I/O Module Type Building Block

## User's Manual





Mitsubishi Programmable Controller



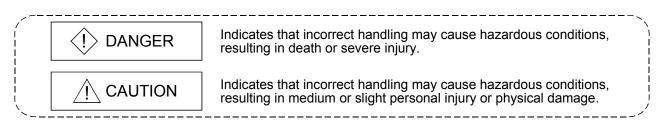
## • SAFETY PRECAUTIONS •

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".



Note that the  $\triangle$ CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

## [Design Instructions]

## 

- Install a safety circuit external to the PLC that keeps the entire system safe if there are problems with the external power supply or PLC. Not doing so may cause false output or malfunction, leading to accidents.
  - (1) Outside the PLC, construct mechanical damage preventing interlock circuits, e.g. emergency stop circuits, protective circuits, forward/reverse or other conflicting operation interlocking circuits, and upper and lower positioning limit switches.

(2) When the PLC detects either of the following problems, it will stop arithmetic operation and turn off all outputs in the case of (a). In the case of (b), it will stop arithmetic operation and hold or turn off all outputs according to the parameter setting.

- (a) The overcurrent protection or overvoltage protection of the power supply module is activated.
- (b) The self-diagnostic function of the PLC CPU has detected a fault such as the watchdog timer error.

In addition, all outputs may be turned on when there are problems undetectable by the PLC CPU, such as in the I/O controller. Build a fail-safe circuit or provide a mechanism externally of the PLC to operate the machine safely at such times. Refer to the CPU module user's manual for fail-safe circuit examples.

(3) Output could be left on or off when there is trouble in the output module's relays, transistors, etc. So build an external monitoring circuit that will monitor any output signal that could lead to a serious accident.

## [Design Instructions]

## 

- When overcurrent exceeding the rated load current or caused by a shorted load or the like flows in the output module for a long time, it may cause smoke or fire. To prevent this, configure an external safety circuit, such as fuses.
- Build a circuit that turns on the external power supply after the PLC power supply has been turned on. If the external power supply is turned on first, it could result in false output or malfunction.
- When there are communication problems with the data link, refer to the corresponding data link manual for the operating status of each station. Not doing so could result in false output or malfunction.
- When connecting a peripheral device to the CPU module or connecting a personal computer or the like to the intelligent function module to exercise control (data change) on the running PLC, configure up an interlock circuit in the sequence program to ensure that the whole system will always operate safely.

Also before exercising other control (program change, operating status change (status control)) on the running PLC, read the manual carefully and fully confirm safety.

Especially for the above control on the remote PLC from an external device, an immediate action may not be taken for PLC trouble due to a data communication fault.

In addition to configuring up the interlock circuit in the sequence program, corrective and other actions to be taken as a system for the occurrence of a data communication fault should be predetermined between the external device and PLC CPU.

# 

• Do not bundle the control wires or communication cables with the main circuit or power wires, or run them close to each other.

They should be run 100mm (3.94in.) or more away from each other.

Not doing so could result in noise that would cause malfunction.

• When the output module is used to control a lamp load, heater, solenoid valve or the like, large current (approximately 10 times greater than the normal) may flow when the output is turned from OFF to ON. Choose an output module having a sufficient rated current.

## [Installation Instructions]

<ul> <li>Use the PLC in an environment that meets the general specifications contained in this manual. Using this PLC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.</li> <li>Hold down the module-loading lever at the module bottom, and securely insert the module-fixing hook into the fixing hole in the base unit. Incorrect loading of the module can cause a malfunction, failure or drop.</li> </ul>
When using the PLC in the environment of much vibration, tighten the module with a screw. Tighten the screw in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to damage to the screw or module.
<ul> <li>When installing extension cables, be sure that the base unit and the extension module connectors are installed correctly.</li> <li>After installation, check them for looseness.</li> </ul>
<ul> <li>Poor connections could cause an input or output failure.</li> <li>Securely load the memory card into the memory card loading connector. After installation, check for lifting.</li> <li>Poor connections could cause an operation fault.</li> </ul>
<ul> <li>Completely turn off the external power supply before loading or unloading the module. Not doing so could result in damage to the product.</li> <li>Do not directly touch the module's conductive parts or electronic components.</li> </ul>

Touching the conductive parts could cause an operation failure or give damage to the module.

## [Wiring Instructions]

## 

- Completely turn off the external power supply before starting wiring. Not doing so could result in electric shock or damage to the product.
- When turning on the power supply or starting operation after wiring work, always mount the product with the supplied terminal cover.

Not doing so could result in electric shock.

## [Wiring Instructions]

Always ground the FG and LG terminals to the protective ground conductor. Not doing so could result in electric shock or malfunction.	b
Before wiring the module, confirm the rated voltage and terminal layout of the product.	اما.
Connecting a power supply that is different from the rating or incorrectly wiring the product courresult in fire or failure.	lia
External connectors should be crimped or pressure-welded with the specified tools, or correctly	/
soldered. Imperfect connections could result in short circuit, fires or malfunction.	
Tighten the terminal screws in the specified torque range.	
Undertightening could result in short circuit, fire or malfunction.	
Overtightening could cause damage to the screws and/or the module, resulting in drop, short circuit or malfunction.	
Be careful not to allow foreign matter such as chips and wire off-cuts to enter the module.	
Foreign matter could cause fire, failure, or malfunction.	
The module has an ingress prevention label on its top to prevent foreign matter, such as wire	
offcuts, from entering the module during wiring.	
Do not peel this label during wiring.	
Before starting system operation, be sure to peel this label because of heat dissipation.	
Install our PLC in a control panel for use.	
Wire the main power supply to the power supply module installed in a control panel through a	
distribution terminal block.	
Furthermore, the wiring and replacement of a power supply module have to be performed by a	3
maintenance worker who acquainted with shock protection.	
(For the wiring methods, refer to the QCPU User's Manual (Hardware Design, Maintenance ar	۱d
Inspection).)	

## [Startup/Maintenance Instructions]

## 

- Do not touch the terminals while power is on. Doing so could cause electric shock.
- Correctly connect the battery. Do not charge, disassemble, heat, place in fire, short circuit, or solder the battery.

Mishandling of the battery can cause heat generation, burst or ignition which could result in injury or fire.

 Switch off all phases of the externally supplied power used in the system when cleaning the module or retightening the terminal or module mounting screws.

Not doing so could result in electric shock.

Undertightening of terminal screws can cause a short circuit or malfunction.

Overtightening of screws can cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.

## [Startup/Maintenance Instructions]

<ul> <li>The online operations conducted for the running CPU module by connecting a peripheral device (especially program modification, forced output, operating status change) should be performed after you have read the manual carefully read and fully confirmed safety.</li> <li>Operation mistakes could cause machine damage or accident.</li> <li>Do not disassemble or modify the modules.</li> </ul>
<ul> <li>Doing so could cause failure, malfunction, injury or fire.</li> <li>Completely turn off the externally supplied power used in the system before mounting or removing the module. Not doing so could result in damage to the product.</li> <li>Do not mount/remove the module to/from the base unit or the terminal block more than 50 times (IEC61131-2-compliant), after the first use of the product.</li> <li>Failure to do so may cause module malfunctions.</li> </ul>
<ul> <li>Before touching the module, always touch grounded metal, etc. to discharge static electricity from human body, etc.</li> <li>Not doing so can cause the module to fail or malfunction.</li> </ul>
[Disposal Instructions]

## 

• When disposing of this product, treat it as industrial waste.

REVISIONS

\* The manual number is given on the bottom left of the back cover.

<b>D</b> : ( <b>D</b> :	.1. 8.4	* The manual number is given on the bottom left of the back cover.
Print Date	* Manual Number	Revision
Dec., 1999	SH (NA)-080042-A	First edition
Feb., 2000	SH (NA)-080042-B	Addition model
		QH42P, QX48Y57, QX70, QX71, QX72, QY18A
		Addition
		Chapter 4
		Partial correction
		Section 1.2, Chapter 5, 8.1,
		Chapters 4 to 8 (changed into Chapters 5 to 9)
Apr., 2000	SH (NA)-080042-C	Deletion
		QY18A
Jul., 2000	SH (NA)-080042-D	Addition model
		QX28,QX40-S1,QY18A,QY22,QI60
		Addition
		Chapter 5
		Partial correction
		Section 1.2
		Chapters 5 to 9 (changed into Chapters 6 to 10)
Nov., 2000	SH (NA)-080042-E	Addition model
		QY70, QY71
		Addition
		Section 1.3
		Partial correction
		CONTENTS, Section 3.3, 5.1
Jan., 2001	SH (NA)-080042-F	Addition model
		QY68A
		Addition
		Section 10.2
		Partial correction
		CONTENTS, Section 1.2, 3.3, 5.1, Chapters 7
Mar., 2001	SH (NA)-080042-G	Partial correction
Mar., 2001		Section 2.4, 8.1
Jul., 2001	SH (NA)-080042-H	
Jul., 2001	СП (INA)-000042-П	Addition model
		Q6TE-18S
		Addition
		Chapter 9, APP 1.3
		Partial correction
		CONTENTS, Section 2.1, 2.2, 2.4, 5.1 Chapters 0 to 10 (chapters 10 to 11)
		Chapters 9 to 10 (changed into Chapters 10 to 11)
Jul., 2002	SH (NA)-080042-I	Addition model
		QX41-S1, QX42-S1, A6CON4
		Japanese Manual Version SH-080024-R

Japanese Manual Version SH-080024-R

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Print Date	* Manual Number	Revision
Mar., 2003	SH (NA)-080042-J	Addition model
		QX82
May, 2003	SH (NA)-080042-K	Partial correction
		Section 1.2, 2.2
May, 2003	SH (NA)-080042-L	Addition model
		QX82-S1
		Partial correction
		Section 1.2, 3.3
		Addition
		Section 2.15
Jul., 2004	SH (NA)-080042-M	
		Section 1.2, 2.1 to 2.15, 3.1 to 3.12, 4.1, 4.2, 5.1, 8.1, 8.2.1, 8.2.2, 10
Jul., 2005	SH (NA)-080042-N	Partial correction
		SAFETY PRECAUTIONS, Section 3.3
		Addition
Am. 0000		Appendix 1.3
Apr., 2006	SH (NA)-080042-O	Partial correction
Sep., 2006	SH (NA)-080042-P	SAFETY PRECAUTIONS, Section 4.1, Chapter6
Sep., 2000	STT (INA)-060042-P	Partial correction Section 11.1, 11.2, Appendix 1.2, 1.3
Oct., 2006	SH (NA)-080042-Q	
001., 2000	STT (NA)-000042-Q	Addition model QX50
		Partial correction
		SAFETY PRECAUTIONS, Section 2.10 to 2.16, 3.4 to 3.12, 4.1, 4.2
		Addition
		Section 2.9
Sep., 2007	SH (NA)-080042-R	Addition model
		QX41Y41P
		Partial correction
		Section 1.2, 1.3.3, 2.1 to 2.16, 3.1 to 3.12, 4.1, 4.3, 5.1, 7.1, 8.1, Chapter
		10, Section 11.1, 11.2, Appendix 1.2
		Addition
		Section 4.2
Jun., 2008	SH (NA)-080042-S	
		QX10-TS, QX40-TS, QX80-TS, QY10-TS, QY40P-TS, QY80-TS
		Partial correction
		Section 1.2, 2.3 to 2.19, 3.3 to 3.15, 9.2, Chapter 10
		Addition Section 2.2, 2.6, 2.16, 3.2, 3.6, 3.14, 9.1, 9.3
		0001011 2.2, 2.0, 2.10, 0.2, 0.0, 0.17, 0.1, 0.0

Print Date	* Manual Number	Revision
Oct., 2008	SH (NA)-080042-T	Addition model
		QX40-H, QX70-H, QX80-H, QX90-H
		Partial correction
		Section 1.2.5, 1.3.1, 2.8 to 2.23, 9.2, Chapter 10
		Addition Section 2.7, 2.14, 2.19, 2.23
		0001012.7, 2.14, 2.13, 2.23

#### INTRODUCTION

Thank you for choosing the MITSUBISHI MELSEC-Q Series General-Purpose Programmable Logic Controller. Before using this product, please read this manual carefully to use the equipment to its optimum.

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APPENDICES

#### About Manuals

The following manuals are also related to this product.

In necessary, order them by quoting the details in the tables below.

#### Related Manuals

Manual Name	Manual Number (Model Code)
QCPU User's Manual (Hardware Design/Maintenance and Inspection)         This manual provides the specifications of the CPU modules, power supply modules, base units, extension         cables, memory cards and others.       (Sold separately)	SH-080483ENG (13JR73)
QCPU User's Manual (Function Explanation/Program Fundamentals)         This manual explains the functions, programming methods, devices on necessary to create programs with the QCPU.         (Sold separately)	SH-080484ENG (13JR74)

## Conformation to the EMC Directive and Low Voltage Instruction

(1) For programmable controller system To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and

Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

(2) For the product

No additional measures are necessary for the compliance of this product with the EMC and Low Voltage Directives.

# MEMO


## 1. GENERAL SPECIFICATIONS MODULES AND PRECAUTIONS FOR USE OF I/O MODULE

This chapter describes the general specifications and precautions for use of I/O module.

#### **1.1 General Specifications**

Refer to the following manual for the general specifications of the I/O modules. • QCPU User's Manual (Hardware Design/Maintenance and Inspection)

#### 1.2 Precautions for Use

#### 1.2.1 Input module

- The number of simultaneous on points of input module depends on its input voltage and ambient temperature. Refer to the number of simultaneous on points shown on the specifications of each input module.
- (2) Input modules may take in noise or the like as an input depending on the pulse width of a signal.

This pulse width has a value as listed below depending on the parameter-set response time. Set input response time while fully consider the operating environment.

Setting value of response time (ms)	Minimum value of pulse width where noise or the like may be taken in as an input (ms)
1	0.3
5	3
10	6
20	12
70	45

For settings of the input response time, refer to Section 1.3.1.

- (3) Read the following precautions carefully for use of the high-speed input modules (QX40H, QX70H, QX80H, and QX90H).
  - (a) When switching to the high-speed input, the specifications of the high-speed input modules and the input module QX40-S1 are identical. On the other hand, when switching to the interrupt input, the specifications of the high-speed input modules and the interrupt module QI60 are identical too.
    Therefore, the specifications of the input module (QX40-S1) are construed as the specifications of the high-speed input module switched to the high-speed input. Similarly, the specifications of the interrupt module (QI60) indicated in the manuals other than this manual are construed as the specifications of the high-speed input.

(b) The high-speed input modules switch module types (high-speed input or interrupt input) for 16 input points all together and between valid and invalid noise filters as shown below.

Function	Noise filter	GX Developer setting		
selector	selector switch	Module type	Module type Interrupt	
switch			operation	
ON	ON	High-speed input <sup>*1</sup>		0
	OFF		×	×* <b>2</b>
OFF	ON	Interrupt <sup>*1</sup>		0
	OFF		0	×* <b>2</b>

○: Settable ×: Not settable

- \*1: When selecting an improper module type, an error (error code: 2100) occurs.
- \*2: Setting the input response time with GX Developer is ignored.
- (c) If the small number of value of input response time is set, the modules tend to have impact of noise. Ensure that the modules do not have impact of noise. For the details of the measure against noise, refer to QCPU User's manual (Hardware Design, Maintenance and Inspection).
- (d) The high-speed input modules connected with electric appliance such as relays may load a chattering as a signal.
- (e) Select a cable whose length is three meters or less, when using the highspeed input module as a CE-compatible product.

### 1.2.2 Output module

- (1) If an output module drives load, its maximum switching frequency must be on for one second or longer and off for one second or longer.
- (2) If a counter or timer which has a DC-DC converter as a load is used with an output module, choosing an output module by its average current can cause a failure due to periodic inrush current at power-on or during operation.

To reduce the influence of inrush current for use of the above load, connect a resistor or an inductance to the load in series or use a module whose maximum load current is large.



- (3) Fuses installed to an output module cannot be replaced.
- (4) Fuses installed to an output module are to prevent external wiring from being burned in case that outputs of the module short. Therefore, if the fuses became a failure due to other than a short-circuit, the output modules may not be protected.

(5) It is recommended to install fuses to external terminals per point to prevent the external device and module from being burned in case of load short in the QY22 or QY68A.

Operations of the following fuses have been checked and ensured by Mitsubishi.

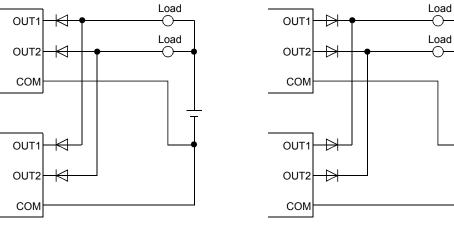
Module model	QY22* <sup>1</sup>		QY22* <sup>1</sup> QY68A* <sup>2</sup>		68A* <sup>2</sup>
Fuse model	216 02.5	216 002	216 3.15	312 003	
Rated current	2.5A	2A	3.15A	ЗA	
Manufacturer	Littelfuse, Inc				

\*1: Fuses that conform to Sheet 1 of IEC60127 are recommended.

\*2: Fast blow fuses whose rated current is 3A are recommended.

(6) Connecting the transistor output modules in parallel may result in a failure of the output elements.

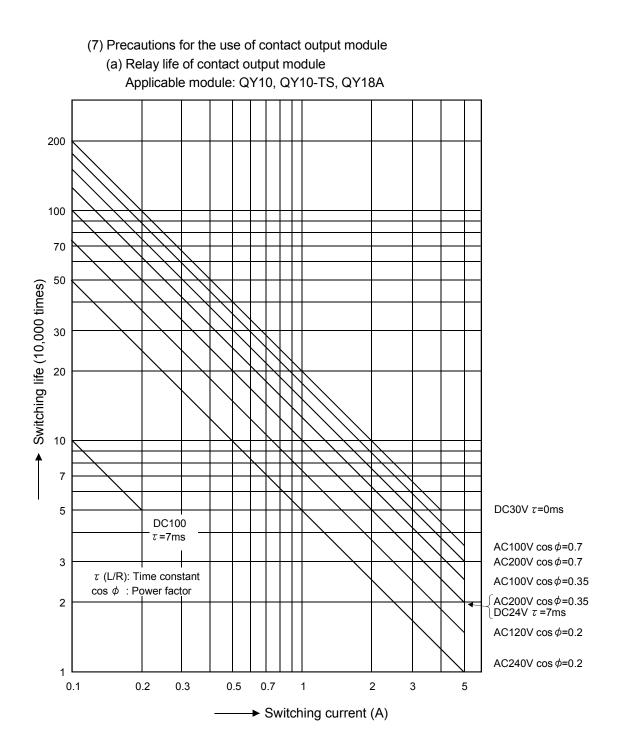
If connecting the transistor output modules in parallel, use diodes for the circuit as shown below.



Sink type

Source type

MELSEC-Q



### POINT

(1) When using the module for the application in which the relay contact is			
frequently switched, the relay life span should be	considered. Therefore, it is		
recommended to use a triac output module.			
(2) The relay life curve shows the value based on ac	tual use, which is not		
guaranteed. Therefore, make sure to allow for a	margin of error.		
The relay life span differs according to the specifi	ications as follows:		
<ul> <li>Rated switching voltage, current load</li> </ul>	100 thousand times		
• 200VAC 1.5A, 240VAC 1A (COS $\phi$ =0.7)	100 thousand times		
• 200VAC 0.4A, 240VAC 0.3A (COS $\phi$ =0.7)	300 thousand times		
• 200VAC 1A, 240VAC 0.5A (COS $\phi$ =0.35)	100 thousand times		
• 200VAC 0.3A, 240VAC 0.15A (COS $\phi$ =0.35)	300 thousand times		
• 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times			
• 24VDC 0.3A, 100VDC 0.03A (L/R=7ms)	300 thousand times		

MELSEC-Q

(b) Measures against inrush current

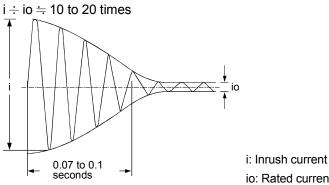
Relay life significantly varies depending on its load type the characteristics of its inrush current.

Take following measures since the inrush current may cause contact welding.

- In case of an increase in inrush current, select a load so that the inrush current will be within the rated current of the module.
- Connect the relay that can sustain inrush current outside the module.
- 1) Inductive load

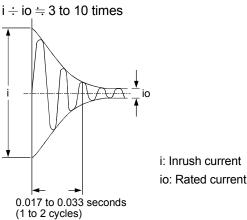
Inrush current of inductive load may flow 20 times as large as the rated current depending on a load.

[Load of a solenoid]



io: Rated current

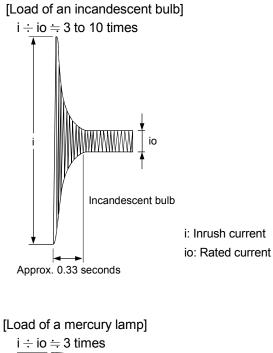
[Load of a magnetic contactor]

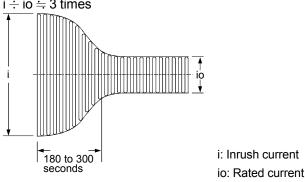


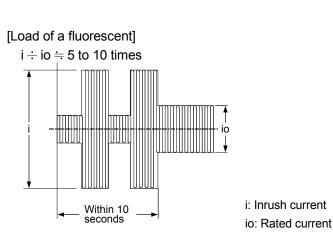
MELSEC-Q

#### 2) Load of a lamp

Inrush current 10 times as large as the rated current may flow through the lamp circuit depending on a load.





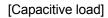


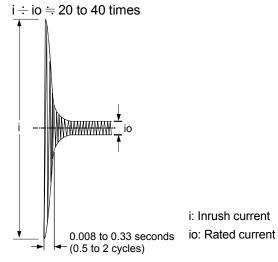
MELSEC-Q

#### 3) Capacitive load

When a load circuit includes such as a capacitor, inrush current 40 times as large as the rated current may flow through the load circuit depending on a load.

Also, pay attention to the wire capacity when the wiring is laid long.





(c) Measures against back EMF

When inductive load such as a magnetic contactor and solenoid is shut off, high back EMF is generated between the contacts and arc discharge occurs. Especially when the power factor is small, the life shortens due to arc discharge. Therefore, take measures against arc discharge.

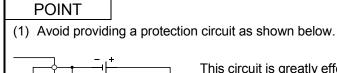
The following is four methods to protect a relay contact against back EMF.

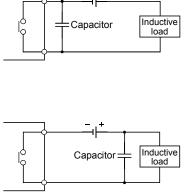
- Capacitor + Resistor method (CR method)
- Diode method
- Diode + Zener diode method
- Varistor method

	Circuit example	Method for selecting elements	Remarks
Capacitor + Resistor method (CR method)	Capacitor Inductive Resistor	Refer to the following for constants of the capacitor and resistor. Note that the following values may differ depending on a nature of the load and a variation of characteristics. • Capacitor 0.5 to 1 ( $\mu$ F) against contact current of 1A • Resistor 0.5 to 1 ( $\Omega$ ) against	If a load is from a relay or solenoid, the recovery time delays. A capacitor suppresses electric discharge while a contact is off, and a resistor restricts a flow of current while a contact is on.
	Capacitor Inductive load Resistor	contact voltage of 1V Use a capacitor whose withstanding voltage is 200 to 300V. In AC circuit, use a capacitor having no polarity.	*1: When using AC power, impedance of CR must be larger enough than that of the load. (prevention of a malfunction due to leak current from the CR)
Diode method	Diode A Inductive	Use a diode whose reverse breakdown voltage is 10 times as large as the circuit voltage or more and whose forward current is equal to or more than the load current.	The recovery time is later than the CR method.
Diode + Zener diode method	Diode Z Zener Diode Z	Use zener voltage for the zener diode equal to or more than the power supply voltage.	The diode method is effective when the recovery time is too late.

(To the next page)

	Circuit example	Method for selecting elements	Remarks
Varistor method	Varistor	Select a cut voltage (Vc) for the varistor to meet the following condition. Multiply the value by root two for use of AC power. Vc > Power supply voltage × 1.5 (V) Note that when selecting an element whose Vc is too high, its effect will weaken.	The recovery time delays slightly.





This circuit is greatly effective to an arc at shut-off. However, since an electric charge has been accumulated in a capacitor while a contact is off, short circuit current of the capacitor flows while the contact is on, which tends to result in contact welding.

This circuit is greatly effective to an arc at shut-off. However, since a charge current of the capacitor flows while the contact is on, which tends to result in contact welding.

(2) A protection circuit must be provided so that it may be close to a load or contact (module). If their distance is far, the protection circuit cannot show its effect. Provide the circuit so that their distance may be within 50cm (19.69 inch) (rough standard).

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### 1.2.3 I/O combined module

(1)I/O numbers of combined I/O modules

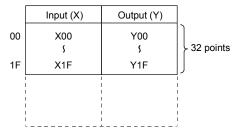
There are two types of combined I/O modules:

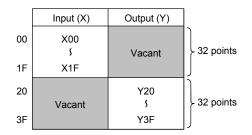
• Module using same I/O numbers for input and output

Since same number is used for input and output, the I/O numbers to be used can be saved.

• Module using sequential I/O numbers for input and output

Since I/O assignments are the same for A series, it is useful when replacing modules from those of A series.





Module using same I/O numbers for input and output (QH42P) Module using sequential I/O numbers for input and output (QX41Y41P)

(2)When using the QH42P, QX41Y41P or QX48Y57, configure it with the following devices.

Part name	Detail
CPU PLC	Product of product information [01112000000000-A] or later
GX Developer	SW5D5C-GPPW or later

The CPU PLCs other than those listed above cannot be used.

When the SW4D5C-GPPW is used, the response time cannot be set (fixed at 10ms).

Set OUTPUT for the I/O allocation.

For how to check product information of the CPU module, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection).

## 1.2.4 I/O module with protection function

The overload protection function and overheat protection function of the following modules are explained below.

(1) QY40P, QY40P-TS, QY41P, QY42P, QX41Y41P, QH42P

Function	Description
Common (Overload and overheat protection functions)	<ul> <li>If an overcurrent due to overload keeps flowing, heat is generated and the overheat protection function is activated.</li> <li>Each protection function is to protect the internal elements of the module, not to protect the external devices.</li> </ul>
Overload protection function	<ul> <li>The overload protection function is activated in units of 1 point at 1A to 3A/point.</li> <li>The overload protection function returns to normal operation when the load becomes a rated load.</li> </ul>
Overheat protection function	<ul> <li>The overheat protection function is activated in units of 1 point.</li> <li>The overheat protection function automatically returns to normal operation after heat reduces.</li> </ul>

#### (2) QY81P

Function	Description
Common (Overload and overheat protection functions)	<ul> <li>If an overcurrent due to overload keeps flowing, heat is generated and the overheat protection function is activated.</li> <li>Each protection function is to protect the internal elements of the module, not to protect the external devices.</li> </ul>
Overload protection function	<ul> <li>The overload protective function is activated in units of 1 point at 1A to 3A/point.</li> <li>The overload protective function returns to normal operation when the load becomes a rated load.</li> </ul>
Overheat protection function	<ul> <li>The overheat protection function is activated in units of 2 points. (It is activated in units of 2 points of Y0/Y1, Y2/Y3,, and when overheat protection is activated, 2 points of them are activated simultaneously. If an overheat status persists, heat is conducted, and which it may activate another overheat protection function.)</li> <li>If an output turns on at the activation of the overheat protection function, the actual output voltage oscillates between 0V and load voltage. At the load voltage of 24V, the average voltage during oscillation is approx. 7V. No oscillation occurs when the output is off at the activation of the overheat protection function. To ensure that the output is turned off at the activation of the overheat protection function, use an external load that turns off at 7V or more.</li> <li>The overheat protective function automatically returns to normal operation after heat reduces.</li> </ul>

### 1.2.5 Interrupt module

(1) If setting the response time during the interrupt input operation of QI60 or QX40H, QX70H, QX80H, and QX90H, use the module whose contents are shown below. The response time cannot be set with other contents (fixed at 0.2ms.).

Product name	Contents
PLC CPU	Product information "02112000000000-B" or later
GX Developer	SW6D5C-GPPW or later

For how to check product information of the CPU module, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection).

#### 1.2.6 Installation and wiring

- (1) Insulation-sleeved-solderless terminals cannot be used with the terminal block. It is recommended to cover the wire connections of the solderless terminals with mark or insulation tubes.
- (2) Use wires of 0.3 to 0.75mm<sup>2</sup> core and 2.8mm (0.11in.) OD max. to connect to the terminal block. When using a wire whose core is 0.75mm or more, it is preferable to use the spring terminal block(Q6TE-18S).
- (3) Tighten the module fixing and terminal block screws to the torques in the following ranges.

Screw location	Tightening torque range
Module fixing screw (M3 $ imes$ 12 screw)	36 to 48 N•cm
I/O module terminal block screw (M3 screw)	42 to 58 N•cm
I/O module terminal block mounting screw (M3 screw)	66 to 89 N•cm

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### 1.3 Various Settings for I/O Module

Various settings for the I/O module can be made with GX Developer. This section describes how to make the settings with GX Developer.

#### 1.3.1 Setting of I/O response time

Set the I/O response time on the I/O assignment tab of PLC Parameter.

(1) For Input/I/O mix module

Select "Input" or "I/O mix" in "Type" combo box on the I/O assignment tab of PLC parameter. Then, click the "Detailed setting" button, and then select the input response time in "I/O response time" combo box.

