

Mitsubishi General-Purpose Programmable Controller Renewal Tool

Conversion Adapter

Model
ERNT-AQT38

User's Manual



50CM-D180197-B(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 SHIMOHASHIKICHO-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 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 between the two modules.

Installation Precautions

CAUTION

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

Wiring Precautions

WARNING

- Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
- After installation and wiring, close the terminal block cover before turning on the module for operation. Failure to do so may result in electric shock.

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 terminal installation screws and terminal screw securely by applying torque within the specified limits. Loose screws will cause short circuit, fire or malfunction. Excessive tightening will damage the screws or the Conversion Adapter which in turn will cause dropping of parts, short circuit or malfunction.
- Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.

Startup and Maintenance Precautions

WARNING

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

CAUTION

- Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause damage.

Disposal Precautions

CAUTION

- When disposing of the product, treat it as industrial waste.

EMC AND LOW VOLTAGE DIRECTIVES

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

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

Authorized representative in Europe

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

1. Overview

This manual describes specifications, handling and other information about the Conversion Adapter "ERNT-AQT38" available as Renewal Tools for the Mitsubishi General-Purpose Programmable Controller.

Before attempting to make a switch 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	Shape	Quantity	Product	Shape	Quantity
Conversion Adapter		1	Mounting bracket fixing screws (M2.6 x 4)		2
Mounting bracket		1	Terminal block		1
			This manual	-	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	Compliant with JIS B 3502 and IEC 61131-2 <table border="1" style="margin-left: 20px;"> <tr> <th></th> <th>Frequency</th> <th>Constant acceleration</th> <th>Half amplitude</th> <th>Sweep count</th> </tr> <tr> <td>Under intermittent vibration</td> <td>5 to 8.4Hz</td> <td>—</td> <td>3.5mm</td> <td>10 times each in X, Y, Z directions</td> </tr> <tr> <td>Under continuous vibration</td> <td>5 to 8.4Hz</td> <td>—</td> <td>1.75mm</td> <td>—</td> </tr> <tr> <td></td> <td>8.4 to 150Hz</td> <td>4.9m/s²</td> <td>—</td> <td>—</td> </tr> </table>		Frequency	Constant acceleration	Half amplitude	Sweep count	Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, Z directions	Under continuous vibration	5 to 8.4Hz	—	1.75mm	—		8.4 to 150Hz	4.9m/s 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																	
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. Products Required by the Conversion Adapter

(1) Conversion Adapter Anchor Base (Sold Separately)
 The conversion adapter anchor base secures the bottom of the conversion adapter. One anchor base is required per base unit.

Conversion Adapter Anchor Base model	Specifications	Weight (g)
ERNT-AQF12	12-slot conversion adapter anchor base	590
ERNT-AQF8	8-slot conversion adapter anchor base	410
ERNT-AQF5	5-slot conversion adapter anchor base	275
ERNT-AQF3	3-slot conversion adapter anchor base	185

(2) Base Adapter (Sold Separately)
 Both the MELSEC-Q series base unit and the conversion adapter anchor base can be installed on the base adapter without drilling screw holes. However, drilling screw holes (M5 screws) is required to install the base adapter to the panel surface. For the base unit models marked with *1 to *5, two or more base adapter models are applicable. Select the most suitable base adapter according to the product dimensions.

Base adapter model	Installable					Product dimensions (mm)	Weight (g)
	MELSEC-Q Series base unit						
	12 slots	8 slots	5 slots	3 slots	2 slots	Anchor Base	
ERNT-AQB38	Q312B	Q38B(*1)				ERNT-AQF12, ERNT-AQF8	480×240 970
ERNT-AQB35		Q38B(*1)				ERNT-AQF8, ERNT-AQF5	382×240 795
ERNT-AQB32			Q35B			ERNT-AQF5	247×240 675
ERNT-AQB68	Q612B	Q68B(*2)		Q33B		ERNT-AQF3	466×240 930
ERNT-AQB65		Q68B(*2)				ERNT-AQF12, ERNT-AQF8	352×240 790
ERNT-AQB62			Q65B(*3)			ERNT-AQF5	238×240 650
ERNT-AQB58		Q68B(*2)		Q63B	Q52B(*5)	ERNT-AQF3	411×240 870
ERNT-AQB55			Q65B(*3)			ERNT-AQF5	297×240 655
ERNT-AQB52			Q55B(*4)		Q52B(*5)	ERNT-AQF3	183×240 505

