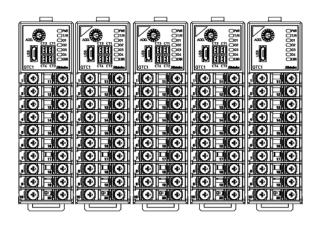
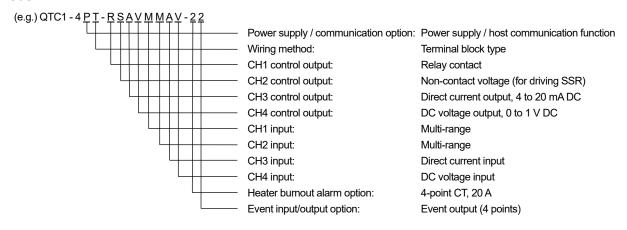
Control Module (4ch)

Model: QTC1-4





■ Model



QTC1 - 4														
Power supply /	0											No options		
communication	Р											Power supply / host communication function		
options														
Wiring method		Т										Terminal block type		
CH1 control output	ıt		1											
CH2 control output	ıt											Con autout and table		
CH3 control output	ıt											See output code table		
CH4 control output	ıt													
CH1 input														
CH2 input												See input code table		
CH3 input														
CH4 input														
										-0		No options		
Heater burnout alarm options (*1)						-2	-2 4-point CT, 20 A (*2)							
-						-A		4-point CT, 100 A (*2)						
											0	No options		
Event input/output	t optior	าร									1	Event input (4 points) (*3)		
													2	Event output (4 points) (*3)

- (*1) Cannot be added to Direct current output type, DC voltage output type, or Triac output type.
- (*2) CT and connector harness are sold separately.
- (*3) Connector harness is sold separately.

Output Codes

Code	Output Type
R	Relay contact output
S	Non-contact voltage output
	(for driving SSR)
Α	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
С	Open collector output
Т	Triac output

Input Codes

Code	In	put Type	Range	
		K	-200 to 1370°C	
		K	-200.0 to 400.0°C	
		J	-200 to 1000°C	
		R	0 to 1760°C	
		S	0 to 1760°C	
		В	0 to 1820°C	
		Е	-200 to 800°C	
		Т	-200.0 to 400.0°C	
		N	-200 to 1300°C	
		PL- II	0 to 1390°C	
	Theorem	С	0 to 2315°C	
	Thermocouple	K	-328 to 2498°F	
		K	-328.0 to 752.0°F	
		J	-328 to 1832°F	
		R	32 to 3200°F	
M		S	32 to 3200°F	
		В	32 to 3308°F	
		Е	-328 to 1472°F	
		Т	-328.0 to 752.0°F	
		N	-328 to 2372°F	
		PL- II	32 to 2534°F	
		С	32 to 4199°F	
	RTD	Pt100	-200.0 to 850.0°C	
	KID	Pt100	-328.0 to 1562.0°F	
	DC voltage	0 to 1 V DC	-2000 to 10000	
		4 to 20 mA DC		
		(Externally mounted	-2000 to 10000	
	Direct current	shunt resistor)		
	Direct current	0 to 20 mA DC		
		(Externally mounted	-2000 to 10000	
		shunt resistor)		
А		4 to 20 mA DC	-2000 to 10000	
	Direct current	(Built-in shunt resistor)		
		0 to 20 mA DC	-2000 to 10000	
-		(Built-in shunt resistor)		
		0 to 5 V DC	-2000 to 10000	
V	DC voltage	1 to 5 V DC	-2000 to 10000	
		0 to 10 V DC	-2000 to 10000	

■ Accessories Sold Separately

Product Name	Model
$50~\Omega$ shunt resistor	RES-S01-050
Front terminal cover	TC-QTC
CT for 20 A	CTL-6-S-H (*1)
CT for 100 A	CTL-12-S36-10L1U (*1)
Heater burnout alarm connector harness	WQ (*1)
Event input/output connector harness	EVQ (*2)

^(*1) For heater burnout alarm (heater burnout alarm option symbols: -2, -A)

