

MITSUBISHI

Q Series Large Type Base Unit/ I/O Module/Blank Cover

User's Manual

Q35BL QX11L QG69L
Q38BL QY13L
Q65BL QY23L
Q68BL
Q55BL

Thank you for purchasing the Mitsubishi programmable controller MELSEC-Q series.

Prior to use, please read this and relevant manuals thoroughly to fully understand the product.

MELSEC-Q
Mitsubishi Programmable
Controller

MODEL	Q-LARGE-U-E
MODEL CODE	13JZ08
IB(NA)-0800408-B(0803)MEE	

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GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations to explain the Q series large type base units, Q series large type I/O modules and Q series large type blank cover.

Generic term/abbreviation	Description
Q series large type base unit	Generic term for Q series large type main base unit and Q series large type extension base units
Q series large type main base unit	Generic term for Q35BL and Q38BL MELSEC-Q series main base units
Q series large type extension base unit	Generic term for Q65BL, Q68BL, and Q55BL MELSEC-Q series extension base units
Q series large type I/O module	Generic term for QX11L, QY13L, and QY23L MELSEC-Q series I/O modules
Q series large type blank cover	Abbreviation for QG69L MELSEC-Q series blank cover
Q series	Abbreviation for Mitsubishi MELSEC-Q series programmable controller
A/QnA series	Abbreviation for Mitsubishi MELSEC-A/QnA series programmable controller
High Performance model QCPU	Generic term for Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU
MELSECNET/H remote I/O module	General term for QJ72LP25-25, QJ72LP25G, QJ72LP25GE, and QJ72BR15
Q3□B	Generic term for Q33B, Q35B, Q38B, and Q312B main base units on which CPU module (except Q00JCPU), Q series power supply module, Q series I/O module, and intelligent function module can be mounted
Q5□B	Generic term for Q52B and Q55B extension base units on which Q series I/O module and intelligent function module can be mounted
Q6□B	Generic term for Q63B, Q65B, Q68B, and Q612B extension base units on which Q series power supply module, Q series I/O module, and intelligent function module can be mounted
QA1S6□B	Generic term for QA1S65B and QA1S68B extension base units on which AnS series power supply module, AnS series I/O module, and special function module can be mounted
QA6□B	Generic term for QA65B and QA68B extension base units on which A series power supply module, A series I/O module, and special function module can be mounted
A5□B	Generic term for A52B, A55B, and A58B extension base units on which A series I/O module and special function module can be mounted without power supply
A6□B	Generic term for A62B, A65B, and A68B extension base units requiring power supply on which A series I/O module and special function module can be mounted
QA6ADP	Abbreviation for QA6ADP QA conversion adapter module
QA6ADP+A5□B/A6□B	Abbreviation for A large type extension base unit on which QA6ADP is mounted

Generic term/abbreviation	Description
Power supply module	Generic term for Q61P-A1, Q61P-A2, Q61P, Q62P, Q63P, Q64P power supply modules
SRAM card	Generic term for Q2MEM-1MBS and Q2MEM-2MBS SRAM cards
32-point terminal block	Abbreviation for MELSEC-A series 32-point terminal block

1. OVERVIEW

1.1 Overview

These products are used to utilize 32-point terminal block mounted on existing A series I/O module without change when replacing the A/QnA series by the Q series.

The following table shows the corresponding models for replacement.

A series I/O module model to be replaced	Q series large type I/O module replacement model
AX11	QX11L
AY13	QY13L
AY23	QY23L

This User's Manual explains specifications, component devices, part names, settings, mounting, and installation of the Q series large type base unit, Q series large type I/O module, and Q series large type blank cover.

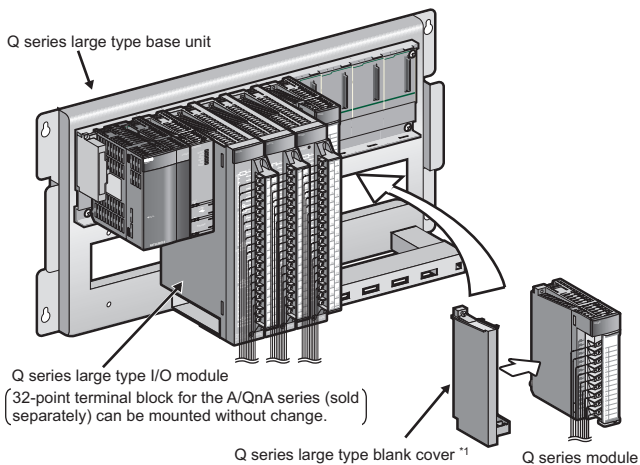
For contents not explained in this manual such as SAFETY PRECAUTIONS, EMC and Low Voltage Directives, and general specifications, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection) SH-080483ENG.

1.2 Features

This section explains features of the Q series large type base unit, Q series large type I/O module, and Q series large type blank cover.

- (1) The 32-point terminal block used for the A/QnA series can be mounted on the Q series large type I/O module.
This eliminates wiring change when replacing the A/QnA series.
- (2) The Q series large type I/O module has performance specifications equivalent to the A/QnA series.
- (3) Since the A/QnA series base unit has the same mounting dimensions with the Q series large type base unit, the mounting holes can be utilized.

- (4) The Q series large type I/O module and Q series module can be mounted together on the Q series large type base unit. The renewal tool manufactured by MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED (hereafter, abbreviated as renewal tool) can be mounted on the Q series module, and a connector and terminal block used with the A/QnA series can be used without wiring change.



*1 : To mount Q series module on the I/O slot of Q series large type base unit, always attach Q series large type blank cover.

1.3 Supplied Parts

The following tables show parts supplied with each module.

(1) Q series large type main base unit

Product	Model	Quantity	Remarks
Q series large type main base unit	Q35BL	1	-
	Q38BL		
Fixture	-	1	-
Fixture attachment screw	-	4	M4 × 10 screws
This manual	-	1	-
Safety Guidelines	IB-0800423	1	-

(2) Q series large type extension base unit

Product	Model	Quantity	Remarks
Q series large type extension base unit	Q65BL	1	-
	Q68BL		
	Q55BL		
Fixture	-	1	-
Fixture attachment screw	-	4	M4 × 10 screws
This manual	-	1	-

(3) Q series large type I/O module

Product	Model	Quantity	Remarks
Q series large type I/O module	QX11L	1	-
	QY13L		
	QY23L		
Dustproof cover for fuse replacement window	-	1	Supplied with the QY23L only.

(4) Q series large type blank cover

Product	Model	Quantity	Remarks
Q series large type blank cover	QG69L	1	-

1.4 Related Parts (Sold Separately)

Purchase the following related parts when necessary.

- (1) 32-point terminal block for I/O module

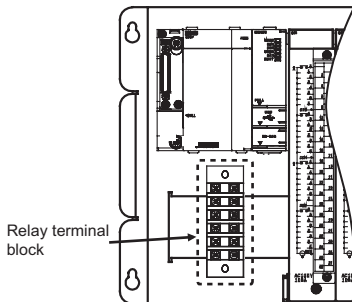
The Q series large type I/O module does not include 32-point terminal block.

To use this product in new system, purchase the following product.

Product	Model	Manufacturer
MELSEC-A series 32-point terminal block	K14K 08H 075 000 03	Mitsubishi Electric System & Service Co., Ltd.

- (2) Relay terminal block for power supply wiring

When the terminal block on power supply module mounted on the Q series large type base unit cannot be wired using wiring to the power supply module used with the A/QnA series, purchase the following terminal block and relay the wiring to the power supply module.



Product	Model	Manufacturer
Relay terminal block	ML-20 (The number of poles: 6 pieces)	SATO PARTS CO.,LTD

2. SYSTEM CONFIGURATION

2.1 System Configuration

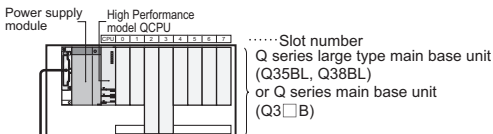
This section explains system configuration when using the Q series large type base unit.

