

T6R-HW SMART THERMOSTAT WITH HOT WATER CONTROL

PRODUCT SPECIFICATION SHEET



The **T6R-HW** smart thermostat is designed to provide automatic time and temperature control of heating and stored Hot water systems in homes and apartments.

It's compatible with 24-230V on/off appliances such as gas boilers, OpenTherm® combi-boilers and heat pump. Also, works with zone valve applications and is suitable for Sundial S, Y and W plan stored hot water systems (on/off). Not with electric heating (240V).

The T6R-HW is for table stand installations (wireless), and consist of a thermostat and a Receiver box.

The solution is designed with the installer in mind and includes a 2-channel Receiver module with mounting options for directly on the wall or on a wall box. Wiring can be from below or from the back by lifting the terminal platform, which makes installation quick and easy.

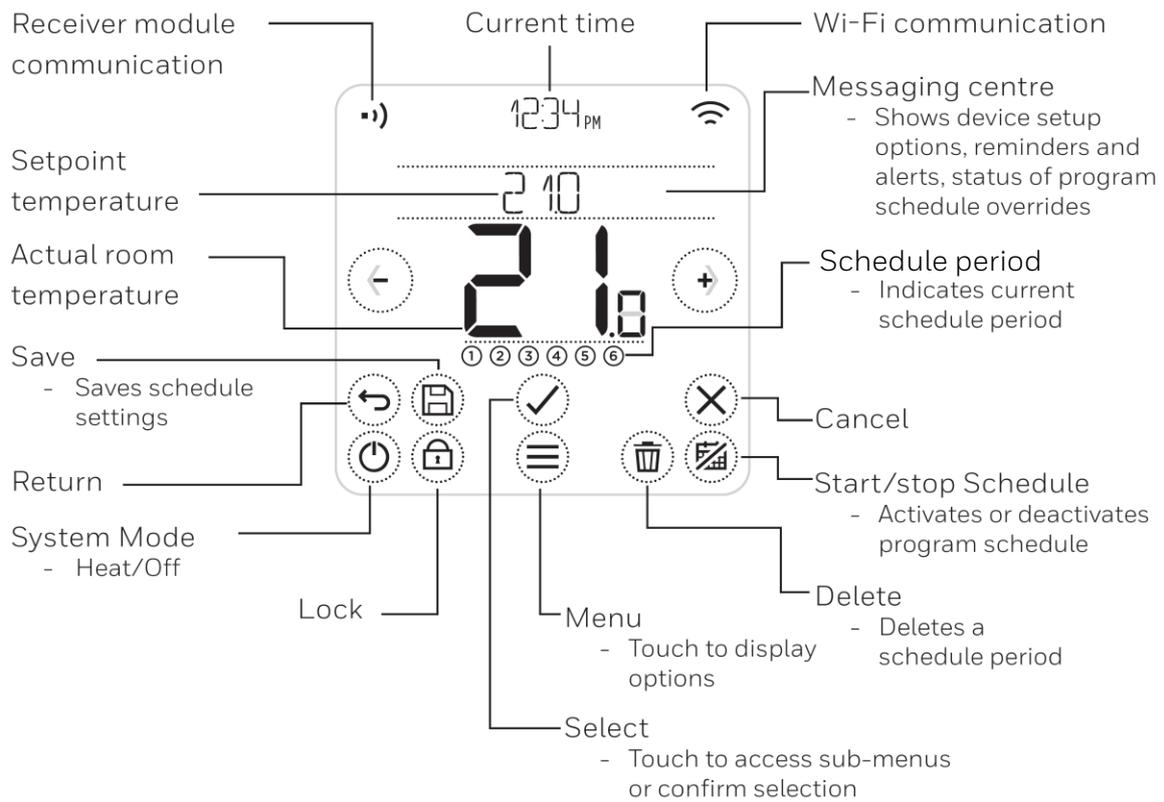
The thermostat has a high contrast PMVA display with dynamic text line and touch screen buttons. The thermostat has a simple programming philosophy to make it easier to install and very user friendly.

The T6 is ideal for consumers who want to control their comfort and hot water remotely and is based on a modern design, which is simple to program and easy to use.

