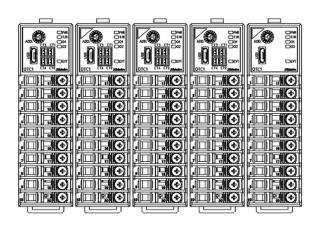
Control Module (2ch)

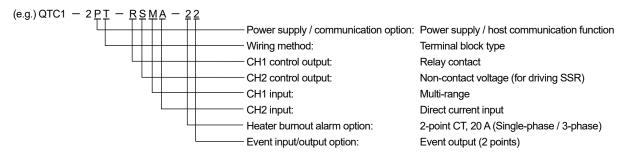
Model: QTC1-2



(Except Relay and Triac Output)



■ Model



QTC1—2							-		
Power	0								No options
supply /	Р								Power supply / host communication function
communica									
tion options									
Wiring metho	d	Т							Terminal block type
CH1 control of	output								Can autout and table
CH2 control of	output								See output code table
CH1 input									Cae input and table
CH2 input									See input code table
<u> </u>							-0		No options
Heater burno	ut alar	m optio	ons (*1)				-2		2-point CT, 20 A (Single-phase / 3-phase) (*2)
			-A		2-point CT, 100 A (Single-phase / 3-phase) (*2)				
								0	No options
Event input/output options								1	Event input (2 points) (*3)
								2	Event output (2 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	
		К	-200 to 1370°C	
		К	-200.0 to 400.0℃	
		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	
		С	0 to 2315℃	
	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℃	
	אוט	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)		
		4 to 20 mA DC	-2000 to 10000	
Α	Direct current	(Built-in shunt resistor)	2000 10 10000	
'`	2000 00110110	0 to 20 mA DC	-2000 to 10000	
		(Built-in shunt resistor)	2000 to 10000	
		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 Ω 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℃	-328.0 to 752.0°F	0.1℃(˚F)				
J	-200 to 1000°C	-328 to 1832°F	1°C(℉)				
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℃(℉)	0 to 1 V	2000 to	10000 (*)	1
N	-200 to 1300°C	-328 to 2372°F	1℃(°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℃	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	асу	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℃ (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	n temperature	Within ±1℃ at -10 to 50℃				
compensation	on 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/℃ 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	ectromagnetic	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				
i		Note: Fixed to 125 ms regardless of settings for thermocouple input and RTD input				

■ Control Performance

Control action		Control method selectable from 2DOF PID control, Fast-PID control, Slow-PID control, ON-OFF control, or					
		Gap-PID control. For optimal control, select the best control method according to the intended use and					
		process.					
		(Factory default: 2DOF PID contro	ıl)				
2	2DOF PID control	2DOF PID control					
F	Fast-PID control	A control method that offers both tracking characteristics with SV changes, and disturbance suppression					
	Slow-PID control	This method offers the same disturbance responsiveness as Fast-PID control as well as control action					
	Gap-PID control	with reduced overshooting.					
		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					
		-		tional gain 2DOF coefficient ($lpha$) is set to 1.00 and the derivativ			
		2DOF coefficient (γ , Cd)		` ,			
		Slow-PID control	13 361 10 1.0	0.			
			for process	eas where generating everebeet is not desired, and process			
				ses where generating overshoot is not desired, and processe			
		where the PV does not easily d	ecrease and	er naving exceeded the Sv.			
		Gap-PID control		the constitution with a state of the formation and the constitution of the constitutio			
		·	•	the operation unit, a slight fluctuation may be maintained nea			
				pand is usually used, but since control is not performed within			
				nt of a disturbance. In this way, this control method ensure			
			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			
				The setting range varies depending on the selected			
				integral/derivative decimal point position. 0.00 to 1.00 0.00 to 10.00 0.00 to 1.00 0.1 to 100.0 sec			
		Proportional gain 2DOF coeffi	cient (α)				
		Integral 2DOF coefficient (β)					
		Derivative 2DOF coefficient ()	r Cd)				
		Proportional cycle	, , , ,				
		Output high limit, output low lir	mit	0.1 to 100.0 sec 0.0 to 100.0% Direct current output: -5.0 to 105.0% 0.0 to 10.0% Proportional band × Gap width 0.0 to 1.0			
		Output high lithit, output low lif	int				
		Gan width /*\					
		Gap width (*)					
		Con coefficient (t)					
		Gap coefficient (*)					
<u> </u>		(*) With Gap-PID control only					
ON-OFF control		Control method that operates with	only two va				
		Item		Setting Range			
		ON/OFF hysteresis	0.1 to 100	00.0°C (0.1 to 1800.0°F)			
			Direct cui	rent input, DC voltage input: 1 to 10000			
Control range		Control output is turn ad OFF advan	the fell	og control ranges are overeded			
		Control output is turned OFF when the following control ranges are exceeded.					
		Thermocouple input (no decimal point)					
		, ,	, ,	nput range high limit +50℃ (90℉)			
		Thermocouple input (decimal poin	,				
		Input range low limit value - (Input span × 1%) °C (F) to Input range high limit + 50.0°C (90.0°F)					
		Direct current input, DC voltage inp					
		Scaling low limit value - Scaling	width × 1%	to Scaling high limit value + Scaling width × 10%			

