User Manual

Model No: **TC-10A**

Thank you for purchasing the **Temperature Controller** by Poniie. Please read this manual carefully before using this product.

1. Safety Precautions

1.1 Ensure the product is used within the specification (Max. 10A).

1.2 Induction loads such as **compressors**, **refrigerators**, **space heaters**, **pumps** may have a start-up amp of 2 to 7 times the continuous rating. Overload start-up amp may cause damage or shorten device's lifespan.

1.3 Do not operate the controller near any high temperature, high humidity, explosive or inflammable field.

1.4 Children are not allowed to operate the device. Keep children away from the controller.

1.5 Do not use in salt water or corrosive water, the metal NTC probe will be slowly damaged by salt water or acid-alkali water.

2. Overview

What is TC-10A?

TC-10A is an easy-to-use, safe and reliable dual relay output temperature controller. It can be connected to both heating and cooling loads at the same time to control temperature.

This unit can be used as over temperature protection or automatic temperature control system for various tasks. Such as Sous-vide, Terrarium Heat Control, Heat Mats, Germination, Fermentation and Brewing.

Main features

- Pre-wired plug and play;
- Dual relay output for heating and cooling;
- Support reading with ℃ and ℉;
- Dual display windows, be able to display measured temperature and set center temperature at the same time;
- Auto saving function with power-off memory;
- Calibration function;
- Compressor delay protection;
- High and low temperature alarm;
- Faulty sensor alarm

3. Specification

Temperature Control Range	-20.0 ~ 80.0℃
Temperature Resolution	0.1℃
Temperature Accuracy	±1.0 ℃ (-20.0 ~ 70.0 ℃)
Input Power	100~125V, 50/60Hz
Maximum Output Load	10A, 100 ~ 125V (1200W @120V)
Buzzer Alarm	Low and High Temperature Alarm
Sensor Type	NTC sensor
Control Panel Cable Length	1.5m / 4.9ft
Input Power Cable Length	1.7m / 5.6ft
Sensor Length	2.0m / 6.6ft
Ambient Temperature	-20.0 ~ 55.0 ℃
Ambient Humidity	20~85% (No Condensate)

4. Key Operation Instruction

4.1 Dual display.

The upper window, in working mode, displays current environment temperature and working status; in setting mode, displays menu code.

ON: Refrigeration is in working state;

FLASHING: Refrigeration is in compressor delay time.

ON: Heating is in working state;

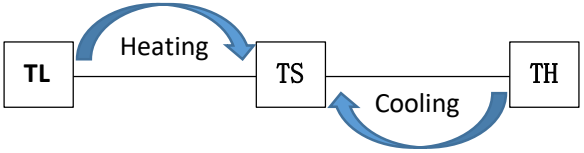
OFF: Not working.

The lower window, in working mode, displays **shutdown temperature point (TS)** for both heating and cooling (It can be taken as the central temperature point); in setting mode, displays setting value of menu codes.

When controller working normally, press "▼" key, the setting Low Temperature (TL) point is displayed; press "▲" key, the setting High Temperature (TH) point is displayed. The screen will auto return to normal display after 2 seconds.

4.2 How to set parameters?

Basic Setting Mode: Press "**SET**" key to enter the basic setting mode, You only need to set three temperature points TL, TS and TH to set a suitable control range. TL/TS/TH relationship is as follows:



After setting, hold down the "**SET**" button 3 seconds or leave it with no operation 15 seconds, the system will save the parameter changes and return to the working mode.

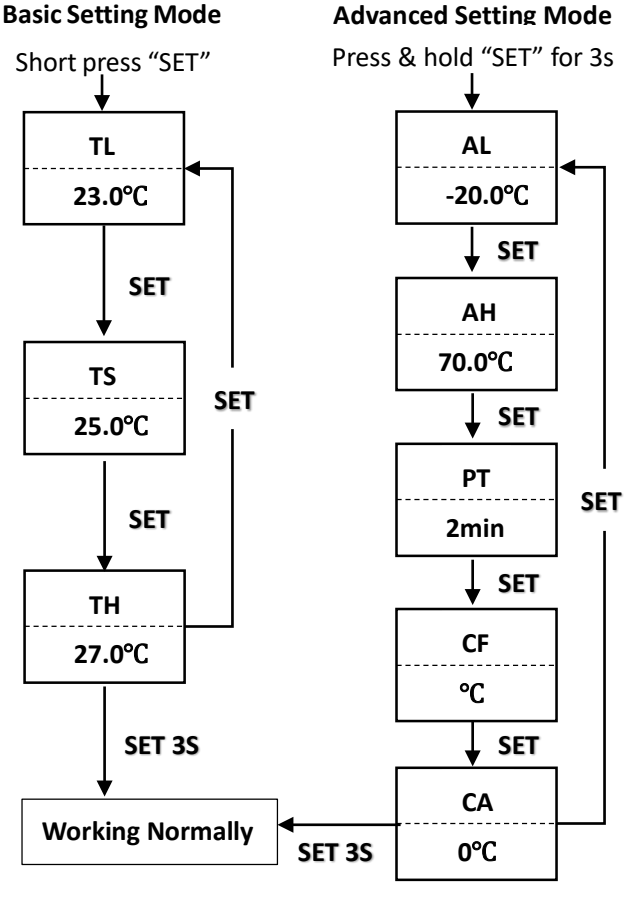
Note: You can only set the basic Settings, leaving the advanced Settings unchanged, and only change the advanced Settings parameters if necessary.

