Centrometal

HEATING TECHNIQUE

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ENG

TECHNICAL INSTRUCTIONS

using of **CONTROLLER**
hot water boiler **BIO-SC**

CE

THE FIRST START-UP MUST BE DONE BY AUTHORIZED PERSON, OTHERWISE PRODUCT WARRANTY IS NOT VALID.

You can find the latest technical instructions for BIO-SC by scanning the QR code or at the web address:

https://www.centrometal.hr/cm-download-bio-sc/

BIO-SC

TU-R-BIO-SC-02-2025-v2.03i-ENG

Content

SWITCHING ON THE CONTROLLER

After switching on "Main switch (0/1)", the screen will show the first initial message screen and then the language selection menu. To choose the language, you must press the flag displayed on the screen indicating the desired language, then confirm the selection with Button to confirm the selection and access the "Main screen (BSC-OE)".

INITIAL MESSAGE

Software version

The flag (language), which is selected

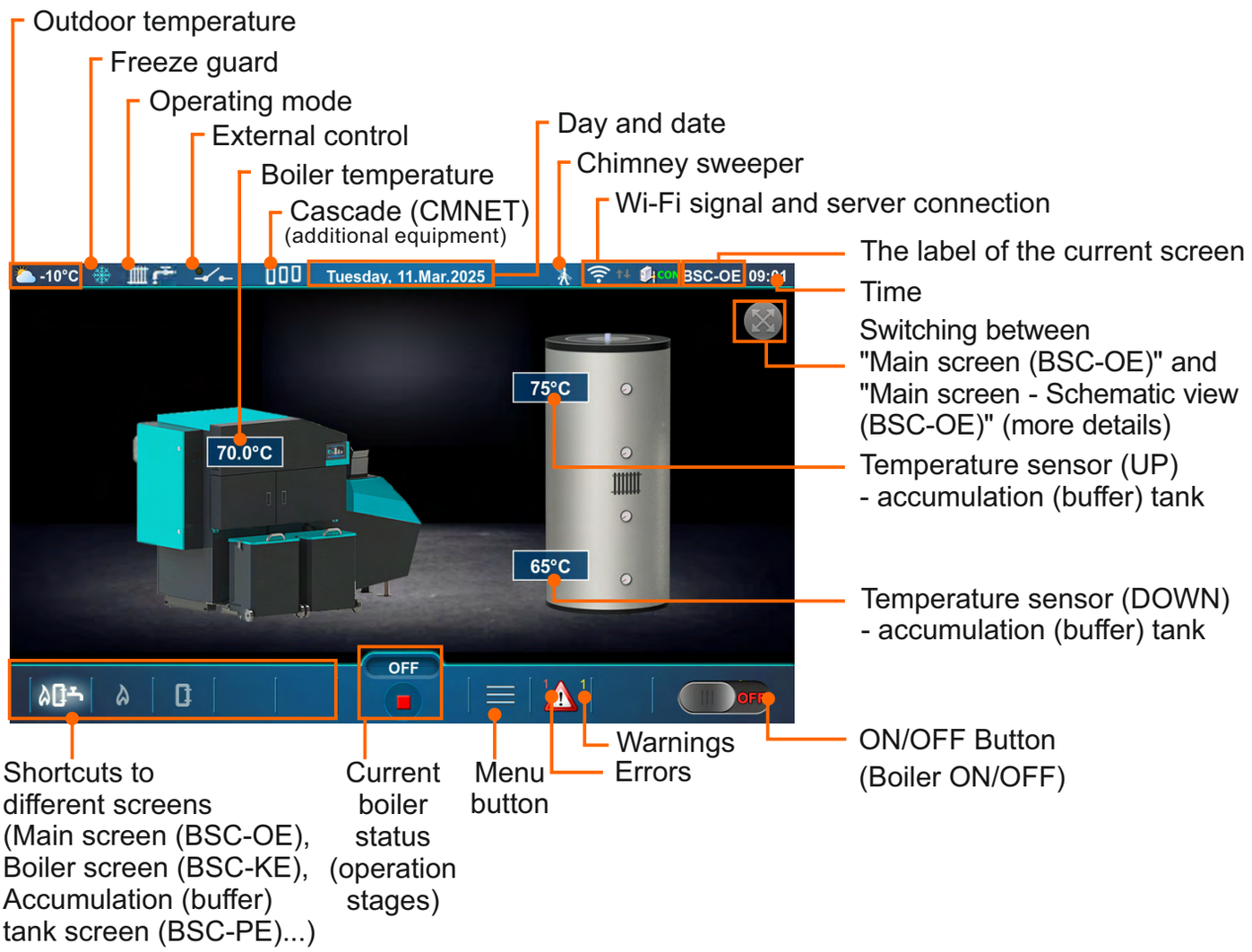
CONFIRM button - button to confirm the selection and access the "Main screen (BSC-OE)"

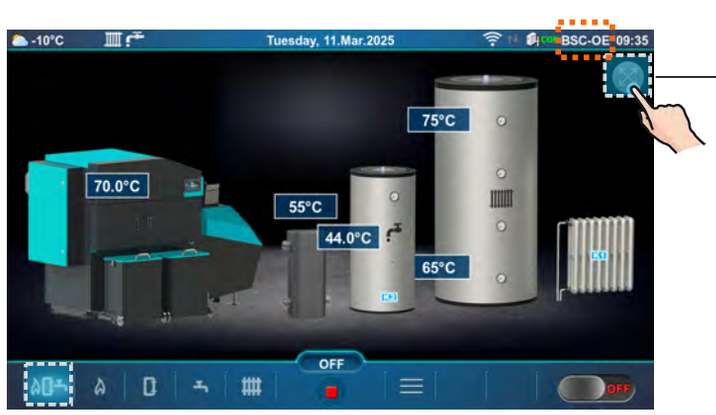
⚠	**If you touch the screen when you switch on "Main switch (0/1)"("Firmware update tool" will appear on the screen), the controller is in "Firmware update". This setting should be used only by authorized technician. If this happens, it is necessary to switch off "Main switch (0/1)" and switch it on again without touching the screen.**

⚠	**The boiler cannot be switched on nor the user menu displayed if value of the weighed fuel is not entered (menu Installation -> Commissioning -> Fuel weighing). It is entered by the authorized service technician when the boiler is first put into operation.**

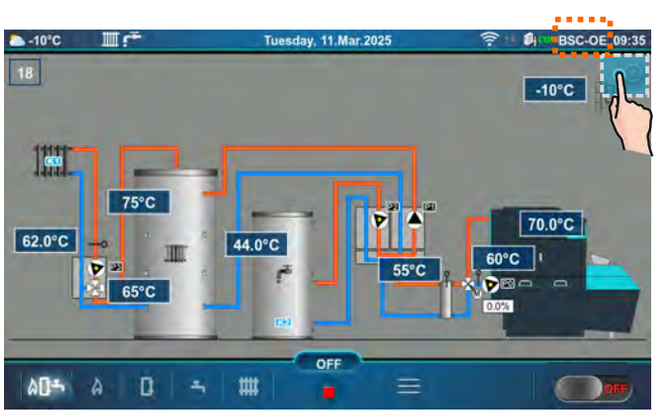
MAIN SCREEN (BSC-OE) AND MAIN MENU

After confirmation of the language selection, the "Main screen (BSC-OE)" is displayed.





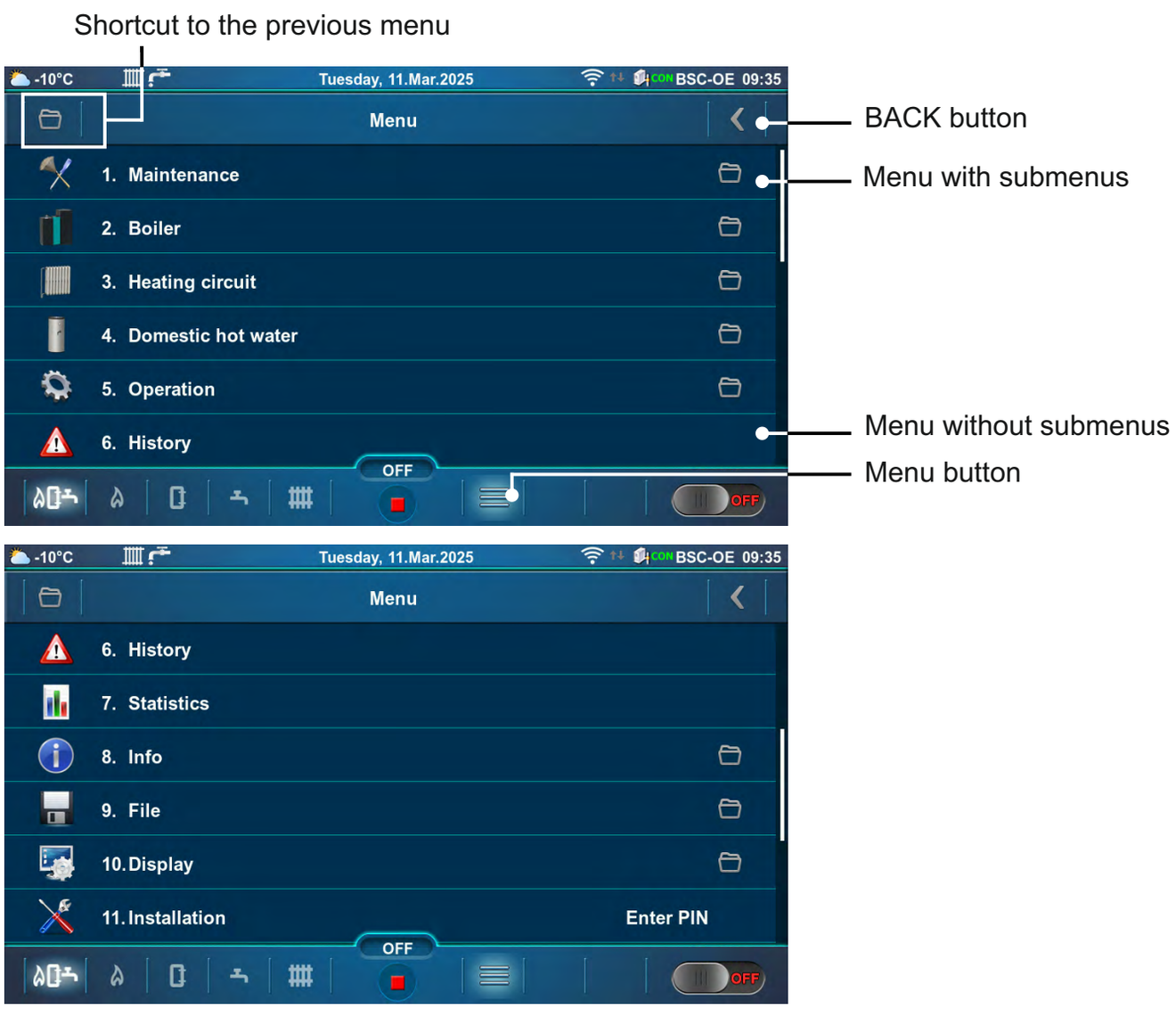
Main screen (BSC-OE)



Main screen - Schematic view (BSC-OE)

The main menu allows you to select the desired submenu. To select a specific submenu, the appropriate icon on the screen must be pressed. To return to "Main Screen (BSC-OE)", press the "Menu button" or "BACK button".

Returning to the previous menu is possible with the "BACK button" or by pressing the icon "Shortcut to the previous menu", where you can select the submenu to which you want to return.



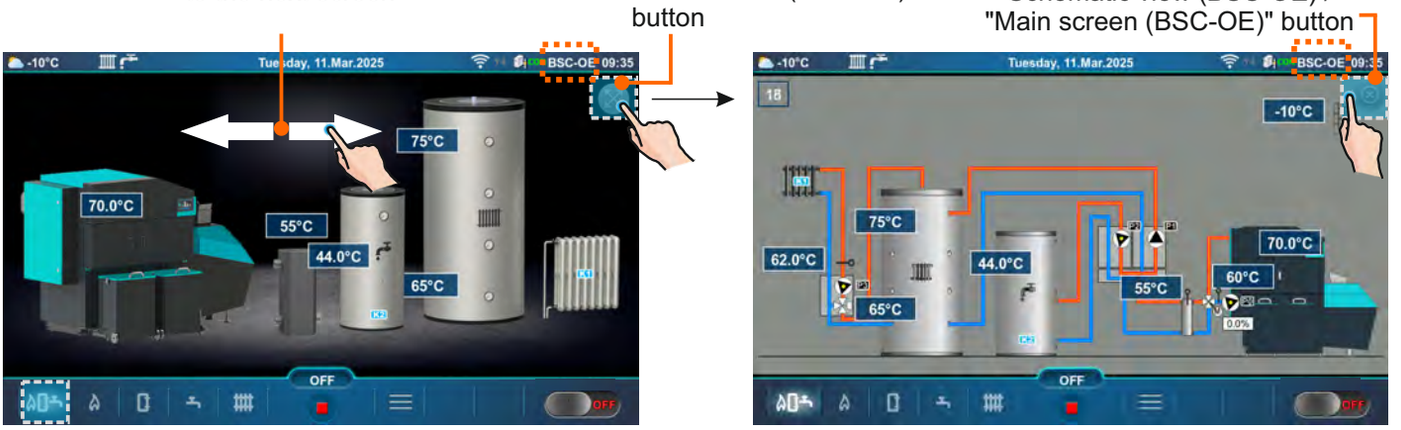
There are 9 to 11 menus in total (depending on the selected configuration).

SHORTCUTS FOR DIFFERENT SCREENS

Swipe left or right to the next screen

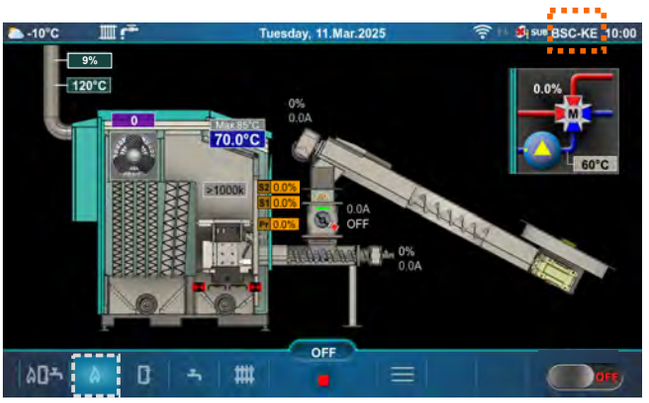
Main screen (BSC-OE) / "Main screen - Schematic view (BSC-OE)" button

Main screen - Schematic view (BSC-OE) / "Main screen (BSC-OE)" button



Main screen (BSC-OE)

Main screen - Schematic view (BSC-OE)

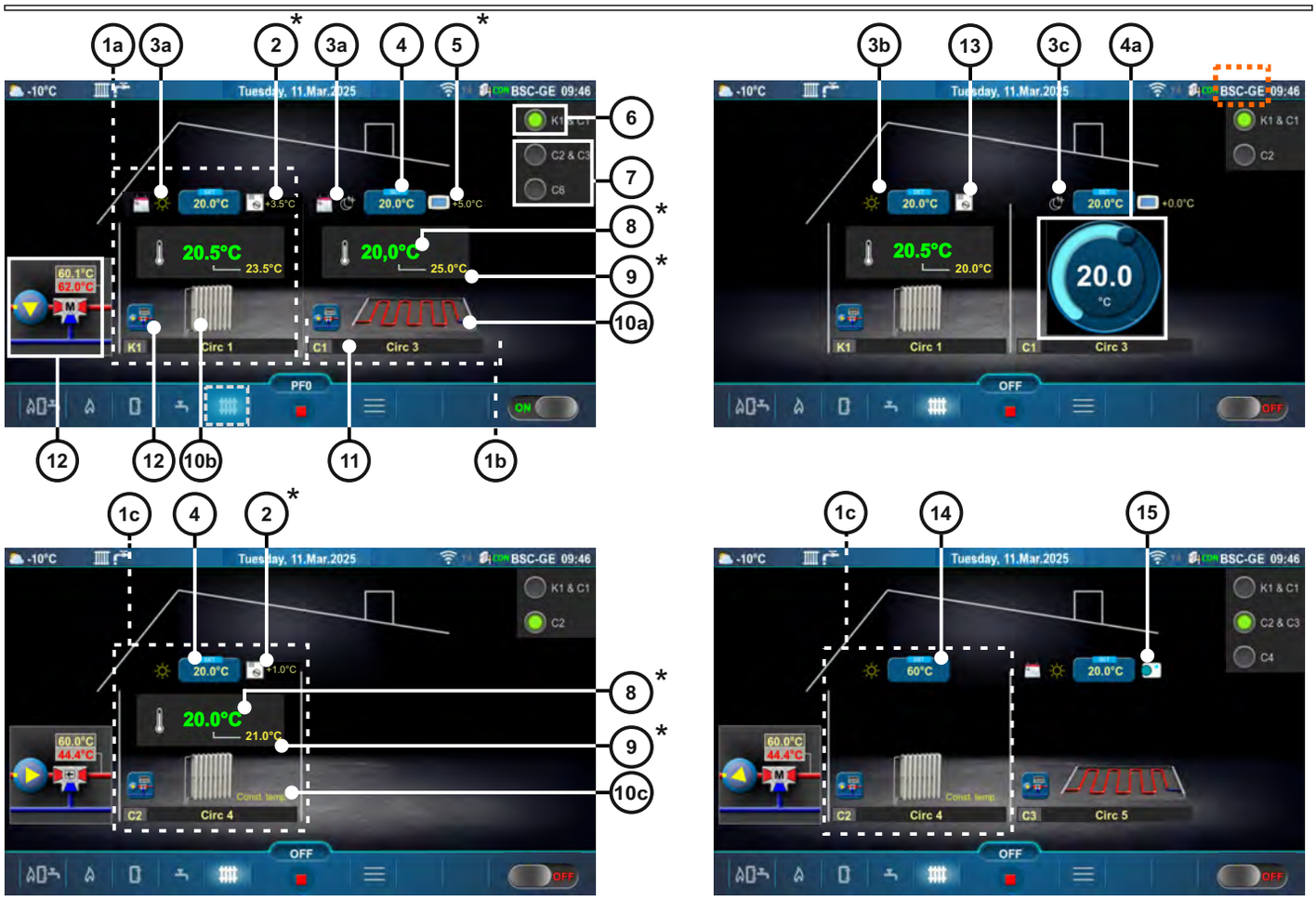


Boiler screen (BSC-KE)

Accumulation (buffer) tank screen (BSC-PE)

Domestic hot water (DHW) tank screen (BSC-SE)

Shortcuts for different screens

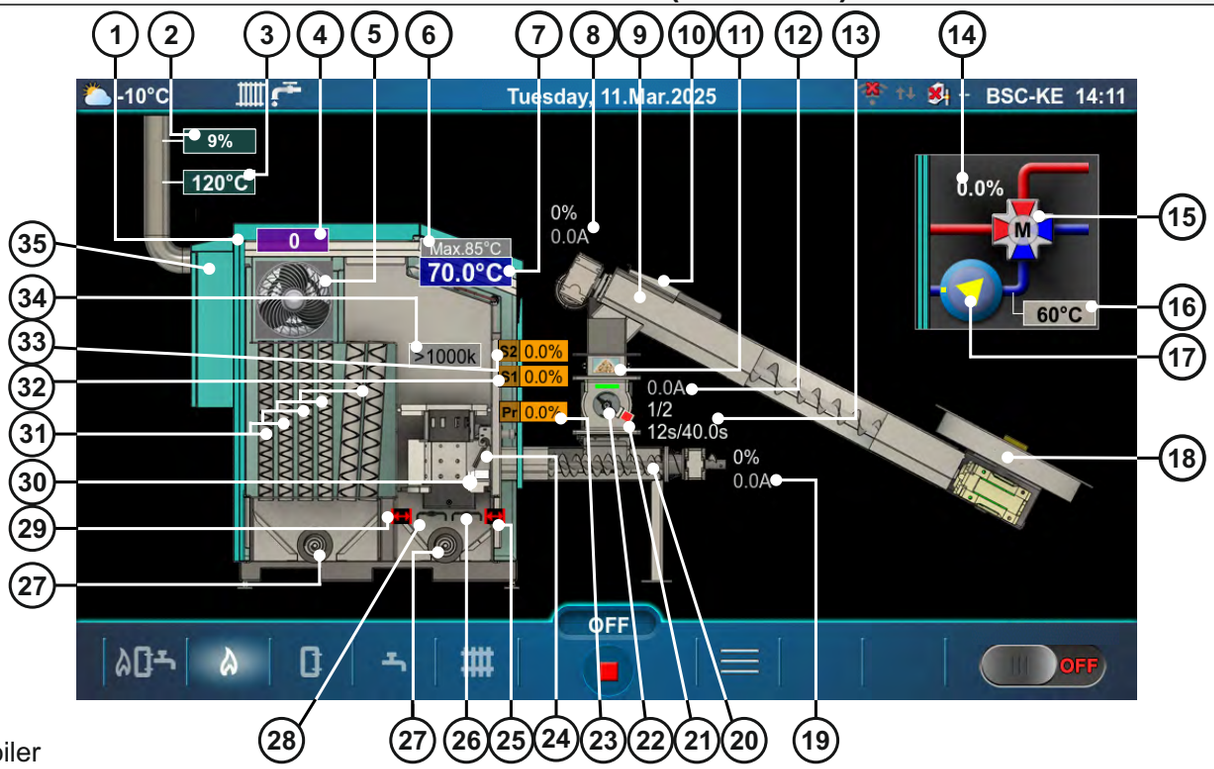


Heating screen (BSC-GE)

1a - Boiler heating circuit K1 (Radiators - Heating type is selected)
1b - CM2K Heating circuit C1 (Floor - Heating type is selected)
1c - CM2K Heating circuit C2 (Constant temperature - Heating type is selected)
2 - Room temperature corrected with room corrector (3 wires) (CSK) (additional equipment)
(instead of label 2 can be label 5)
3a - Activated schedule of the Day/Night temperature
3b - Day temperature is selected
3c - Night temperature is selected
4 - Button for setting the room temperature
4a - Button for quick adjustment of the set room temperature
(it is activated by pressing the Button for setting the room temperature)
5 - Room temperature corrected with digital room corrector (CSK-Touch) (additional equipment)
(instead of label 5 can be label 2)
6 - Boiler heating circuit
7 - CM2K heating circuits (CM2K-additional equipment)
8 - Measured room temperature
9 - Set room temperature + correction
10a - Symbol of floor heating
10b - Symbol of radiator heating
10c - Symbol of constant temperature
11 - Heating circuit symbol ((K1, (K2) - boiler heating circuits), (C1...C6 - CM2K heating circuits)) and custom selected heating circuit name
12 - Shortcut button - 3-way mixing valve with pump, main flow set temperature and measured temperature
13 - Room corrector (CSK) with 2 wires
14 - Button for setting the main flow temperature (setting/changing the temperature is possible if the Button for setting the main flow temperature is pressed)
15 - Room thermostat / Reg. control (thermostat that switches the heating circuit pump on/off)

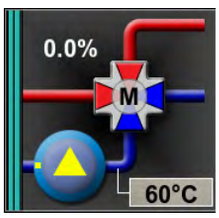
*The symbols will be shown only if corrector is selected in the heating circuit.

SYMBOLS ON THE BOILER SCREEN (BSC-KE)

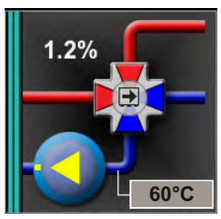


1 - Boiler
2 - Measured O_2 (with lambda probe)
3 - Flue gas temperature
4 - Fan speed (rpm)
5 - Fan symbol (when operating, the symbol is rotating)
6 - Maximum (set) boiler temperature
7 - Measured boiler temperature
8 - Motor electricity consumption for the feeder screw 2
9 - Symbol of feeder screw 2 (when operating, the symbol moves)
10 - Symbol of lid for the feeder screw 2 opening (it is red, when the lid is not properly closed)
11 - Pile (ultrasound sensor (receiver/transmitter) has stopped the operation of feeder screw 2 because there is enough fuel above the rotary valve)
12 - Motor electricity consumption for the rotary valve
13 - Counter and filling cycle of the rotary valve
14 - Percentage of opening of the 4-way mixing valve with actuator (0 % - closed, 100 % - open)
15 - 4-way mixing valve with actuator (when operating, left/right arrow will be shown)
16 - Boiler return flow temperature
17 - P0 - boiler pump, position: connected to the boiler
18 - Fuel mixer in the large tank
19 - Motor electricity consumption for the feeder screw 1
20 - Symbol of feeder screw 1 (when operating, the symbol moves)
21 - 1 / 2 of position of the rotary valve sensor
22 - Rotary valve (RSE) (when operating, the symbol is rotating)
23 - Actuator of primary air
24 - Combustion chamber (firebox) flap (it is red when there is too much fuel in the combustion chamber, at which point one or both microswitches of the flap are pressed)
25 - Symbol, which indicates that the right grate is closed
26 - Symbol of grate 1
27 - Ash screw (when operating, the symbol moves)
28 - Symbol of grate 2
29 - Symbol, which indicates that the left grate is closed
30 - Electric heater symbol (when operating, the symbol changes color)
31 - Turbulator symbol (when operating, the symbol moves)
32 - Actuator of secondary air 1
33 - Actuator of secondary air 2
34 - Photocell resistance (flame light intensity in kOhm)
35 - Boiler junction box (jbox)

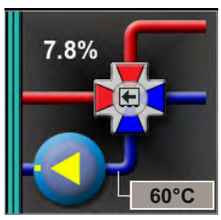
4-way mixing valve with actuator



Actuator does not work

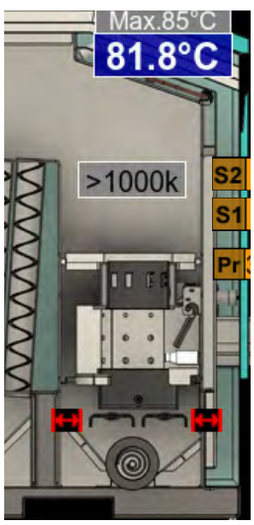


Actuator is opening the valve

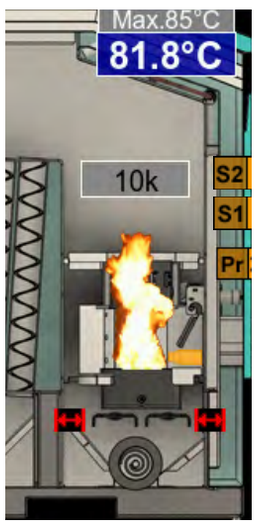


Actuator is closing the valve

Flame symbol



There is no flame in the boiler



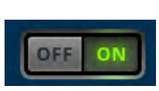
There is a flame in the boiler

Position of grate 1 and grate 2

Grates are open (Open - cleaning)

Grates are closed (Closed - ready to operate)

The option is disabled

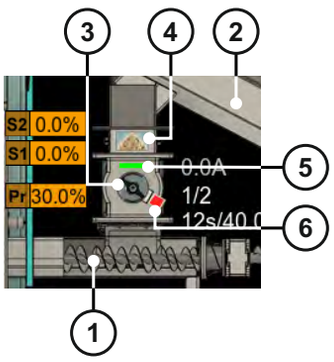


The option is enabled

DISPLAY OF FUEL SUPPLY PRINCIPLE

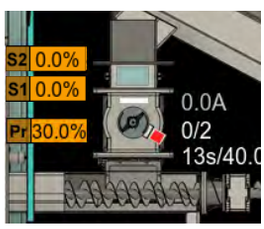
The rotary valve (RSE) (3) has two chambers that are filled/emptied with fuel. The rotor of the rotary valve rotates in steps of 90° with a defined total duration for each step (rotation and resting).

In one step, after rotation, both chambers are closed, and this is the position in which feeder screw 2 (2) supplies fuel to the upper part of the rotary valve rotor. On the upper part of the rotary valve, above the rotor, there is an ultrasound sensor (5) (transmitter/receiver) that gives the command to start/stop feeder screw 2. When the ultrasound sensor detects that there is enough fuel, it displays a "pile" (4)  and stops the operation of feeder screw 2.



1 - Feeder screw 1
2 - Feeder screw 2
3 - Rotary valve (RSE)
4 - "Pile"
5 - Ultrasound sensor indication
6 - Inductive sensor indication - openness of the chamber

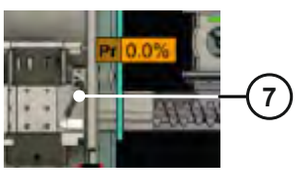
In the next step of the rotary valve (3) operation, both chambers open. Fuel falls from the lower chamber into feeder screw 1 (1) (which feeds the fuel into the boiler's combustion chamber), while fuel that was delivered in the previous step by feeder screw 2 to the upper side of the rotary valve rotor falls into the upper chamber, thus the "pile" display disappears.



This procedure repeats in a cycle (loop), and it is controlled by the boiler controller.
On the side of the rotary valve, there are two inductive sensors (6) that provide information to the boiler controller on whether the rotary valve chambers are open or closed.

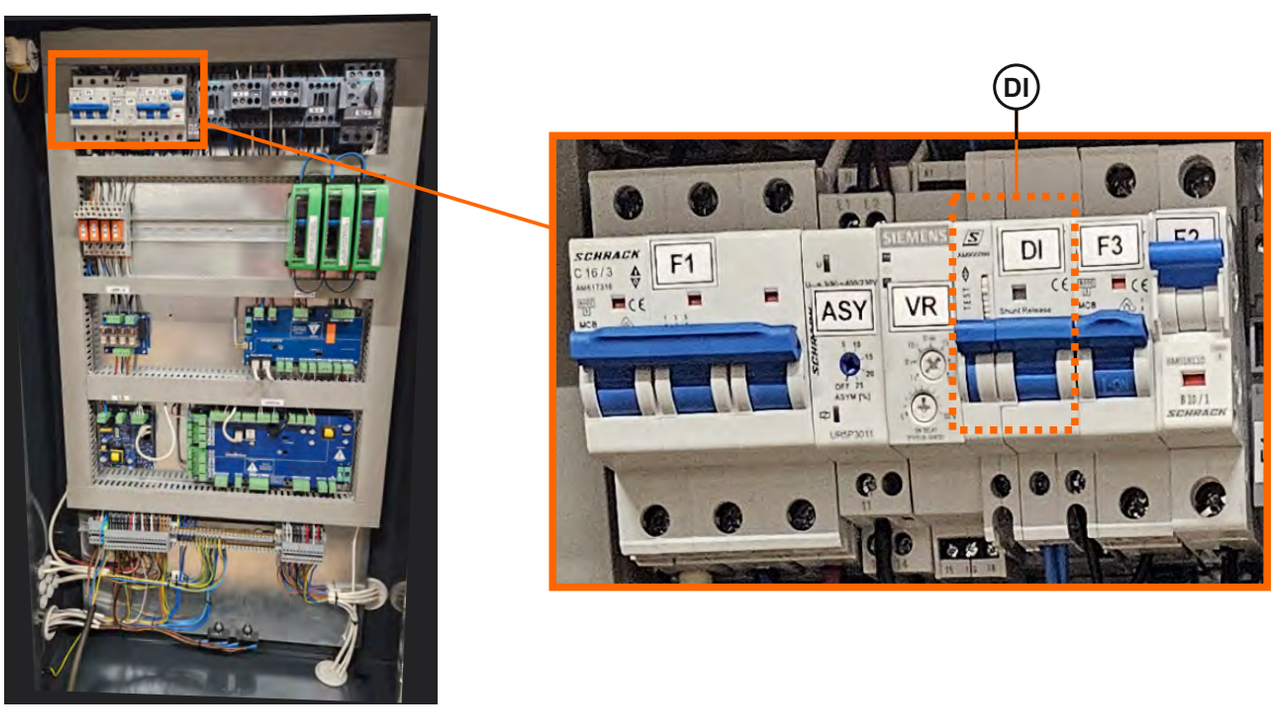
In the boiler's combustion chamber, there is a "combustion chamber (firebox) flap" (7) that has two defined limit height levels.
If the "combustion chamber (firebox) flap" reaches the "first limit height," the boiler controller stops the fuel supply to the boiler (I10 is displayed in the "History," and the "combustion chamber (firebox) flap" symbol on the controller screen turns red) until the flap drops below the "first limit height."
If the "combustion chamber (firebox) flap" reaches the "second limit height," there will be a mechanical power disconnect for the motors involved in the fuel supply process to the boiler, and error E87 will be displayed in the "History." Reaching the "second limit height" is not typical during normal operation; it is a safety function, and it results by tripping the automatic fuses (DI) in the boiler's junction box (jbox).

If the "combustion chamber (firebox) flap" reaches the "second limit height" and error E87 appears, it is necessary to first eliminate the cause of the "combustion chamber (firebox) flap" rise, lower the flap below the "second limit height," turn on the automatic fuses (DI) in the boiler junction box (jbox), and confirm the display of error E87 on the boiler control screen.



7 - Combustion chamber (firebox) flap
DI - Automatic fuses

NOTE,
Manually raising the "combustion chamber (firebox) flap" (e.g., during manual cleaning of the boiler combustion chamber) above the "second limit height" will also lead to a mechanical power disconnect for the motors involved in the fuel supply process to the boiler (tripping the automatic fuses (DI) in the boiler's junction box (jbox)), and error E87 will be displayed in the "History."



CONFIGURATION SYMBOLS

The following symbols are displayed on the controller screen

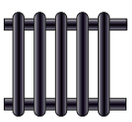
Pump (when the pump is operating, the symbol rotates, otherwise idle)

The pump has a work request (in the middle of / next to the pump is the yellow square symbol when there is a operating request of the pump. The pump does not operate if all conditions for its work are not met, for example: low boiler temperature, otherwise the pump operates).

Room corrector (CSK)

Digital room corrector (CSK-Touch)

Room thermostat / Reg. control

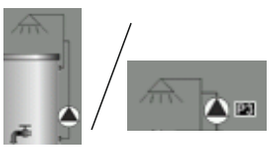


Heating circuit

Buffer tank with integrated DHW tank

Domestic hot water (DHW) tank with current temperature

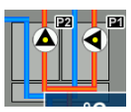
Accumulation (buffer) tank with current temperature at top and bottom of the tank

* 

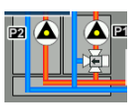
DHW recirculation

* 

DHW recirculation is installed but is switched off



Two direct heating circuits

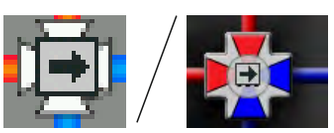


One direct heating circuit and one heating circuit with 3-way mixing valve

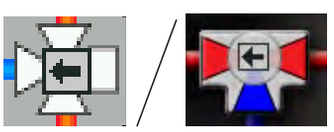
Outdoor temperature sensor

Hydraulic crossover temperature sensor

Temperature sensor



4-way mixing valve (shows valve opening and closing)



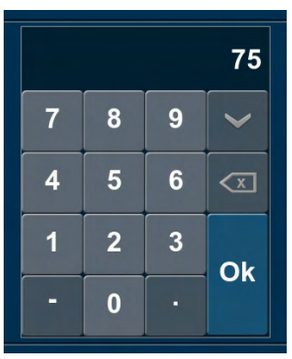
3-way mixing valve (shows valve opening and closing)

3-way diverter valve (indicates direction of flow, AB-A)

* The symbol appears only if recirculation exists in the configuration and if the authorized service technician has switched it on in the Installation menu (option "Recirculation installed").

CHANGING/ENTERING PARAMETERS

Drag the slider button / press the button to increase/decrease the value

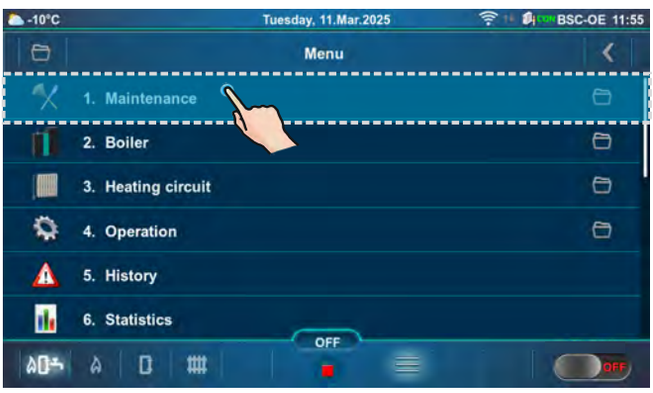


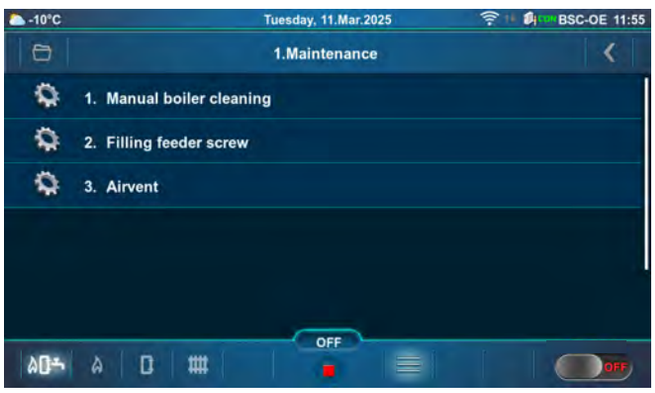
Keyboard: Value entry

Button for multiplication change (left / right)
x1, x10, x100

NOTE: The number of menu depends on the selected heating system configuration.

