

THERMOSTAT

terneo sx

smart control of heating



Wi-Fi thermostat

the new generation
of the more smart thermostats

the operation of warmth
by means of internet

essential economy
and the possibility of control
of energy consumption

Technical datasheet

Installation instructions



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

Purpose

Thermostat terneo ax can be controlled remotely from any Smartphone, tablet, desktop with Internet access.

Currently, there are three options for the remote management:

«terneo» app for **Android** ;

The application is supported on **Android 4.1 and above**



operating systems. Except for the function of binding new heat controllers, which is only supported on Android, versions 5 and above.

«terneo» app for **iOS**;



account in **my.terneo.ua**

The settings and the schedule are stored in the non-volatile memory of the thermostat. In case of absence of Internet the temperature regulator continues its work according to the set schedule, and at the connection recovery statistics of temperature during absence of Internet is transferred to the «cloud».

The thermostat can be blocked for changes from the cloud; in such case the cloud will only perform the role of accumulating statistics.

With the help of a set of special functions and a schedule, significant energy savings are achieved.

Not recommended to use in networks with Multi WAN technology.

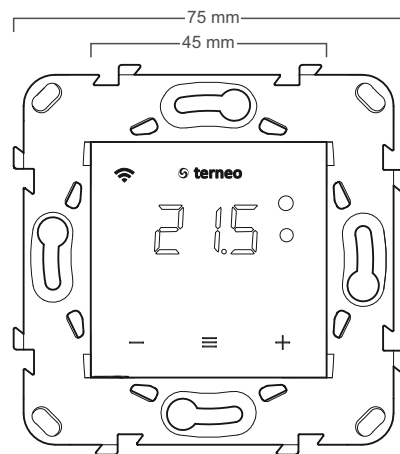


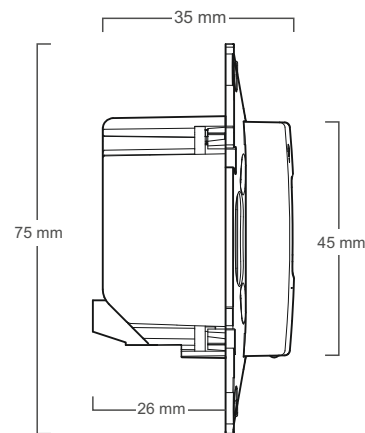
Figure 1. Overall dimensions

2

This thermostat 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 additional settings of «cloud» function Normally closed contact.

Technical data

№ p/p	Parameter	Value
1	Adjustment range	5...45 °C
2	Maximum load current	16 A
3	Rated load capacity	3 000 VA
4	Input voltage	230 V ±10 %
5	Weight in the complete set	0,18 kg ±10 %
6	Temperature sensor (in set)	NTC thermo-resistor 10K OM at 25 °C
7	The length of the sensor connected cable	3 m
8	Types of the supported sensors: analog digital	NTC 4.7, 6.8, 10, 12, 15, 33, 47K OM at 25 °C D18
9	Number combinations under heat, at least	50 000 cycles
10	Number of combinations without heating, no less than	20 000 000 cycles
11	Temperature hysteresis by floor	0,5...10 °C, step 0,1 °C
12	Wireless Networking Standard	802.11 b/g/n
13	Wi-Fi power output	+20 dBm
14	Minimum recommended speed of Internet connection	128 kb / s
15	Operating frequency range	2400-2483,5 MHz
16	Minimal Internet traffic	20-30 MB / ms.
17	Measured temperature range	-28...+75 °C



3

Supply package

Thermostat, frame	1 piece
Temperature sensor with connected sensor	1 piece
Warranty certificate and card	1 piece
Technical passport, installation instructions	1 piece
Operating Instructions	1 piece
The packing box	1 piece

Wiring

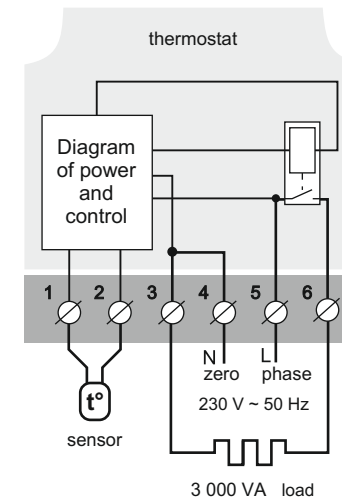
Thermostat supports two types of sensors: analog sensor (thermal resistor) or digital sensor (DS18B20).

Analog sensor (R10) is connected to terminals 1 and 2. Wires colors are of no importance.

