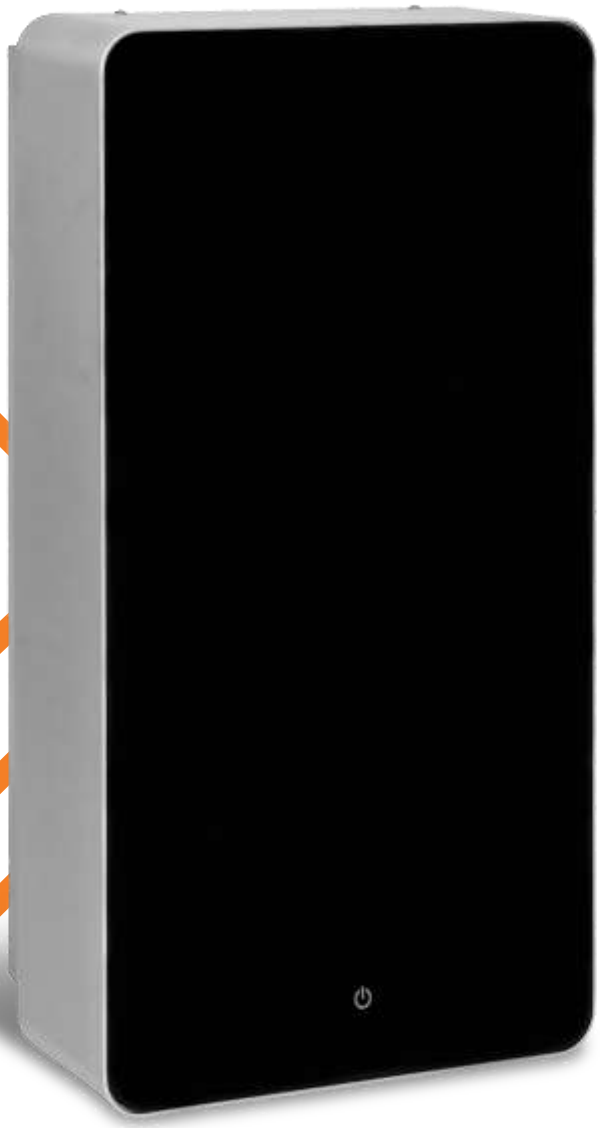
TEKNIX
ENGINEERING

ELECTRIC HEATING BOILER



TEKNIX series ESPRO

OPERATING MANUAL

VERSION 2.1.

DEAR BUYER!

You have bought a boiler from **TEKNIX**, developed using modern technologies. The manufacturer thanks you for your choice, as well as for trusting the products!

WARNING SIGNS, DANGER AND SAFETY SIGNS

WARNING!

OBLIGATORY ACQUAINTANCE WITH INSTRUCTIONS

DANGER OF ELECTRIC SHOCK

PROTECTIVE EARTHING

Read this Operating Manual carefully before operating the boiler! Adherence to the rules set out in the Manual will ensure long-term, safe and comfortable operation of the boiler you purchased.

Abbreviations used in the text

HS – heating system

DHW – hot water supply system

CONTENT

1. GENERAL PROVISIONS

1.1 The effect of this Guide applies to household wall-mounted electric water heater TEKNIX series ESPRO (hereinafter - "boiler") models **ESPRO-4.5, ESPRO-6, ESPRO-7.5, ESPRO-9, ESPRO-12, ESPRO-15, ESPRO-18, ESPRO-21, ESPRO-24**.
The boiler is designed for individual heating of apartments, residential buildings, premises and other facilities equipped with a water heating system with forced water circulation, and is also used as a backup heating source. The boiler can also be used to heat domestic water (DHW) in an external storage water heater indirect heating (boiler).
Industrial use of boilers for the production of heat for technological needs is prohibited.

1.2 TEKNIX electric boilers of the ESPRO series with a production capacity of 4.5 to 24 kW, designed to operate in both single-phase and three-phase AC networks with a nominal voltage of 220 / 380V, a frequency of 50 Hz and a grounding system TN-C-S, TN-S.

1.3 For boilers with a capacity of 4.5; 6 and 7.5 kW provides the ability to work in single-phase AC networks with a frequency of 50 Hz and a nominal voltage of 220V.

1.4 The boiler meets the requirements of the Directives 2014/35/EU of the European Parliament and the Council on Low Voltage Equipment (Low Voltage Directive LVD), Directive 2014/30/EU of the European Parliament and the Council on Electromagnetic Compatibility Directive (EMC), confirmed by a certificate of conformity and declaration of conformity (CE).

1.5 Installation and commissioning of the boiler is carried out only by an authorized service organization that has a permit (license) for this activity and a certificate from TEKNIX.

1.6 The manufacturer reserves the right to make design changes that will not lead to deterioration of the technical characteristics of the boiler.

1.7 The boiler is easy to operate, it can be operated by persons over eighteen years of age, as well as persons with disabilities who have been instructed in the proper safe operation of the boiler and who are aware of the dangers of non-compliance with the operating instructions in this manual.

1.8 RECOMMENDATIONS FOR BOILER CHOICE
1.8.1 When choosing a boiler, the heat loss of the room must be taken into account, which must not exceed the nominal heat output of the boiler. For the correct and most cost-effective operation of the heating system, the boiler and related equipment must be installed and used in accordance with the technical design developed in accordance with applicable laws and regulations.
1.8.2 To connect an electric boiler to the mains, the user must have a permit from the local electricity supply organization. The maximum power of the boiler can not exceed the allowable power.

1.9 OPERATING CONDITIONS
1.9.1 The boiler is designed to operate in rooms with ambient temperatures from + 5 ° C to + 40 ° C and relative humidity up to 70%.
1.9.2 The boiler is not intended for work in damp and damp rooms, rooms with aggressive environment, saturated with vapors of acids, alkalis and other substances, in explosive and flammable places.

WARNING!
Use of the boiler in conditions other than those specified in this Manual is considered to be misuse.
Improper or improper use may endanger the health and life of the user or third parties, as well as the risk of damage to the product and other property.

1.10 Use of the boiler for its intended purpose means compliance with the rules and instructions on the operation of the product, timely inspection and maintenance set out in this Manual.

1.11 The package includes:плект поставки включає:
- electric boiler in a box (1 piece);
- Operation manual (1 piece);
- warranty card (1 piece);
- terminal jumper of the terminal box for connection to a single-phase network (for models ESPRO-4.5, ESPRO-6, ESPRO-7.5) (1 piece);
- boiler temperature sensor (1 piece);
- air temperature sensor (1 piece);
- mounting bracket with fasteners (1 set).

WARNING!

When buying a boiler:

- require the trade organization to fill out a certificate of sale of the boiler and a warranty card.

- check the equipment and appearance. After the sale of the boiler, the manufacturer does not accept claims regarding the complete set, appearance and mechanical damage to the boiler

1.12 LABEL


TEKNIX
ENGINEERING
Electric boiler for heating and water heating TEKNIX ESPRO
QR code that allows you to download the application
Download the mobile management application:
Synchronize the boiler with the application:
The code contains all the necessary information about the boiler
Technical characteristics of the model
Boiler serial number: 12345678901234567890
Unit
Value
Series
ESPRO
Model
ESPRO - 18
Nominal heat output
kW
18
Power consumption
kW
Power supply
Hz
Amperage
A
The maximum temperature of the coolant at the outlet of the boiler
Nominal operating water pressure of water in the heating system
0,04 - 0,15
The volume of the coolant in the heat exchanger
L
2,8
Degree of protection
IP
20
Number
pcs
1
Mass, net
kg
7,8
Mass, gross
kg
9
Dimensions of the device (WxDxH)
mm
250x135x650
Dimensions in the box (WxDxH)
mm
294x195x680
SAMPLE
Producer:
S Plusz K Technik Kft
Address
S Plusz K Technik Kft
Wai Adam Krt. 4-6/2 Em.208
H-4400 Nyíregyháza, Hungary
5 999860 669081
: 04.08.2021
Product barcode

2. INSTRUCTIONS FOR CONNECTING THE BOILER TO YOUR MOBILE DEVICE

STEP-BY-STEP INSTRUCTIONS FOR CONNECTION:

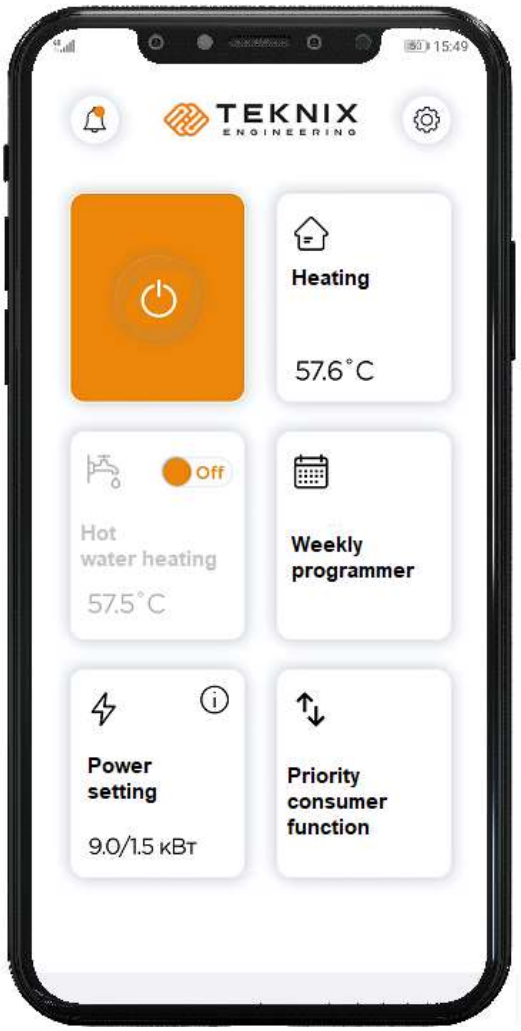
1. Turn on your home network in the phone and turn on geolocation, you need to know the network name and password to connect.

WARNING! Wi-Fi network must have a password..

2. Switch on the boiler in standby mode, the red button should light up on the screen.
3. To download a mobile application for remote boiler control, scan the QR code on your boiler, or find a mobile application called "TEKNIX Smart boiler" in your mobile application store (free download).
4. Enter your phone number to register and then the verification code.
5. Scan the QR code on the sticker of your boiler (or box). It has data on the model and serial number, thanks to which the connection between the boiler, the application and the mobile phone is established.
6. The next step is to choose your home Wi-Fi network. Connect to it and enter the password from your network.
7. When connecting the program to the boiler via the Internet, wait for the full connection and confirm all pop-ups.
8. Done. The functionality of the mobile application opens in front of you.

WARNING! Two devices cannot be connected to the boiler at the same time, the program can be connected to only one device. To connect to the second device - you need to disconnect on the previous one.

9. After entering the main screen, wait up to 15 seconds for the application to connect to the boiler.



MOBILE APPLICATION FUNCTIONS:

ON/OFF

Boiler on and off button.
After turning on the boiler, wait up to 15 seconds to establish contact with the application..

HEATING TEMPERATURE ADJUSTMENT.

The main screen shows the current temperature in the heating system.
To regulate the current temperature you need:
1. Go to the "Heating" section.
2. Switch on the required heating mode: setting the air in the room or the temperature in the system.
3. Move the temperature slider to the desired value.
4. Confirm changes.

Both settings (air temperature or system temperature) cannot work at the same time. The last setting works.

WARNING! If you set the mode settings manually, after programming the settings for the week using the "Weekly programmer" function, the latter function is automatically switched off. To turn on the weekly programmer, you need to go to this section and turn on the required programming by turning it on by turning the candle to the "ON" position.

SWITCHING ON WATER HEATING *

Hot water temperature setting.
Display the current water temperature in the system on the main screen. The setting works similarly to the previous item.
* works only in the complete set of a copper, with the boiler of heating of water connected to system. In all other cases, the function is not active.

WEEKLY PROGRAMMER

Allows you to program repetitive weekly temperature settings for heating and water heating. To use the programmer, go to this section and enable the desired function (switch logo).
You can program the operation of the boiler for heating and water heating for each day of the week. The settings are set at three-hour intervals for your daily comfort and savings. The weekly programmer settings start working 5 minutes after the programmer function is activated.

WARNING! Switching on the weekly programmer switches off the manual temperature setting, the manual settings are no longer active. In order for the manual settings to work, you need to turn off the "WEEKLY PROGRAMMER" function.

OPERATING POWER ADJUSTMENT

Adjust the power and consumption of the boiler. Set different operating power for water heating and heating.

PRIORITY CONSUMER AUTOMATIC POWER REDUCTION FUNCTION

Set the lower value of the boiler power to which it will decrease if another powerful device is switched on in the building. An important feature for users who have a limited power limit.

For example: 7 kW of power is allocated to your apartment. The boiler operates in 6 kW mode. And you still have an electric stove that requires 2.5 kW. You can set the priority consumer setting to 4.5 kW (depending on the model) and the boiler will automatically drop to this value when you cook. As soon as the load on the network becomes smaller - the boiler turns on its standard set power again.

NOTIFICATION ON THE STATUS OF THE BOILER

This section contains information on communication problems or boiler errors.

CAUSES OF PROBLEMS IN THE APPLICATION:

1. There is no connection of the boiler to Wi-Fi.
If there is no Internet connection in the room where the boiler is installed, the data from it is not transferred to the mobile application and it works in the last set mode.
What to do: check the Wi-Fi router. Check if there is an Internet connection through the router. Reboot the router. If the connection could not be restored - call our support service.

2. Error message E1-E7 has arrived.
Follow the steps on pages 34-35 of the basic boiler instructions.

3. The boiler is not connected to the new router, or you have changed the mobile number.
You need to go to the "Settings" section in the upper right corner of the main screen of the application. And press "Reset boiler Wi-Fi module settings".
Then register on p. 2 first.

If you have other difficulties in the operation of the mobile application, which are not reflected in the instructions, go to the link splusktechnik.hu/help. There is an extended library of answers to frequently asked questions related to the application. Or call the hotline 0-800-50-16-90.

3. SAFETY MEASURES

3.1 In case of improper use of the boiler or its misuse, there may be a danger to the health and life of the user or third parties, as well as the risk of damage to the product and other material values..
3.2 Do not start the boiler without reading this manual in detail. Follow only the operations specified in the Operation Manual..
3.3 The method of application of the boiler is defined in this Manual.
3.4 Installation, installation in accordance with the technical design, connection, commissioning and maintenance of the boiler are carried out only by qualified specialists of the authorized service organization that has a permit (license) for this activity and a certificate from TEKNIX.
3.5 During installation, operation and maintenance of the boiler, the requirements and safety measures specified in this Manual must be observed.
3.6 The use of a circuit breaker to connect the boiler to the mains is mandatory. Consumption current and recommended rated circuit breaker current are shown in Table 1.

3.7 IT IS PROHIBITED:
► block, interfere with the operation of protective devices and safety devices;
► violate the integrity of the body and components of the product;
► use elements, devices, devices not provided by the design;
► operate the boiler in case of non-compliance of the parameters of the electrical network set by the manufacturer, the pressure of the coolant in the system;
► operate the boiler with the front panel removed;
► operate the boiler without grounding;
► use the boiler for other purposes;
► make changes to the design of the product;
► use the boiler in explosive and flammable areas;
► connect the boiler to the mains in case of freezing of the coolant in the heating system;
► switch on the boiler, which is not filled with water, with the shut-off valves of the shut-off valve connected to the heating system closed;
► use the boiler as a flow heater;
► store flammable and explosive materials and products near the boiler (at a distance of less than 1 m) and on the boiler body.
3.8 Visual inspection of the integrity of the insulation and protective earthing must be carried out before each switching on of the boiler.
3.9 It is recommended not to turn off the power supply for protective functions and safety devices.
3.10 Before removing the boiler cover, be sure to turn off the power (turn off the external circuit breaker).
3.11 All inspection and maintenance work must be carried out only after the boiler power supply circuits have been disconnected.
3.12 The boiler must always operate at the operating pressure, the range of which is set by the technical characteristics (see Table 1).
3.13 The surface of the boiler can be cleaned only with non-flammable non-aggressive household appliances.
3.14 In case of emergency power failure, the boiler is switched off. After the power supply is restored, the boiler automatically switches on and restores the last stored mode.
3.15 The manufacturer is not liable for any damage caused by improper or careless operation of the boiler.

4. TECHNICAL CHARACTERISTICS AND DESCRIPTION

4.1 Technical characteristics of boilers are shown in Table 1.
4.2 The boiler operates reliably throughout its service life in compliance with the operating conditions set out in this Manual and timely maintenance.
4.3 The boiler device is shown in Figures 1, 2.
4.4 The coolant is heated in the heat exchanger flask. The number of heating elements and their power depends on the boiler model (see Table 1). To extend the service life of heating elements, alternating switching on of heating elements (rotation of heating elements) is provided.
4.5 Operation of the boiler is provided by the control unit.
The control unit controls the following parameters:
► value of coolant temperature at the boiler outlet;
► the value of the air temperature in the room where the temperature sensor is installed (supplied);
► temperature values in the DHW indirect heating boiler (if connected);

► condition of the room thermostat (if connected, the thermostat is not included). The boiler maintains the air temperature in the room according to the value set by the room thermostat;
► coolant flow in the boiler;
► input status of the "Priority Consumer" function;
► the amount of leakage current;
► the magnitude of the input voltage.
Also manages the work:
► circulating pump;
► heating elements;
► DHW three-way valve (not included).

4.6 A manometer is installed in the boiler to visually monitor the working pressure. The operating pressure range of 0.4 ... 1.5 bar is highlighted in blue on the manometer.
4.7 For safe and reliable operation, the boiler is equipped with protective mechanisms and safety devices that provide:

► **Boiler protection** against overpressure - the boiler has a safety valve to protect against overpressure. If the pressure value exceeds 3 bar, the coolant is automatically discharged.
► **Overheat protection** - in case of coolant overheating in the heat exchanger bulb, the emergency thermostat switches off the boiler power supply and, accordingly, the heating elements, regardless of the presence of a switching signal from the control unit.
► **Protection against the absence of water flow in the boiler** - the boiler is equipped with a flow sensor. If the flow of water through the boiler is reduced to less than 3.7 l / min, the heating is automatically switched off and an error code appears on the boiler display.
► **Protection against high voltage;**
► **Leakage current protection.**

Table 1 - Technical characteristics

PARAMETER DESCRIPTION		ESPRO 4,5	ESPRO 6	ESPRO 7,5	ESPRO 9	ESPRO 12	ESPRO 15	ESPRO 18	ESPRO 21	ESPRO 24
Power consumption, kW, no more		4,6	6,1	7,6	9,1	12,1	15,1	18,1	21,1	24,1
Coefficient of performance, %		99								
Rated mains voltage, V,		380 (1x220) ± 10%			380 ±10%					
Mains frequency, Hz		50								
Type of mains grounding system		TN-C-S / TN-S								
Current consumption, A, no more	**At three-phase inclusion**	7	9	11	14	18	23	27	32	36
	At single-phase inclusion	20,5	27	34	---	---	---	---	---	---
Recommended rated current of the switch, A	**At three-phase inclusion**	10	16	16	16	20	25	32	40	40
	At single-phase inclusion	25	32	40	---	---	---	---	---	---
Recommended cross section of power cable with copper core, mm²	**At three-phase inclusion (3L+N+PE)**	5 x 1,5	5 x 2	5 x 2,5	5 x 2,5	5 x 4	5 x 6	5 x 6	5 x 6	5 x 8
	At single-phase inclusion (L+N+PE)	3 x 4	3 x 4	3 x 6	---	---	---	---	---	---
Number of heating elements, their power, pcs. x kW		3 x 1,5	6 x 1	6 x 1,25	6 x 1,5	6 x 2	6 x 2,5	6 x 3	9 x 2,33	9 x 2,66
Operating pressure range, bar		0,4 - 1,5								
Maximum pressure, bar		3,0								
Range of regulation of temperature of the heat carrier on an exit from a copper, ° C		from + 30 to + 80								
The maximum temperature of the coolant at the outlet of the boiler, ° C		+ 80								
Indoor air temperature control range, ° C (according to the sensor included)		from + 10 to + 26								
Range of regulation of temperature of water of SGV in a boiler of indirect heating, ° C		from + 30 to + 60								
Type of circulating pump		WILO Para 15/6								
Pump power, W.		3 - 43								
Temperature of operation of the emergency thermostat of an overheat, 0C		+ 105								
Minimum water flow through the boiler, l / min		3,7								
Volume of an expansion tank, l		6								
Excess pressure of expansion tank, bar		1,0								
Overall dimensions, mm, no more **- width** **- depth** **- height**		375 248 744								
Boiler weight without coolant, kg, no more		23			24					
Connecting size		G3/4								
Degree of protection		IP30								
WI-FI module characteristics		- wireless interface (standard) - 802.11, 2.4 GHz - operating modes: client (STA), access point (AP), client + access point (STA + AP). A dual-band router 2.4 GHz and 5 GHz is recommended								

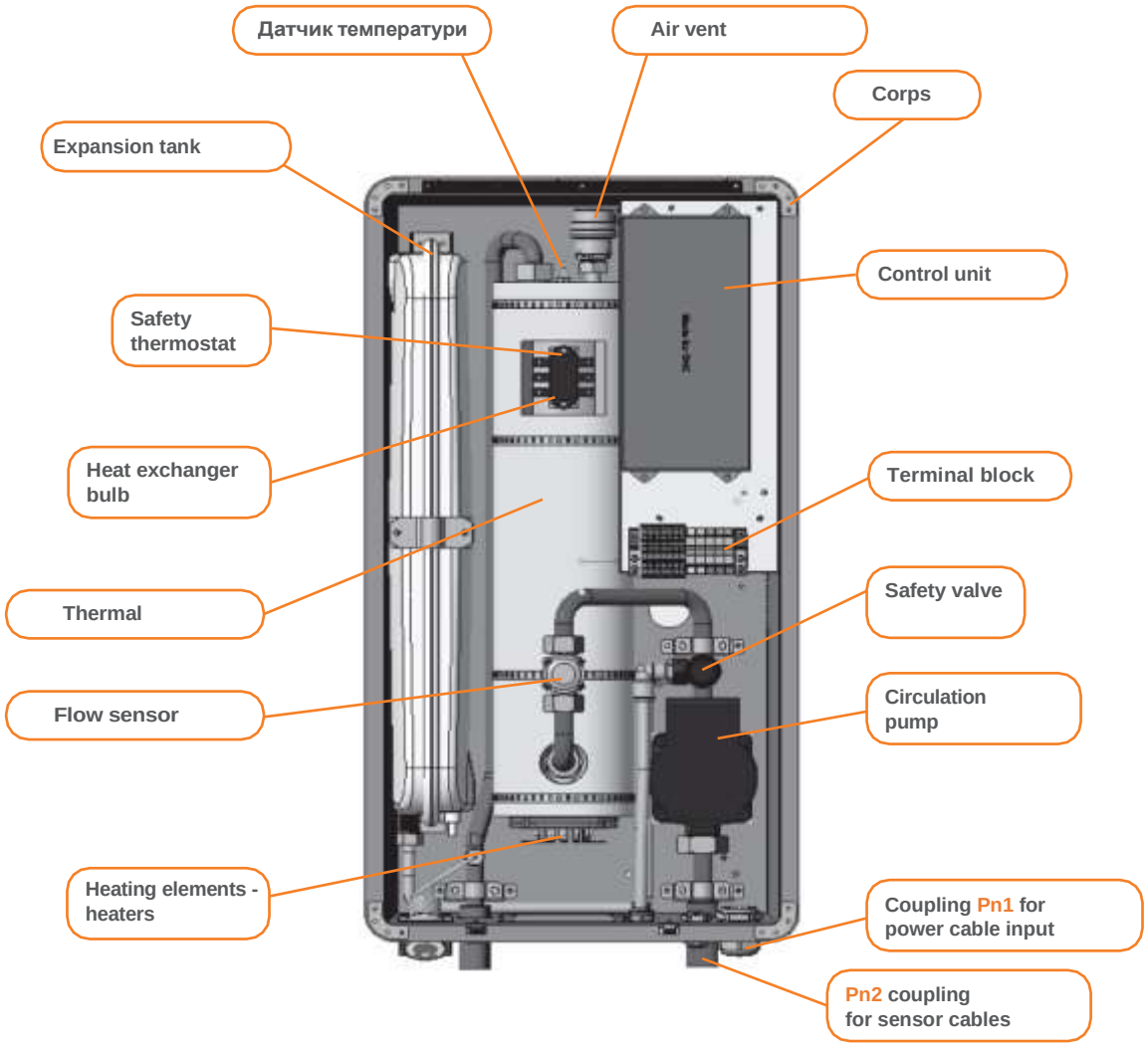


Figure 1 - Internal elements of the electric boiler.

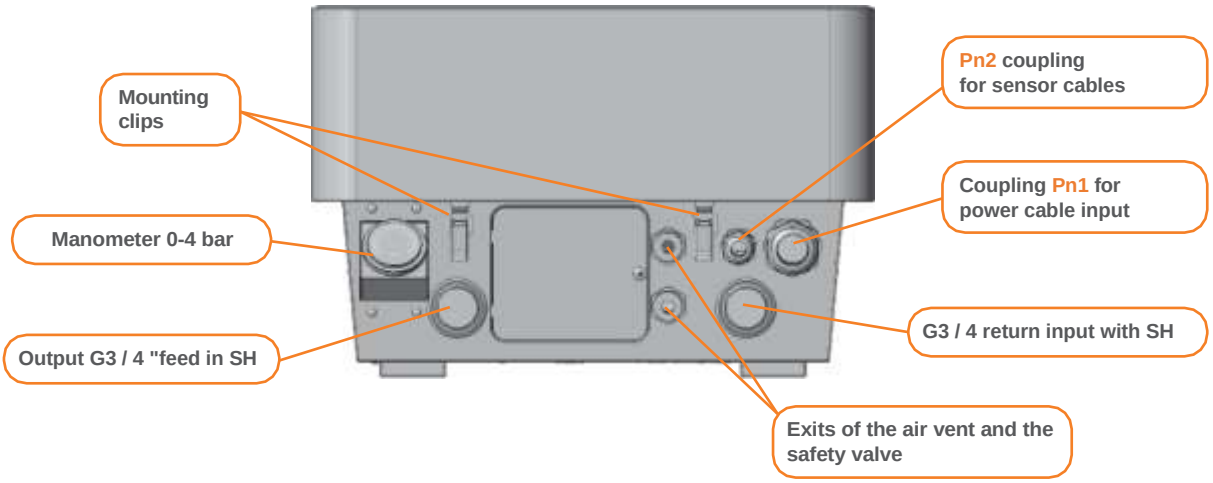


Figure 2 - Boiler connection panel (boiler view from below).

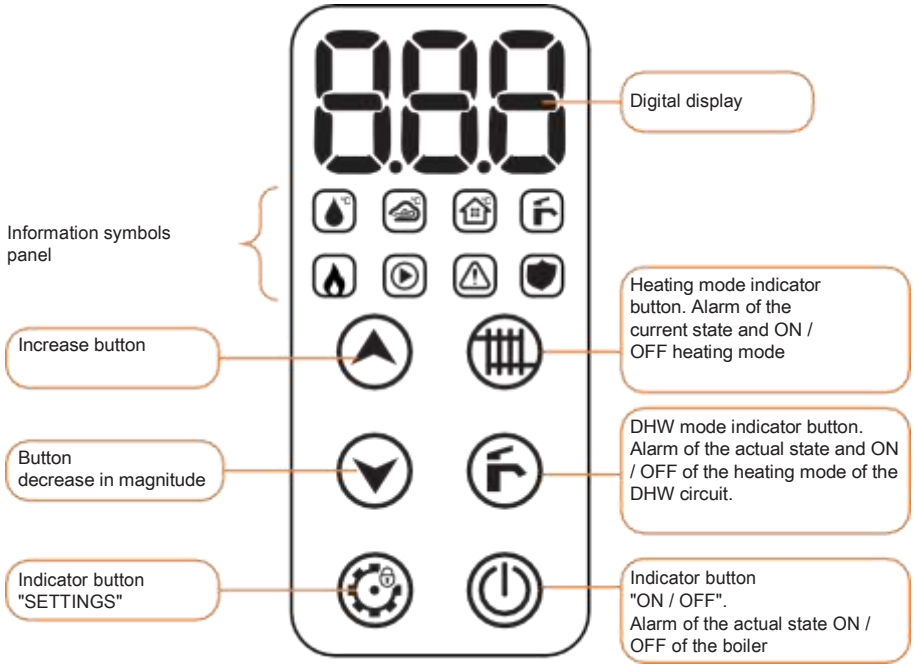
4.8 ADDITIONAL FUNCTIONS ARE PROVIDED WHEN OPERATING THE BOILER:

► **"Antifreeze" -** protection of the boiler from freezing when the temperature drops;
► **"Child lock" -** protection of the boiler control panel from accidental access;
► **"Anti-Legionella", pr**otection against bacteria in the indirect heating boiler (for a description of the function, see Section 5 "Operating procedure. DHW mode");
► **"Protection against blockage of the pump and the three-way valve"** - protection against jamming of the pump and the three-way valve SGV (in the presence of a contour SGV) at long shutdown of a copper;
► **"Priority consumer"** - automatic limitation of boiler power when receiving a signal from "Priority consumer" (requirements for connection of "Priority consumer" see section 4.6 of this Manual);
► **"Limitation of the maximum power of the boiler"** - the possibility of software reduction of power if necessary or desired by the User in different modes of operation of the boiler (heating and DHW);
► **"Operation with a room thermostat"** - the ability to control the operation of the boiler when connecting a room thermostat (requirements for connecting a room thermostat are described in Section 4.5 of this Guide).

Detailed description of additional functions and possibilities for their adjustment and adjustment is given in Section 5.3 "**Selecting and Adjusting the Operation Mode**" of this Guide.

4.9 On the front panel of the boiler there is a touch control panel (display), the appearance of which is shown in Figure 3.
4.10 It is also possible to control the operation of the boiler through a specialized application. You can download the application from GOOGLE PLAY (for Android users) or App Store (for iOS users). To do this, scan the QR code from the Manual or the label on the boiler. Follow the link, install the application and after a short registration in the system, connect your boiler to the application. For stable connection with the WI-FI module of the boiler, it is necessary to place the router as close as possible to the electric boiler.
A description of the work is given in Appendix 1 to this Guide.

Figure 3 - View of the control panel (display).



Information symbols to signal the current state of the boiler

	Indicator "Coolant outlet temperature"
	Indoor "Indoor air temperature" indicator
	Thermostat indicator
	DHW tank heating mode indicator

	Heating indicator
	Pump indicator
	Accident indicator
	Anti-Legionella indicator

5. INSTALLATION MANUAL

5.1 GENERAL REQUIREMENTS

5.1.1 Installation, assembly, commissioning of the boiler must be carried out by qualified specialists of an authorized service organization that has a permit (license) for this type of activity and a certificate from the company TEKNIX.

5.1.2 The boiler shall be installed inside a room in which the ambient air temperature range from + 5 ° C to + 40 ° C is provided at a relative humidity not exceeding 70%, in a convenient place for maintenance.

5.1.3 If the boiler is unpacked in low temperature conditions, the installation of the equipment should be carried out not earlier than 2 hours after introduction into a warm room in compliance with the requirements of Section 4 of this Manual.

5.1.4 Recommendations to the installation site:

► The room in which the boiler is installed must not contain conductive dust, chemically active substances;

► the distance from the boiler body to objects and structures made of combustible materials must be at least 1.0 m. If it is impossible to ensure the specified distance, objects and structures made of combustible materials must be protected by non-combustible insulating materials;

► The minimum free distances from the surfaces to the boiler body are shown in Figure 4;

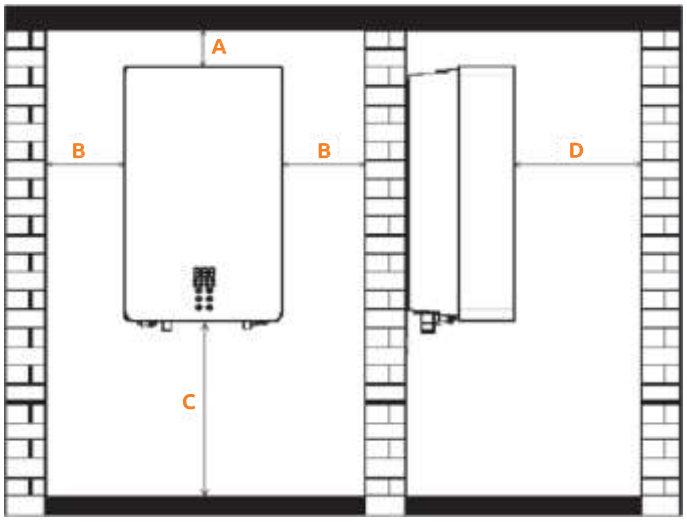
► The boiler must not block passages, emergency exits;

► In the place of installation of the boiler the supply of engineering communications must be provided;

► The boiler must not be installed close to climatic appliances and devices that could damage the product (for example, above the hob from which fat-containing vapors depart);

► It is forbidden to install a boiler in bathrooms and showers, where the influence of moisture and water is possible;

► The surface on which the boiler is suspended must be level, have sufficient load-bearing capacity to withstand the load of the working weight of the product.



