

Operating instructions

RTC 230 V~ with NC / NO contact, 1-way switch and control light
Order no. 2472 00



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1 Safety instructions



Electrical devices may be mounted and connected only by electrically skilled persons.

Serious injuries, fire or property damage are possible. Please read and follow the manual fully.

Danger of electric shock. Always disconnect before carrying out work on the device or load. In so doing, take all the circuit breakers into account, which support dangerous voltages to the device and or load.

These instructions are an integral part of the product, and must remain with the end customer.

2 Device components

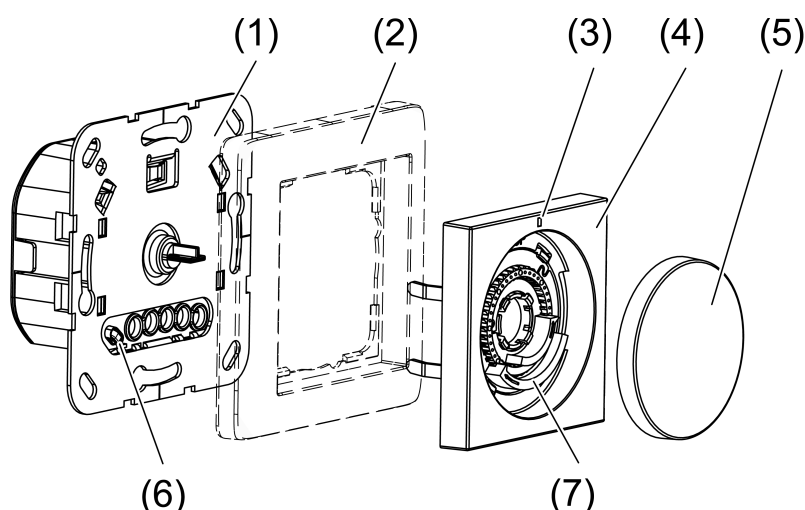


Figure 1: Device components

- (1) Room temperature controller insert
- (2) Cover frame
- (3) Status LED
- (4) Central plate
- (5) Control knob
- (6) Internal temperature sensor
- (7) Adjustment rings for temperature limit



During renovation work, the temperature sensor (6) must not become dirty or be painted over.

3 Intended use

- Electronic room temperature controller for controlling electrothermal valve drives for 230 V~
- Control of the room temperature in closed rooms

- Mounting in appliance box with dimensions according to DIN 49073

4 Product characteristics

- Manually setting a comfort temperature
- Manually switching off the temperature control
- Input terminal for activation of reduction temperature (ECO) via central clock
- Input terminal for activating the cooling mode via central control
- Internal temperature sensor
- Frost protection function
- Silent switching
- Temperature drop detection (adjusting to frost protection temperature when window is opened)
- Controller output working method: pulse width modulation (PWM) or two-point switchable
- Adaptation to valve type (deenergised opened or deenergised closed, switchable)
- Offset adjustment (correction value for measured temperature)
- Valve protection function (once a week opening and closing of valve)

5 Functional description

Lowering mode (ECO)

In many areas of the building it makes sense for the temperature to be set to a lower level at certain times rather than to heat permanently to the comfort temperature. By connecting the input terminal \ominus to 230 V, the temperature is reduced by 4 °C. This should be controlled by a central clock.

Cooling mode

Modern heat pump systems often also provide the option of cooling rooms. In cooling mode, it is possible to change the cooling temperature using the control knob. Switching between heating and cooling mode is done via the control knob or by wiring the input terminal "C" with 230 V.

Temperature drop detection

In the event of a sharp drop in temperature, e.g. after opening a window, the system regulates to the frost protection temperature of 5 °C for a maximum of 30 minutes. Pressing or turning the control knob cancels the operation.

Offset

This function allows the adjustment of the position of the control knob so that it corresponds to the room temperature. Thus, the indication of the temperature via the control button is comparable in different rooms. An adaptation of up to $\pm 3\text{ }^{\circ}\text{C}$ is possible.

Controller adaptation

Depending on the heating system, the control behaviour can be adjusted.

Pulse width modulated control (factory setting): Optimised for electrothermal valve drives (see Technical data): The output is not permanently actuated, but for a time period (pulse width) that depends on the difference between setpoint and actual temperature. This method brings the actual temperature gradually closer to the setpoint temperature.

Two-point control: The output remains switched on until the selected setpoint temperature has been exceeded by $0.5\text{ }^{\circ}\text{C}$. The output will not be switched on again until the setpoint value is undercut by $0.5\text{ }^{\circ}\text{C}$. Since most heating systems respond very slowly, this type of control can entail temperature overshooting.

Setting the valve type

Depending on the electrothermal valve drive used, an adaptation to the valve type must be made. There are valve drives where the valve is opened (deenergised opened) or closed (deenergised closed, factory setting) when no supply voltage is applied.

