

Operation manual for HMI-43P

Touchscreen PID Oven Temp Controller

Version 0.95 (Pre-released)

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Introduction

Thank you for choosing the Auber temperature controller. We sincerely appreciate your decision and trust that our controller will meet your expectations in both the quality of the result and the value of the product. While we are delighted that you may be anxious to operate the controller, please still spend a few minutes reading through this manual because this will serve to enhance your experience in the months and years ahead. In particular, we urge you to read through the safety warnings below. Although this plug-and-play controller is very easy to use, the process involves high temperature and high wattage appliances and your safety is paramount.



SAFETY WARNINGS

- This controller is designed only to be used with limited-power device and pairing thermal cutoff protection such as a thermostat or thermal.
- Do not place any objects on the top of controller surface because that may prevent venting excess heat during its operation.
- This controller needs to be powered by an external 24V DC power supply. 50W or more is recommended.
- The controller cannot drive any loads directly due to its limited output capacity. External SSR (Solid State Relay) is required to drive external heaters. External miniature relays may be required to drive external light & fans.
- **Always place the temperature sensor in your controlled subject (like your oven) before you turn on your controller.** Leaving the temperature sensor outside of your controlled subject will form an open loop operation. **If the sensor is left outside**, the controller will assume the temperature is low even if the controlled subject is already very hot. The controller will provide full power to the heater. It will not only overheat the controller, but also damage your appliance or even cause a fire. If the sensor is not permanently mounted on the system and left outside of the system, there is a potential problem. **If no sensor is connected to the controller**, as protection, this controller will turn off its output to your controlled subject.
- This controller is designed to control the devices recommended by Auber Instruments only. Using it to control a not recommended device can be dangerous and even cause fire. Auber Instruments is not liable for damages caused by misuse of the controller. If you are not sure the controller can be used, please contact Auber Instruments before usage.
- If an abnormal display or noise is observed, turn the controller off, unplug the power cord and contact the manufacturer before using it again.
- Clean the controller only when it is cool and unplugged.
- Do not allow children to operate the controller.

1. Specifications

Screen type: 4.3" capacitive touch screen display

Power supply voltage: 24V DC.

Power supply wattage: 35W (minimum), 50W (recommended).

Accuracy: $\pm 0.5\%$ Full Scale

Temp display resolution: 0.1C or 0.1F

Input sensor type: Thermocouple type K, E, N, S. PT100 RTD.

Heater output: 24V SSR output (Y0) or 1A/240V resistive dry contact (Y4)

Fan/Light/Alarm output: 24V SSR output (Y1/Y2/Y3) or 1A/240V resistive dry contact (Y5/Y6/Y7).

Timer limit: 9999 mins (simple mode), 546 mins per step (profiled mode).

Internal clock battery: CR1220, 1pc

Overall size: 140 x 90 x 50 mm (5.5 x 3.5 x 2.0")

Mounting cutout size: 131 x 80 mm (5.16 x 3.15")

Connection type: screw terminals

2. Pin Assignment & Wiring Guide

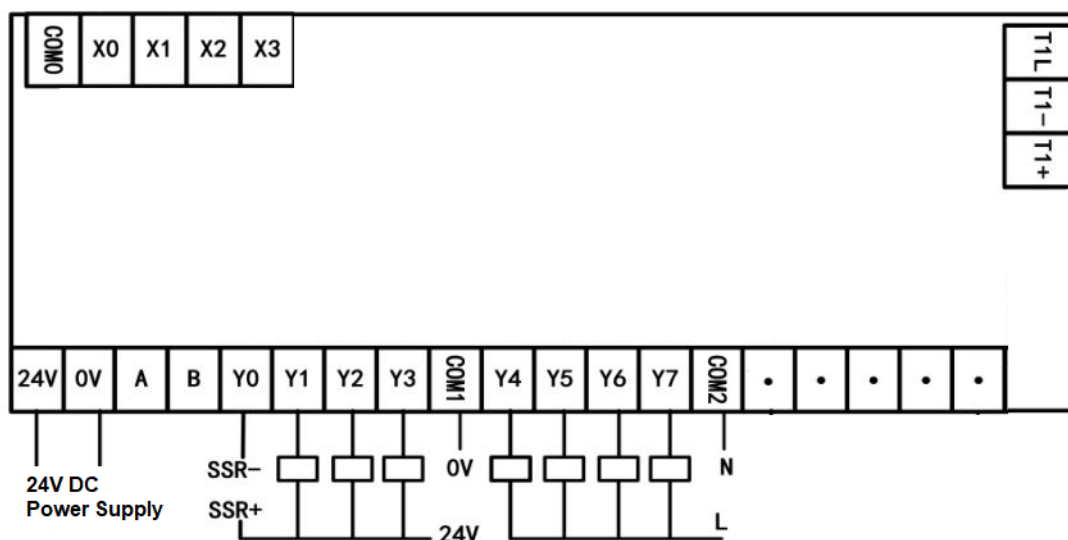


Figure 1. Pin assignment

24V & 0V: 24V DC power supply. 24V is positive and 0V is negative.

A & B: Reserved

COM 0: Common terminals for X0, X1, X2 and X3 external alarm/trigger signals.

COM 1: Common terminals for Y0, Y1, Y2 and Y3 outputs.

COM 2: Common terminals for Y4, Y5, Y6 and Y7 outputs

Y0 & Y4: Main heater outputs. Y0 is for SSR output and Y4 is for dry contact output. Only one can be used at one time.

Y1 & Y5: Fan outputs. Y1 is for SSR output and Y5 is for dry contact output.

Y2 & Y6: Light outputs. Y2 is for SSR output and Y6 is for dry contact output.

Y3 & Y7: Alarm outputs. Y3 is for SSR output and Y7 is for dry contact output.

T1+, T1-, T1L: Temp sensor input terminals. For thermocouple, connect positive to T1+ and

negative to T1-. T1L is not used. For 3-wire PT100 RTD, connect two same color wires to T1+ and T1-, connect the different color wire to T1L. The controller was set to type K thermocouple by default.