FEATURES

- Attractive, ultra-modern styling makes it ideal for any location in any type of home.
- Table stand thermostat to fit a new and replacement installations.
- For control of central heating and stored hot water systems
- Suitable for Sundial S, Y and W plan stored hot water systems (on/off)
- Wi-Fi communication to connect to the Internet
 - Smart Home and Apple HomeKit ready
- Honeywell Home mobile App for:
 - Remote view and change of settings of heating and hot water
 - Schedule changes
 - Smartphone Geolocation temperature control
- A dynamic text display on the LCD that gives enhanced feedback to the user / installer.
- High LCD Contrast and backlighting for easier viewing in all light conditions.
- Time out screen with selectable brightness
- Heating control:
 - Factory programmed daily or 5+2 default schedule
 - Schedule with up to 6 independent time and temperature pairs to suit the comfort needs.
 - "Hold until" temperature override of programmed schedule temperature till the next switch point.
 - Schedule off mode for manual operation.
 - Setpoint and room temperature always displayed.
 - OFF position has an integral frost protection setting at minimum 5°C so that pipes in the house will never freeze in winter.
- Hot water control:
 - Factory programmed daily or 5+2 default schedule.
 - Schedule with up to 3 ON periods per day to suit the comfort needs.
 - Hot water Boost function for temporary override
- Alert messages to assist in fault-finding.
- 2-channel Receiver box with clear LED indications and override buttons (heating and hot water)
 - A flip up wiring platform for easy wiring
 - On/Off compatible heating control.
- User menu allows extra functions to be set at the discretion of the user:
 - Language selection
 - Wi-Fi setup
 - Optimisation
 - Clock setting
 - Resetting the heating program to factory default
 - Brightness
 - Temperature offset
 - Lock function
- Advanced menu (Installer Set-Up) allows extra functions to be set at the discretion of the installer to match the consumers applications and needs:
 - Language selection
 - System type
 - 5+2 or daily schedule option
 - Upper / Lower Set point Limit Adjust
 - Minimum ON time
 - Cycle rate
 - Factory Reset
 - Binding (wireless version)
- Pre-configured and bound system pack

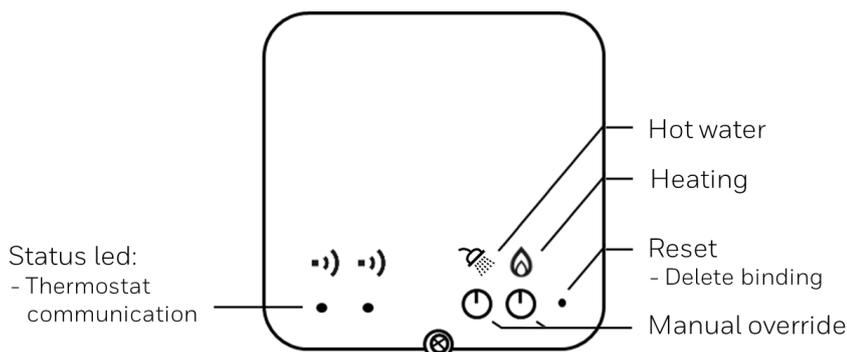
THERMOSTAT DISPLAY/BUTTON LAYOUT



Reference to the icons:

- | | | | |
|--|--------------------------------|--|--------------------------------------|
| | Geofencing active | | Heating demand active |
| | Geofencing home active | | Hot Water Enabled |
| | Geofencing away active | | Heating Mode |
| | Geofencing sleep active | | Cooling Mode |
| | Failure/Alarm | | Receiver module communication |
| | Optimisation active | | Communication failure |
| | Schedule disabled | | Wi-Fi communication |
| | Schedule enabled | | Wi-Fi failure |
| | Temporary Hold active | | |

2-CHANNEL RECEIVER BOX



SPECIFICATIONS

T6R-HW Thermostat

| | |
|---------------------------|--|
| Control form | : Adaptive Fuzzy Logic |
| Room | : From 0°C to 50°C |
| Temperature display range | |
| Dimensions (w x h x d) | : T6R (wireless) 108 x 103 x 68 mm |
| Time display | : 24 hour or 12 hour AM/PM format |
| Time keeping accuracy | : Synchronized with Internet when connected or typically better than 10 minutes per year |
| Program Heating | : 5+2 or daily schedule with 6 daily time and temperature level changes |
| Program Hot water | : 5+2 or daily schedule with 3 ON periods per day |
| Time setting resolution | : Program - 10 minute steps |
| Sensing element | : 100K (@ 25 °C) NTC thermistor |
| Temperature setting range | : Program : 5 to 37°C in 0.5 °C steps OFF : 5°C |
| Power | : T6R (wireless) 5VDC power adapter |

RF communication

| | |
|-----------------------|--|
| RF operation band | : ISM (868.0-868.6) MHz, 1% duty cycle |
| Max. power | : 25mW |
| Protocol | : Encrypted |
| Comm. Range | : 30 m in a residential building environment |
| Comm. technology | : short, high rate transmissions to minimise air time and avoid collisions |
| Receiver class R.E.D. | : RX Cat 2 (ETSI EN300 220-1 version 1.3.1) |
| RF binding method | : Factory pre-bound |
| Wi-Fi | : IEEE 802.11b/g/n – 2.4GHz |
| Max. power | : 100mW |