6 Operation

Brief overview

Function	Control knob	Status LED	LED colour
Change room temperature	... turn right or left	maximum 2 minutes	Red = heating mode Blue = cooling mode Orange = frost protection (10 seconds)
Display operating mode	... press briefly	10 seconds.	Red = heating mode Blue = cooling mode Orange = frost protection

Increasing or reducing the room temperature

- Turn the control knob to the right or left.
If the setpoint temperature is not reached, the LED lights up for a maximum of 2 minutes in the colour of the current operating mode.

In the middle position, the device regulates to approx. 20 °C target temperature. The room temperature reached depends on the installation location of the device and the ambient conditions. The lowest setpoint temperature is approx. 5 °C and the highest setpoint temperature is approx. 30 °C (see figure 4).

Indication of the current operating mode

- Press the control knob briefly.

The LED lights up for 10 seconds in the colour of the current operating mode. **Orange** = frost protection, **blue** = cooling mode, **red** = heating mode.

Switching off the temperature control

- Press the control knob for longer than 2 seconds until the LED lights up **orange**.

The device has switched to frost protection. The frost protection prevents the temperature from falling below 5 °C.

Each time the control knob is turned, the LED lights up **orange** for 10 seconds.

- To activate the temperature control, press the control knob again for more than two seconds.

The device switches back to the previous operating mode. The LED lights up for 10 seconds.

Red = heating mode, **blue** = cooling mode.

Manual switching between heating and cooling mode

- i** If 230 V is present at the input terminal **C**, manual switching to heating mode is not possible.

- Press the control knob for longer than 4 seconds until the LED flashes **red** in heating mode or flashes **blue** in cooling mode.
- Briefly press the control knob again to change the operating mode.
- Press the control knob for longer than one second until the LED lights up continuously to accept the displayed operating mode.
After 10 seconds without actuation, the displayed operating mode is automatically adopted.

Red = heating mode, **blue** = cooling mode.

7 Information for electrically skilled persons

Selecting a suitable installation location

- Recommended installation height: 1.50 m on interior walls.
- Do not mount the device near sources of interference, such as ovens, refrigerators, draughts (e.g. next to the door) or direct sunlight. This affects the temperature measurement of the internal temperature sensor.

- Do not mount the device within shelf walls or behind curtains and similar covers.
- Do not use the device in multiple combinations with heat-generating devices such as dimmers.



DANGER!

Mortal danger of electric shock.

Disconnect the device. Cover up live parts.

Connecting and fitting the device

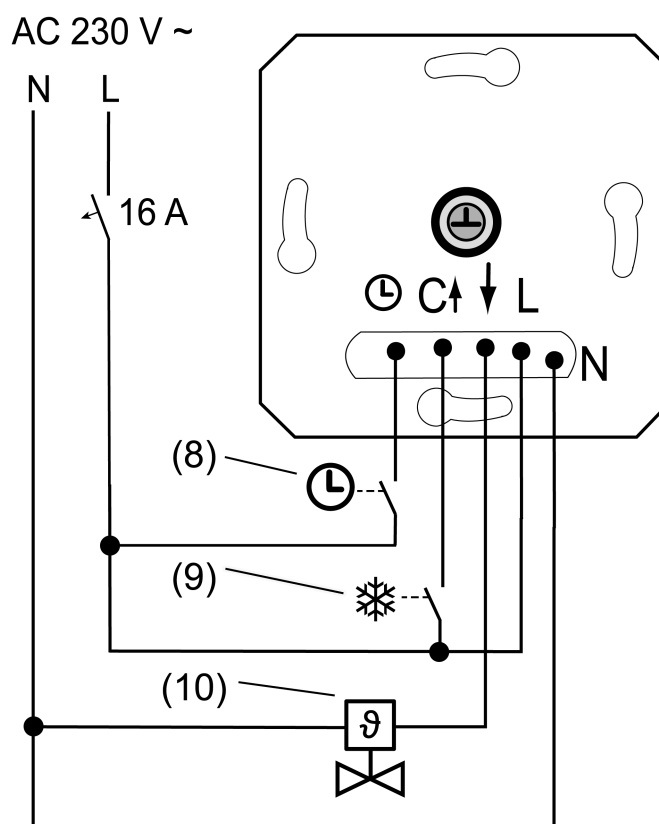


Figure 2: Connection example of the insert

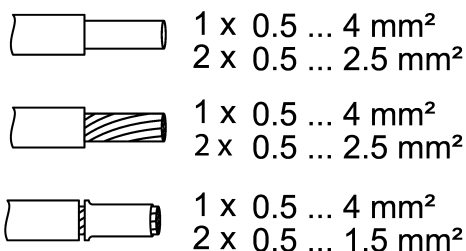


Figure 3: Clampable conductor cross-section

- Connect electrothermal valve drive (10) to insert (1) according to connection diagram (see figure 2). Observe the conductor cross-sections (see figure 3).

- i** Device defect due to incorrect or excessive load. Observe information on valve drives (technical data), check performance data if necessary.
- Optionally, connect the lowering mode input ☉ via a switching contact of a central clock (8).
If 230 V is applied to the input, the setpoint temperature is reduced by 4 °C.
- Optionally, connect the cooling input **C** via a switching contact of the heating system (9).
If 230 V is applied to input C, the cooling mode is active. If 230 V is switched off, the device automatically switches to heating mode.
After each switchover, the LED lights up for 10 seconds in the colour of the current operating mode.
- Fit device in appliance box; device connection terminals must be at the bottom.
- Fit cover frame (2), central plate (4) and control knob (5).
- Switch on mains voltage.
- i** When testing the function of the device, make sure that the output is activated with a delay of up to 30 seconds.

