
TC-2xx Digital Temperature Controller

Instruction Manual A1.0

Feature:

TC-2xx series is heating/cooling thermostat, Front panel water-proof level is IP65, easy to install and operate.

Main Function

-  Cooling/Heating working mode
-  One temp. Measurement/ display
-  One/two output(s)
-  Sensor calibration, failure warning
-  Control output delay protection
-  Buzzer alarm output












Model list:

Model	Function
TC-210	One heating/cooling control output, one temperature sensor measurement
TC-220	Two heating/cooling control output, one temperature sensor measurement

Size Specification

1. Front panel dimension: 78* 34.5mm
2. Drilling template: 71* 29mm
3. Whole device dimension: 78* 34.5* 71mm
4. Length of sensor(s): 3m (including the sensor probe)




Technical Specification

-  Temperature Sensor: NTC
-  Setting range: -50~150℃
-  Display Range: -50~150℃
-  Working Temperature: -10~45℃
-  Storage Temperature: -30~70℃
-  Humidity: 5~85%RH (Without dewing)
-  Power Supply: AC185~245V 50HZ
-  Terminal: wire 2*1.5mm²
or 1*2.5mm².
-  Load Current: 7A 250Vac (Resistive Load)
-  Case: PC + ABS Fireproof
-  Protection Degree: IP65(Front panel)

Display Indication

When no alarm, and no operation for 30 seconds, the brightness will darken to save device power consumption.

Display Signs Description


Icon	Function	On	Off	Blinking
	Output 1	Output 1 active, or setting set-point 1	Output 1 de-active	Output 1 delay protecting
	Output 2	Output 2 active, or setting set-point 2	Output 2 de-active	Output 2 delay protecting
	Alarm	----	No Warning	Warning



Panel digits Description

No.	Display Code	Instruction
1	“E1”	temperature sensor fault (Short circuit or open circuit)
2	“EE”	Data access error
3	“Err”	Password error
4	“UnL”	Restore to the default parameter

Key Operation

Set Cooling/heating temperature

Keeping [S] pressed for 3 seconds to enter temperature setting mode. The digits is blinking showing the current “set temperature”, the “” lights up.

(For model TC-220: Press [P] to select setup temp 1 and temp 2. “” means setting set temp1, “” means setting set temp 2.)

Press key [▲] or [▼] to change the set temperature (Keeping [▲] or [▼] pressed, it will be adjusted quickly); Press [S], the set temperature will be saved and leave the setting mode.

Note: Do not press any keys for 30 seconds; the device will leave the set mode, and saving the set data.

Set System Parameters

Keeping [P] pressed for 3 seconds, the system will give a short beep, and enter into system parameters setting.

If the password is “0000”, the password is disabled, the system will show parameter code now.

If the password is not “0000”, the password is enabled, the system will show [---0]. Press [▼] to select the digit, press [▲] to select the value of the digit(0-9), press [S] to confirm. If the password is wrong, it will shows [Err], and exit the setting mode, and beeping 3 times. If the password is correct, the system will give a short beep, and show parameter code now.

Press [▲] or [▼] to select the parameter code. Press [S] to show its value. Press [▲] or [▼] to set the value. Press [S] to return parameter code display status.

Exit the setting mode:

Keep depressing [P] for 3 seconds, the set parameters will be saved, the mode exits.

If do not press any key for 30 seconds, the mode will exit, the setting will be saved.

TC-210 Parameter Code:

No.	Parameter code	Function	Range	Note	Factory setting
1	F11	Set temperature 1	U14~U13		20
2	F12	Temperature difference 1	0.1~20.0°C		1.0
3	F21	Output delay protection 1	0~10min		3
4	F29	Working mode 1	CO/HE	CO: Cooling HE: Heating	C0
5	U13	Max set temperature	-50°C~150°C	U14≤U13	60°C
6	U14	Min set temperature	-50°C~150°C		-20°C
7	U20	Sensor calibration	-20~+20		0
8	U30	Buzzer alarm	0/1	0:enable, 1:disable	0
9	U99	password	0000~9999	If 0000, disabled	0000
10	End	End			

TC-220 Parameter Code:

No.	Parameter code	Function	Range	Note	Factory Setting
1	F11	Set temperature 1	U14~U13		20
2	F12	Temperature difference 1	0.1~20.0°C		1.0
3	F21	Output delay protection 1	0~10min		3
4	F29	Working mode 1	CO~HE	CO: cooling HE: Heating	C0
5	L11	Set temperature 2	U14~U13		10
6	L12	Temperature difference 2	0.1~20.0°C		1.0
7	L21	Output delay protection 2	0~10min		3
8	L29	Working mode 2	CO/HE	CO: Cooling HE: Heating	HE
9	U13	Max set temperature	-50°C~150°C	U14≤U13	60°C
10	U14	Min set temperature	-50°C~150°C		-20°C
11	U20	Sensor calibration	-20~+20		0
12	U30	Buzzer alarm	0/1	0: enable, 1: disable	0
13	U99	password	0000~9999	If 0000, disabled	0000
14	End	END			

**Control Function Description:****Cooling****■Control output**

- ◇ When the temperature \cong “Set temperature”+ “Temperature Difference” ,
and the output has stopped for “Output delay protection”,
the output starts.
- ◇ When the temperature \cong “Set temperature”, the output stops.

Heating

■ Controlled output

- ◇ When the temperature \cong “Set temperature”- “Temperature Difference” , and the output has stopped for “Output delay protection”, the output starts.
- ◇ When the temperature \cong “Set temperature”, the output stops.

Output delay function

- ◇ After power supply, the output is able to start only after the time (Output delay function) has passed
- ◇ After the output stops, it is able to restart again only after the time (Output delay function) has passed.

Buzzer Function

Buzzer sounds shortly for every key press. When confirming the parameter setting, it sounds longer. 3 short beeps means invalid.

When the system comes wrong or external alarm input, the buzzer alarm function will be off if U30=0, or the buzzer continuous alarming if U30=1. After the system problem solved and disappears, warning will stopped.

Calibration Function

When there is tolerance between the measured temperature and real temperature, set (temperature calibration) to calibrate. The calibration range is $\pm 20^{\circ}\text{C}$. When setting the parameter, the step is 0.1°C for key $\llbracket \blacktriangle \rrbracket$ or $\llbracket \blacktriangledown \rrbracket$. Keep the key pressed, the set data will increase/decrease continuously and quickly.

Restoring the Default Parameters and Password:

Keep **[P]** and **[▲]** keys pressed for 5 seconds, buzzer sounds and the device displays “UnL”, press **[▼]** twice, buzzer sounds, system auto restores the default parameters and password“0000”.

Controller Installation

Warning:

Avoid installing the device in the following environment:

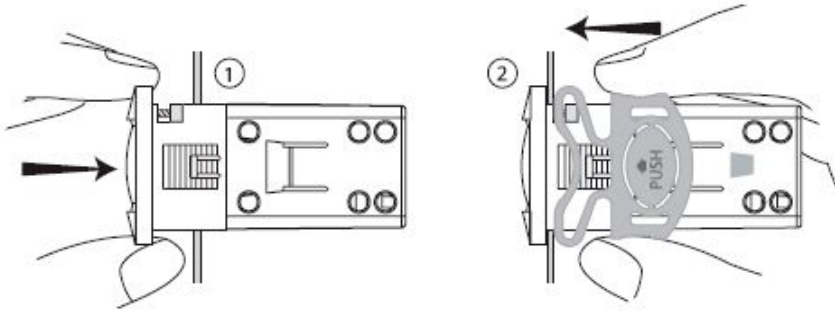
- Relative humidity is greater than 90%, or possibly dewing.
- Strong vibration.
- Possibility be dropped, or within fog.
- Exposed to eroding and polluting gases (such as: air containing sulfur and ammonia, salty fog, smoky mist) to prevent erosion and oxidation.
- Ambient containing explosive or inflammable materials/gases.



Installation Procedure

Insert the controller into hole (step one)

Slide the bracket to fix the device (step two)



Electrical Connection



Warning

- Electrical wiring must be manipulated by certified electrician.
- Wrong power supply may damage the device and system seriously.
- Try with effort to layout the sensors and switches line apart from inductive load lines and power supply lines. The sensors and switches lines are not allowed go with the power supply lines and inductive load lines in a same pipeline, and are not allowed to pass near the contactor, breaker and the similar.
- Reduce the length of sensors' wiring as possible, avoid forming a spiral shape near the power devices.
- Avoid direct contact with the internal electronic components.
- After finish and check the electrical wiring layout, before connect them to the device, please follow this instruction: Pay attention the "electrical wiring diagram" below, wrong connection possibly damages the device and the system, and may be dangerous to the user. All security and protecting device for the equipments are necessary. They are very important to protect the equipments, and the user's safety.

Electrical wiring diagram:

