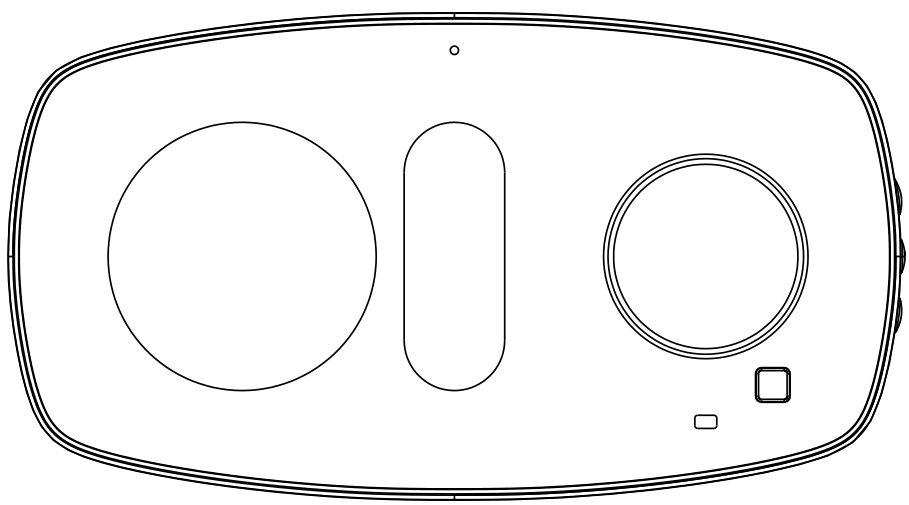


PCT503-Z Multi-stage Thermostat

Quick Start Guide

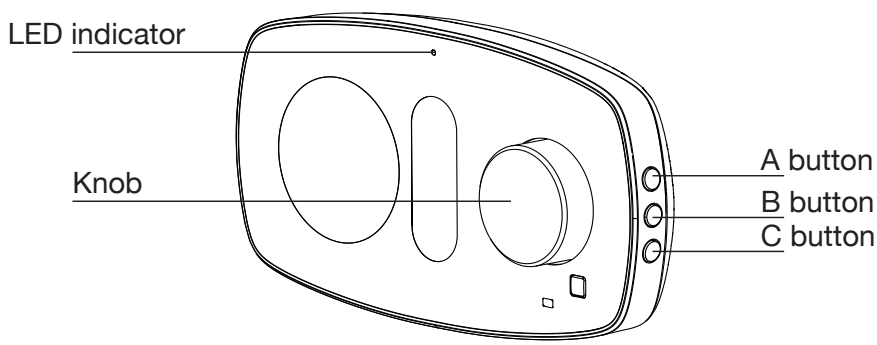
Overview of this guide

1 Welcome

The PCT503-Z makes it easier to control your household temperature. It is designed to work with the ZigBee gateway so that you could remotely control the temperature anytime through your mobile phone. You can schedule your thermostat working hours so it will work based on your plan.

This guide will provide you with an overview of the product and will help you understand how to use it.

2 Get to know your device



Knob

Rotate to choose from different given options, press to select.

A button

Time and date. Press to show time and date.

B button

Away/Home mode. Press to switch between Away and Home mode.

C button

Permanent hold. Press to enter "Permanent hold" mode. Hold current target temperature regardless of the schedule.This will over ride the current schedule

settings.This function is not available when your device is in “Away” mode.

LED status

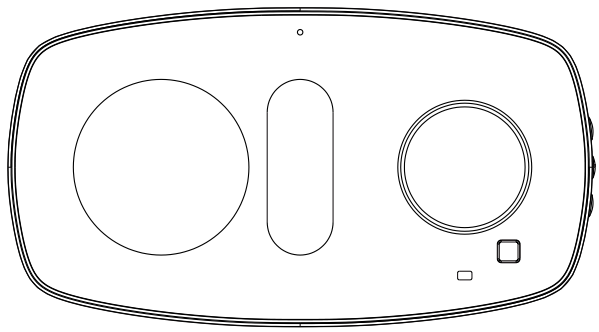
The LED status gives the following information of the thermostat:

LED status	What it means
Red LED flashing	The device has not joined a network.
Alternately flashing in RGB	Thermostat initializing.
Green solid on	Entering update mode.
Green LED flashing	In the process of updating.
No light	The device has joined a network.

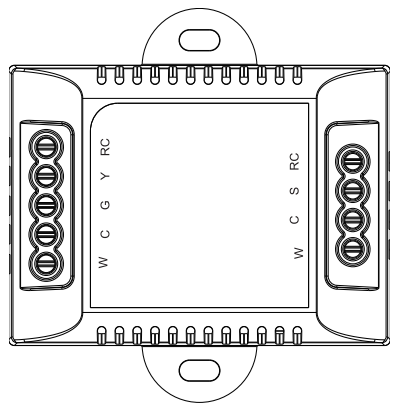
3 Installation Guide

3.1. In the box

PCT503-Z Multi-stage thermostat



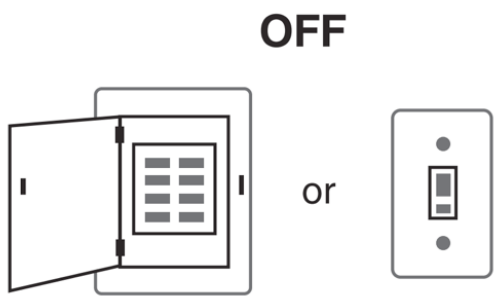
Wiring Module SWB511 (Optional)



3.2. Thermostat installation

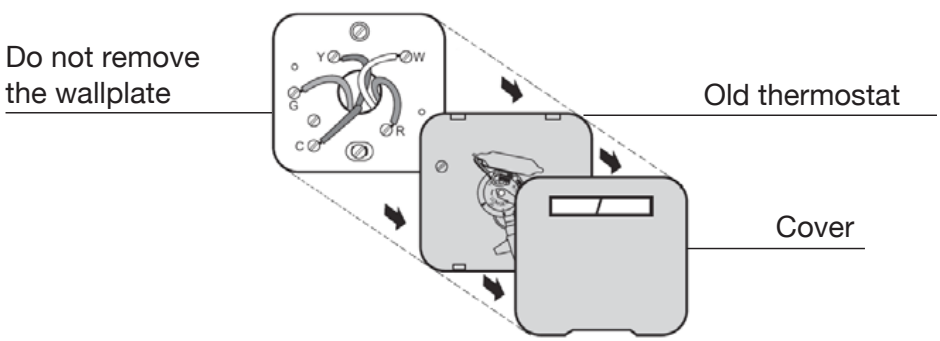
Step 1. Switch off your HVAC system

Before you start, please switch off your HVAC system. Adjust the temperature in your old thermostat to double check the system is off.



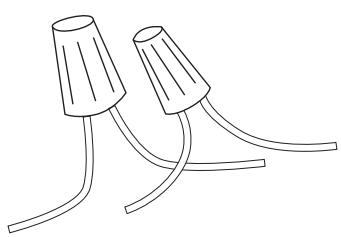
Step 2. Remove the old thermostat

Remove the old thermostat cover from the wall, keep the wallplate with wires.



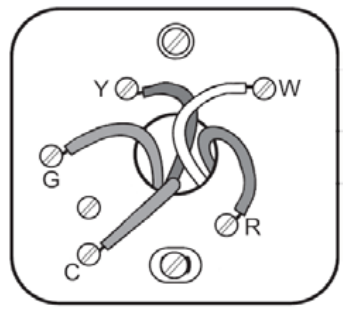
Step 3. Check the old Thermostat's backplate

If you find a thick wire with wire nuts, or if your old system is using 120v or 240v, it will not be compatibled with PCT503. If all good, please continue to the next step.



