

sneg + OSA

smart control of heating

The terneo sneg + OSA thermostat is designed to organize a snow and ice melting system that ensures the safety of movement for people and vehicles in winter, and allows you not to use salt and snow removal devices.

The terneo sneg thermostat operates based on data from two sensors: the R10 air temperature sensor and the OSA precipitation sensor. When the air temperature reaches the set range, the thermostat will start checking for precipitation and only after confirmation will it turn on the heating.

The OSA precipitation sensor detects the presence of precipitation based on the moisture resistance on its sensitive contacts and displays this resistance on the thermostat screen in relative units. The higher the moisture content, the lower the resistance value. Once the moisture sensor detects a resistance of 200 units or less, it will activate the heating. The resistance level at which the heating is activated can be adjusted in the menu (the factory default is 200 units). After fully clearing the sensor surface from precipitation, the thermostat will additionally activate the Postheating mode to completely remove any remaining snow and ice from the roof.

The operation logic based on resistance is as follows:

- Resistance above 999 units: no precipitation detected.
- Resistance from 999 to 200 units: there is a possibility of precipitation. If the temperature on the sensor surface drops below 3 °C, the thermostat will activate internal heating to melt solid precipitation and accurately measure their resistance.
- Resistance below 200 units: heating is activated.

The terneo sneg thermostat can function without the OSA precipitation sensor: heating will be triggered based on the air temperature without considering the presence of precipitation.

IMPORTANT! Before starting the installation and use of the thermostat, please read this document in its entirety. This will help you avoid potential hazards, errors, and misunderstandings.

IN THE BOX

Thermostat	1 piece
Temperature sensor with connected wire	2 pieces
Technical data sheet, installation and operation manual, warranty card	1 piece
The packing box	1 piece

TECHNICAL DATA

THERMOSTAT TERNEO SNEG

Adjustment range	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
Resistance measurement range precipitation sensor	10...990 kOhm
Input voltage	230 V ±10 %
Temperature hysteresis	0,1...10 °C
Temperature sensor	NTC thermo-resistor 10 kOhm at 25 °C (R10)
Length of the sensor connected cable	4 m
Number of combinations under heat, no less than	50 000 cycles
Number of combinations without heating, no less than	20 000 000 cycles
Degree of protection GOST14254	IP20
Range of measured temperatures	-30...+75 °C

PRECIPITATION SENSOR OSA

Ambient temperature	-50...+70 °C
Measured temperature range	-30...+75 °C
Length of the sensor connected cable	10 m
Internal heating capacity	5 W ±5 %
Internal temperature sensor	NTC thermo-resistor 10 kOhm at 25 °C (R10)
Degree of protection GOST14254	IP68
Dimensions: diameter and height	60 x 30 mm
Gross brutto mass of the set	1,100 kg ±10 %

WIRING

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

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

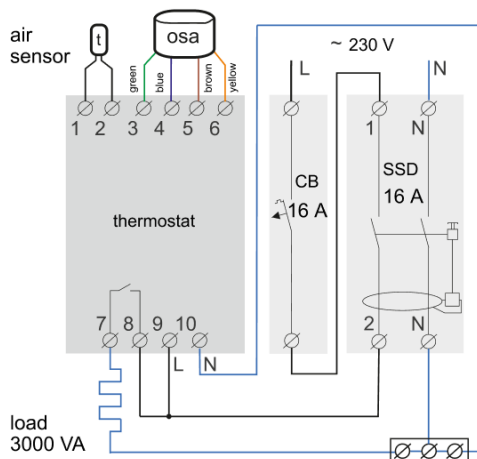
Digital sensor is connected to terminal 1 using white wire and to terminal 2 using blue wire. If message «OC» appears on the air temperature sensor screen, try to connect the opposite. If the thermo does not see the sensor at both attempts, contact the Service Center.

The supply voltage (230 V ±10 %, 50 Hz) is applied to terminals 9 (phase, L) and 10 (zero, N).

