# uponor

# Uponor Base thermostat display T-27 230V

Installation and operation manual

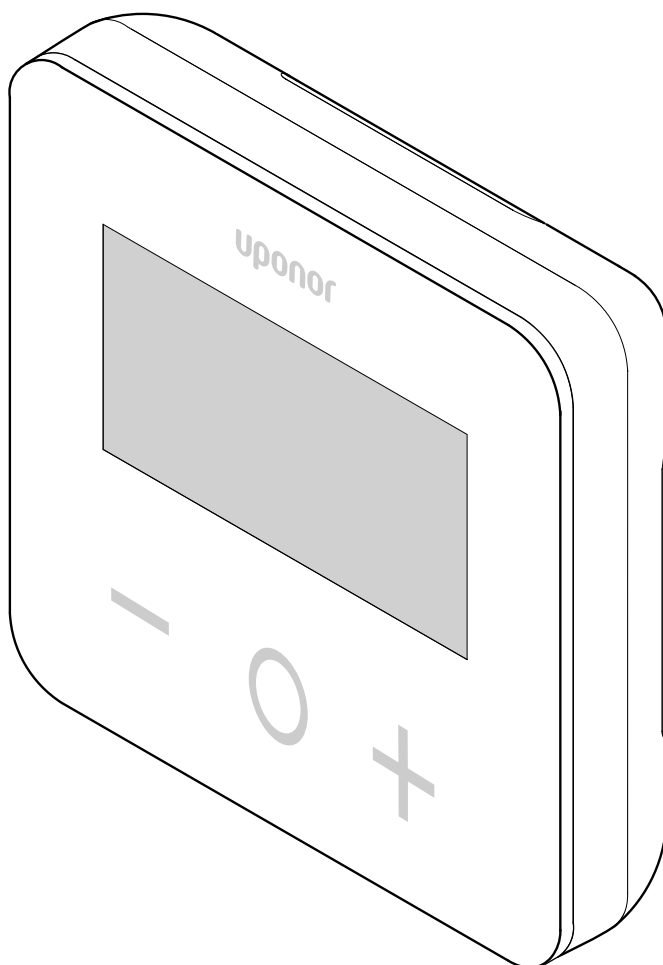CD0000452

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# 2 Preface

This installation and operation manual describes how to install and operate the components of the system.

## 2.1 Safety instructions

### Safety measures

Conform to the following measures when installing and operating any Uponor equipment:

- Read and follow the instructions in the installation and operation manual.
- Installation must be performed by a competent person in accordance with local regulations.
- It is prohibited to make changes or modifications not specified in this manual.
- All power supplies must be switched off before starting any wiring work.
- Do not use water to clean Uponor components.
- Do not expose the Uponor components to flammable vapours or gases.

Uponor cannot accept any responsibility for damage or breakdown that can result from ignoring these instructions.

### Power

| STOP | **Warning!** |
|---|---|
| | The Uponor system uses 50 Hz, 230 V AC power. In case of emergency, immediately disconnect the power. |

### Technical constraints

| ⚠ | **Caution!** |
|---|---|
| | To avoid interference, keep installation/data cables away from power cables of more than 50 V. |

## 2.2 Correct disposal of this product (Waste Electrical and Electronic Equipment)

| ! | **Note** |
|---|---|
| | Applicable in the European Union and other European countries with separate collection systems |

This marking shown on the product or its literature indicates that it should not be disposed with other household wasted at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes of disposal.

# 3 Uponor Base thermostat display T-27 230V - description
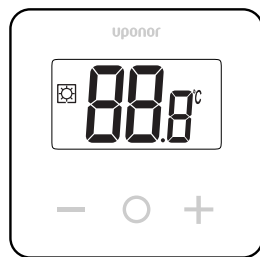


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Uponor Base thermostat display T-27 230V (thermostat T-27) comes with a big LCD display and capacitive keys.

The temperature is displayed in large digits for easy readability also from a distance.

The capacitive keys and the front glass make cleaning of the front of the thermostat easy.

A special electronics (triac) ensures that the thermostat is operating completely noiseless and provides highest comfort in all rooms.

## 3.1 Thermostat features

Main characteristics for the thermostat:

- Mounting
  - on wall
  - on standard European patress box/flush mounting box
- Noiseless switching (triac)
- Can supply up to 5 actuators with power
- Optional: an external temperature sensor can be connected to the thermostat, to measure the room or floor temperature

### Software features

Main characteristics of the thermostat software:

- Temperature limitation
- Optional floor sensor connectivity
- Heating/cooling switch
- Regulation modes
  - **rt**: room temperature
  - **rS**: external sensor temperature
  - **rFt**: room temperature with floor temperature limitation
- Comfort/ECO modes
- Demand indication in the display
- Calibration
- Valve exercise - triggers the actuator valve to open for 2 minutes if the actuator has been closed for 3 days (72 hours)
- Factory reset

## 3.2 System compatibility

> **Note**
>
> For more detailed information, product range and documentation please visit the Uponor website: www.uponor.com.
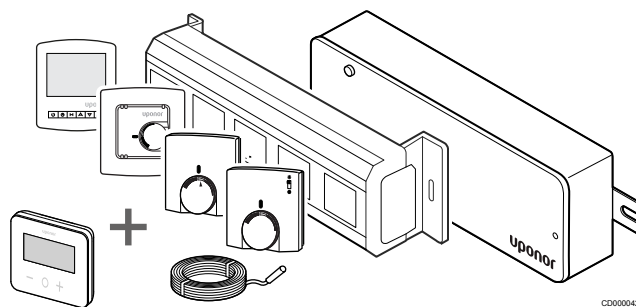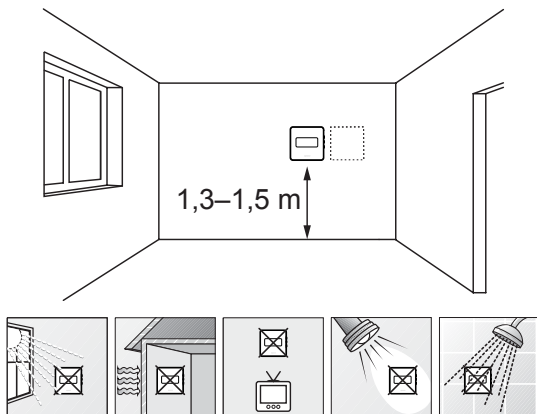


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The thermostat T-27 is compatible with the current Uponor Base control system 230 V, the Uponor Base flexiboard controllers (X-24/X-25/X-26/X-27), the Uponor Base X-23 wiring box as well as the Uponor Smatrix floor/remote sensor S-1XX.