	Choose I	npuv	n/O mix.				Cn	10036	Dei	ailed setting
n(H) Param	eter									>
		LC file	PLC RAS De	evice   Pro	oram Ì B	Boot file	e Ísi	FC	1/0 =	ssianment
	20 0/01011	20 1110	1. 2011 10 10 10	1.10	gram Te		1.			
-1/0 Assignn									_	
SI			Model na	me	Poin		Star	<u>tXY</u> _	4 5	witch setting
0 PLC	PLC 🚽					-			ļŤ	Michielding
1 O(*-O)	Input	-			16points	_			1.	
2 1(*-1)	Empty Input	<b>^</b>				-				etailed setting
3 2(*-2)	Hi. input		L			-				
4 3(*-3)	Output									
5 4(*-4) 6 5(*-5)	I/Omix Intelli.	-				÷				
<u>6 5(*-5)</u> 7 6(*-6)	THICEIR.	-	-			÷				
									_	
			ot necessary as th		es it auto	omatica	ally.			
Leaving	this setting blan	k will r	not cause an erro	r to occur.						
🗆 Base setti	ng(*)									
	Base model r		Power model na	ma Euto	nsion cal	bla	Slot	. 🔺	⊢ B-	ase mode ¬
	base modern	laine	Fower model na	me Exter	ISION Cal	DIE	5100	×	6	Auto
Main								•		Detail
Ext.Base1								<b>-</b>	Ľ	Detail
Ext.Base2								-	80	Slot Default
Ext.Base3								•		nor Deradar
Ext.Base4							_	-	12	Slot Default
Ext.Base5	i							• •	_	
	should be set a	s same	e when	Import Mu	ltiple CP	U Para	amete	er 📘	Rea	d PLC data
	should be set a Iltiple CPU.	s same	e when	Import Mu	ltiple CP	U Para	amete	er 🗌	Rea	d PLC data
ั้นsing mu		_	e when	1		U Para Checl		er Er	_	d PLC data
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ั้นsing mu	iltiple CPU.	_		1		Check	<	Er	nd	
ั้นsing mu	iltiple CPU.	_		1		Check	<	Er e I/O	<sup>id</sup>	Cancel
	iltiple CPU.	it Mi	ultiple CPU settin	1		Check	<	Er e I/O	<sup>id</sup>	Cancel onse time
using mu Acknowledge	ultiple CPU. e XY assignmer	it Mi	ultiple CPU settin	gs Defa		Check	<	Er e I/O	<sup>id</sup>	Cancel onse time ilt: 10ms).
using mu Acknowledge Alligent fun	ultiple CPU. e XY assignmen retional modu	t Mi	ultiple CPU setting	Defa	ult	Checl Chc	oose	Er e I/O (c	nd resp lefau	Cancel onse time It: 10ms).
using mu Acknowledge	ultiple CPU. e XY assignmer	t Mi	ultiple CPU settin	Defa	HAW time oper	Checl Chc 'error PLC ation	oose	Er e I/O	nd resp lefau	Cancel onse time ilt: 10ms).
using mu Acknowledge Alligent fun Slot	iltiple CPU. XY assignmer ctional modu Type	t Mi	ultiple CPU setting	Error time output mode	H/W time oper mo	Checl Chc Chc error PLC ation ode	oose	Er EI/O (C	nd resp lefau onse	Cancel onse time llt: 10ms).
using mu scknowledge elligent fun Slot PLC	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Defa	H/W time oper mo	Check Cho Cho rerror PLC ation ode		Er Er (c	nd resp lefau onse	Cancel onse time ilt: 10ms).
elligent fun Slot	iltiple CPU. XY assignmer ctional modu Type	t Mi	ultiple CPU setting	Error time output mode	HAw time oper mc	Checl Chc error PLC ation ode	< , oose 1/0	Er e I/O (c	nd resp lefau onse	Cancel onse time lit: 10ms).
using mu cknowledge elligent fun Slot PLC 0(*-0) 1(*-1)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	HAw time oper mc	Checl Chc Chc ' error PLC ation ode		Er e I/O (c	nd resp lefau onse	Cancel onse time ilt: 10ms). Control PLC
using mu acknowledge sligent fur Slot PLC 0(*-0) 1(*-1) 2(*-2)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W time oper mc	Checl Chc Chc rerror PLC ation ode	<	Er Er (C ) respo time	nd resp lefau onse	Cancel onse time ilt: 10ms). Control PLC (*)
Using m. cknowledge elligent fur Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W time oper mc	Checl Chc Chc ' error PLC ation ode	<	Er Er (C ) respo time	nd resp lefau onse	Cancel onse time ilt: 10ms). Control PLC
using mt           ccknowledge           slitigent fun           PLC           0(*-0)           1(*-1)           2(*-2)           3(*-3)           4(*-4)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	HAW time oper mc	Check Chc PLC ation ode	<	Er Er (C ) respo time	nd resp lefau onse	Cancel onse time ilt: 10ms). Control PLC (*)
using m. Acknowledge alligent fun Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 3(*-3) 5(*-5)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W time oper mc	Check Chc rerror PLC ation ode	<	Er Er (C ) respo time	nd resp efau onse	Cancel onse time llt: 10ms).
using mt           Acknowledge           alligent fun           Slot           PLC           0(*-0)           1(*-1)           2(*-2)           3(*-3)           4(*-4)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	HAW	Check Chock PLC ation ode	<	Er Er (C ) respo time	nd resp efau onse	Cancel onse time llt: 10ms).
sligent fun Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 4(*-4) 5(*-5) 5(*-6)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	HAw time oper c	Checl Choo de error PLC ation ode	<	Er Er (C ) respo time	id resp efau	Cancel onse time lit: 10ms).
using m. Acknowledge sligent for Slot PLC 0(°-0) 1(°-1) 2(°-2) 3(°-3) 4(°-4) 5(°-5) 7(°-7) 8(°-8)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	HAW time oper mc	Checl Choo de error PLC ation de v	<	Er Er (C ) respo time	resp lefau	Cancel onse time ilt: 10ms).
using mt           acknowledge           slligent fun           PLC           0(*-0)           1(*-1)           2(*-2)           3(*-3)           4(*-4)           5(*-5)           6(*-6)           9(*-8)           9(*-3)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W	Checl Chc PLC ation ode	<	Er Er (C ) respo time	resp lefau	Cancel onse time ilt: 10ms). Control PLC (*) • • • • • • •
Ligent fun Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 4(*-4) 4(*-4) 4(*-4) 4(*-4) 5(*-5) 6(*-6) 7(*-7) 8(*-8) 9(*-9) 10(*-10) 11(*-11)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W time operations of the second sec	Checl Choc PLC ation ade	<	Er Er (C ) respo time	efau onse	Cancel onse time llt: 10ms).
using m. Acknowledge slligent fun Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 5(*-5) 5(*-5) 5(*-5) 5(*-5) 6(*-6) 7(*-7) 8(*-8) 9(*-9) 10(*-10) 11(*-11) 12(*-12)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	H/W time oper mc	Check Chock ? error PLC ation 	<	Er Er (C ) respo time	respuedence	Cancel onse time lit: 10ms).
using mu Acknowledge alligent for Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 4(*-4) 2(*-2) 3(*-3) 4(*-4) 4(*-6) 5(*-5) 5(*-5) 5(*-5) 5(*-5) 8(*-8) 9(*-9) 10(*-10) 11(*-11)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	ult	Check Chcc error PLC ation ode v v v v v v v v v v v v v v v v v v v	<	Er Er (C ) respo time	resp lefau	Control PLC Control PLC (M) Control PLC (M) (M) (M) (M) (M) (M) (M) (M)
using m. Acknowledge slligent fun Slot PLC 0(*-0) 1(*-1) 2(*-2) 3(*-3) 5(*-5) 5(*-5) 5(*-5) 5(*-5) 6(*-6) 7(*-7) 8(*-8) 9(*-9) 10(*-10) 11(*-11) 12(*-12)	Ittiple CPU. a XY assignmer ctional modu Type PLC	t Mi	ultiple CPU setting	Error time output mode	ult	Check Chock ? error PLC ation 	<	Er Er (C ) respo time	respuedence	Cancel onse time lit: 10ms).

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(2) For high-speed input module/QI60

Select "Hi. input" or "Interrupt" in "Type" combo box on the I/O assignment tab of PLC parameter. Then, click the "Detailed setting" button, and then select the input response time in "I/O response time"\*1 combo box.

	Choose	Choo	se Detailed setting			
Qn(H) Para	neter					×
PLC name	PLC system	PLC file	PLC RAS Devic	e Program Boot	file SFC	1/0 assignment
-1/0 Assign 0 PLC 1 0(*C 2 1(*-1 3 2(*-2 4 3(*-3 5 4(*-4 6 5(*-5 7 6(*-6	inent(*) PLC PLC Input Input Hit input Uutput Intelli Intelli		Model name	Points 16points	StartXY	Switch setting Detailed setting
Leaving	this setting bla	ınk will no	t cause an error to	occur.		
Base sel	ting(*)					
	Base mode	Iname F	ower model name	Extension cable	Slots 📥	Base mode
Main					<b>•</b>	C Detail
Ext.Base					-	
Ext.Base Ext.Base						8 Slot Default
Ext.Base	-					
Ext.Base					<b>•</b> •	12 Slot Default
	s should be set nultiple CPU.	as same i	when Imp	port Multiple CPU Pa	arameter	Read PLC data
Acknowled	ge XY assignme	ent Mul	tiple CPU settings	Default Che	eck E	ind Cancel

	Slot	Туре	Model name	Error time output mode	H/W error time PLC operation mode	D	O response time	Control PLC
0	PLC	PLC		<b>•</b>	•	,	•	<b>–</b>
1	0(*-0)	Hi. input		•	•	0.2	ms 🔻	<u> </u>
2	1(*-1)			-	<b>•</b>		ms	<b>•</b>
3	2(*-2)			-	•		2ms Ims	<b>T</b>
4	3(*-3)			-	•		òms	<b>•</b>
5	4(*-4)			-	•	1m		<b>•</b>
6	5(*-5)			-	•		•	<b>•</b>
7	6(*-6)			-	•		•	-
8	7(*-7)			-	•		•	-
9	8(*-8)			-	•		•	<b>•</b>
10	9(*-9)			<b>•</b>	•		•	<b>•</b>
11	10(*-10)			<b>-</b>	•		•	<b>•</b>
12	11(*-11)			<b></b>	•	<u> </u>	•	<b>•</b>
13	12(*-12)			<b></b>	•	<u> </u>	•	<b>•</b>
14	13(*-13)			<b>•</b>	<b>•</b>	-	• •	
15	14(*-14)			<b>-</b>	•		•	<b>•</b> •

T

Choose I/O response time

\*1: When the actual response time differs from the setting value, refer to the specifications of the relevant I/O modules.

(3) For high-speed input module/QX40H, QX70H, QX80H, QX90H Select "Hi.input" or "Interrupt", which is the same module type as the one selected with the high-speed input module switch, in "Type" combo box on the I/O assignment tab of PLC parameter.\*1 Then, click the "Detailed setting" button, and then select the input response time in "I/O response time"\*2\*3 combo box.

			nput/Interrupt.		Choos	e Detailed settir
• •	Parama ame   P		e PLC RAS Devic	e Program Boot	file SFC	I/O assignment
- 1/0 4	Assignm					_
	Slo		Model name	Points	StartXY 🔺	Switch setting
0	PLC	PLC 🚽 💌	•		·	Jawachisedding
1	0(*-0)	Hi. input 🗖	•	16points 🗨	r	<b>•</b>
2	1(*-1)	Empty 🔺			r	Detailed setting
3	2(*-2)	Input Hi, input			r	
4	3(*-3)	Output			r	
5	4(*-4)	1/0 mix			•	
6	5(*-5)	Intelli. 💽	·		•	
7	6(*-6)	-	•			•
			ot necessary as the C		cally.	
Le	eaving th	his setting blank will	not cause an error to	occur.		
_ Baa	se settin	g(*)				
		Base model name	Power model name	Extension cable	Slots 🔺	⊢Base mode⊣
		Base model name	Power model name	Extension cable	510(\$	Auto
	Main				-	
Ext	.Base1				-	🔿 Detail
Ext	.Base2				-	
Ext	.Base3				-	8 Slot Default
Ext	.Base4				-	12 Slot Default
Ext	.Base5				<b>•</b> •	12 SIGC Default
		hould be set as sam tiple CPU.	e whenIm	port Multiple CPU Pa	arameter	Read PLC data
Ackno	owledge	XY assignment	lultiple CPU settings	Default Che	ick Er	nd Cancel

	Slot	Туре	e detailed setting Model name	Error time output	H/W error time PLC	Ŀ,	O response	Control PLC
				mode	operation mode		time	(*)
)	PLC	PLC		•	-		<b>, ,</b>	-
1	0(*-0)	Hi. input		<b>•</b>	-		2ms 🔻	<b>•</b>
2	1(*-1)			•	•		lms	•
3	2(*-2)			-	•		2ms 4ms	-
4	3(*-3)			•	-		Sms	-
5	4(*-4)			•	-	1m	าร	-
	5(*-5)			•	•		-	•
7	6(*-6)			•	•		-	•
B	7(*-7)			•	-		-	•
	8(*-8)			•	-		-	<b>•</b>
0	9(*-9)			•	•		-	•
1	10(*-10)			•	•		-	•
2	11(*-11)			<b>•</b>	<b>•</b>		•	-
	12(*-12)			<b>•</b>	-		-	-
	13(*-13)			•	<b>•</b>		•	-
5	14(*-14)			-	-		-	•

L

Choose I/O response time

- \*1: If selected a different module type with the one selected by the function selector switch of high-speed input module, an error occurs.
- \*2: If disabled the noise filter with the noise filter selector switch of the high-speed input module, the setting value is ignored.
- \*3: When the actual response time differs from the setting value, refer to the specifications of the relevant I/O modules.

## 1.3.2 Setting of error-time output mode

Set the error-time output mode on the I/O assignment tab of PLC parameter in GX Developer.

Select "Output" or "I/O mix" in the "Type" combo box on the I/O assignment tab of PLC parameter. Then, click the "Detailed setting" button, and then select "Clear" or "Hold" in the "Error time output mode" combo box.

	e Detailed setting				
n(H) Param	eter				×
PLC name 📗	PLC system PLC file	e PLC RAS Devic	e Program Boot	file SFC	1/0 assignment
			1 - 1		1 1
- 1/0 Assignn	nent(*)				
	ot Type	Model name	Points	StartXY 🔺	Switch setting
0 PLC	PLC 🚽 💌			·	5 witch setting
1 0(*-0)	Output	•	16points 🗨	·	Datalland cattional
2 1(*-1)	Empty A				Detailed setting
3 2(*-2) 4 3(*-3)	Hi. input				
5 4(×-4)	Output				
6 5(*-5)	Intelli.			-	
7 6(*-6)					-
Assigning	the I/O address is n	ot necessary as the C	PU does it automati	cally.	-
Leaving	, his setting blank will	not cause an error to	occur.	-	
⊢Base setti					
		<u> </u>			- Base mode -
	Base model name	Power model name	Extension cable	Slots -	Auto
Main				•	C Detail
Ext.Base1				<b>•</b>	
Ext.Base2				<b>•</b>	8 Slot Default
Ext.Base3					
Ext.Base4					12 Slot Default
	should be set as sam Iltiple CPU.	e when	port Multiple CPU Pa	arameter	Read PLC data
Acknowledge	e XY assignment M	ultiple CPU settings	Default Che	eck Er	nd Cancel



Inte	lligent fund	ctional modu	le detailed setting			,	×			
	Slot	Туре	Model name	Error time output mode	H/W error time PLC operation mode	1/O response time	Control PLC (*)			
0	PLC	PLC		+ -	-	۲	<b>•</b>			
1	0(×-0)	Output		Clear 🗸 🔻	-	+	<u> </u>			
2	1(*-1)			Clear	-	•	<b>•</b>			
3	2(*-2)			Hold	<b>•</b>	•	<b>•</b>			
4	3(*-3)			•	-	•	<b>•</b>			
5	4(*-4)			•	-	+	<b>•</b>			
6	5(*-5)			•	-	+	<b>•</b>			
7	6(*-6)			•	-	+	<b>•</b>			
8	7(*-7)			•	-	+	<b>•</b>			
9	8(*-8)			-	-	+	<b>•</b>			
10	9(*-9)			-	-	+	<b>•</b>			
11	10(*-10)			-	-	+	<b>•</b>			
12	11(*-11)			•	<b>•</b>	•	<b>•</b>			
13	12(*-12)			-	<b>•</b>	<b>•</b>	<u> </u>			
14	13(*-13)			-	-	+	<b>•</b>			
15	14(*-14)			-	<b>•</b>	•	<b>• •</b>			
(*):	(*)settings should be set as same when using multiple PLC. End Cancel									

MELSEC-Q

### 1.3.3 Switch setting of interrupt module

Perform the switch setting on the I/O assignment tab of PLC parameter when operating the interrupt input for QI60, QX40H, QX70H, QX80H, or QX90H. Select "Interrupt" in the "Type" combo box on the I/O assignment tab of PLC parameter. Then, click the "Switch setting" button, and then select "HEX" in the "Input format" combo box. Lastly, set 0 (leading edge) or 1 (trailing edge) in the "Switch1" box for the interrupt processing.

	'LC nan	·	system F	LC file	PLC RAS	Device	e Pro	igram Bo	ot fil	e SFC	I/	/O assi	ignment	   
	1/0 As	signment												
		Slot	Typ		Mode	el name		Points		StartX1	스튁	Swit	tch settir	na III.
		2LC	PLG				-	10 11	•				1	-
		(*-0) (*-1)	Interrupt Input	-				16points	* *		- 1	Deta	iled setti	nall
		(*-1) (*-2)	Hi. input	<u> </u>					Ŧ		-			
ŀ		(*-3)	Output		L				-		-			
		(*-4)	1/0 mix Intelli.						-		-			
		(*-5)	Interrupt	•					•		-			
		(*-6)		-					•		-			
L	Lea	ving this : setting(*)	etting blan	k will i	ot necessary not cause an Power mode	error to (	occur.	nsion cable	_	Slots	<u> </u>	- Base	e mode-	
			ase model i	Idille	- Ower mode	aname	E XIEI	nsion cable	2				Auto	
		ain						-	_	•			Detail	
	Ext.B								+	-				
	Ext.B Ext.B								+			8 Slo	t Defaul	ε
	Ext.B								+					
	Ext.B								+	-	-	12 Sic	ot Defau	
-						ettings		ault C	hec	<u> </u>	End		Cance	
:h :	setting	g for 1/0	and inte	lliger	nt functiona	ł	,	Input for	С	hoose	e HI			
:h :						al modu	ıle	Input for	C	hoose	e HI	EX.		
	Slot	g for 1/0 Tyj PLC			nt functiona	al modu	ıle		C	hoose	e HI	EX.		
PL0	Slot C	Ту	De			al modu	ıle	Input for	C	hoose	e HI	EX.		
PL0 0(*4 1(*4	<u>Slot</u> C 0) 1)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*-1 1(*-1 2(*-1	Slot C 0) 1) 2)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC D(*-1 1(*- 2(*-1 3(*-1	Slot C 0) 1) 2) 3)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*-1 1(*- 3(*- 4(*-	Slot C 0) 1) 2) 3) 4)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*-1 2(*- 3(*- 3(*- 5(*-)	Slot C 0) 1) 2) 3) 4) 5)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC D(*-1 1(*- 2(*- 3(*- 5(*-1 5(*-1	Slot C 0) 1) 2) 3) 4) 5) 6)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*-1 2(*- 3(*- 5(*-1 5(*-1 5(*-1 7(*-1	Slot C 0) 1) 2) 3) 4) 5) 6) 7)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*+ 1(*- 2(*+ 3(*+ 5(*+ 6(*+ 7(*- 8(*+	Slot C 0) 1) 2) 3) 4) 5) 6) 7) 8)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*-1 2(*- 3(*- 3(*- 5(*-1 5(*-1 5(*-1 9(*-1 9(*-1	Slot C 0) 1) 2) 3) 4) 5) 6) 7) 8)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*+ 2(*+ 3(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5	Slot C 0) 1) 2) 3) 4) 5) 6) 7) 8) 9)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(*+ 1(*- 2(*- 3(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5(*+ 5	Slot 0) 1) 2) 3) 4) 5) 5) 6) 7) 8) 9) *-10)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(* 1(*- 2(* 3(* 5(*))))))))))))))))))))))))))))))))))))	Slot C 0) 1) 2) 2) 3) 4) 5) 5) 6) 7) 8) 9) *-10) *-11) *-12) *-13)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		
PLC 0(* 1(*- 2(* 3(* 5(*))))))))))))))))))))))))))))))))))))	Slot C 0) 1) 2) 3) 4) 5) 6) 7) 8) 9) *-10) *-11) *-12)	Ty PLC	De			al modu	ile	Input for	C	hoose	e HI	EX.		

Set the interrupt processing conditions Setting inhibited. (leading edge/trailing edge) of CH1 to CH16.

Set the interrupt processing condition with switch 1. The relationships between bits and inputs are as indicated below.

b15							to								b0
XF	XE	XD	XC	XB	XA	X9	X8	X7	X6	X5	X4	X3	X2	X1	X0

0: Leading edge, 1: Trailing edge

## 2. INPUT MODULE SPECIFICATIONS

## 2.1 QX10 AC Input Module

	Туре	AC Input Module	
Specifications		QX10	Appearance
Number of input points		16 points	
Isolatio	n method	Photocoupler	
Rated input vo	ltage, frequency	100-120VAC (+10/-15%) 50/60Hz (±3Hz)	QX10
Input volta	ge distortion	Within 5% (Refer to section 1.2)	0 1 2 3 4 5 6 7 8 9 A B C D E F
Rated in	put current	Approx. 8mA (100VAC, 60Hz), approx. 7mA (100VAC, 50Hz)	
Input	derating	Refer to the derating chart.	
Inrush	n current	Max. 200mA within 1ms (at 132VAC)	
ON voltage	e/ON current	80VAC or higher/5mA or higher (50Hz, 60Hz)	
OFF voltage	e/OFF current	30VAC or lower/1.7mA or lower (50Hz, 60Hz)	
Input in	npedance	Approx. 12k $\Omega$ (60Hz), approx. 15k $\Omega$ (50Hz)	
Response	OFF to ON	15ms or less (100VAC 50Hz, 60Hz)	<u>3</u> 2
time	ON to OFF	20ms or less (100VAC 50Hz, 60Hz)	
Dielectric wit	hstand voltage	1780VAC rms/3 cycles (altitude 2000m (6557.38ft.))	4
Insulation	n resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 1500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise i	immunity	and 25 to 60Hz noise frequency	7
		First transient noise IEC61000-4-4: 1kV	
	n of degree	IP1X	B 9
	inal arrangement	16 points/common (common terminal: TB17)	A
	of I/O points	16 (I/O allocation is set as a 16-points input module)	B
	n indicator	ON indication (LED)	
External of	connections	18-point terminal block (M3 $\times$ 6 screws)	
Applicable wire size		0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	
Applicable cr	imping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	100VAC 8mA60Hz
	ernal current umption	50mA (TYP. all points ON)	7mA50Hz
W	eight	0.17kg	]

Derating Chart	Terminal Block Number	Signal Name
(%)	TB1	X00
	TB2	X01
90 ON 80 120VAC	TB3	X02
ratio 70	TB4	X03
60 132VAC	TB5	X04
40 40 20 30 40 50 55(°C)	TB6	X05
Ambient temperature	TB7	X06
External Connections	TB8	X07
	TB9	X08
	TB10	X09
┎──╸╺───┿┖──┿╢┿─┿╬┍ <u></u> ┱──╖┤  ┝╥╷╽	TB11	X0A
	TB12	X0B
	TB13	X0C
	TB14	X0D
	TB15	X0E
	TB16	X0F
100VAC	TB17	COM
	TB18	Vacant

## 2.2 QX10-TS AC Input Module

This module is a spring clamp terminal block type and an input module that has
indicators for checking the insertion state of wire.

	Туре	AC Input Module	
Specifications		QX10-TS	Appearance
Number of input points		16 points	
Isolation	n method	Photocoupler	QX10-TS
Rated input vo	Itage, frequency	100-120VAC (+10/-15%) 50/60Hz (±3Hz)	0 1 2 3 4 5 6 7
Input voltag	ge distortion	Within 5% (Refer to section 1.2)	89ABCDEF
Rated inp	out current	Approx. 8mA (100VAC, 60Hz), approx. 7mA (100VAC, 50Hz)	
Input o	derating	Refer to the derating chart.	
Inrush	current	Max. 200mA within 1ms (at 132VAC)	
ON voltage	e/ON current	80VAC or higher/5mA or higher (50Hz, 60Hz)	
OFF voltage	e/OFF current	30VAC or lower/1.7mA or lower (50Hz, 60Hz)	
Input im	pedance	Approx. 12k $\Omega$ (60Hz), approx. 15k $\Omega$ (50Hz)	3 15 []
Response	OFF to ON	15ms or less (100VAC 50Hz, 60Hz)	
time	ON to OFF	20ms or less (100VAC 50Hz, 60Hz)	
	nstand voltage	1780VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation	resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 1500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise i	mmunity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
	n of degree	IP2X	
	nal arrangement	16 points/common (common terminal: TB17)	
	f I/O points	16 (I/O allocation is set as a 16-points input module)	
Operation	n indicator	ON indication (LED)	
External connections		Two piece Spring clamp terminal block	
Applicable wire size		0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)	
Applicable cri	mping terminal	Refer to section 9.1	
	rnal current mption	50mA (TYP. all points ON)	
We	eight	0.17kg	

Derating Chart	Terminal Block Number	Signal Name
(%)	TB1	X00
	TB2	X01
90 ON 80 120VAC	TB3	X02
ratio 70	TB4	X03
60 132VAC	TB5	X04
40 40 40 40 40 40 40 40 40 40 40 40 40 4	TB6	X05
Ambient temperature	TB7	X06
External Connections	TB8	X07
	TB9	X08
	TB10	X09
	TB11	X0A
	TB12	X0B
) ( Internal ) circuit	TB13	X0C
	TB14	X0D
	TB15	X0E
	TB16	X0F
100VAC	TB17	COM
	TB18	Vacant

2

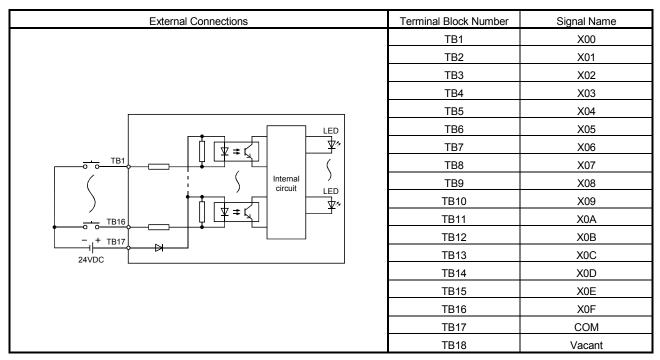
## 2.3 QX28 AC Input Module

	Туре	AC Input Module	
Specifications		QX28	Appearance
Number of input points		8 points	
Isolatio	n method	Photocoupler	
Rated input vo	ltage, frequency	100-240VAC (+10/-15%) 50/60Hz (±3Hz)	
Input volta	ge distortion	Within 5% (Refer to section 1.2)	QX28
Rated in	put current	Approx. 17mA (200VAC, 60Hz), approx. 14mA (200VAC, 50Hz) Approx. 8mA (100VAC, 60Hz), approx. 7mA (100VAC, 50Hz)	0 1 2 3 4 5 6 7
Input	derating	Refer to the derating chart.	
Inrush	n current	Max. 500mA within 1ms (at 264VAC)	
ON voltage	e/ON current	80VAC or higher/5mA or higher (50Hz, 60Hz)	
OFF voltage	e/OFF current	30VAC or lower/1.7mA or lower (50Hz, 60Hz)	
Input in	npedance	Approx. 12k $\Omega$ (60Hz), approx. 15k $\Omega$ (50Hz)	
Response	OFF to ON	10ms or less (100VAC 50Hz, 60Hz)	
time	ON to OFF	20ms or less (100VAC 50Hz, 60Hz)	
Dielectric wit	hstand voltage	2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))	3
Insulation	n resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 1500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise i	immunity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protectio	n of degree	IP1X	
Common term	inal arrangement	8 points/common (common terminal: TB17)	
Number of	of I/O points	16 (I/O allocation is set as a 16-points input module)	
Operatio	on indicator	ON indication (LED)	
External of	connections	18-point terminal block (M3 $ imes$ 6 screws)	
Applicab	le wire size	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	200VAC 17mA60Hz
Applicable cr	imping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	14mA50Hz
	ernal current umption	50mA (TYP. all points ON)	
W	eight	0.20kg	

Derating Chart	Terminal Block Number	Signal Name
(%) 100% 45 °C	TB1	X00
100 90 90 100% 55 °C ▲ 240V 90 264V	TB2	Vacant
ON 80 87.5% 55°C 204V	TB3	X01
ratio 70 60	TB4	Vacant
50	TB5	X02
40 40 40 50 50 °C )	TB6	Vacant
Ambient temperature	TB7	X03
External Connections	TB8	Vacant
	TB9	X04
	TB10	Vacant
	TB11	X05
	TB12	Vacant
) ( Internal ) circuit	TB13	X06
	TB14	Vacant
	TB15	X07
	TB16	Vacant
100/200VAC	TB17	СОМ
	TB18	Vacant

### 2.4 QX40 DC Input Module (Positive Common Type)

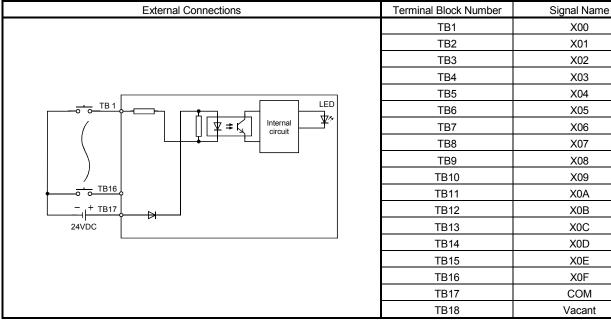
	Туре	DC Input Module (Positive Common Type)					
Specifications		QX40	Appearance				
Number	of input points	16 points					
Isolation method		Photocoupler					
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	0)///0				
Rated	input current	Approx. 4mA	QX40 0 1 2 3 4 5 6 7				
Inpi	ut derating	No	89ABCDEF				
ON volta	age/ON current	19V or higher/3mA or higher					
OFF volta	age/OFF current	11V or lower/1.7mA or lower					
Input	impedance	Approx. 5.6k $\Omega$					
	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$					
Response time		Initial setting is 10ms.					
	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$					
		Initial setting is 10ms.					
Dielectric	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))					
Insulati	ion resistance	10M $\Omega$ or more by insulation resistance tester					
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width					
Nois	e immunity	and 25 to 60Hz noise frequency					
		First transient noise IEC61000-4-4: 1kV					
Protect	tion of degree	IP2X	A A				
Common ter	minal arrangement	16 points/common (common terminal: TB17)	B				
Numbe	er of I/O points	16 (I/O allocation is set as a 16-points input module)	E C				
Opera	tion indicator	ON indication (LED)					
Externa	al connections	18-point terminal block (M3 $\times$ 6 screws)	NC E				
Applica	able wire size	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	24VDC 4mA				
Applicable	crimping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)					
5VDC internal current consumption		50mA (TYP. all points ON)					
	Weight	0.16kg					



\* 1: For the setting method, refer to the section 1.3.1.

# 2.5 QX40-S1 DC Input Module (Positive Common Type)

		Туре			DC Input Mode	ule (Positive Co	mmon Type)	
Specification	s				QX40-S1			Appearance
Number	of input poin	its			16 points			
Isola	tion method				Photocoupler			
Rated input voltage				24VDC (+20/	-15%, ripple rat	io within 5%)		
Rated	Rated input current				Approx. 6mA			QX40-S1
	ut derating				No			0 1 2 3 4 5 6 7 8 9 A B C D E F
	age/ON curre				higher/4.0mA o	-		
	age/OFF curr	rent		-	lower/1.7mA o	r lower		
Input	impedance				Approx. 3.9k Ω			
	Set value		0.1	0.2	0.4	0.6	1	
Response	OFF to ON	Тур	0.05ms	0.15ms	0.30ms	0.55ms	1.05ms	
time		max	0.10ms	0.20ms	0.40ms	0.60ms	1.20ms	2
	ON to OFF	Тур	0.15ms	0.20ms	0.35ms	0.60ms	1.10ms	4 3
Dialactria	withstand val	max	0.20ms 0.30ms 0.50ms 0.70ms 1.30ms 560VAC rms/3 cycles (altitude 2000m (6557.38ft.))					
	withstand vol	-			5 5 5			
Insulat	UTTESISIANO	e	10M $\Omega$ or more by insulation resistance tester By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width					
Nois	e immunity		and 25 to 60Hz noise frequency					• <del>₀</del> 9 7
	e mining	·			nt noise IEC610	1 7		
Protect	tion of degree	е			IP2X			
Common ter	minal arrang	ement		16 points/comr	non (common t	erminal: TB17)		A A B
Numbe	er of I/O point	S	16 (l/	O allocation is	set as a 16-poir	nts Hi. input mo	dule)	
Opera	tion indicator	-		10	N indication (LE	D)		
Externa	al connection	s			minal block (M3			
Applica	able wire size	9	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)					24VDC
Applicable crimping terminal			R1.25-3 (sleeved crimping terminals cannot be used.)					6mA
5VDC internal current			60mA (TYP. all points ON)					
	nsumption							
	Weight				0.20kg			

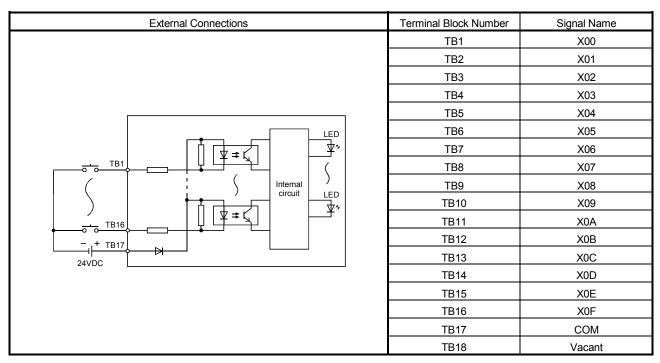


\* 1: CPU parameter setting. (Initial setting is 0.2ms)
 Response time can be changed on SW5D5C-GPPW or later.
 For the setting method, refer to the section 1.3.1.