Advanced Setting Mode: Press & hold down "**SET**" key 3 seconds to enter the advanced setting mode. You are able to set AL (Low Alarm Temperature point), AH (High Alarm Temperature point), PT (Compressor Protection Time), CF (℃/℉ Display setting) and CA (Calibration function) parameters. After settings, press & hold down "**SET**" key 3 seconds or leave it with no operation 15 seconds to save parameter changes and return to working mode.

User Tips: 1) Under setting mode, press "**SET**" key to cycle through all parameter codes, press "▼"& "▲" to adjust the setting values below.

2)Press & hold down "▼" & "▲" can adjust setting value more quickly.

5. Setup Flow Chart



6. Menu Instruction

Menu Code	Function	Setting Range	Default Setting	Remarks
TL	Low Temperature Point	-20.0~80.0℃	23.0℃	**6.1**
TS	Shutdown Temperature Point	-20.0~80.0℃	25.0℃	
TH	High Temperature Point	-20.0~80.0℃	27.0℃	
AL	Low Alarm Temperature	-20.0~(TL-0.5)℃	-20.0℃	**6.2**
AH	High Alarm Temperature	(TH+0.5)~80.0℃	70.0℃	
PT	Compressor Delay	0~10min	2min	**6.3**
CF	℃/℉ Display	℃/℉	℃	**6.4**
CA	Temperature Calibration	-20.0~20.0℃	0℃	**6.5**

6.1 Temperature Control Range Setting (TL, TS, TH)

This controller has a heating and cooling control outlets. However, you can only use the heating or cooling side for your project.

When measured temperature ≤ TL, system enter heating state, the heating outlet relay starts to work; when it heats up to shutdown point (TS), the heating relay stops.

When measured temperature ≥ TH, system enter cooling state, the cooling outlet relay starts to work; when it cools to shutdown point (TS), the cooling relay stops.

In case the time interval between two cooling action is less than PT, please refer to **6.3**.

Caution: Please be aware of the temperature surge risk when setting a large temperature gap between TL--TS /TS--TH. Recommend to set the gap smaller than 10 degrees. The tighter gap the more stable real temperature.

Note: Please check and test your setting every time before leaving controller to a long-term running.

6.2 Temperature Alarm Setting (AL, AH)

When measured temperature ≤ AL, low temperature alarm will be triggered, buzzer will alarm until temperature＞AL or any key is pressed.

When measured temperature ≥ AH, high temperature alarm will be triggered, buzzer will alarm until temperature＜AH or any key is pressed.

Note: If you set the AL ≥ TL, then the real low temperature alarm point is TL-0.5℃. If you set the AH ≤ TH, the real high alarm point is TH+0.5℃.

6.3 Compressor Protection Time (PT)

Under cooling mode, compressor protection will keep the refrigeration off between cycles to protect your compressor. That means compressor won't start refrigeration immediately, but waiting for a delay time if it falls into the PT time frame. Delay time will be

calculated right after the moment refrigeration stops.

6.4 Display in Celsius or Fahrenheit degree (CF)

Users can select display in Celsius or Fahrenheit degree unit according to their needs. Default setting is ℃.

Note: when you select Fahrenheit unit, the display for over 100℉ will be a whole number, resolution becomes 1℉.

6.5 Temperature Calibration (CA)

When there is a deviation between measured temperature and actual temperature, you can use the calibration function to align the measured temperature and actual temperature. The corrected temperature equals to temperature before calibration plus corrected value (corrected value can be positive, 0 or negative value)

7. Error Description

1) If LED displays flashing code AL or AH, please kindly check your AL or AH setting in advanced setting mode. Buzzer will alarm until temperature fall into setting range or any key is pressed (the flash indication will continue unless the temperature goes into normal range).

2) If LED displays code ER, then sensor is in short circuit or open loop. Please contact Poniie customer service (support@poniie.com) for solution.