The following modules can be mounted on the CPU slot of the Q series large type base unit.

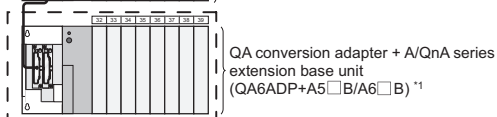
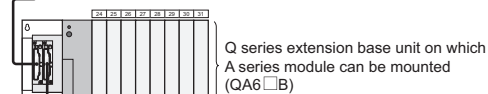
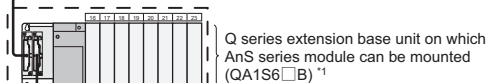
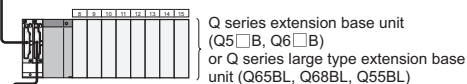
- High Performance model QCPU
- MELSECNET/H remote I/O module

(1) System configuration using the High Performance model QCPU

■ Main base unit



■ Extension base unit



*1 : The extension base units QA1S6□B and QA6ADP+A5□B/A6□B cannot be used together.

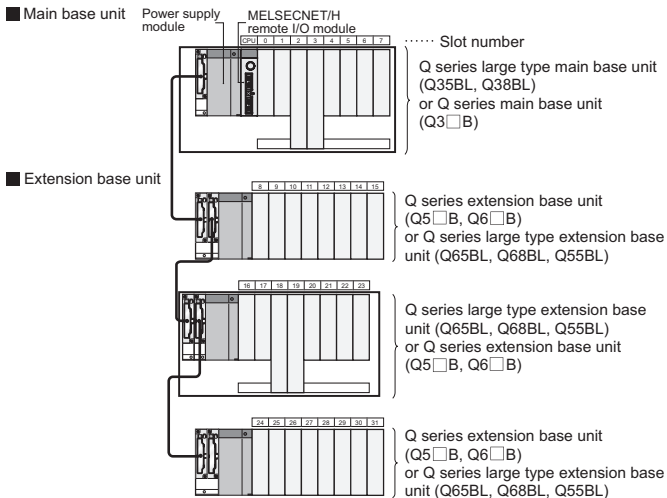
The following table shows restrictions on system configuration.

Maximum number of extension stages of extension base units	7 extension stages	
Maximum number of mountable I/O modules	64 modules	
Applicable main base unit model	Q33B, Q35B, Q38B, Q312B, Q35BL, Q38BL	
Applicable extension base unit model	Model requiring no power supply module	Q52B, Q55B, QA6ADP+A5□B, Q55BL
	Model requiring Q series power supply module	Q63B, Q65B, Q68B, Q612B, Q65BL, Q68BL
	Model requiring AnS series power supply module	QA1S65B, QA1S68B
	Model requiring A series power supply module	QA65B, QA68B, QA6ADP+A6□B
Extension cable model	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Q series power supply module model	Q61P-A1, Q61P-A2, Q61P, Q62P, Q63P, Q64P	
AnS series power supply module model	A1S61PN, A1S62PN, A1S63P	
A series power supply module model	A61P, A61PN, A62P, A63P, A61PEU, A62PEU	

■ Precautions

- Use extension cable so that the overall extension length can be within 13.2m (43.31 ft.).
- Do not install the extension cable together with the main circuit (high voltage and high current) line or bring them close to each other.
Keep a distance of 100mm (3.94 inch) or more between them.
- Set the number of extension stages so that the number is not duplicated with another.
- The extension base units QA1S6□B and QA6ADP+A5□B/A6□B cannot be used together.
- When multiple types of extension base units are used together, connect them in the following order from the nearest position of the main base unit.
(Q5□B/Q6□B → QA1S6□B → QA6□B) or
(Q5□B/Q6□B → QA6□B → QA6ADP+A5□B/A6□B)
- Assign module I/O number with putting each series in block so that the order can be "from Q series to A series" or "from A series to Q series". Failure to do so causes an error "SP.UNIT LAY ERR." (error code: 2124). In addition, do not duplicate the I/O number.
- Connect the extension cable from OUT of the extension cable connector on the base unit to IN of the extension base unit on the next stage.
- If the number of mounted modules exceeds the maximum number of mountable I/O modules, an error "SP.UNIT LAY ERR." (error code: 2124) occurs.

(2) System configuration using the MELSECNET/H remote I/O module



The following table shows restrictions on system configuration.

Maximum number of extension stages of extension base units	7 extension stages	
Maximum number of mountable I/O modules	64 modules	
Applicable main base unit model	Q33B, Q35B, Q38B, Q312B, Q35BL, Q38BL	
Applicable extension base unit model	Model requiring no power supply module	Q52B, Q55B, Q55BL
	Model requiring Q series power supply module	Q63B, Q65B, Q68B, Q612B, Q65BL, Q68BL
Extension cable model	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Q series power supply module model	Q61P-A1, Q61P-A2, Q61P, Q62P, Q63P, Q64P	

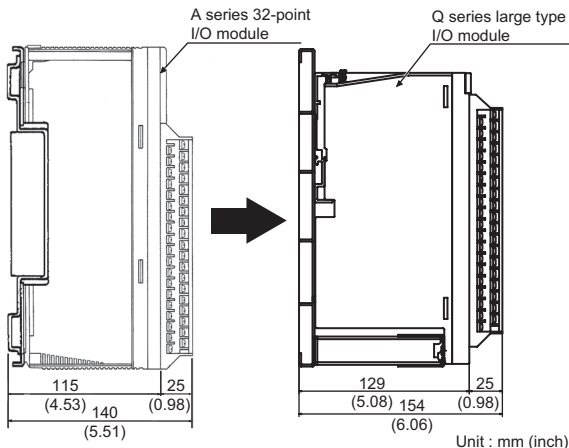
■ Precautions

- Use extension cable so that the overall extension length can be within 13.2m (43.31 ft.).
- Do not install the extension cable together with the main circuit (high voltage and high current) line or bring them close to each other.
Keep a distance of 100mm (3.94 inch) or more between them.
- Set the number of extension stages so that the number is not duplicated with another.
- Connect the extension cable from OUT of the extension cable connector on the base unit to IN of the extension base unit on the next stage.
- If the number of mounted modules exceeds the maximum number of mountable I/O modules, an error "SP.UNIT LAY ERR." (error code: 2124) occurs.

2.2 Precautions for System Configuration

This section explains precautions for using the products.

- (1) The Q series large type main base unit or Q series large type extension base unit cannot configure multiple CPU system.
- (2) To mount the Q series module on Q series large type base unit, always attach the Q series large type blank cover.
(unnecessary for a module mounted on CPU slot and power supply module.)
- (3) To mount the Q series module between Q series large type I/O modules, wire the Q series module beforehand.
- (4) The Q series large type I/O module is larger than A series 32-point I/O module in depth by 14mm (0.55 inch). Before replacing the A/QnA series, check if there is enough space for depth.



- (5) Since the A series and Q series differ in rated output current of power supply module (24VDC), when the power supply module is used as external supply power for I/O module with the A series, another external power supply may be required in replacement from the A series.

2.3 Modules that cannot be Mounted on the Q Series Large Type Base Unit

This section explains modules that cannot be mounted on the Q series large type base unit.

(1) Two-slot module

Example Such as Q64TCRTBW, Q64TCTTBW, QD70D4, QD70D8, and QJ71LP21S-25

(2) Module to which the Q series large type blank cover cannot be attached since its height exceeds 98mm (3.86 inch)

Example Module on which such as the Q66AD-DG, Q66DA-G, Q68AD-G or Q7BAT-SET is mounted

3. SPECIFICATIONS

3.1 Specifications of the Q Series Large Type Base Unit

The following tables show performance specifications of the Q series large type base unit.

