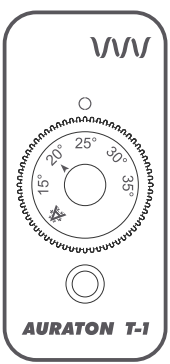
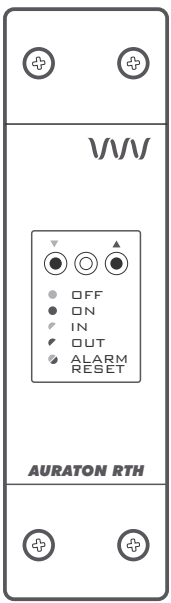
AURATON T-1 RTH

www.auraton.pl

User Manual





Thank you for purchasing this modern, advanced, microprocessor-based temperature regulator ***AURATON T-1 RTH***.

Pre-installed lithium battery.
Wireless temperature controller is equipped with a highest quality lithium battery produced by a Swiss Company (Swatch Group). Such battery provides an uninterrupted operation time of a controller ***AURATON T-1*** up to 20 years. Standard temperature controllers usually require the battery replacement. Therefore, the standard thermostat uses 20-40 batteries within 20 years. This causes additional costs and introduces harmful substances to the environment every year.

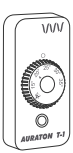
16A **Operation under the load of up to 16 A.**
The ***AURATON RTH*** receiver is equipped with a relay capable of operating with the load of up to 16 A. Its low-sparking technique of switching mains voltage contributes to the low wear of relay contacts.

Interference-free communication between devices.
The transmitter and the receiver from the ***AURATON T-1 RTH*** set communicate at the frequency of 868 MHz. Very short, encrypted data transmission packets (approx. 0.004 s) ensure very efficient and interference-free operation of the device.

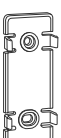
LED
LED's diode indicates the operation mode status of the controller.

Box content - elements of the assy

Actuator
(executive device)
Receiver
AURATON RTH



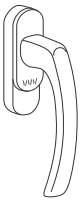
Wireless
temperature controller
AURATON T-1



Mounting plate (handle)
fixing an appliance
to the wall

NOTE: The ***AURATON T-1*** wireless temperature regulator sold with the ***AURATON RTH*** receiver is already paired. **Devices sold separately require "pairing"**.

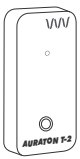
Optional elements of the system



AURATON H-1

Window handle (sold separately)

A window handle, equipped with a position sensor and a transmitter, is an optional element of the system. This way the handle provides information about the state of the window. The handle also differentiates between 4 widow positions: opened, closed, pivoted and trickle ventilated (micro-ventilation). The handle transmits information to the ***RTH*** receiver that controls the relay, e.g. switching off a heater in the event of opening the window or lowering the temperature down to 3 °C to conserve energy. One RTH receiver operates with max 25 handles.



AURATON T-2

Thermometer (sold separately)

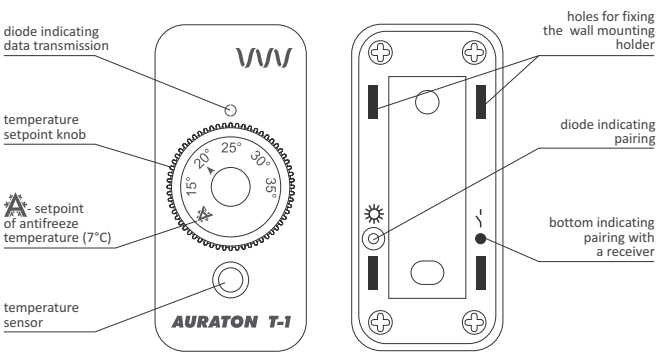
An optional element of the system allowing for controlling temperature in a room other than that with the ***AURATON 2025 RTH*** regulator.

Detailed information about optional elements of the system are included in a section " Operating rules".