# 2.6 QX40-TS DC Input Module (Positive Common Type)

	Туре	DC Input Module (Positive Common Type)				
Specifications		QX40-TS	Appearance			
Number	of input points	16 points				
Isolat	tion method	Photocoupler				
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	QX40-TS 0 1 2 3 4 5 6 7			
Rated	input current	Approx. 4mA	89ABCDEF			
Inpu	ut derating	No				
ON volta	age/ON current	19V or higher/3mA or higher				
OFF volta	age/OFF current	11V or lower/1.7mA or lower				
Input	impedance	<b>Αρρrox. 5.6k</b> Ω				
	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$				
Response		Initial setting is 10ms.				
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$				
		Initial setting is 10ms.				
Dielectric v	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))				
Insulati	on resistance	10M $\Omega$ or more by insulation resistance tester				
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	- 9 序 [] ([) (] () () () () () () () () () () () () ()			
Nois	e immunity	and 25 to 60Hz noise frequency				
		First transient noise IEC61000-4-4: 1kV				
	ion of degree	IP2X				
	minal arrangement	16 points/common (common terminal: TB17)				
	r of I/O points	16 (I/O allocation is set as a 16-points input module)	15╠Ш())			
	tion indicator	ON indication (LED)				
Externa	al connections	Two piece Spring clamp terminal block				
Applicable wire size		0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)				
Applicable	crimping terminal	Refer to section 9.1				
5VDC internal current consumption		50mA (TYP. all points ON)				
۱. ۱	Weight	0.16kg				

This module is a spring clamp terminal block type and an input module that has indicators for checking the insertion state of wire.



\*1: For the setting method, refer to the section 1.3.1.

#### 2.7 QX40H DC High-Speed Input Module (Positive Common Type)

		Туре				DC high-spee	d input modul	e (Positive Co	ommon Type)	1
Specificatio	ons	/				QX	40H			Appearance
Numbe	r of input poi	nts		16 points						
Isola	ation method					Photod	coupler			
Rated	l input voltag	е			24VD0	C (+20/-15%, r	ipple ratio with	nin 5%)		
	l input currer	nt				Approx				
	out derating					Refer to the c				-
	age/ON curr					Ŭ	3mA or higher			-
	age/OFF cu					8V or lower/1				
Inpu	t impedance			1		Approx	. <b>3.9k</b> Ω			0 1 2 3 4 5 6 7 8 9 A B C D F F
	SW1 (no filter) *		OFI	F			ON			
Response	Set value	*2	Inva	lid	0.1	0.2	0.4	0.6	1	0X40H
time	OFF to ON	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	
unic		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	
(	ON to OFF	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	
		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	
Function setting	SW2*	4			OFF	: Interrupt, ON	l: High-speed	input		$100^{\circ}$
Dielectric	withstand vo	oltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))							
Insulat	tion resistan	ce	10M $\Omega$ or more by insulation resistance tester							
Noise	immunity *	5	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency							
Protec	tion of degre	e		IP2X					A A	
	mon termina rangement	I			8 points/co	ommon (comn	non terminal:	TB9,TB18)		
Numbe	er of I/O poir	nts	16 (I	16 (I/O allocation is set as a 16-points high-speed input module or interrupt module) * 4						
Opera	ation indicato	or			Set by Sv	witch setting ir	GX Develope	er*4 *6		
External connections ON indication (LED)										
Applic	able wire siz	e	18-point terminal block (M3×6 screws)					ļ		
Applicable	rminal	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.)OD max.)					ļ			
Protec	tion of degre	e		R1.25-3(sleeved solderless terminals cannot be used.)					4	
	internal curre	ent		80mA (TYP. all points ON)						
	Weight					0.1	6kg			<u> </u>

\* 1: If turning on the switch 1, the noise filter takes effect.

The off-status noise filter disables I/O response time setting.

After switching on or off the switch 1, reset the power supply of the CPU module.

\*2: Set an input response time in "I/O response time" combo box of PLC parameter in GX Developer. (Default: 0.2ms) The response time in SW6D5C-GPPW or later can be changed. For the setting details, refer to Section 1.3.1.

\*3: The actual response time is 5  $\mu$  s delay when turning on, 10  $\mu$  s delay when turning off, because the hardware response time is added. For the details of the CPU overhead time, refer to QCPU User's Manual (Function Explanation, Program Fundamentals)...

\*4: The module function can be changed according to the switch 2 status.

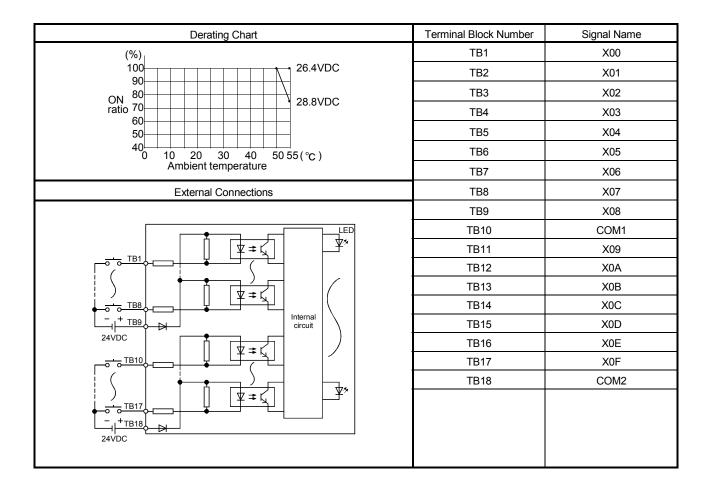
ON : High-speed input

OFF : Interrupt

If changing the switch 2 setting while the CPU module is in RUN, an error (error code:2100) occurs.

\*5: Indicates the noise immunity when the noise filter takes effect (the switch is turned on).

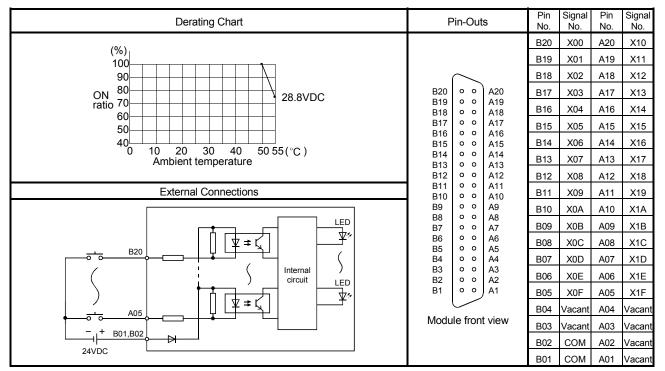
\* 6: For the setting method, refer to Section 1.3.3.



# MELSEC-Q

#### 2.8 QX41 DC Input Module (Positive Common Type)

	Туре	DC Input Module (Positive Common Type)	
Specifications		QX41	Appearance
Number	of input points	32 points	
Isolation method Rated input voltage		Photocoupler	
		24VDC (+20/-15%, ripple ratio within 5%)	
Rated input current		Approx. 4mA	QX41
Inpi	ut derating	Refer to the derating chart.	0 1 2 3 4 5 6 7 8 9 A B C D E F
ON volta	age/ON current	19V or higher/3mA or higher	0 1 2 3 4 5 6 7
OFF volta	age/OFF current	11V or lower/1.7mA or lower	8 9 A B C D E F
Input	impedance	Approx. 5.6k $\Omega$	24VDC QX41
	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1	4mA
Response		Initial setting is 10ms.	O
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1	
		Initial setting is 10ms.	
Dielectric withstand voltage		560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulati	ion resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Nois	e immunity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protect	tion of degree	IP2X	
Common ter	minal arrangement	32 points/common (common terminal: B01, B02)	
Numbe	er of I/O points	32 (I/O allocation is set as a 32-points input module)	
Opera	tion indicator	ON indication (LED)	
Externa	al connections	40-pin connector	
Applica	able wire size	0.3mm <sup>2</sup> (For A6CON1 or A6CON4) * 2	
External	wiring connector	A6CON1, A6CON2, A6CON3, A6CON4 (optional)	
Applicable connector/terminal block conversion module		A6TBXY36, A6TBXY54, A6TBX70	
5VDC internal current consumption		75mA (TYP. all points ON) (0.08A is shown on the rating plate of the module.)	
	Weight	0.15kg	



<sup>\* 1:</sup> For the setting method, refer to the section 1.3.1.

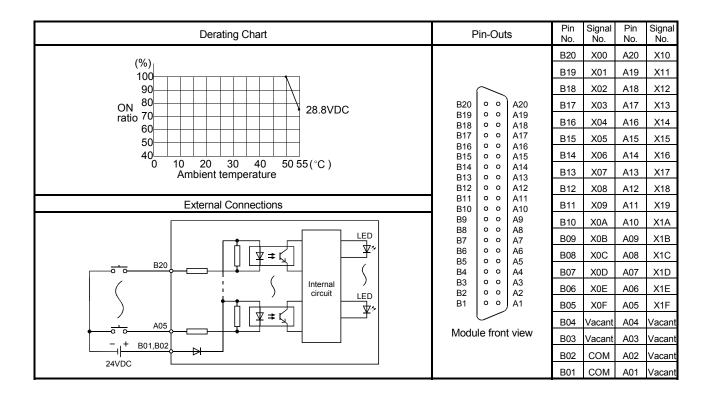
\*2: When using A6CON2 or A6CON3, refer to Chapter 7.

#### 2.9 QX41-S1 DC Input Module (Positive Common Type)

	_	Туре			DC Input Mode	ule (Positive Co	ommon Type)	-	
Specification	s				QX41-S1			Appe	earance
Number	of input poin	ts	32 points						
Isolat	tion method				Photocoupler				
Rated	input voltage			24VDC (+20/	-15%, ripple rat	io within 5%)			
Rated	input current				Approx. 4mA				
	ut derating				to the derating			QX41-S1	4567
	age/ON curre				higher/3.0mA o			8 9 A B	CDEF
	age/OFF curr	ent			lower/1.5mA c	r lower			4567 CDEF
Input	impedance				Approx. 5.6k $\Omega$		[	24VDC	QX41-S1
	Set value		0.1	0.2	0.4	0.6	1	4mA	
Response	OFF to ON	Тур	0.05ms	0.15ms	0.30ms	0.55ms	1.05ms		
time		max	0.12ms	0.20ms	0.40ms	0.60ms	1.20ms	$\left  \right $	
	ON to OFF	Тур	0.15ms	0.20ms	0.35ms	0.60ms	1.10ms	$\left  \right $	
		max	0.20ms	0.30ms	0.50ms	0.70ms	1.30ms		
	withstand vol		560VAC rms/3 cycles (altitude 2000m (6557.38ft.))						
Insulati	ion resistance	e	$10M \Omega$ or more by insulation resistance tester						
Nisia	- i		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width						
INOIS	e immunity		and 25 to 60Hz noise frequency						
Drotool	tion of degree		First transient noise IEC61000-4-4: 1kV IP2X						
	minal arrang		32 points/common (common terminal: B01, B02)						
	er of I/O point				set as a 32-poir		,		
	tion indicator		52 (1/		V indication (LE	· · ·			
	al connection				0-pin connecto	,			
	able wire size	-			r A6CON1 or A				
	External wiring connector A6CON1, A6CON2, A6CON3, A6CON4 (optional)								
	connector/ter		, ((	,	, , ,	· · ·	,		
	nversion mod		A6TBXY36, A6TBXY54, A6TBX70						
5VDC ii	nternal currer	nt	75mA (TYP. all points ON)						
cor	nsumption		(0.08A is shown on the rating plate of the module.)						
	Weight				0.15kg				

\* 1: CPU parameter setting. (Initial setting is 0.2ms)
 Response time can be changed on SW5D5C-GPPW or later.
 For the setting method, refer to the section 1.3.1.

\*2: When using A6CON2 or A6CON3, refer to Chapter 7.



#### 2.10 QX42 DC Input Module (Positive Common Type)

	Туре	DC Input Module (Positive Common Type)	
Specifications		QX42	Appearance
Number	of input points	64 points	
Isolation method		Photocoupler	QX42
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	01234567
Rated	input current	Approx. 4mA	8 9 A B C D E F 0 1 2 3 4 5 6 7
Inpi	ut derating	Refer to the derating chart.	89ABCDEF
ON volta	age/ON current	19V or higher/3mA or higher	QX42
OFF volta	age/OFF current	11V or lower/1.7mA or lower	24VDC DISPLÂY 4mA F D L
Input	impedance	Approx. 5.6k Ω	4mA FOL
Response	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1 Initial setting is 10ms.	0 0
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1 Initial setting is 10ms.	
Dielectric	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulat	ion resistance	10M $\Omega$ or more by insulation resistance tester	
Nois	se immunity	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protect	tion of degree	IP2X	
	rminal arrangement	32 points/common (common terminal: 1B01, 1B02, 2B01, 2B02)	
Numbe	er of I/O points	64 (I/O allocation is set as a 32-points input module)	
	tion indicator	ON indication (LED), 32 point switch-over using switch	
Externa	al connections	40-pin connector	
Applica	able wire size	0.3mm <sup>2</sup> (For A6CON1 or A6CON4) * 2	
External wiring connector		A6CON1, A6CON2, A6CON3, A6CON4 (optional)	
Applicable connector/terminal block conversion module		A6TBXY36, A6TBXY54, A6TBX70	$\bigcirc \bigcirc \bigcirc$
	current consumption	90mA (TYP. all points ON)	
	Weight	0.18kg	

\*1: For the setting method, refer to the section 1.3.1.\*2: When using A6CON2 or A6CON3, refer to Chapter 7.

Derating Chart	I	Pin-Οι	ıts	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. ∦4	Signal No.	Pin No. *4	Signal No.
(%)				1B20	X00	1A20	X10	2B20	X20	2A20	X30
				1B19	X01	1A19	X11	2B19	X21	2A19	X31
90				1B18	X02	1A18	X12	2B18	X22	2A18	X32
ON 70 ratio 60		$\frown$	<u>`</u>	1B17	X03	1A17	X13	2B17	X23	2A17	X33
60 50 50 50 50 50 50 50 50 50 50 50 50 50	B20 B19	0 0 0 0	A20 A19	1B16	X04	1A16	X14	2B16	X24	2A16	X34
40 28.8VDC	B18 B17	0 0 0 0	A18 A17	1B15	X05	1A15	X15	2B15	X25	2A15	X35
30 20 0 10 20 30 40 50 55 (°C)	B16 B15	0 0 0 0	A16 A15	1B14	X06	1A14	X16	2B14	X26	2A14	X36
0 10 20 30 40 50 55 (°C ) Ambient temperature	B14 B13	0 0 0 0	A14 A13	1B13	X07	1A13	X17	2B13	X27	2A13	X37
	B12 B11	0 0 0 0	A12 A11	1B12	X08	1A12	X18	2B12	X28	2A12	X38
External Connections	B10 B9	0 0	A10 A9	1B11	X09	1A11	X19	2B11	X29	2A11	X39
	B8 B7		A8 A7	1B10	X0A	1A10	X1A	2B10	X2A	2A10	X3A
	B6	0 0	A6	1B09	X0B	1A09	X1B	2B09	X2B	2A09	X3B
	B5 B4	0 0	A5 A4	1B08	X0C	1A08	X1C	2B08	X2C	2A08	X3C
( Internal $($ $) $ $($ $)$	B3 B2	0 0 0 0	A3 A2	1B07	X0D	1A07	X1D	2B07	X2D	2A07	X3D
	B1	0 0	J A1	1B06	X0E	1A06	X1E	2B06	X2E	2A06	X3E
	M	odule		1B05	X0F	1A05	X1F	2B05	X2F	2A05	X3F
Left side (first half) o SW Indication		view	,	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
Right side o (latter half) *3				1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
				1B02	COM1	1A02	Vacant	2B02	COM2	2A02	Vacant
The above diagram shows the first half of 32 points (F).				1B01	COM1	1A01	Vacant	2B01	COM2	2A01	Vacant
The latter half of 32 points (L) are similar.											

\* 3: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (X20 to X3F) LED indications.

\*4: Pin number of 1 \_\_\_\_\_ indicates that of the left-hand side connector, and pin number of 2 \_\_\_\_\_ indicates that of the right-hand side connector.

		Туре			DC Input Mode	ule (Positive Co	ommon Type)	
Specification	IS				QX42-S1			Appearance
Number	r of input poin	nts			64 points			
Isola	tion method							
Rated	input voltage	;		24VDC (+20/	-15%, ripple rat	io within 5%)		
Rated	input current	t			Approx. 4mA			
Inp	ut derating			Refer	to the derating	chart.		QX42-S1 0 1 2 3 4 5 6 7
ON volta	age/ON curre	ent		19V or	higher/3.0mA o	r higher		8 9 A B C D E F 0 1 2 3 4 5 6 7
OFF volta	age/OFF curr	rent		9.5V or	r lower/1.5mA c	r lower		8 9 A B C D E F
Input	impedance				Approx. 5.6k $\Omega$			QX42-S1 DISPLAY
	Set value	e *1	0.1	0.2	0.4	0.6	1	24VDC FOL
Response	OFF to ON	Тур	0.05ms	0.15ms	0.30ms	0.55ms	1.05ms	
time		max	0.12ms	0.20ms	0.40ms	0.60ms	1.20ms	0 0
unie	ON to OFF	Тур	0.15ms	0.20ms	0.35ms	0.60ms	1.10ms	
		max	0.20ms	0.30ms	0.50ms	0.70ms	1.30ms	
Dielectric	withstand vol	tage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))					
Insulat	ion resistance	е	10M $\Omega$ or more by insulation resistance tester					
			By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width					
Nois	e immunity		and 25 to 60Hz noise frequency					
			First transient noise IEC61000-4-4: 1kV					
	tion of degree		IP2X					
	rminal arrang				mon terminal: 1		. ,	
	er of I/O point				set as a 64-poir			
	tion indicator		ON i	, ,	), 32 point switc	0	witch	
	al connection	-			10-pin connecto			
	able wire size				r A6CON1 or A		-1)	
	wiring connec connector/ter		Ab	,	12, A6CON3, A	<b>V</b> 1	aı)	
block cor	nversion mod	ule	A6TBXY36, A6TBXY54, A6TBX70					
	nternal currei	nt	90mA (TYP. all points ON)					
	Weight				0.18kg			

# 2.11 QX42-S1 DC Input Module (Positive Common Type)

\* 1: CPU parameter setting. (Initial setting is 0.2ms)
 Response time can be changed on SW5D5C-GPPW or later.
 For the setting method, refer to the section 1.3.1.

\*2: When using A6CON2 or A6CON3, refer to Chapter 7.

Derating Chart	Pin-Outs	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.
(%) 100 90 ON ratio 60 50 40 50 40 20 10 20 30 40 50 (°C) Ambient temperature External Connections $(%)$	Pin-Outs B20 0 0 0 A20 B19 0 0 A19 B18 0 0 A17 B16 0 0 A16 B15 0 0 A16 B15 0 0 A12 B11 0 0 A11 B10 0 0 A11 B10 0 0 A12 B11 0 0 A12 B11 0 0 A12 B11 0 0 A12 B11 0 0 A12 B1 0 0 A1 B1 0 0 A B 0 A B 0 0 A B 0 0 A B 0 A B 0 0 A B 0 A B 0 0 A B B 0 A B B 0 A B B B 0 A B B B B	No.		No.		No.		No.	
$ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	B1 0 0 A1	1B06 1B05	X0E X0F	1A06 1A05	X1E X1F	2B06 2B05	X2E X2F	2A06 2A05	X3E X3F
	Module front view	1B03	Vacant	1A04	Vacant	2B00	Vacant	2A04	Vacant
(first half) SW Indication		1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
Right side selector (latter half) *3		1B02	COM1	1A02	Vacant	2B02	COM2	2A02	Vacant
24VDC		1B01	COM1	1A01	Vacant	2B01	COM2	2A01	Vacant
The above diagram shows the first half of 32 points (F). The latter half of 32 points (L) are similar.									

\* 3: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (X20 to X3F) LED indications.

\*4: Pin number of 1 indicates that of the left-hand side connector, and pin number of 2 indicates that of the right-hand side connector.

# 2.12 QX50 DC (Positive Common/Negative Common Shared Type)/ AC Input Module

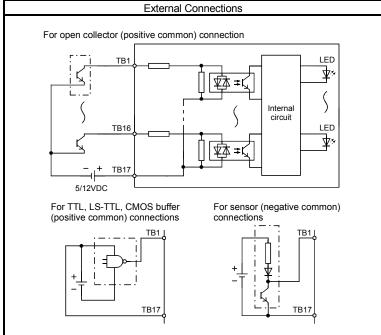
	Туре	DC (positive common	/negative common shared type)/ AC ir	iput module
		QX	50	Appearance
Specifications		DC Input	AC Input	Appearance
Number of	f input points	16 pc	pints	
Isolatio	n method	Photoc	oupler	OX50
Rated in	put voltage	48VDC (+20/-15%, ripple ratio within 5%)	QX50 01234567 89ABCDEF	
Rated in	put current	Approx	. 4mA	
Input	derating	Refer to the d	erating chart.	
ON voltage	e/ON current	28V or higher/2	.5mA or higher	
OFF voltage	e/OFF current	10V or lower/1	.0mA or lower	
Input in	npedance	Approx.	<b>11.2k</b> Ω	
Response	OFF to ON	5ms or less	15ms or less	$\overline{00^3}$ $\sqrt{5}$ 2
time * 1	ON to OFF	20ms or less	20ms or less	$\frac{\overline{00}}{\overline{00}}$ $\frac{2}{3}$
Dielectric wit	hstand voltage	1060VAC rms/3 cycles (al	titude 2000m (6557.38ft.))	005 VS 4
Insulation	resistance	10M Ω or more by insu		
		By noise simulator of 500Vp-p r		
Noise i	immunity	and 25 to 60Hz		
		First transient noise		<u> </u>
	n of degree	IP2		
	inal arrangement	16 points/common (co	,	
	of I/O points	16 (I/O allocation is set as	, ,	
	n indicator	ON indicat	· · /	
	connections	18-point terminal blo		
	le wire size	0.3 to 0.75mm <sup>2</sup> core (2.8		
	imping terminal	R1.25-3 (sleeved crimping	terminals cannot be used.)	
	ernal current umption	50mA (TYP. a		
W	eight	0.13	3kg	

Derating Chart	Terminal Block Number	Signal Name
(%)	TB1	X00
100 48VDC/AC	TB2	X01
90	TB3	X02
ON 70 ratio 60 57.6VDC	TB4	X03
50 51.8VD0	TB5	X04
40 40 40 50 55 (°C)	TB6	X05
Ambient temperature	TB7	X06
External Connections	TB8	X07
	TB9	X08
	TB10	X09
	TB11	X0A
	TB12	X0B
Circuit LED	TB13	X0C
	TB14	X0D
	TB15	X0E
	TB16	X0F
+ - 48V 	TB17	COM
	TB18	Vacant

\*1: Response time cannot be changed. Parameter setting of the CPU module will be invalid.

#### 2.13 QX70 DC Input Module (Positive Common/Negative Common Shared Type)

	Туре	DC Input Module (F	ositive Common/Negative Common Sh	ared Type)
Specifications		Q	Appearance	
Number of input points		16	points	
Insulatio	on method	Photo	ocoupler	
Rated in	put voltage	5VDC	12VDC	
Trated III	put voltage	(+20/-10%, ripple ratio within 5%)	(+20/-15%, ripple ratio within 5%)	QX70
Rated in	put current	Approx. 1.2mA	Approx. 3.3mA	0 1 2 3 4 5 6 7 8 9 A B C D E F
Input	derating		one	89ABCDEF
ON voltage	e/ON current	3.5V or highe	r/1mA or higher	
OFF voltage	e/OFF current	1V or lower/0	0.1mA or lower	
Input re	esistance		κ. 3.3k Ω	
	OFF to ON		less (CPU parameter setting) * 1	
Response		Initial sett		
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or		
		Initial sett		
	aximum voltage	560VAC rms/3 cyc		
Insulation	n resistance	10M Ω or more by ins	····7	
		By noise simulator of		
Noise	immunity	$1 \mu$ s noise width and 25	A   🖌 8	
	<u> </u>	First transient noise	B 9	
	n of degree	IF	A	
	inal arrangement		ommon terminal: TB17)	
	of I/O points		s a 16-points input module)	
	n indicator		ation (LED)	
	connections	•	block (M3 $\times$ 6 screw)	NC E
Applicable wire size			tside diameter: 2.8mm or smaller)	1.2mA 3.3mA
	nnector terminal	R1.25-3 (Terminals wit		
	ernal current	55mA (TYP,		
	umption	(0.06A is shown on the r		
W	eight	0.1	14kg	



Terminal Block Number	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	X08
TB10	X09
TB11	X0A
TB12	X0B
TB13	X0C
TB14	X0D
TB15	X0E
TB16	X0F
TB17	COM
TB18	Vacant

\* 1: For the setting method, refer to the section 1.3.1.

#### 2.14 QX70H DC High-speed Input Module (Positive Common Type)

	DC high-speed input module (Positive Common Type) QX70H									
Specificatio			Appearance							
Numbe	Number of input points					16 p	oints			
Isolation method						Photod	coupler			
Rateo	l input voltag	е			5VDC	(+20/-15%, ri	pple ratio with	in 5%)		
Rateo	l input currer	nt				Approx	k. 6mA			
	out derating					-	ne			-
	age/ON curr					3.5V or higer/		•		_
	age/OFF cu						1mA or lower			ОХ70Н
Inpu	t impedance					Approx	. 470 \?			0 1 2 3 4 5 6 7 8 9 A B C D E F
	SW1 (no filter) *		OFI	F			ON			
Response	Set value	*2	Inva	lid	0.1	0.2	0.4	0.6	1	0X70H
time	OFF to ON	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	
unic		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	too1 VS
	ON to OFF	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	$\overline{000^2}$ $\overline{000^3}$ $\overline{000^3}$ $\overline{000^3}$
		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	
Function setting	SW2*	4		OFF: Interrupt, ON: High-speed input					$\overline{000}{00}{1}$	
Dielectric	withstand vo	oltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))							
Insula	tion resistan	ce	10M $\Omega$ or more by insulation resistance tester							
Noise	immunity *	5	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency						$\begin{array}{c} \overline{00} \xrightarrow{9} \\ \overline{00} \xrightarrow{A} \\ \overline{00} \xrightarrow{A} \\ \overline{00} \xrightarrow{B} \\ \overline{0} \xrightarrow{B} \\ \overline{0} \\ \overline$	
Protec	ction of degre	e		IP2X						
	mon termina rangement	1		8 points/common (common terminal: TB9,TB18)						
Number of I/O points			16 (I	16 (I/O allocation is set as a 16-points high-speed input module or interrupt module) * 4						
Opera	ation indicate	or			Set by Sv	witch setting ir	GX Develope	er*4 *6		
External connections						ON indica	tion (LED)			
Applicable wire size				18-point terminal block (M3×6 screws)						
Applicable crimping terminal				0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.)OD max.)						
Protection of degree				R1.25-3 (sleeved solderless terminals cannot be used.)						
	internal curre	ent		80mA (TYP. all points ON)						
	Weight					0.1	6kg			

\* 1: If turning on the switch 1, the noise filter takes effect.

The off-status noise filter disables I/O response time setting.

After switching on or off the switch 1, reset the power supply of the CPU module.

\*2: Set an input response time in "I/O response time" combo box of PLC parameter in GX Developer. (Default: 0.2ms)

The response time in SW6D5C-GPPW or later can be changed. For the setting details, refer to Section 1.3.1.

\*3: The actual response time is 5 µ s delay when turning on, 10 µ s delay when turning off, because the hardware response time is added. For the details of the CPU overhead time, refer to QCPU User's Manual (Function Explanation, Program Fundamentals)...

ON : High-speed input

OFF : Interrupt

If changing the switch 2 setting while the CPU module is in RUN, an error (error code:2100) occurs.

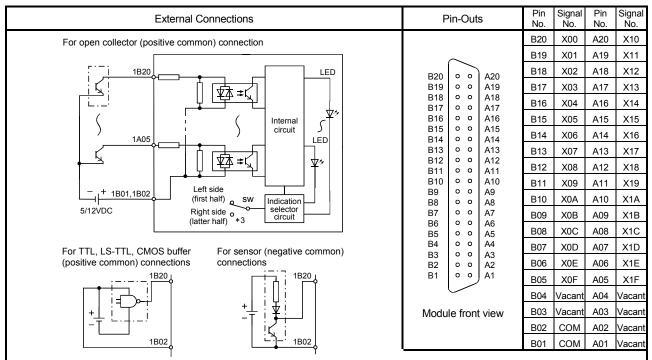
\*5: Indicates the noise immunity when the noise filter takes effect (the switch is turned on).

\* 6: For the setting method, refer to Section 1.3.3.

External Connections	Terminal Block Number	Signal Name
	TB1	X00
	TB2	X01
	TB3	X02
	TB4	X03
	TB5	X04
	TB6	X05
	TB7	X06
	TB8	X07
	TB9	X08
5VDC	TB10	COM1
	TB11	X09
	TB12	X0A
	TB13	X0B
	TB14	X0C
	TB15	X0D
	TB16	X0E
5VDC	TB17	X0F
	TB18	COM2

#### 2.15 QX71 DC Input Module (Positive Common/Negative Common Shared Type)

	Туре	DC Input Module (F	Positive Common/Negative Common Sh	ared Type)
Specifications		Q	Appearance	
Number o	f input points	32	points	
Insulatio	on method	Photo	ocoupler	
Rated in	put voltage	5VDC (+20/-10%, ripple ratio within 5%)	12VDC (+20/-15%, ripple ratio within 5%)	QX71
Rated in	put current	Approx. 1.2mA	Approx. 3.3mA	0 1 2 3 4 5 6 7 8 9 A B C D E F
Input	derating	N	lone	0 1 2 3 4 5 6 7
ON voltage	e/ON current	3.5V or highe	r/1mA or higher	8 9 A B C D E F
OFF voltage	e/OFF current	1V or lower/	0.1mA or lower	5/12VDC QX71 1.2 / 3.3mA
Input re	esistance		x. 3.3k Ω	
Response	OFF to ON	Initial set	less (CPU parameter setting) * 1 ting is 10ms	
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or Initial sett		
Dielectric ma	aximum voltage	560VAC rms/3 cy		
Insulation	n resistance	10M $\Omega$ or more by ins		
Noise	immunity	By noise simulator of $1 \mu$ s noise width and 2		
	-	First transient noise		
Protectio	n of degree	IF		
Common term	inal arrangement	32 points/common (cor	nmon terminal: B01, B02)	
Number of	of I/O points	32 (I/O allocation is set a	s a 32-points input module)	
Operatio	on indicator	ON indic	ation (LED)	
External	connections		connector	
Applicab	le wire size	0.3mm <sup>2</sup> (For A6C0	ON1 or A6CON4) * 2	
External wir	ring connector		CON3, A6CON4 (optional)	
	ernal current umption	70mA (TYP,	, all points ON)	
W	eight	0.1	12kg	



\* 1: For the setting method, refer to the section 1.3.1.

\*2: When using A6CON2 or A6CON3, refer to Chapter 7.

#### 2.16 QX72 DC Input Module (Positive Common/Negative Common Shared Type)

	Туре	DC Input Module (Po	ositive Common/Negative Common S	Shared Type)
Specifications		Q	Appearance	
Number of input points		64 p		
Insula	ition method	Photo	coupler	
Rated	input voltage	5VDC		
			(+20/-15%, ripple ratio within 5%)	QX72 0 1 2 3 4 5 6 7
Rated	input current	Approx. 1.2mA	Approx. 3.3mA	8 9 A B C D E F 0 1 2 3 4 5 6 7
	ut derating		one	89 Å B C D E F
	age/ON current	3.5V or higher	/3mA or higher	QX72 DISPLAY
	age/OFF current	1V or lower/0	.1mA or lower	5/12VDC DISPLAT
Input	resistance		. <b>3.3k</b> Ω	
Response	OFF to ON		ess (CPU parameter setting) * 1 ng is 10ms	0 0
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms		
Dielectric r	naximum voltage	560VAC rms/3 cyc		
	on resistance	10M Ω or more by insu		
		By noise simulator of s		
Nois	e immunity	1 $\mu$ s noise width and 25		
		First transient noise I		
Protect	tion of degree	IP		
Common ter	minal arrangement	32 points/common (common ter	minal: 1B01, 1B02, 2B01, 2B02)	
Numbe	r of I/O points	64 (I/O allocation is set as	a 64-points input module)	
Opera	tion indicator	ON indication (LED), 32-pc	bint switchover using switch	
External connections			onnector	
Applica	able wire size	0.3mm <sup>2</sup> (For A6CO	N1 or A6CON4) * 2	
External v	wiring connector	A6CON1, A6CON2, A6C		
5VDC internal current consumption		85mA (TYP, (0.09A is shown on the ra		
,	Weight		3kg	

\* 1: For the setting method, refer to the section 1.3.1.

