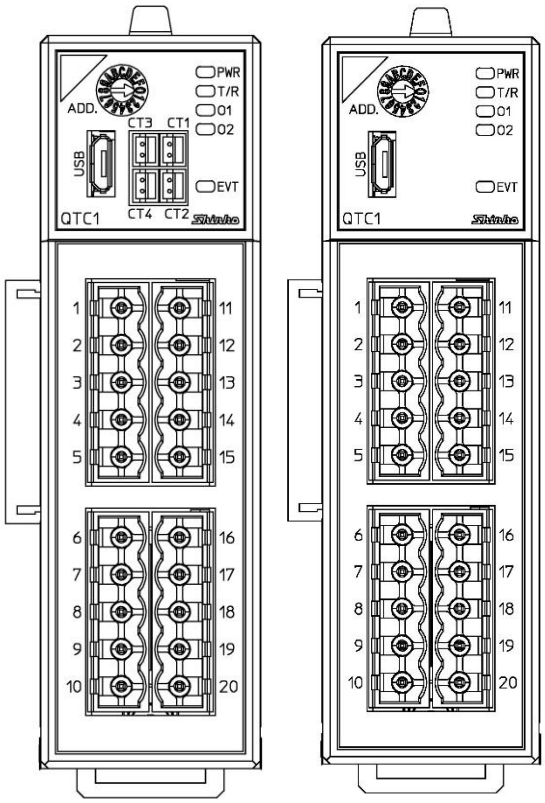
Control Module

QTC1-R

Mounting and wiring instruction manual



Shinko

Preface

Thank you for purchasing our control module [QTC1-R].
This manual contains instructions for the mounting and wiring when operating the control module [QTC1-R].
To prevent accidents arising from the misuse of this instrument, please ensure the operator receives this manual.

For details on how to use it, refer to the instruction manual (detailed version) of each model. Please access our website from the following URL or QR code to download the instruction manual (detailed version).
https://shinko-technos.co.jp/e/download/d_manual_download.html#Q

Notes

- This instrument should be used in accordance with the specifications described in the manual. If it is not used according to the specifications, it may malfunction or cause a fire.
- Be sure to follow the warnings, cautions and notices. If they are not observed, serious injury or malfunction may occur.
- The contents of this instruction manual are subject to change without notice.
- Care has been taken to ensure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- This instrument is designed to be installed on a DIN rail in an indoor control panel. If it is not, measures must be taken to ensure that the operator does not touch power terminals or other high voltage sections.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos Co., Ltd. is not liable for any damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

SAFETY PRECAUTIONS (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: “Warning” and “Caution”.
Depending on circumstances, procedures indicated by ⚠ Caution may result in serious consequences, so be sure to follow the directions for usage.

⚠ Warning Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠ Caution Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

⚠ Warning

- To prevent an electrical shock or fire, only Shinko or qualified service personnel may handle the inner assembly.
- To prevent an electrical shock, fire, or damage to instrument, parts replacement may only be undertaken by Shinko or qualified service personnel.

⚠ Safety Precautions

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Proper periodic maintenance is also required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

Meaning of Warning Message on Model Label

⚠ Caution

If do not handle this instrument correctly, may suffer minor or moderate injury or property damage due to fire, malfunction, or electric shock. Please read this manual carefully and fully understand it before using it.

⚠ Caution with Respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument.
In the case of resale, ensure that this instrument is not illegally exported.

Precautions for Use

1. Installation Precautions

⚠ Caution

This instrument is intended to be used under the following environmental conditions (IEC61010-1):

- Pollution degree 2

Ensure the mounting location corresponds to the following conditions:

- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of -10 to 50°C(14°F to 122°F) that does not change rapidly, and no icing
- An ambient non-condensing humidity of 35 to 85%RH
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or the vapors of these substances can come into direct contact with the unit.
- When installing this unit within a control panel, please note that ambient temperature of this unit – not the ambient temperature of the control panel – must not exceed 50°C (122°F).
  Otherwise the life of electronic components (especially electrolytic capacitor) may be shortened.

* Avoid setting this instrument directly on or near flammable material even though the case of this instrument is made of flame-resistant resin.

2. Wiring Precautions

⚠ Caution

- Do not leave bits of wire in the instrument, because they could cause a fire and malfunction.
- When wiring, use a crimping pliers and a solderless terminal with an insulation sleeve in which an M3 screw fits.
- Tighten the terminal screw using the specified torque. If excessive force is applied to the screw when tightening, the screw or case may be damaged.
- Do not pull or bend the lead wire with the terminal as the base point during or after wiring work. It may cause malfunction.
- This instrument does not have a built-in power switch, circuit breaker and fuse. It is necessary to install a power switch, circuit breaker and fuse near the instrument.
  (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)
- When wiring the power supply (24 VDC), do not confuse the polarities.
- Do not apply a commercial power source to the sensor which is connected to the input terminal nor allow the power source to come into contact with the sensor.
- Use a RTD of 3-conducting wire type that meets the sensor input specifications of this instrument.
- When using a relay contact output type, externally use a relay according to the capacity of the load to protect the built-in relay contact.
- Separate the input line (RTD, etc.) from the power line and load line.

3. Operation and Maintenance Precautions

⚠ Caution

- It is recommended that auto-tuning (AT) be performed on the trial run.
- Do not touch live terminals. This may cause electrical shock or problems in operation.
- Turn the power supply to the instrument OFF when retightening the terminal or cleaning.
  Working on or touching the terminal with the power switched ON may result in severe injury or death due to electrical shock.
- Use a soft, dry cloth when cleaning the instrument.
  (Alcohol based substances may tarnish or deface the unit.)
- As the panel part is vulnerable, be careful not to put pressure on, scratch or strike it with a hard object.

4. Compliance with Safety Standards

⚠ Caution

- If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.
- Use equipment that is reinforced-insulated or double-insulated from the primary power supply for external circuits connected to this instrument.