A ≥ 100 мм
B ≥ 200 мм
C ≥ 400 мм
D ≥ 500 мм

Figure 4 - Minimum free distances from the surfaces to the boiler body

5.1.5 The boiler is designed for wall mounting. Prior to installation, make sure that the fasteners included with the boiler can be used for a specific wall.

5.1.6 Fastening of the product is carried out according to Figure 5. The main dimensions are shown in Figure 6.

5.1.7 To remove the front panel, unclip the mounting clips at the bottom of the boiler body (see Figure 2), lift the panel upwards, gently pulling on itself. Disconnect the display connection cable without abrupt movements while holding the canopy panel. Then move the front panel to the side.

The front panel should be mounted in the reverse order.

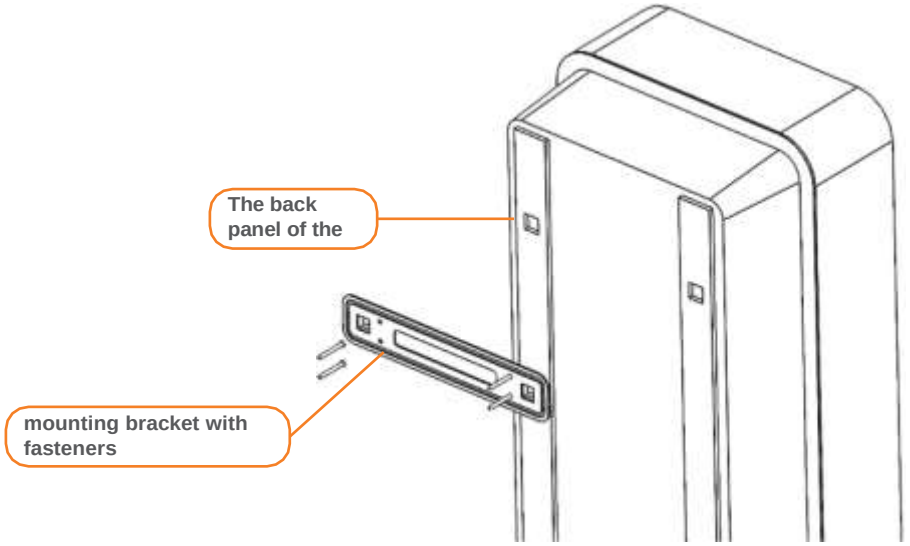


Figure 5 - The order of fastening the product.

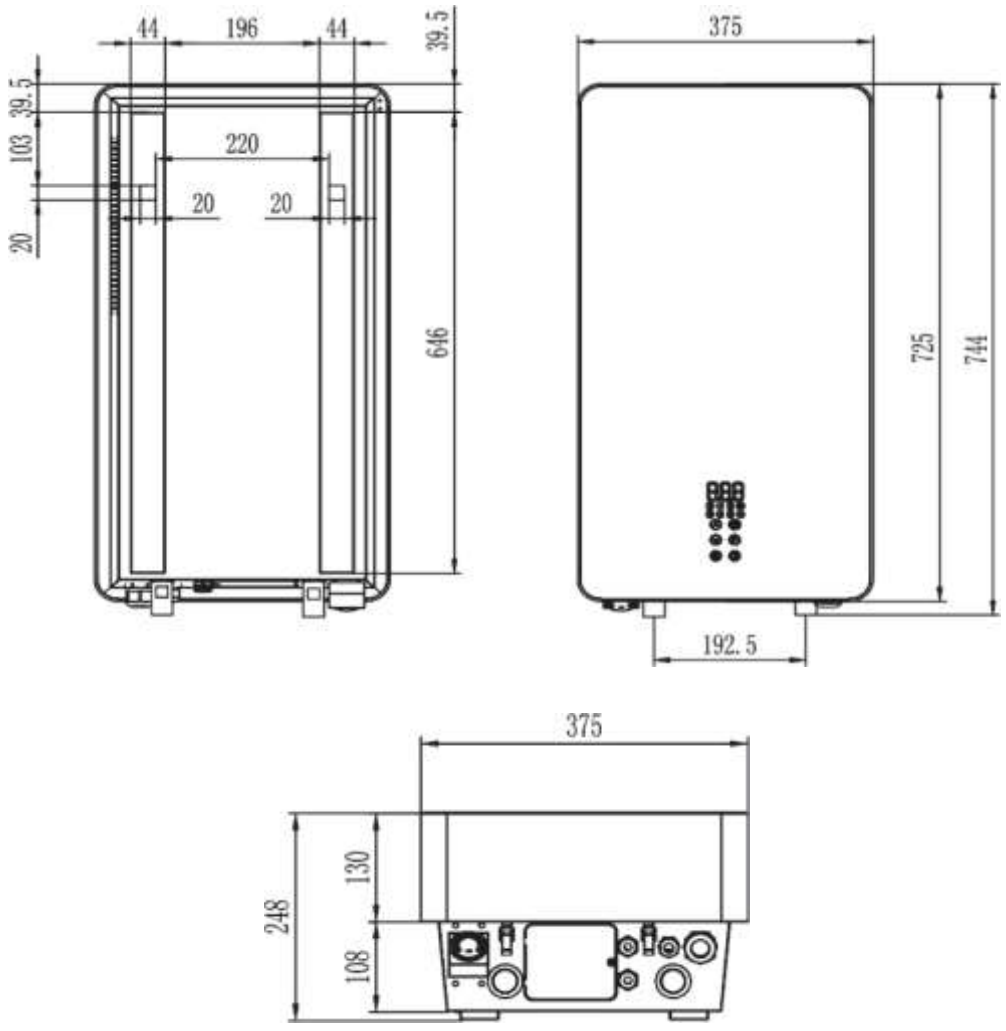


Figure 6 - Basic dimensions.

5.2 CONNECTING THE HEATING SYSTEM

WARNING!
It is forbidden to use the boiler in open heating systems without excessive pressure..

5.2.1 Before the final installation of the boiler, the heating system must be rinsed several times with clean water under pressure in the direction opposite to the flow of coolant

Pipeline

5.2.2 Pipes, fittings, connecting parts, heating devices (radiators) that meet the requirements of current regulations (standards, regulations, etc.) must be used to connect the heating system. When choosing the material of pipes and heaters must take into account the functional purpose of premises, buildings, structures, operating conditions, coolant temperature, as well as service life and water quality requirements.
5.2.3 The piping of the heating system shall be laid in such a way as to prevent air congestion and to ensure constant removal of air from the system. Valves and taps for air release should be located at the highest point of the system and on all radiators. Pipes for heating systems must have a low coefficient of thermal linear expansion when heated and must not allow air to enter the heating water.
5.2.4 Connection of the boiler to the heating system and DHW circuit should be carried out through shut-off valves for the possibility of service maintenance of the boiler.
5.2.5 To protect against mechanical impurities, a strainer with a mesh size of at least 500 μm must be installed in front of the boiler circulation pump.
5.2.6 In heating systems with variable coolant flow, it is recommended to use a hydraulic separator (hydraulic arrow) between the boiler and the heating system. This will ensure optimal stable operation of the boiler and balance the operation of the heating circuit.

WARNING!
Mandatory requirement when installing a boiler in heating systems without the use of a hydraulic separator is the lack of control devices (thermal head, mixer, etc.) in the radiator closest to the boiler, which will ensure a constant flow of coolant through the boiler at least 3.7 l/min.

Heat carrier

5.2.7 The manufacturer recommends using prepared water as a heat carrier for the heating system with ESPRO electric boiler.
5.2.8 Water should have a pH above 7 and a minimum carbonate hardness of not more than 0.7 mg-eq/L.
5.2.9 The recommended coolant pressure in the system is 1.2 ... 1.5 bar.

Use of antifreeze liquids

5.2.10 To protect the boiler and the heating system, the manufacturer recommends using the "Antifreeze" function (for details, see Section 6 "Operating Procedure" of this Manual. If this is not possible for any reason, high quality antifreeze intended for heating systems may be used living quarters, the composition of which provides protection against corrosion of the internal parts of the boiler, the circulation pump and the heating system as a whole.
5.2.11 If it is necessary to use antifreeze liquids, it is necessary to take into account their impact on the boiler and heating system, taking into account the following features: reduced heat capacity, higher coefficient of volumetric expansion rubber and fluoroplastic sealants.

WARNING!
For calculation and installation of heating system with use of not freezing liquids as the heat carrier it is necessary to address in the specialized design and installation organizations

WARNING!
When using an indirect heating boiler for DHW, non-freezing liquids may only be used on a food basis, provided that this is permitted by the boiler manufacturer.

5.2.12 The concentration of antifreeze in the heating system and in the boiler should not exceed 40%. In any case, follow the recommendations of the antifreeze manufacturer.

WARNING!

When using non-freezing liquids, the coolant temperature at the boiler outlet must be limited to + 60 ° C in the service settings (see section "Service menu").

WARNING!
When putting into operation the boiler in the case of using non-freezing liquids as a coolant, the representative of the service organization must enter the data in the coupon for commissioning.

Expansion tank

5.2.13 For stable operation of the heating system it is necessary that the pressure in the expansion tank was 1 atm

WARNING!
Check and adjust the air pressure (nitrogen) in the expansion tank should be carried out only by an authorized representative of a specialized service!!

WARNING!!
If the water volume in the heating system is more than 60 l, an additional expansion tank must be installed in front of the boiler on the return line from the heating system. The minimum volume of the expansion tank (l) must be at least 10% of the volume of water in the heating system.

Circulation pump

5.2.14 The boiler is equipped with a Wilo PARA 15-130 / 6-43 / SC circulation pump with three operating modes. Factory settings of the operating mode of the circulating pump - "Constant speed-III". When the pump is switched on, the indicator of pump operation, operating mode and indicator III - speed are lit (see Figure 7).

WARNING!
Only an authorized representative of the specialized service department is allowed to make changes in the operating mode of the pump!

5.2.15 The operating characteristics of the Wilo PARA 15-130 / 6-43 / SC pump set by the manufacturer (factory settings) are shown in Table 2 and Figure 8.

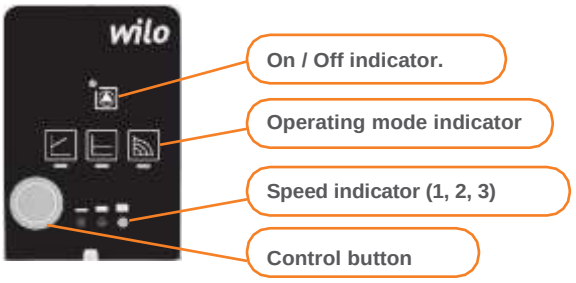


Figure 7 - Wilo PARA pump control panel.

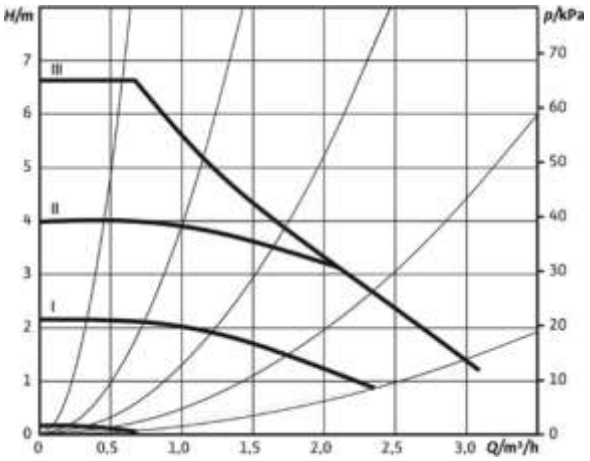
WARNING!
When changing the operating mode and operating speeds of the pump, it is necessary to ensure a constant flow of coolant through the boiler at least 3.7 l / min.

WARNING!
If the heating system has more hydraulic resistance than the boiler pump can overcome, it is necessary to install an additional pump on the return line to the boiler. The pump is selected according to the design data for the heating system.

5.2.16 In heating systems with several heating circuits (with variable flow and head), it is recommended to use hydraulic separator circuits.

Table 2 - Electrical characteristics of the circulating pump.

Degree	Power, W	Current consumption, A
I	15	0,06
II	30	0,14
III	43	0,44



H - head height, m;
p - pressure, kPa;
Q - volume consumption, m3/h.

Figure 8 - Characteristics of the Wilo PARA 15-130 / 6-43 / SC pump for "Constant pump speed" operating mode

5.2.17 If necessary, the Wilo PARA pump can be reconfigured to other operating modes:

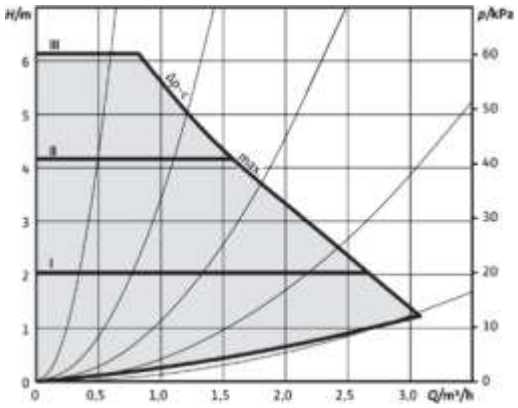
► **constant pressure drop (Δp-s) - indicator**,

The set setpoint of the pressure drop H is maintained at the maximum characteristic within the allowable range of productivity (see the graph - Figure 9-a). This method of regulation is recommended for use in the presence of a heating circuit "underfloor heating" or when using heating systems with large pipelines, as well as in all applications where there are no variable characteristics of the pipeline network, such as boiler booster pumps.

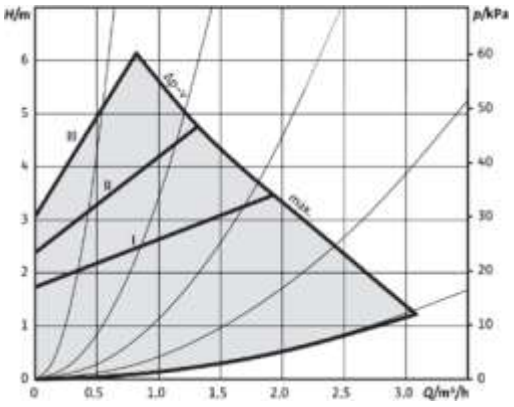
► **variable pressure drop (Δp-v) - indicator**.

A linear increase of the set value of the pressure drop H within the allowable range of productivity between ½H and H is performed (see graph Figure 9-b). The pressure drop generated by the pump is set to the corresponding setpoint of the pressure drop. This method of control is especially recommended for heating systems with heating elements of radiator heating, because it reduces the noise level from the flow of liquid in thermostatic valves.

5.2.18 Switching between pump modes and speeds is performed using the control button (see Figure 7).



a) Constant pressure drop (Δp-c)



b) Variable pressure drop (Δp-v)

H - head height, m; **p** - pressure, kPa; **Q** - volume consumption, m3/h.

Figure 9 - Characteristics of the Wilo PARA 15-130 / 6-43 / SC pump for modes.

WARNING!
When the boiler power supply is switched off, all settings of the circulation pump operation mode are saved.

5.3 ELECTRICITY CONNECTION

5.3.1 The boiler is designed for stationary connection to the mains. The mains must meet the requirements specified in Table 1.

5.3.2 The electric power of the boiler must not exceed the allowed allocated power.

WARNING!
The presence of an automatic boiler power switch is mandatory!

RISK OF ELECTRIC SHOCK!
Before performing installation work it is necessary:
- turn off the automatic power switch,
- take measures to prevent the re-supply of power;
- check for voltage.

5.3.3 The recommended values of the rated current of the circuit breaker and the cross section of the power cable cores are given in Table 1.

5.3.4 Insertion of cables into the electric boiler is carried out in the places of installation of sealing couplings in the lower part of the boiler body (see Figures 2, 10), the power cable must be passed through the sealing coupling Pn1, and other wires Pn2. Laying the power supply cable inside the boiler must comply with Figure 10.

5.3.5 The power supply cable is connected to terminal block X1 (see Figures 10-11 according to the boiler wiring diagram - see Figures 13-15. The PE core of the power cable must be connected to the PE grounding terminal (see Figures 10-11).

5.3.6 The maximum cross-section of the power electric cable for connection to the terminal block is 10 mm2.

5.3.7 To connect 4.5 kW, 6 kW and 7.5 kW ESPRO boilers to a 220V (50Hz) single-phase electrical network, it is necessary to install the supplied jumper on terminals L1, L2, L3 of the X1 connector (see Figure 12). The power supply cable must be connected according to Figure 11-b.

