AURATON

200 RTH

Thank you for purchasing the modern temperature controller based on an advanced microprocessor.

AURATON 200 RTH

❄ **FrostGuard function:**
Protects the interior from freezing

🕐 **Enables cyclic reduction of set temperature**
by 3°C for 6 hours.

LCD **Backlit LCD display**
The backlit display enables device control even in dark rooms.

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.
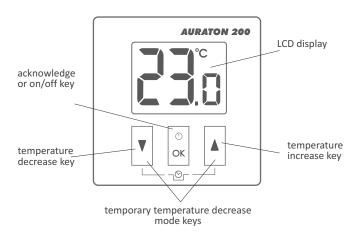
AURATON T-2

Thermometer (sold separately)

An optional element of the system allowing for controlling temperature in a room other than that with the *AURATON 200 RTH* regulator.

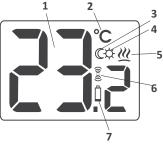# AURATON 200 RTH temperature controller explained

The front of the enclosure has a backlit LCD display and three function buttons.

acknowledge or on/off key

temperature decrease key

temperature increase key

LCD display

temporary temperature decrease mode keys

- **hold** – controller on/off ($\circlearrowleft$)
- **short press** – acknowledge temperature setting (OK)

Display screen

1. **Temperature**
   In normal operating mode, the controller displays the temperature of the room it is installed in.

2. **Temperature unit (℃)**
   Indicates temperature displayed in centigrade.

3. **Temporary temperature decrease mode indicator (ℂ)**
   Appears when the temporary temperature decrease program is active.

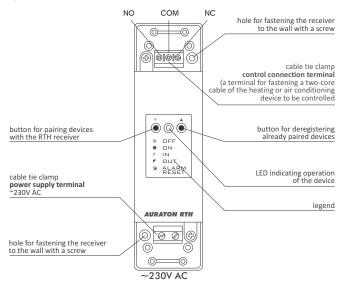4. **Temporary temperature decrease mode programming indicator (☼)**
   WIndicates the temporary temperature decrease mode planned by the user. Displayed when the mode is not executed but the function of the temporary temperature decrease is active *(refer to "Temporary temperature decrease setting" section for more details)*.

5. **Controller power on indicator (⟰)**
   Indicates the operating status. Appears when the controller device is started.

6. **Transmission symbol (⟰)**
   Indicates communication with the receiver.

7. **Battery exhausted (▯)**
   Displayed when the battery voltage drops below the allowed limit. Replace the battery as soon as possible.

Description of the AURATON RTH receiver

The *AURATON RTH* receiver cooperates with the *AURATON 200 RTH* wireless receiver. The receiver is installed on the heating or air conditioning device and can operate under the load of 16 A.

NO   COM   NC

hole for fastening the receiver to the wall with a screw

cable tie clamp **control connection terminal** (a terminal for fastening a two-core cable of the heating or air conditioning device to be controlled

button for pairing devices with the RTH receiver

button for deregistering already paired devices

LED indicating operation of the device

legend

cable tie clamp **power supply terminal** ~230V AC

AURATON RTH

hole for fastening the receiver to the wall with a screw

~230V AC

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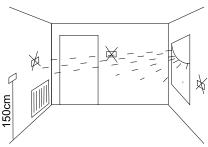
- ✦ OUT **The LED flashes red** – the *RTH* receiver awaits the device to be deregistered *(chapter: "Deregistering the regulator from the RTH receiver").*

- ◉ 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").*

Selecting proper location for AURATON 200 RTH temperature controller

Controller location largely affects its proper operation. When located in a place without air circulation or exposed to direct sunlight, the controller may not control the temperature properly. The controller should be located on an internal wall of a building (partition wall) in a place with free air circulation. Avoid locations near sources of heat (TV set, heater, refrigerator) or places exposed to direct sunlight. Location near doors and the resultant vibration may cause the controller to function improperly.

Battery installation / replacement

Battery sockets are located inside the controller on both sides of the display. To install the batteries, remove the controller enclosure as shown in the figure.
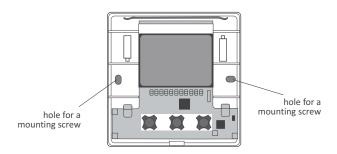

Place two AAA 1.5 V batteries in the battery socket observing the correct polarity.

