

**Terneo kt** thermostat is designed for the organization of snow and ice melting systems, which ensure the safety of people and vehicles, as well as reducing damage to buildings in the winter period.

When the readings of the air temperature sensor are within the range of +5...-10 °C (adjustable), the thermostat turns on the load.

**IN THE BOX**

- Thermostat** 1 piece
- Temperature sensor with connected sensor** 1 piece
- Technical data sheet and installation and operation manual and warranty card** 1 piece
- The packing box** 1 piece

**TECHNICAL DATA**

The limits of regulation	upper: 0...10 °C lower: -20...-1 °C
Maximum load current (for category AC-1)	16 A
Rated load capacity (for category AC-1)	3 000 VA
Input voltage	230 V ±10 %
Weight in the complete set	0,18 kg ±10 %
Overall dimensions (w × h × d)	75 × 75 × 39 mm
Temperature sensor	NTC thermo-resistor 10 kOhm 25 °C (R10)
The length of the sensor connected cable	3 m
Number combinations under heat, at least	50 000 cycles
Number of combinations without heating, no less than	20 000 000 cycles
Degree of protection GOST14254	IP20
Measured temperature range	-30...+90 °C

**IMPORTANT.** Before the installation and operation of the device, please read by the end of this document. This will help to avoid possible danger, mistakes and misunderstandings.

**WIRING**

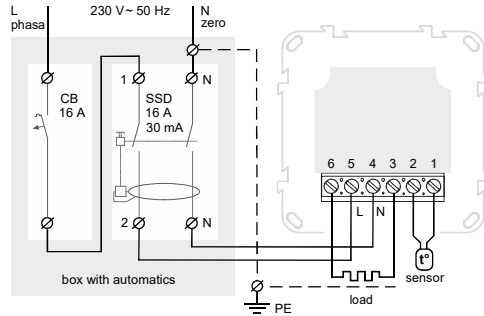
Thermostat supports two types of sensors: analog sensor (R10) or digital sensor (D18).

Analog sensor is connected to terminals 1 and 2. Wires colors are of no importance.

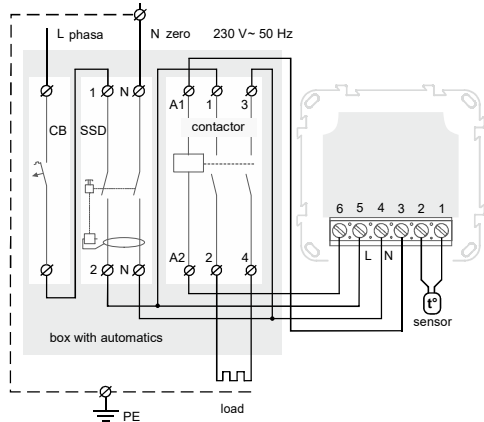
Digital sensor is connected to terminal 1 using white wire and to terminal 2 using blue wire. In case of incorrect connection, the thermostat will switch to percentage control mode (page 6).

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. Connection of the circuit breaker and SSD



Wiring 2. Connection through a magnetic starter

**RELIABILITY OF THE POWER RELAY** provides protection against frequent switching in the thermostat. If there was less than 1 minute between relay switching, the relay activation will be delayed, marking the countdown with a flashing dot.

**IN THE CASE OF INCORRECT WIRING**, is possible failure of the thermostat. Make sure that external sensor and mains voltage are connected correctly.

**INSTALLATION**

The thermostat 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 thermostat 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 thermostat should be in the range 0,4...1,7 m above the floor level. The thermostat 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 thermostat. The circuit breaker is installed in the gap of phase conductor, as shown in the Wiring 1. It should be designed for not more than 16 A.

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 SSF 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 SSF. In Wiring 1 protective neutral earthing is shown with dotted line.

The thermostat 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 thermostat in the mounting box. To this a front frame must be removed. Put the thermostat in the mounting box and tighten the mounting screws.