(1) Q series large type main base unit

Item	Model		
	Q35BL	Q38BL	
Number of mountable I/O modules	5	8	
Extendability	Extendable		
Applicable module	Q series module, Q series large type I/O module		
5 VDC internal current consumption	0.11A	0.12A	
External dimensions	H	240mm (9.45 inch)	
	W	382mm (15.04 inch)	480mm (18.90 inch)
	D	110mm (4.33 inch)	
Weight	1.87kg	2.35kg	
DIN rail installation	Not installable		

(2) Q series large type extension base unit (with power supply)

Item	Model		
	Q65BL	Q68BL	
Number of mountable I/O modules	5	8	
Extendability	Extendable		
Applicable module	Q series module, Q series large type I/O module		
5 VDC internal current consumption	0.11A	0.12A	
External dimensions	H	240mm (9.45 inch)	
	W	352mm (13.86 inch)	466mm (18.35 inch)
	D	110mm (4.33 inch)	
Weight	1.81kg	2.32kg	
DIN rail installation	Not installable		

(3) Q series large type extension base unit (without power supply)

Item	Model	
	Q55BL	
Number of mountable I/O modules	5	
Extendability	Extendable	
Applicable module	Q series module, Q series large type I/O module	
5 VDC internal current consumption	0.10A	
External dimensions	H	240mm (9.45 inch)
	W	297mm (11.69 inch)
	D	110mm (4.33 inch)
Weight	1.59kg	
DIN rail installation	Not installable	

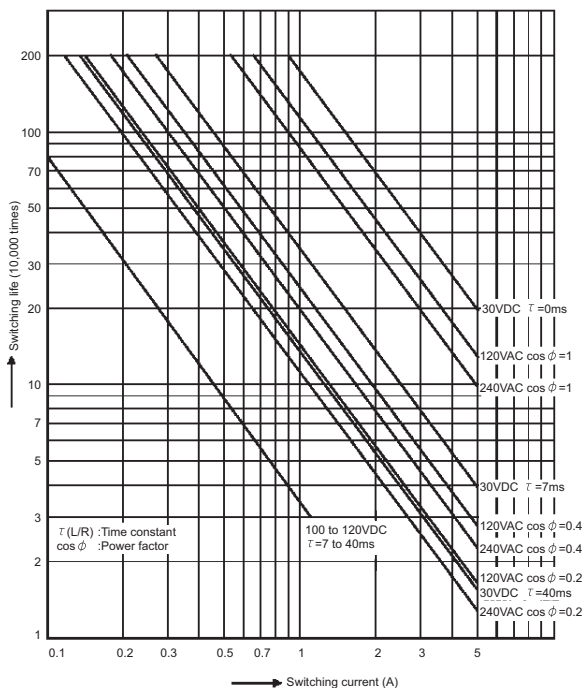
3.2 Specifications of the Q Series Large Type I/O Module

This section explains performance specifications and precautions for selecting the Q series large type I/O module.

3.2.1 Precautions for selection

- (1) The maximum switching frequency when output module drives L load must be on for 1 second or longer and off for 1 second or longer.
- (2) The following chart shows the actual value of relay life for a relay output module.

Applicable module model: QY13L



1. When using a module in an application for high switching frequency, the relay life will be short. Therefore, consider using a triac output module.
2. The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin.
The relay life differs according to the specifications as follows:

Rated switching voltage, current load	200,000 times
200VAC 1.5A, 240VAC 1A ($\text{COS } \phi = 0.7$)	200,000 times
200VAC 0.75A, 240VAC 0.5A ($\text{COS } \phi = 0.35$)	200,000 times
24VDC 1A, 100VDC 0.1A ($L/R = 7\text{ms}$)	200,000 times
3. Relay life is substantially affected by the load type and inrush current characteristics.
The inrush current may cause contact welding. Therefore, consider inrush current as well as stationary current.
 - (a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is cut off, high back electromotive force is generated between the contacts and an arc discharge occurs. Consider the life when the power factor is low, as it may decrease the life.
In addition, make sure to consider the contact welding, as the inrush current from 5 to 15 times higher than the stationary current flows at power-on.
 - (b) Lamp load
Make sure to consider the contact welding, as the inrush current from 10 to 15 times higher than the stationary current flows in the lamp circuit.
 - (c) Capacitive load
Make sure to consider the contact welding when a device such as capacitor is used in a load circuit, as the inrush current 20 to 40 times higher than the stationary current may flow in the circuit.
Also, pay full attention to the wire capacity if the wiring becomes longer.

- (3) Do not use I/O modules under environment where atmospheric pressure equal to or higher than 0m (0 ft.) altitude is pressurized. Doing so may cause a malfunction.
When using them under such environment, please consult your sales representative.
- (4) For wiring and short-circuit current of output module with fuse, satisfy the following values.
If not satisfied, the fuse cannot protect the module. Then, connect protection fuse outside.

Item	When a load is 100/200VAC
Wiring length	3m (9.84 ft.) or more
Wire size	2mm ² or less
Transformer capacity	2KVA or less

However, a fuse connected to output module cannot protect against overload.

As measures against overload, connect a fuse per point outside.

- (5) Precautions for connecting to the uninterruptible power supply (UPS)
Use line-interactive UPS whose power distortion is 5 % or less.
Do not use an UPS of online commercial feeding system.
- (6) Precautions for using the QX11L
When setting PLC parameter with GX Developer (SW □D5C-GPPW-E), make sure of the following points.
- Always set the I/O assignment type "Input".
 - Do not change the response time (default: 10ms)

3.2.2 Specifications of the Q series large type I/O module

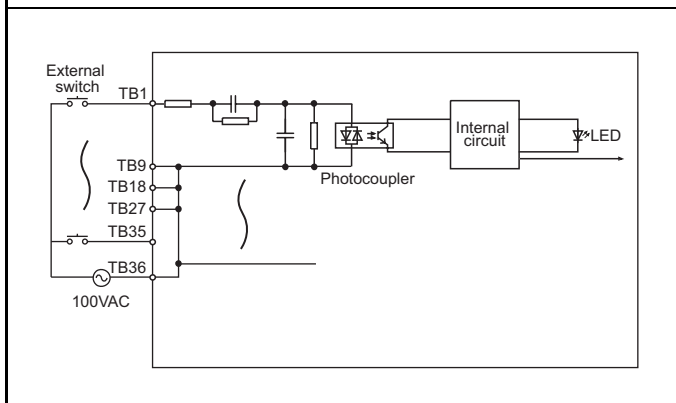
The following table shows performance specifications of the Q series large type I/O module.

(1) QX11L AC input module

Item		Model
		QX11L
Number of input points		32 points
Insulation method		Photocoupler
Rated input voltage, frequency		100 to 120VAC (+10/-15%), 50/60Hz (± 3 Hz)
Input voltage distortion		Within 5%
Rated input current		10mA (100VAC, 60Hz)
Maximum number of simultaneous input points		60% (20 points) simultaneously on
Inrush current		Maximum 300mA, Within 0.3ms (at 132VAC)
On voltage/On current		80VAC or more/6mA or more
Off voltage/Off current		30VAC or less/2mA or less
Input impedance		Approx. 10k Ω (60Hz), Approx. 12k Ω (50Hz)
Response time	Off to On	15ms or less
	On to Off	25ms or less
Dielectric withstand voltage		1780VAC rms/3 cycles (altitude 2000m (6557.38 ft.))
Common terminal arrangement		32 points/common (common terminal: TB9, TB18, TB27, TB36)
Operation indication		On indication (LED)
External wiring system		38-point terminal block connector (M3 \times 6 screws)
Applicable wire size		0.75 to 2mm ² (Applicable tightening torque 0.68N \cdot m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		75mA (TYP. all points On) (0.08A is shown on the rating plate of the module.)
External dimensions		220 (8.66) (H) \times 37.5 (1.48) (W) \times 116.5 (4.59) (D) mm (inch)
Weight		0.33kg