^(*2) For event input or event output (event input/output option symbols: 1, 2)

■ Rating

Rated Scale

Input (TC)	Scale F	Resolution	Input (RTD)	Scale	Range	Resolution	
К	-200 to 1370°C	-328 to 2498°F	1°C(°F)	Pt100	-200.0 to 850.0°C	-328.0 to 1562.0°F	0.1℃(℉)
K	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1℃(°F)				
J	-200 to 1000°C	-328 to 1832°F	1°C(°F)				
R	0 to 1760°C	32 to 3200°F	1°C(°F)				
S	0 to 1760°C	32 to 3200°F	1°C(°F)	Input (DC)	Scale	Range	Resolution
В	0 to 1820°C	32 to 3308°F	1°C(°F)	4 to 20 mA			
E	-200 to 800°C	-328 to 1472°F	1℃(°F)	0 to 20 mA			
Т	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C(°F)	0 to 1 V	2000 to	10000 (*)	1
N	-200 to 1300°C	-328 to 2372°F	1°C(°F)	0 to 5 V	-2000 10	7 10000 ()	•
PL-II	0 to 1390°C	32 to 2534°F	1°C(°F)	1 to 5 V			
С	0 to 2315°C	32 to 4199°F	1℃(°F)	0 to 10 V			

^(*) Scalable

Input

nput			
Thermocouple (TC)	K, J, R, S, B, E, T, N, C (JIS C1602-2015), PL- II (ASTM E1751M-15)		
	External resistance: 100 Ω or less (However, B input: 40 Ω or less)		
RTD Pt100, 3-wire type (JIS C1604-2013)			
	Allowable input lead wire resistance: 10 Ω or less per wire		
Direct current (mA DC)	0 to 20 mA DC, 4 to 20 mA DC		
	Input impedance: 50 Ω (Shunt resistance)		
	Allowable input current: 50 mA or less		
DC voltage (V DC)	0 to 1 V DC		
	Input impedance: 1 MΩ or more		
	Allowable input voltage: 5 V DC or less		
	Allowable signal source resistance:2 $k\Omega$ or less		
	0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC		
	Input impedance: 100 kΩ or more		
Allowable input voltage: 15 V DC or less			
	Allowable signal source resistance:100 Ω or less		

■ Performance

Basic accura	су	At ambient temperature of 23°C and mounting angle of ±5 degrees					
	Thermocouple	Within ±0.2% of each input span					
		However, below 0°C (32°F): Within ±0.4% of each input span					
		R, S inputs, 0 to 200°C (32 to 392°F): Within ±6°C (12°F)					
		B input, 0 to 300°C (32 to 572°F): Accuracy is not guaranteed.					
	RTD	Within ±0.1% of each input span					
	Direct current	Within ±0.2% of each input span					
	DC voltage	Within ±0.2% of each input span					
Cold junction	temperature	Within ±1°C at -10 to 50°C					
compensation	n accuracy						
Effect of amb	oient temperature	Thermocouple input (no decimal point): Within ±100 ppm/°C of each input span					
		Below 0°C (32°F): Within ±200 ppm/°C of each input span					
		Thermocouple input (decimal point): Within ±200 ppm/°C of each input span					
		Below 0°C (32°F): Within ±400 ppm/°C of each input span					
		Other: Within ±100 ppm/°C of each input span					
Effects of ele	ctromagnetic	Within ±1% of each input span					
interference							
Input sampling period		20 ms (with only DC voltage input and direct current input enabled)					
		50 ms (with only DC voltage input and direct current input enabled)					
		125 ms					
l		Note: Fixed to 125 ms regardless of settings for thermocouple input and RTD input					