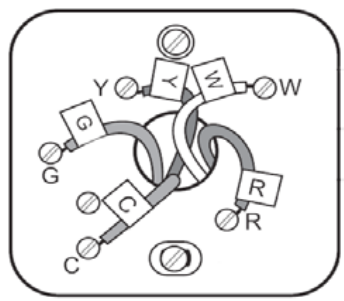
Step 4. Take a photo

Take a picture of the wires connected to the terminal of your old thermostat. You may need to reference this photo later on.



Step 5. Label the Wires with Tags

Carefully disconnect and label the wires from your old themostat one wire at a time, using the label (label 1)provided.



Terminal designation:

Terminals	What it means
RC	24VAC primary for cooling
RH	24VAC primary for heating
W1	1st stage Primary heating relay / Aux heat
W2	2nd stage Secondary heating relay / Aux heat
Y1	1st stage Primary cooling compressor contactor
Y2	2nd stage Secondary cooling compressor contactor
G	Fan relay
C	24VAC common*
O/B	Changeover valve for heat pumps
S	Wiring Module Connection
*	Multiple use reserved, including but not limited to: emergency heat line, humidifier control

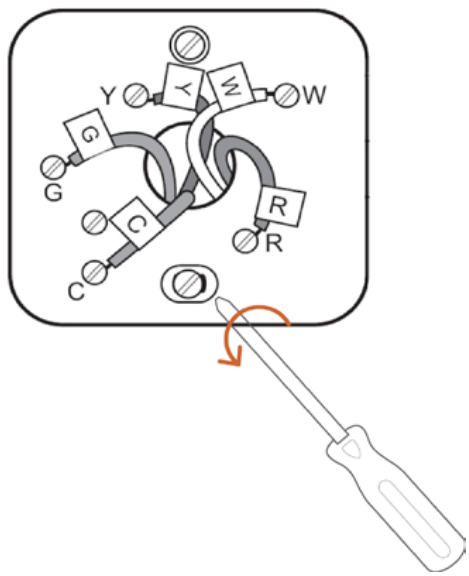
Note:Do you have a C wire connected to your old thermostat?

YES →Guide 1. NO→ Guide 2.

Guide 1: Install the thermostat with a C-wire

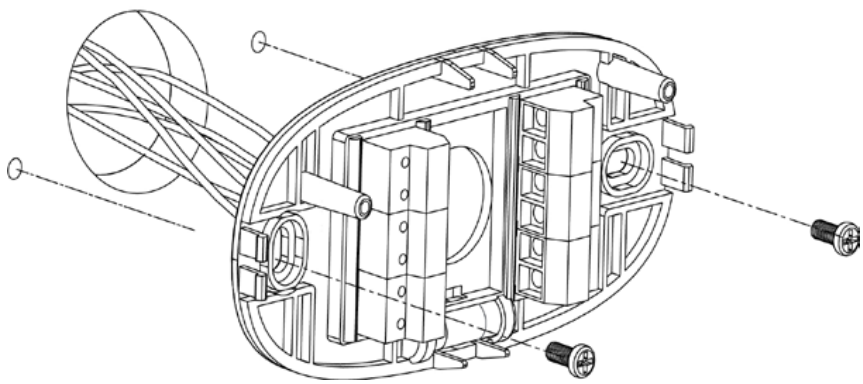
Step 1. Remove the old thermostat base

Unscrew the old thermostat base from the wall, gently pull it out and ensure the wires will not fall back into the hole.



Step 2. Attach the base of PCT503 to the wall

Bundle and insert the wires through the hole of the thermostat base, then attach the base to the wall with the screws.

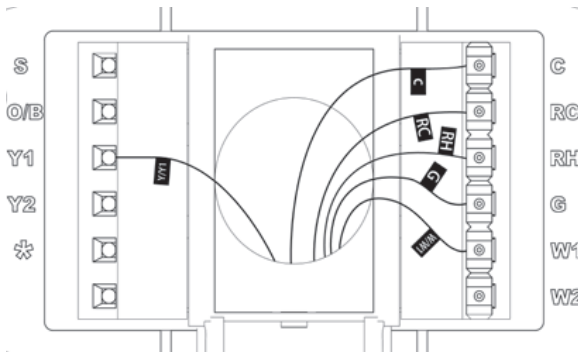


Step 3. Connect Wires

Connect wires to the corresponding terminal in the base. Take a picture of the wires when you finished. You may need to refer it for the wirings in the setup wizard later on.

Do you have more than one R wire(R, RC, and RH)?

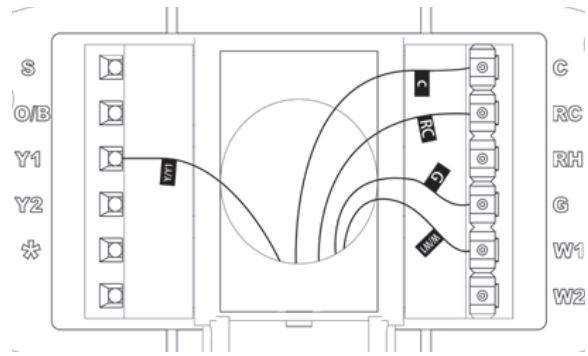
YES:



R or RC wire into the RC terminal

RH wire into the RH terminal

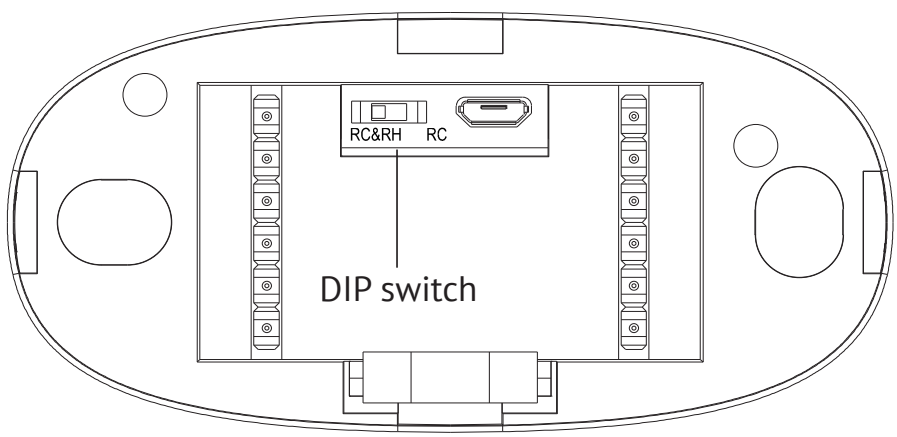
NO:



R, RC, or RH wire into the RC terminal

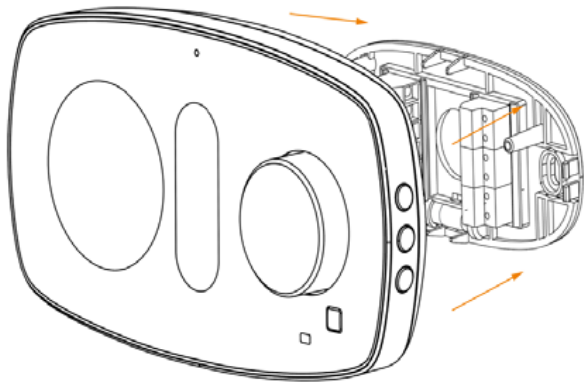
Step 4. Switch the DIP

Switch the DIP switch on the back of the thermostat to RC if you have connected both the RC-wire and the RH-wire to the wallplate, otherwise switch it to the RC&RH side.