Pin number	Signal name	Pin number	Signal name	Pin number	Signal name	Pin number	Signal name
TB1	X00	TB11	X09	TB21	X12	TB31	X1B
TB2	X01	TB12	X0A	TB22	X13	TB32	X1C
TB3	X02	TB13	X0B	TB23	X14	TB33	X1D
TB4	X03	TB14	X0C	TB24	X15	TB34	X1E
TB5	X04	TB15	X0D	TB25	X16	TB35	X1F
TB6	X05	TB16	X0E	TB26	X17	TB36	COM
TB7	X06	TB17	X0F	TB27	COM	TB37	Empty
TB8	X07	TB18	COM	TB28	X18	TB38	Empty
TB9	COM	TB19	X10	TB29	X19	-	-
TB10	X08	TB20	X11	TB30	X1A	-	-

External connection

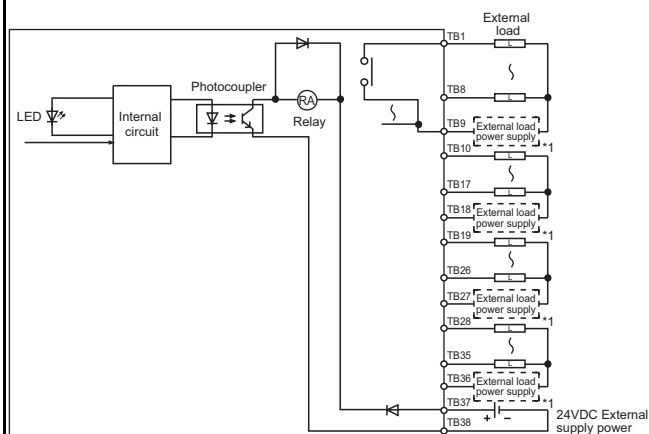


(2) QY13L contact output module

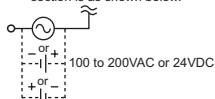
Item		Model
		QY13L
Number of output points		32 points
Insulation method		Photocoupler
Rated switching voltage/ current		24VDC 2A(Resistance load) /point, 5A/common 240VAC 2A(COS $\phi = 1$)
Minimum switching load		5VDC 1mA
Maximum switching voltage		264VAC 125VDC
Response time	Off to On	10ms or less
	On to Off	12ms or less
Life	Mechanical	20 million times or more
	Electrical	Rated switching voltage/current load 200,000 times or more
		200VAC 1.5A, 240VAC 1A (COS $\phi = 0.7$) 200,000 times or more
		200VAC 0.75A, 240VAC 0.5A (COS $\phi = 0.35$) 200,000 times or more
	24VDC 1A, 100VDC 0.1A (L/R = 7ms) 200,000 times or more	
Maximum switching frequency		3600 times/hour
Surge suppressor		None
Dielectric withstand voltage		1500VAC for 1 minute
Relay socket		None
Common terminal arrangement		8 points/common (common terminal: TB9, TB18, TB27, TB36)
Operation indication		On indication (LED)
External supply power	Voltage	24VDC $\pm 10\%$ Ripple voltage 4Vp-p or less
	Current	290mA (TYP. 24VDC all points On)
External wiring system		38-point terminal block connector (M3 \times 6 screws)
Applicable wire size		0.75 to 2mm ² (Applicable tightening torque 0.68N \cdot m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		230mA (TYP. all points On)
External dimensions		220 (8.66) (H) \times 37.5 (1.48) (W) \times 116.5 (4.59) (D) mm (inch)
Weight		0.45kg

Pin number	Signal name	Pin number	Signal name	Pin number	Signal name	Pin number	Signal name
TB1	Y00	TB11	Y09	TB21	Y12	TB31	Y1B
TB2	Y01	TB12	Y0A	TB22	Y13	TB32	Y1C
TB3	Y02	TB13	Y0B	TB23	Y14	TB33	Y1D
TB4	Y03	TB14	Y0C	TB24	Y15	TB34	Y1E
TB5	Y04	TB15	Y0D	TB25	Y16	TB35	Y1F
TB6	Y05	TB16	Y0E	TB26	Y17	TB36	COM 4
TB7	Y06	TB17	Y0F	TB27	COM 3	TB37	24VDC
TB8	Y07	TB18	COM 2	TB28	Y18	TB38	0V
TB9	COM 1	TB19	Y10	TB29	Y19	-	-
TB10	Y08	TB20	Y11	TB30	Y1A	-	-

External connection



*1 The external load power supply section is as shown below.

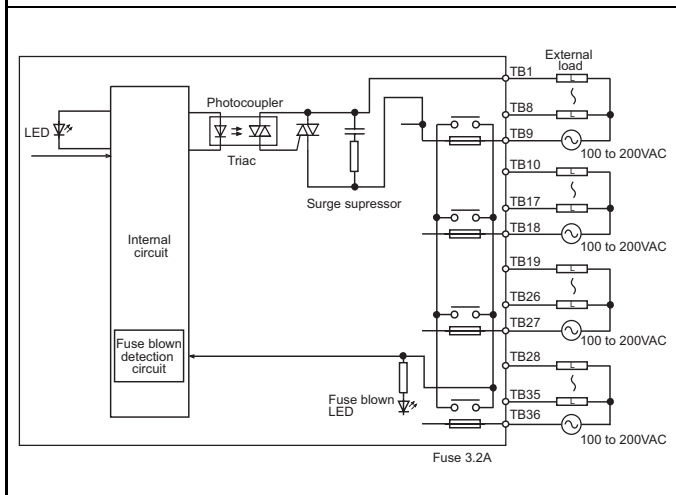


(3) QY23L Triac output module

Item		Model
		QY23L
Number of output points		32 points
Insulation method		Photocoupler
Rated load voltage		100 to 240VAC (+10/-15%)
Maximum load voltage		264VAC
Maximum load current		0.6A/point, 2.4A/common
Minimum load voltage/current		24VAC 100mA, 100VAC 10mA, 240VAC 10mA
Maximum inrush current		20A 10ms or less, 8A 100ms or less
Leakage current at Off		1.5mA (for 120VAC, 60Hz), 3mA (for 240VAC, 60Hz)
Maximum voltage drop at On		1.5VAC or less (100 to 600mA), 1.8VAC or less (50 to 100mA), 2VAC or less (10 to 50mA)
Response time	Off to On	1ms or less
	On to Off	1ms + 0.5 cycles or less
Surge suppressor		CR absorber (0.022 μ F + 47 Ω)
Fuse rating		3.2A fast blow fuse (1 fuse/common) type HP-32
Fuse blown indication		Available (LED turns on by fuse blown, and a signal is output to CPU module.)
Dielectric withstand voltage		1500VAC for 1 minute
Common terminal arrangement		8 points/common (common terminal: TB9, TB18, TB27, TB36)
Operation indication		On indication (LED)
External wiring system		38-point terminal block connector (M3 \times 6 screws)
Applicable wire size		0.75 to 2mm ² (Applicable tightening torque 0.68N·m)
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3
5VDC internal current consumption		590mA (TYP. all points On)
External dimensions		220 (8.66)(H) \times 37.5 (1.48) (W) \times 116.5 (4.59) (D) mm (inch)
Weight		0.45kg

Pin number	Signal name	Pin number	Signal name	Pin number	Signal name	Pin number	Signal name
TB1	Y00	TB11	Y09	TB21	Y12	TB31	Y1B
TB2	Y01	TB12	Y0A	TB22	Y13	TB32	Y1C
TB3	Y02	TB13	Y0B	TB23	Y14	TB33	Y1D
TB4	Y03	TB14	Y0C	TB24	Y15	TB34	Y1E
TB5	Y04	TB15	Y0D	TB25	Y16	TB35	Y1F
TB6	Y05	TB16	Y0E	TB26	Y17	TB36	COM 4
TB7	Y06	TB17	Y0F	TB27	COM 3	TB37	Empty
TB8	Y07	TB18	COM 2	TB28	Y18	TB38	Empty
TB9	COM 1	TB19	Y10	TB29	Y19	-	-
TB10	Y08	TB20	Y11	TB30	Y1A	-	-

External connection



3.3 Specifications of the Q Series Large Type Blank Cover

The following table shows performance specifications of the Q series large type blank cover.