The thermostat 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 for the temperature controller to switch the current to no more than 2/3 of the maximum current specified in the specification. If the current exceeds this value, the load must be connected through a contactor (magnetic actuator, power relay), which is optimized for this current (Wiring 2).

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

**Mounting the sensor**

Air temperature sensor should be mounted on the wall or under the edge of the roof in order to ensure its protection

from direct sunlight, rain and snow, and ensure the opportunity for easy replacement in the event of a malfunction or damage (Figure 1).

If necessary, it is allowed to shorten and expand sensor connecting wires (separate cable not more than 40 m long with a cross-section greater than 0,75 mm<sup>2</sup>). Power wires should not be placed near connection wire of sensor otherwise they may cause interference.

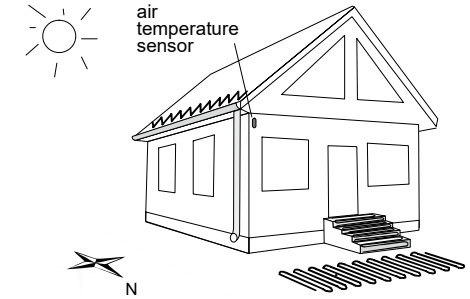


Figure 1. Air temperature sensor installation

**WARRANTY TERMS**

The warranty for **terneo** devices is valid for **36 months** from the date of sale, provided that the instructions are followed. The warranty period for products without a warranty certificate is counted from the date of production.

If your device is not working properly, we recommend that you first read the section «Possible problems». If you cannot find an answer, contact Service Center. In most cases, these actions resolve all issues.

If you continue to have issues with the device, please send it to a Service Center or to the store where you purchased the device. If your device is defective due to our fault, we will repair or replace it under warranty within 14 business days.

Please see the full text of the warranty and the data you need to send to your Service Center on the website <https://www.ds-electronics.com.ua/en/>. If you have a warranty case, please, contact the General distributor in your area.

**WARRANTY CARD**

serial №:	date of sale:
a seller, a seal:	place of a seal
an owner contact for a service center:	

## EXPLOITATION

To view the menu items, hold down the «≡» button for a certain number of seconds (see Table 1). Use «↵» and «↓» to change parameters. Upon first press — the parameter flashes, the second press — it is available for modification. 3 seconds after pressing the thermostat returns to the display of the current temperature.

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

### Preset temperature

(factory settings: upper limit 5 °C; lower limit –10 °C)

To view the upper limit, press the button «↵» and to view the lower limit press — «↓». Use the «↵» or «↓» buttons to change the flashing value. If the temperature of the sensor is within the set limits, the heater will turn on and the red indicator will light up.

### Switching to sleep mode



Hold down the «⏻» button for 4 seconds (three dashes will appear on the screen one after the other) until «OFF» appears on the screen. To turn it off completely, you need to turn off the automatic switch.



To exit sleep mode, also hold the «⏻» button for 4 seconds until «ON» appears on the screen.

### 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.

Table 1. FUNCTION MENU

Menu section	Hold «≡»	Screen	Notes
<b>Correction of screen reading</b> (factory setting «0.0» range ±5,0 °C, step — 0,1 °C)	6 sec		If necessary you can use the adjustment in the floor temperature display on the thermostat screen.
<b>Sensor type</b> (factory setting «10r»)	9 sec		Select the type of sensor you want to use: analog: 2r3, 4r7, 6r8, 10r, 12r, 15r, 33r, 47r, where r — is kOhm at 25 °C.
<b>Firmware version</b>	12 sec		The manufacturer reserves the right to modify the firmware to enhance the device technical characteristics.
<b>Resetting to factory settings</b>	18 sec		After releasing the button, the thermoregulator will reset all settings to the factory settings and will reboot.

## POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

### While load is running, the screen shows «3HE»



*Possible cause:* short circuit in the sensor circuit.

