

TEMPERATURE CONTROLLER

(Modbus, 4 digit, LED display type, size 48 × 48mm)

MODEL **TC10CM**

BEFORE USE

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Temperature controller
 (controller + CJC sensor, 1 pcs + terminating resistor, 1 pcs) ... (1)
 Mounting frame (1)
 Watertight packing (1)
 Engineering unit label sheet (1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures. For detailed explanations, please refer to the Model TC10CM operating manual (EM-9584-B).

This controller is programmable by using the PC Configurator Software. For detailed information on the PC configuration, refer to the TC10CFG users manual. The TC10CFG PC Configurator Software is downloadable at our web site.

■ SYMBOLS USED ON THE PRODUCT AND IN THIS MANUAL

△ The symbol indicated on the equipment means that the user must refer to the related parts in the manual for safe operation of the equipment. It is essential to read the instructions wherever the symbol appears in the manual.

△ **WARNING:** is reserved for conditions and actions that can cause serious or fatal injury.

△ **CAUTION:** is reserved for conditions and actions that can cause injury or instrument damage.

⚠ CAUTION

■ REGARDING SAFETY

• If the equipment is used in a manner not specified by us, the protection provided by the equipment may be impaired.

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2 and Installation Category II (transient voltage 2500V). Reinforced insulation (signal input or output or Modbus to power input: 300V) and basic insulation (signal input to output to Modbus: 300V) are maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.

- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
 * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-2 and properly indicate it.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
 100 – 240V AC rating: 85 – 264V, 47 – 66 Hz, approx. 4.5 – 6.5 VA

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 5 to 90% RH in order to ensure adequate life span and operation.

■ REQUIREMENTS TO ENSURE IP66

- Observe the designated panel cutout size (45 × 45 mm).
- The watertight packing included in the product package must be placed behind the panel.
- Confirm visually that the sealing is not contorted or excessively run off the edge after installation.

■ WIRING

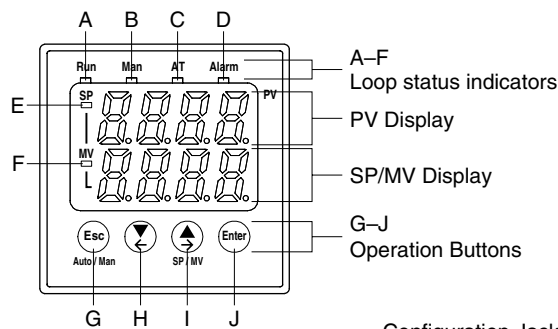
- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ AND

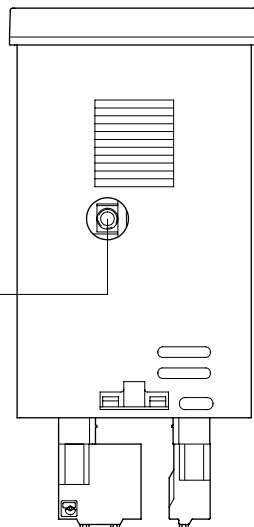
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.
- With voltage output, do not leave the output terminals shortcircuited for a long time. The unit is designed to endure it without breakdown, however, it may shorten appropriate life duration.

COMPONENT IDENTIFICATION

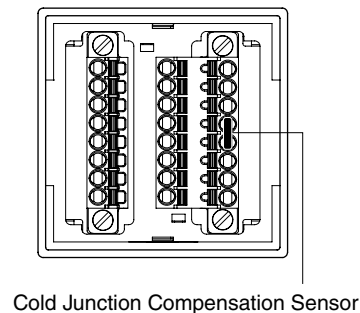
■ FRONT VIEW



■ BOTTOM VIEW



■ REAR VIEW



■ LOOP STATUS INDICATOR

No.	ITEM	FUNCTION
A	Run	Green LED turns on while loop is in operation.
B	Man	Green LED turns on during manual mode.
C	AT	Green LED turns on during auto-tuning.
D	Alarm	Red LED turns on while alarm is occurring.
E	SP	Red LED turns on while displaying SP value.
F	MV	Red LED turns on while displaying MV value.

■ OPERATION BUTTON

No.	ITEM	FUNCTION
G	Esc Auto/Man	Long-press during setting to return to the normal state. Press in the normal state to switch between auto and manual.
H	▼←	Press and release quickly to move down through numbers or settings. Long-press to move to the lower digit.
I	▲→ SP/MV	Press and release quickly to move up through numbers or settings. Long-press to move to the upper digit. Press in the normal state to switch between SP value and MV value.
J	Enter	Determine the setting value, and at the same time write the setting value to non-volatile memory.