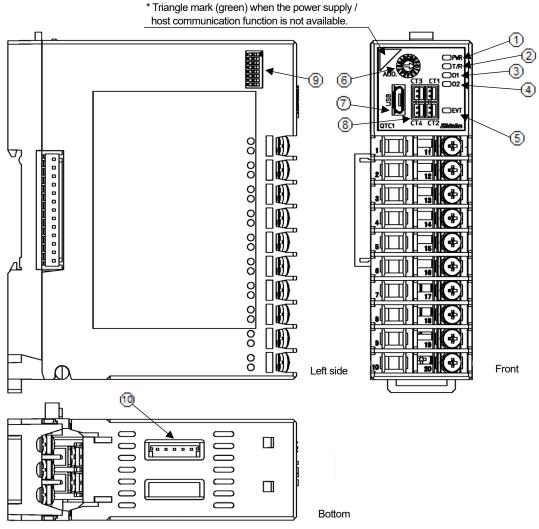
Control output	Relay contact output:	1a				
		Control capacity:3 A 250 V AC (resistive load)				
		$1 A 250 V AC$ (inductive load $\cos \varphi = 0.4$)				
		Electrical life: 100,000 cycles				
		Minimum applicable load: 10 mA 5 V DC				
	Non-contact voltage output	12 V DC ± 15%				
	(for driving SSR)					
		* 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. 150 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

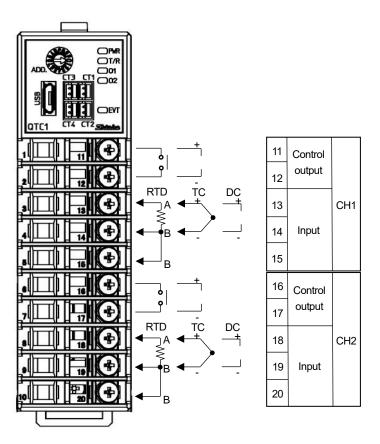
Action inc	icatoi				
No.	Symbol (color)	Name, Task		Symbol (color)	Name, Task
	PWR	Power indicator	3	O1 (green)	CH1 control output indicator
	(green)	Off: No power supplied to module		O2 (green)	CH2 control output indicator
1		On: Power supplied to module		EVT (red)	Event indicator
		Flashing: Internal error during warm-up			Lights up when an alarm is activated, a loop
	(Non-volatile memory, ADC input circuit)				break alarm is activated, or a heater burnout
	T/R Communication indicator		(5)		alarm (optional) is activated.
	(yellow)	Flashing: Normal communication, Communication			Flashes in the event of a sensor error or
2		error (reception error)			overscale/underscale.
		Off: Communications error (no response), USB			
communication					

Switches, Connectors

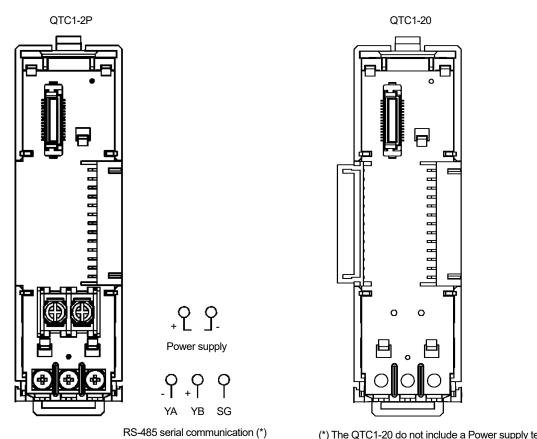
Switches,	Connectors							
No.	Symbol	Name, Task						
6	ADD.	Rotary switch for module address selection						
		Use the rotary switch to select the module address from 0 to F (1 to 16).						
7	USB	Micro USB Type-B console communication connector						
	CT1	CH1 CT input connector						
8	CT2	CH2 CT input connector						
(*1)	CT3	CH3 CT input connector (for Ch1 3-phase)						
	CT4	CH4 CT input connector (for Ch2 3-phase)						
9		DIP switches for selecting communications specification						
•		Use the DIP switches for selecting the communication speed, data bit, parity, stop bit, and communication protocol.						
10		Event input/output connector						
(*2)								

