

GPO electric smart thermostat is a complete solution for building a remotely controlled heating device. It is equipped with BLE and Wi-Fi (2.4GHz) modules which allow it to be controlled distantly from mobile smart devices over BLE or the Internet. Being connected to a Wi-Fi it keeps a connection with the server allowing its owner to monitor and control it from anywhere.

Features

Hardware

- Support WIFI, BLE distant control as well as control over OLED display using tactile keypad
- Noiseless operation due to using solid-state electronic regulator
- 0.96" OLED display for monitoring state and controlling operation
- Supports external 2x3 matrix or 5x1 static keyboard
- An on-board RTC clock with a backup battery keeps time for years
- On-board alarm zoomer
- External NTC sensors for heater temperature and ambient air temperature
- The low-voltage side is fully galvanically isolated from the high-voltage side.

Software

- Controlling temperature according to user settings based on both ambient and internal temperature sensors
- Operation control according to manual settings, schedules, or timer
- Distant control over Wi-Fi or BLE
- Supports using external BLE sensor for ambient temperature, and humidity
- Firmware updating over the air upon release of new features or improvements
- Optional open window detection stops heating upon a rapid temperature drop to avoid power loss.

Application

The main applications for the thermostat are electrical heaters, electrical water boilers, electrical floor warming.

Technical parameters

AC supply voltage	70 ¹ ..260 VAC, 50Hz
Active load resistance	15..1000 Ohm
Active load power	50..3000 W
Maximum load current	15 A
WIFI/BLE band	2.4 GHz
Ambient air temperature	-20..60 °C
Maintained indoor temperature (by default ²)	0..35 °C
External NTC temperature sensors	Beta
	Resistance
	3950
	10 kOhm at 25°C
Weight	50 g
Available languages in on-board menu	en, uk, pl, et, lv, lt, ru

Installation

The thermostat is designed for indoor usage. Installing the thermostat in a high moisture space, ensure minimizing the risk of moisture or liquid entering the installation area. When installing in bathrooms, toilets, kitchens, or swimming pools, place the thermostat where it won't be exposed to accidental water drops. The ambient temperature during installation should be between –5 and +45 °C.

To protect against short circuits in the load circuit, install a circuit breaker (CB) before the thermostat. The circuit breaker should be placed in the phase conductor line and should be rated for no more than 16 A.

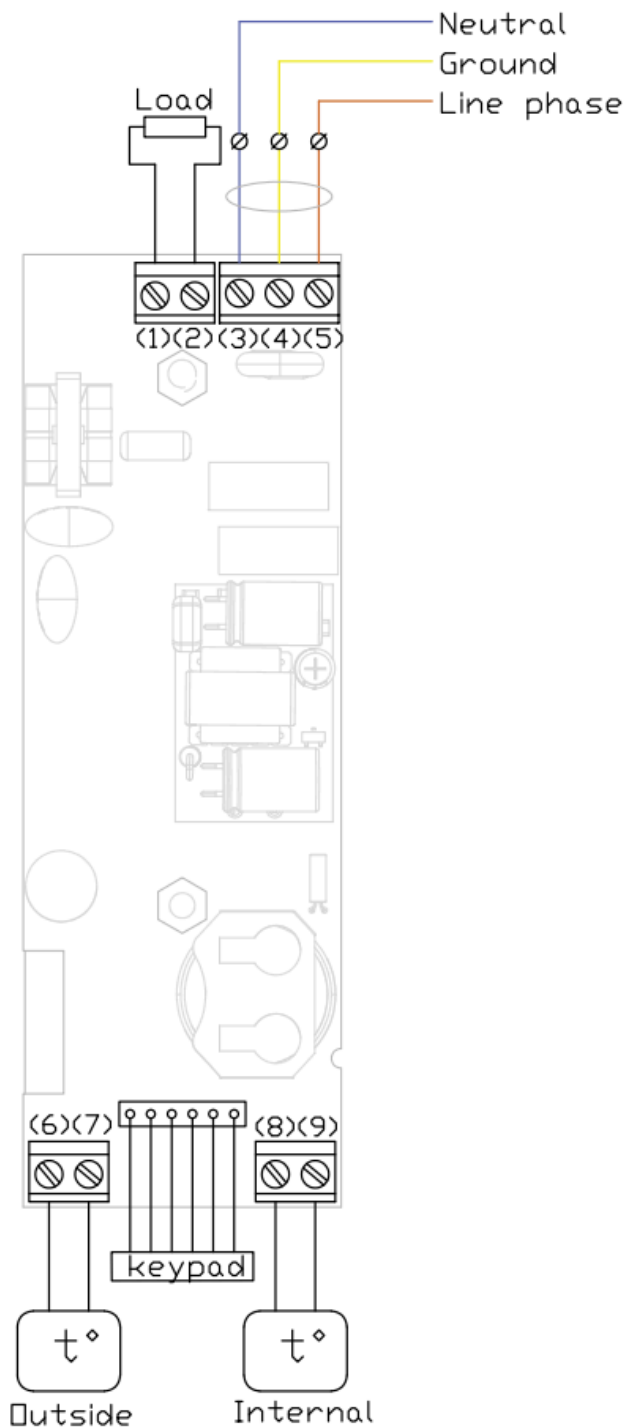
To protect people against electric shock, a Safety Shutdown Device must be installed. This is mandatory when installing a thermostat in wet areas.