NOTE: We recommend using alkaline batteries to supply AURATON controllers. Rechargeable batteries should not be used because their rated voltage is too low.

Fixing the AURATON 200 RTH controller to the wall

To fix the AURATON 200 controller to the wall:

1. Remove the enclosure (as described on the "Battery installation/replacement" section).

2. Drill 2 holes diameter 6 mm in the wall *(use the back of the controller enclosure to set the right spacing of the holes).*
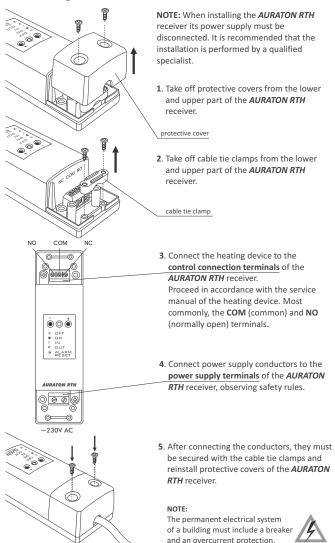

hole for a mounting screw

hole for a mounting screw

3. Place plastic plugs in the drilled holes.
4. Screw the back of the controller enclosure to the wall with the two screws provided.
5. Install the batteries and replace the controller enclosure.

NOTE: No expansion bolts are needed for wooden walls. Just drill holes diameter 2.7 mm (instead of 6 mm) and screw the screws directly into the wood.

Alternative fixing methods

The controller can be mounted to a smooth surface with e.g. two-sided adhesive tape.
The controller can also be placed in any location on an even surface on a support at the back of the enclosure.
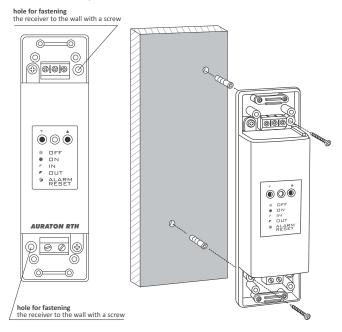
Fastening the RTH receiver

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

NO   COM   NC

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.

AURATON RTH

~230V AC

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

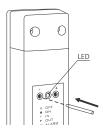To fasten the *AURATON RTH* receiver to the wall:

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.

hole for fastening
the receiver to the wall with a screw

AURATON RTH

hole for fastening
the receiver to the wall with a screw

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.**

Pairing the AURATON 200 RTH wireless temperature regulator with the RTH receiver

NOTE: The *AURATON 200 RTH* wireless temperature regulator sold with the *AURATON RTH* receiver is already paired. **Devices sold separately require "pairing".**

1. **The process of pairing** the *200 RTH* 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.
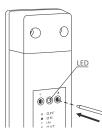
   The AURATON RTH receiver waits for pairing for 120 seconds. After that time, it automatically returns back to normal operation.

2. On the *AURATON 200 RTH* regulator, press and hold the buttons $\boxed{\blacktriangledown} - \boxed{\circ \atop OK}$ or $\boxed{\circ \atop OK} - \boxed{\blacktriangle}$ for 6 seconds until the transmission symbol ((((•)))) appears on the display.

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.

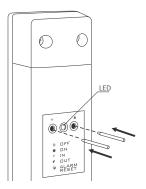## Deregistering the regulator from the RTH receiver

1. **Deregistering** the *200 RTH* 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. On the *AURATON 200 RTH* regulator, press and hold the buttons ▼ – OK or OK – ▲ for 6 seconds until the transmission symbol ((((•)))) appears on the display. Release the button - the regulator transmits the pairing signal for 5 seconds.

3. A properly completed deregistering 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.

LED

● OFF
● ON
● IN
● OUT
● ALARM
  RESET

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.

Starting the AURATON 200 RTH controller for the first time

After correct installation on batteries, the LCD will display, for a second, all segments (display test) followed by the firmware version number.

After a while, the current temperature in the room will be displayed. The controller is ready to use.

Temperature setting

NOTE: When pressing any function key for the first time, the backlight is turned on and then the key function is activated.