To control the load, terminals 7 and 8 (relay) are used. The relay used in the thermo has a potential-free contact normally open contact, i.e. the relay contacts do not have a galvanic connection with the power supply circuits.

The precipitation sensor is connected to terminals 3-6. The green wire (precipitation temperature sensor) is connected to terminal 3, the blue (moisture sensor) to terminal 4, brown (common) to terminal 5 and orange (heater) to terminal 6.

The sensor uses a duplexed system. In the event of a failure in the precipitation sensor, use redundant wires of the appropriate color with a white stripe (page 14).



Wiring 1. Connection of the circuit breaker and SSD

DO NOT CONNECT TWO GREEN OR TWO ORANGE wires (main and standby) to terminals 3 and 6 at the same time. This can damage the thermostat or cause it to malfunction.

INSTALLATION

The stat is designed for indoor installation. The ingress risk of moisture or liquid into the place of installation must be minimized.

The ambient temperature during installation must be between -5...+ 45 °C. The installation height of the thermostat should be in the range 0,5...1,7 m above the floor level.

The thermostat is installed in a special box, which allows conducting easy installation and operation. Cabinet should be equipped with standard mounting rail 35 mm width (DINrail). The appliance takes in width of three standard modules on 18 mm.

The thermostat is installed and activated after installation and inspection of the voltage.

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.

To protect a people against electric shock leakage is installed the SSD (safety shutdown device). 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.

The thermostat terminals are designed for a wire with section not more than 2,5 mm². 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.

To increase the service life of the relay, it is necessary for the thermostat to switch the current not more than 2/3 of the maximum current specified in the passport. Otherwise, use a contactor designed for this current (Wiring 2).

The contactor is also used to control the 3-phase load. Wiring 3 shows the possible option of connecting a contactor for controlling a 3-phase load with a 230 V coil, and wiring 4 — with a 400 V coil.

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 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.

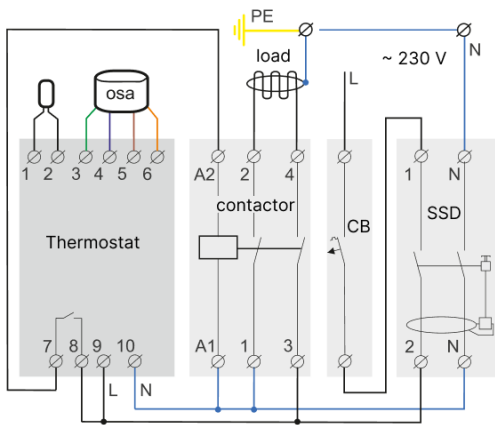
Please see the full text of the warranty and the data you need to send to your Service Center on the website <https://www.ds-electronics.company>. If you have a warranty case, please, contact the General distributor in your area.



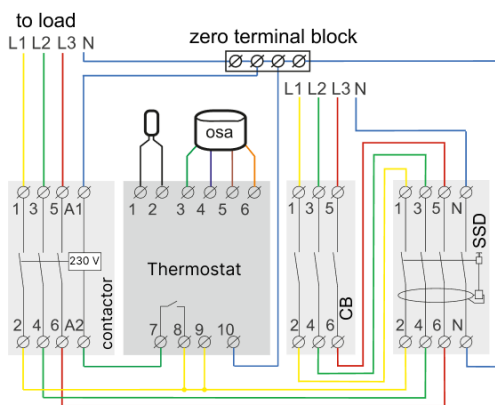
SERVICE CENTER CONTACT
+38 (091) 481-91-81
Viber WhatsApp Telegram
support@dse.com.ua

