

Angus Orligno 100 Multi Fuel Boiler

Installation, Operation and Maintenance Manual



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1. Boiler application

The Orligno 100 steel boiler is tested according to EN 303-5 and is designed for central heating installations with a maximum temperature on the boiler of 90°C and a working pressure of 3 bar.

Recommended fuel for boiler: wood, coke, coal and in the case of mounting pellet burner – pellets.



WARNING!

Using fuel different than the recommended does not guarantee optimum boiler operation and achieving parameters featured in the technical data. It can also affect the durability of the boiler and its components.



WARNING!

Using a fuel different than the recommended is treated as wrong boiler operation and resultant performance irregularities cannot be a reason for any complaints.

2. Installation

2.1 Boiler room ventilation

According to European safety regulations each boiler room should have supply-exhaust ventilation ensuring correct boiler operation and user's safety. Lack of ventilation or its obstruction is the main reason of incorrect boiler operation (i.e. boiler cannot reach set temperature). Exhaust ventilation removes used air and harmful gases from the boiler room. A boiler room with natural ventilation cannot have installed mechanical ventilation.

2.2 Air supply ventilation

1. Ventilating duct section should have at least 50% area of chimney's section and not less than 20 x 20cm. Duct should be placed 1m above the floor.
2. Ventilating duct should have installed device for air flow control; device shouldn't limit duct section above 1/5. Ventilating duct should be made of non-flammable material.

2.3 Exhaust ventilation

1. Exhaust duct should be made of bricks with section of at least 25% of chimney section not less 14 x 14 cm. Inlet hole cannot have any devices that reduce its section. Outlet hole should be placed close to the ceiling led out 1.5m above the roof. Ventilating duct should be made of a non-flammable material.
2. The minimum height of the boiler room should be 2.2m.

2.4 Chimney connection

Chimney ducts should be installed according to binding rules and norms in countries to which boilers are sold. The part of a chimney system connecting the boiler with the chimney is called a flue. In order to lower flow resistance of exhaust gases this part should lead as a straight pipe with, if necessary, joints of up to 45°.

Because of the exhaust gases temperature, Orligno 100's need to be connected to heat-resistant material. 30cm above the floor closing door should be installed with tight closing.

Chimney section should be round or close to square shape because of low flow resistance.

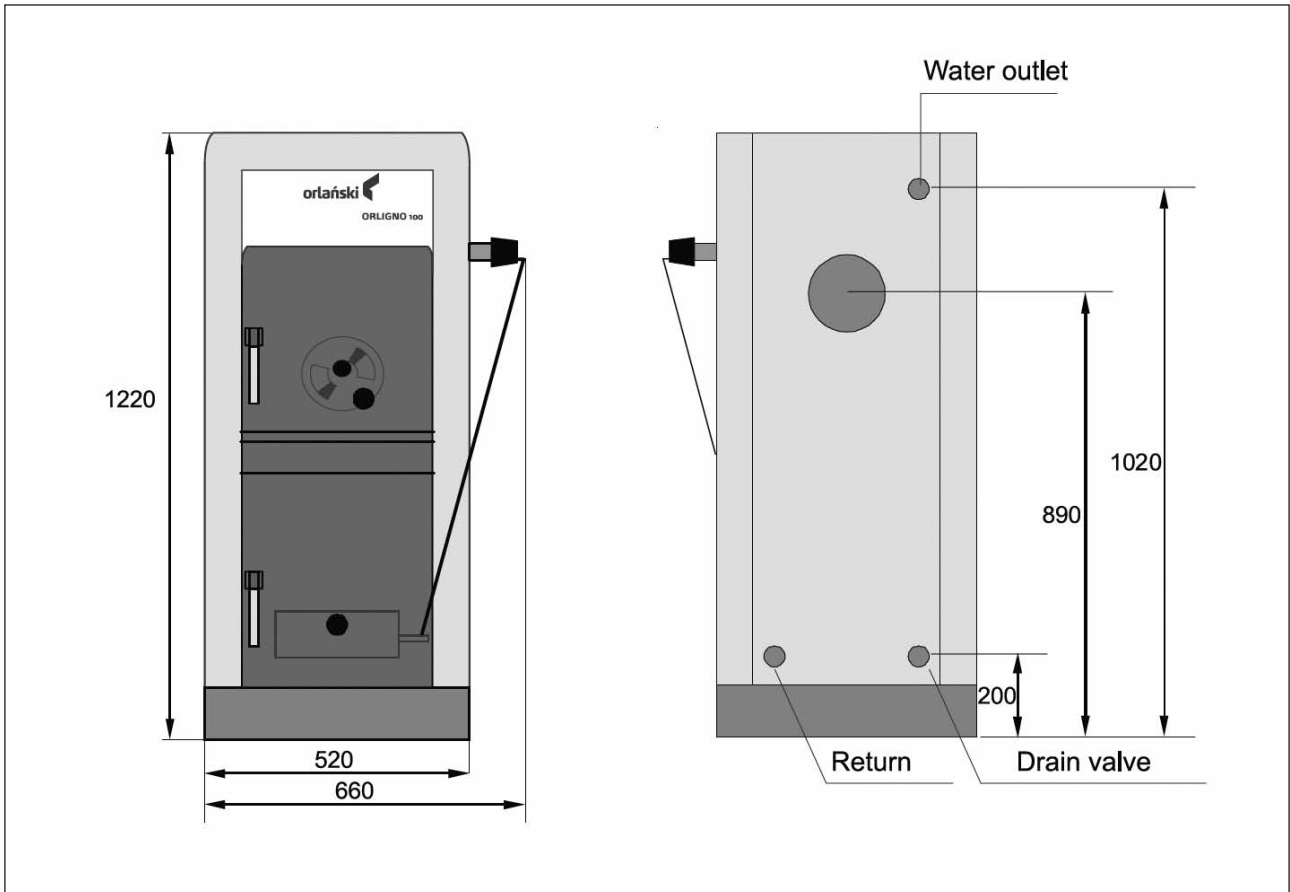
The minimum flue diameter should be 160mm.

Chimney should lead to above the roof. Chimney outlet location is dependent on roof pitch and its combustibility.

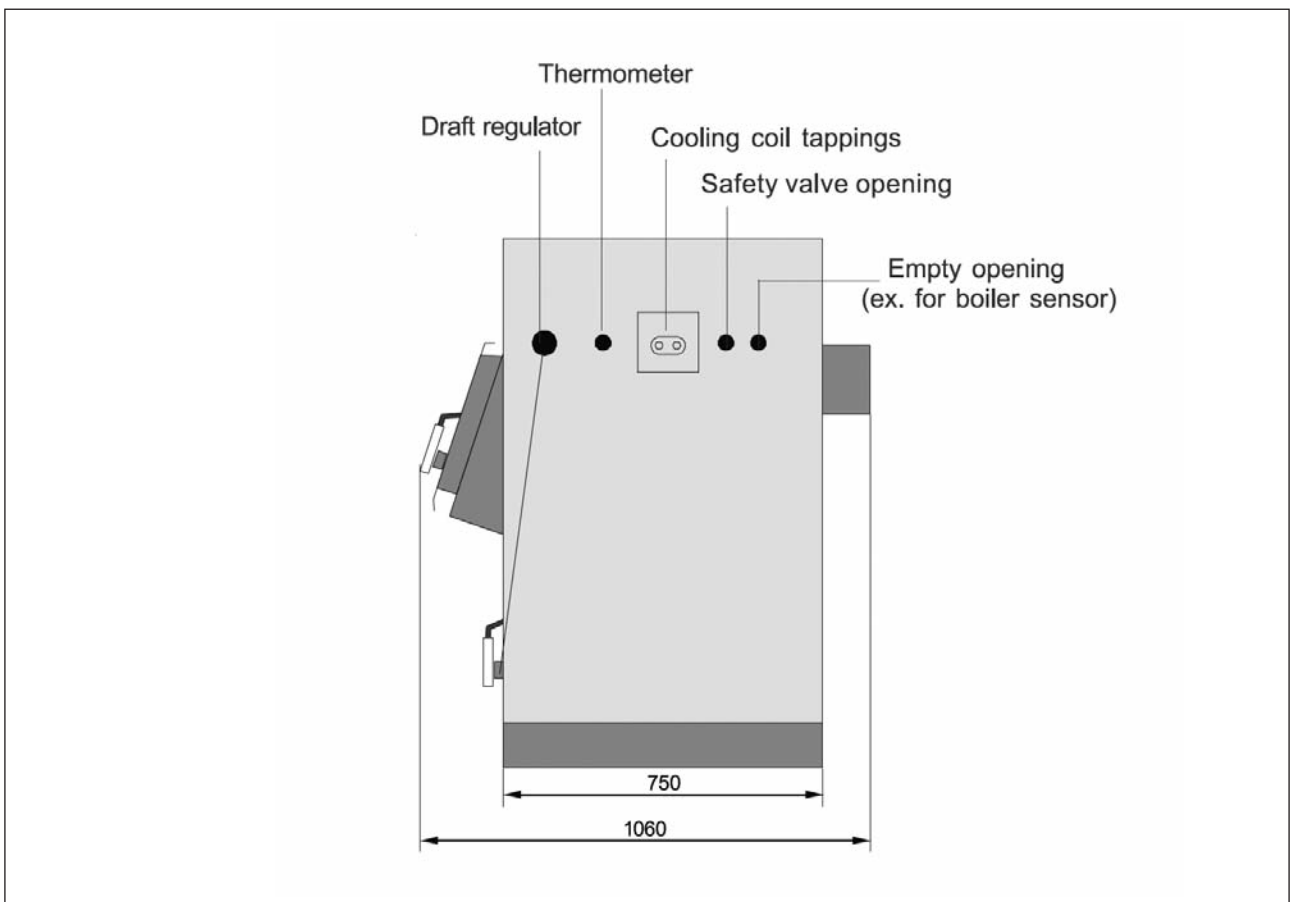
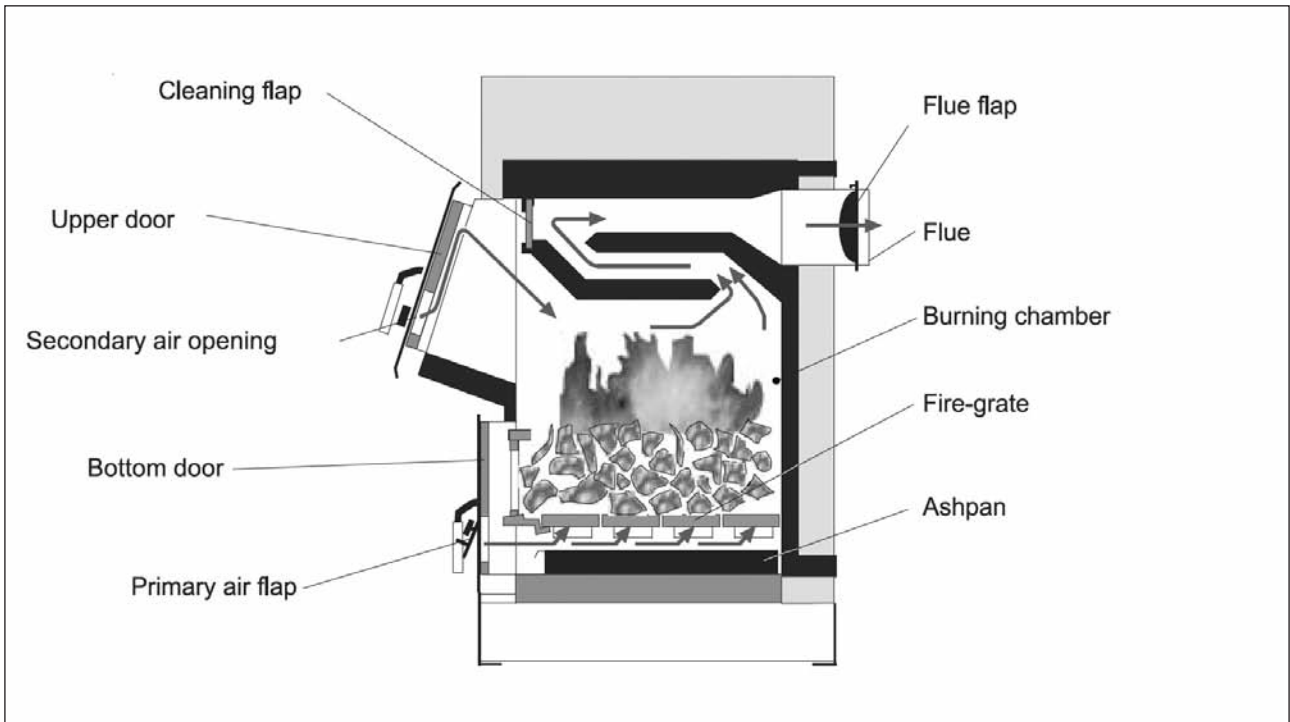
3. Orlingo 100 – technical data

