Robertshaw RTC-500, RTC-500-WIFI Temperature and Humidity Controller User Manual

Contents

Robertshaw RTC-500, RTC-500-WIFI Temperature and Humidity Controller

Frequently Asked Questions

Q: How do I calibrate the humidity and temperature values?

A: Humidity and temperature values can be calibrated if they deviate from actual readings. Refer to the manual for specific calibration instructions based on your requirements.

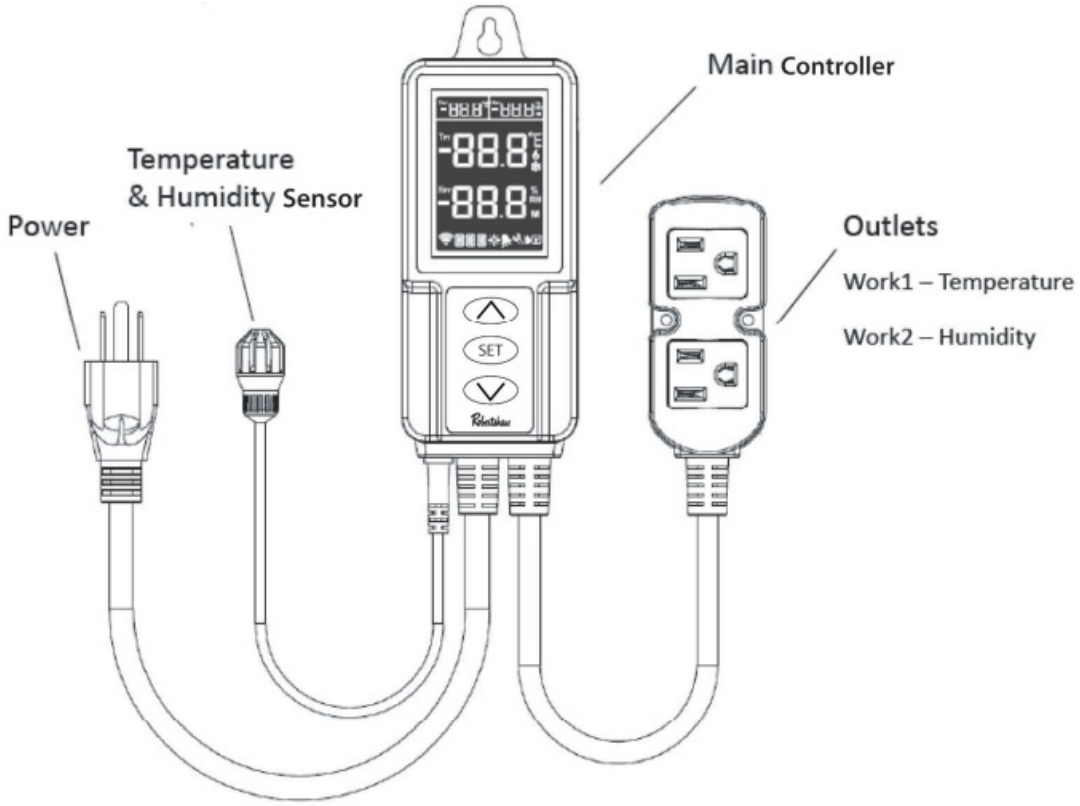
Q: What do the different alarm limits signify?

A: The alarm limits set high and low thresholds for temperature and humidity values. If the readings exceed or fall below these limits, the controller will alert you with corresponding codes.

Introduction

The Robertshaw RTC-500 / RTC-500-WIFI is a digital controller that has two output sockets to control temperature (work1) and humidity (work2). This controller comes with two probes, a dual temperature and humidity sensor and a fully submersible temperature sensor. The large LCD screen intuitively displays temperature, humidity and other parameters. The three-key design enables quick parameter settings, such as alarm limit calibration, protection time, unit switching, etc., for many different application scenarios.

Overview



Display Information

Please check the instructions below before parameter configuration.