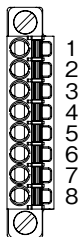
■ PV display

PV value is displayed in the normal state, and setting item is displayed during setting.

■ SP/MV display

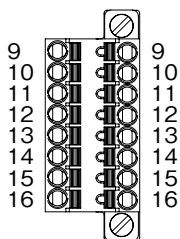
SP value and MV value are switched in the normal state, and setting item is displayed during setting.

■ Connector for power input, CT input 1, control output 3, 4



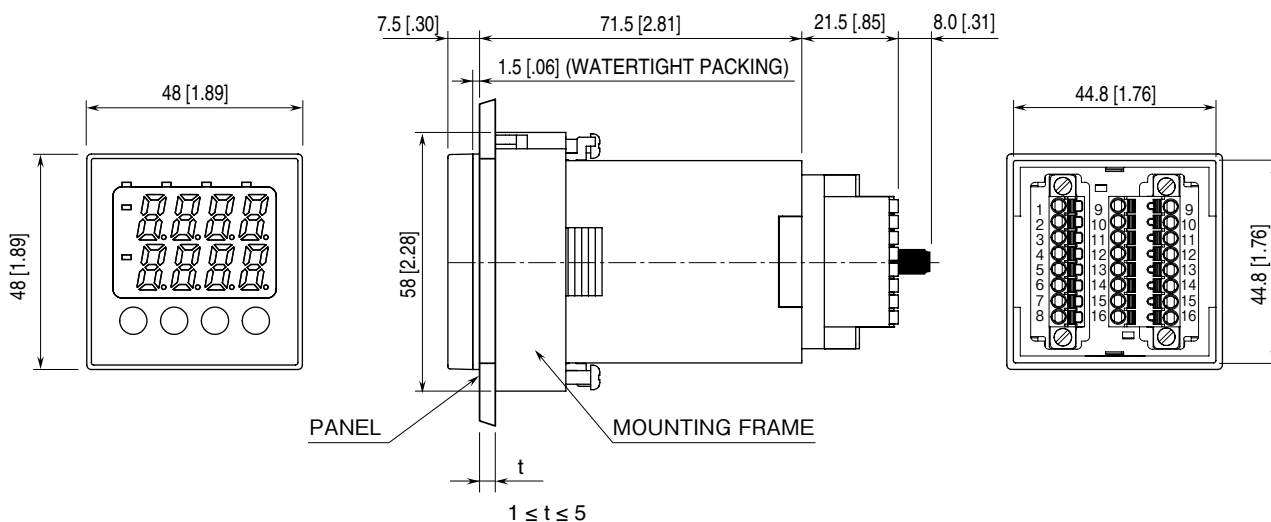
No.	ID	FUNCTION
1	Do1	Control output 3
2	Do2	Control output 4
3	COM	Control output 3, 4 COM
4	k	Clamp-on current sensor
5	l	Clamp-on current sensor
6	NC	Unused
7	U	Power input
8	V	Power input

■ Connector for universal input 1, control output 1, 2, Modbus



No.	ID	FUNCTION
9	Mv1	Control output 1
10	Mv2	Control output 2
11	COM	Control output 1, 2 COM
12	Pv1	Universal input 1
13	Pv2	Universal input 1
14	Pv3	Universal input 1
15	DA	Modbus
16	DB	Modbus

EXTERNAL DIMENSIONS unit: mm [inch]

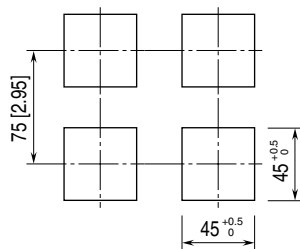


INSTALLATION

■ PANEL CUTOUT unit: mm [inch]

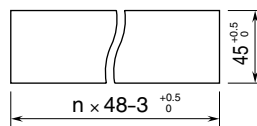
■ Single Mounting

(Conform to degree of protection IP66)



■ Clustered Mounting

(Not conform to degree of protection IP66)

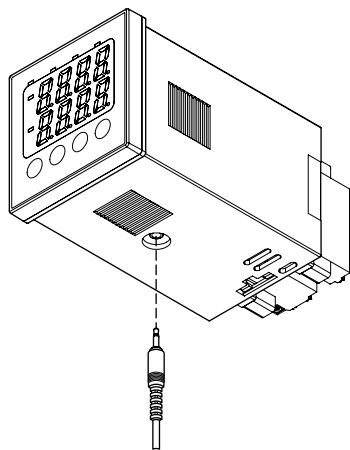


(n : number of the units)

