terneo

Technical data sheet, installation and operation manual

SX

smart wi-fi thermostat

Smart thermostat terneo sx is used to maintain a comfortable temperature in a room that is heated via an electrical cable, infrared film, convectors, infrared panels or water pipes. Thanks to the mobile and desktop app, you can save up to 50% with the weekly schedule and geofencing function. The underfloor heating is working only as soon as needed!

Thermostat terneo sx is suitable for controlling underfloor heating based on:

- heating cable, heating mats and infrared film;
- water pipes;
- electric convectors, infrared panels.

The water floor heating is controlled by a thermo-electric servo with an operating voltage of 230 V. The servo can be normally closed or normally open. When connecting a normally open actuator to the terneo, activate the Normally Closed (NC) function in the Mobile App terneo.

Heating based on electric convectors, infrared panels and other electric heaters is controlled by placing a temperature sensor in the air.

In the absence of voltage, all thermostat settings and heating schedule are stored in the thermostat's non-volatile memory, and the clock will continue to operate from the internal power supply for three days.

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

Scan to download the terneo app

Available languages:
ua, en, rom, cs, pl, de, ru

Download on the App Store

GET IT ON Google Play

IN THE BOX

Thermostat, frame	1 pcs.
Temperature sensor with connected wire	1 pcs.
Technical data sheet and installation and operation manual and warranty card	1 pcs.
The packing box	1 pcs.

TECHNICAL DATA

Maximum load current (for category AC-1)	16 A
Maximum power load (for category AC-1)	3 000 VA
Input voltage	230 V ±10 %
Number combinations under heat, at least	50 000 cycles
Number of combinations without heating, no less than	20 000 000 cycles
Adjustment range	5...45 °C
Temperature hysteresis by floor	0,5...10 °C, step 0,1 °C
Temperature sensor (in set)	NTC thermo-resistor 10 kOhm at 25 ° C (R10)
Supported sensor types: analog	NTC 4.7, 6.8, 10, 12, 15, 33, 47 kOhm at 25 °C
digital	D18
Cross section of connection wires	not more than 2,5 mm²
Length of the sensor connected cable	3 m
Maximum extension length of the temperature sensor	20 m
Measured temperature range	–28...+75 °C
Wireless Networking Standard	802,11 b/g/n
One of the ports is used	tcp 9000, 9010, 9020, 9030
Minimum speed of Internet connection	128 kb/s
Operating frequency range	2400-2483,5 MHz
Minimal Internet traffic	30 MB/ms
Overall dimensions (w·h·d)	75 x 75 x 35 mm
Inner overall dimensions of decorative frame:	45 x 45 mm
Weight in the complete set	0,18 kg ±10 %
Compatibility with frames from other manufacturers	Schneider Electric Unica та Unica New

Please note! Whenever you want to use the buttons on the thermostat to view or change settings, first swipe from left to right "–" "≡" "+" buttons — the screen will show three dashes. This is necessary because the touch buttons automatically lock 20 sec after the last press.

INSTALLATION

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. Minimize the risk of moisture and liquids entering the installation area.

Recommendations for connecting loads more then 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 be interfere.

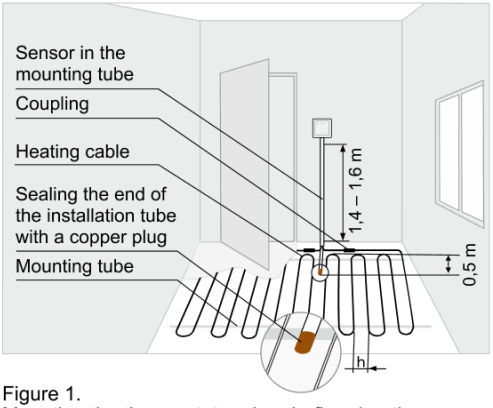


Figure 1.
Mounting the thermostat and underfloor heating

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.company

terneo

SERVICE CENTER CONTACT
+38 (091) 481-91-81
Viber Whats App 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:

WIRING

The analog sensor (R10) is connected to terminals 1 and 2. The colors of the wires are not important.

The digital sensor (D18) is connected with a blue wire to terminal 2 and a white wire to terminal 1. If the thermostat enters the Timed Emergency Mode (page 12), try connecting the blue wire to terminal 1 and the white wire to terminal 2. If the thermostat does not detect the sensor after both attempts, contact the Service Center.