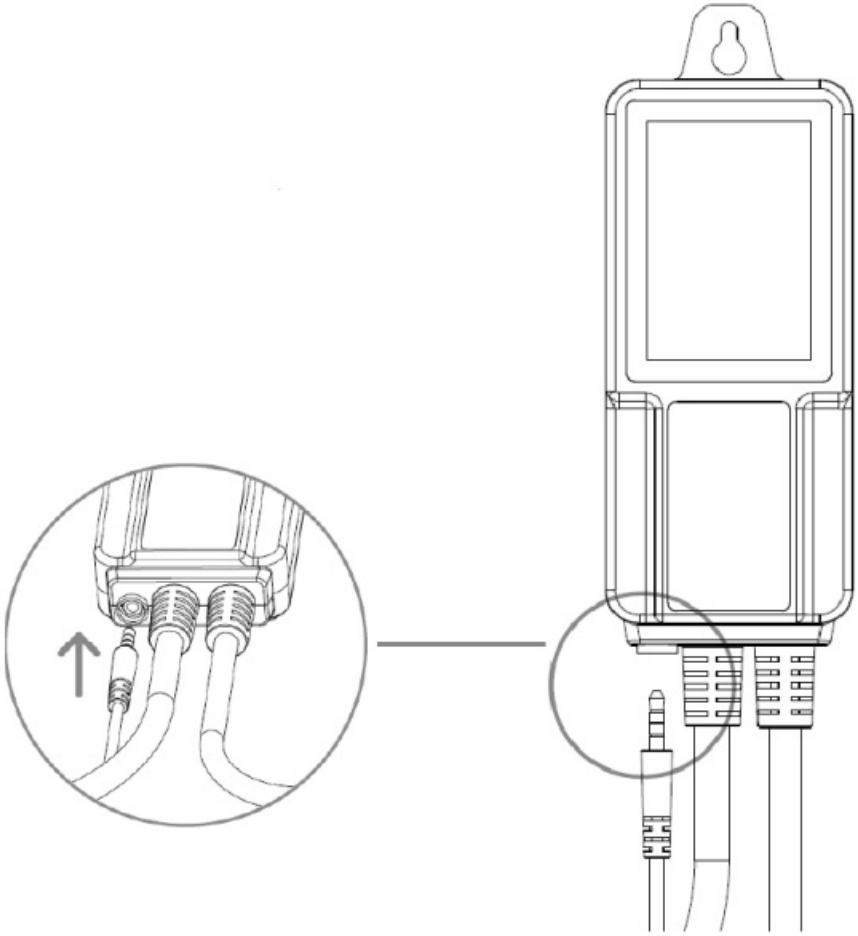
Icon Table

S/N	Icon	Function	Status		
			OFF	Flashing	ON
1		Wi-Fi connection status	Not connected	Resetting	ON
2		Cooling status	OFF	Protection delay	ON
3		Alarm status	No alarm	——	Alarm
4		Heating Status	OFF	Protection delay	ON
5		Humidification status	OFF	Protection delay	ON
6		Dehumidification Status	OFF	Protection delay	ON
7		Setting Status	Non-setting	——	Setting
8	T_{PV}	Temperature-present value	——	——	——
9	H_{PV}	Humidity-present value	——	——	——
10	——	Parameter code	——	——	——
11	T_{SV}	Temperature-set value	——	——	——
12	H_{SV}	Humidity-set value	——	——	——

Operation

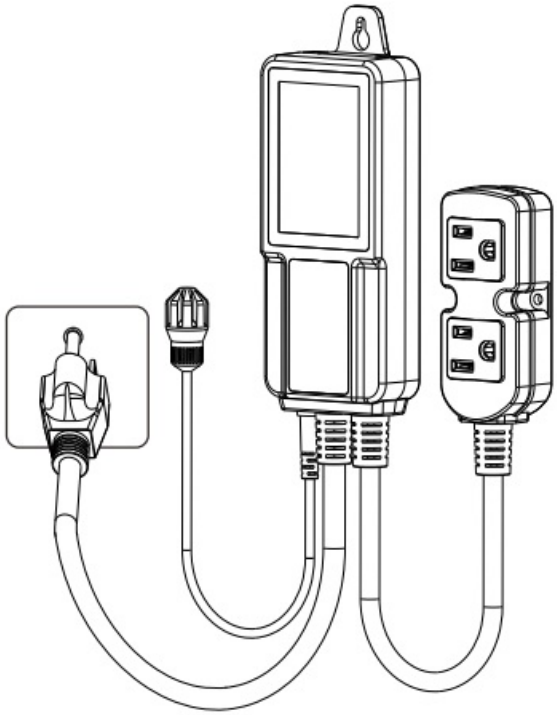
Important: Improper use of the product may cause injury or product damage. Please read, understand and follow the operating steps below.