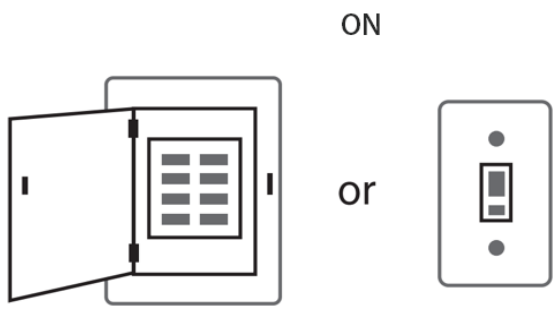
Step 5. Attach the PCT503 to the base

Gently press the PCT503 into the base until it clicks.



Step 6. Power on your system

Congratulation, the installation is finished. Please power on your HVAC system.



Step 7. Setup the thermostat

Follow the instructions on your smart thermostat to complete the setup. You can use the picture you took to help you remember the wiring （turn to page18）.

Guide 2: Install the thermostat without a C-wire (Optional)

CHECKPOINT: 3 OR 4 WIRES

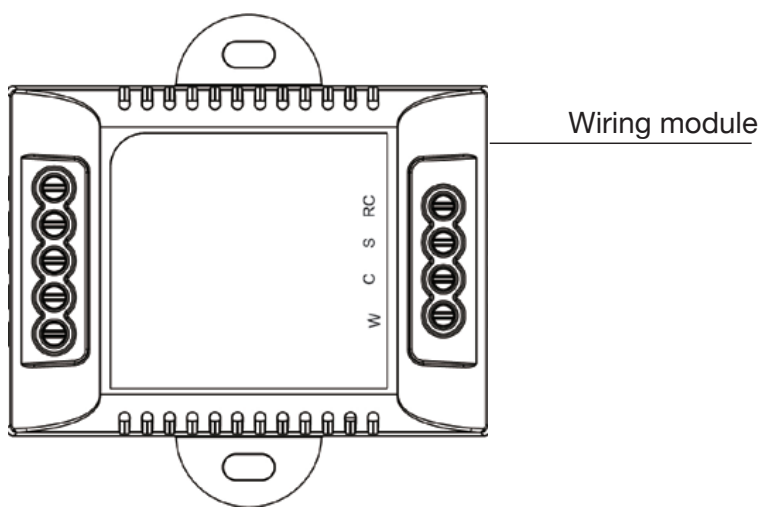
The wiring module requires your system to have the following wires:

4 wires: W/W1, Y/Y1, G, and R (or Rc or Rh)

or 3 wires: Y/Y1, G, and R (or Rc or Rh)

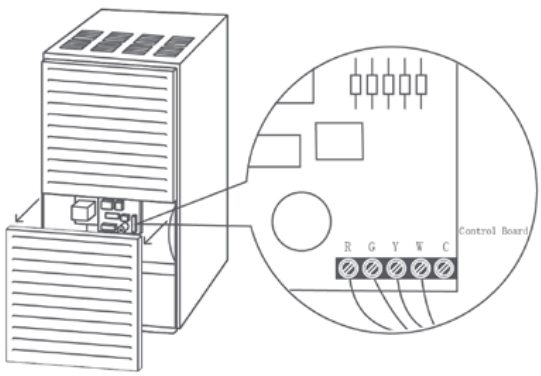
If you don't have those wires, your system might not be compatible. Please contact the local dealer.

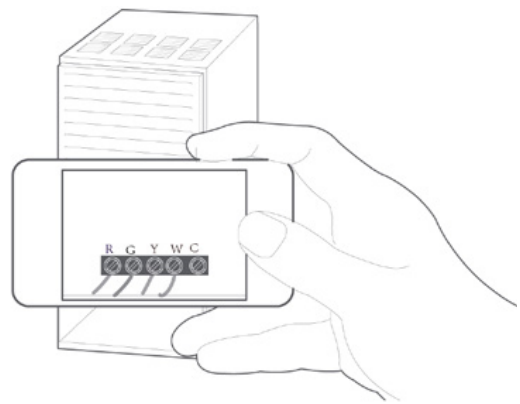
Install the wiring module to use the exiting wires to power your thermostat.



Step 1. Find the HVAC terminals

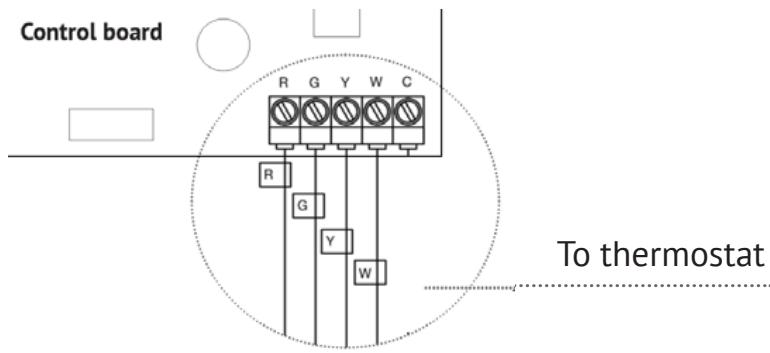
Find the control board of your HVAC system.Take a picture of the wires connected to the terminals of your old thermostat. You may need to reference this photo later on.





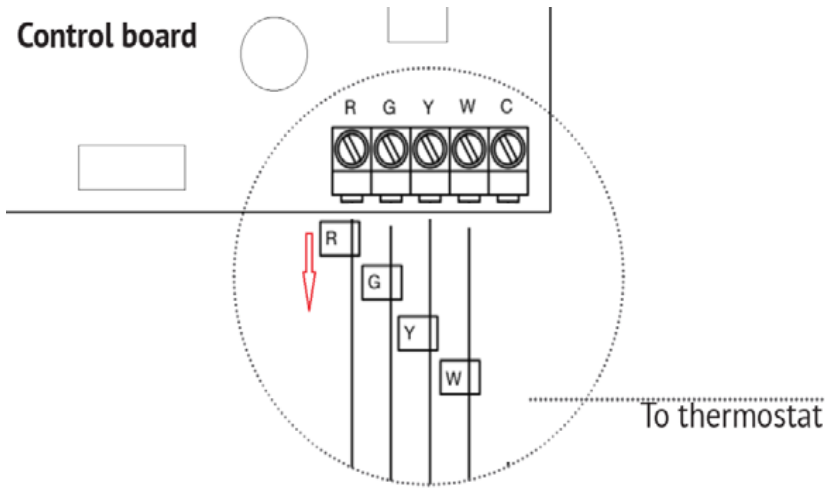
Step 2. Label the wires

Use the tags provided (label 2) to label the wires from the control board to the thermostat.



Step 3. Disconnect the wires

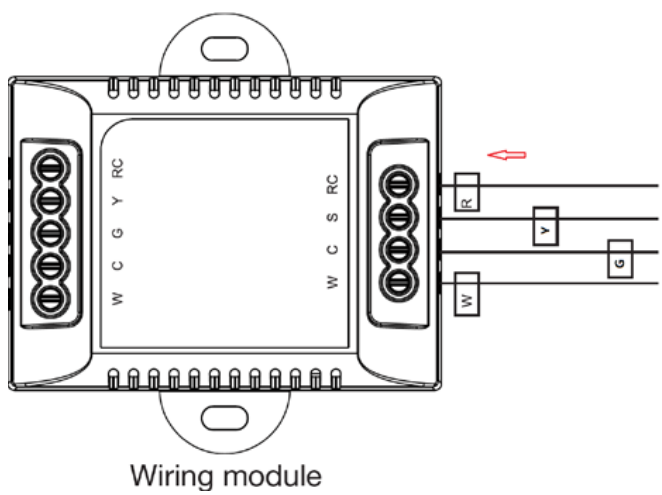
Disconnect the R/RC, W, Y, G wires from the control board.