Item	Model
	QG69L
External dimensions	108 (4.25) (H) × 37.5 (1.48) (W) × 54 (2.13) (D) mm (inch)
Weight	0.03kg

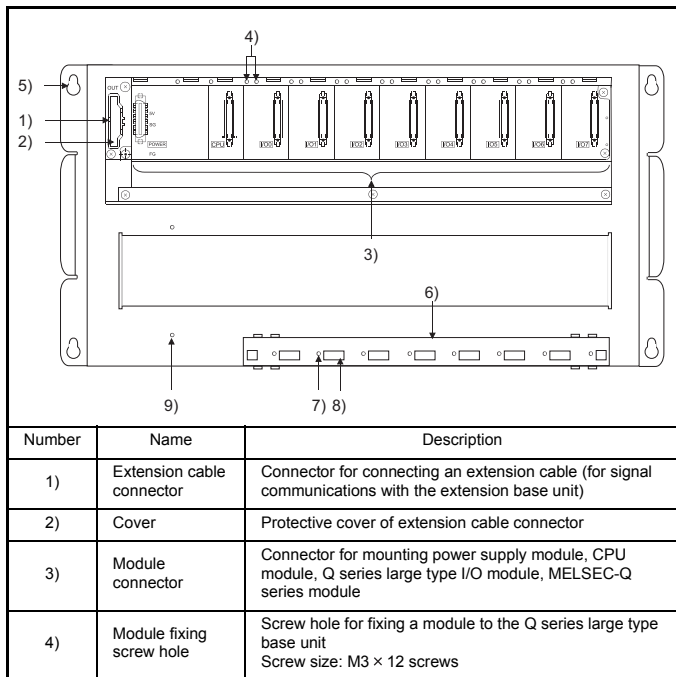
4. PARTS NAMES

4.1 Parts Names

This section explains the part names of the Q series large type base unit, Q series large type I/O module, and Q series large type blank cover.

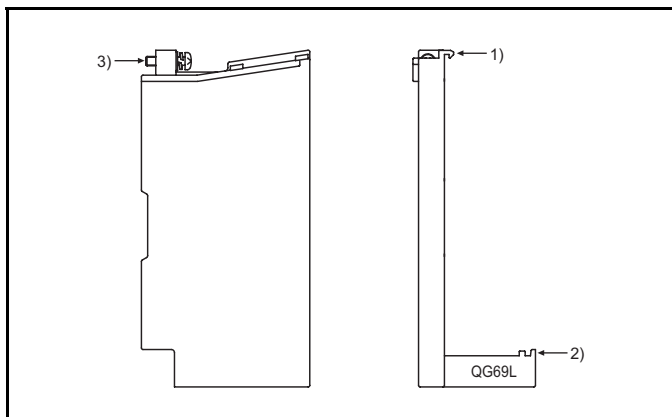
(1) Part names of the Q series large type base unit

The following explains part names of the Q series large type base unit.



Number	Name	Description
5)	Base mounting hole	Hole for installing the Q series large type base unit on a panel such as control panel (The dimensions are the same as the MELSEC-A series base unit.)
6)	Fixture	Required for mounting the Q series large type I/O module.
7)	Module bottom fixing screw hole	Screw hole for fixing the bottom of the Q series large type I/O module to a fixture Screw size: M3 × 15 screws
8)	Module fixing hole	Hole for inserting a fixing projection on the back of the Q series large type I/O module to fix the module
9)	Relay terminal block mounting screw hole	Screw hole for fixing a relay terminal block Screw size: M4 screw

- (3) Part names of the Q series large type blank cover
 The following explains part names the Q series large type blank cover.



Number	Name	Description
1)	Top fixing hook	Hook for fixing the Q series large type blank cover to the Q series module top
2)	Bottom fixing hook	Hook for fixing the Q series large type blank cover to the Q series module bottom
3)	Module fixing screw	Screw for fixing a module to the Q series large type base unit (M3 × 12 screws)

5. MOUNTING AND INSTALLATION

5.1 Handling Precautions

This section explains handling precautions for the Q series large type base unit and Q series large type I/O module.

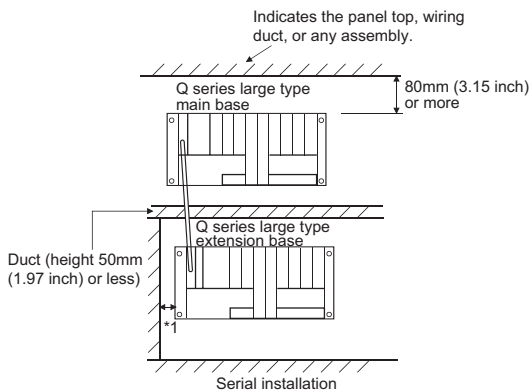
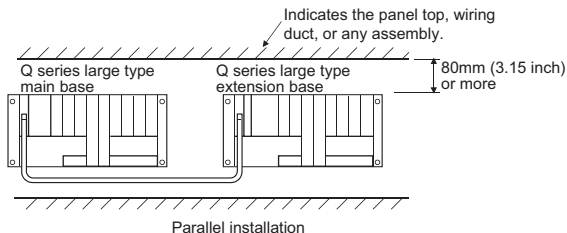
- (1) Do not disassemble the Q series large type base unit since it is precision apparatus.
- (2) When handling the Q series large type base unit, hold it by the handles located at both sides of the module, not by a fixture.
- (3) The Q series large type base unit cannot be installed to DIN rail. Install it to a control panel by tightening screws through the base mounting holes to the control panel.
- (4) Always mount power supply module on the Q series large type extension base unit excluding the Q55BL.
When the load of a module used is light, the module may operate without power supply module; however, the operation cannot be guaranteed because of its instability.
- (5) Tighten the fixture attachment screws, module fixing screws, and terminal block screws within the following range.

Location of screw	Tightening torque range
Fixture attachment screw (M4 × 10 screws)	1.39 to 1.89N·m
Module fixing screw (M3 × 12 screws)	0.36 to 0.48N·m
Module bottom fixing screw (M3 × 15 screws)	0.36 to 0.48N·m
I/O module terminal block screw (M3 × 6 screws)	0.43 to 0.57N·m
I/O module terminal block fixing screw (M4 × 16 screws)	1.02 to 1.38N·m

- (6) Do not install the extension cable together with the main circuit (high voltage and high current) line or bring them close to each other.
Keep a distance of 100mm (3.94 inch) or more between them.

5.2 Precautions for Installing the Q series Large Type Base Unit

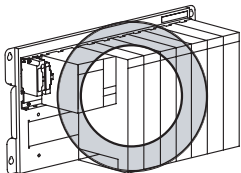
(1) Module installation position



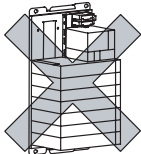
*1 : 20mm (0.79 inch) or more is required when connecting extension cable without removing adjacent modules.

(2) Module installation direction

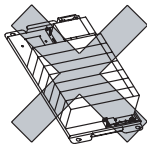
- (a) Install the programmable controller in the direction shown below to ensure ventilation for heat dissipation.



- (b) Do not install it in the directions shown below.



Vertical position



Horizontal position

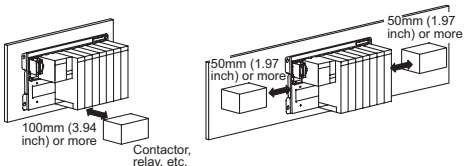
(3) Install the base unit on a flat surface.

When the base unit is installed on an uneven surface, the printed-circuit board may be strained, resulting in a malfunction.

- (4) Do not install the programmable controller together with a vibration source such as a large electromagnetic contactor or non-fuse breaker. Install the programmable controller to the separate panel or isolate it as far as possible.