■ Control Performance

Control action		Control method selectable from 2	DOF PID co	ontrol, Fast-PID control, Slow-PID control, ON-OFF control, o				
		Gap-PID control. For optimal con	trol, select	the best control method according to the intended use and				
		process.						
		(Factory default: 2DOF PID contro	l)					
2D	OF PID control	2DOF PID control						
Fa	st-PID control	A control method that offers both tracking characteristics with SV changes, and disturbance suppression.						
Slo	ow-PID control	This method offers the same disturbance responsiveness as Fast-PID control as well as control actions						
	ap-PID control	with reduced overshooting.						
08	ap-i ib control	Fast-PID control						
		This general PID control method is used for constant value control (SV control at a single value).						
		 P control: When integral time and derivative time are set to 0. PI control: When derivative time is set to 0. 						
		PD control: When integral to a Deviation DID control: When						
				tional gain 2DOF coefficient ($lpha$) is set to 1.00 and the derivativ				
		2DOF coefficient (γ , Cd)	is set to 1.00	U.				
		Slow-PID control	,					
				ses where generating overshoot is not desired, and processe				
		where the PV does not easily d	ecrease afte	er having exceeded the SV.				
		Gap-PID control						
		•	-	the operation unit, a slight fluctuation may be maintained near				
				pand is usually used, but since control is not performed withi				
		dead bands, the PV changes in the event of a disturbance. In this way, this control method ensures						
		deviation characteristics in dead	d bands and	allows for disturbance responses.				
		Item		Setting Range				
		Proportional band (P)		1 to Input span °C (°F) or 0.1 to Input span °C (°F)				
				Direct current input, DC voltage input: 0.10 to 100.00%				
		Integral time (I)		0 to 3600 sec or 0.0 to 2000.0 sec				
				1 to 3600 sec or 0.1 to 2000.0 sec (When Slow-PID control				
				is selected)				
				The setting range varies depending on the selected				
				integral/derivative decimal point position.				
		Derivative time (D)		0 to 3600 sec or 0.0 to 2000.0 sec				
		Bentalive lime (B)		The setting range varies depending on the selected				
				integral/derivative decimal point position. 0.00 to 1.00 0.00 to 10.00				
		Proportional gain 2DOF coeffic	piont (a)					
			cient (a)					
		Integral 2DOF coefficient (β)	0.11					
		Derivative 2DOF coefficient (γ	∕, Cd)	0.00 to 1.00				
		Proportional cycle		0.1 to 100.0 sec				
		Output high limit, output low lin	nit	0.0 to 100.0%				
				Direct current output: -5.0 to 105.0%				
		Gap width (*)		0.0 to 10.0% Proportional band × Gap width 0.0 to 1.0				
		Gap coefficient (*)						
		(*) With Gap-PID control only						
10	N-OFF control	Control method that operates with	only two va	lues: ON and OFF				
		Item		Setting Range				
				00.0°C (0.1 to 1800.0°F)				
		State of the s		rent input, DC voltage input: 1 to 10000				
			D 001 04	Total page of the control of the con				
Control range		Control output is turned OFF when the following control ranges are exceeded.						
		Thermocouple input (no decimal point)						
		Input range low limit value -50°C (90°F) to Input range high limit +50°C (90°F)						
		Thermocouple input (decimal point), RTD input						
		Input range low limit value - (Inp	out span × 1	%) °C (°F) to Input range high limit + 50.0°C (90.0°F)				
		Direct current input, DC voltage inp		, , ,				
				to Scaling high limit value + Scaling width × 10%				