Step 4. Connect the wiring module

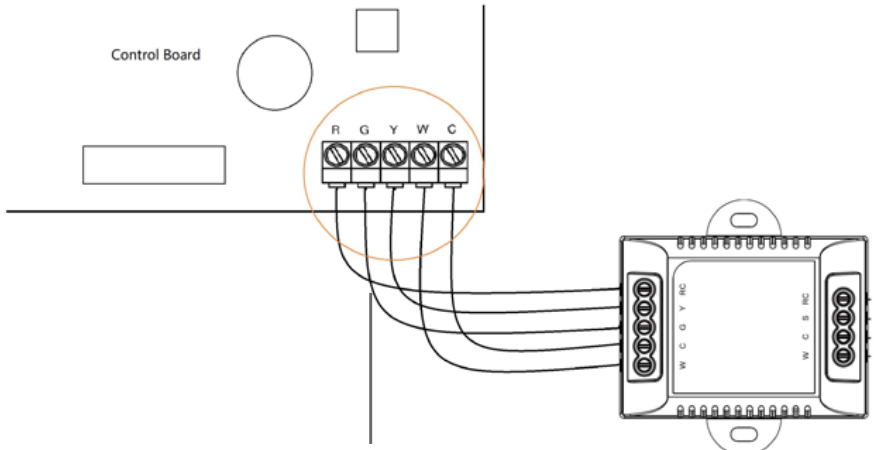
Reconnect them correspondingly to the 4 terminals side of the wiring module.

R/RC/RH→RC **W/W1→W** **G→C** **Y/Y1→S**



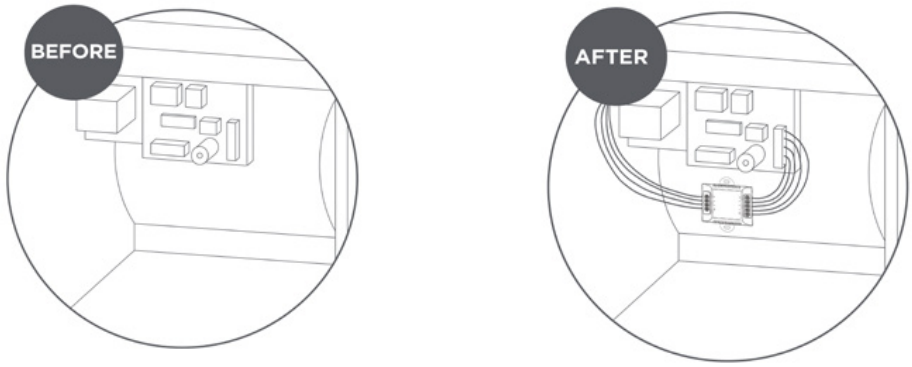
Step 5. Connect the wires

Generally the control board will have R, G, Y, W, C terminal, connect the pre-wired side of the wiring module (5 terminals) to the corresponding terminals.



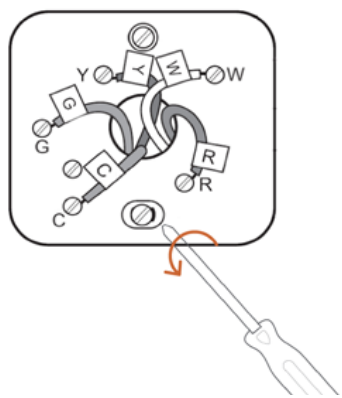
Step 6. Close the HVAC cover panel

Close the HVAC cover panel securely and reture to your thermostat.



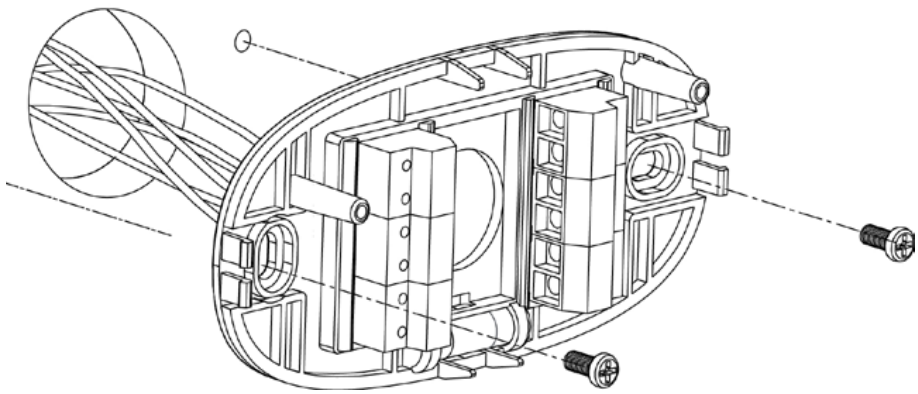
Step 7. Remove the old thermostat base

Unscrew the old thermostat base from the wall, gently pull it out and ensure the wires will not fall back into the hole.



Step 8. Attach the base of PCT503 to the wall

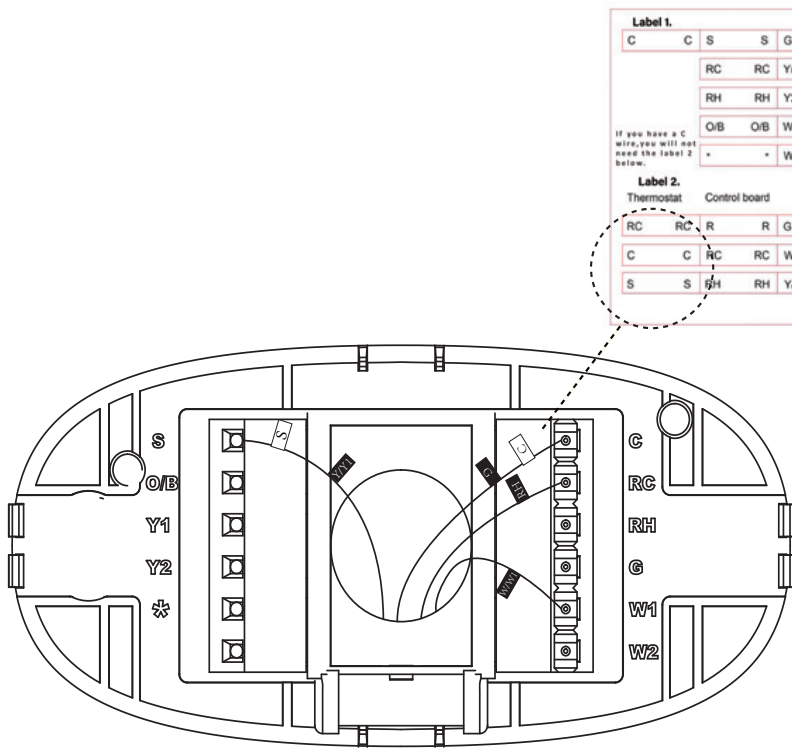
Bundle and insert the wires through the hole of the thermostat base, then attach the base to the wall with the screws.