- (*1) When using the heater burnout alarm option (heater burnout alarm option symbols: -2, -A)
- (*2) When using the event input or event output option (event input/output option symbols: 1, 2)

■ Terminal Arrangement



Front



Base

(*) The QTC1-20 do not include a Power supply terminal and RS-485 serial communication terminal.

■ 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 enabled, control is performed at the specified change rate between the current PV and the SV.				
Setting range 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 disable			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 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 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) is substituted for the		
	slave-side SV (CH2), 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. Heating/cooling control cannot be selected for		
	CH2.		
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. 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 con	status flag during serial communication.		
Rating	Rating Single-phase/3-phase: 20 A, Single-phase/3-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)

1 1 1 1	,	
When an event input is input, the operations selected by the event input assignment selection are performed.		
Event input assignment selection No action, Control start/stop (CH independent), Control start/stop (CH interlock)		
No. of inputs	2	
Input method	Voltage contact input sink method	
Circuit 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 No action, EVT output (CH independent), EVT output (CH interlock)			
No. of outputs	2		
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 communication		
Communication speed	Selecting 9600, 19200, 3840	00, or 57600 bps is possible using t	the DIP switches. (Factory default: 57600 bps)
Synchronization method	Start-stop synchronization		
Data bit/parity	Data bits: 8		
	Parity: Selecting even	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		T	1
	Communication 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.

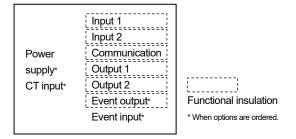
The communication protocol uses QW and QR commands, and PLCs capable of using A-compatible 1C frame AnA/AnU common commands (QR/QW) (D resister) are supported.

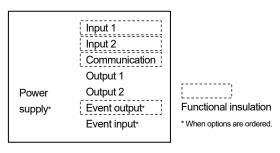
■ Insulation / Dielectric Resistance

Circuit Insulation Configuration

· Relay output, Open collector output, Triac output

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





	500 V DO 40 MO	
Insulation resistance	500 V DC, 10 MΩ or more	
Dielectric resistance	Between input terminal and ground:	1.5 kV AC for 1 minute
	Between power terminal and ground:	1.5 kV AC for 1 minute
	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

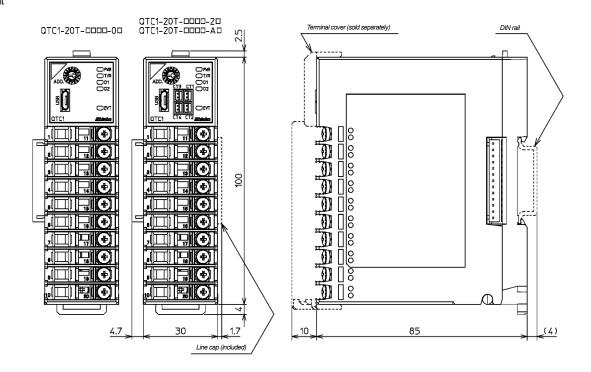
Power failure countermeasures	Setting data is backed up to non-volatile IC memory.		
Self-diagnosis	The watchdog timer monitors runaway and halt of the program, and when an abnormality is detected		
	it resets the MCU and initiali	zes the instrument.	
Automatic cold junction temperature	Detect the temperature 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 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	, , , , , , , , , , , , , , , , , , ,	failure in an internal circuit, the control output of the channel where the	
7.200	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 he	ater 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, Heater burnout alarm, Loop break alarm, Sensor error, Input		
		erscale), Input error (underscale), Cold junction error, Non-volatile IC error, ADC error	
	-	· · ·	
Console	Connect a communication cable (commercially available) to the console communication connector to		
communication	perform operation from an external 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	
		(3) Modification of functions	
	Communication protocol	MODBUS RTU	
	Communication cable	USB to Micro USB Type-B (Commercially available)	
	Software	Console software (SWC-QTC101M)	
Firmware update function		cable (commercial item) to the console communication connector, and WC-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 separately	Shunt resistor (50 Ω) (RES-S01-050), Front terminal cover (TC-QTC), CT for heater burnout alarm 20 A (CTL-6-S-H), 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