2.1 Wiring Example #1 (Power supply & single SSR / heater)

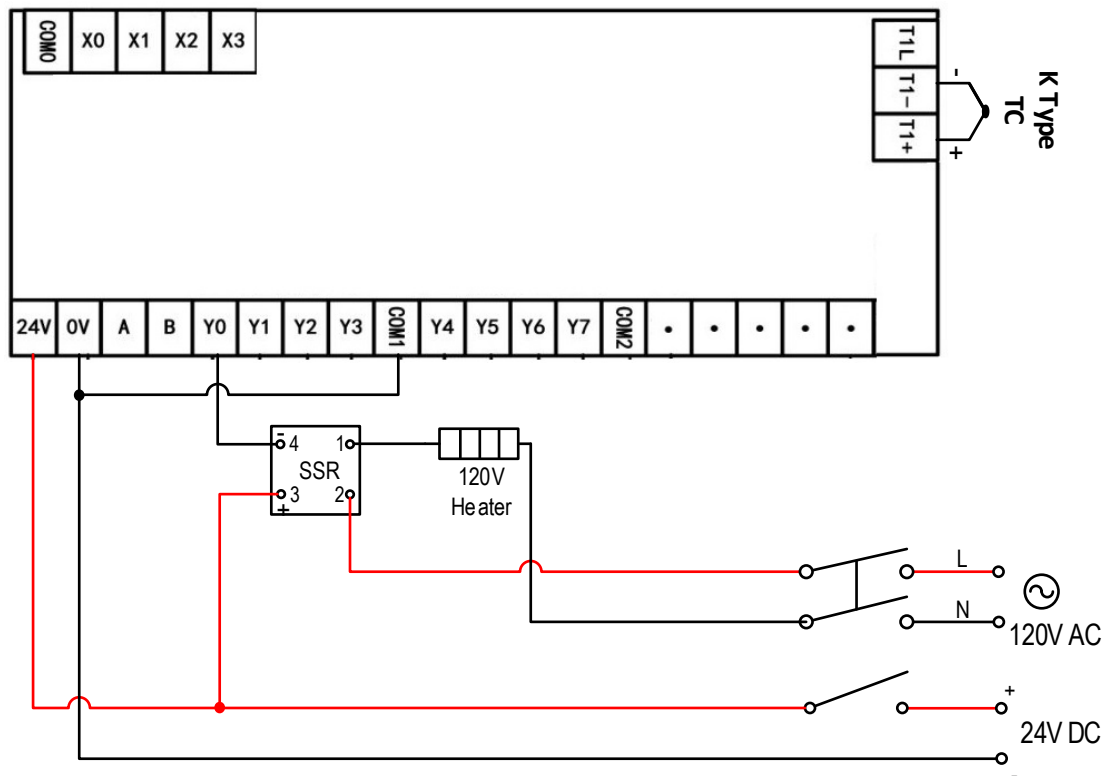


Figure 2a. SSR heater output (Y0)

Note: Different than a regular PID controller, the SSR output (Y0) is a dry output and it doesn't supply any DC voltage to drive the external SSR by itself. You need to supply an external DC power source (like the controller's 24V power supply) to it. Directly connect 24V+ from power source to pin3 from the SSR (input+). Jump a wire from "0V" to "COM1" on the controller. Connect "Y0" from the controller to pin4 from the SSR (input-).

2.2 Wiring Example #2 (Multiple SSRs / heaters)

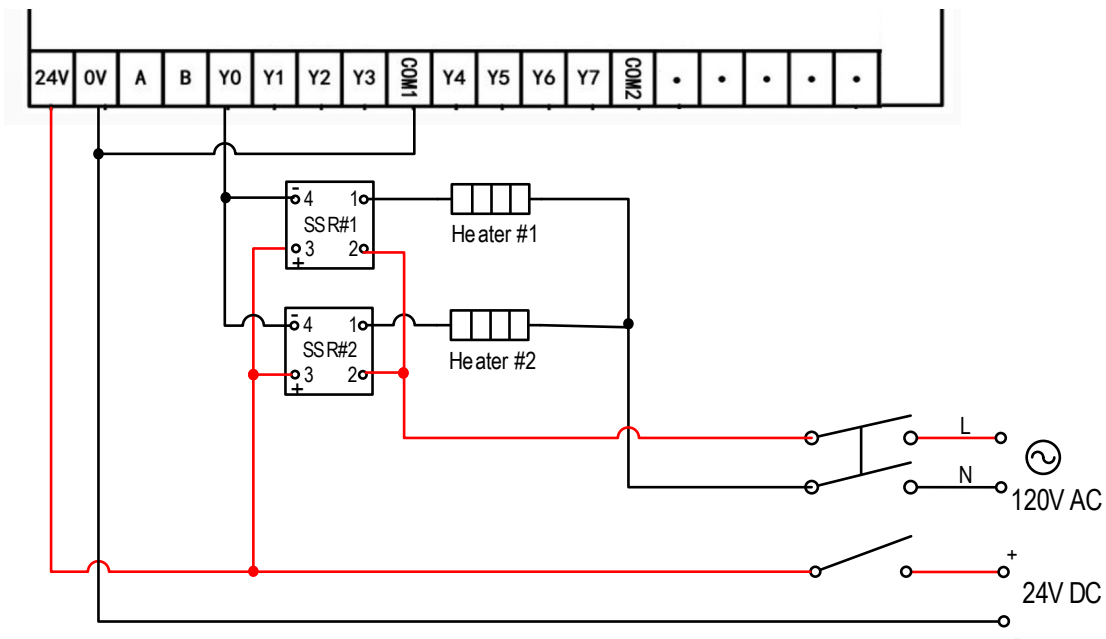


Figure 2b. Multiple SSRs heater output (Y0)

Note: this wiring is very similar as example 2.1. To drive multiple SSRs & heaters at the same time, wire all SSRs in parallel to Y0. All SSRs & heaters will be ON/OFF at the same time (single zone control).

2.3 Wiring Example #3 (Power supply & single mechanical relay / heater)

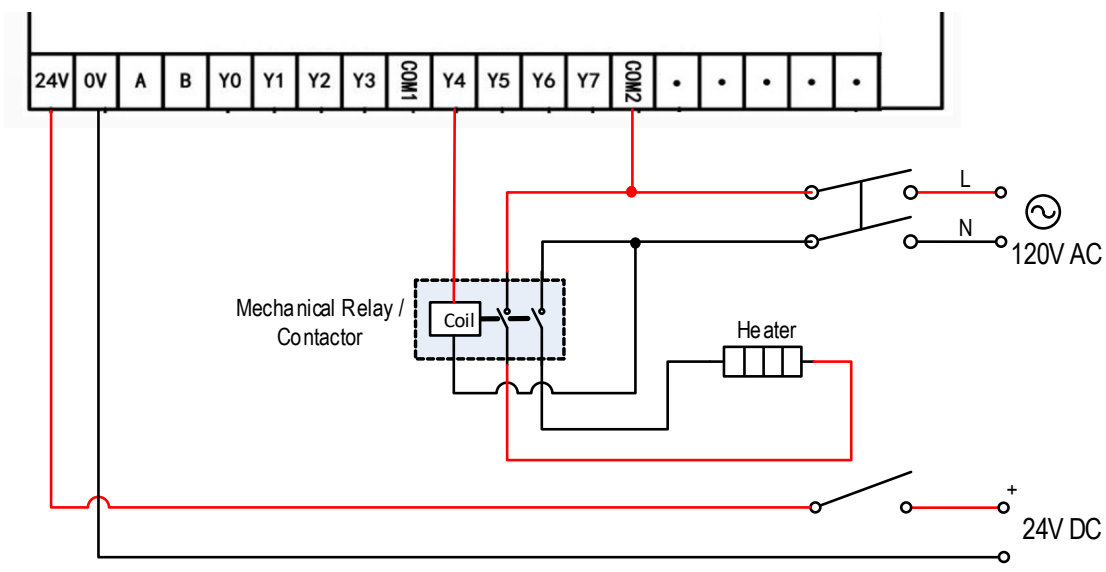


Figure 2c. Use mechanical relay (120V coil) as the main output to drive heaters (Y4)

Note: Y4 is dry relay outputs, rated as 1A/240V max, resistive load. To drive a normal heater, an external mechanical relay/contactors is required.