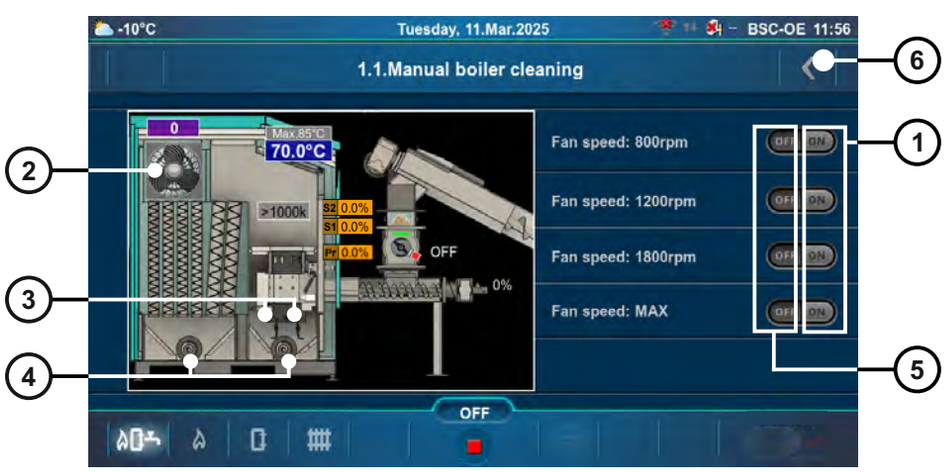
1.0. MAINTENANCE





1.1. MANUAL BOILER CLEANING

Manual boiler cleaning - by entering this submenu, the burner grates (3) will move to the open position (100 %) and transporters for ash removal (4) will start operating. By choosing the desired fan speed (2), the fan starts (press "ON" (1) next to the desired fan speed). This option enables that during combustion chamber cleaning, ash does not come out of the boiler but instead falls onto the transporters for ash removal, which transport the ash to the ash boxes. After cleaning, it is necessary to press the "OFF" button (5) to stop the fan (the same thing will happen if you press the "BACK button" (6)). When exiting this menu (press the "BACK button" (6)) the burner grates return to the closed position (0 %) and after a few seconds, transporters for ash removal (4) will stop operating. After cleaning, empty the ash boxes as needed.

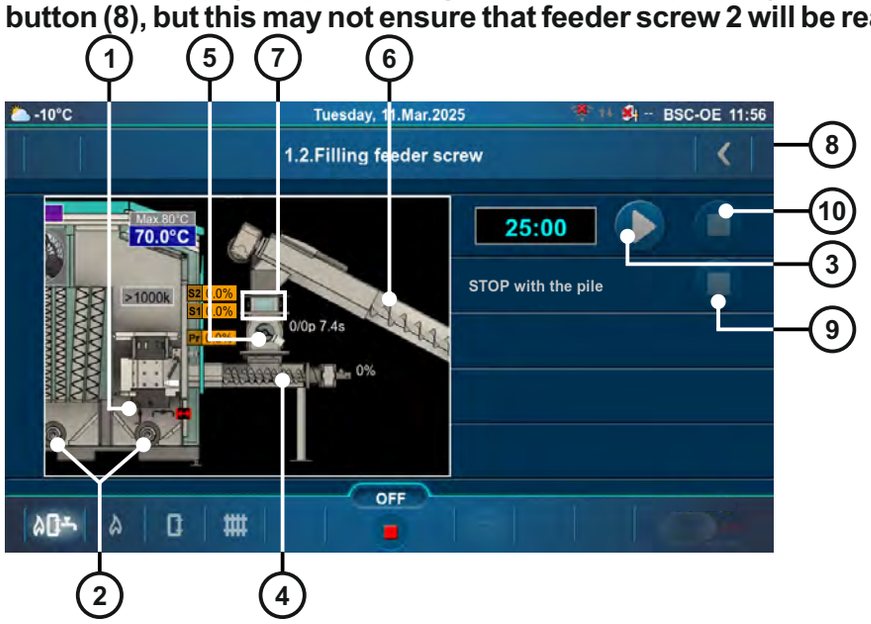


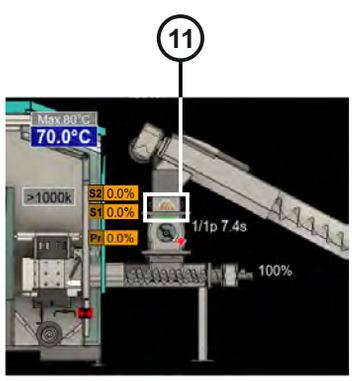
1.2. FILLING FEEDER SCREW

Filling feeder screw - by entering this submenu, the left burner grate (1) will move to the open position and transporters for ash removal (2) will start operating. By pressing the "PLAY" button (3) feeder screw 1 (4), rotary valve (5) and feeder screw 2 (6) will start to operate. Feeder screw 2 operates only when the rotary valve is in a specific position without a "pile" (7). The rotary valve operates/stops according to the set interval. Upon exiting this submenu (press the "BACK" button (8)), the left burner grate returns to the closed position (0%), and after a few seconds, the transporters for ash removal (2) will stop operating.

IMPORTANT: After starting the feeder screw filling option by pressing the "START" button (3), press the button "STOP with the pile" (9) which will give the boiler controller an order to stop this feeder screw filling process after the "pile" (11) appears in the upper part of the "rotary valve", that will also mean that the feeder screw 2 (6) is filled and ready to start the boiler. Of course, if the "pile" (11) does not appear within the specified time, the option will be stopped due to timeout. If for some reason you want to use this option to supply fuel to the boiler combustion chamber, do not press the "STOP with the pile" button (9) as long as you want the feeder screws to operate, and then press the "STOP with the pile" button (9).

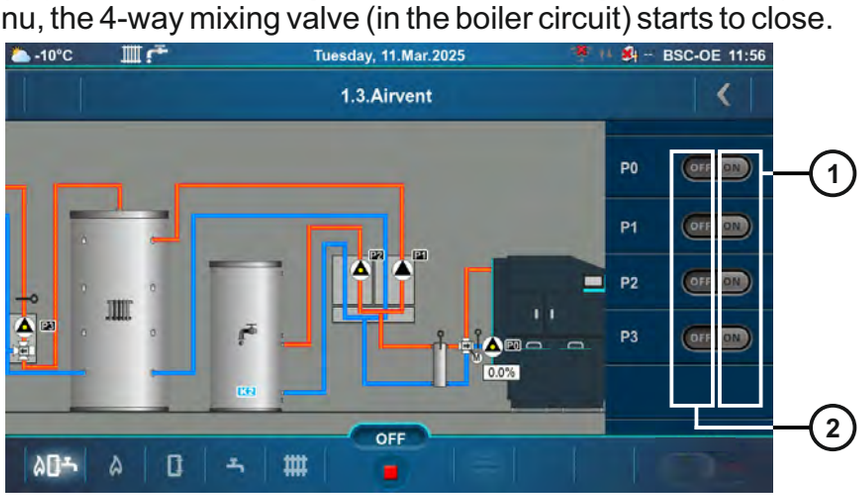
You can currently stop the filling feeder screw option by pressing the "STOP" button (10) or "BACK" button (8), but this may not ensure that feeder screw 2 will be ready to start the boiler.





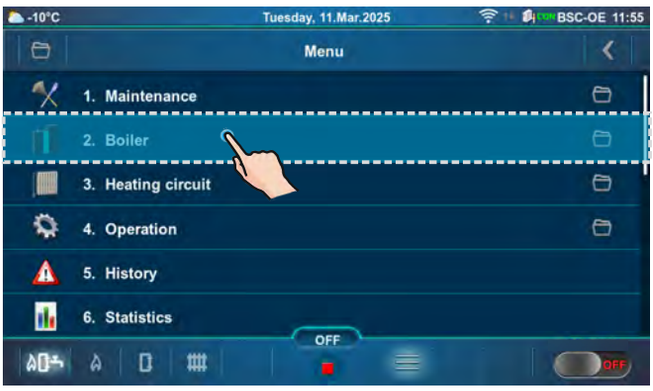
1.3. AIRVENT

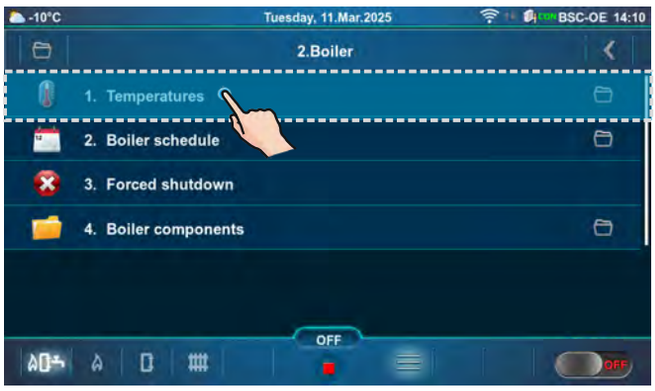
By entering the "Airvent" submenu, the 4-way mixing valve (in the boiler circuit) opens to 50 %. By pressing "ON" (1) next to a pump symbol, the pump starts operating. By pressing the "OFF" button (2) the pump stops. Manually open the other mixing valves of the heating installation (to 50 %) as needed. When exiting this submenu, the 4-way mixing valve (in the boiler circuit) starts to close.



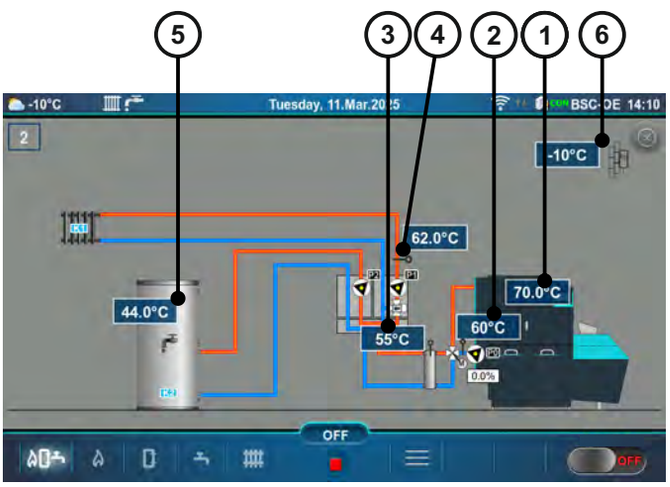
2.0. BOILER

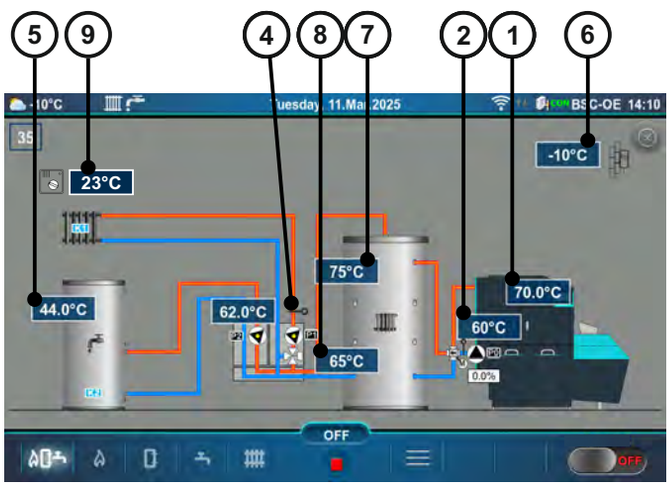
2.1. TEMPERATURES





Temperature choice depends on the configuration of the heating system. Below are shown examples of two configurations (Main screen - Schematic view (BSC-OE)).





1 - Boiler temperature sensor
2 - Return flow temperature sensor
3 - Hydraulic crossover temperature sensor
4 - Temperature sensor ((K1) Heating circuit 1- main flow)
5 - Temperature sensor domestic hot water (DHW) ((K2) Heating circuit 2)
6 - Outdoor temperature sensor
7 - Temperature sensor (UP) - accumulation (buffer) tank
8 - Temperature sensor (DOWN) - accumulation (buffer) tank
9 - Room corrector CSK ((K1) Heating circuit 1) / CSK-Touch (additional equipment)

Configuration: 1, 2, 3, 6, 7, 9, 10, 45.
Temperature values (factory, minimum/maximum):

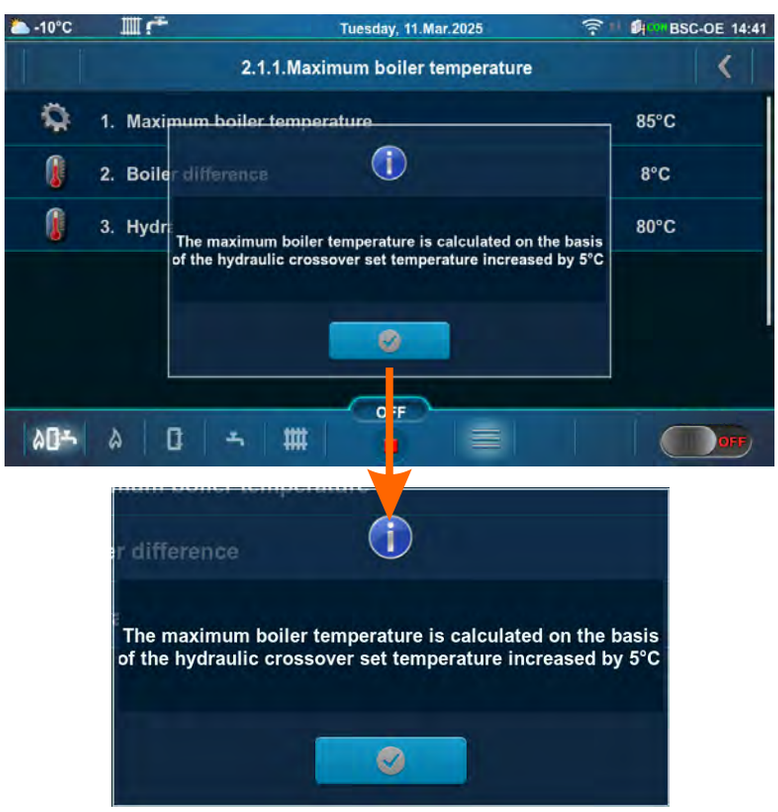
a) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Installation** (menu Installation-> Configuring -> Temperature maintenance: Installation)

	Factory:	Min/Max	Unit
* 1.Maximum boiler temperature	85	70 / 90	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 85	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 90 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 2)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature

**Example of maximum boiler temperature setting: Configuration 2



b) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Boiler** (menu Installation-> Configuring -> Temperature maintenance: Boiler)

	Factory:	*Min/Max*	*Unit*
* *1.Maximum boiler temperature*	80	70 / 80	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 75	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 2)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature

**Example of maximum boiler temperature setting: Configuration 2

c) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Hydraulic crossover** (menu Installation-> Configuring -> Temperature maintenance: Hydraulic crossover)

	Factory:	Min/Max	Unit
* 1.Maximum boiler temperature	80	70 / 80	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 75	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 2)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature

**Example of maximum boiler temperature setting: Configuration 2

d) If is selected **And another heating controller** (menu Installation -> Configuring -> Boiler control: And another heating controller)

		Factory:	*Min/Max*	*Unit*
*	*1.Maximum boiler temperature*	80	70 / 80	°C
	2.Boiler difference	8	8 / 10	°C
	3.Hydraulic crossover temperature	75	68 / 75	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 2)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature

**Example of maximum boiler temperature setting: Configuration 2

Configuration: 4, 5.

Temperature values (factory, minimum/maximum):

	Configuration: 4	Factory:	Min/Max	Unit
*	*1.Maximum boiler temperature (manual entry)*	80	68 / 80	°C
	2.Boiler difference	8	8 / 10	°C

	Configuration: 5	Factory:	Min/Max	Unit
*	*1.Maximum boiler temperature*	80	68 / 80	°C
	2.Maximum boiler temperature (manual entry)	80	68 / 80	°C
	3.Boiler difference	8	8 / 10	°C

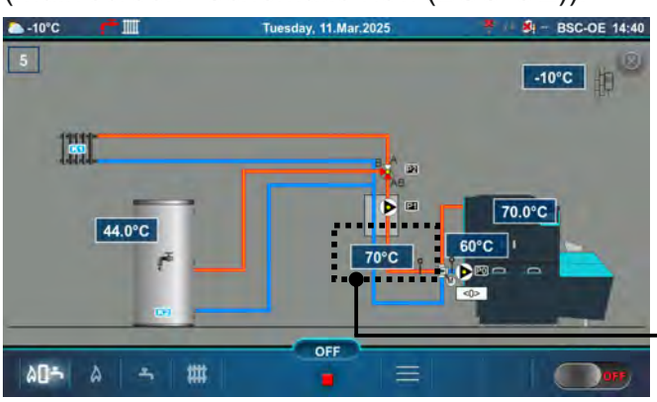
Maximum boiler temperature (manual entry)= Manually selected maximum boiler temperature (see **Example of maximum boiler temperature setting: Configuration 4)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the DHW set temperature increased by 5 °C or manual entry. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 5)

Boiler difference = Boiler temperature difference

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

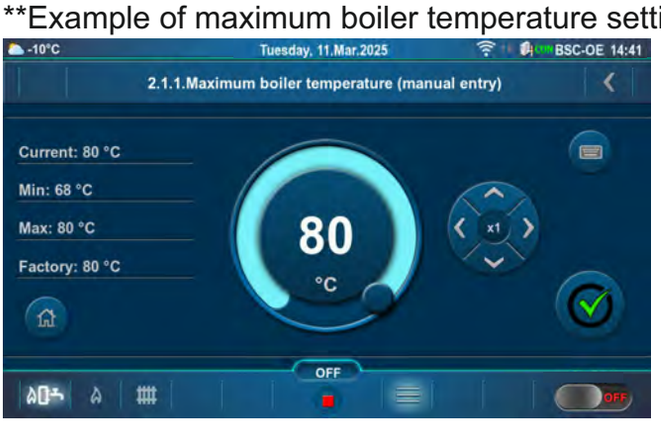
Configuration 5 display
(Main screen - Schematic view (BSC-OE)).



Main flow sensor - for information only (Configuration 4,5,8)

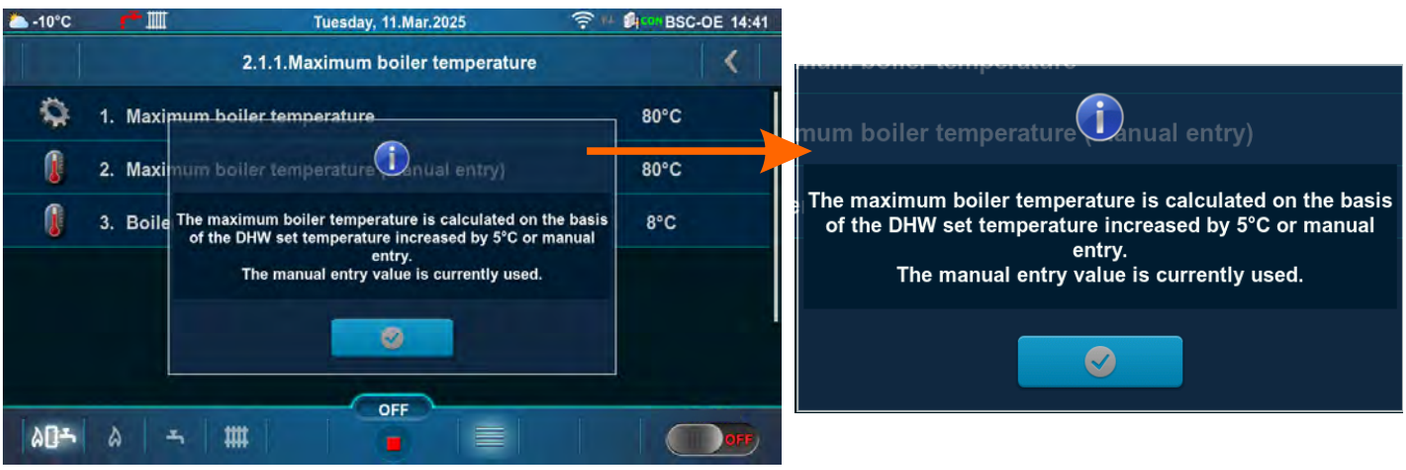
Authorized service technician can turn on or off the "Main flow sensor" display.

**Example of maximum boiler temperature setting: Configuration 4



**Example of maximum boiler temperature setting: Configuration 5.

1. (Temperature DHW + 5 °C) </= Maximum boiler temperature (manual entry):



2. (Temperature DHW + 5 °C) > Maximum boiler temperature (manual entry):

Configuration: 8.
Temperature values (factory, minimum/maximum):

		Factory:	Min/Max	Unit
*	*1.Maximum boiler temperature*	80	70 / 80	°C
	2.Boiler difference	8	8 / 10	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis on the DHW set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 8)
Boiler difference = Boiler temperature difference

**Example of maximum boiler temperature setting: Configuration 8

1. Temperature DHW < 65 °C

2. Temperature DHW >/= 65 °C

Configuration: 11, 12, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44.
Temperature values (factory, minimum/maximum):

		Factory:	Min/Max	Unit
*	*1.Maximum boiler temperature*	85	70 / 90	°C
	2.Boiler difference	8	8 / 10	°C
	3.Buffer tank temperature	80	40 / 85	°C
	4.Buffer tank temperature difference	10	5 / 40	°C
	5.Stop buffer tank difference	5	3 / 30	°C

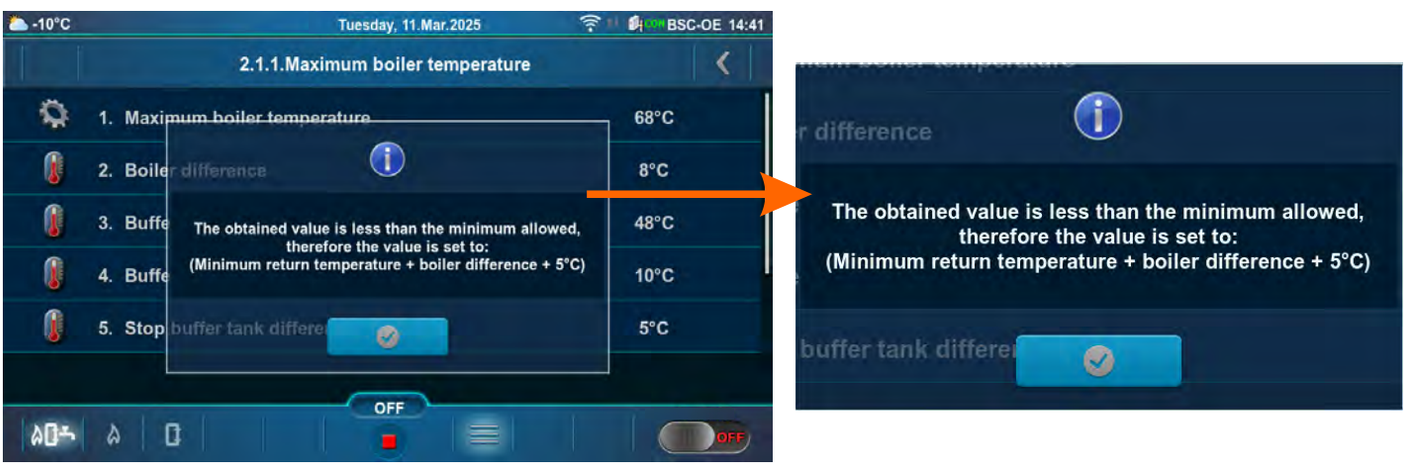
*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 90 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 11)
Boiler difference = Boiler temperature difference
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

**Example of maximum boiler temperature setting: Configuration 11.

1. Buffer tank temperature set to >/= 65 °C:

2. Buffer tank temperature set to <65 °C:



Configuration: 13, 14, 15, 16.
Temperature values (factory, minimum/maximum):

		Factory:	Min/Max	Unit
*	1.Maximum boiler temperature	85	70 / 90	°C
	2.Boiler difference	8	8 / 10	°C
	3.Buffer tank temperature	80	40 / 85	°C
	4.Buffer tank temperature difference	10	5 / 40	°C
	5.Stop buffer tank difference	5	3 / 30	°C

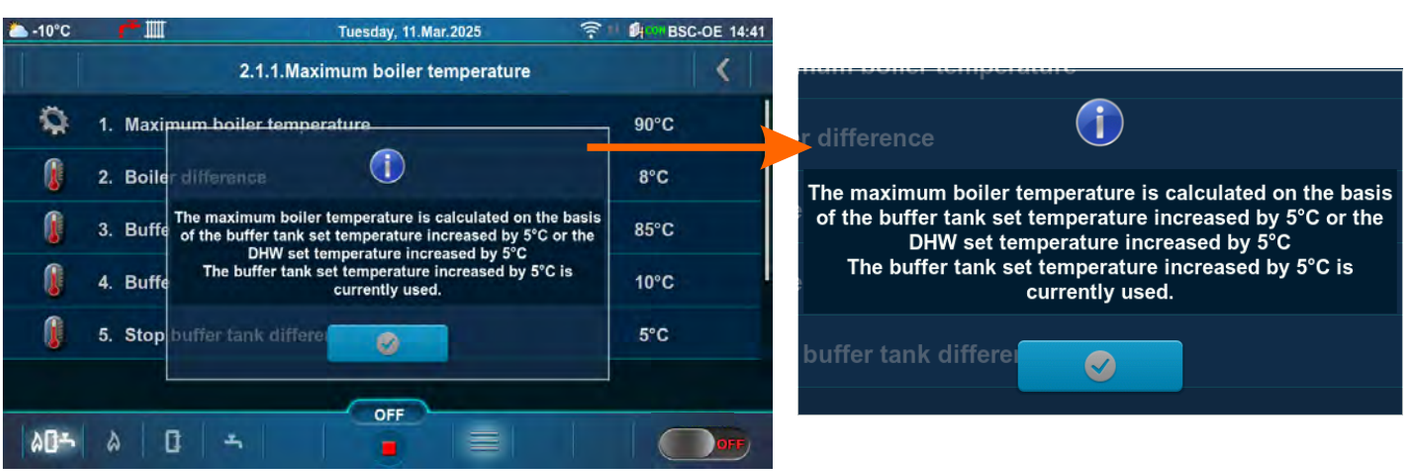
*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 90 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C or the DHW set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 13)
Boiler difference = Boiler temperature difference
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

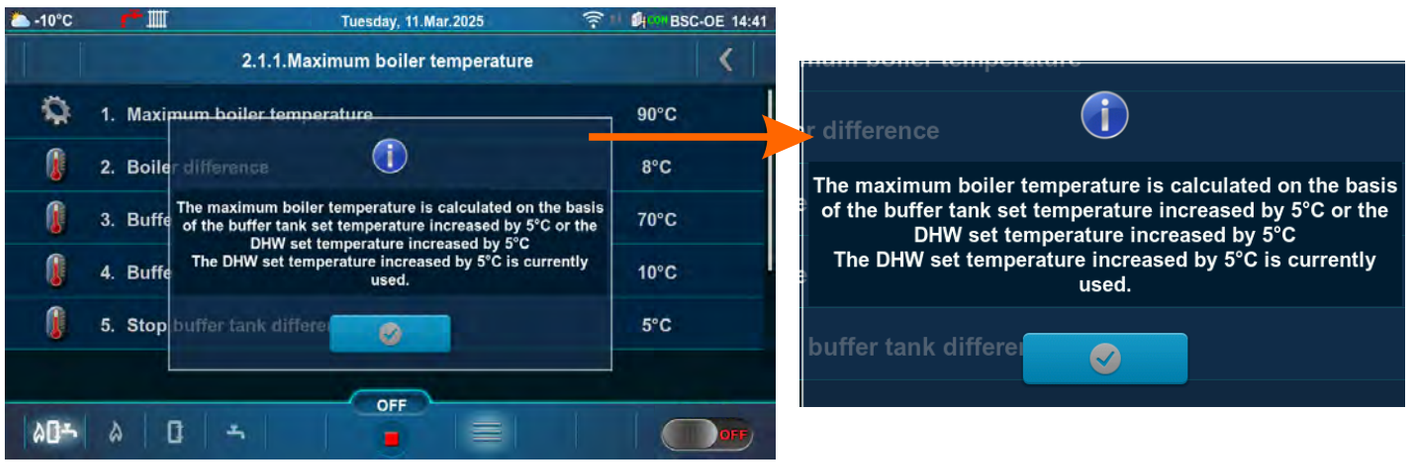
**Example of maximum boiler temperature setting: Configuration 13

1. Buffer tank temperature set to >/= 65 °C:

1a. Buffer tank temperature set to >/= DHW set temperature

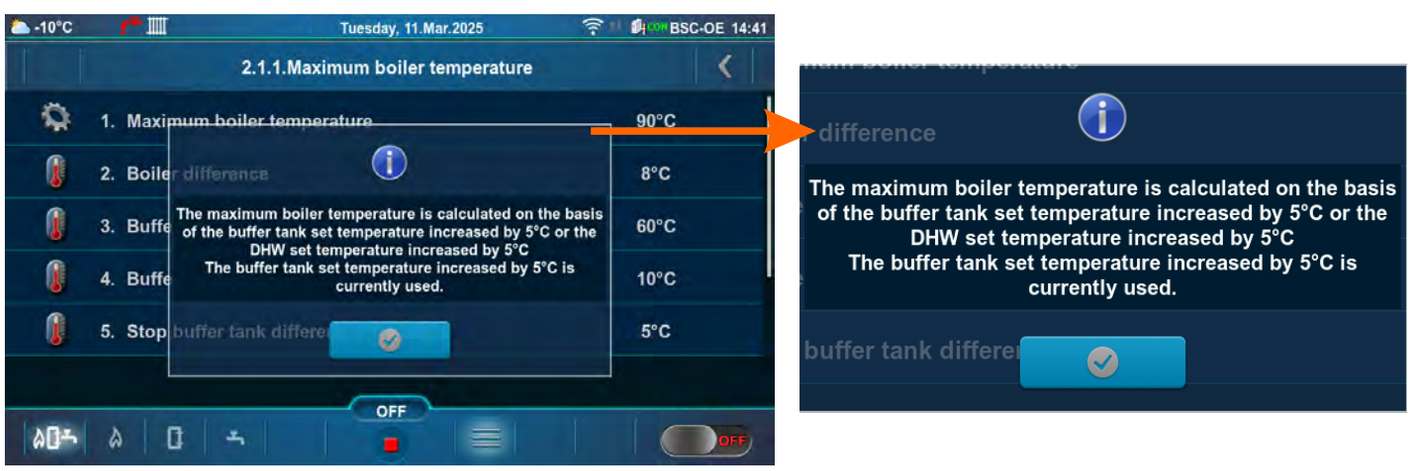


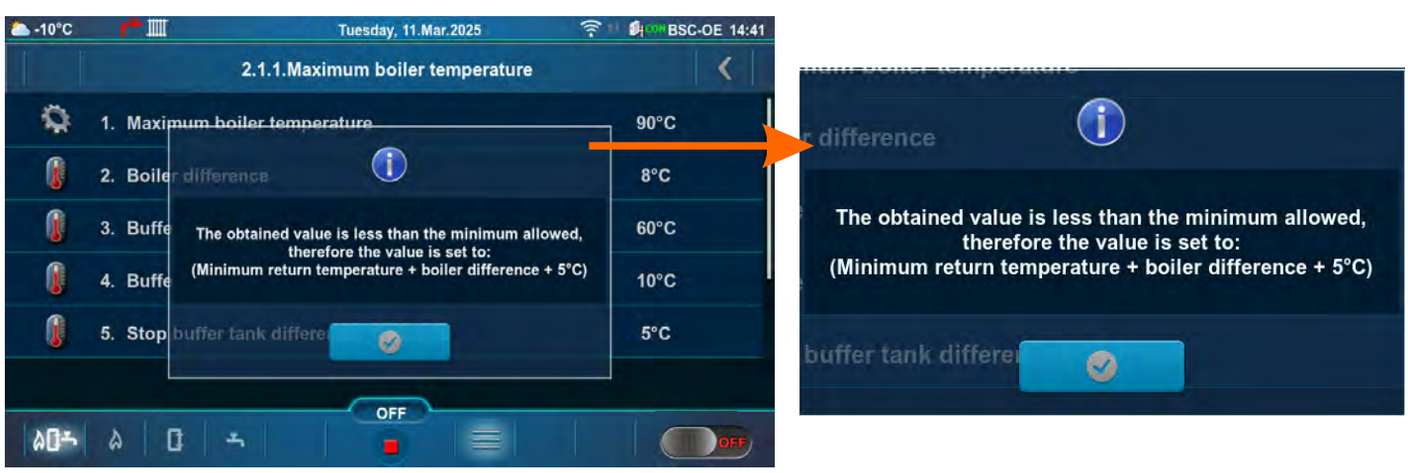
1b. Buffer tank temperature set to < DHW set temperature



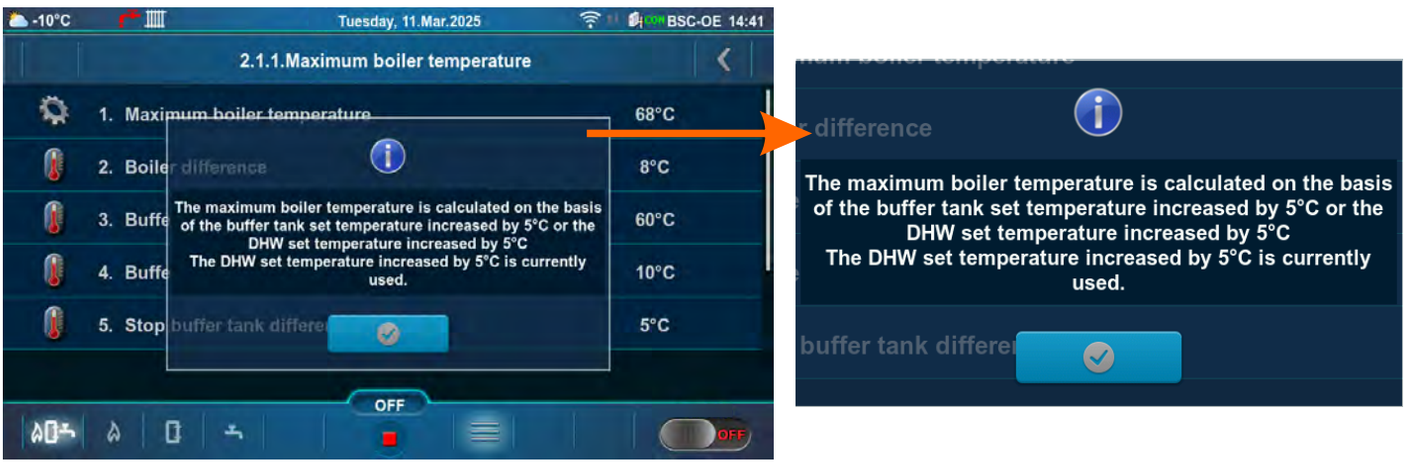
2. Buffer tank temperature set to <65 °C:

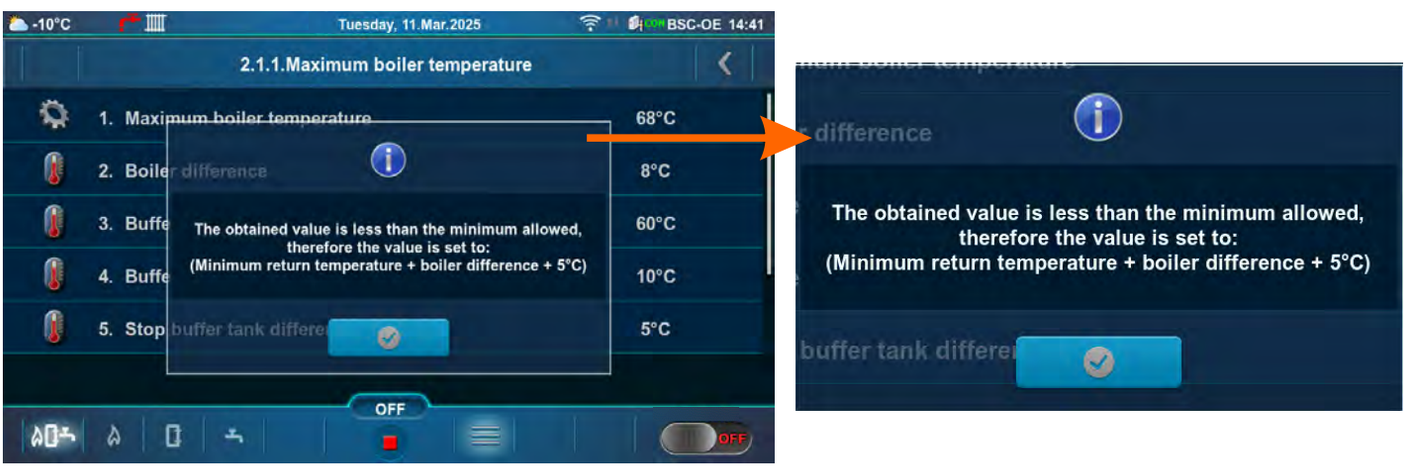
2a. Buffer tank temperature set to >/= DHW set temperature