\*2: When using A6CON2 and A6CON3, refer to Chapter 7.

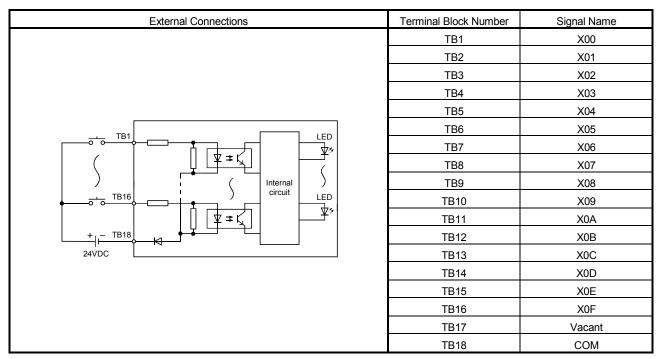
External Connections	Pin-Outs	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.
For open collector (positive common) connection		1B20	X00	1A20	X10	2B20	X20	2A20	X30
		1B19	X01	1A19	X11	2B19	X21	2A19	X31
		1B18	X02	1A18	X12	2B18	X22	2A18	X32
	B20	1B17	X03	1A17	X13	2B17	X23	2A17	X33
	B18	1B16	X04	1A16	X14	2B16	X24	2A16	X34
) 1A05 Circuit J	B16 ° ° A16	1B15	X05	1A15	X15	2B15	X25	2A15	X35
	B14 ° ° A14	1B14	X06	1A14	X16	2B14	X26	2A14	X36
┃ ┝──── │ │ │ └⊈ये≠Ҁ│ │   ヤ/ │ │	B13	1B13	X07	1A13	X17	2B13	X27	2A13	X37
	B11	1B12	X08	1A12	X18	2B12	X28	2A12	X38
(first half) sw Indication	B9 0 0 A9	1B11	X09	1A11	X19	2B11	X29	2A11	X39
5/12VDC Right side o selector (latter half) *3	B8	1B10	X0A	1A10	X1A	2B10	X2A	2A10	ХЗА
For TTL, LS-TTL, CMOS buffer For sensor (negative common)	B6 ° ° A6	1B09	X0B	1A09	X1B	2B09	X2B	2A09	X3B
(positive common) connections connections	B4 0 0 A4	1B08	X0C	1A08	X1C	2B08	X2C	2A08	X3C
	B3	1B07	X0D	1A07	X1D	2B07	X2D	2A07	X3D
	B1 0 0 A1	1B06	X0E	1A06	X1E	2B06	X2E	2A06	X3E
		1B05	X0F	1A05	X1F	2B05	X2F	2A05	X3F
	Module	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
	front view	1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
The above diagram shows the first half of 32 points (F).		1B02	COM1	1A02	Vacant	2B02	COM2	2A02	Vacant
The latter half of 32 points (L) are similar.		1B01	COM1	1A01	Vacant	2B01	COM2	2A01	Vacant

\* 3: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (X20 to X3F) LED indications.

\*4: Pin number of 1 indicates that of the left-hand side connector, and pin number of 2 indicates that of the right-hand side connector.

# 2.17 QX80 DC Input Module (Negative Common Type)

	Туре	DC Input Module (Negative Common Type)				
Specifications		QX80	Appearance			
Number	of input points	16 points				
Isolation method		Photocoupler				
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	0.100			
Rated	input current	Approx. 4mA	QX80 0 1 2 3 4 5 6 7			
Inpu	ut derating	No	89ABCDEF			
ON volta	age/ON current	19V or higher/3mA or higher				
OFF volta	age/OFF current	11V or lower/1.7mA or lower				
Input	impedance	<b>Approx. 5.6k</b> Ω				
	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$				
Response		Initial setting is 10ms.				
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$				
		Initial setting is 10ms.				
Dielectric v	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))				
Insulati	on resistance	10M $\Omega$ or more by insulation resistance tester $56$				
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width				
Nois	e immunity	and 25 to 60Hz noise frequency				
		First transient noise IEC61000-4-4: 1kV				
Protect	tion of degree	IP2X				
Common ter	minal arrangement	16 points/common (common terminal: TB18)				
Numbe	r of I/O points	16 (I/O allocation is set as a 16-points input module)	F C			
Opera	tion indicator	ON indication (LED)	NC D			
External connections		18-point terminal block (M3×6 screws)				
Applicable wire size		0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	24VDC 4mA			
Applicable crimping terminal		R1.25-3 (sleeved crimping terminals cannot be used.)				
5VDC internal current consumption		50mA (TYP. all points ON)				
N	Weight	0.16kg				

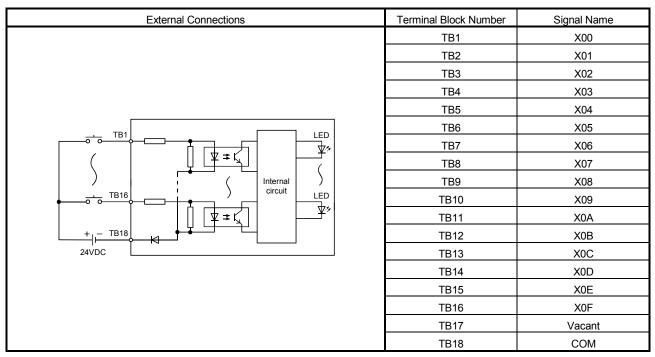


\* 1: For the setting method, refer to the section 1.3.1.

# 2.18 QX80-TS DC Input Module (Negative Common Type)

	Indicate	ors for checking the insertion state of wire.	
	Туре	DC Input Module (Negative Common Type)	
Specifications		QX80-TS	Appearance
Number	of input points	16 points	
Isolat	tion method	Photocoupler	
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	QX80-TS 0 1 2 3 4 5 6 7
Rated	input current	Approx. 4mA	89ABCDEF
Inpu	ut derating	No	
ON volta	age/ON current	19V or higher/3mA or higher	
OFF volta	age/OFF current	11V or lower/1.7mA or lower	
Input	impedance	<b>Αρρτοχ. 5.6k</b> Ω	
	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$	
Response		Initial setting is 10ms.	
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) $*_1$	
		Initial setting is 10ms.	
Dielectric v	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	7 - 10
Insulati	on resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Nois	e immunity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protect	ion of degree	IP2X	
Common ter	minal arrangement	16 points/common (common terminal: TB18)	
Numbe	r of I/O points	16 (I/O allocation is set as a 16-points input module)	
Operation indicator		ON indication (LED)	
External connections		Two piece Spring clamp terminal block	
Applicable wire size		0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)	
Applicable crimping terminal		Refer to section 9.1	
5VDC internal	current consumption	50mA (TYP. all points ON)	
N	Weight	0.16kg	

This module is a spring clamp terminal block type and an input module that has indicators for checking the insertion state of wire.



 $\pm$  1: For the setting method, refer to the section 1.3.1.

#### 2.19 QX80H DC High-speed Input Module (Negative Common Type)

		Туре				DC high-spee	d input modul	e (Negative Co	ommon Type)	
Specificatio	pecifications				Appearance					
Numbe		16 points								
Isolation method							coupler			
	l input voltag				24VD0	C (+20/-15%, r	ipple ratio with	nin 5%)		
	l input curre	nt				Approx				
	out derating					Refer to the c	0			
	age/ON curr					13V or higer/3	Ŭ			
	age/OFF cu					8V or lower/1		•		 
Inpu	t impedance					Approx.	. <b>3.9k</b> Ω			0 1 2 3 4 5 6 7 8 9 A B C D E F
	SW1 (no filter) *		OFI	F		1	ON		1	
Response	Set value		Inva		0.1	0.2	0.4	0.6	1	CXBOH S
time	OFF to ON	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	
		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	
	ON to OFF	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	00-3 V3 2
		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	3
Function setting	SW2*	4		OFF: Interrupt, ON: High-speed input						
0	withstand vo	oltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))							
	tion resistan	v	$10M\Omega$ or more by insulation resistance tester							
Noise	immunity *	5	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency							
Protec	tion of degre	ee		IP2X						
	mon termina angement	l		8 points/common (common terminal: TB9,TB18)						
Numbe	er of I/O poir	nts	16 (I	16 (I/O allocation is set as a 16-points high-speed input module or interrupt module) * 4						
Operation indicator				Set by Switch setting in GX Developer *4 *6						
External connections				ON indication (LED)						
Applicable wire size			18-point terminal block (M3 $ imes$ 6 screws)							
Applicable crimping terminal				0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.)OD max.)						
Protection of degree				R1.25-3 (sleeved solderless terminals cannot be used.)						
	internal curre	ent		80mA (TYP. all points ON)						
	Weight					0.1	6kg			

\* 1: If turning on the switch 1, the noise filter takes effect.

The off-status noise filter disables I/O response time setting.

After switching on or off the switch 1, reset the power supply of the CPU module.

\*2: Set an input response time in "I/O response time" combo box of PLC parameter in GX Developer. (Default: 0.2ms) The response time in SW6D5C-GPPW or later can be changed.

For the setting details, refer to Section 1.3.1.

\*3: The actual response time is 5 µ s delay when turning on, 10 µ s delay when turning off, because the hardware response time is added. For the details of the CPU overhead time, refer to QCPU User's Manual (Function Explanation, Program Fundamentals)...

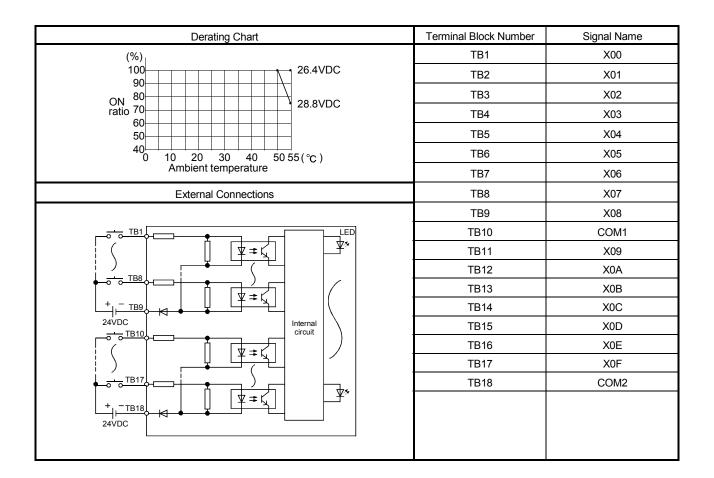
ON : High-speed input

OFF : Interrupt

If changing the switch 2 setting while the CPU module is in RUN, an error (error code:2100) occurs.

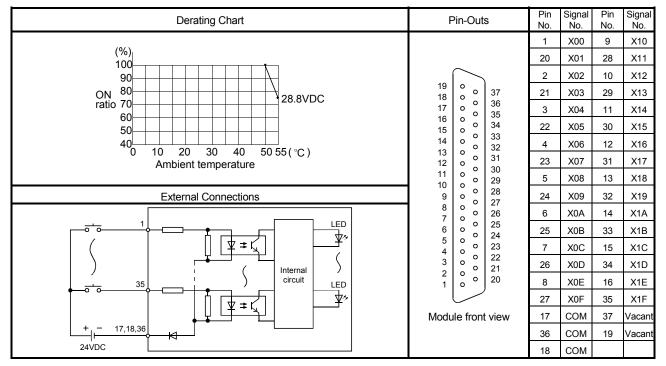
\*5: Indicates the noise immunity when the noise filter takes effect (the switch is turned on).

\*6: For the setting method, refer to Section 1.3.3.



#### 2.20 QX81 DC Input Module (Negative Common Type)

	Туре	DC Input Module (Negative Common Type)			
Specifications		QX81	Appearance		
Number	of input points	32 points			
Isolation method		Photocoupler			
Rated input voltage		24VDC (+20/-15%, ripple ratio within 5%)			
Rated input current		Approx. 4mA	QX81		
Inpu	ut derating	Refer to the derating chart.	0 1 2 3 4 5 6 7 8 9 A B C D E F		
	age/ON current	19V or higher/3mA or higher	0 1 2 3 4 5 6 7 8 9 A B C D E F		
OFF volta	age/OFF current	11V or lower/1.7mA or lower	QX81		
Input	impedance	Approx. 5.6k Ω	QX81 24VDC		
Boononac	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1	4mA		
Response time		Initial setting is 10ms. 1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1			
unic	ON to OFF	Initial setting is 10ms.			
Dielectric v	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	• •		
Insulation resistance		$10M\Omega$ or more by insulation resistance tester			
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	0		
Nois	e immunity	and 25 to 60Hz noise frequency	0 0		
	-	First transient noise IEC61000-4-4: 1kV	0		
Protect	tion of degree	IP2X	° °		
Common ter	minal arrangement	32 points/common (common terminal: 17, 18, 36)	0		
Numbe	er of I/O points	32 (I/O allocation is set as a 32-points input module)	0		
Opera	tion indicator	ON indication (LED)	0 0 0		
Externa	al connections	37-pin D-sub connector	0		
Applica	able wire size	0.3mm <sup>2</sup> (For A6CON1E) * 2	· · ·		
External wiring connector		A6CON1E, A6CON2E, A6CON3E (optional)			
Applicable connector/terminal block conversion module		A6TBX36-E, A6TBX54-E, A6TBX70-E			
5VDC internal current consumption		rent consumption (0.08A is shown on the rating plate of the module.)			
	Weight	0.16kg			



<sup>\*</sup> 1: For the setting method, refer to the section 1.3.1.

\*2: When using A6CON2E or A6CON3E, refer to Chapter 7.

# 2.21 QX82 DC Input Module (Negative Common Type)

	Туре	DC Input Module (Negative Common Type)	)
Specifications		QX82	Appearance
Number	of input points	64 points	
Isolat	tion method	Photocoupler	QX82
Rated	input voltage	24VDC (+20/-15%, ripple ratio within 5%)	0 1 2 3 4 5 6 7
Rated	input current	Approx. 4mA	8 9 A B C D E F 0 1 2 3 4 5 6 7
Inpu	ut derating	Refer to the derating chart.	89ABCDEF
ON volta	age/ON current	19V or higher/3mA or higher	QX82
OFF volta	age/OFF current	11V or lower/1.7mA or lower	24VDC DISPLAY 4mA F C L
Input	impedance	Approx. 5.6k Ω	4mA
Response	OFF to ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1 Initial setting is 10ms.	0 0
time	ON to OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) *1 Initial setting is 10ms.	
Dielectric v	withstand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
	ion resistance	10M $\Omega$ or more by insulation resistance tester	
Nois	e immunity	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency	
	,	First transient noise IEC61000-4-4: 1kV	
Protect	tion of degree	IP2X	
Common ter	minal arrangement	32 points/common (common terminal: 1B01, 1B02, 2B01, 2B02)	
Numbe	er of I/O points	64 (I/O allocation is set as a 64-points input module)	
Opera	tion indicator	ON indication (LED), 32 point switch-over using switch	
Externa	al connections	40-pin connector	
Applicable wire size		0.3mm <sup>2</sup> (For A6CON1 or A6CON4) * 2	
External wiring connector		A6CON1, A6CON2, A6CON3, A6CON4 (optional)	
Applicable connector/terminal block conversion module			$\bigcirc \bigcirc \bigcirc$
5VDC internal current consumption		90mA (TYP. all points ON)	
	Weight	0.18kg	

 $\ast$  1: For the setting method, refer to the section 1.3.1.  $\ast$  2: When using A6CON2 or A6CON3, refer to Chapter 7.

Derating Chart	Pin-Outs	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.
(%)		1B20	X00	1A20	X10	2B20	X20	2A20	X30
		1B19	X01	1A19	X11	2B19	X21	2A19	X31
90		1B18	X02	1A18	X12	2B18	X22	2A18	X32
ON 70 ratio 60	B20 0 0 A20	1B17	X03	1A17	X13	2B17	X23	2A17	X33
60 50 26.4VDC	B19 • • A19	1B16	X04	1A16	X14	2B16	X24	2A16	X34
40 28.8VDC	B17 • • A17	1B15	X05	1A15	X15	2B15	X25	2A15	X35
30 20	B16	1B14	X06	1A14	X16	2B14	X26	2A14	X36
0 10 20 30 40 50 55 (°C )	B14	1B13	X07	1A13	X17	2B13	X27	2A13	X37
Ambient temperature	B12 0 0 A12 B11 0 0 A11	1B12	X08	1A12	X18	2B12	X28	2A12	X38
External Connections	B10 • • A10 B9 • • A9	1B11	X09	1A11	X19	2B11	X29	2A11	X39
	B8 0 0 A8	1B10	X0A	1A10	X1A	2B10	X2A	2A10	ХЗА
	B7	1B09	X0B	1A09	X1B	2B09	X2B	2A09	ХЗВ
	B5	1B08	X0C	1A08	X1C	2B08	X2C	2A08	X3C
	B3 0 0 A3 B2 0 0 A2	1B07	X0D	1A07	X1D	2B07	X2D	2A07	X3D
	B1 0 0 A1	1B06	X0E	1A06	X1E	2B06	X2E	2A06	X3E
+, - 1801.1802	Module front	1B05	X0F	1A05	X1F	2B05	X2F	2A05	X3F
	view	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
(first half) SW Indication		1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
Right side o selector (latter half) *3		1B02	COM1	1A02	Vacant	2B02	COM2	2A02	Vacant
								Vacant	
The latter half of 32 points (L) are similar.									

\*3: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (X20 to X3F) LED indications.

\*4: Pin number of 1 indicates that of the left-hand side connector, and pin number of 2 indicates that of the right-hand side connector.

# 2.22 QX82-S1 DC Input Module (Negative Common Type)

	/	Туре			DC Input Modu	le (Negative Co	ommon Type)	
Specification	s		QX82-S1				Appearance	
Number of input points		its			64 points			
Isolat	tion method				Photocoupler			
Rated	input voltage	;		24VDC (+20/	-15%, ripple rat	io within 5%)		
Rated	input current	t			Approx. 4mA			
Inpu	ut derating			Refer	to the derating	chart.		QX82-S1 0 1 2 3 4 5 6 7
ON volta	age/ON curre	ent		19V or	higher/3.0mA o	r higher		8 9 A B C D E F 0 1 2 3 4 5 6 7
	age/OFF curr	ent			lower/1.5mA c	r lower		8 9 A B C D E F
Input	impedance				Approx. 5.6k $\Omega$			QX82-S1 DISPLAY
	Set value		0.1	0.2	0.4	0.6	1	24VDC FOL
Response	OFF to ON	Тур	0.05ms	0.15ms	0.30ms	0.55ms	1.05ms	
time		max	0.12ms	0.20ms	0.40ms	0.60ms	1.20ms	
time	ON to OFF	Тур	0.15ms	0.20ms	0.35ms	0.60ms	1.10ms	
		max	0.20ms	0.30ms	0.50ms	0.70ms	1.30ms	
	withstand vol	-	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))					
Insulati	on resistance	е	10M $\Omega$ or more by insulation resistance tester					
			By noise simulator of 500Vp-p noise voltage, 1 µs noise width					
Nois	e immunity		and 25 to 60Hz noise frequency					
Ducto		-		First transiei	nt noise IEC610	00-4-4: 1kV		
	tion of degree		22 pointo	loommon (oom	IP2X mon terminal: 1		01 2002)	
	minal arrang		•	•	set as a 64-poir			
Number of I/O points Operation indicator			•		), 32 point switc	· ·	,	
External connections					0-pin connecto		witch	
Applicable wire size		-			r A6CON1 or A			
	wiring connect		A6		12, A6CON3, A		al)	
	connector/ter							
5VDC internal current consumption		nt	90mA (TYP. all points ON)					
	Weight				0.18kg			

\* 1: CPU parameter setting. (Initial setting is 0.2ms) Response time can be changed on SW5D5C-GPPW or later. For the setting method, refer to the section 1.3.1.
\* 2: When using A6CON2 or A6CON3, refer to Chapter 7.

Derating Chart	Pin-Outs	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.	Pin No. *4	Signal No.
(%)		1B20	X00	1A20	X10	2B20	X20	2A20	X30
		1B19	X01	1A19	X11	2B19	X21	2A19	X31
90		1B18	X02	1A18	X12	2B18	X22	2A18	X32
ON 70	B20 0 0 A20	1B17	X03	1A17	X13	2B17	X23	2A17	X33
60 24VDC 50 26.4VDC	B19 • • A19	1B16	X04	1A16	X14	2B16	X24	2A16	X34
40 28.8VDC	B18 • • A18 B17 • • A17	1B15	X05	1A15	X15	2B15	X25	2A15	X35
30	B16 • • A16 B15 • • A15	1B14	X06	1A14	X16	2B14	X26	2A14	X36
20 10 20 30 40 50 55 ( °C )	B14 0 0 A14 B13 0 0 A13	1B13	X07	1A13	X17	2B13	X27	2A13	X37
Ambient temperature	B12 0 0 A12	1B12	X08	1A12	X18	2B12	X28	2A12	X38
External Connections	B11	1B11	X09	1A11	X19	2B11	X29	2A11	X39
	B9 0 0 A9 B8 0 0 A8	1B10	X0A	1A10	X1A	2B10	X2A	2A10	ХЗА
	B7	1B09	X0B	1A09	X1B	2B09	X2B	2A09	X3B
(	B5 0 0 A5 B4 0 0 A4	1B08	X0C	1A08	X1C	2B08	X2C	2A08	X3C
	B3 0 0 A3	1B07	X0D	1A07	X1D	2B07	X2D	2A07	X3D
	B2	1B06	X0E	1A06	X1E	2B06	X2E	2A06	X3E
		1B05	X0F	1A05	X1F	2B05	X2F	2A05	X3F
	Module front view	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
(first half) SW Indication		1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
Right side o circuit (latter half) *3		1B02	COM1	1A02	Vacant	2B02	COM2	2A02	Vacant
The above diagram shows the first half of 32 points (F).		1B01	COM1	1A01	Vacant	2B01	COM2	2A01	Vacant
The latter half of 32 points (L) are similar.									

\*3: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (X20 to X3F) LED indications.
\*4: Pin number of 1 \_\_\_\_\_ indicates that of the left-hand side connector, and pin number of 2 \_\_\_\_\_ indicates that of the right-hand

side connector.

#### 2.23 QX90H DC High-speed Input Module (Negative Common Type)

		DC high-speed input module (Negative Common Type)								
Specifications						QX	90H			Appearance
Number of input points						16 p	oints			
Isola	ation method						coupler			
Rateo	l input voltag	je			5VDC	(+20/-15%, ri	pple ratio with	in 5%)		
	l input curre	nt				Approx				
	out derating						ne			
	age/ON curr					3.5V or higer/		ſ		
	age/OFF cu						1mA or lower			[ QX90H
Inpu	t impedance					Approx	. 470 \2			0 1 2 3 4 5 6 7 8 9 A B C D E F
	SW1 (no filter) *		OFI	F			ON			
Response	Set value	*2	Inva	lid	0.1	0.2	0.4	0.6	1	
time	OFF to ON	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	
unio		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	
	ON to OFF	TYP.	0ms	*3	0.04ms	0.10ms	0.25ms	0.50ms	0.95ms	$\overline{1}$
		MAX.	-	*3	0.05ms	0.15ms	0.30ms	0.60ms	1.00ms	<u>+∞∞</u> <u>+</u> <u>3</u> <u>3</u>
Function	SW2*	W2*4 OFF: Interrupt, ON: High-speed input								
Setting Dielectric withstand voltage				560VAC rms/3 cycles (altitude 2000m (6557.38ft.))						
	tion resistan	0		$10M\Omega$ or more by insulation resistance tester						
Noise	immunity *	5		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency						
Protec	tion of degre	ee		IP2X						
	mon termina angement	l			8 points/co	ommon (comn	non terminal:	TB9,TB18)		
Number of I/O points			16 (I	I/O allo	ocation is set	as a 16-points modu	s high-speed i le)*4	nput module c	or interrupt	
Operation indicator					Set by Sv	witch setting ir	GX Develope	er*4 *6		
Extern	al connectio	ns	ON indication (LED)							
Applic	able wire siz	ze	18-point terminal block (M3 $ imes$ 6 screws)							
	crimping te			0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.)OD max.)						
	tion of degre			R1.25-3 (sleeved solderless terminals cannot be used.)						
	internal curre	ent		80mA (TYP. all points ON)						
	Weight					0.1	6kg			

\*1: If turning on the switch 1, the noise filter takes effect.

The off-status noise filter disables I/O response time setting.

After switching on or offthe switch 1, reset the power supply of the CPU module.

\*2: Set an input response time in "I/O response time" combo box of PLC parameter in GX Developer. (Default: 0.2ms) The response time in SW6D5C-GPPW or later can be changed.

For the setting details, refer to Section 1.3.1.

\*3: The actual response time is 5 µ s delay when turning on, 10 µ s delay when turning off, because the hardware response time is added. For the details of the CPU overhead time, refer to QCPU User's Manual (Function Explanation, Program Fundamentals)...

ON : High-speed input

OFF : Interrupt

If changing the switch 2 setting while the CPU module is in RUN, an error (error code:2100) occurs.

\*5: Indicates the noise immunity when the noise filter takes effect (the switch is turned on).

\*6: For the setting method, refer to Section 1.3.3.

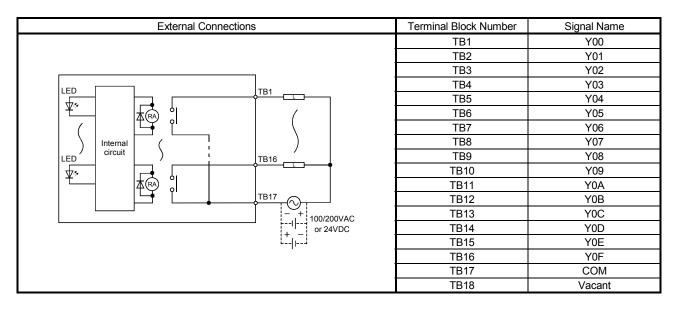
External Connections	Terminal Block Number	Signal Name
	TB1	X00
	TB2	X01
	TB3	X02
	TB4	X03
	TB5	X04
	TB6	X05
	TB7	X06
	TB8	X07
5VDC Internal	TB9	X08
	TB10	COM1
	TB11	X09
	TB12	X0A
	TB13	X0B
	TB14	X0C
5VDC	TB15	X0D
	TB16	X0E
	TB17	X0F
	TB18	COM2