In this example (a mechanical relay with 120V coil), 120V hot is connected to COM2, then connect Y4 to one side of the contactor coil. Then connect other side of the contactor coil to the 120V neutral.

Note 1: Y4 output is disabled by default. To enable it, see startup settings in section 5.11, page 17. **This controller only has one main output.** Both Y4 and Y0 outputs cannot be enabled at the same time.

Note 2: Y4, Y5, Y6 and Y7 shared the same COM port (COM2). You need to make sure those outputs are powered by the same voltage.

2.4 Wiring Example #4 (120V fan output)

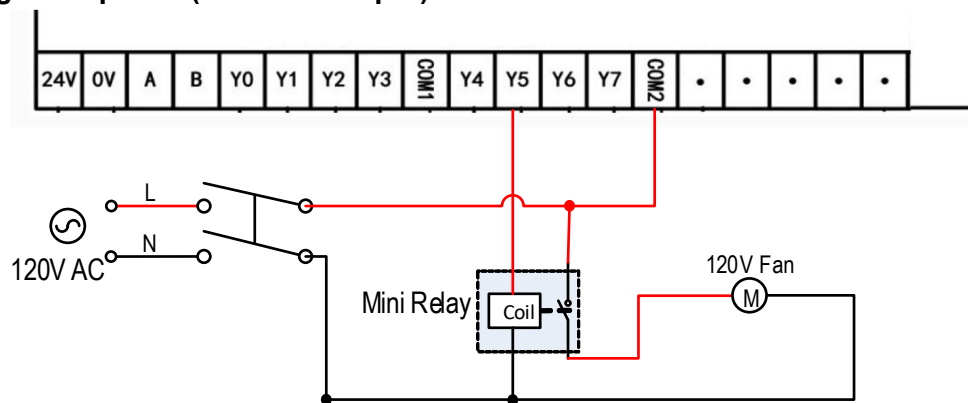


Figure 3. 120V fan output wiring (Y5)

Note: Y4/Y5/Y6/Y7 are dry relay outputs, rated as 1A/240V max, resistive load. If your light and/or fan consumes close or over 1A, it is recommended to use an external relay/contactors to extend the life time of the internal relay.

In this example, 120V hot is connected to COM2, then connect Y5 to one side of the contactor coil. Then connect other side of the contactor coil to the 120V neutral.

2.5 Wiring Example #5 (120V light output)

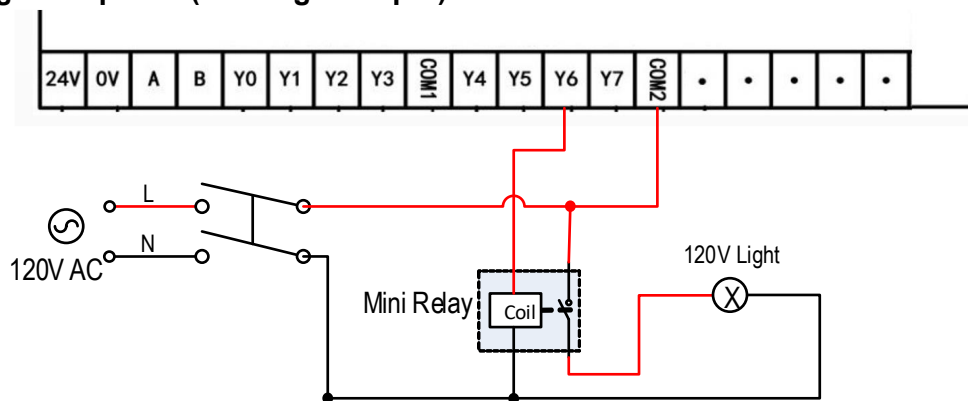


Figure 4. 120V light output wiring (Y6)

Note: see the note in the wiring example #4 for details.

2.6 Wiring Example #6 (120V indicator/buzzer output)

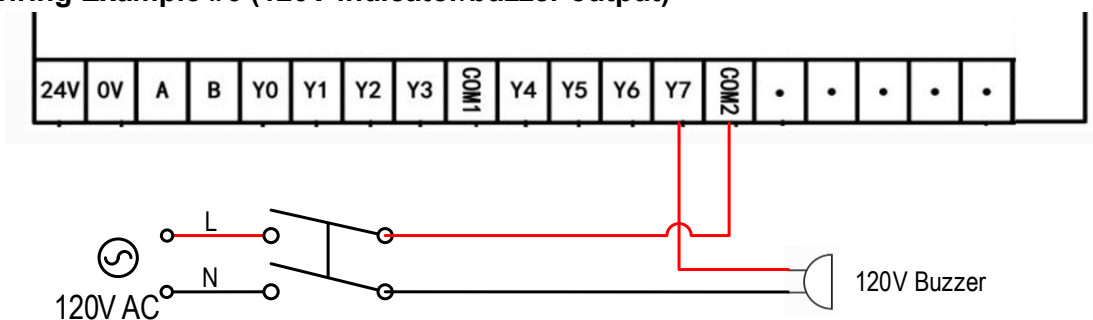


Figure 5. 120V indicator/buzzer alarm wiring (Y7)

Note: Typically, the buzzer/indicator used for alarm purposes consumes very low amperage. So in the example, we use Y7 to drive it directly. If you are using a high-power buzzer/indicator, an external relay is also required.

3. Icons & Buttons

The control system supports two operating modes: single set point control mode (simple mode) and ramp soak mode (profiled mode).

