Instruction Manual

TD130A/AW-TD130W TEMPERATURE CONTROLLER

INSTRUCTION MANUAL

Version 1.3 (June, 2021)

1. Overview

This instruction manual is for TD130A (non-WIFI) and AW-TD130W (WIFI) temperature controllers. This controller contains one temperature probe and two independent outputs. One output is for cooling devices such as refrigerators and the other one is for heating devices. It can be used for applications such as beer fermentation or to convert a refrigerator into a kegerator. By using both cooling and heating devices, the refrigerator can be controlled at specific temperature, regardless if it's in the hot summer or cold winter.

No wiring is required for this plug-n-play controller. User only needs to plug in the power cord from heater/cooler to the output sockets on the controller. Both the heating and cooling control modes make use of a simple on/off control. This controller is similar to the control mode of mechanical thermostat but with much higher precision due to the adjustable hysteresis band, precise temperature sensor and digital readouts. In addition, an anti-short function has been provided to protect the compressor from being cycling on/off during high pressure Freon.

Unlike other two-stage temperature controllers with economic NTC/PTC thermistor sensors, this controller uses a digital silicone bandgap sensor as a more reliable and accurate option for moist environments. These silicone bandgap sensors can be fully immersed in water over extended periods of time without any issues, and perform with more precision and uniform accuracy over an entire specific temperature range.

A reversed logic function has been recently added to this model, which can activate the one single output when temperature is in a range set by HSP (heating setpoint) and CSP (cooling setpoint). For details, see note 7 on page 3.

2. Specification

Temperature Control Range	-50 ~ 105°C, -58 ~ 221°F
Temperature Resolution	0.1 °C (between -9.9 ~ 99°C) 1 °C (between -50 ~ -10°C, 100 ~ 120°C) 0.1 °F (between -9.9 ~ 99.9°F) 1 °F (between -58 ~ -10°F, 100 ~ 248°F)
Temperature Accuracy	0.5 °C or 0.9 °F
Temperature Control Mode	On/Off Control. Heating and Cooling
Temperature Control Output	10A, 120V or 240V AC*
Audio Alarm	High and Low Limit
Sensor Type	Silicon Band Gap Sensor
Sensor Size	0.25" OD (6.35 mm) x 1" (25mm) long
Ambient Temperature	0 ~ 120°F (-20 ~ 50°C)
Dimension	91 x 140 x 46 mm
Input Power	85 ~ 242V AC, 50Hz/60Hz
Sensor Cable Length	6 ft (2m)
Power Cable Length	3 ft (1m)
Warranty	1 Year Limited Warranty

*: Either the heating or cooling output is limited to 10 Amps. The output voltage is the same as the input voltage. When the controller is plugged into 120V AC, the output will be 120V AC. If the controller is connected to 240V AC, the output will be 240V AC.

3. Front Panel

Figure 1a. Front Panel (TD130A)

Figure 1b. Front Panel (AW-TD130W)

4. WIFI setup (for WIFI model only)

Please download the latest AuberWIFI app from the iOS App store or Android Google Play Store and process the setup through the app. For support, please visit help center section under auberins.com, then look for "App with WiFi setup" page. To reset the WIFI function of this controller, push down and hold the SET key and down arrow key together at simultaneously for about 3s. Then WIFI indicator will then

blink fast (4 Hz). It indicates that the controller is ready for a new set up. After the controller has setup to your phone successfully, the WIFI indicator will be solid ON.

5. Setup Flow Chart

When the controller is powered on, it will display the measured temperature. The controller will keep running based on the saved settings. If the temperature sensor is shorted/disconnected, the controller will display "Err". Please see Figure 2 and Figure 3 for the flow chart to set the parameters.

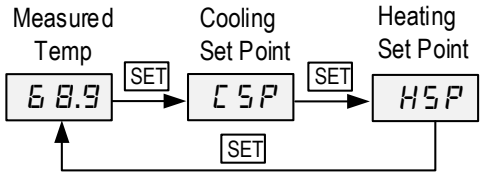


Figure 2. Flow Chart Part 1

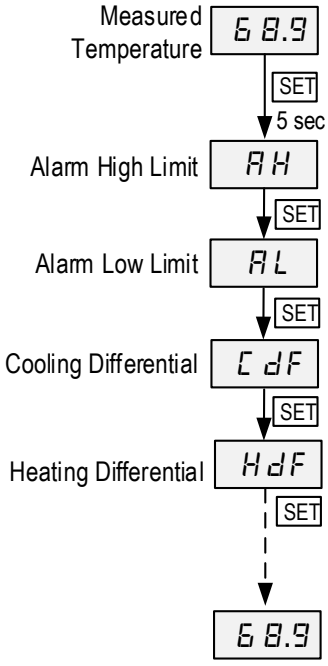


Figure 3. Flow Chart Part 2

6. Parameter Settings

To change the target temperature (set points), press the SET key momentarily. The controller will show the CSP (Cooling set point); if you press the SET key again, it will show the HSP (heating set point). When the controller shows CSP or HSP, use the Up or Down key to change the value. Then press the SET key to confirm the change. See figure 2 for details.

