BRAGER EXPERT

PELE BORD 890

ECO-PALNIK Skiepko

OPERATIONAL MANUAL

EN

BRAGER®

BRAGER Sp. z o.o.
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EU Declaration of Conformity
nr 0100/2025

Brager Sp. z o. o. Pleszew, Rolna 11,
63-300 Pleszew declares that the product manufactured by us:

Temperature regulator: PELE BORD 890

spełnia wymogi następujących dyrektyw:

2014/35/UE Dyrektywa niskonapięciowa (LVD),
2014/30/UE Dyrektywa kompatybilności elektromagnetycznej (EMC)

Based on harmonized standards:

PN-EN 60730-1:2012
PN-EN 60730-2-9:2011

The product is CE marked: 05/2025

CE

Rafał Urbaniak
CEO Brager Sp. z o. o.

1. Safety

1.1. General safety notes

Please read the following regulations before using the product. Failure to comply with them may result in personal injury or damage to the device. To ensure the safety of life and property, take the precautions contained in the following manual, as the manufacturer is not responsible for losses caused by improper use of the device or the User's negligence.

1.2. Warnings

- The regulator can't be applied with boilers operating in heating systems compliant with valid legal guidelines, including standard PN-EN 303-5. The device is intended to control operation of a C.O. (central heating) boiler with its own, independent safeguard against improper operation, e.g. excessive pressure growth in the system, or overheating of the boiler.
- Live electrical device. It is not allowed to perform any connection works when the device is connected to supply voltage, failure to follow the above information is dangerous to human health and life. Before commencing any works at the regulator, it is absolutely required to disconnect current supply, and to secure against accidental activation.
- The assembly of the device should be performed by a person having the appropriate electrician qualifications.
- Before activating the regulator, measure the earthing resistance of any electrical motors, and measure the resistance of any electrical cable insulation.
- The device may only be operated by adults.
- Incorrect wiring can damage the device!
- Owing to electromagnetic network noise that may affect operation of the microprocessor system, and for safe operation of devices fed with 230V network voltage, the regulator should be connected to a system with a protective conductor.
- The regulator may not be exposed to flooding with water or to any conditions causing steam condensation and penetration of conductive dirt and dusts into the regulator.
- Atmospheric discharges can damage the controller, therefore during a storm, it should be disconnected from the grid by pulling the power plug out of the socket.
- The unit must not be used for purposes other than those intended.
- Before and during the heating season it is necessary to check the technical condition of the cables, check the fixing of the unit, clean it from dust and other dirt.
- The manufacturer reserves the right to make changes in the software and principle of the device's operation without modification of the contents of the manual every time.

1.3 Warranty notes

- Any modifications and repairs made to the device on one's own may result in the deterioration of its operating parameters and safety of its use. Carrying them out is tantamount to losing the warranty for the device.
- Blown fuses in the device are not subject to guarantee replacement.

2. Intended use

PELE BORD 890 is a modern device designed for complex control of pellet boiler and heating system. Regulation of the heat output of the boiler is carried out by precise dosage of air and fuel delivered to the combustion process. A modified proportional P algorithm was used to reduce temperature fluctuations and increase the stability of the combustion process in the unit.

In order to obtain the required thermal comfort in heated rooms, the Controller continuously controls all boiler parameters and heating system operation, presenting them on a clear display. The Controller also features the function of preparing domestic hot water (DHW) in SUMMER, WINTER mode with or without priority, the possibility of connecting a room thermostat and an additional room panel.

This appliance also lets you optimize the quality of the combustion process based on data from the compact Flue Gas BCA-02 eco Analyzer. The Boiler automation system, expanded with the analyzer, enables monitoring of the parameters occurring in the combustion process as well as adjustment of the dose of air supplied to the boiler, which translates into CENTRA BORD 100 reduction in costs associated with the amount of fuel consumed, as well as greater care for the environment.

The Controller supports operation of one mixing valve system as standard, however, this value can be increased to five mixing valves by connecting dedicated expansion modules. Implemented functions allow the control of three-way and four-way valves in the floor mode or the radiator mode with or without weather control. In addition, the Controller offers control of the valve pump operation.

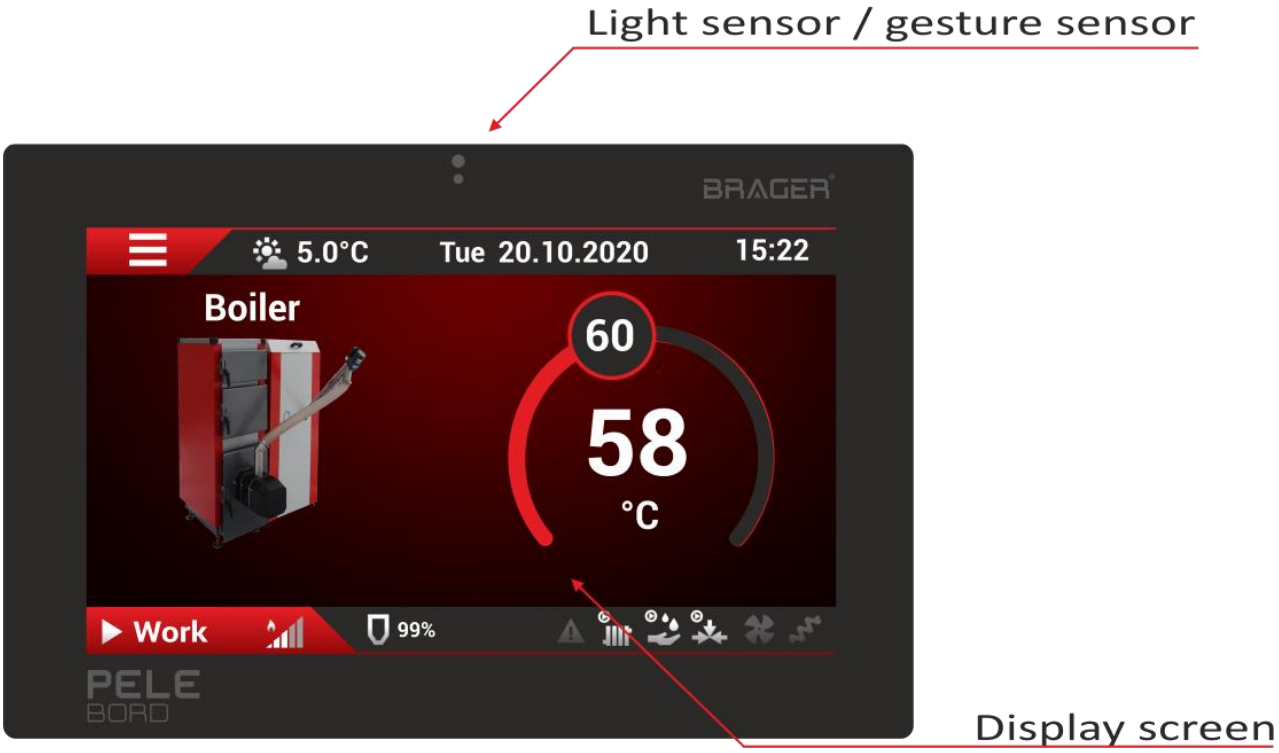
An additional advantage is the possibility of connecting the Controller to the Internet by means of the Media Bord 200 module. The Controller has a large, colorful and easy to read display with a pleasant and intuitive user interface, which makes it easy to operate the boiler and the complete heating system.

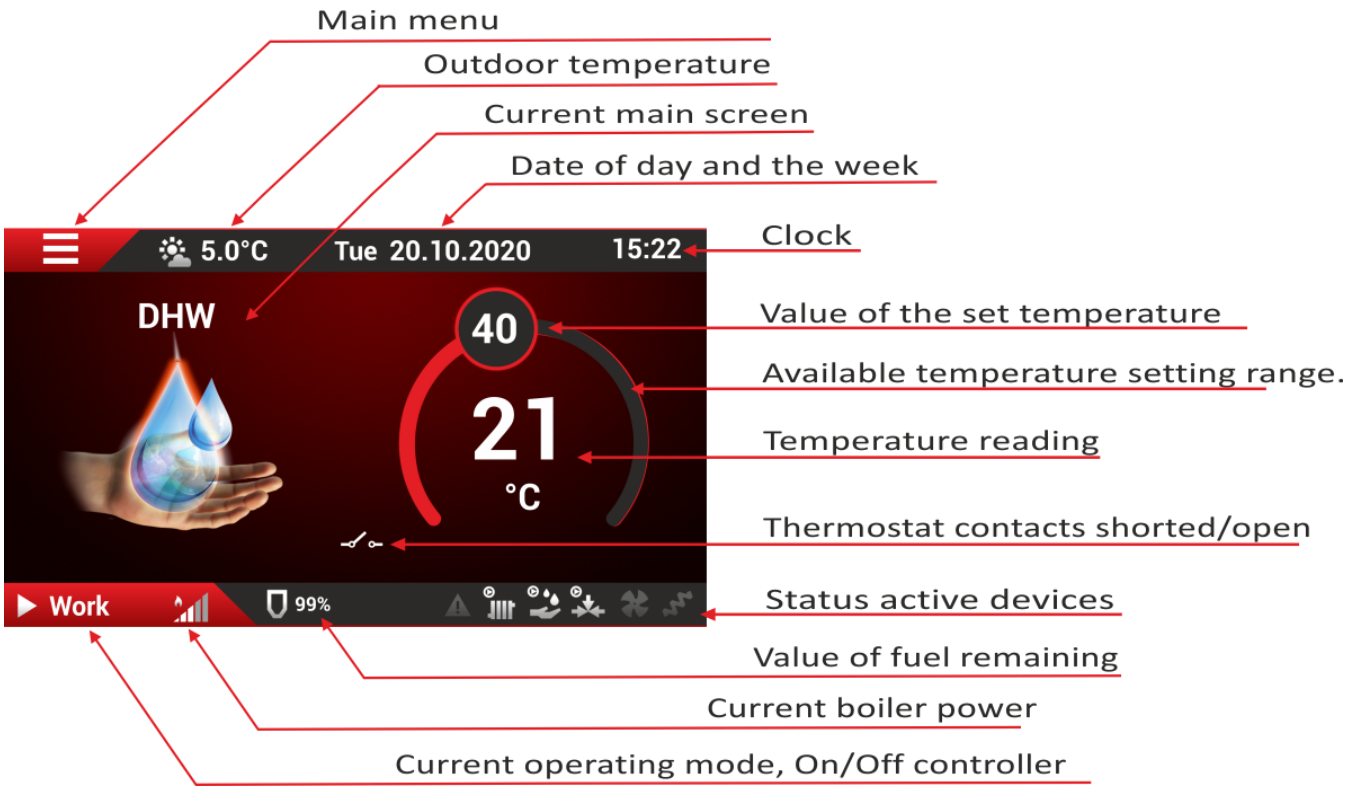
A modern algorithm of automatic regulation of the combustion process BRAGER EXPERT has been implemented in the device. Many years of experience and cooperation with scientific institutions allowed to create the first regulation algorithm using both expert knowledge and modern computing mechanisms.

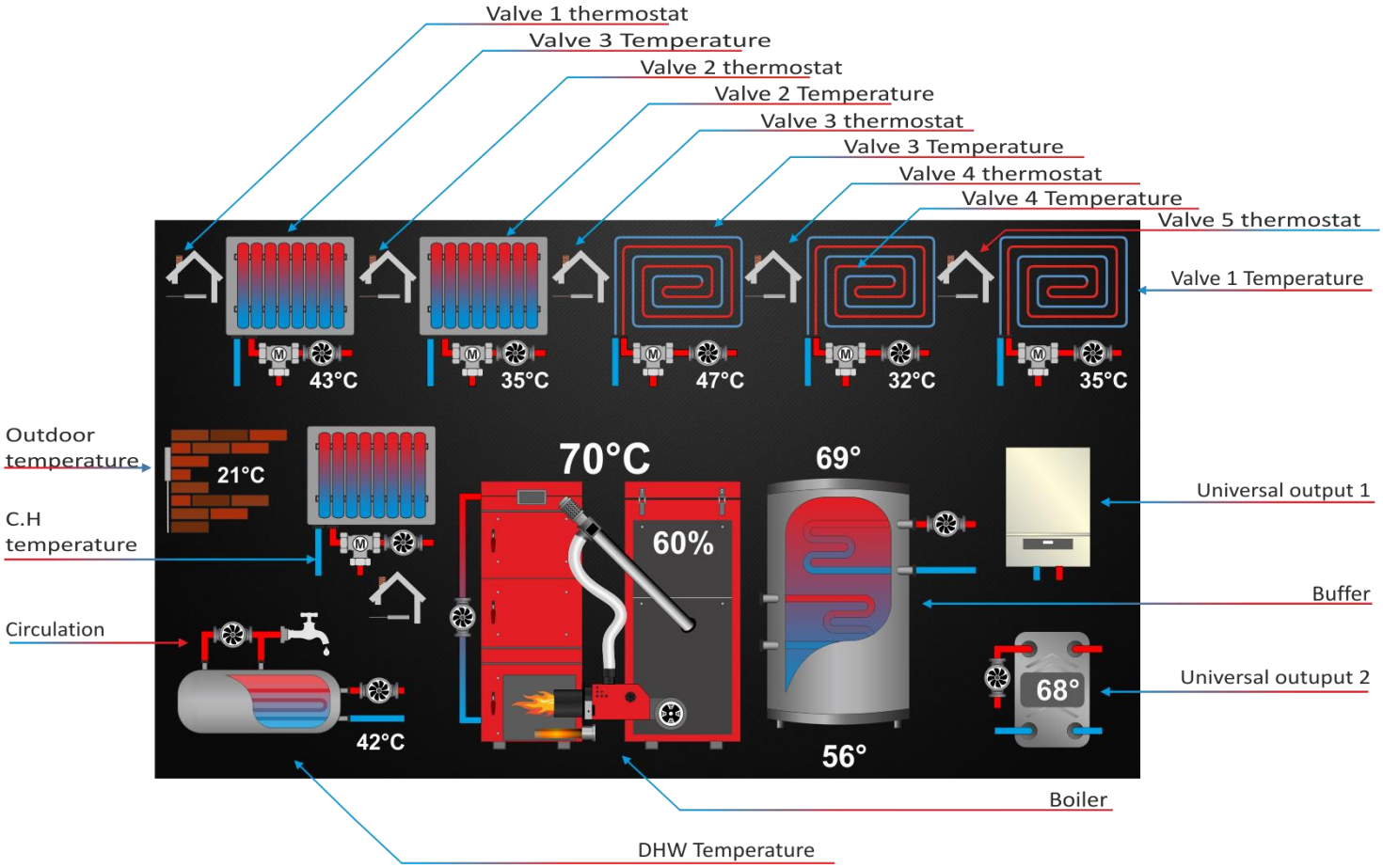
The task of the algorithm is automatic selection of optimum settings for boiler operation, the value of which will guarantee adjustment of current output to momentary demand for heat. Dynamic selection of operating parameters allows continuous operation of the boiler, reducing emissions and extending its service life.

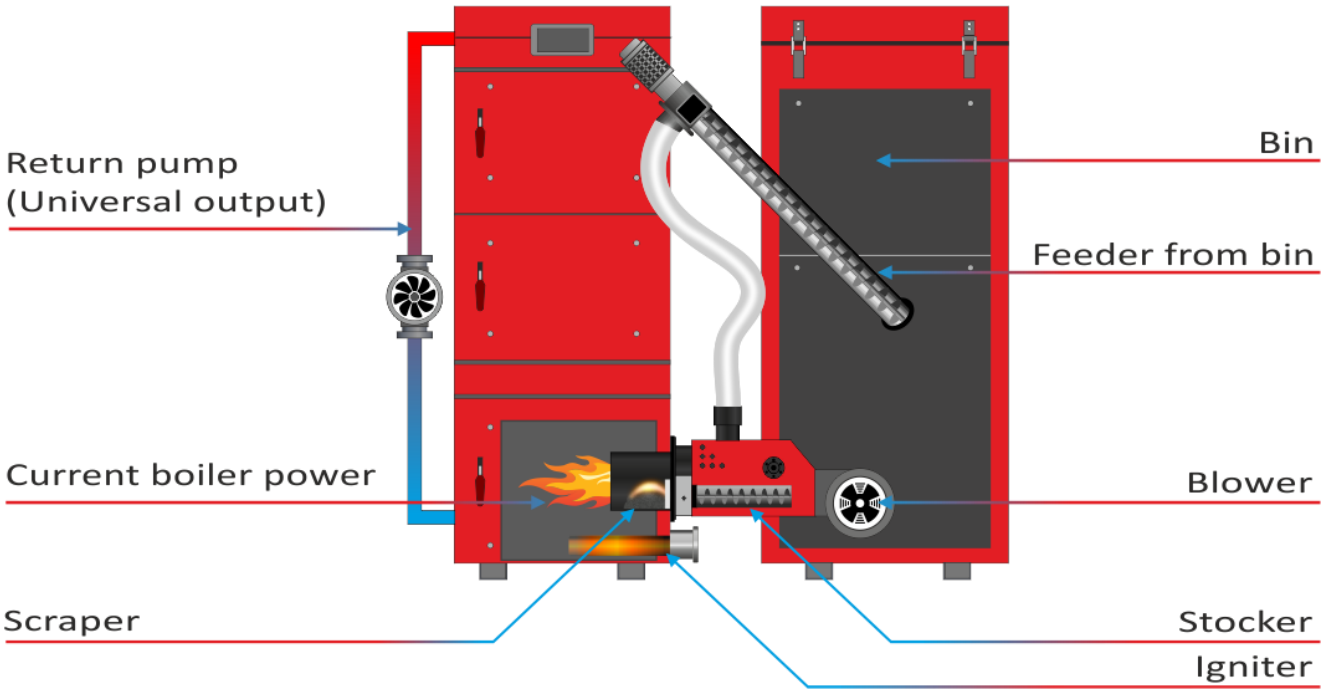
3. Control panel

3.1. Visualization of a display, panel and marking of signaling diode

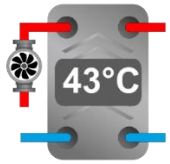
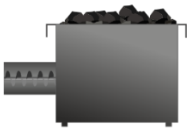
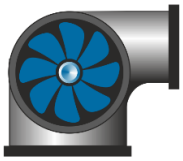
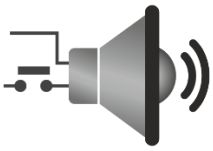