Power	wood coke/pellets	kW	22 30/16
Boiler class acc. to EN-303-5	3		
Efficiency	coke pellets	%	76.5 86
Max. working pressure	bar		3
Max. temperature	°C		90
Min. temperature	°C		60
Water capacity	ltr.		60
Weight	kg		305
Loading chamber capacity	ltr.		70
Length	mm		1100
Width	mm		675
Height	mm		1220
Upper door dimensions	mm		300x300
Water outlet	inner thread	inch	5/4"
Return	inner thread	inch	5/4"
Drain valve	inner thread	inch	1/2"
Cooling coil	inner thread	inch	1/2"
Min. cooling coil pressure	bar		2
Flue diameter	mm		160
Required chimney draught	Pa		20
Max. moisture content	wood/pellets	%	23/12
Exhaust gases temperature at nominal power	°C		250-280
Burning period at nominal power	coke	h	4.5
	wood	h	2-2.5
Fuel parameters	wood/max. length	mm	500
	pellets/diameter	mm	6-8
Water resistance	$\Delta t=20$ K	mbar	0.8
	$\Delta t=10$ K	mbar	3.4

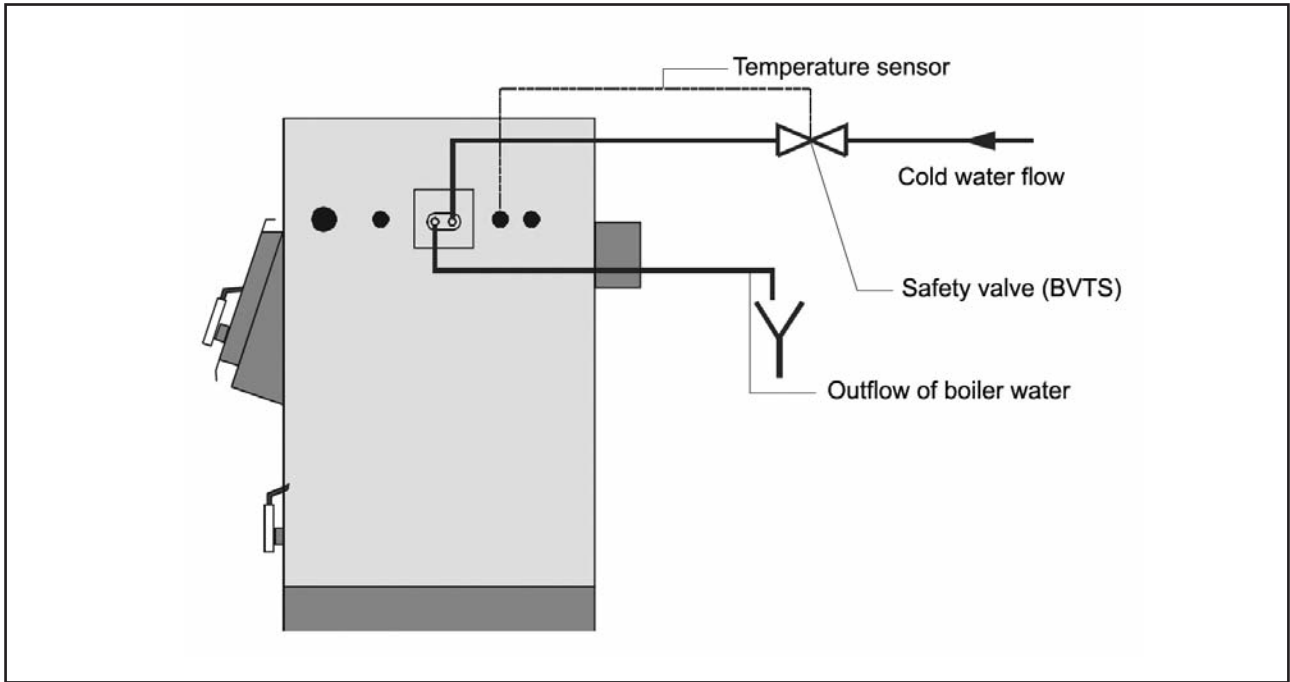
3.1 Dimensions



3.2 Boiler construction

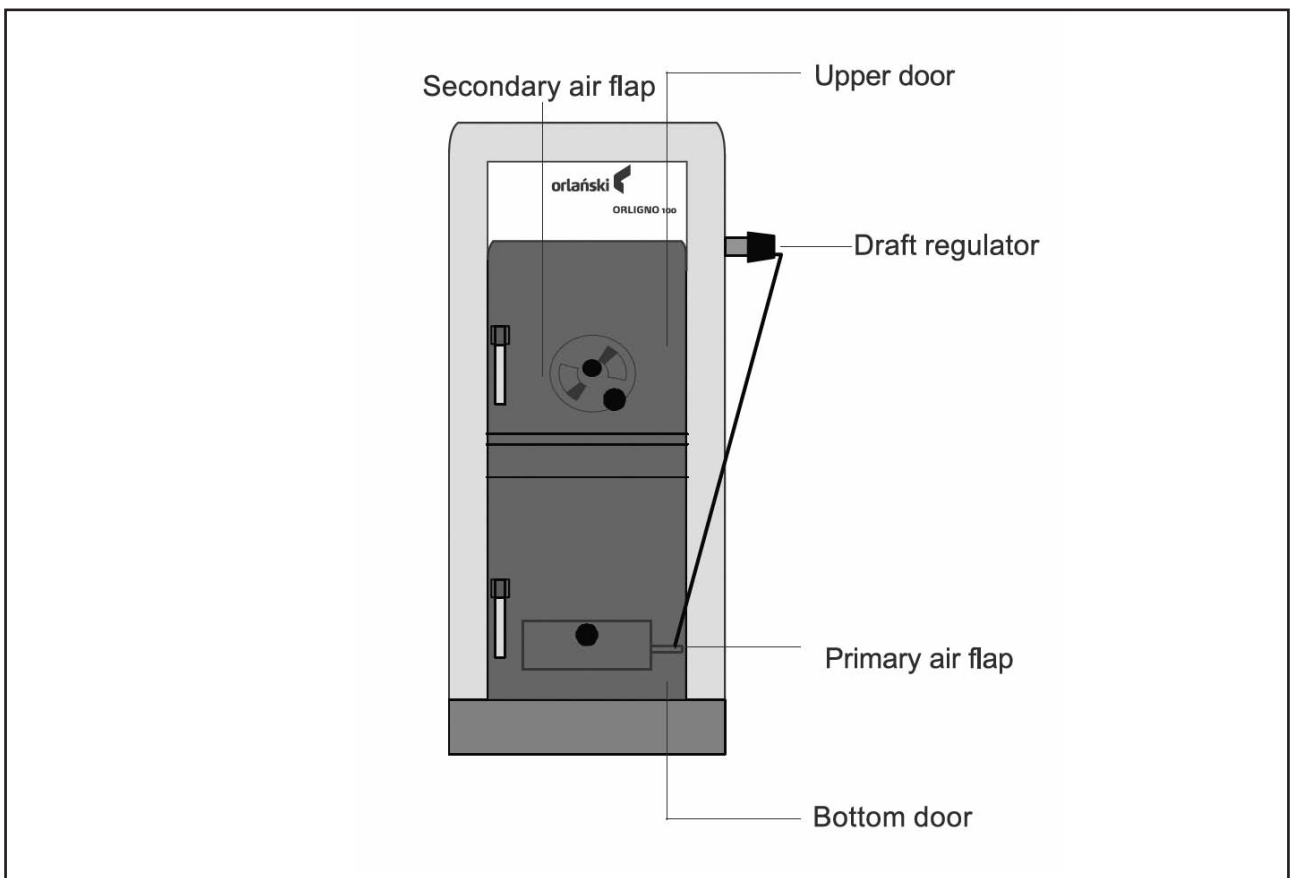


3.3 Safety valve connection



The Orligno 100 is equipped with a copper cooling coil mounted in the boiler body, protecting the boiler from overheating. To one of cooling coil tapings on right side of the boiler you should connect the safety valve.

When the temperature increases above 95°C a safety valve opens and lets in cold water through the cooling coil. Water from the mains at 10°C cools down the boiler, water from the boiler is then drained.



4. Boiler startup

Before first startup it is necessary to:

- Check water level on installation, pressure on installation should be 2 bar.
- Check fire-grate location (fire-grate gaps at the bottom should be larger than at the top).
- Draught regulator seal with oakum and mount, fit arm and block with screw.

Startup:

- Mount ventilation regulator horizontally with the regulator set to 70°C.
- Open flue flap.
- Put some paper and small pieces of wood on fire-grate and open bottom door.
- After igniting, place larger logs on and create an ember layer (close bottom door and unscrew primary air flap – opening in flap should be at least 2cm – regulation knob is located on bottom door).
- After creating ember layer, fully load boiler with wood or coke. Insert logs along chamber.
- Set chimney ventilation with flue flap.
- Connect ventilation regulator chain with primary air flap. Once the boiler has reached 70°C then set ventilation regulator to 70°C and shorten chain until primary air flap is open slightly. Draught regulator knob is for adjusting temperature. Markings on regulator are in 10°C increments.



WARNING!

Before stoking boiler slowly open upper door to remove gases.



WARNING!

It is not allowed to open bottom door during boiler burning – embers may fall out.

Secondary air settings:

- Wood opening 1/2".
- Coke opening 1/4".

Troubleshooting

Reason	Activity
Heat exchanger gets dirty too fast	Use good quality wood with a moisture content of between 18 and 23%.
Smoke leakage	Seal chimney pipe, increase flue flap opening, check chimney ventilation.
Temperature of exhaust gases too high	Check fuel moisture content – it cannot be too dry. Check secondary air settings.