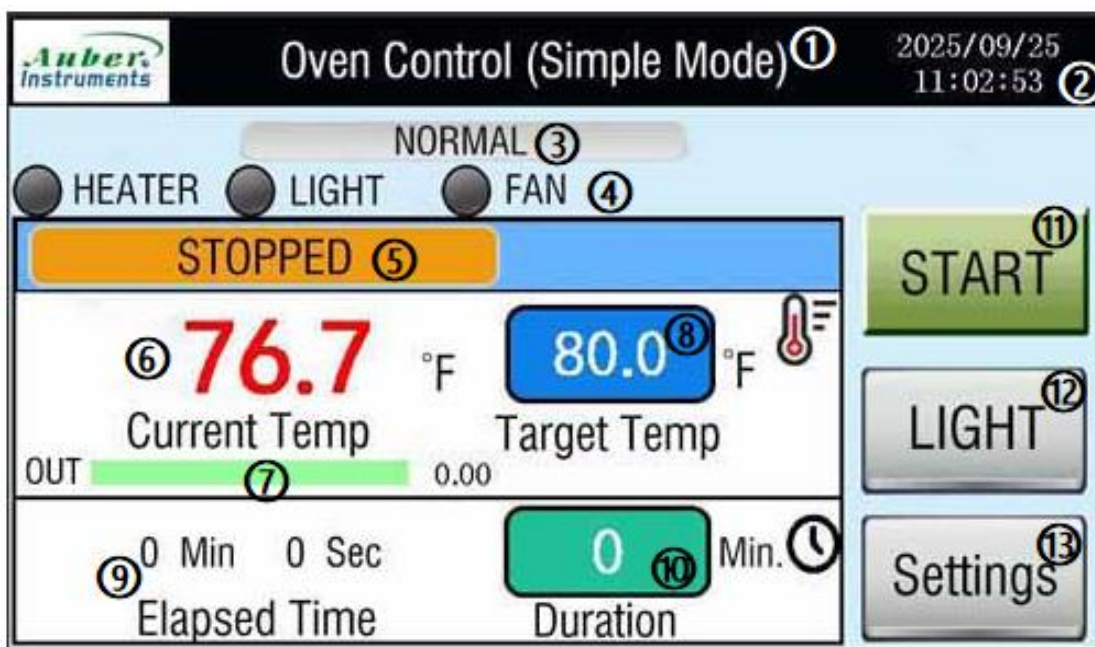


Figure 6. Simple mode main screen

1. Name for the current running mode. Simple mode is for the single set point temp control.
2. System date and time.
3. System status. If the alarm is triggered, or sensor failure, it will be displayed here.
4. Output indicators. Each indicator for each output. When the indicator is lid up, it means that output is triggered.
5. Program running status. It will show either the program is running or stopped.
6. PV. Current reading temp.

7. Current output percentage.
8. SV. Target temp. Touch here to change target temp.
9. Elapsed time, after the timer is started.
10. The duration for the timer. Touch here to change the timer.
11. Start/Stop button. Press it once to start the temp control. Press it again to stop the control.
12. Light button. Press it once to turn on the light output. Press it again to turn it off.
13. Settings button. Press it once to enter the menu.

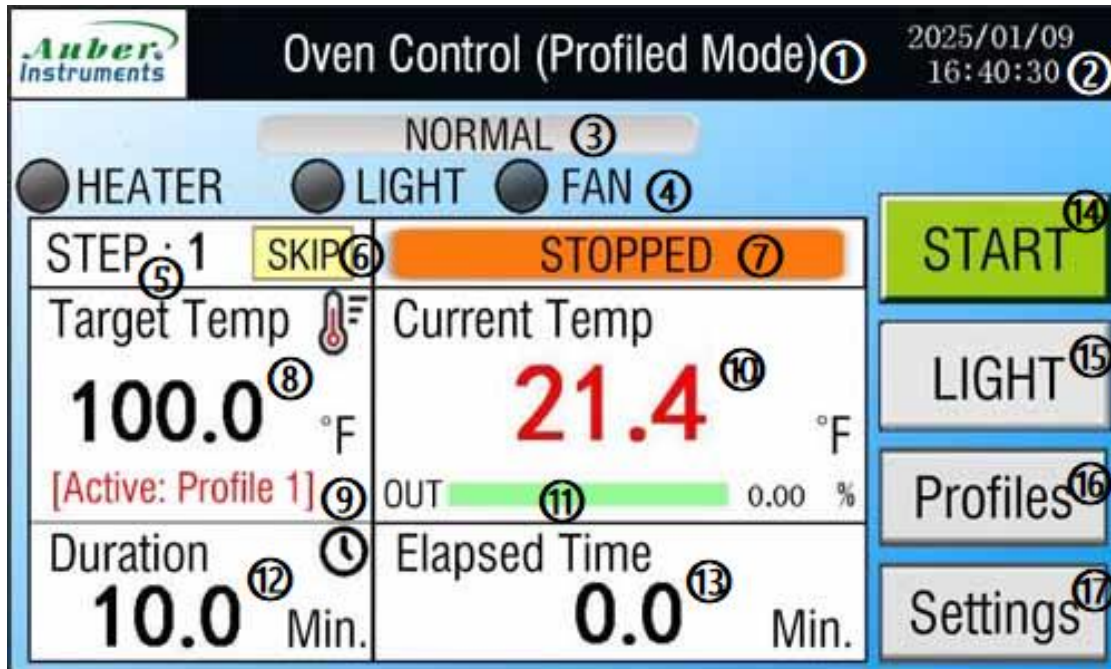


Figure 7. Profiled mode main screen

1. Name for the current running mode. Profiled mode is the ramp soak mode.
2. System date and time.
3. System status. If the alarm is triggered, or sensor failure, it will be displayed here.
4. Output indicators. Each indicator for each output. When the indicator is lid up, it means that output is triggered.
5. Step number. It will show the current running step.
6. Skip button, to skip the current step.
7. Program running status. It will show either the program is running or stopped.
8. SV. The target temp in the current step.
9. Current ramp soak profile number. See section 4.2 for details.
10. PV. Current reading temp.
11. Current output percentage.
12. The timer duration for the current step.
13. The elapsed time for the current step.
14. Start/Stop button. Press it once to start the temp control. Press it again to stop the control.
15. Light button. Press it once to turn on the light output. Press it again to turn it off.
16. Ramp soak profile settings.
17. Settings button.

4. Operation modes

The control system supports two operating modes: single set point control mode (simple mode) and ramp soak mode (profiled mode). Users can switch the operation mode in the system settings/startup settings.

4.1 Simple Mode / Single Set Point Mode

Like a regular Auber PID controller with a built-in timer (SWA-2451, for example), the user can set a target temp and a holding time (optional). Touch the dark blue box (#8 in figure 6) to edit the set temp and touch green blue box (#10 in figure 6) to edit the timer. If you don't use a timer, leave the timer as 0. Press the START button to start the process and control your heater. Press the STOP button once to stop the process.