Valve 1 thermostat
Valve 3 Temperature
Valve 2 thermostat
Valve 2 Temperature
Valve 3 thermostat
Valve 3 Temperature
Valve 4 thermostat
Valve 4 Temperature
Valve 5 thermostat
Valve 1 Temperature
43°C
35°C
47°C
32°C
35°C
Outdoor temperature
21°C
C.H temperature
70°C
60%
69°
Universal output 1
Buffer
Circulation
42°C
68°
Universal outuput 2
56°
Boiler
DHW Temperature

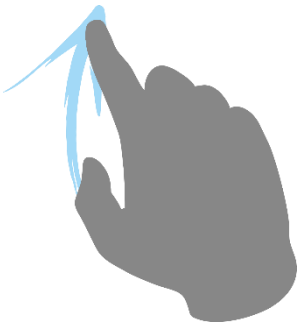

Return pump
(Universal output)
Bin
Feeder from bin
Current boiler power
Blower
Scraper
Stocker
Igniter

Universal output configurations

	*Heat Exchanger*		*Ash removal*
	*Reserve Boiler*		*Exhaust fan*
	*Alarm signal*		*Return pump*
	*Circulation*		*Work signal*

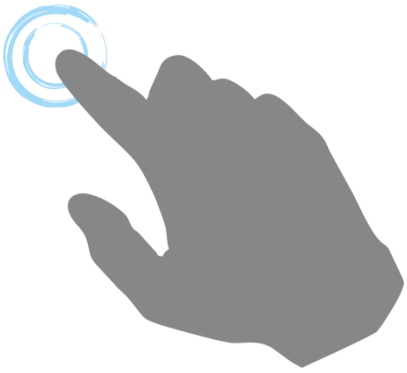
3.2. Navigation the menu

Swipe left - This gesture switches between the main screens, the temperature settings and toggles the status screens. **Swipe right** -This gesture switches between the main screens, the temperature settings and toggles the status screens



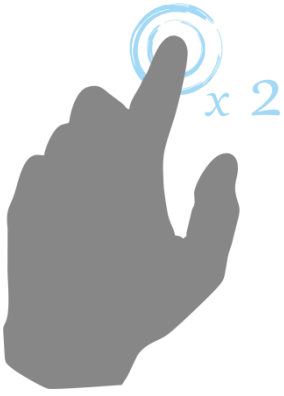
Swipe up - this gesture allows you to navigate the Controller menu. In addition, it is used for expanding (by dragging from the bottom edge of the screen) the alarm, parameter and graph screens (after you have expanded the alarm screens, move the screen to the left to switch screens between parameters and graphs).

Swipe down - this gesture also allows you to retract menu boxes (by dragging from the top edge of the screen)



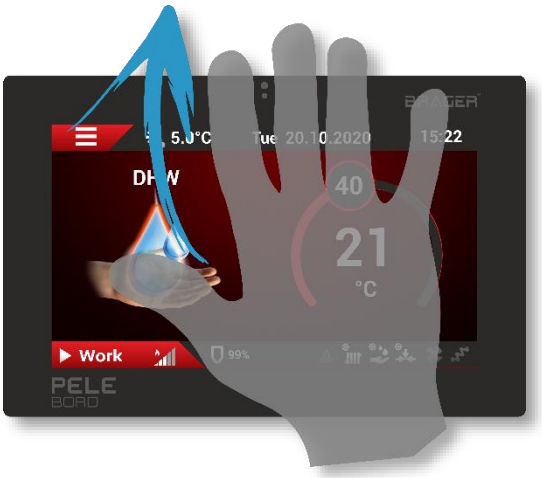
Single tap - it used for most of possible actions in the Controller: enter the menu, confirm parameters, etc.

Double tap - Use it on any home screen to display a collective view containing tiles of all active modules

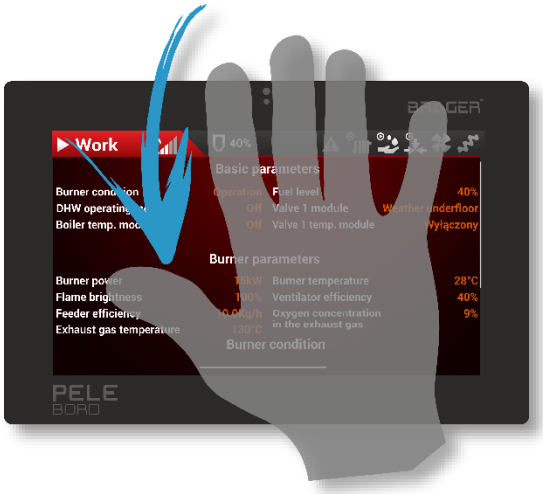


3.3. Available gestures

The regulator PELE BORD 890 panel allows you to navigate through the main screens using your own gestures made within range of a gesture and light intensity sensor. Using gestures, it is possible to move between main screens (right and left gestures), as well as to quickly access alarm and burner parameters.

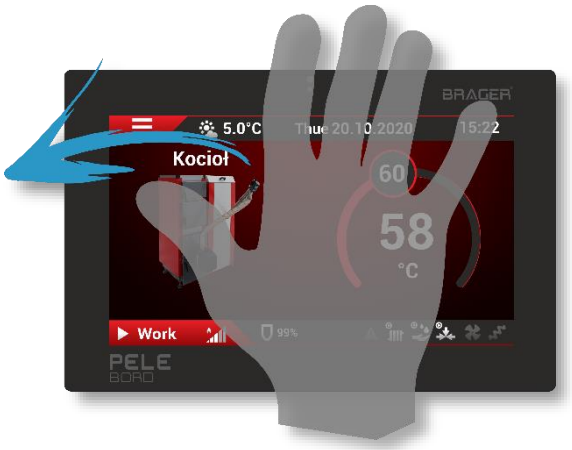


Up gesture - is responsible for switching to the alarms, parameters and regulator graphs screen (once the alarms screen has slid out, swipe left to switch between the parameters and graphs screens).



Down gesture - is responsible for moving from alarm information or basic regulator parameters screen to one of the main screens. This gesture also enables you to navigate through the status, program version and boiler configuration screen.

Left and right gestures - are responsible for switching between the main screens of the regulator. They also let you switch between the alarm screen, burner parameters screen, and the graph screen.



3.4. Explanation of the status icons

 **FAULT** - Icon indicates any fault, e.g. boiler water overheating, temperature sensor failure, etc.

 **CENTRAL HEATING PUMP** - Icon signals central heating pump operation.

 **DOMESTIC HOT WATER PUMP** - Icon signals domestic hot water pump operation.

 **VALVE PUMP** - Icon signals valve pump operation.

 **BLOWER** - Icon signals fan operation.

 **FEEDER** - Icon signals feeder operation.

4. Handling of the regulator

4.1 First start-up

After starting the PELE BORD 890 Controller with the switch located on the back of its housing, the display will show a welcome screen, followed by one of the main screens of the Controller. The Controller is in inactive mode *(no external devices such as a blower or burner are running)*. This status is indicated by the Stop caption at the bottom left part of the screen.

You can configure the Controller according to your needs at any time: select the burner operation mode, activate required modules or set the values of all editable parameters.

In order to facilitate the operation of the unit, the most important settings and temperature readings are located on the main screens which can be switched by pressing the arrow symbol on the sides of the screen  .

The number of main screens depends on the number of running modules and functions. *(Fig. 1)*

fig. 1

Apart from displaying current parameters, the main screens also provide the possibility to change basic settings. This sample screen (Fig. 2) shows the hot water reading and the basic parameters associated with it The DHW temperature setpoint is increased and decreased using the setting wheel. Parameter is displayed on the screen in real time (value 40°C in the example screen), in the middle of the setting circle, which symbolizes the available possible range within which you can move while setting the DHW temperature value. The current DHW temperature reading (value of 21°C in the example screen) is located in the right side in the middle of the circle. The top bar keeps us informed about the outside temperature, current time and date. The lower information bar displays the current operating status of the device, the value of the remaining fuel in the tank and a bar informing about the current status of devices connected to the Controller.

Fig. 2

Fig. 3

Inactive main screens are displayed in gray (Fig.3). They indicate that a module, although activated, has not been setup and its current status is disabled. You can change its status in the controller settings *(in Figure 3, this change is made in the "DHW Menu").*

Figure 4 shows the main Valve 1 Temperature screen, which shows the current temperature reading and a cloud with a paperclip symbol in the center of the screen. This symbol indicates that the preset temperature value for the mixer valve is determined on the basis of the outside temperature. You may change temperature ranges and the setpoint values assigned to them in the main menu of the Controller in the tab **Mixing valve 1.**

Fig. 4

See section 4.7 for more information on the operation of valves in the Weather Mode

Double-tapping the screen

brings up a overview screen that contains all active modules on the Controller *(Fig. 5).*

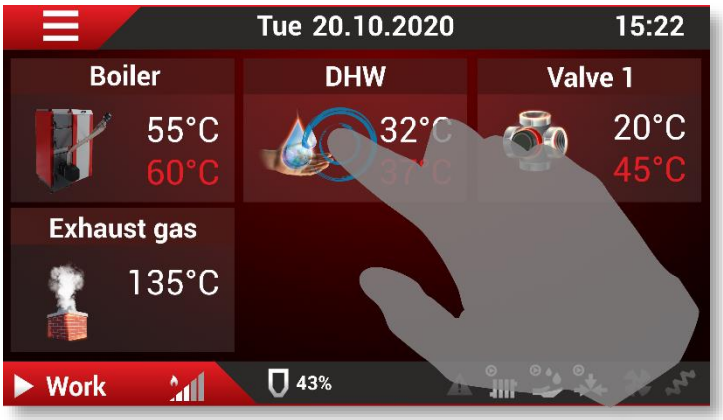


Fig. 5

Once the overview screen is displayed, by single tapping on the selected screen, you have the option to switch to the display of the selected full-featured home screen.

The bottom bar of the screen is divided into three functional boxes:

The left side, apart from the information about the current status of the device, enables you to start and stop the boiler operation.

The middle part informs you about the amount of remaining fuel in the fuel bin. Additionally, clicking in the middle area will display the message "Refuel?". This function enables to set the percentage value again to 100%, this operation is performed after each filling of the tank with fuel.

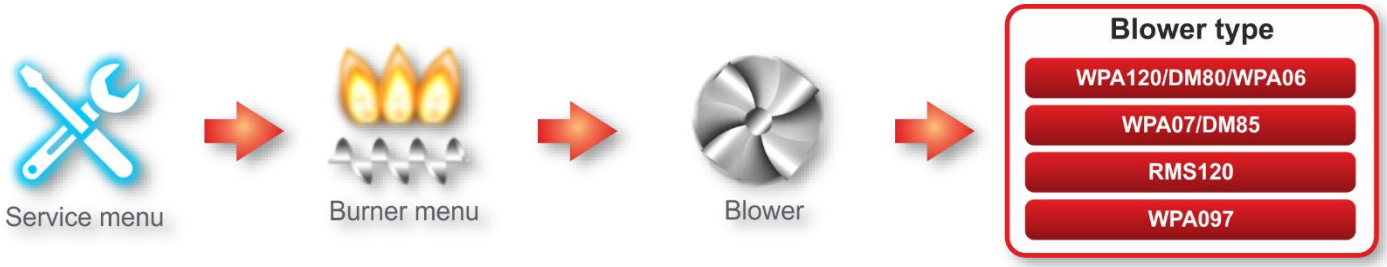
The right side of the bar keeps you informed about the current status of devices connected to the Controller (on an example bar, all available pumps are working, while the fan and feeder are off) and the alarm activation. In addition, clicking on the bar causes the screen of alarms and statuses to appear, which can be switched away by sliding the screen to the right. In order to return to the previous main screen, click on the bar again.

4.2 Initial configuration

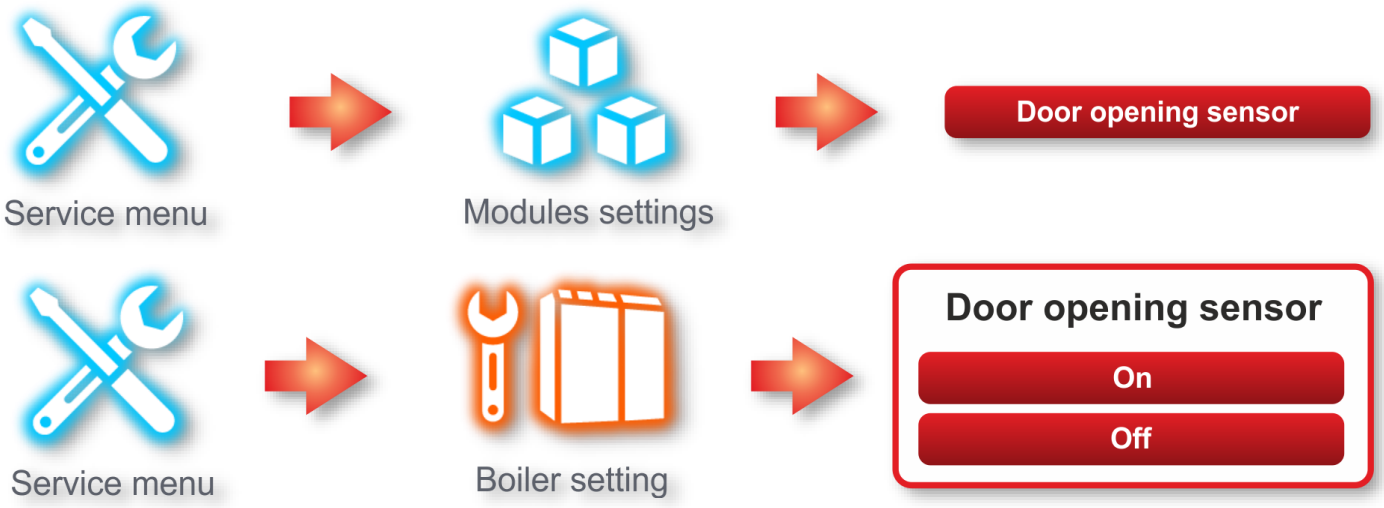
Access to the main menu is possible by tapping the  tile. To simplify navigation and to hide configuration parameters of the controller, some settings have been placed in the Advanced Menu View, which is accessible after entering a service password. Depending on the password entered (installer or manufacturer), the number of available parameters will vary.
Access to advanced settings is time-limited to 10 minutes. After this time, the device will automatically return to the standard view.

Most important configuration regulator settings PELE BORD890 include:

Blower type selection

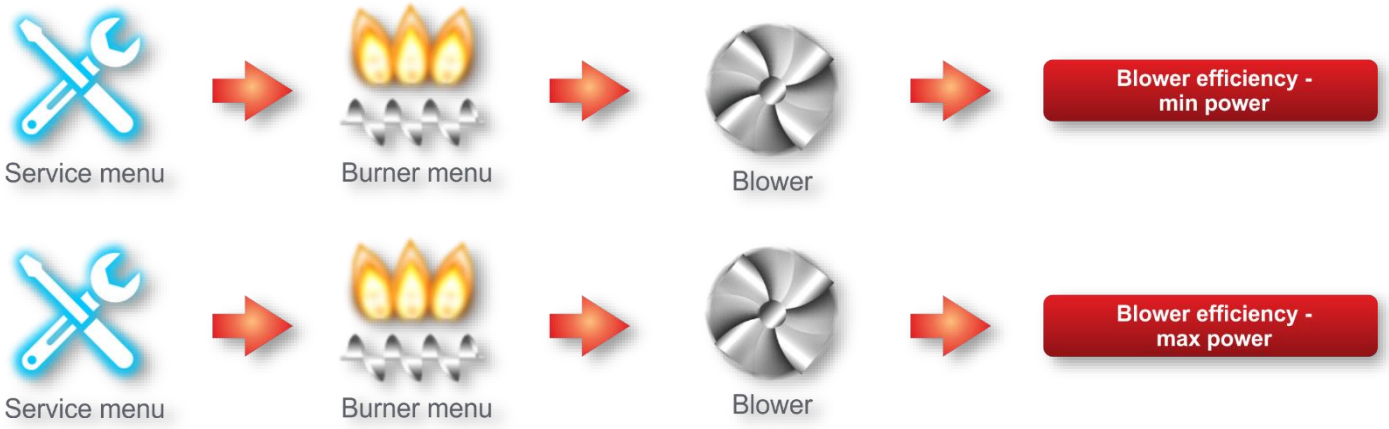


Boiler door sensor activation

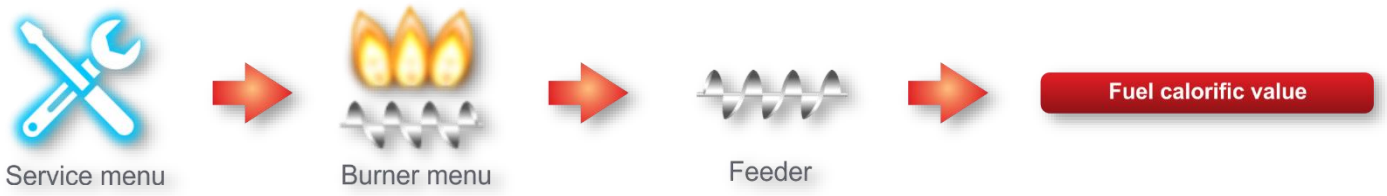


Setting minimum and maximum burner power

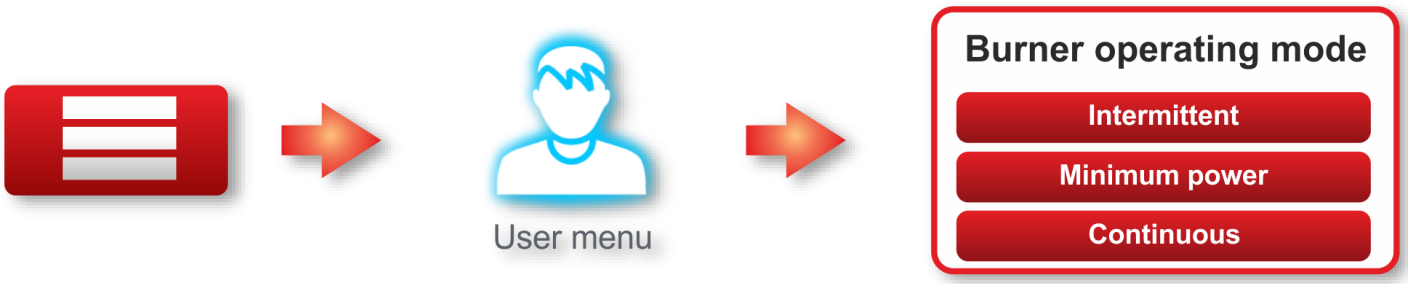
Setting minimum and maximum blower efficiency



Setting fuel calorific value

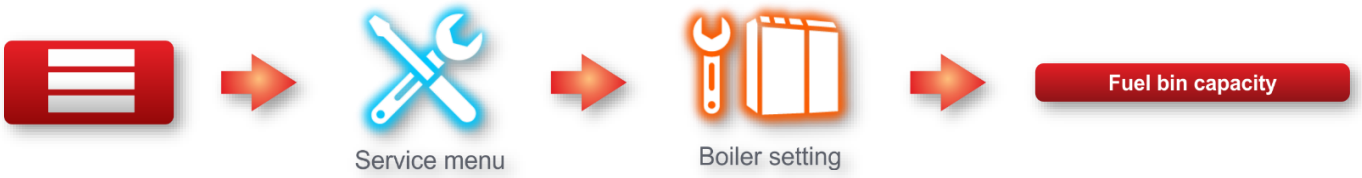


Burner operating mode



Exhaust temperature sensor activation

Setting fuel bin capacity



Feeder efficiency calibration

On the main screen (fig. 6), press and hold the Stop button for two seconds. The service menu (fig. 7) will open, allowing you to perform the feeder output calibration process.