2-channel Receiver box

| | |
|-------------------------|--|
| Power | : 230VAC |
| Electrical rating | : 230 V~, 50..60 Hz, 0.5 A to 5 A resistive |
| 2 relay contacts (SPDT) | : 0.5 A to 3 A inductive (0.6 pf) 24 V~, 50..60 Hz, 0.5 A to 5 A resistive 0.5 A to 3 A inductive (0.6 pf) |
| Cycle rate | : Selectable by application (see installer set up) |
| Wiring | : Terminal block capable of accepting wires up to 1.5 mm ² |
| Wire access | : From back via large wall box opening. From bottom with cable clamps. Mains wiring – left. Low voltage wiring – right. |
| Dimensions | : 110 x 110 x 40 mm (w x h x d) |
| IP class | : 30 |

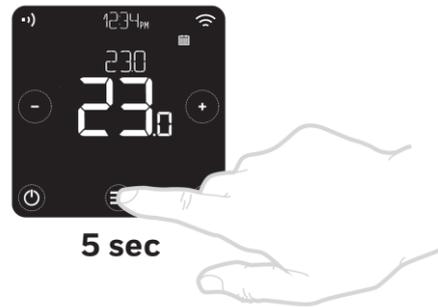
Environmental and standards

| | |
|---|--------------------------------|
| Operating temperature range | : 0 to 40°C |
| Shipping and storage temperature | : -20 to 55°C |
| Humidity range | : 10 to 90% rh, non-condensing |
| EMC | : 2014/30/EU |
| LVD | : 2014/35/EU |
| R&TTE: | : 1995/5/EC |
| ErP | : Class V (+3%), (EU) 811/2013 |
| Honeywell, declares that this thermostat is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU | |

ADVANCED MENU

To enter the Advanced menu (installer set-up):

Press the  menu key for 5 seconds.



| Menu item | Default | Options |
|--------------------|---|--|
| Language | English | English, Francais, Espanol, Deutsch, Nederlands, Italiano |
| System type | Heat + H/W | Heat only, Heat + H/W |
| OpenTherm | - | OpenTherm boiler data when a available |
| Cycle rate | 6 | 3,6,9 or 12 |
| Min on time | 1 minute | 1, 2, 3, 4 or 5 minutes |
| Heat range | Min = 5.0 Max = 37.0 | Min: 5.0°C to 21.0 °C, Max:21.0°C to 37.0 °C |
| Schedule options | Daily | 1 = daily schedule, 2 = 5+2 days schedule |
| Optimisation | Opt.start on Opt.stop off | Opt start: 0 = off, 1 = on, 2 = Delayed start Opt stop: 0 = off, 1 = on |
| Clock | Format: 24h Time: --:-- Date: 01/09/2016 | Clock format: 1 = 12h, 2 = 24h Setup time and date |
| Low Load Control | ON | 0= Off, 1 = On |
| Temperature offset | 0.0 | -1.5°C to 1.5 °C |
| Bind | - | Bind, check RF and clear bind. |
| Adv Reset | - | Factory, schedule, Wi-Fi and Homekit reset |
| Failsafe | OFF | 0= Off, 1 = On |

| Specific Applications | | Setting | | What do you need to change? |
|-----------------------|------------------------|----------------|---------------------------------|--|
| | | Cycle/ Hour | Minimum ON time (in minutes) | Note : a. To change Cycle/Hour, b. To change Minimum ON Time, |
| Heating | Gas Boilers (<30KW) | 6 | 1 | No action required |
| | Oil Boiler | 3 | 4 | 1. Set Minimum ON Time to 4 minutes. 2. Set Cycle/Hour to 3. |
| | Thermal Actuator | 12 | 1 | Set Cycle/Hour to 12. |
| | Zone valve | 6 | 1 | No action required. |

| Special Features | Description |
|------------------|---|
| System Type | When bound to a 2-channel receiver box the system type can be set: Heating only, Heating + Hot Water |
| OpenTherm | If the Receiver box is connected to an OpenTherm appliance various appliance specific data can be viewed. The data displayed is depending on what the appliance is providing. |
| Heat Range | The normal lower temperature limit of 5 °C can be increased up to 21 °C to protect the inhabitants from cold conditions. This is a useful feature aimed at supporting the elderly, children and disabled inhabitants. The normal upper temperature limit of 35 °C can be reduced down to 21 °C to save energy. This feature is useful for leased homes and apartments. |
| Schedule options | The thermostat has 2 default schedules: daily (every day) and 5+2 (week + weekend days) |

