Operating instructions of wood burning boilers

This instruction contains important information for safe and competent installation, commissioning, service and maintenance of solid fuel boilers Balkan Energy and Balkan Energy P series.

The installation and maintenance instructions are aimed at specialists who, based on specialized education and experience, have knowledge in handling heating installations.

The boiler service information is aimed at the user of the installation and is labeled accordingly.

Training on the specific features and requirements of the product, aimed at specialists authorized to carry out service activities, is conducted by the manufacturing plant.

The training of the end user (the user of the boiler) on use, cleaning and the necessary operational activities is carried out by the service specialist who installed the facility.

1. Explanation of symbols used

	Warnings shall be written in an enclosed field, on a gray background and shall be indicated by a triangle and an exclamation mark.

	In case of danger due to electric current, the exclamation point is replaced by the lightning symbol.

	Important information that does not pose a danger to people or property is marked with the symbol shown and surrounded by lines, below and above the text.

Instructions for the heating specialist

Country-specific regulations and standards must be observed during installation and operation:

• local building regulations for placement, combustion air supply and exhaust, and chimney connection.

• The regulations and norms for equipping the heating installation with safety equipment.

Instructions for the installation room

	DANGER: from poisoning. Insufficient air flow in room air-dependent mode operation can lead to dangerous exhaust gas leak. - Make sure that the intake and exhaust air openings are not reduced or closed. - If you do not remedy the faults immediately, the boiler must not be operated. - Provide a written instruction to the user of the installation regarding this malfunction and the resulting danger.

Requirements:

- The boiler room must be protected against freezing;
- Constant access to air necessary for combustion must be ensured in the boiler room;
- The boilers must not be placed in habitable rooms;
- Each boiler room must have a properly calculated ventilation opening according to the boiler output. The hole should be protected by netting or grating. The size of the ventilation opening is calculated according to the formula:

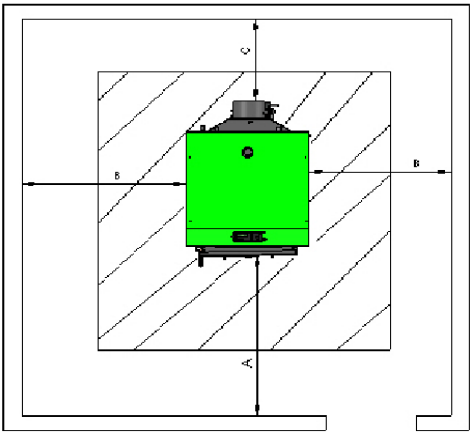
S=6,02*P - where:

S - The surface of the hole in cm,

P - the power of the boiler in kW

- The boiler must be positioned so that it can be cleaned and serviced as easily as possible;
- Installation must be carried out according to the installation diagrams shown;
- Objects of combustible materials and liquids must not be placed on (near) the boiler.

Minimum distances from the walls of the boiler room



Distances from the walls of the boiler room in mm.

A – 1000

B – 600

C – 600

Mount the boiler on a non-combustible base (foundation) larger than the base of the boiler - at least 300 mm at the front, about 100 mm at the other sides.

Observe the regulations of the building supervision, especially the current Ordinance for fuel devices and storage of combustible materials, regarding the construction requirements for the installation premises, as well as for the ventilation.

Caution:
There is a risk of damage to the installation due to freezing.
- Install the heating system in a room protected from frost.

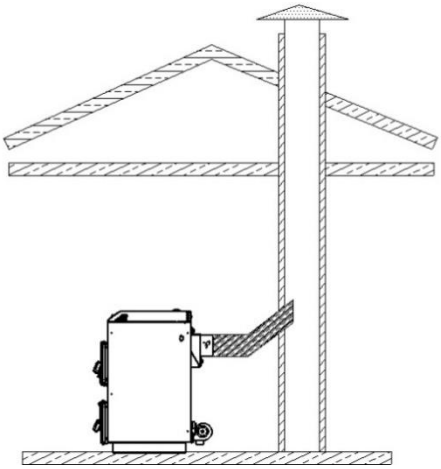
Minimum distance and flammability of building materials

DANGER: Fire hazard due to flammable materials or liquids.
- Ensure that there are no flammable materials or liquids in the immediate vicinity of the operating boiler.
- Indicate to the user of the installation the valid minimum distances to easily or hard-to-burn materials.

- Country-specific minimum distances other than those specified may apply - please ask your service technician.
- The minimum distance of the boiler and the flue gas pipe to hard or medium combustible materials must be at least 100 mm.
- The minimum distance to easily combustible materials must be at least 200 mm. Observe the distance of 200 mm also in case the flammability of the materials is not known.

Combustibility of building materials	
Class A - non-combustible	Asbestos, stones, bricks, ceramic tiles, baked clay, solutions, plaster
Class B - they are not easily flammable	Gypsum board plates, basalt felt plates, glass phaser, plates of AKUMIN, IZOMIN, RAJOLIT, LIGNOS, VELOX and HERAKLIT
Class C1 - hard to burn	Wood from oak, beech, plywood, felt, plates from HOBREX, VERSALIT, UMAKART
Class C2 - medium combustible	Pine, spruce and larch wood, laminated wood
Class C3 - easily combustible	Asphalt, cardboard, cellulose materials, tar, wood fiber boards, cork, polyurethane, polyethylene, floor fiber, parquet

Building the chimney connection



Note that the connection of the heating boiler to the chimney must be carried out in accordance with the prescriptions of the relevant local building control and agreed with the chimney sweep.
The presence of a chimney with a good draft is a basic prerequisite for the correct functioning of the heating boiler. Power and economy largely depend on it. The draft of the chimney is functionally dependent on its section, height and roughness of the internal walls.

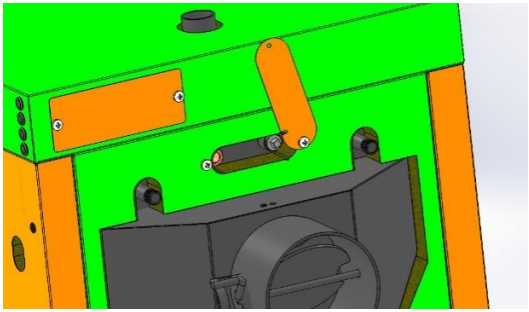
The recommended minimum chimney draft is 20 Pa. The boiler must be connected to a separate chimney. The diameter of the chimney should not be smaller than the outlet of the boiler.

The flue must be connected to the chimney opening. In terms of mechanical properties, the flue must be strong and well sealed (to avoid the release of gases) and allow easy access for cleaning from the inside. The internal section of the flue must not exceed the size of the clear section of the chimney and must not be narrowed. The use of elbows is not recommended. In case of impossibility, the use of elbows at an angle of 135° (45°) is allowed, but not more than two (keep in mind that each elbow at a right angle (90°) reduces the draft of the chimney by half). The recommended distance of the boiler from the chimney is 300 – 600 mm. It is not recommended to use a longer horizontal section of connecting pipes. The reverse slope is absolutely unacceptable. The cleaning door should be installed in the lowest part of the chimney. The wall chimney must be three-layered, with the middle layer made of mineral wool. As the thickness of the insulation must be no less than 30 mm,
when installing the chimney inside the building and 50 mm thick when installing outside.

Attention:
To connect the boiler to the chimney, use only pipes made of non-combustible materials. Pipes longer than 2 m must be additionally reinforced..

Connecting the emergency coil

In countries where EN 303-5 applies, the boiler must be equipped with a device to ensure the safe removal of excess heat without additional energy.
The heating boilers are equipped with a cooling heat exchanger for safety (emergency coil). It connects to a thermostatic valve
to the water network. In case of overheating, the thermostatic valve lets in cold water from the water network, which passes through the heat exchanger and takes the heat from the boiler. After the heat exchange, the water is discharged into the sewer. In this way, it is ensured that the water in the water jacket of
boiler will not exceed 95°C. The minimum working pressure of the coolant
water flowing through the emergency coil from the water network must be within 2 ÷ 10 bar. A flow rate of at least 12 liters/min is required.



To install the thermostatic valve:

1. Remove the inspection cover for the sensors;
2. Remove the galvanized plug G ½;
3. In the same socket, install the sleeve for the sensor of the thermostatic valve;
4. On one end of the safety heat exchanger, install the thermostatic valve. Install a filter at the inlet before the thermostatic valve. Connect the filter to the water network;
5. Connect the other end of the safety heat exchanger to the sewer.

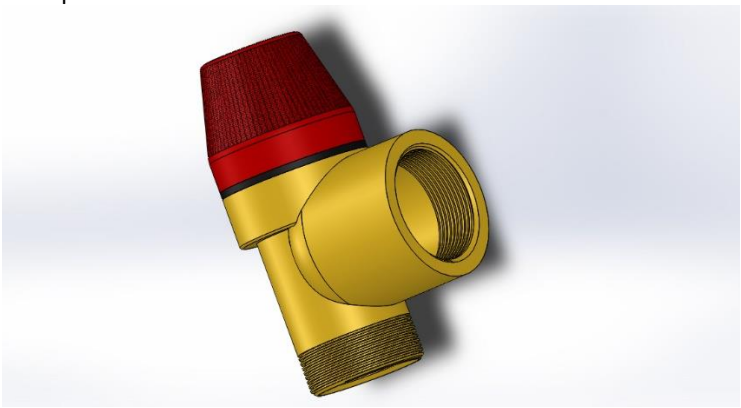
The emergency heat exchanger has no inlet and outlet - the names are only conditional. There is no requirement to the pins which one is used as input and which one as output. For convenience during installation, connect the terminals according to the specific

requirements of the installation.

Connecting the boiler to the heating installation

	**Attention:** There is a risk of damage to the installation due to unsealed connections. Install the de-energized connecting piping to the boiler connections.

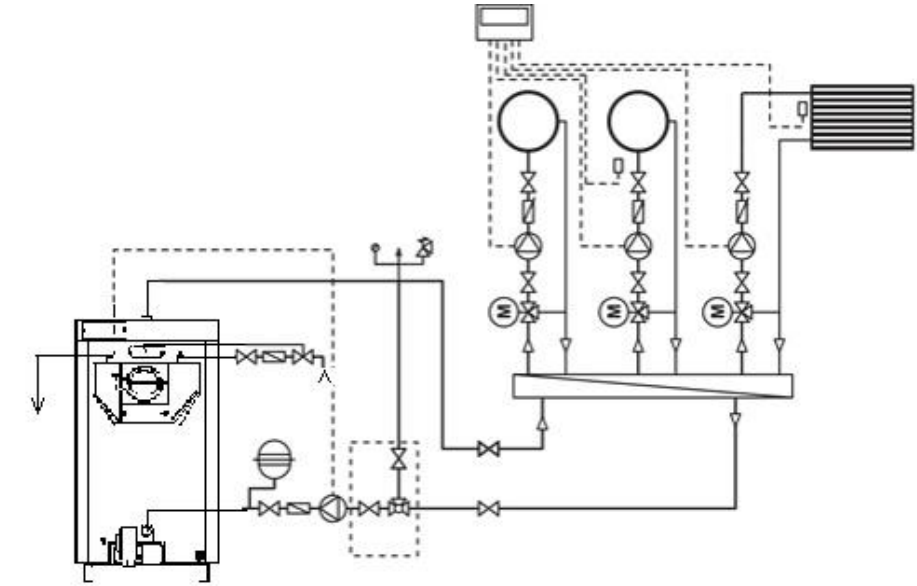
When the boiler is connected to a closed type heating system, a 3 bar safety valve and an expansion tank must be installed.

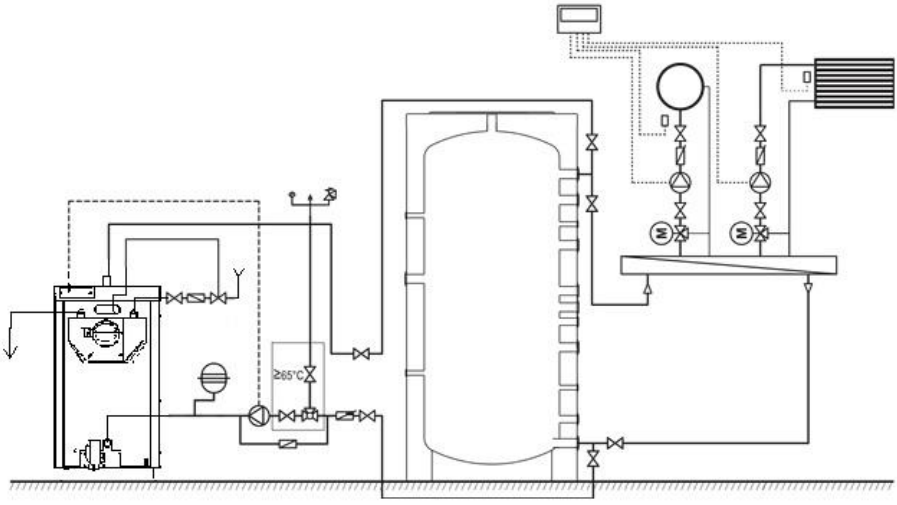


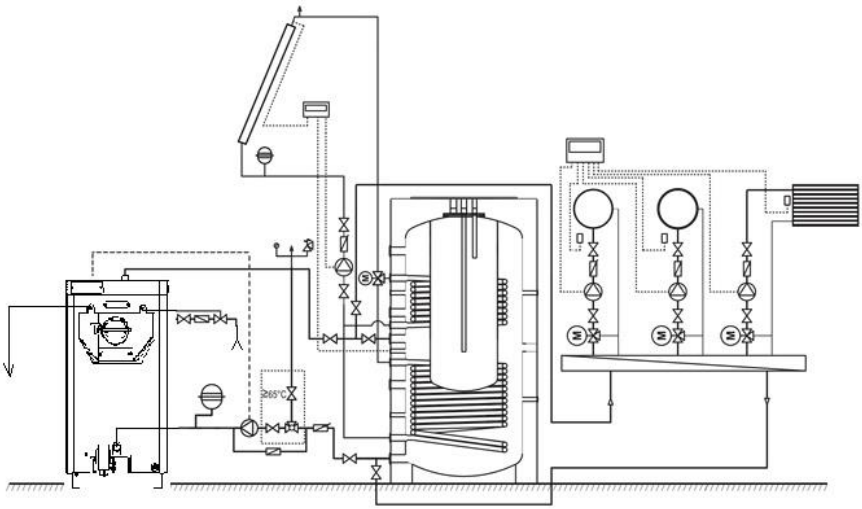
In open-type systems, a safety valve is not necessary - only an open expansion vessel is installed. There must not be any shut-off elements between the safety valve, the expansion tank and the boiler.
For normal operation, the return water temperature should not fall below 65 °C. Therefore, a thermostatic mixer must be installed on the heating return pipe to increase the temperature of the return water.

	**Attention:** Supplying water with a lower temperature at the boiler inlet leads to the formation of a large amount of condensates, which can seriously damage your boiler .

Example diagrams of connecting a heating boiler to some types of heating installations are shown.



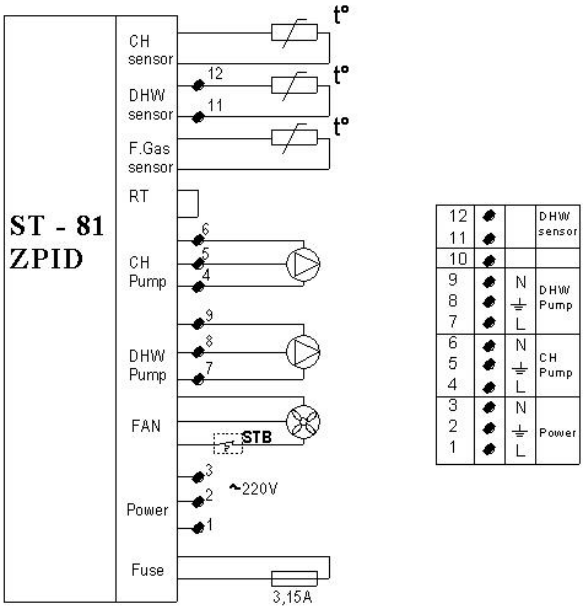

≥65°C



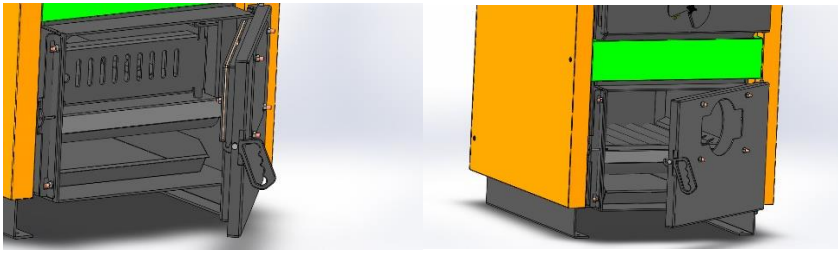
Connection to the electrical network

	Attention! Electrical device! Before to take any actions aimed at working with the power supply of the device (connecting cables, mounting the device, etc.) make sure that the controller is disconnected from the power supply network. Check that the power supply network is grounded.

When connecting, take into account the electricity consumed by the controller and pumps and ensure the necessary power of the electrical installation. Overheating of the boiler is possible when the supply voltage is turned off (current cut), to prevent it, it is necessary to provide a backup power supply with the necessary power.



Operation of Balkan Energy boilers with a burner



Remove the plates covering the burner mounting holes on the outside and inside of the bottom door of the boiler. Remove the lower safety door (grill). Remove the insulation material only in the area of the opening. To install the burner you will need a transitional connection flange with holes corresponding to the connection holes of the purchased burner and the connection studs of the boiler.

Follow the manufacturer's instructions for working with the burner. Balkan Energy boilers have no special requirements for working with a burner. For the normal operation of the boiler with a burner installed, ensure the conditions described in this instruction and the operating instructions of the burner used.

Attention:
When installing a burner, disconnect the pressure fan of the boiler from the connection socket. Inadvertent starting of the fan while the burner is in operation can lead to a back draft and release of flue gases into the room. This may prevent or damage your burner.

Filling the heating installation

It is possible to damage the installation due to stress in the material due to temperature differences. Fill the heating installation only in a cold state (the inlet temperature should not be more than 40°C).
There is a risk of damage to the installation due to build-up of deposits. Condensation and tar deposition can reduce the life of the boiler. Do not operate the heating boiler for a long time in partial load mode. Boiler inlet temperature should be no less than 60°C - 65°C, boiler water temperature should be between 70°C and 85°C. To heat hot water in the summer, use the boiler for a short time.

Attention:
All work on installing the boiler, connecting to the heating and electrical installations, installing and starting the burner and various parts of the installation must be carried out only by an authorized installer (service).
Any manipulation of the boiler and installation by other persons is prohibited. Intervention by unauthorized persons voids the warranty.

Tools, materials and aids

Standard tools and materials from the field of heating technology and water installation are required for the installation and maintenance of your boiler. No special tools are required.

BOILER TRANSPORTATION

We recommend shipping packed on the pallet to the installation site. The boiler is securely fastened to a wooden pallet using fasteners.

During transport and installation, depending on the weight, use appropriate safety equipment in accordance with Directive 2006/42/CE. When transporting products weighing more than 30 kg, the use of a trans pallet truck, forklift or other lifters is required.

	Important: When installing the boiler, remove the wooden pallet on which the boiler is placed by unscrewing the bolted connections using the S13 key.

	Dispose of packaging material in an environmentally friendly manner. Parts of wood or paper packaging can be used for heating, the rest should be disposed of in the places specified for the respective material.

Instructions for the user of the installation

	**DANGER:** due to poisoning or explosion. Burning waste, plastics or liquids can release poisonous exhaust gases. - Only use the specified fuels. - In case of danger of explosion, fire, exhaust gases or vapors, take the boiler out of operation.

	**DANGER:** from injury/damage to the installation through incompetent application. - The heating boiler can only be serviced by adults who are familiar with its instructions and operation. - As a user, you are only allowed to put the boiler into operation, set the temperature for operation, take the boiler out of service and clean it. - Make sure that unsupervised children cannot come within reach of a working boiler.

- Operate the boiler up to a maximum temperature of 85 °C and monitor its operation from time to time.
- Do not light liquids or use them to increase the power of the heating boiler.
- Fill the ashes in a non-combustible container with a lid.
- Clean the surface of the boiler only with non-flammable means.

- Do not place combustible objects on the heating boiler or near it (within the safe distance).
- Do not store combustible materials in the installation room (eg wood, paper, gas, oil).

Loading and ignition of the boiler

When the boiler is first lit, condensate forms, which then flows out (it is not a matter of boiler damage).

The fuel is loaded through the top door of the combustion chamber, it is recommended that the pieces of wood are the length of the combustion chamber and be well arranged with as few air gaps as possible. Both boiler doors must be closed and sealed. The controller is turned on, the maximum temperature of the boiler is set, and depending on the fuel used, the fan power and chimney draft are adjusted using a gas analyzer.

When burning wet wood, the boiler does not work efficiently and has the following consequences:
- significantly increases fuel consumption;
- the desired power is not reached;
- the lifetime of the boiler and chimney is shortened.

Boiler cleaning

Boiler cleaning should be done periodically and qualitatively over a period of 3 to 5 days (depending on the power and fuel used). Ash accumulated in the combustion chamber, condensed moisture and tar deposits significantly reduce the life expectancy and power of the boiler, and deteriorate the properties of its heat exchange surface.

At the start of a new heating season, it is recommended to have the boiler cleaned by a competent service.

If necessary, clean the ash and stuck soot from the walls of the combustion chamber. Remove the turbolators and clean the exhaust pipes. For this purpose, use the rye and the brush from the set.

Caution: Hot surfaces
Clean the boiler only when it is not working. Wait for it to cool. Before cleaning, make sure that there are no coals or burning fuel in the combustion chamber .

Attention! There may be smoldering coals in the ash. Dispose of ashes only in designated areas. In a household waste container it can cause a fire.

Attention: There may be smoldering coals in the ash. Dispose of ashes only in designated areas. In a household waste container it can cause a fire .
- Inform the end user of the immediate dangers to him or his property arising from the improper use of the heating boiler.

Description of boilers.

Balkan Energy water boilers are designed to work with local, steam installations for heating homes, single-family houses, small hotels, etc.

They can work with natural, untreated wood (wood with a length of 350 to 550 mm and humidity below 25%), coal, briquettes and eco-briquettes.

When burning wetter wood, due to its lower calorific value, the boilers generate less power.
Combustion of wet wood reduces the efficiency of boilers.

It is possible to operate the water heating boilers with a pellet, gas or oil burner mounted on the lower door, through a connection kit (flange).

Structurally, Balkan Energy boilers are made of high-quality boiler steel with a thickness of 4-5 mm for the combustion chamber and 3 and 4 mm for the water jacket.

The boilers are three-pass, and to increase the efficiency, the third pass of the flue gases passes through pipes with built-in turbolators. For complete absorption of the generated heat, the water jacket completely covers the combustion chamber and ensures complete circulation of the water heating surfaces. The boiler body is insulated from the environment with high-temperature, 50 mm stone wool.

To ensure safe operation, the boilers are equipped with an emergency coil for forced cooling of the water and protection against overheating, as well as with a pressure safety valve up to 3 bar.

For improved removal of flue gases and ensuring low internal chamber resistance, water boilers have a chimney body with a special shape, equipped with a valve for adjusting the draft in the chimney.

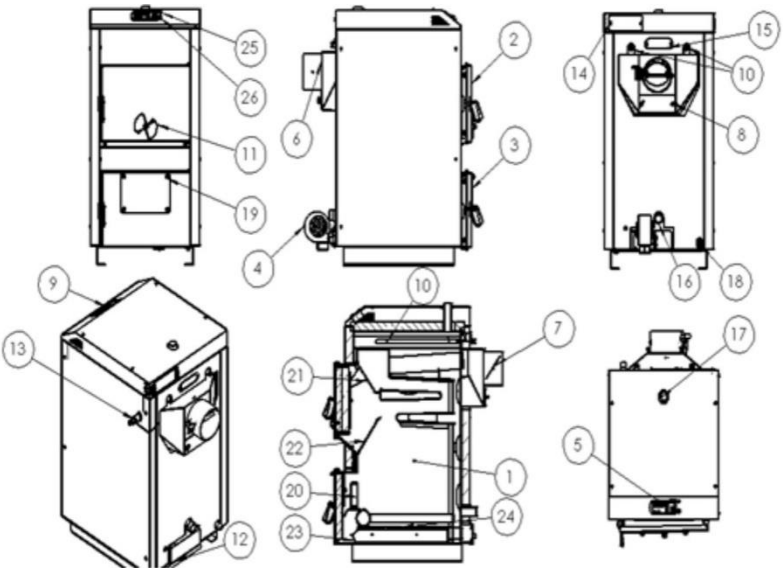
The boilers are atmospheric boilers equipped with a thermostat for automatic regulation of the air entering the combustion chamber, and thus the generated heat. To control the current water temperature, the boiler is equipped with a sensor thermometer.

Our boilers have forced air injection, using a pressure fan. They are equipped with a built-in digital program control that controls the fan, the central heating circulation pump and the domestic hot water (DHW) pump based on the current values of the temperature in the heating installation, domestic water, flue gas

temperature and the type of used fuel. Innovative proportional-integral-differential control (zPID – control) contributes to more complete fuel combustion, increasing efficiency and lowering consumption.

It is important to note that the boilers are modular, i.e. a Balkan Energy boiler can easily be converted (upgraded) to a Balkan Energy P boiler and vice versa. If the user wishes, the boilers can be converted by replacing several modules. This, together with the ability to fit a pellet burner, gives the user choice and flexibility in terms of fuel used.

1 - Combustion chamber
2 - Fuel filler door
3 - Ash cleaning door
4 - Pressure fan (for Balkan Energy P series boilers)
5 - ST-81 zPID control (for Balkan Energy P series boilers)
6 - Chimney
7 - Valve for regulating draft in the chimney
8 - Inspection hole for chimney cleaning
9 - Sensor thermometer (for Balkan Energy boilers)Аварийна серпентина
10 - Valve for secondary air
11 - Air supply valve (for Balkan Energy boilers)
12 - Mechanical temperature regulator (for Balkan Energy boilers)
13 - Cable socket cover
14 - Inspection cover for sensors
15 - G 1½“ Water inlet fitting
16 - G 1½“ Water outlet fitting
17 - G ½“ Connection for filling and draining the boiler
18 - Burner mounting hole coverПредпазна вратичка за пепелта
19 - Door to secure the chimney
20 - Upper safety door
21 - Ash tray
22 - Air distributor
23 - Fuse
24 - Boiler safety thermostat – STB



Delivery volume

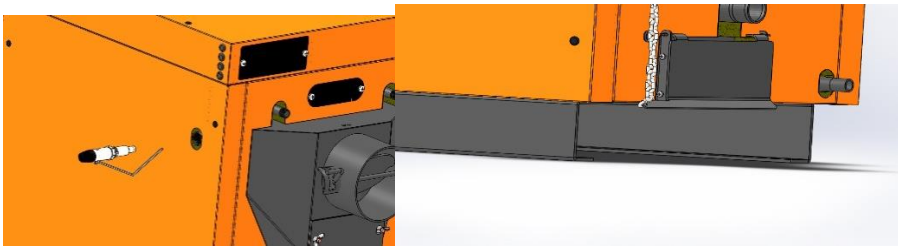
When purchasing a Balkan Energy boiler, check the supplied equipment and ensure its availability. Missing element(s) may cause the boiler to malfunction.

№	Name	Balkan Energy P	Balkan Energy
1	Boiler	1	1
2	Thermostat	0	0
3	Safety valve 3 bar	1	1
4	Fire iron	1	1
5	Wire brush	1	1
6	Ash tray	1	1
7	Operating instructions	1	1
8	Warranty card	1	1

Setting the thermostat

A mechanical thermostat is not included in the set of atmospheric boilers. It is designed to automatically regulate the flow of fresh air in the combustion area by means of a valve, depending on a preset temperature of the boiler.

Install the thermostat on the right side of the boiler in the G ¾ " port, sealing the non-leak joint (with Teflon tape).



Using the chain, connect the movable lever of the thermostat to the valve for supplying fresh air.
Turn on the boiler and heat the water to a temperature of 70°C. Read the temperature on the control thermometer of the boiler.
Turn the handle of the thermostat until it reads 70°C.
Adjust the length of the connecting chain so that the air valve is fully closed and the chain is taut.

If you have set the thermostat correctly:
- when turning the handle to a higher temperature, the valve will open;
- when turning the handle to a lower temperature, the valve will remain closed and the connecting chain will loosen.

The thermostat is now set for normal operation. Set, by turning the handle, the desired water temperature for the boiler to maintain.

Electronic management

	Electronic control (ST-81zPID) and pressure fan are included only in the P series boilers. ST-81 zPID regulates the fan rate (amount of supplied air) and the operation of two types of pumps: circulation – for the heating installation (CH pump) and domestic hot water pump – for heating the boiler (DHW Pump). The fan runs continuously and its power depends on the measured temperature of the boiler and the temperature of the flue gases.

Controller view and explanation.

	Attention! Electrical device! Do not touch with wet hands. If there is moisture or a leak near the boiler, disconnect from the power supply and contact the support service. Do not use the boiler until the causes are eliminated.

By installing this controller, fuel consumption can be reduced by up to 15% and ensure a constant water temperature and a longer service life for your boiler. The heat of the flue gases is used for heating instead of being lost through the chimney.

Technical characteristics of controller model ST 81

1.	Operating voltage	230V/50Hz+/-10%
2.	Power	5 W
3.	Operating temperature	5 ÷ 50°C

4.	Maximum load on the pump outlet	0,5A
5.	Maximum fan terminal load	0,6A
6.	Temperature range of measurement	0 ÷ 90°C
7.	Sensitivity	1°C
8.	Range of temperature sensors	-25÷90°C
9.	Security guard	3,15A

Explanation of buttons:
↑ - Navigation arrow up / plus;
↓ - Navigation arrow down / minus;
MENU - MENU button - menu selection/confirmation of settings;
EXIT - Exit/cancel settings;

- **On/off button**

- **Fan operation indicator**

- **Indicator for the operation of the central heating pump (CH pump)**

- **DHW pump operation indicator**

- **Manual operation indicator**

Fire-up.

The cycle starts when the “Ignition” function is activated from the controller menu and is active until the temperature of the central heating system of the boiler reaches 40°C (the default ignition threshold) and when the temperature does not fall below this value for 2 min. (default ignition timing). Under these conditions, the controller will switch to duty mode and the housing manual adjustment symbol will go out. If for 30 min. from the activation of "Ignite", the controller fails to reach the parameters for inclusion in working mode, the message "Unable to fire up" will appear on the screen. In this case, the ignition cycle must be restarted.

Operating mode (Duty)

Main cycle of the controller, switching to it immediately after the completion of the "Ignite" cycle. The fan power is automatically adjusted when the zPID function is activated, depending on the water temperature and the flue gas temperature. If the temperature exceeds the set, the "Interruption" mode (supervision mode)

Interruption (supervision mode)

The mode is activated automatically in cases when the temperature reaches/or exceeds the given one. In order to gradually lower the temperature of the circulating water, it is necessary to adjust the time of the fan.