Description of the AURATON T-1 and AURATON RTH receiver

AURATON T-1

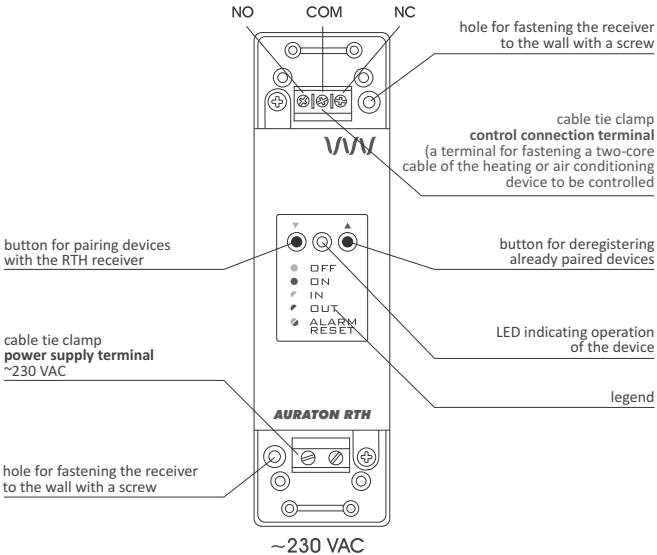
Wireless temperature controller.



AURATON T-1 *is equipped with pre-installed lithium battery. Life span of the battery is up to 20 years..*

AURATON RTH

The receiver is installed on the heating or air conditioning device and can operate under the load of **16 A**.



Legend - description of LED signalling

● OFF **The LED light's green** – the output device is off *(the contacts **COM** and **NC** are closed)*.

● ON **The LED light's red** – the output device is on *(the contacts **COM** and **NO** are closed)*.

IN **The LED flashes green** – the ***RTH*** receiver awaits the device to be paired *(chapter: "Pairing the AURATON 2025 RTH wireless regulator and the RTH receiver").*

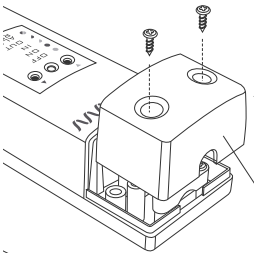
OUT **The LED flashes red** – the ***RTH*** receiver awaits the device to be deregistered *(chapter: "Deregistering the regulator from the RTH receiver").*

ALARM RESET **The LED flashes alternating red and green**:

ALARM - the ***RTH*** receiver has lost connection with one of the paired devices *(chapter "Special situations").*

RESET - receiver deregisters all previously paired devices - *(chapter "Deregistering all devices paired with the RTH receiver").*

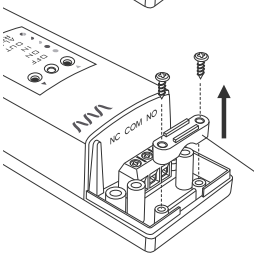
Fastening the RTH receiver



NOTE: When installing the ***AURATON RTH*** receiver its power supply must be disconnected. It is recommended that the installation is performed by a qualified specialist.

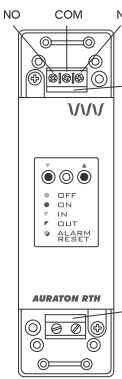
1. Take off protective covers from the lower and upper part of the ***AURATON RTH*** receiver.

protective cover



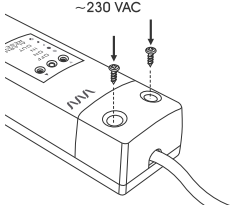
2. Take off cable tie clamps from the lower and upper part of the ***AURATON RTH*** receiver.

cable tie clamp



3. Connect the heating device to the **control connection terminals** of the ***AURATON RTH*** receiver.
Proceed in accordance with the service manual of the heating device. Most commonly, the **COM** (common) and **NO** (normally open) terminals.

4. Connect power supply conductors to the **power supply terminals** of the ***AURATON RTH*** receiver, observing safety rules.



5. After connecting the conductors, they must be secured with the cable tie clamps and reinstall protective covers of the ***AURATON RTH*** receiver.

NOTE:
The permanent electrical system of a building must include a breaker and an overcurrent protection.

Fastening the RTH receiver to the wall

To fasten the ***AURATON RTH*** receiver to the wall:

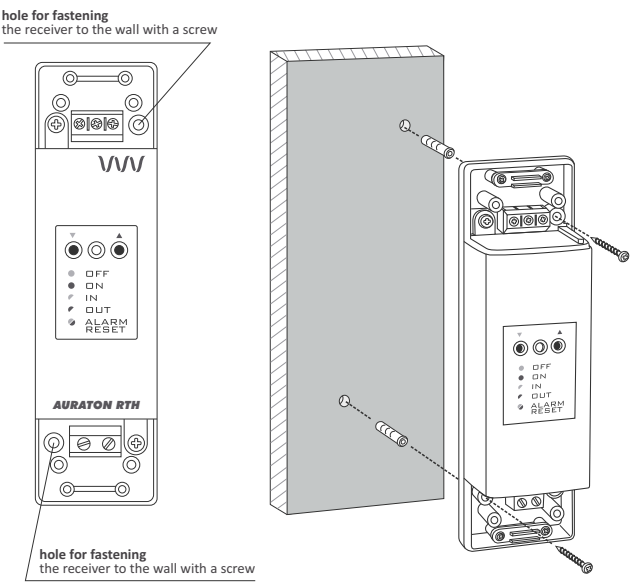
1) Remove protective covers from the lower and upper part of the regulator. *(See chapter: "Fastening the RTH receiver").*

2) On the wall, mark the location of holes for fastening screws.

3) In marked places, drill holes of a diameter corresponding to the bundled wall plugs (5 mm).

4) Insert wall plugs into the drilled holes.

5) Screw in the RTH receiver to the wall with screws, making sure they hold the receiver securely.

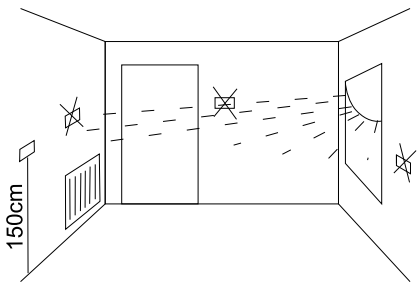


NOTE: If the wall is wooden, there is no need to use wall plugs. In such a case, drill two holes 2.7 mm in diameter instead of 5 mm, and screw the screws directly into the wood.

NOTE: **The *RTH* receiver cannot be placed in metal containers (e.g. an assembly box, a metal enclosure of a heater) in order to not to interfere with its operation.**

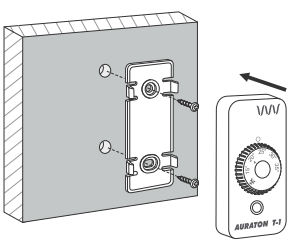
Selecting the proper location for the temperature regulator

Proper operation of the regulator is greatly affected by its location. Installing it in a place with no air circulation or exposed to direct sunlight causes improper regulation of temperature. In order to ensure proper operation, the regulator must be installed on an interior wall of a building (partition wall). A place should be selected that is occupied most frequently, providing undisturbed circulation of air. Avoid heat radiating devices (television set, heater, refrigerator etc.) or places exposed to direct sunlight. In order to avoid vibration, do not place the regulator in close vicinity of doors.



Fastening the temperature regulator to the wall

NOTE: Before installing the appliance to the wall, it needs to be paired with a previously connected receiver.
A controller ***T-1*** and a receiver purchased together, do not require pairing. The appliances have been already pre-paired.

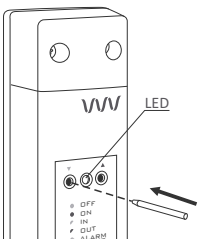


1. Drill two 5mm holes in the wall (select the span of holes with a wall-mounted holder- enclosed to the set with controller ***AURATON T-1***).
2. Insert the wall anchors to the holes (attached to a set).
3. Fix the mounting plate to the wall.
4. Press to join the regulator tightly against the mounting holder(the holes on a back part of the unit should be suitable for snap-on of the holder).

NOTE: If the wall is made of wood, there is no need to use the wall anchors. Drill 2,7mm holes in the wall instead of 5mm and screw the screws directly in a wood.

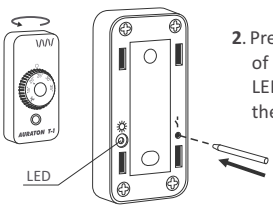
Pairing the AURATON T1 with the RTH receiver

NOTE: The ***AURATON T1*** wireless temperature regulator sold with the ***AURATON RTH*** receiver is already paired. **Devices sold separately require "pairing"**.



1. **The process of pairing** the ***T-1*** regulator with the ***RTH*** receiver is initiated by pressing the left pairing button (marked with a green triangle - ▼) on the ***RTH*** receiver and holding it for at least 2 seconds, until the LED starts flashing green, and then releasing the button.