The thermostat terminals are intended for wires with a maximum section of 2 mm². To minimize mechanical stress on the terminals, it is advisable to use soft wire. Clean and crimp the wire ends with insulated ferrules. Tighten the wires into the terminals with the screws, apply reasonable force to avoid damaging the threads.

Depending on the commuted current, the triac will naturally heat up. To prevent overheating, it should be mounted on a flat metal surface of adequate thickness. To ensure that the cooling conditions of the triac are sufficient, activate the load current for at least 20 minutes and ensure that the temperature at the triac mounting point does not exceed 80°C.

¹ Low voltage will lead to decreased max power

² Parameter may be changed by request



Wiring

Wire connection is performed in accordance with the following figure. Line and neutral of the power voltage (230V AC 50Hz) is connected to terminals (3) and (5) in either order, and the ground to terminal (4). The load is connected to terminals (1) and (2).

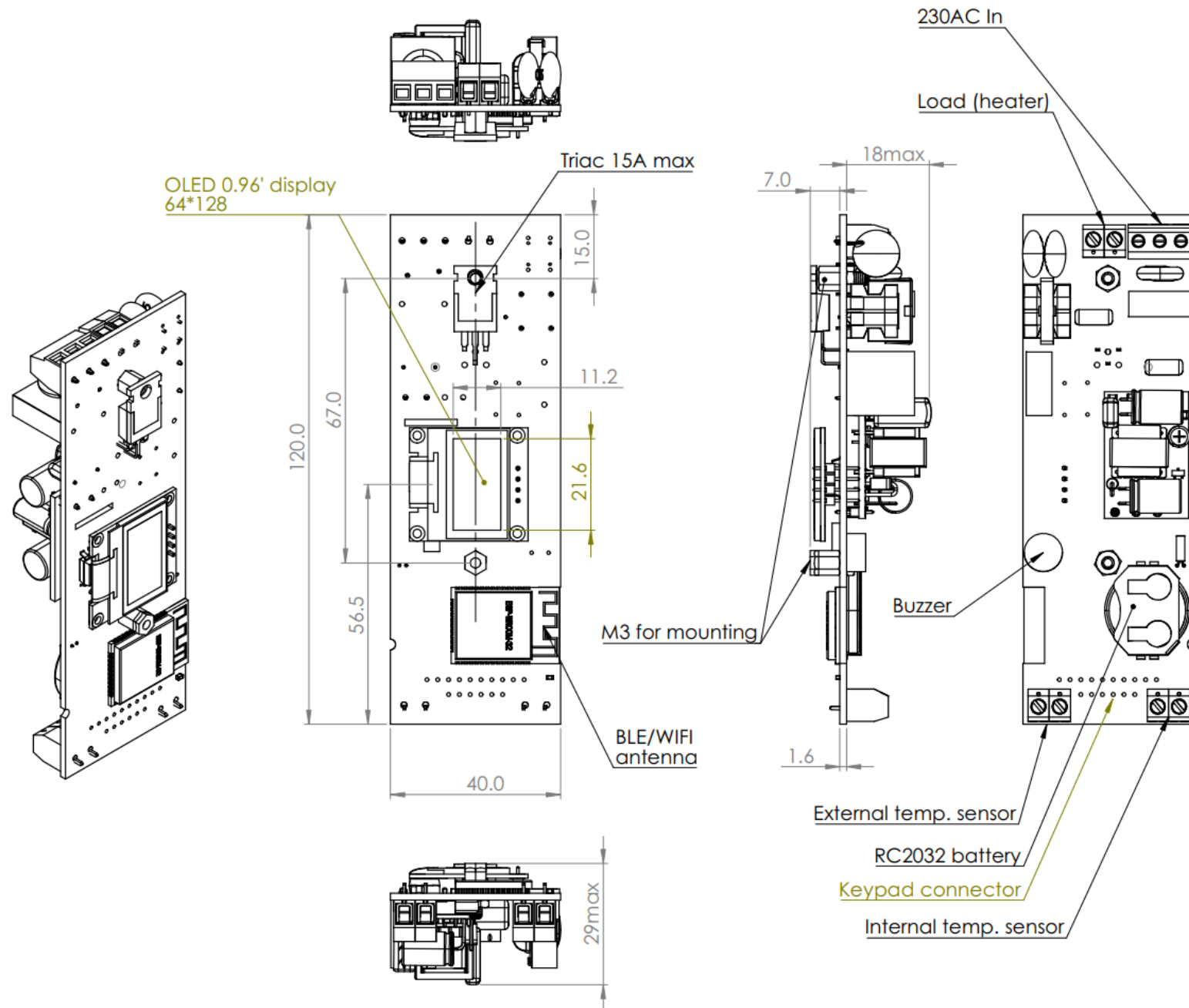
Wired temperature sensors should be connected to the terminals on the opposite side of the board: outside temperature sensor to (6) and (7), and inside temperature sensor to (8) and (9). As temperature sensors, could be used appropriate thermistors with a resistance of 10 kOhm at 25°C and a beta value 3950.



Check the connection carefully as incorrect wiring can lead to the thermostat breaking down.

The connector marked **keypad** is used to connect a keypad.

Assembly drawing



Operations basics

Modes and Scheduling

The thermostat operation is defined by the State and Mode. While the thermostat stays in the off state, no heating will happen regardless of the active mode, however communication means remain activated, so it may be switched on remotely.

The **Mode** represents a bunch of rules (schedules) that define the scheduled behavior of the heater - what time it should maintain what temperature. You can create several modes for different needs and switch between them depending on the need.

There are 2 types of modes available: *manual mode* and *scheduled mode*.

In the **Manual mode**, the thermostat permanently maintains the temperature set by the user in the room which is referred to as the **target temperature** or **set temperature**.

In the Scheduled mode, the thermostat will operate maintaining the temperature specified by the active schedule. You can specify by which days of the week the schedule is to be repeated.

Gaps in the schedule between set time intervals (blank time intervals) are interpreted as “no heat” during which the heater stops heating.

The **timer** is a separate feature that provides the user with an ability to change the target temperature, switch between modes, or switch the thermostat on or off after a specified period of time.