WARRANTY CARD

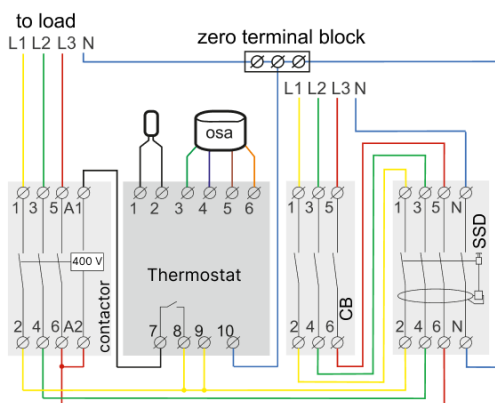
serial Nr:	date of sale:
a seller, a seal:	place of a seal
an owner contact for a service center:	



Wiring 2. Connection via contactor



Wiring 3. A possible option for controlling 3-phase load with a 230 V contactor coil



Wiring 4. A possible option for controlling 3-phase load with a 400 V contactor coil

Air temperature sensor installation

The air temperature sensor is installed on the wall or under the roof edge so that it is not exposed to sunshine, rain and snow, and there is the possibility of unobstructed replacement in case of malfunction or damage (Fig. 1).

If necessary, it is allowed to shorten and increase the sensor connecting wires (separate cable not more than 40 m with a cross section of more than 0,75 mm²). The power wires should not be located near the sensor connection wire — they can cause interference.

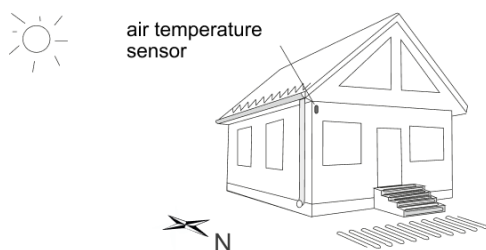


Figure 1. Air temperature sensor installation

Installation of the precipitation sensor

The surface of the sensor must always be placed horizontally during installation, the contacts for determining the precipitation (sensor) must be directed upwards.

If necessary, the sensor cable can be extended. For example, using an intermediate junction box or simple elongation with sealing connections, for example, shrink tubing.

The sensor cable is pulled through the mounting tube to the installation site of the thermostat. Do not install the sensor cable close to power cables, they may interfere.

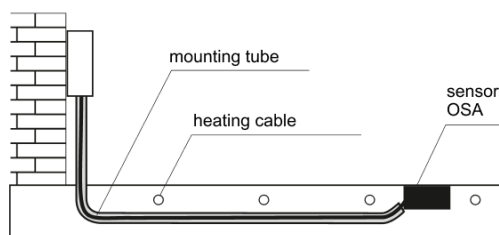


Figure 2. Method of mounting the precipitation sensor when heating the soil

When choosing the location for installation of the precipitation sensor in the heated surface of the soil, use these criteria:

- the longest shadow throughout the day;
- the largest amount of precipitation (where the snow first appears and the wind turns snowdrifts).

Rules for sensor installation:

- position the sensor in the concrete base, at the same level as the heated surface (Fig. 2). The foundation beneath the sensor installation site should be solid. This is necessary to prevent the sensor from being compressed into the ground under heavy loads from above;
- the precipitation sensor should be positioned inside the heated surface area and at least 1 m away from its edge (Fig. 3).
- the sensitive element of the sensor should be positioned at the top.

For asphalt pavement, the mounting pipe should be made of metal (it will withstand high temperatures). During asphalt laying, avoid exposing the sensor and cable to high temperatures. Use a wooden or similar plug instead of the sensor until it cools down completely.

Ensure proper sealing of the side joint of the sensor with the pavement to ensure reliable drainage of melted water onto the sensor surface. Otherwise, it may leak and seep into the ground.