You can set the timer to be started after reaching the set temp (mode "On Temp"), or immediately after startup (mode "On Start"). For "On Temp" mode, you can set a temp band (**Safety start band**) for it. For example, if you set safety start band as 10F, when your reading temp is 10F away from your set point, the timer will be started. See section 5.5 PID parameters in page 14.

4.2 Profiled Mode / Ramp Soak Mode

Similar to the simple mode, press the START button to start the process then press STOP button to stop. If you want to skip the current step, press the yellow SKIP button (#6 in figure 7).

4.2.1 Ramp soak profile introduction

This controller has three ramp soak profiles. One is the current running profile. Two saved profiles. You can edit all three profiles directly. You cannot save the current running profiles into the saved profiles.

Settings

Current Profile

BACK

Displaying values in Profile 1. Values cannot be modified in this page.

STEP	TARGET TEMP	DURATION
1	100.0 °F	10.0 min
2	100.0 °F	120.0 min
3	0.0 °F	0.0 min
4	0.0 °F	0.0 min
5	0.0 °F	0.0 min

Do not change temperature or duration while program is running.

>>

Next Page

Figure 8. Profiled mode, current programming profile

To edit the ramp soak profile, touch the Profiles button once from the main screen. This is the current running ramp soak profile.

You can edit your ramp soak profile here. **To edit target temp and timer, touch the blue boxes under the “TARGET TEMP” and “DURATION”.** For example, to edit step 1 target temp and timer, you can touch the red boxes in figure 8. Press Next Page to show the remaining steps. You can program up to 30 steps. Press Settings button on the left top to enter the profile settings. For the definition of ramp soak programming, see the next section for details.

You can enable/disable **safety start feature** for profiled mode here (pause timer until target temp is reached).

Figure 9. Profiled mode settings.

You can edit the screen saver (left top), pre-purge fan timer, pause timer for temp function / safety start here. On the right screen, you can choose which profile to be used, and also edit the saved profiles. Touch the EDIT button, you will see the screen below.

STEP	TARGET TEMP	DURATION	STEP	TARGET TEMP	DURATION
1	0.0 °F	0.0 Min	6	0.0 °F	0.0 Min
2	0.0 °F	0.0 Min	7	0.0 °F	0.0 Min
3	0.0 °F	0.0 Min	8	0.0 °F	0.0 Min
4	0.0 °F	0.0 Min	9	0.0 °F	0.0 Min
5	0.0 °F	0.0 Min	10	0.0 °F	0.0 Min

Figure 10. Saved programming profiles

It looks very similar as the current running profile (figure 8), but you will see the saved profile name on the top, as profile 1 or profile 2.

4.2.2 Ramp soak profile definition & programming

Step (n)

You can program up to 30 steps in this controller. Each step has two parameters: Target temp and duration timer.

Step Target Temperature (C[n])

The end temp of the current step. So if you set step 1 set temp as 200F, it means once step 1 is completed, the final temp is 200F.

Step Set Time / Duration Time (t[n])

The set time between the previous step to the current step. So if you set step 2 timer as 60mins, it means it will take 60 mins to ramp or soak from step 1 target temp to step 2 target temp.

Program Ramp

Ramp means change the temperature from one point to another during a specified time. To program a ramp, you need to set the start temperature C[n-1], the end temperature C[n], and the time duration t[n]. The ramping speed is

$$V = (C[n] - C[n-1]) / t[n].$$

During this ramping step, the displayed set temperature will linearly change from C[n-1] to C[n] in proportion to the time that has been passed in this step. For example, at step 3, you want the controller to ramp up from 200 to 300 degrees in 50 minutes, then you'll need to set C02 = 200°F, C03 = 300°F and t03 = 50min. The ramp up speed is 2°F/min. If this step has been run for 10min, the set temperature is 220°F at this moment.

By default, the timer has a higher priority than the temp. So when the timer is ended but temp is still away from the target temp, the timer will not be paused and it will move to the next step automatically. So the ramping speed should be less than or equal to the maximum ramping speed that the current system can achieve at full power. In other words, the ramping time should be longer than the minimum time needed for the system to jump from C[n-1] to C[n]. Otherwise, the process temperature will gradually fall behind the schedule. For example, the maximum heating speed of an electric water kettle is 20°F/min, but the ramping step is set as C01 = 90°F, C02 = 212°F and t02 = 1min, and the controller will not be able to achieve this goal. At the end of this step, the water temperature is probably at 110°F.

To solve this issue, this controller has a feature called safety start which can pause the timer when temp is far away. See figure 9 above. At the end of every step, the controller will check whether the reading temp vs step end temp. If the actual reading temp reaches the target temp, the program will continue and the timer for the next step will be started. If the temperature is out of the safety range, the program will pause, the controller will keep on trying to reach the set temperature, and the timer won't be started until this condition is satisfied. This feature is called "safety-start". This feature only applies to the end of each step.

If the maximum speed of a system is unknown or varies with environmental conditions, users can use the "safety-start" feature to ensure that the temperature and the time during a ramp/soak step are kept within a reasonable range required by the process.

Special note for step 1: by the programming definite above, the step 1 target temp is the end temp for step 1. The step 1 start temp is the ambient temp.

Program Soak

The soak segment maintains the temperature for a specified time. It can be considered as a special case of ramping with a zero degree slope. To program a soak, you need to set the start and the end temperature to be the same, i.e., $C[n-1] = C[n]$, and the soaking time is specified by $t[n]$. For example, at step 3, the user wants the parts to be soaked in at 200°F for 60 minutes, then the program for this step should be $C02 = 200$, $C03 = 200$ and $t03 = 60$.

Note: The step time is not how long the controller will stay at the set temperature for the **current** step. It is how long the controller will take from the current step set temperature to the next step set temperature. These two concepts are very different.

Program Run

Touch the START button in the main screen to run the program from the beginning. The program running status (#7 in figure 7) will show the current status.

Program Stop

Touch the STOP button in the main screen to run the program from the beginning. The program running status (#7 in figure 7) will show the current status.

Skip Step

Touch the skip button (#6 in figure 7) once to skip the current step and run the next step.

4.2.3 Ramp soak profile programming examples

Example 1: One step hold.

Holding the oven temperature at 800°F for 2 hours.

Assuming that the heater is able to heat the oven from 25°F to 800°F within 30 minutes, we can write a program like this:

Step 1: $C01 = 800$, $t01 = 30$. Start linear temperature heating up from ambient to 800°F, over a time period of 30 minutes (24.2°F /minute, assuming ambient temp is 75°F).

Step 2: $C02 = 800$, $t02 = 120$. Maintain 800°F for 120 minutes, then stop the program. Heater off, relay drop off. The oven cools down at its natural cooling speed.