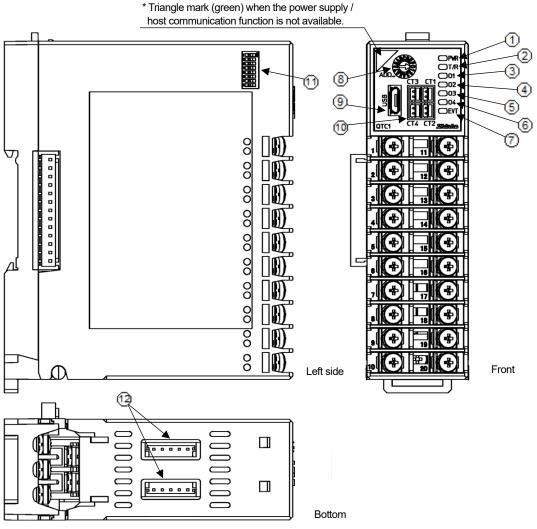
Control output	Relay contact output:	1a				
		Control capacity: 3 A 250 V AC (resistive load)				
		$1 A 250 V AC$ (inductive load $\cos \varphi = 0.4$)				
		Electrical life: 100,000 cycles				
		Minimum applicable load: 10 mA 5 V DC				
	Non-contact voltage output	12 V DC ± 15%				
	(for driving SSR)	Max. 40 mA (short circuit protected)				
		* The power supply is not electrically insulated from the output.				
	Direct current output	4 to 20 mA DC, 0 to 20 mA DC (Resolution: 12000)				
		Load resistance:Maximum 550 Ω				
		* The power supply is not electrically insulated from the output.				
	DC voltage output:	0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 1 to 10 V DC (Resolution: 12000)				
		Allowable load resistance: $1 \text{ k}\Omega$ or more				
		* The power supply is not electrically insulated from the output.				
	Open collector output (NPN):	Allowable load current:100 mA or less				
		Load voltage: 30 V DC or less				
	Triac output:	Allowable load current: 0.5 A or less				
	(AC output zero-cross method)	Load voltage: 75 to 250 V AC				

■ General Structure

Weight		Approx. 170 g					
Dimensions		30 × 100 × 85 mm (W × H × D) (excl. protrusions)					
		Depth with terminal cover attached: 95 mm					
Mounting meth	od	DIN rail mounting					
Case		Flame-resistant resin, Color: Black					
Panel		Polycarbonate sheet					
Standards (*)	EN	EN61010-1 (Pollution degree 2)					
	EC	EMI: EN61326					
	(EMC directive)	Electric-field strength of radiated disturbance: EN55011 Group 1, Class A					
		Terminal noise voltage: EN55011 Group 1, Class A					
		EMS: EN61326					

 $^{(\}mbox{\ensuremath{^{\star}}})$ Triac output specifications are not applied to each standard.

■ Indication Structure / Settings Structure



Action Indicator

No.	Symbol (color)	Name, Task		Symbol (color)	Name, Task
	PWR	Power indicator		O1 (green)	CH1 control output indicator
	(green)	Off: No power supplied to module		O2 (green)	CH2 control output indicator
1		On: Power supplied to module		O3 (green)	CH3 control output indicator
		Flashing: Internal error during warm-up	6	O4 (green)	CH4 control output indicator
		(Non-volatile memory, ADC input circuit)		EVT (red)	Event indicator
	T/R	Communication indicator			Lights up when an alarm is activated, a loop
	(yellow)	Flashing: Normal communication, Communication	(7)		break alarm is activated, or a heater burnout
2		error (reception error)			alarm (optional) is activated.
		Off: Communications error (no response), USB			Flashes in the event of a sensor error or
		communication			overscale/underscale.

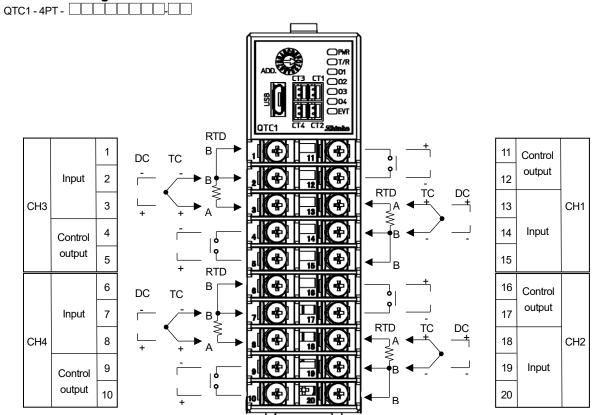
Switches, Connectors

No.	Symbol	Name, Task						
8)	ADD.	ADD. Rotary switch for module address selection						
		Use the rotary switch to select the module address from 0 to F (1 to 16).						
9	USB	Micro USB Type-B console communication connector						
	CT1	CH1 CT input connector						
10	CT2	CH2 CT input connector						
(*1)	CT3	CH3 CT input connector						
	CT4	CH4 CT input connector						
DIP switches for selecting communications specification								
		Use the DIP switches for selecting the communication speed, data bit, parity, stop bit, and communication protocol.						
(*2)		Event input/output connector						