AVOID CLOGGING THE SENSOR SURFACE with things leaves, gravel and other that can distort the data of precipitation

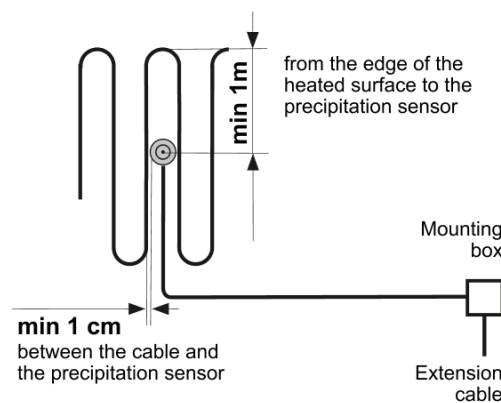


Figure 3. Location of the precipitation sensor and the heating cable heating the soil

EXPLOITATION

1. First screen — air sensor temperature
2. Second screen — moisture resistance
3. Third screen — temperature of the precipitation sensor



Switching on

To turn on, apply the voltage to terminals 9, 10. Within 3 seconds will be displayed on the screen «888». Then the temperature of the air and precipitation sensors will be indicated. The work of the load (of the heating system) will be signaled by a red indicator light.

In the absence of moisture on the surface of the precipitation sensor (resistance at the sensor terminals above 999 units), the thermostat will output — «dRY».

Temperature range

(factory settings upper limit 5 °C, lower -10 °C)

To view the upper temperature limit, press briefly «+», the lower limit — «-». The flashing limit value can be changed with the buttons «+» or «-».

3 seconds after the last pressing of the buttons or short pressing of the button «≡», the thermostat switches to the normal operation mode.

Forced Heating

(factory settings 3 hours)

To activate Forced Heating, press the «≡» button. The middle screen will display the remaining time until the end of the heating cycle.

You can adjust the duration of Forced Heating using the «+» or «-» within the range of 0,5 to 9 hours, with increments of 0,5 hours. To turn off press «≡» button.

Protection against internal overheating

If the temperature inside the device exceeds 80 °C, the thermostat will disconnect the load and once the temperature normalizes to 65 °C, it will resume operation.

If the Protection feature is triggered more than 5 times consecutively, the thermostat will enter a locked state until the temperature drops below 65 °C and one of the buttons is pressed. This measure is intended to draw the user's attention to the potentially dangerous situation.

Menu settings

- To access the menu, hold the «≡» button for 3 sec.
- To navigate through the menu, press «≡» button.
- To change parameters, use «+» and «-» buttons.

The first press will cause the parameter to flash, and subsequent presses will allow you to make changes. After 3 seconds of inactivity, the thermostat will exit the menu and return to normal operation.

Menu	screen	notes
Postheating time — post heat factory settings 2 год range 0,5–9 hours, step 0,1 hour		Post-heating is necessary for the complete removal of any precipitation that may have remained on the heated surface. Choose the duration for which the heating will continue after the OSA sensor detects the absence of moisture on its surface. To reset the post-heating, press «≡».
Correction of air temperature on the screen — correction factory settings 0 range ±5 °C, step 0,1 °C		If you need to make a correction to the air sensor readings on the thermo screen.
The resistance level of moisture at which the thermostat will activate the load — resistance humidity factory settings 200 units. range 10–990 units, step 10 units		By default, this parameter is optimally set for urban areas. However, if the snow melting system is located in an environmentally clean zone with low salt content in precipitation, it may require an adjustment of this parameter, for example, to 300 units. Once the selected resistance level is reached in this menu section, the snow melting system will be activated.
Timer for automatic shutdown of the snow melting system — time humidity factory settings 36 hours range 1–240 hours, step 1 hour		This function protects against excessive and prolonged operation of the snow melting system without your supervision. If the system operates continuously for 36 hours, the thermostat will stop heating to draw your attention to potential blockage of the moisture sensor surface by leaves, gravel, etc. It also safeguards against excessive energy consumption.
Hysteresis — hysteresis factory settings 1 °C, range 0,1...10 °C, step 0,1 °C		Hysteresis is the difference between the activation and deactivation temperatures of the load. Therefore, the thermostat will start checking for precipitation on the OSA sensor when the temperature is not just within the set temperature range but closer to 0 °C by the size of the hysteresis. By default, the thermostat is set with a hysteresis of 1 °C and a temperature range of -10 °C to +5 °C. With these settings, the thermostat will start checking for precipitation when the temperature is within the range of -9 °C to +4 °C and stop when the temperature goes beyond -10 °C to +5 °C.