Sensor Installation
Plug the sensor fully into the 3.5mm jack on the bottom of the main controller.



Power On

Power on controller by plugging into electrical outlet (within the range of 100-240VAC).
The screen will light up and display the temperature, humidity and other readings.



Parameter Setting

Parameters can be set on the Robertshaw app for RTC-500-WIFI (Section 8 of manual).
Plug the RTC-500 in to power on the controller.
On the home screen, press and hold the SET button until you hear a beep and the TCH parameter displays. To

adjust parameters:

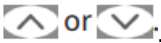
1. Press the SET button. The parameter value will flash meaning it is now adjustable.
2. To adjust the parameter press  or .
3. Confirm your selection by pressing the SET button. The parameter value will stop flashing meaning it has been set.
4. Go to the next parameter by pressing  . You should now be on the BL parameter.
5. Continue steps 1-4 for each parameter.
6. When you have set all the parameters needed, simply press and hold the SET button until the controller returns to the home screen.

Table 2

Parameter	Function	Description	Ranges
TCH	Temperature Control Mode	C = Cooling Mode, H = Heating Mode	H or C
BL	Screen Display Time	Determines how long the screen will stay on. BL = 0 means the screen will not turn off. (Minutes)	0 to 999
COT	Continuous Operating Time	Determines length of on and off cycles during humidity control. (Minutes)	0 to 999
HCA	Humidity Calibration Value	Calibrated if the Hpv deviates from the actual humidity.	-10 to 10%RH
HAL	Humidity Alarm Low Limit	Sets a low limit that will alert you if Hpv drops below your set value. (EHL code)	5 to 99%RH

Parameter	Function	Description	Ranges
HAH	Humidity Alarm High Limit	Sets a high limit that will alert you if Hpv rises above your set value. (EHH code)	5 to 99%RH
HPT	Humidity Protection Delay	The time interval for its power off to power on again should meet the time requirement for HPT	0 to 10

HD	Humidity Differential	Acceptable humidity range depending on HS (Percentage)	1 to 30%RH
HS	Humidity Set Value	Desired humidity (Percentage)	5 to 99%RH
HDH	Humidity Control Mode	D = Dehumidifying, H = Humidifying	H or D
CF	Temperature Unit	Choose between Celsius and Fahrenheit	C or F
TCA	Temperature Calibrated Value	Calibrated if the Tpv deviates from the actual t emperature.	-15° to 15°F -10° to 10°C
TAL	Temperature Alarm Low Limit	Sets a low limit that will alert you if Tpv drops below your set value. (ETL code)	23° to 158°F -5° to 70°C
TAH	Temperature Alarm High Limit	Sets a high limit that will alert you if Tpv rises above your set value. (ETH code)	23° to 158°F -5° to 70°C
TPT	Temperature Protection Time	The time interval for its power off to power on again should meet the time requirement for T PT.	0 to 10
TD	Temperature Differential	Acceptable temperature range depending on TS (Degrees)	1° to 30°F .2° to 15°C
TS	Temperature Set Value	Desired temperature (Degrees)	23° to 158°F -5° to 70°C
Work1	Temperature Socket	Will turn on and off depending on the Tpv in c omparison to the TS and TD values	
Work2	Humidity Socket	Will turn on and off depending on the Hpv in c omparison to the HS and HD values	

Function Descriptions

Temperature Setting – TCH, TS, TD

Cooling mode (TCH=C)

- When Tpv is higher than TS + TD, ❄ will appear, Work1 will be turned on, and cooling will begin.
- When Tpv is lower than TS, ❄ will disappear, Work1 will be turned off, and cooling will stop.
- For example: TS=15ºC, TD=5ºC, as shown in Figure A.

Heating mode (TCH=H)

- When Tpv is lower than TS – TD, ☼ will appear, Work1 will be turned on, and heating will begin.
- When Tpv is higher than TS, ☼ will disappear, Work1 will be turned off, and heating will stop.
- For example: TS=15ºC, TD=5ºC, as shown in Figure B.