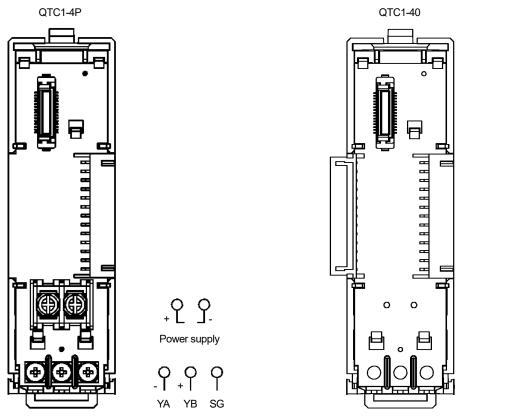
^(*1) When using the heater burnout alarm option (heater burnout alarm option symbols: -2, -A)

 $^{(\}sp{*}2)$ When using the event input or event output option (event input/output option symbols: 1, 2)

■ Terminal Arrangement



Front



RS-485 serial communication (*)

(*) The QTC1-40 do not include a Power supply terminal and RS-485 serial communication terminal.

Base

■ Standard Functions

Alarm Output

Alarm types	12 alarm types: High limit alarm, Low limit alarm, High/Low limits alarm, High/Low limit range alarm, Process high alarm, Process low alarm, High limit with standby alarm, Low limit with standby alarm, High/Low limits with standby alarm,	
	High/Low limits independent alarm, High/Low limit range independent alarm, High/Low limits with standby independent	
	alarm. No alarm action can also be selected. (Factory default: No alarm action)	
Action	ON/OFF action	
Hysteresis	0.1 to 1000.0°C (0.1 to 1800.0°F) (Factory default: 1.0°C (1.8°F))	
	Direct current, DC voltage input: 1 to 10000 (Factory default: 10)	
Output	Event output assigned by status flag or event output assignment selection	
Alarm value 0	If "Enabled" is selected in [Alarm value 0 Enabled/Disabled], the following alarm type activates even if the alarm value is	
Enabled/Disabled	set to 0 (zero): High limit alarm, Low limit alarm, High/Low limits alarm, High/Low limit range alarm, High limit with standby	
	alarm, Low limit with standby alarm, High/Low limits with standby alarm, High/Low limits independent alarm, High/Low	
	limit range independent alarm, High/Low limits with standby independent alarm.	

Loop Break Alarm

_				
	Setting range	Loop break alarm time:	0 to 200 minutes	
		Loop break alarm action span:	Thermocouple, RTD inputs:	0 to 150°C (0 to 270°F) or 0.0 to 150.0°C (0.0 to 270.0°F)
			Direct current, DC voltage input:	0 to 1500
	Output	Event output assigned by status flag or event output assignment selection		

Set Value Ramp Function

When changing SV, this function enables control at the specified change rate between the previous SV and the changed SV rate.					
When control is	When control is enabled, control is performed at the specified change rate between the current PV and the SV.				
Setting range	SV rise rate:	SV rise rate: Thermocouple, RTD inputs: 0 to 10000°C/minute (0 to 18000°F/minute) or			
			0.0 to 1000.0°C/minute (0.0 to 1800.0°F/minute)		
		Direct current, DC voltage input:	0 to 10000/minute		
	SV fall rate:	Thermocouple, RTD inputs:	0 to 10000°C/minute (0 to 18000°F/minute) or		
			0.0 to 1000.0°C/minute (0.0 to 1800.0°F/minute)		
		Direct current, DC voltage input:	0 to 10000/minute		
	The factory default for both the SV rise rate and SV fall rate is 0. However, when set to 0, this function is disabled.				

Power-On Return Action Selection

Select whether to return to a continued state (state before the power was turned off) or in the stopped state after the power is turned on.