Contents

1. Overview 6
2. Model 7
2.1 Model 7
3. Name and Functions 8
3.1 Control Module QTC1-R 8
4. Communication Parameter Setting 10
4.1 Communication Parameter Setting 10
4.1.1 Communication Parameter Setting 10
4.1.2 Selection of Module Address 11
4.1.3 Setting of CUnet communication specification 12
5. Mounting 13
5.1 External Dimensions (Scale: mm) 14
5.2 Mounting 14
6. Wiring 16
6.1 Recommended Terminal and Recommended Rod Terminal 16
6.2 Terminal Arrangement 17
6.2.1 Input and Output Terminal Arrangement 17
6.2.2 Power Supply and Serial Communication / CUnet Communication Terminal Arrangement 18
6.2.3 Event Input and Output Terminal Arrangement 19
6.2.4 CT Input Connector Arrangement 19
7. Specifications 19

1. Overview

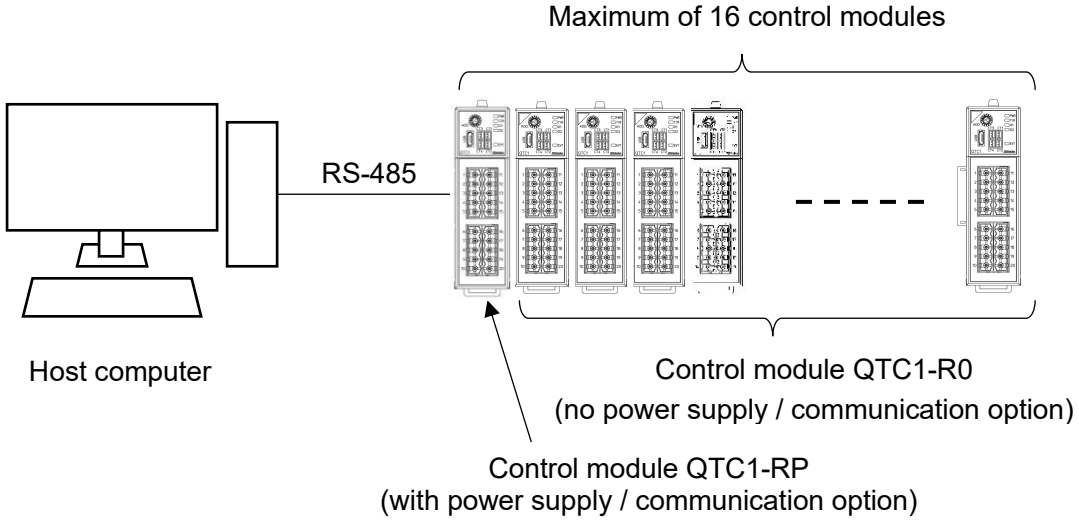
This instrument is a control module that can be 2ch controlled.

A multi-point control system can be configured with the control module alone, or via a host computer or PLC.

A maximum of 16 instruments can be connected via BUS, and a maximum of 32 points can be controlled.

One block connected to BUS is called "1 unit".

In addition, a maximum of 16 units can be connected using the communication expansion module QMC1-C□ and a maximum of 512 points can be controlled.



2. Model

2.1 Model

QTC1-R	□	□	-□	□	□	□	-□	□	
Power supply / communication option	0								No option
	P								With power supply / communication option
	C								With power supply / CUnet communication option
Wiring type		C							Connector type
Control output 1			-□						Refer to output code table
Control output 2				□					
Input 1					R				Pt100 4-wire type
Input 2						R			Pt100 4-wire type
Heater burnout alarm option							-0		No option
							-2		CT 2 points 20 A (*1) (Single-phase / 3-phase)
							-A		CT 2 points 100 A (*1) (Single-phase / 3-phase)
Event input/output option								0	No option
								1	Event input (2 points) (*2)
								2	Event output (4 points) (*2)

(*1): CT and connector harness are sold separately.

(*2): Connector harness is sold separately.

Output code table

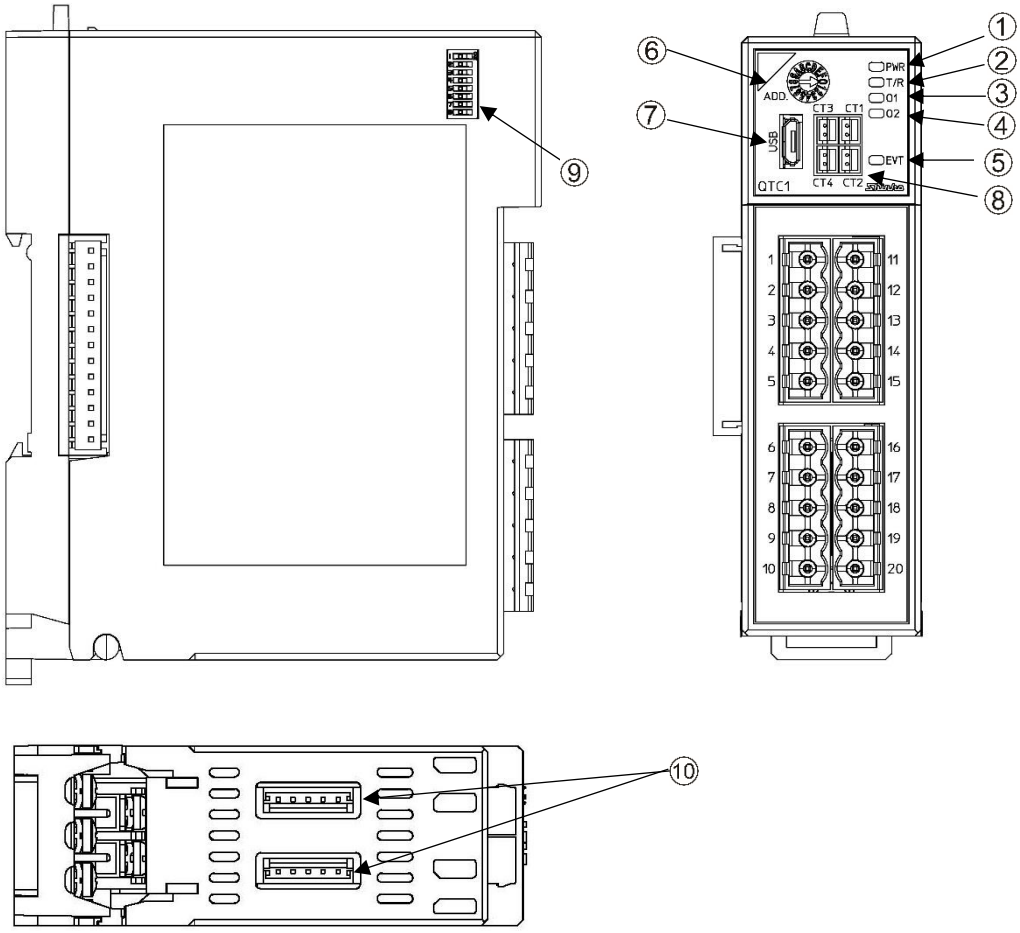
Output code	Output type
R	Relay contact output
S	Non-contact voltage output (For SSR drive)
A	Direct current output 4 to 20 mA DC
0	Direct current output 0 to 20 mA DC
V	DC voltage output 0 to 1 V DC
1	DC voltage output 0 to 5 V DC
2	DC voltage output 1 to 5 V DC
3	DC voltage output 0 to 10 V DC
C	Open collector output