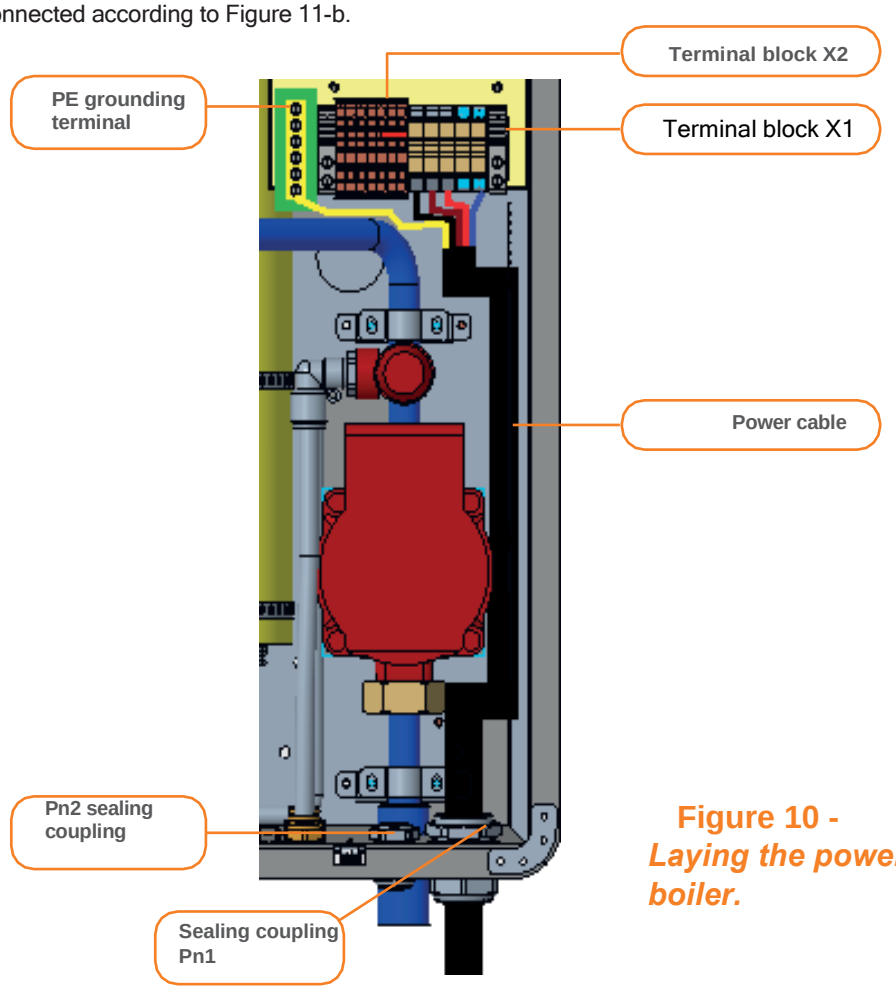
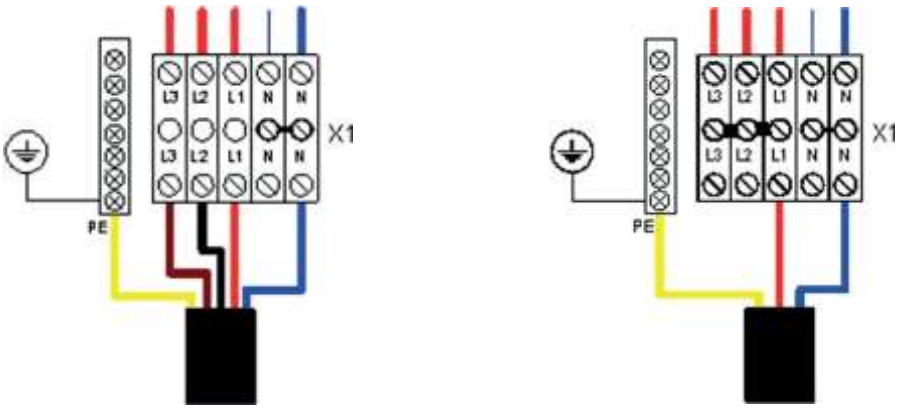


Figure 10 -
Laying the power supply cable inside the boiler.



a) 3L + N + PE

b) (L + N + PE)

Figure 11 - Connecting the power cable.

Figure 12 - Appearance of the three-pin jumper.

WARNING!
After connecting, make sure that the power cord wires and connecting wires are securely fastened to the terminals.

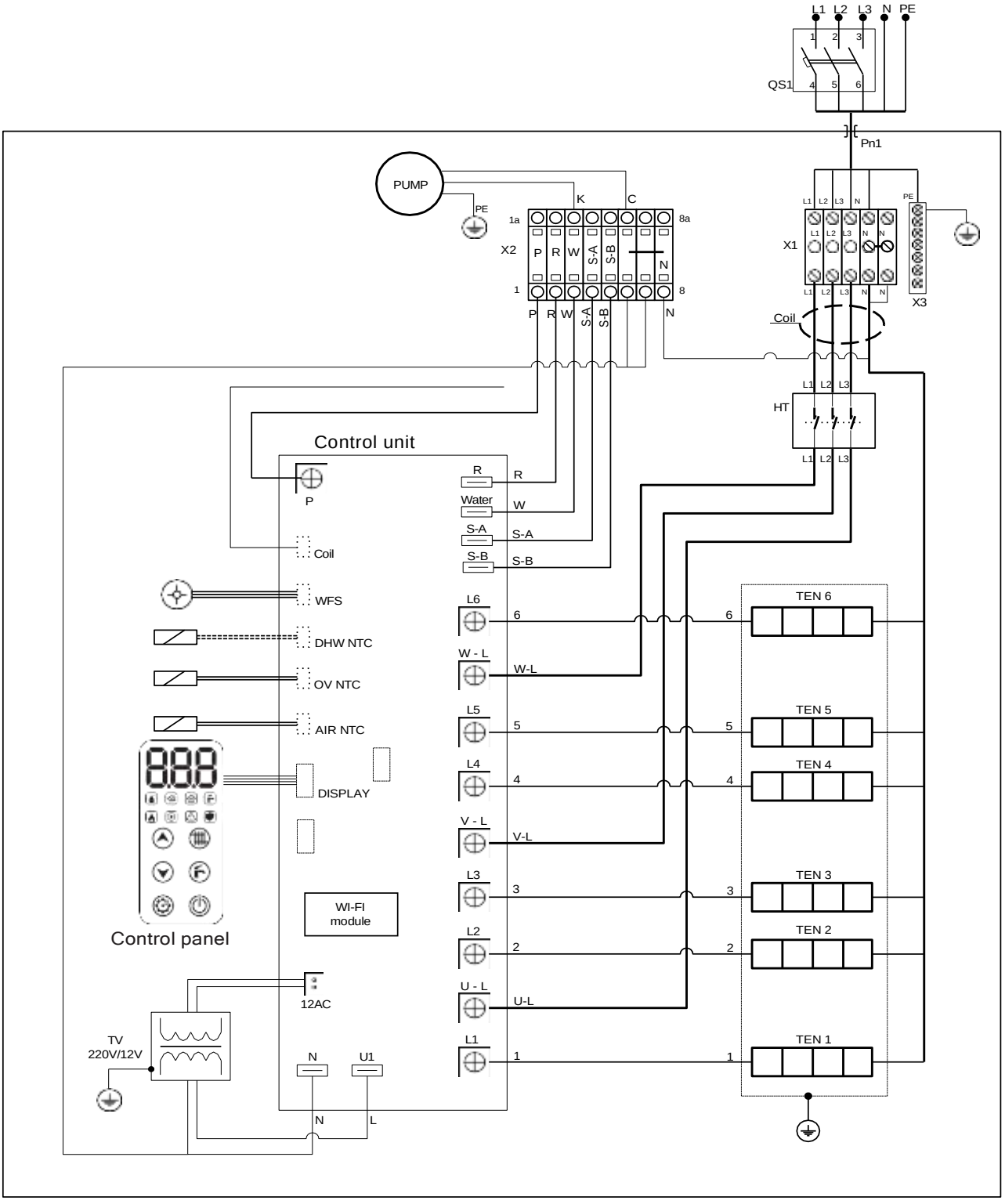


Figure 13 -
Wiring diagram of the ESPRO boiler 4.5-18 kW to a three-phase network 380V (50Hz).

MARKING:
OV NTC - sensor OV NTC
AIR NTC - air sensor NTC
DHW NTC- DHW boiler sensor
Coil
WFC - water flow sensor
DISPLAY - control and indication panel
X1, X2, X3 – terminal blocks
TEN1 - TEN6 - heating elements
R - room thermostat (dry contact)
W- pump
S-A - the motor of the three-running DHW valve (on DHW)
S-B - motor three-way DHW valve (on HS)
QS1 – external circuit breaker
L1, L2, L3 - phase wire
N – neutral wire
PE - protective earthing
TV - transformer 220V/12V
C – blue wire
K - black wire
P - Priority Consumer Terminal
Pn1- clutch

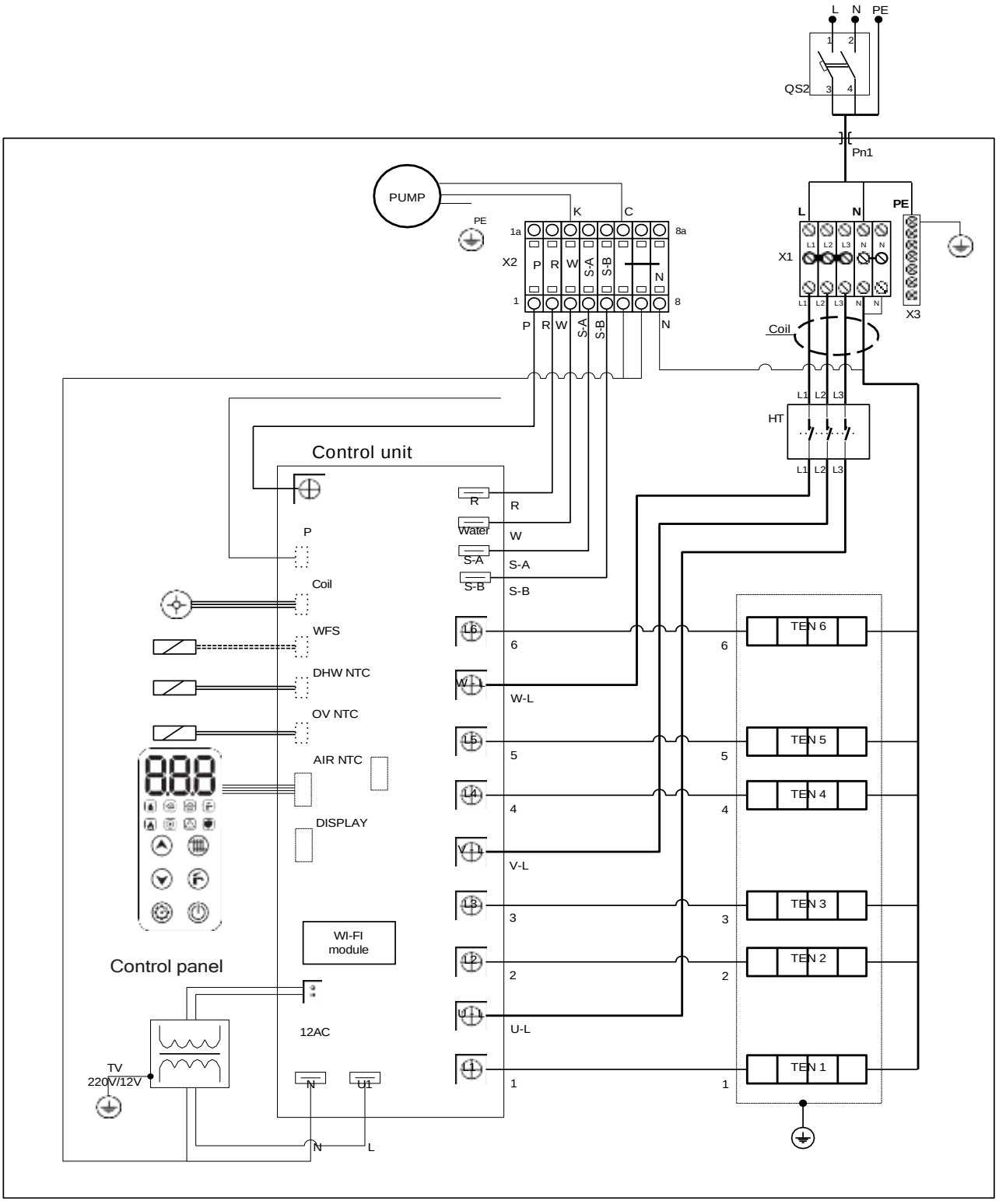


Figure 14 - Scheme of connection of ESPRO boilers 4.5 kW, 6 kW and 7.5 kW to a single-phase network 220V (50Hz).

MARKING:
OV NTC - sensor OV NTC
AIR NTC - air sensor NTC
DHW NTC- DHW boiler sensor
Coil
WFC - water flow sensor
DISPLAY - control and indication panel
X1, X2, X3 – terminal blocks
TEN1 - TEN6 - heating elements
R - room thermostat (dry contact)
W- pump
S-A - the motor of the three-running DHW valve (on DHW)
S-B - motor three-way DHW valve (on HS)
QS1 – external circuit breaker
L1, L2, L3 - phase wire
N – neutral wire
PE - protective earthing
TV - transformer 220V/12V
C – blue wire
K - black wire
P - Priority Consumer Terminal
Pn1- clutch

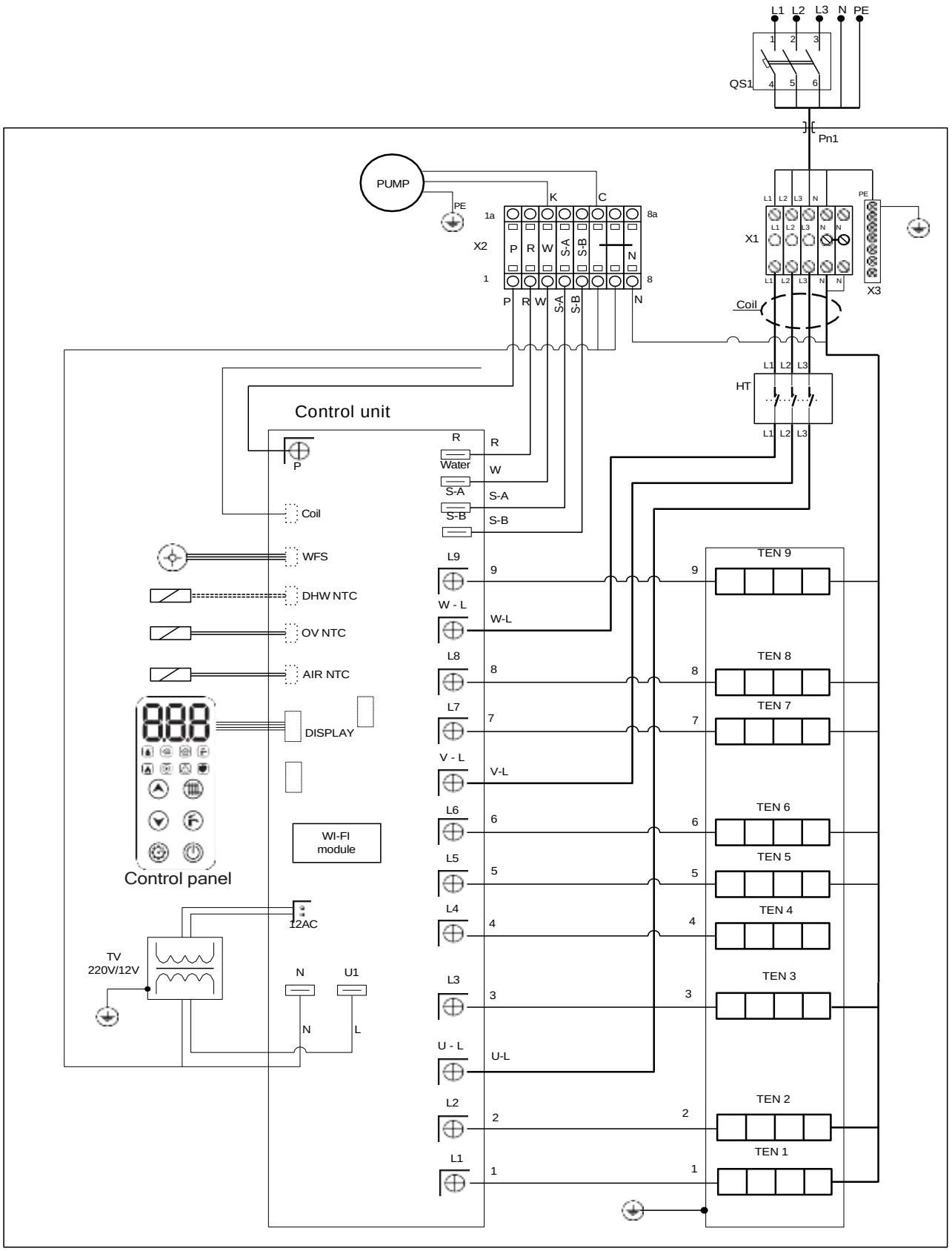


Figure 15 - Scheme of connection of ESPRO boilers 21 kW and 24 kW to a three-phase network 380V (50Hz).

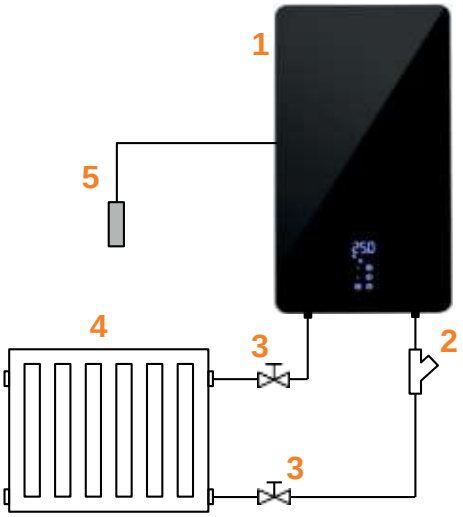
ПОЗНАЧЕННЯ:
OV NTC - OV NTC sensor
AIR NTC - air sensor
DHW NTC - boiler sensor
Coil
WFC - water flow sensor
DISPLAY - control and indication panel
X1, X2, X3 – terminal blocks

HT - emergency thermostat
TEN1 - TEN9 - heating elements
R - room thermostat (dry contact) W-pump
S-A - motor three-way valve DHW (on DHW)
S-B - motor three-way valve DHW (on HS)
QS1 - external circuit breaker
L1, L2, L3 - phase wire

N - is the neutral wire
PE - protective earthing
TV - transformer 220V / 12V C - blue wire
K - black wire P - Terminal
"Priority consumer" Pn1 coupling

5.4 CONNECTING THE AIR TEMPERATURE SENSOR

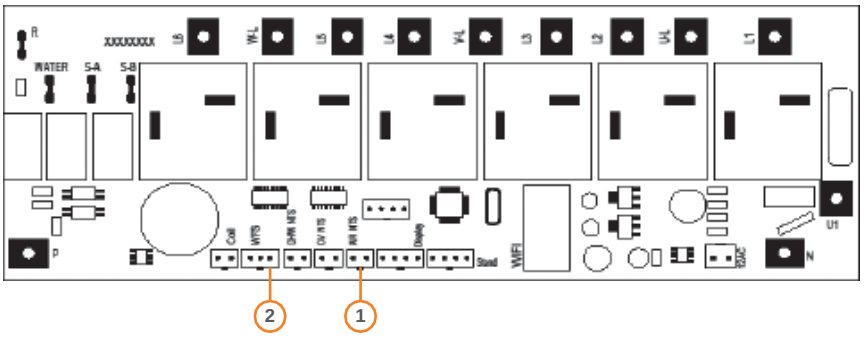
5.4.1 The connection of the supplied air temperature sensor (see Figure 16) is made to the AIR NTC terminal connector on the boiler board (see Figure 17).



1 – boiler;
2 – filter;
3 - shut-off valve
4 - heating system;
5 - air temperature sensor (supplied).

Figure 16 - Connecting the supplied air temperature sensor

Figure 17 - Boiler board



1 - **AIR NTC connector (temperature sensor connection)**
2 - **DHW NTC connector (connection of the DHW temperature sensor)**

5.4.2 It is better to install the temperature sensor in living quarters. Location of the sensor according to the recommendations - see Figure 18. It is not recommended to install the temperature sensor next to the climatic equipment, for drafts. Avoid direct sunlight on the sensor.

5.4.3 After connecting the air temperature sensor to the boiler, the boiler operation must be adjusted (see section 6. 3 of this Manual).

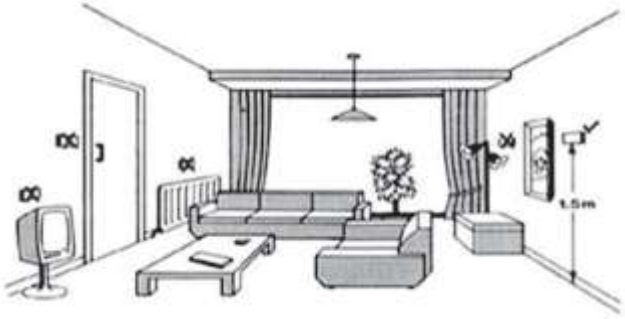


Figure 18 - Installation in a room thermostat or air temperature sensor.

5.5 CONNECTING THE ROOM THERMOSTAT

5.5.1 It is allowed to use a wired thermostat with a discrete output signal "dry contact" with galvanic isolation from other external electrical contacts of the device. To connect to the boiler you need to use a closed pair of contacts of the room thermostat.

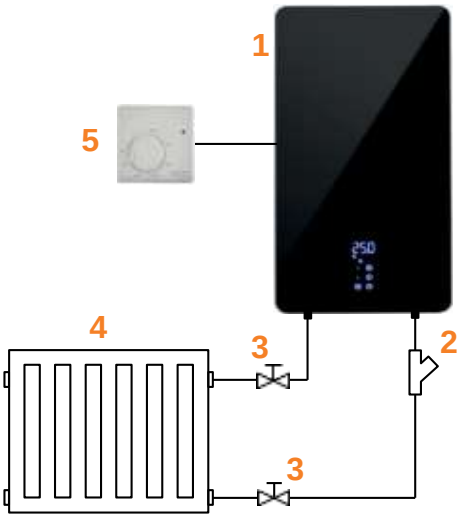
5.5.2 Place of installation of the thermostat according to recommendations of item 4.4.2.

5.5.3 The connection of the room thermostat to the boiler (see Figure 19) is made by a two-core copper wire with a cross section of at least 0.75 mm2 and a maximum length of 15 m.

5.5.4 The cable of the room thermostat should not be located in close proximity to power supply wires. The minimum allowable distance must be at least 10 mm.

5.5.5 Terminals for connecting the thermostat are located in the left part of the terminal block X2 of the boiler (Figures 1, 10 and connection diagrams of the boiler - Figures 13-15). When delivering the boiler, a jumper is installed between the terminal contacts "R" and "N1" pad X2 (Figure 20). To connect the thermostat to the boiler, remove the jumper, connect one wire of the normally closed pair of thermostat contacts to terminal "R" and the other to terminal "N1" block X2 (Figure 20).

5.5.6 When connecting the thermostat, the service technician is obliged to make entries in the warranty card and certify them with a signature and seal..



1 – boiler;
2 – filter;
3 – shut-off valve
4 – heating system;
5 – air temperature sensor (supplied).

Figure 19 - Thermostat connection (not included).

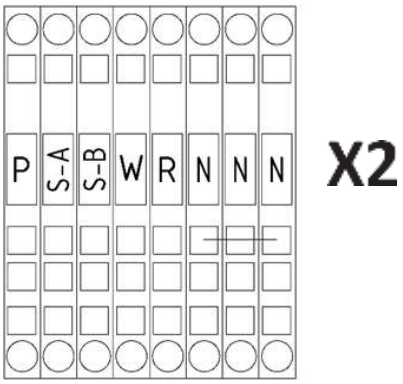


Figure 20 - Terminal block X2.

5.6 CONNECTION OF THE "PRIORITY CONSUMER" FUNCTION

The "priority consumer" function is activated using an external priority relay and makes it possible to limit the power consumption of the boiler. In case of increased load on the power supply network, when switching on energy-intensive equipment (such as electric kettles, electric stoves, electric boilers, etc.) in the presence of limited power supply and the inability of the power supply to meet the power supply at the same time, the load on the power supply network is minimized.

5.6.1 To ensure the operation of the "Priority Consumer" function, it is necessary to connect a pair of contacts from the "Priority Consumer" device (eg relay) with a discrete output signal "dry contact", galvanically isolated from other external electrical contacts of the device. A normally open pair of contacts must be used to connect to the boiler.

5.6.2 Connection of a pair of contacts from the device "Priority consumer" to the boiler is carried out by a two-core copper wire with a cross section of at least 0.75 mm2 and a maximum length of 15 m. Connect one core wire to terminal "P" "N" terminal block X2. (see Figure 20).

5.6.3 The cable of the **"Priority Consumer"** device must not be located in close proximity to the power supply wires. The minimum allowable distance must be at least 10 mm.
5.6.4 When connecting the **"Priority Consumer"** device, the service technician is obliged to make entries in the warranty card and certify them with a signature and seal.

WARNING!
Before making connections to external devices, you need to disconnect the boiler from the mains, check the absence of voltage on the terminal block of the boiler. The procedure for switching off the boiler is described in Section 5.2 of this Manual. It is recommended to switch off the external input circuit breaker 1 minute after switching off the boiler.

5.7 CONNECTING DHW
5.7.1 An indirect heating boiler (DHW tank) can be connected to the boiler. The recommended volume of indirect heating boiler is shown in Table 3.

Table 3 - Recommendations for indirect heating boilers.

Boiler power, kW	Boiler volume, l, no more
4,5-9	80
12-15	100
18-24	200

WARNING!
Before connecting, check the characteristics of the indirect heating boiler according to its technical documentation

5.7.2 Для A connection kit must be used to connect the boiler and the indirect heating boiler FUGAS, which includes:
1) Separating three-way valve) (item 1 of Figure 21) with electric drive (item 4 of Figure 21);
2) Tee ¾ "(position 2 of Figure 21);
3) DHW boiler temperature sensor (item 7 of Figure 21);
4) Power cable of the three-way valve drive (item 3 of Figure 21);
5) Mounting brackets for the three-way valve drive (items 5, 6 of Figure 21).
5.7.3 The scheme of connection to the boiler of the DHW boiler is shown in Figure 22.

WARNING!
The scheme shown in Figure 22 is not a technical design. To avoid improper operation of the heating system and indirect heating boiler, it is necessary to install and use the equipment in accordance with the technical design. To develop a project, contact a specialized design organization.

Figure 21 - Connection kit (FUGAS).

5.7.4 The scheme of installation of the three-way valve at the boiler outlet when connecting the DHW is shown in Figure 23.
5.7.5 The electric actuator of the three-way valve must be connected to the terminal connectors "S-A", "S-B" and "N1" on the block X2 (see Figure 20 and boiler connection diagrams - Figures 13-15).
5.7.6 Thermal cylinder of the DHW temperature sensor must be installed in the DHW indirect heating boiler (in a special immersion tube for sensors).).
5.7.7 The DHW temperature sensor is connected to the DHW NTC terminal on the boiler board (see Figure 17).
5.7.8 After installation and connection of the DHW cylinder and elements of the FUGAS connection set, the heating circuit of the DHW cylinder must be filled with coolant. Then switch on the DHW mode from the boiler control panel (for details, see Section 5 "Operating procedure. DHW mode").

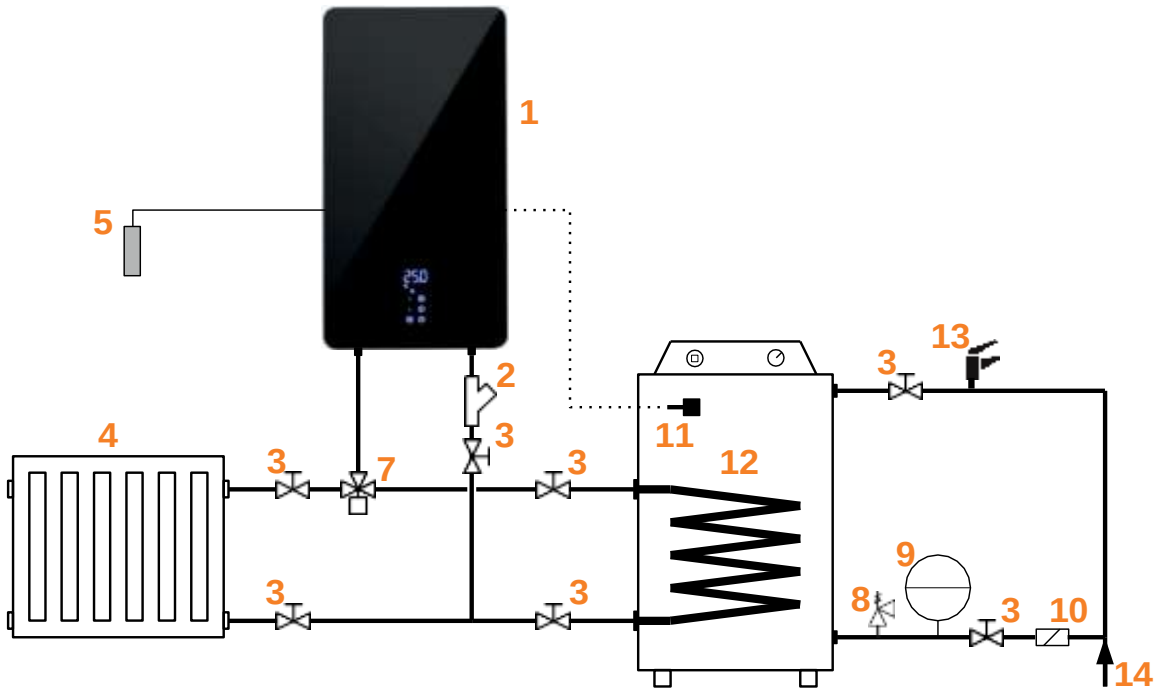
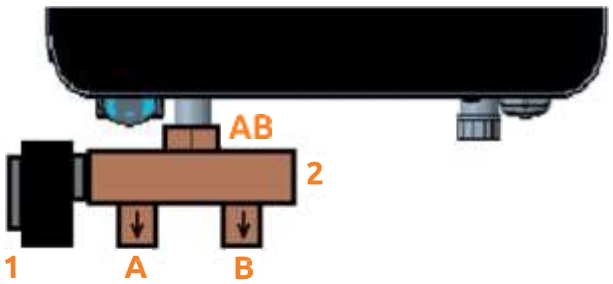


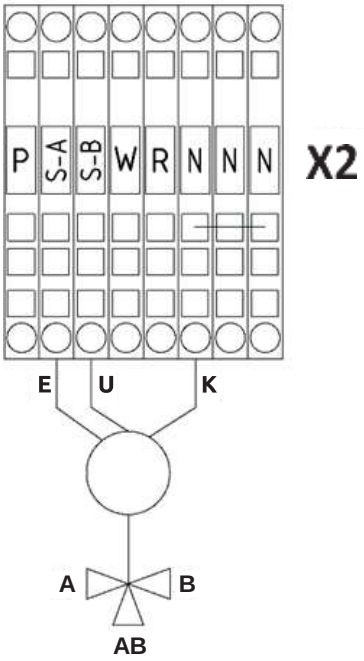
Figure 22 - Wiring diagram for the boiler DHW.

1 – boiler
2 – filter
3 - shut-off valve
4 - heating system
5 – air temperature sensor (supplied with the boiler)
7 - three-way valve with electric drive
8 - safety valve DHW
9 - expansion tank DHW
10 - check valve
11 - DHW boiler sensor
12 - DHW indirect heating boiler
13 - domestic water mixing tap
14 - output of cold tap water



1 - Electric drive of the three-way valve;
2 - Three-way valve;
A - Output to heat the DHW boiler;
B - Exit to the heating of HS;
AB - Exit the boiler.

Figure 23 - Installation of the three-way valve on a branch pipe of an exit from a copper.



Color marking of cores of a cable of the electric drive of the three-way valve:
U - red (phase, HS contour)
K - black N wire (zero)
E - white (phase circuit DHW)

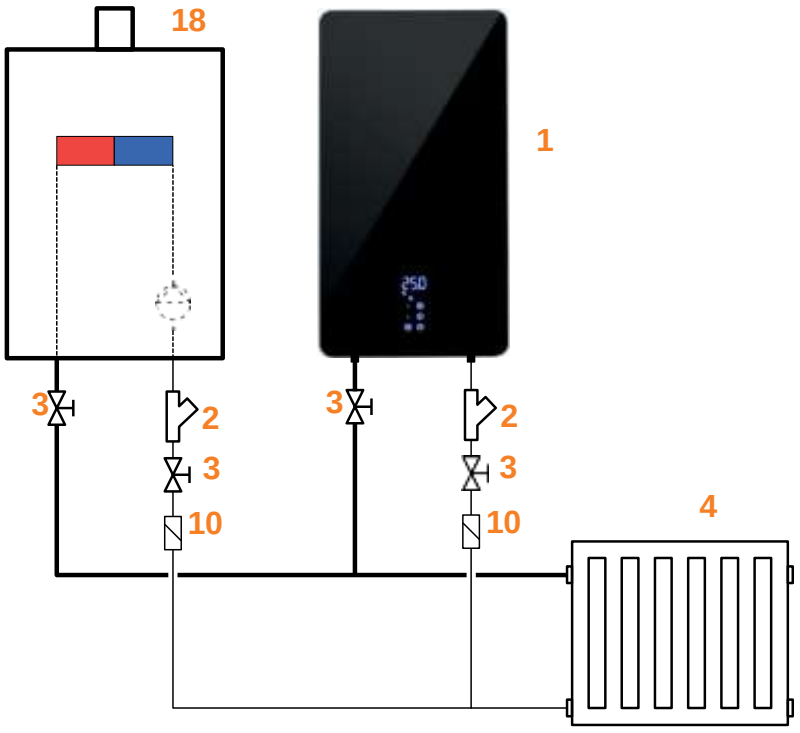
WARNING!
If the manufacturer changes the color of the wires on the connector, follow the termination of the wires with a multimeter.

Figure 24 - Electrical connection of the three-way valve drive

5.8 CONNECTING THE BOILER WITH OTHER HEAT SOURCES

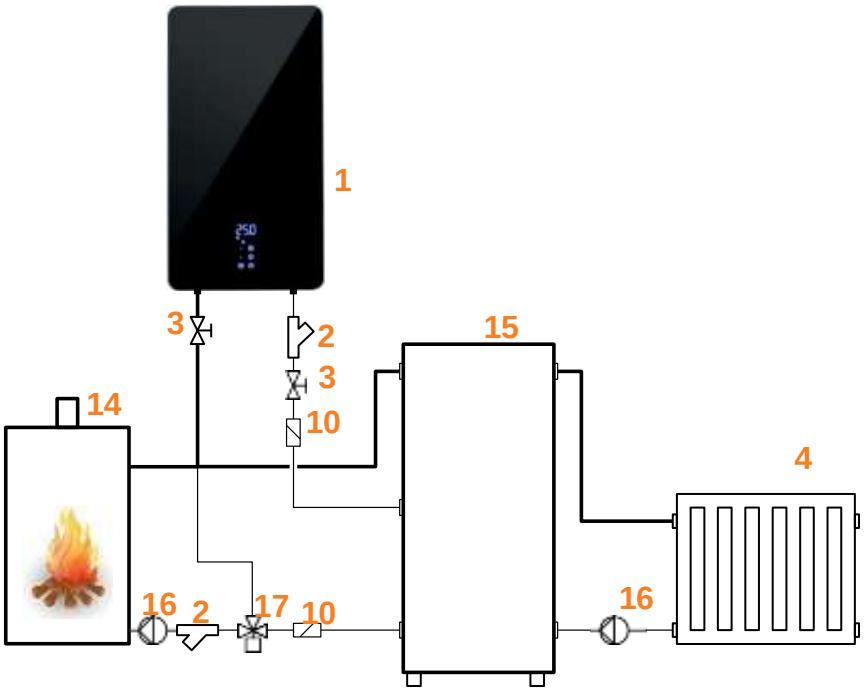
5.8.1 When connecting an ESPRO electric boiler with other heat sources (see Figure 25 - 26), the electric boiler is used as a backup heat source, for example, it can operate at night at a reduced rate of electricity tariff (if the consumer has multi-tariff metering) .

WARNING!
The diagrams shown in Figures 25-26 are not a technical design. To avoid improper functioning of the heating system, it is necessary to install and use the equipment in accordance with the technical design. To develop a project, contact a specialized project organization



1 - Electric boiler;
2 – Filter;
3 - Shut-off valve;
4 - Heating system;
10 – Check valve;
18 – Gas boiler.

Figure 25 - Wiring diagram of gas and electric boilers.



1 - electric boiler;
2 – filter;
3 - shut-off valve;
4 - heating system;
10 - check valve;
14 - solid fuel boiler;
15 - battery tank;
16 – pump;
17 – thermostatic three-way valve.

Figure 26 - Wiring diagram of electric and solid fuel boilers with a battery tank.

6. OPERATING PROCEDURE

6.1 COMMISSIONING

WARNING!
Commissioning of the boiler after its installation and connection can be carried out only by a certified specialist of an authorized service organization.

At start-up of a copper in operation the representative of service firm is obliged:
► check the position, reliable mounting and correct connection of the boiler to the mains and heating system;
► check the tightness of the boiler and all connections;
► make sure that the coolant pressure in the system is in the operating range;
► make sure that the boiler operates correctly in operating modes (see Section 5 "Operating procedure");
► instruct the user on safe operation of the boiler and its maintenance;
► fill in the commissioning certificate and warranty card, stamp and sign it.

6.2 BOILER ON / OFF

6.2.1 After commissioning the boiler (See item 5.1) the boiler is switched on and off in accordance with the requirements of this Section.
6.2.2 Power supply to the boiler is carried out from the external input circuit breaker.

WARNING!
Before switching on, make sure that the boiler is connected to the mains.

6.2.3 An external input circuit breaker must be switched on to supply power to the boiler. Then a beep sounds and the indicator button on the display lights up red. To turn on the electric boiler, you need to press the button , a beep sounds, and the backlight of the button changes color from red to white. Buttons and illuminated by 50%.
6.2.4 To switch off the electric boiler it is necessary to unlock the control panel by pressing the indicator button ,

then press the button . The boiler will stop heating by turning off all heating elements.

6.2.5 When the boiler is in standby mode (power supply is supplied, external circuit breaker is switched on), all protective functions of the boiler are active, including the "Antifreeze" function. The indicator button on the display lights up in red .

WARNING!
When the introductory circuit breaker is switched off, all protection functions, including "Antifreeze", are not active. Therefore, it is important to consider the ambient temperature. In case of risk of freezing when the power supply is switched off, it is necessary to drain the coolant from the boiler, heating system and hot water supply circuit.

6.3 SELECTING AND SETTING THE OPERATING MODE

6.3.1 After switching on from the control panel, the following boiler operating modes are available:

- ► heating mode;
- ► DHW mode;
- ► combined mode (boiler works for DHW and HS heating).

WARNING!
Water heating in the DHW indirect heating boiler is a priority mode of boiler operation. When heating the water in the DHW boiler, the heating system does not heat up!

6.3.2 The following additional functions are also provided during boiler operation:

- ► **"Antifreeze"** function;
- ► **"Anti-Legionella"** function (for a description, see the "SGV REGIME" section of this Guide);
- ► **"Pump and three-way valve protection"** function;
- ► **"Child lock"** function;
- ► **"Priority Consumer"** function (for a description, see the "Service Menu" section of this Guide);
- ► **"Boiler maximum power limit"** function (for description, see the "Service menu" section of this manual);
- ► **"Room thermostat operation"** function (for a description, see the **"HEATING MODE"** section of this manual).

6.3.3 The algorithm of the **"Antifreeze"** function is implemented as follows. The boiler controls the temperature of the coolant at the boiler outlet. When the temperature drops to +5°C, the circulation pump starts automatically, the three-way valve is moved to the "Heating system" position, and the heating of the heating system is switched on. The message **"AFr"** appears on the display. Heating continues until the temperature of the coolant at the outlet of the boiler + 30°C. After that, the heating is switched off and the message **"AFr"** disappears on the display.

WARNING!
When the "Antifreeze" function is activated, the DHW circuit heating stops automatically. At the end of the "Antifreeze" cycle, the boiler returns to its original mode.

6.3.4 The **"Pump and three-way valve protection"** function is activated if the pump and three-way valve have not been operated for 24 hours. The pump will switch on for 1 minute and the three-way valve will switch and return to its original position. When the function is activated, the message **"PPr"** (Pump Protection) appears on the display.
In case of prolonged disconnection of the boiler from the mains, it is recommended to periodically start the boiler at least once a month at regular intervals.

6.3.5 Operation of the circulation pump in any operating mode of the boiler is indicated by an indicator on the control panel.

6.3.6 Implementation of the "Child lock" function involves locking the control panel. The control panel buttons are automatically locked when switched off for 20 seconds or when the button is pressed briefly (1 second) .

6.3.7 Управління Control of operating modes and parameter settings are available from the control panel, the appearance of which is presented in Figure 3, as well as through the appendix (the operation of the program is described in Appendix 1 to this manual).

6.3.8 To unlock the control panel, press and hold the button for 5 seconds .

HEATING MODE

6.3.9 To activate the heating mode on the control panel, briefly press the button .

When switching to heating mode, the button is illuminated 100%.

6.3.10 **In the heating mode the following parameters can be set:**

- ► the temperature of the coolant at the boiler outlet is displayed by an indicator індикатором ;
- ► room air temperature (temperature sensor supplied with the boiler) is indicated by an indicator ;
- ► the value of the difference between the on and off temperatures of the boiler;
- ► Input value (contact status) "Thermostat".

6.3.11 With the active parameter **"Coolant outlet temperature"** (indicator), the boiler maintains the coolant outlet temperature set for the heating mode. Automatic switching on of the boiler heating elements occurs when the coolant temperature decreases (by default - by 5 ° C from the set temperature parameter). When the heating is switched on, the indicator lights up on the display. The heating will be switched off when the coolant temperature reaches the set value.

6.3.12 When the **"Indoor air temperature"** parameter (indicator) is active, the boiler maintains the set room air temperature in which the supplied temperature sensor is installed. Automatic activation of the boiler heating elements occurs when the room temperature decreases by 0.5 ° C (when the heating is switched on, the indicator lights up on the display).

6.3.13 Operation of the boiler in heating mode according to the value of the input (contact state) **"Thermostat"** is a priority. The boiler control unit automatically monitors the presence of a signal from the room thermostat (not included). When the temperature in the room reaches the set value, the thermostat contacts open, the boiler heating is switched off, the indicator is illuminated on the boiler display.

WARNING!
When operating the heating mode according to the parameter "Indoor air temperature" or "Thermostat", the heating temperature of the coolant at the boiler outlet is set by the parameter "Coolant temperature at the boiler outlet".
To achieve the set room air temperature, it may be necessary to adjust the coolant temperature at the boiler outlet.

6.3.14 After switching off the heating in the heating mode with the active parameter **"Room air temperature"** or **"Thermostat"**, the boiler circulation pump is switched off after 10 minutes, if no request for heating has been received during this time. Upon receipt of the request for heating, the pump will start again.

6.3.15 Changing and adjusting the heating mode parameters is done in the **"Heating settings"** menu. To enter the **"Heating settings"** menu, press and hold the button for 5 seconds. In the **"Heating settings"** menu, the button flashes when the heating mode settings are changed.

6.3.16 When the boiler is switched on for the first time, the indicator lights up in the **"Heating settings"** menu. During further operation, the last edited parameter will be displayed on the display when entering the **"Heating settings"** menu.

6.3.17 B In the **"Heating settings"** menu, the setting option is selected by pressing the buttons , . The selected parameter is illuminated and the corresponding indicator.

6.3.18 You can complete the configuration in one of the following ways:
- inactivity for 10 seconds, after which the new values are saved;
- by pressing the button for one second.

6.3.19 Setting the heating mode according to the parameter **"Coolant temperature at the boiler outlet"** is carried out in the menu **"Heating settings"**. To enter the **"Heating settings"** menu, press and hold the button for 5 seconds, after which the button starts flashing. Buttons used to select the parameter (the indicator should be illuminated, the display shows the current value of the coolant temperature). To change the value of the coolant temperature at the boiler outlet, press the button , after which the indicator starts flashing. Buttons are used to set the desired value of the coolant temperature at the boiler outlet.
The coolant temperature range is limited by the service menu settings from +30 to +80°C.

6.3.20 You can set the boiler operation according to the **"Indoor air temperature"** parameter in the **"Heating settings"** menu. To enter the **"Heating settings"** menu, press and hold the button for 5 seconds, after which the button starts flashing. Buttons used to select an option (the indicator lights up, the display shows the current value of the room temperature). To change the value of the room air temperature, press the button , after which the indicator starts flashing. Buttons are used to set the desired value of the room temperature in the range **from +10 to +30°C** (0,5°C one press). To save the **"Indoor air temperature value"** parameter, press the button for one second. To activate the heating mode according to the parameter **"Indoor air temperature value",** go to the Main menu.

6.3.21 To change the **"Boiler on and off temperature difference"** parameter, enter the **"Heating settings"** menu (button flashes, the indicator should light up, the display shows the current temperature difference value, the default value is 5°C). Press the button , after which the indicator starts flashing. Buttons are used to set the desired value of the difference between the on and off temperature of the boiler in the range **from +1 to +10°C** (1°C one press).

DHW MODE

6.3.22 To activate/deactivate the **DHW mode** (indirect heating boiler heating), briefly press the button after activating the control panel. When the **DHW mode** is on, the button is 100% illuminated.
6.3.23 In the **DHW mode** it is provided:
► the **setting of the water heating temperature** in the indirect heating boiler is displayed by the indicator;
►The on / off function of the **"Anti-Legionella"** function is indicated by the indicator.

6.3.24By default, the value of the coolant temperature at the boiler outlet for heating the DHW circuit is set +80°C. The boiler control unit controls the heating temperature in the DHW tank. When the DHW circuit heating is switched on, the indicator lights up on the display. When the set water temperature in the DHW tank is reached, the heating is switched off. When operating in combined mode, the three-way valve is automatically switched to heat the heating system.

WARNING!
The maximum value of water temperature in the boiler of indirect heating +60°C (limited to the service menu).

6.3.25 For optimal heating of water in the DHW circuit it is necessary that the temperature of the coolant at the boiler outlet was 20 - 25°C above the set value of water temperature in the boiler (see section **"Service menu"** Table 3 Parameters **P5, P8, P9**).
6.3.26 When activating the **"Anti-Legionella"** function (indicator), the boiler heats the water in the boiler of indirect DHW heating to a temperature of + 70 ° C and maintains it for 10 minutes. After that, the boiler returns to operating mode. The indicator goes out when the **"Anti-Legionella"** function expires.

WARNING!

The "Anti-Legionella" function is available after switching on the boiler regardless of the selected operating mode. When activating the "Anti-Legionella" function, the value of the coolant temperature at the boiler outlet is automatically set to +80°C, regardless of the set operating settings of the boiler in DHW mode.

WARNING!
It is forbidden to use the indirect heating boiler when activating the "Anti-Legionella" function! Risk of thermal burns due to high temperature of water heating in the boiler of indirect heating of DHW (up to +70°C). Take all measures to prevent thermal burns. Always open the cold water tap first, then gradually add hot water.

6.3.27 You can activate the **"Anti-Legionella"** function (indicator) in the **"DHW settings"** menu. To enter the DHW settings menu, press and hold the button for 5 seconds, after which the button starts flashing. Buttons used to select the parameter (the indicator should light up, the display shows the current status of the **"On"/"Off"** parameter). To turn on the **"Anti-Legionella"** function, press the button after which the indicator starts flashing. Use the buttons to select the status of the **"On"** parameter.
To forcibly disable **the "Anti-Legionella"** function in the **"DHW settings"** menu with the buttons, you can select the status of the **"Off"** parameter.
6.3.28 Changing and adjusting the **DHW mode** parameters is performed in the "DHW settings" menu. To enter the **DHW settings** menu, press and hold for 5 seconds. In the **"DHW settings"** menu, the button flashes when the mode settings are changed.
6.3.29 When entering the **DHW settings** menu, the display will show the last parameter edited.
6.3.30 In the **"DHW settings"** menu, the setting parameter is selected by pressing the buttons. The selected parameter is illuminated by the corresponding indicator.
6.3.31 You can complete the configuration in one of the following ways:
- inactivity for 10 seconds, after which the new values are saved;
- by pressing the button for one second.

6.3.32 You can change the value of the parameter **"Water heating temperature in the indirect heating boiler"** (indicator) in the menu **"DHW settings"**. To enter the **DHW settings** menu, press and hold the button for 5 seconds, after which the button starts flashing. Buttons are used to select the parameter (the indicator lights up, the display shows the current value of the water temperature in the indirect heating boiler). To change the value of the water temperature in the tank, press the button, after which the indicator starts flashing. Buttons are used to set the desired value of the water temperature in the tank in the range **from +30 to +60°C**.