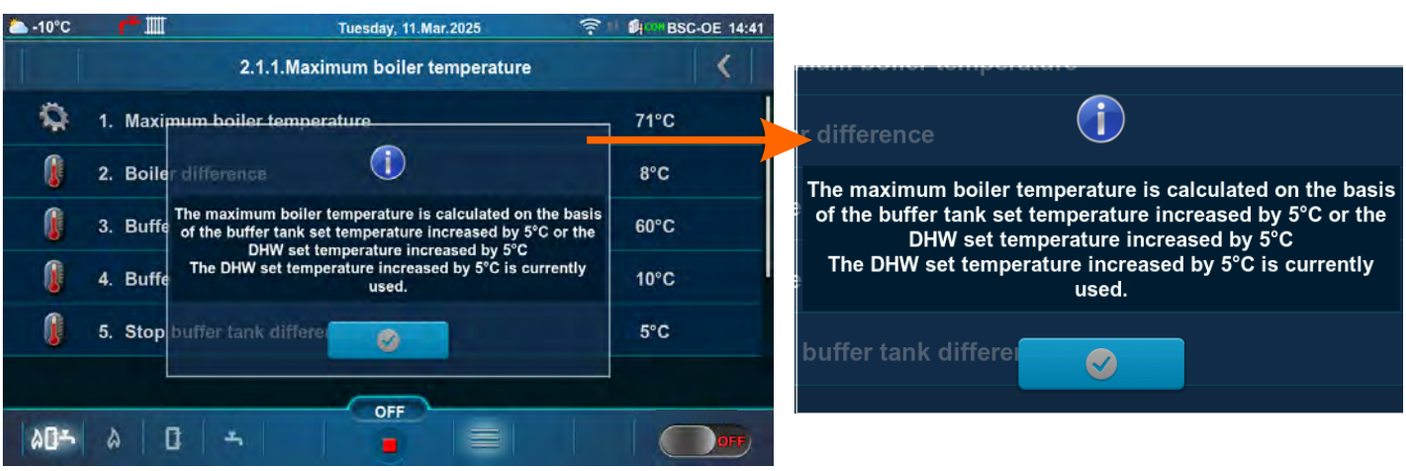


2b. Buffer tank temperature set to < DHW set temperature





2c. DHW set temperature > Buffer tank temperature set and DHW set temperature >/= 65 °C



Configuration: 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32.
Temperature values (factory, minimum/maximum):

a) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Installation** (menu Installation-> Configuring -> Temperature maintenance: Installation)

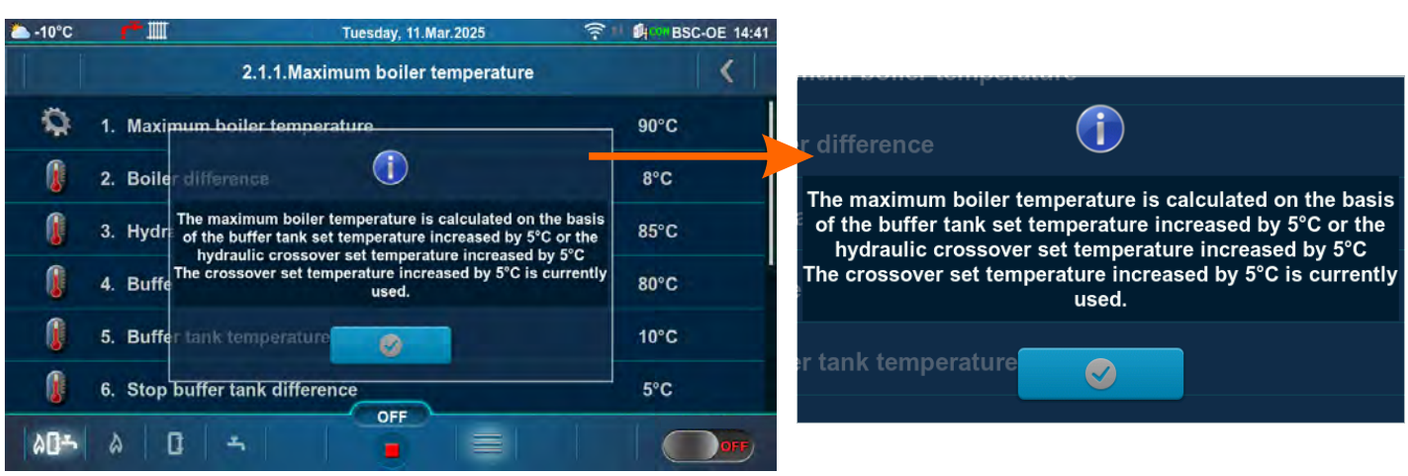
	Factory:	Min/Max	Unit
* 1.Maximum boiler temperature	85	70 / 90	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 85	°C
4.Buffer tank temperature	80	40 / 85	°C
5.Buffer tank temperature difference	10	5 / 40	°C
6.Stop buffer tank difference	5	3 / 30	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 90 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

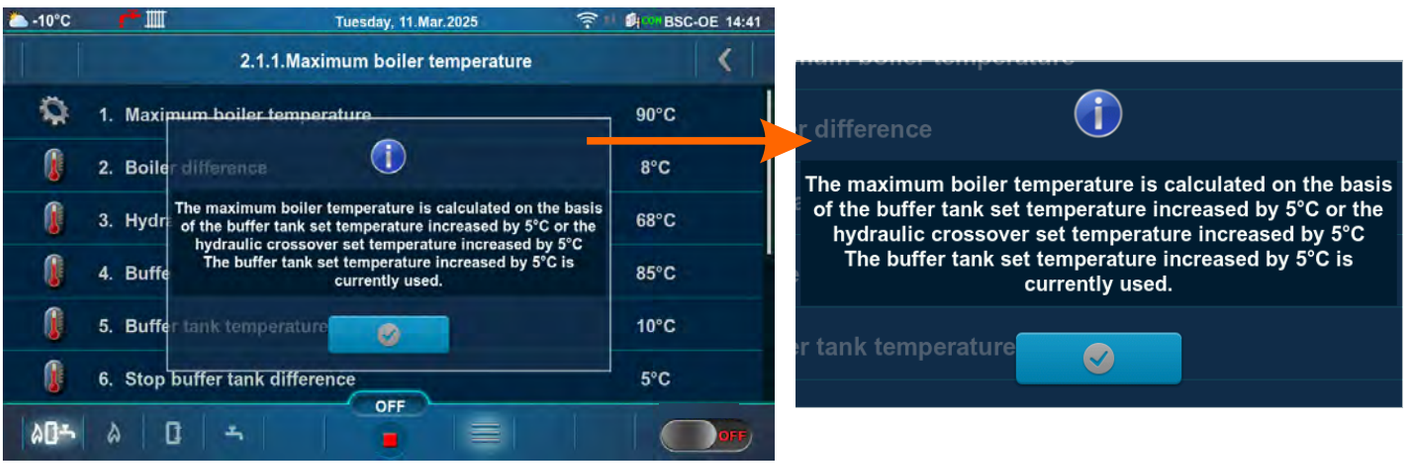
Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C or the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 17)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

**Example of maximum boiler temperature setting: Configuration 17

1. Hydraulic crossover temperature >/= Buffer tank temperature



2. Hydraulic crossover temperature < Buffer tank temperature



b) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Boiler** (menu Installation-> Configuring -> Temperature maintenance: Boiler)

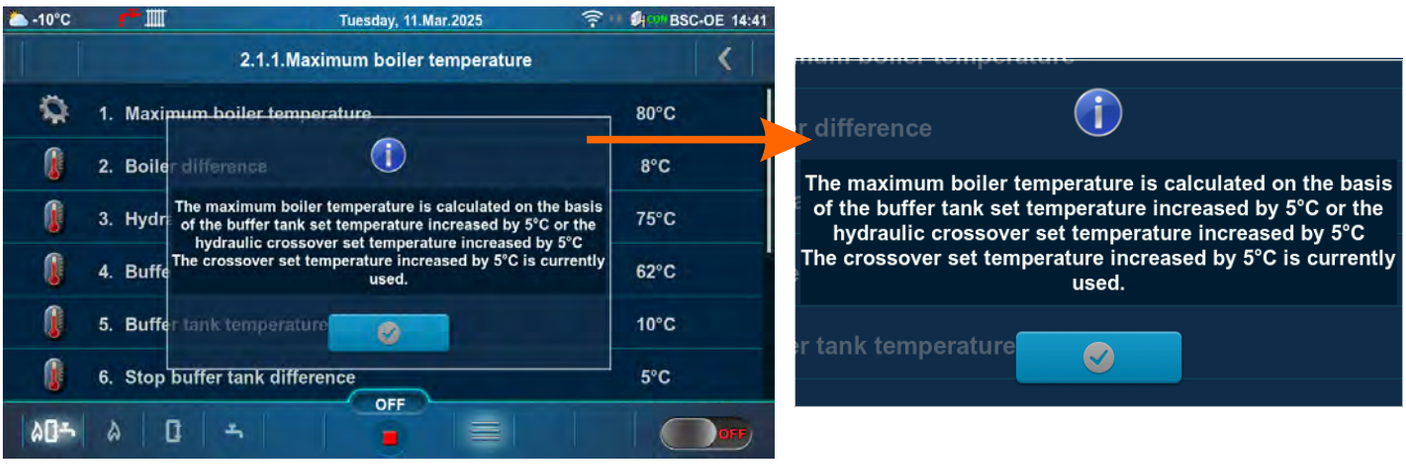
	Factory:	*Min/Max*	*Unit*
* *1.Maximum boiler temperature*	80	70 / 80	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 75	°C
4.Buffer tank temperature	80	40 / 85	°C
5.Buffer tank temperature difference	10	5 / 40	°C
6.Stop buffer tank difference	5	3 / 30	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

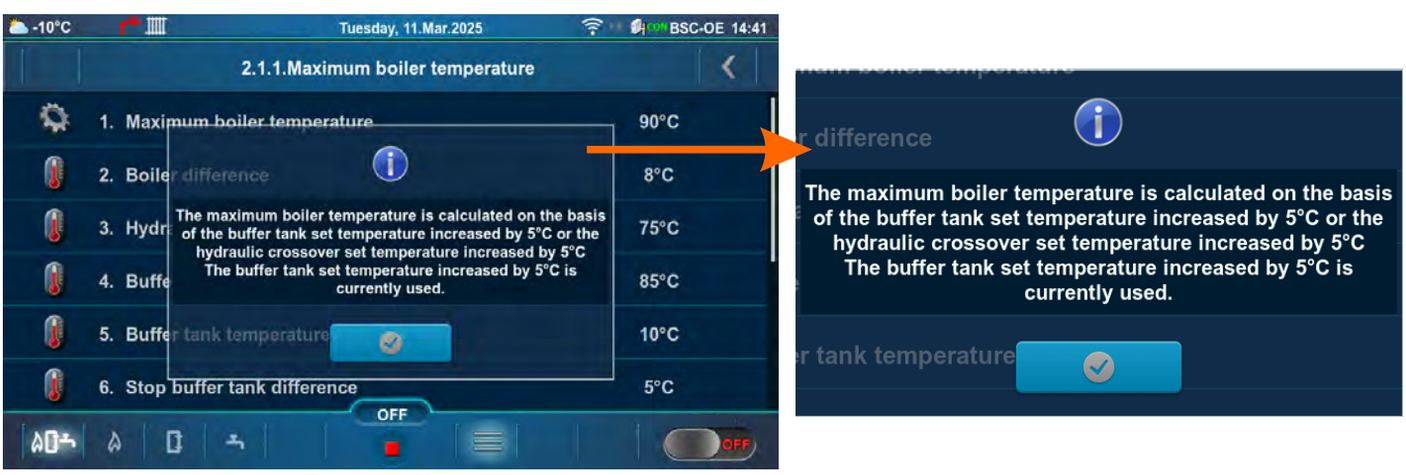
Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C or the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 17)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

**Example of maximum boiler temperature setting: Configuration 17

1. Hydraulic crossover temperature >/= Buffer tank temperature



2. Hydraulic crossover temperature < Buffer tank temperature



c) If is selected **Only boiler regulation** (menu Installation -> Configuring -> Boiler control: Only boiler regulation) and if as Temperature maintenance is selected **Hydraulic crossover** (menu Installation -> Configuring -> Temperature maintenance: Hydraulic crossover)

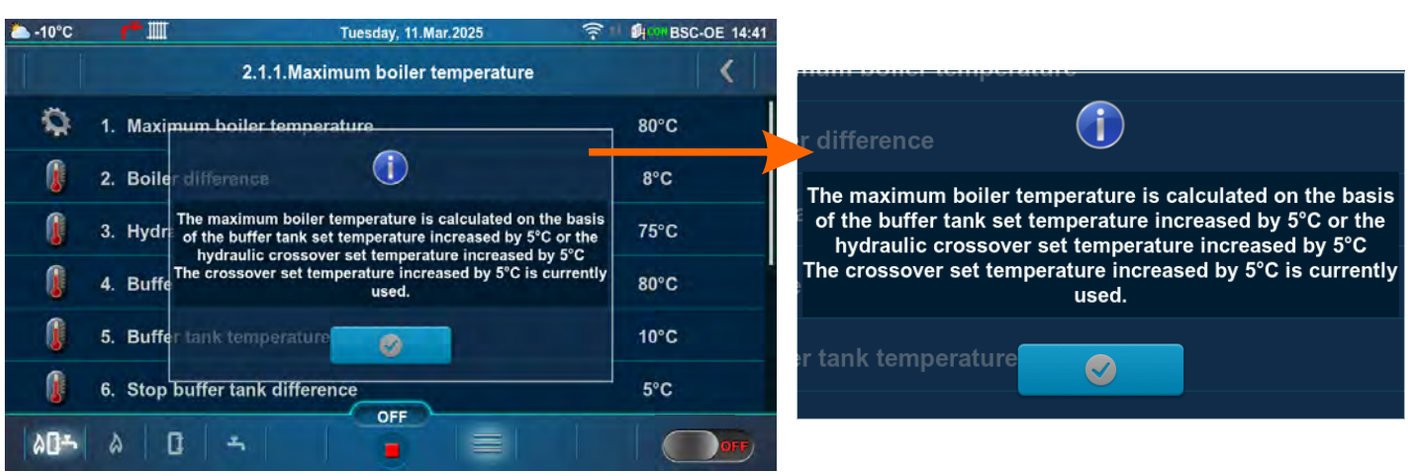
	Factory:	Min/Max	Unit
* 1.Maximum boiler temperature	80	70 / 80	°C
2.Boiler difference	8	8 / 10	°C
3.Hydraulic crossover temperature	75	68 / 75	°C
4.Buffer tank temperature	80	40 / 85	°C
5.Buffer tank temperature difference	10	5 / 40	°C
6.Stop buffer tank difference	5	3 / 30	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

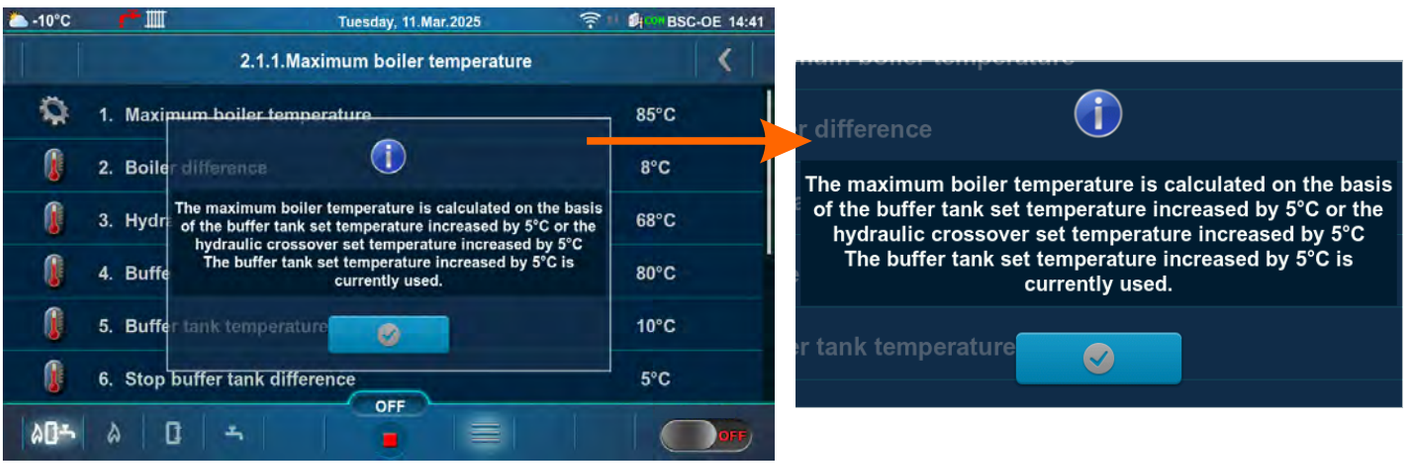
Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C or the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 17)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

**Example of maximum boiler temperature setting: Configuration 17

1. Hydraulic crossover temperature >/= Buffer tank temperature



2. Hydraulic crossover temperature < Buffer tank temperature



d) If is selected **And another heating controller** (menu Installation -> Configuring -> Boiler control: And another heating controller)

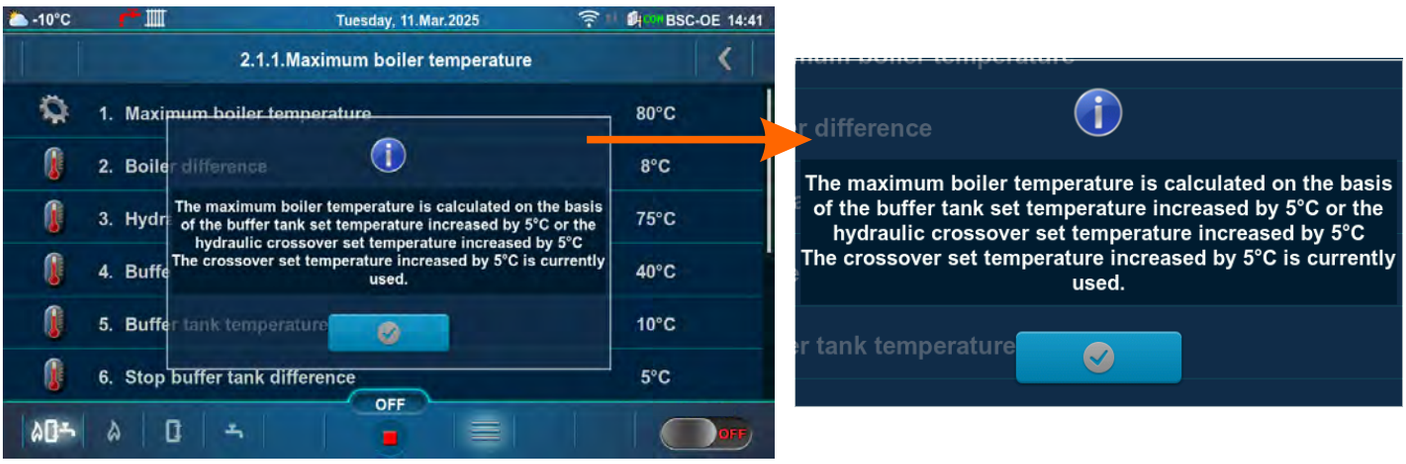
		Factory:	*Min/Max*	*Unit*
*	*1.Maximum boiler temperature*	80	70 / 80	°C
	2.Boiler difference	8	8 / 10	°C
	3.Hydraulic crossover temperature	75	68 / 75	°C
	4.Buffer tank temperature	80	40 / 85	°C
	5.Buffer tank temperature difference	10	5 / 40	°C
	6.Stop buffer tank difference	5	3 / 30	°C

*By turning on the "Chimney sweeper" option, the "Maximum boiler temperature" is automatically set to 80 °C. By turning off the "Chimney sweeper" option, this condition ceases. (see an example of message 5.X.1. Chimney sweeper)

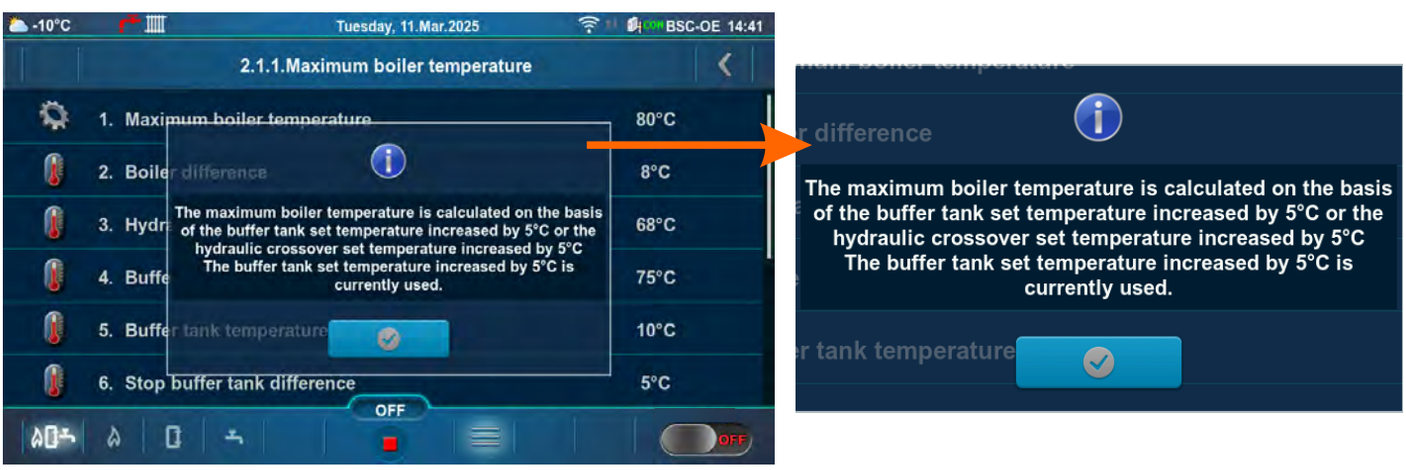
Maximum boiler temperature = The maximum boiler temperature is calculated on the basis of the buffer tank set temperature increased by 5 °C or the hydraulic crossover set temperature increased by 5 °C. (automatically calculated) (see **Example of maximum boiler temperature setting: Configuration 17)
Boiler difference = Boiler temperature difference
Hydraulic crossover temperature = Hydraulic crossover temperature
Buffer tank temperature = Desired (set) buffer tank temperature
Buffer tank temperature difference = If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the upper (UP) sensor) is greater than the set value "Buffer tank temperature difference", the controller issues a request to heat the buffer tank (the buffer tank pump receives a work request and will operate if the temperature of the water taken by the pump is 5 °C higher than the temperature measured in the buffer tank (measured on the upper (UP) sensor)).
Stop buffer tank difference = Buffer tank shutdown temperature difference. If the difference between the set temperature of the buffer tank and the measured temperature of the buffer tank (measured on the lower (DOWN) sensor) is smaller than the set value "Stop buffer tank difference", the request for heating of the buffer tank is interrupted (the buffer tank pump does not require operation).

**Example of maximum boiler temperature setting: Configuration 17

1. Hydraulic crossover temperature >/= Buffer tank temperature



2. Hydraulic crossover temperature < Buffer tank temperature

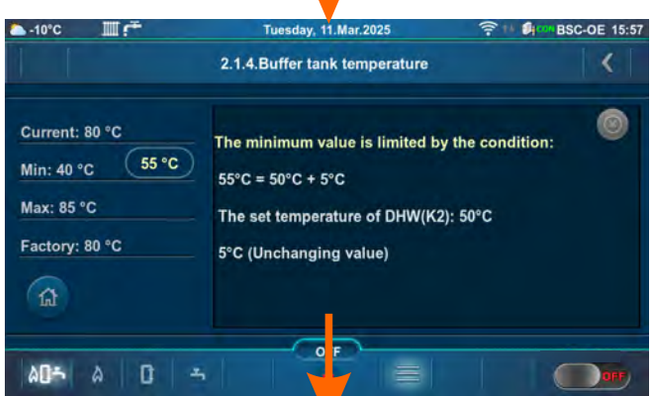


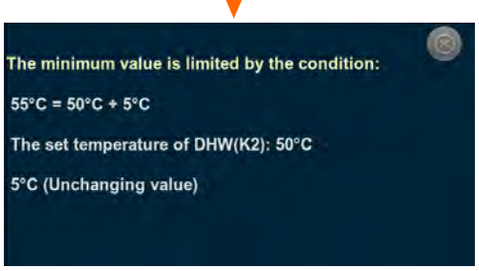
The way of changing the set temperature:

- example of changing the default Hydraulic crossover temperature:

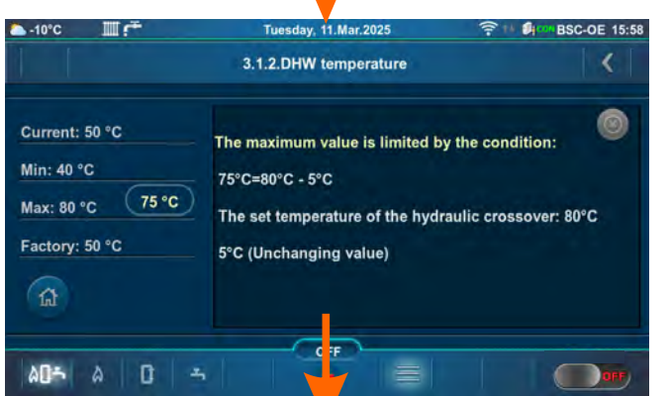
Possible min/max values, factory value and the reasons (descriptions) for some restrictions:

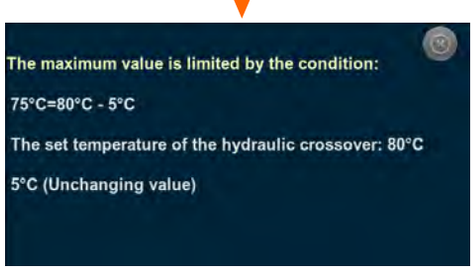
Example: Configuration 20,
Buffer tank temperature





Example: Configuration 20,
DHW temperature





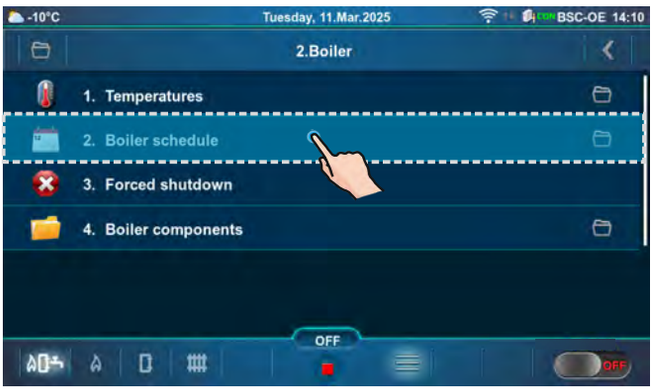
2.1.X. DHW / HEATING

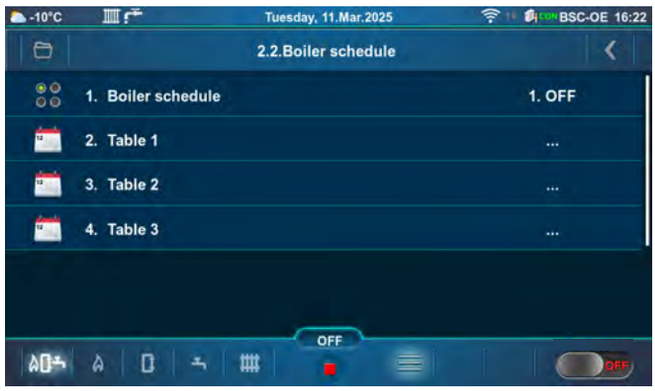
Configuration: 2, 5, 6, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 25, 32, 35, 40, 43, 44.

This menu will only appear if "Auto" is selected (automatic switching between DHW / Heating), see point 5.1. of this Technical Instructions.

	Factory:	*Min/Max*	*Unit*
1. Outdoor temperature	20	0 / 40	°C
2. Outdoor temperature difference	3	2 / 10	°C
3. Time (Heating OFF)	30	0 / 10080	min
3. Time (Heating ON)	30	0 / 10080	min

2.2. BOILER SCHEDULE





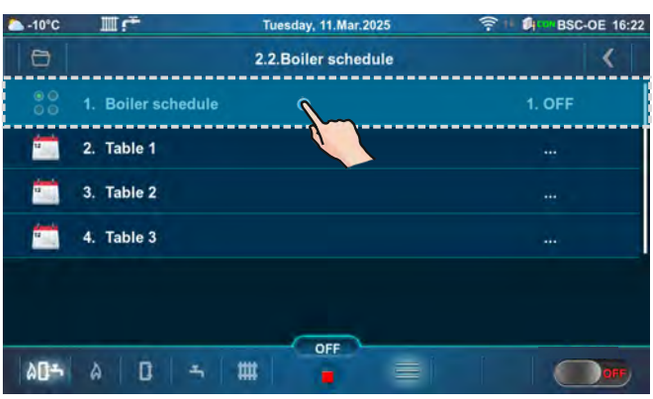
2.2.1. BOILER SCHEDULE

The possibility of adjusting the operating times is carried out using tables. Three operating time tables can be preset (Table 1, Table 2, Table 3), but only one can be active.

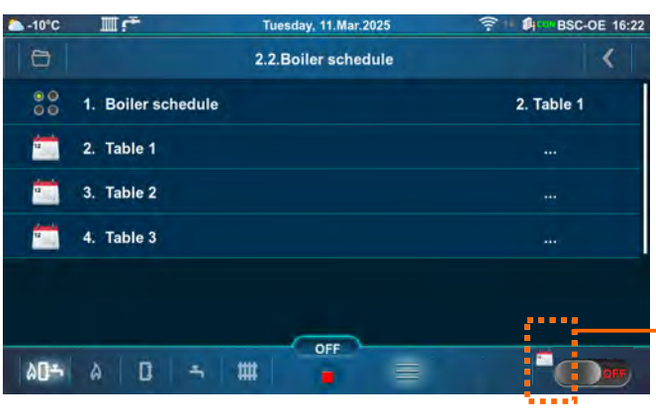
Factory: OFF

Possible selection:

OFF - operating times are disabled
Table 1 - Table 1 is activated and boiler works according to the settings in Table 1
Table 2 - Table 2 is activated and boiler works according to the settings in Table 2
Table 3 - Table 3 is activated and boiler works according to the settings in Table 3

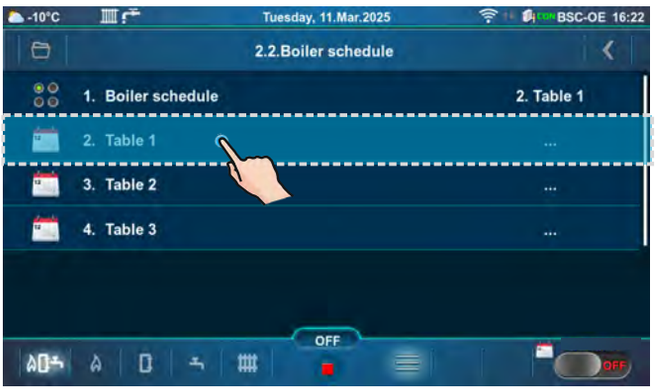


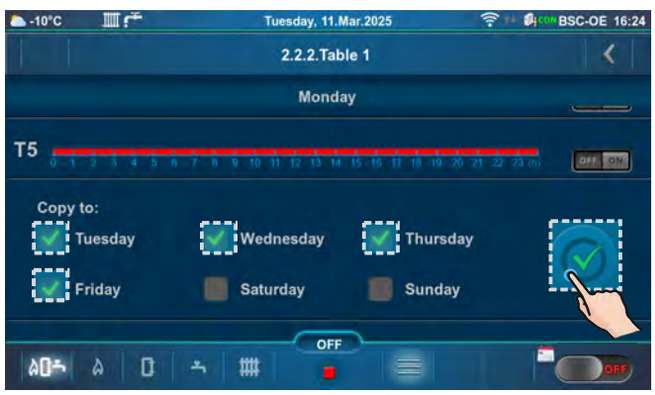
Example of Table 1 activation.

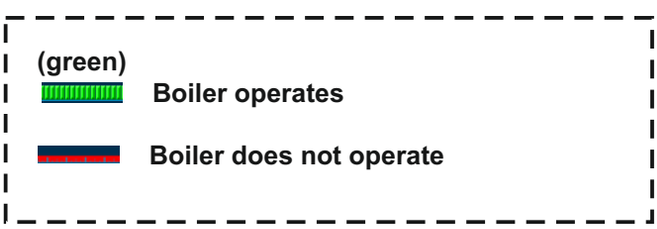


The icon indicates that the "Boiler schedule» is activated (example: Table 1 is activated).

2.2.2. - 2.2.4. TABLE 1, TABLE 2, TABLE 3





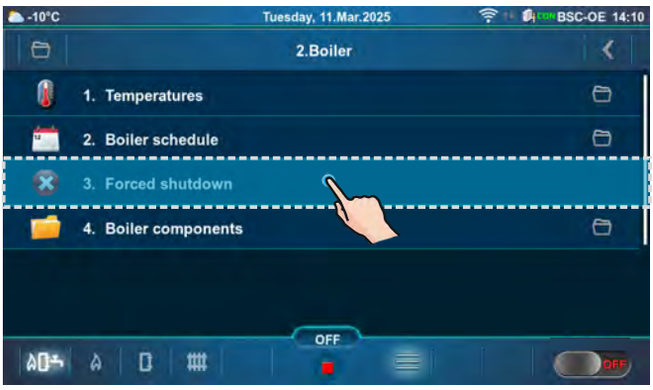


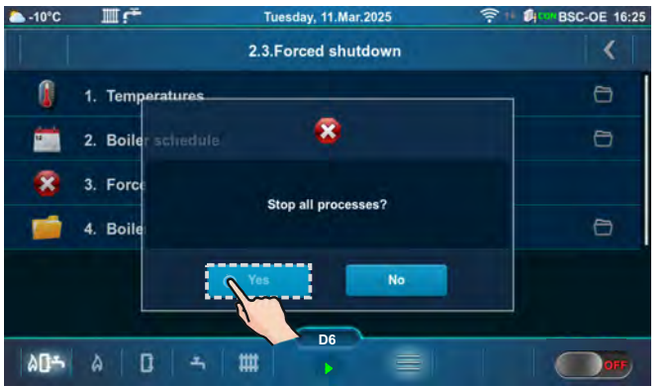
It is possible to set 5 activations and 5 deactivations of the boiler (T1-T5) for each day of the week. In the table, the time when the boiler is operating is marked in green and the time when the boiler is not operating is marked in red. It is possible to set the operating times for one day and copy the same operating times for all other days. Under "COPY TO:", mark the day or days for which you want to have the same operating times and confirm by pressing the "CONFIRM" button.

In the "Table 1" example, the boiler will operate on Monday from 5:00 a.m. to 9:15 a.m., from 2:00 p.m. to 6:00 p.m. and from 7:00 p.m. to 10:00 p.m. In the periods from 00:00 to 4:59 a.m., from 9:16 a.m. to 1:59 p.m., from 6:01 p.m. to 6:59 p.m. and from 10:01 p.m. to 11:59 p.m. the boiler will not operate. The schedule for Monday is copied to Tuesday, Wednesday, Thursday and Friday.

2.3. FORCED SHUTDOWN

"Forced shutdown" option is used for forced shutdown of all processes. First press the ON/OFF button to put the boiler into the shutdown process, then press the "Forced shutdown" button. All processes are stopped. After activating this option, it is necessary to clean the burner grate before restarting.

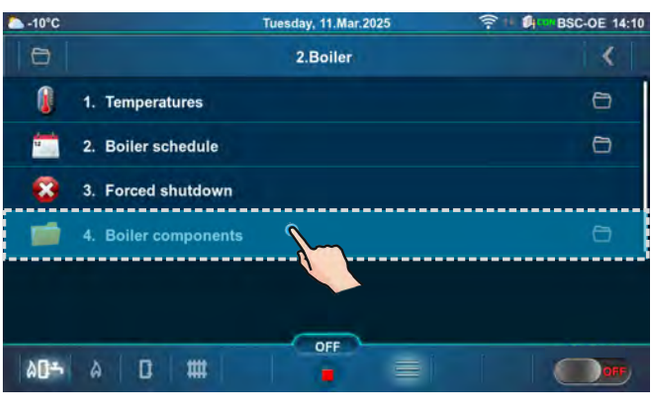


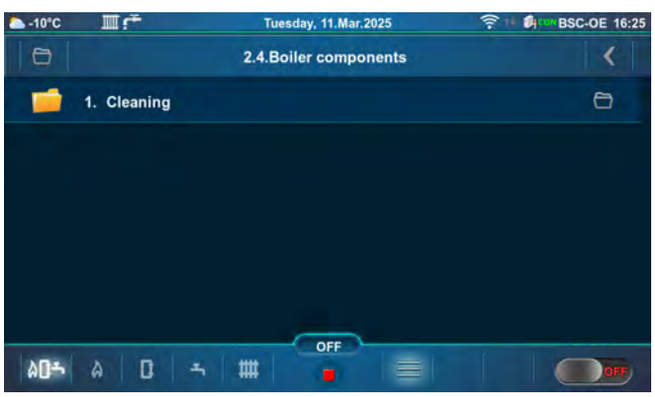


IMPORTANT! To be able to stop all processes, you must first switch off the boiler in the usual way by switching ON ON to OFF OFF .