Damping

If the temperature of the boiler drops by 2°C below the "Ignition" threshold and for 30 min. did not rise (default decay time), the controller will switch to "Fade" mode. During this mode, the fan stops and the display reads “Damping.

Main page

42 °C	55 °C *
C.H.	SETPOINT

During controller operation (CH mode only), the Main screen is displayed, with information about:

- Boiler temperature (from the left of the screen)
- The set temperature (from the right of the screen)
- Fan operation symbol*
- Operating mode – a symbol corresponding to the active operating mode is written in the lower right corner:

⬆ – residential heating; ▷ – parallel pumps; ◀1 – DHW priority; ▷* – summer mode.

This screen enables a quick change of the set water temperature in the boiler, using the plus and minus buttons. With the MENU button you move to the 1-menu. In each menu, the user can move up and down with plus and minus buttons. With the MENU button you go to the next menu or select a specific function. With the EXIT button, you return to the main menu or cancel the given function.

The user is given the opportunity to choose between three main main screens – a central heating screen (C.H. screen), a domestic hot water screen (H.C.W. or DHW screen) and a flue gas screen (Flue gas screen). Screen selection is done by holding down the “EXIT” button for 3 seconds”.

C.H. SCREEN		
H.C.W. Screen		
33°C	45°C	65%
C.H.	Flue Gas	Fan

H.C.W. SCREEN
Flue Gas Screen

H.C.W. Screen
FLUE GAS SCREEN

In the screen (H.C.W. Screen) the + and – buttons can be used to quickly change the desired water temperature in the boiler (right), and the current temperature is displayed on the left side of the screen.

Screen (Flue Gas Screen) is only informative - there is no possibility to quickly change parameters. On the screen from left to right are observed: boiler water temperature, exhaust gas temperature and fan speed in percent.

Fire up/Fan

When the boiler is lit, the operation of the controller is started using the "Menu" button. If the boiler is already burning, the fan is switched on/off (Fan - (•) ON, (•) OFF).

Attention:
When the fan is running, do not open the boiler door.
Before opening (e.g. to refuel) first stop the fan as described .

If for 30 min. boiler does not reach a temperature of 40°C (default parameters), the following warning message will be displayed on the screen:

22 °C	55 °C
UNABLE TO FIRE UP	

To restore the operation of the boiler and clear the alarm, restart the "Ignition" mode“.

Manual mode

The manual control mode is a big plus.

Fire up
MANUAL MODE

With it, each individual mechanism is accessible (or unavailable) independently of the others. "Blow force" is a menu in which the speed of the fan is entered in manual control mode in%.

Blow force
FAN

The fan is turned on by pressing the MENU button and will run until you press the button again.

FAN
C.H. PUMP

Press the MENU button to start/stop the central heating pump.

C.H. Pump
H.C.W. PUMP

Press the MENU button to start/stop the DHW pump.

H.C.W. Pump
ALARM

Press the MENU button to activate/deactivate the alarm.

Fuel type

42 ° 55 °C
C.H. SETPOINT

Manual Mode
FUEL TYPE

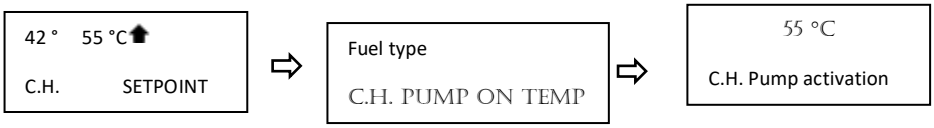
Wood
COAL

⇨ ⇨

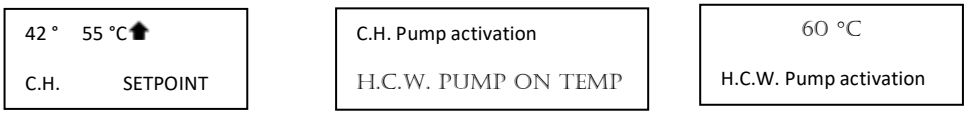
This menu allows you to select the type of fuel that will be used in the heating boiler. The correct choice is important for the correct management of the combustion process.

Selection of pump temperature for Central Heating CH and domestic hot water HCW

Using these functions it is possible to set the temperature that will switch on the central control pump (boiler temperature) and the domestic hot water pump (boiler temperature).



The control of the CH pump is carried out according to the temperature of the water in the boiler detected by the CH sensor. In the example provided, the central heating pump will turn on when 55°C is reached. When the boiler cools down to a temperature below the set minus the set hysteresis (2°C) the pump stops (in the indicated case at 53°C) and is activated again when the water heats up.



⇨

The control of the HCW pump is carried out according to the temperature of the water in the boiler, read by the CH sensor and by the temperature of the water in the boiler, read by the HCW sensor. Thus, two conditions must be met to activate the domestic hot water pump:

1. The temperature of the water in the boiler is higher than the set one (in this case above 60°C);
2. The water temperature in the boiler is lower than the set one.

I.e. the pump starts when the boiler heats up to 60°C and stops when the boiler heats up to 60°C. With a set hysteresis of 3°C, the HCW pump will also stop if the water in the boiler falls below 57°C. Once heated to 60°C water heater stops the pump and activates it in case the water heater cools down to 57°C.

