

# THERMOSTAT

**terneo vt**

smart control of heating



Use of the thermoregulator is:

**energy**  
savings up to 30%

**comfortable**  
level of temperature

## Technical datasheet

Installation and operation manual

Low Voltage Directive 2014/35/EU  
EMC Directive 2014/30/EU



## Purpose

Before the start of installation and use of the device, please refer to this document. This will help to avoid mistakes and misunderstandings.

Main designated area of the thermostat is electric heating system. The thermoregulator is designed to maintain a constant temperature of 0...35 °C.

The temperature is controlled in the place where the sensor is located.

Design feature of terneo vt is an internal temperature sensor. The readability of the thermoregulator is affected by internal heating. The degree of heating depends on the load power, which is connected to the thermoregulator.

**The thermoregulator is protected from frequent switching of the heavy-duty relay in order to extend its service life. If the time between switching the relay exceeds one minute, the thermoregulator will delay the relay switching on while marking the countdown with a flashing indicator in the rightmost position.**

This thermostatic controller is excellent to regulate the temperature in the warm water floor system with a normally closed electrothermal actuator, operating voltage 230V. To measure the temperature with the internal sensor correctly, set the minimum power in the thermoregulator, because of servo has low power consumption (100 W, look page 5).

## Technical data

| No p/p | Parameter  | Value                               |
|--------|--|-------------------------------------|
| 1      | Adjustment range   | 0...35 °C                           |
| 2      | Maximum load current   | 16 A                                |
| 3      | Rated load capacity  | 3 000 VA                            |
| 4      | Input voltage  | 230 V ± 10 %                        |
| 5      | Current consumption at 230 V: active status at max brightness, sleep mode (off button) | maximum 6,5 mA<br>maximum 1,9 mA    |
| 6      | Weight in the complete set   | 0,18 kg ± 10 %                      |
| 7      | Overall dimensions   | 75 × 75 × 39 mm                     |
| 8      | Temperature sensor   | NTC thermo-resistor 10K OM at 25 °C |
| 9      | Number combinations under heat, at least   | 50 000 cycles                       |
| 10     | Number of combinations without heating, no less than                                   | 20 000 000 cycles                   |
| 11     | Temperature hysteresis   | 1 °C                                |
| 12     | Degree of protection GOST14254   | IP20                                |

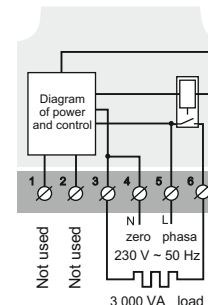
## Supply package

|                                 |         |
|---------------------------------|---------|
| Thermoregulator, frame          | 1 piece |
| Warranty certificate and card   | 1 piece |
| Technical passport, instruction | 1 piece |
| The packing box                 | 1 piece |

## Wiring

Power voltage (230 V ± 10 %, 50 Hz) is supplied to terminals 4 and 5, at that phase (L) is determined by indicator and is connected to terminal 5, and neutral (N) — to terminal 4.

Load (connecting wires from heating element) is connected to terminals 3 and 6.



Wiring 1. Wiring and simplified internal circuit

## Attention!

The thermoregulator has an internal system for patching the temperature readings. Actual temperature of the internal sensor is indicated when the thermoregulator is switched on for the first time. Simultaneously with the internal heating and in accordance with the output power of the load, the thermoregulator readings will be automatically adjusted and will correspond to the ambient temperature.

If, at this time to deenergized and then energized the thermoregulator, it will display for 10–12 °C more than the ambient air temperature is at the moment. After 50 minutes, as a result of patching, the readings will correspond to the actual air temperature.

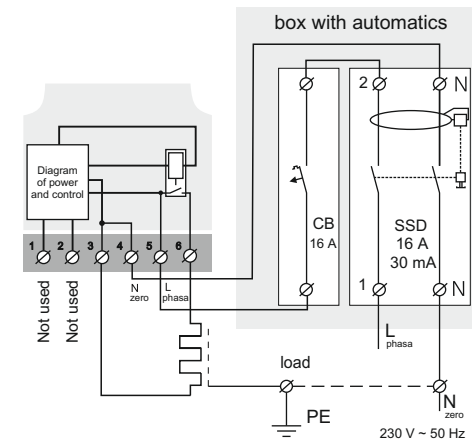
## Installation

The thermoregulator is designed for indoor installation. The ingress risk of moisture or liquid into the place of installation must be minimized. When installed in a bathroom, toilet, kitchen, swimming pool the thermoregulator should be installed at the place out of reach of casual spraying.