Too short burning period	Exhaust gases temperature too high – burning period depends on fuel used and heat demand.

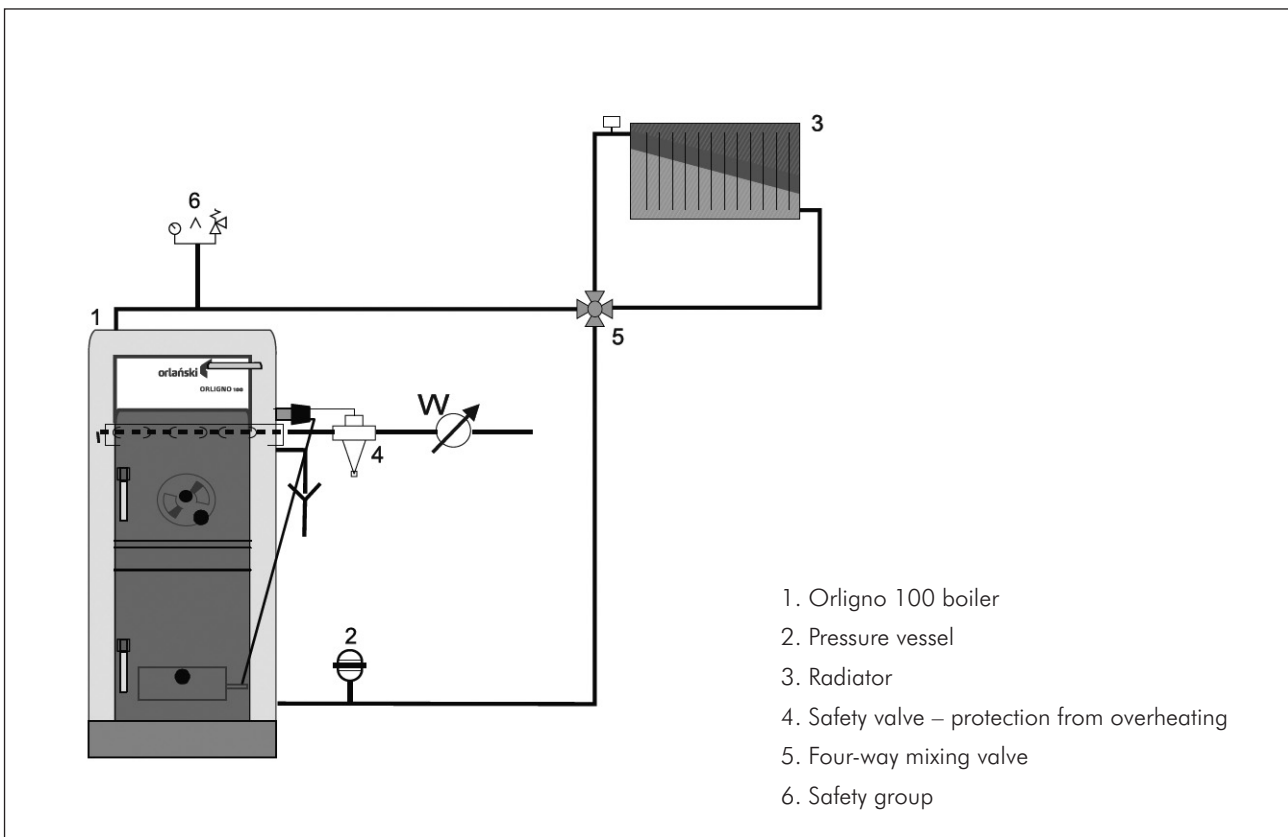
4.1 Boiler stoking

In order to stoke boiler:

1. Close primary air flap.
2. Open flue flap completely.
3. Open upper door slightly in order to expel gases through chimney.
4. Open upper door completely and stoke boiler.
5. Close upper door, return to previous setting of flue flap and primary air.

4.2 Tarring and condensation

Igniting a cold boiler may cause water precipitated from fuel on boiler walls running down to the ash chamber. This may look like boiler leakage. It is important to keep the boiler temperature to at least 70°C. It is recommended to install a four-way mixing valve which protects the boiler from low temperature return to below 50°C. If the wood is too damp this may lead to tarring at low temperatures. In order to avoid the problem of tarring and condensation – keep the boiler temperature high. The boiler must be properly sized to heated space to avoid oversizing – boiler will then operate at lower temperatures.



1. Orligno 100 boiler
2. Pressure vessel
3. Radiator
4. Safety valve – protection from overheating
5. Four-way mixing valve
6. Safety group

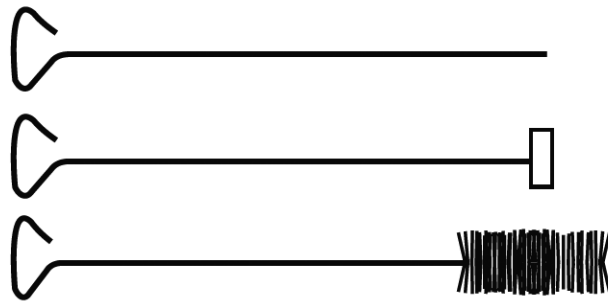
5. Maintenance



WARNING!

Advice: A clean boiler works more efficiently and the boiler life is extended.

- Fire-grate and ash – remove/clean daily.
- Boiler must be cool during cleaning.
- Open upper door and remove cleaning flap.
- Check if heat exchanger surfaces are dirty and if so clean with the brush.
- Remove ash from bottom chamber (ashpan may be hot).
- Fit cleaning flap.
- Clean boiler every 2-4 weeks depending on burning intensity.




1. Basic information

1.1 Construction description and burner application

The self-cleaning burner is a new approach in the automatic burning of solid fuels in Europe – pellets of 6-8mm in diameter maintain low emissions – complying with European norms.

The burner doesn't have any drawbacks of chute burners –gravitational, in which ash and sinter have to be removed manually.

The main burner advantage is its simplicity: just fill the hopper with pellets and press ON/OFF  button. Reports are shown on the big graphic display. Within a few minutes the burner will automatically select work parameters, maintaining constant room temperature and hot water.

Burner's features:

- Automatic start of burner.
- Automatic modulation.
- Flame control through photo-cell.
- Low heat inertness during start and stop.
- Low electricity energy consumption.
- Possibility to control 16 heating circuits (radiators and underfloor heating or hot water) – option.
- Control of burner's temperature.
- Three phases of lighting-up eliminate risk of explosions.
- AUTOSTART function after power failure – last settings stored in the memory.
- Separation of primary and secondary air – emissions on the same level as gas and oil burners.
- Efficiency > 94.5%.
- Soot = 0.
- Self-cleaning function, automatically removes ash from the burner's grate.

2 year warranty for appliance durability – decreasing exploitation and service costs.

Burner's regulator can control:

- Boiler pump.
- 1-16 heating circuits (radiators or underfloor heating) controlled according to outside temperature.
- Room temperatures.

1.2. Fuel characteristics

a) Pellet granules made according to DIN 51731

- Granules 5-8mm.
- Recommended calorific value 17,500-19,500 kJ/kg.
- Ash content 1.5%.
- Maximum moisture content 12%.
- Density 1-1.4 kg/dm³.



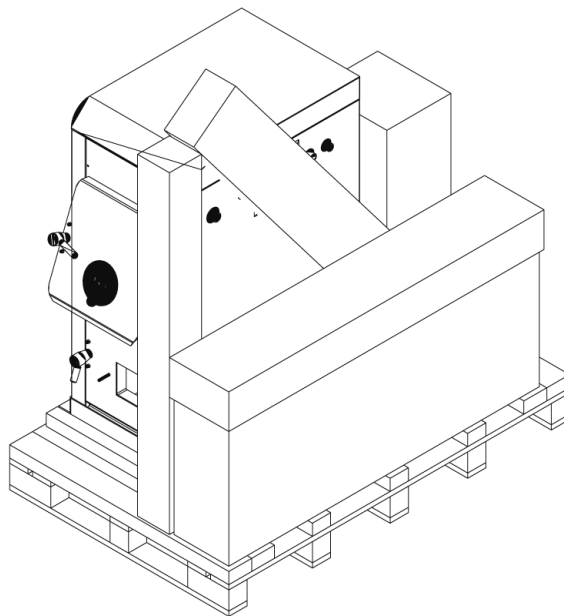
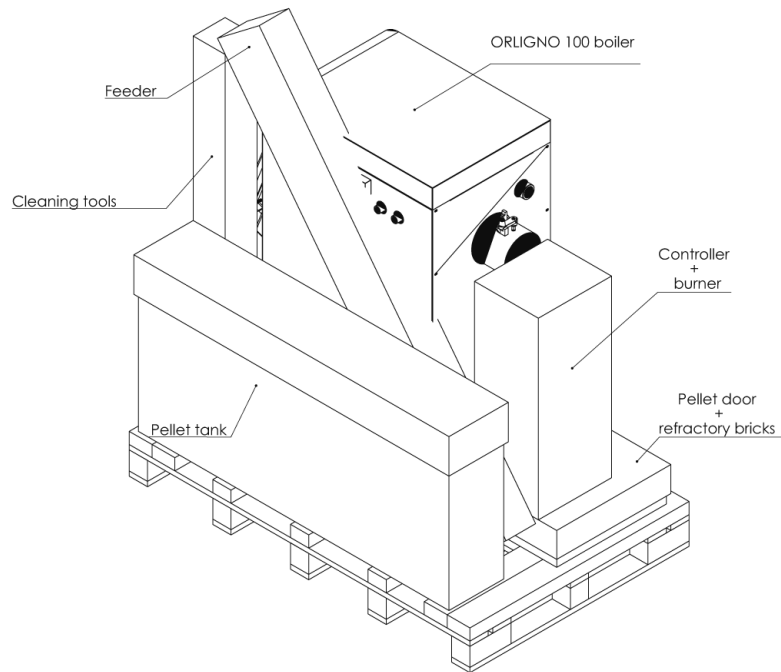
WARNING!

It is recommended to use fuel from reliable sources. Fuel should have appropriate humidity and low content of small fractions. It is necessary to pay special attention to mechanical pollution (stones), which reduce the burning process and may lead to the burner's failure.

Eko-Vimar Orlański sp. z.o.o. is not responsible for appliance failure or improper burning process when using inappropriate fuel.

1.3 Transport and delivery specification

During transportation the burner should be secured with straps to avoid leaning and movement. The burner needs to be stored in a roofed and dry place. The burner is delivered in separate boxes wrapped in foil. Boxes contain: pellet tank with lid, fuel feeder, burner with controller and elastic feeding pipe. Before installation it is recommended to check you have all the components and also their condition.



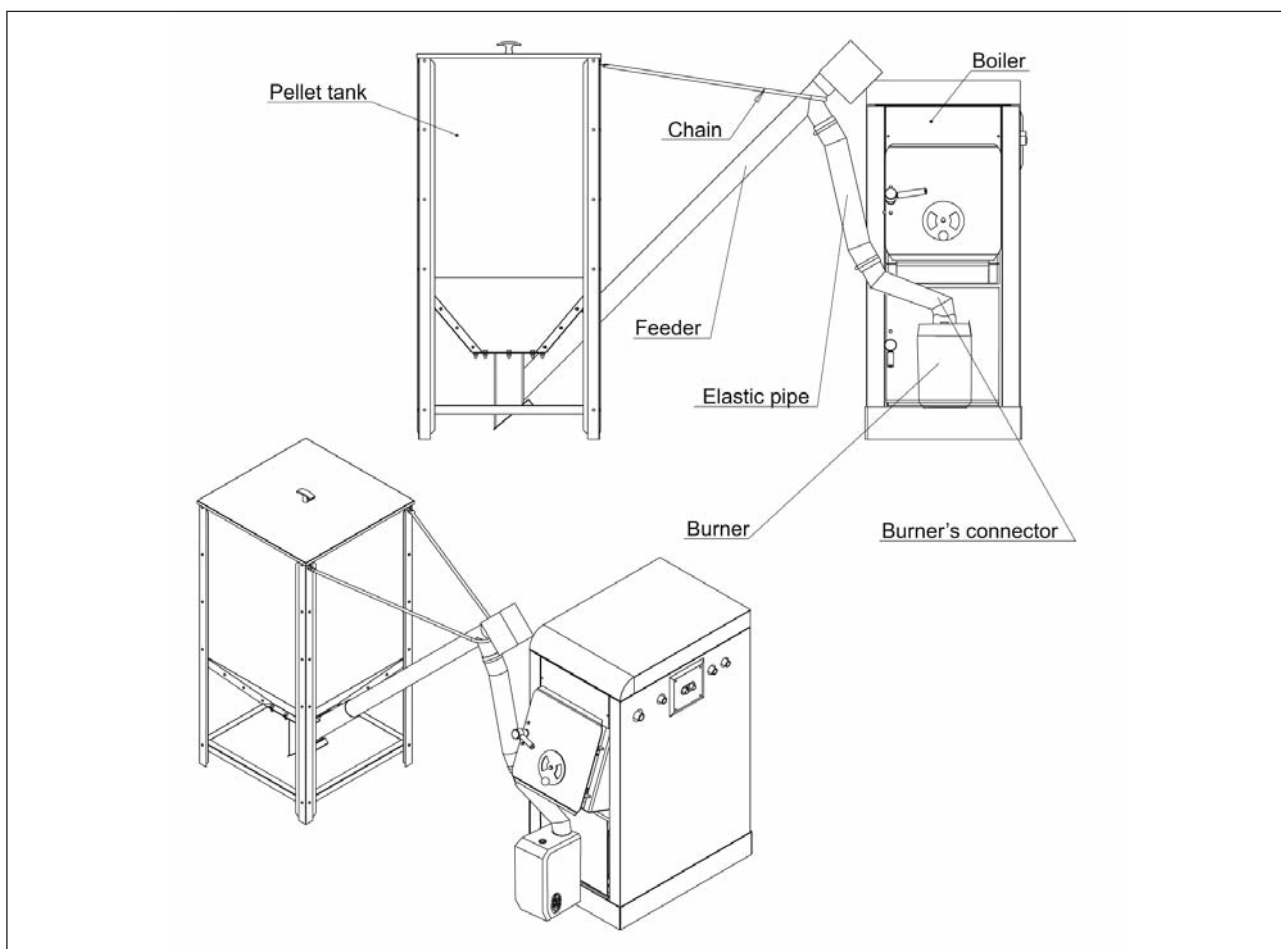
2. Burner's technical data

Parameter	SI	16 kW	24 kW
Pellet power range	kW	4-16	7-24
Efficiency	%	>94.5	>94.5
CO emission	ppm	<200	<200
Weight	kg	14	14.5
Feeder length standard	m	1.3-1.6	1.3-1.6
Fuel		pellets	pellets
Fuel diameter	mm	6-8	6-8
Voltage	V	230	230
Power consumption	W	30	35
Protection level		IP40	IP40
Tank dimensions	mm	622 x 622 x 1302	622 x 622 x 1302
Capacity	L	315	315

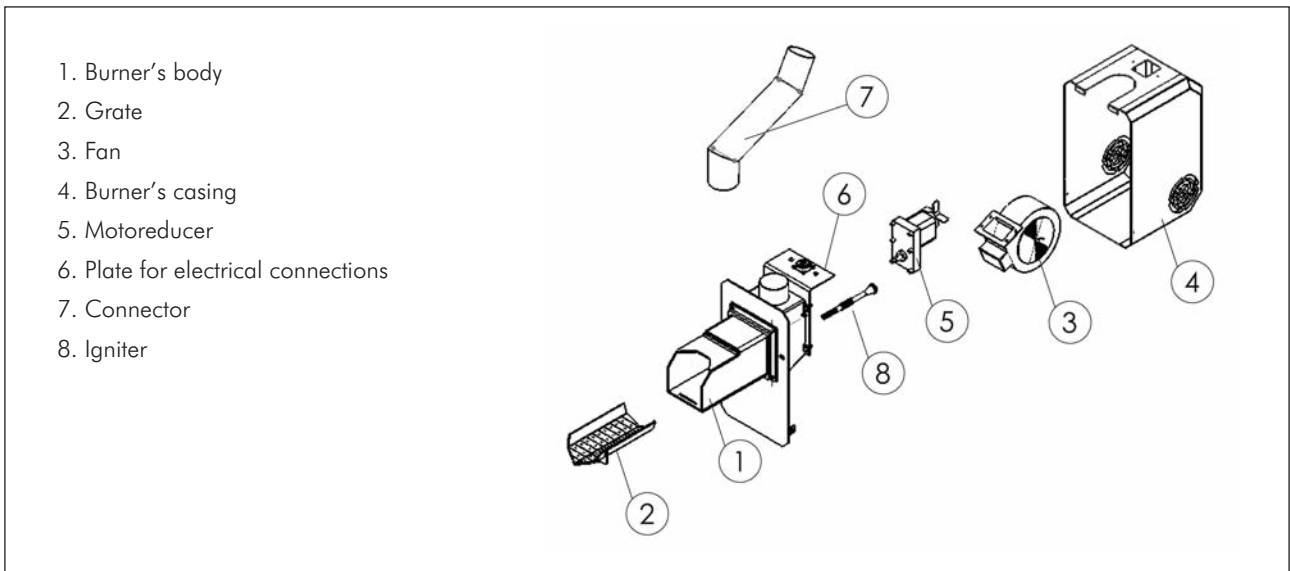


WARNING!

The manufacturer reserves the right to make modifications in order to improve the boiler without notice.



Pic. 1. Basic package components



Pic. 2. Burner construction

3. Contents of boiler

Standard package:

- Burner.
- Controller.
- Fuel feeder with motoreducer.
- Tank.
- Manual.
- 4 refractory bricks.
- Elastic pipe.
- Band clips.

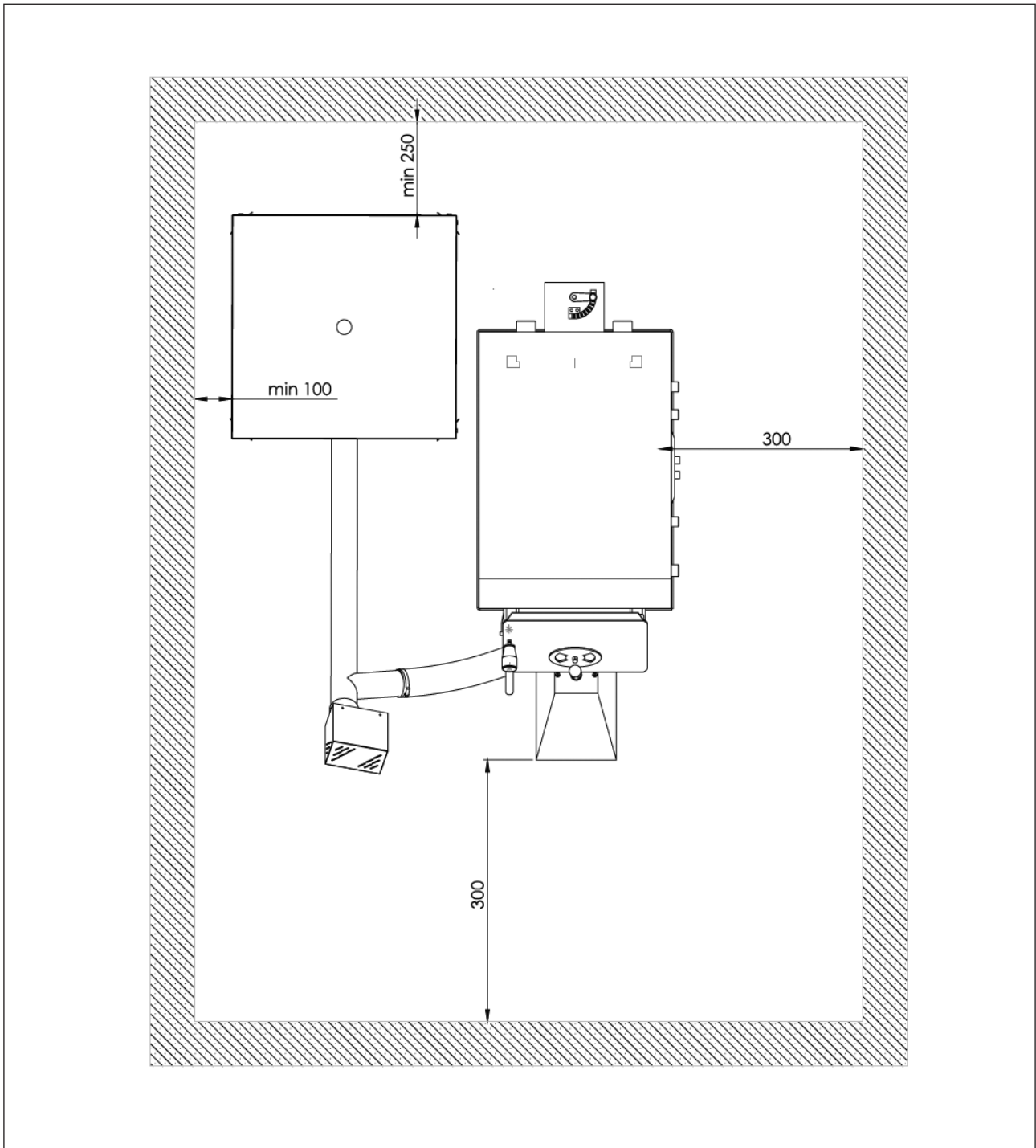
Extra accessories for the controller:

- Room sensor.
- Domestic hot water sensor.
- Central heating sensor.
- External module CAN I/O MC-1.

4. Location and boiler installation

4.1 Rules, norms and recommendations

The boiler room should comply with construction laws valid in country where boiler is installed.



Pic. 3. Boiler room layout

4.2 Boiler room recommendations

- Package (boiler, burner, tank and feeder) should be placed in a separate room, centrally to heated rooms.
- The front door should open outwards and must be made of non-flammable materials with 0.8mm thickness.
- Floors should be made of non-flammable materials or covered with a 0.7mm steel plate at minimum distance of 0.5m to door edges. The boiler should be located on a non-flammable foundation, raised 0.05m above floor level.
- Boiler room should have artificial lighting but natural light is also recommended.
- Distance to walls in boiler room should allow for easy access to all sides of the boiler.
- Minimum distance from the front side of the boiler to opposite wall should be 1m.
- Minimum height of the boiler room should be at least 2.2m – in existing buildings it is permitted to be 1.9m with assured supply-exhaust ventilation.
- It is forbidden to install the boiler and burner in damp rooms or with elevated humidity. Corrosion may damage the boiler and burner.

4.3 Ventilation

- Boiler room should have 200 cm² supply-air duct.
- Exhaust duct should have at least a 14 x 14cm section with inlet hole under boiler room ceiling that should lead above roof and be placed near chimney.
- Ventilation ducts should be made of non-flammable materials.
- It is forbidden to install mechanical ventilation.



WARNING!

High risk of carbon monoxide poisoning exists if the boiler is located in a room with insufficient access to fresh air.

4.4 Safe distance to flammable substances

- During installation and exploitation it is advisable to maintain safe a distance of 200mm to flammable substances.
- For flammable substances with C3 grade combustibility which rapidly and easily burn (e.g. paper, cardboard, wood and plastic) the minimum distance should be 400mm.
- If combustibility grade is unknown the safe distance should be doubled.

Combustibility grade of building products	Building products
A – non-burning	sandstone, concrete, bricks, fire plaster, mortar, tile, granite
B – slow burning	cement board, fibreglass, mineral insulation
C1 – slow burning	beech tree, oak tree, plywood
C2 – medium burning	pine, larch, spruce tree, cork, rubber floor cover
C3 – easy burning	tarmac, plywood, celluloids, polyurethane, polystyrene, polyethylene, plastic

Users please remember:

- Only an adult acquainted with this manual may operate the burner. It is forbidden for children get close to the burner without the presence of an adult.
- If flammable gases penetrate boiler room during activities (varnishing, gluing) it is recommended to turn off the burner.
- It is forbidden to use flammable substances for lighting up the burner – the burner will light up automatically.
- High risk of fire exists when using naked flames or flammable substances close to the boiler.
- Burner should be turned off during maintenance (OFF position).
- Pay attention to hot burner's surfaces – risk of burning.
- It is forbidden to lay flammable items on or nearby the burner.
- All defects should be removed at once.
- After the winter heating season it is recommended to clean the burner and pellet tank thoroughly.
- Check the burner after a power failure
- It is forbidden to tamper with any electric parts or interfere in burner's construction.