Thermostat controlling with the keypad

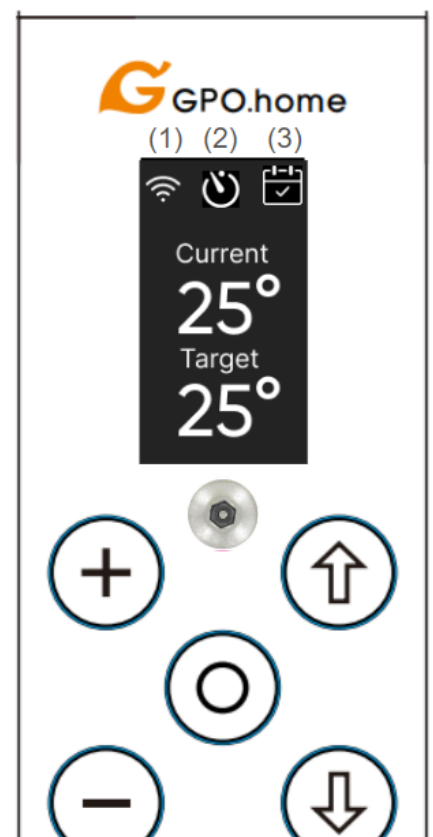
Control is performed using the keypad and on-board display.

In the regular case, when the panel is powered on, the Home Screen (see the picture) is displayed, showing the current and target temperatures, as well as the status of WiFi connectivity (1), timer status (2), and active mode (3) (manual or scheduled).

Menu
Modes
Timer
Connection
Monitoring
Information
Service
Language

If the panel is operating in manual mode, pressing the '+' or '-' buttons will adjust the target temperature. However, if the panel is operating in one of the scheduled modes, pressing the '+' or '-' buttons will prompt a request on the display to switch to manual mode since editing the scheduled modes using the buttons is not allowed.

A single click on the central “O” button from the Home screen opens the menu screen:



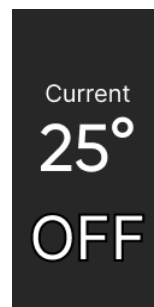
The menu can be closed with a single press of the "O" button or it will be closed automatically after 30 seconds.

The "+" button provides access to the submenu, and pressing "-" will lead back to an upper-level menu. "Up" and "Down" buttons respectively provide scrolling between the menu items.

Pressing the 'Up' button while the main screen is open will open the Timer menu.

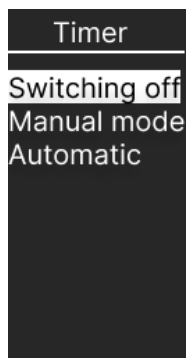
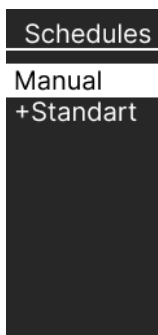
A long press (3s) of the "O" button from the Home screen switches the thermostat between OFF and ON states, however, it is enough for any single key press to switch to the ON state.

In the OFF state, the main screen looks like in the figure, displaying the room temperature.



Overview of the menu items

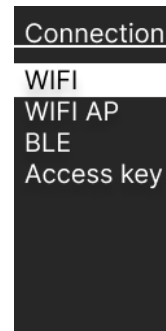
The "**Mode**" item allows you to view the available modes and switch between them. Only two modes are available in the list, where the first one is always Manual mode, and the other is either "Standard" mode by default, or the last scheduled mode activated by the user from the App.



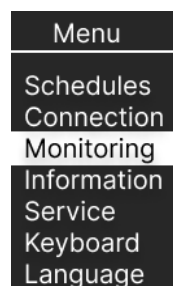
The "**Timer**" menu lets you configure the timer feature. There are three options available. "**Switching off**" allows to schedule automatic switching the thermostat off after a certain time. "**Manual mode**" allows you to switch the active mode to manual specifying the target temperature, and the "**Automatic**" item lets you switch to the scheduled mode after the time specified passed. If any option is activated, you'll see time remaining and an option to stop the timer.

While a timer is active, you will also see the indicator  in the middle top of the main screen.

 The timer stays active regardless of the thermostat state, so it can be used to switch it on and off.

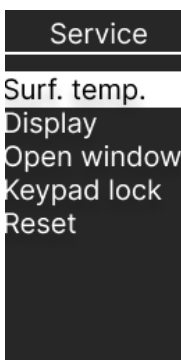
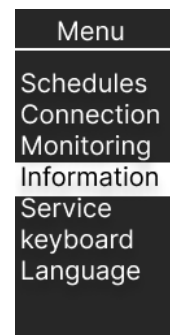


In the "**Connection**" item, you can view the available WIFI networks, enable/disable BLE, and WIFI access point (AP), and also get the access key to the panel required for BLE connection. By default, BLE is always active and WiFi AP is disabled.