Input code table

Input code	Input type	Range
R	Pt100 4-wire type	0.000 to 32.000°C

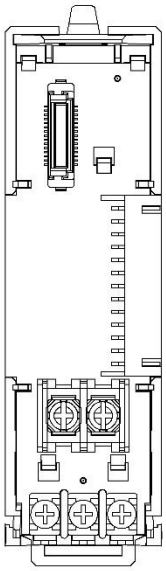
3. Name and Functions

3.1 Control Module QTC1-R

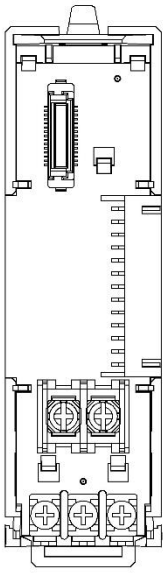


Base part

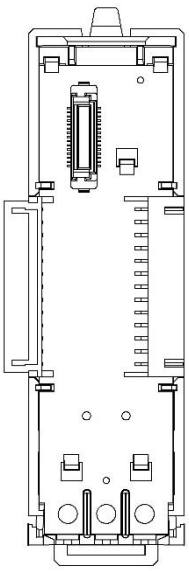
With power supply / upper communication option



With power supply / CUnet communication option



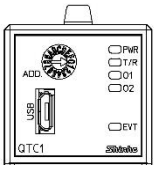
No power supply / communication option



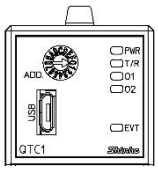
Panel part

Depending on whether have the communication option, the panel design differs.

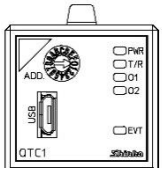
With power supply / upper communication option



With power supply / CUnet communication option



There is a triangle mark on the upper left of the panel



Operation indicator

No.	Symbol (color)	Name and Function
①	PWR (Green)	Power indicator
②	T/R (Yellow)	Communication indicator
③	O1 (Green)	Control output OUT1 indicator
④	O2 (Green)	Control output OUT2 indicator
⑤	EVT (Red)	Event indicator

Switch and connector

No.	Symbol	Name and Function
⑥	ADD	Module address selection rotary switch
⑦	USB	Console communication connector
⑧	CT1	CT input connector for single-phase/3-phase heater; used with CH1 (*1)
	CT2	CT input connector for single-phase/3-phase heater; used with CH2 (*1)
	CT3	CT input connector for three-phase heater; used with CH1 (*1)
	CT4	CT input connector for three-phase heater; used with CH2 (*1)
⑨		Communication specification selection dip switch
⑩		Event input/output connector (*2)

(*1): When the heater burnout alarm option is added

(*2): When the event input/output option is added

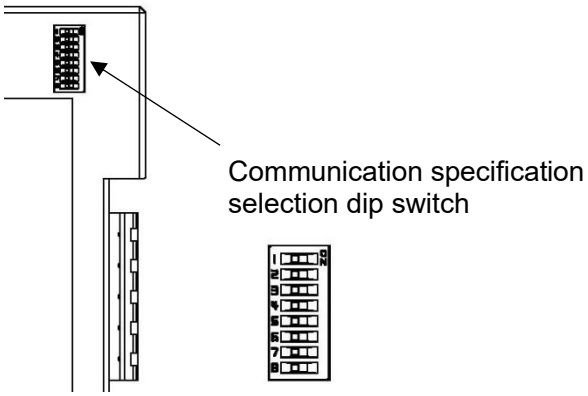
4. Communication Parameter Setting

4.1 Communication Parameter Setting

4.1.1 Communication Parameter Setting

> **⚠ Caution**
>
> When connecting to the communication expansion module QMC1-C□, the communication specification selection is not required.
> Use it in the factory default (all OFF).

Use the communication specification selection dip switch on the left side of the instrument to select communication specifications.



Select the communication speed, data bit, parity, stop bit and communication protocol.
All are off when shipped from the factory.

- Communication speed: 57600 bps
- Data bit: 8 bits
- Parity: Even
- Stop bit: 1 bit
- Communication protocol: MODBUS specification

(1) Selection of communication speed

Communication specification selection dip switch		Communication speed
1	2	
OFF	OFF	57600 bps
ON	OFF	38400 bps
OFF	ON	19200 bps
ON	ON	9600 bps

(2) Selection of data bit, parity and stop bit

Communication specification selection dip switch			Data bit, parity and stop bit
3	4	5	
OFF	OFF	OFF	8 bits, Even, 1 bit
ON	OFF	OFF	8 bits, Even, 2 bits
OFF	ON	OFF	8 bits, Odd, 1 bit
ON	ON	OFF	8 bits, Odd, 2 bits
OFF	OFF	ON	8 bits, None, 1 bit
ON	OFF	ON	8 bits, None, 2 bits

(3) Selection of communication protocol

Communication specification selection dip switch	Communication protocol
6 (*)	
OFF	MODBUS specification
ON	SIF specification

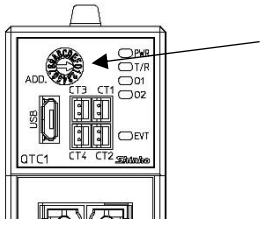
(*): Valid for QTC1-RP (with power supply / upper communication function)

4.1.2 Selection of Module Address

⚠ Caution

When SIF specification is selected in "Selection of communication protocol (P.5-2)" or when auto balance control function is selected in "Extension function selection (P.8-31)", select module addresses from 1 to consecutive numbers.
If select MODBUS specification, select any number from 0 to F (1 to 16).