# MEMO


# 3. OUTPUT MODULE SPECIFICATIONS

#### 3.1 QY10 Contact Output Module

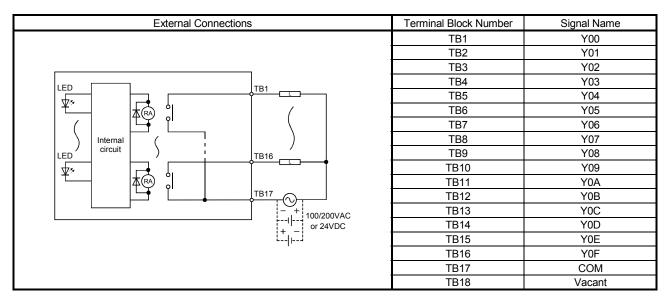
Specifications     QY10     Appearance       Number of output points     16 points     16 points       Isolation method     Relay       Rated switching voltage, current     240VAC 2A (cos ∅ = 1)     /point, 8A/common       Minimum switching load     5VDC 1mA       Maximum switching load     264VAC 125VDC       Response     OFF to ON     10ms or less       time     ON to OFF     12ms or less       Mechanical     20 million times or more     0 1 2 3 4 5 8 7       200VAC 15A, 240VAC 105C (SG = 0.7) 300 thousand times or more     200VAC 15A, 240VAC 0.3A (COS ◊ = 0.7) 300 thousand times or more       200VAC 1A, 240VAC 0.3A (COS ◊ = 0.3) 500 thousand times or more     24VDC 1A, 100VDC 0.1A (L/R=7ms) 300 thousand times or more       24VDC 1A, 100VDC 0.3A, 240VAC 0.3A (COS ◊ = 0.3) 500 thousand times or more     3       Surge suppressor     No       Fuse     No       Surge suppressor     No       Noise immunity     By noise simulator of 1500Vp-p noise voltage, 1 /1 s noise width arrangement       16 points/common (common terminal: TB17)     B       arrangement     16 points/common (common terminal: TB17)       Applicable wire size     0.3 roffsme? cre (2.8mm (0.11in.) OD max.)       Applicable wire size     0.3 roffsme? cre (2.8mm (0.11in.) OD max.)       Applicable erimping terminal     R1:25.3 (sleeved crimping terminalis cannot		Туре	Contact Output Module	
Isolation methodRelayRated switching voltage, current24VDC 2A (resistive load) $240VAC 2A (cos \heartsuit = 1)/point, 8A/commonMinimum switching load5VDC 1mAMaximum switching load264VAC 125VDCResponseOFF to ON10ms or lesstimeON to OFF12ms or lessMechanical200VAC 15A, 240VAC 14 (COS \diamondsuit = 0.7) 100 thousand times or more200VAC 15A, 240VAC 0.3A, (COS \diamondsuit = 0.7) 300 thousand times or more200VAC 0.3A, 240VAC 0.3A, (COS \diamondsuit = 0.7) 300 thousand times or more200VAC 0.3A, 240VAC 0.3A, (COS \circlearrowright = 0.3) 300 thousand times or more24VDC 0.3A, 100VDC 0.1A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.03A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.03A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VD$	Specifications		QY10	Appearance
Rated switching voltage, current       24VDC 2A (resistive load) /point, 8A/common         Minimum switching load       26VVAC 2A (cos 0 = 1) /point, 8A/common         Maximum switching load       264VAC 125VDC         Response       OFF to ON       10ms or less         Mechanical       20 million times or more         Mechanical       20 million times or more         200VAC 15A, 240VAC 0.4 (COS 0 = 0.7) 100 thousand times or more         200VAC 15A, 240VAC 0.3A (COS 0 = 0.35) 100 thousand times or more         200VAC 15A, 240VAC 0.15A (COS 0 = 0.35) 100 thousand times or more         200VAC 1A, 240VAC 0.15A (COS 0 = 0.35) 300 thousand times or more         200VAC 1A, 240VAC 0.15A (COS 0 = 0.35) 300 thousand times or more         200VAC 1A, 240VAC 0.15A (COS 0 = 0.35) 300 thousand times or more         200VAC 1A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more         24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more         Surge suppressor       No         Fuse       No         Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         Noise immunity       By noise simulator of 1500Vp-p noise voltage, 1/L's noise width arrangement         Noise immunity       16 points/common (common terminal: TB17)         Applicable wire s	Number of output points		16 points	
current240VAC 2A (cos $\phi = 1$ )(point, 6A/Continion)Minimum switching loadSVDC 1mAMaximum switching load264VAC 125VDCResponseOFF to ON10ms or less10ms or lesstimeON to OFF200VAC 15A, 240VAC 10 (COS $\phi = 0.7$ ) 100 thousand times or more200VAC 1A, 240VAC 0.5A (COS $\phi = 0.7$ ) 100 thousand times or more200VAC 1A, 240VAC 0.5A (COS $\phi = 0.7$ ) 300 thousand times or more200VAC 1A, 240VAC 0.5A (COS $\phi = 0.35$ ) 100 thousand times or more200VAC 0.3A, 240VAC 0.16A (COS $\phi = 0.35$ ) 300 thousand times or more200VAC 0.3A, 240VAC 0.16A (COS $\phi = 0.35$ ) 300 thousand times or more200VAC 0.3A, 240VAC 0.16A (COS $\phi = 0.35$ ) 300 thousand times or more200VAC 0.3A, 240VAC 0.16A (COS $\phi = 0.35$ ) 300 thousand times or more200VAC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.16A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.16A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more9 FuseNoDielectric withstand voltage10 M $\Omega$ or more by insulation resistance testerBy noise simulator of 1500Vp- poise voltage, 1 // s noise widthand 25 to 60Hz noise frequencyProtection of degreeCommon terminalarrangement16 (//O allocation is set as a 16-points output module)Operation indicatorOP ention indicatorON indication (LED)External connections18-point terminal block (M3 $\times$ 6 screws)Applicable wire size<	Isolation	n method	Relay	
Current240VAC 2A (CSC $^{\circ}$ = 1)1Minimum switching loadSVDC 1mAMaximum switching load264VAC 125VDCResponseOFF to ONImage: Constraint of the second	Rated switc	hing voltage,	24VDC 2A (resistive load)	
Maximum switching load       264VAC 125VDC         Response       OFF to ON       10ms or less         ON to OFF       12ms or less         Mechanical       20 million times or more         Mechanical       20 million times or more         Life       Retect switching voltage/current load         More than 100 thousand times or more       200VAC 1.5A, 240VAC 0.5A (COS ≠ =0.7) 100 thousand times or more         200VAC 0.4A, 240VAC 0.5A (COS ≠ =0.7) 300 thousand times or more       200VAC 0.3A, 240VAC 0.5A (COS ≠ =0.35) 300 thousand times or more         200VAC 0.3A, 240VAC 0.5A (COS ≠ =0.35) 300 thousand times or more       24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more         24VDC 1.3A, 100VDC 0.3A, (L/R=7ms) 300 thousand times or more       24VDC 1.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more         Surge suppressor       No         Fuse       No         Dielectric withstand voltage       2830VAC ms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         Noise immunity       By noise simulator of 1500V-p- noise voltage, 1 //s noise width and 25 to 60Hz noise frequency         Protection of degree       IP1X         Common terminal arrangement       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)			240VAC 2A (cos $\varphi$ =1)	
Response timeOFF to ON10ms or less0N to OFF12ms or less01 12 3 4 5 6 7Mechanical20 million times or more8 9 A B C D E FLife200VAC 1.5A, 240VAC 0.3A (COS $\phi = 0.7$ ) 300 thousand times or more 200VAC 1.4A, 240VAC 0.3A (COS $\phi = 0.7$ ) 300 thousand times or more 200VAC 0.4A, 240VAC 0.3A (COS $\phi = 0.7$ ) 300 thousand times or more 200VAC 0.3A, 240VAC 0.3A (COS $\phi = 0.35$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 				
time         ON to OFF         12ms or less           Mechanical         20 million times or more         01 1 2 3 4 5 6 7           Mechanical         20 million times or more         8 9 A B C D E F           Life         Electrical         More than 100 thousand times or more         200VAC 1.5A, 240VAC 0.4C (COS \$ 0-0.7) 100 thousand times or more           200VAC 0.4A, 240VAC 0.5A (COS \$ 0-0.7) 100 thousand times or more         200VAC 1.4, 240VAC 0.5A (COS \$ 0-0.35) 100 thousand times or more           200VAC 1.4, 240VAC 0.5A (COS \$ 0-0.35) 100 thousand times or more         24VDC 1.4, 100VDC 0.14 (L/R=7ms) 100 thousand times or more           24VDC 0.3A, 100VDC 0.3A (L/R=7ms) 100 thousand times or more         3           Maximum switching         3600 times/hour           frequency         3600 times/hour           Surge suppressor         No           Fuse         No           Piese         No           Noise immunity         By noise simulator of 1500V-p noise voltage, 1 // s noise width and 25 to 60Hz noise frequency           First transient noise IEC61000-4.4: 1kV         B           Protection of degree         IP1X           Common terminal arrangement         16 (I/O allocation is set as a 16-pointis output module)           Operation indicator         0.3 to 0.75mm² core (2.8mm (0.111.) OD max.)           Applicable wire size				
Mechanical20 million times or moreNechanical20 million times or moreRated switching voltage/current load More than 100 thousand times or more200VAC 1.5A, 240VAC 0.1A (COS $\phi = 0.7$ ) 100 thousand times or more 200VAC 1.4A, 240VAC 0.5A (COS $\phi = 0.35$ ) 300 thousand times or more 200VAC 1.5A, 240VAC 0.5A (COS $\phi = 0.35$ ) 300 thousand times or more 200VAC 1.5A, 240VAC 0.5A (COS $\phi = 0.35$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 100 thousand times or more 45Maximum switching frequency3600 times/hour TubeInsulation resistance Insulation resistance10M $\Omega$ or more by insulation resistance tester IPANoise immunityBy noise simulator of 1500Vp-p noise voltage, 1 /L s noise width and 25 to 60Hz noise frequencyNumber of I/O points16 (I/O allocation is set as a 16-points output module) Operat				QY10
InternationalRated switching voltage/current load More than 100 thousand times or moreLifeRated switching voltage/current load More than 100 thousand times or more 200VAC 0.5A, 240VAC 0.3A ( $COS \phi = 0.7$ ) 300 thousand times or more 200VAC 0.3A, 240VAC 0.5A ( $COS \phi = 0.35$ ) 100 thousand times or more 200VAC 0.3A, 240VAC 0.5A ( $COS \phi = 0.35$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.1A ( $L/R=7ms$ ) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 3600 times/hourMaximum switching frequencyBy noise simulator of 1500Vp-p noise voltage, 1/4 s noise width and 25 to 60Hz noise frequencyNoise immunityBy noise simulator of 1500Vp-p noise voltage, 1/4 s noise width and 25 to 60Hz noise frequencyNumber of 1/O points16 ( $I/O$ allocation is set as a 16-points output module) Operation indicatorOperation indicatorON indication (LED)External connections18-point terminal block ( $M3 \times 6$ screws) Applicable wire sizeApplicable wir	time			0 1 2 3 4 5 6 7
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LifeElectrical $200VAC 0.4A, 240VAC 0.3A (COS $\varphi = 0.7) 300 thousand times or more200VAC 1A, 240VAC 0.5A (COS $\varphi = 0.35) 100 thousand times or more200VAC 0.3A, 240VAC 0.15A (COS $\varphi = 0.35) 300 thousand times or more24VDC 0.3A, 100VDC 0.1A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more24VDC 1A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more3600 times/hourSurge suppressorNoSurge suppressorNoDielectric withstand voltageFuse100 \Omega or more by insulation resistance testerNoise immunityBy noise simulator of 1500Vp-p noise voltage, 1/L s noise widthand 25 to 60Hz noise frequencyNoise immunityFirst transient noise IEC61000-4.4: 1kVProtection of degreeIP1XCommon terminalarrangement16 (I/O allocation is set as a 16-points output module)Number of I/O points16 (I/O allocation is set as a 16-points output module)Operation indi$				
Electrical200VAC 1A, 240VAC 0.5A ( $\cos \phi = 0.35$ ) 100 thousand times or more 200VAC 0.3A, 240VAC 0.15A ( $\cos \phi = 0.35$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.1A ( $L/R=7ms$ ) 100 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 24VDC 1A, 100VDC 0.03A ( $L/R=7ms$ ) 300 thousand times or more 25 $10^{-1}$ Maximum switching frequency Surge suppressor3600 times/hour $1^{-1}$ $1^{-1}$ Surge suppressorNo $1^{-1}$ $1^{-1}$ $1^{-1}$ Dielectric withstand voltage Insulation resistance2830VAC ms/3 cycles (altitude 2000m (6557.38ft.)) Insulation resistance tester $1^{-1}$ $1^{-1}$ Noise immunityBy noise simulator of 1500Vp-p noise voltage, 1/L s noise width and 25 to 60Hz noise frequency $1^{-1}$ $1^{-1}$ Number of I/O points16 (I/O allocation is set as a 16-points output module) $0^{-1}$ $1^{-1}$ Operation indicatorON indication (LED) $2^{-1}$ $1^{-1}$ External connections18-point terminal block (M3 × 6 screws) $2^{-1}$ $1^{-1}$ Applicable wire size0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.) $1^{-1}$ $1^{-1}$ Applicable crimping terminalR1.25-3 (sleeved crimping terminals cannot be used.) $1^{-1}$ 5VDC internal current $43$	1.16			
$\frac{200VAC 0.3A, 240VAC 0.15Å (COS $ = 0.35) 300 \text{ thousand times or more}}{24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 \text{ thousand times or more}} \\ \frac{24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 \text{ thousand times or more}}{24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 \text{ thousand times or more}} \\ \frac{Maximum switching}{frequency} & 3600 \text{ times/hour} \\ \hline \\ Surge suppressor & No \\ \hline \\ \hline \\ Surge suppressor & No \\ \hline \\ \hline \\ Dielectric withstand voltage & 2830VAC rms/3 cycles (altitude 2000m (6557.38ft.)) \\ \hline \\ Insulation resistance & 10M \Omega or more by insulation resistance tester \\ \hline \\ By noise simulator of 1500Vp-p noise voltage, 1 \mu's noise width \\ and 25 to 60Hz noise frequency \\ \hline \\ \hline \\ First transient noise IEC61000-4.4: 1kV \\ \hline \\ \hline \\ Protection of degree & IP1X \\ \hline \\ \hline \\ Number of I/O points & 16 (I/O allocation is set as a 16-points output module) \\ \hline \\ Operation indicator & ON indication (LED) \\ \hline \\ External connections & 18-point terminal block (M3 × 6 screws) \\ \hline \\ Applicable wire size & 0.3 to 0.75mm^2 core (2.8mm (0.11in.) OD max.) \\ \hline \\ Applicable vire size & 0.3 to 0.75mm^2 core (2.8mm (0.11in.) OD max.) \\ \hline \\ Applicable crimping terminal \\ B1.25-3 (sleeved crimping terminals cannot be used.) \\ \hline \\ SVDC internal current & 430mA (TXP, all points ON) \\ \hline \end{array}$	Life	Electrical		
200VAC 0.3A, 240VAC 0.15A (L/R=7ms) 100 thousand times or more         24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more         24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more         24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more         Maximum switching frequency         Surge suppressor         No         Fuse         No         Dielectric withstand voltage         2830VAC ms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance         10M Ω or more by insulation resistance tester         By noise simulator of 1500Vp-p noise voltage, 1/L s noise width and 25 to 60Hz noise frequency         First transient noise IEC61000-4-4: 1kV         Protection of degree         IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal SVDC internal current       430mA (TXPR all points ON)				
24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more 24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or moreMaximum switching frequency3600 times/hourSurge suppressorNoFuseNoDielectric withstand voltage2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))Insulation resistance10M Ω or more by insulation resistance testerBy noise simulator of 1500Vp-p noise voltage, 1 // s noise width and 25 to 60Hz noise frequencyProtection of degreeIP1XCommon terminal arrangement16 points/common (common terminal: TB17)Number of I/O points16 (I/O allocation is set as a 16-points output module)Operation indicatorON indication (LED)External connections18-point terminal block (M3 × 6 screws)Applicable wire size0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.)Applicable crimping terminal SVDC internal currentR1.25-3 (sleeved crimping terminals cannot be used.)				
Maximum switching frequency       3600 times/hour         Surge suppressor       No         Fuse       No         Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         By noise simulator of 1500Vp-p noise voltage, 1 // s noise width and 25 to 60Hz noise frequency         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal 5VDC internal current       R1.25-3 (sleeved crimping terminals cannot be used.)				
frequency       3600 times/nour         Surge suppressor       No         Fuse       No         Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         By noise simulator of 1500Vp-p noise voltage, 1 // s noise width       8         A       9         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)	Maximum	a switching	24VDC 0.3A, 100VDC 0.03A (L/R=711s) 300 thousand times of more	
Surge suppressor       No         Fuse       No         Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         By noise simulator of 1500Vp-p noise voltage, 1 // s noise width       8         Noise immunity       By noise simulator of 1500Vp-p noise voltage, 1 // s noise width         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm² core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXP, all points ON)		0	3600 times/hour	
Fuse       No         Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         Noise immunity       By noise simulator of 1500Vp-p noise voltage, 1 ¼ s noise width and 25 to 60Hz noise frequency         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)	-	,	No	
Dielectric withstand voltage       2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))         Insulation resistance       10M Ω or more by insulation resistance tester         Noise immunity       By noise simulator of 1500Vp-p noise voltage, 1 ¼ s noise width         Noise immunity       and 25 to 60Hz noise frequency         First transient noise IEC61000-4-4: 1kV         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)	Fι	use	No	
Insulation resistance       10M S2 or more by insulation resistance tester         By noise simulator of 1500Vp-p noise voltage, 1 // s noise width         and 25 to 60Hz noise frequency         First transient noise IEC61000-4-4: 1kV         Protection of degree         IP1X         Common terminal         arrangement         Number of I/O points         16 (I/O allocation is set as a 16-points output module)         Operation indicator         Operation indicator         Applicable wire size         0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal         SVDC internal current	Dielectric with	hstand voltage	2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Noise immunity       By holse simulator of 1500 Vp-p holse voltage, 1/2 s holse width         Noise immunity       and 25 to 60Hz noise frequency         First transient noise IEC61000-4-4: 1kV         Protection of degree       IP1X         Common terminal       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)	Insulation	resistance		
Noise initiality       First transient noise lEC61000-4-4: 1kV         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)				
Protection of degree       IP1X         Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXP, all points ON)	Noise ir	mmunity		
Protection of degree       IP1X         Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXP, all points ON)				
Common terminal arrangement       16 points/common (common terminal: TB17)         Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXR all points ON)		0	IP1X	
Number of I/O points       16 (I/O allocation is set as a 16-points output module)         Operation indicator       ON indication (LED)         External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXR all points ON)			16 points/common (common terminal: TB17)	
Operation indicator     ON indication (LED)       External connections     18-point terminal block (M3 × 6 screws)       Applicable wire size     0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)       Applicable crimping terminal     R1.25-3 (sleeved crimping terminals cannot be used.)       5VDC internal current     430mA (TXR all points ON)			16 (I/O allocation is set as a 16-points output module)	24VDC
External connections       18-point terminal block (M3 × 6 screws)         Applicable wire size       0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)         Applicable crimping terminal       R1.25-3 (sleeved crimping terminals cannot be used.)         5VDC internal current       430mA (TXR all points ON)				
Applicable wire size     0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)       Applicable crimping terminal     R1.25-3 (sleeved crimping terminals cannot be used.)       5VDC internal current     430mA (TXR all points ON)	External connections			
5VDC internal current (30mA (TVP, all points ON)	Applicable	e wire size		
5VDC internal current (30mA (TVP, all points ON)	Applicable crimping terminal		R1.25-3 (sleeved crimping terminals cannot be used.)	
Weight 0.22kg			0.22kg	



# 3.2 QY10-TS Contact Output Module

This module is a spring clamp terminal block type and an output module that has indicators for checking the insertion state of wire.

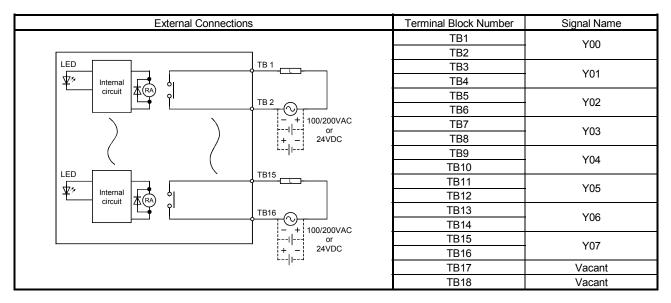
Specifications Number of outp Isolation mo Rated switching	iethod	QY10-TS 16 points	Appearance
Isolation me	iethod		
Rated switching	a voltage	Relay	_
		24VDC 2A (resistive load) 240VAC 2A (cos $\phi$ =1) /point, 8A/common	7
curren	-		-
Minimum switc		5VDC 1mA 264VAC 125VDC	
Maximum swite	U		QY10-TS 0 1 2 3 4 5 6 7
	OFF to ON	10ms or less	89ABCDEF
	ON to OFF	12ms or less	
	Mechanical	20 million times or more	
		Rated switching voltage/current load More than 100 thousand times or more	
		200VAC 1.5A, 240VAC 1A (COS $\phi$ =0.7) 100 thousand times or more	
Life	Electrical	200VAC 0.4A, 240VAC 0.3A (COS $\phi$ =0.7) 300 thousand times or more	
	Electrical	200VAC 1A, 240VAC 0.5A (COS $\phi$ =0.35) 100 thousand times or more	
		200VAC 0.3A, 240VAC 0.15A (COS $\phi$ =0.35) 300 thousand times or more	
		24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	
		24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand times or more	
Maximum sw frequen	0	3600 times/hour	
Surge supp		No	
Fuse		No	┦   9 ┣ Ш(Ц)
Dielectric withsta	and voltage	2830VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation res		10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 1500Vp-p noise voltage, 1 µ s noise width	
Noise imm	nunity	and 25 to 60Hz noise frequency	
	-	First transient noise IEC61000-4-4: 1kV	
Protection of		IP2X	
Common terminal arrangement		16 points/common (common terminal: TB17)	
Number of I/O points		16 (I/O allocation is set as a 16-points output module)	
Operation in		ON indication (LED)	
External conn	nections	Two piece Spring clamp terminal block	
Applicable wire size		0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)	
Applicable crimping terminal		Refer to section 9.1	
5VDC internal current consumption		430mA (TYP. all points ON)	
Weigh		0.22kg	1



MELSEC-Q

# 3.3 QY18A Contact Output Module (All Independent)

	Туре	Contact Output Module (All points Independent)	
Specifications		QY18A	Appearance
Number of output points		8 points	
Isolation	n method	Relay isolation	
Rated s	witching	24VDC 2A (resistive load) $\{point, 8A/unit\}$	
voltage	current	240VAC 2A ( $\cos \varphi = 1$ ) J	
	ching load	5VDC 1mA	QY18A
Max. swit	ching load	264VAC 125VDC	0 1 2 3 4 5 6 7
Response	OFF to ON	10ms or shoter	89ABCDEF
time	ON to OFF	12ms or shoter	
	Mechanical	20 million cycles or more	
		Rated switching voltage/current load: 100 thousand cycles or more	
		200VAC 1.5A, 240VAC 1A (COS $\phi$ =0.7) 100 thousand cycles or more	
Life		200VAC 0.4A, 240VAC 0.3A (COS $\phi$ =0.7) 300 thousand cycles or more	
2	Electrical	200VAC 1A, 240VAC 0.5A (COS $\phi$ =0.35) 100 thousand cycles or more	
		200VAC 0.3A, 240VAC 0.15A (COS $\phi$ =0.35) 300 thousand cycles or more	
		24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand cycles or more	• II - 2 3
		24VDC 0.3A, 100VDC 0.03A (L/R=7ms) 300 thousand cycles or more	
	ng frequency	3600 cycles/hour	
ÿ	e killer	None	
	ise	None	
	ximum voltage	2830VAC rms/3 cycles (altitude 2000m)	
Insulation	resistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 1500Vp-p noise voltage,	
Noise ii	mmunity	1 $\mu$ s noise width and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
	of degree	IP1X	C
Number of I/O points		16 (I/O allocation is set as a 16-points output module)	
Operation indicator		ON indication (LED)	NC E
External connections		18-point terminal block (M3 $ imes$ 6 screws)	240VAC 240VAC
Applicable wire size		Core cable: 0.3 to 0.75mm <sup>2</sup> (Outside diameter: 2.8mm or smaller)	
Applicable connector terminal		R1.25-3 (Terminals with sleeve cannot be used)	
5VDC internal current consumption		240mA (TYP. all points ON)	
Weight		0.22kg	



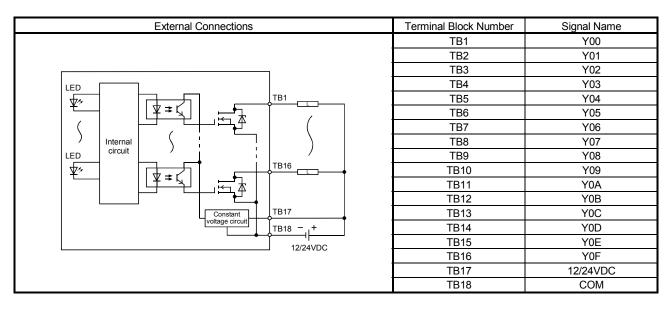
# 3.4 QY22 TRIAC Output Module

Туре		TRIAC Output Module	
Specifications		QY22	Appearance
Number of o	utput points	16 points	
Isolation	method	Photocoupler	
Rated load	d voltage	100 to 240VDC 50/60Hz ± 5%	
Load voltage of	distortion rate	Within 5%	
Maximum lo	oad voltage	264VAC	
Maximum Ic	oad current	0.6A/point, 4.8A/common	QY22
Minimum load v	oltage/current	24VAC 100mA, 100VAC 25mA, 240VAC 25mA	0 1 2 3 4 5 6 7 8 9 A B C D E F
Maximum ru	ush current	20A/cycle or less	
Leakage cur	rent at OFF	3mA or lower (for 240V, 60Hz), 1.5mA or lower (for 120V, 60Hz)	
Maximum volta	ge drop at ON	1.5V or lower	
Response time	OFF to ON	1ms or less	
	ON to OFF	1ms + 0.5 cycles or less (rated load, resistance load)	
Surge	killer	CR absorber	
Fus	20	None (Attaching a fuse to each external wiring is recommended. Refer to	
1 40		Section 1.2)	
Dielectric maxi	imum voltage	2830VAC rms/3 cycles (altitude 2000m)	
Insulation r	resistance	10M $\Omega$ or higher by insulation resistance meter	
		By noise simulator of 1.5kVp-p noise voltage,	
Noise im	nmunity	1 $\mu$ s noise width and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection		IP1X	
Common termin		16 points/common (common terminal: TB17)	
Number of I/O points		16 (I/O allocation is set as a 16-points output module)	100VAC E
Operation indicator		ON indication (LED)	240VAC 0.6A
External co	nnections	18-point terminal block (M3 $\times$ 6 screws)	
Applicable		Core cable: 0.3 to 0.75mm <sup>2</sup> (Outside diameter: 2.8mm or smaller)	
Applicable conr	nector terminal	R1.25-3 (Terminals with sleeve cannot be used)	
5VDC interr consun		250mA (Max., all points ON)	
Wei	ght	0.40kg	

External Connections	Terminal Block Number	Signal Name
	TB1	Y00
	TB2	Y01
	TB3	Y02
	TB4	Y03
	TB5	Y04
│ / │ │ ¦ <u>↓ ┌──</u> ╃╲│ ╎ ¦ │ │ │	TB6	Y05
	TB7	Y06
	TB8	Y07
	TB9	Y08
	TB10	Y09
	TB11	Y0A
	TB12	Y0B
	TB13	Y0C
	TB14	Y0D
	TB15	Y0E
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	TB16	Y0F
	TB17	COM
	TB18	Vacant

# 3.5 QY40P Transistor Output Module (Sink Type)

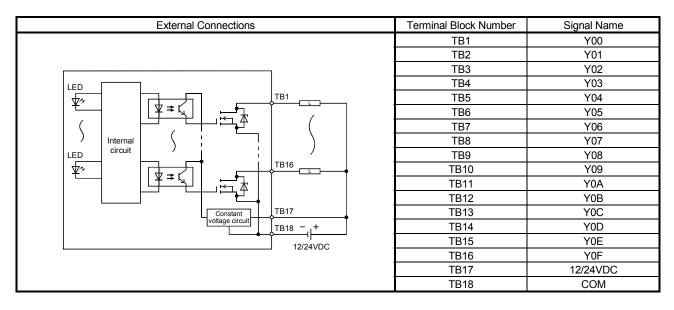
Туре		Transistor Output Module (Sink Type)	
Specifications		QY40P	Appearance
Number of output points		16 points	
Isolation I	method	Photocoupler	
Rated load	l voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.1A/point, 1.6A/common	
Maximum inn	ush current	0.7A, 10ms or less	
Leakage curr	ent at OFF	0.1mA or less	QY40P
Maximum voltag	ge drop at ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	0 1 2 3 4 5 6 7 8 9 A B C D E F
Response time	OFF to ON	1ms or less	
Response time	ON to OFF	1ms or less (rated load, resistive load)	
Surge sup	pressor	Zener diode	
Fus	e	No	
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	10mA (when 24VDC and all point is ON)	
Dielectric withs	tand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection of	of degree	IP2X	
Common termina	al arrangement	16 points/common (common terminal: TB18)	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
		Yes (overload protection function, overheat protection function)	
Protection	function	<ul> <li>Overheat protection function is activated in increments of 1 point.</li> </ul>	
		Overload protection function is activated in increments of 1 point.	
Operation indicator		ON indication (LED)	12VDC 24VDC 0.1A
External con	nnections	18-point terminal block (M3×6 screws)	0.1A
Applicable		0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	
Applicable crim		R1.25-3 (sleeved crimping terminals cannot be used.)	
5VDC intern		65mA (TYP. all points ON)	
consum		(0.07A is shown on the rating plate of the module.)	
Weig	ght	0.16kg	



## 3.6 QY40P-TS Transistor Output Module (Sink Type)

Туре		Transistor Output Module (Sink Type)	1
Specifications		QY40P-TS	Appearance
Number of ou	utput points	16 points	
Isolation	method	Photocoupler	
Rated load	d voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.1A/point, 1.6A/common	
Maximum inr	ush current	0.7A, 10ms or less	QY40P-TS
Leakage curr	ent at OFF	0.1mA or less	0 1 2 3 4 5 6 7 8 9 A B C D E F
Maximum voltag	ge drop at ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	
Deepense time	OFF to ON	1ms or less	
Response time	ON to OFF	1ms or less (rated load, resistive load)	
Surge sup	pressor	Zener diode	1100
Fus	e	No	
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	10mA (when 24VDC and all point is ON)	
Dielectric withs	stand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation r	esistance	10M $^{\Omega}$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	9 F 🛛 💭
		First transient noise IEC61000-4-4: 1kV	
Protection	of degree	IP2X	
Common termina	al arrangement	16 points/common (common terminal: TB18)	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
		Yes (overload protection function, overheat protection function)	
Protection	function	Overheat protection function is activated in increments of 1 point.	
		Overload protection function is activated in increments of 1 point.	
Operation		ON indication (LED)	
External connections		Two piece Spring clamp terminal block	
Applicable		0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)	
Applicable crim		Refer to section 9.1	
5VDC interr		65mA (TYP. all points ON)	
consum		(0.07A is shown on the rating plate of the module.)	
Weight		0.16kg	

This module is a spring clamp terminal block type and an output module that has
indicators for checking the insertion state of wire.

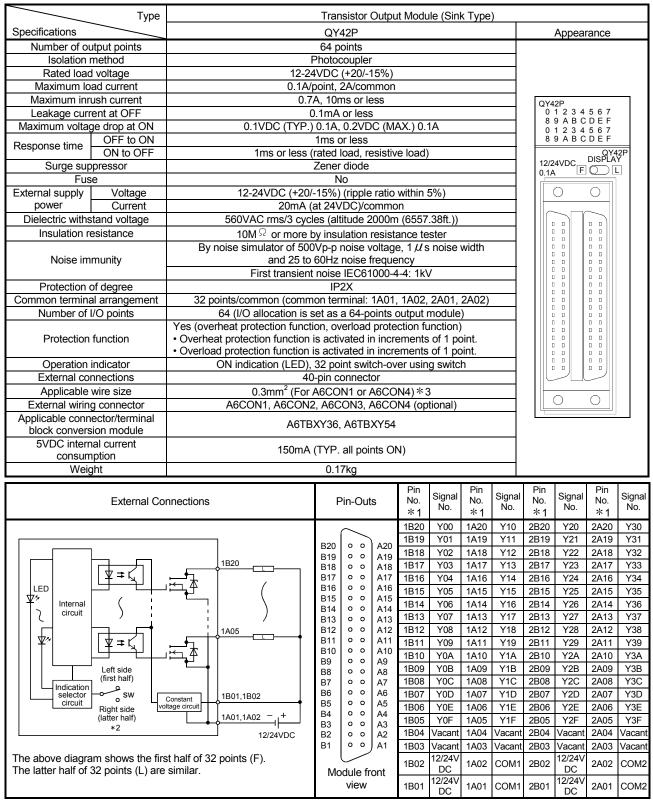


## 3.7 QY41P Transistor Output Module (Sink Type)

Туре	Transistor Output	Module (Sink Type)	
Specifications	QY41P		Appearance
Number of output points	32 points		
Isolation method	Photocoupler		1
Rated load voltage	12-24VDC (+20/-15%)		
Maximum load current	0.1A/point, 2A/common		
Maximum inrush current	0.7A, 10ms or less		QY41P
Leakage current at OFF	0.1mA or less	X \ 0.44	0 1 2 3 4 5 6 7 8 9 A B C D E F
Maximum voltage drop at ON OFF to ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MA	X.) 0.1A	0 1 2 3 4 5 6 7 8 9 A B C D E F
Response time OFF to ON ON to OFF	1ms or less 1ms or less (rated load, resistive	load)	OV41P
Surge suppressor	Zener diode	. 1044)	12/24VDC
Fuse	No		
External supply Voltage	12-24VDC (+20/-15%) (ripple ratio v	within 5%)	
power Current	20mA (at 24VDC)		
Dielectric withstand voltage	560VAC rms/3 cycles (altitude 2000m	(6557.38ft.))	
Insulation resistance	10M $\Omega$ or more by insulation resista		
	By noise simulator of 500Vp-p noise voltage		
Noise immunity	and 25 to 60Hz noise frequer		
Desta stian of downs	First transient noise IEC61000-4	-4: 1kV	
Protection of degree Common terminal arrangement	IP2X 32 points/common (common terminal	· A01 A02)	
Number of I/O points	32 (I/O allocation is set as a 32-points o		
	Yes (overheat protection function, overload protection		
Protection function	Overheat protection function is activated in incre		
	Overload protection function is activated in incre	ments of 1 point.	
Operation indicator	ON indication (LED)		
External connections	40-pin connector		
Applicable wire size	0.3mm <sup>2</sup> (For A6CON1 or A6CON		
External wiring connector Applicable connector/terminal	A6CON1, A6CON2, A6CON3, A6CON	N4 (optional)	
block conversion module	A6TBXY36, A6TBXY54		
5VDC internal current	105mA (TYP. all points ON	1)	-
consumption	(0.11A is shown on the rating plate of	, the module.)	
Weight	0.15kg		1
			Pin Signal Pin Signal
E	xternal Connections	Pin-Outs	No. No. No. No.
			B20 Y00 A20 Y10
		_	B19 Y01 A19 Y11
			B18 Y02 A18 Y12
		B20	B17 Y03 A17 Y13
		B18 º º A18	B16 Y04 A16 Y14
	B20	B17	B15 Y05 A15 Y15
	≠√││ ⊢┓┓	B16 0 0 A16 B15 0 0 A15	B14 Y06 A14 Y16
		B14 0 0 A14	B13 Y07 A13 Y17
) Internal		B13	B12 Y08 A12 Y18
LED		B11 º º A11	B11 Y09 A11 Y19
		B10	B10 Y0A A10 Y1A
	<u>∓∖</u>   , <u> </u>	B8 0 0 A8	B09         Y0B         A09         Y1B           B08         Y0C         A08         Y1C
	┕┼┙┕┶┲╴┥	B7 0 0 A7	B08         Y0C         A08         Y1C           B07         Y0D         A07         Y1D
	Constant B01,B02	B6	B07 Y0D A07 Y1D B06 Y0E A06 Y1E
	voltage circuit	B4 0 0 A4	B05 Y0F A05 Y1F
	A01,A02 - +	B3 0 0 A3 B2 0 0 A2	B04 Vacant A04 Vacant
	12/24VDC	B2	B03 Vacant A03 Vacant
			12/24
		Module front view	B02 VDC A02 COM
			B01 12/24 A01 COM
			VDC AUT CONT

\* 1: When using A6CON2 or A6CON3, refer to Chapter 7.