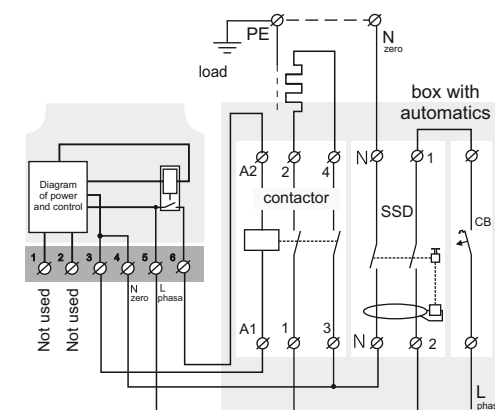
The ambient temperature during installation must be between –5...+45 °C.

The installation height of the thermoregulator should be in the range of 0,4 to 1,7 m above the floor level.

The thermoregulator is mounted and connected after the installation and load testing. To protect against short-circuit in the load circuit the circuit breaker (CB) has to be installed before installing the thermoregulator. The circuit breaker is installed in the gap of phase conductor, as shown in the Wiring 2. It should be designed for not more than 16A.



Wiring 2. Connection of the circuit breaker and SSD



Wiring 3. Wiring and simplified internal circuit

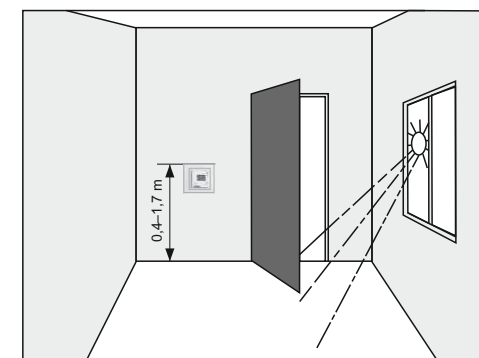


Figure 1. Mounting the thermoregulator and «warm floor» system

To protect a people against electric shock leakage is installed the SSD (safety shutdown device). This event is obligatory when installing floor heating in wet areas. For working of SSD the heating cable screen must be grounded (connected to the protective conductor PE) or, if there is two-wire network, it is necessary to make protective neutral earthing. That is to connect the screen to a zero before SSD. In Wiring 2 protective neutral earthing is shown with dotted line.

The thermoregulator is mounted in the standard mounting box 60 mm in diameter, with mounting screws.

For installation you must:

- make a hole in the wall for box mounting and wall chase for power wires and the sensor;

- take the power wires of the heating system and the sensor to the mounting box;

- perform the compounds according to the passport data;

- fix the thermoregulator in the mounting box. To this a front frame must be removed by slipping it from the side with screwdriver inserted into the slot. Put the thermoregulator in the mounting box and tighten the mounting screws.

It is important to remember that it is desirable to place the on the inner wall of the room. It is recommended to store out the thermoregulator of direct sunlight and drafts (Fig. 1).

The thermoregulator terminals are designed for a wire with section not more than 2,5 mm<sup>2</sup>. To reduce the mechanical loads on the terminals it is desirable to use a soft wire. The ends of the wires must be cleaned and crimped with ferrules with insulation. The wires are tightened in the terminals using a screwdriver with a blade width no more than 3 mm. The screwdriver with a blade width more than 3 mm can cause mechanical damage to the terminals. This may result in the loss of right for warranty. The terminals should be tighten with torque 0,5 N · m.

It is necessary that the thermoregulator commutes the current not more than 2/3 of the maximum current specified in the passport. If the exceeds 2/3 of the maximum current specified in the data sheet, the heating cable must be connected with a contactor (magnetic starter, power relay), which is designed for this current (Wiring 3). This condition is caused by the risk of increasing the voltage over 230 V. In the case of voltage increase the load capacity will also increase.



When controlling contactor (Wiring 3), the load power will be set to a minimum (100 W). This is necessary for correct measurement of the temperature of the air in the thermoregulator.

The sections of the wires, which is connected to the thermoregulator, must be at least: copper 2 × 1,0 mm<sup>2</sup>. Use of aluminum is not desirable.