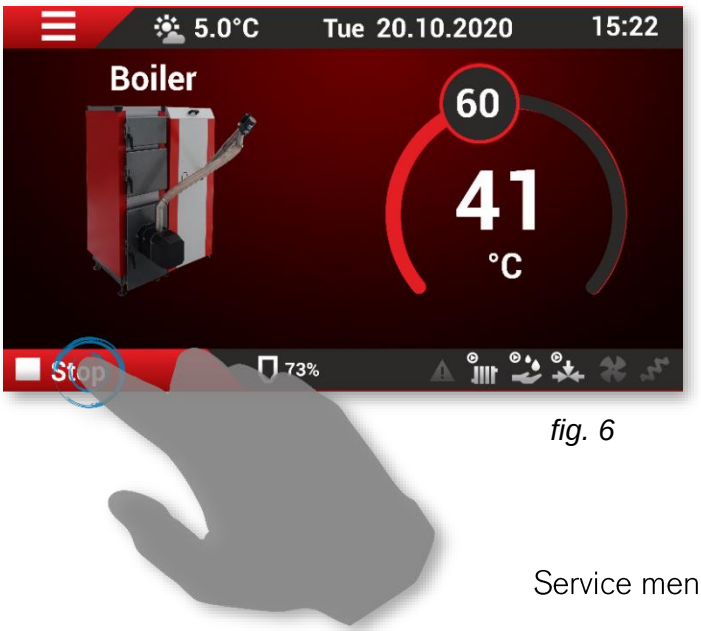


fig. 6

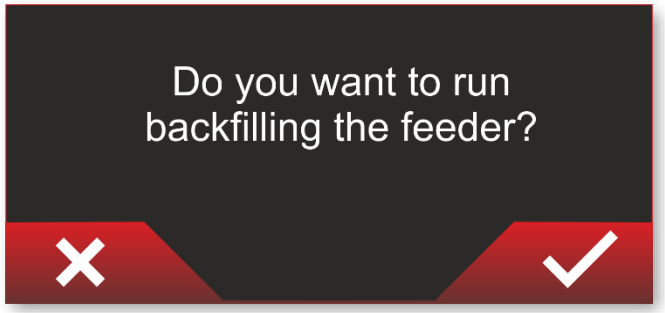
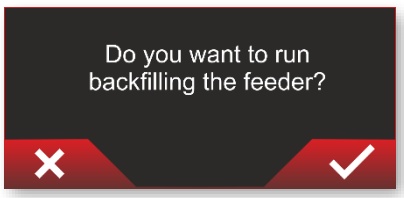


fig. 7

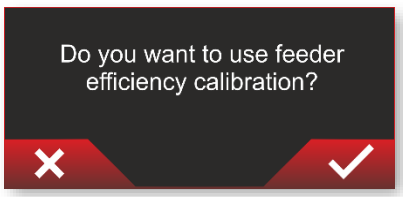
Service menu consists of a sequence of consecutive main screens.

1.

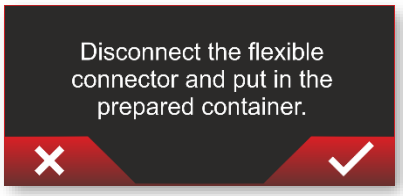


2.

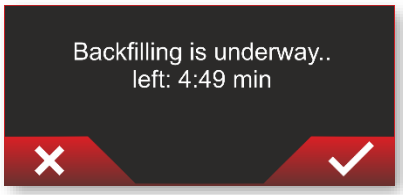
3.



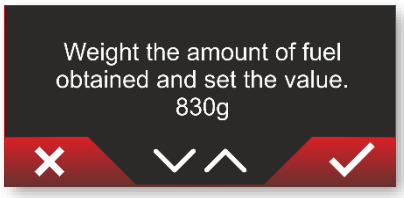
4.



5.

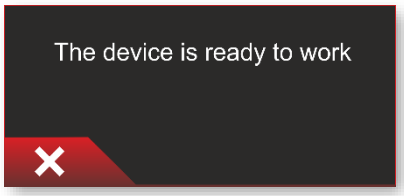


6.

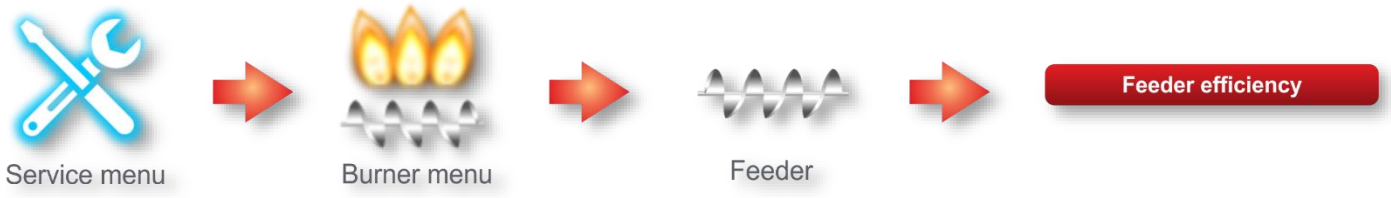


7.

8.

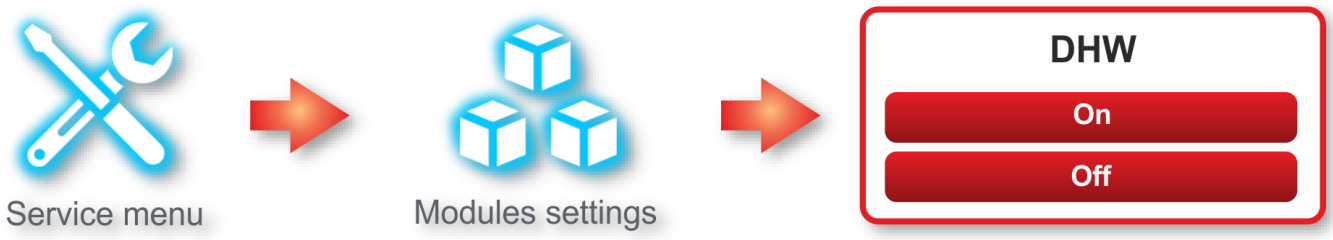


A successfully completed calibration saves the determined feeder output value. This parameter can be found in the main menu of the controller under the FEEDER tab.



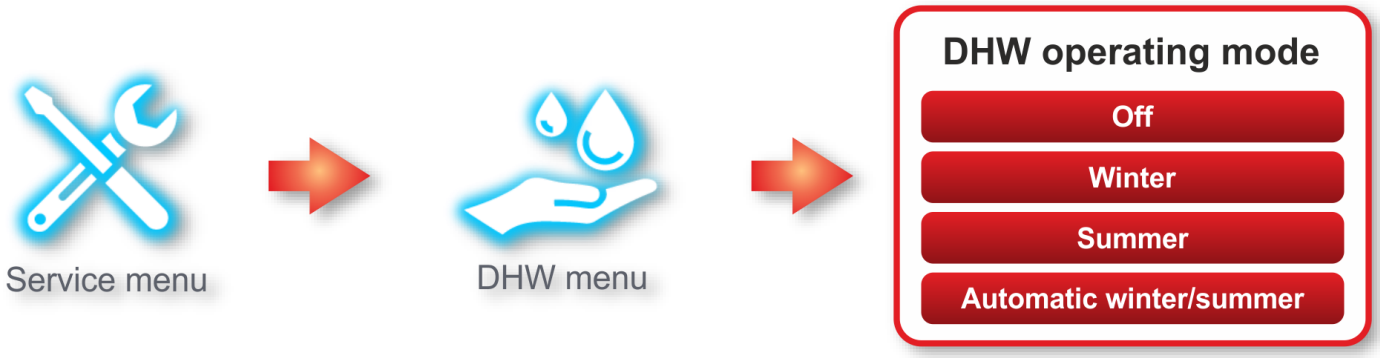
4.3 Activation and configuration of the DHW module

To activate the domestic hot water (DHW) module, first enter the Installer/Factory password (see section 4.2). Then, in the controller's service menu, find the "Module Settings" option and change the DHW module status to "ON".



If the module is enabled, the main menu will display a setup box for setting the DHW pump, and an additional main screen with DHW temperature preview is activated.

The next step is to switch the pump mode from OFF to one of the three active operating modes.



Setting the DHW pump to Winter, Summer or Auto mode changes the main screen from inactive *(gray main graphic)* to active mode. From now on, the DHW pump operates in one of the modes you have selected. You may change the DHW temperature setpoint directly on the DHW main screen using the setting circle.

Summer Mode - In this mode the main task of the boiler is to prepare hot water in the boiler. All other pumps are switched off (with the exception of when the boiler temperature exceeds the value set in the **Maximum boiler temperature** parameter, after which, in order to protect the boiler from overheating, all the pumps are switched on).

Winter Mode - In winter mode both the central heating system pump and the hot water pump are operated.

Auto Summer/Winter Mode - In automatic summer/winter mode, the mode set for the DHW pump is determined by the outdoor temperature sensor reading.

PARAMETERS DESCRIBING DHW PUMP OPERATION:

DHW pump overrun (All modes)

This parameter defines how many minutes the DHW pump will keep running despite having reached the desired temperature in the boiler. This function is useful in situations of intensive hot water consumption. *(Available range 0 – 15 minutes, factory default: 3 minutes)*

DHW hysteresis (All modes)

The value set in this parameter specifies how many degrees below the DHW setpoint temperature the temperature in the DHW tank must drop in order for the Controller to restart the DHW pump. For example, if the set temperature is 40°C and the Hysteresis is 2°C, the DHW pump will start after the temperature drops to 38°C. (Available range: 1 - 15°C, factory default: 5°C)

Domestic hot water priority (Automatic and winter mode)

If this parameter is set to "enabled", the central heating system pumps (CH pump, valve pump) are switched OFF and the water in the DHW tank is prepared first. The main temperature on the basis of which the boiler operates becomes the DHW temperature and it receives a higher priority than the temperature set on the boiler.

Boiler setting increase by domestic hot water (All modes)

This function allows you to set how many degrees the boiler temperature can rise in order to prepare hot water faster. E.g., if the boiler temperature is set at 50°C, DHW at 60°C and the boiler setting increase from DHW at 5°C, the boiler temperature will be increased to 65°C until hot water is prepared in the boiler. *(Available range: 0°C - 15°C, factory default: 5°C)*

DHW operation time (Automatic and winter mode)

After the temperature in the boiler drops by 5°C below the user-set temperature, the DHW pump is reactivated until the target temperature in the storage tank is reached again.

The “DHW Temperature Not Reached Time” parameter allows you to set the maximum duration the DHW pump will attempt to reach the desired temperature. Proper adjustment of this parameter helps to quickly heat the water in the boiler while preventing the central heating (CH) system from cooling down too much. This function only operates when the DHW pump is running in Winter or Automatic mode with priority enabled. *(Available range: 30 min – 120 min, factory default: 30 minutes)*

Domestic hot water switch on temperature (Automatic mode)

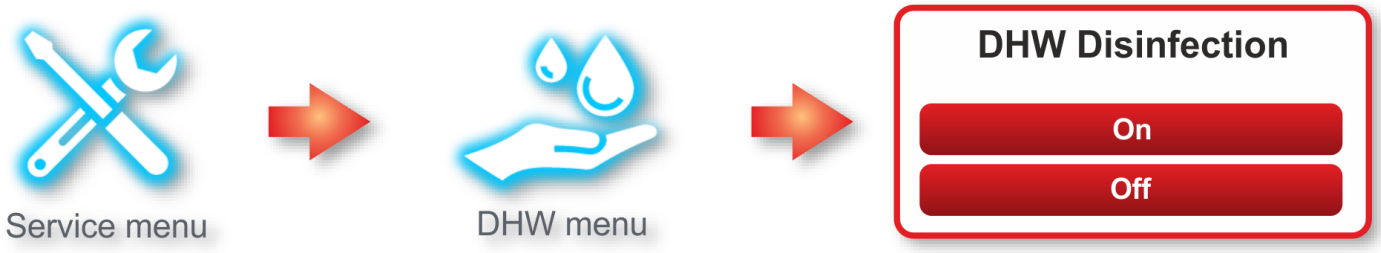
This parameter defines the value, specified in degrees Celsius, after exceeding of which the DHW pump follows the settings for its operation in Summer Mode. *(Available range: 0°C - 20°C, factory default: 10°C)*

Domestic hot water switch off temperature (Automatic mode)

The parameter defines the value, specified in degrees Celsius, below which the regulator will operate in accordance with the settings for the Winter mode for the DHW pump. *(Available range: 0°C - 20°C, factory default: 7°C)*

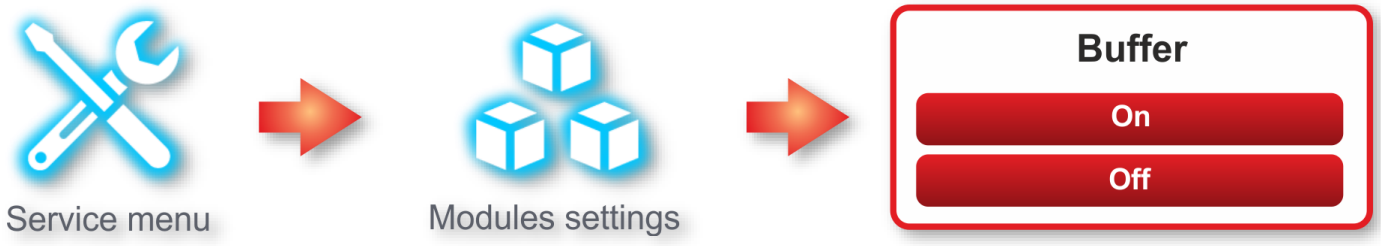
Domestic hot water disinfection (All modes)

By setting the DHW operation to summer, winter, or automatic mode, the **Domestic Hot Water Disinfection** function can be activated, the purpose of which is to neutralize Legionella bacteria that can grow in hot water tanks. If the disinfection parameter is enabled, the tank temperature is raised to 72 °C for 15 minutes at 1 am on Saturday/Sunday. During this time, the "DHW Disinfection" message appears on the DHW temperature screen, the ALARM symbol flashes, and the DHW Disinfection message appears in the error/fault list.

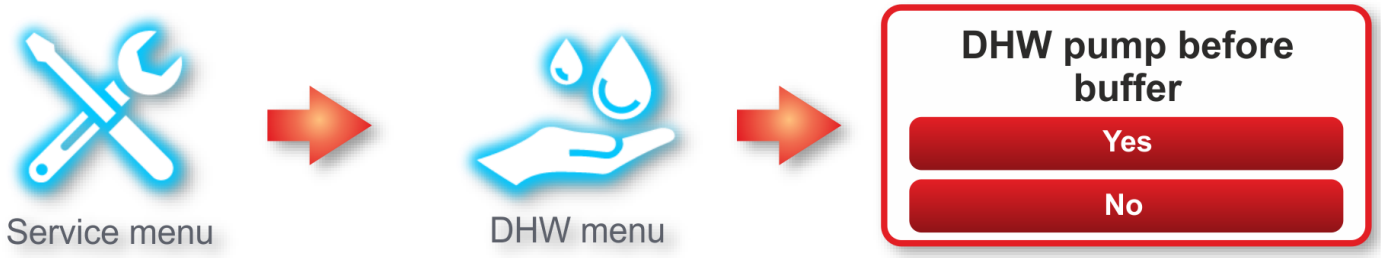


DHW pump before buffer (All modes)

The function is activated when the Buffer Output is enabled



The "DHW Pump Before Buffer" function determines the heat source for the domestic hot water (DHW) tank in the installation. The available values for this setting are "Yes" or "No". Selecting one of these options defines the source from which water will be drawn to heat the domestic hot water.