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

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

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

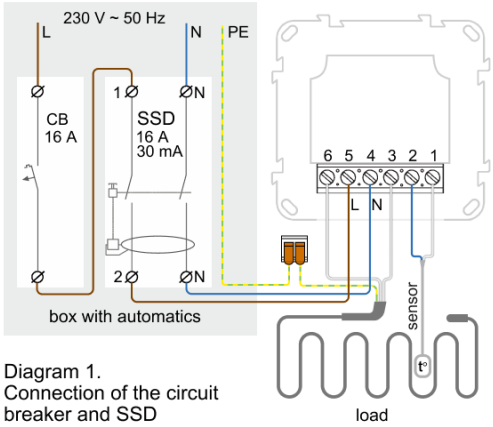


Diagram 1.
Connection of the circuit breaker and SSD

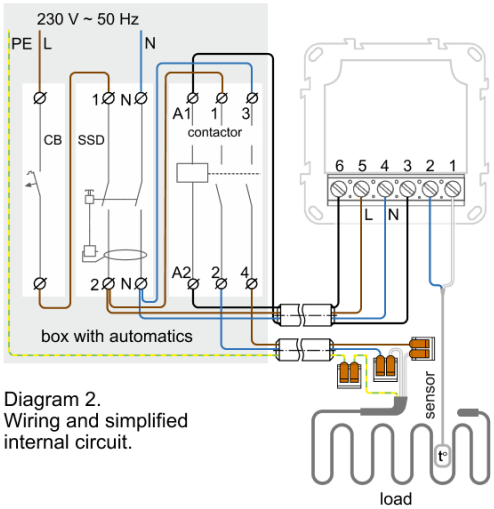


Diagram 2.
Wiring and simplified internal circuit.

BINDING TO THE TERNEO APP

- Please note! The thermostat does not work with 5G Wi-Fi networks. During operation, the router always creates two networks: 2.4G and 5G. When binding, be sure to select 2.4G.
- It is not recommended to connect the thermostat to a Wi-Fi network that uses Multi WAN technology.

How the server works in the presence of the Internet

The thermostat is constantly synchronized with the server, executing its commands, receiving the latest settings, and sending telemetry about its status. If you disable remote control of the thermostat, the server can only be used to accumulate statistics (details in Table 1). For proper operation of statistics and heating schedule, after connecting to the server, please specify your time zone. Afterwards, the thermostat will automatically update the date and time via the Internet.

How the server works in the absence of the Internet

The thermostat continues to operate according to the set settings. During this time, you can control the thermostat using the thermostat's buttons or the offline mode in the terneo app. Please note that instead of a fixed internet connection, you can use mobile internet. For this, you will need a separate device (for example, a smartphone) that will act as a Wi-Fi hotspot. After restoring the Internet connection, all settings will be synchronized.

Status of the indicator on the thermostat

●	lights	connection to the server is available
○	does not light	no Wi-Fi connection or it is turned off
((●))	flashing 1 times / 0,5 sec	mode Access Point (AP)
((●))	flashing 1 time / 3 sec	Client mode "CLI" Wi-Fi is available, but there is no connection to the server

Connection via mobile application

For your convenience, we have prepared video instructions — **How to connect the terneo Smart Wi-Fi thermostat to the mobile application**

Scan for iOS

Scan for Android

1. Download the terneo app from Google Play for Android or from the App Store for iOS.

2. Register or log in using your Telegram, Apple ID, or Google account.

3. Upon the first power-up, the thermostat will enter the "AP" mode for the first 10 minutes. After that, set the "AP" independently:

- click "≡" until "APC" is displayed
- by means of "+" and "–" to select "AP"

4. Go to the app and press "+" → "Device" or "≡" → "Add" → "Device".

Complete the setup for Android

5. Select the Wi-Fi network created by the thermostat, for example, terneo sx_A68FDB.

6. Then follow the prompts in the app. If there is an internet connection, the thermostat will be added to the main screen of the app and registered in the servers.

Complete the setup for iOS

5. Enter the name and password of your Wi-Fi network, then press "Next"

6. Go to Wi-Fi Settings on your iPhone. Connect to the Wi-Fi network created by the thermostat; its name will be in the format — terneo sx_A68FDB. Enter the password DSEXXXXXX, where XXXXXX represents the last six characters of the network name (for example: DSEA68FDB).