Non-Volatile IC Memory Data Save Selection

Selecting whether to allow or prohibit saving data to the non-volatile IC memory is possible.

If saving is prohibited, all setting values can be changed temporarily until the power is turned off and back on, at which time the values will return to the values applied before saving was prohibited.

Automatic/Manual Control Switching

Switching between automatic and manual control is possible through host communication.

Sensor Correction Coefficient

Setting the sensor input value slope is possible.		
Setting range	0.000 to 10.000 (Factory default: 1.000)	

Sensor Correction

If the control location temperature and the sensor location temperature are different, shifting and correction of the PV is possible.			
(Valid within the rated in	(Valid within the rated input range regardless of the sensor correction value.)		
Setting range	Thermocouple, RTD inputs:	-100.0 to 100.0℃ (-180.0 to 180.0℉)	
	Direct current, DC voltage input:	-1000 to 1000	

Control Function Selection

Selecting between standar	between standard control, heating/cooling control, cascade control, or output selection function is possible.		
Cascade control	The master-side operation output amount obtained from the master-side SV and PV (CH1 or CH3; same applies		
	below) is substituted for the slave-side SV (CH2 or CH4; same applies below), slave-side calculation is performed,		
	and the slave-side control output is output. (With CH1 control output OFF (Current output: 0 mA))		
Heating/cooling control	When heating/cooling control is selected as the control function for CH1, heating/cooling control is performed with		
	CH1 as the heating side output and CH2 as the cooling side output. When heating/cooling control is selected as the		
	control function for CH3, heating/cooling control is performed with CH3 as the heating side output and CH4 as the		
	cooling side output. Heating/cooling control cannot be selected for CH2 and CH4.		
Output selection function	When using the controller, if there is an unused input and an error occurs in the input channel currently being used,		
	the input can be changed to an unused channel, and the output location for the input can be selected.		

Extension Function Selection

Selecting between no extension, Peak power suppression function and the auto-balance control function is possible.			
Peak power suppression function	A function to suppress the peak power value when there is a power limit for the facility. The total current		
	can be set, and power suppression control can be performed when the sum of the current values set for		
	each channel is less than or equal to the total current. *(Disabled when Direct current output or DC voltage		
	output are selected, and each set value change is effective only when control is stopped.)		
Auto-balance control function	This function controls the temperature of a controlled object at multiple control points to suppress partial		
(For devices with power supply /	burning and mechanical distortion.		
host communication function)	There are two auto-balance control types: using multiple control modules, or using independent control		
	modules.		

Output Gain/Bias Function

When multiple outputs are used for inputs, such as input-based heater controls at multiple outputs, if the output amount distribution is known in advance, this function enables uniform control by setting the ratio and bias for the reference output.

Input Calculation Function

Input calculation function selection can be used to select between standard input, difference input, and addition input.

The calculation function selected for CH1 applies to CH1 and CH2, and the calculation function selected for CH3 applies to CH3 and CH4. However, the selection becomes invalid if a non-standard control function is selected.

Input Difference Detection Function

The input difference between the current input difference detection selection channel and the selected channel is detected, and if the value set in the input difference detection setting is exceeded, 1 is set as the input difference flag. However, if the current input difference detection selection channel is selected, this function is disabled.

■ Optional Functions

Heater Burnout Alarm (Heater burnout alarm option symbols: -2, -A)

This function cannot be added to Direct current output, DC voltage output or Triac output type. The status can be determined by reading the		
status flag during serial communication.		
Rating	Single-phase: 20 A, Single-phase: 100 A (specified when ordering)	
Setting range	20 A: 0.0 to 20.0 A (Off when set to 0.0)	
	100 A: 0.0 to 100.0 A (Off when set to 0.0)	
Setting accuracy	±5% of rated value	
Action point	Set value	
Action	ON/OFF action	
Output	Event output selected by status flag or event output assignment selection	

Event Input (Event input/output option symbol: 1)