6.6 VIDEO INSTRUCTIONS

6.6.1 In order to get acquainted with the correct method of boiler control, please follow the QR code to view the video instructions.

6.6.2 To connect the application correctly, please follow the QR code to view the video instructions.

6.6.3 If you have difficulties connecting the application, please follow the QR code to view the video instructions for resetting the WI-FI module to factory settings..

7 MAINTENANCE

7.1 To ensure long-term, safe and comfortable operation, the user must ensure the maintenance of the boiler in accordance with the requirements of this section. The list of boiler maintenance operations is given in Table 6.

WARNING!
The manufacturer recommends concluding a service contract with specialized organizations that are authorized representatives of S PLUSZ K TECHIK KFT.

DANGEROUSLY!
There is a risk of electric shock when in contact with live parts!
Before carrying out maintenance work, the boiler must be switched off.

WARNING!
Water and moisture on the boiler control panel can damage the electrical equipment.
Prevent moisture and water from getting on the control panel and the boiler body.
Before starting work on the boiler hydraulics, close the shut-off valves in front of the boiler and drain the water from the boiler.

7.2 With frequent addition of coolant, the heating system may fail due to corrosion and scaling.
7.3 The manufacturer is not responsible for untimely, poor quality and improper maintenance.

Table 4 - Service parameters.

Parameter	Parameter description	Parameter value	Status description (values)	Factory settings	Note
P1.	Forced pump activation	0	Pump off	**0**	
		1	Pump on		
P2.	Position of the three-way valve	0	The three-way valve is switched off	**0**	When the pump is switched on (**P1 = 1**), the three-way valve automatically switches to the "DHW mode" position (**P2 = 1**).
		1	Valve in position "mode DHW "(~ 220 V at terminal **"S-A")**		
		2	The valve is in the "heating mode" position (~ 220 V at the terminal **"S-B"**)		
P3.	Duct indication		The actual value of the coolant flow in the boiler, l/min is displayed	**-**	
P4.	Limiting the maximum power of the boiler in heating mode	1 ... 3	The maximum value of parameter **P4.** corresponds to the number of heaters installed in the boiler The number on the display indicates the number of heating elements active in the heating mode	**3**	for boiler capacity 4,5 kW
		1 ... 6		**6**	for boiler capacity 6-18 kW
		1 ... 9		**9**	for boiler capacity 21 i 24 kW
P5.	Limiting the maximum power of the boiler in DHW mode	1 ... 3	The maximum value of parameter **P5**. corresponds to the number of boilers installed in the boiler. The number on the display indicates the number of active heaters in the DHW mode.	**3**	for boiler capacity 4,5 kW
		1 ... 6		**6**	for boiler capacity 6-18 kW
		1 ... 9		**9**	for boiler capacity 21 i 24 kW
P6.	Boiler power limitation in all modes (heating and DHW) in the presence of the signal "Priority consumer"	0 ... 3	The value of parameter **P6**, **other than "0"**, corresponds to the number of active heaters. The value of parameter **P6** cannot be greater than the values set in parameters **P4 and P5**	**3**	for boiler capacity 4,5 kW
		0 ... 6		**6**	for boiler capacity 6-18 kW
		0 ... 9		**9**	for boiler capacity 21 i 24 kW
P7.	The maximum value of the coolant temperature at the boiler outlet in the heating mode of the heating system	30 ... 80	Setting the maximum temperature in the range **from +30 to + 80°C**	**80**	
P8.	The maximum value of water temperature in the boiler of indirect heating in the DHW mode	30 ... 60	Setting the maximum temperature in the range **from +30 to + 60°C**	**60**	
P9.	The maximum value of the coolant temperature at the boiler outlet in DHW mode	30 ... 80	Setting the maximum temperature in the range **from +30 to + 80°C**	**80**	The value of **P9** should be greater than the value of **P8** by **20-25°C**
P10.	Reset to factory settings	0	When the value **P10. = 1** is set, it is reset to the factory settings	**0**	
		1			
P11.	Reset Wi-Fi to factory settings	0	When the value **P11. = 1** is set, it is reset to the factory settings Wi-Fi boiler module.	**0**	
		1			

7.4 POSSIBLE FAULTS

7.4.1 The list of possible faults and actions of the user at their detection are given in Table 5.

7.4.2 In the event of a fault, the boiler signals an error by switching on the **"EMERGENCY"** indicator on the control panel, the fault code is shown on the display (see Table 5).

7.4.3 Troubleshooting, repair of the boiler should be carried out by an authorized service specialist.

WARNING!
The manufacturer recommends concluding a service agreement with specialized organizations that are authorized representatives of TEKNIX.

7.4.4 The list of faults listed in Table 5 covers typical faults that may occur during operation. The list does not include damage caused by negligent handling or operation in conditions resulting from:
- mechanical, chemical or thermal effects obtained during operation;
- misuse of the boiler;
- non-compliance with the requirements of this Manual.

Table 5 (1 part) - List of possible faults.

Fault description	Error code	Possible reason	Troubleshooting	Note
A current leak was detected	**E1**	Violation of the integrity of the insulation	- Disconnect the boiler power supply by switching off the external automatic boiler power switch; - Contact an authorized service center.	If error E1 occurs, there is a high risk of electric shock. It is forbidden to use the boiler until the error E1 is eliminated!
Violation of water flow through the boiler	**E2**	Pump malfunction	- Check the open position of the shut-off valves of the heating system and the DHW circuit; - Check and clean the filter rough cleaning in front of the boiler circulation pump; - Visually check the heating system and DHW circuit for the absence of coolant leakage; - If necessary, fill the system with coolant to the recommended pressure of 1.2 -1.5 bar (control of coolant pressure is carried out according to the readings of the boiler manometer); - Check the serviceability of the air vents of the heating system; - If necessary, remove air from the heating system; Contact an authorized service center	It is recommended that you use a service center to troubleshoot parameters P1, P2, P3. When diagnosing a fault, the boiler must be switched off and on again
		The flow of water through the boiler is less than 3.7 l / min		
		Duct sensor malfunction		
		Coolant leak		
		The presence of air in the system heating, malfunction automatic air vent		
Error of the coolant Temperature sensor at the boiler outlet	**E3**	No connection sensor with unit boiler control Fault sensor	Contact an authorized service center	**Until the error is corrected E3 enjoy boiler is prohibited!**
Temperature sensor error	**E4**	No connection sensor with unit boiler control	Contact an authorized service center	When an **E4** error occurs the boiler continues work.

Table 5 (Part 2) - List of possible faults.

Fault description	Error code	Possible reason	Troubleshooting	Note
Error of the water temperature sensor in the boiler of indirect DHW heating	**E5**	There is no connection between the sensor and the boiler control unit	Contact an authorized service center	При появі помилки **E5** , котел продовжує працювати тільки в режимі опалення
		Sensor malfunction		
Overheating (coolant temperature in the boiler is more than + 90°C)	**E6**	Control unit malfunction	· Check the condition of the filter in front of the boiler; - Contact an authorized service center	При появі помилки **E6** нагрівання припиняється. Помилка **E6** автоматично зникне при охолодженні теплоносія до температури + 65°C
Absence remote management boiler	**E7**		Check your WI-FI connection	
There is no indication on the control panel, including the button is not lit.	-	No power supply voltage	· Check for mains voltage;	
		An emergency overheat thermostat was triggered in the boiler	· Check the on position of the external input circuit breaker; · Check the condition of the boiler power cable for breakage and damage;	
		The safety fuse in the boiler control unit has tripped	· Contact an authorized service center	
The boiler does not reach the set mode parameters	-	Incorrect boiler operating mode settings are set	· Check the correct settings of the selected mode;	
		Failure of heating elements	- Check the compliance of the boiler capacity of the project;	
		Control unit malfunction	- Contact an authorized service center	
		Insufficient boiler power	Contact an authorized service center	

7.6 COMBINED MODE

7.6.1 In the combined mode, the boiler heats both DHW and HS, with priority DHW.

7.6.2 To activate the combined mode, it is necessary to switch on the heating mode, and then the DHW mode by briefly pressing the corresponding buttons on the control panel and after activating the control panel. When working in combined mode, the buttons are backlit 100%. In the combined mode, the display alternately shows the HS temperature and the water temperature in the DHW boiler.

7.6.3 HS and DHW heating parameter settings are described in the relevant sections of this Manual ("heating mode" and "DHW mode").

7.7 SERVICE MENU

7.7.1 There are eleven parameters in the service menu, which are described in Table 4.

WARNING!
It is recommended to agree on changes in the service menu settings with the service department.

7.7.2 To enter the service menu, switch off the button to highlight it by 50% and press the button for 5 seconds To exit the service menu, press the button for one second.

AWARNING!
It is possible to enter the service menu only when the heating modes, DHW and anti-legionella functions are switched off.

7.7.3 After entering the service menu, select the option with the buttons , The selected parameter is shown on the display. Change the value of the parameter by pressing the button .

7.7.4 Service parameters **P1. "Forced pump activation"** and **P2. "Provisions of the three-way valve"** are applied at check of work (adjustment, the first start at commissioning) and maintenance of a copper. When changing the value of parameter **P2**. there is a forced switching of the three-way valve to the mode of DHW or heating.
When exiting the service menu, parameters **P1**. and **P2**. are reset to factory settings (see Table 4).

WARNING!
Parameter P1. can be used only if the boiler heat exchanger is filled with coolant with an excess pressure of at least 1.2 bar..

7.7.5 Сервісний Service parameter **P3. "Indication of a channel"** is applied at check of work (adjustment, the first start at commissioning) and maintenance of a copper. Parameter **P1.1** must be set to display the coolant flow value in the boiler. When the value of parameter **P2.1**, parameter **P3**. reflects the actual value of the coolant duct in the DHW circuit; when the value of parameter **P2.2**, parameter **P3**. reflects the actual value of the coolant duct in the heating circuit.

7.7.6 Parameters **P4.** and **P5**. are designed to implement the function **"Limit the maximum power of the boiler"** and allow you to programmatically reduce the maximum power of the boiler for heating the heating system and DHW according to the needs or wishes of the user. When activating the function, the boiler control unit allows the operation of such a number of heating elements, which is set by parameter **P4**. for heating mode and parameter **P5**. for DHW mode (see Table 4).

7.7.7 Parameter **P6**. designed to implement the function of **"Priority Consumer"**. The **"Priority Consumer"** function allows you to automatically limit the power of the boiler when an external signal is received on the boiler control board.
When activating the **"Priority Consumer"** function, the boiler power will be limited by the value of parameter **P6.** (see Table 4). The value of parameter **P6** cannot be greater than the values set in parameters **P4**. and **P5**.
When the **"Priority User"** function is activated, the message **"PU"** (Priority User) will be displayed.
After opening the contacts of the **"Priority Consumer"** device, the message **"PU"** disappears from the display, the boiler returns to operation with the previously set maximum power parameters.
The **"Priority Consumer"** connection is described in Section 4.6 of this Guide.

Table 6 - List of maintenance operations

Maintenance operation	Frequency of holding	Performer	Note
1. Visual control of a condition of a copper, heating systems for existence of leaks, control of pressure of the heat carrier in heating system according to indications of the manometer of a copper	Regularly during operation	Boiler user	If necessary, fill the system with coolant to the recommended pressure of 1.2. 1.5 bar. Follow the requirements presented to the coolant, set out in this Guide
2. Cleaning the boiler body	As pollution	Boiler user	Clean with a soft cloth. The use of household cleaners that do not contain aggressive components is allowed
3. Comprehensive inspection of the technical condition of the boiler	Once a year before the heating season	Service specialist	 The service specialist is obliged to make notes on the maintenance in the relevant section of the Operation Manual
- visual inspection of internal parts and components of the boiler, the state of insulation and the absence of damage			
- check of serviceability of heating elements, if necessary their clearing of a scum			
- check the operation of the pump			
- check of reliability of fastenings of demountable electric connections, to carry out tightening of screw connections			
- grounding condition check			
- checking and adjusting the air pressure (nitrogen) in the expansion tank			
- control of coolant in the system			
- antifreeze condition monitoring (if available)			
- очищення фільтра грубої очистки			
- checking the efficiency of the boiler in all modes			
4. Elimination of damages detected during a comprehensive inspection of the technical condition of the boiler	If necessary	Service specialist	

8 TRANSPORTATION AND STORAGE

8.1 The boiler is delivered in factory packaging
8.2 Transportation of the boiler may be carried out in factory packaging by any mode of transport, provided that mechanical damage, precipitation and exposure to electromagnetic fields are prevented in compliance with the rules and requirements applicable to these modes of transport.
8.3 Prior to transport, make sure that there is no damage to the packaging and completeness.
8.4 Graphical marking on the handling of goods according to ISO 780.
8.5 Uninstalled boiler should be stored in the manufacturer's packaging, indoors with a non-aggressive environment and low dust, while ensuring natural air circulation, at a temperature of +5 to + 55°C, relative humidity up to 70%, without possible shocks and vibrations.

9 DISPOSAL

9.1 Disposal of packaging is carried out in accordance with local regulations for the disposal of packaging materials.
9.2 This product contains materials that can be recycled..
9.3 After the end of the product's service life, it is recommended to sort the boiler components and send them for recycling or disposal.
9.4 Waste management - in accordance with current legislation.

10 WARRANTY OBLIGATIONS

Manufacturer "S Plusz K Technik Kft", Vay Adam Krt. 4-6 / 2 Em.208 N-4400 Nyíregyháza, Hungary ("S Plusz K Technik Kft", Vay Adam Krt. 4-6 / 2 Em. 208 H-4400 m. Nyiregyhaza, Hungary).

10.1. The manufacturer guarantees the compliance of the boiler with the requirements of the specified normative documents, provided that the consumer complies with the rules set out in this Manual.
10.2. The date of manufacture of the boiler is indicated on the package.
10.3. The warranty period of the boiler is 24 months.
10.4. The service life of the boiler is 8 years. The manufacturer guarantees the possibility of using the product for its intended purpose during its service life, provided that the requirements of this Manual for operation and annual maintenance are met.
10.5. During the warranty period, the consumer has the right to free repair of the boiler and its components..

The consumer loses the right to warranty service, and the manufacturer is not responsible in the case of:

- lack of stamp of the trade organization, date of sale and signature of the seller;
- lack of consumer signature on familiarization with warranty obligations;
- no mark on the commissioning of the boiler;
- no connection of the boiler to the ground circuit;
- violation of the rules of operation, maintenance, transportation and storage of the boiler;
- lack of a mark on the annual scheduled maintenance;
- misuse of the boiler;
- changes in the design, completion of the boiler;
- clogging of the heat exchanger as a result of the formation of limescale and mechanical contaminants and the heating system;
- Violation of other requirements of this Guide.

If the boiler was operated in violation of the rules or the consumer did not follow the recommendations of the company performing warranty service of the boiler, the repair is carried out at the expense of the consumer.
10.6. The boiler is accepted for warranty repair at the request of the consumer (with contact information) only in the original packaging and with the Operation Manual (original with the appropriate marks in the coupons)
In case of boiler failure, the manufacturer is not responsible for other elements of the system, the technical condition of the facility as a whole, in which the boiler is used, as well as for the consequences.
A product that has lost its appearance due to the fault of the consumer is not subject to exchange and return under warranty.
10.7. FIRST UKRAINIAN DISTRIBUTION LIMITED LIABILITY COMPANY is a company that provides warranty service, as well as accepts complaints and suggestions.

11 WARRANTY COUPON

The boiler is heating **ESPRO**-_____

Factory number_____

the date of manufacture is indicated on the boiler nameplate.