Digital sensor (D18) is connected to terminal 1 using white wire and to terminal 2 using blue wire. If a thermostat pass into accidental regime of work of offloading by timer (Operating Instructions page 7), try connecting to terminal 2 using blue wire and to terminal 1 using white wire. If, at both attempts, the thermostat does not see the sensor, contact the Service Center.

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. Wiring and simplified internal circuit

4

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Indicator of switch-on Relay Mode

Indicator of Wi-Fi Mode

State of Indicator of Wi-Fi Mode

Blue mode Wi-Fi and the connection with the server	● lights	There is a connection with the cloud
	○ does not light	No Wi-Fi connection or Wi-Fi off
	⦿ 2 times / s	Mode Access Point (AP)
	⦿ 1 time / 3 s	The mode Client is a Wi-Fi, but there is no connection to the cloud

Operating Instructions

is of current interest

for the version of the insertion F2.5

If the firmware version of thermostat does not meet the version mentioned in the manual, download from www.terneo.ua Web-site Operation Manual for the required version.

The thermostat is designed to control a warm floor based on an electrical heating cable or a heating film.

The temperature is controlled at the location where the external sensor is located. The temperature is controlled at the location where the external sensor is located. Without the sensor, the thermostat pass into accidental regime of work of offloading by timer (page 7).

Control from the buttons

Enabling / disabling

Hold the «≡» button for 4 seconds (3 dashes will appear on the display one by one) before appearing on the display «on» or «oFF».

After switching on the thermostat will start to display the sensor temperature. If it is below the current set temperature, voltage is applied to the load. The indicator starts to glow red.

After shutdown of temperature regulator from the button, it moves in the sleep mode about which is confirming light of points in extreme left discharge of the screen. At pressing of buttons on 1c the text «oFF» lights up.

Functional menu



For viewing of necessary section of the menu press certain number of times button «≡». For the selection and change use buttons «+» and «-».

5 seconds after the last push of the buttons, there is a return to the temperature display.

Table 1. Navigating through the Function menu

Menu section	press button «≡»	Screen	Factory setting	change the buttons «+» and «-»	Notes
Robot mode	1 time	rEG hnd		hnd Sch	«hnd» — Hand mode «Sch» — Schedule mode
The brightness in the mode of waiting (brightness)	2 times	br 6		0...9	With 0 in the screen only points will be displayed: left — indicator of the presence of the tension of the power supply; middle — is reflected state of loading; right — is reflected state of Wi-Fi net;
PIN-code or local IP (the section is available when connected thermostat to a Wi-Fi network)	when connection to a Wi-Fi network 3 times	Pi n i P			When connected to the cloud, it outputs a PIN-code for registration. When you connect to Wi-Fi, but the lack of communication with the cloud will output your local IP address. When Wi-Fi is turned off, the item is unavailable.
Operating mode Wi-Fi	when connection to a Wi-Fi network 4 times otherwise 3 times	APC CL		AP CL oFF	«AP» — Access point mode. «CL» — Client mode. «oFF» — Wi-Fi is turned off.
Floor temperature correction (correction)	when connection to a Wi-Fi network 5 times otherwise 4 times	Cor 00		±9,9 °C, step 0,1 °C	If necessary, it is possible to make correction to the floor temperature at Indicator of the thermostat.
Installed load capacity	when connection to a Wi-Fi network 6 times otherwise 5 times	Pa 200		0,1...25,0 kW 0,1...1,5 kW step 0,01, 1,5...10 kW step 0,02, 10...25 kW step 0,1	For proper operation of energy consumption statistics, it is required to insert installed load capacity.
Remote management blocking by thermostat (blocking)	when connection to a Wi-Fi network 7 times otherwise 6 times	bLc LAN		oFF cLd LAN on	«oFF» — switched off. «cLd» — switched on blocking of changes from «cloud». «LAN» — switched on blocking of changes through local area network. «on» — total blocking of management from the cloud. It is possible to change parameters only using buttons of the thermostat.

The modes of work

For the electing of the mode of work watch Table 1.

Sch SCHEDULE

Is tuned only by means of the application «terneo» or browser in my.terneo.ua.

hnd HAND

Mode, in which the Schedule mode is disabled and the thermostat maintains the constant set temperature.

AWY AWAY

Is tuned only by means of the application «terneo» or browser in my.terneo.ua.

For the cancellation of the mode Away withhold middle button during 4 seconds 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 period of the Away.

TEMPORARY

If to change the temperature of the setting in the mode Schedule to the timetable, the thermostat will support it until the end of the current period. The outcome from the temporary mode under: the return of the setting back, the shutdown of the supply, turning on of the period of the leaving.