When an event input is input, the operations selected by the event input assignment selection are performed.			
Event input assignment selection	Event input assignment selection No action, Control start/stop (CH independent), Control start/stop (CH interlock)		
No. of inputs	4		
Input method	Voltage contact input sink method		
Circuit current when closed	rcuit current when closed Approx. 6 mA		
Reading judgment time Approx. 100 ms			

Event Output (Event input/output option symbol: 2)

The operations selected by the event output assignment selection are performed.			
Event output assignment selection	vent output assignment selection No action, EVT output (CH independent), EVT output (CH interlock)		
No. of outputs	4		
Circuit	NPN open collector		
Maximum load voltage	30 V DC		
Maximum load capacity 50 mA			

Power Supply / Host Communication Function (Power supply/communication option symbol: P)

Communication line	EIA RS-485 compliant			
Communication method	Half-duplex of	Half-duplex communication		
Communication speed	Selecting 960	00, 19200, 3840	00, or 57600 bps is possible using t	the DIP switches. (Factory default: 57600 bps)
Synchronization method	Start-stop syr	nchronization		
Data bit/parity	Data bits:	Data bits: 8		
	Parity:	Selecting eve	en, odd, or no parity is possible usir	ng the communication specification selection
	DIP switch. (Factory default: 8 bits / Even)			
Stop bit	Selecting 1 or 2 is possible using the communication specification selection DIP switch. (Factory default: 1)			
Response delay time setting	0 to 1000 ms (Factory default: 0 ms)			
, ,	The response from the module after receiving a command from the host can be delayed.			
Data structure		1		
	Communica	ation protocol	MODBUS RTU	
	Start bit		1	
	Data bit		8	
	Parity		Enabled (even, odd), Disabled	
	Stop bit		1 or 2	
			·	

Smart InterFace (SIF) Function (Program-less communication function)

This function enables a serial communication connection with Mitsubishi Electric MELSEC-Q series PLCs and writes/reads various data to/from the PLC register using the PLC communication protocol.

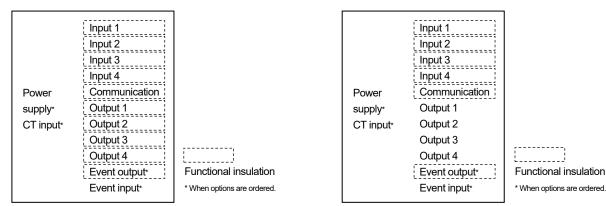
The communication protocol uses QW and QR commands, and PLCs capable of using A-compatible 1C frame AnA/AnU common commands (QR/QW) (D resister) are supported.

■ Insulation / Dielectric Resistance

Circuit Insulation Configuration

· Relay output, Open collector output, Triac output

 \cdot Non-contact voltage output, Direct current output, DC voltage output



	Insulation resistance	500 V DC, 10 MΩ or more		
ĺ	Dielectric resistance	Between input terminal and ground: 1.5 kV AC for 1 minute		
١		Between power terminal and ground:	1.5 kV AC for 1 minute	
١		Between power terminal and input terminal:	750 V AC for 1 minute	

■ Environmental Conditions

Ambient temperature	-10 to 50°C (Non-condensing, no icing)
Ambient humidity	35 to 85% RH (Non-condensing)
Altitude	2,000 m or less
Installation environment	Pollution Degree 2 (according to EN61010-1)
Memory protection	Non-volatile IC memory (write cycles: 1 million)
Environmental specifications	RoHS Directive Compliant