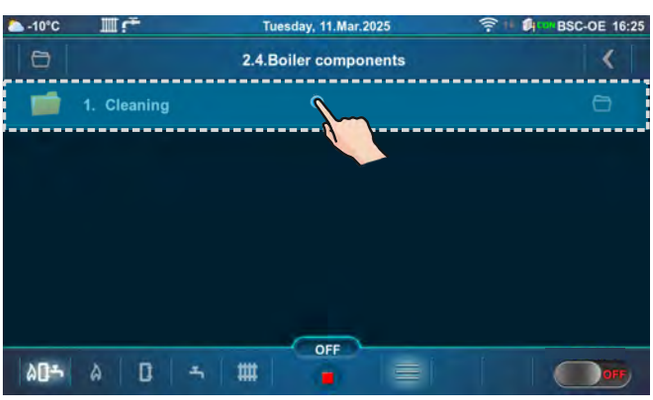
2.4. BOILER COMPONENTS

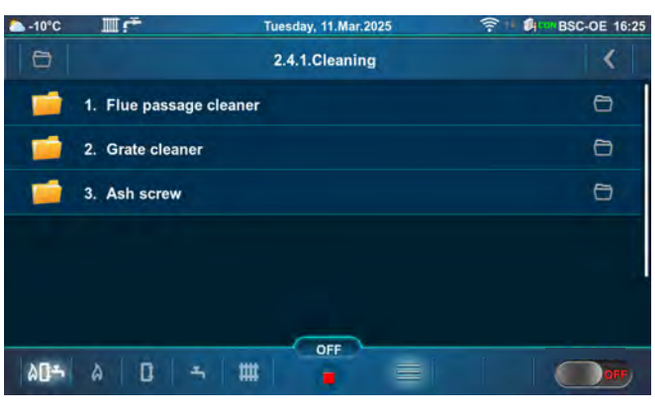
This submenu allows only an overview.



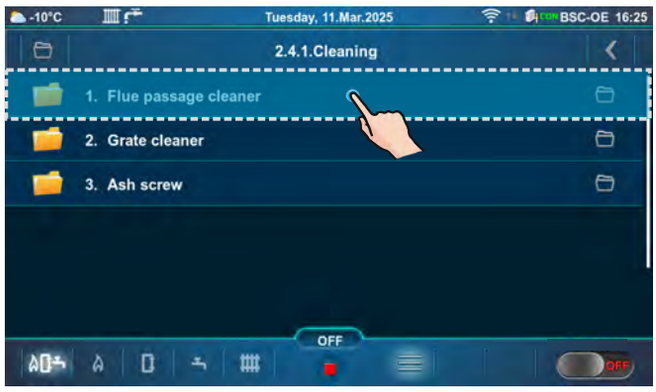


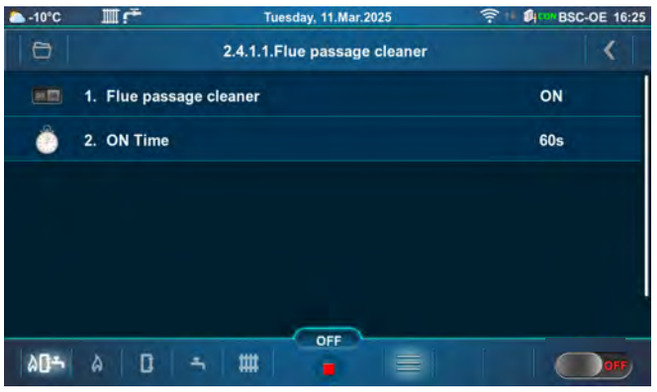
2.4.1. CLEANING



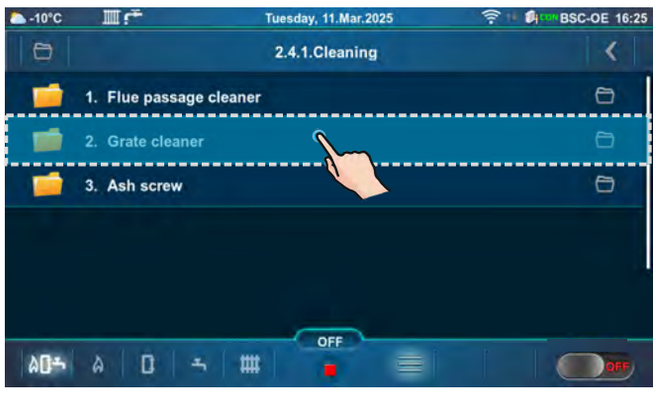


2.4.1.1. FLUE PASSAGE CLEANER

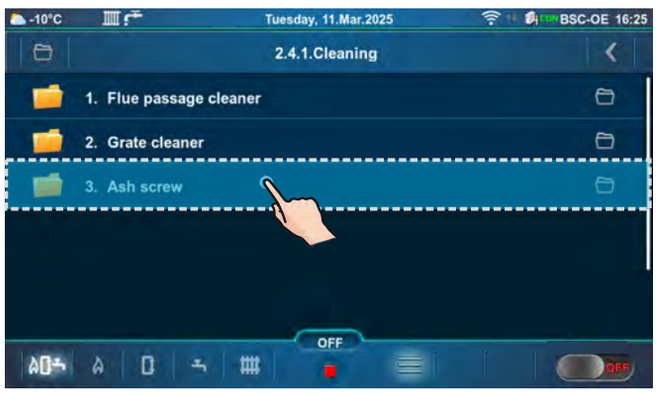


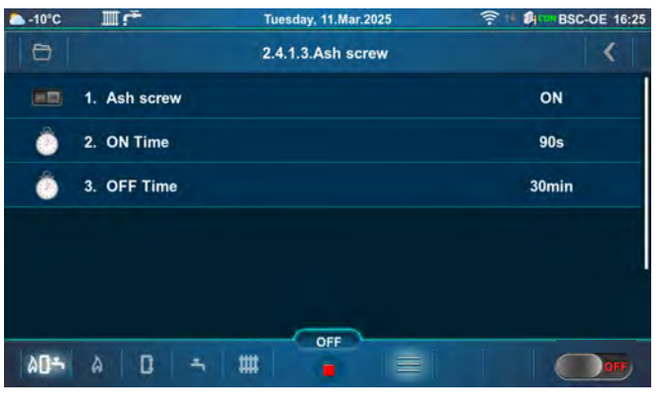


2.4.1.2. GRATE CLEANER



2.4.1.3. ASH SCREW

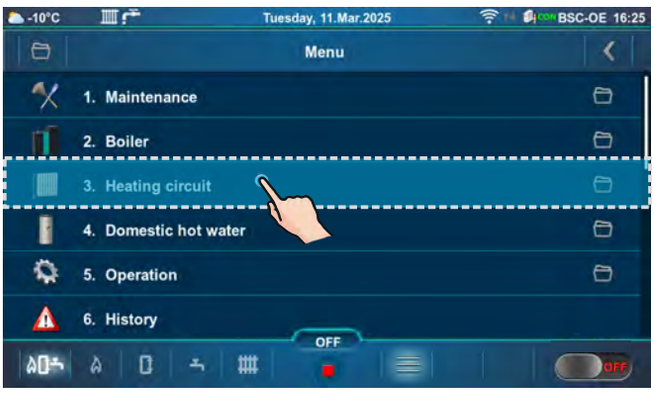


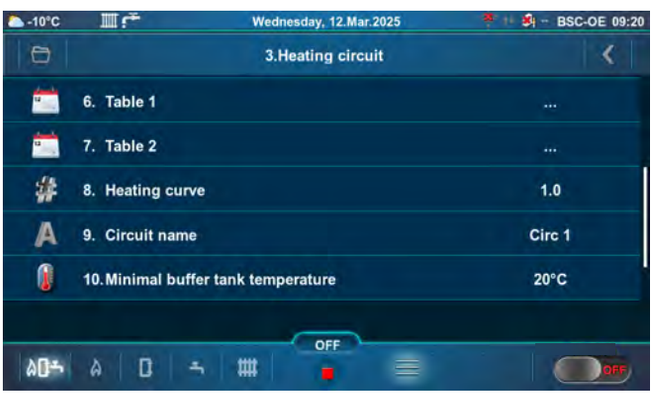


NOTE: All displayed menus are based on configuration 18.

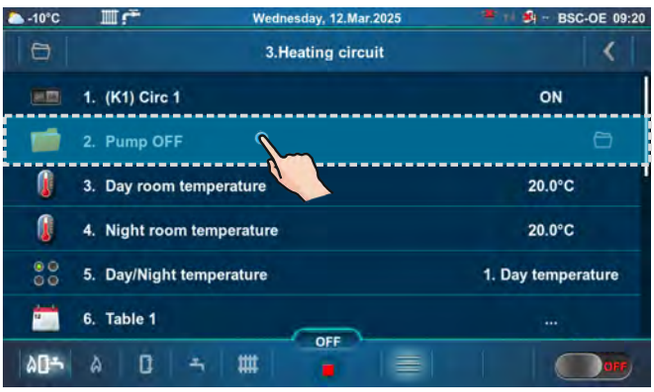
3.0. HEATING CIRCUIT

In certain configurations, the menus will be different (with or without the Heating circuit/Domestic hot water menu).





3.2. PUMP OFF



Configuration: 1, 2, 3, 4, 5, 6, 7, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 - if the measured outdoor temperature is higher than the set outdoor temperature + set outdoor temperature difference for the duration of the set time the heating circuit pump is turned off.

	Factory:	*Min/Max*	*Unit*
1. Outdoor temperature	22	0 / 40	°C
2. Outdoor temperature difference	2	0 / 5	°C
3. Time	30	0 / 10080	min

Outdoor temperature - set outdoor temperature
Outdoor temperature difference - set outdoor temperature difference
Time - set time

3.3. TEMPERATURES

Below are the configurations, which have heating circuits.

Values for configuration: 1, 2, 25.

	Factory:	*Possible selection:*
(K1) Circ 1	ON	ON / OFF

		Factory:	*Min/Max*	*Unit*
*	*Day room temperature*	20.0	5.0 / 30.0	°C
*	*Night room temperature*	20.0	5.0 / 30.0	°C
**	*Day constant temperature*	60	20 / 90	°C
**	*Night constant temperature*	40	20 / 90	°C
***	*Measurement correction - Corrector*	0.0	-5.0 / 5.0	°C
	Heating curve	1.0	0.1 / 4.0	

	Factory:	*Possible selection:*
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)
Day room temperature - Setting the day room temperature
Night room temperature - Setting the night room temperature
Day constant temperature / Night constant temperature - setting the flow temperature in the heating circuit
Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)
Heating curve - Setting the heating curve

*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 3.

	Factory:	Possible selection:
1.(K1) Circ 1	ON	ON / OFF
2.(K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
*	Day room temperature	20.0	5.0 / 30.0	°C
*	Night room temperature	20.0	5.0 / 30.0	°C
**	Day constant temperature	60	20 / 90	°C
**	Night constant temperature	40	20 / 90	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C
	Heating curve	1.0	0.1 / 4.0	

	Factory:	Possible selection:
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

	(K2) Circ 2	Factory:	Min/Max	Unit
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)
(K2) Circ 2 - Heating circuit 2 (direct circuit)

Day room temperature - Setting the day room temperature

Night room temperature - Setting the night room temperature

Day constant temperature / **Night constant temperature** - setting the flow temperature in the heating circuit

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

Heating curve - Setting the heating curve

*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 4, 5, 6, 21, 22, 26, 27, 32.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF

		Factory:	Min/Max	Unit
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (direct circuit)

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 7.

	Factory:	Possible selection:
1. (K1) Circ 1	ON	ON / OFF
2. (K2) Circ 2	ON	ON / OFF

	(K1) Circ 1, (K2) Circ 2	Factory:	Min/Max	Unit
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (direct circuit)
(K2) Circ 2 - Heating circuit 2 (direct circuit)

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 14, 18, 33, 34, 35.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF

	Factory:	Min/Max	Unit
* Day room temperature	20.0	5.0 / 30.0	°C
* Night room temperature	20.0	5.0 / 30.0	°C
** Day constant temperature	60	20 / 90	°C
** Night constant temperature	40	20 / 90	°C
*** Measurement correction - Corrector	0.0	-5.0 / 5.0	°C
Heating curve	1.0	0.1 / 4.0	
Minimal buffer tank temperature	20	5 / 75	°C

	Factory:	Possible selection:
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)

Day room temperature - Setting the day room temperature

Night room temperature - Setting the night room temperature

Day constant temperature / Night constant temperature - setting the flow temperature in the heating circuit

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

Heating curve - Setting the heating curve

Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 15,19, 38, 39, 40.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF

	Factory:	Min/Max	Unit
Minimal buffer tank temperature	20	5 / 75	°C
*** Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (direct circuit)

Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 23, 24.

	Factory:	Possible selection:
1.(K1) Circ 1	ON	ON / OFF
2.(K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
*	Day room temperature	20.0	5.0 / 30.0	°C
*	Night room temperature	20.0	5.0 / 30.0	°C
**	Day constant temperature	60	20 / 90	°C
**	Night constant temperature	40	20 / 90	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C
	Heating curve	1.0	0.1 / 4.0	

	Factory:	Possible selection:
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

	(K2) Circ 2	Factory:	Min/Max	Unit
	Minimal buffer tank temperature	20	5 / 75	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)
(K2) Circ 2 - Heating circuit 2 (direct circuit)
Day room temperature - Setting the day room temperature
Night room temperature - Setting the night room temperature
Day constant temperature / Night constant temperature - setting the flow temperature in the heating circuit
Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)
Heating curve - Setting the heating curve
Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 30, 31.

	Factory:	Possible selection:
1. (K1) Circ 1	ON	ON / OFF
2. (K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

	(K2) Circ 2	Factory:	Min/Max	Unit
	Minimal buffer tank temperature	20	5 / 75	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (direct circuit)
(K2) Circ 2 - Heating circuit 2 (direct circuit)
Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)
Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 28, 29.

	Factory:	Possible selection:
1.(K1) Circ 1	ON	ON / OFF
2.(K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
*	Day room temperature	20.0	5.0 / 30.0	°C
*	Night room temperature	20.0	5.0 / 30.0	°C
**	Day constant temperature	60	20 / 90	°C
**	Night constant temperature	40	20 / 90	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C
	Heating curve	1.0	0.1 / 4.0	
	Minimal buffer tank temperature	20	5 / 75	°C

	Factory:	Possible selection:
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

	(K2) Circ 2	Factory:	Min/Max	Unit
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)
(K2) Circ 2 - Heating circuit 2 (direct circuit)

Day room temperature - Setting the day room temperature

Night room temperature - Setting the night room temperature

Day constant temperature / **Night constant temperature** - setting the flow temperature in the heating circuit

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

Heating curve - Setting the heating curve

Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 41, 42.

	Factory:	Possible selection:
1. (K1) Circ 1	ON	ON / OFF
2. (K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
	Minimal buffer tank temperature	20	5 / 75	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

	(K2) Circ 2	Factory:	Min/Max	Unit
	Minimal buffer tank temperature	20	5 / 75	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (direct circuit)
(K2) Circ 2 - Heating circuit 2 (direct circuit)

Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)

Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

Values for configuration: 36, 37.

	Factory:	Possible selection:
1.(K1) Circ 1	ON	ON / OFF
2.(K2) Circ 2	ON	ON / OFF

	(K1) Circ 1	Factory:	Min/Max	Unit
*	Day room temperature	20.0	5.0 / 30.0	°C
*	Night room temperature	20.0	5.0 / 30.0	°C
**	Day constant temperature	60	20 / 90	°C
**	Night constant temperature	40	20 / 90	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C
	Heating curve	1.0	0.1 / 4.0	
	Minimal buffer tank temperature	20	5 / 75	°C

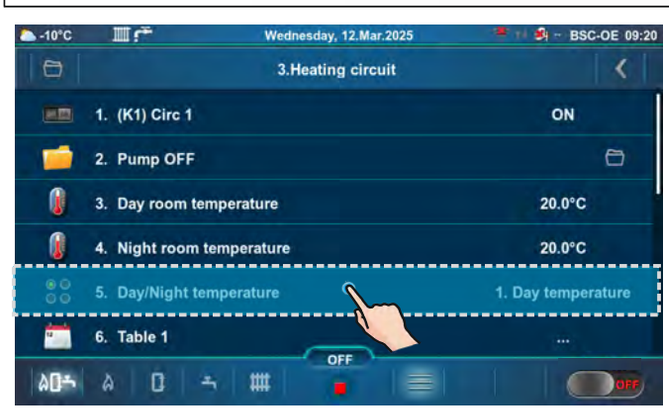
	Factory:	Possible selection:
Day/Night temperature	Day temperature	Day temperature/ Night temperature/ Table 1/Table 2

	(K2) Circ 2	Factory:	Min/Max	Unit
	Minimal buffer tank temperature	20	5 / 75	°C
***	Measurement correction - Corrector	0.0	-5.0 / 5.0	°C

(K1) Circ 1 - Heating circuit 1 (with mixing valve 1)
(K2) Circ 2 - Heating circuit 2 (direct circuit)
Day room temperature - Setting the day room temperature
Night room temperature - Setting the night room temperature
Day constant temperature / Night constant temperature - setting the flow temperature in the heating circuit
Measurement correction - Corrector - correction of the measured temperature (in the room) with the CSK corrector (possible reason for the correction - the room corrector CSK is placed in a part of the room that is for some reason warmer or colder than the rest of the room)
Heating curve - Setting the heating curve
Minimal buffer tank temperature - the possibility of setting the desired minimum temperature of the buffer tank for each heating circuit (disable the water temperature cooling in the buffer tank below the set temperature for each heating circuit). When the temperature of the upper sensor of the buffer tank is lower than the set minimum temperature of the buffer tank for an individual heating circuit, the heating pump of the corresponding heating circuit is switching off.

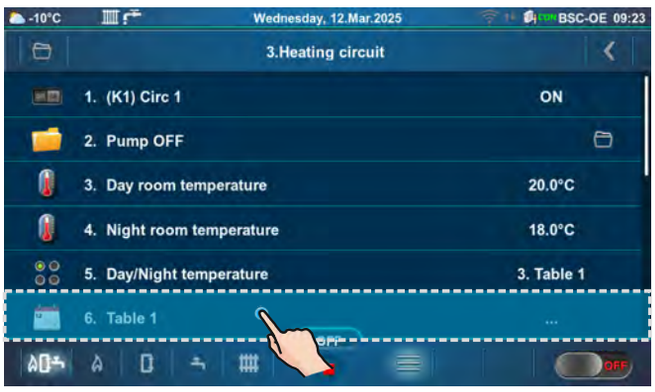
*Not displayed when a constant temperature (Heating type) is selected and the corrector is OFF.
** Only displayed if a constant temperature (Heating type) is selected.
*** Only displayed if the corrector (CSK (2 wires or 3 wires)) is ON.

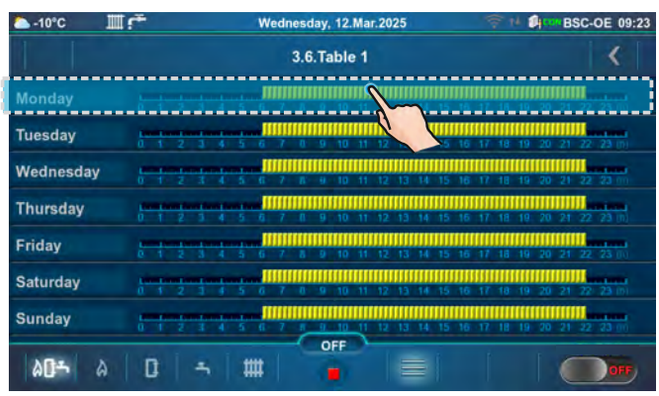
3.5. DAY / NIGHT TEMPERATURE

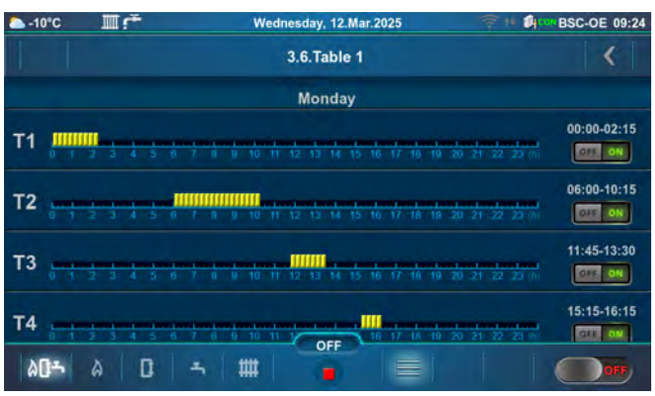


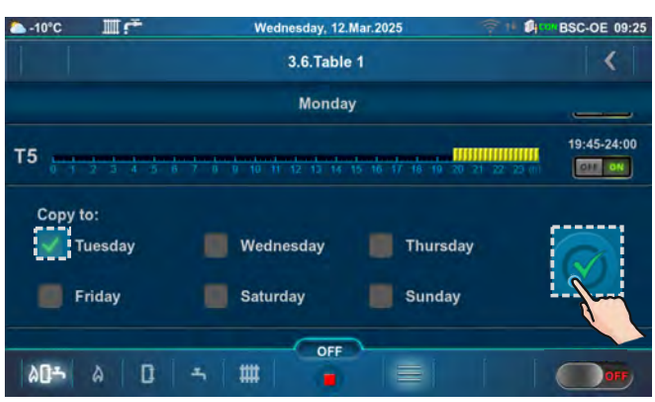
Factory: Day temperature
Possible selection:
Day temperature - the heating circuit operates according to the set Day temperature
Night temperature - the heating circuit operates according to the set Night temperature
Table 1/Table 2 - automatically switches between day and night temperatures which are set in the table

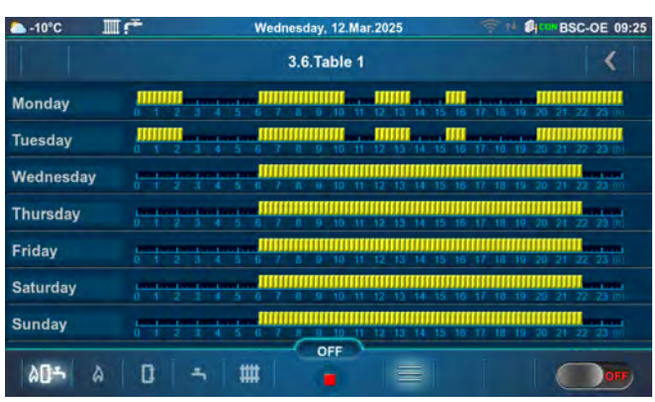
3.6.-3.7. TABLE 1, TABLE 2











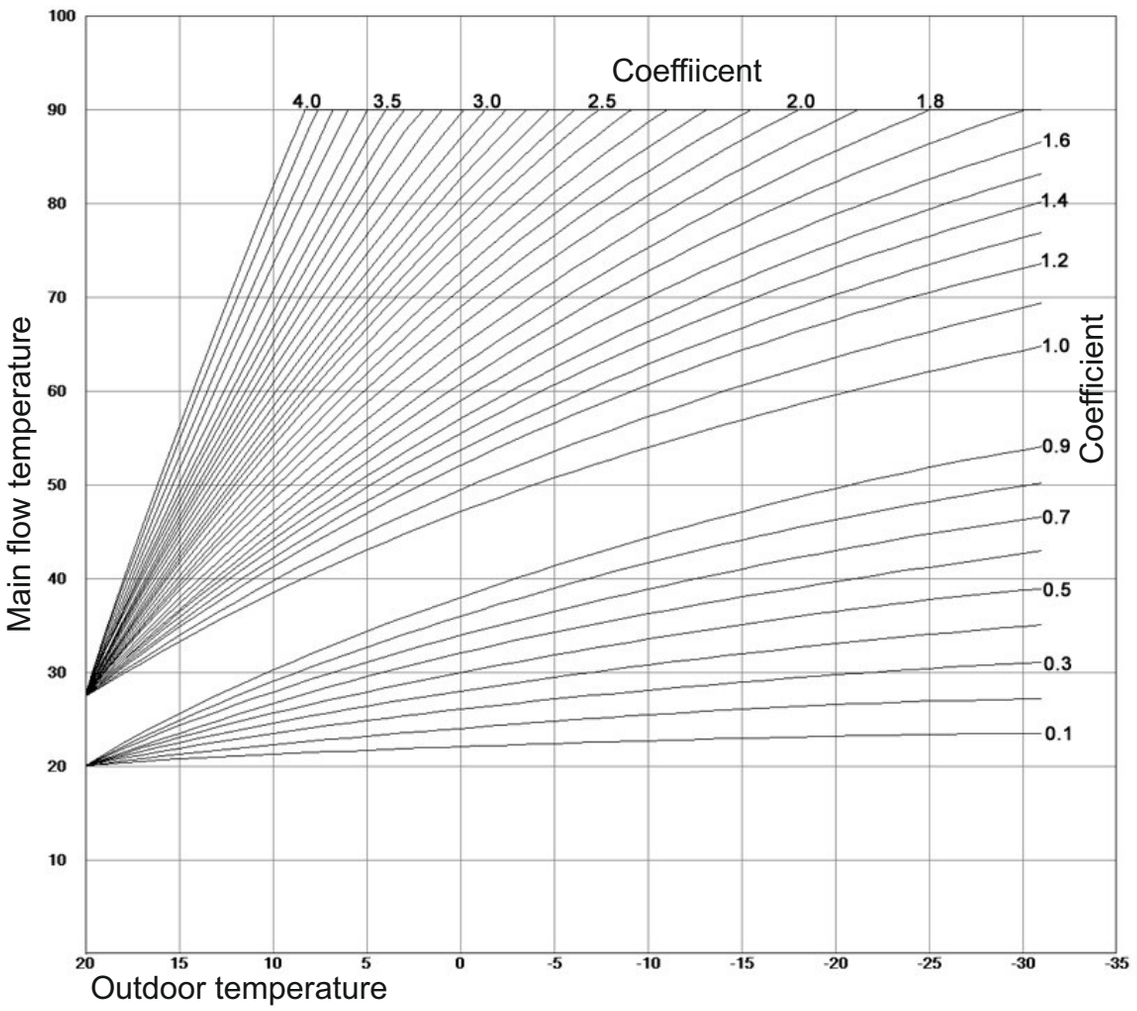
(yellow) Day room temperature set Night room temperature set

Setting the schedule tables with change of heating circuit mode between day and night temperature. For each day it is possible to set 5 mode changes (T1-T5). In the table Day room temperatures are marked in yellow and night room temperatures in black. It is possible to define a schedule for one day and copy the same schedule for all other days. Under "COPY TO:", mark the day or days for which you want to have the same schedule and confirm by pressing the "CONFIRM" button.

According to the data in the table, on Monday from 00:00 to 2:15 a.m., 6:00 a.m. to 10:15 a.m., 11:45 a.m. to 1:30 p.m., 3:15 p.m. to 4:15 p.m. and 7:45 p.m. to 11:59 p.m. it is set Day room temperature mode. Night room temperature mode schedule is set from 2:16 a.m to 5:59 a.m., 10:16 a.m. to 11:44 a.m., 1:31 p.m to 3:14 p.m., 4:16 p.m. to 7:44 p.m. The schedule for Monday is copied to Tuesday.
Other days have set Night room temperature mode from 00:00 to 5:59 a.m., 10:01 p.m. to 11:59 p.m. and Day room temperature mode from 6:01 a.m. to 10:00 p.m.

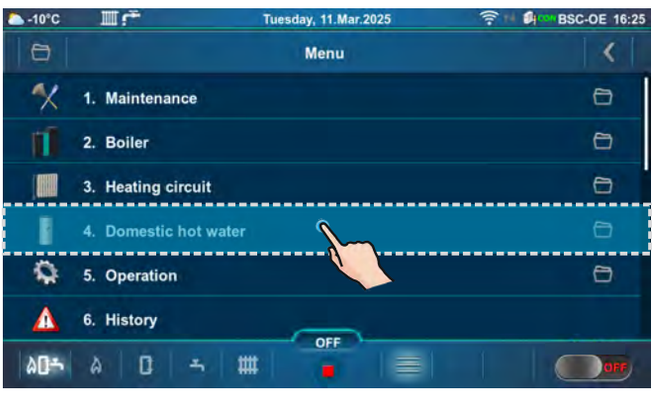
3.8. HEATING CURVE

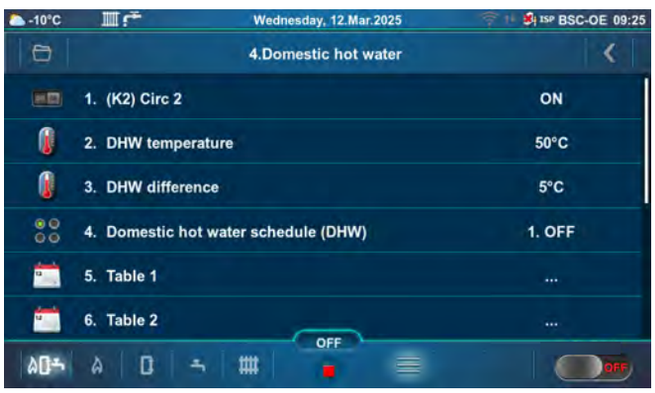
Setting of the heating curve. Heating curve is one of the parameters for main flow temperature calculation.

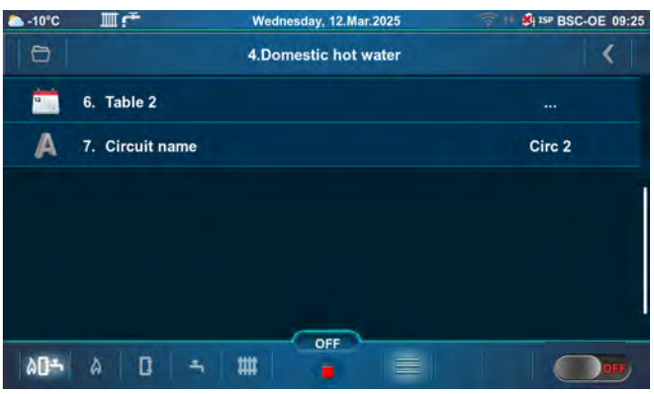


4.0. DOMESTIC HOT WATER (DHW)

The *Domestic hot water* menu appears only if the selected configuration has a domestic hot water (DHW) tank.







Below are types of installation and configuration, which have a domestic hot water tank (DHW).

Selection and possible values for configuration: 2, 6, 35, 40.

	Factory:	Possible selection:
(K2) Circ 2	ON	ON / OFF
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
* *Recirculation*	ON	ON / OFF
* *Recirculation schedule*	OFF	ON / OFF

	Factory:	Min/Max	Unit
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K2) Circ 2 - Heating circuit 2 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 18, 19, 25, 32.

	Factory:	*Possible selection:*
(K2) Circ 2	ON	ON / OFF
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2

	Factory:	*Min/Max*	*Unit*
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K2) Circ 2 - Heating circuit 2 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

Selection and possible values for configuration: 5.

		Factory:	*Possible selection:*
	(K2) Circ 2	ON	ON / OFF
	Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
*	*Recirculation*	ON	ON / OFF
*	*Recirculation schedule*	OFF	ON / OFF

	Factory:	*Min/Max*	*Unit*
DHW temperature	50	40 / 75	°C
DHW difference	5	4 / 40	°C

(K2) Circ 2 - Heating circuit 2 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 14, 15.

		Factory:	*Possible selection:*
	(K2) Circ 2	ON	ON / OFF
	Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
*	*Recirculation*	ON	ON / OFF
*	*Recirculation schedule*	OFF	ON / OFF

	Factory:	*Min/Max*	*Unit*
DHW temperature	50	40 / 85	°C
DHW difference	5	4 / 40	°C

(K2) Circ 2 - Heating circuit 2 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 8.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
* *Recirculation*	ON	ON / OFF
* *Recirculation schedule*	OFF	ON / OFF

	Factory:	Min/Max	Unit
DHW temperature	50	40 / 75	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1 - Heating circuit 1 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 9, 17, 43.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
* *Recirculation*	ON	ON / OFF
* *Recirculation schedule*	OFF	ON / OFF

	Factory:	Min/Max	Unit
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1 - Heating circuit 1 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 13.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2
* *Recirculation*	ON	ON / OFF
* *Recirculation schedule*	OFF	ON / OFF

	Factory:	Min/Max	Unit
DHW temperature	50	40 / 85	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1 - Heating circuit 1 (DHW)
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 10, 44.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF
(K2) Circ 2	ON	ON / OFF

(K1) Circ 1, K(2) Circ 2	Factory:	Min/Max	Unit
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1, (K2) Circ 2	Factory:	Possible selection:
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2

	(K1) Circ 1	Factory:	Possible selection:
*	*Recirculation*	ON	ON/OFF
*	*Recirculation schedule*	OFF	ON/OFF

(K1) Circ 1 - Heating circuit 1 (DHW)
(K2) Circ 2 - Heating circuit 2 (DHW)
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

Selection and possible values for configuration: 16.

	Factory:	Possible selection:
(K1) Circ 1	ON	ON / OFF
(K2) Circ 2	ON	ON / OFF

(K1) Circ 1	Factory:	Min/Max	Unit
DHW temperature	50	40 / 85	°C
DHW difference	5	4 / 40	°C

	(K1) Circ 1	Factory:	Possible selection:
*	*Recirculation*	ON	ON/OFF
*	*Recirculation schedule*	OFF	ON/OFF

K(2) Circ 2	Factory:	Min/Max	Unit
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1, (K2) Circ 2	Factory:	Possible selection:
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2

(K1) Circ 1 - Heating circuit 1 (DHW)
(K2) Circ 2 - Heating circuit 2 (DHW)
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW
Domestic hot water schedule (DHW) - Domestic hot water schedule
Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule

*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed". When the option is switched on, on the "Main screen - Schematic view (BSC-OE)" will be displayed the recirculation symbol.

**Selection and possible values for configuration: 12, 22, 27, 34, 37, 39, 42.

	Factory:	*Possible selection:*
Recirculation	ON	ON / OFF
Recirculation schedule	OFF	ON / OFF

	Factory:	*Min/Max*	*Unit*
Recirculation Time On	5	0 / 1440	min
Recirculation Time Off	5	0 / 1440	min

Recirculation - Hot water circulation option from the domestic hot water (DHW) tank to the domestic hot water (DHW) outlet (DHW consumption)
Recirculation schedule - Setting the recirculation schedule
Recirculation Time On - Operating time of the recirculation pump
Recirculation Time Off - Time when recirculation pump is not operating

**For these configurations, the "Domestic hot water" menu will only be displayed if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed".

Selection and possible values for configuration: 20.

	Factory:	*Possible selection:*
(K1) Circ 1	ON	ON / OFF
(K2) Circ 2	ON	ON / OFF

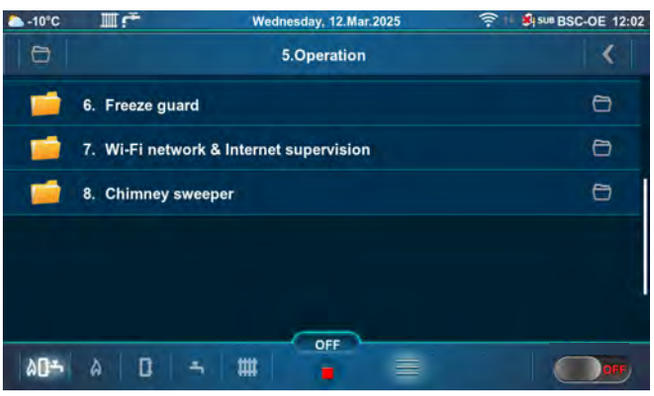
(K1) Circ 1, (K2) Circ 2	*Factory:*	*Min/Max*	*Unit*
DHW temperature	50	40 / 80	°C
DHW difference	5	4 / 40	°C

(K1) Circ 1, (K2) Circ 2	*Factory:*	*Possible selection:*
Domestic hot water schedule (DHW)	OFF	OFF/Table 1/ Table 2

(K1) Circ 1 - Heating circuit 1 (DHW)
(K2) Circ 2 - Heating circuit 2 (DHW)
DHW temperature - Setting the domestic hot water temperature
DHW difference - Possibility of setting the temperature difference of DHW
Domestic hot water schedule (DHW) - Domestic hot water schedule

5.0. OPERATION

NOTE: Some submenus of the Operation menu are displayed or hidden depending on the items enabled in the menu Installation.

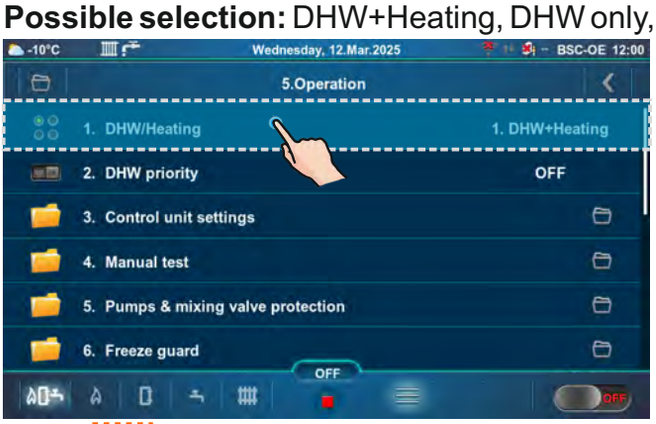


5.1. DHW / HEATING

Submenu 5.1. DHW/Heating is only displayed if the configuration with Domestic hot water (DHW) is selected.