## Operation

### Switching on/ switching off

Press «+» button and hold for 4 seconds, 3 dashes will appear on the screen one by one. After appearing on the screen «on» / «oFF» release the button.

After switching on the thermoregulator starts to display the temperature of the sensor. On-load voltage is supplied when the temperature is below the setpoint temperature. Whereby the indicator light turns red.

In the waiting mode (when the buttons aren't currently being used) the brightness of the screen and the diode will be reduced from 100 % to 30%.

After switch-off thermoregulator switches to the sleep mode. To switch off thermoregulator completely you should switch off the circuit breaker.

### Preset temperature

(factory setting 25 °C)

When you click «-» or «+» the thermoregulator is switched to the display mode and change the setting temperature. While flashes if the «+» button is pressed tpreset will increase if the «-» button is pressed tpreset will be reduced. 3 seconds after last pressing the key the controller is switched to display the temperature air.

### Function menu (Table 1)

Hold down «-» button for a certain number of seconds to view desired menu item. Then change the parameter with the «+» and «-» buttons.

3 seconds after the last pressing, the thermoregulator will automatically return to the air temperature display.

Table 1. Navigating through the Function menu

| Menu item                                      | Hold time<br>«-» | Screen | Factory<br>setting   | Change with<br>«+» and «-»                   | Notes   |
|--|------------------|--------|--|--|---|
| Recessed<br>temperature<br>correction          | 6 sec            | no n   | 00   | ±5,0 °C,<br>step 0,1 °C                      | Is used for more nuanced precision<br>setting of the thermoregulator.   |
| Correcting the error<br>of the thermoregulator | 9 sec            | Pa     | 12   | 0,10 (100 W) –<br>3,00 (3 000 W)<br>step 0,1 | Used to enter the power with which<br>the thermoregulator will operate. |
| Firmware version                               | 11 sec           | 888    | <b>Attention!</b> The manufacturer reserves the right to modify<br>the firmware to enhance the device technical characteristics. |  |   |
| Resetting to<br>factory settings               | 30 sec           | dEF    | After releasing the button, the thermoregulator will reset<br>all settings to the factory settings and will reboot.              |  |   |

### Button blocking

(child and public protection)

In order to enable (disable) button blocking press the «+» and «-» buttons at the same time for 6 seconds till the «Loc» («oFF») sign appears on the screen.

### POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

**The temperature on the screen differs from the real one by 2 °C or more.**

*Possible cause:* the load power introduced into the thermoregulator does not correspond to the real one.

*It is necessary:* introduce correct power value.

**Neither indicator nor screen light up upon thermoregulator switch-on.**

*Possible reason:* no power supply voltage.

*Required:* check availability of power supply voltage using a voltmeter. If power supply voltage is available then contact the Service center please.

### Protection from internal overheating

If the temperature inside the frame exceeds 85 °C, the emergency power cutoff will take place. The screen will show the «ПГ» (overheat) sign once per second. When the temperature inside the frame falls below 80 °C, the thermoregulator will turn on the load and restart its work.

After the protection is activated more than 5 times in a row, the terneo will be blocked till a button will be activated and the temperature inside the frame falls below 80 °C.

In the case of internal overheating sensor breakout or short-circuiting the device will continue functioning in the normal mode, but each 5 seconds the «Ert» sign (a problem with sensor) will be displayed. In this case the internal overheating control will be disabled.

## Safety precautions

To avoid injuring or damage of the device, carefully read and understand for yourself these instructions.

Connecting the device must be carried out by a qualified electrician.

Before installation (dismantling) and connection (disconnection) disconnect the power supply, and act in accordance with the «Rules for Electrical Installation».

Do not switch the nonassembled device to the network.

Keep away from humidity.

Do not expose to extreme temperatures (above +45 °C or below –5 °C).

Not clean the device using chemicals such as benzene and solvents.

Do not store or use the device in dusty places.

Do not try to disassemble and repair the device.

Do not exceed the limit values for current and power.

For protection against overvoltage caused by lightning strikes use surge arresters.

Do not immerse the sensor with a connecting wire in the liquid medium.

Do not burn or dispose the device with household waste.

The used device must be disposed in accordance with current law.

The products are transported packed, ensuring the safety of the product.

The device is transported by any type of vehicle (rail road, auto, marine, air transport).

The date of manufacture is indicated on the back side of the device.

If you have any questions or something will not be clear for you, call please the telephone center services listed below.

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