Fan speed

With this function, the fan speed is set and adjusted, with degrees expressed in %. The speed selection is made with the plus and minus buttons.

This function is only active if zPID control is disabled. With the zPID function active, the fan speed is determined automatically and is not affected by user settings.

Priority modes (Work mode)

Using the priority mode, one of the four operating modes is selected - Home heating, DHW priority, Parallel pumps and Summer mode. The active mode of operation is marked in the right corner with the corresponding symbol: ⌂ – home heating; ▷ – parallel pumps; ◀ – DHW priority; ▷ * – summer mode.

Priority House heating

The central control pump is actuated in the CH Pump control manner described above.

42 ° 55 °C⌂	HOUSE HEATING *
C.H. SETPOINT	H.C.W. priority

H.C.W. priority

The pump is active until the set temperature for DHW is reached. After that, the C.O. pump is turned off and on. The pump for C.O. works until the temperature of the circulating water falls below the set values. The fan works constantly, protecting the boiler from overheating (62°C). DHW Priority mode means that domestic water (DHW) will be heated before the water in the radiators is heated.

	**Attention:** The boiler must have non-return valves installed - on the central heating pump and the DHW pump, to prevent mixing of water from the two systems .

Parallel pumps

In the Parallel Pumps mode, the pumps start working simultaneously when the set start-up temperature is reached. This value can be different for the two systems according to the user's preferences, which will cause the pumps to turn on at different times, but at some point they will run simultaneously. The pump for C.O. runs continuously while the DHW pump stops after reaching the set water temperature in the boiler. The detailed principle of operation of the two pumps was described above.

	**Attention:** For operation in this mode, a non-return valve designed to operate at different temperatures must be installed - for DHW and for central heating .

Summer mode

When operating in Summer mode, only the HCW hot water pump is active for heating the water in the boiler. The pump is switched on in a preset parameter - switch-on threshold (see the pump switch-on temperature function) and will work until it reaches the set switch-off value (the desired water temperature in the boiler). The pump will start working again as soon as the temperature drops to the switch-on value. When summer mode is active, a symbol is activated – *.

Language selection

With this function, you can set the desired language for the controller.

LANGUAGE Factory settings

Factory Settings

The device has preset parameters, the so-called factory settings, but still needs to be adjusted according to the user's requirements. The program allows a return to factory settings at any time. By selecting the Factory settings menu, all parameters additionally changed or set by you will be replaced with those of the manufacturer. After returning to this initial position, you can set your parameters again.

Protect the controller

To ensure maximum safety at work, the controller is equipped with a number of safety measures. The alarm is marked with a sound and a special message is written on the display. To restore the operation of the controller, press the main button. In case of signal alarm message C.H. Temperature Too High (Too high temperature for the heating system), wait until the temperature drops below the critical point.

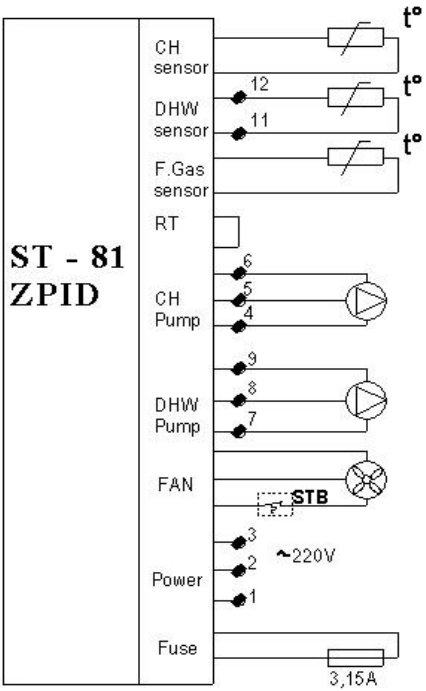
Thermal protection. The boiler is protected with an additional temperature sensor - which stops the fan when a temperature of 92°C is reached. This prevents the water in the system from boiling, in case of overheating of the boiler or in case of damage to the controller. When thermal protection kicks in even if the temperature drops to a safe level, the sensor must be reset manually.

Automatic check of the serviceability of the sensors.

In case of damage to a sensor of the central heating system or the DHW system, there is an alarm with additional signaling - the display shows which sensor is damaged, e.g. "C.H. Sensor Damaged" (The sensor of the heating system is damaged). The fan stops and both pumps are activated simultaneously according to the temperature values reached. If the CH system sensor is damaged, the alarm will remain on until it is replaced. In the event of a DHW system sensor failure, you can stop the alarm by selecting the menu to stop the alarm and restore the single pump operation mode (for C.O.) - this is the only safe operation mode allowed in this situation. In order to access the remaining modes, you must replace the damaged sensor of the DHW system.

Temperature protection. Once the temperature reaches 85°C, an alarm will be triggered with the following message on the screen: ALARM Temperature toohigh. The instantaneous temperature is measured by an electronic sensor and processed by the thermostat. When "Temperature protection" is switched on, the fan stops working, and the two pumps are switched on alternately for the operation of both systems - for central heating and for DHW.

Fuse (fuse). The regulator has a tube fuse WT 3.15 A. Higher values may damage the controller.



12 11	●		DHW sensor
10	●		
9 8 7	● ● ●	N ⏚ L	DHW Pump
6 5 4	● ● ●	N ⏚ L	CH Pump
3 2 1	● ● ●	N ⏚ L	Power