### 3.8 QY42P Transistor Output Module (Sink Type)



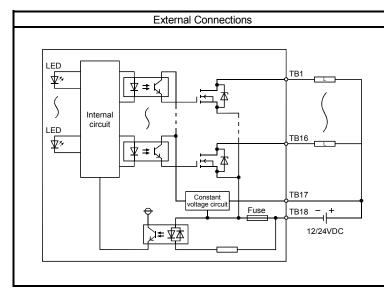
\* 1: Pin number of 1 \_\_\_\_\_ indicates that of the left-hand side connector, and pin number of 2 \_\_\_\_\_ indicates that of the right-hand side connector.

\*2: Selection of left-hand (F) side provides the first half (Y00 to Y1F) LED indications, and selection of right-hand (L) side provides the latter half (Y20 to Y3F) LED indications.

\*3: When using A6CON2 or A6CON3, refer to Chapter 7.

# 3.9 QY50 Transistor Output Module (Sink Type)

Туре		Transistor Output Module (Sink Type)	
Specifications		QY50	Appearance
Number of output points		16 points	
Isolation r	method	Photocoupler	
Rated load	l voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.5A/point, 4A/common	
Maximum inre	ush current	4A, 10ms or less	
Leakage curr	ent at OFF	0.1mA or less	QY50 0 1 2 3 4 5 6 7 8 9 A B C D E F
Maximum voltag	ge drop at ON	0.2VDC (TYP.) 0.5A, 0.3VDC (MAX.) 0.5A	89ABCDEF FUSED
Response time	OFF to ON	1ms or less	
Response une	ON to OFF	1ms or less (rated load, resistive load)	
Surge sup	pressor	Zener diode	
Fus	e	6.7A (unchangeable) (fuse blow capacity: 50A)	
Fuse blow i	ndication	Yes (When fuse blows, LED indicates it and signal is output to CPU) $\pm 1$	
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	20mA (at 24VDC)	
Dielectric withs	tand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 µ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection of	of degree	IP2X	
Common termina	Ŭ	16 points/common (common terminal: TB18)	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
Operation indicator		ON indication (LED)	12VDC 24VDC
External cor	nnections	18-point terminal block (M3×6 screws)	0.5A
Applicable	wire size	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	
Applicable crim	ping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	
5VDC internal current consumption		80mA (TYP. all points ON)	
Weight		0.17kg	

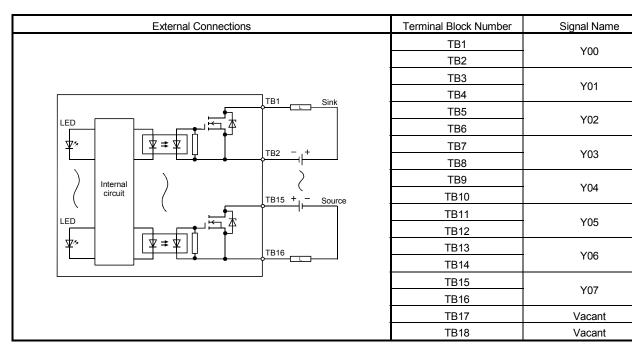


Terminal Block Number	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
ТВ9	Y08
TB10	Y09
TB11	Y0A
TB12	Y0B
TB13	YOC
TB14	Y0D
TB15	Y0E
TB16	Y0F
TB17	12/24VDC
TB18	COM

 $\ast$  1: Fuse disconnection is not detected when the external power supply is off.

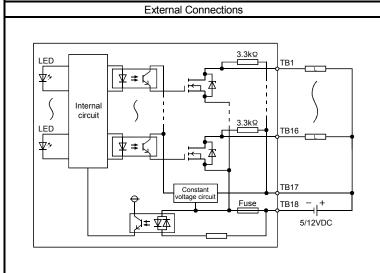
## 3.10 QY68A Transistor Output Module (All Points Independent, Sink/Source Type)

Туре		Transistor Output Module (All Points Independent, Sink/So	ource Type)
Specifications		QY68A	Appearance
Number of output points		8 points	
Isolation	method	Photocoupler	
Rated load	l voltage	5-24VDC (+20/-10%)	
Maximum lo	ad current	2A/point, 8A/unit	07684
Maximum inr	ush current	8A, 10ms or less	QY68A 0 1 2 3 4 5 6 7
Leakage curr	ent at OFF	0.1mA or less	
Maximum voltag	ge drop at ON	0.3VDC (MAX.) 2A	
Deenenee time	OFF to ON	3ms or less	
Response time	ON to OFF	10ms or less (resistive load)	
Surge sup	pressor	Zener diode	
Fus	•	None (Attaching a fuse to external wiring is recommended. Refer to	
Fus	e	Section 1.2)	
External sup	ply power	None	
Dielectric withs	tand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation r	esistance	10M $^{\Omega}$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	5 8
		First transient noise IEC61000-4-4: 1kV	
Protection	of degree	IP2X	
Common termina	al arrangement	All points Independent	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
Operation	indicator	ON indication (LED)	NC D
External co	nnections	18-point terminal block (M3 $\times$ 6 screws)	
Applicable	wire size	0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	5/12/ 24VDC 2A
Applicable crim	ping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	
5VDC interr	al current	110mA (TYP. all points ON)	
consum	ption		
Weig	ght	0.14kg	



# 3.11 QY70 Transistor Output Module (Sink Type)

Туре		Transistor Output Module (Sink Type)	
Specifications		QY70	Appearance
Number of ou	utput points	16 points	
Isolation r	method	Photocoupler	
Rated load	l voltage	5/12VDC (+25/-10%)	
Maximum lo	ad current	16mA/point, 256mA/common	
Maximum inr	ush current	40mA, 10ms or less	
Output volta	ge at OFF	Voн: 3.5VDC (Vcc=5VDC, Ioн=0.4mA)	QY70 0 1 2 3 4 5 6 7 8 9 A B C D E F
Maximum voltag	ge drop at ON	Vol: 0.3VDC	8 9 A B C D E F FUSE□
Response time	OFF to ON	0.5ms or less	
Response time	ON to OFF	0.5ms or less (resistive load)	
Surge sup	pressor	None	
Fus	e	1.6A (unchangeable) (fuse blow capacity: 50A)	
Fuse blow i	ndication	Yes (When fuse blows, LED indicates it and signal is output to CPU) $\pm 1$	
External supply	Voltage	5/12VDC (+25/-10%) (ripple ratio within 5%)	
power	Current	90mA (when 12VDC and all point is ON)	
Dielectric withs	tand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $\Omega$ or more by insulation resistance tester	
Noise im	munity	By noise simulator of 500Vp-p noise voltage, 1 µ s noise width and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection of	of degree	IP2X	
Common termina		16 points/common (common terminal: TB18)	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
Operation indicator		ON indication (LED)	
External connections		18-point terminal block (M3×6 screws)	5VDC 12VDC 16mA
Applicable wire size		0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	
Applicable crim	ping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	
5VDC intern	al current	95mA (TYP. all points ON)	
consumption		(0.10A is shown on the rating plate of the module.)	
Weight		0.14kg	



Terminal Block Number	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	Y08
TB10	Y09
TB11	Y0A
TB12	Y0B
TB13	YOC
TB14	Y0D
TB15	Y0E
TB16	Y0F
TB17	5/12VDC
TB18	COM

 $\ast$  1: Fuse disconnection is not detected when the external power supply is off.

## 3.12 QY71 Transistor Output Module (Sink Type)

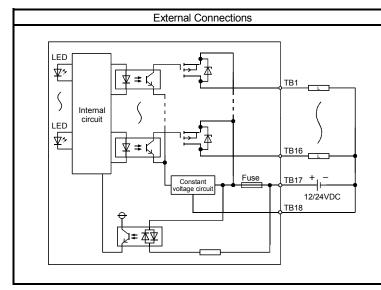
Туре		Transistor Output Module (Sink Type)	
Specifications		QY71	Appearance
Number of ou	utput points	32 points	
Isolation I	method	Photocoupler	
Rated load	l voltage	5/12VDC (+25/-10%)	
Maximum lo	ad current	16mA/point, 512mA/common	QY71
Maximum inr	ush current	40mA, 10ms or less	0 1 2 3 4 5 6 7 8 9 A B C D E F
Output volta	ge at OFF	Voн: 3.5VDC (Vcc=5VDC, Ioн=0.4mA)	0 1 2 3 4 5 6 7
Maximum voltag	ge drop at ON	Vol: 0.3VDC	8 9 A B C D E F
Response time	OFF to ON	0.5ms or less	5/12VDC FUSE 16mA O
Response ame	ON to OFF	0.5ms or less (resistive load)	
Surge sup	pressor	None	
Fus	e	1.6A (unchangeable) (fuse blow capacity: 50A)	
Fuse blow i	ndication	Yes (When fuse blows, LED indicates it and signal is output to CPU) *1	
External supply	Voltage	5/12VDC (+25/-10%) (ripple ratio within 5%)	
power	Current	170mA (when 12VDC and point is ON)	
Dielectric withs	stand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $^{\Omega}$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection of	of degree	IP2X	
Common termina	al arrangement	32 points/common (common terminal: A01, A02)	
Number of	I/O points	32 (I/O allocation is set as a 32-points output module)	
Operation indicator		ON indication (LED)	
External connections		40-pin connector	
Applicable wire size		0.3mm <sup>2</sup> (For A6CON1 or A6CON4) *2	
External wiring	g connector	A6CON1, A6CON2, A6CON3, A6CON4 (optional)	
5VDC internal current consumption		150mA (TYP. all points ON)	
Weig	ght	0.14kg	

External Connections	Pin-Outs	Pin No.	Signal No.	Pin No.	Signal No.
Image: constant of the second seco	B20         0         A20           B19         0         A19           B18         0         A18           B17         0         A17           B16         0         A17           B16         0         A17           B16         0         A17           B16         0         A17           B17         0         A17           B16         0         A16           B15         0         A13           B12         0         A13           B12         0         A12           B11         0         A11           B10         0         A10           B9         0         A9           B8         0         A3           B7         0         A7           B6         0         A3           B2         0         A2           B1         0         A1				

 $\ast$  1: Fuse disconnection is not detected when the external power supply is off.  $\ast$  2: When using A6CON2 or A6CON3, refer to Chapter 7.

# 3.13 QY80 Transistor Output Module (Source Type)

Туре		Transistor Output Module (Source Type)	
Specifications		QY80	Appearance
Number of ou	utput points	16 points	
Isolation	method	Photocoupler	
Rated load	l voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.5A/point, 4A/common	
Maximum inr	ush current	4A, 10ms or less	
Leakage curr	ent at OFF	0.1mA or less	QY80 0 1 2 3 4 5 6 7
Maximum voltag	ge drop at ON	0.2VDC (TYP.) 0.5A, 0.3VDC (MAX.) 0.5A	8 9 A B C D E F FUSE□
Response time	OFF to ON	1ms or less	
Response une	ON to OFF	1ms or less (rated load, resistive load)	
Surge sup	pressor	Zener diode	
Fus	e	6.7A (unchangeable) (fuse blow capacity: 50A)	
Fuse blow i	ndication	Yes (When fuse blows, LED indicates it and signal is output to CPU) $\pm 1$	
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	20mA (at 24VDC)	
Dielectric withs	stand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	
Protection	of degree	IP2X	
Common termina	al arrangement	16 points/common (common terminal: TB17)	
Number of	I/O points	16 (I/O allocation is set as a 16-points output module)	
Operation indicator		ON indication (LED)	12VDC 24VDC
External co	nnections	18-point terminal block (M3 $\times$ 6 screws)	0.5A
Applicable wire size		0.3 to 0.75mm <sup>2</sup> core (2.8mm (0.11in.) OD max.)	
Applicable crim	ping terminal	R1.25-3 (sleeved crimping terminals cannot be used.)	
5VDC internal current consumption		80mA (TYP. all points ON)	
Weig	ght	0.17kg	



Terminal Block Number	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
ТВ9	Y08
TB10	Y09
TB11	Y0A
TB12	Y0B
TB13	YOC
TB14	Y0D
TB15	Y0E
TB16	Y0F
TB17	СОМ
TB18	0V

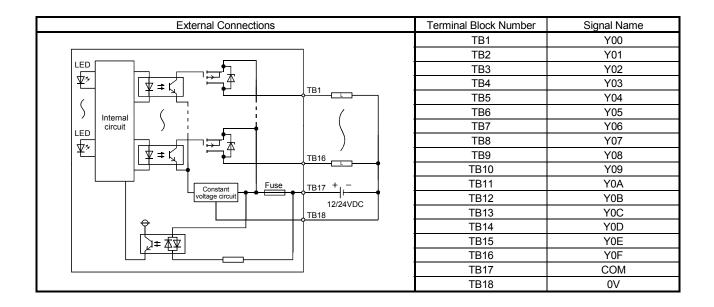
\* 1: Fuse disconnection is not detected when the external power supply is off.

# 3.14 QY80-TS Transistor Output Module (Source Type)

This module is a spring clamp terminal block type and an output module that has
indicators for checking the insertion state of wire.

	Туре	Transistor Output Module (Source Type)	
Specifications		QY80-TS	Appearance
Number of ou	tput points	16 points	
Isolation r	nethod	Photocoupler	
Rated load	l voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.5A/point, 4A/common	
Maximum inre	ush current	4A, 10ms or less	QY80-TS 0 1 2 3 4 5 6 7
Leakage curr	ent at OFF	0.1mA or less	89ABCDEF FUSE
Maximum voltag	ge drop at ON	0.2VDC (TYP.) 0.5A, 0.3VDC (MAX.) 0.5A	
Response time	OFF to ON	1ms or less	$(\mathcal{T})$
Response time	ON to OFF	1ms or less (rated load, resistive load)	
Surge sup	pressor	Zener diode	
Fus	e	6.7A (unchangeable) (fuse blow capacity: 50A)	
Fuse blow i	ndication	Yes (When fuse blows, LED indicates it and signal is output to CPU) $\pm 1$	
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	20mA (at 24VDC)	
Dielectric withs	tand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation re	esistance	10M $\Omega$ or more by insulation resistance tester	9 [- 10]
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	11╠Ш() (12
		First transient noise IEC61000-4-4: 1kV	
Protection of	of degree	IP2X	
Common termina	al arrangement	16 points/common (common terminal: TB17)	
Number of	/O points	16 (I/O allocation is set as a 16-points output module)	
Operation	indicator	ON indication (LED)	
External cor	nnections	Two piece Spring clamp terminal block	
Applicable	wire size	0.3 to 2.0mm <sup>2</sup> core (AWG22 to 15)	
Applicable crim	ping terminal	Refer to section 9.1	
5VDC intern	al current	80mA (TYP. all points ON)	
consum	ption		
Weig	pht	0.17kg	

\* 1: Fuse disconnection is not detected when the external power supply is OFF.



# 3.15 QY81P Transistor Output Module (Source Type)

	Туре	Transistor Output Module (Source Type)	
Specifications		QY81P	Appearance
Number of ou	utput points	32 points	
Isolation	method	Photocoupler	
Rated load	l voltage	12-24VDC (+20/-15%)	
Maximum lo	ad current	0.1A/point, 2A/common	
Maximum inr	ush current	0.7A, 10ms or less	QY81P
Leakage curr	ent at OFF	0.1mA or less	0 1 2 3 4 5 6 7
Maximum volta		0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	8 9 A B C D E F 0 1 2 3 4 5 6 7
Response time	OFF to ON	1ms or less	89ABCDEF
Response unie	ON to OFF	1ms or less (rated load, resistive load)	QY81P
Surge sup	pressor	Zener diode	12/24VDC
Fus	e	No	0.1A
External supply	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
power	Current	40mA (at 24VDC)	
Dielectric withs	stand voltage	560VAC rms/3 cycles (altitude 2000m (6557.38ft.))	
Insulation r	esistance	10M $\Omega$ or more by insulation resistance tester	
		By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width	
Noise im	munity	and 25 to 60Hz noise frequency	
		First transient noise IEC61000-4-4: 1kV	• •
Protection (	of degree	IP2X	
Common termina	al arrangement	32 points/common (common terminal: 17, 18, 36)	
Number of	I/O points	32 (I/O allocation is set as a 32-points output module)	• • •
		Yes (overheat protection function, overload protection function)	0 0
Protection	function	Overheat protection function is activated in increments of 2 points.	0 0 0
<b>.</b>		Overload protection function is activated in increments of 1 point.	- · · · ·
Operation		ON indication (LED)	
External co		37-pin D-sub connector	
Applicable		0.3mm <sup>2</sup> (For A6CON1E) * 1	
External wirin		A6CON1E, A6CON2E, A6CON3E (optional)	
Applicable conn		A6TBY36-E, A6TBY54-E	
block convers			_
5VDC interr		95mA (TYP. all points ON)	
consum		(0.10A is shown on the rating plate of the module.)	4
Weig	gnt	0.15kg	

Derating Chart	Pin-Outs	Pin No.	Signal No.	Pin No.	Signal No.
		1	Y00	9	Y10
	$\frown$	20	Y01	28	Y11
		2	Y02	10	Y12
	10 0 0 36	21	Y03	29	Y13
	16 0 <sup>0</sup> 35	3	Y04	11	Y14
√√   □ − − − − − − − − − − − − − − − − − −	15 0 22	22	Y05	30	Y15
	13 0 32	4	Y06	12	Y16
	12 0 0 31 0 30	23	Y07	31	Y17
) Internal (	11 0 0 29 10 0 29	5	Y08	13	Y18
	9 0 <sup>0</sup> 28	24	Y09	32	Y19
	8 0 0 27 8 0 26	6	Y0A	14	Y1A
	<sup>7</sup> ο ο 25	25	Y0B	33	Y1B
Constant voltage circuit	$5 \circ 0 24$	7	Y0C	15	Y1C
DC12/24V	4 0 0 22 3 0 22	26	Y0D	34	Y1D
	2 0 0 21	8	Y0E	16	Y1E
	$\begin{bmatrix} 2 & 0 \\ 1 & 0 \end{bmatrix}$ $\begin{bmatrix} 20 \\ 20 \end{bmatrix}$	27	Y0F	35	Y1F
		17	COM	37	0V
	Module front view	36	COM	19	0V
		18	COM	$\nearrow$	

\* 1: When using A6CON2E or A6CON3E, refer to Chapter 7.

# MEMO


# 4. COMBINED I/O MODULE

#### 4.1 QH42P I/O Module

- When using the main module, use the constructions listed in Section 1.2.3 (2).
- This module uses same I/O numbers for input and output.

For I/O numbers of combined I/O modules, refer to Section 1.2.3.

#### (1) DC Input Specification (Positive Common Type)

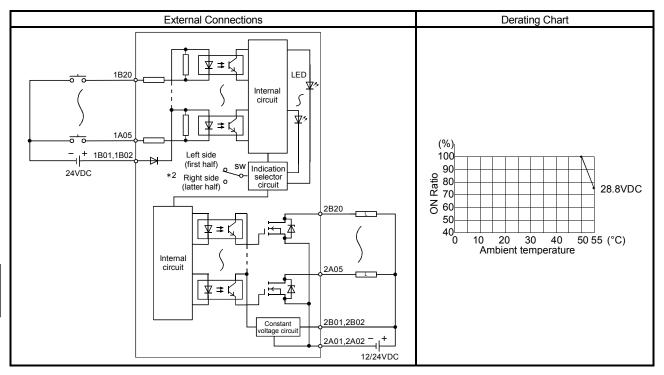
Specifications	Туре	QH42P I/O Module (Input Specification)
Number of i	nput points	32 points
Insulation	method	Photocoupler
Rated inpu	ut voltage	24VDC (+20/-15%, ripple ratio within 5%)
Rated inp		Approx. 4mA
Input de		See the derating chart.
ON voltage/		19V or higher/3mA or higher
OFF voltage/		11V or lower/1.7mA or lower
Input res	sistance	Approx. 5.6k $\Omega$
Response time	OFF→ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms
Response time	ON→OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms
Dielectric max	imum voltage	560VAC rms/3 cycles (altitude 2000m)
Insulation	resistance	10M $^{\Omega}$ or more by insulation resistance tester
Noise in	nmunity	By noise simulator of 500Vp-p noise voltage, 1 // s noise width and 25 to 60Hz noise frequency First transient noise IEC61000-4-4: 1kV
Protection	of degree	IP2X
Common termin	al arrangement	32 points/common (common terminal: 1B01, 1B02)
Number of I/O o	occupied points	32 points (For I/O allocation on I/O mixed module, set 32 points.)
Operation	indicator	ON indication (LED), 32-point switchover using switch * 2
External co	onnections	40-pin connector
Applicable	wire size	0.3mm <sup>2</sup> (For A6CON1 or A6CON4) * 3
External wirir	ng connector	A6CON1, A6CON2, A6CON3, A6CON4 (optional)
Mixed connecto conversio		A6TBXY36, A6TBXY54, A6TBX70
5VDC internal cur		130mA (TYP, all points ON)
Wei	ight	0.20kg

\* 1: For the setting method, refer to the Section 1.3.1.

\*2: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (Y00 to Y1F) LED indications.

\* 3: When using A6CON2 or A6CON3, refer to Chapter 7.





\*2: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (Y00 to Y1F) LED indications.

# (2) Transistor Output Specification (Sink Type)

Specifications	Туре	QH42P I/O Module (Output Specification)	Appearance
Number of ou	tput points	32 points	011405
Insulation I	method	Photocoupler	QH42P 0 1 2 3 4 5 6 7
Rated load	voltage	12-24VDC (+20/-15%)	8 9 A B C D E F 0 1 2 3 4 5 6 7
Max. load	current	0.1A/point, 2A/common	89ABCDEF
Max. rush	current	0.7A/10ms or less	24VDC4mA QH42P
Leakage curre	ent at OFF	0.1mA or lower	
Max. voltage	drop at ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	
Response time	OFF→ON	1ms or shorter	
Response time	ON→OFF	1ms or shorter (rated load, resistance load)	
Surge I	killer	Zener diode	
Fuse	е	None	
External power	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
supply	Current	15mA /common (when 24VDC and all point is ON)	
Common termina	l arrangement	32 points/common (common terminal: 2A01, 2A02)	
Protection	function	Provided (overheat protection function, overload protection function) • Overheat protection function operate independently of each other. • Overload protection function operate independently of each other.	

Pin-Outs	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.
	1B20	X00	1A20	X10	2B20	Y00	2A20	Y10
	1B19	X01	1A19	X11	2B19	Y01	2A19	Y11
B20 o o A20	1B18	X02	1A18	X12	2B18	Y02	2A18	Y12
B19 • • A19 B18 • • A18	1B17	X03	1A17	X13	2B17	Y03	2A17	Y13
B17 0 0 A17	1B16	X04	1A16	X14	2B16	Y04	2A16	Y14
B16	1B15	X05	1A15	X15	2B15	Y05	2A15	Y15
B15 0 0 A15 B14 0 0 A14	1B14	X06	1A14	X16	2B14	Y06	2A14	Y16
B13 0 0 A13	1B13	X07	1A13	X17	2B13	Y07	2A13	Y17
B12	1B12	X08	1A12	X18	2B12	Y08	2A12	Y18
B10 • • A10	1B11	X09	1A11	X19	2B11	Y09	2A11	Y19
B9 0 0 A9	1B10	X0A	1A10	X1A	2B10	Y0A	2A10	Y1A
B8 0 0 A8 B7 0 0 A7	1B09	X0B	1A09	X1B	2B09	Y0B	2A09	Y1B
B6	1B08	X0C	1A08	X1C	2B08	Y0C	2A08	Y1C
B5 0 0 A5 B4 0 0 A4	1B07	X0D	1A07	X1D	2B07	Y0D	2A07	Y1D
B4 0 0 A4 B3 0 0 A3	1B06	X0E	1A06	X1E	2B06	Y0E	2A06	Y1E
B2 o o A2	1B05	X0F	1A05	X1F	2B05	Y0F	2A05	Y1F
B1 0 0 A1	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
	1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
Module front view	1B02	COM1	1A02	Vacant	2B02	12/24 VDC	2A02	COM2
	1B01	COM1	1A01	Vacant	2B01	12/24 VDC	2A01	COM2

\*4: Pin number of 1 \_\_\_\_\_ indicates that of the left-hand side connector, and pin number of 2 \_\_\_\_\_ indicates that of the right-hand side connector.

### 4.2 QX41Y41P I/O Module

- When using the main module, use the constructions listed in Section 1.2.3 (2).
- This module uses sequential I/O numbers for input and output. For I/O numbers of combined I/O modules, refer to Section 1.2.3.

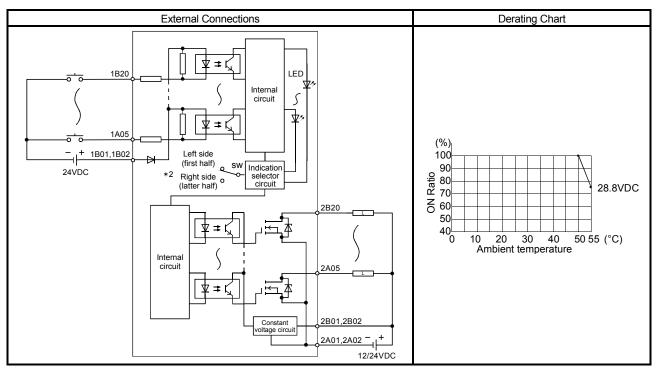
#### (1) DC Input Specification (Positive Common Type)

Specifications	Туре	QX41Y41P I/O Module (Input Specification)
Number of i	input points	32 points
Insulation		Photocoupler
Rated inp		20.4 to 28.8VDC (ripple ratio within 5%)
Rated inp	ut current	Approx. 4mA
Input d	erating	See the derating chart.
ON voltage/		19V or higher/3mA or higher
OFF voltage	OFF current	11V or lower/1.7mA or lower
Input res	sistance	Approx. 5.6k $\Omega$
Response time	OFF→ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms
Response time	ON→OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms
Dielectric max	imum voltage	560VAC rms/3 cycles (altitude 2000m)
Insulation	resistance	10M $\Omega$ or more by insulation resistance tester
Noise in	nmunity	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency First transient noise IEC61000-4-4: 1kV
Protection	of degree	IP2X
Common termin	al arrangement	32 points/common (common terminal: 1B01, 1B02)
Number of I/O of	occupied points	64 points (For I/O allocation on I/O mixed module, set 64 points.)
Operation	indicator	ON indication (LED), 32-point switchover using switch * 2
External co	onnections	40-pin connector
Applicable	e wire size	0.3mm <sup>2</sup> (For A6CON1 or A6CON4) * 3
External wirir	ng connector	A6CON1, A6CON2, A6CON3, A6CON4 (optional)
Mixed connecto conversio		A6TBXY36, A6TBXY54, A6TBX70
5VDC internal cur		130mA (TYP, all points ON)
We	ight	0.20kg

\*1: For the setting method, refer to the Section 1.3.1.

\*2: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (Y00 to Y1F) LED indications.

\* 3: When using A6CON2 or A6CON3, refer to Chapter 7.



\*2: Selection of left-hand (F) side provides the first half (X00 to X1F) LED indications, and selection of right-hand (L) side provides the latter half (Y00 to Y1F) LED indications.

# (2) Transistor Output Specification (Sink Type)

Specifications	Туре	QX41Y41P I/O Module (Output Specification)	Appearance
Number of ou	tput points	32 points	
Insulation I	method	Photocoupler	QX41Y41P 0 1 2 3 4 5 6 7
Rated load	voltage	12-24VDC (+20/-15%)	8 9 A B C D E F 0 1 2 3 4 5 6 7
Max. load	current	0.1A/point, 2A/common	89ABCDEF
Max. rush	current	0.7A/10ms or less	24VDC4mA QX41Y41P DISPLAY
Leakage curre	ent at OFF	0.1mA or lower	24VDC4mA QX41Y41P 12/24VDC DISPLAY 0.1A F D L
Max. voltage of	drop at ON	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	
Response time	OFF→ON	1ms or shorter	
Response time	ON→OFF	1ms or shorter (rated load, resistance load)	
Surge k	killer	Zener diode	
Fuse	е	None	
External power	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)	
supply	Current	15mA /common (when 24VDC and all point is ON)	
Common termina	l arrangement	32 points/common (common terminal: 2A01, 2A02)	
Protection	function	Provided (overheat protection function, overload protection function) • Overheat protection function operate independently of each other. • Overload protection function operate independently of each other.	

Pin-Outs	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.	Pin No.4 *4	Signal No.
	1B20	X00	1A20	X10	2B20	Y20	2A20	Y30
$\sim$	1B19	X01	1A19	X11	2B19	Y21	2A19	Y31
B20 • • A20	1B18	X02	1A18	X12	2B18	Y22	2A18	Y32
B19	1B17	X03	1A17	X13	2B17	Y23	2A17	Y33
B17 0 0 A17	1B16	X04	1A16	X14	2B16	Y24	2A16	Y34
	1B15	X05	1A15	X15	2B15	Y25	2A15	Y35
B15	1B14	X06	1A14	X16	2B14	Y26	2A14	Y36
B13 0 0 A13	1B13	X07	1A13	X17	2B13	Y27	2A13	Y37
B12	1B12	X08	1A12	X18	2B12	Y28	2A12	Y38
	1B11	X09	1A11	X19	2B11	Y29	2A11	Y39
B9	1B10	X0A	1A10	X1A	2B10	Y2A	2A10	Y3A
B8 0 0 A8 B7 0 0 A7	1B09	X0B	1A09	X1B	2B09	Y2B	2A09	Y3B
B6 0 0 A6	1B08	X0C	1A08	X1C	2B08	Y2C	2A08	Y3C
B5 0 0 A5	1B07	X0D	1A07	X1D	2B07	Y2D	2A07	Y3D
B4 0 0 A4 B3 0 0 A3	1B06	X0E	1A06	X1E	2B06	Y2E	2A06	Y3E
B2 0 0 A2	1B05	X0F	1A05	X1F	2B05	Y2F	2A05	Y3F
B1 0 0 A1	1B04	Vacant	1A04	Vacant	2B04	Vacant	2A04	Vacant
	1B03	Vacant	1A03	Vacant	2B03	Vacant	2A03	Vacant
Module front view	1B02	COM1	1A02	Vacant	2B02	12/24 VDC	2A02	COM2
	1B01	COM1	1A01	Vacant	2B01	12/24 VDC	2A01	COM2

\*4: Pin number of 1 \_\_\_\_\_ indicates that of the left-hand side connector, and pin number of 2 \_\_\_\_\_ indicates that of the right-hand side connector.

### 4.3 QX48Y57 I/O Module

- When using the main module, use the constructions listed in Section 1.2.3 (2).
- This module uses sequential I/O numbers for input and output.
  - For I/O numbers of combined I/O modules, refer to Section 1.2.3.

#### (1) DC Input Specification (Positive Common Type)

Specifications	Туре	QX48Y57 I/O Module (Input Specification)	Appearance
Number of	input points	8 points	
Insulation	n method	Photocoupler	
Rated inp	out voltage	24VDC (+20/-15%, ripple ratio within 5%)	
Rated inp	out current	Approx. 4mA	QX48Y57
Input d	lerating	None	0 1 2 3 4 5 6 7
ON voltage	ON current	19V or higher/3mA or higher	8 9 A B C D E F FUSE□
OFF voltage	OFF current	11V or lower/1.7mA or lower	
Input re	sistance	Approx. 5.6k $\Omega$	
Response	OFF→ON	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms	
time	ON→OFF	1ms/5ms/10ms/20ms/70ms or less (CPU parameter setting) * 1 Initial setting is 10ms	$\begin{array}{c c} & & & 1 \\ \hline \hline$
Dielectric max	kimum voltage	560VAC rms/3 cycles (altitude 2000m)	
Insulation	resistance	10M $^{\Omega}$ or more by insulation resistance tester	+ <del>005</del> 4
Noise ir	nmunity	By noise simulator of 500Vp-p noise voltage, 1 $\mu$ s noise width and 25 to 60Hz noise frequency	+ <del>0 0 6</del> 5 - <del>0</del> 6
		First transient noise IEC61000-4-4: 1kV	
Protection	of degree	IP2X	+⊡_9   ∑ 8
	n terminal gement	8 points/common (common terminal: TB9)	
	/O occupied ints	16 points (For I/O allocation on I/O mixed module, set 16 points.)	
Operation	n indicator	ON indication (LED)	
External c	onnections	18-point terminal block (M3×6 screw)	
Applicable	e wire size	Core cable: 0.3 to 0.75mm <sup>2</sup> (Outside diameter: 2.8mm or smaller)	12/24VDC 0.5A
Applicable con	nector terminal	R1.25-3 (Terminals with sleeve cannot be used)	
	rnal current mption	80mA (TYP, all points ON)	
We	eight	0.20kg	]

\*1: For the setting method, refer to the Section 1.3.1.