Next, return to the application and follow the prompts. If you have an internet connection, the thermostat will be added to the main screen of the application and registered in the server.

Connection through the desktop application www.my.terneo.ua

1. From the thermostat buttons, go to the "Wi-Fi mode" menu section by pressing the menu button until "APC" appears on the screen. Make sure that it is in the "AP" mode. If the screen is "CLI" (client), follow step three on page 10.

2. On your computer, go to Wi-Fi settings and connect to the Wi-Fi network created by the thermostat. Its name will be in the format terneo sx_A68FDB. If a password is required for the connection, enter DSEXXXXXX, where XXXXXX represents the last six characters in the network name (for example: DSEA68FDB).

The Android operating system may prompt you to confirm the connection to a Wi-Fi network that has no internet access. To proceed with the connection, press "Do not disconnect".

3. Open the browser and enter 192.168.0.1 in the address bar.

4. On the browser page of the thermostat interface, select your Wi-Fi network and enter its password. Click "Connect".

5. Please wait for a minute until the thermostat connects to your Wi-Fi network, and the indicator on the thermostat lights up blue.

6. Go to the Wi-Fi settings on your phone or computer and make sure you are already connected to your home Wi-Fi network.

7. Go to my.terneo.ua and register using your Telegram, Apple ID, or Google account.

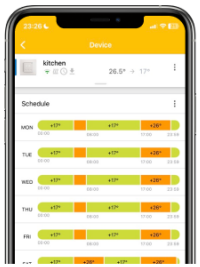
8. To add a thermostat, press "+ Add" → "Device" → set a name, for example, "Bedroom" → enter the PIN-code from the thermostat screen → press "Next" to add the device.

If you don't see the PIN-code on the thermostat screen, press the "≡" 3 times until "Pin" appears on the screen. Then, press "+" or "–" to request the PIN-code.

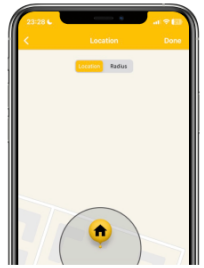
Possible malfunctions:

- If instead of the PIN-code, the thermostat displays "iP", it indicates a lack of connection to the server. Check the internet connection on the router to which the thermostat is connected.
- If you cannot find the "Pin" and "iP" in the menu, it means there is no Wi-Fi connection. Repeat the connection process through the desktop application starting from step 1.

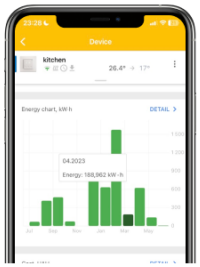
All further settings can be made in the mobile app. Smart functions can save up to 50% by maintaining a comfortable underfloor heating temperature only when you need it.



Set up the heating schedule for savings, for example, during your absence and at night



Turn on Geofencing, and heating will automatically turn off when there's no one at home



Fill in your tariff and load to calculate electricity consumption costs

Enable Preheating, and terneo will automatically calculate the time to start heating in advance

CONTROL WITH THE BUTTONS

When connected and during operation, the thermostat displays the current temperature of the remote sensor. If it is lower than the set temperature, the load is energized. In this case, the indicator lights up red.

Use "+" or "–" buttons to change the heating temperature. First, the screen displays the operating mode, then the set temperature of this mode.

hnd — Hand mode allows maintaining a constant set temperature all the time.

Sch — Schedule mode allows setting different temperatures for each day of the week and throughout the day to save energy when you are away. If the Preheat function is enabled in the app, the screen will display "Prh" during its operation. If you change the temperature during the Schedule mode, the screen will display "tPr". This means that the new temperature will be maintained only until the end of the current schedule period, and after its completion, terneo will return to the standard schedule.

tPr

AUY — Away mode. For the cancellation — withhold middle button during 4 sec to the apparition of "oFF" in the indicator. After release of the button the thermostat will return in the acting mode before beginning of the Away period.

Locking the buttons

Loc — If you want to securely protect the settings from children or unauthorized access, press and hold the "+" and "–" simultaneously for 6 sec until "Loc" appears on the screen, or in case of unlocking, "unLoc" will appear.