Preset temperature

Having pressed «+» or «-», you will see on the screen an operation mode, then the set temperature of this mode. Then using «+» and «-» buttons you can change this value.

Button blocking

(child and public protection)

In order to enable (disable) button blocking press the «+» and «-» buttons at the same time for 6 sec till up to appearance in indicator «Loc» or running line («unLoc»).

Buttons AutoLock

(protection against false button tapping)

It turns on 20 s. after the last button tap, when the «Button blocking» function is off. To unlock, consistently tap 3 buttons from left to right. Simultaneously with taps, the screen will display 3 dashes «- - -».

Version of insertion

Holding button «-» during 12 seconds will display on the screen the version of insertion.

After release of button, thermostat will return to the normal mode.

Reduce to factory reset

For reset of all settings to factory (besides Wi-Fi settings) press button «-» during 30 sec. before emergence on the screen of the inscription «dEF». After release of the button thermostat will reload.

Table 2. Symbols on the screen

Meaning	Symbol
On/ Off	on / oFF
Blocking the button (locking)	Loc/unLoc
Internal heating (overheat)	oht
Activity of preheating	PrH
Plugging in regime of the access point every 5 sec (connection)	con
Correction of the floor sensor (Correction)	Cor
Operation mode Wi- Fi	APC
Access point (Access Point)	AP
Client (Client)	CL
Wi-Fi Off	oFF
Remote management blocking	bLc
Management blocking from the cloud	cLd
Management blocking via local area network	LAN
Reset to factory settings (default)	dEF
Firmware version	F25
Fault of sensor of the internal heating	ErE
Local IP address	i P
PIN-code for registering in the cloud	Pi n
Low charge of internal power supply	LbE
Sensor breakage (open circuit)	oC
Sensor closure (short circuit)	SC

Connecting to the Cloud

If to say in brief, the cloud is intended for the safe keeping of the data in the net Internet, comfortable and safe long-distance connection and operation.

There are 3 variants of thermostat connection to the cloud:

- through the **Android** «terneo» application;
- through the **iOS** «terneo» application;
- through **my.terneo.ua**.

After the connection by any of ways login and password will be common for other variants of connection. Cloud user interface is available in Russian, Ukrainian, English, German, Czech and Romanian.

To connect to the cloud, the thermostat shall be in «AP» Access Point mode.

In this mode the thermostat will create own Wi-Fi network and will wait for settings from the application or browser for the connection to your Wi-Fi network.

Upon the first switching on of the thermostat will stay in the Access Point mode during approximately 5 minutes. If during this period of time there is no connection to the thermostatic regulator, there will automatic return to the Client mode.

In order to pass to Access Point regime button «≡» before emergence of the inscription «APC»,caption, release the button, then using «+» or «-» replace «Cl» value with «AP».

When connecting to the thermostat in the Access Point mode, on the screen there will be a message like «con» (connection) every 5 s.

If previously you connected the thermostat to your Wi-Fi network or want to use these settings, choose «Cl» Client mode.

The connection using the «terneo» app for Android

- Download the free app «terneo» on Google Play and launch it.
- Register or log in with the help of your Facebook account, VK or Google account.
- Turn the thermostat to the Access point mode.
- In the application press «+» or «≡», further «Add the thermostat».
- Select the Wi-Fi network created by the thermostat (for example, terneo sx_A68FDB).
- Enter the password from your Wi-Fi.

After setting up Wi-Fi, in the presence of the internet, the thermostat will be added to the main application screen and registered in the cloud (when you sign in to my.terneo.ua, the thermostat will be available for control on the main page).

Connection through «terneo» application for iOS

- Download «terneo» free application in App Store and launch the application.
- Log in or sign up using Facebook, VK or Google account.
- Switch the thermostat into the Access Point mode.
- Press «+» or «≡», in the application, then «Add thermostat».
- Connect to Wi-Fi network, created by the thermostatic regulator (for example, terneo sx_A68FDB). If a password is required for the connection, enter DSEXXXXXX, where XXXXXX is the last six symbols in the name of network (for example: DSEA68FDB).
- In the active window press «Device Configuration» button.
- Enter password and name of your Wi-Fi network.
- Switch to Wi-Fi of your router.
- Press «Add device». Then you can assign it group and name.