To change the system parameters, press the SET key for 5 seconds. The controller will then enter into parameter menu. The first parameter AH will show on the display. Use the Up or Down key to modify the parameter value. Then press the SET key to confirm the change. The display will show the parameter again. Press the SET key to show the next parameter. The instrument will automatically exit if no key is pressed for 10 seconds. See figure 3 & table 1 for details.

Table 1. Parameters Description

Code	Symbol	Description	Setting range	Initial	Note
Menu for set points (Figure 2)					
CSP	CSP	Cooling Set Point	-58 ~ 248ºF -50 ~ 125ºC	67.0	1
HSP	HSP	Heating Set Point	-58 ~ CSPºF -50 ~ CSPºC	62.0	
Menu for parameters (Figure 3)					
AH	AH	Alarm High Limit	-58 ~ 248ºF -50 ~ 125ºC	95.0	2
AL	AL	Alarm Low Limit	-58 ~ AHºF -50 ~ AHºC	34	
CdF	CdF	Cooling Differential	0 ~ 50.0ºF	3.0	1
HdF	HdF	Heating Differential	0 ~ 50.0ºF	0.0	
AS	AS	Cooling Antishort	0 ~ 12 min	0	3
SFA	SFA	Sensor Failure Operation	0-0, 0-1, 1-0	0-0	4
oFS	oFS	Temperature Offset	0 ~ 10.0	0	5
C-F	C-F	Temperature Unit	C: Celsius F: Fahrenheit	F	6
LGC	LGC	Logic Control	nor, r-C, r-H	nor	7
rST	rSt	Factory Reset	no, YES	No	8
PSd	PSd	Device Access Password	000~777	777	9

Note 1. For cooling (or heating), the output will be turned off when the temperature is below (or over) the set point; it will turn back on when the temperature rises up (or drops down) to CSP + CdF (or HSP - HdF).

The maximum value of the HSP can be set is the current value of CSP. But CSP can be set to the value between -58 ~ 248ºF or -50 ~ 125ºC. When the CSP is set to a value lower than current HSP, the HSP will be adjusted to the CSP value automatically.

For example, when CSP = 67.0ºF, HSP = 62ºF, HSP can be set to any value between -58ºF and 67.0ºF. For CSP, it can still be set to any value between -58ºF and 248ºF. If you set it to 55.0, the HSP will be adjusted to 55.0ºF automatically.

Small differentials (CdF/HdF) give tight control; large differentials reduce the frequency of cycle on and off. It will extend the life of relay and compressor. Please adjust both differentials accordingly.

Note 2. When the measured temperature is higher than AH, the high limit alarm will be on; when the measured temperature is lower than AL, the low limit alarm will be on.

When the alarm is on, the display will be flashing between the measured value and alarm type. To mute the alarm, press the Down key momentarily. If the measured value gets out of the alarm zone then gets back to the alarm zone again, the alarm will sound again. To disable the alarm, set AH the same value as AL (AH = AL).

The maximum value of the AL can be set is the current value of AH. The AH value can be set at -58 ~ 248ºF or -50 ~ 125ºC. When AH is set to a value lower than current AL, the AL will be adjusted to the AH value automatically.

For example, when AH = 95.0ºF, AL = 32ºF, AL can be set to any value between -58ºF and 95.0ºF. For AH, it can be set to any value between -58ºF and 248ºF. If you set it to 25.0ºF, the AL will be adjusted to 25.0ºF automatically.

Note 3. The Cooling Anti-short is the delay time to turn the cooling load on. When the controller is used for cooling and load is a compressor, it should not turn on the compressor when it is at high pressure (just right after it turned off). Otherwise, it may shorten the life of the compressor. The anti-short cycle delay function can be used to prevent the rapid cycling of the compressor, establishing the minimum time that the NO contact remains open (after reaching cutout) before closing again. The delay overrides any Load Demand and does not allow the NO contacts to close until the set time-delay value has elapsed, giving the system time to release the refrigerant pressure through evaporator. It is typically set to 4 ~ 6 minutes.