4. Product Specifications

For the details of specifications of the MELSEC-Q series modules not described herein, refer to the user's manual of the applicable MELSEC-Q series module. Also, check that the specifications of the connected devices meet the specifications of the MELSEC-Q series module.

(1) MELSEC-Q Series module

The conversion adapter can be used in combination with the following MELSEC-Q series modules.

Input/Output	MELSEC-Q Series module model			
Input	QX41	QX41-S1	QX41-S2	QX71
Output	QY41P	QY41H	QY71	

(2) Specifications of the terminal block (conversion adapter accessory)

- Applicable solderless terminal

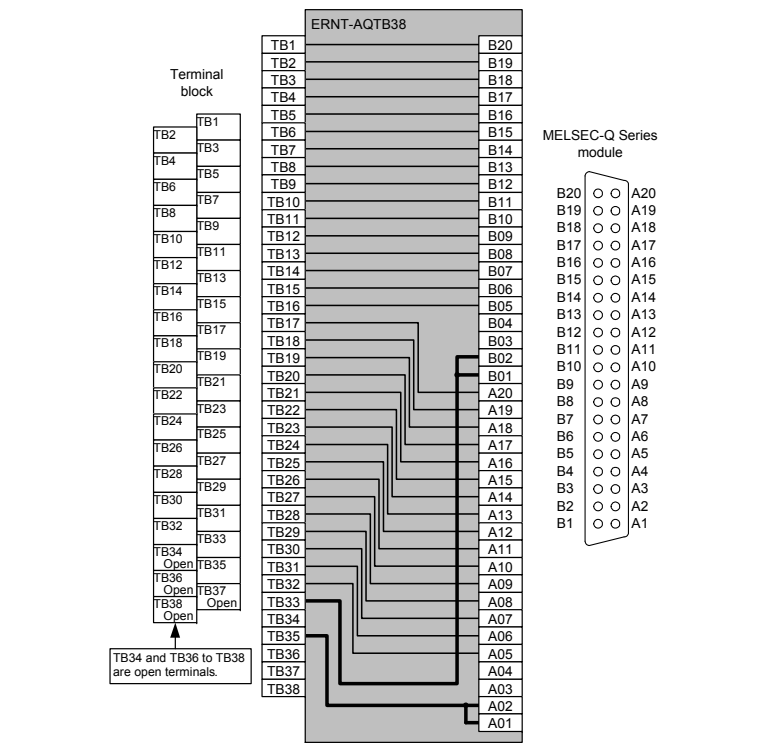
Unit: mm

※The minimum length is 4.75 mm when the solderless terminal is attached up side down as shown below.