The module address is selected with the rotary switch.



Module address selection rotary switch



Use a small flat blade screwdriver to select the module address.

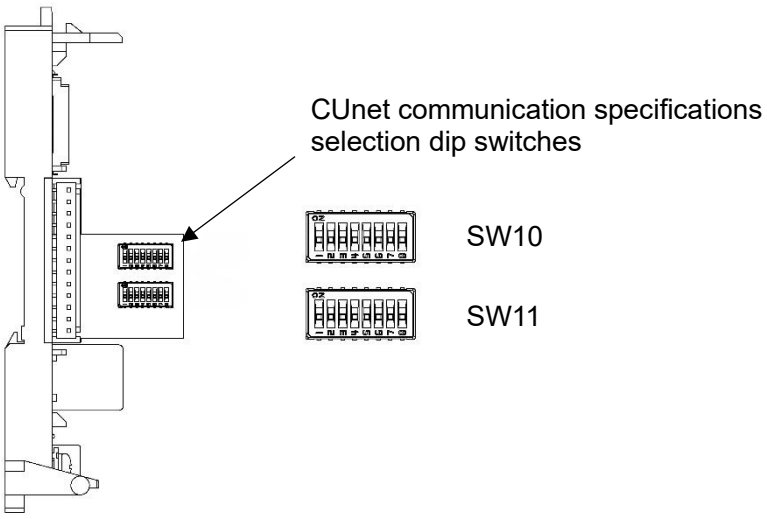
The value obtained by adding 1 to the value of the selected rotary switch becomes the module address.

Module address: 0 to F (1 to 16)

Rotary switch	0	1		9	A	B		F
Module address	1	2		10	11	12		16

4.1.3 Setting of CUnet communication specification

The CUnet communication specifications are set by the dip switches (SW10, SW11) on the base part.



SW	No.	State		Factory default
SW10	1	Station address setting	Bit0 ON: Enable, OFF: Disable	Disable
	2		Bit1 ON: Enable, OFF: Disable	Disable
	3		Bit2 ON: Enable, OFF: Disable	Disable
	4		Bit3 ON: Enable, OFF: Disable	Disable
	5		Bit4 ON: Enable, OFF: Disable	Disable
	6		Bit5 ON: Enable, OFF: Disable	Disable
	7	Communication speed setting	7:OFF 8:OFF 12Mbps 7:ON 8:OFF 6Mbps 7:OFF 8:ON 3Mbps 7:ON 8:ON Disable (12 Mbps)	12 Mbps
	8			
SW11	1	Master address setting	Bit0 ON: Enable, OFF: Disable	Disable
	2		Bit1 ON: Enable, OFF: Disable	Disable
	3		Bit2 ON: Enable, OFF: Disable	Disable
	4		Bit3 ON: Enable, OFF: Disable	Disable
	5		Bit4 ON: Enable, OFF: Disable	Disable
	6		Bit5 ON: Enable, OFF: Disable	Disable
	7	Number of occupied (OWN) items selection(*)	7: OFF 8: OFF 1 item 7: ON 8: OFF 2 items 7: OFF 8: ON 3 items 7: ON 8: ON 4 items	1 item
	8			

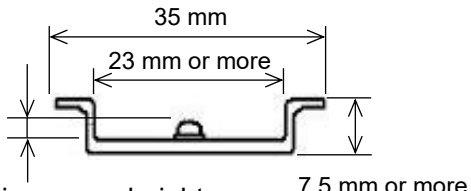
(*): The following items are allocated to global memory for each module.

Number of occupied (OWN) items	QTC1-R	
	Read item	Write item
1	PV: 03E8-03EB	SV: 0018-001B
2	Status flag 1: 03F4-03F7	Control Allowed/Prohibited: 0004-0007
3	MV: 03EC-03EF	Auto/Manual control: 0010-0013
4	SV: 03F0-03F3	Manual control MV: 0014-0017

5. Mounting

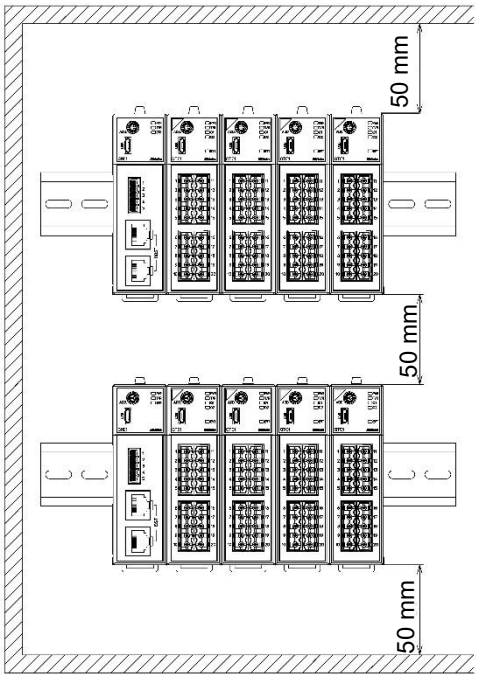
⚠ Caution

- When mounting or removing this instrument, be sure to turn off the power supply to this instrument.
- Mount the DIN rail horizontally.
- This instrument fits the following DIN rails.
  Top hat rail TH35 JIS C 2812-1988