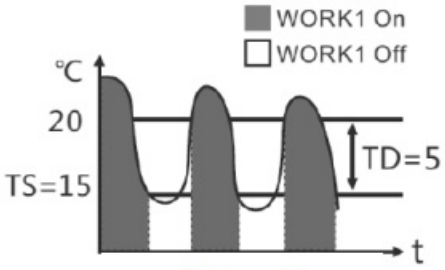


Figure A

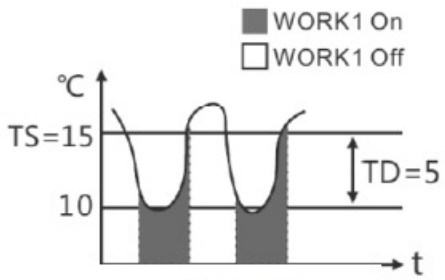


Figure B

Temperature Protection Time – TPT

- Work1 is a temperature socket and the time interval for its power off to power on again should meet the time requirement for TPT. If not, ❄ or ☼ will flash.
- This protection time requirement should also be satisfied when the controller is just powered on.

Temperature Alarm Limits – TAH, TAL

- When Tpv is higher than TAH, the temperature alarm high limit will be triggered, and EtH code will be displayed.
- When Tpv is lower than TAL, the temperature alarm low limit will be triggered, and EtH code will be displayed.
- During the alarm, the buzzer makes a sound of “bi-bi-Biii” until the temperature is back to the normal temperature range; press any button to mute the alarm. During the temperature alarm limit, the output of Work1 socket is not affected.

Temperature Calibration – TCA

- The temperature can be calibrated if the Tpv deviates from the actual temperature.
- Tpv after calibration = Tpv before calibration + TCA

Temperature Unit – CF

- The temperature unit can be switched between Celsius and Fahrenheit.
- The temperature-related parameter values will be restored to factory default values after the temperature unit is changed.

Humidity Settings – HDH, HS, HD

Dehumidifying mode (HDH=D)

- When Hpv is higher than HS + HD, will appear, Work2 will be turned on, and dehumidifying will begin.
- When Hpv is lower than HS, will disappear, Work2 will be turned off, and dehumidifying will stop.
- For example: HS=50%RH, HD=10%RH, as shown in Figure C.

Humidifying Mode (TCH=H)

- When Hpv is lower than HS – HD, will appear, Work2 will be turned on, and humidifying will begin.
- When Hpv is higher than HS, will disappear, Work2 will be turned off, and humidifying will stop.
- For example: HS=50%RH, HD=10%RH, as shown in Figure D.

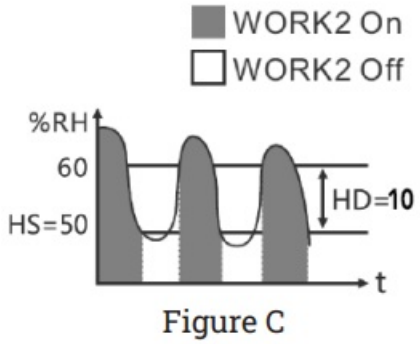


Figure C

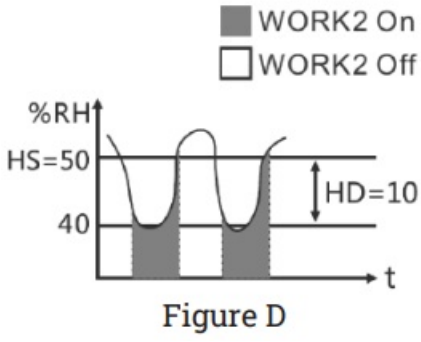


Figure D

Humidity Protection Delay – HPT
Work2 is a humidity socket and the time interval for its power off to power on again should meet the time

requirement for HPT. If not, or will flash.
This protection time requirement should also be satisfied when the controller is just powered on.

Humidity Alarm Limits – HAH, HAL

When Hpv is higher than HAH, the humidity alarm high limit will be triggered, and EHH code will be displayed.
When Hpv is lower than HAL, the humidity alarm low limit will be triggered, and code EHL will be displayed.
During the alarm, the buzzer makes a sound of “bi-bi-Biii” until the humidity is back to the normal humidity range; press any button to mute the alarm. During the humidity alarm limit, the output of Work2 socket is not affected.