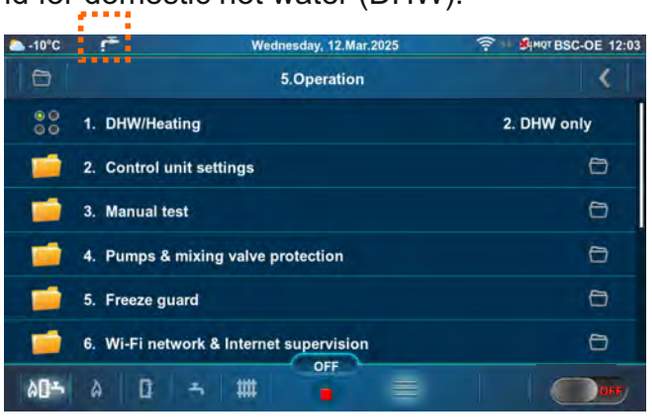
Factory: DHW+Heating

Possible selection: DHW+Heating, DHW only, Heating only, Auto



DHW+Heating - the boiler operates as needed for heating or for domestic hot water (DHW).

DHW only - boiler operates only when there is demand for domestic hot water (DHW).

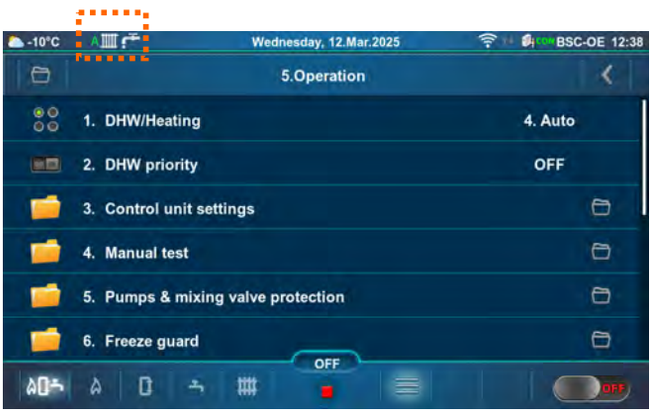


Heating only - boiler operates only when there is demand for heating.

Auto - boiler switches automatically between **DHW+Heating** and **DHW only** operating mode.

Example: factory setting of
Outdoor temperature,
Outdoor temperature difference,
Time (Heating OFF),
Time (Heating ON)

If the outdoor temperature is >/= 20 °C for more than 30 minutes.



If the outdoor temperature is <(20-3) °C for more than 30 minutes.

5.2. DHW PRIORITY

If the option "DHW priority" is active:
- every time the pump of the domestic hot water tank (DHW) / domestic hot water tank (DHW) 1. heating circuit is in operation, the other pumps of the heating circuit are at rest (except the pump of the boiler circuit).

In configurations with diverter valve and domestic hot water (DHW) tank (5, 13, 14, 15, 16), DHW priority is factory activated.
In configurations with pumps and domestic hot water (DHW) tank (2, 6, 9, 10, 17, 18, 19, 20, 25, 32, 35, 40, 43, 44), DHW priority is factory deactivated.

Possible choice: OFF, ON

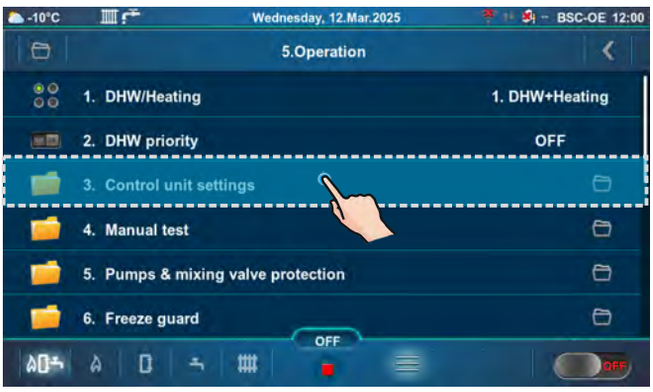
Current: OFF

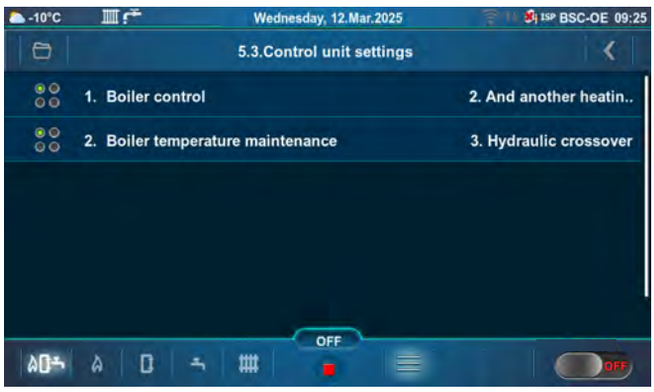
Current: ON

If the option is active, the domestic hot water (DHW) icon changes color from white to red and changes position in the top bar of the screen.

5.3. CONTROL UNIT SETTINGS

This submenu allows only an overview.

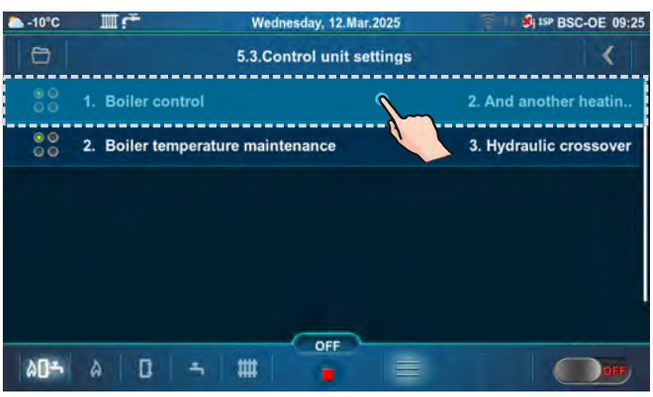


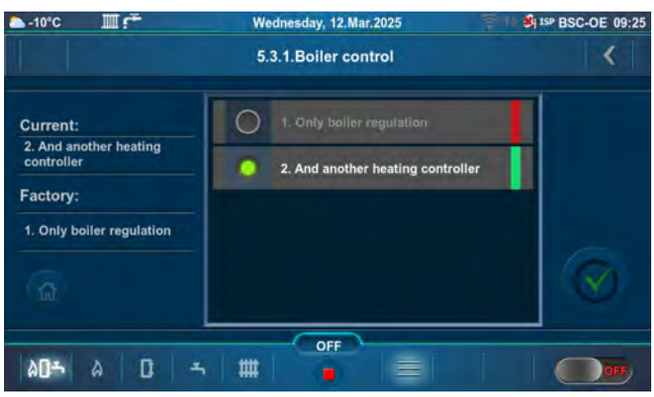


5.3.1. BOILER CONTROL

Boiler control (this information appears only if the authorized technician has activated "And another heating controller")

And another heating controller - this option can be activated by an authorized technician in certain configurations when part of the heating circuits or the preparation of the DHW connected to hydraulic crossover (CRO) is managed by another regulation independent of the boiler regulation. When this option is activated, the authorized technician cannot adjust the boiler to maintain the temperature required by the installation (see "Boiler temperature maintenance").





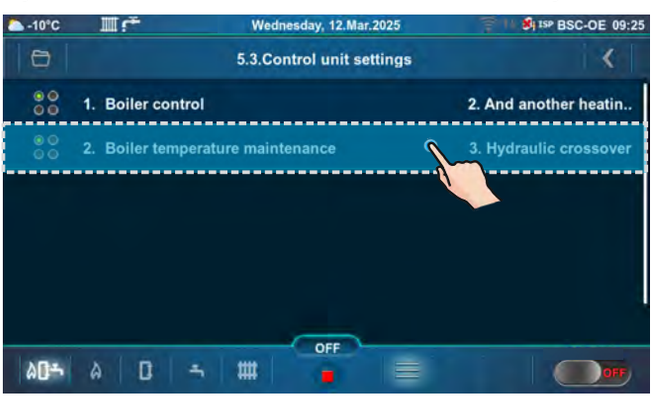
5.3.2. BOILER TEMPERATURE MAINTENANCE

Boiler temperature maintenance (the selected one by the authorized technician is marked)

Installation - maintaining the temperature according to installation requirements. The boiler does not operate if there is NO heating request from installation component (heating, DHW). If there is a demand from the installation, the boiler starts when the temperature in the boiler drops below (Maximum boiler temperature - Boiler difference) and operates up to the set (calculated) maximum temperature of the boiler or until all installation requirements disappear and it shuts down. This option can be selected by an authorized technician if the option "And another heating controller" (Boiler control) is not selected and there is at least one element of the heating installation or DHW.

Boiler - the boiler maintains its temperature regardless of installation requirements, the boiler starts when its temperature drops below (Maximum boiler temperature - Boiler difference) and turns off when it reaches the maximum boiler temperature.

Hydraulic crossover with sensor - maintaining the set temperature of the hydraulic crossover. The boiler will not operate if there is NO heating demand from the hydraulic crossover. In case of a hydraulic crossover request, the boiler starts when the temperature in the boiler drops below (Maximum boiler temperature - Boiler difference) and operates up to the set (calculated) maximum temperature of the boiler or until the request of the hydraulic crossover disappears and stops. This option can be selected by an authorized technician if there is a hydraulic crossover in the configuration.

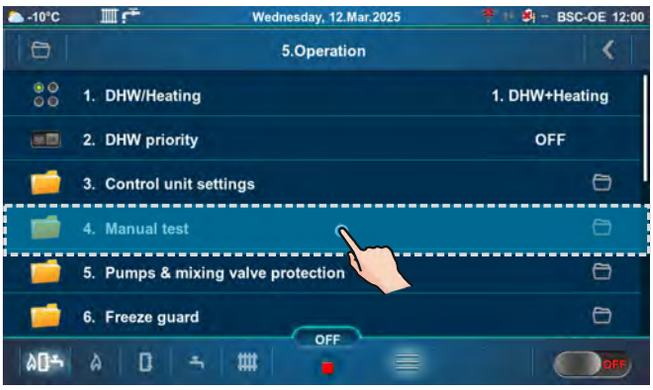


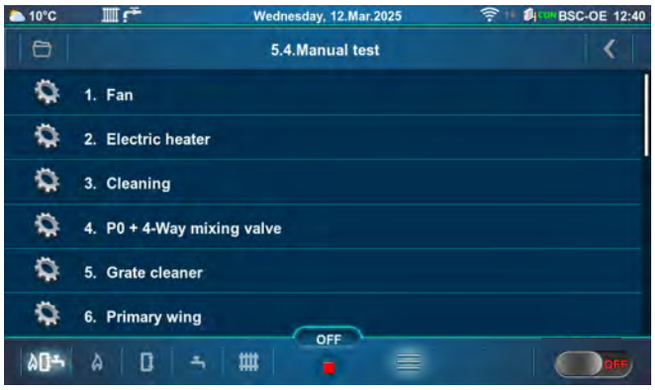
Note:
By turning on the "Chimney sweeper" option, the controller is automatically set to "Boiler temperature maintenance: Boiler" and this menu disappears. By turning off the "Chimney sweeper" option, everything returns to its previous state.

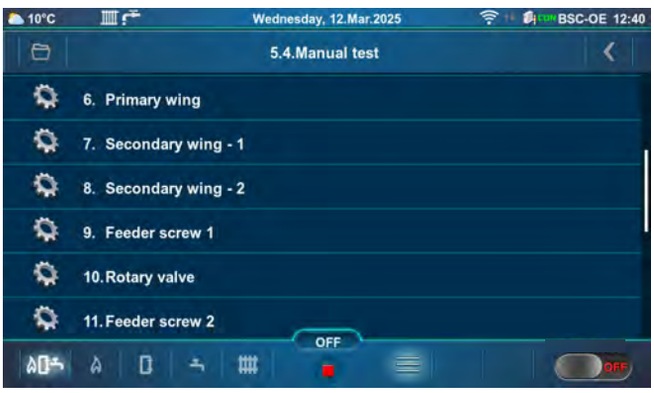
5.4. MANUAL TEST

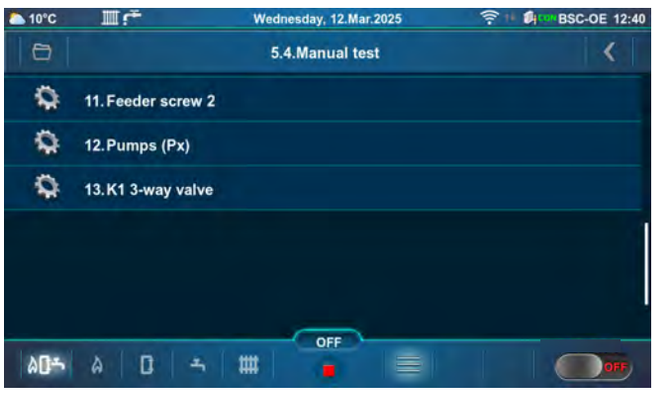
"Manual test" is option that allows turning on an individual relay and thus testing the operation of the equipment connected to the individual relay.

NOTE: Submenus in the "Manual test" depend on the selected configuration.

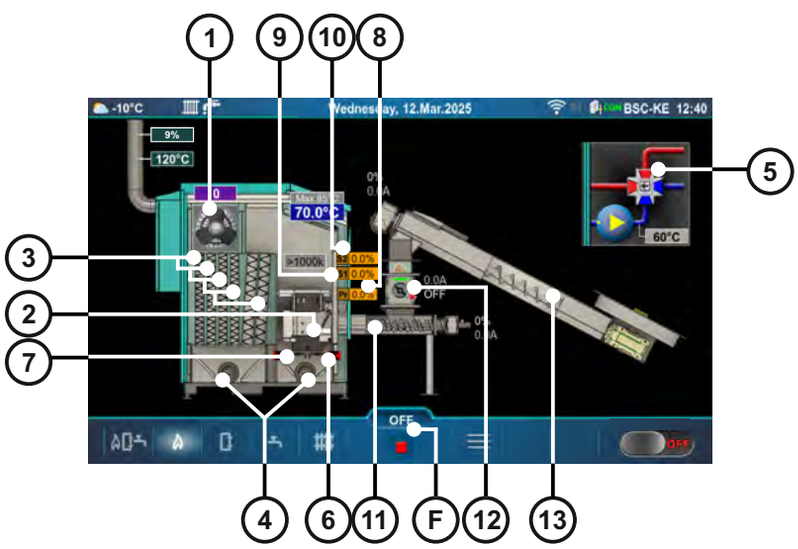








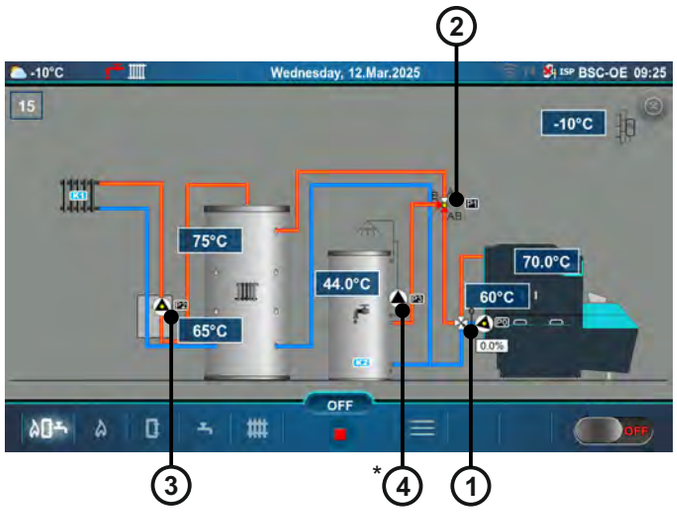
MANUAL TEST IS POSSIBLE ONLY IF BOILER IS IN PHASE OFF (F).



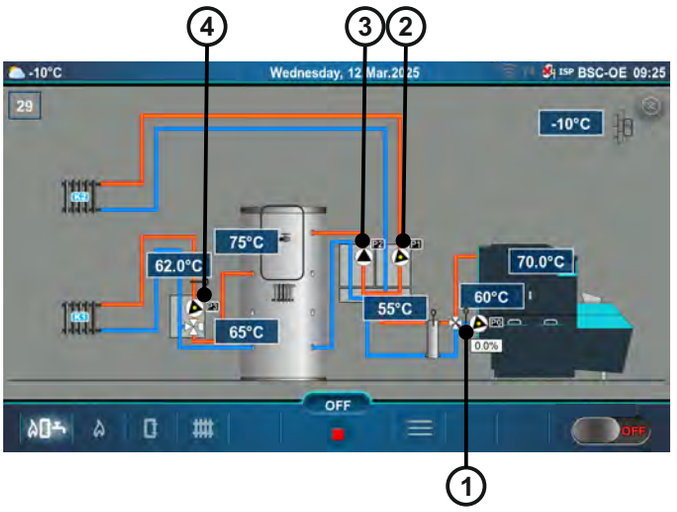
Parts of the boiler that can be tested manually:

1 - Fan
2 - Electric heater
3 - Flue passages cleaner
4 - Transporters for ash removal
5 - P0 + 4-way mixing valve
6 - Grate 1
7 - Grate 2
8 - Actuator of primary air
9 - Actuator of secondary air 1
10 - Actuator of secondary air 2
11 - Feeder screw 1
12 - Rotary valve
13 - Feeder screw 2

Below are shown two "Main screen - Schematic view (BSC-OE)" with pumps and valves, which can be manually tested.



Left "Main Screen - Schematic View (BSC-OE)":
1 - P0 pump - boiler circuit + 4-way mixing valve
2 - P1 - Diverter valve
3 - P2 - Main flow of the heating circuit
*4 - P3 - Recirculation DHW



Right "Main Screen - Schematic View (BSC-OE)":
1 - P0 pump - boiler circuit + 4-way mixing valve
2 - P1 - Direct heating circuit
3 - P2 - Buffer tank with integrated DHW tank
4 - P3 - Heating circuit + 3-way mixing valve

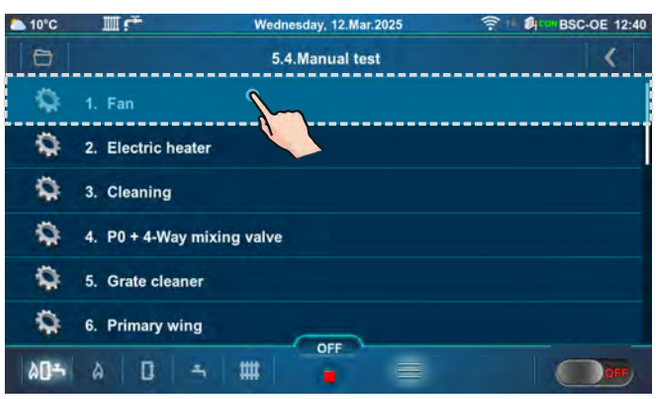
*Displayed only if the authorized service technician (in the Installation menu) has switched on the option "Recirculation installed".

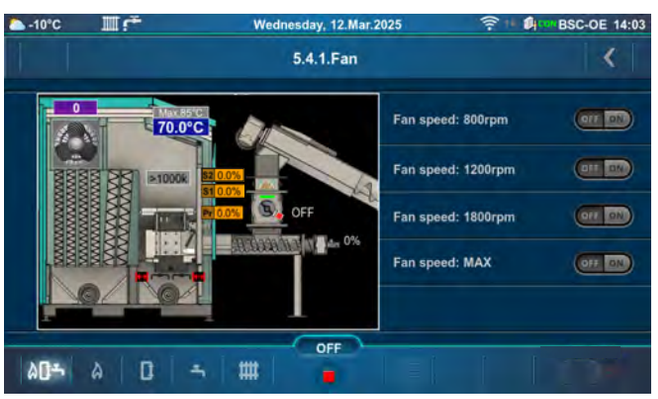
Note: The number of pumps depends on configuration.

5.4.1. FAN

This option allows you to check if the fan is operating.
It is necessary to press the "ON" button next to the corresponding symbols and check if the fan operates according to the selected option (800/1200/1800 rpm or approximately 2800 rpm). Every time you press the "ON" button, it lights up green. After pressing the "OFF" button the fan will stop.

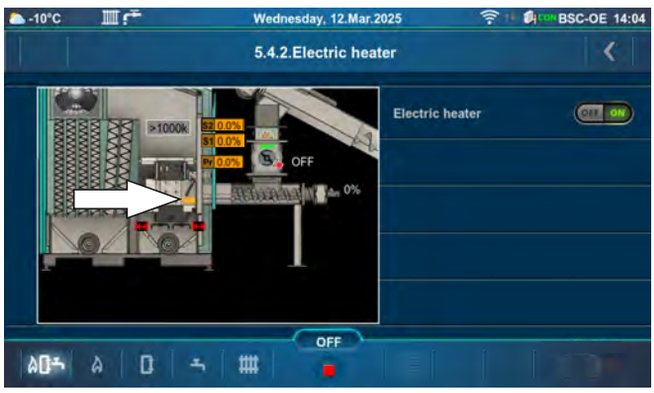
Possible selection:
Fan speed: 800 rpm - fan speed must be 800 rpm
Fan speed: 1200 rpm - fan speed must be 1200 rpm
Fan speed: 1800 rpm - fan speed must be 1800 rpm
Fan speed: MAX - the fan speed must be on maximum (around 2800 rpm)





5.4.2. ELECTRIC HEATER

This option allows you to check if the electric heater is operating. It is necessary to press the "ON" button next to the "Electric heater" and check if the electric heater is operating. Every time you press the "ON" button, it lights up green. The screen will display an animation of the electric heater when the option is active. After pressing the "OFF" button the electric heater will stop operating.



5.4.3. CLEANING

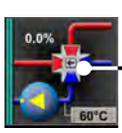
This option allows you to check the operation of the flue passage cleaner and transporters for ash removal. Press the "ON" button and check if the motor of the selected equipment is operating, if turbulators / transporters for ash removal are moving. Every time you press the "ON" button, it lights up green. After pressing the "OFF" button the motor of the selected equipment will stop operating.

Flue passage cleaner

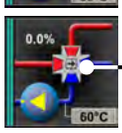
Ash removal

5.4.4. P0 + 4-WAY MIXING VALVE

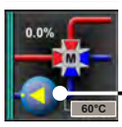
This option allows you to check the operation of the P0 pump and the 4-way mixing valve.
Press the "ON" button next to the corresponding symbol and check whether the valve is open/closed or whether the pump is running. Every time you press the "ON" button, it lights up green. After pressing the "OFF" button, the valve/pump will stop operating.



Valve closing



Valve opening

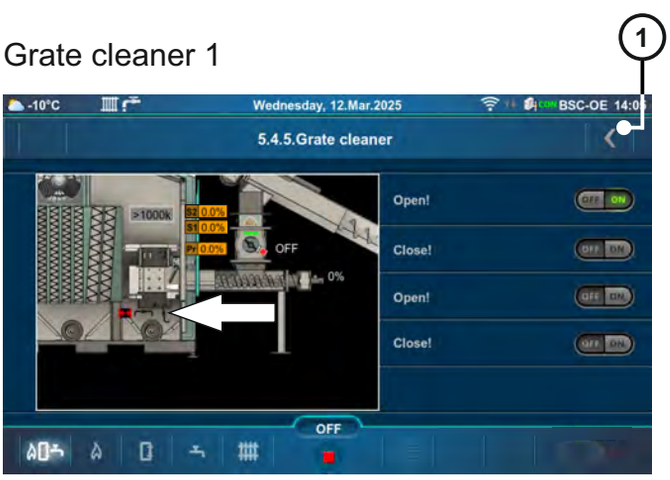


P0

5.4.5. GRATE CLEANER

This option allows you to check the operation of the grate cleaner motors (motor of grate cleaner 1 and grate cleaner 2).
By pressing the first upper button "ON" next to "Open!", the motor of grate 1 (right grate) starts operating in the counterclockwise direction. By pressing the second upper button "ON" next to "Close!", the first upper button will switch to "OFF", and the motor of the right grate will start operating in the clockwise direction. When you press the "ON" button, it lights up green. By pressing the first upper button "ON" next to "Open!" again, the motor of the right grate starts operating in the counterclockwise direction, and the second upper button will switch to "OFF," repeating the process described above. When both first and second upper button are in the "OFF" position, and one of them was previously in the "ON" position, the motor of grate 1 (right grate) will stop, and the grate will remain in its current position.
The same will occur with the motor of grate 2 (left grate), which is controlled using the third and fourth "ON/OFF" switch when viewed from the top. However, pressing the third "ON" switch from the top will cause the motor of grate 2 (left grate) to start operating in the clockwise direction, while pressing the fourth "ON" switch from the top will cause the motor of grate 2 (left grate) to start operating in the counterclockwise direction.
Every time the grate passes through the position - CLOSED GRATE on the screen (along with the rotating grate), the symbol of the microswitch will appear, confirming that the motor is operating.
By pressing the "BACK" (1) button, you exit this option, and the grates will automatically position themselves in the CLOSED GRATE position, as indicated by the microswitch symbols at the end of both grates.

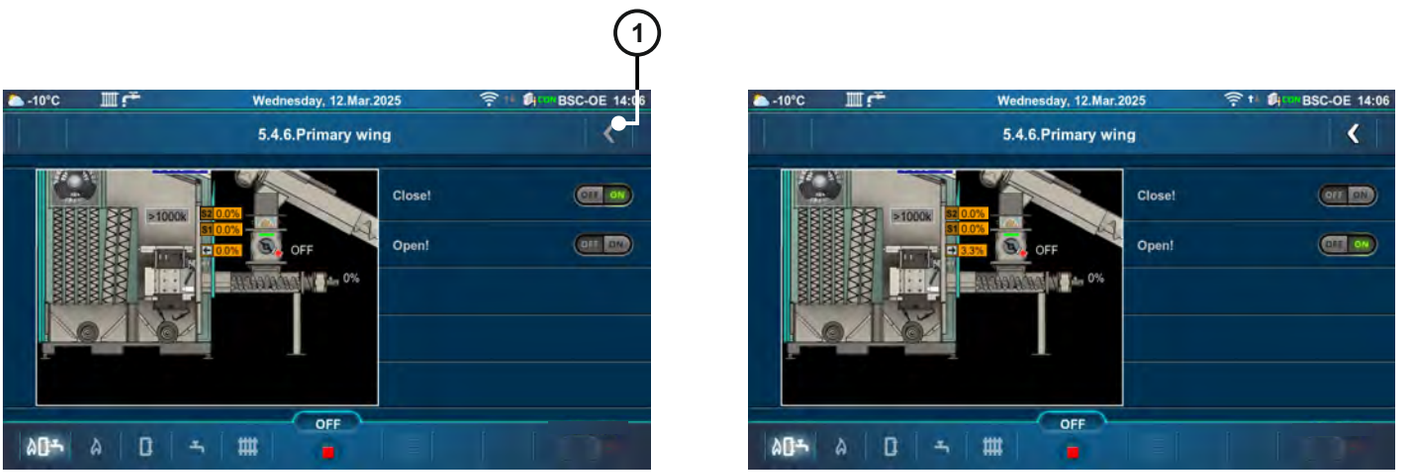
Grate cleaner 1



Grate cleaner 2

5.4.6. PRIMARY WING

This option allows you to check the operation of the primary air flap actuator (motor).
By pressing the "ON" button next to "Close!", an arrow will appear (pointing to the left), and the primary flap actuator will begin to close. Pressing the "ON" button next "Open!" will cause the first upper button to switch to "OFF", and primary flap actuator will start opening. When you press the "ON" button, it lights up green.
By pressing the "BACK" (1) button, you exit this option, and the primary flap actuator will automatically position itself in the CLOSED position.

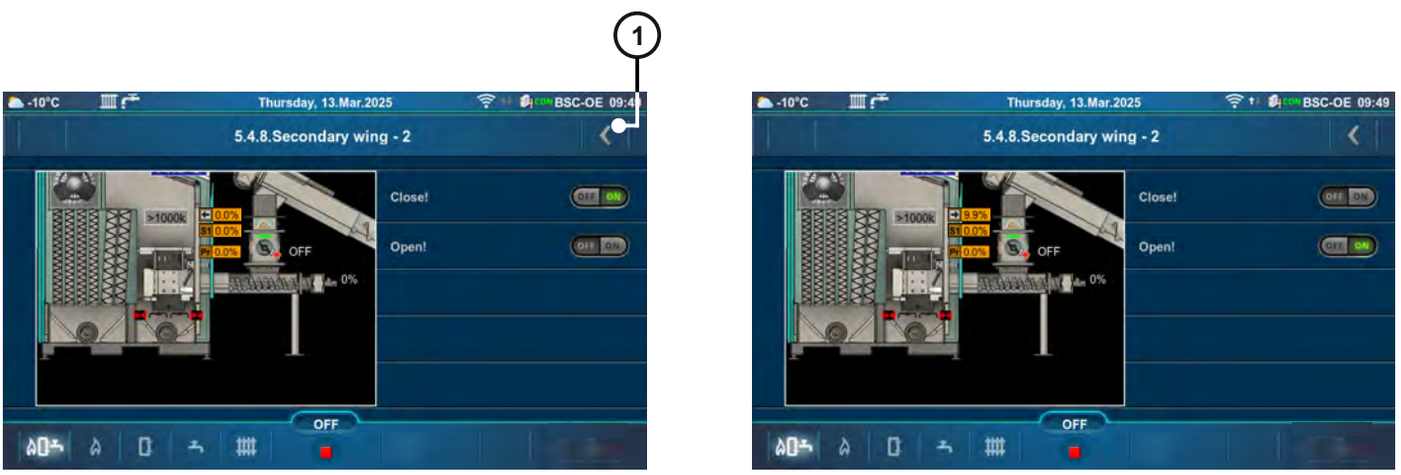


5.4.7. SECONDARY WING - 1

This option allows you to check the operation of the secondary air 1 flap actuator (motor).
By pressing the "ON" button next to "Close!", an arrow will appear (pointing to the left), and the secondary 1 flap actuator will begin to close. Pressing the "ON" button next "Open!" will cause the first upper button to switch to "OFF", and secondary 1 flap actuator will start opening. When you press the "ON" button, it lights up green.
By pressing the "BACK" (1) button, you exit this option, and the secondary 1 flap actuator will automatically position itself in the CLOSED position.

5.4.8. SECONDARY WING - 2

This option allows you to check the operation of the secondary air 2 flap actuator (motor).
By pressing the "ON" button next to "Close!", an arrow will appear (pointing to the left), and the secondary 2 flap actuator will begin to close. Pressing the "ON" button next "Open!" will cause the first upper button to switch to "OFF", and secondary 2 flap actuator will start opening. When you press the "ON" button, it lights up green.
By pressing the "BACK" (1) button, you exit this option, and the secondary 2 flap actuator will automatically position itself in the CLOSED position.



5.4.9. FEEDER SCREW 1

This option allows you to check the operation of the feeder screw 1.
Press the "ON" button next to "MOTOR" and check if the feeder screw 1 operates. Every time you press the "ON" button, it lights up green. When the option is active, the feeder screw symbol will move. After pressing the "OFF" button next to "MOTOR", feeder screw 1 motor will stop operating.
By pressing the button , the direction of the motor operation changes, and thus the direction of feeder screw 1's operation. The direction of feeder screw 1's operation, as in normal operation, is indicated by a green arrow, while the direction of operation in the opposite direction is shown by a red arrow (operation of feeder screw 1 in the opposite direction is limited to 3 seconds, after which feeder screw 1 stops)."

5.4.10. ROTARY VALVE

This option allows you to check the operation of rotary valve.
Press the "ON" button next to "MOTOR" and check if the rotary valve operates. Every time you press the "ON" button, it lights up green. When the option is active, the rotary valve symbol will rotate. After pressing the "OFF" button next to "MOTOR", rotary valve motor will stop.
By pressing the button , the direction of the motor operation changes, and thus the direction of the rotary valve's operation. The direction of the rotary valve's operation, as in normal operation, is indicated by a green arrow, while the direction of operation in the opposite direction is shown by a red arrow (operation of the rotary valve in the opposite direction is limited to 3 seconds, after which rotary valve stops)."

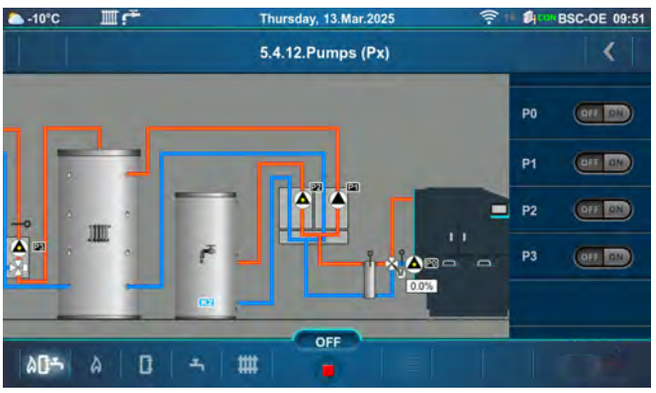
5.4.11. FEEDER SCREW 2

This option allows you to check the operation of the feeder screw 2.
Press the "ON" button next to "MOTOR" and check if the feeder screw 2 operates. Every time you press the "ON" button, it lights up green. When the option is active, the feeder screw symbol will move. After pressing the "OFF" button next to "MOTOR", feeder screw 2 motor will stop operating.
By pressing the button , the direction of the motor operation changes, and thus the direction of feeder screw 2's operation. The direction of feeder screw 2's operation, as in normal operation, is indicated by a green arrow, while the direction of operation in the opposite direction is shown by a red arrow (operation of feeder screw 2 in the opposite direction is limited to 3 seconds, after which feeder screw 2 stops)."

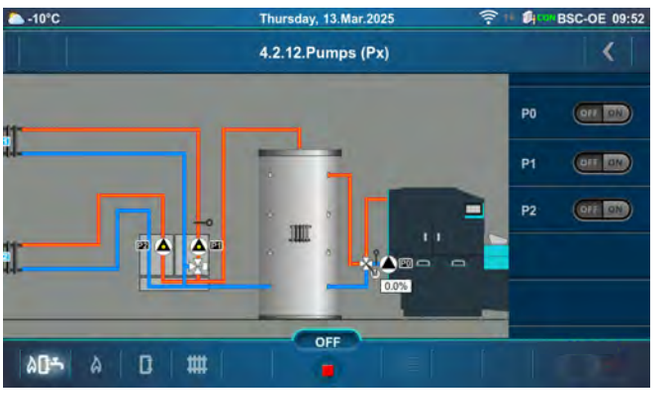
5.4.12. PUMPS (Px)

This option allows you to check the operation of each pump.
Depending on the selected configuration, the number of pumps is different. Press the "ON" button next to the pump you want to test and check if the symbol of the selected pump rotates. It is necessary to check the operation of the selected pump in the heating system. Every time you press the "ON" button, it lights up green. After pressing the "OFF" button, the pump will stop.

Example: Configuration 18

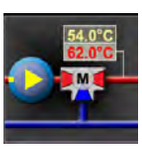


Example: Configuration 36



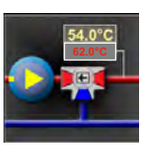
5.4.13. K1 3-WAY VALVE (If exists in configuration)

This option allows you to check the operation of the 3-way valve and the pump of circuit 1. Press the "ON" button next to the corresponding symbol and check if the valve is open/closed or if the pump is operating. Every time you press the "ON" button, it lights green. After pressing the "OFF" button, the valve/pump will stop operating.



Pump!

Open!

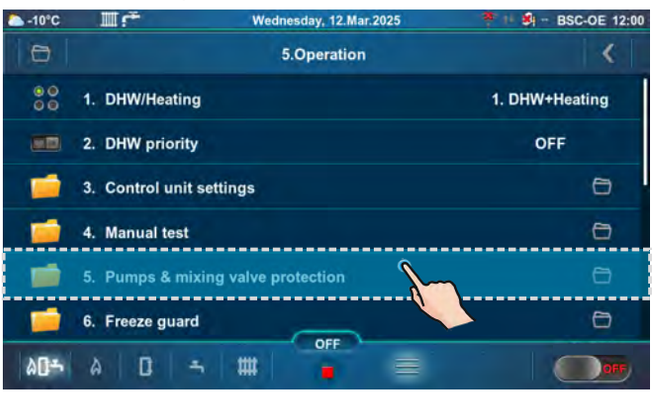


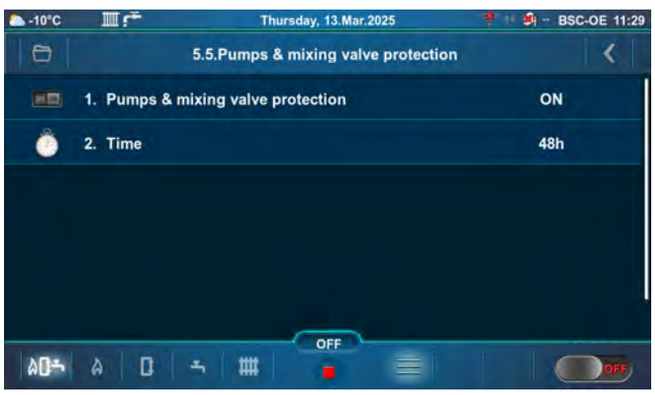
Close!