*The **AURATON RTH** receiver waits for pairing for 120 seconds. After that time, it automatically returns back to normal operation.*



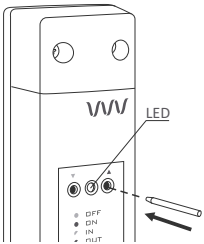
2. Press the pairing button (⍀), placed on the rear side of housing and hold it for about 2 seconds. When LED diode (☼) will starts flashing red stop pressing the button.

3. A properly completed pairing process is signalled by the LED on the ***AURATON RTH*** receiver no longer flashing green and the receiver reverting back to normal operation.

In the event of an error during the pairing process, repeat steps 1 and 2. Should more errors occur, deregister all devices by executing the RESET function of the RTH receiver (see "RESET - Deregistering all devices paired with the RTH receiver") and attempt to pair the device again.

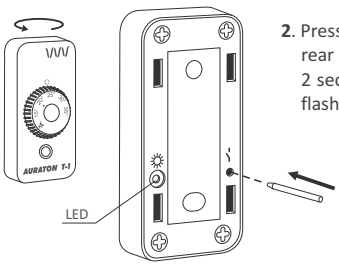
NOTE: One receiver can have only one temperature regulator assigned.

Deregistering the regulator from the RTH receiver



1. **Deregistering** the ***T-1*** regulator from the ***RTH*** receiver is initiated by pressing the right deregistering button (marked with a red triangle - ▲) on the ***RTH*** receiver and holding it for at least 2 seconds, until the LED starts flashing red, and then releasing the button.

The AURATON RTH receiver waits for deregistering for 120 seconds. After that time, it automatically returns back to normal operation.

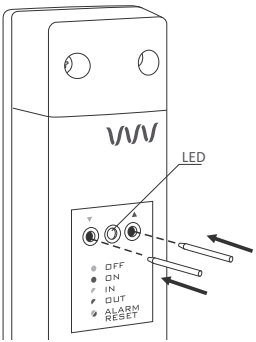


2. Press the pairing button (⌇), placed on the rear side of housing and hold it for about 2 seconds. When LED diode (☼) will starts flashing red stop pressing the button.

3. A properly completed deregis-tering process is signalled by the LED on the ***AURATON RTH*** receiver no longer flashing red and the receiver reverting back to normal operation.

In the event of an error during the deregistering process, repeat steps 1 and 2. Should more errors occur, deregister all paired devices *(see "RESET - Deregistering all devices paired with the RTH receiver")* and attempt to pair the device again.

RESET - Deregistering all devices paired with the RTH receiver



In order to deregister all devices paired with the RTH receiver, simultaneously press both the pairing and the deregistering button (▼ and ▲) and hold them for at least 5 seconds until the LED flashes alternating red and green. Then release both buttons.

A properly completed process of deregistering all devices is signalled after approx. 2 seconds by the LED colour changing to green and then switching it off for a short period of time.

***NOTE**: If after executing the RESET function the RTH receiver is disconnected from power supply and then connected again, the receiver will automatically enter "pairing" mode for 120 seconds. A newly purchased RTH receiver without any factory-paired devices (i.e. not the one bundled with the regulator) will behave the same way.*

Signalling operation and reception of data packet

Each radio transmission received by the ***AURATON RTH*** receiver from the paired device is signalled by a temporary change of LED colour to orange. Switching on the relay is signalled by the LED lit red, whereas switching it off is signalled by the LED lit green.

Setting the anti-freezing temperature - ❄

A controller is equipped with antifreeze mode - ❄ .
This operation mode results in maintaining the room temperature amounting 7 °C. It is used during longer absence to prevent freezing of water in heating installation.

Cooperation of the RTH receiverwith a heating device

Basic configuration of devices

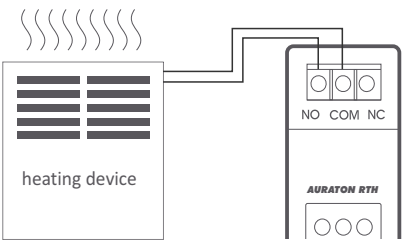
AURATON RTH
Receiver connected to the heating device

AURATON T-1
Wireless temperature controller

Additional system devices

AURATON T-2
Wireless thermometer (sold separately)

AURATON H-1
Window handle (sold separately)



A simplified schematic of connecting the ***AURATON RTH*** receiver with the heating device

Cooperation of the AURATON RTH receiver with the AURATON T-1 regulator and/or the AURATON T-2 thermometer

The operation of temperature regulation in the receiver is based on the binary algorithm (on/off) using one or two sensor elements.