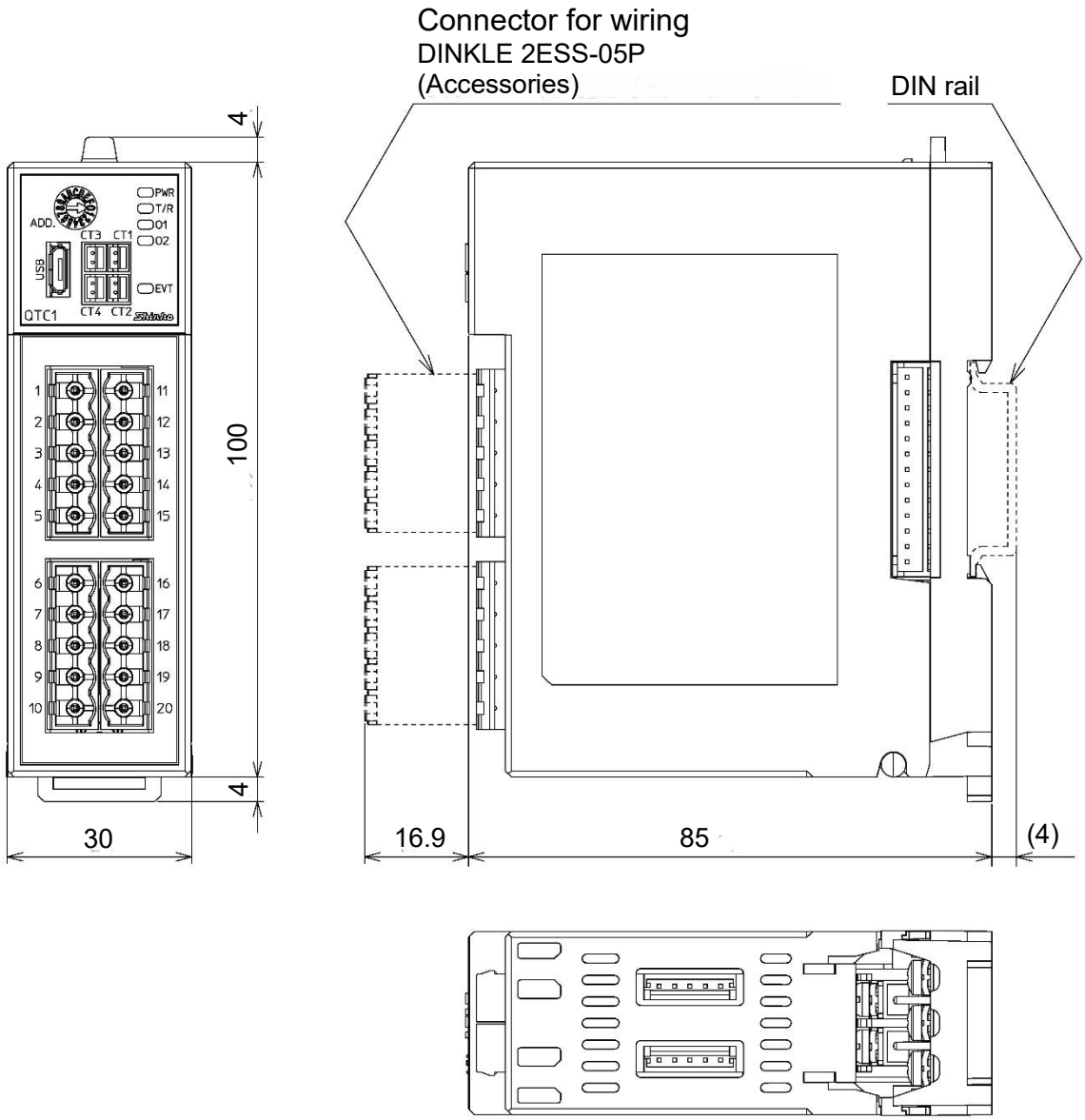


Width: 35 mm
Height: 7.5 mm or more
Groove width: 23 mm or more
DIN rail mounting screw height:
6 mm or more
(For DIN rail height 7.5 mm)

- If this instrument is mounted in a position susceptible to vibration or shock, mount commercially available stopper at both ends of the instrument.
  Recommended stooper: HDV-3, manufactured by TOYOGIKEN CO., LTD.
- When installing, make sure that the orientation (upper and lower) of this instrument is correct.
- When mounting or removing this instrument on the DIN rail, it must be tilted slightly
  Secure a space of 50 mm or more in the vertical direction of the instrument, considering the wiring space of the power supply/communication line and heat dissipation.



5.1 External Dimensions (Scale: mm)



5.2 Mounting

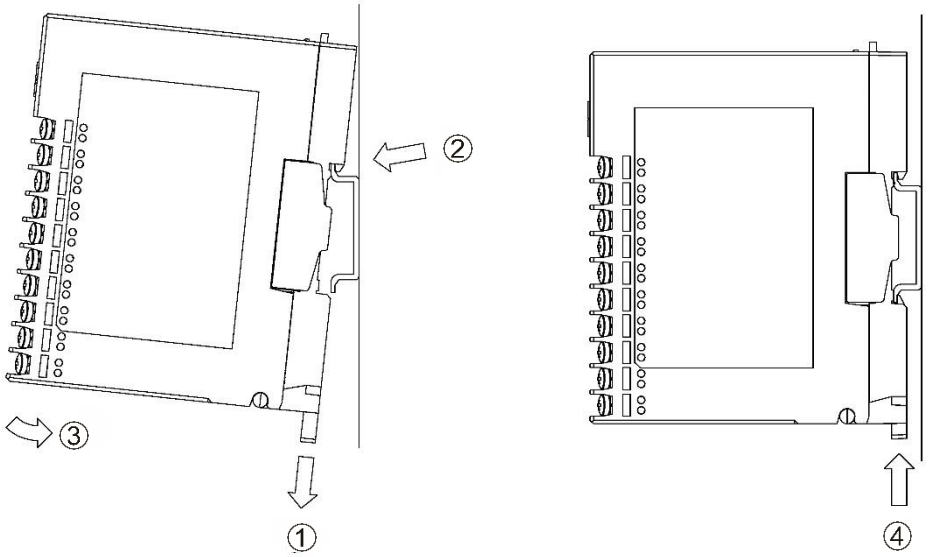
Mounting to the DIN rail

① Lower the lock lever of this instrument. (The lock lever of this instrument has a spring structure, but if lower it in the direction of the arrow until it stops, it will be locked in that position.)