*It is necessary:* remove short circuit in the sensor circuit. Otherwise, heating temperature control is unavailable.

### While the load is running, the screen displays «ON»



The thermostat has switched to the percentage load control mode.

*Possible cause:* incorrect connection, damage to the sensor circuit, or the temperature has exceeded the measurement limits (–30...+90 °C).

*It is necessary:* to check the place of connection of the temperature sensor to thermostat and its circuit, the absence of mechanical damage along the entire length of the connecting wire, as well as the absence of power wires that are laid close.

*Operation of Interest Management Mode.* This mode will ensure the operation of the heated floor in the event of damage to the sensor: in a 30-minute cyclic interval, the load is turned on for set time and it is turned off the rest of the time. The load operating time percentage can be set within range from 0 to 90% using the «↵» or «↓» buttons.

When the load is turned on for the first time, the percentage of the load's operating time is equal to 0% «0П». If you set 50% «50П», the load will be on for 15 minutes in a 30-minute time interval.

Heating temperature control is not available in this mode.

### Load is off, screen and indicator are off

*Possible cause:* No power supply.

*It is necessary:* make sure that the supply voltage is available. If power supply is available, contact the Service Center.

### The load does not work, the «ПГ» flashes on the screen



The temperature inside the housing exceeded 85 °C, the protection against internal overheating worked.

*Possible cause:* internal overheating of the thermostat, which can be caused by: poor contact in the terminals of the thermostat, high ambient temperature, exceeding the power of the switching load, or the cross section of the wires for connection is incorrectly selected.

*It is necessary:* to check the tightening of power wires in the terminals of the thermostat, make sure that the switching load power does not exceed the permissible one, the cross section of the wires for connection are selected correctly.

*Features of the protection against internal overheating:* when the temperature inside the housing drops below 80 °C, the thermostat will resume operation. When the protection is triggered more than 5 times in a row, the thermostat will be blocked until the temperature inside the housing drops below 80 °C and one of the buttons is pressed.

### Every 5 seconds the screen displays «Ert»



*Possible cause:* is a break or short circuit of the internal overheating sensor. Internal overheating is not monitored.

*It is necessary:* to send the thermostat to the service center. Otherwise, overheating control will not be carried out.

## ADDITIONAL INFORMATION

Do not fire and do not throw away the device with the household waste.

After the end of its service life, the product must be disposed of in accordance with applicable law.

Transportation of goods carried in the package, ensuring the safety of the product.

The device is transported by any kind of transport (rail, sea, motor, air transportation).

Date of manufacture is on the back side of device. Application time is unlimited.

The device does not contain harmful substances.

If you have any questions or you something will not clear, call the Service centre the telephone number listed below.

Table 2. RESISTANCE OF EXTERNAL TEMPERATURE SENSOR at different ambient temperatures

5 °C	25339 Ω
10 °C	19872 Ω
20 °C	12488 Ω
30 °C	8059 Ω
40 °C	5330 Ω

## SAFETY INSTRUCTIONS

Carefully read and become aware of yourself these instructions.

Connection of the device must be done by a qualified electrician.

Do not connect 230 V mains voltage instead of the sensor (it leads to failure of the thermostat).

Before the installation (dismantling) and connection (disconnection) of the device, turn off voltage supply and also act according to the «Rules of an arrangement of electric installations».

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

Do not switch the non assembled device to the network.

Turning on and off or and configure the device should be with dry hands.

Do not connect the device to the network disassembled.

Avoid hitting of water or moisture to the device.

Do not expose the device to extreme temperatures (higher than 40 °C or below –5 °C) and high humidity.

Never clean the device with the use of chemicals such as benzene, solvents.

Do not store the device and do not use it in areas with the dust.

Do not attempt to disassemble and repair the device.

Do not exceed the landmarks value adaptor and power.

To protect against overvoltage caused by lightning discharges, use a lightning protector.

Protect the children from games with the working device, it is dangerous.

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

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