

THERMOSTAT

terneo rk

smart control of heating



Viewing the preset temperature and parameter incising

Viewing and changing hysteresis

Viewing the preset temperature and parameter decreasing

Use of the thermostat is:

- energy savings
- comfort level of temperature

Technical datasheet

Installation and operation manual



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

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

Purpose

Thermostat is designed for constant temperature maintenance -55...+125 °C. Temperature is regulated in the place of temperature gauge location. The sensor must be positioned in such a way as to allow for its replacement in the future.

This temperature regulator is perfectly suitable for temperature regulating in the system warm water floor by means of electro-thermal servo actuator with operating voltage of 230 V. Servo actuator can be both normally closed, and normally open. At the connection of normally open servo actuator to the temperature regulator use in the functional menu of the temperature regulator function «Inverse load control».

Supply package

Thermostat	1 piece
Temperature sensor with connected sensor	1 piece
Warranty certificate	1 piece
Technical passport, instruction	1 piece
The packing box	1 piece

Technical data

No p/p	Parameter	Value
1	Adjustment range	-55...+125 °C
2	Rated load current	32 A (max 40 A for 10 min)
3	Rated power	7 000 VA
4	Input voltage	230 V ±10 %
5	Current consumption at 230 V	no more 78 mA
6	Weight in the complete set	0,26 kg ±10 %
7	Overall dimensions	70 × 85 × 53 mm
8	Temperature sensor	DS18B20 (D18)
9	The length of the sensor connected cable	4 m
10	Number combinations under heat, at least	100 000 cycles
11	Number of combinations without heating, no less than	1 000 000 cycles
12	Temperature hysteresis	0,5-25 °C
13	Degree of protection GOST14254	IP20
14	Power consumption	no more than 1,5 kW per month

Wiring

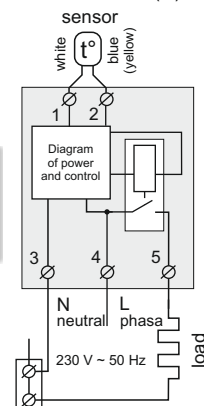
Digital sensor (D18) is connected to terminal 1 using white wire and to terminal 2 using blue (yellow) wire. If the

thermoregulator changes to Percentage load control mode, try connecting to terminal 2 using blue wire and to terminal 1 using white wire. If, at both attempts, the thermoregulator does not see the sensor, contact the Service Center.

Power voltage (230 V ± 10 %, 50 Hz) is supplied to terminals 3 and 4, at that phase (L) is determined by indicator and is connected to terminal 4, and neutral (N) — to terminal 3.

The load interconnecting wires are connected to terminal 5 and to the zero terminal block (not included in the package).

DO NOT connect zero loads in terminal 3!



Wiring 1. Wiring and simplified internal circuit

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 temperature controller should be mounted in a special cabinet, which allows accessible installation and operation. The cabinet must be equipped with a standard 35 mm mounting rail (DIN rail). The temperature controller has width of three standard 18 mm modules.

The installation height of the thermoregulator should be in the range 0,5...1,7 m above the floor level.

The thermostat is mounted and connected after the installation and load testing.

In order to protect from short circuits and excess power events appearance in the load circuit, it is necessary to install an automatic circuit breaker (CB), which should be installed in the live wire break, as shown on Diagram 2. It must be appropriate for rated load current (Page 2).

In order to protect a person from electric shock, a residual current device (RCD) should be installed. The load should be grounded (connected to the protective conductor) for proper operation of the RCD or, if the power supply is two-wire, a protective grounding (i.e. load to neutral to the RCD) should be made. To install the temperature controller you should:

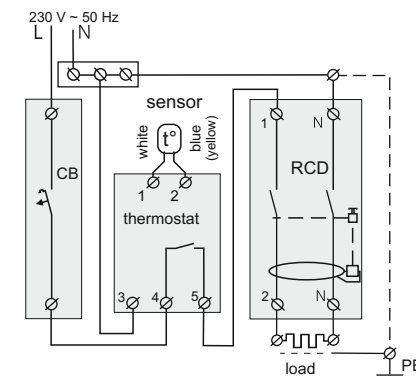


Diagram 2. Circuit breaker and RCD wiring

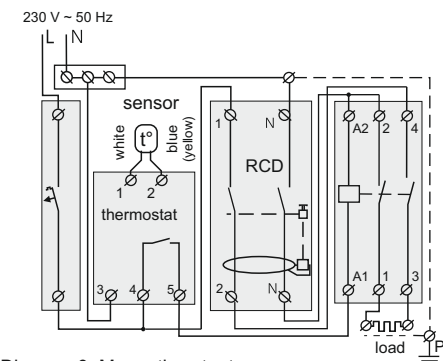


Diagram 3. Magnetic actuator

- fix the temperature controller on the mounting rail (DIN);

- supply power, load and sensor wires;

- Make a connection according to this manual.

The terminals of the temperature controller are designed for a wire with a cross section not exceeding 16 mm². It is desirable to use a soft copper wire to reduce the mechanical loads on the terminals. The use of aluminum is not desirable. Strip the ends of wires 10 ± 0,5 mm. If the stripped end is longer, it may cause a short circuit and, if shorter, can cause an unreliable connection. Use cable lugs. Loosen the terminal screws and insert the stripped end of the wire into the terminal. Tighten the power terminal with moment of 2.4 Nm and sensor terminal - 0.5 Nm. Poor tightening can lead to poor contact and overheating of terminals and wires, and excessive tightening - to damage of terminals and wires. The wires are tightened in the power terminals with a screwdriver with a bit width of not more than 6 mm, and in the terminals for the sensor - of not more than 3 mm. A screwdriver with a bit width of more than 6 mm for power terminals (more than 3 mm for sensor terminals) can cause mechanical damage to the terminals. This may cause to the loss of the warranty. If necessary,

shortening and extension (not more than 20 m) of the sensor wires is allowed. The best solution is to use an individual cable to the sensor mounted in an individual tube.