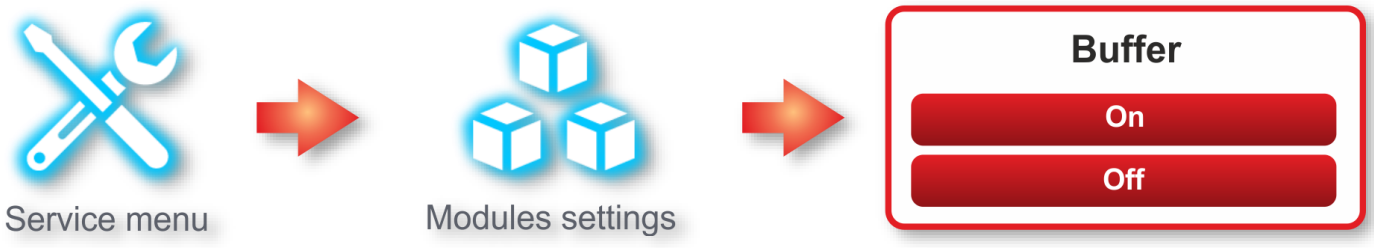
- Setting the value to "Yes" means that domestic hot water will be heated directly from the boiler.

- Setting the value to "No" means that domestic hot water will be heated from the water stored in the thermal buffer.

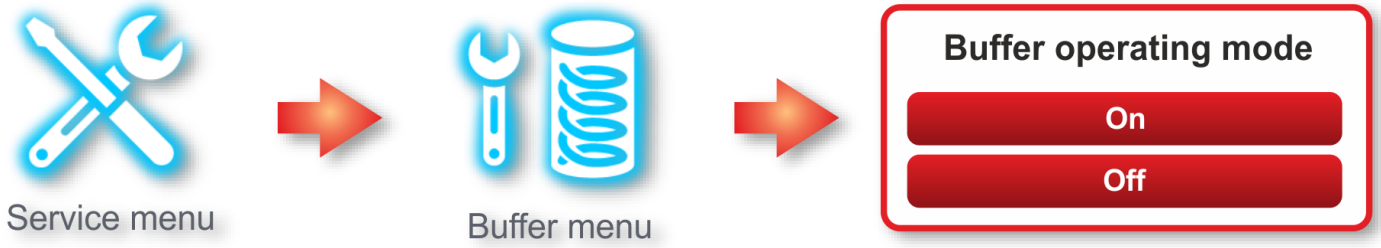
Disabled mode - The DHW pump is turned OFF, this is indicated by the grey main screen responsible for displaying information about the DHW temperature

4.4 Activation and operation of the buffer module

To activate the buffer module, first enter the Installer/Factory password (see section 4.2). Then, in the controller's service menu, locate the Modules Settings option and set the Buffer module status to **„ON"**.



The next step is to change the operating mode of the buffer module from Off to On.



Once the buffer module is activated, a dedicated section will appear in the main menu of the controller. Additionally, a main screen will be enabled, showing the buffer temperature and setpoint value (see fig. 8).

fig. 8

To increase or decrease the buffer temperature setpoint, use the setting dial. This parameter is continuously visible on the right side of the screen (e.g., value 80°C in the sample screen).

Parameters available in the buffer menu:

Buffer Operating Mode

This parameter is used to define the buffer's operating mode. You can choose between „on” or „off”.

Buffer pump activation temperature

This parameter defines the temperature value at the buffer at which the pumps connected to the buffer will be activated. (Available range: 30–50°C, factory default: 35°C).

Temperature – reload start

When the temperature read from the top buffer sensor drops below the value defined in the **"Temperature – reload start"** parameter, the buffer charging pump is reactivated. (Available range: 40–84°C, factory default: 50°C)

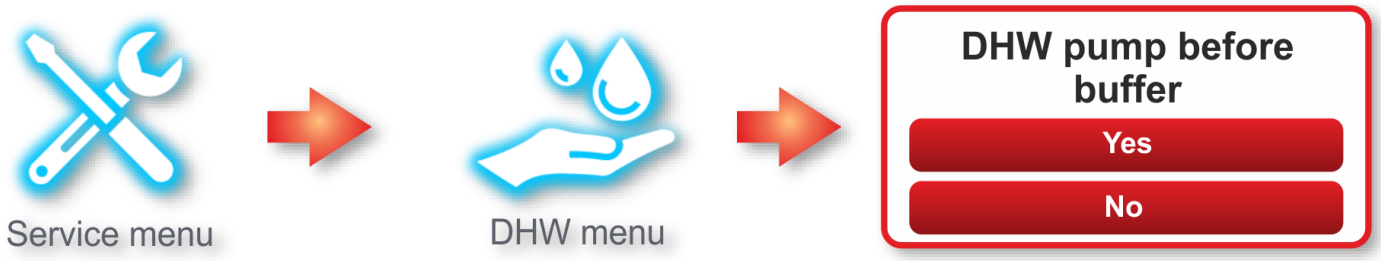
Temperature – loading finish

The buffer charging pump is turned off once the temperature on the bottom sensor reaches the buffer's setpoint temperature. This parameter is identical to the buffer temperature setpoint.
(Available range: 41–85°C, factory default: 60°C)

Additionally, in the DHW (Domestic Hot Water) menu, the parameter **DHW Pump Before Buffer** will become available.

The "DHW Pump Before Buffer" function determines the heat source for the domestic hot water (DHW) tank in the installation. The available values for this setting are "Yes" or "No". Selecting one of these options defines the source from which water will be drawn to heat the domestic hot water.

- Setting the value to "Yes" means that domestic hot water will be heated directly from the boiler.
- Setting the value to "No" means that domestic hot water will be heated from the water stored in the thermal buffer.



4.5 Exhaust gas sensor activation

The PELE BORD890 controller is equipped with a connector that allows for the installation of a exhaust gas temperature sensor, enabling real-time monitoring of exhaust gas temperature. The current exhaust gas temperature is continuously displayed on one of the main screens. The connector intended for the sensor is labeled T9.

fig. 9

To activate the sensor, navigate to the Exhaust Gas Menu in the controller's service menu and set the Exhaust Gas Temperature Sensor parameter to **„ON"**.

Once the sensor is activated, the exhaust gas temperature will be continuously displayed on one of the main screens. Additionally, if the measured exhaust gas temperature exceeds the acceptable level, the controller will trigger an alarm. An excessively high exhaust gas temperature may indicate improper controller settings or significant internal fouling of the boiler surfaces, which prevents effective heat transfer.

Maximum exhaust gas temperature – The parameter defines the maximum exhaust gas temperature, above which the controller will trigger an audible alarm.
(Available range: 80 – 300°C, factory setting: 120°C)

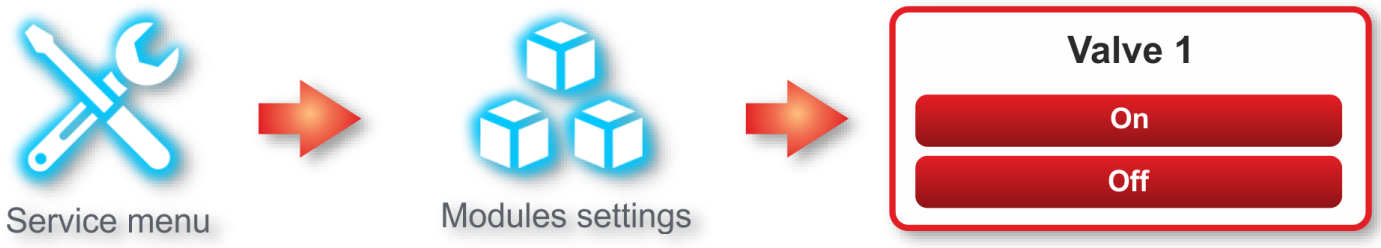
Max. exhaust gas temperature overshoot time - The parameter defines how long (in minutes) the exhaust gas temperature can exceed the set maximum before the "Maximum exhaust gas Temperature" alarm is triggered (available range: 0–240 minutes, factory setting: 60 minutes).

Warning!!! The flue gas temperature sensor (PT 1000) is not supplied with the basic Controller setup.

4.6 Activation and operation of mixing valves

The PELE BORD 890 Controller is equipped with outputs for operating the valve pump and valve actuator. Additionally, it is possible to connect room thermostats to room valves and to work with external temperature sensors, which together with a number of settings characterizing the operation of valves gives a complete device for fully automated control of temperatures in the apartment. In its basic form, the Controller can control one valve actuator and valve pump, but it can be expanded to fully control up to 5 independent pumps and valve actuator.

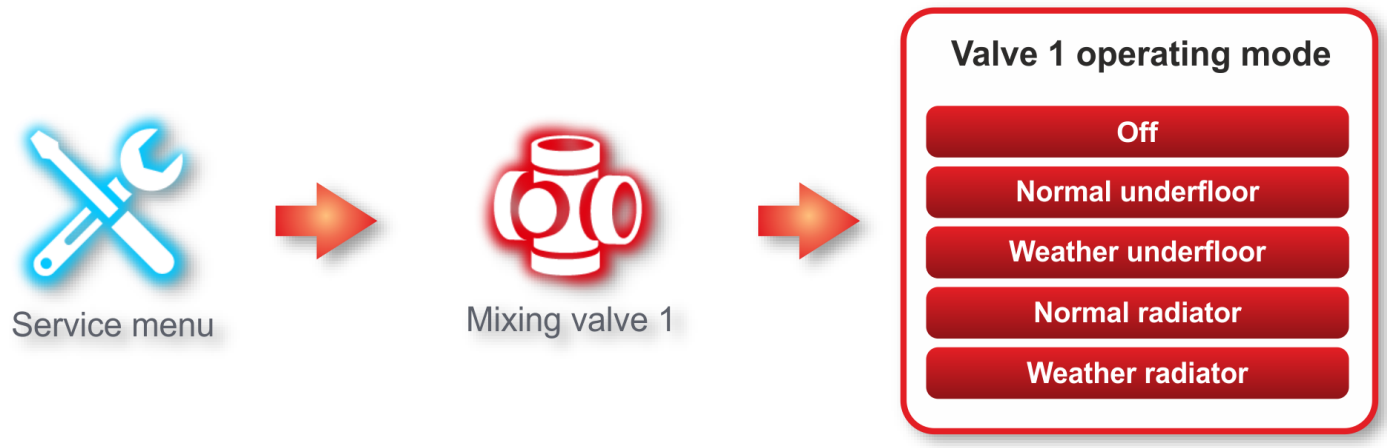
Valve operation can be enabled after entering the Installer/Factory password (see section 4.2). Then, in the service menu, locate the Modules Settings option and activate the block responsible for valve control.



Upon activation of the valve module, a box is made available in the main menu of the regulator, containing parameters defining the mode of operation for the mixing valve 1 and an additional valve temperature screen is activated; (Fig.10) grey color of the screen means that the valve has been activated, but its mode of operation has not been set yet.

fig. 10

Valve operation mode settings are made in the main menu in the "Mixing valve 1" area.



From now on, to control the operation of the valve, the main screen is available (Fig. 11), where you can directly set the temperature value that the valve will strive to maintain, and the settings menu, which contains a number of functions that characterize the operation of the valve.

fig. 11

Warning!!! If the valve is set to weather mode, the possibility of setting the temperature is blocked, which is indicated by the weather mode icon in center of the screen

Valve operating modes:

Normal radiator - This mode is designed for monitoring of water temperature in radiator installation, temperature setting range has been extended to 75°C. In the normal mode in case of exceeding of the water temperature above the value set in the **Maximum boiler temperature** function, the valve is opened unconditionally until the temperature in the boiler is stabilized.

Normal underfloor - This mode is designed for monitoring the water temperature in the floor system; the maximum temperature setting is limited to 45°C. In Normal underfloor mode, the priority is to protect the installation from too high a temperature, so in emergency situations the valve closes.

Weather radiator and weather underfloor - These modes are designed to work with an outdoor temperature sensor, after selecting one of these modes, the preset valve temperature is divided into three values:

- Setpoint at outdoor temperature: -10°C
- Setpoint at outdoor temperature: +10°C

Depending on the outdoor temperature, the controller automatically calculates the temperature value for the valve based on the declared setpoint values *(-10, +10)*.

The difference between the radiator mode and the underfloor mode lies in the valve's behavior in emergency situations (when the supply temperature rises above the alarm threshold) — in radiator mode, the valve opens, whereas in underfloor mode, standard operation is maintained along with simultaneous control of the set temperature for the floor heating circuit.

The following valve settings are available for the normal and weather modes:

Valve 1 open time - This is the time for which the valve actuator will be turned on. *(Available range: 1 - 60 seconds, factory default: 5 seconds)*

Valve 1 Measurement waiting time - This parameter defines the interval between successive activations of the valve actuator. *(Available range: 5 - 30 seconds, factory default: 20 seconds)*

Valve 1 hysteresis - The value set in this parameter determines by how many degrees above the set temperature the valve temperature must increase in order for the regulator to start closing the mixing valve. E.g., when the set temperature is 35°C and the Hysteresis is 2°C, the valve will start closing cycle after reaching 37°C on the valve. *(Available range: 1 - 5°C, factory default: 1°C)*

Valve 1 operating range above setting - The value determines by how many degrees the temperature on the valve can rise to the maximum. Once this value is exceeded, the valve closes and remains in this state until the temperature on the valve drops below the value specified in this function. *(Available range: 1 - 10°C, factory default: 5°C)*

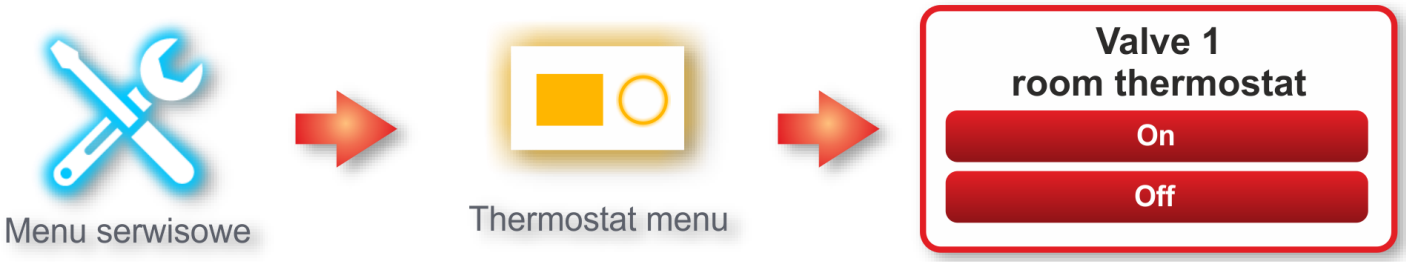
Heat source for Valve pump 1 Activating the buffer module allows you to define the source from which water will be supplied to the Valve 1 circuit. The circuit can be supplied either with water from the buffer or directly from the boiler.

START-UP AND OPERATION OF THE VALVE THERMOSTAT:

Valve 1 room thermostat - The "Valve 1 room thermostat" function allows heating control via an external panel/thermostat, which monitors the room temperature to maintain it at a user-defined level. Room temperature regulation is achieved by controlling either the valve pump or the valve actuator.

The connector designated for connecting the room thermostat for Valve 1 is marked as I3 on the main board.

The functions of the room thermostat for Valve 1 are activated in the thermostat menu.

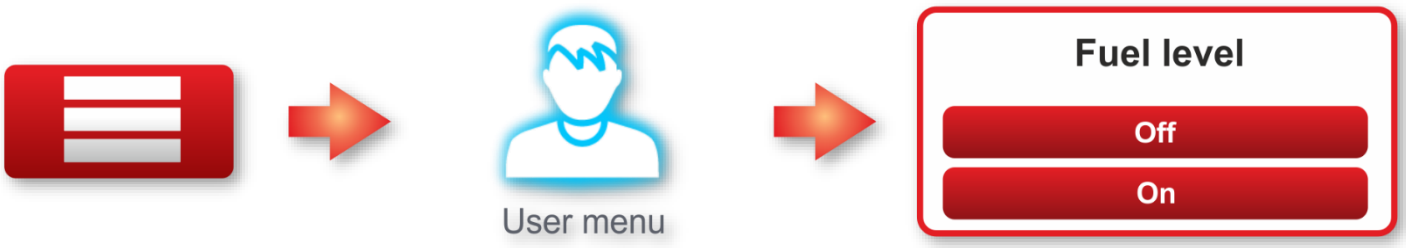


Valve 1 setting lowering by thermostat - This parameter determines how many degrees the temperature at the mixing valve will be decreased, if the room temperature has been reached *(contact open). (Available range: 0 – 30°C, factory default: 0°C)*

Switching off the pump from the thermostat - The function decides whether the valve pump 1 will be switched off when the set temperature is reached on the room thermostat (open contact).

4.7 Fuel level function – activation and setup

To access this function, enter the main menu and find the "User menu" option in the available setting.



When the Fuel Level is set to "enabled", an 80% icon will appear on the main screen indicating the percentage of fuel bin filling.

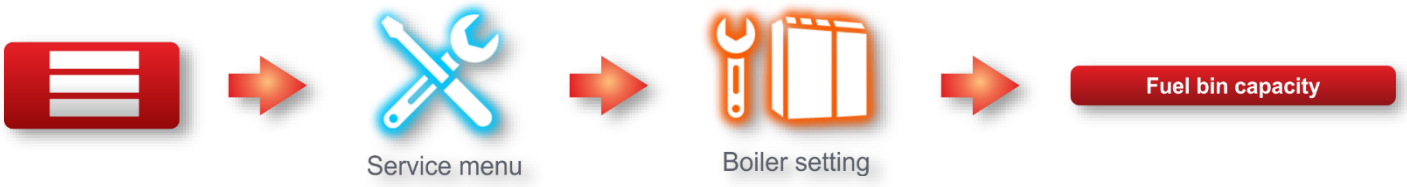
In the same menu there is a function responsible for setting the Fuel Level to 100%, thanks to which it is necessary to set the fuel level to 100%, i.e. the fully loaded fuel bin, every time the hopped is fully filled with fuel.

In addition, the fuel bin refill function can be recalled by pressing a 80% tile in the home screen.

For the percentage indicator to correctly determine the amount of remaining fuel in the fuel bin, the following options must be calibrated correctly: **Fuel bin capacity** and **Feeder efficiency**.

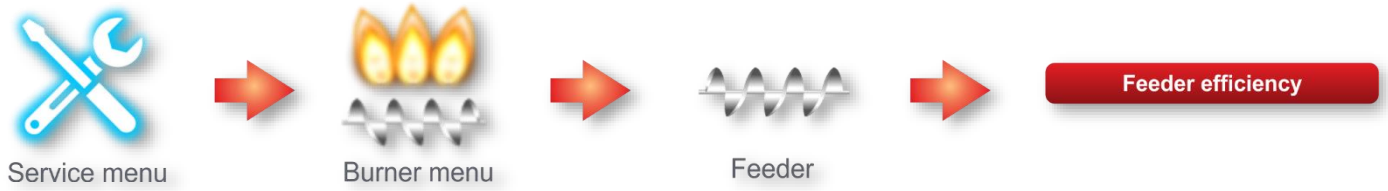
Fuel bin capacity

This option sets the capacity of the fuel bin to a value equal to your bin capacity. *(Available range: 20 liters - 1275 liters, factory default: 200 liters)*



Feeder efficiency

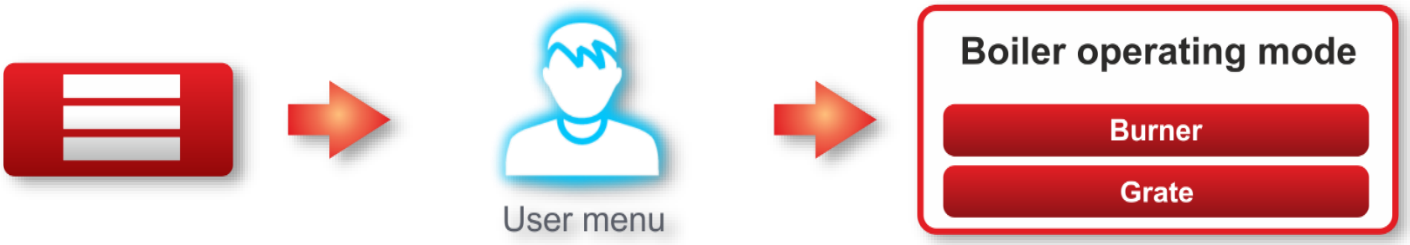
This parameter determines how much fuel the feeder is able to feed to the burner for one hour of continuous operation. *(Available range: 1 kilo - 200 kilo, factory default: 10,0 kilo)*



4.8 Burner-free operating mode

The PELE BORD 890 regulator is equipped with a function that allows burning on the emergency grate without the participation of the burner. In the emergency grate mode, the regulator operates in the same way as in the automatic mode (excluding the burner), where all active pumps, sensors and the fan are active. Putting the regulator into automatic emergency grate operating mode can be done with the ▶ Start button At any time it's possible to stop the automatic operation by pressing the ■ Stop button.

To activate this mode, you must switch the boiler modes in the user menu option.



Once the boiler operating mode is set to "Grate", the functions responsible for regulating the operation of the blower (found in the Boiler Settings) will be activated.

Blower efficiency, grate – This setting makes it possible to adjust the blower power, and the parameter will be active when the boiler is trying to reach the set temperature. (Available range: 1 - 100%, factory default: 20%)

Boiler switch off temperature - When the boiler temperature drops below this value, the controller turn off all peripheral devices (pumps, blower) and switches to the STOP mode.
The controller shutdown may occur due to an empty fuel bin, improper boiler settings, or power supply interruptions. (Available range: 30 – 40°C, factory setting: 35°C).

Boiler hysteresis, grate - When the regulator shifts from the heat sustain mode into the work mode (the temperature drops below the set temperature), the hysteresis value would specify with what delay (after how many degrees Celsius) the regulator would enter the work mode again (start the blower). For example, when the set temperature for the boiler is 60°C and the hysteresis is set at 2°C, the boiler will enter the work mode from the sustain mode after the temperature drops to 58°C. (Available range: 1 - 3°C, factory default: 2°C).

Scavenge time - This parameter determines for how long (how many seconds) the blower will be switched on. The function will be available after the boiler reaches the set temperature. (Available range: 0 - 25 seconds, factory default: 10 seconds).

Time between scavenging - When the boiler has reached the temperature set by the User, the blower goes into cyclic intervention mode to maintain the combustion process. Thanks to this setting you can indicate the length of the intervals between these cyclic blower interventions. (*Available range: 3 – 45 minutes, factory default: 5 minutes).*

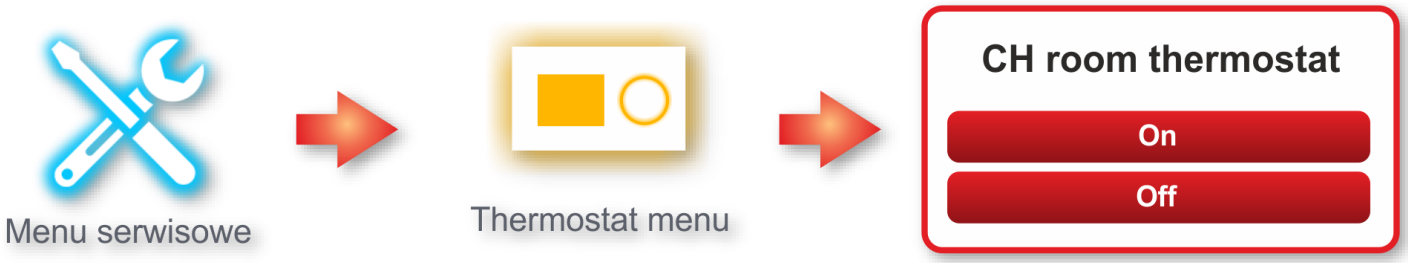
4.9 Operation with room thermostat

The PELE BORD 890 Controller is equipped with a room thermostat connection. It allows to control the temperature in the room (where the thermostat is installed) by switching on and off the central heating pump. The connector on the Controller intended for connection of a room thermostat is marked as "I2". A detailed wiring diagram can be found in Section 7.1.

Warning!!! The Controller requires a thermostat that opens the contacts when the room temperature is reached and closes them when the temperature is lower than that set on the thermostat.

To activate the CH room thermostat module, first you must first enter the password (See section 4.2).

The functions of the room thermostat are activated in the regulator's service menu, after its prior activation in the 'Modules Settings' menu.



Central heating room thermostat - The circulation pump will be started each time the room temperature drops below the value set on the thermostat *(contact closed)*. When the room temperature reaches that set on the thermostat *(contact open)*, the Controller will cyclically start the circulation pump in order to maintain the room temperature.

The connected thermostat (closed contacts) is indicated by displaying the 'contact' symbol on the main screen; an open thermostat causes the symbol to disappear

To access the parameter settings of the circulation pump, the password must be changed, see section 4.2.

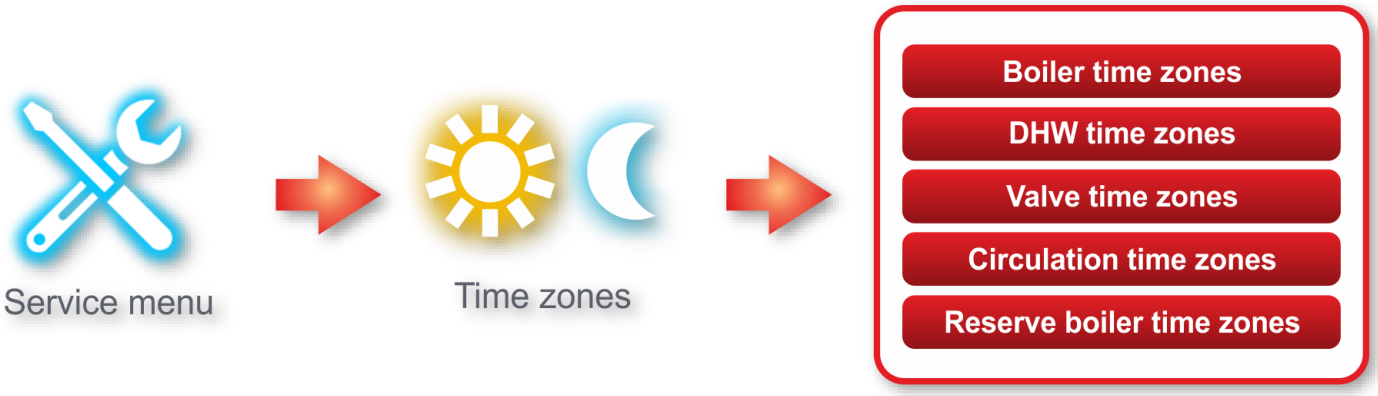
CH pump operation time - When the room temperature reaches the temperature set on the thermostat, this setting determines for how long the central heating pump will be activated. *(Available range: 30 – 240 seconds, factory default: 30 seconds)*

CH pump cutoff pump - This is the time that specifies the intervals between successive activations of the central heating pump. The setting is only active, when the room temperature set on the thermostat is reached. Setting this parameter to "0" means that the circulation pump will not be activated at all. *(Available: 0 - 240 minutes, factory default: 15 minutes)*

Warning!!! If the temperature of water in the boiler exceeds the value set in parameter "**Maximum boiler temperature**", in order to protect the boiler against overheating, the room thermostat control over the central heating pump is disabled.

4.10 Activation and setup of time zones

In order to have greater control over the operation of the boiler, the hot water reservoir and the temperature in the apartment, PELE BORD 890 the Controller has an extensive time zone function. Due to time zones it is possible to setup the Controller individually for hours of the day *(fixed mode - for all days the same)* or for weekdays and two days of the weekend separately *(weekly mode)*. Reasonable time zone setup allows for significant reduction of costs related to heating of rooms and management of hot water resources.



Permanent - Allows identical hourly settings for all days of the week. When you select this mode, the **Time settings (Boiler, Domestic hot water, Valve 1, Circulation and Reserve boiler)** function is enabled depending on the module selected.

Weekly - Allows separate time setting for weekdays and for two weekend days. When this mode is selected, depending on the selected module, the following functions are activated:

Time settings Mon-Fri(Monday- Friday)

Time settings Sat (Saturday)

Time settings Sun (Sunday)

The time zone setup screens look the same for all units and they are set in the same way, the upper bar (Fig. 12) is divided into three colors *(red, green, blue)*, which designate three zones/ranges that make it possible to set a different temperature offset value for each of them.

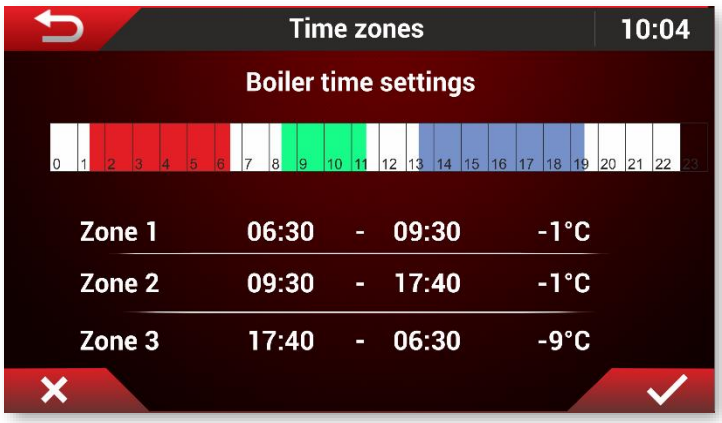


Fig. 12

The width of each zone and thus the range of its operation can be freely adjusted. Zones cannot overlap, and the gaps left between them mean that in this period of time no offset is made and the Controller will operate according to standard settings.

The bottom bar is divided into four main blocks:

- **Zone selection** (Zone 1 - red, Zone 2 - green, Zone 3 - blue),
- **Initial time of zone activation**
- **End time of zone activation**
- **Offset value**

Warning!!! For the circulation pump time zones, the last setting block is set to **Off** or **On.** If the setting is **"On"** - the circulation pump is running, and when **"Off"-** the circulation pump will not work.

4.11 Configuration of the universal output / input

UNIVERSAL OUTPUT:

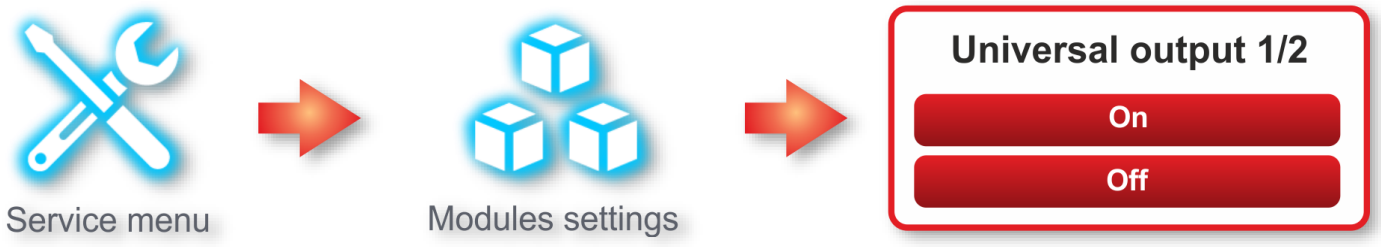
The PELE BORD 890 controller is equipped with two universal outputs, which can be configured by the user as:

- **Circulation pump,**
- **Heat exchanger**
- **Alarm signal**
- **Work signal**
- **Exhaust fan**
- **Ash removal**
- **Return pump**
- **Reserve boiler**

The universal outputs are labeled on the main board as Q3 for Universal Output 1 (relay, voltage-free output) and Q9 for Universal Output 2 (230V voltage output).

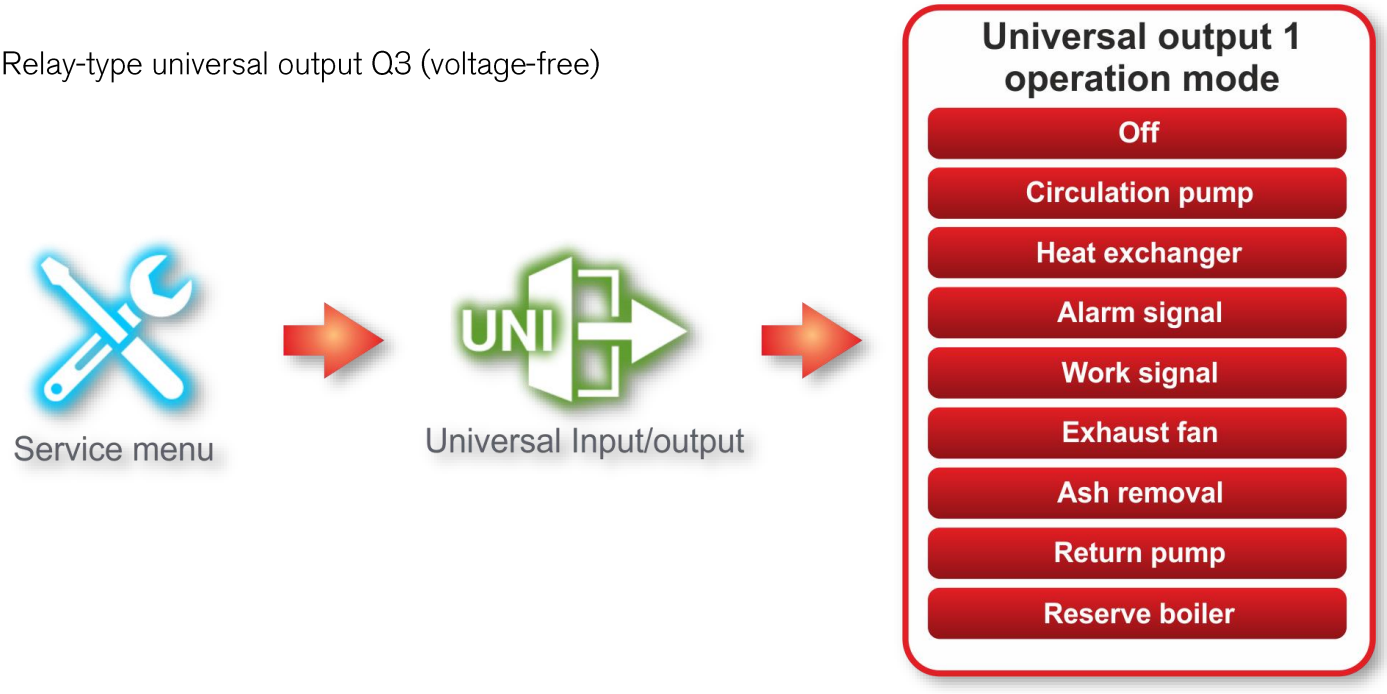
Activation of the universal outputs is possible after entering the installer/manufacturer password (see section 4.2).

Then, return to the service menu, find the 'Module Settings' option, and activate the required universal output."

