			Refer to the table on the back									
		Ambient temperature 23℃±5℃	Full sc	ale × (±0.3%) ±1digit		_		_					
	Indication	Ambient temperature 25℃±5℃		-	Full scal	e × (±0.3%) ±1digit	F	Full scale × (±0.3%)					
	accuracy	Ambient temperature 0 to 55℃		Full scale × (±0	F	Full scale × (±0.7%)							
Accu	Cold junction temperature	Ambient temperature :-100℃ or more			-	Within ±1.0℃							
racy	compensation accuracy (ambient	Ambient temperature :-150℃ to -100℃				Within ±2.0℃							
	(ambient temperature temperature												
Sampling cycle				500ms/ 4 (constant independently of the	Switchable between 250ms/ 4 channels and 500ms/ 4 channels								
Contr	rol output cycle			1 to 1		0.5 to 100.0s							
	t from wiring resist	ance of 1Ω			Refer	to the table on the back							
	impedance		1ΜΩ										
Input	filter		0 to 100s (0: Input filter OFF)										
Sensor correction value setting			version A: -5.00 to 5.00% on B or least : -50.00 to 50.00%	-5	0.00 to 50.00%		out range)) to Full scale of input range mpatible mode function is used						
	ation at sensor inpu					Jpscale processing							
Temp	perature control me		PID ON/OFF pulse or two-position control										
		PID constants setting	Can l	be set by auto tuning	Can be set by	auto tuning or self tuning		n be set by auto tuning					
PID constants range Proportional band (P)		Proportional band (P)	0.0 to 1000.0% (0: Two-position control)					de is used e of input range e decimal point position) control) mpatible mode function is used 1: Two-position control)					
		Integral time (I)	1 to 3600s					0 to 3600s (Set 0 for P control and PD control)					
Derivative time (D)			0 to 3600s (0: PI control)					0 to 3600s (Set 0 for P control and PI control)					
Set v	alue setting range		Within the temperature range set by the temperature sensor to be used										

Dead band setting range (depending on the decimal point position) ■ When the Q compatible mode function is used ON/OFF pu Rated load voltage 10.2 to 30VDC Max. load curren 0.1A/point 0.4A/comr

1.0VDC(TYP) 0.1A 2.5VDC(MAX) 0.1A Max. voltage drop at O OFF→ON: 2ms or less ON→OFF: 2ms or less

Between input terminal and programmable controller power supply: Transformer insulat Between input channels: Transformer insulation tween input and grounding: Transformer insulation Insulation method CTL-12-S36-10 (0.0 to 100.0A) CTL-12-S56-10 (0.0 to 100.0A) CTL-6-P-H (0.00 to 20.00A) CTL-6-S-H (0.00 to 20.00A) U.R.D.co.,LTD CTL-12-S36-8 (0.0 to 100.0A) CTL-6-P(-H) (0.00 to 20.00A) U.R.D.co.,LTD CTL-12-S36-8 (0.0 to 100.0A) CTL-6-P(-H) (0.00 to 20.00A) Current senso

Heater disconnection detection CTL-12L-8 (0.0 to 100.0A specifications Multiplexor method A/D Multiplexor method A/D Input method 3 to 255 I/O occupied points 32 points 2 slots 20-point terminal block Two 18-point terminal blocks Connection method

Precautions for the program

- (1) AnS series module and iQ-R series module differ from each other in the way input/output signals (X, Y) and buffer memory addresses are allocated. Therefore, you need make necessar changes to the sequence program that is used.
- (2) Set "0 (Use standard Terminal Block)" in the "Cold junction temperature compensation selection (address 182)" of the buffer memory of the MELSEC iQ-R series module

POINT

Transistor output

1) When the measured temperature has a margin of error, the sensor compensation function of R60TCTRT2TT2/R60TCTRT2TT2BW can compensate the error.