② Hook the part ② of this instrument onto the top of the DIN rail.

③ Insert the lower part of this instrument with the part ② as a fulcrum.

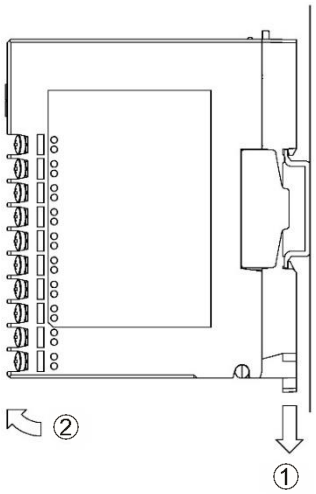
④ Raise the lock lever of this instrument. Make sure it is fixed to the DIN rail.



Removal from the DIN rail

① Insert a flat blade screwdriver into the lock lever of this instrument and lower the lock lever until it stops.

② Remove this instrument from the DIN rail by lifting it from below.



Mounting multiple modules to the DIN rail

This section describes an example of mounting multiple control modules QTC1-R on the DIN rail.

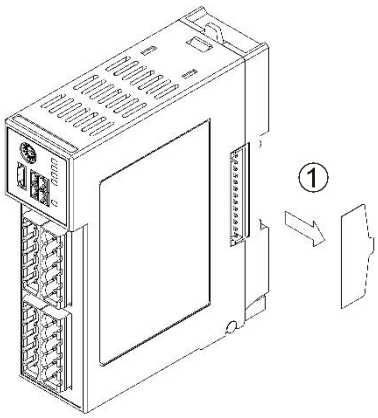
① Remove the protective sticker on the right side of the QTC1-RP.

② Lower the lock lever of the QTC1-R0, and mounting the QTC1-R0 to the DIN rail.

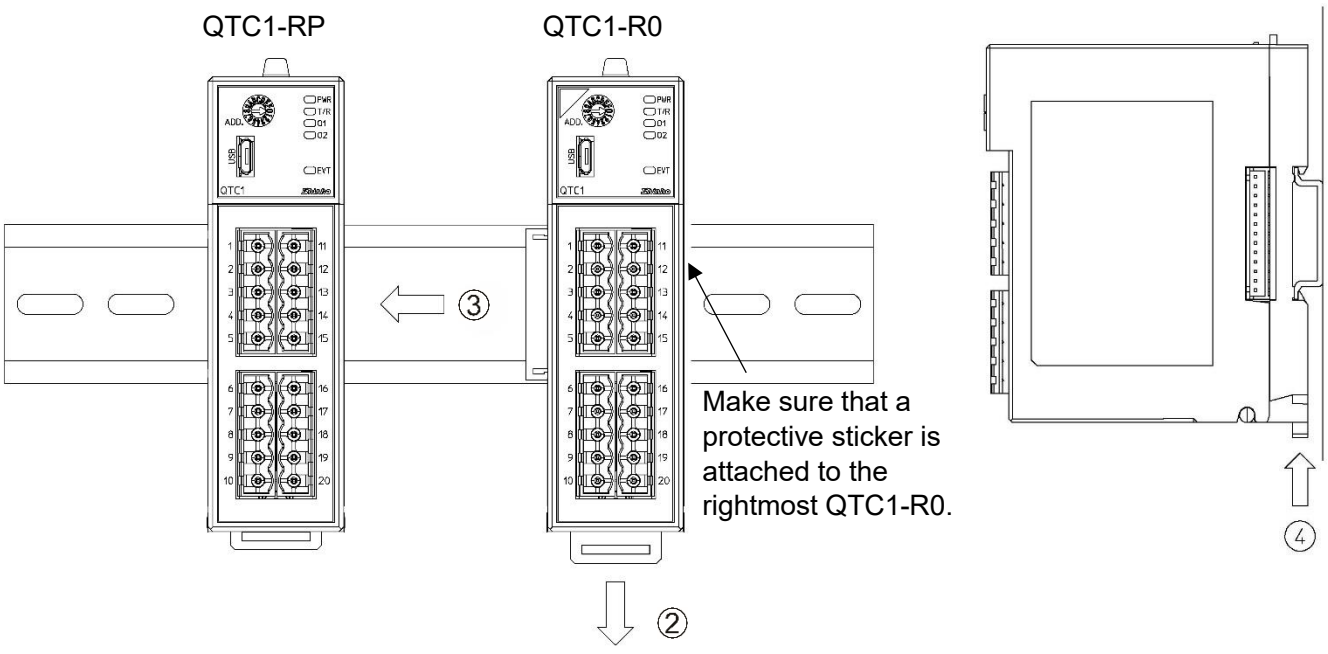
③ Slide the QTC1-R0 to the left and connect the connectors to each other.

④ Raise the lock lever of this instrument. Make sure it is fixed to the DIN rail.

QTC1-RP



QTC1-RP QTC1-R0



6. Wiring

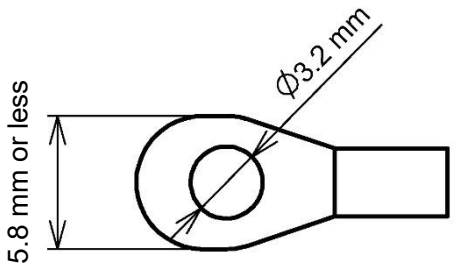
> **⚠ Warning**
>
> Turn off the power supply to this instrument before wiring.
> If you work while the power is supplied, you may get an electric shock, which could result in an accident resulting in death or serious injury.

6.1 Recommended Terminal and Recommended Rod Terminal

Recommended terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below.
Ring-type for power supply, serial communication section and CUnet communication section.