5. Putting into operation

5.1 Burner start

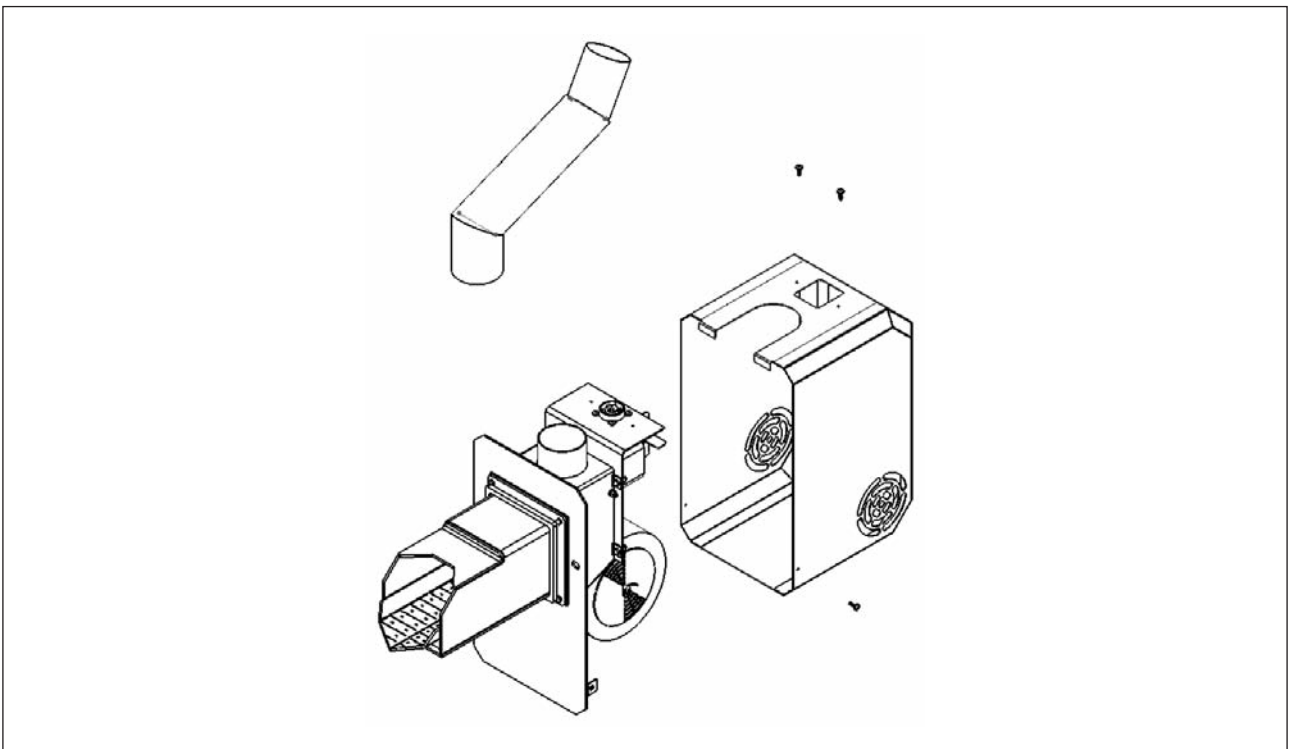
The first startup of the burner must be carried out by an authorised company trained by the manufacturer with a valid certificate of authorised serviceman issued by Eko-Vimar Orłański Ltd.

5.2 Orligno 100 burner assembly

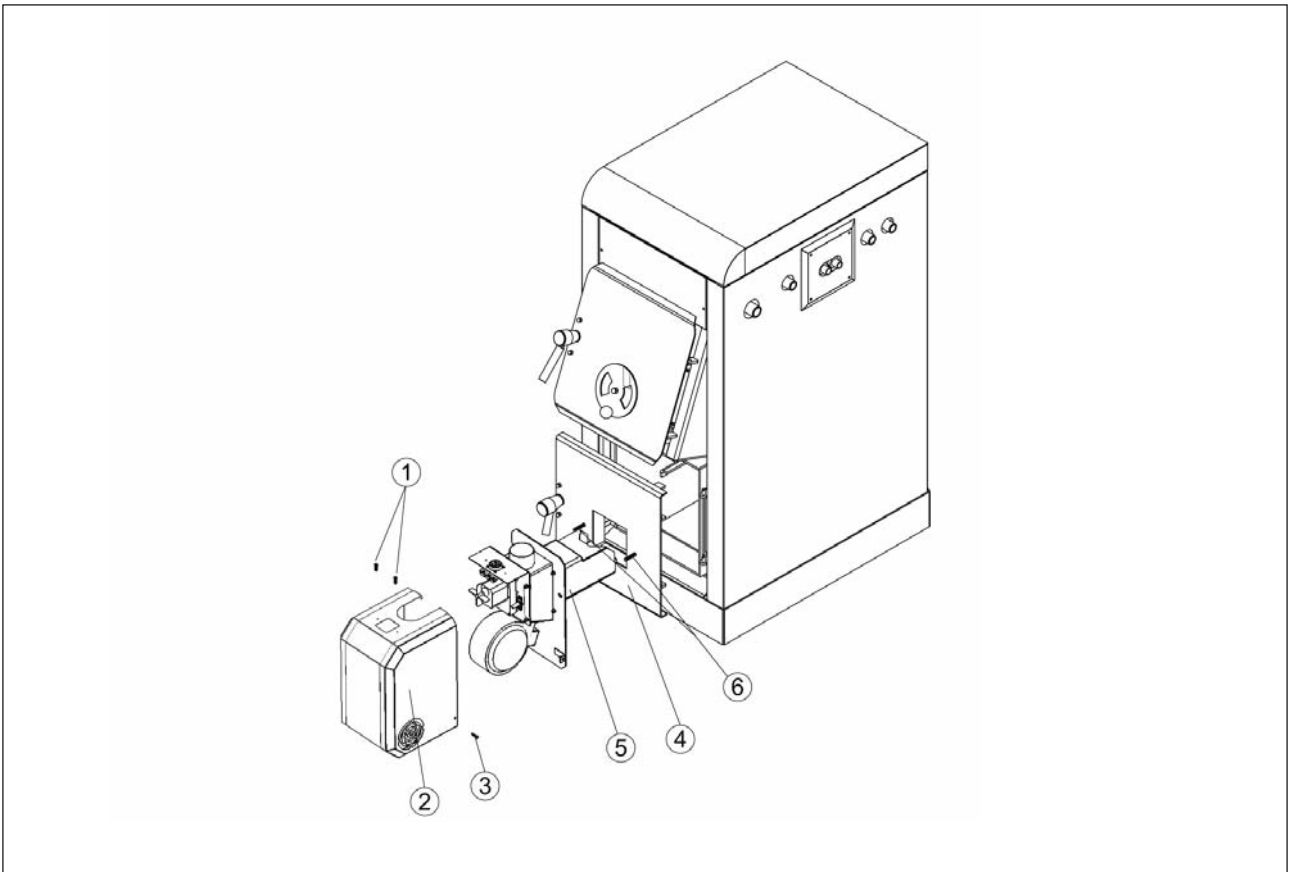
1. Remove the screws (1) and side screws (3) fastened to burner's casing and take off burner's casing (2) (pic. 5).
2. Remove the Orligno 100 bottom door.
3. Fix adapter (4) in bottom door place (pic. 5).
4. Fix burner (5) onto adapter's screws (6), block with nuts (pic. 5).
5. Mount burner's casing (2) and fix it with screws (1) and side screws (3) (pic. 5).
6. Slide feeder's pipe (7) into fixing pipe (8) (pic. 6).
7. Fit flexible pipe (9) on feeder's pipe (7) and secure with band clip (10) (pic. 6).
8. Fit metal connector (12) into burner's pipe (11) (pic. 6).
9. Fit flexible pipe (9) onto metal connector (12) and secure it with band clip (10) (pic. 6).

5.3 Adjustment of Orligno 100 to work with pellet burner

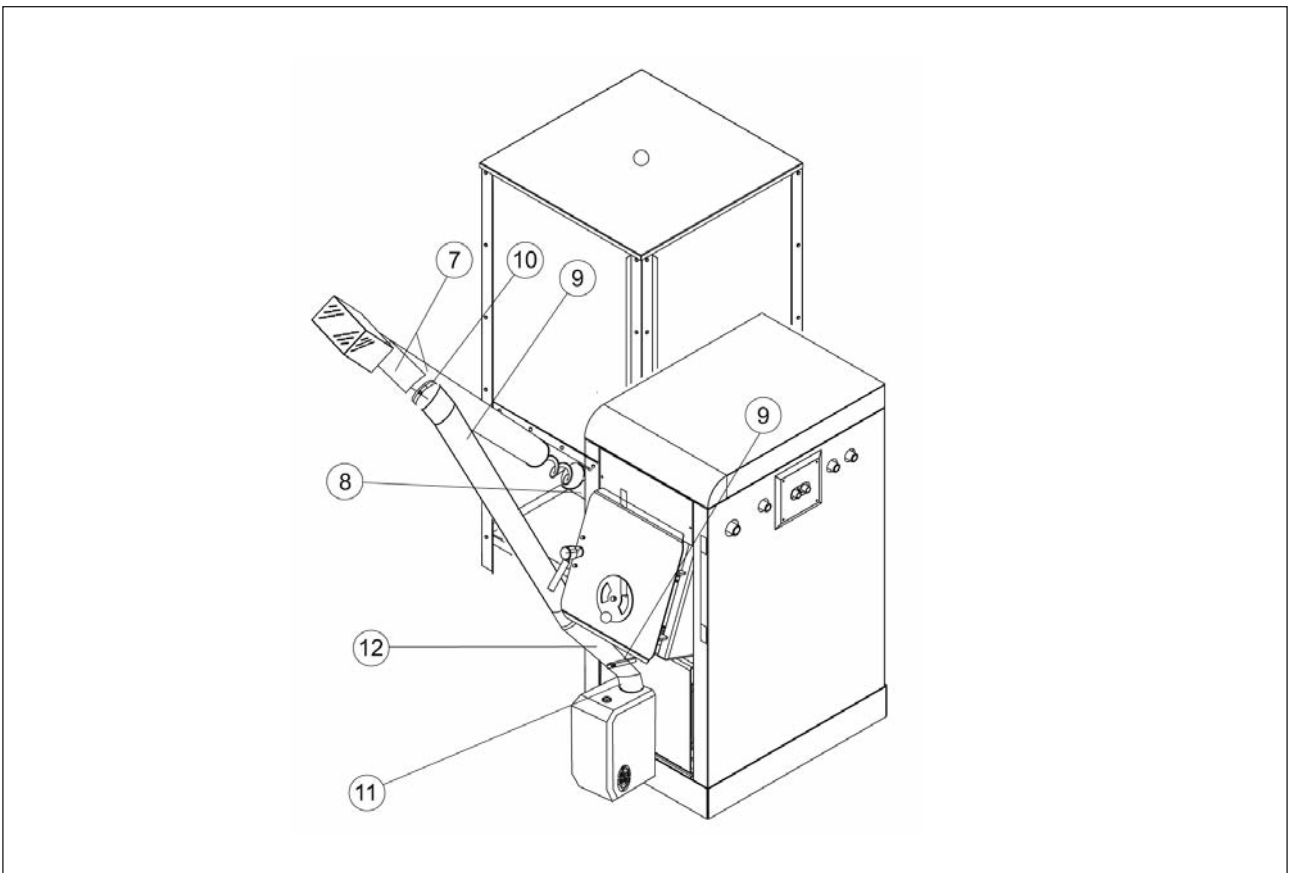
1. Remove cast iron grate from boiler.
2. Place two refractory bricks on each of two supports above support for cast iron grate.
 - Two bottom bricks push to front; and
 - Two upper bricks push to back.