Step 9. Attach the tags

Attach the tags provided(label 2 Thermostat) to the wires as shown below:

R/RC/RH→RC **G→C** **Y→ S**

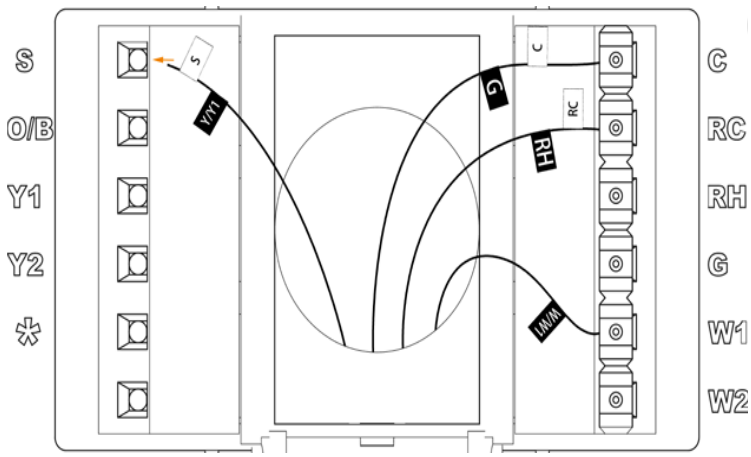


Step 10. Connect the wires to the corresponding terminal

First, connect 3 wires as shown below:

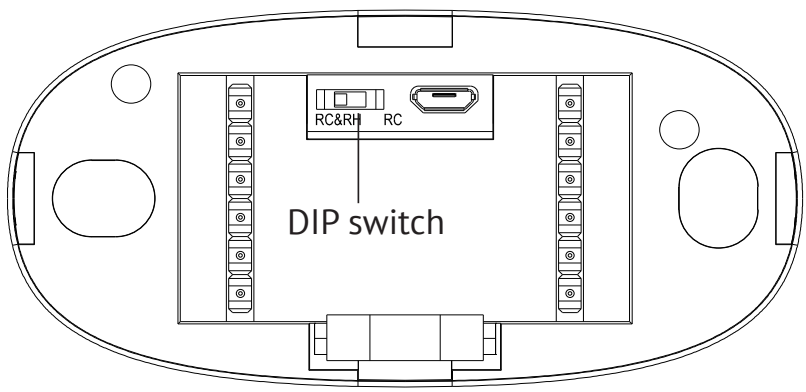
RC C S

Then connect other wires to the corresponding terminal in the base. Take a picture of the wires when you finished. You may need to refer it for the wirings in the setup wizard later on.



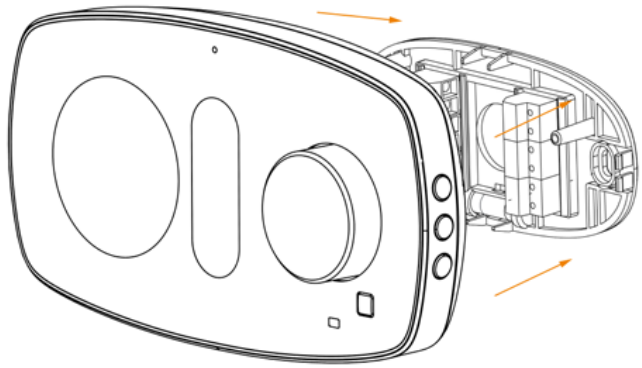
Step 11. Switch the DIP

Switch the DIP switch on the back of the thermostat to RC if you have connected both the RC-wire and the RH-wire to the wallplate, otherwise switch it to the RC&RH side.



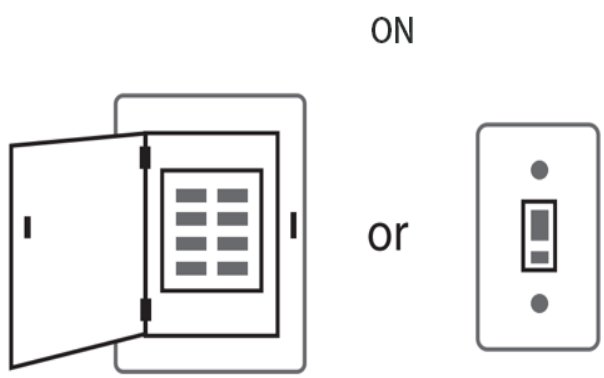
Step 12. Attach the PCT503 to the base

Gently press the PCT503 into the base until it clicks.



Step 13. Power on your system

Congratulation, the installation is finished. Please power on your HVAC system.



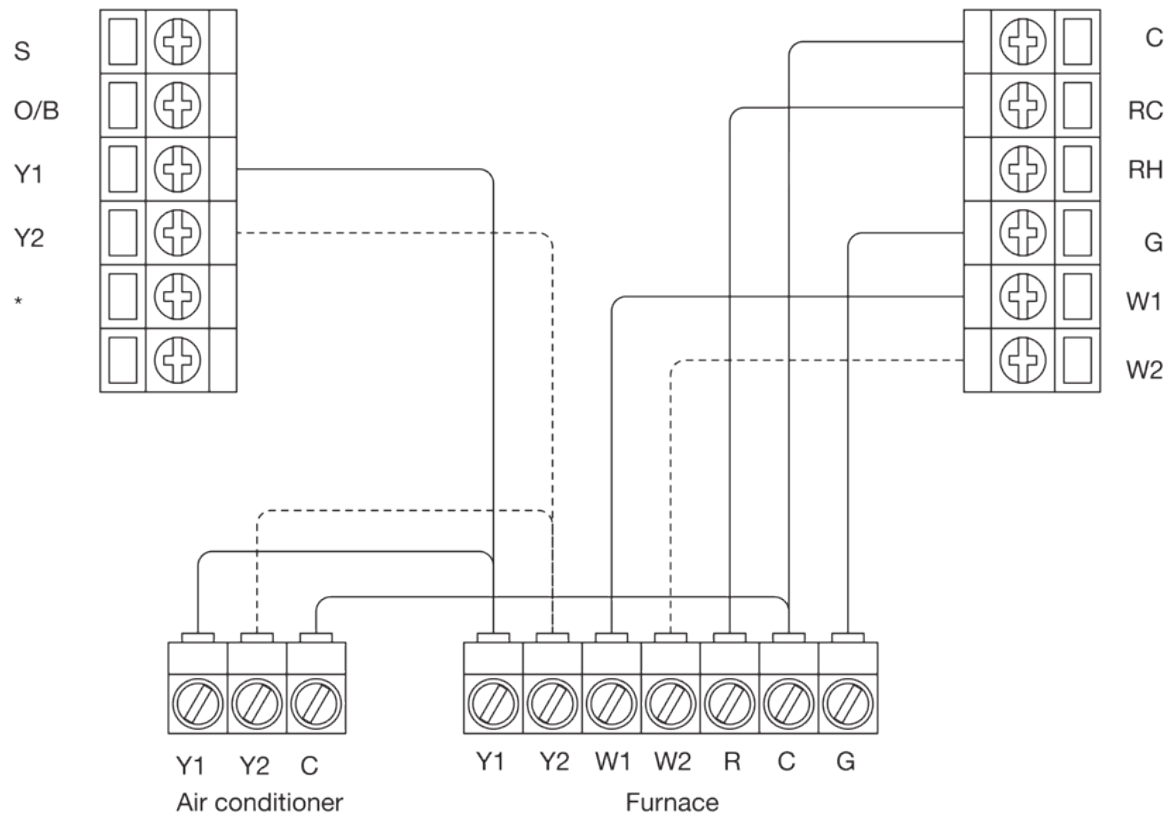
Step 14. Setup the thermostat

Follow the instructions on your smart thermostat to complete the setup. You can use the picture you took to help you remember the wiring.

Wiring diagrams

Below is the wiring diagrams for common HVAC equipments.

