

The **terneo st thermostat** is designed to maintain a constant temperature in underfloor heating systems:

- Based on electric heating cable or film;
- Water floor using a normally closed electrothermal servo with an operating voltage of 230 V.

The thermostat controls heating based on data from the temperature sensor located in the floor. All settings are stored in non-volatile memory.

To ensure the durability of the power relay and the reliability of its contacts, the thermostat includes protection against frequent relay switching. The load is switched on as close as possible to the moment when the voltage sine wave crosses zero. Minor deviations from the zero-crossing point may occur due to variations in the disconnection time across different power relay samples.

**IN THE BOX**

Thermostat, frame	1 piece
Temperature sensor with connected wire	1 piece
Technical data sheet and installation and operation manual and warranty card	1 piece

**TECHNICAL DATA**

Adjustment range	5...40 °C
Maximum load current (for category AC-1)	16 A
Maximum power load (for category AC-1)	3 000 VA
Input voltage	230 V ±10 %
Supported sensor types:	analog NTC 4.7, 6.8, 10, 12, 15, 33, 47 kOhm at 25 °C
	digital D18
Measured temperature range	analog -30...+130 °C
	digital -55...+125 °C
Temperature sensor (in set)	NTC thermo-resistor 10 kOhm at 25 °C (R10)
Length of the sensor cable	3 m
Number combinations under heat	at least 50 000 cycles
Number of combinations without heating	no less than 20 000 000 cycles
Temperature hysteresis	1 °C
Protection degree according to GOST 14254	IP20
Weight in the complete set	0,18 kg ±10 %
Overall dimensions	85 × 80 × 35 mm

**INSTALLATION**

Read this document carefully before installing and using the thermostat. This will help to avoid possible hazards, errors, and misunderstandings.

The thermostat is designed for indoor installation at a height ranging from 1,4–1,6 meters from the floor level. The ambient temperature during installation should be within -5...+45 °C. When installing in a bathroom, toilet, kitchen, or pool, place the thermostat in a location not exposed to accidental splashes. Exclude the risk of moisture and liquids entering the installation area.

**Recommendations for connecting loads more than 10 A**

The terneo thermostat may not handle a current of 16 A and could overheat in the presence of unfavorable factors such as poor heat dissipation from the socket, high ambient temperature, or poor installation quality. We guarantee stable operation of the thermostat with a current up to 10 A. If the current exceeds 10 A, we recommend connecting the heating cable through a contactor (magnetic starter) rated for the required current. See diagram 2.

To protect against short circuits, install an automatic circuit breaker (CB) with a rating of up to 16 A in the phase wire break before the thermostat.

To protect against electric shock, install an SSD (safety shutdown device). See diagram 1.

For installation you need:

- make a hole in the wall with a diameter of 60 mm for the mounting box and channels for power supply and sensor wires;
- bring the heating system power and sensor wires to the mounting box;
- make connections according to this manual;
- secure the thermostat in the mounting box.

The terminals of the thermostat are designed for wires with a cross-section of no more than 2.5 mm². It is recommended to use soft copper wire, which can be tightened in the terminals using a screw-driver with a blade width not exceeding 3 mm and a torque of 0.5 N·m. The use of aluminum is not desirable.

A screwdriver with a blade width greater than 3 mm may cause mechanical damage to the terminals, which can result in the loss of warranty service rights.

Place the sensor in the floor screed using a mounting tube, such as a 16 mm diameter metal-plastic tube, which bends once with a radius of at least 5 cm and is inserted into the heating zone for 50 cm. To ensure the sensor can be replaced in the future, seal the end of the tube with a copper plug or insulation tape. Sealing with a copper plug will provide more accurate floor temperature measurements. Insert the sensor into the tube after the screed has hardened. Strip and crimp the ends of its wire with insulated terminals.

If necessary, reduction and increasing (up to 20 m) of sensor connecting wires is acceptable. For extending, use a separate cable with a cross-section of 0,5... 0,75 mm². Near the sensor connecting wires should not be the power cables, they may interfere.

**WIRING**

The analog sensor (R10) supplied with the thermostat is connected to terminals 1 and 2. The colors of the wires do not matter when connecting.

The digital sensor (D18) is connected with the blue wire to terminal 2 and the white wire to terminal 1. If the thermostat switches to Emergency Timer Mode (pages 7–8), try connecting the blue wire to terminal 1 and the white wire to terminal 2. If the terneo thermostat does not detect the sensor after both attempts, please contact the Service Center.

The supply voltage (230 V ±10%, 50 Hz) is applied to terminals 4 (N, neutral) and 5 (L, phase).

Connect the load to terminals 3 and 6 (connecting wires from the heating element).