External Connections	Terminal Block No.	Signal Name
	TB1	X00
	TB2	X01
	TB3	X02
	TB4	X03
	TB5	X04
	TB6	X05
	TB7	X06
	TB8	X07
	TB9	COM1
	TB10	Y08
	TB11	Y09
	TB12	Y0A
	TB13	Y0B
	TB14	Y0C
	TB15	Y0D
Constant TB17	TB16	Y0E
	TB17	12/24VDC
12/24VDC	TB18	COM2

(2) Transistor	Outout	Specifications	(Cink	Tunna
(z) manalator	Output	opecifications		iype)

Type QX48Y57 I/O Module (Output Specifications		QX48Y57 I/O Module (Output Specification)				
Number of c	output points	7 points				
Insulation	n method	Photocoupler				
Rated loa	id voltage	12-24VDC (+20/-15%)				
Max. loa	d current	0.5A/point, 2A/common				
Max. rus	h current	4A/10ms or less				
Leakage current at OFF 0.1mA or lower		0.1mA or lower				
Max. voltage drop at ON		0.2VDC (TYP.) 0.5A, 0.3VDC (MAX.) 0.5A				
Response	OFF→ON	1ms or shorter				
time	ON→OFF	1ms or shorter (rated load, resistance load)				
Surge killer		Zener diode				
Fu	se	4A (Not replaceable) (Fuse breakage capacity: 50A)				
Fuse breaka	ge indication	Provided (When fuse is broken, LED lights and a signal is output to CPU) *2				
External	Voltage	12-24VDC (+20/-15%) (ripple ratio within 5%)				
power supply	Current	10mA (at 24VDC)				
Common terminal arrangement 7 points/common (common terminal: TB18)		7 points/common (common terminal: TB18)				

\*2: When the external power supply is turned off, fuse breakage is not detected.

# 5. INTERRUPT MODULE

#### 5.1 QI60 Interrupt Module

# For usage of the main module, refer to the QCPU User's Manual (Function Explanation/Program Fundamentals).

		Туре		- 9		terrupt Module		
Specification		Type			Appearance			
		5			QI60 16 points			Appearance
	of input point on method	เร						
	nput voltage			24\/DC (+20	Photocoupler /-15%, ripple rat	io within 5%)		
	nput current			24VDC (+20	Approx. 6mA	10 within 5%)		
	t derating				No			Q160
	ge/ON currel	nt		19\/ or	higher/4.0mA or	higher		0 1 2 3 4 5 6 7 8 9 A B C D E F
	ge/OFF curre				r lower/1.7mA or			
	mpedance	JII		1100	Approx. 3.9k Ω	lower		
input	Set value	*1	0.1	0.2	0.4	0.6	1	
		Тур	0.05ms	0.15ms	0.30ms	0.55ms	1.05ms	
Response	OFF to ON	max	0.10ms	0.20ms	0.40ms	0.60ms	1.20ms	
time			0.15ms	0.20ms	0.35ms	0.60ms	1.10ms	
	ON to OFF	Typ max	0.10ms	0.20ms	0.50ms	0.70ms	1.30ms	
Dielectric	ithstand volt				cles (altitude 20			
	n resistance	•	50		e by insulation re		•//	
insulduc	in resistance	,	By nois		00Vp-p noise vo		se width	5
Noise	e immunity		By HOIS		to 60Hz noise fre	-		
110130	; in introducty				ent noise IEC610			9 7
Protecti	on of degree				IP2X	00-4-4. IKV		A 8
	Common terminal				11 2/			B 9
	ngement			16 points/com	mon (common te	erminal: TB17)		A
	of I/O points	2	16 (1/C	allocation is se	et as a 16-points	interrunt modul	e) *3	B
Interrupt pro			10 (1/C		the CPU parame		6) 113	
	ion indicator				N indication (LE			
	connections	2			minal block (M3			NC E
	ble wire size		(		core (2.8mm (0.		)	
					, ,			6mA
	rimping term ternal curren		RI.	25-3 (sleeved d	rimping termina	is cannot be use	ea.)	
	sumption	IL		60m/	A (TYP. all points	s ON)		
	Veight				0.20kg			
V	veigin				0.20Kg			
		Ex	ternal Connecti	ons		Terminal E	lock Number	Signal Name
						1	B1	X00
							TB2	X01
							B3	X02
					] LED		B4	X03
			┑┎╬╤		¥*		B5	X04
				≠ K   Internal circuit	<b>⊢</b> Ť		<sup>-</sup> B6 	X05 X06
							B8	X00 X07
				L	-		B9	X07 X08
							B10	X09
						B11	X0A	
							B12	X0B
	+ тв17	>	<b></b>				B13	X0C
	24VDC						B14	XOD
	L						B15	XOE
							B16 B17	X0F COM
							B18	Vacant
l						I	010	vacant

\*1: Use the CPU parameter settings to select. (Default: 0.2ms). Refer to Section 1.3.1 for the setting method.

For the QCPUs and GX Developer where the response time can be set, refer to Section 1.2.5.

\*2: For the setting method, refer to the section 1.3.3.

\*3: When making settings with an SW5D5C-GPPW or earlier GX Developer, select "16 point intelligent module."

# MEMO

# 6. BLANK COVER MODULE

This chapter provides the specifications of the blank cover module used to protect the vacant slot (between I/O modules) of the base module from dust.

Type Item		QG60		
Number of I/O points occupied		Default: 16 points (Can be changed to 0, 16, 32, 48, 64, 128, 256, 512, 1024 points by "PLC system" of "PLC parameter".)		
Application		Used as a dustproof cover for a slot not loaded with an I/O module (especially a vacant slot between modules).		
Н		98(3.86) mm(inch)		
External	W	27.4(1.08) mm(inch)		
umensions	D	90(3.55) mm(inch)		
Weight		0.07 kg		

Table 6.1 Blank Cover Module Specifications

\* Load the blank cover module with the connector cover of the base module fitted.

# MEMO


# 7. CONNECTORS

The 40-pin connectors and 37-pin D-sub connectors used with the input and output modules are to be user-prepared.

The following tables list the connector types and applicable models, and introduce crimp-contact and pressure-displacement tools.

#### (1) 40-pin connectors (a) 40-pin connectors

Туре	Model Name	Applicable Wire Size	Applicable Model
Soldering type connector	A6CON1	0.3mm <sup>2</sup> (AWG#22)	QX41, QX41-S1, QX42,
Crimp-contact type connector	A6CON2	AWG#24 to 28	QX42-S1, QX71, QX72,
Pressure-displacement type connector	A6CON3	AWG#28 (twisted)	QX82, QY41P, QY42P, QY71, QH42P,
Soldering type connector	A6CON4	AWG#30 (single wire) 0.3mm <sup>2</sup> (AWG#22)	QX41Y41P

# (b) 40-pin connector crimp-contact and pressure-displacement tools

Туре	Model Name	Contact
Crimp-contact tool	FCN-363T-T005/H	
Pressure-displacement tool	FCN-367T-T012/H	
	(locator plate)	
	FCN-707T-T001/H	FUJITSU COMPONENT
	(cable cutter)	
	FCN-707T-T101/H	
	(hand press)	

#### (2) 37-pin D-sub connectors (a) 37-pin D-sub connectors

Туре	Model Name	Applicable Wire Size	Applicable Model
Soldering type connector	A6CON1E	0.3mm <sup>2</sup> (AWG#22)	
Crimp-contact type connector	A6CON2E	AWG#24 to 24	
Pressure-displacement type connector	A6CON3E	AWG#28 (twisted) AWG#30 (single wire)	QX81, QY81P

# (b) 37-pin D-sub connector crimp-contact and pressuredisplacement tools

Туре	Model Name	Contact
Crimp-contact tool	91503-1	
	768349-1 (die set) 768338-1	
Pressure-displacement tool	91220-1 (cable cutter)	Tyco Electronics AMP K.K.
	91085-2 (hand mini- press)	

## 8. SPECIFICATIONS OF CONNECTOR/TERMINAL BLOCK CONVERTOR MODULES

## 8.1 Specifications of Connector/Terminal Block Convertor Modules

This chapter explains the specifications of connector/terminal block convertor modules.

Туре	Details	Weight	Applicable wire size	Applicable crimping terminal	Applicable Models
A6TBXY36	For positive common type input modules and sink type output modules (standard type)	0.4kg			Q series: QX41, QX41-S1, QX42, QX42-S1, QY41P, QY42P, QH42P, QX41Y41P AnS series: A1SX41, A1SX41-S1, A1SX41-S2,
A6TBXY54	For positive common type input modules and sink type output modules (2-wire type)	0.5kg			A1SX42, A1SX42-S1, A1SX42-S2, A1SX82-S1,A1SY41, A1SY41P, A1SY42, A1SY42P, A1SY82, A1SH42, A1SH42P, A1SH42P-S1, A1SH42P-S1 A series: AX42, AX42-S1, AY42, AY42-S1, AY42-S3, AY42-S4, AH42 CC-Link: AJ65SBTCF1-32D, AJ65SBTCF1-32T, AJ65SBC1-32D, AJ65SBC1-32T MELSECNET-MINI: AJ35TC1-32D, AJ35TC1-32T
	For positive common type input modules (3-wire type)	0.6kg	0.75 to 2mm <sup>2</sup>	1.25-3.5(JIS) 1.25-YS3A V1.25-YS3A V1.25-YS3A 2-3.5(JIS) 2-YS3A V2-S3 V2-YS3A	Q series: QX41, QX41-S1, QX42, QX42-S1, QH42P, QX41Y41P AnS series: A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX82-S1, A1SH42, A1SH42P, A1SH42-S1, A1SH42P-S1 A series: AX42, AX42-S1, AH42 CC-Link: AJ65SBTCF1-32D, AJ65SBC1-32D MELSECNET-MINI: AJ35TC1-32D
	For negative common type input modules (standard type)	0.4kg			Q series: QX81
	For negative common type input modules (2-wire type)	0.5kg			AnS series: A1SX81, A1SX81-S2 A series: AX82
AGIBX/0-E	For negative common type input modules (3-wire type)	0.6kg			
A6TBY36-E	For source type output modules (standard type)	0.4kg			Q series: QY81P AnS series: A1SY81
A6TBY54-E	For source type output modules (2-wire type)	0.5kg			A series: AY82EP

#### (1) Connector/Terminal Block Convertor Module Specifications

POINT	
(1) The number of	of connectable I/O points is 32 for all connector/terminal block
convertor mod	dules.
Two connecto	pr/terminal block convertor modules and two cables for
connector/terr	ninal block convertor modules are required for 64-point I/O
modules.	
(2) Though the A	1SX81(S2) is used either as a sink or source type, use the
A6TBX36-E, /	A6TBX54-E or A6TBX70-E.
The A6TBXY	36, A6TBXY54 or A6TBX70 cannot be used.
(3) Though the A	1SX82-S1 is used either as a sink or source type, the
A6TBXY36/X	Y54/X70 may be used only when the A1SX82-S1 is used as a sink
type.	
When it is use	ed as a source type, the A6TBXY36/XY54/X70 cannot be used.
(4) Though the A	1SY82 is a source type output module, use theA6TBXY36 or
A6TBXY54. T	he A6TBY36-E or A6TBY54-E cannot be used.
(5) In the A series	s, the plus common input module is separately labeled as a sink
type input mo	dule, and the minus common input module is separately labeled
as a source ty	/pe input module.
(6) When using t	he A6TBXY70 as a mixed input/output module, use at the input
side.	
(7) Tighten the m	odule terminal screws to the following torque.
Supply line co	onnecting terminal screw (M3.5 screw): Tightening torque
78.4N•cm	

(2) (	Cable
-------	-------

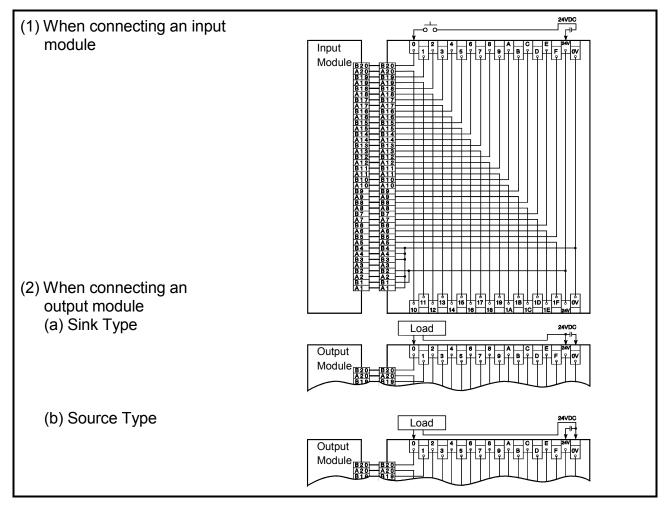
Туре	Details	Weight	Applicable Models
AC05TB	0.5 m (19.69 in.), for sink modules	0.17kg	
AC10TB	1 m (39.37 in.), for sink modules	0.23kg	
AC20TB	2 m (78.74 in.), for sink modules	0.37kg	
AC30TB	3 m (118.11 in.), for sink modules	0.51kg	A6TBXY36
AC50TB	5 m (196.85 in.), for sink modules	0.76kg	A6TBXY54
AC80TB	8 m (314.96 in.), for sink modules (common current not exceeding 0.5 A)	1.2kg	A6TBX70
AC100TB	10 m (393.7 in.), for sink modules (common current not exceeding 0.5 A)	1.5kg	
AC05TB-E	0.5 m (19.69 in.), for source modules	0.17kg	A6TBX36-E
AC10TB-E	1 m (39.37 in.), for source modules	0.23kg	A6TBY36-E
AC20TB-E	2 m (78.74 in.), for source modules	0.37kg	A6TBX54-E
AC30TB-E	3 m (118.11 in.), for source modules	0.51kg	A6TBY54-E
AC50TB-E	5 m (196.85 in.), for source modules	0.76kg	A6TBX70-E

8

MELSEC-Q

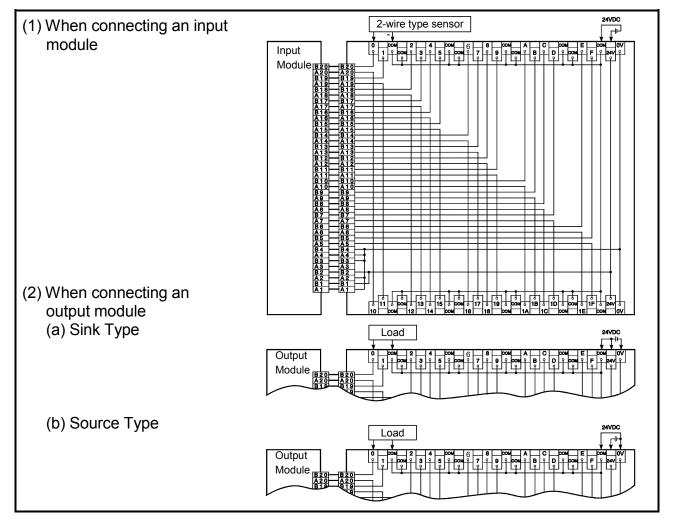
# 8.2 Connector/Terminal Block Convertor Module Connection Diagrams

#### 8.2.1 A6TBXY36



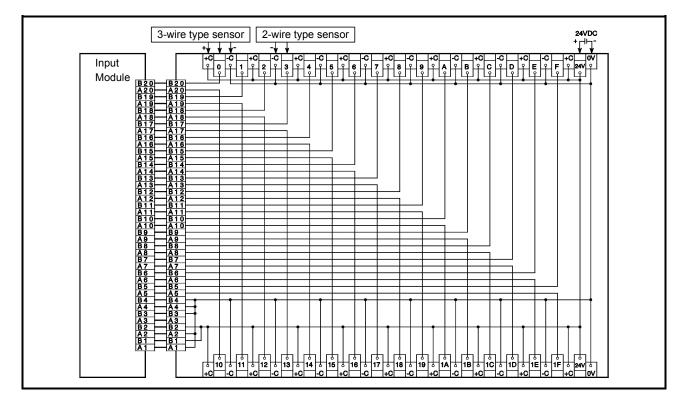
MELSEC-Q

## 8.2.2 A6TBXY54

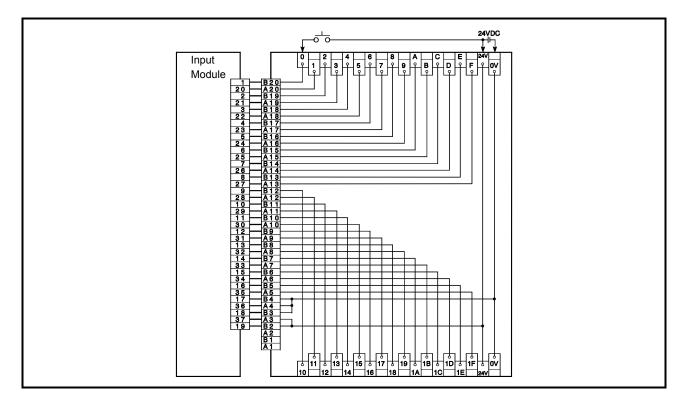


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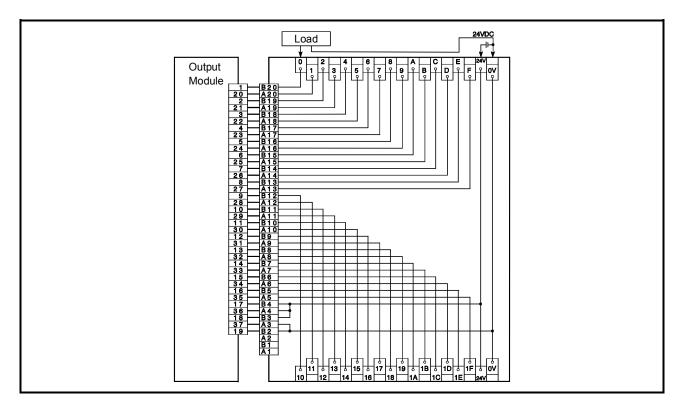
## 8.2.3 A6TBX70



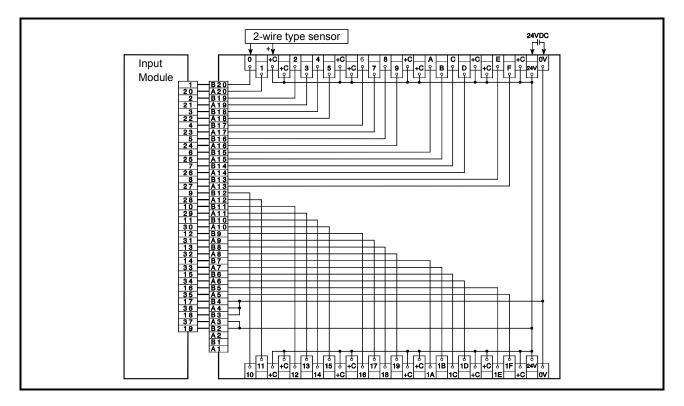
#### 8.2.4 A6TBX36-E



#### 8.2.5 A6TBY36-E



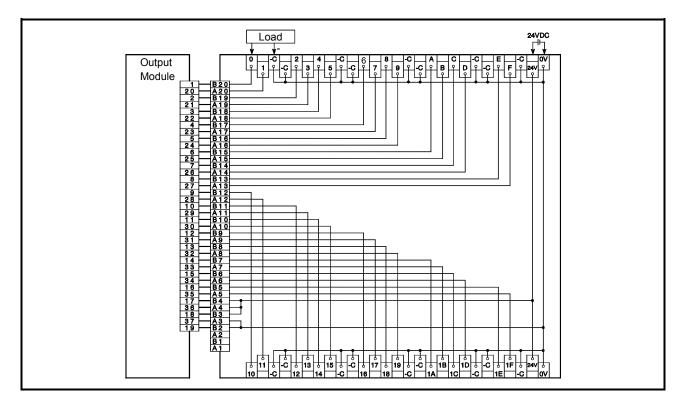
#### 8.2.6 A6TBX54-E



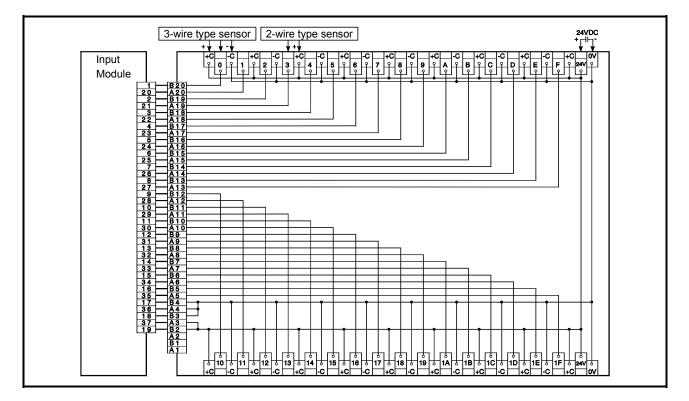
MELSEC-Q

MELSEC-Q

#### 8.2.7 A6TBY54-E



#### 8.2.8 A6TBX70-E



# 9. SPRING CLAMP TERMINAL BLOCK

This chapter describes a spring clamp terminal block.

#### 9.1 Spring Clamp Terminal Block I/O Module

The spring clamp terminal block I/O module is an I/O module of spring clamp terminal block type.

Since this module uses a spring clamp it does not require screw tightening, which greatly reduces the number of wiring procedures.

#### (1) Model Name

The model name of spring clamp terminal block I/O module is described below.

Model type	Model name		
I/O module	QX10-TS	QX40-TS	QX80-TS
	QY10-TS	QY40P-TS	QY80-TS

#### POINT

• Use bar solderless terminals for wiring this module.

• For the signal names corresponding to the terminal numbers when connected to an external device, refer to Chapter 2 and 3 in this manual.

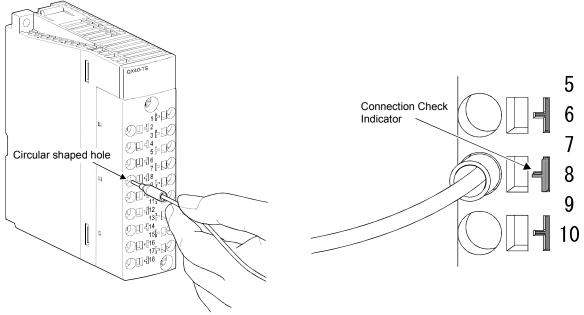
#### (2) Cable Installation

Strip off about 6.5mm of the cable tip to install the bar solderless terminal to the stripped part.

Connect the cable either by the (a) method or by the (b) method described below.

## (a) Connection by inserting the cable

Insert the wire with the bar solderless terminal into the circular shaped hole and then force the wire into the hole until the connection check indicator comes out. \*1



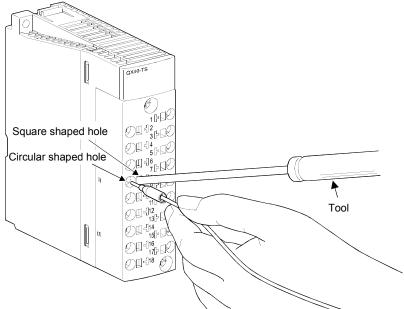
\*1: If the connection check indicator does not come out, the cable is not connected to the module properly. Insert the cable until the connection check indicator comes out.

9

# (b) Use of spring clamp terminal block tool

Insert the spring clamp terminal block tool into the corresponding square shaped hole until it stops. While the tool is inside the hole, insert the wire into the corresponding square hole until the connection check indicator comes out, and pull the tool out of the hole completely.

After pulling the tool, check whether the connection check indicator comes out. \*1

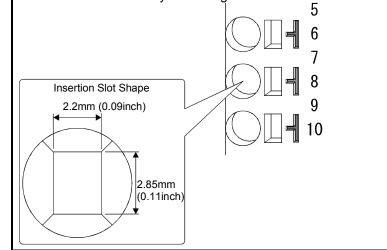


\*1: If the connection check indicator does not come out, the cable is not connected to the module properly. Insert the wire until the connection check indicator comes out.

### POINT

- If the stripped wire is inserted into the corresponding hole without installing the bar solderless terminal, the connection check indicator does not come out. Do not use the stripped wire without installing the bar solderless terminal.
- The wire strip length must follow the specification of the bar solderless terminal. Also, use a crimp tool when installing the bar solderless terminal to the wire.
- Before inserting the bar solderless terminal, check the corresponding circular shaped hole and the bar solderless terminal. Before inserting, pay attention to the angle of bar solderless terminal.

If a bar solderless terminal, which is bigger than the insertion slot, is inserted, the terminal block may be damaged.



### (3) Cable Removable

Insert the tool into the corresponding square shaped hole until it stops. Pull the wire out of the hole completely.

# (4) List of Introductory Products

The tools and the bar solderless terminals used for wiring the spring clamp terminal block I/O module are listed below.

Manufacturer	Name of product	Model name	Applicable wire size
Mitsubishi Electric System & Service Co., Ltd.	Spring clamp terminal block tool	KD-5339	—
Mitsubishi Electric Engineering Co., Ltd.	Bar solderless terminal	FA-VTC125T9	0.3 to1.65mm <sup>2</sup>
		FA-VTCW125T9	
	Bar solderless terminal tool	FA-NH65A	—
Nichifu Co.,Ltd.	Bar solderless terminal	TE 0.5-8/10	0.3 to 0.5mm <sup>2</sup>
		TE 0.75-8/10	0.75mm <sup>2</sup>
		TE 1.0-8/10	0.9 to 1.0mm <sup>2</sup>
		TE 1.5-8/10	1.25 to 1.5mm <sup>2</sup>
	Bar solderless terminal tool	NH79	_
Phoenix Contact Co.,Ltd.	Bar solderless terminal	AI 0.34-8TQ	0.34mm <sup>2</sup>
		AI 0.5-8/10WH	0.5mm <sup>2</sup>
		AI 0.75-8/10GY	0.75mm <sup>2</sup>
		AI 1-8/10RD	1.0mm <sup>2</sup>
		AI 1.5-8/10BK	1.5mm <sup>2</sup>
		AI 2.5-8/10BU	2.0 to 2.5mm <sup>2</sup>
	Bar solderless terminal tool	CRIMPFOX ZA 3	—

## 9.2 Spring clamp terminal block (Q6TE-18S)

The Q6TE-18S shall be used attached to a Q Series terminal block type I/O module or an intelligent function module.

Since the Q6TE-18S uses a spring clamp it does not require screw tightening, which greatly reduces the number of wiring procedures.

(1) Compatible Models

The QT6E-18S can be used with the following models:

Model type		Model name				
I/O module	QX10 QX70	QX28 QX70H	QX40 QX80	QX40H QX80H	QX40-S1 QX90H	QX50 QY10
	QY18A QY80	QY22 QX48Y57	QY40P QI60	QY50	QY68A	QY70
Intelligent function	Q62DA Q68DAVN	Q62DAN Q68DAI	Q62FA-FG Q68DAIN	Q64DA	Q64DAN	Q68DAV
module	Q62AD-DGH Q64TCRT	Q64AD Q64TCRTBW	Q64AD-GH Q64RD	Q68ADV Q64RD-G	Q68ADI	

### POINT

The terminal numbers of the Q6TE-18S correspond to the terminal numbers on the compatible module.

For the signal names corresponding to the terminal numbers when connected to an external device, please refer to the following manual.

- I/O module: Chapter 2, 3, 5
- Intelligent function module: User's manual for each module

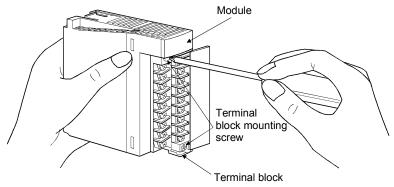
### (2) Specifications

Q6TE-18S specification is explained.

Item	Specifications
Applicable wire size	0.3 to 1.5 mm <sup>2</sup> (AWG22 to 16)
Wire strip length	8 to 11 mm
Mounting screw tightening torque range	66 to 89 N - cm
Weight	0.07kg

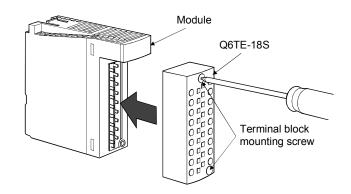
(3) Removal of Terminal Block

Unscrew the two terminal block mounting screws situated at the top and bottom of the terminal block and take them off.



(4) Installation of Q6TE-18S

Mount Q6TE-18S onto the module and tighten the terminal block mounting screws within the specified torque range.



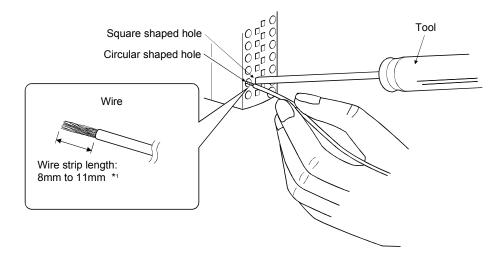
(5) Cable Installation

Insert the tool into the square shaped hole, which corresponds to the terminal you wish to use.

While the tool is inside the hole, insert the wire into the circular shaped hole (as shown below).

Remove the tool from the square shaped hole, taking care not to remove the wire.

After the wire has been clamped, gently pull the wire to confirm that it is secure.



### [Cautions]

\*1: Take care that the wire strip length is between 8mm to 11mm.

If the wire strip length is too long, this will expose the bare wire, which increases the risk of electric shock or short circuit.

If the wire strip length is too short, this will result in the wire not being securely attached.

(6) Cable removal

Insert the tool into the corresponding square shaped hall until it stops. Pull the wire out of the hall completely.

# (4) List of Introductory Products

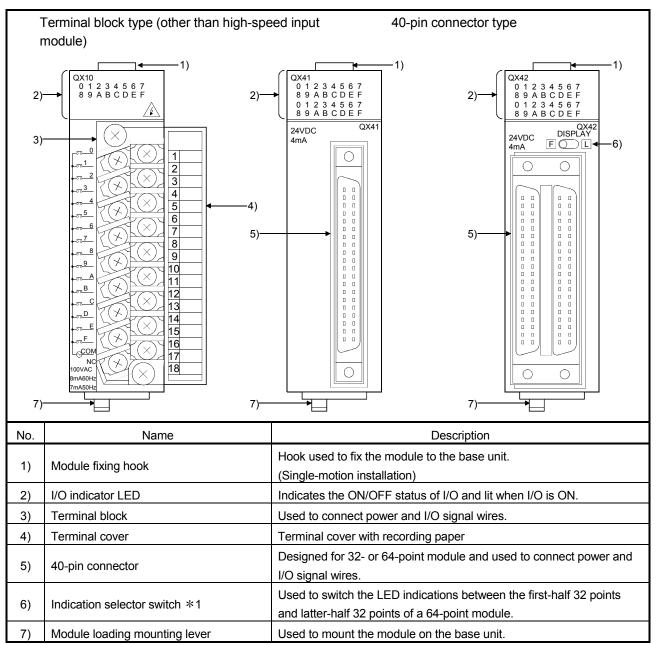
The tools and the bar solderless terminal used for wiring the spring clamp terminal block I/O module are listed below.

Manufacturer	Name of product	Model name	Applicable wire size
Mitsubishi Electric System & Service Co., Ltd.	Spring clamp terminal block tool	KD-5339	_
		TE 0.5	0.5 mm <sup>2</sup>
	Bar solderless terminal *1	TE 0.75	0.75 mm <sup>2</sup>
Nichifu Co.,Ltd.		TE 1	0.9 to 1.0 mm <sup>2</sup>
		TE 1.5	1.25 to 1.5 mm <sup>2</sup>
	Bar solderless terminal tool	NH77	—

\*1: This terminal is used when the wire performed terminal treatment is inserted into the

spring clamp terminal block or more than one wire is inserted into one terminal.