If the hysteresis value is chosen to be smaller than the temperature range, the thermostat will recalculate the hysteresis. For example, with a hysteresis of 3 °C and a temperature range of -1 °C to 0 °C, the hysteresis will be recalculated as $1/2 = 0,5$ °C.

Service information

To enter the Service information, press and hold the «≡» button for the specified number of seconds.

Total load running time in hours

To view, press and hold the «≡» button for 6 seconds. For example, if the value «8.50» is displayed on the screen, it means 8 hours and 30 minutes.

Firmware version

To view, press and hold the «≡» button for 12 seconds. The manufacturer reserves the right to update the firmware in order to improve the device's characteristics.

Load relay switch counter

To view, press and hold the «≡» button for 15 seconds.

Thermostat switch counter

To view, press and hold the «≡» button for 18 seconds.

Reset to factory settings

To reset all settings to factory defaults, press and hold the «≡» button for 30 seconds. After releasing the button, the thermostat will reset all settings to factory defaults and the screen will display «dEF».

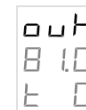
POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

At turning on neither indicator nor screen do not shine

Possible cause: there is no power supply voltage.

It is necessary to: ensure supply voltage presence. If there is voltage, then please contact the Service Center.

The load does not work according to the settings, the first screen displays «ouh»



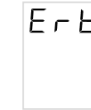
The temperature inside the housing exceeded 80 °C, the protection from internal overheat worked.

Possible cause: internal overheating of the thermostat, which can lead to: poor contact in the terminals of the thermostat, high ambient temperature, exceeding the power of the switched 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 power of the switched load does not exceed the permissible one,
- the cross section of the wires for connection is selected correctly.

The first screen displays «Ert» every 5 sec



Possible cause: 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.

The first screen displays «OC» or «SC». Load does not work according to settings



open circuit — air sensor circuit break



short circuit — short circuit of the air sensor circuit

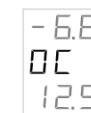
It is necessary to:

- check the correct connection,
- the temperature sensor circuit,
- the absence of damage to the sensor connecting wire,
- the absence of closely passing power wires,
- make sure that the temperature does not exceed the measured limits.

If the problem persists, contact the Service Center.

Operation of the thermostat in case of damage to the air temperature sensor. The temperature control will be based on the temperature of the OSA precipitation sensor. The OSA sensor will automatically activate internal heating for 20 minutes every hour and deactivate it for 40 minutes if no humidity is detected. The thermostat will activate the load if precipitation is detected and the temperature of the precipitation sensor is within the range of 3...10 °C during the 20-minute internal heating period, or within the range of -20...-1 °C during the 40-minute internal heating-off period.

The second screen displays «OC» or «SC». Precipitation is not determined, internal heating of OSA sensor does not work



open circuit — drop of precipitation sensor circuit



short circuit — short circuit of precipitation sensor circuit

It is necessary to:

- check the correctness of connection,
- the circuit of the precipitation sensor,
- the absence of damage to the connecting wire of the sensor, the absence of close power wires,
- make sure that there are no contaminants on the sensor surface.

If the problem cannot be resolved, contact the Service Center, otherwise the thermostat will continue without detecting moisture.

The third screen displays «OC» or «SC» Internal heating of OSA sensor does not work constantly when precipitation is detected

-6.6
1.15
OC

open circuit — break of the temperature sensor circuit in the precipitation sensor

-6.6
1.15
SC

short circuit — short circuit of the temperature sensor circuit in the precipitation sensor

Possible cause: incorrect connection of the precipitation sensor, damage to the sensor circuit or temperature is beyond the measured limits (see Technical data).

It is necessary to: check the OSA sensor and the integrity of its cable. Connect the backup internal temperature sensor — green-white wire (Fig. 4.2). If the problem cannot be resolved, contact the Service Center.