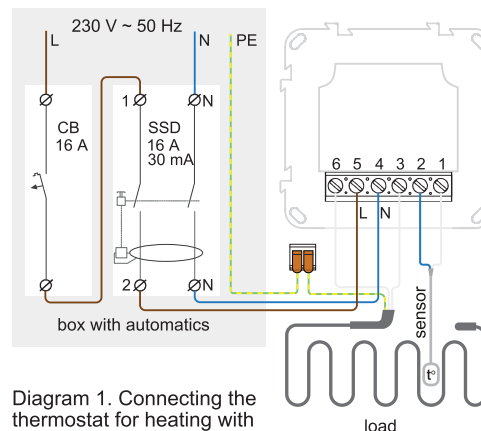


Diagram 1. Connecting the thermostat for heating with a twin-core cable

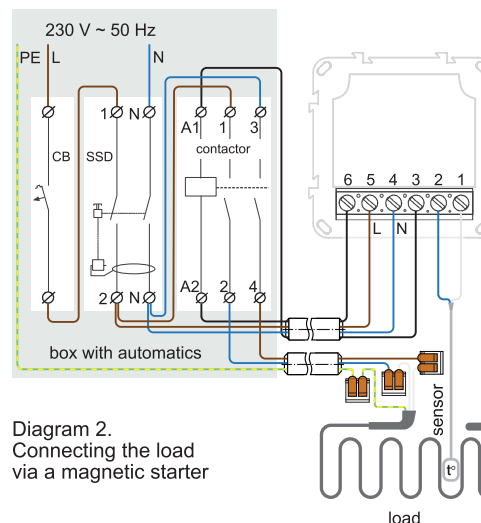


Diagram 2. Connecting the load via a magnetic starter

**Important!** Install and check the load before installing and connecting the thermostat. Before turning on the device, make sure that the wires are connected correctly. Failure to do so may result in the thermostat malfunctioning.

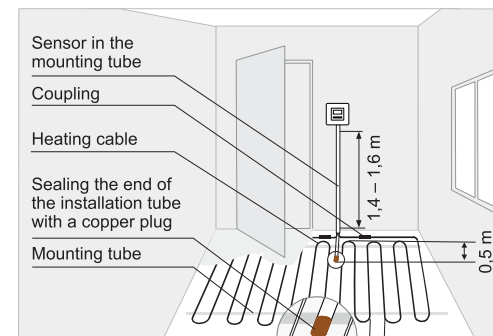


Figure 1. Installation of the thermostat and underfloor heating

**WARRANTY TERMS**

The warranty for 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, contact the General distributor in your area or 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 check 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>



**SERVICE CENTER CONTACT**  
+38 (091) 481-91-81  
Viber WhatsApp Telegram  
support@dse.com.ua

**WARRANTY CARD**

serial №: \_\_\_\_\_ date of sale: \_\_\_\_\_

a seller, a seal: \_\_\_\_\_ place of a seal \_\_\_\_\_

an owner contact for a service center: \_\_\_\_\_

## EXPLOITATION

### Temperature setting

(factory setting 25 °C)  
Use "+" and "-" to select the temperature. When the load is applied to the underfloor heating, the red indicator light will turn on. Heating turns off when the desired temperature is reached and turns back on when it drops by 1°C.

### Menu

Use "=" to select a menu item, and "+" and "-" buttons to change the parameters. The first time you press the button, the parameter will start blinking, the second time it will change. 5 seconds after the last press, the display returns to the temperature display.

#### Timer for maintaining a temperature different from the main one

(factory setting "toF", range of changes: "toF" — off, "ton" — on)

toF

ton

While the Timer is running, the screen will display the time remaining until the heating starts. For example, 9.0h with a flashing "h" symbol. If the temperature drops below 5 °C, the anti-freeze mode will turn on and the thermostat will maintain a temperature of 5 °C until the end of the Timer.

#### Timer — duration

(factory setting "9.0h", adjustable range 0.5–99 hours, step size 0.5 hours).  
If the timer duration is more than 10 hours, the step will be 1 hour

t h

This is the time during which the temperature, set by you, will be maintained differently from the main one. The max. duration of the timer is up to 4 days. During the operation of the Timer, the thermostat alternately displays the countdown time and the current temperature. The time is displayed in the format:  
1. XXh, where XX is time in hours (if the time is > 10h)  
2. X.YY, where X is hours, YY is minutes (if the time is < 10h)

#### Timer — temperature during operation

(factory setting "5.0", range 5,0...40,0 °C or "oFF")

toC

Choose the temperature to be maintained during Timer operation. The factory setting is 5 °C, and you can increase it or turn it off as desired.

#### Time counter load operation

(view only)

t r L

To view the time press "+" or "-". While viewing, you can also reset the counter using "-" button. The display of time is done using the moving line (hours.min.).

#### Correction for the floor temperature

(factory setting 0, a range of change ±5,0 °C)

Cor

If necessary, you can use the correction of the floor temperature on the thermostat screen.

#### Inverse control of the load

(factory setting "oFF", range of changes "on")

nc

Enable it if the water floor is controlled by a normally closed electrothermal actuator. "nc" — normally close contact.