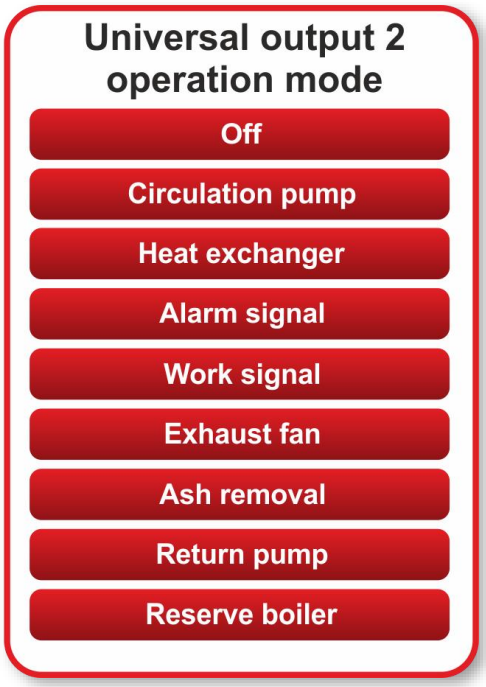


The next step is to define the operating mode of the universal output:

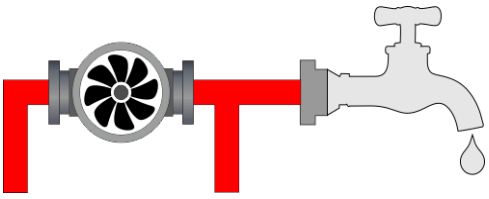
Relay-type universal output Q3 (voltage-free)



Voltage-type universal output Q9 (230V)



Circulation pump - Configuring the universal output in this way makes it possible to control the operation of the circulation pump, which is responsible for transporting hot water between the boiler and the final receivers in the system, e.g. shower, tap, etc.



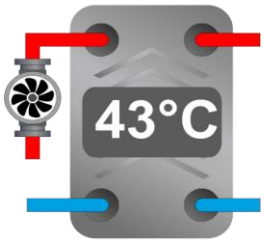
Circulation pump operation - This is the time, specified in seconds, for which the circulation pump is activated. *(Available range: 10 - 250 seconds, factory default: 30 seconds)*

Circulation pump pause - This function allows the user to set intervals between pump activations. *(Available range: 1 - 250 minutes , factory default: 5 minutes)*

Minimum DHW temperature for circulation - This parameter defines the minimum temperature in the DHW tank which must be reached for the circulation pump to be activated. *(Available range: 30 - 70°C, factory default: 40°C)*

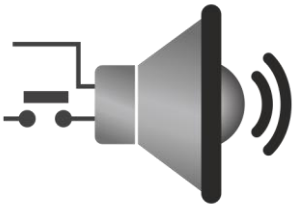
Warning!!! In order to activate the circulation pump, you must configure time zones that define the hours of operation of the pump *(permanent mode)* or detailed configuration *(weekly mode).* For more information about time zones, see Section 4.10.

Heat exchanger - The boiler pump operating mode set to "Heat Exchanger" is used in situations where the installation includes a device that enables heat transfer between fluids while maintaining complete isolation between them, meaning no direct contact.

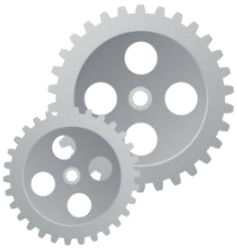


When the heat exchanger mode is active, the universal output is triggered each time another installation pump is running.

Alarm - The PELE BORD890 controller allows the use of a universal output to connect external devices that signal the occurrence of an alarm. Devices can be powered directly with 230V (in the case of universal output Q9) or connected as a voltage-free contact (in the case of output Q3). In this mode, the universal output will be activated when an error or alarm occurs in the controller.



Work signal - Configuring the universal output in this way will result in the activation of the universal output when the controller is switched to automatic work mode.



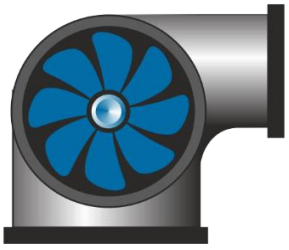
Return pump - The boiler pump operating mode set to "Return pump" is intended to control the operation of a pump that protects the boiler from low-temperature corrosion caused by water returning to the boiler at too low a temperature. When this mode is active, an additional main screen is displayed, showing the current reading from the sensor installed on the return line.

The sensor should be connected to the terminal labeled T6 on the main board.

fig. 13

Warning !!! – The sensor is not included in the basic equipment of the controller.

Exhaust fan - The controller allows PELE BORD890 the use of a universal output to connect an exhaust fan. In this mode, the universal output will be activated every time the blower supplying air to the burner is turned on.

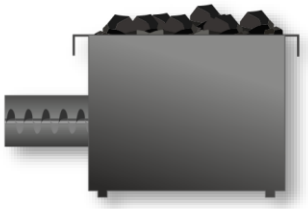


Reserve boiler – The universal output operating in the "Reserve Boiler" mode allows controlled shutdown of the main boiler and activation of the backup device. For this function to work properly, it is necessary to configure time zones for the reserve boiler (see section 4.11).

Configuring the time zones will cause the burner to shut off and the universal output to activate whenever the parameter value in the reserve boiler's time zones is set to 1.

Ash removal – The universal output operating in the "Ash Removal" mode allows cyclic activation of the universal output, which can control external boiler cleaning mechanisms. The function operates based on two parameters:

- Ash removal operation time
- Ash removal pause time



UNIVERSAL INPUT:

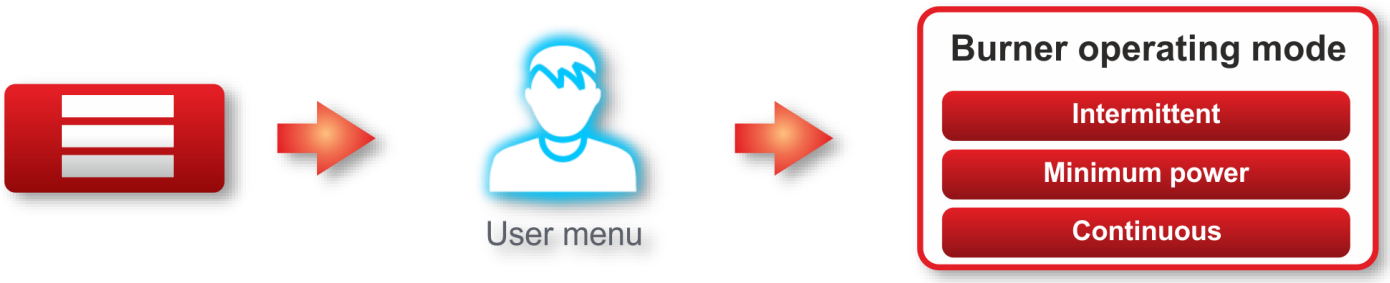
The PELE BORD 890 controller is equipped with a universal input that the user can configure as an external fault signal. This input operates as a potential-free contact — when the circuit is closed, the burner operation is halted, and the controller displays an alarm "Additional Equipment Fault." The input intended for the signal connection is labeled as I5 on the main board.

Universal input 1 - polarization - The function allows changing the contact polarity in the resting state from Normally Closed (NC) to Normally Open (NO).

4.12 Burner menu –Setup and operation

PELE BORD 890 controller is designed for comprehensive operation of a boiler equipped with a pellet burner. All stages of burner operation: **BLOW, IGNITING, STABILIZATION, WORK, DAMPING CLEANING, and STANDBY** take place fully automatically, which makes the boiler operation virtually unattended. The operation of a pellet burner can be divided into several stages, each characterized by different functions and a number of editable settings that control the burner operation.

The burner can operate in three modes:



INTERMITTENT – This is the standard burner mode, in which the burner shuts down after reaching the set temperature. The burner will restart when there is a heat demand in any heating circuit, domestic hot water system, or buffer tank.

MINIMUM POWER – This mode is similar to the intermittent mode, with the difference that the burner continuously operates at minimum power. Once all set temperatures are reached, the burner will shut down and restart in minimum power mode when heat demand appears again.

CONTINUOUS– In continuous mode, the burner operates without interruption. After completing all heating tasks, it does not shut down but instead switches to minimum power operation.

For the proper operation of the pellet burner, an initial configuration of the burner parameters is required:

- *Maximum burner power*
- *Minimum burner power*
- *Feeder efficiency (see point 4.2, page 14)*
- *Fuel calorific value*
- *Blower efficiency for max power*
- *Blower efficiency for min power*

Correct configuration of the above parameters ensures proper burner power adjustment during work. Some of the parameters apply to all stages of burner operation or serve as configuration parameters.
The most important include:

Burner model ***(User menu)*** **–** The parameter allows selecting the type and size of the burner used in the boiler. Proper burner selection ensures the assignment of appropriate parameter ranges, which translates into smooth and stable operation of the device.

Feeder ignition detection ***(Feeder menu)*** **–** The parameter determines whether the controller will read the temperature in the feeder pipe.

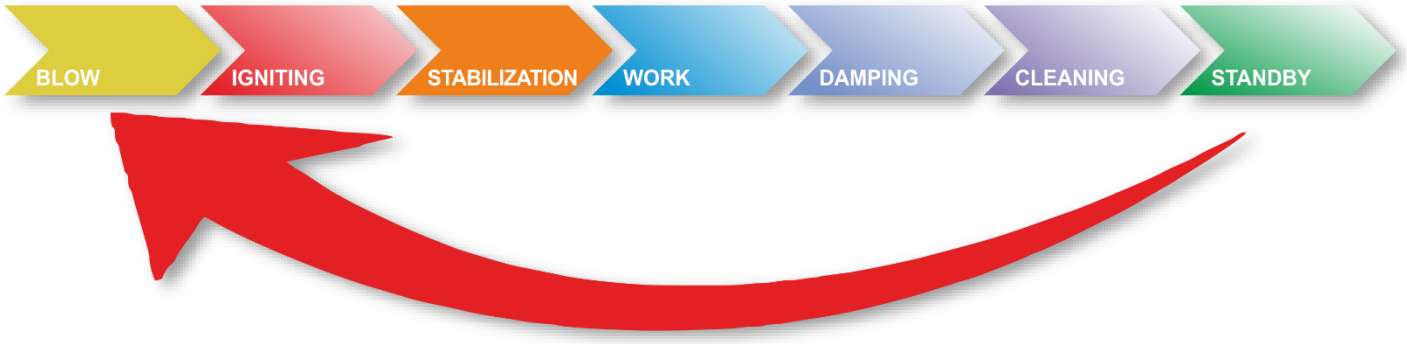
Feeder ignition temperature ***(Feeder menu)*** **–** This parameter defines the threshold value for the feeder ignition temperature. Exceeding this value will cause the burner to switch to emergency mode. This parameter becomes active when the **"Feeder ignition detection"** parameter is set to **YES**.
(Available range: 40°C – 70°C, factory setting: 45°C).

Changing the direction of the grate ***(Cleaning mechanism menu)*** **–** Setting this parameter to YES inverts the output of the cleaning mechanism.

Stoker extension time ***(Feeder menu)*** **–** This parameter allows extending the operation time of the stoker in relation to the feeder from the hopper. For example, if this parameter is set to 5 seconds, when the hopper feeder stops, the stoker (burner feeder) will continue to run for an additional 5 seconds. (Available range: 0–20 seconds, factory setting: 5 seconds).

Mechanism opening time ***(Cleaning mechanism menu)*** **–** This parameter defines the time required for the mechanism to fully open during the cleaning process.
(Available range: 1–350 seconds, factory setting: 250 seconds).

The complete operating cycle of the pellet burner consists of the following stages:



First of all, before each ignition, the **BLOW** mode is activated in the combustion chamber. The blower is turned on to remove ashes and gases remaining from the combustion process.

Burner operation during BLOW mode is defined by the following functions:

Pre-blow - This parameter defines the duration (in seconds) for which the blower will be activated before the burner enters the ignition phase. (Available range: 0–250 seconds, factory setting: 40 seconds)

Blower efficiency during cleaning - This parameter sets the blower power during the cleaning process. (Available range: 1–100%, factory setting: 100%)

IGNITING

When the BLOW phase is completed, the controller switches to the ignition mode. First, fuel is fed into the combustion chamber, then the igniter is activated, and finally the blower starts after the time defined by the "**Heating up the Igniter"** parameter.

The correct course of the ignition process is monitored by the flame brightness sensor – its current reading is continuously available on the "Burner parameters" screen (Fig. 14), which can be accessed by swiping up and then right from the alarm view.

When its value rises above the level set in the "**Flame detection threshold**" parameter, the controller will recognize that the boiler has been ignited, switch off the igniter, and proceed to the stabilization phase.

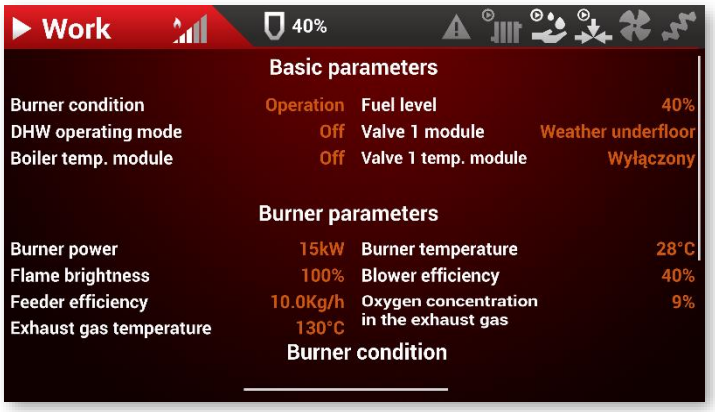
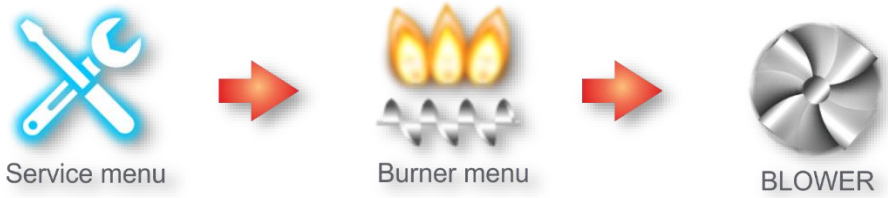


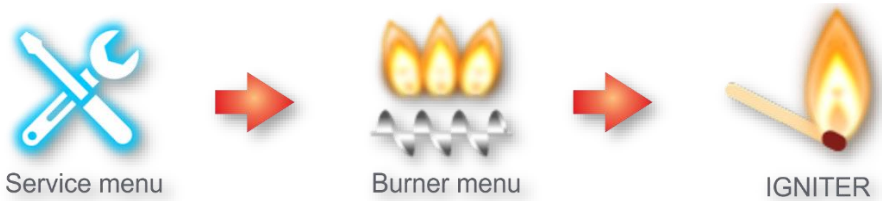
fig. 14

If the flame brightness does not reach the expected value within the time set in the **"Fuel ignition time"** parameter, the controller will consider the ignition unsuccessful and restart the entire process. After three failed attempts, the controller will enter stop mode, display the "Ignition failure" alarm, and terminate the process by initiating the damping and cleaning cycle.

Burner operation during IGNITION mode is defined by the following functions:



Blower efficiency during ignition - This setting defines blowing capacity during ignition. (Available range 1 - 100%, factory setting: 60%)



Heating up the igniter – The parameter defines how long the igniter will remain active. After the "**Heating up the igniter**" time elapses, the blower will be activated. (Available range: 0–60 seconds, factory setting: 20 seconds).

Fuel ignition time - This parameter defines the maximum duration of the ignition process. The controller will consider the ignition successful if the flame brightness increases to the value set in the “Flame detection threshold” parameter. (Available range: 1–15 minutes, factory setting: 7 minutes).

Flame detection threshold - This parameter defines the threshold value (in percent) above which the controller considers the ignition process successful. (Available range: 10–100%, factory setting: 35%).

Flame detection insensibility time - The time set by this parameter eliminates momentary spikes in the flame brightness reading. For example, setting this value to 30 seconds will cause the controller to consider the ignition phase successful only after 30 seconds have passed since the flame brightness exceeded the value set in the "**Flame detection threshold**" parameter. (Available range: 0 – 120 seconds, factory setting: 25 seconds).

Starting dose of fuel - The parameter specifies the duration for which the feeder will run to supply fuel during ignition (Available range: 5 - 250 seconds, factory setting: 30 seconds).

After completing the IGNITION mode, the controller will switch to STABILIZATION mode, whose purpose is to stabilize the fuel combustion process. The duration of stabilization and the blower efficiency can be set using the following parameters:

Blower efficiency in stabilization - This function determines the blower performance during the STABILIZATION mode. (Available range: 1 - 100%, factory setting: 50%)

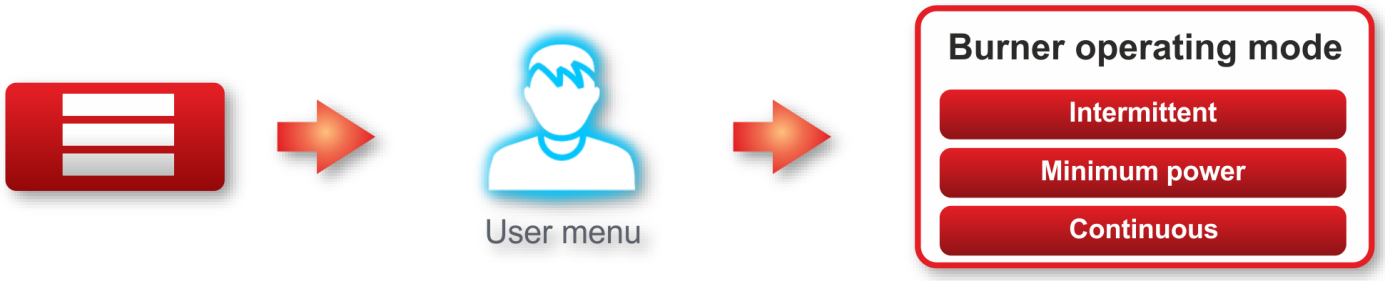
Stabilization - Parameter defines the duration, in minutes, during which fuel feeding is carried out based on the parameters set for the minimum power. After this time elapses, the stabilization phase ends and the controller switches to the WORK mode. (Available range: 0-10 minutes, factory setting: 2 minutes)

When the STABILIZATION mode is finished, the Controller enters the operation mode, the screen displays the name of the mode and a graphic representation of the current boiler output (Fig.15).

fig. 15

In the WORK mode, the Controller aims at reaching the preset temperature on the boiler. The blower operates continuously within the settings of minimum and maximum blower capacity and the feeder operation is started cyclically. The feeder operation cycle (work and standby) is set by the **Feeder cycle** function, calculated automatically

Regulator PELE BORD 890 wyposażony został w trzy opcjonalne tryby, które odpowiadają za osiągnięcie i stabilizacje temperatury zadanej:



INTERMITTENT – This is the standard burner mode, in which the burner shuts down after reaching the set temperature. The burner will restart when there is a heat demand in any heating circuit, domestic hot water system, or buffer tank.