- (5) Provide the following distances between the programmable controller and devices (contactor and relay) to avoid the influence of radiated noise or heat.

- Device installed in front of the programmable controller:
100mm (3.94 inch) or more
- Device installed on either side of the programmable controller:
50mm (1.97 inch) or more



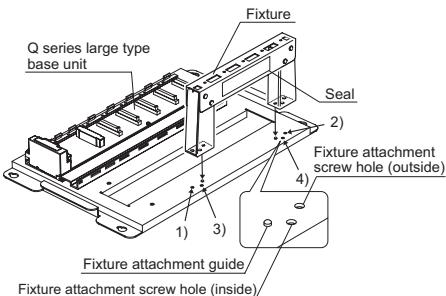
5.3 Attaching a Fixture to the Q Series Large Type Base Unit

- (1) The following shows a procedure for attaching a fixture to the Q series large type base unit.

Fix a fixture so that it can fit to the fixture attachment guide at the bottom of the Q series large type base unit. (Set the fixture so that the side on which a seal is affixed can be the front.)

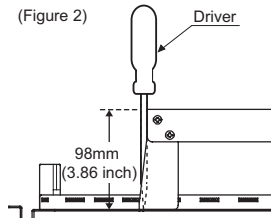
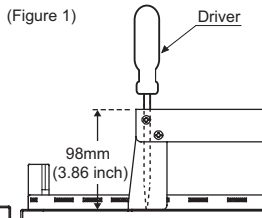
Tighten fixture attachment screws on the Q series large type base unit by four places in the order from 1) to 4).

End



Point

1. Before installing the Q series large type base unit to a control panel, attach a fixture to the base unit.
2. Attach a fixture to the Q series large type base unit with screws as shown below.
 - Tightening the inside fixture attachment screws (Figure 1)
Insert a driver (100mm (3.94 inch) or more) from square holes at the both top sides of the fixture and tighten the screws.
 - Tightening the outside fixture attachment screws (Figure 2)
Tighten them from outside of the fixture.



- (2) When removing the fixture from the Q series large type base unit, make sure that the fixture attachment screws are completely loose beforehand.

5.4 Mounting/Removing Modules

This section explains procedures for mounting/removing the Q series large type I/O module and Q series module on/from the Q series large type base unit.

5.4.1 Mounting/removing the Q series large type I/O module

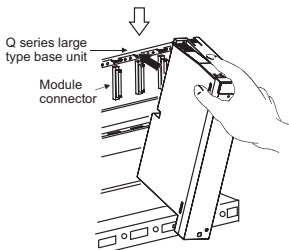
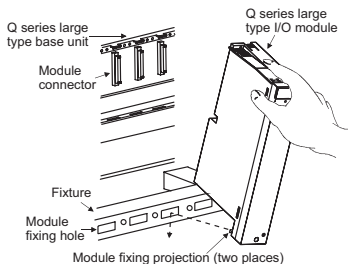
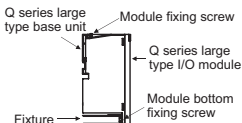
- (1) The following shows a procedure for mounting the Q series large type I/O module on the Q series large type base unit.

Insert the module fixing projections (two places) into module fixing holes on the fixture attached to the Q series large type base unit.

To mount Q series large type I/O module on the Q series large type base unit, push the module in the direction of the arrow while using the module fixing hole as a supporting point.

After checking that the Q series large type I/O module is fully inserted into the Q series large type base unit, fix the module with module fixing screws and module bottom fixing screws.

End



Point

1. Always insert the module fixing projections of the Q series large type I/O module into the module fixing holes. Forced mounting without inserting the projections may damage the module connector and/or Q series large type I/O module.
2. When mounting the Q series large type I/O module on the Q series large type base unit, tighten module fixing screws and module bottom fixing screws.
3. When mounting the renewal tool on the left of the QY23L, always mount the QY23L first.

- (2) The following shows a procedure for removing the Q series large type I/O module from the Q series large type base unit.

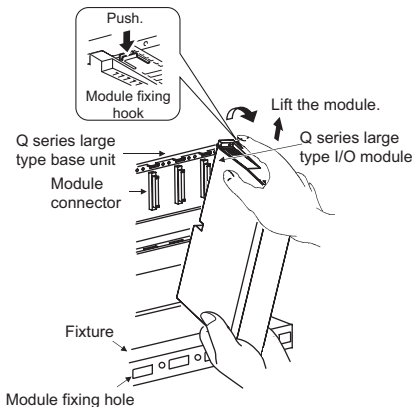
Remove the module fixing screws and module bottom fixing screws.

Hold the Q series large type I/O module with both hands and push the module fixing hook at the module top with a finger until it stops.

Push the module fixing hook while using the module bottom as a supporting point, and pull the Q series large type I/O module forward.

Pull the module fixing projections out of the module fixing holes while lifting the Q series large type I/O module.

End



Point

1. To remove the Q series large type I/O module, always loosen the module fixing screws and module bottom fixing screws first, and then pull the module fixing projections out of the module fixing holes. Forced removal of the module may damage the module fixing projections.
2. When the renewal tool is mounted on the left of the QY23L, always remove the renewal tool first.

5.4.2 Attaching/removing the dustproof cover for fuse replacement window (QY23L only)

When mounting the QY23L on the Q series large type base unit in the following conditions, attach the supplied dustproof cover for fuse replacement window.

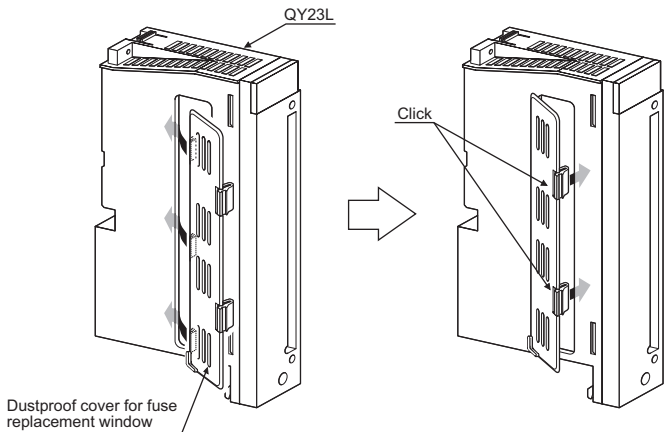
- Mounting the Q series module on the I/O slot immediate left of a slot where the QY23L is to be mounted
- Mounting the QY23L on the I/O slot leftmost on the Q series large type base unit

Not attaching the dustproof cover for fuse replacement window may cause an entry of foreign matter inside the module, resulting in a failure.

(1) Attachment

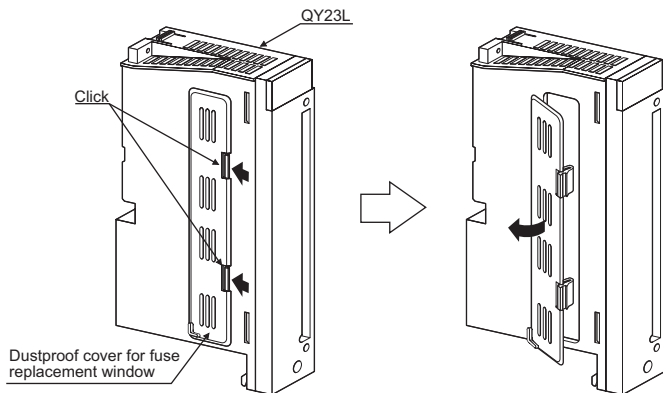
As shown below, insert the left side of dustproof cover for fuse replacement window first, and then push the two clicks on the dustproof cover into the module side.

(Make sure to attach it without a lift.)