Solderless Terminal	Manufacturer	Model	Compatible wire size	Tightening torque
Ring-type	NICHIFU TERMINAL INDUSTRIES CO., LTD.	TMEX1.25-3	AWG22 to 16	Input/output section: 0.63 N•m Power supply section: 0.5 N•m Serial communication section: 0.3 N•m CUnet communication section: 0.3 N•m
		TMEX2-3S	AWG16 to 14	
	J.S.TMFG.CO.,LTD.	V1.25-3	AWG22 to 16	
		V2-MS3	AWG16 to 14	



(Fig. 7.1-1)

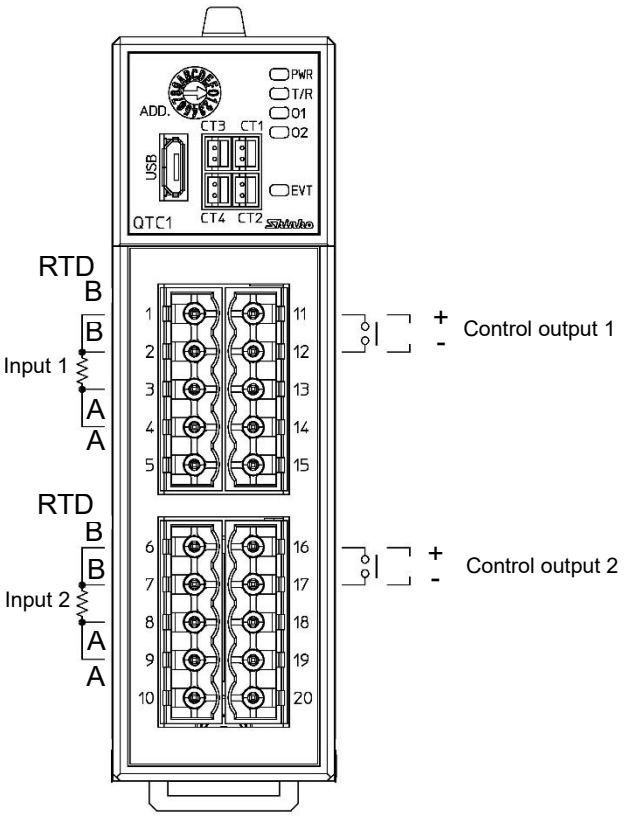
Recommended rod terminal

Use PHOENIX CONTACT brand rod terminals with insulating sleeves and crimping tools for the input/output sections.

Model	AWG	Crimping tool
AI 0,25-10 YE	AWG24	ZA3 CRIMPFOX UD 6
AI 0,34-10 TQ	AWG22	
AI 0.5-10 WH	AWG20	
AI 0,75-10 GY or AI 1-10 RD	AWG18	
AI 1,5-10 BK	AWG16	
AI 2,5-10 BU	AWG14	
AI 4-10 GY	AWG12	

6.2 Terminal Arrangement

6.2.1 Input and Output Terminal Arrangement



11	Control output	CH1
12		
1	Input	
2		
3		
4		
16	Control output	CH2
17		
6	Input	
7		
8		
9		

⚠ Caution

Be sure to use the correct polarity for the power supply voltage (24 V DC).

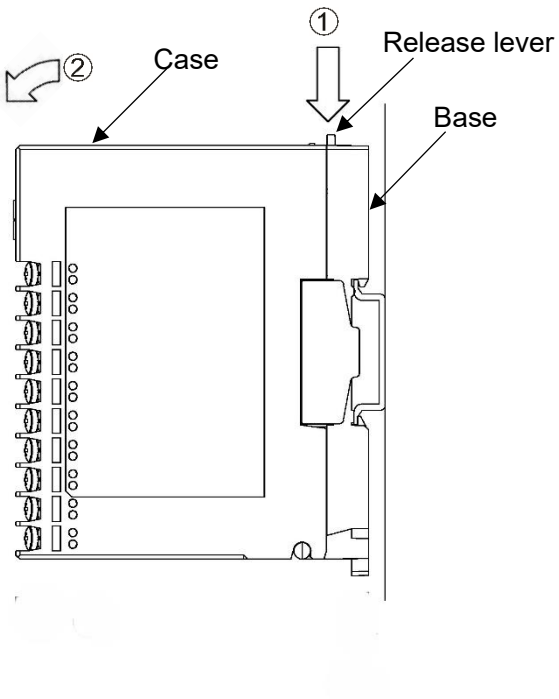
The terminal block for power supply and serial communication / CUnet communication is located on the base of this instrument.

Wiring by the following procedure.

(1) Case removal

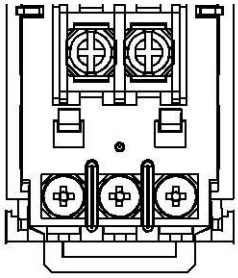
① Push the release lever on the top of this instrument to unlock it.

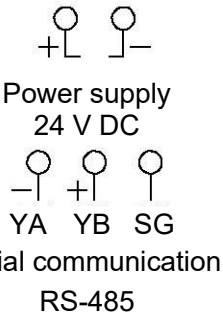
② Remove the case.