Note 4. The SFA defines how the output would be if the sensor fails. It can be set to 0-0, 0-1, or 1-0. Please refer to table 2 for details.

Table 2. Output of the controller when sensor fails:

SFA	Controller output when sensor fails
0-0	cooler off, heater off
1-0	cooler on, heater off
0-1	cooler off, heater on

For example, when this unit controls a refrigerator for food, you may want to set the SFA to ON if the sensor fails to keep the food cold. When it controls a heater, you may want to set the output to OFF for safety purpose.

Note 5. The offset is used to set an input offset to compensate the error produced by the sensor or input signal itself.

For example, for temperature, if the unit displays 37ºF when the actual temperature is 32ºF, setting parameter oFS = -5 will make the controller display 32ºF.

Note 6. C-F determines the temperature unit. It can be set to C (Celsius, ˚C) or F (Fahrenheit, ˚F).

Note 7. (Advanced feature) LGC Control Logic This parameter is used to change the current control logic mode. Three modes are available:

- NOR -- normal control logic (default)
- R-C -- reverse logic, output send to Cooling socket (left)
- R-H -- reverse logic, output send to Heating socket (right)

Under the default mode (NOR), when this controller is calling for heat, the heating output socket on the right will be triggered. When this controller is calling for cool, the cooling output socket on the left will be triggered.

If the controller is set to reverse modes (R-C/R-H) when this controller is calling for heat or cool, the output is disabled. In other conditions, the output will be triggered. You can assign this output to cooling the socket (R-C), or heating socket (R-H). For details, see flow chart below.

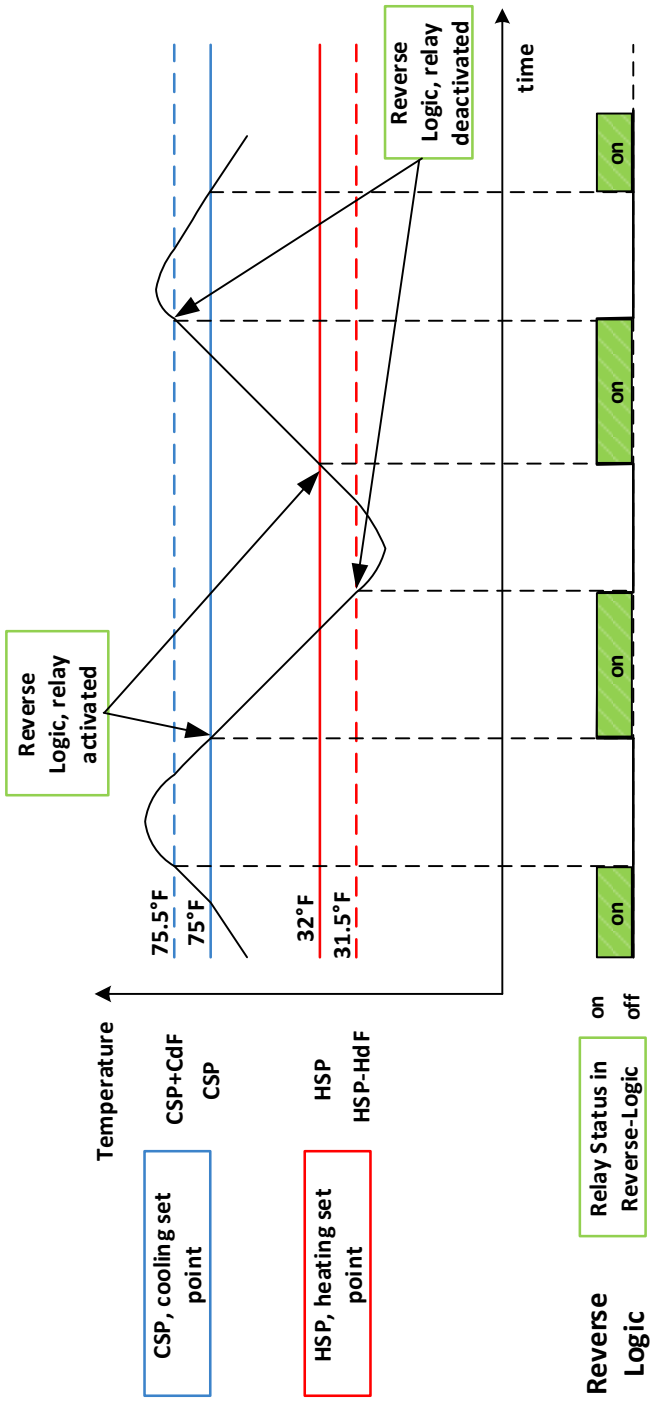


Figure 4. Reverse mode flow chart

Explanation:

1. The plot on the top shows how the room temperature changes as time goes by. The diagram on the bottom shows the status of the output relay as temperature move across each set point.