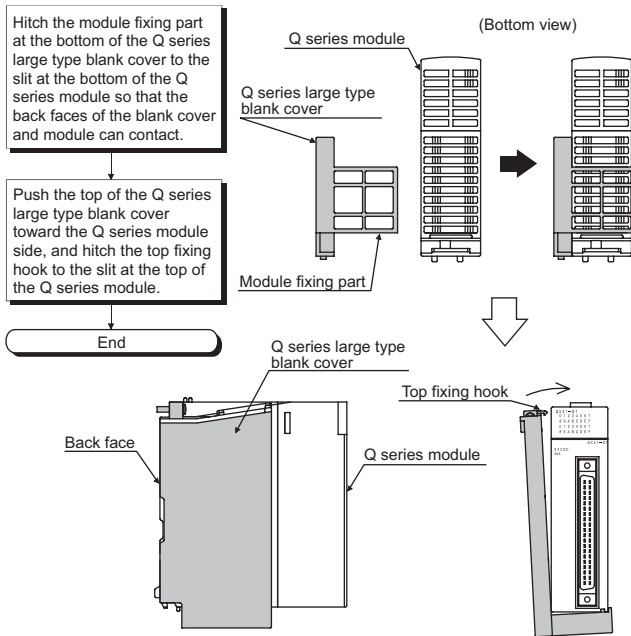
(2) Removal

As shown below, lift the dustproof cover for fuse replacement window while pressing the two clicks on the dustproof cover in the direction of the arrows.




5.4.3 Mounting/removing the Q series module

- (1) The following shows procedures for mounting the Q series module on the Q series large type base unit.
 - (a) Attaching the Q series large type blank cover
The following shows a procedure for attaching the Q series large type blank cover to the Q series module.



Point

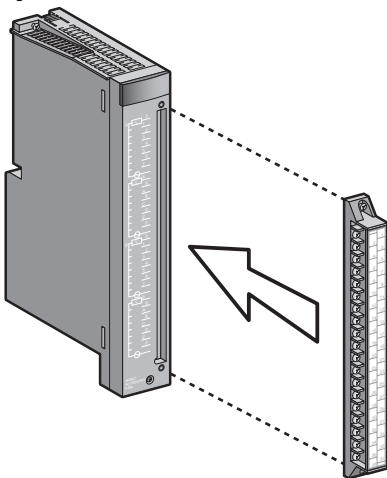
When mounting the Q series module with Q series large type blank cover on the Q series large type base unit, always tighten the module fixing screws of the Q series large type blank cover.

- (b) Removing the Q series large type blank cover
To remove the Q series large type blank cover from the Q series module, remove the bottom fixing hook first.
- (c) Mounting to/removal from the Q series large type base unit
For procedures of mounting/removing the Q series module on/from the Q series large type base unit, refer to the following manual.
 QCPU User's Manual (Hardware Design, Maintenance and Inspection)

5.5 Attaching/Removing the Terminal Block

This section explains the methods for attaching/removing the A series 32-point terminal block to/from the Q series large type I/O module.

- (1) Attaching the terminal block
Attach the A series 32-point terminal block to the Q series large type I/O module and tighten the terminal block fixing screws by the top and bottom of the terminal block with the specified torque range.



- (2) Removing the terminal block
Loose the terminal block fixing screws at the top and bottom of the terminal block and remove the terminal block.

6. MAINTENANCE AND INSPECTION

6.1 Replacing Output Module Fuse

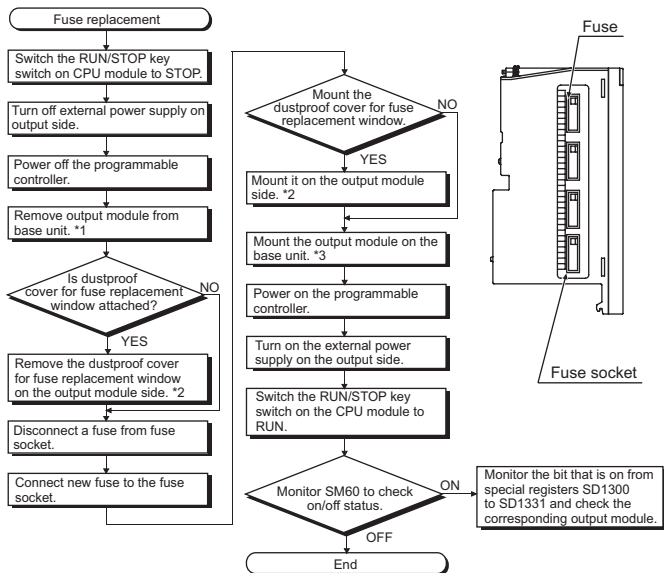
Even if a fuse is not blown, the element is gradually deteriorated due to inrush current; therefore, it should be replaced at regular intervals.



CAUTION

- When replacing a fuse, use the specified fuse. Using high capacity fuse or an electric wire may cause a fire.

The procedure for replacing a fuse is as follows.



*1 : When the renewal tool is mounted on the left of output module, always remove the renewal tool first.

*2 : For attaching/removing dustproof cover for fuse replacement window, refer to Section 5.4.2.

*3 : When mounting the renewal tool on the left of output module, always mount the output module first.

6.2 Battery Replacement

When replacing batteries used for CPU module (SRAM card), Web server module, MES interface module, be sure of the following.

- (1) The Web server module and MES interface module cannot replace a battery with Q series large type blank cover mounted.
Replace the battery after removing the blank cover.
For replacement procedure of batteries, refer to the User's Manual for each module.
- (2) If modules having larger depth than the CPU module are mounted on the both adjacent slots, using the following tweezers are recommended for replacing SRAM card battery.

Product	Model	Manufacturer
Plastic tweezers	NK-2539	Mitsubishi Electric System & Service Co., Ltd.

For replacement procedure of SRAM card battery, refer to the following manual.



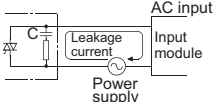
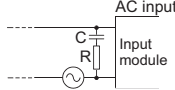
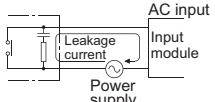
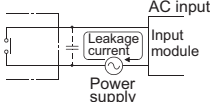
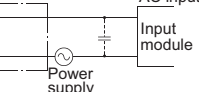
QCPU User's Manual (Hardware Design, Maintenance and Inspection)

7. I/O MODULE TROUBLESHOOTING

This chapter explains possible problems with I/O circuits and their corrective actions.

7.1 Input Circuit Troubleshooting

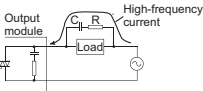

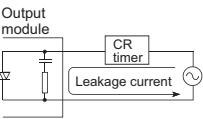

This section explains possible problems with input circuits and their corrective actions.

Number	Status	Cause	Corrective action
Example 1	Input signal does not turn off.	<ul style="list-style-type: none"> Leakage current of input switch (such as a drive with contactless switch). 	<ul style="list-style-type: none"> Connect an appropriate capacitor and resistor so that the voltage between the terminals of the input module can be lower than the off voltage value.  <p>Using 0.1 to $47\ \mu\text{F}$ + 47 to $120\ \Omega$ ($1/2\text{W}$) as the constant of the capacitor and resistor is recommended.</p>
Example 2	Input signal does not turn off.	<ul style="list-style-type: none"> Drive with a limit switch with neon lamp 	<ul style="list-style-type: none"> Same as Example 1 Separate the circuit and create another display circuit.
Example 3	Input signal does not turn off.	<ul style="list-style-type: none"> Leakage current due to line capacity of wiring cable <p>(Line capacity C of twisted pair cable is approximately $100\ \text{pF/m}$).</p> 	<ul style="list-style-type: none"> Same as Example 1 (However, leakage current is not generated when the power supply is on the input device side as shown below.) 

7.2 Output Circuit Troubleshooting

This section explains possible problems with output circuits and their corrective actions.