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 (Diagram 3).

Operation

Switching on

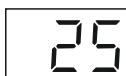


To turn on the regulator, apply voltage to terminals 3 and 4. The display will show «888» for 3 seconds.

Then the sensor temperature will be displayed.

Preset temperature

(factory setting 25 °C)



When you click «-» or «+» the thermostat is switched to the display mode and change the setting temperature.

While flashes if the «+» button is pressed t_{preset} will increase if the «-» button is pressed t_{preset} will be reduced.

If the set point temperature is higher than the sensor temperature, the heater will turn on and the red indicator will light up.

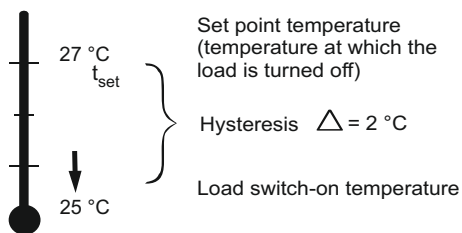
Example: It is necessary that the heater maintains a room temperature of 25...27 °C.

We set:

set point temperature (t_{set}) - 27 °C

hysteresis - 2 °C

The power will turn off at 27 °C and turn on at 25 °C.



Operation with an analog sensor

The thermostat supports operation with an analog NTC R10 10 kΩ sensor at 25 °C (R10) in the temperature range -30...+85 °C.

The colors of the wires for the analog sensor do not matter when connected.

Function menu (Table 1)

Use the «≡» button to select the desired menu item.

Use «+» or «-» to change parameters. After the first press, the parameter starts blinking. At the next press, the parameter is changed.

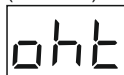
5 seconds after the last pressing, the thermostat will automatically return to the air temperature display.

View firmware version

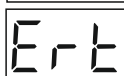
Holding the «-» button for more than 6 seconds will display the firmware version. After releasing the button, the thermostat will return to normal mode.

Protection from inner overheating

In case if the temperature inside the exceed 80 °C, will be emergency lockout of loading. On the screen 1 time/s (overheat) will be displayed.



The device will be unlocked in case if the temperature inside will decrease to 60 °C.

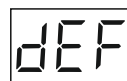


If the protection trips more than 5 times within 24 hours, the thermostat is blocked until the temperature inside the case drops to 60 °C and one of the buttons is pressed.

At breakout or short circuit of temperature sensor, device continues to operate normally, but every 5 seconds the message «Ert», indicating the problem with sensor. In this case, control over inner overheating will not be done.

Reset to the factory settings

To reset the factory settings, hold the three buttons at the same time for more than 12 s. until «dEF» message



appears on the screen.

After release it will reset to the factory settings and reboot.

POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

When indicator is not lit by turning on the thermostat at all positions of the regulating knob.

Possible cause: No power.

It is necessary to: make sure there is power supply voltage with a voltmeter. If there is voltage, then please contact the Service center.

The thermostat switched to the Emergency Timer mode

Possible reasons:

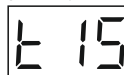
- sensor disconnection;
- an open circuit in the sensor circuit or the temperature has gone beyond the measured temperatures (-55...+125 °C);
- a source of an electromagnetic field near the sensor wire, which prevents data transmission.

It is necessary:

- check the conformity of the sensor connection;
- check the connection point of the sensor to the thermostat, as well as the absence of mechanical damage along the entire length of the sensor connecting wire;
- absence of a source of electromagnetic field near the sensor wire;

Emergency operation as per timer Mode

(factory settings 15 minutes)



The «t» symbol will flash on the screen and the remaining time until the next load on/off is displayed. In this case, every 5 seconds the cause of the sensor maloperation «OC»

Table 1. Navigating through the Function menu

Menu item	Hold the middle button	Indicator	Factory setting	Change with «+» and «-»	Notes
Hysteresis	1 time	H, S	10	0.5 - 25, step - 0.5	Load will turn on after set temperature decreases by the value of hysteresis (Heating mode).
Starting / resetting the delay of the load switch on	2 times	ton tof	tof	The load will shut off. The screen will display: 1. XXh, where XX is the remaining time in hours, if the time is > 10 h. 2. X.YY, where X is hours, YY is minutes, with alternating ton inscription every 10 seconds, if time is <10 hours	
Delay control for switching on load (time to temperature maintaining resume)	3 times	t h	90h	0,5-99 h, step — 0,5 h	When setting the timer time over 10 hours — step 1 hour.
Changing the readings of the indicator (correction)	4 times	Cor	00	±5 °C, step — 0,1 °C	If there is a need to adjust the temperature of the indicator.
Inverse load control	5 times	nc	off	on off	Is in effect in load control using a normally closed contact.
Load work time counter	6 times	trL	review	«+» or «-» — review. During reviewing: «-» — is counter reset	Time output (hours.minutes) is carried out with using creeping line.

(open circuit) or «SC» (short circuit) will be displayed. Select the load operation time in a 30-minute cyclic interval, the rest of the time the load will be turned off. The load operation time can be set in the range off, 1 ... 29 min, on. For the load to work continuously, select «on»; to turn it off completely, select «off».

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 non assembled 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 arr esters.

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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