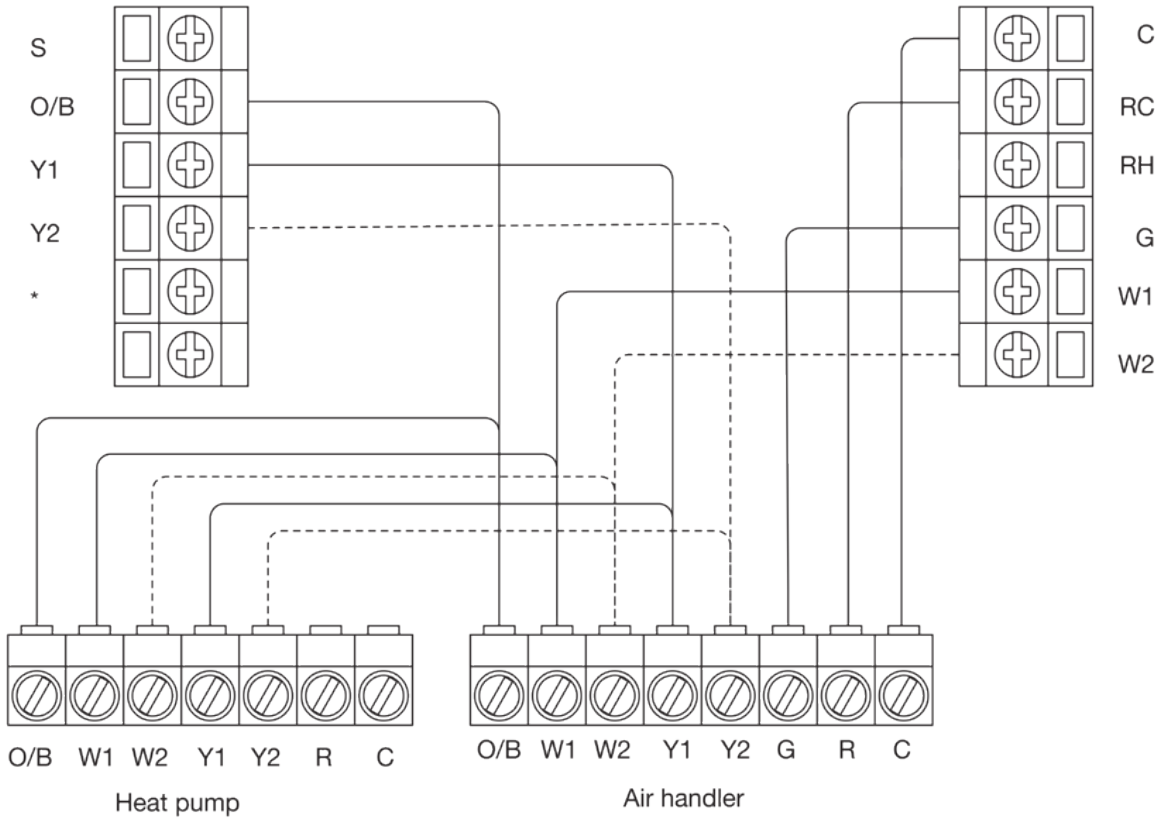
Conventional heating and cooling system



- - - - - - - - - - - - - - - For dual heat and cooling system, if applicable.

Remove the jumper for RC or RH, switch the DIP switch on the back of the thermostat to RC if you have connected both RC-wire and RH-wire to the wallplate, otherwise switch it to the RC&RH side.

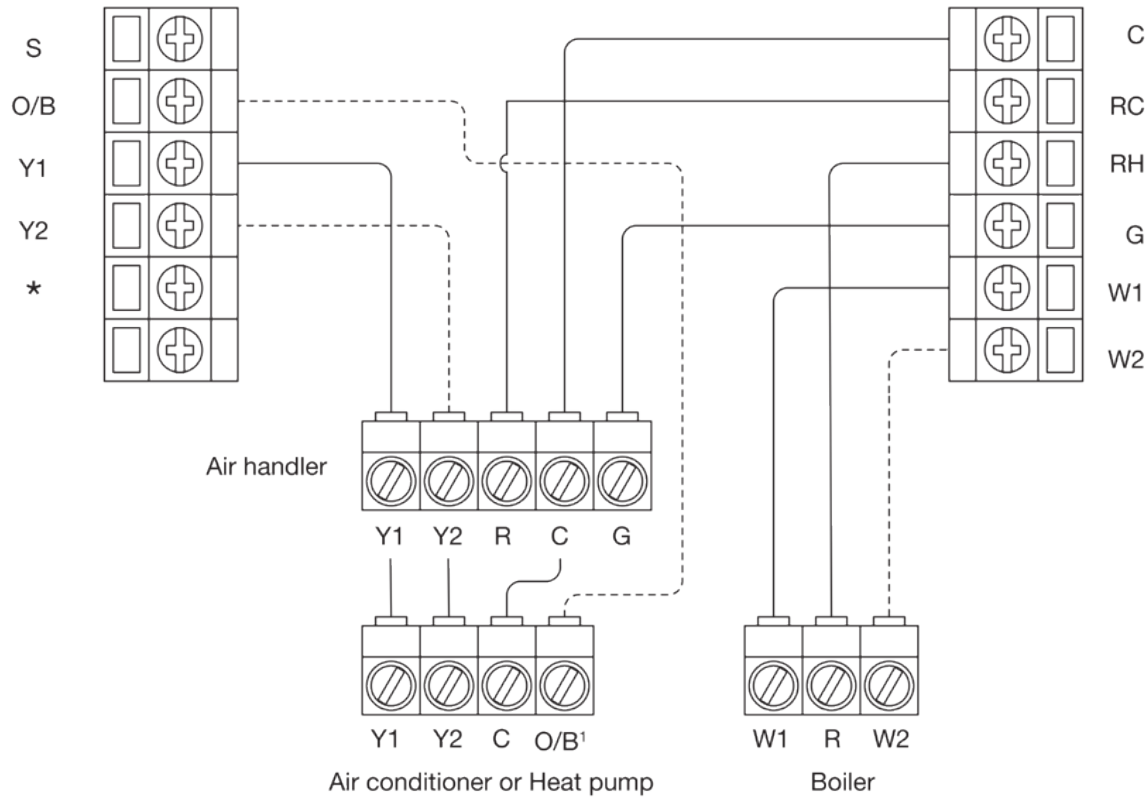
Heat pump (air or geothermal) with auxiliary heat



- - - - - - - - - - - - - - - For dual heat and cooling system, if applicable.

Remove the jumper for RC or RH, switch the DIP switch on the back of the thermostat to RC if you have connected both RC-wire and RH-wire to the wallplate, otherwise switch it to the RC&RH side.

Boiler or radiant system with air handler and conventional cooling or heat pump



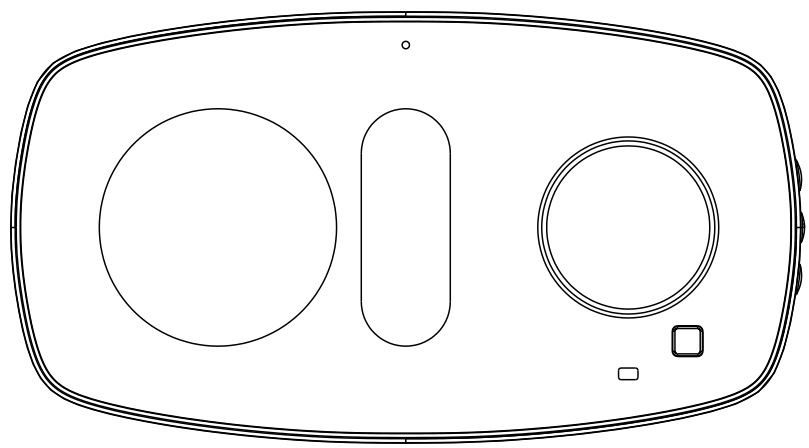
- - - - - - - - - - - - - - - For dual heat and cooling system, if applicable.

1 For heat pump only.

Remove the jumper for RC or RH, switch the DIP switch on the back of the thermostat to RC if you have connected both RC-wire and RH-wire to the wallplate, otherwise switch it to the RC&RH side.