Connection through my.terneo.ua:

- Switch the thermostat into the Access Point mode.
- On the desktop connect to Wi-Fi network, created by the thermostat (for example, terneo sx_A68FDB). If a password is required for the connection, enter DSEXXXXXX, where XXXXXX is the last six symbols in the name of network.
- In the address bar of the browser, type **192.168.0.1**
- On the thermostat page, select your Wi-Fi network and enter its password.
- Click the «Connect» button.
- The thermostat during one minute will generate the connection to your Wi-Fi net. During this in the screen will flash on points in turns.
- After the successful connection the screen of the thermostat will display PIN-code, necessary for the connection to cloud.
- In the address bar of the browser, enter **my.terneo.ua**
- Register or log in with the help of your Facebook account, VK or Google account. For correct operation of statistics, graphs and schedules, please enter your time zone. In the future, the thermostat will automatically update the date and time via the Internet.
- Click «+ Add» – «Device» and enter a name (for example, «Bedroom») and a pin-code (**if there is no PIN-code on the thermostat screen, read the chapter «PIN-code for registration in the cloud or local IP» table 1.**) Press «Next» and device will be added.

In this case, the indicator status of the connection with Wi-Fi will burn constantly.

To change the password of your Wi-Fi network, follow the first six points of the section «Connecting through my.terneo.ua.».

The operation of thermostat

During operation, the thermostat constantly synchronizes with the cloud, performs its commands, receives the latest settings and sends the telemetry about its status.

In the absence of the Internet, the thermostat will continue its operation according to the latest settings from the cloud. With the buttons it is possible to change the set point of temperature of the current timetable period or use Manual mode.

In the absence of voltage, all the settings of the thermostat will be stored in non-volatile memory, and the course of the clock will continue from the internal power source within 3 days.

If the supply voltage had been absent for more than 3 days, the stroke of the internal clock is knocked down and the thermostat automatically switches to Manual mode, if previously worked on a schedule, and when you press the control buttons, on the display, before the menu items, will output «Lbt» indicating the discharge of the internal power supply.

When restoring the Wi-Fi connection of the thermostat with the cloud, all settings are synchronized (priority of synchronization according time of modification).

Preliminary warming up / cooling

For correct work of function there should pass the period of automatic training for collecting statistics. For this purpose not less than 7 days of work of temperature regulator in the mode according to the schedule can be required. During training heating can be switched on before appointed time. Further the regulator will automatically warm up floor up to the required temperature by beginning of the next period of the schedule.

Function can work incorrectly if sharp temperature changes or capacities of heat-insulated floor is not enough for achievement of set temperature less than in three hours indoors are often observed.

Upon transition between the modes heating / cooling and change of Correction of Temperature parameter settings of preliminary warming up are reset, and it is necessary to pass training cycle again.

COMMON TROUBLES, REASONS AND REMEDIES

The thermostat passed in the mode of emergency work according to timer

The possible reason: the incorrect connection, the disconnection, the short circuit of the inductor or the temperature pushed the limits of the measurable temperatures (see the Technical data page 2).

It is necessary to: test the place of the connection of inductor of the temperature with the thermostat and it's line

(Table 3), the absence of the mechanical damages throughout the length of the connecting wire, and as well the absence of the power leads, that are traversed closely.

Regime of emergency application by timer (factory settings 15 minutes)



In the utmost left discharging of display the symbol «t» will flash on and off, and display remaining time for the next switch on/ switch off charging. Herewith, once in 5 seconds the reason of malfunctioning of indicator displays «OC» (open circuit) or «SC» (short circuit).

The user selects the time of the work of the applied force, the rest time in the 30 – minutes cyclic interval the applied force will be switched off. The time of the work of the applied force can be installed in the range of 0FF, 1...29 minutes, on. For the purpose that applied force will work constantly elect «on», for the purpose to switch off it completely select «off».

Neither indicator nor display light up upon thermostat switch-on.

Possible reason: no power supply voltage.

Required: check availability of power supply voltage using a voltmeter. If power supply voltage is available then contact the Service center please.

The internal overheating protection

If the temperature inside the frame exceeds 90 °C, the emergency power cutoff will take place. The indicator will show the «oht» (overheat) sign once per second. The pressing on any button will type-out the temperature of interior inductor.

When the temperature inside the frame falls below 71 °C, the thermostat will turn on the load and restart its work.

After the protection is activated more than 5 times in a row, the terneo will be blocked till and the temperature inside the frame falls below 63 °C and one of buttons or in case of expiration of 30 min. will not be pressed without clicking of buttons.

In the case of internal overheating sensor breakout or short-circuiting the device will continue functioning in the normal mode, but each 5 seconds the «Ert» sign (a problem with sensor) will be displayed. In this case the internal overheating control will be disabled.

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



vF25_200909

Manufacturer and vendor: DS ELECTRONICS LTD
04136, Ukraine, Kyiv region, Kyiv, 1–3 Pivnichno-Syretska str.
phone: +38 (044) 485-15-01
e-mail: support@terneo.ua www.terneo.ua