# 4 Installation

## 4.1 Placement of thermostat



SD0000002

- Select an indoor wall and a position 1,3 m to 1,5 m above the floor.
- Ensure that the thermostat is away from direct sunlight.
- Ensure that the thermostat will not be heated through the wall by sunshine.
- Ensure that the thermostat is away from any source of heat, for example television set, electronic equipment, fireplace, spotlights, and so on.
- Ensure that the thermostat is away from any source of humidity and water splashes (IP30).
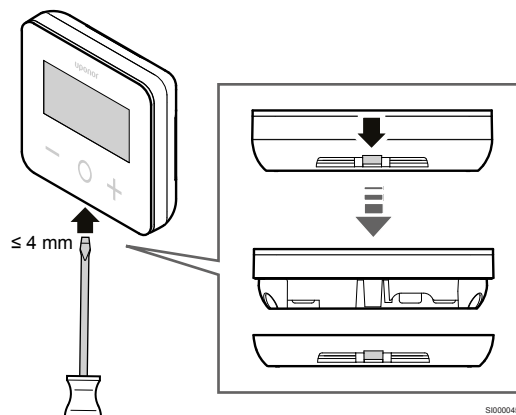
## 4.2 Installation procedure

| STOP | **Warning!** |
|------|--------------|
|      | The thermostat uses 230 V AC power. Never open and/or separate the front cover from the rear face of the thermostat! |

| ⚠ | **Caution!** |
|---|--------------|
|   | Do not push hard on the LCD screen as this may cause irreparable damage. |



SI0000464

To install the thermostat, follow these steps:

## Remove the back plastic cover

1



SI0000456

Use a flat screw driver/tool (width max. 4 mm) to remove the back plastic cover.

## If necessary: cut the back part plastic

2
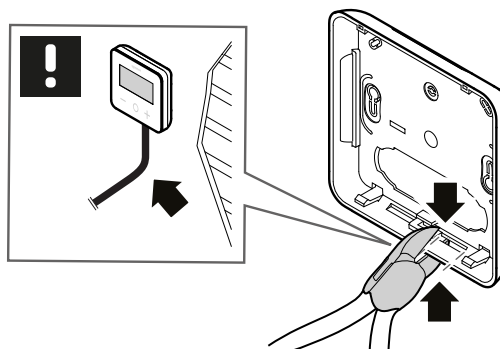


SI0000457

If the thermostat is wall mounted and the cables (or some of them) are placed on the wall, cut the back part plastic.

## Remove the breakouts

3



SI0000458

**Wall mounting with 2 screws**: Remove the 2 breakouts for the screws in the back cover.

**Option — wall mounting with 1 screw**: Remove the breakout of the center hole in the back cover.

## Attach the back plastic cover to the wall

### Wall box mounted

4a



SI0000459
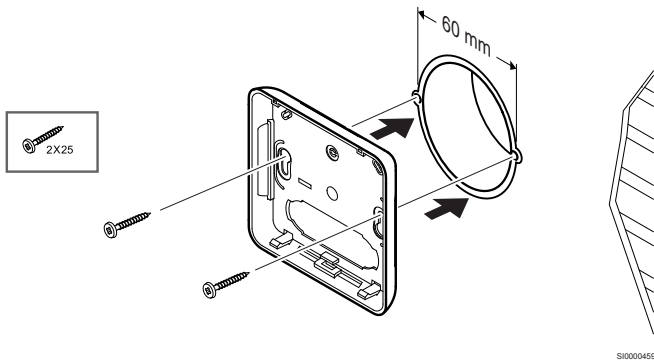
Attach the back cover to the wall box.

### Wall mounted

4b



OPTION

SI0000460
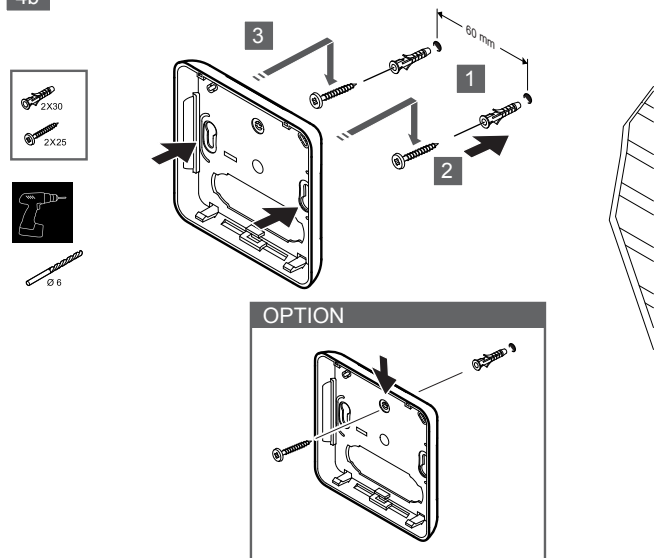
Attach the back cover to the wall with 1 or 2 screws.