- The ***AURATON T-1*** regulator allows for setting and/or monitoring the temperature.
- The ***AURATON T-2*** thermometer provides information about the current temperature only, without the capability of changing it manually.

A) The manual setpoint – pairing the ***AURATON T-1*** regulator with the ***RTH*** receiver allows for setting the temperature manually and controlling it in the location of the fastening of the ***T-1*** regulator.

B) The remote setpoint – if the ***T-2*** thermometer is additionally paired with the ***RTH*** receiver, the ***AURATON T-1*** regulator retains the capability of temperature setting, however its control is performed with the paired ***T-2*** thermometer only. This feature allows for regulating the temperature in a room other than the one where the ***AURATON T-1*** regulator is placed.
*An example: you want the temperature in the "children's room" to be always at 22 °C, however you do not want children to be able to change it - in that room, you install the **T-2** thermometer, and the **AURATON T-1** regulator in e.g. the kitchen. This way the temperature in the "children's room" will always be at 22°C regardless of temperature fluctuations in the kitchen.*

C) The factory setpoint (20 °C) – if the ***T-2*** thermometer is the only device paired with the ***RTH*** receiver, it is not possible to set the temperature manually, and the ***RTH*** receiver maintains the factory temperature setpoint of 20 °C.

NOTE!

1. The sequence of pairing the ***AURATON T-1*** regulator and the ***T-2*** thermometer is very important. If you want to maintain the remote setpoint, you must first pair the ***AURATON T-1*** with the ***RTH*** receiver, and then the ***T-2*** thermometer. Reversing the pairing sequence will cause automatic deregistering of the previously paired ***T-2*** thermometer and entering the mode of operation described in item A.
2. The ***RTH*** receiver can operate with one ***AURATON T-1*** regulator and/or one ***T-2*** thermometer only. Pairing a new regulator causes deregistering the previously paired regulator and the ***T-2*** thermometer. Pairing a new ***T-2*** thermometer causes deregistering the previously paired ***T-2*** thermometer only.
3. The ***T1 RTH*** regulator and/or the ***T-2*** thermometer can operate with an unlimited number of receivers, e.g. one regulator can simultaneously control two independent heating devices.

Cooperation with the AURATON T-1 regulator and/or the AURATON T-2 thermometer as well as the AURATON H-1 handles

By default, the ***AURATON RTH*** receiver does not have any ***AURATON H-1*** handle paired, therefore the relay is controlled by the paired ***AURATON T-1*** regulator and/or the ***AURATON T-2*** thermometer. When at least one ***H-1*** handle is paired with the ***RTH*** receiver, the relay is controlled in the following manner:

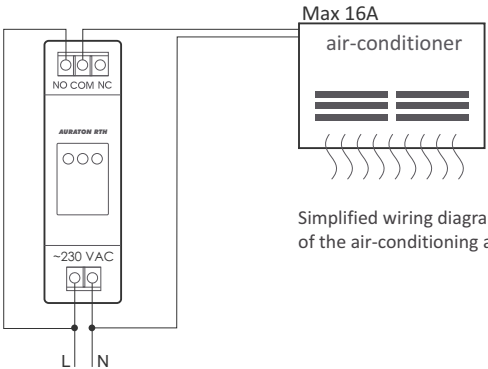
A) The window is closed or trickle-ventilated (micro-ventilation).
When the ***H-1*** window handles are paired with the receiver, and all windows are closed or trickle-ventilated, the relay still maintains the setpoint from the paired ***AURATON T-1*** regulator and/or the ***T-2*** thermometer.

B) The window is pivoted.
If at least one window is pivoted, the temperature set in the ***AURATON T-1*** regulator is lowered in ***AURATON RTH*** receiver down to 3 °C. This state will be maintained until closing. This state will last until all windows are closed or trickle-ventilated.

C) The window is opened.
When you open a window equipped with the ***H-1*** handle paired for longer than 30 seconds, the relay in the ***AURATON RTH*** receiver is switched off, as is the connected heating device. If all the assigned windows are again in a state other than "opened", the ***RTH*** receiver returns to normal cooperation with the ***AURATON T-1*** regulator and/or the ***T-2*** thermometer no earlier than 90 seconds after switching off the relay. The purpose of this delay is to prevent too rapid transitions of the connected heating devices between the ON and OFF states. However, if the temperature in the room drops below 7 °C, the relay inside the receiver is switched on regardless of the positions of windows in order to prevent the room from freezing.