7.1 Commissioning

Setting the control mode and valve type

Default setting:

- Pulse width modulated control (PWM)
- Valve type deenergised closed (NC)

This setting can be used with most heating systems without adaptation.

Changing the settings

- Press the control knob for longer than 20 seconds.
The LED flashes **green** for PWM control and **green/blue** for 2-point control.
- Press the control knob briefly: The control behaviour is changed.
- Press the control knob for longer than one second: The control behaviour is saved.
Adapting the valve type.
The LED flashes **red** for valve type “deenergised closed” (NC) and **red/blue** for valve type “deenergised opened” (NO).
- Press the control knob briefly: The valve type is changed.
- Press the control knob for longer than one second: The valve type is saved.
The setting mode is exited automatically.

- i** After approx. 2 minutes without any operation the menu is exited without saving.

Setting the temperature limits

The room temperature controller has a setting range of 5 ... 30 °C. The adjustment rings on the central plate can be used to limit the temperature setting range.

The specified temperature values may deviate from the actual room temperature depending on the installation location.

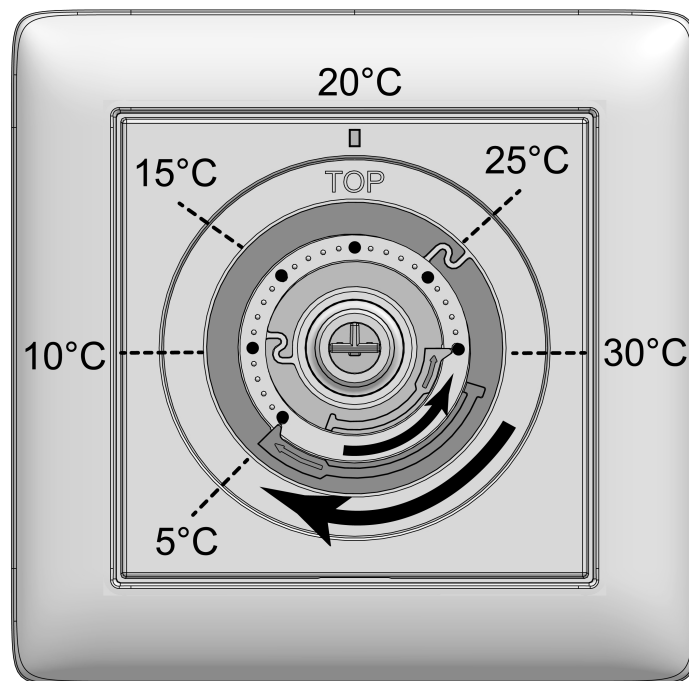


Figure 4: Adjustment rings for temperature limit

- Pull the control knob (5) off the central plate (4) so that the adjustment rings (7) are visible (see figure 4). The temperature values shown in the picture are for orientation purposes.
- Turn the large blue adjustment ring clockwise to the desired minimum temperature. Each notch corresponds to a change of about 1 °C.
- Turn the small red adjustment ring anticlockwise to the desired maximum temperature.
- Replace the control knob, observing the coding of the control knob and rotary axle.

Setting the offset

This function allows the adjustment of the position of the control knob so that it corresponds to the room temperature. Thus, the indication of the temperature via the control button is comparable in different rooms. An adaptation of up to +/- 3 °C is possible.

- i** This setting is only possible if the lower temperature limit has not been raised by the blue setting ring (see Setting the temperature limits).

Precondition: The desired setpoint temperature has been reached in the room.

- Turn the control knob to 5 °C (left stop) and press twice in quick succession (double-click).
The LED flashes quickly, alternately **red** and **green**.
- Turn the control knob to the desired position for the current room temperature and press it for longer than one second.
The control knob position is saved and the LED lights up **green** for 5 seconds.

If the LED flashes **red** for 5 seconds, the change was greater than +/- 3 °C and the adaptation is discarded.

8 Technical data

Rated voltage	AC 230 V ~
Mains frequency	50 / 60 Hz
Standby power	Max. 0.5 W
Connected load	20 W
Sum of switch-on currents (100 ms)	Max. 5.5 A
Connection of thermal valve drives	
Order no.: 2169 00	1 ... 10
Valve drive from other manufacturers	1 ... 3
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Cable length inputs	Max. 100 m
Controller class (EU 811/2013)	IV
Contribution to energy efficiency	2%
Data according to DIN EN 60730-1	
Type of action	1.Y
Degree of soiling	2
Measured surge voltage	4000 V

9 Warranty

The warranty is provided by the specialist trade in accordance with statutory requirements. Please submit or send faulty devices postage paid together with a fault description to your responsible salesperson (specialist trade / installation company / electrical specialist trade). They will forward the devices to the Gira Service Center.

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