## Connect the thermostat

**Note**

Read the wiring diagram in the technical data chapter before making any electrical installation!
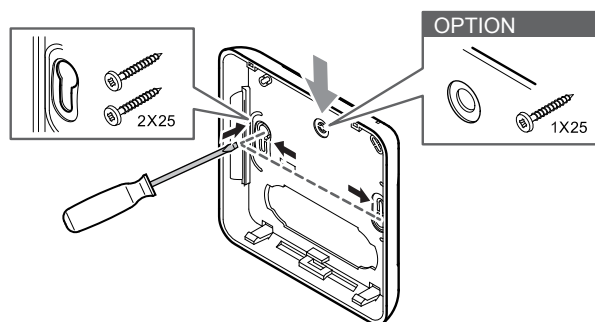
5



230 V
50 Hz

L  L_out  N

SI0000461
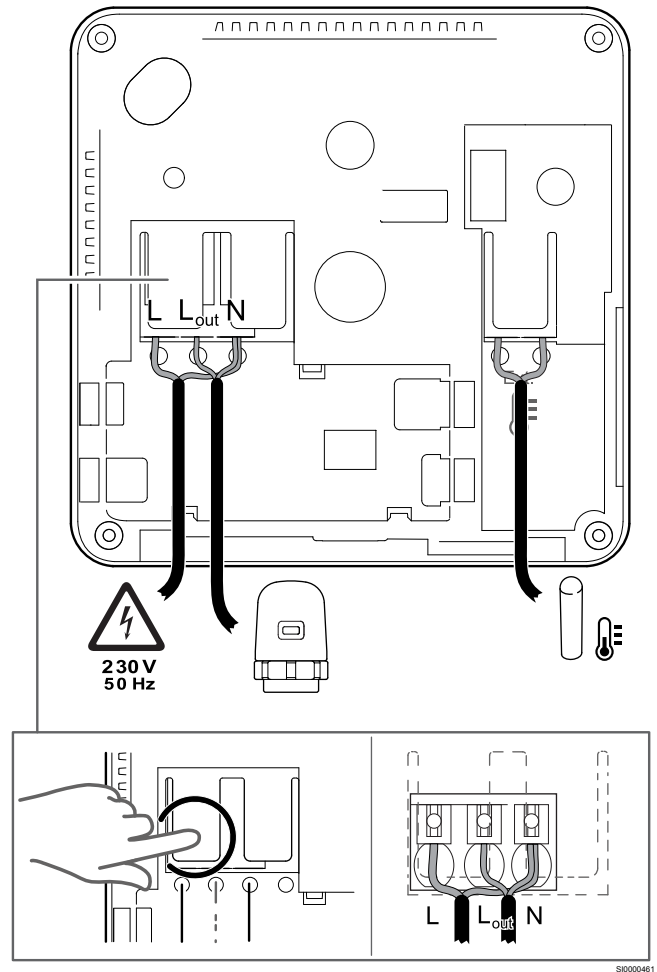
Connect the power cables to the backside of the thermostat. External sensor is optional.

The cables from the actuators can be connected directly to the thermostat or to a separate connection box.

For easier wiring, Uponor Base Flexiboard X-24/X-25/X-26/X-27 offers flexible allocation of one or more actuators to the room thermostats via selector switch during or after installation.

# Attach the thermostat to the back cover

6



SI0000462
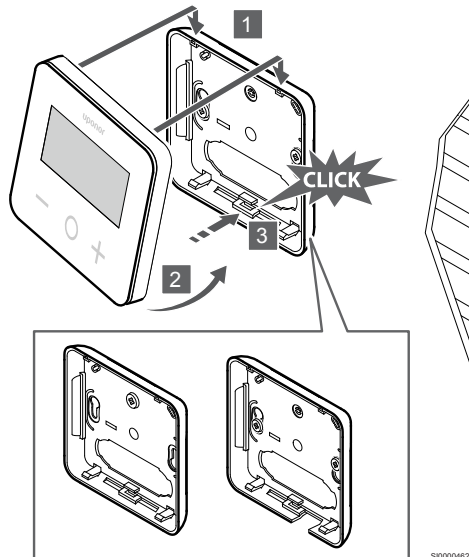
Attach the thermostat to the back cover.

1. Attach the thermostat body to the back cover by using the 2 hooks in the upper part as hinge.
2. Gently press the thermostat down towards the clips at the bottom of the back cover until a clicking sound is heard.
3. The thermostat is attached to the back cover.

# Remove the thermostat from the wall



≤ 4 mm

SI0000463
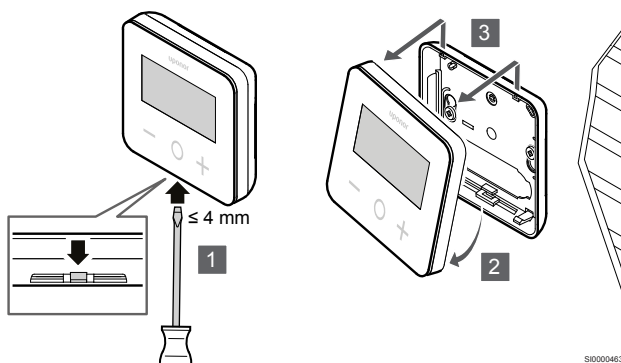
Press the clips at the bottom of the back cover with a flat screwdriver (width max. 4,0 mm) to unlock and remove the thermostat.

# 5 Operation

## 5.1 Activate the termostat

### Power on/reset display

The software version is displayed after power on, or after a product reset.

### Current mode
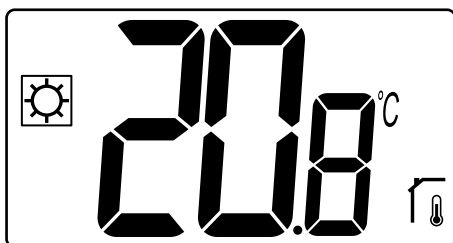
After the power has been set on or the thermostat has been reset, the thermostat runs current mode (Comfort or ECO).

### Thermostat key descriptions
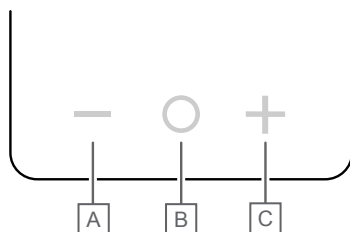
| Key/icon | Description |
|---|---|
| — | Minus/decrease |
| O | OK |
| + | Plus/increase |

Press a key on the thermostat T-27 to initiate an action related to that key.