5.5. PUMPS & MIXING VALVE PROTECTION

This option allows to protect the pumps/valves to not get jammed during a long period of standstill (usually during the summer season when the heating is turned off). Factory is this option enabled and the maximum standstill time of outputs is set to 48 hours. According to this setting, any pump/valve output that is not activated within 48 hours will be activated for a duration of 60 seconds. When a certain pump/valve output is activated, its standstill time is reset.

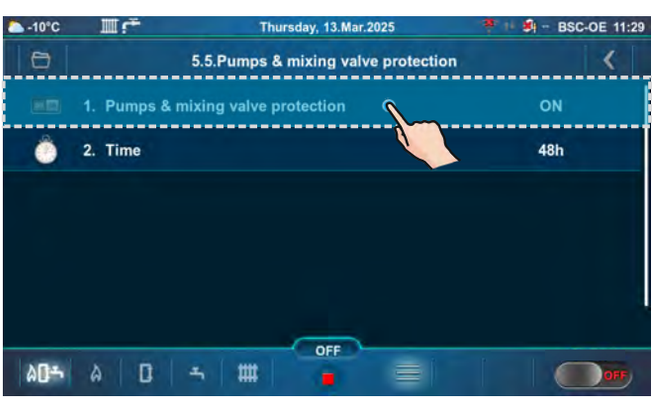
NOTE: The boiler must be connected to the power supply and "Main Switch (0/1)" must be switched on, for this function to be active.





5.5.1. PUMPS & MIXING VALVE PROTECTION

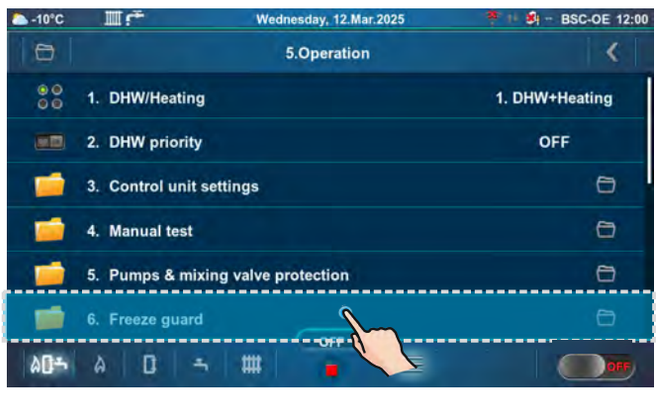
This option enables activation/deactivation of pumps and valves protection.
Factory: ON
Possible selection: ON, OFF

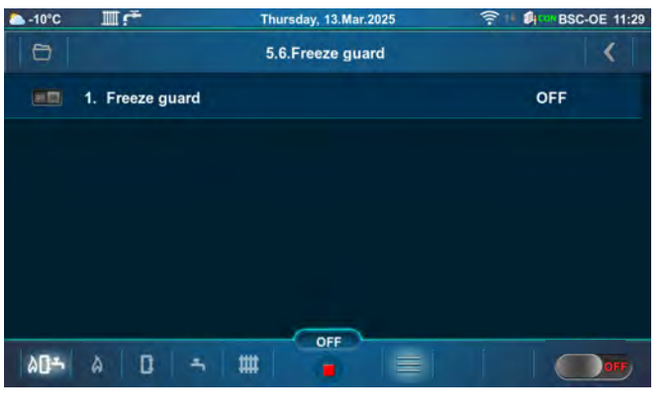


5.5.2. TIME

5.6. FREEZE GUARD

This option enables activation/deactivation of the "Freeze guard" option and defining its options. The "Freeze guard" option can work with or without outdoor temperature sensor.



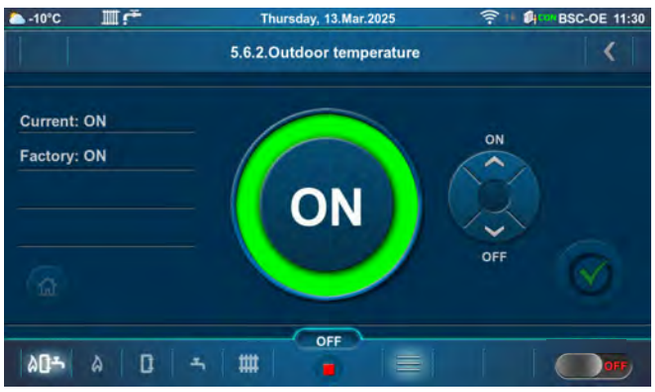


5.6.1. FREEZE GUARD

Possibility of activating or deactivating of the "Freeze guard" option. When this option is activated, a snowflake icon appears on the top bar of the screen.
Factory: OFF
Possible selection: ON, OFF

5.6.2. OUTDOOR TEMPERATURE

Outdoor temperature option shows if the sensor for freeze guard function is ON or OFF.



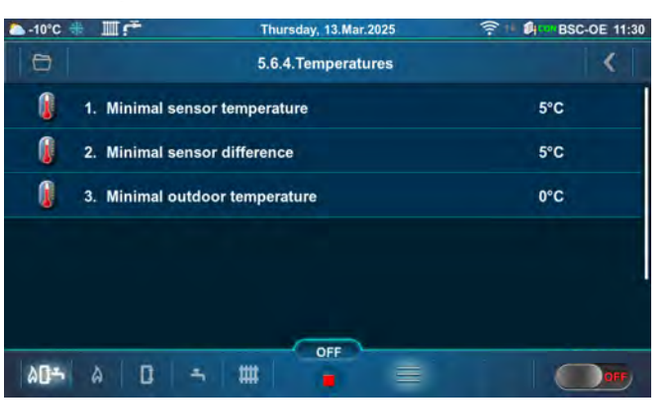
5.6.3. OPTION

"Option" enables the monitoring of sensor temperatures of certain system elements. Possible selection depends on the set configuration and installed additional equipment. If conditions which are set in Freeze guard/Temperature submenu are met, Freeze guard option will be activated for selected elements.

Possible selection: 1. Boiler, 2. (K0), 3. (K1), 4. (K2)

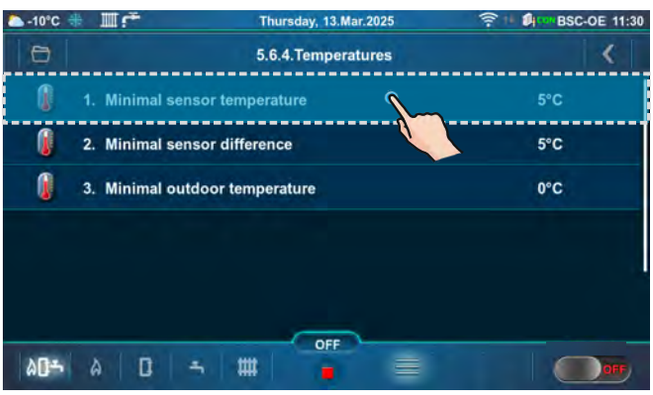
5.6.4. TEMPERATURES

This option allows setting the minimal sensor temperature and minimal sensor difference, as well as the minimal outdoor temperature at which the "Freeze Guard" option will be activated.



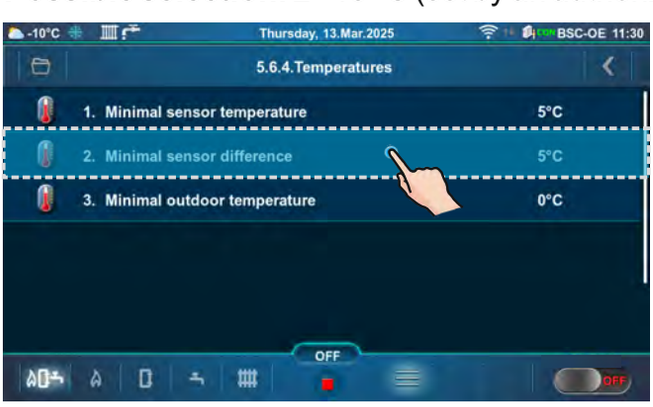
5.6.4.1. MINIMAL SENSOR TEMPERATURE

This submenu allows only an overview.
Setting the sensor temperature for selected "Option(s)" at which "Freeze guard" option will be activated.
Factory: 5 °C
Possible selection: 3 - 10 °C (set by an authorized technician)



5.6.4.2. MINIMAL SENSOR DIFFERENCE

This submenu allows only an overview.
Setting the temperature difference after which the "Freeze guard" option will be deactivated.
Factory: 5 °C
Possible selection: 2 - 15 °C (set by an authorized technician)



5.6.4.3. MINIMAL OUTDOOR TEMPERATURE

Setting the outdoor temperature at which the "Freeze guard" option will be activated.
Factory: 0 °C
Possible selection: -5 - 5 °C

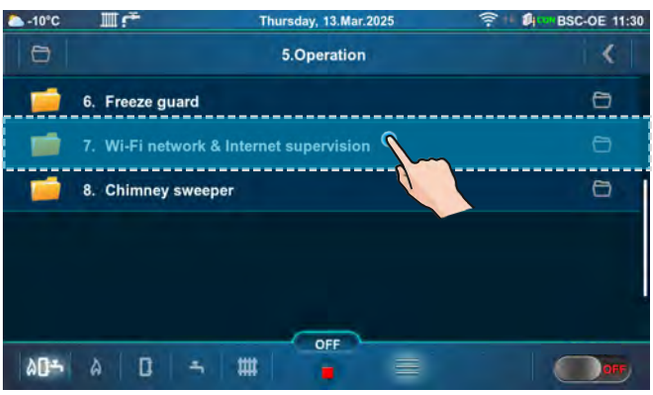
5.7. Wi-Fi NETWORK & INTERNET SUPERVISION

IMPORTANT NOTES:

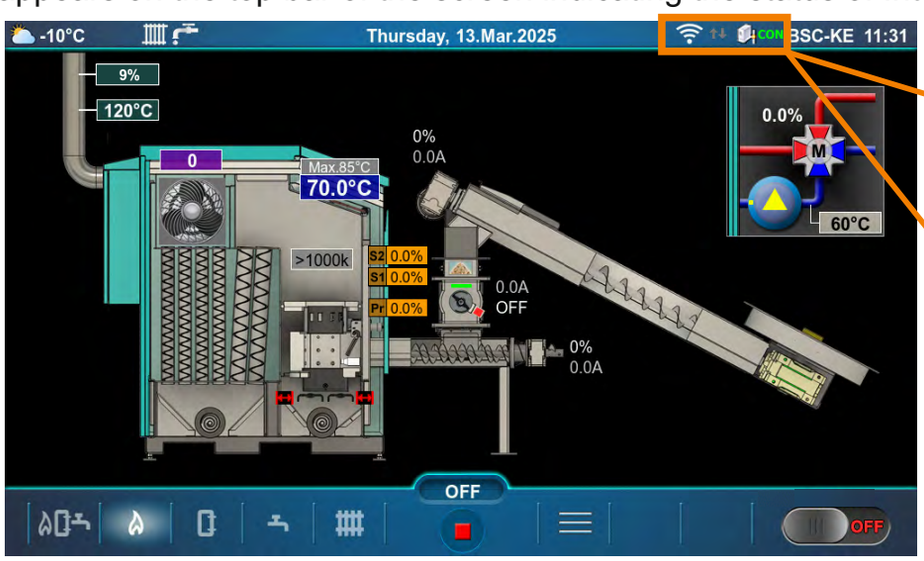
Boiler controller requires an active DHCP server at the access point (e.g. router) because manual adjustment of network parameters is not possible. For more information, contact your home network administrator.

This submenu allows configuration of the controller for boiler connection to the Internet via the local Wi-Fi network.

This submenu is used to change Internet supervision settings.



When the controller is connected to the boiler and "Internet supervision" is enabled, a new icon appears on the top bar of the screen indicating the status of Internet supervision.

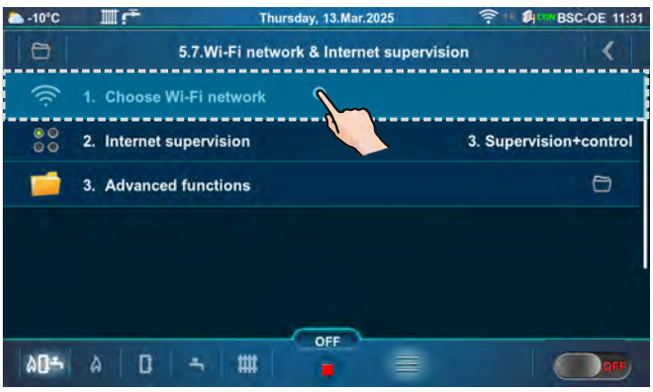


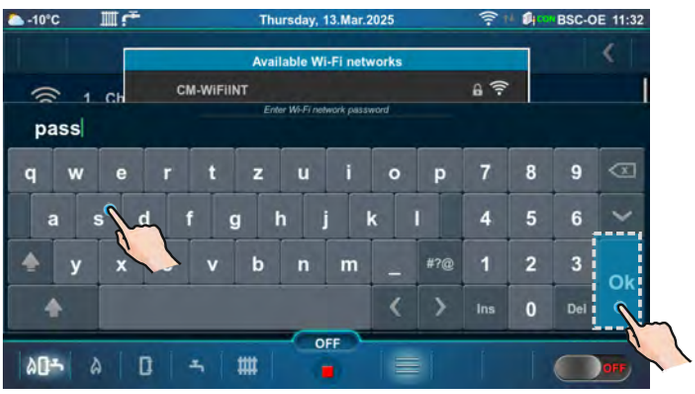
The controller is connected to the web portal.
(Internet supervision is possible)

The controller is not connected to the web portal.
(Internet supervision is not possible)

5.7.1. CHOOSE Wi-Fi NETWORK

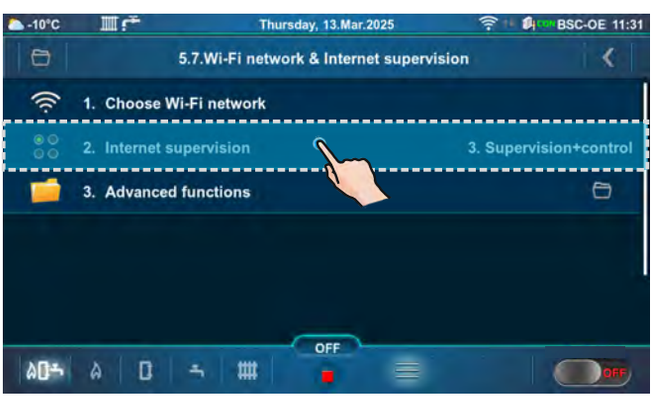
Boiler controller finds all available Wi-Fi networks. Select the Wi-Fi network you have access to. Press the button "JOIN", enter the password if necessary and confirm with the "OK" button. If you want to disconnect from a Wi-Fi network, press the button "DISCONNECT".



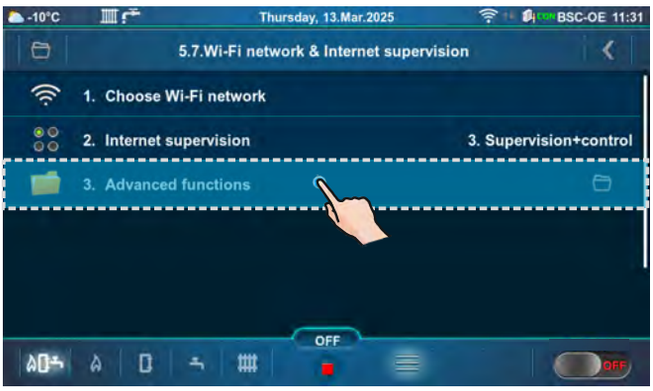


5.7.2. INTERNET SUPERVISION

This option is used to set and enable/disable "Internet Supervision".
Factory: Supervision+control
Possible selection: OFF, Supervision, Supervision+control

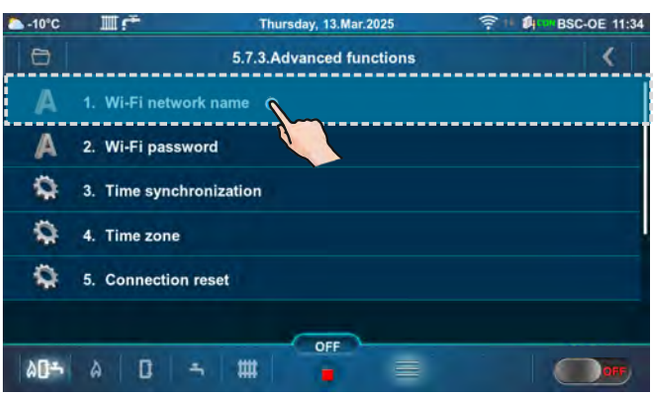


5.7.3. ADVANCED FUNCTIONS



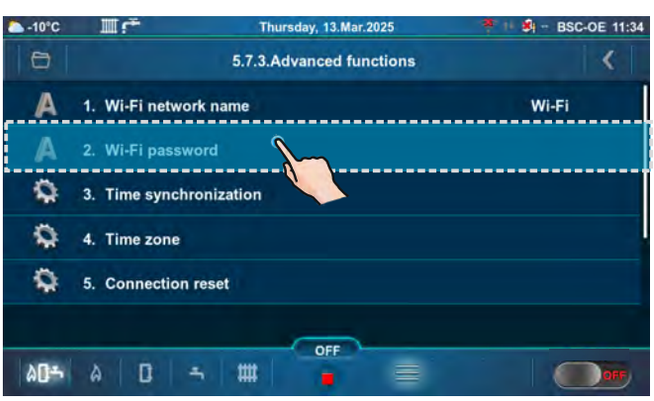
5.7.3.1. Wi-Fi NETWORK NAME

This option allows entering the name of the Wi-Fi home network to which you want to connect the controller and boiler. The correct Wi-Fi network name must be entered, otherwise the boiler will not be able to connect to the Wi-Fi network.



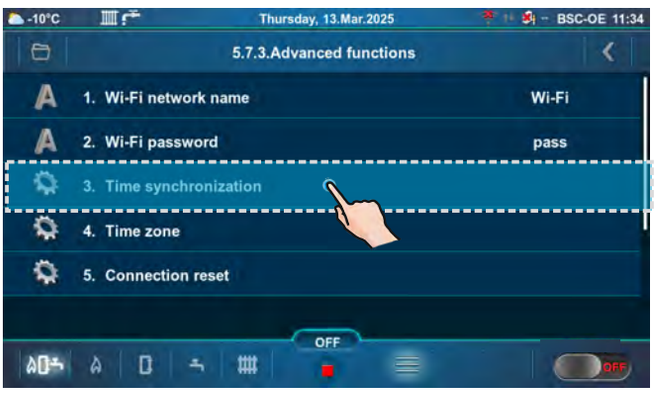
5.7.3.2. Wi-Fi PASSWORD

This option allows entering a password for the local Wi-Fi network. The correct password for the local Wi-Fi network must be entered, otherwise the boiler will not be able to connect to the Wi-Fi network.



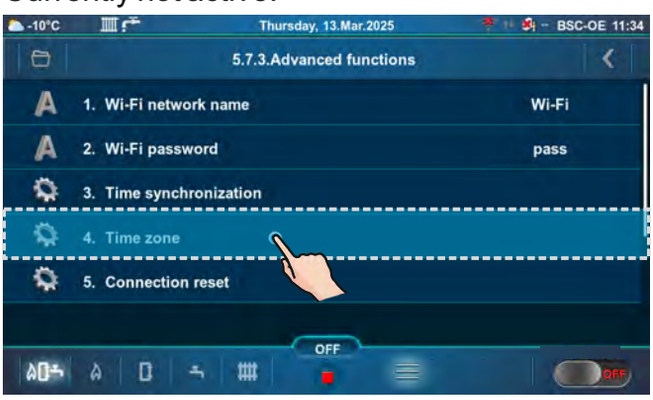
5.7.3.3. TIME SYNCHRONIZATION

Currently not active.



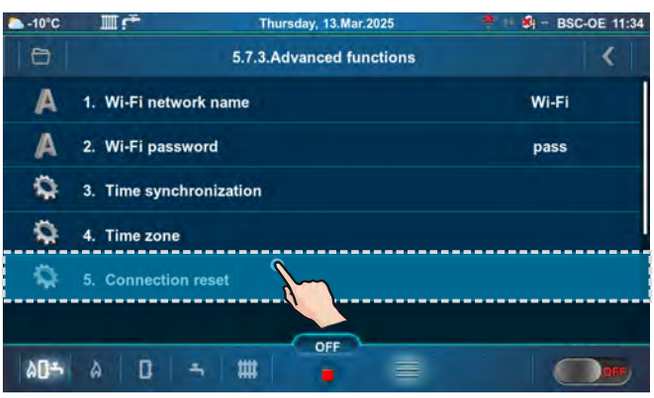
5.7.3.4. TIME ZONE

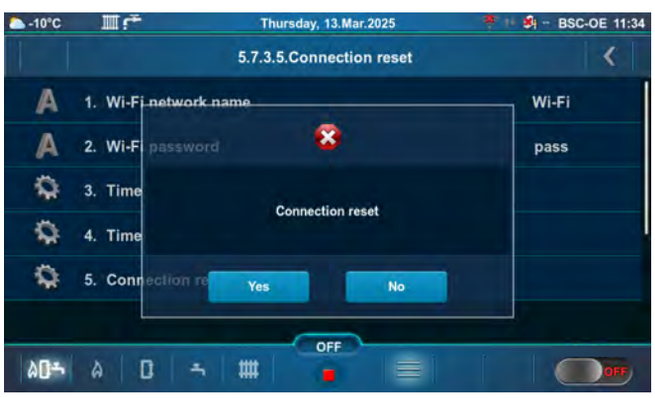
Currently not active.



5.7.3.5. CONNECTION RESET

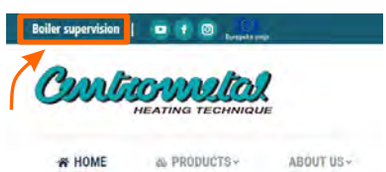
This option allows resetting of the controller connection with the local network.





5.8. INTERNET PORTAL FOR SUPERVISION AND MANAGEMENT

In order to be able to use internet supervision and management, you must be registered on the portal with your email address and the identification number (WiFi ID). You can see the registration procedure on the video instructions. Please scan QR code with your smartphone or open web page from link below.



IMPORTANT:
For WiFi ID, see point 8.1. Software info.

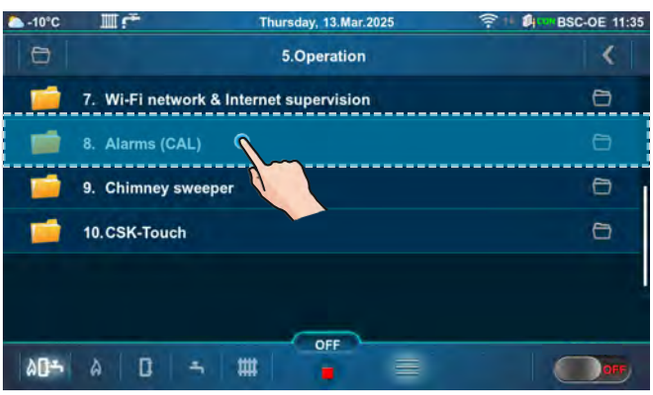
https://portal.centrometal.hr

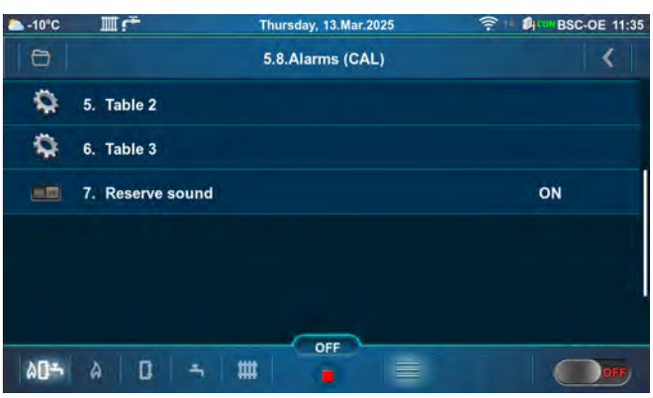
https://www.centrometal.hr/portal-video/

NOTE: The number of submenu 5.X. depends on the additional equipment that has been activated (it is activated by an authorized technician in the Installation -> PIN menu).

5.X. ALARMS (CAL)

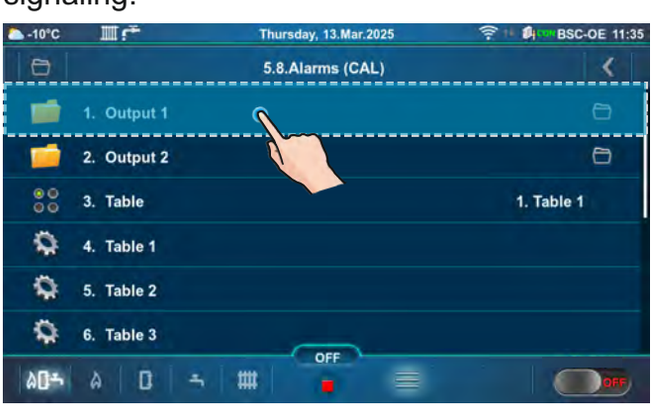
This option is used to configure the visual or audible alarm (speaker and indicator light are optional and must be installed by an authorized technician) to alert the user when he is not near the boiler. The warning mode and cause can be set in this submenu (errors, low fuel level, etc.). "Delay" is the time between two alerts.





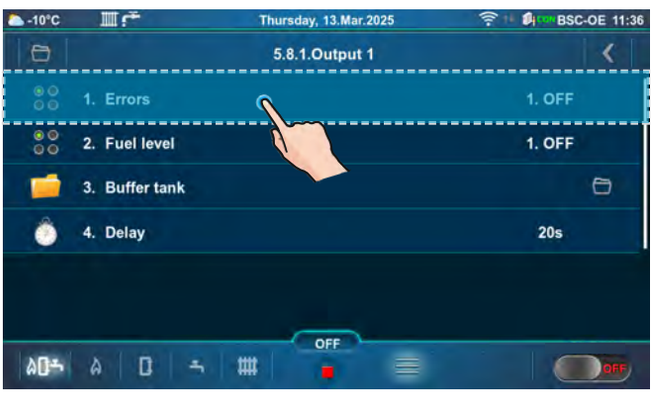
5.X.1. OUTPUT 1

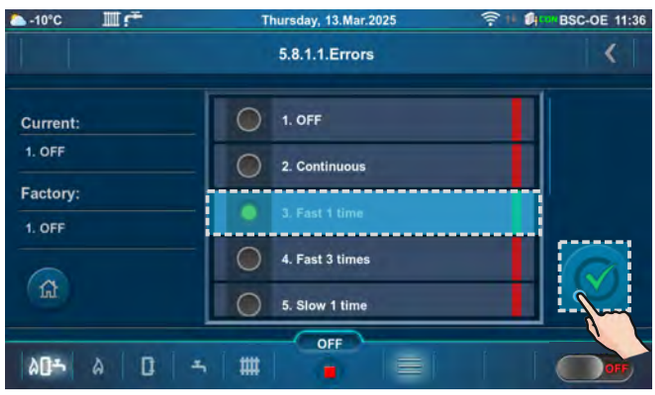
This submenu allows configuration of "Output 1". It is possible to select the mode of errors or fuel level signaling.



5.X.1.1. ERRORS

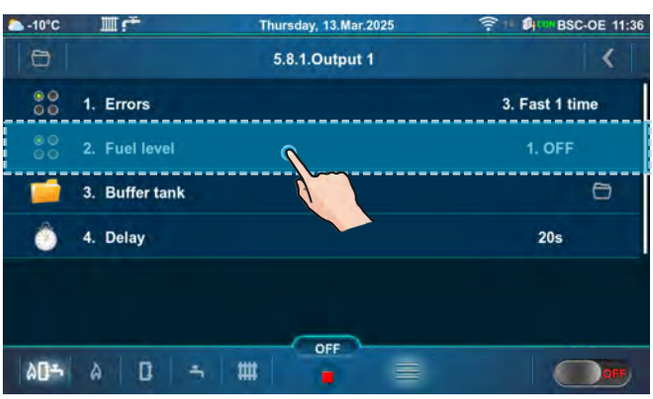
This option determines whether "Output 1" will notify errors. By choosing a particular type of signal, error notification will be activated in the form of the chosen signal.
Factory: OFF
Possible selection: 1. OFF, 2. Continuous, 3. Fast 1 time, 4. Fast 3 times, 5. Slow 1 time, 6. Slow 3 Times, 7. Table



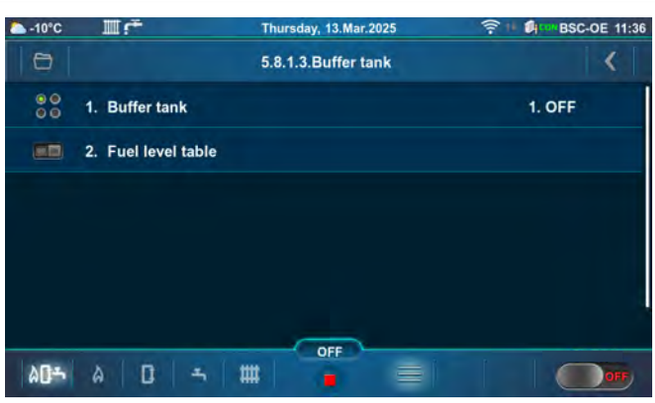


5.X.1.2. FUEL LEVEL

This option determines whether "Output 1" will notify of the fuel level. By choosing a particular type of signal, fuel level notification will be activated in the form of the chosen signal.
Factory: OFF
Possible selection: 1. OFF, 2. Continuous, 3. Fast 1 time, 4. Fast 3 times, 5. Slow 1 time, 6. Slow 3 Times, 7. Table

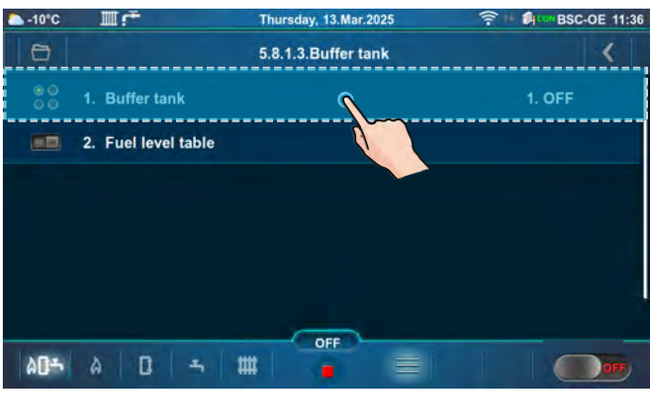


5.X.1.3. BUFFER TANK



5.X.1.3.1. BUFFER TANK

This option determines whether "Output 1" will notify a low temperature in the buffer tank.
Factory: OFF
Possible selection: 1. OFF, 2. Continuous, 3. Fast 1 time, 4. Fast 3 times, 5. Slow 1 time, 6. Slow 3 Times



5.X.1.4. DELAY

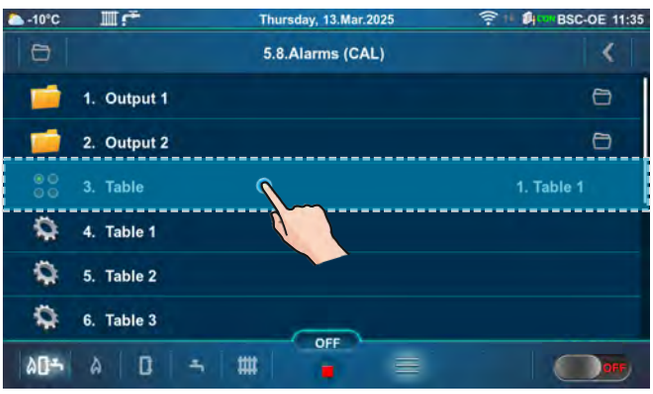
The option determines time after which the error notification or fuel level warning signal will appear again (this parameter is not valid if a continuous signal is chosen).
Factory: 20s
Possible selection: 5-3600s

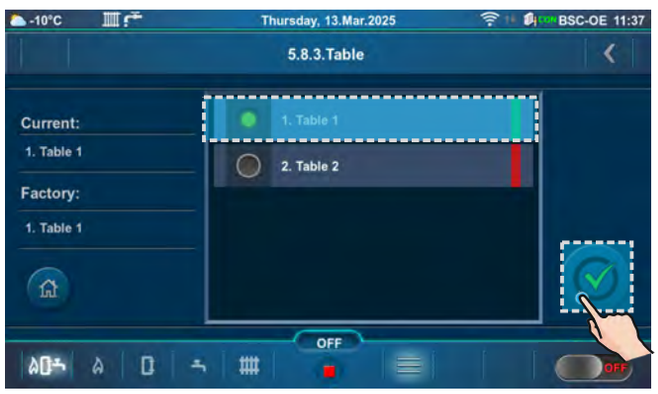
5.X.2. OUTPUT 2

In the same way as for "Output 1", the parameters for "Output 2" (5.X.2.) can be set.

5.X.3. TABLE

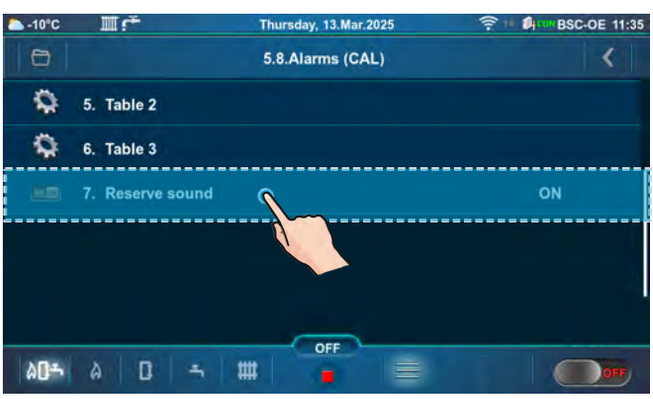
This option allows table selection according to which alarm outputs will operate. The change or automatic deactivation of the signal within a specified period of time.
Factory: Table 1
Possible selection: Table 1, Table 2





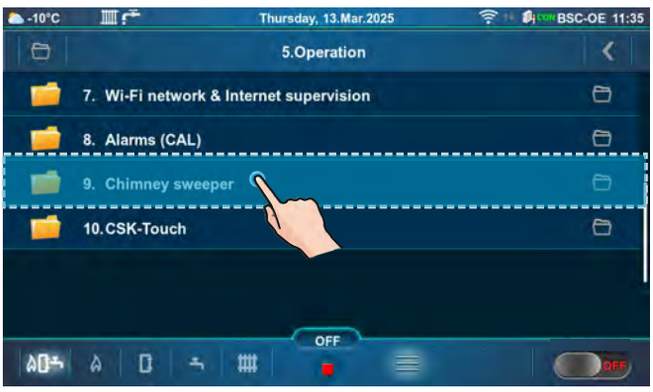
5.X.7. RESERVE SOUND

Factory: ON
Possible selection: ON, OFF



5.X. CHIMNEY SWEEPER

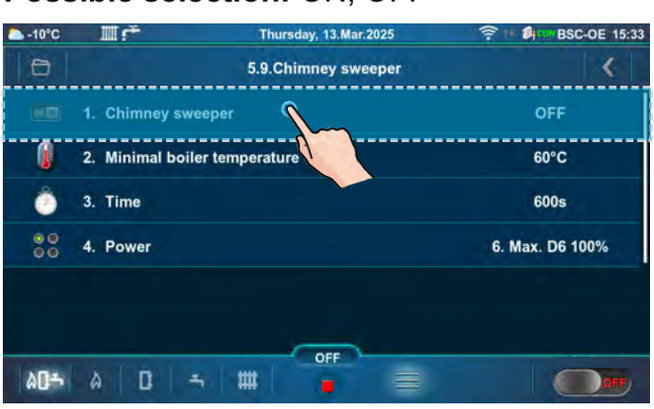
This submenu enables measurement of combustion flue gases at nominal power (D6) and minimum power (D2) of the boiler.