D) The signal is lost.
When the ***RTH*** receiver has lost the signal from the ***H-1*** handle paired (3 consecutive transmissions are lost), it changes the status if this window to "closed". When the transmission is restored, the ***H-1*** handle is again properly read off by the ***RTH*** receiver.

RTH - cooperation with the air-conditioner



Simplified wiring diagram
of the air-conditioning appliances

Cooperation AURATON RTH receiver with the AURATON H-1 handles without T-1 and T-2

In order for the ***RTH*** receiver to be able to control the air-conditioning it cannot be associated with any ***T-1*** controller or ***T-2*** thermometer and must be associated with at least one ***H-1*** handle. Upon fulfillment of the above requirements, the ***RTH*** receiver automatically goes into the air-conditioning control mode.

- **Window open or ajar** – If we connect the power supply circuit of the air-conditioning device through the transmitter and open or leave ajar any window with the associated ***H-1*** handle for longer than 30 sec, the transmitter in the ***RTH*** receiver will turn off the air-conditioning device.
- **Window closed or unsealed** – If all windows with the associated ***H-1*** handle will again be in the position other than open or ajar, the ***RTH*** receiver after time not shorter than 90 sec from turning off the transmitter shall again activate the transmitter and the air-conditioning device. This is an intentional delay to prevent too rapid changes of air conditioning devices between the ON - OFF position, which can lead to compressor damage.
- **Loss of signal** – When the ***RTH*** receiver loses signal from the associated ***H-1*** handle (3 subsequent transmission losses), it changes this window's status to closed. After restoring the transmission the sensor is again correctly read by the receiver.

NOTE*: the association of the* ***RTH*** *receiver with the* ***T-1*** *controller or* ***T-2*** *thermometer automatically changes the way the receiver works to controlling the heating device.*

Note*: One AURATON RTH receiver can operate max. 25 handles.*

Special situations

- When 3 consecutive transmissions (after 15 minutes) from the ***AURATON T-1*** regulator and/or the ***T-2*** thermometer are lost, an error is signalled on the ***RTH*** receiver (LED flashing continuously red and green). The ***RTH*** receiver starts executing the ON - OFF cycle memorised during the last 24 hours of operation until the problem is removed.
- When both signals return (from the ***AURATON T-1*** regulator and the ***T-2*** thermometer), the error is cancelled and the receiver enters its normal mode of operation.
- When only the ***T-2*** thermometer signal returns, the receiver uses the last memorised setpoint value and maintains it while signalling the error.
- When the ***H-1*** handles, the ***T-2*** thermometer and the ***AURATON T-1*** regulator (the temperature is measured with the ***T-2*** thermometer) are paired with the receiver, then maintaining the work cycle from the last 24 hours occurs only after losing the signal from the ***T-2*** thermometer. When only the signal from the ***AURATON T-1*** is missing, the RTH receiver automatically maintains the last memorised setpoint from the ***AURATON T-1*** regulator and also signals an error.
- When you have only the ***H-1*** handles and the ***T-2*** thermometer paired with the ***RTH*** receiver without the ***AURATON T-1*** regulator, the ***RTH*** receiver maintains a constant, factory-defined temperature of 20 °C. If you pivot any window equipped with the ***H-1*** handle paired with the receiver, a temperature of 17 °C is maintained. If you open any window equipped with the ***H-1*** handle paired with the ***RTH*** receiver, the receiver switches off the heating device, but will switch it back on when the temperature falls below 7 °C.

Unique features of AURATON T-1

- A pre-installed lithium battery produced by Swiss Company (Swatch Group), provides an interrupted operation up to 20 years.
- Switching the relay is synchronised with the wave of the 230 V mains voltage in order to ensure that closing and opening contacts of the relay occurs around the zero-crossing point. This prevents the occurrence of an electric arc, significantly extending the relay service time.
- The ***AURATON RTH*** receiver is equipped with a unique algorithm for analysing the ON - OFF cycles. The entire heating cycle from the last 24 hours is recorded in the memory of the ***RTH*** receiver. In the event of losing communication with the ***AURATON T-1 RTH*** regulator and/or the ***T-2*** thermometer, the ***RTH*** receiver automatically executes the ON - OFF cycle memorised during the last 24 hours. This provides time for restoring transmission (removing interferences) or fixing the ***T-1*** regulator and/or the ***T-2*** thermometer without a significant deterioration of thermal comfort conditions in the controlled spaces.