| Special Features | Description |
|--|---|
| Optimisation (optimal start, optimal stop and delayed start) | <p><u>Optimal Start</u>: learns how long it takes your system to reach the programmed temperature. It turns on the heating system earlier to make sure it's comfortable at the scheduled time.</p> <p><u>Optimal Stop</u>: Saves energy and money by switching off a little bit earlier than the normal programmed time. If the home is up to temperature, it will not notice the effect on the temperature, but will show a difference in the fuel bill.</p> <p><u>Delayed start</u>: Saves energy by slightly delaying the start of heating depending on the difference between the scheduled temperature and the actual room temperature</p> |
| Clock setting | Change display format (default 24hr) and adjust time and date. When connected to Internet time and date will be synchronized |
| Low Load Control | If the Receiver box is connected to an OpenTherm appliance this setting is used in the demand control. When an appliance is no longer able to modulate lower the control switches from modulating control to low/off control. |
| Temperature Offset | If the Thermostat is located in a hot/cold location and cannot be moved because of wiring then the measured/ displayed temperature can be adjusted by +/- 1,5 °C. This feature is useful if the homeowner wants the reading to match another appliance temperature display. |
| Binding | Menu to bind the Thermostat and the Receiver box, test the RF signal strength of the radio communication and to clear an existing binding. |
| Reset | Menu to reset the thermostat back to factory default settings, reset the schedule to default settings, reset the Wi-Fi and Homekit settings. |
| Failsafe | When the radio communication between the Thermostat and Receiver box is lost for longer than 1 hour the Receiver box will start to cycle the demand 20% on / 80% off. |

OPENTHERM® COMMUNICATION

OpenTherm® is a manufacturer independent communication protocol between modulating appliances (boilers, air heaters and heat recovery units) and room thermostats.

Via the OpenTherm® protocol, the Receiver box of the T6 / T6R thermostat constantly communicates with the connected appliance.

Modulating

The T6/T6R thermostat controls, via the Receiver box, the OpenTherm® communicating appliance modulating. This means that, depending on the heat demand, the burner capacity is adjusted in the appliance. This creates a very accurate control of the room temperature.

On top of that, this method of temperature control is more energy-efficient and environmentally friendly.

Low Load Control

When a boiler is no longer capable of modulating back it will stop the burner and then will be a cycling on it's own continuously during this low control setting (requested water temperature).

In order to have a proper performance and to switch the pump on/off as well we created low load control. This is cycling between off and min modulation level.

The cycle rate is related to the time the water temperature is cooling off below the control setpoint (demand) and the on time of the boiler to get heated to the control setpoint.

It's an algorithm which optimizes the cycle rate and tries to get the boiler on for the longest time.

Hot water control

Most OpenTherm® Combi-boilers have a small internal storage for hot tap water or are connected to a large storage tank which is kept on temperature. With a longer period of none use or absence, for example away during the day, sleep or holiday, the hot water storage does not have to be kept at a high temperature.

The T6R-HW thermostat can provide additional savings here with a dedicated Hot water schedule. The schedule provides 3 on periods per day which can be programmed. Also during the Holiday the hot water status can be set to off.

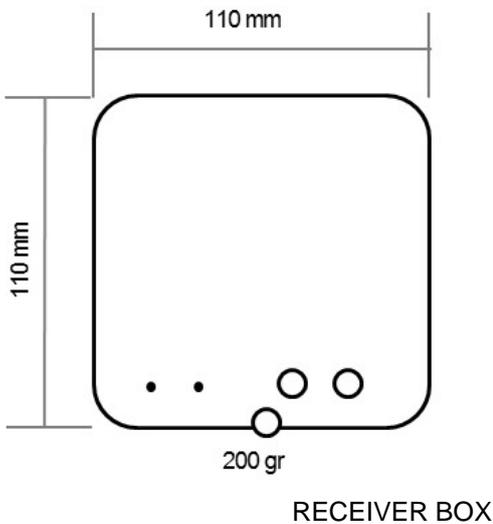
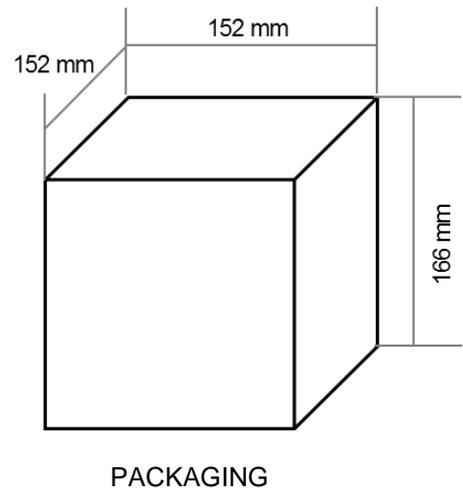
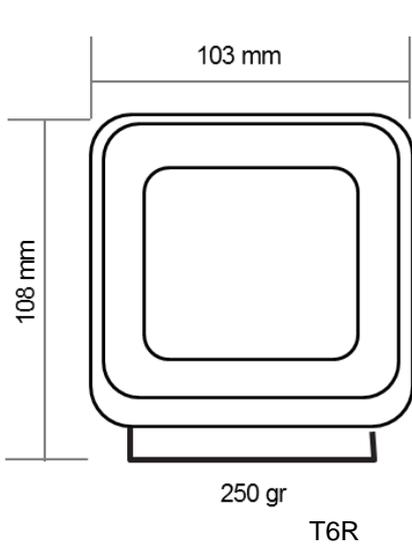
OpenTherm® data

De T6/T6R thermostat offers the ability to view some appliance data via de OpenTherm® communicatie. See table on page 6 which data can be viewed.