### — and + keys

The keys **–** and **+** are used to

- Adjust setpoint temperature
- Move from one parameter to the next/previous one in the settings menu

### O (OK) key

The key **O** (OK) is used to

- Display temperature measure
- Toggle between current status data, and values of available sensors connected to the thermostat
- Enter and exit the settings menu (holding the key for about **3 seconds**)
- Confirm a setting

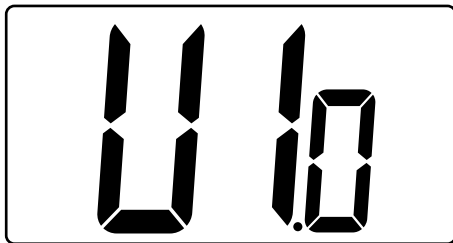## 5.2 LCD display descriptions
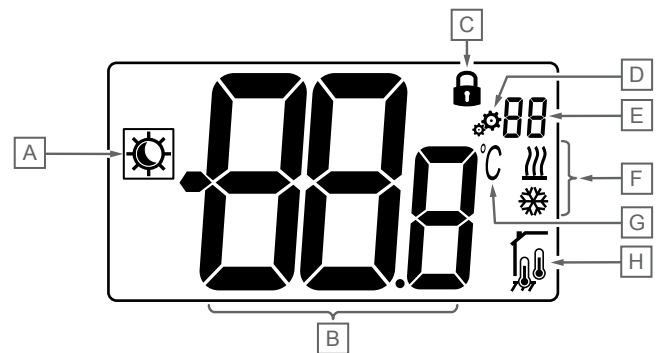
### Symbols/icons

The figure shows all possible symbols and characters that can be shown on the display:

| Item | Icon | Description |
|---|---|---|
| A | ☼/☾ | **Comfort/ECO modes**<br>Visible depending on the selected mode |
| B | 88.8 | **Temperature**<br>Value from internal or external temperature sensor |
| C | 🔒 | Locked display and keys |
| D | ⚙ | Settings |
| E | 88 | Settings menu number |
| F | ))) /❄ | Heating/cooling demand on the display |
| G | °C | Temperature unit |

| Item | Icon | Description |
|------|------|-------------|
| H | | Type of measured data and sensor used for system regulation: |
| | (room temp sensor icon) | Room temperature sensor (rt) |
| | (room temp with floor sensor icon) | Room temperature with external floor sensor (rFt) |
| | (remote temp sensor icon) | Remote temperature sensor (rS) |

## Display text

The following table contains an overview of all the display texts with reference to the respective sections where they are described.

| Display text | | Description | Settings menu number |
|--------------|--|-------------|----------------------|
| 00.5 | $00_5$ | ECO mode setback temperature | 03 |
| CLd | $CLd$ | Cooling mode | 01 |
| Cmf | $CnF$ | Comfort mode | 02 |
| dls | $d\,l_5$ | Lock keys and display function | 09 |
| Eco | $Eco$ | ECO mode | 02 |
| Err | $Err$ | Error | — |
| FL.H | $FLH$ | High limitation of floor temperature | 05 |
| FL.L | $FLL$ | Low limitation of floor temperature | 06 |
| Hot | $Hot$ | Heating mode | 01 |
| HYS | $HY_5$ | Hysteresis value | 13 |
| MAH | $MAH$ | Maximum heat / Maximum value of setting range of the setpoint temperature | 12 |
| Min | $\Pi\,ln$ | Minimum / Minimum value of setting range of the setpoint temperature | 11 |
| Mod | $\Pi od$ | Mode / Heating/cooling modes | 01 |
| no | $nO$ | Calibration of internal room sensor | 07 |
| no | $nO$ | Calibration of external room sensor | 08 |
| rEG | $rEG$ | Regulation selection | 04 |
| rES | $rE5$ | Factory reset | — |
| rFt | $rFt$ | Room temperature with external floor sensor | 04 |
| rS | $r5$ | Remote sensor | 04 |
| rt | $rt$ | Room temperature | 04 |
| U1.0 | $U\,l_0$ | Software version | 10 |
| YES | $YE5$ | Yes | 07/08 |

## 5.3 Display temperatures (Comfort/ECO)

Follow below instructions to **display the temperatures**:

1. Press the key **—** or **+** to see the setpoint
2. Press the key **O** (OK) to display the room temperature and floor temperature (external sensor must be connected and the regulation set to rFt)

## 5.4 Temperature setpoint (Comfort/ECO)

The Comfort/ECO temperature setpoint is continuously monitored.

Follow below instructions to **modify the temperature setpoints**:

1. Press the key **—** or **+** to see the current temperature setpoint
2. Press the key **—** or **+** again to modify the setting temperature
3. Press the key **O** (OK) to confirm the temperature setpoint value

## 5.5 Settings

> **Note**
>
> After 1 minute of user inactivity in the settings menu, the thermostat returns automatically to the current mode.
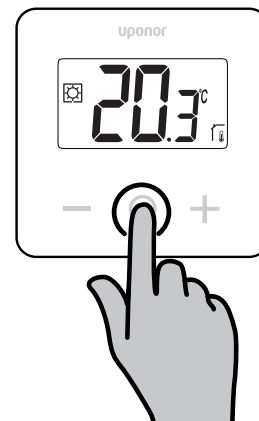


SI0000427

## Settings menu overview

The following table contains an overview of all the settings with reference to the respective sections where they are described.

| Settings menu number | Name | Description |
|----------------------|------|-------------|
| 01 | Mod | *Heating/cooling modes, Page 11* |
| 02 | Eco | *Comfort/ECO modes, Page 11* |
| 03 | Setback | *ECO mode setback temperature, Page 11* |
| 04 | rEG | *Regulation selection, Page 12* |
| 05 | FL.H | *High limitation of floor temperature, Page 12* |
| 06 | FL.L | *Low limitation of floor temperature, Page 12* |
| 07 | no | *Calibration of internal room sensor, Page 12* |
| 08 | no | *Calibration of external room sensor, Page 13* |
| 09 | dls | *Lock keys and display function, Page 13* |
| 10 | U1.0 | *Software version, Page 14* |
| 11 | Min | *Min. value of setting range of the setpoint temperature, Page 14* |

| Settings menu number | Name | Description |
|---|---|---|
| 12 | MAH | *Max. value of setting range of the setpoint temperature, Page 14* |
| 13 | HYS | *Hysteresis value, Page 14* |
| — | rES | *Factory reset, Page 14* |

## Enter the settings menu

The settings menu is accessible in both Comfort and ECO modes.