#### Sensor type

(factory setting 10r)

SEn

Select the type of sensor you are using: analog sensor — 4.7r, 6.8r, 10r, 12r, 15r, 33r, 47r, where r — is kΩ at 25 °C, digital sensor — d18.

#### Brightness in standby mode

(factory default 30%, adjustable range 0...100).

br,

Use this feature to reduce the visual emphasis on the room thermostat. When the buttons are used, the screen lights up to 100% brightness.

#### Switching to sleep mode

(factory setting "on")

on

oFF

Hold the "=" button for 4 seconds, then release it. Three dashes will appear on the screen one after another. After turning off the load, the "oFF" message will be preserved on the screen.

### Reset to factory settings

dEF

Hold the 3 buttons for 9 seconds until "dEF" appears. When released, the thermostat will reset and reboot.

### Firmware version

Hold "-" button for 6 seconds. The manufacturer reserves the right to make changes to the firmware in order to improve the characteristics of the thermostat.

### Locking the buttons

Loc

Hold down the "+" and "-" buttons for 6 sec until "Loc" (or "un Loc") appears on the screen. This function is used as child lock and in public places.

## POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

### The load does not work, the screen says "oht"

oht

Temperature inside the frame exceeds 85 °C, triggered protection against internal overheating

*Instructions:* Check the tightness of the power wires in the thermostat terminals; ensure that the power of the connected load does not exceed the permissible limit, and the wire cross-section for connection is selected correctly.

*Features of the internal overheating protection:* when the temperature inside the casing drops below 60 °C, the thermostat will resume operation. If the protection is triggered more than 5 times in a row, the device will be locked until the temperature inside the casing drops below 60 °C, and one of the buttons is pressed.

### Every 4 sec the screen displays "Ert"

Ert

*Reason:* open or short circuit of the internal overheating sensor. Control over inner overheating will not be done.

*Required:* Send the device to the Service Center. Otherwise, control over inner overheating will not be done.

### The load is disabled, indicator nor the screen light up

*Possible reason:* no power supply voltage.

*Required:* check availability of power supply voltage. If power supply voltage is available then contact the Service.

### The screen displays "Er0" every 10 seconds

Er0

*Reason:* malfunction of the control system for the transition of the sinusoid through zero.

*Required:* Send the device to the Service Center. Otherwise, the control of the transition of the sinusoid through zero will not be carried out.

### The load is working, "t" flashes on the screen

t 15

The thermostat has entered the Emergency Timer Mode (described below). The symbol "t" is flashing on the screen, indicating the time remaining until the next load activation/deactivation.

OC

open circuit — breakage of the sensor circuit

SC

short circuit — short circuit of the sensor circuit

*Possible cause:* damage to the sensor and its chain, incorrect sensor type selected in the thermostat settings, the temperature measured by an analog sensor has gone beyond the range (see Tech. data table).

*Required action:* check the integrity of the sensor and the absence of mechanical damage to its chain, check for nearby power wires. Check the correctness of the colors during the connection of the digital sensor. Make sure the appropriate type is selected in the sensor settings.

### Emergency Timer Mode (factory setting 15 minutes):

This mode ensures the operation of the thermostat in case of sensor damage. In a 30-minute cyclic interval, it activates the load for a set time, keeping the load off for the rest of the time. The operation time of the load is adjustable in the range from 1 to 29 min using "+" or "-".

To make the load work constantly, increase the time to the maximum "on", or completely turn it off to the minimum "oFF". Temperature control during heating is not available during this time.

## ADDITIONAL INFORMATION

Do not burn or dispose of the thermostat with household waste.

After the service life ends, the product must be disposed of in accordance with applicable legislation.

The product should be transported in packaging that ensures its integrity.

The thermostat can be transported by any type of transport (road, air, rail, or sea).

The manufacturing date is indicated on the device housing. The shelf life is unlimited. The device does not contain harmful substances.

For questions regarding this device, please contact the Service Center at the phone number provided in the warranty card.

## SAFETY INSTRUCTIONS

To avoid injury and damage to the thermostat, carefully read and understand these instructions for yourself.

The installation of the thermostat should be carried out by a qualified electrician.

Do not connect 230 V mains voltage instead of the sensor (this will damage the thermostat).

Before starting the installation (disassembly) and connection (disconnection) of the thermostat, disconnect the power supply and follow the "Rules of an arrangement of Electric Installations".

Do not immerse the sensor with its connecting wire in liquid environment.

Do not connect the thermostat to the power supply in a disassembled state.

Prevent liquid or moisture from coming into contact with the thermostat.

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

Do not clean the thermostat using chemicals such as benzene and solvents.

Do not store or use the thermostat in dusty environments.

Do not attempt to disassemble or repair the thermostat yourself.

Do not exceed the maximum current and power limits.

Use surge protectors to protect against overvoltage caused by lightning discharges.

Keep children away from playing with a functioning device as it is dangerous.

version: 3G.3.3\_2411

EMC Directive 2014/30/EU

Low Voltage Directive 2014/35/EU



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