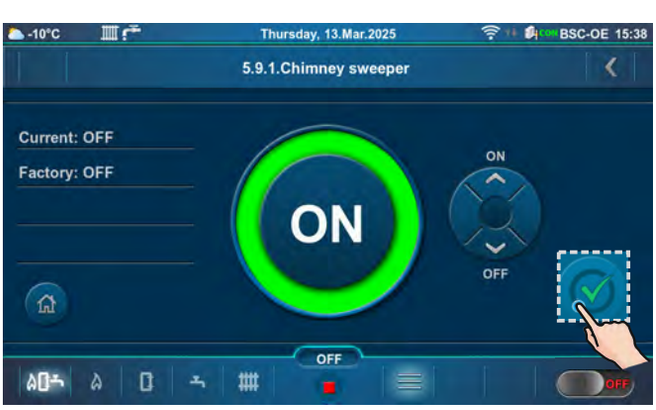


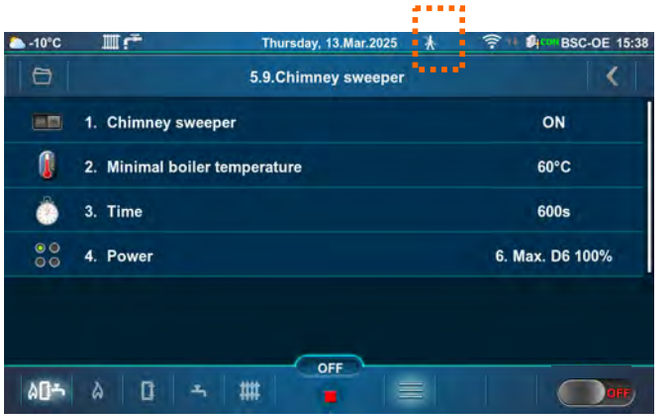
5.X.1. CHIMNEY SWEEPER

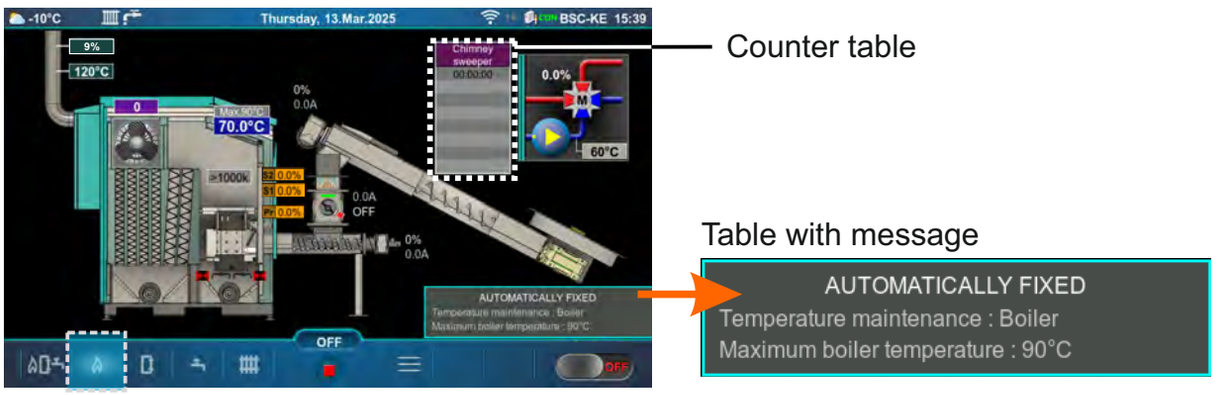
Activating this option will display a chimney sweeper icon on the top bar of the screen. By selecting the "Boiler screen (BSC-KE)", a table with counter and table with message will appear. The countdown begins when the boiler reaches the selected power (Dx) and the text on the counter is red. When the boiler is at the selected power (Dx) for the set "Time" and the "Minimal boiler temperature" condition is met, the counter digits turn green and measurement can be performed.

Important,
if after starting the flue gas measurement, a red counter appears on the screen (the boiler went into modulation), it is necessary to stop the started measurement, for a new measurement, wait until the counter turns green again. Flue gas measurement performed while the counter is even briefly red is not valid.
Factory: OFF
Possible selection: ON, OFF









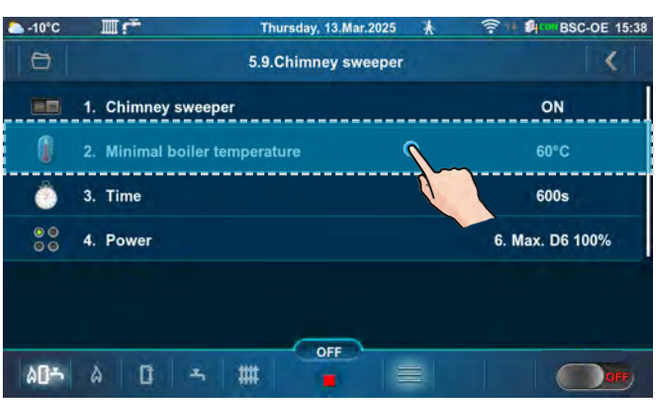
POWER MODULATION PRINCIPLE IN "CHIMNEY SWEEPER" OPTION:
Modulation - power decrease:
D6==>**D5** (Tk=Tkmax – 3,0°C),
D5==>**D4** (Tk=Tkmax – 2,5°C),
D4==>**D3** (Tk=Tkmax – 2,0°C),
D3==>**D2** (Tk=Tkmax – 1,5°C),
D2==>**D1** (Tk=Tkmax – 1,0°C),
D1==>**D0** (Tk=Tkmax – 0,5°C),
D0==>**S7-1** (Tk=Tkmax)

Modulation - power increase:
D0==>D1 (Tk=Tkmax – 0,5°C),
D1==>D2 (Tk=Tkmax – 1,0°C),
D2==>D3 (Tk=Tkmax – 1,5°C),
D3==>D4 (Tk=Tkmax – 2,0°C),
D4==>D5 (Tk=Tkmax - 2,5°C),
D5==>D6 (Tk=Tkmax - 3,0°C)

Legend:
Tkmax - set boiler temperature
Tk - measured water temperature in the boiler
D0…D6, S7-1 - operating phases

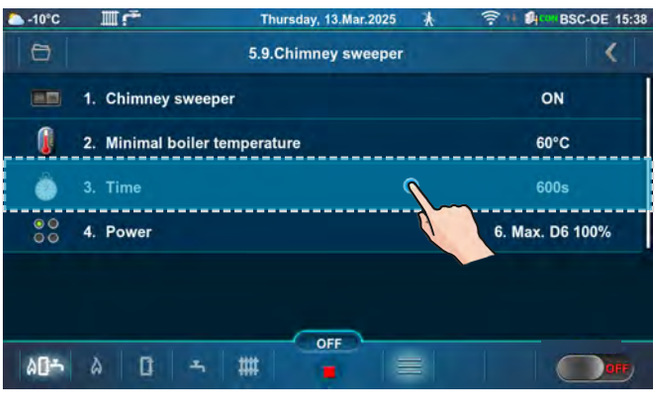
5.X.2. MINIMAL BOILER TEMPERATURE

This submenu allows only an overview.
The factory set temperature that must be achieved to start the measurement (except for conditions that can be changed - boiler power and time):
- Minimal boiler temperature: min. 60 °C (it cannot be changed)
Factory: 60 °C



5.X.3. TIME

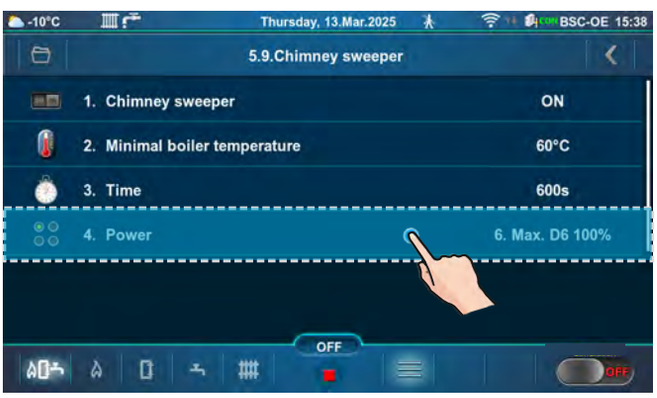
Period of time during which the boiler operates at the chosen power (D6/D2), after the "Minimal boiler temperature" is reached (so that the flame stabilizes).
After this time, the text on the counter turns green and only then you can start measuring flue gases.
Factory: 600s
Possible selection: 600-3600s



5.X.4. POWER

This option enables the boiler to operate at the selected power (D6 or D2) so that the combustion flue gases can be measured. The boiler operates at selected power until this option is deactivated or the temperature in the boiler rises to:
- (power D6) 3 °C less than the maximum temperature of the boiler (in this case the boiler reduces power)
- (power D2) 1 °C less than the maximum temperature of the boiler (in this case the boiler reduces power).

Factory: 6. Max. D6 100%
Possible selection: 2.Min. D2 ~25%, 6.Max. D6 100%



IMPORTANT!

When the "Chimney sweeper" option is activated:
- **the external control is automatically deactivated. Once the option is deactivated, the boiler and its peripherals devices continue to operate.**
- **the boiler shutdown option due to grate cleaning is automatically deactivated if the "Chimney sweeper" option is activated.**

6.0. HISTORY

The list of errors/warnings/info provides an overview of the errors/warnings/info that have occurred. On the screen is displayed: label, name, time and date when the error/warning/info occurred.

E - conditions that cause the shutdown of the boiler. The error must be rectified before boiler is started again.

ERROR	NAME	DESCRIPTION
E2	BUFFER TANK SENSOR (UP) ERROR	**Boiler status:** Boiler goes to phases S7, C0 and OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, cold connection or buffer tank sensor (UP) is invalid.
E3	BUFFER TANK SENSOR (DOWN) ERROR	**Boiler status:** Boiler goes to phases S7, C0 and OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, cold connection or buffer tank sensor (DOWN) is invalid.
E4	FLUE GAS SENSOR ERROR	**Boiler status:** Boiler goes to phases S7, C0 and OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, cold connection or invalid flue gas sensor, measured flue gas temperature above 300 °C.
E5	OUTDOOR TEMPERATURE SENSOR ERROR	**Boiler status:** The boiler works normally, the problem occurs in the operation of the heating circuits (if configured) and the CM2K regulator (if installed). **Possible causes:** Interruption on el. connections between sensor and boiler, cold connection or invalid outdoor temperature sensor.
E7	RETURN FLOW TEMPERATURE SENSOR ERROR	**Boiler status:** Boiler goes to phases S7, C0 and OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, connection to the boiler, cold connection or invalid return flow sensor.
E9	BOILER SENSOR ERROR	**Boiler status:** Boiler goes to phases S7, C0 and OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, connection to the boiler, cold connection or invalid sensor.

E10	UNKNOWN BOILER POWER	**Boiler status:** Remaining in the OFF phase. **Possible causes:** Unknown software, incorrect configuration software.
E11	PHOTOCELL ERROR	**Boiler status:** Boiler goes to phase OFF after ending phase S0 (retry start is allowed). **Possible cause:** Invalid photocell (sending information that flame exist in phase S0).
E12	SAFETY PRESSURE SWITCH	**Boiler status:** Boiler immediately goes to phase OFF. **Possible causes:** If any door or any opening for cleaning on boiler is not properly closed. Interruption in el. connection between safety pressure switch and boiler, connection to the boiler, cold connection or invalid safety pressure switch. Interruption or bad sealing of safety pressure switch pipe. Blocked / obstructed flue passages. Blocked / obstructed flue installation.
E13	FAN ERROR	**Boiler status:** Boiler immediately goes to phase OFF. **Possible causes:** Interruption on el. connections between fan and boiler, problem with rpm fan sensor, problem with fan motor.
E14	MEMORY ERROR	**Boiler status:** Boiler immediately goes to phase OFF.
E15	COMMUNICATION ERROR WITH MOTHERBOARD	**Boiler status:** Boiler immediately goes to phase OFF. **Possible cause:** Problem with the UTP Ethernet cable/connector (connections between MOTHERBOARD and 7" screen).
E17	LAMBDA PROBE ERROR	a) Error occurs in the phase of "OFF" - The problem is with the communication system within the lambda (Cables, connectors, el. boards, software). b) Error occurs in all phases except "OFF" - The problem is with el. heater which is integrated into the lambda probe or with the communication system within the lambda (Cables, connectors, el. boards, software).
E18	NO FLAME IN IGNITION STAGE	**Boiler status:** Boiler immediately goes to phase OFF. **Possible cause:** There is not enough fuel in the combustion chamber, a problem with the electric heater, problem with the photocell (faulty photocell or dirty glass between the photocell and the boiler combustion chamber that needs to be cleaned periodically), and the fuel is too humid.
E19	FLAME DISAPPEARED IN WORKING PHASE	**Boiler status:** Boiler immediately goes to phase OFF. **Possible cause:** There is not enough fuel in the combustion chamber, problem with the photocell (faulty photocell or dirty glass between the photocell and the boiler combustion chamber that needs to be cleaned periodically), and the fuel is too humid.
E21	ERROR GRATE CLEANER	**Boiler status:** Boiler immediately goes to phase OFF. **Possible causes:** Interruption on el. connections between grate microswitches and boiler control unit, cold connection or problem with grate motor.

E23	FLAME DISAPPEARED IN IGNITION STAGE	**Boiler status:** Boiler immediately goes to phase OFF. **Possible cause:** There is not enough fuel in the combustion chamber, problem with the photocell (faulty photocell or dirty glass between the photocell and the boiler combustion chamber that needs to be cleaned periodically), and the fuel is too humid.
E24	FLAME DISAPPEARED IN STABILIZATION STAGE	**Boiler status:** Boiler immediately goes to phase OFF. **Possible cause:** There is not enough fuel in the combustion chamber, problem with the photocell (faulty photocell or dirty glass between the photocell and the boiler combustion chamber that needs to be cleaned periodically), and the fuel is too humid.
E25	HYDRAULIC CROSSOVER SENSOR ERROR	**Boiler status:** Boiler immediately goes to phase OFF. **Possible causes:** Interruption on el. connections between sensor and boiler, connection to the boiler, cold connection or invalid hydraulic crossover sensor.
E28.1	COMMUNICATION ERROR WITH CM2K-CIRCUIT C1 & C2	**Boiler status:** Boiler works normally, the problem occurs in the operation of the heating circuits (if configured) and the CM2K regulator (if installed). **Possible cause:** Problem with the UTP Ethernet cable (connections between CM2K and the boiler controller).
E28.2	COMMUNICATION ERROR WITH CM2K-CIRCUIT C3 & C4	**Boiler status:** Boiler works normally, the problem occurs in the operation of the heating circuits (if configured) and the CM2K regulator (if installed). **Possible cause:** Problem with the UTP Ethernet cable (connections between CM2K and the boiler controller).
E28.3	COMMUNICATION ERROR WITH CM2K-CIRCUIT C5 & C6	**Boiler status:** Boiler works normally, the problem occurs in the operation of the heating circuits (if configured) and the CM2K regulator (if installed). **Possible cause:** Problem with the UTP Ethernet cable (connections between CM2K and the boiler controller).
E38	This configuration needs functional CM2K	**Boiler status:** Boiler can't work. In this configuration CM2K must be installed and configured for the boiler to be able to operate.
E40	SAFETY THERMOSTAT	**Boiler status:** Feeder screw 1, rotary valve (RSE), and flue gas fan are currently stop working, and the boiler immediately goes in the OFF phase. Feeder screw 1, rotary valve (RSE), and flue gas fan lose electricity, manual tests do not work. **Possible cause:** The water temperature in the boiler is too high (above 104 °C). **Troubleshooting:** Wait until the water temperature in the boiler drops below 70 °C and perform the procedure from "SAFETY THERMOSTAT - boiler malfunction".

E42	ASH SCREW High motor current	**Boiler status:** The ash removal (ash screw) immediately stops, and the boiler goes to the shutdown phase S7-1 and OFF. **Possible cause:** Within 12 working hours, the W42 warning was not confirmed. One or both ash boxes are full and need to be emptied. There is a problem with the motor or chain drive of the ash removal, a problem with the electrical wiring and connections on the boiler controller or motor. Problem - one or both transporters for ash removal are jammed. **What needs to be done:** Check if the ash boxes (or one of them) are quite full. If they are full, they should be emptied and returned to a ready-to-operate state for the boiler. Then, confirm the warning (press "seen" on the screen) and, if necessary, start the boiler. If the boxes were empty and this warning appeared, check if the transporters for ash removal or one of them is jammed. If the problem is still not resolved, contact an authorized technician to check the electrical connections and the ash removal motor.
E48	DATE AND TIME ARE NOT SET	**Boiler status:** The boiler can not operate. The boiler states under different circumstances are described in point "Possible cause". **Possible cause:** The battery of the 7" screen is empty. (Time resets to 00:00 and the date to 1.1.2020. after switching off the controller on the main switch or due to power outage, and at least one switching time (SCHEDULE) (boiler/DHW/recirculation/CM2K) is switched on). Detection of an empty battery is possible only after power outage and restoring of the power supply to the 7" screen. If neither one switching time (SCHEDULE) is switched ON, error E48 will not appear, only warning W9 will appear. When error E48 appears, the boiler goes into the shutdown phase S7 (S7-1). **Troubleshooting:** It is necessary to replace the battery of the 7" screen (CR 1632).

E80.1	CONTROL ERROR MOD 1, FEEDER SCREW 1	
E80.2	CURRENT RISE ERROR MOD 1, FEEDER SCREW 1	
E80.3	ERROR CURRENT TOO HIGH MOD 1, FEEDER SCREW 1	
E80.4	ERROR ASYMMETRY MOD 1, FEEDER SCREW 1	
E80.5	ERROR CURRENT TOO LOW MOD 1, FEEDER SCREW 1	
E80.6	ERROR UNWANTED CURRENT MOD 1, FEEDER SCREW 1	
E80.7	THERMAL OVERLOAD MOD 1, FEEDER SCREW 1	
E80.8	THERMAL OVERLOAD FEEDER SCREW 1 MOTOR	
E81.1	CONTROL ERROR MOD 2, ROTARY VALVE	
E81.2	CURRENT RISE ERROR MOD 2, ROTARY VALVE	
E81.3	ERROR CURRENT TOO HIGH MOD 2, ROTARY VALVE	
E81.4	ERROR ASYMMETRY MOD 2, ROTARY VALVE	

E81.5	ERROR CURRENT TOO LOW MOD 2, ROTARY VALVE	
E81.6	ERROR UNWANTED CURRENT MOD 2, ROTARY VALVE	
E81.7	THERMAL OVERLOAD MOD 2, ROTARY VALVE	
E81.8	THERMAL OVERLOAD ROTARY VALVE MOTOR	
E82.1	CONTROL ERROR MOD 3, FEEDER SCREW 2	
E82.2	CURRENT RISE ERROR MOD 3, FEEDER SCREW 2	
E82.3	ERROR CURRENT TOO HIGH MOD 3, FEEDER SCREW 2	
E82.4	ERROR ASYMMETRY MOD 3, FEEDER SCREW 2	
E82.5	ERROR CURRENT TOO LOW MOD 3, FEEDER SCREW 2	
E82.6	ERROR UNWANTED CURRENT MOD 3, FEEDER SCREW 2	
E82.7	THERMAL OVERLOAD MOD 3, FEEDER SCREW 2	
E82.8	THERMAL OVERLOAD FEEDER SCREW 2 MOTOR	

E83.1	FEEDER SCREW 1 CONTROL 1 ERROR	
E83.2	FEEDER SCREW 1 CONTROL 2 ERROR	
E84.1	ROTARY VALVE CONTROL 1 ERROR	
E84.2	ROTARY VALVE CONTROL 2 ERROR	
E85.1	FEEDER SCREW 2 CONTROL 1 ERROR	
E85.2	FEEDER SCREW 2 CONTROL 2 ERROR	
E86	CONVEYOR LID	**Boiler status:** Feeder screw 2 immediately stops operating. **Possible cause:** Raising the lid of feeder screw 2. **What needs to be done:** Close the lid of feeder screw 2 and confirm the error.
E87	CONVEYOR FLAP	**Boiler status:** Entering the shutdown phase S7-1 and OFF. A mechanical power disconnect occurs for the motors involved in the fuel supply process to the boiler by tripping the automatic fuses (DI) in the boiler's junction box (jbox). **Possible causes:** - see the point "DISPLAY OF FUEL SUPPLY PRINCIPLE" in these instructions - the electrical wires between the microswitch and the boiler's junction box (jbox) are disconnected - faulty microswitch **What needs to be done:** - see the point "DISPLAY OF FUEL SUPPLY PRINCIPLE" in these instructions
E88	PRESSURE SENSOR	
E89	NO FUEL FROM THE LARGE TANK	**Boiler status:** Boiler goes to shutdown phase S7-1 and OFF. **Possible cause:** No fuel in the large tank, something is stuck in the large tank or feeder screw-2, problem with the feeder screw-2 auger.

Errors of additional equipment: CMNET (module for boiler cascade)

E27	COMMUNICATION ERROR WITH CMNET	**Boiler status:** Boiler immediately goes to phase OFF.

Errors of additional equipment: CM2K

E29.1	SENSOR K1 CIRCUIT	**Boiler status:** Boiler works normally. The problem occurs in the work of additional equipment CM2K if embedded.
E29.2	SENSOR K2 CIRCUIT	
E29.3	SENSOR CM2K C1 CIRCUIT	
E29.4	SENSOR CM2K C2 CIRCUIT	
E29.5	SENSOR CM2K C3 CIRCUIT	
E29.6	SENSOR CM2K C4 CIRCUIT	
E29.7	SENSOR CM2K C5 CIRCUIT	
E29.8	SENSOR CM2K C6 CIRCUIT	
E30.1	CORRECTOR CIRCUIT K1	
E30.2	CORRECTOR CIRCUIT K2	
E30.3	CORRECTOR CM2K C1 CIRCUIT	
E30.4	CORRECTOR CM2K C2 CIRCUIT	
E30.5	CORRECTOR CM2K C3 CIRCUIT	
E30.6	CORRECTOR CM2K C4 CIRCUIT	
E30.7	CORRECTOR CM2K C5 CIRCUIT	
E30.8	CORRECTOR CM2K C6 CIRCUIT	

INFORMATION / WARNING

W- Information about the state of the boiler, which does not stop the boiler operation

WARNING

W2	NO FLAME IN IGNITION STAGE	**Boiler status:** Fire did not appear after the adjusted max. time. Boiler will repeat ignition several times before error E18 "No flame in ignition stage" appears. **Possible cause:** Insufficient fuel quantity in the combustion chamber for proper ignition, the fuel is too humid, the electric heater is defective.
W2.1	RETRY IGNITION	**Boiler status:** Boiler still adds a certain quantity of fuel/restarts ignition a certain number of times before error E18 appears. There is no flame during ignition phase. **Possible cause:** Insufficient fuel quantity in the combustion chamber for proper ignition, the fuel is too humid, the electric heater is defective.
W5	FACTORY SETTINGS LOADED	**Boiler status:** Boiler works normally with loaded factory default settings.
W6	LOW RETURN TEMPERATURE	**Boiler status:** Boiler will work normally (it is necessary to eliminate the cause, as long-term operation of the boiler will cause condensation in the boiler and flue gas tubes clogging). **Possible cause:** Problem with 4-way mixing valve/ actuator, problem with return flow temperature sensor.
W7	LOW BUFFER TANK TEMPERATURE	**Boiler status:** Boiler is operating normally. Pumps for the heating circuits stop. The DHW pump operates normally according to its conditions and demand.
W8	PRESSURE SWITCH	**Boiler status:** Boiler will continue to operate normally. Warning "Pressure switch" will be active on the screen until the next start of the boiler. The cause of the warning must be resolved (dirty boiler, clogged holes on the burner grate, the connection between the boiler and the chimney is dirty, the chimney is dirty...).
W9	DATE AND TIME ARE NOT SET	**Boiler status:** Boiler can operate (if the boiler switching times (SCHEDULE) are used the E48 error occurs and the boiler can not operate). **Possible cause:** The battery of the 7" screen is empty. (Time resets to 00:00 and the date to 1.1.2020. after switching off the controller on the main switch or due to power outage). **What needs to be done:** It is necessary to change the battery on the 7" controller screen (CR 1632), set the date and time on the controller.

W42	ASH SCREW High motor current	**Boiler status:** The ash removal (ash screw) immediately stops and the boiler will operate for another 12 working hours. After that, error E42 will appear and the boiler goes to the shutdown phase S7-1 and OFF. If you confirm this warning (press "seen" on the screen) within 12 working hours of its appearance, the boiler will continue normal operation, and the ash removal will be reactivated. (IMPORTANT! Do not confirm this warning if you have not emptied the ash boxes beforehand. The primary purpose of this warning is to notify when the ash boxes need to be emptied.) **Possible cause:** One or both ash boxes are full and need to be emptied (this is the common cause of this warning). There is a problem with the motor or chain drive of the ash removal, a problem with the electrical wiring and connections on the boiler controller or motor. Problem - one or both transporters for ash removal are jammed. **What needs to be done:** Switch off the boiler. Check if the ash boxes (or one of them) are quite full. If they are full, they should be emptied and returned to a ready-to-operate state for the boiler. Then, confirm the warning (press "seen" on the screen) and, if necessary, start the boiler. If the boxes were empty and this warning appeared, check if the transporters for ash removal or one of them is jammed. If the problem is still not resolved, contact an authorized technician to check the electrical connections and the ash removal motor.

INFO - IW

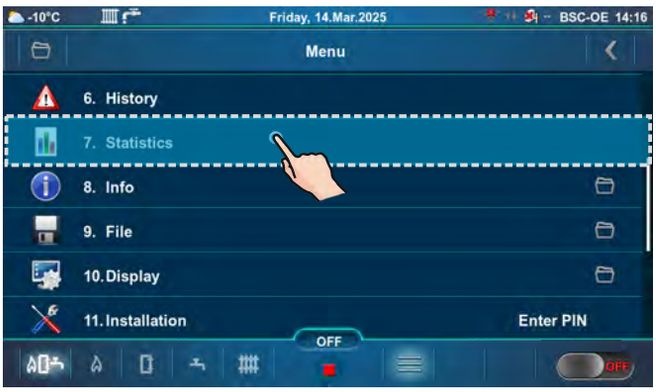
IW1-1	POWER DOWN	**Power outage** Power cut
IW1-2	POWER UP	Return of electricity

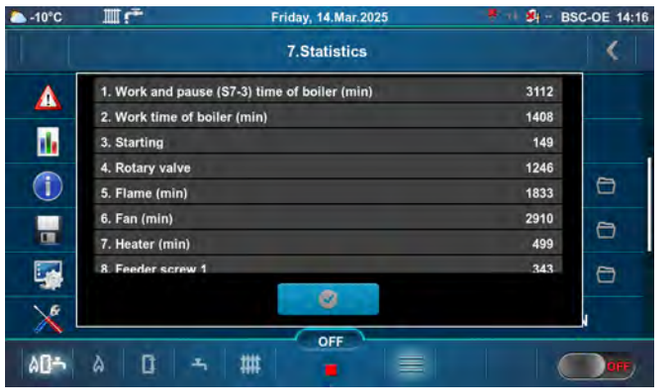
INFO - I

I1	REFILL	After a failed ignition (flame did not appear), the fuel is automatically replenished for 30 % of the initial charging time and goes to phase S3.
I2	FLAME DISAPPEARED IN IGNITION STAGE	
I2.1	RETRY IGNITION	Re-ignition due to the disappearance of the flame during the ignition phase.
I3	NO FLAME IN STABILIZATION STAGE	
I3.1	RETRY IGNITION	Re-ignition due to the disappearance of the flame during the stabilization phase.
I9	ULTRASOUND SENSOR	The rotary valve has reached the position where feeder screw 2 should receive the command for operation, but the ultrasound sensor detects that there is enough fuel above the rotor of the rotary valve.
I10	TOO MUCH FUEL IN THE FIREBOX	The "combustion chamber (firebox) flap" has reached the "first limit height". For the description, see the item "DISPLAY OF FUEL SUPPLY PRINCIPLE" in these instructions.
I19	FLAME DISAPPEARED IN WORKING PHASE	
I19.1	RETRY IGNITION	Re-ignition due to the disappearance of the flame during the working phase (D2 - D6).
I80.1	CONTROL MOD 1, FEEDER SCREW 1	
I80.2	CURRENT RISE MOD 1, FEEDER SCREW 1	

I80.3	CURRENT TOO HIGH MOD 1, FEEDER SCREW 1	
I80.4	ASYMMETRY MOD 1, FEEDER SCREW 1	
I80.5	CURRENT TOO LOW MOD 1, FEEDER SCREW 1	
I80.6	UNWANTED CURRENT MOD 1, FEEDER SCREW 1	
I81.1	CONTROL MOD 2, ROTARY VALVE	
I81.2	CURRENT RISE MOD 2, ROTARY VALVE	
I81.3	CURRENT TOO HIGH MOD 2, ROTARY VALVE	
I81.4	ASYMMETRY MOD 2, ROTARY VALVE	
I81.5	CURRENT TOO LOW MOD 2, ROTARY VALVE	
I81.6	UNWANTED CURRENT MOD 2, ROTARY VALVE	
I82.1	CONTROL MOD 3, FEEDER SCREW 2	
I82.2	CURRENT RISE MOD 3, FEEDER SCREW 2	
I82.3	CURRENT TOO HIGH MOD 3, FEEDER SCREW 2	
I82.4	ASYMMETRY MOD 3, FEEDER SCREW 2	
I82.5	CURRENT TOO LOW MOD 3, FEEDER SCREW 2	
I82.6	UNWANTED CURRENT MOD 3, FEEDER SCREW 2	

7.0. STATISTIC





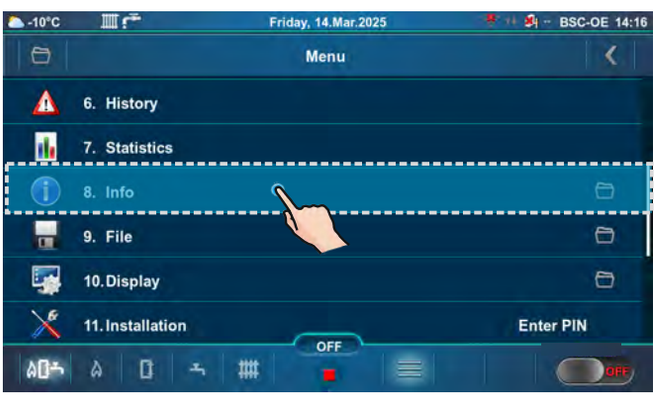
Statistics of boiler operation and certain parts:

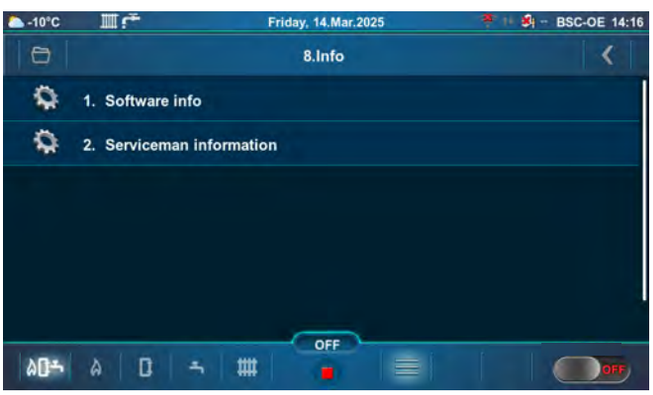
- Work and pause (S7-3) time of boiler (min)
- Work time of boiler (min)
- Starting
- Rotary valve
- Flame (min)
- Fan (min)
- Electric heater (min)
- Feeder screw 1
- Feeder screw 2
- D6 (min)
- D5 (min)
- D4 (min)
- D3 (min)
- D2 (min)
- D1 (min)
- D0 (min)

The controller follows the startup number of the boiler and the operation time of certain parts of the boiler.

8.0. INFO

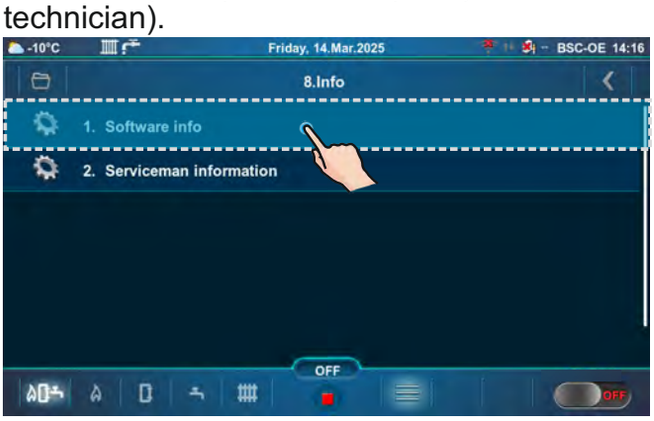
Menu with general information.





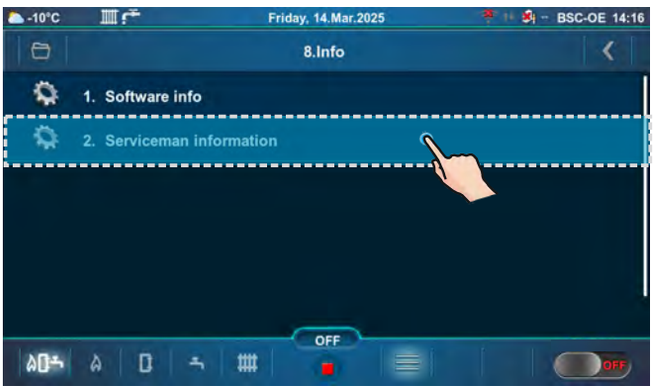
8.1. SOFTWARE INFO

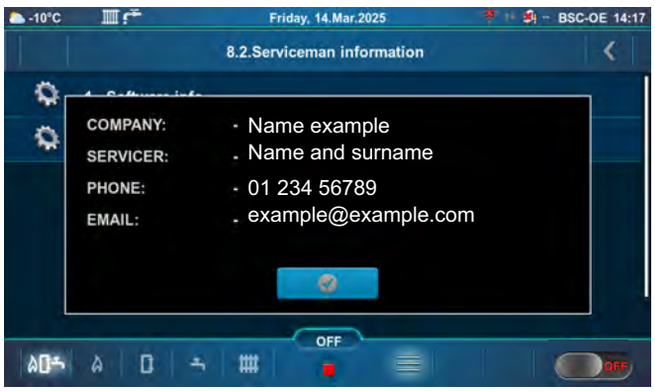
Software information (Boiler power, Software version, Wi-Fi ID, Active file, MB). (The active file can be a user (USR) or service (SRV) file that is selected in the File menu by user or authorized service technician).



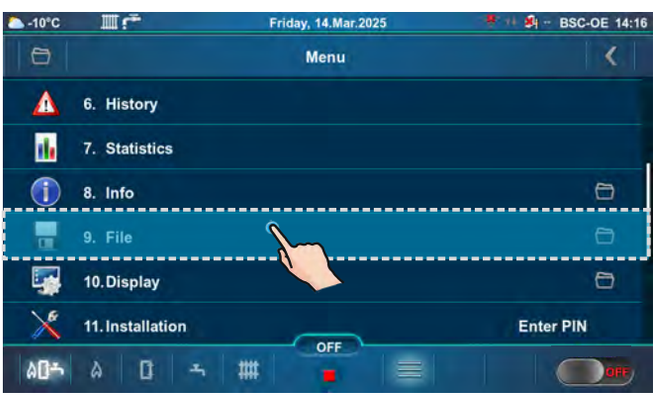
8.2. SERVICEMAN INFORMATION

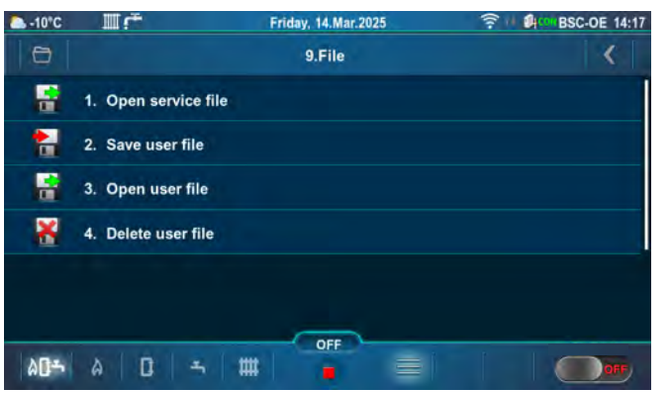
Information about the service technician (Company, Service technician, Telephone, Email). If the authorized service technician enters his data, a screen as below is displayed. If nothing is entered, only hyphens (-) are displayed.





9.0. FILE





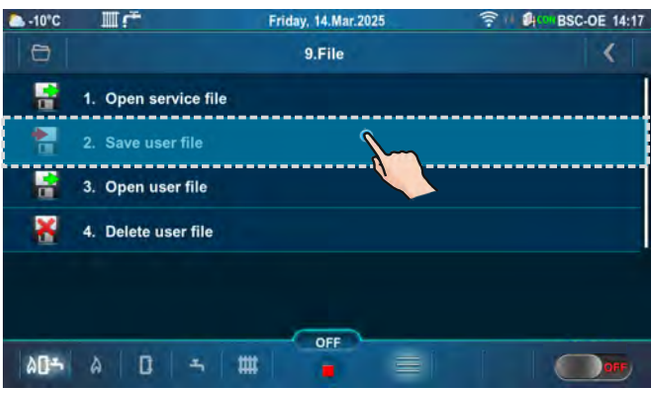
9.1. OPEN SERVICE FILE

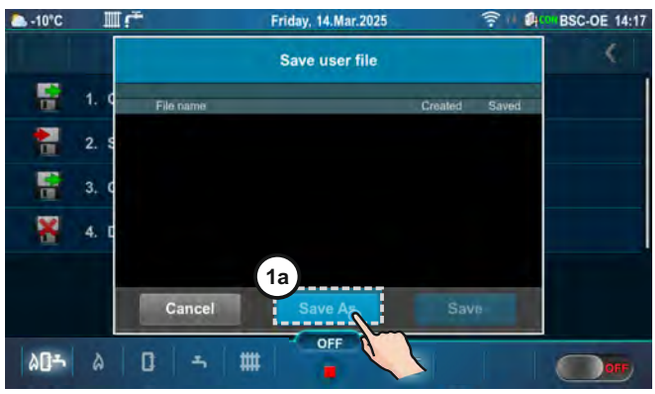
After pressing "Open service file", it is possible to choose and open the service file (press the "Open" button). Press the "Cancel" button to return to the submenu.