Congratulations,
you have completed the wiring!

To complete your setup, follow the instructions on the configuration guide below.



In here you'll find:

— Meet your thermostat
— Device user guide
— Troubleshooting
— Technical specifications

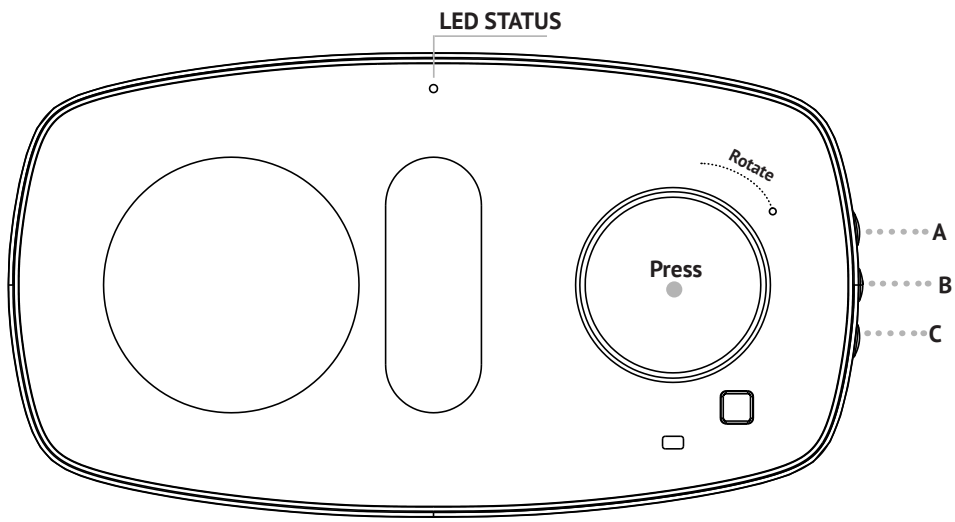
4 Welcome

This guide will help you understand how to use it.You will be able to remotely control the temperature anytime through your mobile phone.

4.1 Get started

To get started, you will need:

- A Zigbee Gateway
- A mobile phone with a mobile APP installed



Rotary button: Rotate the button for more options, press to select .

RESET:

Method: Menu page > **Settings** > **Reset**

1.Press the rotary button to enter menu page

2.Rotate to Setting

3.Press to enter Setting

4.Rotate to Reset

5.Press Reset to select the item

4.2 Connect to the gateway

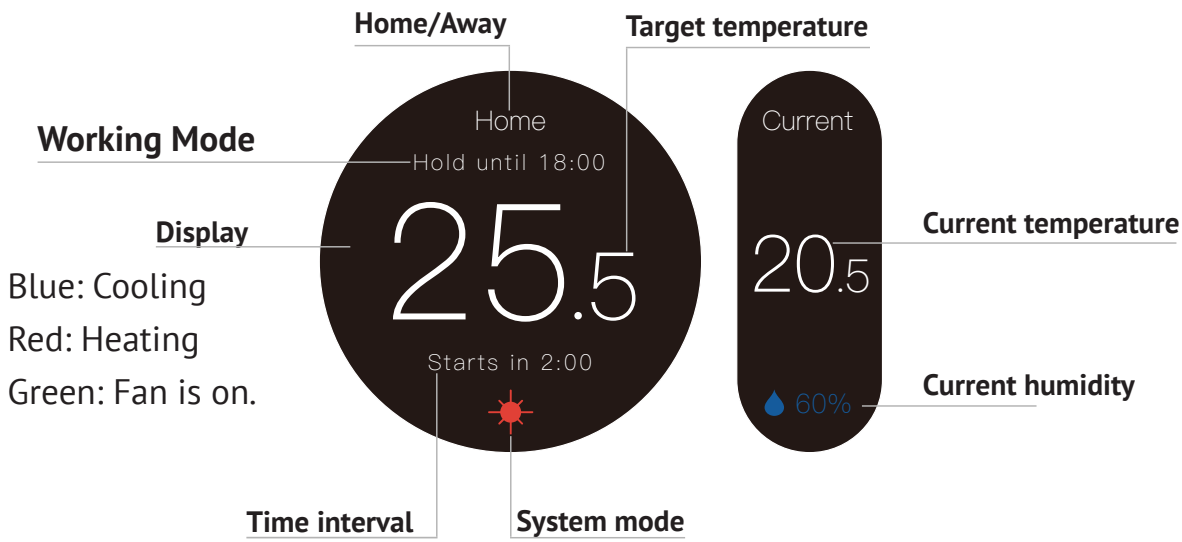
1.Power on your devices

2.Ensure the LED indicator is flashing red, if not, please reset the device.

3.Set your gateway to permit joining

4.The PCT503 will add into the gateway system automatically, the LED indicator will be off when joining is successful. Please check the application to make sure it has been added to the system.

Overview



A two-minute countdown is set to protect the compressor.

Cooling/Heating/ Emergency heating/Auto

Device menu (Press the Knob to enter).

System.

Off: Turn the system off

Cool: Cooling only

Heat: Heating only

Auto: Automatic control of heating and cooling based on ambient temperature

Emergency Heat: This only works when the device connects Heat pump and W wire

Fan.

Auto:Automatically adjust Fan while heating or cooling

Cycle:Runs at intervals to circulate air

On:Runs continuously

Setting.

Date&Time: Set date and time.

Time Zone. Change time zone setting.

Brightness: Adjust screen brightness.

Away setting: Set the temperatures for away mode.

F/C: Celsius or Fahrenheit.

Equipment: Reconfigure your thermostat.

Click sound: Turn on/off the click sound.

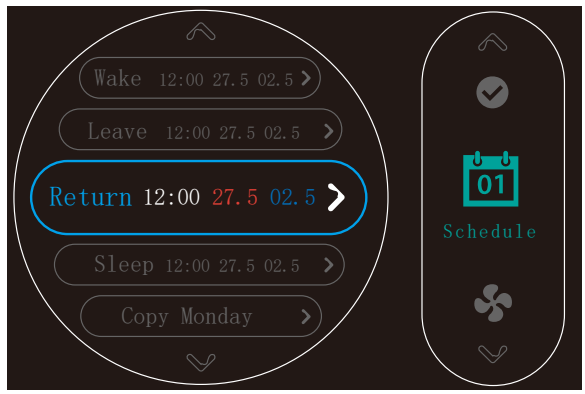
Device info: Show device information.

Reset: Reset Network setting. Reset schedule (Clear all Schedule). Reset all settings (reset the thermostat to default factory setting).

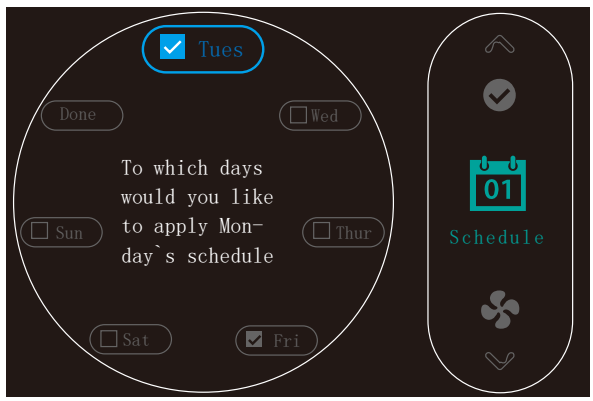
Schedule. Set Schedule to change the temperature automatically

-Press the button to get into Schedule setting and rotate to select the day you want to set.

-Press the button and modify your start time and target temperature.



-You can copy this Schedule to other day, or you can select "done" to complete your configuration.