Follow below instructions to enter the settings menu:

1. Press the key **O** (OK) for **3 seconds**
2. Scroll up and down in the menu with the keys **—** and **+**
3. Select the desired menu by pressing the key **O** (OK)
4. Change the value with the keys **—** and **+**
5. Press the key **O** (OK) to confirm the settings
6. Press the key **O** (OK) for **3 seconds** to return to the current mode

## 5.6 Heating/cooling modes



CD0000442
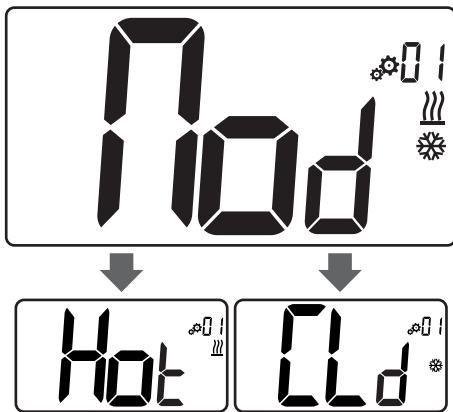
Values: **Hot/CLd**

| Value | Description |
|---|---|
| **Hot** | Heating mode (default) |
| **CLd** | Cooling mode |

## 5.7 Comfort/ECO modes



CD0000437
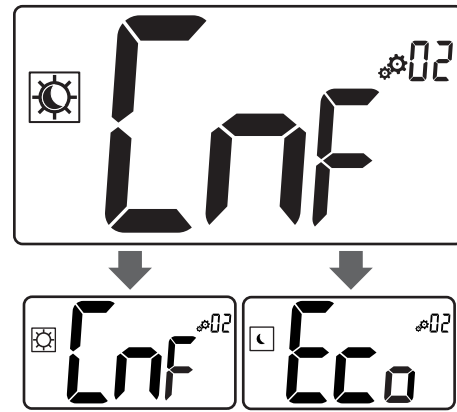
Values: **Comfort/ECO modes**

| Value | Description |
|---|---|
| **CmF** | Comfort mode (default) |
| **Eco** | ECO mode |

### Comfort mode

| Setpoint setting | Step | Temperature range |
|---|---|---|
| 21 °C | 0,5 °C | 5,0 °C to 35 °C |

*If no limitation is defined, please see the settings menu*

### ECO mode

| Setpoint setting | Step | Temperature range |
|---|---|---|
| 17 °C | 0,5 °C | 5,0 °C to 31 °C |

*If no limitation is defined, please see the settings menu*

## 5.8 ECO mode setback temperature



CD0000440

| Description | Value |
|---|---|
| Default value | 4 °C |
| Step | 0,5 °C |
| Values | 0 °C to 11 °C |

## Calculation of ECO setpoint temperature

When the mode is changed from Comfort to ECO, the value displayed as setpoint temperature is:

• Comfort setpoint – ECO setback (in heating)

or

• Comfort setpoint + ECO setback (in cooling)
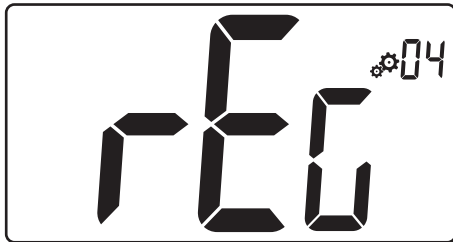
When the mode is changed from ECO to Comfort, the value shown as setpoint temperature is only the setpoint.

## 5.9 Regulation selection



CD0000438

| Description | Value |
|---|---|
| Default value | rt |
| Values | rt/rFt/rS |

| Mode | Icon | Sensor | Description |
|---|---|---|---|
| rt | | Internal | Indoor temperature |
| | | | The room temperature is measured with the internal sensor in the thermostat |
| rFt | | Internal & external | Indoor temperature with floor temperature limitation |
| | | | The room temperature is measured with the internal sensor in the thermostat, and the floor temperature with external sensor |
| | | | Press the key O (OK) to switch between room temperature and floor temperature |
| rS | | External | Remote sensor temperature |
| | | | The room or floor temperature is measured with an external sensor |

## 5.10 High limitation of floor temperature

> **Note**
>
> This value is displayed only when the setting "**rEG**" is set on "**rFt**".



CD0000443

| Description | Value |
|---|---|
| Default value | 26 °C |
| Step | 0,5 °C |
| Values | 20 °C (or "FL.L") to 35 °C |

## 5.11 Low limitation of floor temperature

> **Note**
>
> This value is displayed and set only if the parameter "**rEG**" is set on "**rFt**".



CD0000446

| Description | Value |
|---|---|
| Default value | 20 °C |
| Step | 0,5 °C |
| Values | 10 °C to 30 °C (or "FL.H") |

## 5.12 Calibration of internal room sensor

> **Note**
>
> This menu is only displayed if the parameter "**rEG**" is set with "**rt**" or "**rFt**".

> **Note**
>
> If the keys **—** and **+** are pressed simultaneously, the sensor calibration is reset.
>
> "**no**" is displayed

| Description | Value |
|---|---|
| Default value | No (0,0 °C) |
| Step | 0,1 °C |
| Values | -3,0 °C to 3,0 °C |

The indicator says "**no**" (correction value is zero) when the calibration mode is entered for the first time. This means no calibration has been performed yet.

Enter the reading on the thermometer using the keys **—** and **+** (step of 0,1 °C).
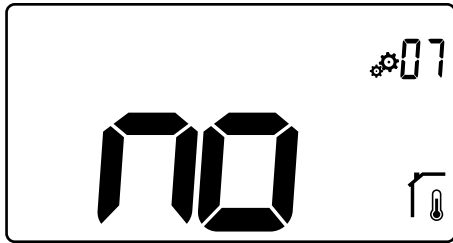
The setting is validated with key **O** (OK).