Note: Depending on the connected appliance, more or less data is displayed on the T6/T6R thermostat and certain settings of the appliance may or may not be changed from the thermostat. Refer to the instruction manual of the appliance for specific information.

| Advanced menu item | Default | Data / Options |
|---------------------------|------------------------|---|
| OpenTherm | Submenu (read only) | <ul style="list-style-type: none"> - Low Load Control - Control Setpoint → Requested supply temperature - Supply Water Temperature → Actual supply water temperature - Return Water Temperature → Actual return water temperature - Max Supply Water Temperature - Hot water Temperature → Actual hot water temperature - Hot Water Setpoint - Actual Power → Actual power of appliance - Water Pressure |
| Hot Water Overnight | 1 | 0= OFF, 1 = ON |
| Hot Water Setpoint | 60 | 30 tot 75 °C (appliance depending) |
| Max Supply Water Setpoint | 90 | 30 tot 90 °C (appliance depending) - future |
| Low Load Control | 1 | 0= OFF, 1 = ON |

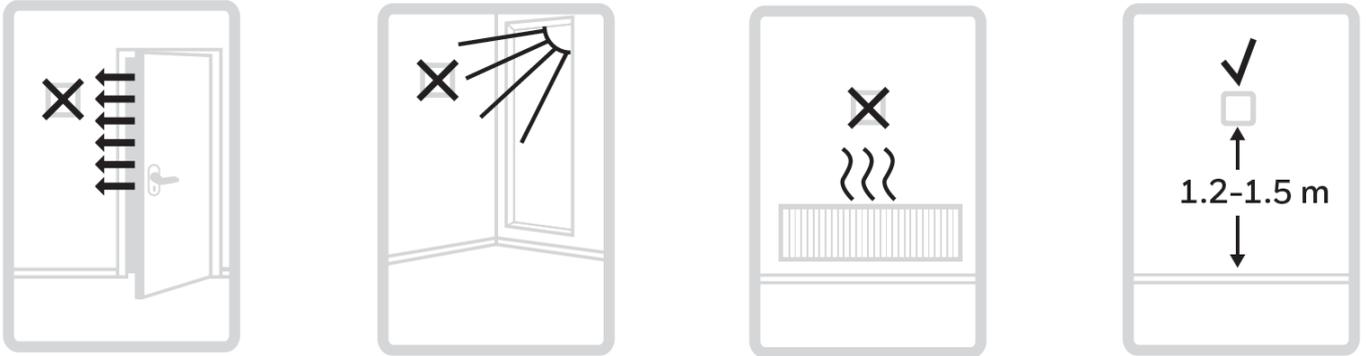
DIMENSIONS



INSTALLATION

To ensure your safety, **always make sure mains power is switched OFF** before accessing wiring.

Before removing the old thermostat take a picture of the old thermostat's wiring as a reference then proceed to installation.



The T6R thermostat should not be placed near draughts, in direct sunlight or near heat sources. It should be at least 1.2 - 1.5 meters from the floor.

Maximum cable length between Receiver box and thermostat: 15m for 0.5mm² cable or 20m for 1.0mm² cable.

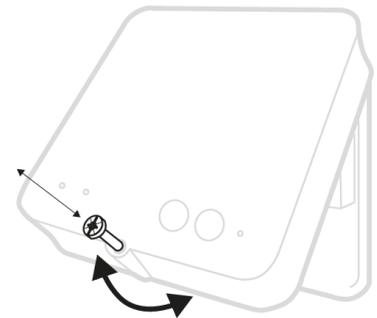
Prepare 2-channel Receiver Box

Needed during installation:

- Cable with 2 wires from the heating valve to Receiver Box.
- Cable with 2 wires from the hot water valve to Receiver box.
- The 2-channel Receiver Box requires 230V power

Find a suitable location near the boiler. Leave at least 30cm distance from any metal objects including wall boxes and boiler housing.

Loosen the front screw to remove cover or tighten it when the cover is back in position.