The temperature profile is shown below.

Note: for one step hold, you can also use simple mode instead of profiled mode.

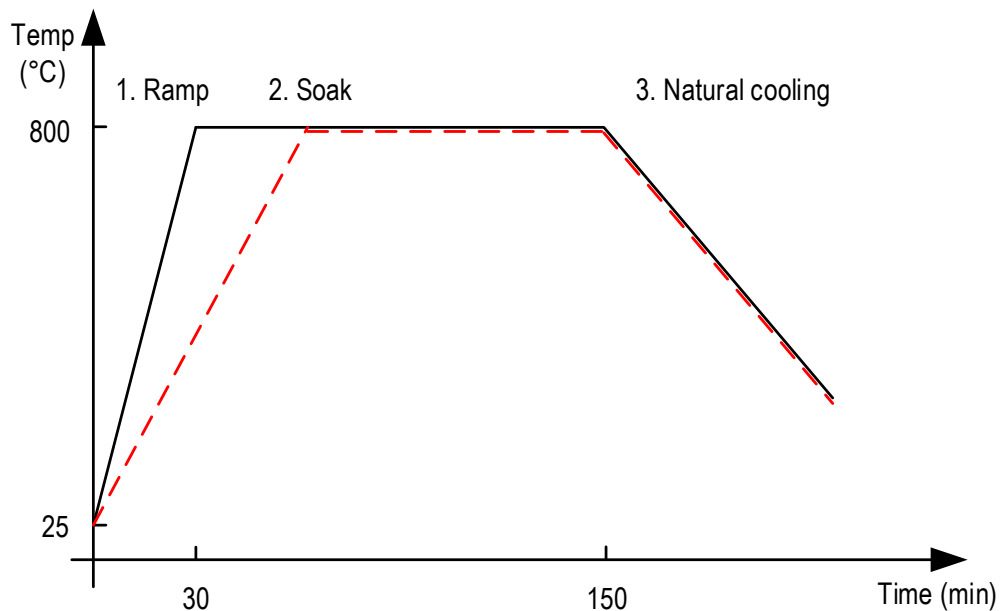


Figure 11. Program example 1

Example 2: Heat treatment oven

Ramp up from ambient to 375°F, then hold there for 20 mins. Then ramp up to 425°F in 10 mins, then soak for 60 mins.

C01 = 375, t01 = 10. Start linear temperature heating up from ambient to 375°F, over a time period of 10 minutes (30°F /minute, assuming ambient temp is 75°F).

C02 = 375, t02 = 20. Soak at 375°F for 20 minutes.

C03 = 425, t03 = 10. Ramp up from 375°F to 425°F, over a time period of 10 minutes (5°F /minute).

C04 = 425, t04 = 60 Maintain 425°F for 120 minutes, then stop the program. Heater off, relay drop off. The oven cools down at its natural cooling speed.

5. Functional Settings

5.1. System access code: 6666, for both parameters and PID advanced settings.

5.2 Schedule:

Supports one-time or daily scheduled startup. Daily start supports once or daily repeat options.

Location: Main screen → Settings → Schedule

10:51:38 (System Clock)		Schedule		BACK
Clock Start		Delayed Start		
OFF ☐ Do NOT power off within 20 seconds of changing settings. 0 : 0 : 0 hr. min. sec. Repeat: DAILY		OFF ☐ Do NOT power off within 20 seconds of changing settings. 60 Min Time to start 0 min 0 sec Elapsed Time		

Figure 12. Schedule settings

5.3 End Alarm

Turn on the alarm for a pre-defined time, when the control process is completed.

Location: Main screen → Settings → End Alarm

End Alarm	BACK
0.0 min Alarm duration after program ends (Set to "0" to disable)	

Figure 13. End alarm settings

5.4 Power Outage Recovery.

Automatically resumes operation after power restoration.

Location: Main screen → Settings → Power Outage Recovery

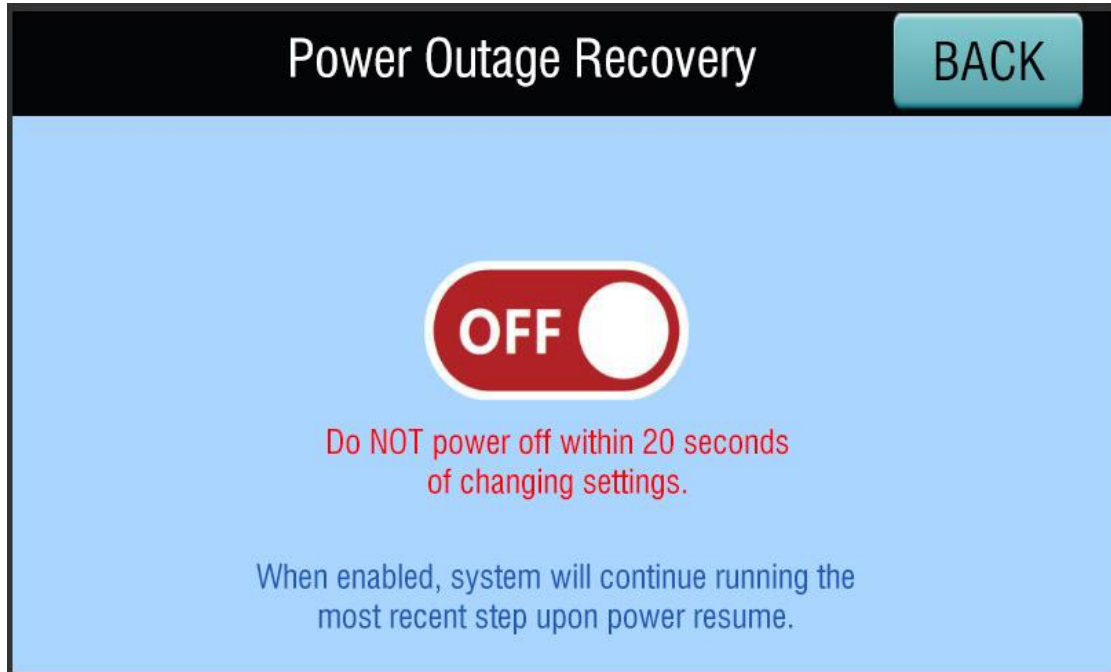


Figure 14. Power outage recovery settings

5.5 PID Parameters, Section 1

Setup alarm and timer mode/safety start for simple mode.