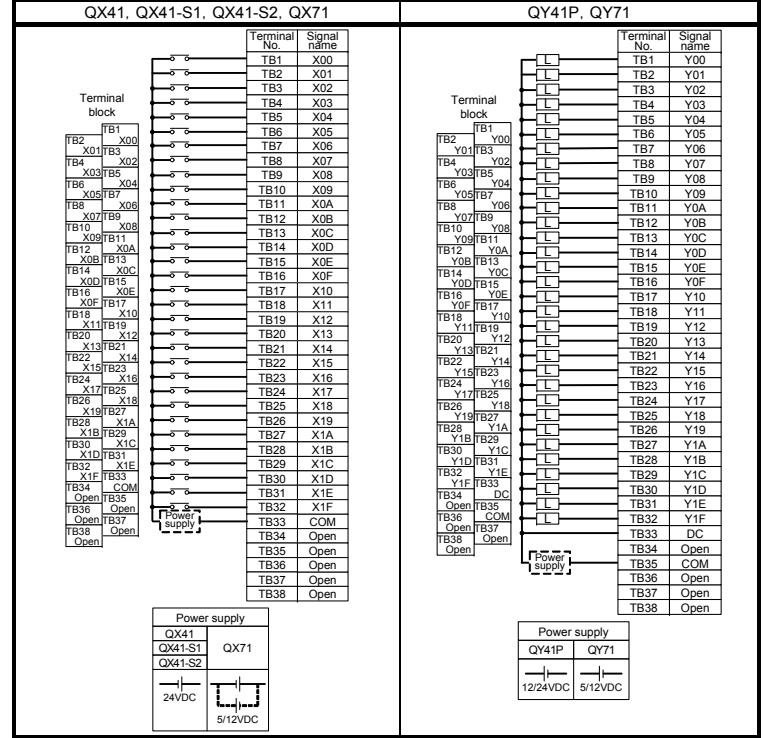
- Terminal block shape

Unit: mm

(3) Internal connection



(4) External connection



(5) MELSEC-Q Series module specification

① Input module

Specification	Model (Positive common)	QX41 (Positive common)	QX41-S1 (Positive common)	QX41-S2 (Positive common)
Number of input points	32 points	32 points	32 points	32 points
Isolation method	Photocoupler isolation	Photocoupler isolation	Photocoupler isolation	Photocoupler isolation
Rated input voltage	24VDC (+20/-15%)	24VDC (+20/-15%)	24VDC (+20/-15%)	24VDC (+20/-15%)
Rated input current	Approx. 4mA	Approx. 4mA	Approx. 4mA	Approx. 8mA
ON voltage/ON current	19V or higher/3mA or higher	19V or higher/3mA or higher	15V or higher/3mA or higher	15V or higher/3mA or higher
OFF voltage/OFF current	11V or lower/1.7mA or lower	9.5V or lower/1.5mA or lower	5V or lower/1.7mA or lower	5V or lower/1.7mA or lower
Input resistance	Approx. 5.6kΩ	Approx. 5.6kΩ	Approx. 3.6kΩ	Approx. 3.6kΩ
Response time	OFF to ON: 1/5/10/20/70ms or less ON to OFF: 1/5/10/20/70ms or less	0.1/0.2/0.4/0.8/1ms or less	1/5/10/20/70ms or less	1/5/10/20/70ms or less
Internal current consumption	75mA(TYP. all points ON)	75mA(TYP. all points ON)	75mA(TYP. all points ON)	75mA(TYP. all points ON)
Common terminal arrangement	32 points/common	32 points/common	32 points/common	32 points/common

② Output module

Specification	Model (Positive/Negative shared common)
Number of output points	32 points
Isolation method	Photocoupler isolation
Rated input voltage	5VDC (+20/-10%) 12VDC (+20/-15%)
Rated input current	Approx. 1.2mA Approx. 3.3mA
ON voltage/ON current	3.5V or higher/1mA or higher
OFF voltage/OFF current	1V or lower/0.1mA or lower
Input resistance	Approx. 3.3kΩ
Response time	OFF to ON: 1/5/10/20/70ms or less ON to OFF: 1/5/10/20/70ms or less
Internal current consumption	95mA(TYP. all points ON)
Common terminal arrangement	32 points/common

(5) MELSEC-Q Series module specification

① Input module

Model	QX41 (Positive common)	QX41-S1 (Positive common)	QX41-S2 (Positive common)
Number of input points	32 points	32 points	32 points
Isolation method	Photocoupler isolation	Photocoupler isolation	Photocoupler isolation
Rated input voltage	24VDC (+20/-15%)	24VDC (+20/-15%)	24VDC (+20/-15%)
Rated input current	Approx. 4mA	Approx. 4mA	Approx. 8mA
ON voltage/ON current	19V or higher/3mA or higher	19V or higher/3mA or higher	15V or higher/3mA or higher
OFF voltage/OFF current	11V or lower/1.7mA or lower	9.5V or lower/1.5mA or lower	5V or lower/1.7mA or lower
Input resistance	Approx. 5.6kΩ	Approx. 5.6kΩ	Approx. 3.6kΩ
Response time	OFF to ON: 1/5/10/20/70ms or less ON to OFF: 1/5/10/20/70ms or less	0.1/0.2/0.4/0.8/1ms or less	1/5/10/20/70ms or less
Internal current consumption	75mA(TYP. all points ON)	75mA(TYP. all points ON)	75mA(TYP. all points ON)
Common terminal arrangement	32 points/common	32 points/common	32 points/common