## 5.13 Calibration of external room sensor

| | |
|---|---|
| **!** | **Note** |
| | This menu is only displayed if the parameter "**rEG**" is set with "**rS**" or "**rFt**". |
| **!** | **Note** |
| | If the keys **—** and **+** are pressed simultaneously, the sensor calibration is reset. |
| | "**no**" is displayed |



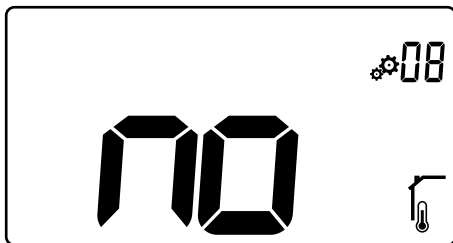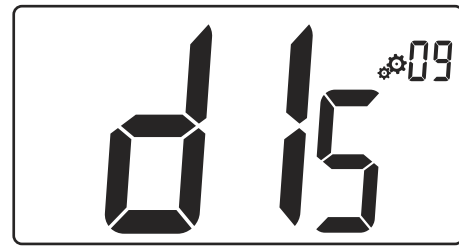| Description | Value |
|---|---|
| Default value | No (0,0 °C) |
| Step | 0,1 °C |
| Values | -3,0 °C to 3,0 °C |

The indicator says "**no**" (correction value is zero) when the calibration mode is entered for the first time. This means no calibration has been performed yet.

Enter the reading on the thermometer using the keys **—** and **+** (step of 0,1 °C).
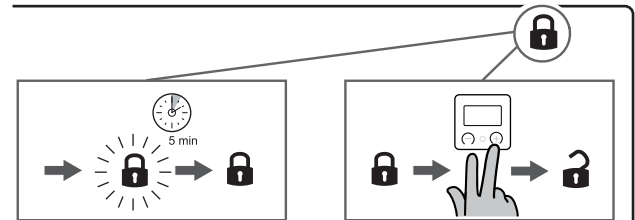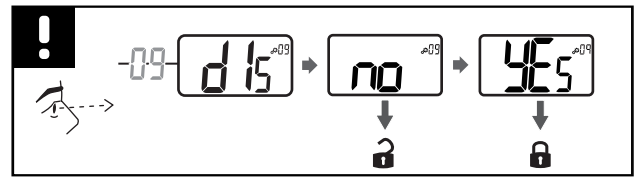
The setting is validated with key **O** (OK).

## 5.14 Lock keys and display function



| Value | Description |
|---|---|
| **Yes** | Activate the lock display and keys |
| **No** | Deactivate the lock display and keys |

The "**lock keys and display function**" is used to lock the thermostat keys and LCD display.



### Lock keys and display

Follow the instruction below to activate the lock function of the thermostat display and keys:

1. Press the key **O** (OK) for **3 seconds**
2. Scroll up in the menu with the key **+** to **09 dls**
3. Select the desired menu by pressing the key **O** (OK)
4. Change the displayed value "**no**" to "**Yes**" with the key **+**
5. Press the key **O** (OK) to confirm the settings
6. Press the key **O** (OK) for **3 seconds** to return to the current mode
7. The lock icon on the display starts flashing
8. After 5 minutes of inactivity, the lock icon stops flushing and the thermostat is locked

### Unlock keyboard and display

#### Temporary deactivation of the lock function

Follow the instruction below to temporarily deactivate the lock function of the thermostat display and keys:

1. Press the keys **—** and **+** during **5 seconds**. The lock icon starts flashing.
2. Make necessary changes in the setpoint, navigate in the settings menu and change parametres.
3. After 5 minutes of inactivity, the thermostat will automatically be locked again.

### Complete deactivation of the lock function

Follow the instruction below to completely deactivate the lock function of the thermostat display and keys:

1. Press the keys — and **+** during **5 seconds**. The lock icon starts flashing.
2. Press the key **O** (OK) for **3 seconds**
3. Scroll up in the menu with the key **+** to **09 dls**
4. Select the desired menu by pressing the key **O** (OK)
5. Change the displayed value "**Yes**" to "**No**" with the key **+**
6. Press the key **O** (OK) to confirm the settings
7. Press the key **O** (OK) for **3 seconds** to return to the current mode
8. The lock icon on the display disappeare and the thermostat is unlocked
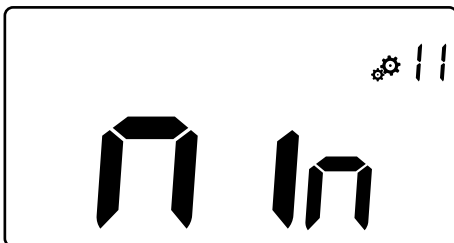
## 5.15 Software version
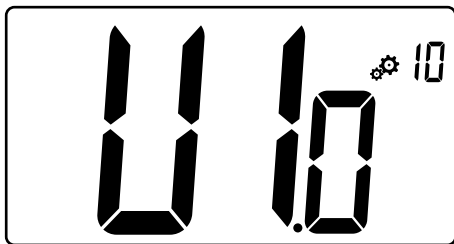


CD0000436

Press and hold the key **O** (OK) to display the software version and debug information.
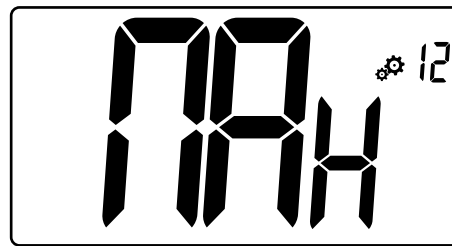
The software version is written: **Vx.x**.

## 5.16 Min. value of setting range of the setpoint temperature



CD0000448

| Description | Value |
|---|---|
| Factory settings value | 5,0 °C |
| Values | 5,0 °C to 15,0 °C |

## 5.17 Max. value of setting range of the setpoint temperature



CD0000447

| Description | Value |
|---|---|
| Factory settings value | 30,0 °C |
| Values | 20,0 °C to 37,0 °C |

## 5.18 Hysteresis value



CD0000444

| Description | Value |
|---|---|
| Default value | 0,3 °C |
| Step | 0,1 °C |
| Values | 0,2 °C to 3 °C |

Follow the instruction below to set the hysteresis value:

1. Use the keys — and **+** to set the hysteresis value
2. Validate the settings with the key **O** (OK)

## 5.19 Factory reset
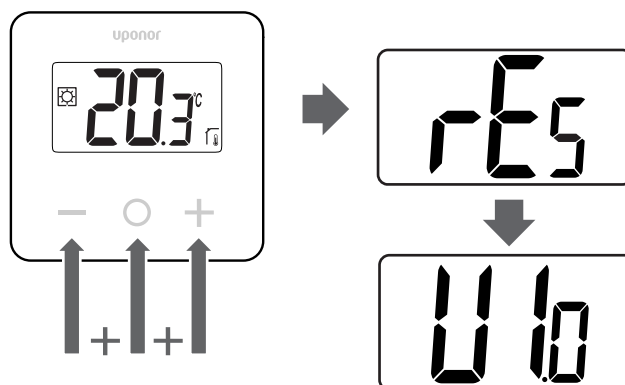


SI0000423

Follow below instructions to **reset the thermostat (factory reset)**:

1. Hold all three keys — and **O** (OK) and **+** for **10 seconds**
2. The thermostat is reset with factoring settings

# 6 Troubleshooting

## 6.1 Temperature measurement errors

> **!** **Note**
>
> The error can be identified in the regulation settings (04) for respective sensor mode rS/rt/rFt.