2. There are two Set Points -- CSP and HSP. Each Set Point has its own output relay, Cooling Relay and Heating Relay. Each Set Point has a control differential value, CdF or HdF.

3. In the Reverse Logic mode, users can choose to use either the Cooling Relay (output socket on the left) or the Heating Relay (output socket on the right) to drive an external load.

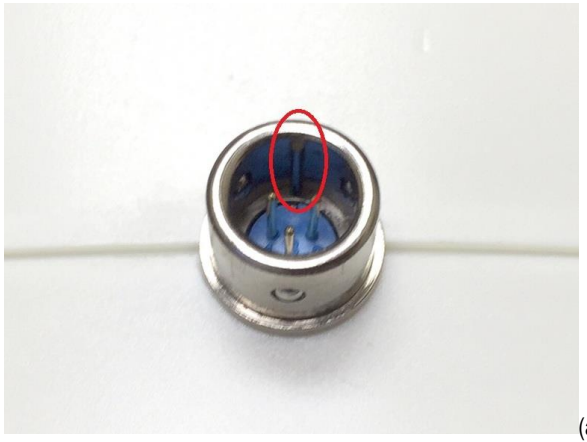
4. In the Reverse Logic mode, the relay will be energized when the probe reading is within the temperature range set by CSP (75°F) and HSP (32°F) as well as their differential bands CdF and HdF.

Note 8. rST is the factory reset parameter. Choose "Yes" to reset all the parameters back to factory settings.

Note 9. PSd is the device access password (AW-TD130W only). This parameter is used to lock the parameter settings on AuberWIFI App.

7. How to install the sensor to the unit.

The connector of the sensor contains a slot for fitting pin connection. It also has a spring lock to prevent disconnections from accidental pulling on the cable. To connect the sensor to the controller, 1) identify the key on the male connector (Figure 5, a) and the notch on the female connector (Figure 5, b); 2) hold the tail of the female connector, align the notch and the key, and push the female connector forward (Figure 5, c). To remove the connector, hold the spring-loaded collar on the female connector and pull it back. Please see Figure 6.


(a)


(b)

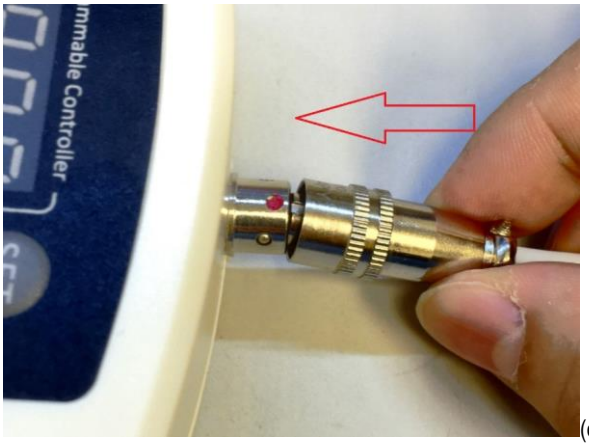

(c)

Figure 5. Install the sensor.

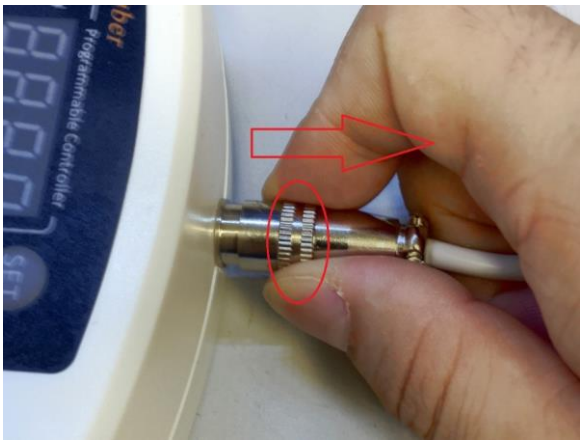


Figure 6. Remove the sensor.

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