MINIMUM POWER – This mode is similar to the intermittent mode, with the difference that the burner continuously operates at minimum power. Once all set temperatures are reached, the burner will shut down and restart in minimum power mode when heat demand appears again.

CONTINUOUS– In continuous mode, the burner operates without interruption. After completing all heating tasks, it does not shut down but instead switches to minimum power operation.

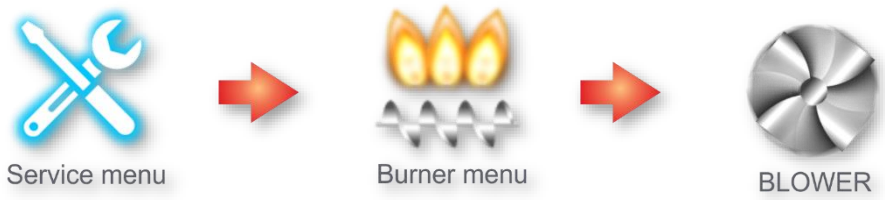
Burner operation during WORK mode is defined by the following functions:

Maximum burner power - The parameter defines the maximum burner power. The value is specified in kW (kilowatts) and its range depends on the selected burner type.

Minimum burner power - The parameter defines the minimum burner power. The value is specified in kW (kilowatts) and its range depends on the selected burner type.

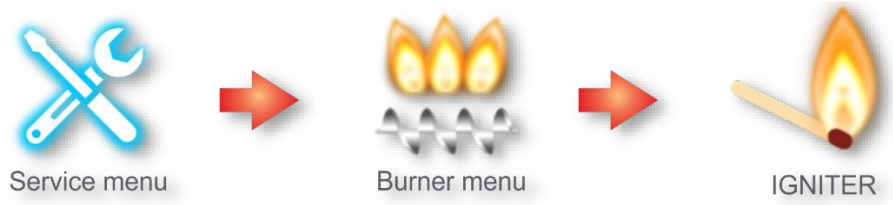
Feeder cycle – Function defined in seconds, consisting of burner pause time and feeder operation time. The ratio of burner operation time is selected automatically based on the momentary output demand. (Available range: 10 - 60 seconds, factory default: 20 seconds)

Upper hysteresis - damping – The parameter defines how many degrees above the set temperature the boiler temperature is allowed to rise. Once the value set in this parameter is exceeded, the controller will start the burner shutdown phase. (Available range: 0 - 20°C, factory setting: 5°C).



Blower efficiency – max power – The power value at which the blower operates when the burner is running at maximum power.

Blower efficiency – min power. – The power value at which the blower operates when the burner is running at minimum power.



No flame detection threshold - The setting defines the limit value of flame brightness, after decrease of which the Controller recognizes the damping process as finished.
(Available range: 10 - 100%, factory default: 15%)

No flame detection time - In the WORK mode, the flame brightness sensor ensures the correct combustion process. In the event of flame failure, e.g. in the event of insufficient fuel in the bin, the regulator will automatically stop the process of reaching the set temperature and go back to the burner Ignition mode. *(Available range: 1 - 10 minutes, factory default: 2 minutes)*

Operation of the mechanism cleaning - The parameter allows setting the operating time of the cleaning mechanism in WORK mode. (Available range: 0 - 250 seconds, factory setting: 30 seconds).

Standstill time of the mechanism cleaning - The parameter defines the duration for which the cleaning mechanism will be paused. After each pause, the cleaning mechanism restarts for the time set in the parameter "**Operation of the cleaning mechanism.**" (Available range: 1 – 60 minutes, factory setting: 10 minutes).

The stage of burner damping takes place when the Controller decides that further demand for energy is unnecessary. E.g., after reaching the preset boiler temperature and reaching the preset DHW temperature when summer mode is active.

The burner feeder, blower and cleaning mechanism are activated to remove the remaining glow from the burner. The correct damping process is controlled by the flame brightness sensor, which after dropping to the value set for No flame detection threshold will consider the process of damping as finished. The final step to complete the DAMPING mode is activating the cleaning mechanism to clean the burner from the remaining ash.

The damping stage will also be terminated if the time set in the **Maximum time without cleaning** setting has passed.

Warning!!! - The parameters **No flame detection threshold** and **No flame detection time** are shared between the WORK and DAMPING modes and can be found in the burner menu under the IGNITER tab.

Burner operation during DAMPING mode is defined by the following functions:

Maximum damping time – The parameter sets the maximum duration of the damping phase (Available range: 5 - 60 minutes, factory setting: 5 minutes).

Minimum damping time – The parameter sets the minimum duration of the damping phase (available range: 1 - 60 minutes, factory setting: 2 minutes).

CLEANING

When the regulator reaches the set boiler temperature and completes the damping process, it will restart the cleaning procedure to remove any remaining ash from the burner. The cleaning mechanism and blower are activated for the duration set in the parameter "**Mechanism opening time**."

Burner operation during Cleaning mode is defined by the following functions:

Blower efficiency during cleaning - The parameter defines the blower power during the cleaning process. (Available range: 1 – 100%, factory setting: 100%)

Maximum time without cleaning - This parameter defines how often burner cleaning will be performed if no other operating stage has triggered a cleaning cycle.

For example, if the boiler has been operating in **MINIMUM POWER** or **CONTINUOUS** mode and burner cleaning has not been carried out, automatic cleaning will be initiated once the time set in the "Maximum time without cleaning" function has elapsed. (Available range: 1 – 200 hours, factory setting: 48 hours)

STANDBY

Proces spalania zostaje wstrzymany i wszystkie peryferia obsługujące palnik zostają wyłączone, pracują jedynie pompy obiegowe. Kolejne uruchomienie palnika nastąpi gdy w jakimkolwiek obiegu grzewczym ponowne wystąpi zapotrzebowanie na energię cieplną.

Warning!!! – When the boiler reaches a temperature higher than the value set in the "**Upper hysteresis - damping**" parameter, the burner will restart only after the temperature drops by the value set in the "**Boiler hysteresis**" parameter.

When the STANDBY stage is interrupted, the controller will resume executing the stages: BLOW | IGNITION | WORK.

4.13 Clock setting

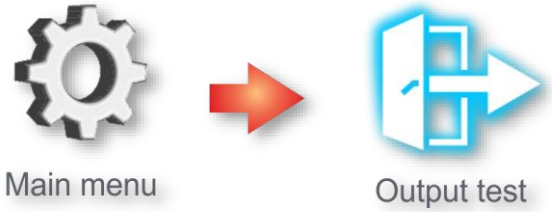
You can set current time and date in the function located in the main menu of the Controller. Correctly set time and date are necessary for correct operation of time zones. In addition, the current time is continuously displayed in the top bar on the home screen.

fig. 16

4.14 Output test

Due to this option it is possible to check the operation and correct connection of all devices operated by the controller. *(Blower, CH pump, DHW pump, mixing valve, valve pump, buffer pump, fuel bin feeder, stoker, igniter and cleaning mechanism).*

Uwaga!!! Function available only after entering the Installer/Factory password – see section 4.2.



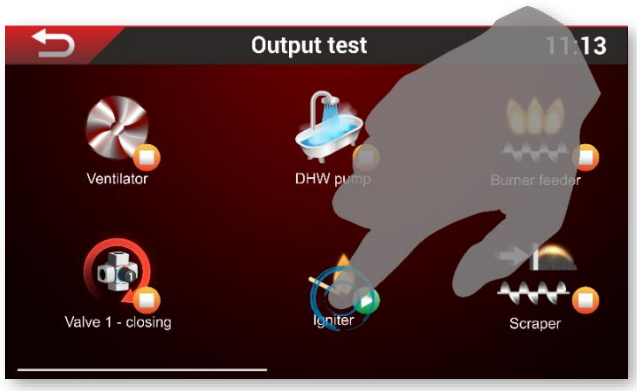


fig. 17

Warning!!! In order to make the output test possible, the regulator must first be stopped by a press of the Start/Stop button:

4.15. Boiler ignition

The boiler ignition, as well as all other stages of pellet boiler operation is fully automatic.

If the feeder capacity has been calibrated, and the feeder pipe is already filled with fuel, you can start automatic operation of the Controller. When you press the STOP tile (Fig. 18), the unit will display "Turn boiler on?".

Fig. 18

A confirmation of this selection will put the controller into automatic operation mode.

From now, a properly set controller shall:

- ✓ Maintain the set temperature on the boiler
- ✓ Read from all installed temperature sensors
- ✓ Operate hot water pump and system pumps
- ✓ Operate mixing valves
- ✓ Ensure automatic boiler ignition and damping
- ✓ Ensure automatic burning cleaning
- ✓ Thermally protect boiler and feeder temperature.

4.16 Change and explanation of configuration parameters

You can enter the Controller main menu by touching the button  .

Main menu

Output test

Due to this option it is possible to check the operation and correct connection of all devices operated by the controller. Detailed operation is described in Section 4.14.

Default settings

The menu includes functions that allow management of factory settings. The user can save new factory settings or restore them to the installer's values or the default factory settings.

Warning!!! - Some functions are hidden and accessible only after entering a password.

Service counters

The menu allows you to view the operating parameters of the pellet boiler, including:

- Number of ignitions
- Amount of fuel burned
- Work and standby time

Alarms

The function allows you to display a list of alarms that have occurred in the controller.

Clock settings

The menu is responsible for setting the current time and date. Correct configuration of the date and clock is essential for the proper work of time zones. Detailed operation and configuration are described in section 4.13.

Settings

The menu contains basic settings related to the display screen as well as the management of sound signals generated by the device.

Sound signal - This function allows you to enable or disable audible signals to inform about any alarms or errors.

Brightness - This parameter defines the screen backlight level. (Available range: 1–100%, factory setting: 80%)

Button sound – The parameter allows enabling the touch sound and accepts the values: on /off

Language settings

The function allows changing the language of the controller's menu.

Software verison

This function is informative and allows to read current software version installed in the Controller, the status of the configuration, as well as the software version of additional modules that cooperate with the regulator.

User Menu

Maximum burner power correction – The function allows adjusting the maximum burner power without the need to change advanced controller settings. The value entered in this parameter sets a new burner power level relative to its maximum power.

Example: If the maximum power correction is set to 80%, the current burner power will be set to 80% of the burner's maximum power.

Burner model – This parameter allows selecting the type and size of the burner used in the boiler. Proper selection of the burner ensures assignment of appropriate parameter ranges, which results in smooth and stable operation of the device.

Fuel level - Setting this parameter to "on" activates the home screen, which displays the percentage of remaining fuel in the fuel bin.

Set fuel level to 100% - Due to this function, when loading fuel into the fuel bin, it is possible to set the fuel level to 100% which means the bin is fully filled with fuel.

Boiler operating mode - This function allows switching the regulator's operating mode from "Burner" to using an emergency/additional grate. Detailed instructions for burning with the emergency grate can be found in section 4.8.

Burner operating mode - This function allows selecting one of three burner operating modes: Intermittent mode, Continuous mode, Minimum power mode. Detailed operation and configuration are described in section 4.12.

Service menu

Burner menu

The menu contains functions responsible for managing the burner operation. Detailed operation and configuration are described in section 4.12.

Exhaust gas menu

The menu contains functions responsible for managing the exhaust gas temperature sensor. Detailed operation and configuration are described in section 4.5.

Boiler setting

The menu contains a summary of the boiler's most essential settings.

Boiler hysteresis - When the temperature on the controller exceeds the value set in the parameter "**Upper hysteresis - damping**", the controller will start the shutdown procedure in the boiler. The burner will resume operation only when the temperature drops below the set temperature minus the value defined in the "Boiler hysteresis" parameter. For example, if the set temperature is 60°C and the hysteresis is set to 15°C, the boiler will switch from standby mode to WORK when the temperature drops to 45°C. (Available range: 1 - 30°C, factory setting: 10°C).

Pump switch on temperature - This setting determines the boiler temperature value, after which all pumps active in the Controller are started. The pumps are switched off when the temperature falls 5°C below the pumps activation temperature. *(Available range: 35 - 60°C, factory default: 45°C)*

Door opening sensor - This function allows you to enable or disable the sensor that detects if the boiler or hopper door is open (depending on the sensor's installation location). To activate this function, it must first be enabled in the "Modules Settings" menu.

Minimum boiler serring - This parameter defines the minimum temperature setting on the boiler. (Available range: 40 - 55°C, factory setting: 45°C)

Fuel bin capacity - This option sets the capacity of the fuel bin to a value equal to your bin capacity. *(Available range: 20 liters - 1275 liters, factory default: 200 liters)*

Maximum boiler temperature - The parameter defines the highest limit value of the water temperature in the boiler that can be set by the user. This parameter is displayed above the temperature bar graph on the main boiler temperature screen. (Available range: 70 – 85°C, factory setting: 85°C).

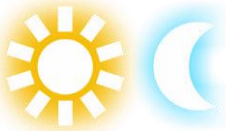
Central heating pump heat source - Activation of the buffer module allows you to specify the source of water for the central heating pump. The circuit can be supplied with water either from the buffer tank or directly from the boiler.

Modules settings

This menu allows you to activate the modules available on the Controller. Their number depends on the Controller type and the number of installed components. In the PELE BORD 890 Controller, the available modules are: DHW, Valve 1 and CH Room thermostat. Universal output 1 /2, Universal input, Buffer and door openning sensor.

Thermostat menu

This menu contains functions responsible for the room thermostat. Detailed operation and configuration is described in section 4.9



Time zones

Due to this option, you can configure operation of the boiler, mixing valves, DHW pumps, the circulation pump and reserve boiler for individual hours and days of the week. Detailed use and settings are described in section 4.10

DHW menu

This menu contains functions responsible for managing the domestic hot water pump. Detailed operation and configuration is described in section 4.3

Universal Input/output

The menu contains functions responsible for the activation and configuration of universal outputs and the universal input. Detailed operation and configuration are described in section 4.11.

Mixing valve 1

This menu contains functions responsible for managing the valve pump. Detailed operation and configuration is described in section 4.6.

Buffer menu

This menu contains functions responsible for managing the buffer. Detailed operation and configuration is described in section 4.4.

Sensors menu

This function allows you to offset small temperature differences between the actual water temperature in the system and the reading on the controller. These differences may be due to the way the sensors are mounted or the location where they are mounted. Each sensor can be individually adjusted in the range of +/- 5°C.

Quick menu

Due to the advanced settings, access to the menu is protected by a password.

Counter reset – This function allows resetting the counters (burner work time, amount of fuel burned, number of ignitions, etc.).

Reset Alarm History – This function allows clearing all alarms that have occurred in the controller during the device's operation.

5. Device parameters

5.1 Working conditions of the regulator

Parameter	Value/range
Power supply	230V/50Hz AC
Humidity	30 - 75%
Ambient temperature	5 - 40°C
Maximum operating temperature of temperature sensors	100°C
Maximum operating temperature of exhaust gas sensors	450°C
Load capacity of outputs: *	
Blower	1A
Stoker	1A
Feeder from bin	1A
Igniter	1A
Cleaning mechanism	1A
CH pump	1A
DHW Pump	1A
Valve pump	1A
Mixing valve actuator	2x 1A
Universal output 1	1A
Universal output 2	1A
Buffer	1A
Power consumption without connected external devices	7W

* The maximum total load capacity of the outputs cannot exceed 6,3A

5.2 List of device parameters

Main menu	
Output test	Default setting
Restore default settings	Safe service settings
Service counters	Alarms
Clock setting	Setting – sound signal
Setting – Button sound	Setting – Brightness
Language setting	Software version

User menu	
Fuel level	Set fuel level to 100%
Boiler operating mode	Burner operating mode
Burner model	Maximum burner power correction

Service menu

Burner menu

Blower	
Blower type	Pre-blow
Blower efficiency during ignition	Blower efficiency – max power
Blower efficiency – min power	Maximum damping time
Minimum dumping time	Blower efficiency during cleaning
Blower efficiency in stabilization	

Feeder	
Maximum burner power	Minimum burner power
Starting dose of fuel	Feeder cycle
Stoker extension time	Feeder ignition detection
Upper hysteresis - damping	Feeder ignition temperature
Feeder efficiency	Stabilization
Fuel calorific value	

IGNITER	
Heating up the igniter	Fuel ignition time
Flame detection threshold	Flame detection insensibility time
No flame detection time	No flame detection threshold

Cleaning mechanism	
Operation of the cleaning mechanism	Changing the direction of the grate
Standstill of the mechanism cleaning	Mechanism opening time
Maximum time without cleaning	

Exhaust gas menu	
Exhaust gas temperature sensor	Max. exhaust gas temperature overshoot time
Maximum exhaust gas temperature	

Boiler setting	
Boiler hysteresis	Boiler hysteresis grate
Pump switch on temperature	Boiler switch off temperature
CH pump heat source	Blower efficiency - grate
Door opening sensor	Scavenge time
Minimum boiler setting	Time between scavenge
Fuel bin capacity	Maximum boiler temperature

Modules settings	
Domestic hot water (DHW)	Central heating room thermostat
Valve 1	Universal output 1
Universal output 2	Universal input
Buffer	Door opening sensor

Thermostat menu	
Central heating room thermostat	CH pump operation time
CH pump cutoff time	Valve 1 room thermostat
Valve 1 – lowering by the thermostat	Switching off the pump from thermostat