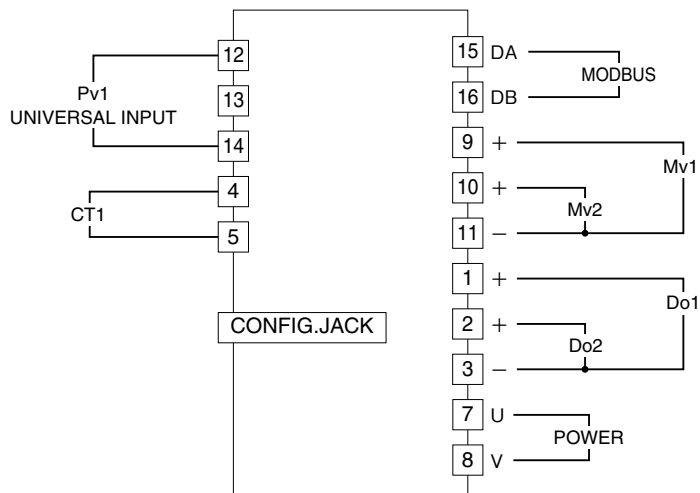
Panel thickness: 1 to 8 [0.04 to 0.31]

■ HOW TO CONNECT CONFIGURATOR CABLE

- The configuration jack is on the bottom of the unit.
When configuring after mounting the panel, keep enough space under the unit.

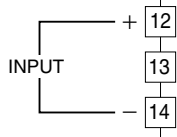


TERMINAL CONNECTIONS

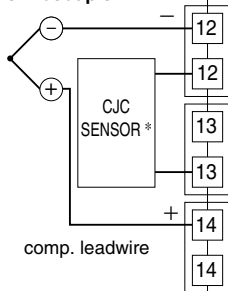


■ UNIVERSAL INPUT CONNECTION (Pv1) e.g.

- DC Current (0 – 20mA DC)
- DC Voltage (-1000 – +1000mV DC)
- DC Voltage (-10 – +10V DC)

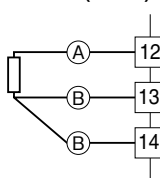


• Thermocouple

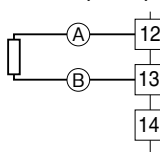


* The CJC sensor does not have polarity. Install compensation leadwire inside the t-branch connector, and CJC sensor on the outside.

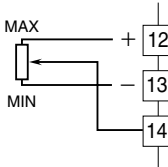
• RTD/Resistor (3-wire)



• RTD/Resistor (2-wire)

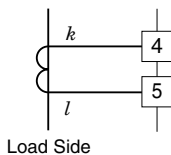


• Potentiometer

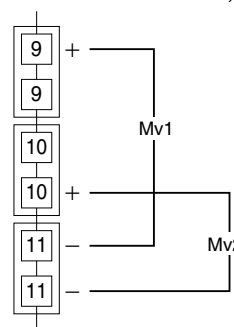


■ CT1 CONNECTION e.g.

- Clamp-on Current Sensor (model : CLSE)

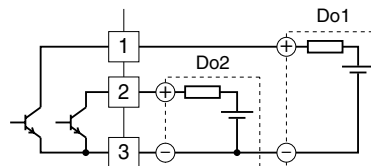


■ CONTROL OUTPUT Mv1, Mv2 CONNECTION e.g.

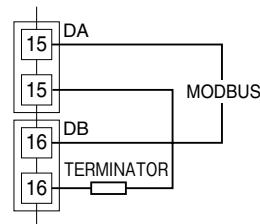


■ CONTROL OUTPUT Do1, Do2 CONNECTION e.g.

- Open Collector

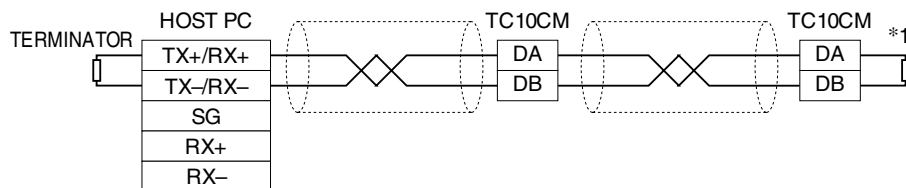


■ MODBUS CONNECTION e.g.



CONNECTION DIAGRAMS

■ MASTER CONNECTION



NO.	ID	FUNCTION
15	DA	DA
16	DB	DB

*1. For using attached terminator, mount it between terminals 15 and 16.