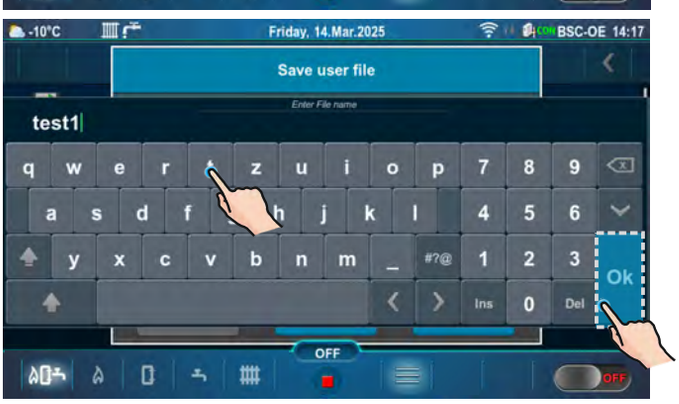
9.2. SAVE USER FILE

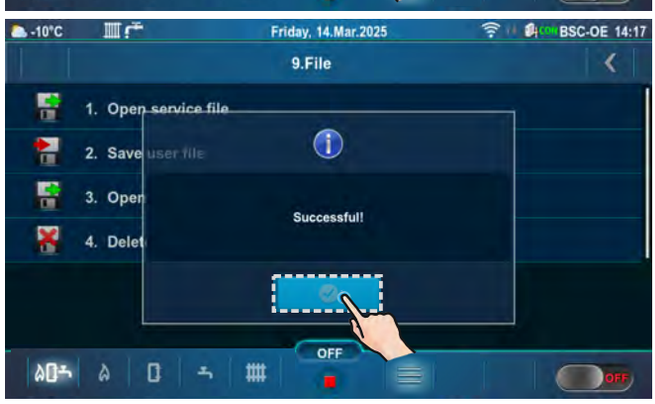
This option enables to save the changed user parameters in memory under the user file (it can be loaded later). The "Save As" option (1a, 1b) saves the current file as a new file and under a new name, while the "Save" option (2) saves the existing file (if exist in user memory) with the new settings. File which is active (selected) is marked with a green tick.

1a - Example if service technician did not save the user file.

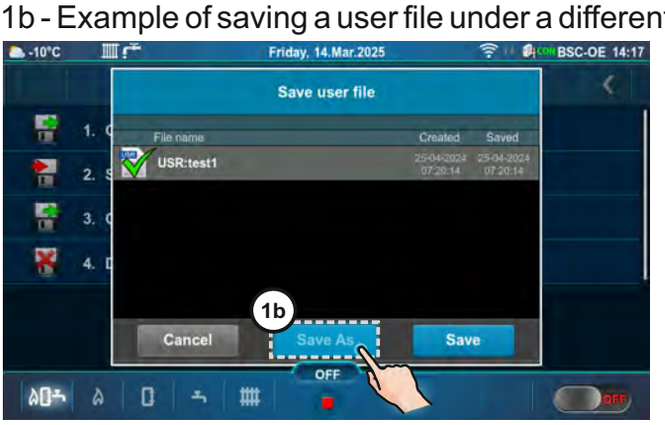


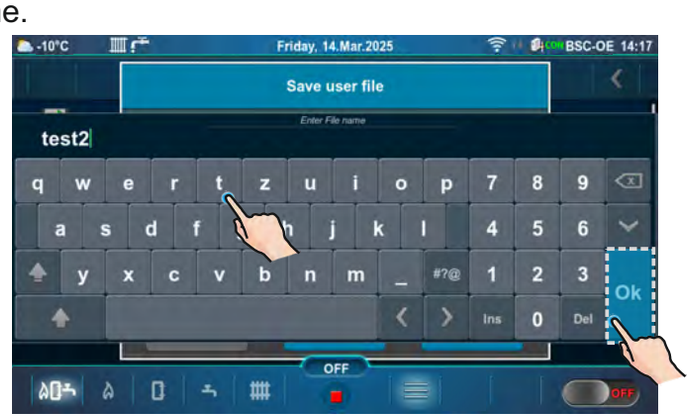


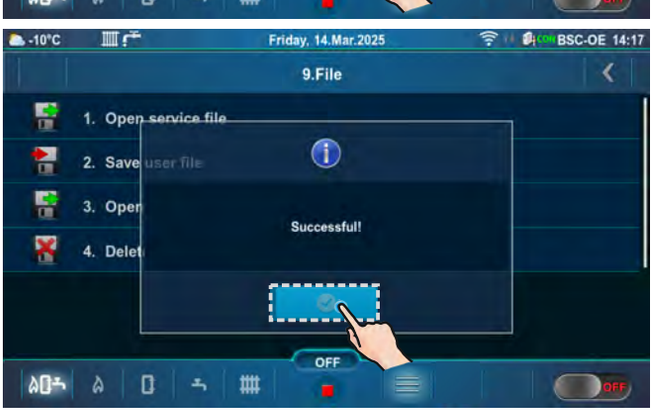


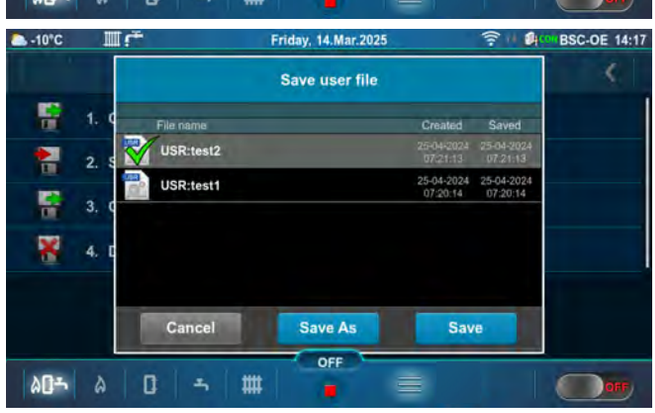


1b - Example of saving a user file under a different name.

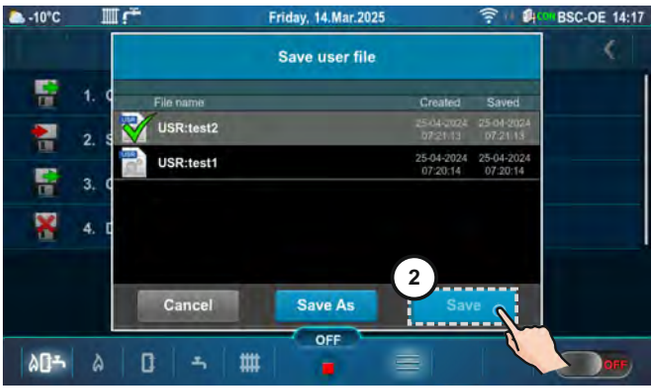


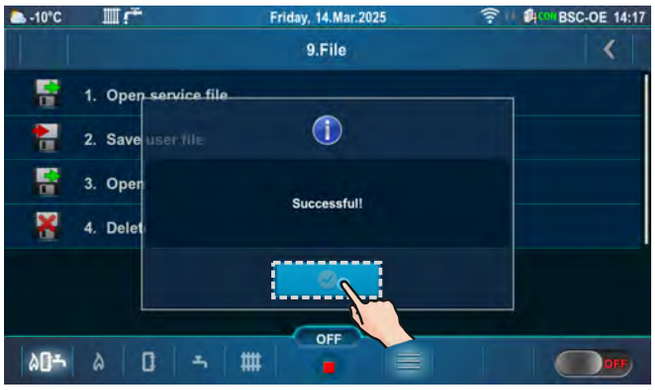






2 - Example of saving changes to an existing (active) file.

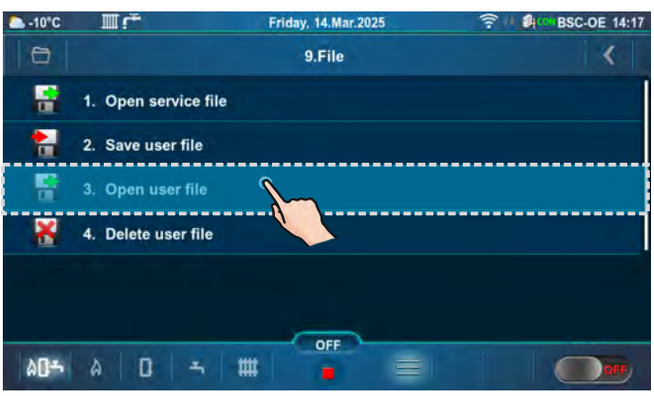


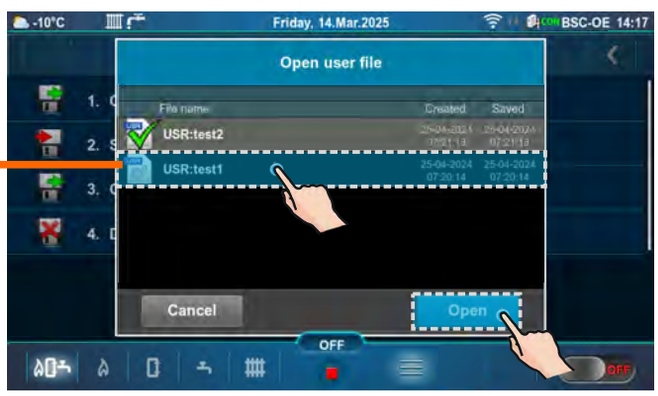


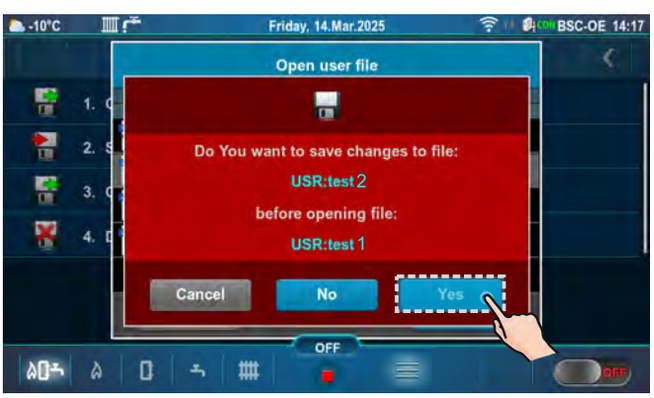
9.3. OPEN USER FILE

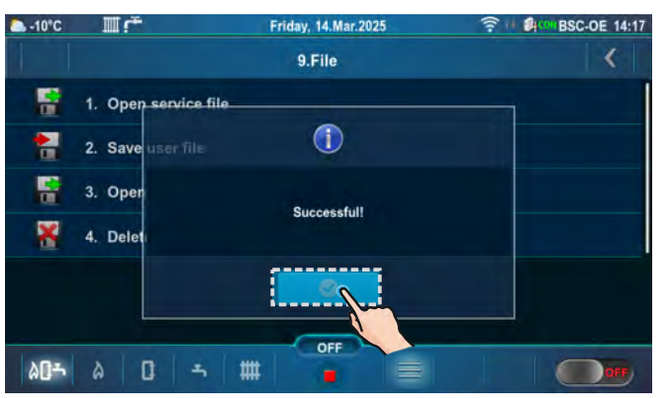
This option can be used to load saved settings from the user file. Appears only if "Save user file" has been done at least once. After pressing "Open user file" it is possible to choose and open user file (press the "Open" button). Press the "Cancel" button to return to the submenu. File which is active (selected) is marked with a green tick.

Example when multiple user files are saved and when was made a change in the active (selected) file.

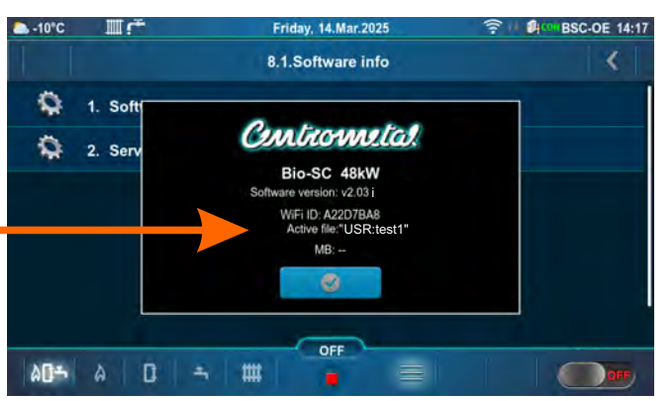








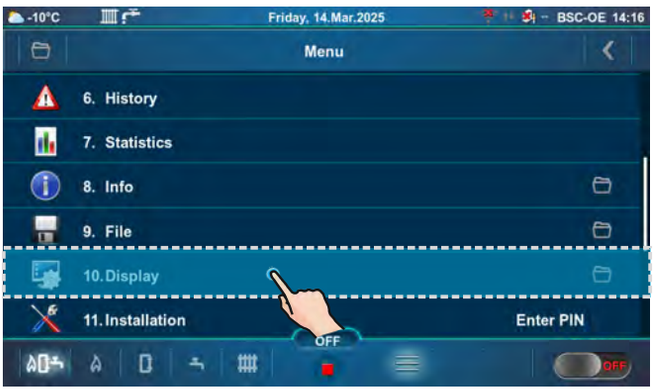
Active file (selected) is showed in menu 8.1. Software info.



9.4. DELETE USER FILE

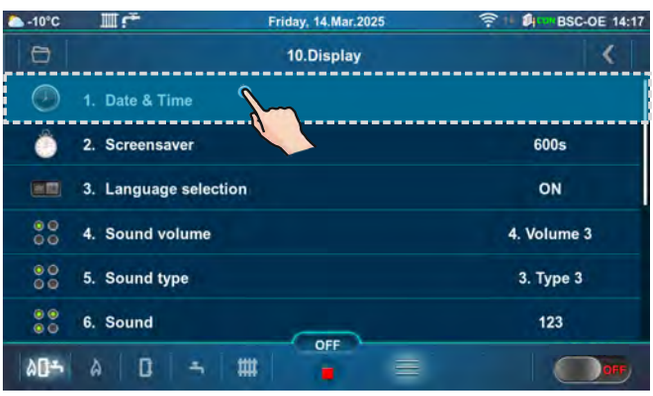
After pressing "Delete user file" it is possible to choose and delete user file (press the "Delete" button). Press the "Cancel" button to return to the submenu.

10.0. DISPLAY



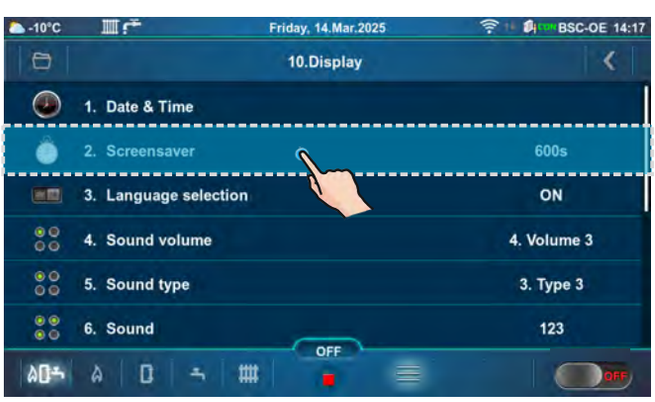
10.1. DATE & TIME

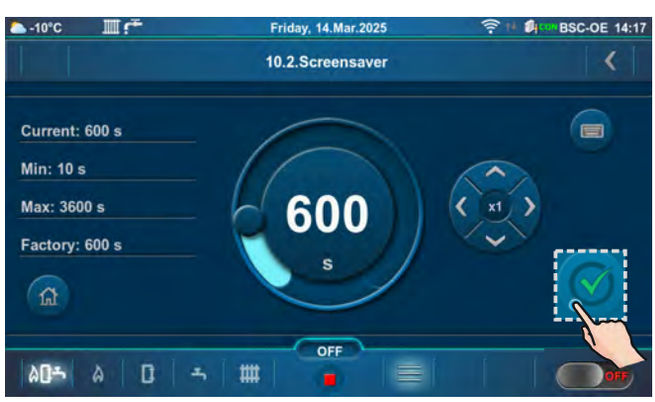
This option is used to set the date and time. Date and time information are necessary for operating programs, as well as for recording errors/warnings. Press "CONFIRM" button to save the settings. If the clock is late or reset to midnight, and the date is 01/01/2020, the battery must be changed (type CR1632). The clock may drift 2-3 minutes per month, which is normal. Periodic adjustment is recommended.



10.2. SCREENSAVER

If the screen is not pressed within the set time, the screensaver will be activated to protect the screen against screen burn. When the screen is touched, the screensaver will turn off.
Factory: 600 s
Possible selection: 10-3600 s



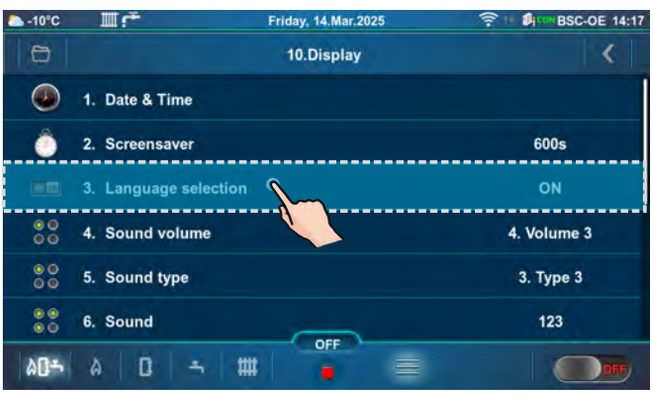


10.3. LANGUAGE SELECTION

This option enables or disables the display of the initial screen with the languages selection for controller when the "Main switch (0/1)" is activated. If option is disabled, after activating "Main switch (0/1)", the setting will appear in the predefined language and after a certain time the "Main screen (BSC-OE)" will appear.

Factory: ON

Possible selection: ON, OFF

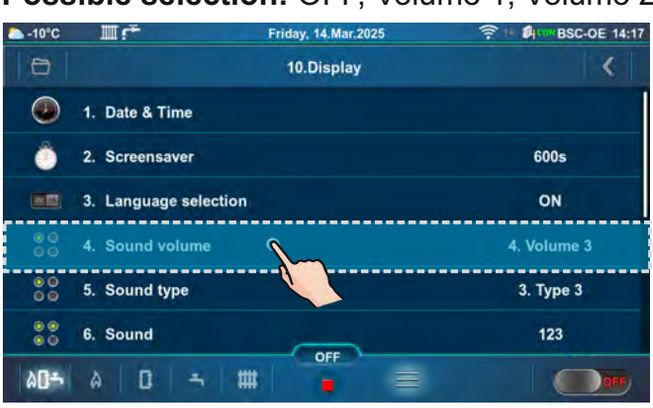


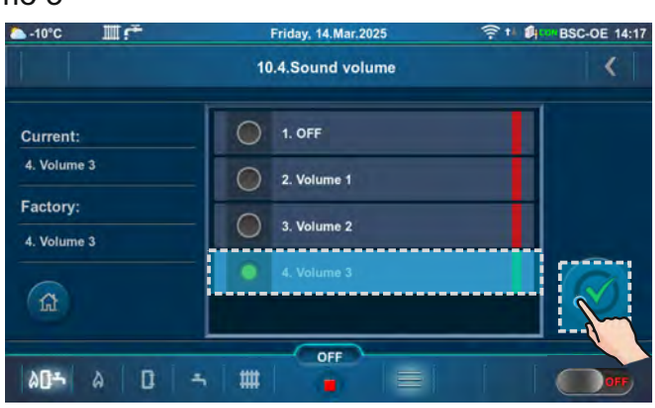
10.4. SOUND VOLUME

This option is used to set the speaker volume.

Factory: Volume 3

Possible selection: OFF, Volume 1, Volume 2, Volume 3



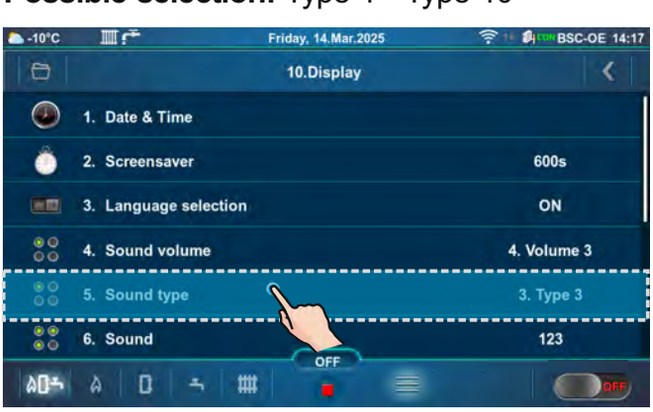


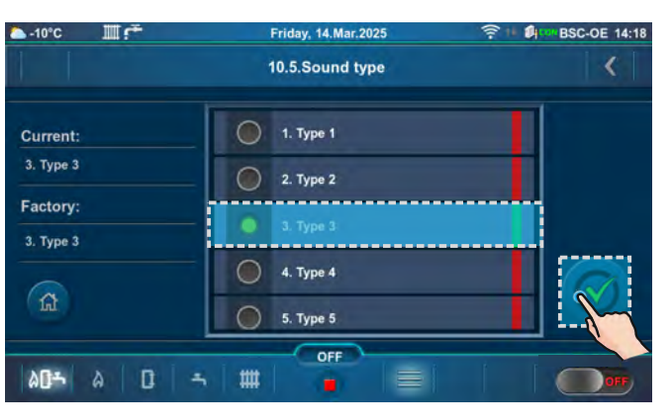
10.5. SOUND TYPE

This option is used to set sound type. It is possible to choose between 10 different types of sounds.

Factory: Type 3

Possible selection: Type 1 - Type 10





10.6. SOUND

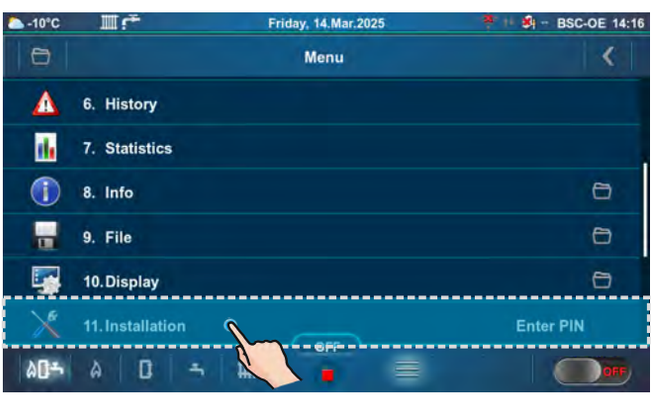
This option is used to enable/disable the controller sound for display, warnings, errors.

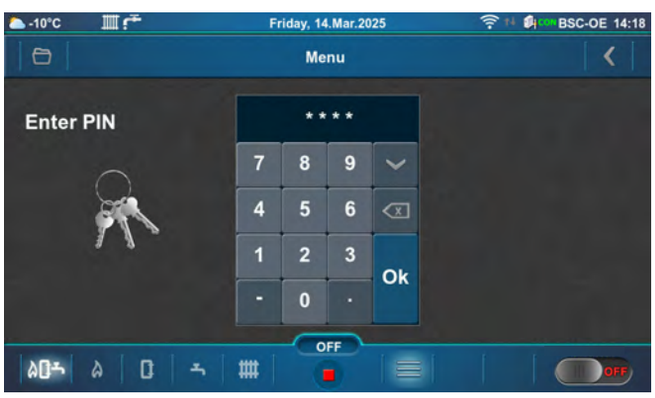
Factory: DISPLAY, WARNINGS, ERRORS

Possible selection: DISPLAY, WARNINGS, ERRORS

11.0. INSTALLATION

MENU FOR AUTHORIZED SERVICE TECHNICIANS ONLY.



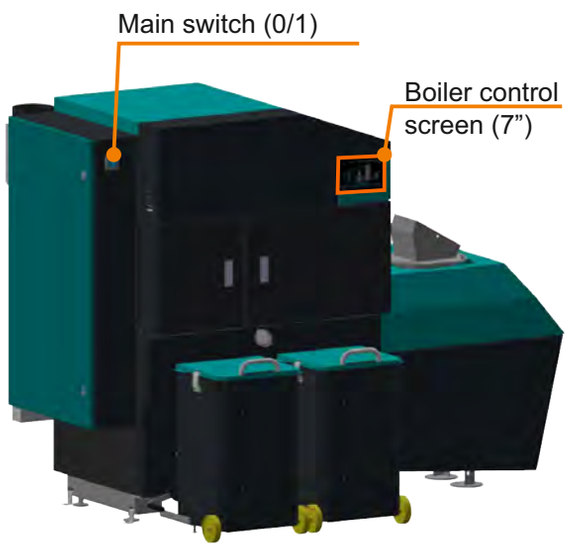


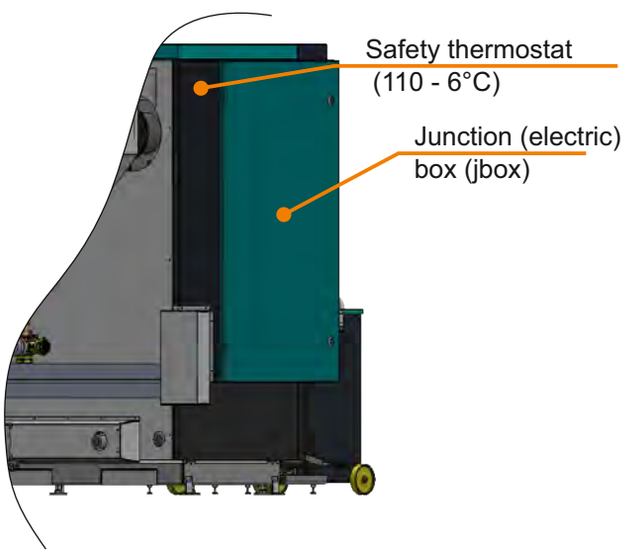
12.0. MALFUNCTION / IMPROPER BOILER OPERATION

12.1. SAFETY THERMOSTAT - boiler malfunction

The following error (E40 SAFETY THERMOSTAT) appears on the boiler controller screen the boiler behaves according to the description of the error E40. The cause of this error is a too high water temperature in the boiler (above 104°C), and the safety thermostat interrupts the operation of the flue gas fan, feeder screw-1 and rotary valve (RSE).

To reactivate the safety thermostat (STB), it is necessary to do the following:
- wait until the boiler temperature drops below 70 °C.
- unscrew and take off the safety thermostat lid (detail A).
- press the thermostat restart button (detail B).
- if the same problem occurs again during the first next boiler firing or if it occurs frequently, ask an advice from the authorized technician.





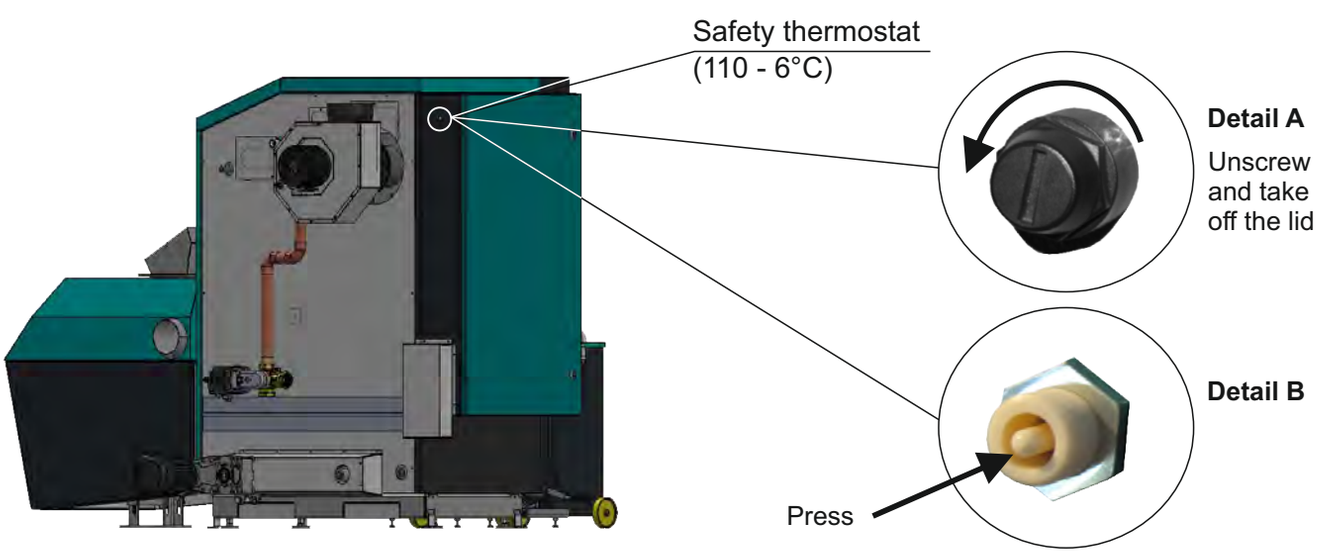


TABLE OF RESISTANCES OF
NTC 5K/25°C SENSOR
Measuring range from -20 to +130 °C
Used as:
Boiler temperature sensor,
DHW temperature sensor,
Main flow temperature sensor,
Return flow temperature sensor.

Temperature (°C)	Resistance (Ω)
-20	48.535
-15	36.465
-10	27.665
-5	21.158
0	16.325
5	12.694
10	9.950
15	7.854
20	6.245
25	5.000
30	4.028
35	3.266
40	2.663
45	2.184
50	1.801
55	1.493
60	1.244
65	1.041
70	876,0
75	740,7
80	629,0
85	536,2
90	458,8
95	394,3
100	340,0
105	294,3
110	255,6
115	222,7
120	190,7
125	170,8
130	150,5

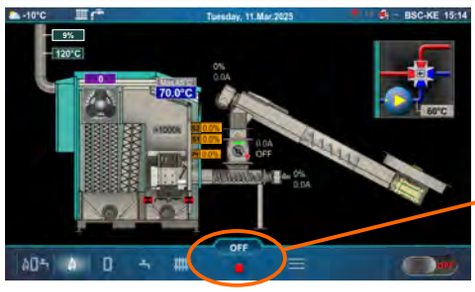
TABLE OF RESISTANCES OF PT1000 SENSOR
Measuring range from -30 to +400 °C
Used as:
Flue gas temperature sensor

Temp. (°C)	Resistance (Ω)
-30	885
-25	904
-20	923
-15	942
-10	962
-5	981
0	1.000
5	1.019
10	1.039
15	1.058
20	1.077
25	1.096
30	1.116
35	1.135
40	1.154
45	1.173
50	1.193
55	1.212
60	1.231
65	1.250
70	1.270
75	1.289
80	1.308
85	1.327
90	1.347
95	1.366
100	1.385
105	1.404
110	1.424
115	1.443
120	1.462
125	1.481
130	1.501
135	1.520
140	1.539
145	1.558
150	1.578
155	1.597
160	1.161
165	1.635
170	1.655
175	1.674
180	1.693
185	1.712

Temp (°C)	Resistance (Ω)
190	1.732
195	1.751
200	1.770
205	1.789
210	1.809
215	1.828
220	1.847
225	1.866
230	1.886
235	1.905
240	1.924
245	1.943
250	1.963
255	1.982
260	2.001
265	2.020
270	2.040
275	2.059
280	2.078
285	2.097
290	2.117
295	2.136
300	2.155
305	2.174
310	2.194
315	2.213
320	2.323
325	2.251
330	2.271
335	2.290
340	2.309
345	2.328
350	2.348
355	2.367
360	2.386
365	2.405
370	2.425
375	2.444
380	2.463
385	2.482
390	2.502
395	2.521
400	2.540

OPERATION STAGES (SHOWN ON THE SCREEN)

IMPORTANT!
Automatic resumption of boiler operation after power failure (PF phases) is not possible if language selection option is turned ON.
To disable option "Language selection" see point "Language selection".



Stage	Description
OFF	Boiler is switched off.
S0	Initial fan blowing, waiting for the grate initial position.
S1	Not used.
S2	Initial pellet filling.
S3	Waiting for flame to appear.
S4	Electric heater working after flame appears.
S5	Flame developing stage.
SP1	Stabilization stage 1.
SP2	Stabilization stage 2.
SP3	Stabilization stage 3.
S6	Additional flame developing stage.
D0	Power D0
D1	Power D1
D2	Power D2
D3	Power D3
D4	Power D4
D5	Power D5
D6	Power D6
S7	Shutdown stage.
S7-1	1st shutdown stage, waiting for the flame to disappear, after that stage S7-2 starts. The flue gas fan operates at the speed (rpm), which had before entering the S7-1 stage.
S7-2	2nd shutdown stage, which lasts the factory-set time. The flue gas fan operates at maximum speed. After this stage, cleaning of the grate begins and transition to stage S7-3.
S7-3	The burner is turned off, the boiler goes into standby mode and waits for the request to start.
PF0	PF0 stage after power supply return, the electric heater activates and waits for the flame, flame appears -> PF1, there is no flame -> Pf4.
PF1	Electric heater switches off and enters PF2.
PF2	Flame developing stage, enter PF3.
PF3	Waits for flame to disappear, enter Pf4.
PF4	Final fan blowing, the boiler goes to "ON" and starts operating or is switched to "OFF" (depending on the request of the boiler).
C0	Grate cleaning stage.

POWER MODULATION PRINCIPLE

Modulation - power decrease:
D6==>**D5** (Tb=Tbmax – 7,0°C),
D5==>**D4** (Tb=Tbmax – 6,0°C),
D4==>**D3** (Tb=Tbmax – 5,0°C),
D3==>**D2** (Tb=Tbmax – 4,0°C),
D2==>**D1** (Tb=Tbmax – 3,0°C),
D1==>**D0** (Tb=Tbmax – 1,5°C),
D0==>**S7-1** (Tb=Tbmax),

D6==>**D5** ((Tbmax-Tret)=/< 12°C),
D5==>**D4** ((Tbmax-Tret)=/< 10°C),
D4==>**D3** ((Tbmax-Tret)=/< 8°C),
D3==>**D2** ((Tbmax-Tret)=/< 6°C),
D2==>**D1** ((Tbmax-Tret)=/< 4,5°C),

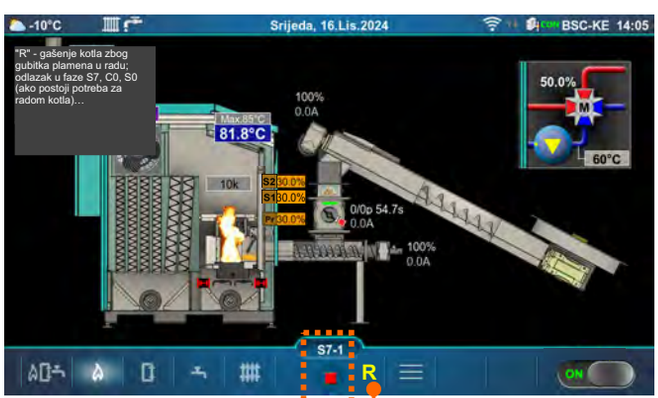
Legend:
Tbmax - set boiler temperature
Tb - measured water temperature in the boiler
Tret - measured temperature of return water to the boiler
D0…D6, S7-1 - operating phases

Note: The request to reduce to a lower power has priority.

Modulation - power increase:
D0==>**D1** (Tb=Tbmax – 1,5°C),
D1==>**D2** (Tb=Tbmax – 3,0°C),
D2==>**D3** (Tb=Tbmax – 4,0°C),
D3==>**D4** (Tb=Tbmax – 5,0°C),
D4==>**D5** (Tb=Tbmax - 6,0°C),
D5==>**D6** (Tb=Tbmax - 7,0°C)

MARKS ON THE SCREEN - the boiler goes into the shutdown phase, perform a certain activity and continues to operate if necessary

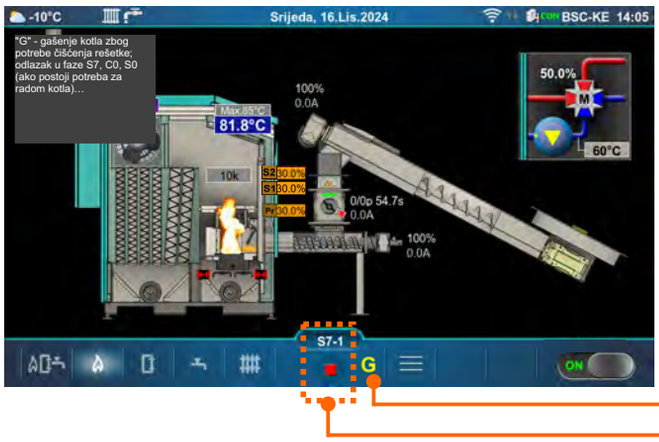
"R" - shutting down the boiler due to loss of flame during operation; going into phases S7-1, S7-2, C0, (S7-3), S0 (if there is a need to operate the boiler)...



"R" mark is blinking

Operating phases: S7-1, S7-2, C0, (S7-3).

"G" - shutting down the boiler due to the need to clean the grate; boiler going to phases S7-1, S7-2, C0, (S7-3), (S0) (if there is a need to operate the boiler)...



"G" mark is blinking

Operating phases: S7-1, S7-2, C0, (S7-3).

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