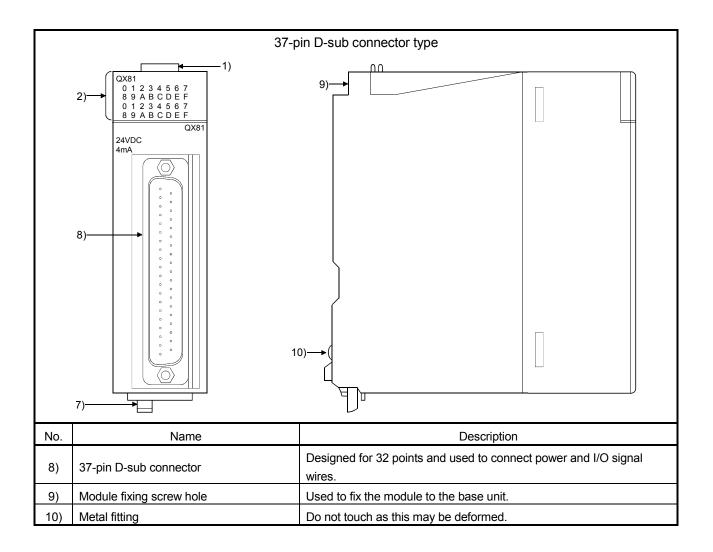
# **10. NAMES OF MODULE PARTS**



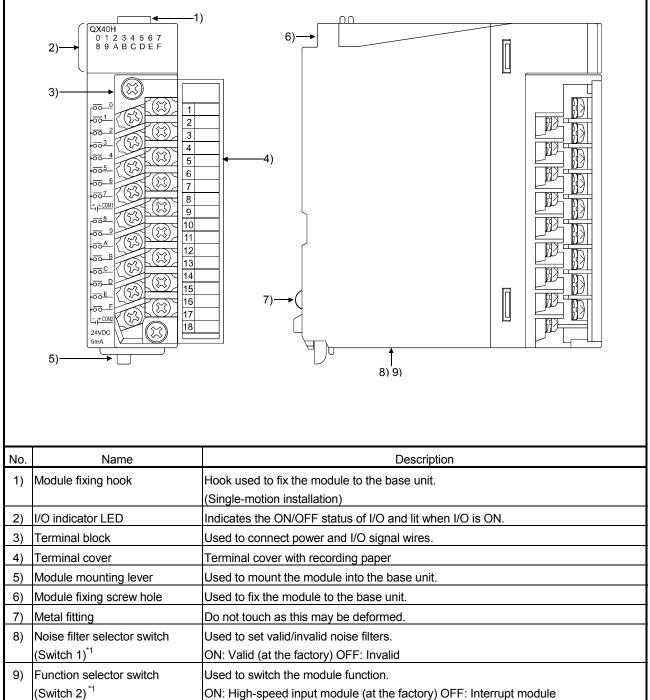
This chapter explains the names of the I/O module parts.

\*1: Operate the indication selector switch with your fingertip.

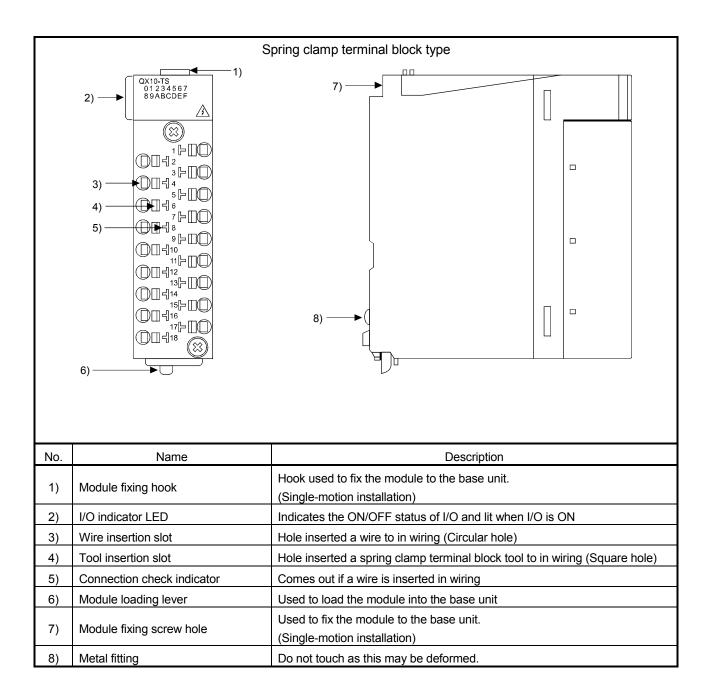
Do not use a screwdriver or similar tool as it may damage the switch.



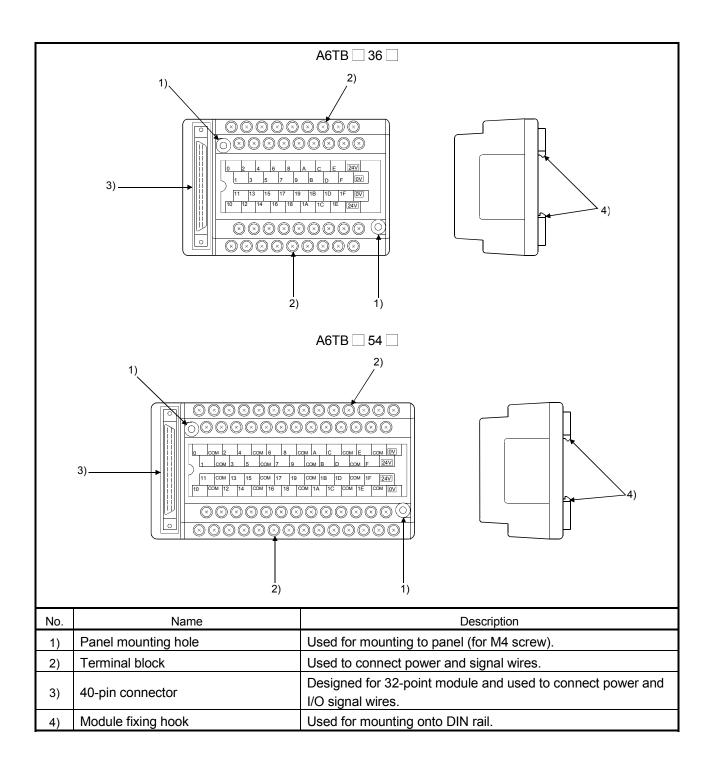
MELSEC-Q

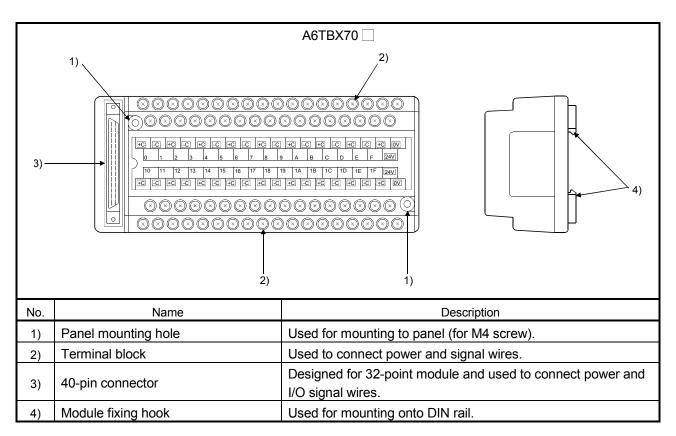


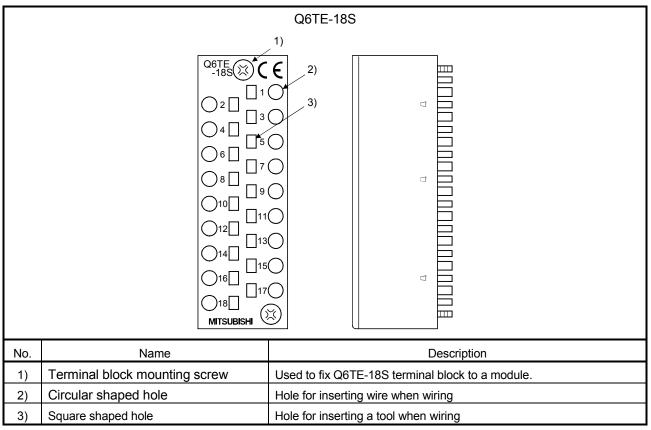
\*1: Operate the switch with an industrial tool such as a driver, because the switch is placed beyond your reach.Operate the switch carefully. Failure to do so may result in damage to the switch.



# 10 NAMES OF MODULE PARTS







# 11. I/O MODULE TROUBLESHOOTING

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

# 11.1 Input Circuit Troubleshooting

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

$\langle$	Condition	Cause	Corrective Action
Example 1	Input signal is not turned OFF.	Leakage current of input switch (e.g. drive by non-contact switch).     AC input     Leakage     Current     Input module     Power supply	• Connect an appropriate resistor which will make the voltage across the terminals of the input module lower than the OFF voltage value. AC input Input module It is recommended to use 0.1 to 47 // F + 47 to 120 \overline (1/2W) for the CR constant.
Example 2	Input signal is not turned OFF.	Drive by a limit switch with neon lamp.     AC input     Leakage     Current     Power supply	<ul> <li>Same as Example 1.</li> <li>Or make up another independent display circuit.</li> </ul>
Example 3	Input signal is not turned OFF.	Leakage current due to line capacity of wiring cable.     (Line capacity C of twisted pair wire is approx.     100 PF/m).     AC input     Leakage     Input module     Power supply	Same as Example 1.     However, leakage current is not generated when the power supply is located in the input equipment side as shown below.

Table 11.1 Input Circuit Problems and Corrective Actions

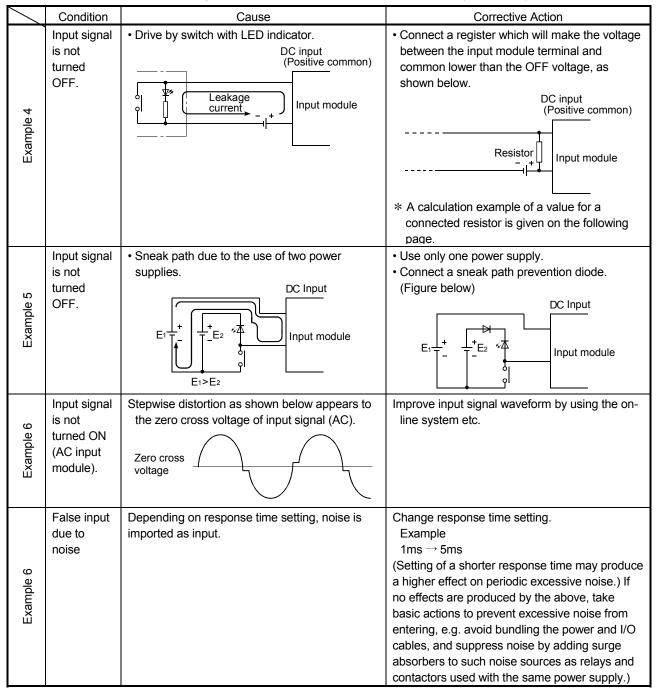
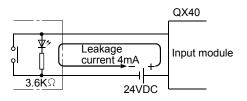


Table 11.1 Input Circuit Problems and Corrective Actions (Continued)

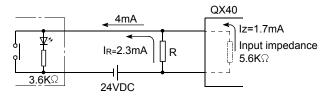
**MELSEC-Q** 

<Calculation example of Example 4>

Consider a switch with LED indicator connected to the QX40, giving a leakage current of 4mA when a 24VDC power is turned on.



(1) The 1.7mA OFF current of the QX40 is not satisfied. Hence, connect a resistor as shown below.



(2) Calculate the resistor value R as indicated below.

To satisfy the 1.7mA OFF current of the QX40, the resistor R to be connected may be the one where 2.3mA or more will flow.

IR: Iz=Z (Input impedance): R

 $R \leq \frac{Iz}{I_R} \times Z$  (Input impedance) =  $\frac{1.7}{2.3} \times 5.6$ =4.14[k  $\Omega$  ]

R<4.14k Ω.

Assuming that resistor R is 3.9k Ω, the power capacity W of resistor R is:

W =  $(input voltage)^2 \div R = 28.8^2 \div 3900 = 0.2(W)$ 

(3) The power capacity of the resistor selected is 3 to 5 times greater than the actual current consumption. A 3.9 (k  $\Omega$ ), 0.6 to 1.0 (W) resistor may therefore be connected to the terminal in question.

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

$\leq$	Condition	Cause	Corrective Action
	When the output is	<ul> <li>Load is half-wave rectified inside (in some cases, this is true of a solenoid).</li> </ul>	• Connect a resistor several tens to hundreds of $\mathbf{k}^{\Omega}$ across the load.
Example 1	OFF, excessive voltage is applied to the load.	• When the polarity of the power supply is as shown in [1], C is charged. When the polarity is as shown in [2], the voltage charged in C plus the line voltage are applied across D1. Max. voltage is approx. 2.2E. (If a resistor is used in this way, it does not pose a problem to the output element. But it may cause the diode, which is built into the load, to deteriorate, resulting in a fire, etc.)	Load
Example 2	The load is not turned OFF (triac output).	Leakage current due to built-in noise suppression.	Connect C and R across the load. (When the wiring distance from the output card to the load is long, there may be a leakage current due to the line capacity.)

Table 11.2 Output Circu	uit Problems and	<b>Corrective Actions</b>
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	Condition	Cause	Corrective Action
Example 3	The load is not turned OFF. (Triac output)	<ul> <li>The load current is lower than the minimum load current.</li> <li>QY22 Surge suppressor</li> <li>Phototriac</li> <li>Phototriac</li> <li>Phototriac</li> <li>Up and the load current is lower than the minimum load current is lower than the minimum load current of the output module, the triac does not operate since the load current flows into a phototriac as shown below.</li> <li>When an inductive load is connected, the load may not be turned OFF since surge at the time of OFF is applied to the phototriac.</li> </ul>	<ul> <li>Connect a resistor to both ends of a load so that the load current is higher than the minimum load current.</li> </ul>

Table 11.2 Output Circuit Problems and Corrective Actions (Continued)

# 11 I/O MODULE TROUBLESHOOTING

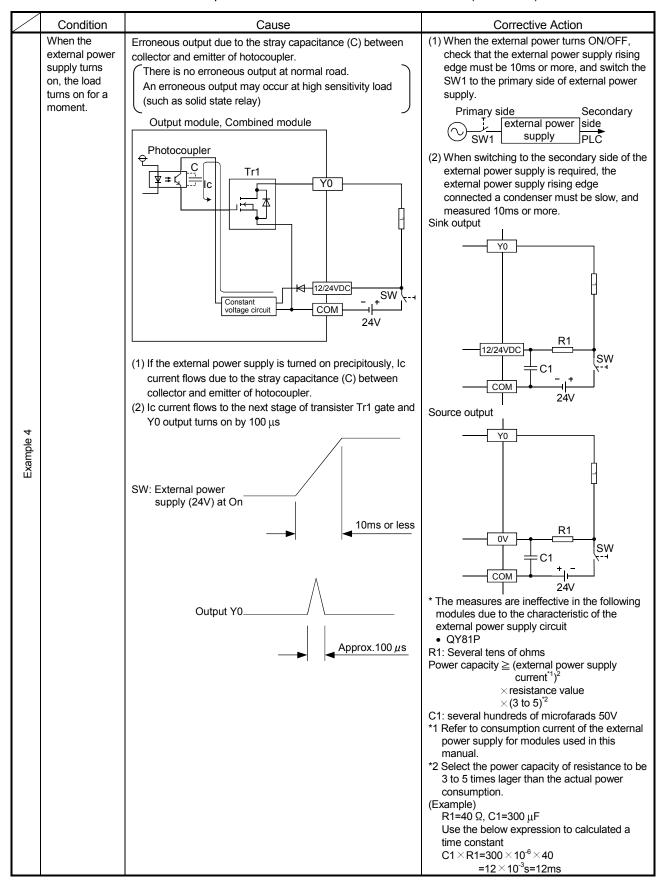


Table 11.2 Output Circuit Problems and Corrective Actions (Continued)

	Condition	Cause	Corrective Action
	The load	The load [2] which was turned OFF may be turned ON	Take action in the following (1) or (2).
	which was	due to back electromotive force at the time of power-	(1) To prevent the generation of the back
	turned OFF	off [1] if an inductive load is used.	electromotive force, connect diode in parallel with
			load where the back electromotive force has been
	is turned ON	Output module, ombined module [3]	generated.
	for a moment	Source outputBack electromotiveforce	Source output [3]
	at power-off.		$\rightarrow$
	(Transistor		Back electromotive +
	output)		Load +
		OFF	
			Sink output
		Shut off	[3]
			Back electromotive
			Load +
			(2) Install a diode between the positive and negative
			external power supply to allow an electric current
		Output module, ombined module	to pass another current path.
		Sink output Back electromotive	When the corrective action shown in the example
			4 is taken simultaneously, the diode must be installed in parallel with the C1 and R1.
			Source outputBack electromotiveforce[3]
		OFF	
10			
le f		Shut off	
Example 5			
EX			Shut off
		12/24VDC	
			Example 4
			* The measures are ineffective in the following
			modules due to the characteristic of the external power supply circuit
			• QY81P
			Sink output
			Shut off
			Example 4
			D1: Reverse voltage VR(VRM)····*1,
			Forward current IF(IFM) ··· *2 *1 Approximately 10times higher than the rated
			voltage in the specifications
			Example: 24 VDC $\rightarrow$ Approximately 200V
			*2 More than twice as much as the maximum load current (common) in the specifications
			Example: $2A/1$ common $\rightarrow$ 4A or more
	Į.		- pro

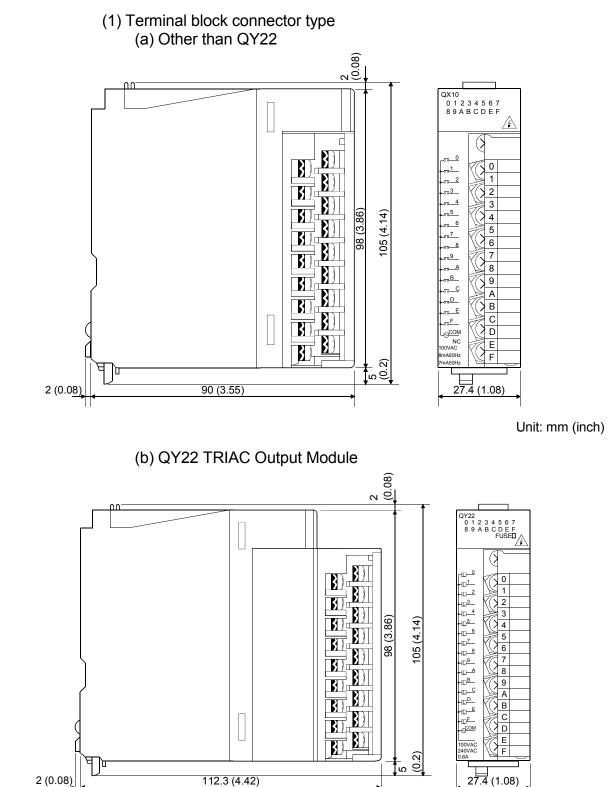
Table 11.2 Output Circuit Problems and Corrective Actions (Continued)

# **APPENDICES**

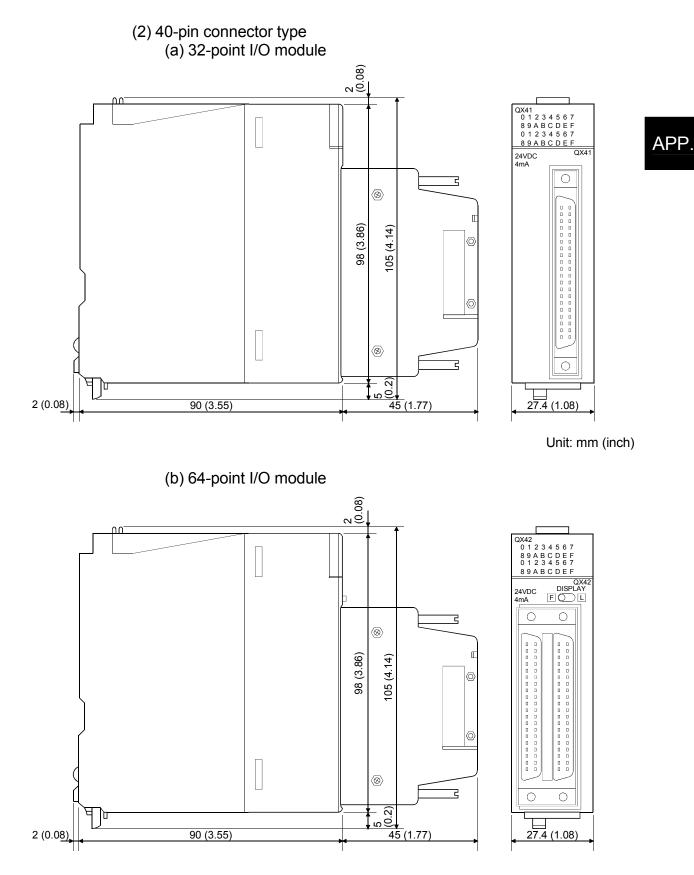
Appendix 1 External Dimensional Drawings

Appendix 1.1 I/O modules

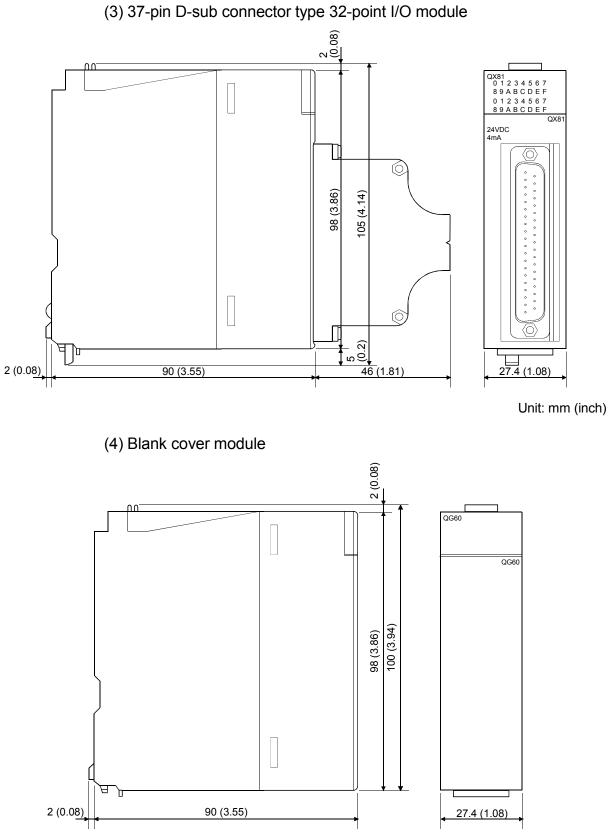
APP.



Unit: mm (inch) App - 1

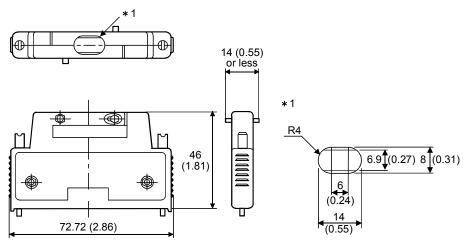


Unit: mm (inch)



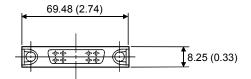
Appendix 1.2 Connectors, connector/terminal block converter modules

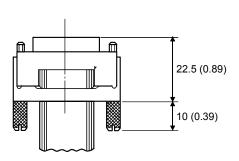
- (1) 40-pin connectors
  - (a) A6CON1 soldering type, A6CON2 crimp-contact type 40-pin connector



Unit: mm (inch)

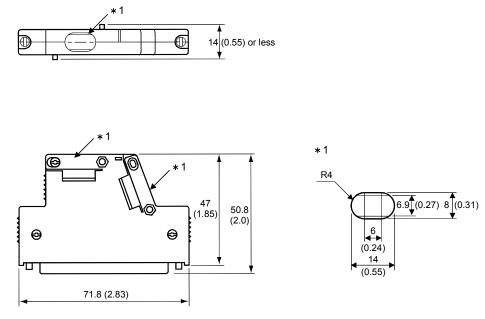
### (b) A6CON3 pressure-displacement type 40-pin connector





\* Flat cable arrangement is in the following sequence. A1  $\rightarrow$  B1  $\rightarrow$  A2...

Unit: mm (inch)

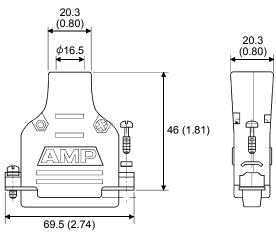


(c) A6CON4 soldering type 40-pin connector (straight/diagonal out type)

Unit: mm (inch)

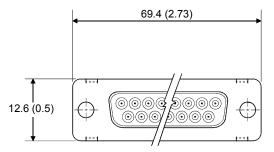
If the cable diameter is thinner than the clamp portion, wind tape, etc. to secure the cable so that it will not come off the cable clamp portion. If the cable is made of slippery material, it is recommended to take anti-slip measures by winding rubber-based tape, etc. (2) 37-pin D-sub connectors

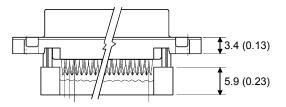
- (a) A6CON1E soldering type 37-pin D sub-connector (straight out type)
  - A6CON2E crimp-contact-type 37-pin D sub-connector (straight out type)



Unit: mm (inch)

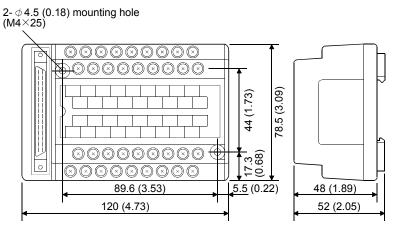
(b) A6CON3E pressure-displacement type 37-pin D-sub connector (flat cable type)





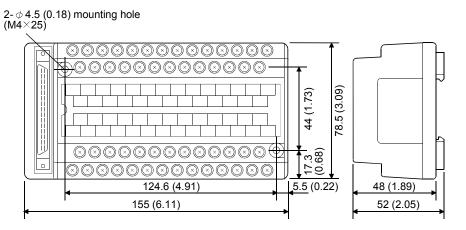
Unit: mm (inch)

## (3) A6TB 36 connector/terminal block converter module



Unit: mm (inch)

## (4) A6TB 54 connector/terminal block converter module

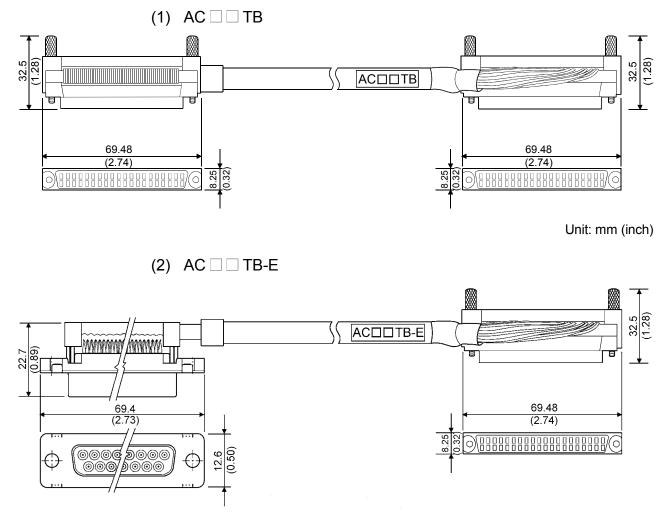


Unit: mm (inch)

# (5) A6TBX70 connector/terminal block converter module

2-  $\phi$ 4.5 (0.18) mounting hole (M4imes25)  $\otimes \otimes$  $(\times)$ K  $\bigcirc$ Q  $\bigcirc$  $(\times)$  $(\times$ 78.5 (3.09) 44 (1.73)  $\odot$ 17.3 (0.68) A  $\bigcirc$  $\bigcirc$  $\bigcirc$  $\overline{\mathbb{X}}$  $\bigcirc$  $(\propto)$ 0  $\odot$   $\odot$   $\odot$   $\odot$   $\odot$   $\odot$   $\odot$   $\odot$   $\odot$ 5.5 (0.22) 159.6 (6.29) 48 (1.89) 190 (7.49) 52 (2.05)

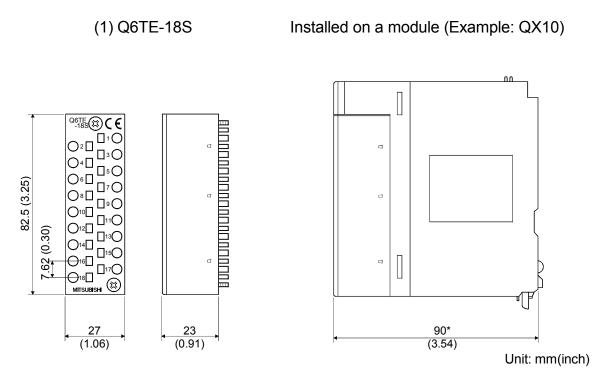
Unit: mm (inch)



Appendix 1.3 Connector/ terminal block converter module cable.

Unit: mm (inch)





\*: The depth of the module installed with a Q6TE-18S is equivalent with the factory default dimensions for that module.

# Appendix 2 Compatibility with MELSEC-AnS Series I/O modules

Note that the MELSEC-Q series I/O modules and MELSEC-AnS series I/O modules are different in external terminal block configuration. Differences in terminal block configuration are indicated below.

(1) Input modules

Terminal Block Number	QX10, QX40	QX80	A1SX10, A1SX40, A1SX80
TB9	X08	X08	COM
TB10	X09	X09	X08
TB11	X0A	X0A	X09
•	•	•	•
•	•	•	•
•	•	•	•
TB16	X0F	X0F	X0E
TB17	СОМ	NC	X0F
TB18	NC	СОМ	СОМ
TB19	_	_	Vacant
TB20	_	_	Vacant

# (2) Output modules

Terminal Block Number	QY10	QY40P	A1SY10	A1SY40
TB9	Y08	Y08	COM1	12/24VDC
TB10	Y09	Y09	Y08	COM1
TB11	Y0A	Y0A	Y09	Y08
•	•	•	•	•
•	•	•	•	•
•	•	•	•	•
TB16	Y0F	Y0F	Y0E	Y0D
TB17	COM	12/24VDC	Y0F	Y0E
TB18	NC	COM	COM2	Y0F
TB19	-	_	24VDC	12/24VDC
TB20	_	_	0V	COM2

Terminal Block Number	QY50	A1SY50	
TB9	Y08	12/24VDC	
TB10	Y09	COM1	
TB11	Y0A	Y08	
•	•	•	
•	•	•	
•	•	•	
TB16	Y0F	Y0D	
TB17	12/24VDC	Y0E	
TB18	COM	Y0F	
TB19	_	12/24VDC	
TB20		COM2	

Terminal Block Number	QY80	A1SY80	
TB9	Y08	COM1	
TB10	Y09	0V	
TB11	Y0A	Y08	
•	•	•	
•	•	•	
•	•	•	
TB16	Y0F	Y0D	
TB17	COM	Y0E	
TB18	0V	Y0F	
TB19	_	COM2	
TB20	_	0V	

# POINT

The 40-pin connector used with the MELSEC-AnS series I/O module can be used intact with the MELSEC-Q series I/O module.

The 37-pin D-sub connector used with the MELSEC-AnS series I/O module is the same in wiring as, but opposite in cable pulling direction to, the MELSEC-Q series I/O module. (The conventional cable for A6TB cannot be used.)

# MEMO

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# WARRANTY

Please confirm the following product warranty details before using this product.

### 1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing onsite that involves replacement of the failed module.

### [Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

### [Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
  - 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
  - 2. Failure caused by unapproved modifications, etc., to the product by the user.
  - 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
  - 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
  - 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
  - 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
  - 7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

### 2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

### 3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

### 4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

### 5. Changes in product specifications

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

### 6. Product application

- (1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
- (2) The Mitsubishi programmable controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable controller applications.

In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable controller range of applications.

However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

# I/O Module Type Building Block

# User's Manual

MODEL

MODEL CODE 13JL99

Q-IO-U-E

SH(NA)-080042-T(0810)MEE

# MITSUBISHI ELECTRIC CORPORATION

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