■ SEPARABLE TENSION CLAMP TERMINAL

Unit side connector: MC 1,5 / 8 - GF - 3,5

TFMC 1,5 / 8 - STF - 3,5 (Phoenix Contact)

Cable side connector: FMC 1,5 / 8 - STF - 3,5 (Phoenix Contact)

Applicable wire size: 0.2 – 1.5 mm²

Stripped length: 10 mm

Recommended solderless terminal

- AI0,25 - 10YE 0.25 mm² (Phoenix Contact)
- AI0,34 - 10TQ 0.34 mm² (Phoenix Contact)
- AI0,5 - 10WH 0.5 mm² (Phoenix Contact)
- AI0,75 - 10GY 0.75 mm² (Phoenix Contact)
- A1 - 10 1.0 mm² (Phoenix Contact)
- A1,5 - 10 1.5 mm² (Phoenix Contact)

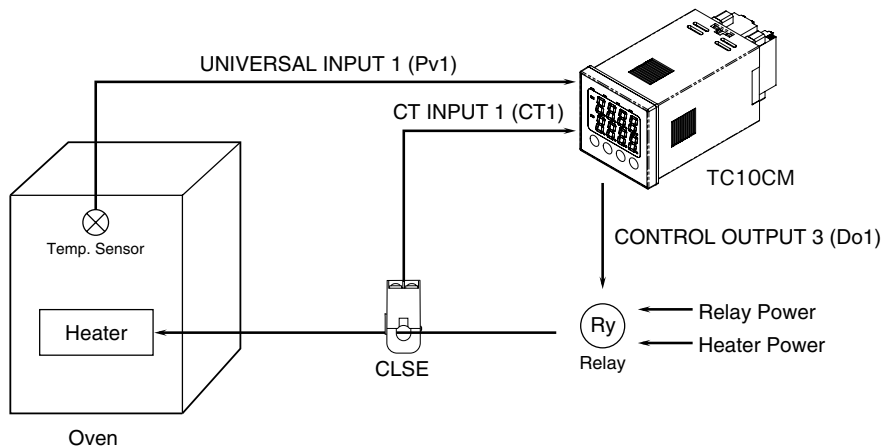
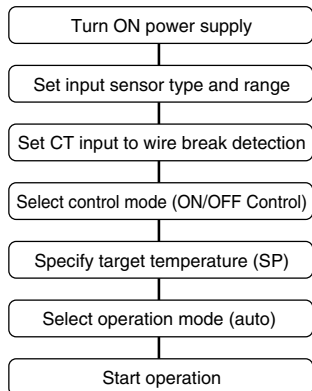
SYSTEM CONFIGURATIONS & CONTROL EXAMPLES

■ Heating ON/OFF control and heater wire break detection

1. Installation example:

- Temperature Controller (model: TC10CM)
- Clamp-on Current Sensor (model: CLSE)
- Oven
- Heater
- Relay
- Temperature sensor

2. Process until start operating:

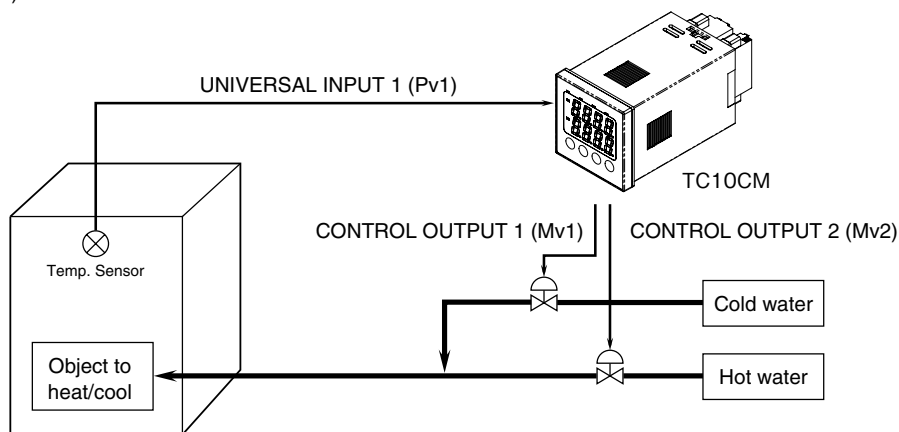
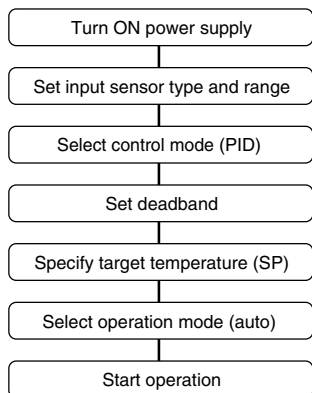


■ Heating and cooling control (PID)

1. Installation example:

- Temperature Controller (model: TC10CM)
- Object to heat/cool
- Temperature sensor

2. Process until start operating:



LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.