In the **"Monitoring"** item, you can view statistics of the panel's operation like max and min detected ambient temperature, current ambient and heating surface temperature, and total power consumption (kW*h). Max/min detected values could be reset by holding the "-" button from the Monitoring submenu for 3 sec.

The **'Information'** menu item lists details such as the product's serial number, firmware version, rated power, local time, and contact details for the support service.



In the **"Service"** menu item you can find several subitems.

By choosing the **"Surf. temper."** menu, you can set up the maximum temperature for the heater up to which it is allowed to heat up. This can be used to protect against burns if the heater is accessible to children or vulnerable people. Press the "+" or "-" buttons to change the limit; to exit this menu item press the "O" button.

💡 Take into account, that changes made directly via the keypad will be overridden if another value is set from the App.

You can also configure the display auto turn off in the **"Display"** sub-menu. Here you have the following options:

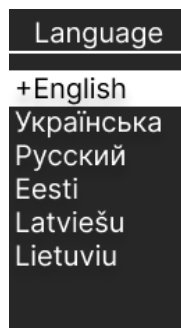
- Always-ON (default) - the display will be kept on all the time
- Auto-OFF - the display will be automatically turned off after 5 minutes of inactivity
- OFF at night - the display will be kept on from 7:00 to 21:00 and automatically off at the rest of the time after 5 minutes of inactivity.

With the screen being turned off, a small indicator will remain on the display to indicate the power state of the heater. The display will be turned on immediately upon any keypad pressing.

"Open window" allows you to enable or disable the Open window detection feature.

Under **"Keypad lock"**, you can switch on the keyboard lock, whereupon the device will no longer respond to button presses, with the exception for a special combination for unlocking - hold the "Up" and "Down" buttons simultaneously for 3 seconds. After the keypad is locked, a "lock" sign is displayed when the buttons are pressed.

To reset the heater's settings, including the Wi-Fi settings, use the **'Reset'** menu item. This action will restore all settings to factory defaults, resulting in the disconnection of the panel from the Wi-Fi network.



In the **"Language"** item, you can switch between available menu languages.

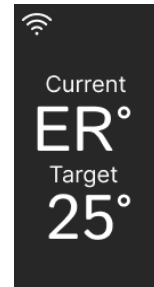
Testing

To test basic operation of a thermostat, it should be connected to a single-phase household power system according to the wiring diagram from above. As a load, any resistive load may be used with a rated power in the range 50W to 3kW. The OLED display should start to display right after applying the power supply. While any or both of the temperature sensors are not connected, an error message will appear. If both sensors are connected properly, the error message will disappear and the outside sensor temperature will be displayed (current).

To test load regulation, it should be properly connected, at which point pressing the “+” key on the keypad, the “Target” temperature should be set higher than the “Current”. This will lead to switching on the regulator and current to pass over the load. The regulator will be switched off as soon as the “Current” temperature is equal to or greater than the “Target”.

To test the keypad's proper connection, press any key. You should hear a beep sound from the buzzer.

Timekeeping requires a battery. If the battery is installed into the battery holder, one could check if the clock goes well by letting the thermostat work for several minutes, then switching off the main power for a few seconds and plugging it back. After this, the current time should be preserved. To check the time, go to the “Information” menu item and switch to the second page by pressing the “Down” key.



Mobile Apps

Dedicated Apps for Android and iOS are available for users. From the App, the user can add several thermostats to their account, organize them into groups and buildings, or manage them as separate devices. Users can configure a single thermostat or a group of devices to work according to their own or one of the standard scheduled modes. Also, the user can specify auto switching between the modes, or schedule switching on/off using the “Timer” feature.

Enhanced statistics available in the Apps for each thermostat or group allows to user monitor electric consumption, and money spending.

To become a GPO Home App user, install the application for your mobile device from the App Store or Play Market.