Pic.4. Disassembly of burner's casing.



Pic.5. Burner assembly.



Pic.6. Feeder assembly

5.5 Before starting the burner

Before starting the burner it is necessary to:

1. Check the installation condition.
2. Fill the tank with pellets and cover with lid.
3. Check if fuel contains any unwanted elements (eg. rocks, metal elements).
4. Connect burner's and feeder's plugs.
5. Turn on controller.

Pellets		
	30% of power	100% of power
Feed time	6	9.5
Max. air	25	40

6. Feed fuel (SIMPLE MENU: Feed fuel: Yes) from the tank until you are able to see them in the flexible pipe.

7. Turn off fuel feed and hold ON/OFF  button – boiler ignites automatically.

8. Burner maintenance after heating season:

- Turn off and disconnect from power supply.
- Clean thoroughly.
- Remove pellets from tank (clean fixing pipe from remaining pellet ash).

6. Maintenance of burner



WARNING!

It is necessary to put out, cool down and disconnect burner from power supply when servicing.

Pay attention to burner's hot surfaces – risk of burning.

In order to maintain high efficiency of the burner it is recommended to clean and service it regularly. Remove soot and ash from burner's grate.

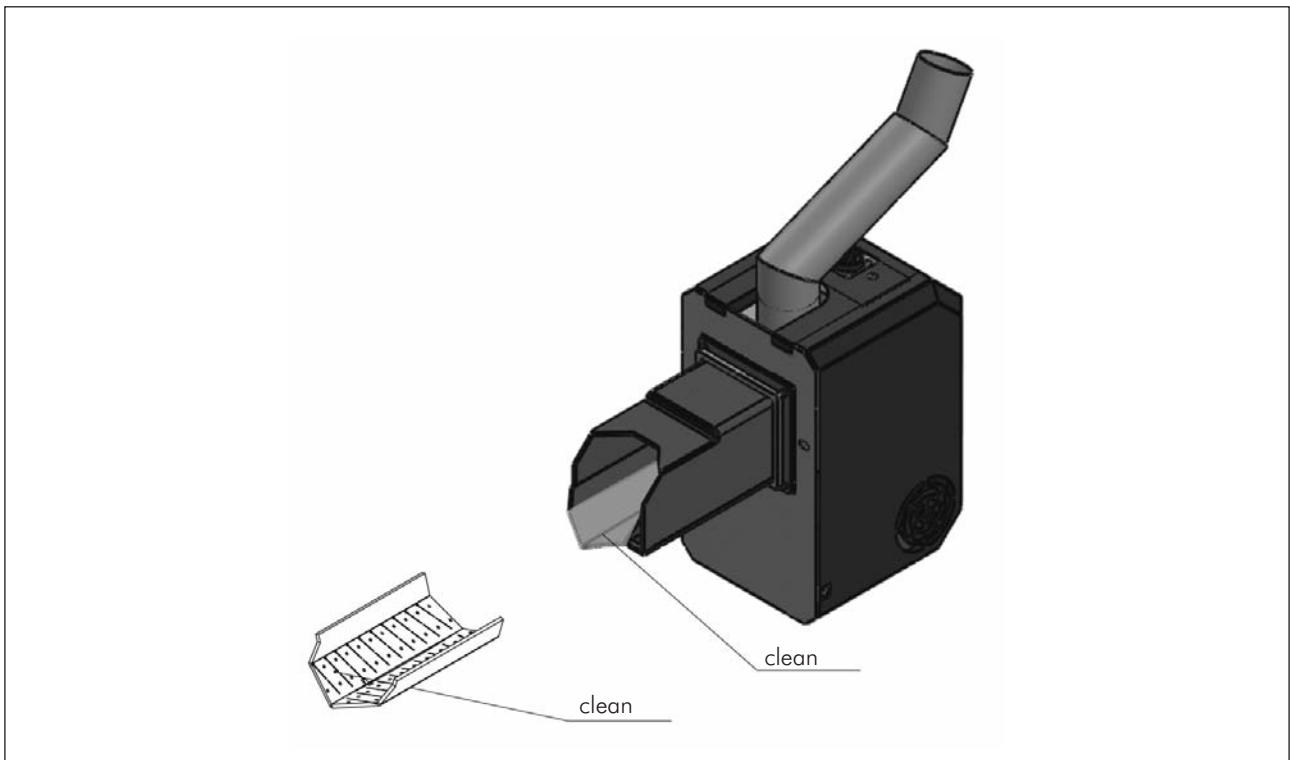


WARNING!

Much more ash is generated when burning oats than if burning pellets.

Cleaning:

1. Turn off the boiler (wait until burner is completely out), disconnect boiler from the power supply and wait until the boiler cools down.
2. Disconnect burner from boiler and power supply.
3. Remove grate from burner and clean it (check permeability of air holes).
4. Clean burner's casing.



Pic. 7. Burner maintenance.

7. Troubleshooting

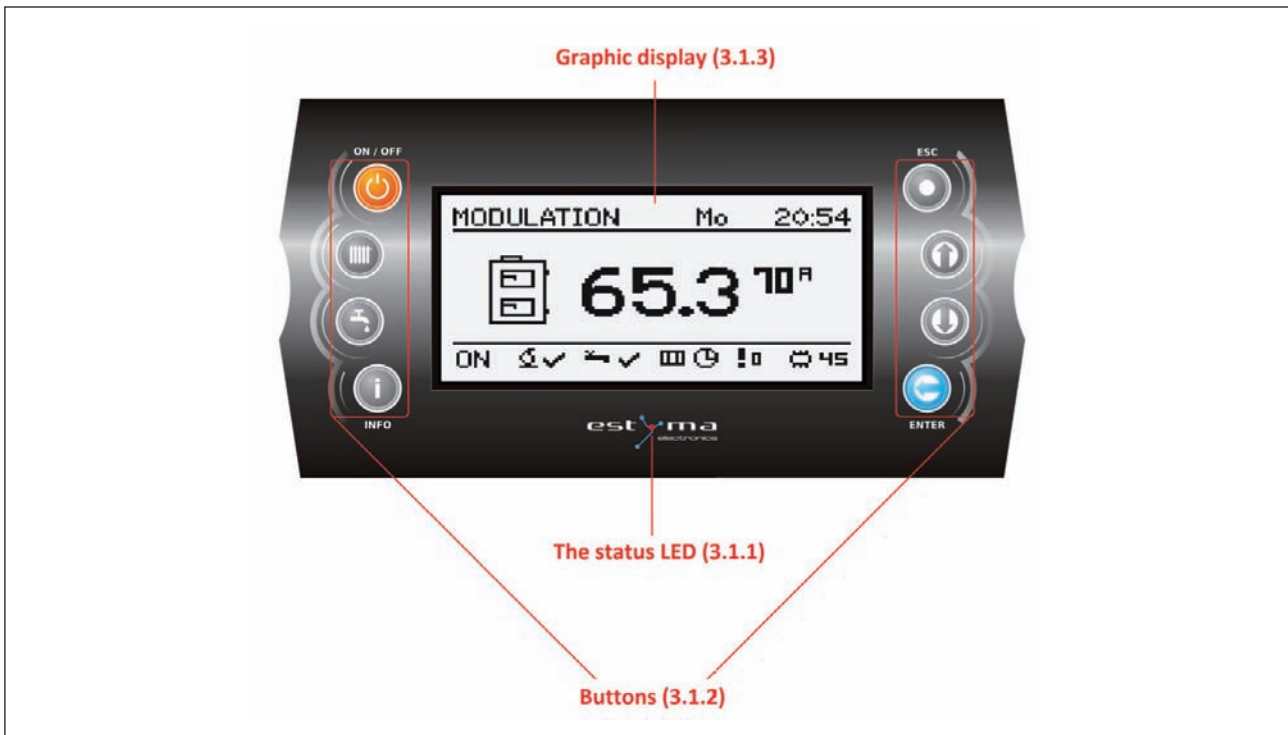
Type of defect	Possible cause of defect	Suggested repair
One of the controller's buttons does not work	Display malfunction	Display repair
Automatic lighting up not working	Wrong connection of igniter or photo-cell	Check plug and wire connections of igniter and photo-cell
	Clogged outlet hole of hot air	Clean heater hole
	Very damp fuel	Change or dry fuel
	Damaged igniter	Replace igniter
	Damaged photo-cell	Replace photo-cell
Smoke from door or burner	Lack of chimney draught	
	Clogged chimney	
	Clogged heat exchanger	Clean heat exchanger
	Damaged sealant (rope)	Replace sealant (rope)
Water in boiler	Lack of chimney draught	Improper chimney installation
	Very damp fuel	Change or dry fuel
	Leaky heat exchanger	To check heat exchanger, turn off boiler after 8 hours, remove water,. If water is still in the boiler – call for service
Boiler cannot reach set temperature	Improperly selected boiler for heating space	Check if boiler is properly selected
	Wrongly located sensor of return water	Check sensor location
	Sensor malfunction	Check sensors
	Set low boiler power	Check feed time and fan power

INPUTS	
Description	Explanation
Tboiler	Boiler temperature sensor.
5 (Teg)	Photocell.
6 (Tbur)	The temperature sensor burner.
Thw	The temperature sensor hot water.
Troom	Room temperature sensor/regulator (CTP).
Tch	The temperature sensor central heating.
Tout	Outdoor temperature sensor (CTZ).
12V	+12V output to supply optional equipment.
5V	+5V output to supply optional equipment.
7 GND	Mass electric to connect sensors.