(5) MELSEC-Q Series module specification

② Output module

Model	QX71 (Positive/Negative shared common)
Number of output points	32 points
Isolation method	Photocoupler isolation
Rated input voltage	5VDC (+20/-10%) 12VDC (+20/-15%)
Rated input current	Approx. 1.2mA Approx. 3.3mA
ON voltage/ON current	3.5V or higher/1mA or higher
OFF voltage/OFF current	1V or lower/0.1mA or lower
Input resistance	Approx. 3.3kΩ
Response time	OFF to ON: 1/5/10/20/70ms or less ON to OFF: 1/5/10/20/70ms or less
Internal current consumption	95mA(TYP. all points ON)
Common terminal arrangement	32 points/common

2 Output module

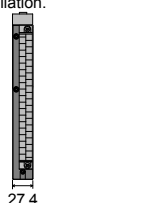
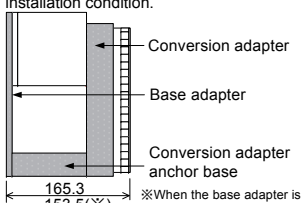
Model	QY41P (Sink type)	QY41H (Sink type)	QY71 (Sink type)
Specification			
Number of output points	32 points	32 points	32 points
Isolation method	Photocoupler isolation	Photocoupler isolation	Photocoupler isolation
Rated load voltage	12 to 24VDC (+20/-15%)	5 to 24VDC (+20/-15%)	5 to 12VDC (+25/-10%)
Maximum load current	0.1A/point, 2A/common	0.2A/point, 2A/common	16mA/point, 512mA/common
Maximum inrush current	0.7A 10ms or less	0.7A 10ms or less	40mA 10ms or less
Leaked current at OFF	0.1mA or less	0.1mA or less	V _{ov} : 3.5VDC (V _{cc} =5VDC, I _{ov} =0.4mA)
Maximum voltage drop at ON	0.1VDC(TYP.)0.1A 0.2VDC(MAX.)0.1A	0.1VDC(TYP.)0.1A 0.2VDC(MAX.)0.1A	V _{cc} : 0.3VDC
Response time	OFF to ON 1ms or less ON to OFF 1ms or less (rated load, resistive load)	2μs or less 2μs or less (rated load, resistive load)	0.5ms or less 0.5ms or less (resistive load)
Surge suppressor	Zener diode	Zener diode	No
Fuse	No	No	1.6A(unchangeable) (fuse capacity: 50A)
Protection function	Yes(overload protection, overheat protection)	No	No
Internal current consumption	105mA(TYP. all points ON)	370mA(TYP. all points ON)	150mA(TYP. all points ON)
Common terminal arrangement	32 points/common	32 points/common	32 points/common

5. Mounting and Installation

5.1 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 Adaptor directly. Contact will cause malfunction or failure in the system.
- Fasten the Conversion Adapter and the Mounting bracket securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter, or Mounting bracket, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Converter Adaptor, Mounting bracket, 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 and Mounting Bracket or do not give a strong impact to it. This will cause damage.