Install 2-channel Receiver Box

A. Wall box or Rear wiring

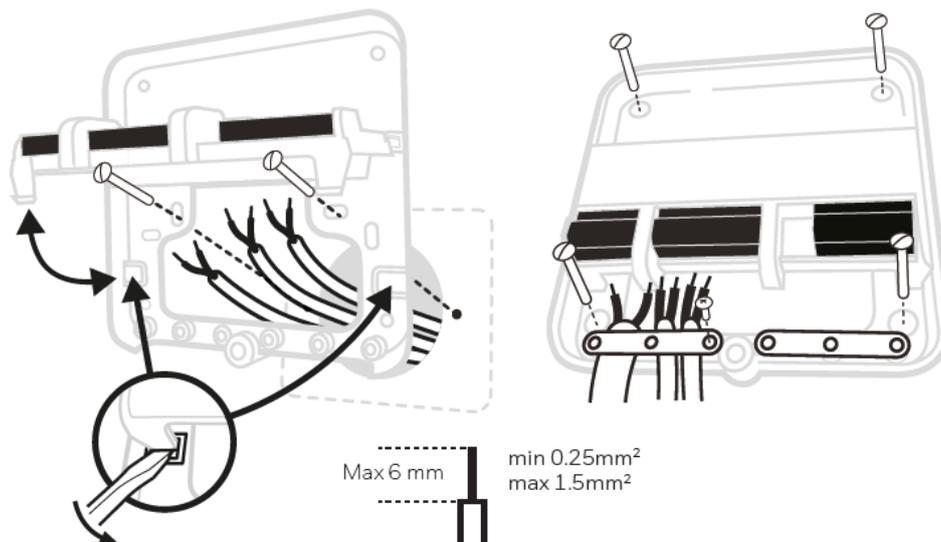
Hinge open the terminal block flap to access the cables and wall box screw holes.

B. Surface wiring

Use the cable clamps to secure the surface wiring.

Replace cover

Locate the hinges at the top of the cover and wall plate, close the cover and secure with the screw.

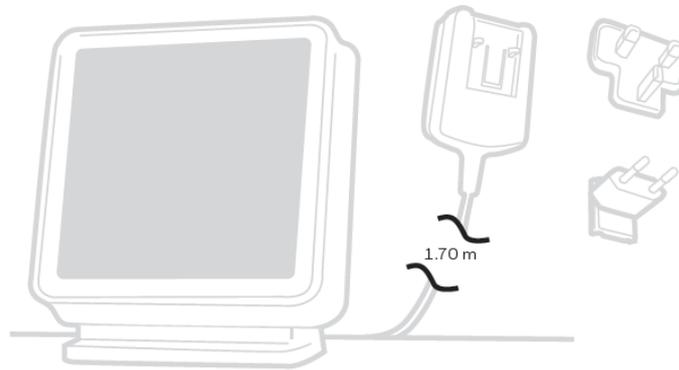


Max 6 mm
min 0.25mm²
max 1.5mm²

Note: See the wiring diagrams on page 9 for the correct wiring connections.

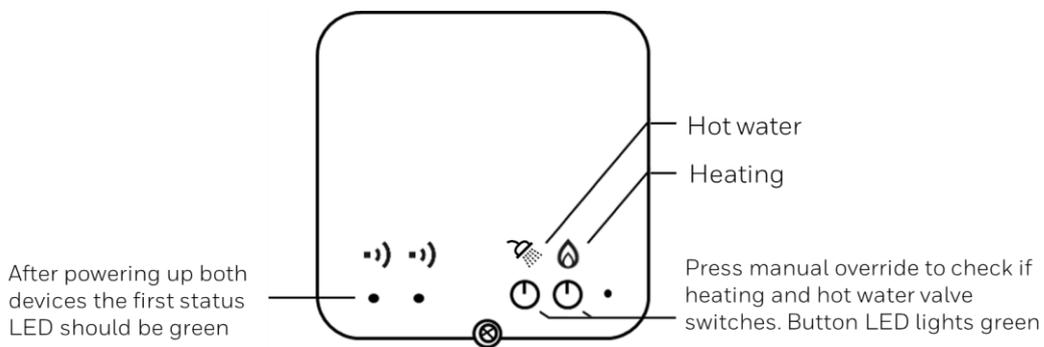
Install the T6R wireless thermostat

Choose the appropriate plug.
Place the thermostat on an even, horizontal surface and plug it in.



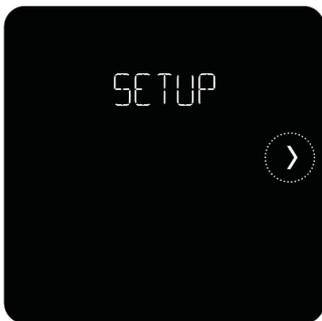
Complete installation

Turn ON mains power to the Heating Appliance and 2-channel Receiver Box.



Setup and configuration

After power up, SETUP is displayed on the thermostat's screen.



Touch to begin.



Select language.



Set clock format, time and date.



Touch to finalise setup.

(to setup using the Honeywell Home App is currently unsupported)

Once setup is completed go to the advanced menu to change application specific changes.