Location: Main screen → Settings → Parameters

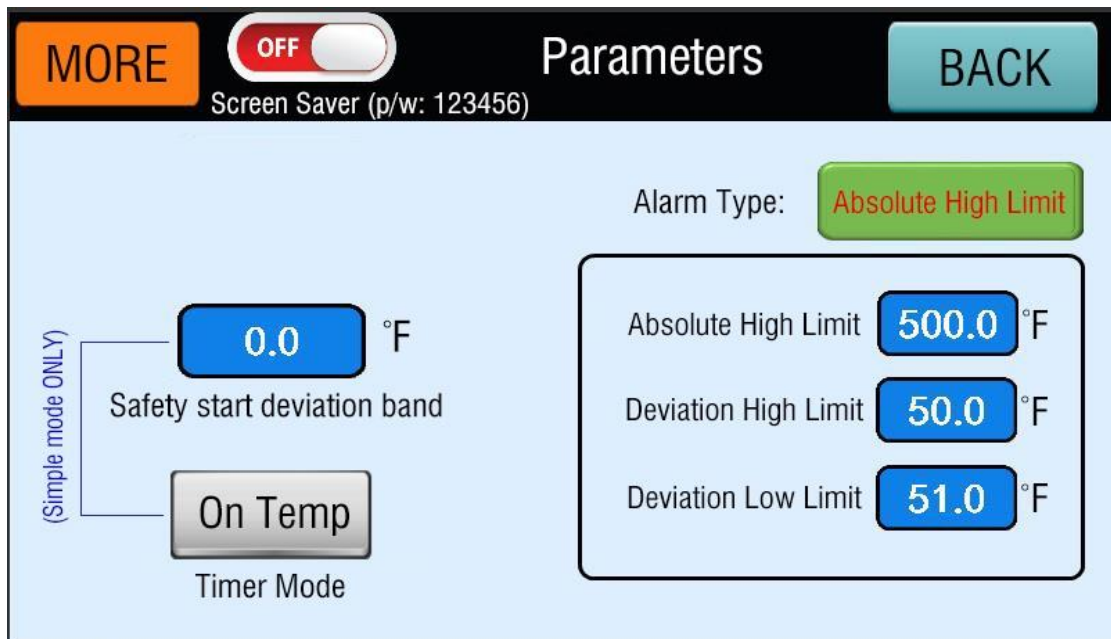


Figure 15. PID Parameters, Section 1

5.6 PID Parameters, Section 2

Adjust PID control parameters & advanced settings. For definitions, see section 6.

Location: Main screen → Settings → Parameters → MORE (left top), default access code 6666

Parameter	Value	Unit
P	100	
I	240	
D	60	
Cycles	2	
Auto-Tune	ON	
(Only when heater is ON)		
Control Mode	PID	
Hysteresis Band	0.5	°F
Input Offset	0.0	°F
Output High Limit	100	%
Output Low Limit	-100	%
Attenuation Const.	0	°F
Overshoot Correction	4	

Figure 16. PID Parameters, Section 2

5.7 Temp Chart

Display historical temperature data

Location: Main screen → Settings → Temp Chart

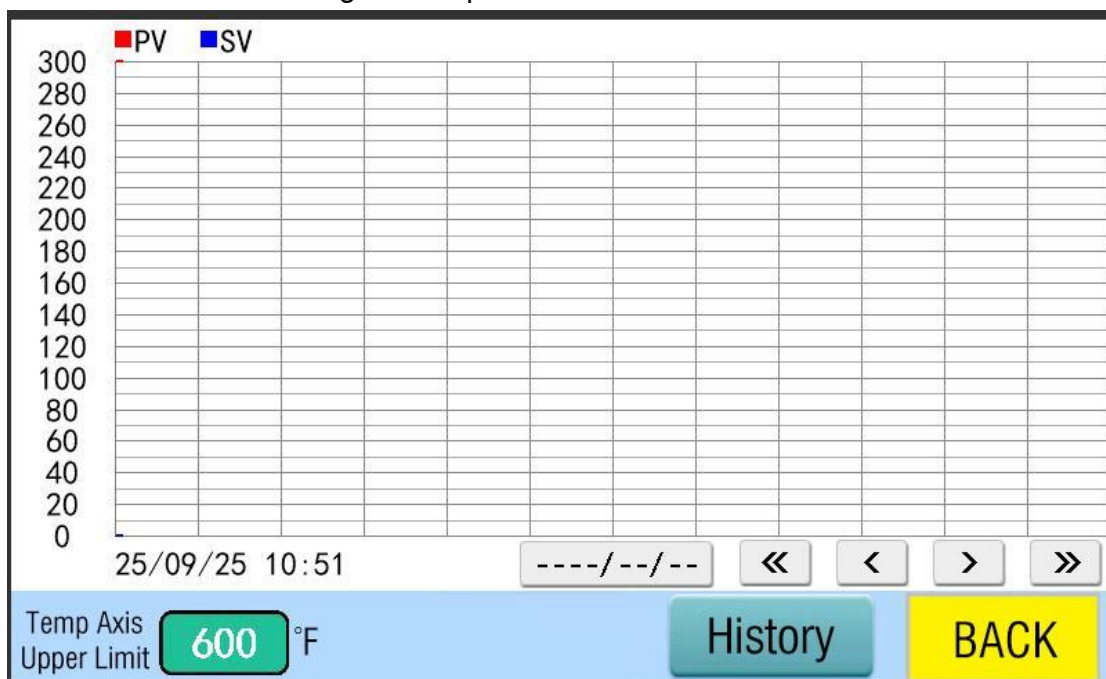


Figure 17. Temp chart

5.8 Alarm History

Show the alarm trigger history

Location: Main screen → Settings → Alarm History

Alarm History		
DELETE	RESET	BACK
000	2025/09/25 10:47:24	Sensor Failure
001	2025/09/25 10:47:24	Temperature High

Figure 18. Alarm history

5.9 Fan Delay Off

Keeps the circulation fan running after the heat control process is completed. This option will be displayed when the fan function is enabled.

Location: Main screen → Settings → Fan Delay Off

Fan Delayed OFF

BACK

(Set to "0" to disable)

0

min

Keeps fan running for a set time
after program ends

Elapsed Time: 0 min 0 sec

Figure 19. Fan delay off settings

5.10 System Clock

Set the date and clock info in this controller. You need to set it again after the internal battery is replaced. The format is YYYY/MM/DD HH:MM:SS.

Location: Main screen → Settings → Systems (Left Top) → System Clock

System Clock

BACK

2025/09/25 10:56:04

0 0 0 0 0 0

Y M D h m s

SAVE

Figure 20. System clock

5.11 Startup Settings, Section 1

Location: Main screen → Settings → Systems (Left Top) → Startup, default access code 6666

MORE

Startup Settings

BACK

K Type

Sensor Type

OFF

Enable Y4

Y3/Y7 Options

PROFILED

Program Mode

0.0

Sec.

Start Hold Timer

Unit - °F

Temperature Unit

OFF

Fan Enable

Do NOT power off within 20 seconds of changing settings.