To set the desired temperature in normal operating mode:

1. Press the $\boxed{\blacktriangledown}$ or $\boxed{\blacktriangle}$ key. The segment displaying temperature will switch to edit mode and start blinking.
2. With the $\boxed{\blacktriangledown}$ and $\boxed{\blacktriangle}$ keys, set the desired temperature with the accuracy of up to 0.2°C.
3. Press the $\boxed{\overset{\circ}{\text{OK}}}$ key to acknowledge selection.

FrostGuard function

AURATON 200 RTH controller features the special FrostGuard function to protect the room from possible freezing.

The function is activated when the controller is **switched off**.

With the controller switched off, when the room temperature drops to 2°C, the **Fr** (Fr) and flame ($\underline{\underline{\mathcal{W}}}$) symbols will appear and signal will be sent to the receiver to start heating. When the temperature raises to 2.2°C, the display will turn off again and signal will be sent to the receiver to turn the heating off.

Setting the temporary
temperature decrease mode

If, for some reasons, you would like to decrease temperature in the room, everyday and at the same time, by 3°C, temporary reduction for 6 hours is possible. To do so:

1. Press and hold for 3 seconds both $\boxed{\blacktriangledown}$ $\boxed{\blacktriangle}$ keys.
   The moon symbol will be displayed ($\mathbb{C}$).

2. The controller is switched to the temporary temperature decrease mode and **everyday at the same time** will decrease the set temperature in a normal mode by 3°C for 6 hours.

NOTE: After 6 hours, the controller will return to the main temperature setting. Instead of the moon symbol ($\mathbb{C}$), the sun ($\diamondsuit$) symbol will be displayed.

NOTE: The temporary temperature decrease mode always starts when the function is turned on. This means that the possible temporary temperature decrease has to be set at the time you want it to take place.

Switching off the temporary temperature
decrease

Press and hold the $\boxed{\blacktriangledown}$ $\boxed{\blacktriangle}$ keys again to switch off the temporary temperature decrease mode.

The moon ($\mathbb{C}$) or sun ($\diamondsuit$) symbol will disappear and only the room temperature will be displayed. The controller returns to the normal operating mode.

Changing hysteresis

Hysteresis prevents the device from switching on too often due to insignificant temperature fluctuation.

E.g. with HI2 hysteresis and temperature setting of 20°C, the boiler switches on at 19.8°C and switches off at 20.2°C. With HI4 hysteresis and temperature setting of 20°C, the boiler switches on at 19,6°C and switches off at 20.4°C.

To change hysteresis, press $\blacktriangledown$, $\blacktriangle$ and $\overset{\circ}{\text{OK}}$ simultaneously and hold for 3 seconds. When hysteresis change mode is active, message **HI** is displayed.
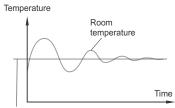
Use $\blacktriangledown$ and $\blacktriangle$ to change hysteresis settings.

HI2 – ±0,2°C *(factory setting)*
HI4 – ±0,4°C
HIP – PWM mode *(see chapter "PWM mode")*

Press $\overset{\circ}{\text{OK}}$ to confirm your selection.
The controller resumes normal operation.

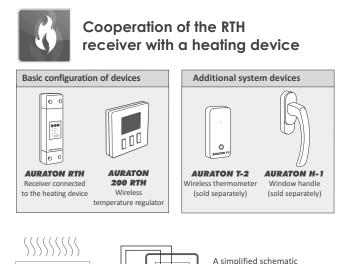## Pulse-Width Modulation mode (PWM)

When changing hysteresis settings, you can enable **PWM** mode. In PWM mode, the controller switches on the heating device in cycles to minimize temperature fluctuations. The controller monitors the temperature rise and drop time.

With these values determined, the controller switches the heating device on and off in cycles that enable maintaining temperature as close to the setpoint as possible.

CAUTION: In PWM mode, the controller can switch on the heating device even though the temperature in the room is higher than preset temperature. This is because the PWM algorithm tries to maintain the preset temperature and stays ahead of the heating system behaviour.