Num ber	Status	Cause	Corrective action
Example 1	Excessive voltage is applied to a load when output turns off.	<ul style="list-style-type: none"> When a load is half-wave rectified inside (This status is typical of some solenoids.) <ul style="list-style-type: none"> When the polarity of the power supply is [1], the capacitor is charged. When the polarity is [2], the voltage charged in capacitor + the power supply voltage is applied to both sides of D1. The maximum value of the voltage is approximately 2.2E. <p>(This usage does not pose problems to the output components but may deteriorate the diode built in the load, causing burnout, etc.)</p>	<ul style="list-style-type: none"> Connect a resistor of several tens of $k\Omega$ to several hundreds of $k\Omega$ to both sides of the load.
Example 2	A load does not turn off. (triac output)	<ul style="list-style-type: none"> Leakage current due to the built-in surge suppressor 	<ul style="list-style-type: none"> Connect a resistor to both sides of the load. <p>(If the wiring from the output module to the load is long, be careful since there may be a leakage current due to line capacity.)</p>

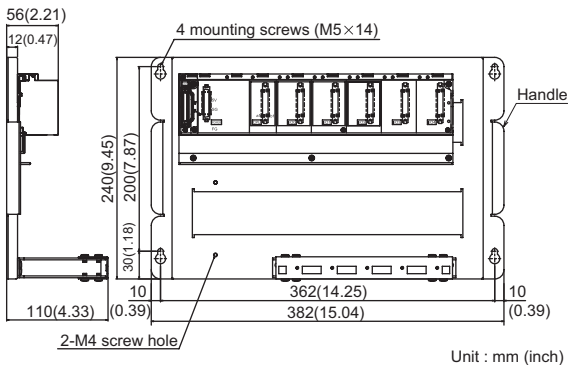
Number	Status	Cause	Corrective action
Example 3	A load turns off with a delay. (triac output)	<ul style="list-style-type: none"> Leakage current due to load surge suppressor. 	<ul style="list-style-type: none"> Remove the surge suppressor from both sides of the load and leave the resistor. (If the wiring from the output module to the load is long, be careful since there may be a leakage current due to line capacity.)  <p>Recommended resistance At 100VAC: 5 to 10kΩ, 5 to 3W At 200VAC: 10 to 20kΩ, 15 to 10W</p>
Example 4	When a load is CR timer, time period fluctuates. (triac output)		<ul style="list-style-type: none"> Connect a resistor to both sides of CR timer. (If the wiring from the output module to the load is long, be careful since there may be a leakage current due to line capacity.)  <p>Calculate the constant of the resistor by a load.</p>

8. EXTERNAL DIMENSIONS

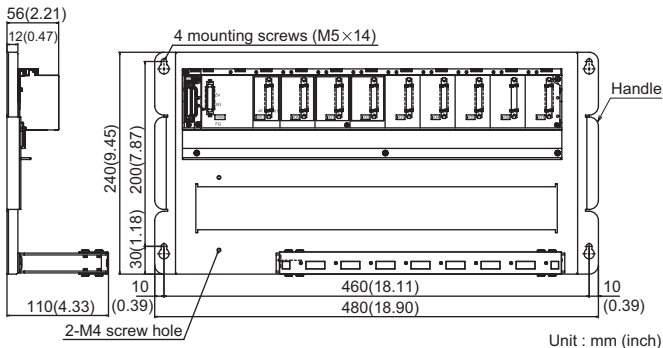
The following shows external dimensions diagrams of the Q series large type base unit, Q series large type I/O module, Q series large type blank cover.

8.1 Q Series Large Type Base unit

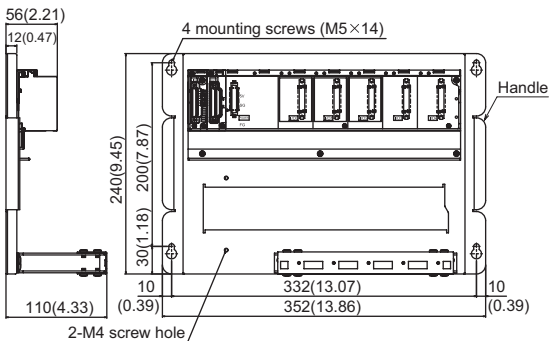
(1) Q35BL



(2) Q38BL

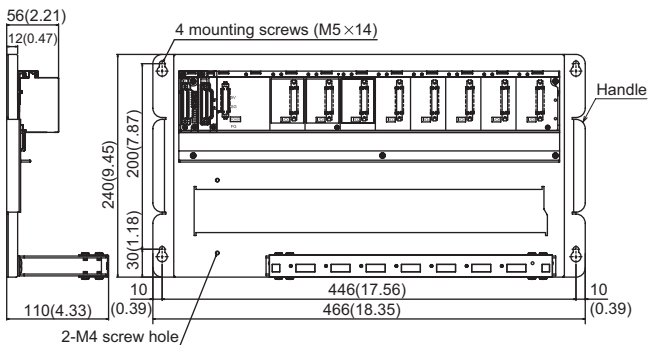


(3) Q65BL



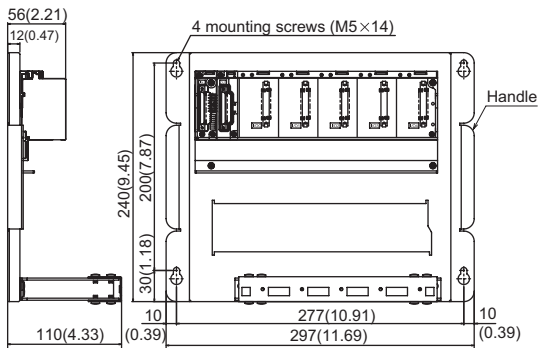
Unit : mm (inch)

(4) Q68BL



Unit : mm (inch)

(5) Q55BL

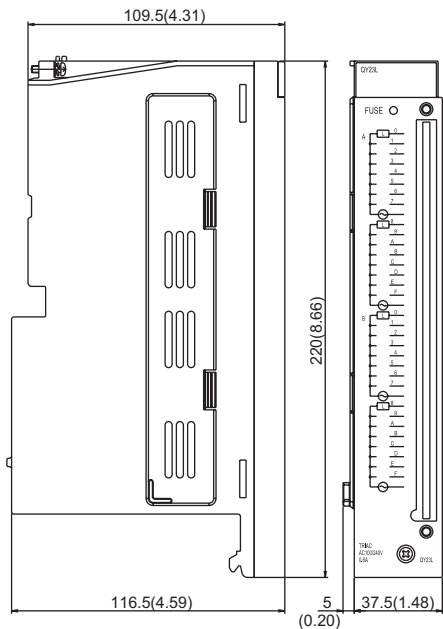


Unit : mm (inch)

8.2 Q Series Large Type I/O Module

- (1) QX11L, QY13L, QY23L

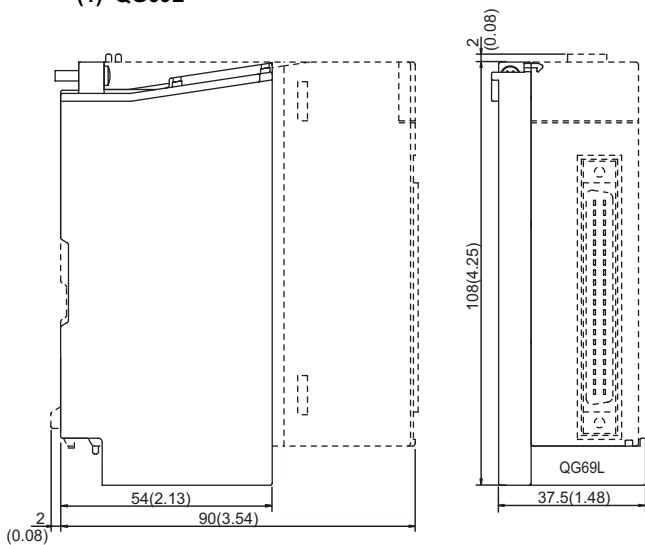
Note that the Q series large type I/O module does not come with terminal block.



Unit : mm (inch)

8.3 Q Series Large Type Blank Cover

(1) QG69L



Unit : mm (inch)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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