Additional information and notes

- The ***AURATON T-1*** regulator and/or the ***T-2*** thermometer must be installed at least 1 metre from the ***RTH*** receiver (too strong a signal from the transmitters can cause interference).
- At least 30 seconds must elapse between switching the relay off and on.
- Data transmission from the ***AURATON T-1*** regulator to the receiver occurs upon each change of 0.2 °C of the surrounding temperature. When the temperature is stable, the regulator sends heart-beat data every 5 minutes (which is signalled with the LED blinking orange on the ***RTH*** receiver).
- In the event of a power outage, the ***RTH*** receiver will switch off. When power is restored, the heating device is switched on automatically, and the ***RTH*** receiver awaits a signal from the paired transmitters (this signal should be received within 5 minutes of restoring power). After receiving the signal, the ***RTH*** receiver enters the normal mode of operation.
- The ***RTH*** receiver cannot be placed in metal containers (e.g. an assembly box, a metal enclosure of a heater) in order to not to interfere with its operation.

Technical specifications

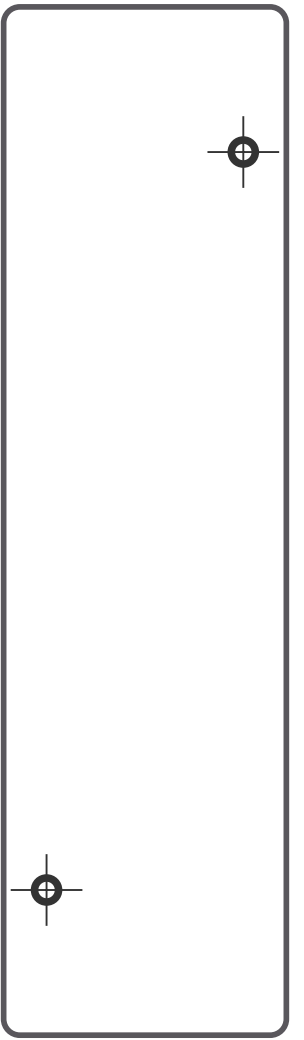
Working temperature range:	0 – 45°C
Temperature measurement range:	7°C; 15 – 35°C
Span:	±0,2°C
Temperature levels:	1
Antifreeze temperature:	7°C
Working cycles:	24 hours
Working mode control:	LED
Maximum load:	~16A 250VAC
Power supply ***T-1***:	pre-installed lithium battery
Power supply ***RTH***:	230VAC, 50Hz
Radio frequency:	868MHz
Operation range:	in a typical building, with standard construction of walls - approx. 30 min an open space - up to 300 m

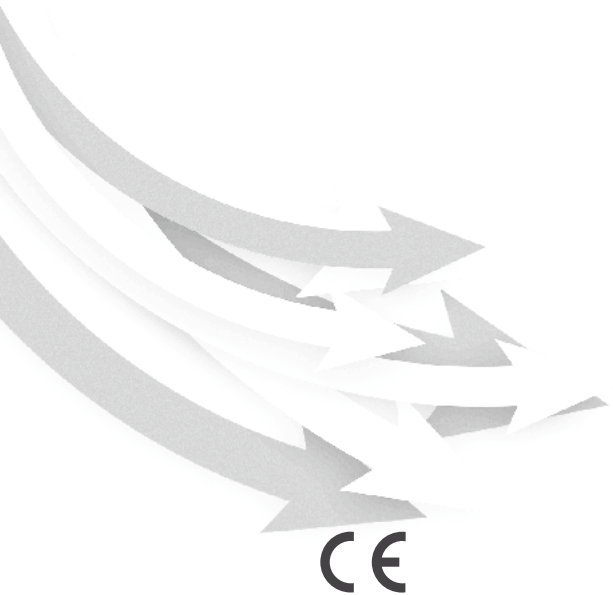
Disposing of the devices

The devices are marked with the crossed waste bin symbol. According to European Directive no. 2002/96/EU and the Act concerning used up electric and electronic equipment, such a marking indicates that this equipment may not be placed with other household generated waste.

The user is responsible for delivering the devices to a reception point for used-up electric and electronic equipment.

A template for drilling holes for fastening
the AURATON RTH receiver (1:1 scale)





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