BINDING

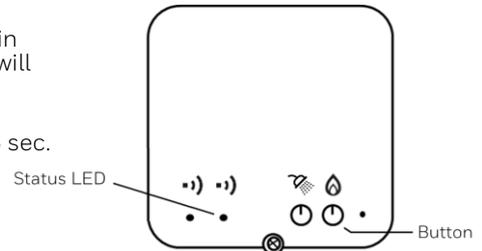
The T6R Smart Thermostat wireless kit comes pre-bound from the factory. The binding operation described below is only required if:

- The T6R thermostat or 2-channel Receiver box is replaced.
- The T6R thermostat or 2-channel Receiver box has incorrect or no binding data stored.
 - Thermostat will indicate the Alert message: NO RECEIVER BOX BINDING
 - Receiver box status LED remains green blinking (no communication from thermostat)
 - Receiver box status LED does not light up (not bound).

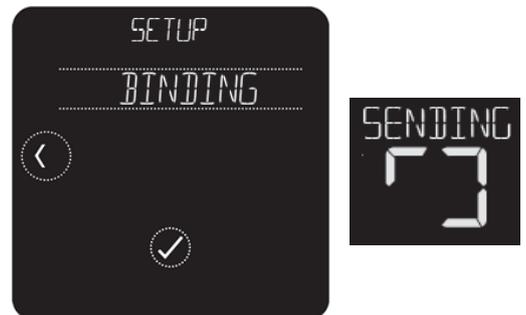
To bind/rebind

Note: When the Receiver box has been bound before first press with a small pin the pinhole for approximately 3 seconds to reset the binding. All LED's will flash amber for a moment.

- Put the Receiver box into binding mode by pressing the Heat button for 3 sec.
 - The first LED will flash amber



- Enable binding on the thermostat:
 - Enter the advanced menu by pressing the  button for 5 sec.
 - Navigate to BINDING
 - Select BIND and the signal will be sent



- When binding is successful:
 - Thermostat will show SUCCESS
 - First Receiver box status LED will show green



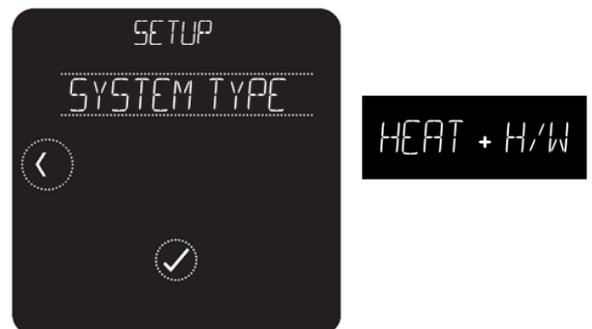
When binding is **NOT** successful:
 - Thermostat will show FAILED
 - Receiver box will exit binding after 3 min.
 RF communication might be too far or is blocked due to wrong location of the Thermostat or Receiver box. Try to move closer or re-locate and re-bind again.



System type setting

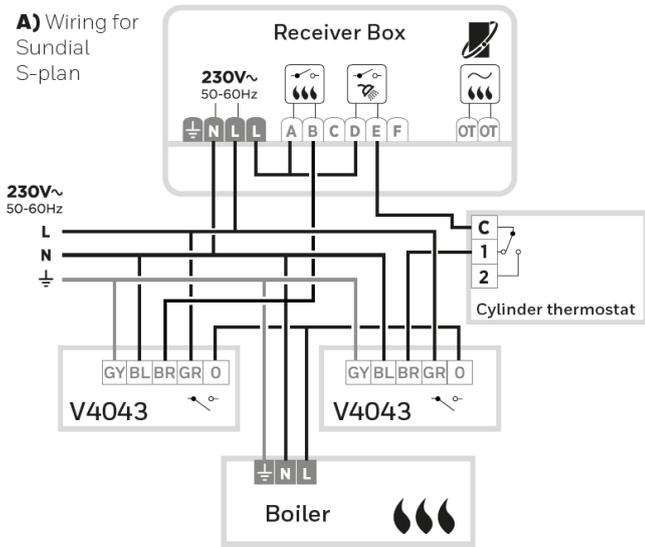
After binding also the System type of the thermostat needs to be set to enable heating and also hot water control.

- In the Advanced menu navigate to System Type.
 - Select Heat + H/W for heating and hot water control
- Exit the Advanced menu and the binding and setup is complete