Humidity Calibration – HCA
The humidity can be calibrated if the Hpv deviates from the actual humidity.
Hpv after calibration = Hpv before calibration + HCA

Continuous Operating Time – COT
During humidity control, when COT ≠ 0 and output conditions are met, Work2 socket will work in on-off, on-off mode. COT is time on as well as time off.
Example: if COT = 10, the Work2 output socket will turn on for 10 minutes and off for 10 minutes, then repeat.
When COT = 0 and output conditions are met, Work2 output socket will not be affected by COT.

Screen Display – BL
BL is the screen display time. When BL = 0 indicates display is always on.

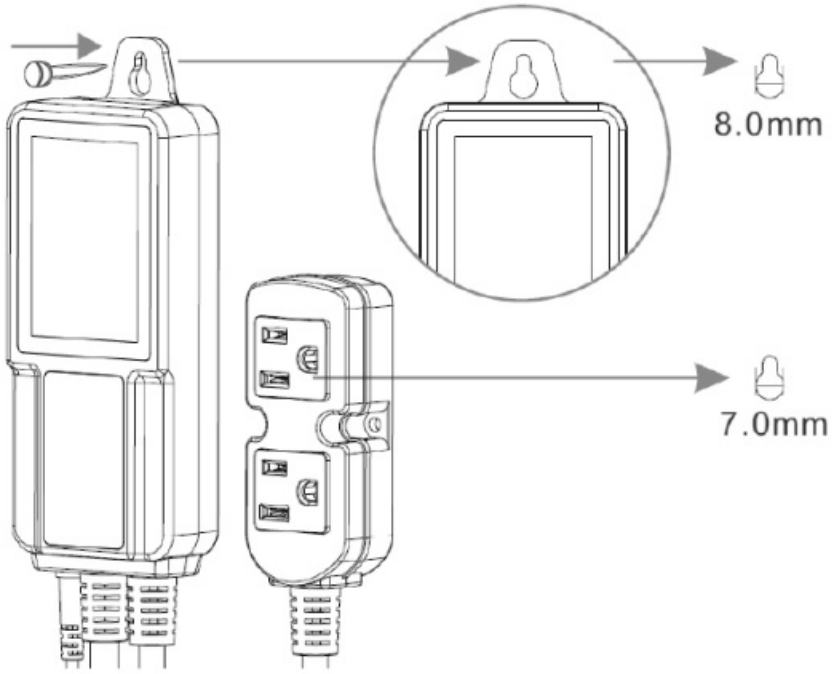
Alarm

In the following circumstances during operation, the buzzer will give a “bi-bi-Biii” alarm, and at the same time, the alarm symbol will appear on the screen. Press any button to mute the alarm.

S/N	Code	Function	Socket output status
1	Err	Sensor failure	Outputs terminated
2	EtH	Temperature alarm high limit	Outputs unchanged
3	EtL	Temperature alarm low limit	Outputs unchanged
4	EHH	Humidity alarm high limit	Outputs unchanged
5	EHL	Humidity alarm low limit	Outputs unchanged

Equipment Installation

As a safety precaution, it is recommended to power on the equipment after the installation is completed. The only installation method is by hanging the equipment. Please check the installation distance and screw size according to its application scenario before installation. The schematic diagram of equipment installation is shown below.



WARNING

- Electrical Shock Hazard – Turn off power at the main power source before installing the RTC control. DO NOT restore electrical power to the unit until the RTC control is properly installed and cover assembled.
- Fire Hazard – DO NOT locate the RTC control in an explosive atmosphere as a fire could result due to possible spark generation in the control.
- All RTC Controls are designed as temperature controls and are not used as temperature limit controls.
- Where failure or malfunction of the RTC control could cause personal injury or property damage, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn or protect against failure or malfunction of the RTC control must be installed.

CAUTION
Read all of the information in these instructions before installing or operating the RTC control.

- The schematic drawings and other information included in these installation instructions are for the purpose of illustration and general reference only.
- RTC controls are not to be located in areas of significant moisture, dirt or dust as use of the control in such environment may cause personal injury or property damage and is likely to shorten the control life.
- It is the responsibility of the installer and the user to assure that the application and use of the RTC control is in compliance with all applicable federal, state, and local laws, regulations and ordinances, including, without any limitation, all requirements imposed under the National Electric Code and any applicable building codes.