■ Attached Functions

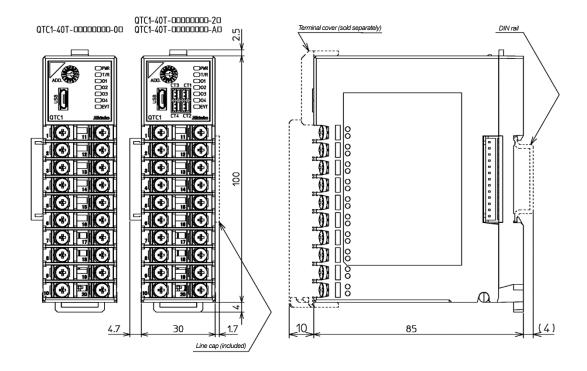
Power failure countermeasures	Setting data is backed up to n	on-volatile IC memory.		
Self-diagnosis	The watchdog timer monitors runaway and halt of the program, and when an abnormality is detected,			
<u> </u>	it resets the MCU and initializes the instrument.			
Automatic cold junction temperature	Detect the temperature at the connection terminal between the thermocouple and the instrument is			
Compensation	detected and adjusted to be the same as if the reference contact were always at 0°C (32°F).			
	(Valid only for channels for wh	(Valid only for channels for which thermocouple input is selected)		
PV filter time constant setting	A digital first-order low-pass filter is used to reduce PV fluctuations caused by noise.			
Moving average count setting	Values that alter input values due to noise are averaged to stabilize the indicated values.			
CH enable/disable selection	Enabled or disabled can be selected for each channel.			
	When disabled, all operations for the selected channel are disabled, and PV becomes 0.			
Overscale	A status flag is set when overscale is detected. However, control continues during overscale.			
Underscale	A status flag is set when underscale is detected. However, control continues during underscale.			
Sensor error	A status flag is set when a sensor error is detected, and control output is turned OFF.			
Cold junction error	A cold junction error occurs when the internal cold junction temperature is below -10°C (14°F) or above			
•	50°C (122°F).			
	(Valid only for channels for which thermocouple input is selected)			
ADC error	If there is an error such as a failure in an internal circuit, the control output of the channel where the			
	error occurred is turned OFF.			
	When this occurs, the PV is 32767.			
Warm-up display	After the power is turned on, the power indicator flashes every 500 ms for about 3 seconds.			
Cumulative contact open/close count	Cumulative measurement of the control output ON/OFF count is possible.			
measurement function				
Cumulative energization time	Checking the cumulative energization time is possible.			
measurement function				
Cumulative heater energization time	Checking the cumulative heater energization time is possible for relay output and SSR output.			
measurement function				
Error history	In the event of an error, the bit ON/OFF status and energization time are saved. The 10 most recent			
	errors are saved.			
	Error history is available for each channel, and device common errors are saved in the all-channel			
	error history.			
	Error details Alarm 1, Alarm 2, Alarm 3, Alarm 4, Heater burnout alarm, Loop break alarm, Sensor error, Input error (overscale), Input error (underscale), Cold junction error,			
		le IC memory error, ADC error		
Ormania	0			
Console	Connect a communication cable (commercially available) to the console communication connector to			
communication	 	ternal computer using the console software (SWC-QTC101M).		
	Operations that can be	(1) Reading and configuration of SV, PID, and various other setting		
	performed	values		
		(2) Reading of PV and operating statuses		
	Communication protocol	(3) Modification of functions MODBUS RTU		
	Communication protocol			
	Communication cable	USB to Micro USB Type-B (Commercially available)		
	Software	Console software (SWC-QTC101M)		
Firmware update function	Connect the communication cable (commercial item) to the console communication connector, and			
	use the console software (SWC-QTC101M) to update the functions from an external computer.			

■ Other

Power supply voltage	24 V DC Allowable fluctuation range: 20 to 28 V DC		
Power consumption	5 W or less		
Rush current	Max. 10 A		
Accessories included	Line cap (1), Power supply terminal cover (1) (for devices with power supply / host communication function),		
	Mounting and wiring instruction manual (1)		
Accessories sold	Shunt resistor (50 Ω) (RES-S01-050), Front terminal cover (TC-QTC), CT for heater burnout alarm 20 A (CTL-6-S-H),		
separately	CT for heater burnout alarm 100 A (CTL-12-S36-10L1U), Heater burnout connector harness (WQ), Event input/output		
	connector harness (EVQ)		
Instruction manual	Please download the full Instruction Manual from the Shinko website.		
	https://shinko-technos.co.jp/e/		

■ Dimensions (Scale: mm)

Main Unit



Accessories Sold Separately