Sleep mode

oFF — Hold the middle button for 4 sec until "oFF" appears on the screen. For a complete shutdown, you need to turn off the automatic switch.

on — To exit the sleep mode, also press and hold the middle button for 4 sec until "on" appears on the screen.

Firmware version

F2.5 — Hold the "–" for 12 sec — this is for the F2.5 version of your thermostat. After releasing the button, the thermostat will return to its normal mode.

Reset to factory settings

dEF — Hold the "–" for 30 sec until "dEF" appears on the screen. After releasing the button, the thermostat will restart. Please note that after this reset, the Wi-Fi settings will be retained.

Menu

Use the middle "≡" to move through the menu. If there is no Wi-Fi connection, the Pin menu item will not be available. To select and change the items, use the "+" and "–". 5 sec after the last button press, the display returns to the temperature mode.

Operating mode

(from the factory "hnd")

rEG hnd / Sch

Use the buttons on the thermostat to switch between the two modes: Manual "hnd" and Schedule "Sch".

If the Preheat function is enabled in the app, the screen will show "Prh" when it is running.

Brightness in standby mode

(from the factory 6, adjustable range 0...9)

bri

To reduce the accent on the thermostat in the room, use brightness level 0. In this mode, the digits on the screen will be hidden:

- left dot indicates the presence of power supply,
- middle dot indicates the load status,
- right dot indicates the Wi-Fi network status.

PIN-code or local IP

(section is available when connecting a thermostat to a Wi-Fi network)

Pin / IP

When connecting to the server, you may need a three-digit PIN code, or in case of no server connection — an IP address. This option is displayed only when Wi-Fi is turned on.

Wi-Fi operating mode

(from the factory mode Access Point "AP")

APC AP / CLi / oFF

Choose the desired Wi-Fi operating mode:

- Access Point to connect to the server
- Client for using previous settings
- oFF to turn off Wi-Fi

Correction of floor temperature

(from the factory is 0, range of change ±9.9 °C, step 0.1 °C)

Cor

If necessary, you can make adjustments to the temperature on the thermostat screen.

Power of the connected load

(factory default: 2.0, adjustable range: 0,01...25.0 kW, step length depends on the power)

Po

To ensure accurate energy consumption statistics, enter the power of your connected load through the app or using the thermostat buttons.

Blocking remote control of the thermostat

(from the factory blocking changes via the local network "LAN")

bLc oFF / cLd / LAn / on

"oFF" mode has no restrictions for remote control.

"cLd" turn on if you plan to control the thermostat through the Smart Home system. The operation status and all statistics can be viewed in the terneo app. All changes through the app will be locked, control from the buttons will remain available.

"LAn" is set by default. Leave it if you plan to control underfloor heating through the terneo app.

"on" enable it if you want to keep control only with the thermostat buttons.

POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

In the app, the current temperature is not visible, or instead of the WI-FI signal level, there is an icon with a crossed-out cloud, and the thermostat status in the app shows — offline.

Possible reasons:

- replacing the router or changing the password of your WI-FI network;
- lack of Internet access or problems on the part of your provider.

Required:

- make sure you have a Wi-Fi network and Internet access;
- if you change the router settings, reconnect the thermostat using the terneo app.

Until the problem is fixed, you can change the temperature using the buttons on the thermostat.

The load is not working according to the settings, and every 5 sec, the screen displays "OC" or "SC". The thermostat has switched to emergency operation mode

OC — open circut — sensor circuit break

SC — short circut — sensor short-circuit

The thermostat has switched to Timer Emergency Mode. This mode will maintain the operation of the underfloor heating in case of sensor malfunctions: in a 30 minute cyclic interval, the load will be turned on for the time set by you, and the rest of the time, the load will be turned off. The load operation time can be set within the range of 1...29 minutes. To keep the load constantly on, select "on"; to turn it off, select "oFF".

Possible cause: incorrect connection, sensor circuit damage, or temperature exceeding the measurement limits (see Technical Specifications).

It is necessary to: check the connection point of the temperature sensor with the thermostat and its circuit, ensure there are no mechanical damages along the entire length of the connecting wire, and make sure there are no power cables passing nearby.

The load is off, the screen and indicator are not lit

Possible cause: there is no power voltage supply.

It is necessary to: please check the power voltage supply to ensure its presence. If there is voltage, please contact the Service Centre.