Restore Operation Functions

Restore Factory Settings

When the controller is powered on and in non-setting parameter status, press + **SET** + buttons simultaneously on the main controller and don't release until the screen turns off. Wait for the equipment to restart automatically and restore to factory settings.

Restore WiFi Network Settings (for RTC-500-WIFI)

If you would like to reconfigure to a new WiFi network, please keep the equipment in power-on status, press **SET** + buttons and release when the symbol on the screen flashes. The icon will disappear after the network restoration is completed. Please do not power off the equipment during the restoration process.

Access to Network for RTC-500-WIFI

RTC-500-WIFI features a built-in WiFi module that allows you to remotely view and configure it on the app.

Before You Begin, Please Make Sure:
The device supports 2.4G WiFi, (5G WiFi is not compatible). The device is in a good and stable WiFi network environment. Search Robertshaw in the App Store, download and install the app.

Connect the Device to the Robertshaw App (for RTC-500-WIFI)

1. Log in or create an account. (Note: Multiple people can use the same account by sharing the login information after setup is complete.)
2. Once logged in select Heating and Cooling to proceed to the device list page.
3. Select the “Add New Device” button to add a controller to your account.
4. Select the correct corresponding controller (RTC-500-WIFI) that you are trying to connect.
5. “Has the device been installed and powered on?” Select the YES button.

6. Ensure the RTC-500-WIFI is plugged in and powered on. Then press and hold the and SET button at the same time until the AP character is displayed. Once it is displayed, select the YES button in the app.
7. Now enter your WiFi and the correct password. Make sure Ap Config is selected before clicking next.
8. You will then be asked to Connect the device to “therm_xxxxxxxxxxx” WiFi. Select YES and it will direct you to your WiFi connections in your settings. Select “therm_xxxxxxxxxxx” then navigate back to the Robertshaw app to continue the setup process.
9. Once you are back in the app it should say Connect the device to “therm_xxxxxxxxxxx” WiFi. Select YES to proceed. Binding will begin and should take 15-30 seconds. A message “Configuration completed successfully” should be displayed on the screen.

1. Back Button
   Return back to Device List screen.
2. Relay
   System Relays and
   Humidity Relays
3. Set temperature and humidity
4. Room temperature
   current room temperature
5. Room humidity
   current room humidity
6. Power
   on or off
7. System Mode

Heat or Cool|

8. Humidity Mode

   Humidity Or Dehumidity

9. More Setting

9. Technical Parameters

- Working voltage: 100-240VAC, 50/60Hz
- Temperature measurement range: 23ºF to 158ºF / -5ºC to 70ºC
- Temperature control range: 23ºF to 158ºF / -5ºC to 70ºC
- Temperature measurement accuracy: 1°F / .5°C
- Temperature resolution: 0.1°F / 0.1°C
- Humidity measurement range: 5 to 99%RH
- Humidity control range: 5 to 99%RH
- Humidity measurement accuracy: 5%RH
- Output power:
  - 2200W (resistive) in total /
  - 200W (inductive) per channel @220VAC,
  - 1100W (resistive) in total /
  - 100W (inductive) per channel @110VAC
- Total power consumption: <5W
- Working environment temperature: 32ºF to 140ºF / 0ºC to 60ºC
- Storage temperature: 14ºF to 140ºF / -10ºC to 90ºC
- Length of power cable: 5ft
- Length of output power cable: 1ft
- Length of sensor cable: 6.5ft (including probe length) Enclosure size: 153mm x 60mm x 29m
- WiFi type available on RTC-500-WIFI: 2.4G (does not support 5G) Complies with FCC Standards
- Warranty: 3 Year Limited Warranty

Customer Service 1 800 304 6563
Technical Support 1 800 445 8299
HVACCustomerService@robertshaw.com
robertshaw.com
352-00318-001 Rev B

3 Year Limited Warranty

Documents / Resources

Robertshaw RTC-500, RTC-500-WIFI Temperature and Humidity Controller [pdf] User Manual

RTC-500, RTC-500-WIFI, RTC-500 RTC-500-WIFI Temperature and Humidity Controller, RTC-500 RTC-500-WIFI, Temperature and Humidity Controller, Humidity Controller, Controller

References

- **Robertshaw | Electronic controls, switches and valves**
- **User Manual**