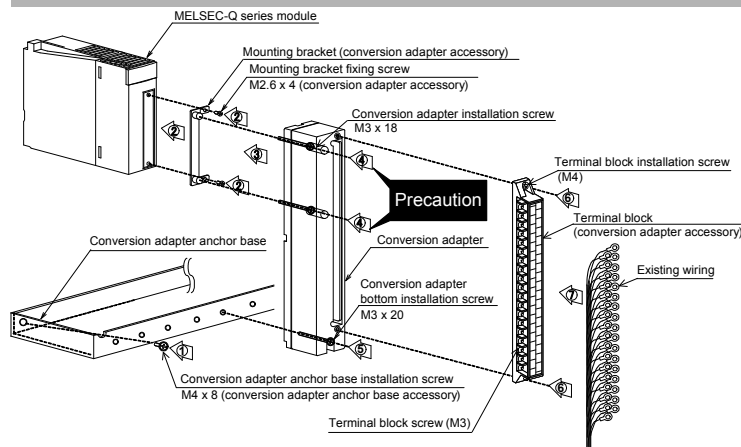
5.2 Use Precautions

Item	Width dimension of module	Depth dimension
Use Precautions	The module width dimension is 27.4 mm. Check the conditions for wiring space and installation. 	The depth dimension required for installation is 165.3 mm. Check the installation condition. 

5.3 Installation Environment

The installation environment is the same as MELSEC-Q series CPU Module to use. Refer to the user's manual of the MELSEC-Q Series CPU Module to be used.

6. Part Names and Installation Method



6.1 Installation Method

- Secure the conversion adapter anchor base to the base adapter or control panel using the conversion adapter anchor base installation screws (M4 x 8) provided as an accessory. (Two end locations)
- Secure the mounting bracket to the Q series module using the mounting bracket fixing screws [M2.6 x 4 (conversion adapter accessory); two upper/lower locations].
- Mount the conversion adapter onto the mounting bracket.
- Secure the conversion adapter using the conversion adapter installation screws (M3 x 18; 2 locations).

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 conversion adapter using the conversion adapter bottom installation screw (M3 x 20; 1 location).

6) Secure the terminal block to the conversion adapter using the terminal block installation screws (M4; two upper/lower locations).

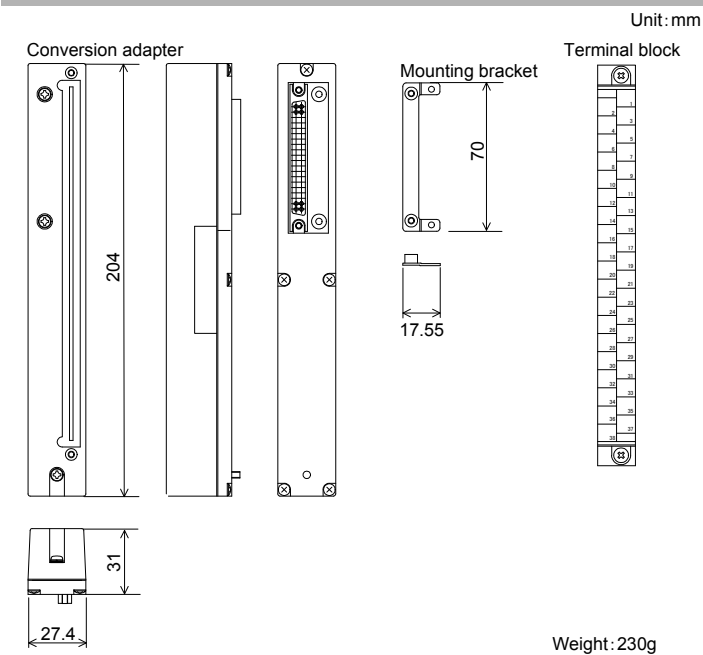
7) Connect the existing wiring to the terminal block.
When any wires are left unconnected, connect them to open terminals or insulate them.

6.2 Tightening Torque

Tighten the 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 anchor base installation screw (M4x8)	1.39 to 1.89N·m
Mounting bracket fixing screw (M2.6x4)	0.20 to 0.29N·m
Conversion Adapter installation screw (M3x18)	0.43 to 0.57N·m
Conversion Adapter bottom installation screw (M3x20)	
Terminal block installation screw (M4 screw)	1.02 to 1.38N·m
Terminal block screw (M3 screw)	0.43 to 0.57N·m

7. External Dimensions



Item	Weight
Conversion adapter	230g

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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.