The thermostat does not respond to changes made in the app

Cause: remote control is locked in the thermostat settings.

It is necessary to: go to the thermostat menu section "blc" and change its status to "oFF" (see Table 1 in the "Remote Control Lock" section).

The load is turned off, and the screen is flashing "oht"

The internal overheating protection has been activated because the temperature inside the casing exceeded 90 °C.

The display on the thermostat is flashing "oht".
To check the current temperature of the thermal protection sensor — press any button.
The thermostat will resume operation when the temperature inside the casing drops below 72 °C.

Possible cause:

- poor contact in the thermostat terminals.
- high ambient temperature.
- exceeding the power capacity of the connected load.
- incorrectly selected wire gauge for the connection.

It is necessary to check:

- over-tightened power wires in the thermostat terminals.
- power capacity of the connected load should not exceed the allowable limit.
- the correct wire gauge should be selected for the connection.

If the protection is activated 5 times within 24 hours, the thermostat will disconnect the load and lock itself to draw attention to the hazardous situation. Once the temperature inside the housing drops below 64 °C, the thermostat will wait for 30 minutes and then resume operation. To unlock it earlier, press any button.

The screen displays "Ert" every 5 sec

Possible cause: open or short circuit of the internal overheating sensor. The internal overheating is not monitored.

It is necessary to: send the thermostat to the Service Center. Otherwise, overheating control will not be possible.

When pressing the buttons on the screen, "Lbt" is displayed

Cause: discharge or damage to the internal power source.

It is necessary to: wait for approximately 1–2 minutes for the power source to charge or contact the Service Center. Otherwise, the clock will not be maintained in the absence of power in the network.

Incorrect password when connecting to the Wi-Fi network created by the thermostat

It is necessary to: enter the password considering the case, language, and the number of characters. The password to input will be DSEXXXXXX, where XXXXXX — represents the last six characters of the Wi-Fi network name created by the thermostat and to which you are connecting (for example: DSEA68FDB).

Preheating does not work or works incorrectly

Possible cause:

- pre-heating function is disabled in the app;
- there are frequent sharp temperature or power changes in the room, or the heating power is insufficient to reach the set temperature in less than 3 hours;
- a switch between heating/cooling modes was made, but there was not enough time for self-learning;
- floor temperature correction was changed, but there was not enough time for self-learning.

It is necessary to: ensure that there are no frequent sharp temperature or power changes in the room and that the heating power is sufficient to reach the set temperature in less than 3 hours.

Make sure that the Pre-heating function is enabled in the app, the thermostat is in Schedule mode, and enough time has passed for its self-learning process.

The heating does not turn off, and the set heating temperature remains unachieved

Possible cause:

- insufficient heating cable power;
- absence or inadequate thermal insulation;
- incorrect installation of the heating cable or temperature sensor;
- inadequate power supply for the operation of the heated floor in the specified mode.

It is necessary to: ensure that the heated floor is installed correctly (the cable's cross-section is chosen correctly, the level of thermal insulation in the room is sufficient, and the installation of the heating cable and temperature sensor complies with the requirements). Also, verify that the power capacity of your power supply is sufficient for the operation of the heated floor. Otherwise, please contact the Service Center.

When pressing the button on the thermostat, the screen displays a flashing dash

Possible cause: automatic button lock.

It is necessary to: press the 3 buttons of the regulator from left to right in sequence. The screen will display 3 dashes.

Thermostat doesn't respond to button pressing

Cause: The thermostat buttons were automatically locked 20 sec after the last press.

It is necessary to: unlock, swipe the "–" "≡" "+" — the screen will show three dashes.

Connection error through Android or iOS apps, and the indicator is glowing blue

The thermostat has connected to the server but has not joined the account.

It is necessary to: follow steps 8–10 to connect via the my.terneo.ua desktop application.

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.

The manufacturer reserves the right to make changes to the firmware, server interface, mobile applications, and desktop application my.terneo.ua to improve the energy efficiency of the thermostat and optimize its operation.

Your personal data is safe

We take user confidentiality seriously and strive to be open and honest in the use of data. We keep your personal data secure and never share information that can identify you without your permission.

More about our Privacy Policy at the link:
https://my.terneo.ua/confidential/en

Technical Support Chat

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

dselectronics_bot
terneo_official

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.

terneo sx
version: F25_2407

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

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