The thermostat operates in case of damage to the temperature sensor in the OSA sensor. The heating of the OSA sensor will be activated for 20 minutes every hour. The load will be activated if there is precipitation and the air temperature is within the specified limits.

Every 5 sec the bottom screen displays «Err», the load is working, the heating of the precipitation sensor is not working

-6.6
1.15
Err

Cause: break of the heater of the precipitation sensor.

It is necessary to: check the precipitation sensor and the integrity of its cable. Damage is determined if it is impossible to heat the precipitation sensor to 3 °C for more than 6 hour. Connect the backup heater — yellow-white wire (Fig. 4.1). If the problem persists, contact the Service Center.

The thermostat operates in case of damage to the OSA sensor heating element. The thermostat will activate the load if the sensor OSA detects precipitation and the air temperature falls within the specified limits.

To restore the thermostat to normal operation, either activate Forced Heating or restart the thermostat (turn off and then turn on the power to the thermostat).

The second screen displays «Err», the load and heating of the precipitation sensor do not work

-6.6
Err
12.5

Cause: the OSA sensor detects precipitation for a longer duration than the time you have set in the Timer for automatic shutdown of the snow melting system (refer to page 9). By default, the timer is set to stop the heating after 36 hours of continuous snow melting system operation.

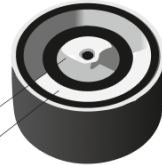
It is necessary to:

- Check if the OSA sensor is not obstructed by leaves, branches, or other debris and clean its surface. To restore the thermostat to normal operation, either activate Forced Heating or restart the thermostat (turn off and then turn on the power to the thermostat).
- If precipitation is indeed occurring for an extended period and you wish to continue the operation of the snow melting system, you will need to increase the time in the Timer for automatic shutdown of the snow melting system.

If the precipitation sensor fails, check:

1. The contact integrity in the moisture circuit

contact with the brown pair
contact with the blue pair



2. The resistance of heater

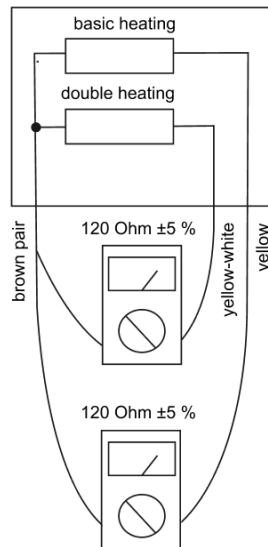


Figure 4.1. Internal organization of the OSA sensor

3. The resistance of internal temperature sensor

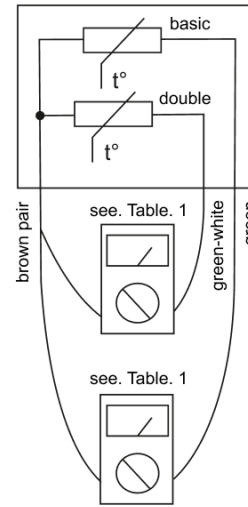


Figure 4.2. Internal organization of the OSA sensor

Table 1. Resistance of external temperature sensor at different ambient temperatures

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

ADDITIONAL INFORMATION

Please do not burn or dispose of the thermostat with household waste.

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

The product is transported in packaging that ensures its preservation.

The thermostat can be transported by any kind of transportation (such as by car, plane, train or ship).

The manufacturing date is indicated on the back of the device, and there is no expiration date.

If you have any questions regarding this device, please contact the Service Center at the phone number provided in the Warranty Terms section.

Technical Support Chat

If you haven't found the answer, please contact our technical support engineer

@dselectronics_bot



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 media.

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.

v25_230608



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

Manufacturer and vendor: DS ELECTRONICS, LTD
04136, Ukraine, Kyiv region, Kyiv, 1-3 Pivnichno-Syretska str.
Sales Department: +38 (091) 481-91-81, support@dse.com.ua
www.ds-electronics.company