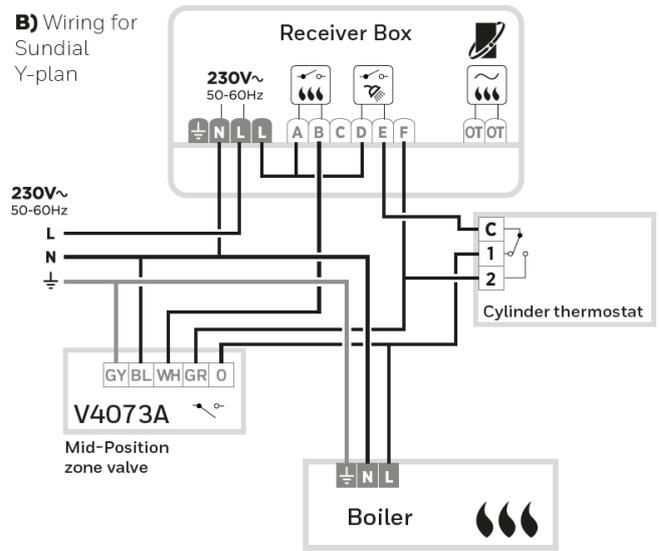


WIRING

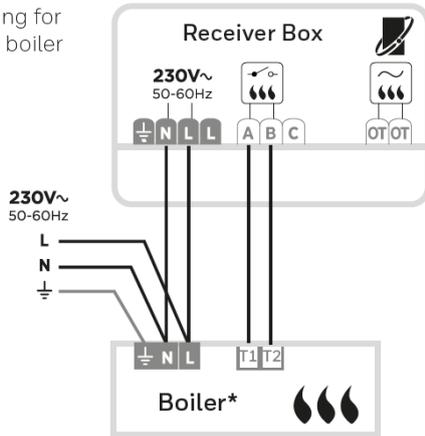
A) Wiring for Sundial S-plan



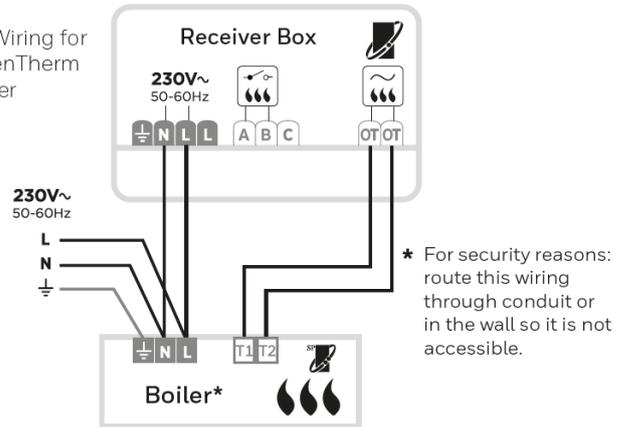
B) Wiring for Sundial Y-plan



C) Wiring for Combi boiler



D) Wiring for OpenTherm boiler



TROUBLE SHOOTING

| Symptom (Fault message) | Possible Cause | Remedy |
|--|--|---|
| The Receiver box button LED is green but the heat or hot water does not switch on. | Heat or hot water wiring might be incorrect or broken | Check the Receiver box wiring |
| The status LED on the Receiver box is red (Communication loss) | The Receiver box receives no communication from the thermostat: RF communication might be too far or is blocked due to Receiver box location. Thermostat is no longer powered. | Try to move thermostat or Receiver box closer or re-locate. Check the power to the thermostat |
| Thermostat alert messages | | |
| WIFI RADIO ERROR | The Wi-Fi radio of thermostat is faulty. | Replace thermostat |
| INTERNAL MEMORY ERROR | The internal memory of thermostat is faulty. | Replace thermostat |
| INDOOR TEMPERATURE SENSOR ERROR | (wired only) The external temperature sensor is not connected or the wiring is faulty. | Check external sensor wiring and sensor |
| NO COMMUNICATION RECEIVER BOX | The thermostat receives no communication from the thermostat: RF signal is blocked due to the location of the thermostat. Receiver box is no longer powered. | RF communication might be too far or is blocked due to the location of the Thermostat or Receiver box. Check the power to the Receiver box |
| RF SIGNAL OF RECEIVER BOX LOW | There is a weak radio signal from the Receiver box | Try to move thermostat or Receiver box closer or re-locate. |
| NO RECEIVER BOX | The thermostat is not bound with the Receiver box | Bind or re-bind the Receiver box |
| NO INTERNET | Thermostat has no longer Internet connection. | End user needs to check their Internet connection via router. |
| NO WIFI SIGNAL | Thermostat has no longer a Wi-Fi connection. | End user needs to check their Wi-Fi network of router. |
| REGISTER ONLINE | Thermostat is connected to Internet but not yet registered to an account. | End user needs to download the App, create an account and register the thermostat. |
| WIFI NOT CONFIGURED | Thermostat is not connected to Wi-Fi network. | End user needs to download the App, create an account, connect and register the thermostat. |
| BOILER FAILURE FAULT XX | The OpenTherm boiler reported a failure number XX. | Check the boiler |
| BOILER LOW WATER PRESSURE | The boiler reported low water pressure. | Fill up the hydronic system with water. |

ORDERING SPECIFICATION

| Description | Model | EAN code | Literature |
|---|--------------|---------------|------------|
| Smart Thermostat with Heating and Hot water control wireless (UK) | Y6H920RW4026 | 5025121380805 | |

Honeywell Control Systems Limited
Newhouse Industrial Estate
Motherwell ML1 5SB
United Kingdom