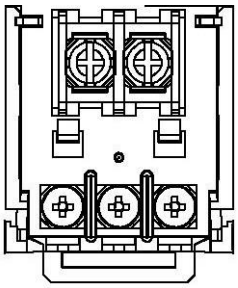
(2) Wiring

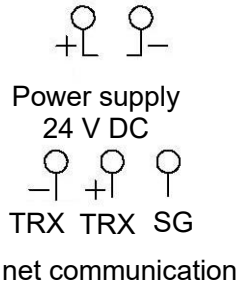
Serial communication





CUnet communication

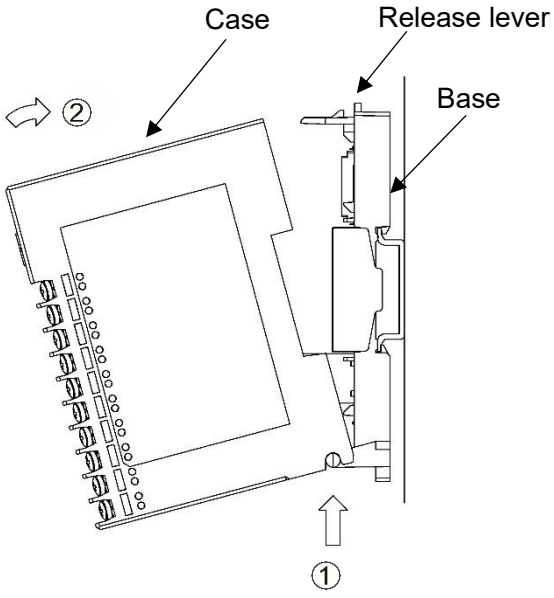




(3) Case mounting

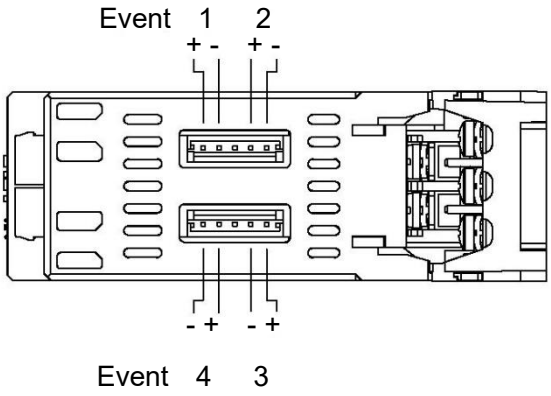
① Hook the case on the lower part ① of this instrument.

② Mount the case so that the lower part ① of this instrument is the fulcrum and covers the release lever.
There is a clicking sound.



6.2.3 Event Input and Output Terminal Arrangement

Using the connector harness EVQ for event input/output.



6.2.4 CT Input Connector Arrangement

Using the connector harness WQ for heater burnout alarm.

Wiring as shown below.

Single phase

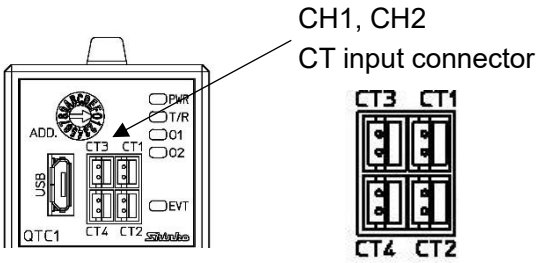
CH1 input connector

CH2 input connector

Three phase

CH1 CT1input: CT1, CT3 input connector

CH2 CT1input: CT2, CT4 input connector



7. Specifications

Power supply voltage	24 V DC Allowable voltage fluctuation: 20 to 28 V DC
Power consumption	3 W or less
Inrush current	Max. 10 A
Base accuracy	When the ambient temperature is 23°C and the mounting angle is ±5 degrees RTD input: Within ±0.05°C
Effect of ambient temperature	Within ±100 ppm/°C of input span
Effect of electromagnetic interference	Within ±1% of each input span
Input sampling period	125 ms
Event input	Input points: 2 points Input type: Voltage contact input sink type Circuit current when closed: Approx. 6 mA Acquisition judgment time: 40 ms to 40 ms + within the range of input sampling
CT input	20 A Specification (-2): Rated voltage: 0.9 V, Rated current: 30 mA 100 A Specification (-A): Rated voltage: 0.9 V, Rated current: 120 mA

<table>
<tr><td>Control output</td><td>
<table>
<tr><td>Relay contact output</td><td>1a
Control capacity: 3 A 250 V AC (resistive load)
1 A 250 V AC (inductive load　cosϕ =0.4)
Electrical life: 100,000 cycles
Minimum applicable load: 10 mA 5 V DC</td></tr>
<tr><td>Non-contact voltage (for SSR drive) output</td><td>12 V DC ±15 %
Max. 40 mA (short circuit protected)
Non-isolated between power supply and output</td></tr>
<tr><td>Direct current output</td><td>4 to 20 mA DC, 0 to 20 mA DC
Resolution: 12000
Resolution
Load resistance: Max. 550 Ω
Non-isolated between power supply and output</td></tr>
<tr><td>DC voltage output</td><td>0 to 1 V DC，0 to 5 V DC，1 to 5 V DC，0 to 10 V DC
Resolution: 12000
Allowable load resistance: 1 kΩ or more
Non-isolated between power supply and output</td></tr>
<tr><td>Open collector output</td><td>NPN
Allowable load current: 100 mA or less
Load voltage: 30 V DC or less
Residual voltage: 1.2 V DC or less
Leakage current when OFF: 0.1 mA or less</td></tr>
</table>
</td></tr>
<tr><td>Event output</td><td>
<table>
<tr><td>Output points</td><td>4 points</td></tr>
<tr><td>Circuit</td><td>NPN open collector</td></tr>
<tr><td>Max. load voltage</td><td>30 V DC</td></tr>
<tr><td>Max. load capacity</td><td>50 mA</td></tr>
</table>
</td></tr>
<tr><td>Control action selection</td><td>2 DOF PID control, Fast-PID control, Slow-PID control, ON-OFF control or Gap-PID control</td></tr>
<tr><td>Ambient temperature</td><td>-10 to 50°C (no condensation or freezing)</td></tr>
<tr><td>Ambient humidity</td><td>35 to 85%RH (no condensation)</td></tr>
<tr><td>Altitude</td><td>2,000 m or less</td></tr>
<tr><td>Weight</td><td>Approx. 150 g</td></tr>
<tr><td>Installation environment</td><td>Pollution degree 2 (EN61010-1)</td></tr>
<tr><td>Memory protection</td><td>Non-volatile memory (Number of writes: 1 trillion times)</td></tr>
<tr><td>Environmental specification</td><td>RoHS directive compliant</td></tr>
</table>

SHINKO TECHNOS CO., LTD.

OVERSEAS DIVISION

Head Office: 2-5-1, Senbahigashi, Minoo, Osaka, 562-0035, Japan

[URL] https://shinko-technos.co.jp/e/　Tel: +81-72-727-6100

[E-mail] overseas@shinko-technos.co.jp　Fax: +81-72-727-7006

No. QTC1R1E1　2026.06