The thermostat can fail to measure the temperature due to connection problems with the temperature sensor.

If the selected mode is "**rS**", the display shows "**Err**".

Change the mode to "**rt**" to continue working with the internal sensor or replace the external sensor.

### Internal sensor (rt)



CD0000445

In "**rt**" mode, "**Err**" is displayed and the icon internal sensor is shown.

### External sensor (rS)



CD0000441

In "**rS**" mode, "**Err**" is displayed and the icon external sensor is shown.

### Internal and external sensors (rFt)

**rFt - Internal sensor error**



CD0000487

If the **internal sensor fails**, "**Err**" and the internal + floor sensor icons are shown.

**rFt - External sensor error**
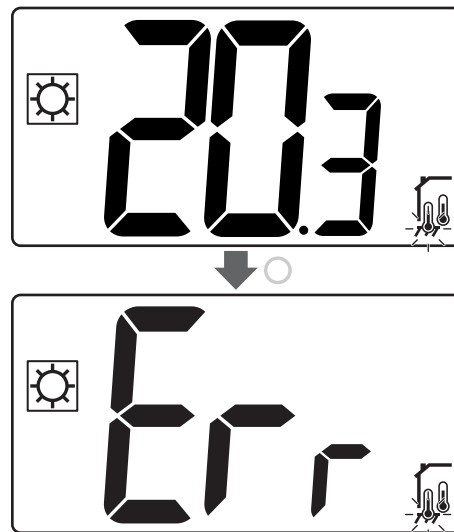


CD0000486

If the **external (floor) sensor fails**, the thermostat carries on to measure the temperature with the internal sensor.

*   The icon with internal and floor sensors is shown, but the floor sensor flashes.
*   Press the key **O** (OK) and "**Err**" is shown instead of the floor temperature, and the floor sensor icon flashes.

# 7 Technical data

## 7.1 Technical specifications

| Description | Value |
|---|---|
| IP | IP30 (IP: degree of inaccessibility to active parts of the product and degree of water) |
| Max. ambient RH (relative humidity) | 60 % at 20 °C |
| Marking | CE, UKCA, EAC |
| ERP | Class I |
| Power supply | 230 V AC, 50 Hz |
| Operating temperature | 0 °C to +50 °C |
| Wired control | TRIAC 230 V |
| Storage temperature | -20 °C to +60 °C |
| Room temperature sensor (rt) | CTN 10 K at 25 °C |
| External temperature sensor | CTN 10 K at 25 °C |
| Thermostat colour | Thermostat body RAL 9016 Transparent front glass |

## Declaration of conformity

| Usable in all Europe |
|---|

**Declaration of conformity**

We hereby declare under our own responsibility that products dealt with by these instructions satisfy all essential demands linked to the information stated in the Safety instruction booklet.



### Directive 2014/35/EU (LVD)

Harmonised standards applicable under Directive 2014/35/EU for Low Voltage (LVD):

- EN 60730-1:2017 Safety — Automatic electrical controls for household and similar use - Part 1: General requirements
- EN 60730-2-9:2013 Safety — Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls

### Directive 2014/30/EU (EMC)

Harmonised standards under Directive 2014/30/EU for Electromagnetic compatibility (EMC):