Note: You can rotate the button to change target temperature at the main interface, but it will get into "Temporary Hold".

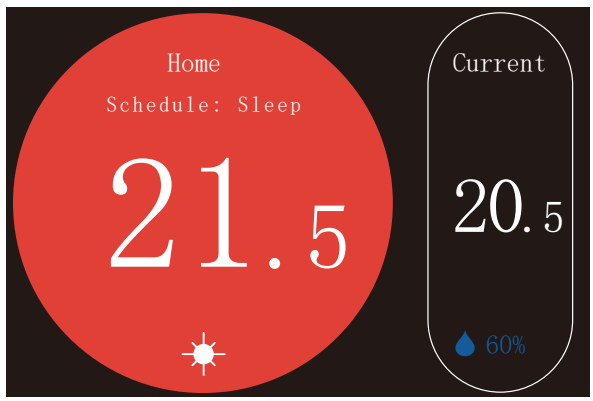
Home/Away. Switch between home and away mode to save energy.
Away. Set the thermostat to away mode when you leave.
Home mode: Following Schedule, Temporary Hold, Permanent Hold

Done. Complete the configuration and return to main interface.

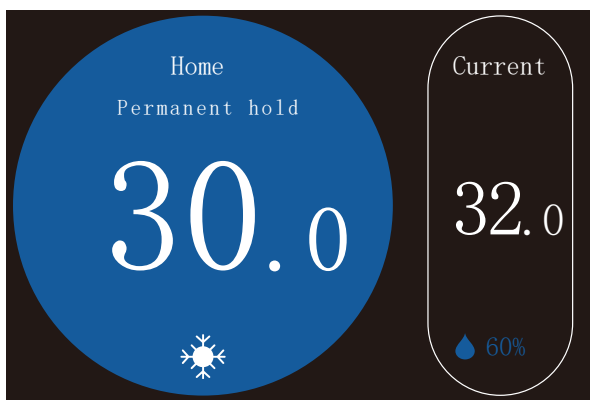
Home page mode

There are four working modes on the device you can use.

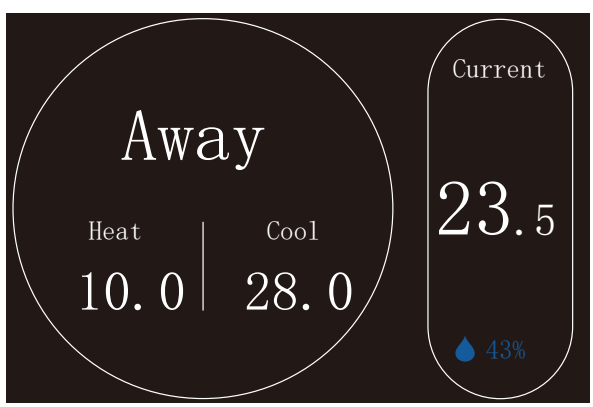
- Following Schedule: Follow the settings of schedule to adjust the temperature.



- Permanent Hold: Hold current target temperature regardless of the schedule. This will over ride the current schedule settings



- Away: Target temperature when you are not at home(regardless of the schedule) You can change target temperature on the setting menu.



• Temporary Hold: Keep the current target temperature until the next scheduled activity begins (This selection only exists when you are adjusting the target temperature under **FollowingSchedule** mode.)

5 FAQ

1.Connect to gateway failure?

-Confirm the gateway's ZigBee profile is Home Automation Profile.
-Confirm the device's LED light is flashing.If not, reset it.
-Confirm the device and gateway are as close as possible.

2.What if the device is offline?

1.Please confirm whether the device is powered on.
2.Please confirm whether the device or the gateway's network has been cut off, if so, please reconnect the network, it may need some time to recover. Please check the status 2 minutes later.
3.Please confirm the network is stable.
Check method: Put another Zigbee device besides your device and make sure they are in the same network environment, try to control them to work.
If they can work, it is recommended to reset your thermostat from Zigbee network and add it again.And you can put a Zigbee extender besides your device to get a better network.

6 Technical specifications

Compatibility	
Compatible systems	• Conventional: 2-stage heater and 2-stage cooling HVAC systems • Supports heat pump, natural gas, electric, hot water, steam or gravity, gas fireplaces (24 Volts), oil heat sources • Supports any combination of systems
Aux Heat	• Up to 2 Stages
Heat Pump	• Up to 2 Stages • 1 stage + 1 aux • 1 stage + 2 aux • 2 stage + 1 aux • 2 stage + 2 aux • Supports dual Fuel • 4 stage heating (2 compressor, 2 aux heat), 2 stage cooling

Wireless Connectivity	
Wi-Fi	• ZigBee 2.4GHz IEEE 802.15.4
Output Power	• +3dBm (up to +8dBm)
Receive Sensitivity	• -100dBm
ZigBee profile	• Home Automation Profile

HVAC Control Functions	
System Mode	• Heat, Cool, Auto, Off, Emergency Heat (Heat Pump only)
Fan Mode	• On, Auto, Cycle
Advanced	• Local and remote setting of the temperature • Auto-changeover between heat and cool mode (System Auto) • Compressor short cycle protection delay of 2 minutes • Failure protection by cutting off all circuit relays thanks to the Super Capacitor
Auto Mode Deadband	• 1.5° C, 3° F
Temp. Sensing Range	• −10°C to 125°C
Temp. Resolution	• 0.1° C, 0.2° F
Temp. Display Accuracy	• ±1°C
Temp. Setpoint Span	• 0.5° C, 1° F
Humidity Sensing Range	• 0 to 100% RH
Humidity Accuracy	• ±4% Accuracy through the range of 0% RH to 80% RH
Humidity Response Time	• 18 seconds to reach 63% of the next step value

Physical Specifications

Embedded Platform	• MCU: 32-bit Cortex M4; RAM: 192K; SPI Flash: 16M
LCD Screen	• 3.5" TFT Color LCD, 480*320 pixels
LED	• 3-color LED (Red, Blue, Green)
Buttons	• One rotary control wheel, 3 side-buttons
PIR Sensor	• Sensing Distance 5m, Angle 30°
Speaker	• Click sound
Data Port	• Micro USB
DIP Switch	• Power selection
Electrical Rating	• 24 VAC, 2A Carry
Switches/Relays	• Latching type relay, 2A maximum loading • 1. 1st stage control • 2. 2nd stage control • 3. 3rd stage control • 4. Emergency Heating control • 5. Fan Control • 6. Heating/cooling Reverse Valve Control • 7. Common
Dimensions	• 160(L) × 87.4(W)× 33(H) mm
Mounting Type	• Wall Mounting
Wiring	• 18 AWG, Requires both R and C wires from the HVAC System
Operating Temperature	• 0° C to 40° C (32° F to 104° F)
Storage Temperature	• -30° C to 60° C
Certification	• FCC

7 Safety Handling

WARNING: Failure to follow these safety notices could result in fire, electric shock, other injuries, or damage to the Thermostat and other property. Read all the safety notices below before using the Thermostat.

- Avoid high humidity or extreme temperatures.
- Avoid long exposure to direct sunlight or strong ultraviolet light.
- Do not drop or expose the unit to intense vibration.
- Do not disassemble or try to repair the unit on your own.
- Do not expose the unit or its accessories to flammable liquids, gases or other explosives.

FCC Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Support

If you have questions, we have answers.
Technical support is available by email :

info@owon.com

Compatible systems

The PCT503 Thernostat works with most centralized residential heating and cooling systems.

- 2-stage heater and 2-stage cooling HVAC systems
- Supports natural gas, heat pump, electric, hot water, steam or gravity, gas fireplaces (24 Volts), oil heat sources
- Supports any combination of systems

The app supports both **Android** and **IOS**