Figure 21. Startup Settings, Section 1

Compatible sensor types: Thermocouple type K, E, N and S. PT100 RTD.
Default: K-type thermocouple.

5.12 Startup Settings, Section 2

Output manual turn on switch (testing purposes), setting reset, change password

Location: Main screen → Settings → Systems (Left Top) → Startup → MORE (Left Top), default access code 6666

6. PID Control Parameters & Auto-tune

To get the control parameters, see section 5.4. Here are the available parameters.

Note: please understand how the following parameters work before you change any settings. Wrong settings may worsen the control result.

P: proportional constant. When P increases, the system is more weak/stable. When P decreases, the system is less stable/stronger. If the P is too small, the system would be oscillatory or even non-convergent. Note: the control logic in this controller has fuzzy logic inside.

Default value: 400

I: Integral time. Bring the system up to the set value by adding a constant to the output that is proportional to the difference between process value and the set value. When I value is decreased, the response speed is faster but the system is less stable. When I value is increased, the response speed is slower, but the system is more stable. When I is set to 0, the controller becomes a PD controller.

Default value: 240

D: Derivative time. Respond to the rate of PV changes, so that the controller can compensate in advance before $|SV - PV|$ gets too big. A larger number increases its action. Setting D value too small or too large would decrease the system stability, cause oscillation or even non-convergence.

Default value: 60

Cycles: Output cycle time. It is the time period that the controller uses to calculate its output. Short time will cause the output to pulse at higher frequency. Longer time may reduce the quality of control and cause fluctuation. The initial value is set to 2s, which is good for SSR/heater control. If you plan to use relay output to drive your main heater, please set cycle time to 20s or more.

Default value: 2

Auto-Tuning: The auto-tuning function (also called self-tuning) can automatically optimize the PID parameters for the system. The auto-tuning function will use the on/off mode to heat up the system until it passes the set point. Then let it cool down. It will repeat this about three times. Based on the response time of the system, the built-in artificial intelligence program will calculate and set the PID parameters for the controller. If your system has a very slow response, the auto tuning could take a long time.

Default value: OFF

To start the auto-tune, change the controller to simple mode, then change your set temp to your most important temp in your temp control. Then start the heat process. Then go to the auto-tune

settings and set it to ON. In the main screen, it will display a red AT showing the auto-tune is running. During the auto-tune process, the temp control will NOT function properly.

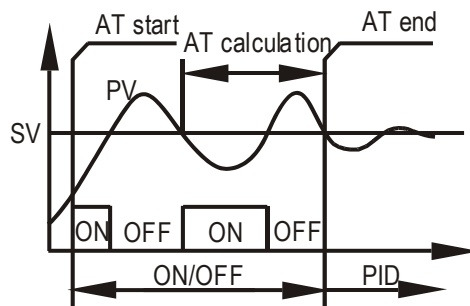


Figure 22 Auto tuning

Control Modes: PID mode and ON/OFF mode are available.

Default value: PID mode

On/off control mode is not as precise as PID control mode. However it is necessary for inductive loads such as motors, compressors, and solenoid valves that do not like to take pulsed power. It works like a mechanical thermostat. When the temperature passes the set point, the heater (or cooler) will be turned off. When the temperature drops back to below the hysteresis band (dead band) the heater will turn on again.

To use the on/off mode, set control mode to ON/OFF mode, then set hysteresis band to the desired range based on control precision requirements. Smaller Hy value results in tighter temperature control but also causes the on/off action to occur more frequently.

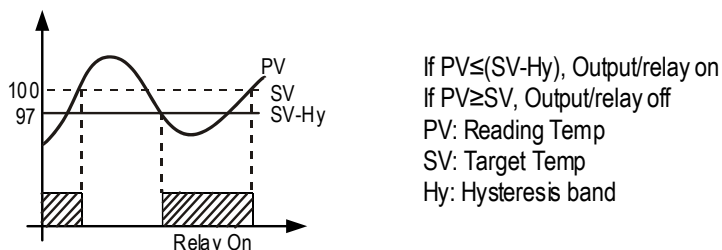


Figure 23. ON/OFF mode

Hysteresis Band. Only work for ON/OFF mode. See section above for details.

Default value: 0.5

Input Offset: It is used to set an input offset to compensate for the error produced by the sensor. For example, if the meter displays 5°F when the probe is in ice/water mixture, setting PSb= -5 will make the controller display 0°F.

Default value: 0

Output High & Low Limit: allow you set the output range low and high limit.

Output low limit is a feature for the systems that need to have a minimum amount of power as long as the controller is powered. For example, if low limit = 20, the controller will maintain a minimum of 20% power output even when input temp is over your set temperature.

Output high limit can be used when you have an overpowered heater to control a small subject. For example, if high limit = 50, the 5000 watt heater will be used as 2500W heater (50%) even when the PID wants to send 100% output.

Default value: 100% (Output High Limit), 0% (Output Low Limit)

Attenuation Constant: It is for adjusting the temperature stability. The default value is 0. If the temperature fluctuates more than one degree, the user can increase the value. If the controller takes too much time to correct the temperature drop, the user can reduce it to make the system more responsive.

Default value: 0

Overshoot Correction: It is for adjusting the temperature overshoot during the initial heating up. For example, if the temperature overshoot 4 degrees, set this parameter to 4 should remove the overshoot. This parameter has no effect after the temperature reaches the set point. The larger value will slow down the initial heating up.

Default value: 4

7. Function limitations

- In the single set point mode (simple mode), the timer function is optional. Set the timer to zero to disable it.
- In the single set point mode (simple mode), the optional timer cannot be paused. You can only start/stop the temp control to reset the timer.
- In the ramp soak mode (profiled mode), the program cannot be paused. You can only start/stop the program. You can skip the current step.
- When the controller is running the ramp steps (ramp soak mode), the displayed target temp will only show the step end temp.
- The light output can only be manual controlled. The fan output can only be automatically controlled. The fan output cannot be manually turned ON or OFF. By design, the fan will be turned on when the heater output is on. You can set the fan to be delayed on and/or delayed off. If you don't use the fan output, the fan function can be disabled in the parameters.
- Current date/time format is yyyy/mm/dd HH:MM:SS, 24hr format only. No 12hr mode nor daylight saving time option.
- Firmware update requires a USB-C cable and a Win computer, which are not included. The touchscreen controller needs to be powered ON via the external 24V power supply during the whole process. USB-C cable cannot be used to power up the controller.
- Enable screen saver mode to prevent accidental touchscreen operation during heating. It can be found in figure 9 and 15.
- When using fan delay shutdown, manually pressing STOP immediately disables heating but the fan may continue operating until the delay timer expires.

(End)