- EN IEC 61000-3-2:2019 — Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current 16 A per phase)
- EN IEC 61000-3-3:2013 + AMD1:2017 — Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current =16 A
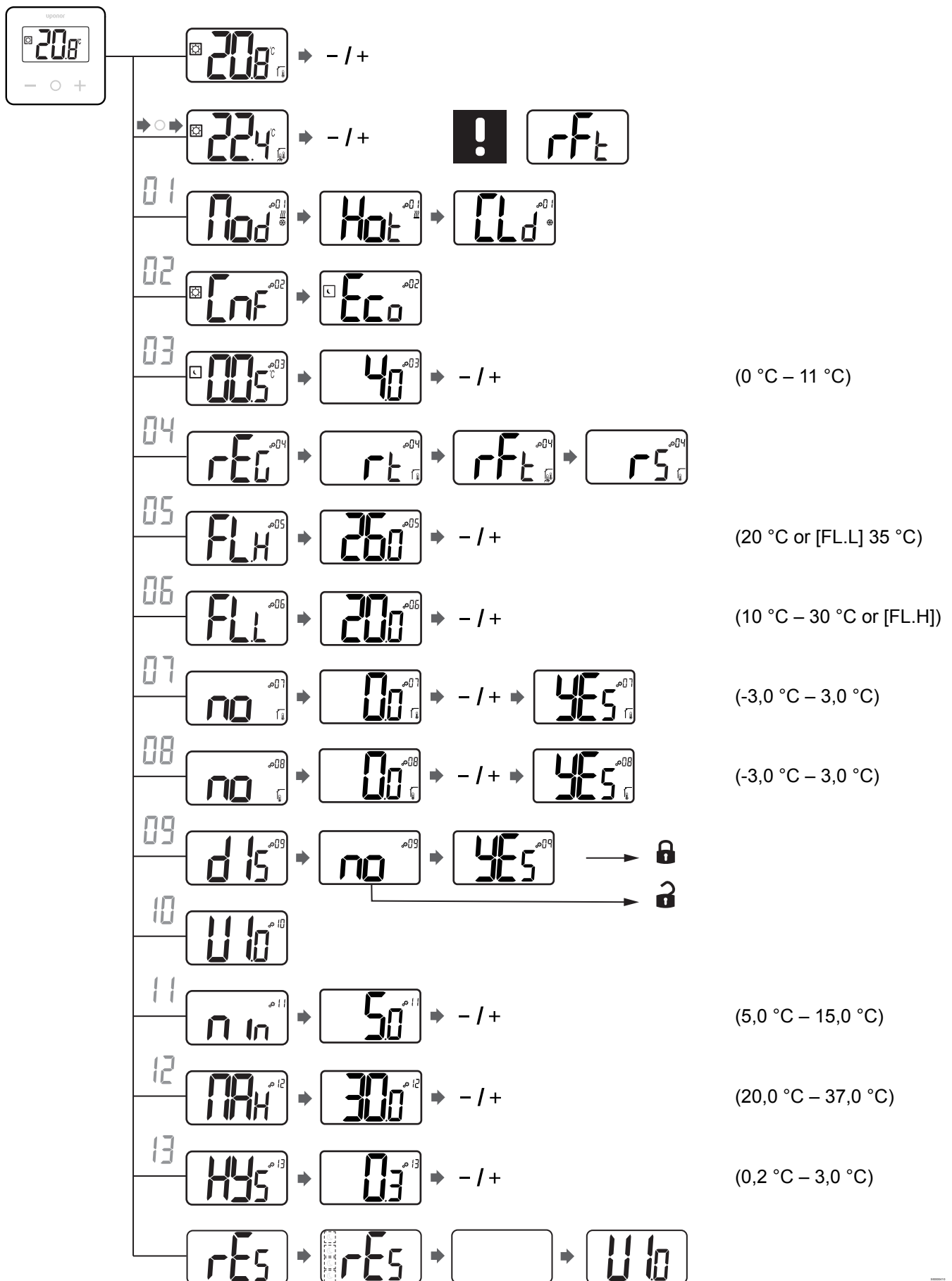
## 7.2 Dimensions
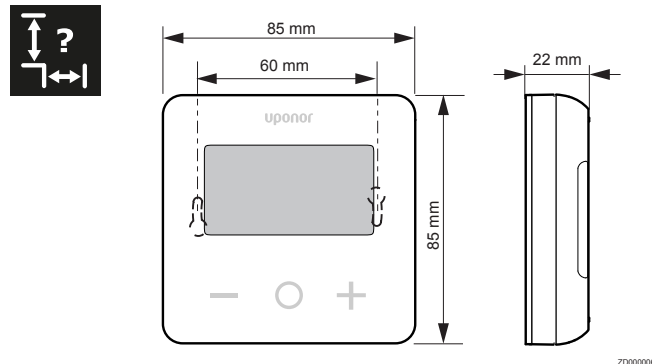


## 7.3 Wiring diagram
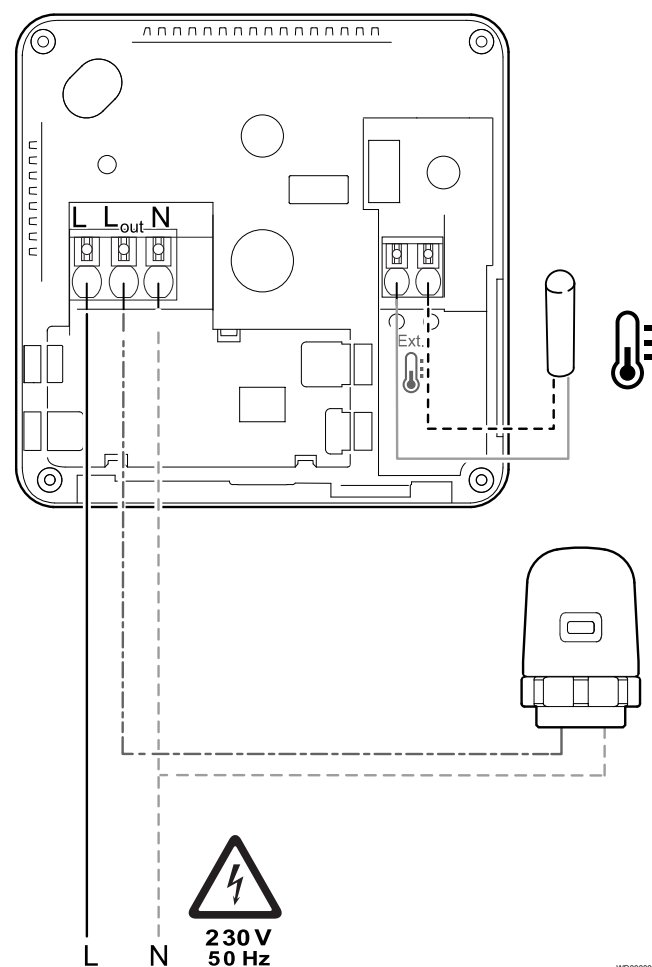


| Item | Connection | Description |
|---|---|---|
| A | L | Power |
| B | L out | Actuator |
| C | N | Neutral |
| D | | External sensor |
| E | | External sensor |

# 7.4 Menu description



| | | | | |
|---|---|---|---|---|
| | 20.8 °C → − / + | | | |
| | 22.4 °C → − / + | ! | rFt | |
| 01 | Mod → Hot → CLd | | | |
| 02 | CnF → Eco | | | |
| 03 | 00.5 °C → 4.0 → − / + | | | (0 °C – 11 °C) |
| 04 | rEG → rt → rFt → rS | | | |
| 05 | FLH → 26.0 → − / + | | | (20 °C or [FL.L] 35 °C) |
| 06 | FLL → 20.0 → − / + | | | (10 °C – 30 °C or [FL.H]) |
| 07 | no → 0.0 → − / + → YES | | | (-3,0 °C – 3,0 °C) |
| 08 | no → 0.0 → − / + → YES | | | (-3,0 °C – 3,0 °C) |
| 09 | dIS → no → YES | 🔒 🔓 | | |
| 10 | U1.0 | | | |
| 11 | nIn → 5.0 → − / + | | | (5,0 °C – 15,0 °C) |
| 12 | MAH → 30.0 → − / + | | | (20,0 °C – 37,0 °C) |
| 13 | HYS → 0.3 → − / + | | | (0,2 °C – 3,0 °C) |
| | rES → rES → → U1.0 | | | |

Uponor reserves the right to make changes, without prior notification,
to the specification of incorporated components in line with its policy of
continuous improvement and development.

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