Time zones	
Boiler time zones	Valve 1 time zones
Boiler time settings Mon-Fri	Valve 1 time settings Mon-Fri
Boiler time settings Sat	Valve 1 time settings Sat
Boiler time settings Sun	Valve 1 time settings Sun
Boiler time settings	Valve 1 time settings
Domestic hot water time zones	Circulation time zones
Domestic hot water time settings Mon-Fri	Circulation time settings Mon-Fri
Domestic hot water time settings Sat	Circulation time settings Sat
Domestic hot water time settings Sun	Circulation time settings Sun
Domestic hot water time settings	Circulation time settings

Reserve boiler time zones	Reserve boiler time settings Mon-Fri
Reserve boiler time settings Sun	Reserve boiler time settings Sat
Reserve boiler time settings	

DHW menu	
DHW operating mode	DHW pump overrun
DHW hysteresis	DHW priority
Boiler setting increase by DHW	DHW operation time
DHW disinfection	DHW pump before buffer
DHW switch off temperature, summer	DHW switch on temperature, summer

Mixing valve 1	
Valve 1 operating mode	Valve 1 measurement waiting time
Valve 1 open time	Valve 1 operating range above setting
Valve 1 hysteresis	Heat source for valve 1 pump
Setpoint when +10C outside	Setpoint when -10C outside

Universal output/input	
Universal output 1 / 2 operation mode	Circulation pump operation
Circulation pump pause	Ash removal operation time
Ash removal pause time	Minimal DHW temperature for circulation
Universal input 1 operation mode	Universal input 1 polarization

Buffer menu	
Buffer operating mode	Buffer pump activation temperature
Temperature – reload start	Temperature loading finish
DHW pump before buffer	

Sensor settings	
Boiler sensor correction	Valve 1 sensor correction
Burner sensor correction	Outdoor temperature sensors correction
DHW sensor correction	Buffer sensor correction
Buffer down sensor correction	Return sensor correction

Quick menu	
Counter reset	Reset alarm history

Passwords

6. Alarms

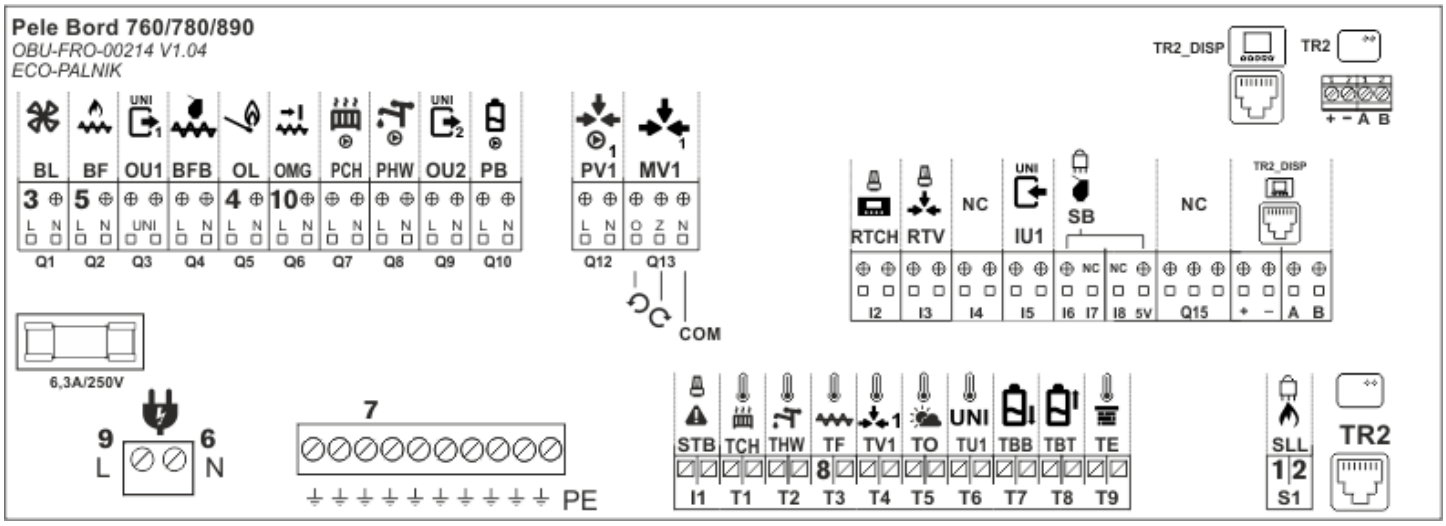
During the operation of the regulator, emergency situations and alarm states may occur. Alarms are displayed directly in the main screen of the regulator.

The following failures may occur in the regulator:

- Boiler temperature sensor error – Missing or damaged sensor
- DHW temperature sensor error – Missing or damaged sensor
- Feeder temperature sensor error – Missing or damaged sensor
- Valve 1 temperature sensor error – Missing or damaged sensor
- Outdoor temperature sensor error – Missing or damaged sensor
- Buffer top temperature sensor error – Missing or damaged sensor
- Buffer bottom temperature sensor error – Missing or damaged sensor
- Boiler emergency threshold exceeded – Boiler temperature exceeded the emergency threshold (temperature above 94°C)
- DHW overheating – Domestic hot water tank temperature exceeded the maximum allowed value
- Feeder overheating – Feeder temperature exceeded the maximum allowed value
- Bin/boiler door open – The boiler's door open or the sensor is damaged
  (Depending on the current burner operating stage, opening the door may cause the burner to enter the damping mode)
- Exhaust gas temperature exceeded – Flue gas temperature exceeded the value set in the "Maximum exhaust gas temperature" parameter
- No Fuel – Low fuel level in the bin
- Ignition failure – Time for ignition (parameter "Maximum ignition time") was exceeded
- Power failure – Unexpected controller shutdown / power failure
- STB overheating – External safety thermostat triggered. Alarm can be cleared once the boiler temperature drops below 60°C
- EEPROM error – Software error – Contact the device manufacturer is required
- Power supply overload – Too many expansion modules connected to the controller. Modules will be disconnected 30 minutes after overload detection

7. Maintenance and assembly of the device

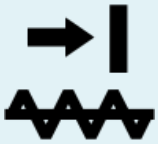
7.1 View of the board and list of the connectors

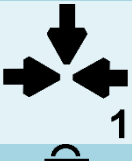


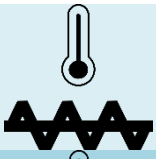
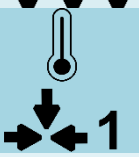
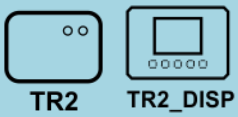
Symbol	Description
Q1	Blower output
Q2	Stoker output
Q3	Universal output 1
Q4	Feeder from bin output
Q5	Ignition output
Q6	Cleaning mechanism output
Q7	CH pump output
Q8	DHW output
Q9	Universal output 2
Q10	Buffer pump output
Q12	Valve 1pump output
Q13	Mixing valve 1 output
O + N	Mixing valve 1 opening
Z + N	Mixing valve 1 closing
I1	Emergency thermostat (STB)
I2	Boiler room thermostat
I3	Valve 1 thermostat
I5	Universal input 1
I6+5V	Boiler door sensor

T1	CH temperature sensor
T2	DHW temperature sensor
T3	Feeder temperature sensor
T4	Valve 1 temperature sensor
T5	Outdoor temperature sensor
T6	Universal temperature sensor
T7	Buffer down temperature sensor
T8	Buffer up temperature sensor
T9	Exhaust gas temperature sensor
S1	Flame brightness
TR2_DISP	Panel and add-on module connectors
- + AB	Alternative connector for additional modules

7.2 Legend of Graphic Symbols and Cable Markings

Symbol	Marking	Description
	**BL**	Blower
	**BF**	Stoker
	**OU1**	Universal output 1
	**BFB**	Feeder from bin
	**OL**	Igniter
	**OMG**	Cleaning mechanism
	**PCH**	Central heating pump

	**PHW**	Domestic hot water pump
	**OU2**	Universal output 2
	**PB**	Buffer pump
	**PV1**	Valve 1 pump
	**MV1**	Mixing valve 1
	**SLL**	Light level sensor
	**RTCH**	Central heating room thermostat
	**RTV**	Valve 1 room thermostat
	**IU1**	Universal input 1
	**SB**	Boiler door sensor
	**STB**	Emergency sensor STB
	**TCH**	CH temperature sensor
	**THW**	DHW temperature sensor

	**TF**	Feeder temperature sensor
	**TV1**	Valve 1 temperature sensor
	**TO**	Outdoor temperature sensor
	**TU1**	Universal sensor
	**TBB**	Buffer down temperature sensor
	**TBT**	Buffer up temperature sensor
	**TE**	Exhaust gas temperature sensor
	**TR, TR_2 DISP**	Panel socket
	**CMV**	Mixing valve closing

	**OMV**	Mixing valve opening
		Power supply

7.3 Connecting and replacing temperature sensors

Before commencing any work relating to interference with the inside of the Controller, it is strictly required to disconnect its plug from the mains socket.

After unplugging the power cord from the mains socket, tighten the mounting screws located on the housing and then remove the top cover. The sensors used in the controller are non-polarized, meaning the order of wire connection is not important. Using the schematic diagram, locate the desired connector and, by pressing on the connector with a flat screwdriver, release the clamping mechanism and disconnect the wire.

Properly mounted wires in the connectors create a secure connection, and it is not possible to remove the wire without pressing the release clamp again.

Warning!!! – The sensor must be installed dry, i.e., without the use of oil, water, or any other substances.

7.4. Outdoor Temperature Sensor

The PELE BORD 890 controller is provided with ability to connect the outdoor temperature sensor (Fig. 19). The sensor has a dedicated bracket with a hole that allows easy installation of the device. Correctly mounted, the sensor should be at a height of about 2m, on a north-facing wall or in such a position that it does not receive direct sunlight. The controller connector used to connect the external sensor is marked as "T5".

Fig. 19

To connect the cable to the external sensor, open the sensor housing cover, make a hole for the cable in the sensor housing, e.g. with a screwdriver (Fig. 20), then pass the cable through the hole and screw it to the terminal strip. The order in which the wires are connected is not relevant. The Controller extended with an external sensor enables current viewing of the temperature in the upper bar on the home screen.

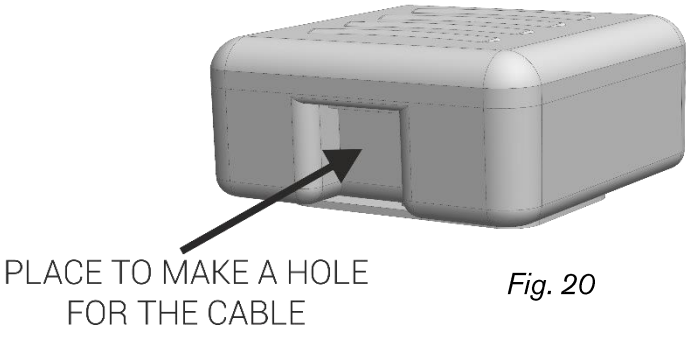
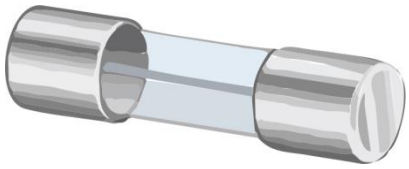


Fig. 20

In addition, an external sensor activates access to the weather temperature settings of the valves, thanks to which separate valve temperature settings can be configured depending on the outside temperature. See section 4.6 for more information on the operation of valves in the weather mode.

7.5 Fuse replacement

If a fuse blows, it is possible to replace it with a new one without losing warranty rights. The receptacle housing the fuse is located on the controller main board. Please note that the new fuse must have the same rating as the old one. For the fuse ratings and dimensions see Figure 21..



Voltage: 250V
Current: 6,3A
Diameter: 5mm
Height: 20mm

fig. 21

Warning!!! – The fuse must have a fast-blow characteristic (type F) and arc-quenching filler (e.g., quartz sand).

7.6 Emergency thermostat operating principle

Additional boiler thermal protection, designated as an emergency thermostat, is required on Class 5 heating units. The PELE BORD 890 Controller with this type of protection is equipped as standard with a combined boiler sensor, which performs the functions of a boiler sensor and an emergency thermostat. The protection in the form of an emergency thermostat activates when the boiler water temperature reaches 94° C (± 4° C). Then, the display panel will show information about the failure (STB overheating and exceeding the boiler emergency threshold).

When the emergency thermostat is activated, the burner is stopped and the central heating pump is switched on, in order to accelerate cooling down of the overheated boiler. Additionally, the DHW and valve pumps can be activated (if the DHW and valve functions are enabled in additional modules). This system prevents the boiler water temperature from rising further if the boiler overheats

Warning!!! The fan can be restarted only after the fault is reset on the control panel, when the boiler water temperature drops below 60°C.

Before and during the heating season, the technical condition of the cables should be checked, the regulator's mounting should be inspected, and the device should be cleaned of dust and other contaminants.

Contents

Warranty repair annotations

Date of rapair	Description of the fault	Signature

Disposal of electrical and electronic waste

V. 1.00

Taking care of the natural environment is our top priority. Awareness that we produce electronic devices obliges us to dispose of waste electronic components and devices in a nature-friendly way. Therefore, the company received a registration number assigned by the Chief Inspector of Environmental Protection.

000002627

The symbol of a crossed-out waste container on a product means that the product must not be disposed of in normal waste bins. By sorting recyclable waste we help to protect the environment. It is the user's responsibility to deliver the waste equipment to a designated collection point for recycling of waste from electrical and electronic equipment.

Warranty conditions and service conditions

1. Warranty for the proper operation of the equipment is given by Brager Sp. z o. o. for a period of 24 months, not exceeding 36 months from the date of manufacture. The date from which the warranty applies is the date of the purchase document, which is recorded on the Warranty Card. The warranty is valid in the territory of the Republic of Poland.
2. If the complaint is considered legitimate, defects revealed during the warranty period will be removed free of charge by the service of the guarantor Brager Sp. z o.o. Rolna 11, 63-300 Pleszew e-mail: serwis@brager.com.pl tel. 795 750 933, 795 750 678. Any defect shall be remedied - at the discretion of Brager sp. z o.o. - by repairing or replacing the defective product, or, if the repair or replacement is impossible or very difficult to make, by refunding the purchase price of the defective product in part or in whole.
3. The warranty covers equipment malfunctions caused by defective parts and / or manufacturer defects.
4. The customer is obliged to allow Brager sp. z o.o. to verify the reported defects and repair or replace the claimed product. For this purpose, the Customer shall immediately send the defective product at the Customer's expense, together with a valid Warranty Card, to the address of the service provider: Brager Sp. z. o. o. ul. Rolna 11, 63-300 Pleszew. Brager sp. z o.o. may also, at its option, release the Customer from the obligation to send back the claimed product and examine the product at the place where it is located, in which case the Customer shall provide Brager sp. z o.o. service technician with access to the product and present a valid Warranty Card.
5. Brager sp. z o.o. is entitled to refrain from satisfying the complaint until the claimed product is sent to it and is not responsible for any resulting damages.
6. The product and all parts, components, etc. subject to replacement are the property of Brager sp. z o.o.
7. If Brager sp. z o.o. takes action to execute the complaint before receiving the defective product from the Customer, this shall not release the Customer from the obligation to send the claimed product in the manner specified in Section 4. If the Customer fails to send the claimed product in the situation described in the previous sentence, Brager sp. z o.o. will be entitled to charge the Customer with a contractual penalty in the amount of 150 PLN, which shall not exclude the right of Brager sp. z o.o. to claim release of the item or compensation for damage exceeding the contractual penalty.
8. The Customer is not entitled to destroy, dispose of, throw away, etc. the claimed product before it has been examined by Brager sp. z o.o. If Customer does so, Brager sp. z o.o. shall be relieved of any liability under the warranty.
9. The Customer sending back the claimed product is obliged to protect it properly for the time of shipment. Packages sent COD shall not be accepted by Brager sp. z o.o.
10. Before making a claim, the Customer must thoroughly check the product, in particular to connect it, turn it on, use it correctly, in order to limit obviously unjustified claims.
11. To be effective, the complaint must include a detailed description of the damage to the equipment and the circumstances in which the defect was revealed. Brager sp. z o.o. reserves the right to require the Customer to provide additional information and materials (especially photographic documentation) that may be relevant to the proper identification of the complaint.
12. If the complaint is legitimate, Brager sp. z o.o. shall remove the defects of the product revealed during the warranty period within 6 working days, but in justified cases this period may be extended, but no longer than 14 days from the date of delivery of equipment to our service, unless the repair or replacement within this period is not possible for reasons beyond the control of Brager sp. z o.o. (especially due to waiting for parts or materials to be delivered). The Service is not responsible for the time of delivery/receipt of equipment (postal/courier time).
13. The warranty does not cover damage or defects resulting from: constant misuse disregarding operating manual, lack of reasonable care, improper installation or operation, unauthorized person alters or repairs, changes and modifications made by the User/Client.
14. Warranty claims and inquiries concerning the Controller must be addressed to the manufacturer. i.e. Brager Sp. z o. o.
15. After the repair or replacement, the equipment shall be returned to the Customer (at the Service expense) through the Polish Post, courier company or to the point of sale where the Customer made the purchase.
16. This warranty shall not exclude, limit or suspend any Buyer's rights under the obligatory guarantee regulations for defects of the sold goods, except for recipients to whom the provisions of the General Terms and Conditions of Sale published on the website apply. https://brager.com.pl/ows.

Notes

Unit Warranty Certificate

……..……...….	……..……...….
Symbol and serial number	**Date of manufacture**
……..……...….	……..……...….
(Date of sale)	**(Stamp of the seller)**

Warranty claims and inquiries regarding the

controller should be addressed to the manufacturer:

Brager Sp. z o. o.

Rolna 11, 63-300 Pleszew

e-mail: serwis@brager.com.pl

phone. 795 750 933