Producer:
«S Plusz K Technik Kft»,
Vay Adam Krt. 4-6 / 2 Em.208 H-4400
Nyiregyhaza, Hungary

TO BE COMPLETED BY THE SELLER

seller_____

(name of enterprise, organization, legal address)

_____

date of sale_____ Price _____

(Number, month, year)

_____ _____

(Name of the responsible person-seller) (signature)

The buyer is acquainted with the warranty obligations and the Operation manual:

_____ _____ _____

(Full Name) (Signature) (Number, month, year)

12 REQUIREMENTS FOR ECO-DESIGN

12.1 General description of the product and its likely use
12.1.1 Recommended use and specifications are listed in sections 1 and 4, installation instructions in section 5, operational requirements in section 6 and maintenance in section 7. The electric boiler meets the requirements of 2009/125/EC, (EU) No. 811/2013 and (EU) No. 813/2013,
12.1.2 Environmental recommendations.
An electric boiler is a device that has very high power currents/power, while it allows you to adjust the temperature in the room to a degree. Which in turn will allow to save energy resources as efficiently as possible.
The first thing to pay attention to is the preparation of the room. It is recommended to conduct an ENERGY AUDIT. This will minimize heat loss and allow us to use our product in a more economical mode. The power of the electric boiler should exceed the calculated value of heat loss by approximately 10%. If you are going to heat water with it, by including an indirect heating boiler in the heating system, these energy costs should also be taken into account.
In order to choose an electric boiler based on power, a preliminary calculation of the heat loss of the house is made for this purpose. For example, if the area of the house is 100 square meters, then the losses will be 100 W (10 kW) per 1 square meter. (this is at an average and lower than average insulation parameter). Thus, to cover heat losses of 10 kW, you need to buy an electric boiler with a capacity of at least 10 kW. Thus, the choice of the power of the electric boiler is influenced by the area of the house (Table 1).") However, if the insulation is above average, you can safely proceed from the calculation of 1 kW of boiler power for 12-15 sq.m. heating area of the room. When choosing an electric boiler by capacity, it should be taken into account that the power consumption is recorded in the technical data sheet of the product without taking into account the individual characteristics of the room (insulated walls, panoramic windows, no heat loss through the floor, residential or non-residential premises, etc.). So, in order to be satisfied, when choosing the power of an electric boiler, you need to take into account the individual characteristics of the room.
Electric boilers of modern models have smooth and stepwise power regulation. In boilers with independent heating elements, step regulation is used. Electric boilers containing a heating element have smooth power regulation. Smooth adjustment of power makes it possible to save more energy, and therefore the efficiency of these boilers is, as a rule, higher than that of similar models with stepped power regulation.
Table 7

Area of the premises (sq. m)	Power, (kW)
35-45	4,5
45-60	6
60-75	7,5
75-90	9
90-120	12
120-150	15
150-180	18
180-210	21
210-240	24

12.2 Measurements and calculations
1. In order to ensure compliance and verify the compliance of space heaters and combined heaters with the requirements of the Technical Regulation on Ecodesign Requirements for Space Heaters and Combined Heaters (hereinafter referred to as the Technical Regulation), measurements and calculations are carried out using standards from the list of national standards, compliance with which provides a presumption compliance of room heaters and combined heaters with the requirements of the Technical Regulations using reliable, accurate and reproducible methods that take into account generally recognized modern methods. The specified methods must comply with the conditions and technical parameters set forth in directives 2009/125/EC, (EU) No. 811/2013 and (EU) No. 813/2013, the methods are partially based on the normative documents EN 50564, EN 12975-2 and in procedure below.
General conditions for measurements and calculations
- for the measurements set out in points 2-5 of this appendix, the temperature inside the room should be equal to 20°C ± 1°C;
- for the calculations set out in points 3-5 of this appendix, the electricity consumption is multiplied by the conversion factor CC = 2.5;
- emissions of nitrogen oxides are measured as the sum of nitrogen monoxide and nitrogen dioxide in terms of nitrogen dioxide;
- for heaters equipped with additional heaters, the additional heater must be taken into account when measuring and calculating nominal thermal power, seasonal energy efficiency (efficiency) of space heating, energy efficiency (efficiency) of water heating, sound power level and emissions of nitrogen oxides;
- declared values of nominal thermal power, seasonal energy efficiency (efficiency) of space heating, energy efficiency (efficiency) of water heating, sound power level and oxide emissions must be rounded to the nearest whole number;
- each heat generator intended for a heater and each heater housing equipped with such a heat generator must be tested with a suitable heater housing and heat generator respectively.
Seasonal space heating energy efficiency (SEE) for space heaters based on heat pumps and combination heaters based on heat pumps.
To establish the nominal efficiency COPrated or the nominal coefficient of primary energy PERra te d , the level of sound power or emissions of nitrogen oxides, the operating conditions must be the standard nominal conditions specified in table 3 of this appendix; the same conditions apply to the declared thermal power.
The seasonal efficiency factor in heating mode SCOPon or the coefficient of primary energy in heating mode SPERon is calculated based on the partial heating load Ph{Tj\ auxiliary heat output sup(Tj) (if applicable) and the specific coefficient of efficiency of bin COPbin(Tj) or the coefficient of primary bin energy PEPip (T^, calculated in bin-hours for which the bin conditions apply, using the following parameters:
reference calculation conditions specified in table 4 of this appendix;

reference heating season under typical climatic conditions specified in table 5 of this appendix;
the impact of the decrease in energy efficiency caused by switching the equipment on and off, depending on the type of heat transfer regulation (if applicable).
The reference annual heating demand QH is calculated as the product of the design heating load Pdesig n h and the reference annual heating time in the heating mode HNE = 2,066 hours.
The annual energy consumption QHE is calculated as the sum of the ratio of the reference annual heating demand QH to the seasonal efficiency factor in the SCOPon heating mode or the primary energy factor in the SPERon heating mode and the energy consumption in the off mode, the thermostat off mode, the standby mode and the operating mode the crankcase is heated;
The seasonal coefficient of useful performance SCOP or the seasonal coefficient of primary energy SPER is calculated as the ratio of the reference annual heating demand QH to the annual energy consumption QHE.
The seasonal energy efficiency of space heating T]s is calculated as the ratio of the seasonal coefficient of useful action SCOP to the conversion coefficient SS, or as the seasonal coefficient of primary energy SPER with corrections for thermostats and for the consumption of electricity from one or more pumps for groundwater (for space heaters based on thermal pumps with heat transfer from water or salt solution and combined heaters based on heat pumps).
12.3 Description of all components of the electric boiler in accordance with the directive 2009/125/EC, related components and materials during the entire period of operation, which are important from the point of view of impact on the environment/consumer,
- air vent – the main task is to release excess pressure from the system, it serves as a fuse; does not pose a danger to the user/installer if the recommendations given in the operating instructions are followed (regarding the recommended fluid of the heating system, installation, maintenance); Cannot be reused after the expiration date!
- housing – the material of the housing is certified by the supplier, resistant to ultraviolet light and mechanical wear, safe during the entire period of operation, does not contain harmful substances, is not toxic; Cannot be reused after the expiration date!
- Control unit – intended for remote control (interaction with the device via remote control and/or interactive display); Cannot be reused after the expiration date!
- Terminal block - the block protects the consumer from contact with open conductors, the insulation capabilities are 1.5 times higher than the breakdown voltage, the location in the case guarantees minimal exposure to ultraviolet light. Cannot be reused after the expiration date!
- safety valve - does not pose a danger, maintenance is required before the start of the heating season; Cannot be reused after the expiration date!
- circulation pump – built into the device, the possibility of accidental contact with the environment/consumer is minimal, maintenance is required before the beginning of the heating season, including maintenance of the liquid filter; Cannot be reused after the expiration date!
- Couplings for the introduction of sensors and power cable - the block protects the consumer from contact with exposed conductors, the insulating capabilities are 1.5 times higher than the breakdown voltage, the location in the housing guarantees minimal exposure to ultraviolet rays. Cannot be reused after the expiration date!;
- Heating elements (HEATERS) – protected by insulating elements, the housing is connected to protective grounding, it is recommended to check the grounding system before the start of the season/installation/use.
- Insulating elements – only materials certified by the supplier are used, resistant to ultraviolet light and mechanical wear, safe during the entire period of operation, does not contain harmful substances, is not toxic; Cannot be reused after the expiration date!
12.4 Environmental aspects
- air vent - release of excess pressure from the heat exchanger bulb, exchange of air with the environment;
- casing – protection of internal parts of the boiler from the environment;
- Control unit – interaction with the consumer through the control system;
- Terminal block - interaction with the consumer during maintenance (at least 2 times a year)
- safety valve – release of excess pressure from the heat exchanger bulb, exchange of air with the environment;
- circulation pump - interaction with the heating system.
- Couplings for the introduction of sensors and power cable - goes beyond the body and can contact the consumer directly, accidental contacts or during maintenance;
- Heating elements (heating elements) are the largest consumer of boiler electricity.
- Insulating elements.
12.5 ISO 9001/45001 quality system has been implemented in production.
a) Including:
- incoming inspection of components from suppliers of spare parts and/or materials;
- storage/registration of materials and their transfer to the warehouse;
- Delivery from the warehouse and intermediate checks of components;
- Production and assembly is performed by personnel who have experience and competence (competence confirmed by training, permits and instructions at workplaces);
- After assembly and packaging, the electric boiler is transferred to the output control production unit. 100 products are tested in accordance with the ISO 9001 and ISO 45001 quality system (insulation resistance, integrity of grounding, output electrical parameters, functional test, operability of connecting control elements, completeness and correctness of labeling on the device and packaging, compliance of the device with the terms of the contract)
b) Environmental parameters in accordance with 2009/125/EC, (EU) No. 811/2013 and (EU) No. 813/2013

Tab. 8 Eco parameters

Characteristic	symbol	unit of measurement	ESPRO 4,5	ESPRO 6	ESPRO 7,5	ESPRO 9	ESPRO 12	ESPRO 15	ESPRO 18	ESPRO 21	ESPRO 24
Device type	-	-	5 kW	6 kW	8 kW	9 kW	12 kW	15 kW	18 kW	21 kW	24 kW
Rated heat output	P_r	kW	4,5	6,0	7,5	9,0	12,0	15,0	18,0	21,0	24,0
Seasonal Energy Efficiency	η_{sh}	%	82	82	82	82	82	82	82	82	82
Energy saving class	-	-	C/B	C/B	C/B	C/B	C/B	C/B	C/B	C/B	C/B
Useful heating capacity (at rated	P	kW	4,46	5,94	7,43	8,91	11,88	14,85	17,82	20,79	23,76

heating capacity during use at high temperatures)											
Efficiency (at rated heating output during use at high temperatures)	Ƞ	%	99	99	99	99	99	99	99	99	99
Additional current consumption in standby mode	P_1	kW	0,004	0,004	0,004	0,004	0,004	0,004	0,004	0,004	0,004
Heat loss in standby mode	P_2	kW	0,105	0,105	0,105	0,105	0,105	0,105	0,105	0,105	0,105
Sound power level	L	dB(A)	40	40	40	40	40	40	40	40	40
Maximum current of the automatic switch, A											
Protection Current											
Maximum outlet temperature, 0C											

12.6 Algorithms used in compliance with environmental requirements set forth in directives 2009/125/EC, (EU) No. 811/2013 and (EU) No. 813/2013, the methods are partly based on the normative documents EN 50564, EN 12975-2 and in the procedure below.

Ƞs =SCOP/CC

SCOP=QH/QHE

QH= Pdesignh*HHE

Ƞs = (Pdesignh*HHE) /(CC* QHE)

Table 8 Water heating load profiles for ESPRO-4,5 combined heaters

No. pp	Controlled parameter	Result
ESPRO-4,5		
1	Number of hours / day for 1 year, hours	8760
2	Number of cold hours	4910
3	Number of warm days/h	3850
4	Sound power level, max dBA	40
5	Losses of heat (electricity) in the state of readiness, kW	0,105
6	Power of the sample in idle mode, kW	0,055
7	Pump power, kW	0,05
8	Peak power at maximum heating, kW	4,5
9	The number of heating elements	6
10	Power in heating mode, kW	0,75
11	Power consumption during the day, kW	21,46
12	Power consumption during the cold period, kW	4390,36
13	Consumption in standby mode during the warm period, kW	19,25
14	Total consumption for the year, kW	4409,61
15	Seasonal energy efficiency of space heating.Ƞs	82
16	Energy efficiency class	C/B

The root of the detachable coupon for commissioning

(Name of organization, legal address)

PP

(signatu

(Master last name)

(Number, month,

BREAKDOWN

Producer:: «S Plusz K Technik Kft»,
Vay Adam Krt. 4-6 / 2 Em.208 H-4400 Nyiregyhaza, Hungary

COMMUNICATION COUNTER
filled in by the contractor

Heating boiler ESPRO- _____

Factory number _____
The date of manufacture is indicated on the boiler nameplate

The boiler is installed at the address _____

_____

Consumer (name) _____

Contact phone of the Consumer _____

1) Commissioning:

_____
(name of enterprise, organization, legal address))

_____

_____

_____ _____
(position, surname, name, patronymic of the performer) (signature)

- Mains voltage "L1" _____ V, "L2" _____ V, "L3" _____ V.
- Grounding act № _____, date ___ _____ 20 ___ .
- Water pressure in the heating system_____ bar.
- Maximum current of the cut-off circuit breaker_____ A.

Date of commissioning_____
(date, month, year)

2) Connection to the mains and instruction on boiler operation:

_____
(name of enterprise, organization, legal address)

_____

_____

_____ _____
(position, surname, name, patronymic of the performer) (signature)

3) Instruction was carried out, the consumer is acquainted with the rules of operation of the boiler

_____ _____ _____
(Name) (Signature) (Number, month, year)

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ACCOUNTING OF WORKS ON WARRANTY REPAIR

Date	Description of shortcomings	The content of the work performed, the name and type of replaced components, components	Artist's signature with transcript

The warranty period has been extended to 20___.

_____ _____

(surname, name, patronymic of the responsible person-executor) (signature)

PP

Signature of the consumer confirming the performance of works

_____ _____ _____

(Full name) (signature) (Number, month, year)

ACCOUNTING OF WORKS ON PLANNED MAINTENANCE

Date	Mark of performance of works		Full name of the specialist	Signature
	technical condition of the boiler	grounding condition		

The root of the detachable coupon for warranty repair within 24 months of the warranty period

PP _____ (Name of organization, legal address)

_____ (Master last name)

_____ (signatu

_____ (Number, month,

BREAKDOWN

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Adam Krt. 4-6 / 2 Em.208 H-4400 Nyiregyhaza, Hungary

COUPON № 1

for warranty repair of the boiler within 24 months of the warranty period

Heating boiler ESPRO- _____

Factory number _____

The date of manufacture is indicated on the boiler nameplate

to be filled in by the seller

seller _____

(name of enterprise, organization, legal address)

_____

date of sale _____

(Number, month, year)

(Surname of the responsible person-seller) _____ (signature) _____

PP

TO BE COMPLETED BY THE CONTRACTOR

Performer

_____

name of enterprise, organization, address

Reason for repair.
Name of the replaced component, component:

_____

_____

_____

_____

_____

_____

_____

Date of repair: _____
(Number, month, year)

_____ _____

(surname, name, patronymic of the responsible person-executor) (signature)

PP

Signature of the Consumer,
confirming the performance of works
on warranty repair _____ _____
(signature) (date)

BREAKDOWN

The root of the detachable coupon for warranty repair within 24 months of the warranty period

PP _____ (Name of organization, legal address)

_____ (Number, month,

BREAKDOWN

_____ (Master last name)

_____ (signatu

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COUPON № 2

for warranty repair of the boiler within 24 months of the warranty period

Heating boiler ESPRO- _____

Factory number _____

The date of manufacture is indicated on the boiler nameplate

to be filled in by the seller

seller _____

(name of enterprise, organization, legal address)

_____

date of sale _____

(Number, month, year)

(Surname of the responsible person-seller) _____ (signature) _____

PP

TO BE COMPLETED BY THE CONTRACTOR

Performer

_____
name of enterprise, organization, address

Reason for repair.
Name of the replaced component, component:

_____

_____

_____

_____

_____

_____

_____

Date of repair: _____
(Number, month, year)

_____ _____
(surname, name, patronymic of the responsible person-executor) (signature)

PP

Signature of the Consumer,
confirming the performance of works
on warranty repair _____ _____
(signature) (date)

BREAKDOWN

The root of the detachable coupon for warranty repair within 24 months of the warranty period

(Name of organization, legal address)

PP

(Master last name)

(signatu

(Number, month,

BREAKDOWN

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Adam Krt. 4-6 / 2 Em.208 H-4400 Nyiregyhaza, Hungary

COUPON № 3

for warranty repair of the boiler within 24 months of the warranty period

Heating boiler ESPRO- _____

Factory number _____

The date of manufacture is indicated on the boiler nameplate

to be filled in by the seller

seller _____

(name of enterprise, organization, legal address)

_____

date of sale _____

(Number, month, year)

(Surname of the responsible person-seller) _____ (signature) _____

PP

TO BE COMPLETED BY THE CONTRACTOR

Performer

_____
name of enterprise, organization, address

Reason for repair.
Name of the replaced component, component:

_____

_____

_____

_____

_____

_____

_____

Date of repair: _____
(Number, month, year)

_____ _____
(surname, name, patronymic of the responsible person-executor) (signature)

PP

Signature of the Consumer,
confirming the performance of works
on warranty repair _____ _____
(signature) (date)

BREAKDOWN

VERSION 2.1

PRODUCER:
«S Plusz K Technik Kft»
Vay Adam Krt. 4-6 / 2 Em.208 H-4400 M.
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