0.3A 10ms

Supported thermocouples and effect from wiring resistance of 1Ω

	°C								°F			
Thermocouple	Temperature measurement range			Resoluti Effect from wiring resistan			nce of 1Ω	ce of 1Ω Temperature measurement range		Effect from wiring resistance of 1Ω		
type	A1S64TCTT-S1 A1S64TCTTBW-S1	A1S64TCTRT A1S64TCTRTBW	R60TCTRT2TT2 R60TCTRT2TT2BW	on	A1S64TCTT-S1 A1S64TCTTBW-S1	A1S64TCTRT A1S64TCTRTBW	R60TCTRT2TT2 R60TCTRT2TT2BW	A1S64TCTT-S1 A1S64TCTRT R60TCTRT2T A1S64TCTTBW-S1 A1S64TCTRTBW R60TCTRT2TT2		A1S64TCTT-S1 A1S64TCTTBW-S1	A1S64TCTRT A1S64TCTRTBW	R60TCTRT2TT2 R60TCTRT2TT2BW
R			0 to 1700	1			0.030℃/Ω	0 to 3000	1			0.054°F/Ω
V	0 to 500, 0 to 800, 0 to 1300			1	1		0.005℃/Ω	0 to 1000, 0 to 2400	1			0.008°F/Ω
K	-200.0 to 400.0, 0.0 to 40		-200.0 to 400.0, 0.0 to 400.0, 0.0 to 500.0, 0.0 to 800.0, -200 to 1300	0.1			0.003 C/32	0.0 to 1000.0	0.1			0.0001/32
1), 0 to 800, 0 to 1200	1			0.003℃/Ω	0 to 1000, 0 to 1600, 0 to 2100	1	1		0.006°F/Ω
	0.0 to 400.0, 0.0 t	to 500.0, 0.0 to 800.0	0.0 to 400.0, 0.0 to 500.0, 0.0 to 800.0, -200.0 to 1000.0	0.1	0.1		0.000 0/32	0.0 to 1000.0	0.1	4		0.0001732
Т	-200 to 400, -200 to 200, 0 to 200, 0 to 400			1	1 0.35µ		0.15µ 0.004℃/Ω	0 to 700, -300 to 400	1	1		0.008°F/Ω
•	-200.0 to 400.0, 0.0 to 400.0 S 0 to 1700			0.1	V/Ω	V/Ω	V/Ω	0.0 to 700.0		1	'	
S			1		0.030℃/Ω		0 to 3000	1	4		0.054°F/Ω	
В	0 to 1800	0 to 1800 400 to 1800 0 to 1800 *1 0 to 400, 0 to 1000 0.0 to 700.0 0.0 to 700.0, -200.0 to 1000.0		1			0.038℃/Ω	0 to 3000 800 to 3000 0 to 3000 *	1 1	0.35µ	0.15u	0.068°F/Ω
E	0.0 t			0.1			0.003℃/Ω	0 to 1800	1	V/Ω	V/Ω	0.005°F/Ω
N	0 to 1300		1			0.006℃/Ω	0 to 2300	٠,	1		0.011°F/Ω	
IN	- 0.0 to 1000.0		0.1	_	_	0.006 C/S2	0 to 2300	1 1			0.011 F/52	
U	0 to 400, -200 to 200		1			0.004℃/Ω	0 to 700, -300 to 400	1			0.009°F/Ω	
	0.0 to 600.0		0.1		0.15μ V/Ω		,		4			
L	0 to 400, 0 to 900 0.0 to 400.0, 0.0 to 900.0		0.1	0.35μ V/Ω			0 to 800, 0 to 1600	1			0.006°F/Ω	
PLII	0 to 1200			1			0.005℃/Ω	0 to 2300	1	1		0.010°F/Ω
W5Re/W26Re	0 to 2300			1		1	0.017℃/Ω	0 to 3000	1	1		0.021°F/Ω

*1: Although a temperature lower than 400℃ or lower than 800℃ can be measured, the accuracy cannot be guaranteed.

4. Mounting and Installation

installing the module.

34.5mr

A1S64TCTT-S1 A1S64TCTRT

R60TCTRT2TT2

A1S64TCTTBW-S1 A1S64TCTRTBW

50TCTRT2TT2B

Installation with the DIN rail

Installation with the Base Adapter

data before installing the module.

110

dimensional data before installing the module.

106 .

4.1 Handling Precautions

4.2 Use Precautions

Item

Width

dimensi

of module

Terminal

Depth and

Height

dimension

block

cover

- (1) Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
 (2) Do not touch live terminals. There is a danger of electric shock or malfunction
- (3) Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- (4) Do not touch the energized part of the Conversion Adaptor directly. Contact will cause malfunction or failure in the system.