Cooperation of the RTH receiver with a heating device

Basic configuration of devices	Additional system devices

AURATON RTH
Receiver connected
to the heating device

AURATON 200 RTH
Wireless temperature regulator

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

NO COM NC

AURATON RTH

heating device

Cooperation of the AURATON RTH receiver with the AURATON 200 RTH 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 200 RTH* 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 200 RTH* regulator with the *RTH* receiver allows for setting the temperature manually and controlling it in the location of the fastening of the *200 RTH* regulator.

B) The remote setpoint – if the *T-2* thermometer is additionally paired with the *RTH* receiver, the *AURATON 200 RTH* 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 200 RTH* 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 200 RTH 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 200 RTH* regulator and the *T-2* thermometer is very important. If you want to maintain the remote setpoint, you must first pair the *AURATON 200 RTH* 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 200 RTH* 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 *200 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 200 RTH 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 or AURATON W-1 window position sensor paired, therefore the relay
is controlled by the paired *AURATON 200 RTH* 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 is paired with the receiver, and all
  windows are closed or trickle-ventilated, the relay still maintains the
  setpoint from the paired *AURATON 200 RTH* 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
  200 RTH* 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 200 RTH* 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.

Special situations

- When 3 consecutive transmissions (after 15 minutes) from the *AURATON 200 RTH* 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 200 RTH* 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 200 RTH* 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 200 RTH* is missing, the RTH receiver automatically maintains the last memorised setpoint from the *AURATON 2025 RTH* 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 200 RTH* 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.
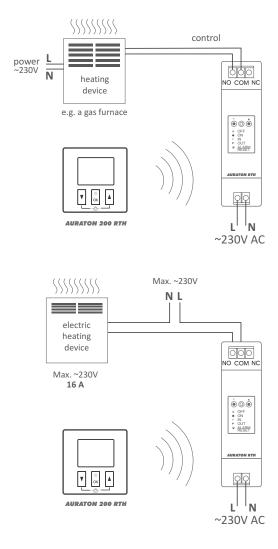
Unique features of AURATON 200 RTH

- 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 200 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 *200 RTH* regulator and/or the *T-2* thermometer without a significant deterioration of thermal comfort conditions in the controlled spaces.
- Cooperation with optional devices (the *AURATON T-2* thermometer, the *AURATON H-1* window handle).

Additional information and notes

- The *AURATON 200 RTH* 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 200 RTH* 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.
- The controller can be switched on or off at any time by holding the $\boxed{\overset{\circ}{\text{ok}}}$ key pressed for a while.
- Pressing any function key for the first time always starts the backlight first, and then the key function is performed.
- While programming any function, if no key is pressed for 10 seconds, this will be interpreted as pressing the $\boxed{\overset{\circ}{\text{ok}}}$ key.

The AURATON RTH receiver connection schematics

control

power ~230V
L
N

heating device

e.g. a gas furnace

NO COM NC

OFF
ON
IN
OUT
ALARM RESET

AURATON RTH

AURATON 200 RTH

L   N
~230V AC

Max. ~230V
N L

electric heating device

Max. ~230V
16 A

NO COM NC

OFF
ON
IN
OUT
ALARM RESET

AURATON RTH

AURATON 200 RTH

L   N
~230V AC

Technical specifications

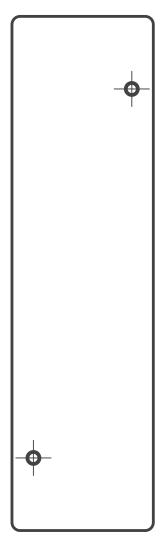|	
Working temperature range:	0 − 45°C
Temperature measurement range:	0 − 35°C
Temperature control range:	5 − 30°C
Span:	±0,2°C / ±0,4°C / PWM
Temperature setting accuracy:	0,2°C
Temperature reading accuracy::	±0,2°C
Default temperature setting:	20°C
Additional function:	FrostGuard
Operating cycle:	Daily
Working mode control:	LED (the RTH receiver) / LCD (the regulator)
Maximum load:	*AURATON RTH* ~ 16A 250V AC
AURATON 200 RTH power supply	2x AAA 1.5V alkaline batteries
RTH power supply:	230V AC, 50Hz
RTH radio frequency:	868MHz
RTH Operation range:	in a typical building, with standard construction of walls - approx. 30 m 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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CE