Use Precautions

<MELSEC_AnS Series> <MELSEC iQ-R Series>

The terminal block cover for MELSEC-AnS Series is bigger than the width

of the MELSEC iQ-R Series Module. Therefore, it is necessary to replace it

Because the module is increased in depth dimension, check dimensiona

66.6mm UP

66.6mmUP

Because the module is increased in depth and height dimension, check

63.6mmUF

27.8m

176.6

169.6

Terminal block cover for the MELSEC-AnS Series

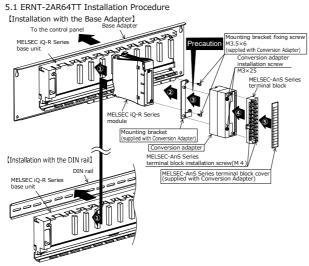
Because the module is reduced in width dimension (34.5mm→27.8mm

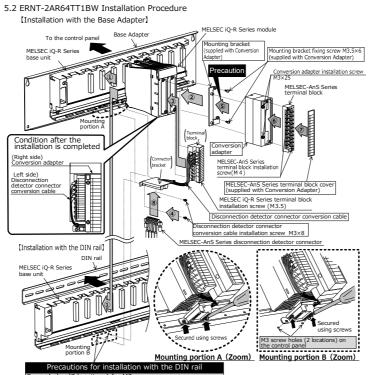
and thus in area available for wiring, check dimensional data before

- (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 iQ-R 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 iQ-R 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.
- (8) Conversion Adapter is intended for indoor use only.
- 4.3 Installation Environment Refer to "Safety Guidelines" for iQ-R Series Modules.
- 4.4 Wiring module power source

External connection to 24VDC power supply circuit of Conversion Adapter must be powered from approved source that meets of SELV/PELV, Class 2, and limited energy according to UL

5. Part Names and Installation Method





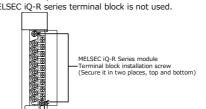
5.3 Installation Method Installation with the Base Adapter Installation with the DIN rail

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

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

Mount the DIN rail mounting adapter

FRNT-FRNT-2AR64 Description TRW Install the MELSEC iQ-R Series module to the MELSEC iQ-R Series Base 1 1 Unit. Remove the terminal block attached with the MELSEC iQ-R Series module after loosening the terminal block installation screws (2 places up and (When using R60TCTRT2TT2BW, remove the terminal blocks from both right and left slots.) The MELSEC iQ-R series terminal block is not used



Secure the mounting bracket to the MELSEC iQ-R Series module (to the right slot when using R60TCTRT2TT2BW) using the mounting bracket fixing screws (M3.5 \times 6). (2 places)

Fix the terminal block for the disconnection detector connector conversion cable to the target MELSEC iQ-R series module (left slot) using the MELSEC iQ-R series terminal block installation screws (M3.5). (2 places, top and bottom)

Fix the connector bracket of the disconnection detector connector conversion cable to the base adapter or the conversion adapter DIN rail mounting bracket (bottom) using the disconnection detector connector conversion cable installation screws (M3 \times 8). (2 places)

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

mounting bracket.

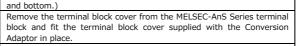
2

2

Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the MELSEC iQ-R Series module. Tightening the screws in floating-off state or tilting state will damage the Conversion Adapter installation screws and the

Secure the MELSEC-AnS Series terminal block to the Conversion Adapte with the supplied terminal block installation screw (M4). (2 places, top





Connect the MELSEC-AnS series disconnection detector connector to the **(8)** disconnection detector connector conversion cable.

5.4 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

nanancion.	
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)	0.78 to 1.18N·m
MELSEC iQ-R Series terminal block installation screw (M3.5)	0.66 to 0.89N·m
Disconnection detector connector conversion cable installation screw (M3×8)	0.61 to 0.82N·m

6. External Dimensions

Unit: mm Disconnection detector connector conversion cable
Terminal block (ERNT-2AR64TT1BW only) 27.4

Duplication Prohibited

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MELSEC, MELSEC iQ-R is a registered trademark of Mitsubishi Electric Corporation in Japan. ERNT is a registered trademark of Mitsubishi Electric Engineering Corporation in Japan.

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

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 othe work carried out by the user.

Changes in Product Specifications

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

This document is a new publication, effective November 2018. Specifications are subject to change without notice.

Developed November 2018 50CM-D180361-A