OUTPUTS	
Description	Explanation
A (CH)	Central heating circulating pump.
B (HW)	Circulating pump for hot water.
4 (Ign)	Burner igniter.
C (Mo)	Opening the central heating mixer.
D (Mc)	Closing the central heating mixer.
3 (Blo)	Burner blower.
E (Ftan)	Feeder tank, or if burning wood, it's blower.
2 (Fbur)	Burner feeder.
1 (N1)	Neutral separable such as by STB.
STB	Protection STB.
N	Neutral standing.
PE	Protective.

9. Overview of the basic functions









9.1 Control panel



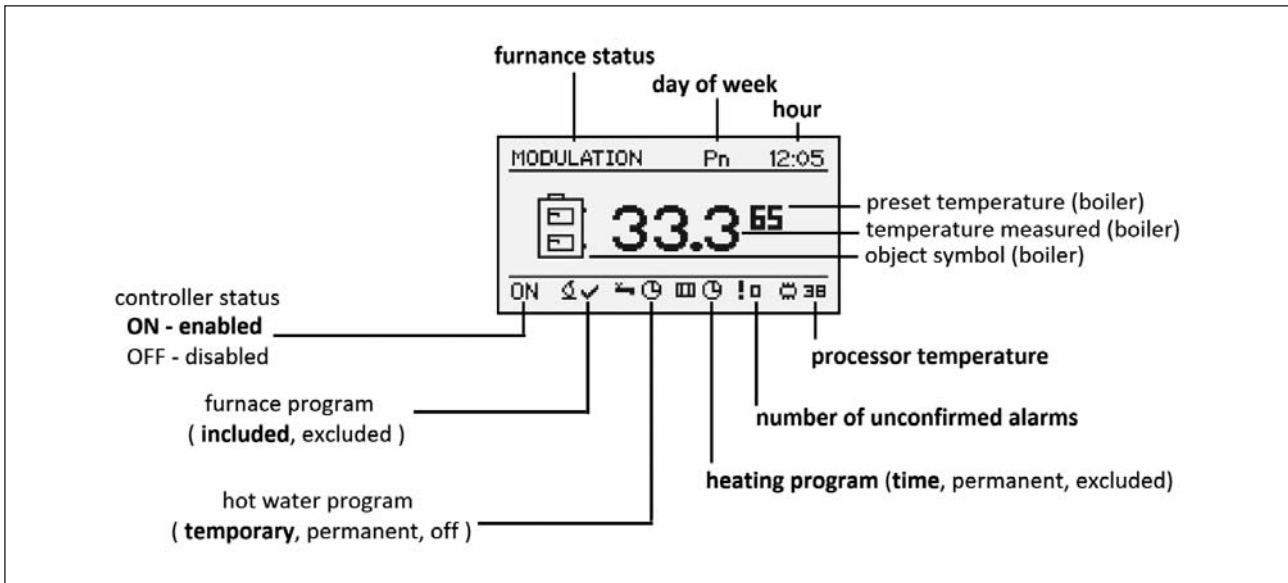
9.1.1 The LED status

Status	Description
Green light continuously	Controller OFF
Green blinks	Controller enabled, burner OFF
Orange light continuously	Controller enabled, burner enabled
Orange blinks	Burner works
Red light continuously	There is an alarm to be confirmed
Red blinks	Alarm active

9.1.2 Buttons

Button	Function
 ON/OFF	Long press on the main screen (>3 seconds) changes the state of the ON/OFF.
 CH	Quick access to the full configuration settings for the central heating.
 HW	Quick access to the full configuration settings for hot water.
 INFO	Shows the navigation information and descriptions of the regulated parameters.
 ESC	Back one level up in the menu, the resignation of the parameter change.
 Up arrow	Navigating through the menus, increasing the value of the parameter being edited. On main screen, enter the simple menu.
 Down arrow	Navigating through the menus, reducing the value of the parameter being edited. On main screen, enter the simple menu.
 ENTER	Access to the menu. Acceptance of changes in the value of the parameter being edited. Confirmation of the alarm.

9.1.3 Graphic display



9.2. Status of furnace

Status	Description
Turned off	The burner is not working. Permission to work off.
Cleaning	Cleaning the burner by a strong stream of air.
Firing up	Firing up fuel. Providing the initial dose of fuel to run igniter and blower.
Incandescing	When the flame in phase of the firing up is discovered, starts providing additional portions of fuel and increase the power of blower for arcing furnace.
Power 1	The burner works with the power first.
Power 2	The burner works with the power of a second.
Modulation	The burner works with modulated power.
Burning off	Quenching of the furnace. Work of burner and blower tray until the complete disappearance of the flame.
Stop	Burner does not work but it is to agree to his work. The required boiler temperature is reached.

10. Handling

10.1. Navigation of the menus

The device has two types of menu: simple and main menu.

Simple menu – allows for quick access to basic controller functions. Enter the menu by simply pressing the “up arrow” or “down arrow” on the main screen. Descriptions of the simple menu can be found in Chapter 11.

Main menu – allows you to access all the functionality of the controller (monitoring, adjustments and service settings.) Access to the main menu is done by pressing the button “Confirm, Enter” on the main screen. Descriptions of the simple menu can be found in Chapter 11.

To return to the main screen press the “Back/Esc” several times.



WARNING!

Access the service is intended only for qualified technical personnel. The changes may cause malfunction of the system.

10.2. Starting the regulator – ON

To run the controller (ON mode) press the “ON/OFF” for 3 seconds on the screen when it is in the OFF mode.

10.3. Switching off the regulator – OFF

To turn off the controller (OFF mode) press the “ON/OFF” for 3 seconds on the screen when it is in the ON mode.



WARNING!

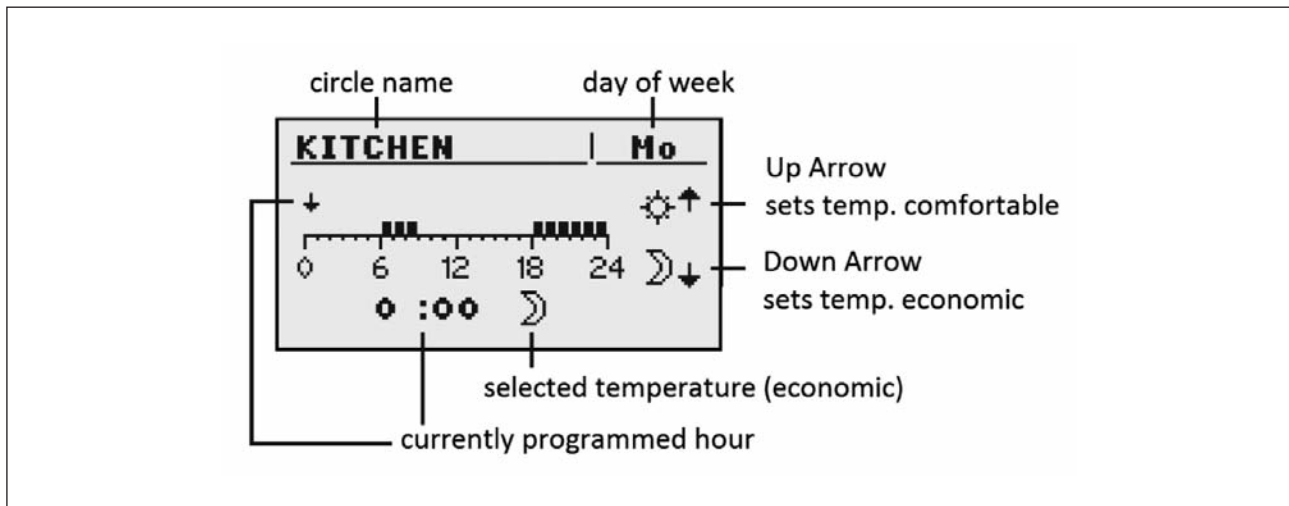
When you turn off the controller, depending on the previous state, the burner can still work (quenching) – this status should not be interrupted. If the device is to be excluded from the power supply, wait for quenching process, until the status of the burner is “OFF”.

10.4 Programming times

The controller is equipped with a clock and calendar. This makes it possible to programme the operation of individual circuit elements for heating depending on the time and day of the week. The date and time are not reset during a power failure as the controller is equipped with a battery (which should be replaced every two years).

Programming takes place in the menu of the circuit (e.g. hot water, heating, buffer) and for each item carried in the same way.

Selecting the day of week. Upon entry in the "Programme Time" day of the week flashes. Arrow buttons to select the day you want to set or just check the settings of the programme. Programming. After selecting the day of week and approved "ENTER", indicator being programmed hours flashes. At the same time also displays the time, and the next to it icon that represents the currently selected setting time (the symbol of the sun means comfortable temperature, the moon is a symbol of the economic temperature.) To move to the next hour, press the down arrow (economy temperature) or the up arrow (comfort temperature). If the day is already programmed in accordance with our wish, press "ENTER". After approved the changes (or cancellation) will blink day of the week.



The picture above shows an example of the preset day of the week.

Temp. economy from 00:00 to 6:00

Temp. comfortable from 6:00 to 9:00

Temp. economy from 9:00 to 18:00

Temp. comfortable from 18:00 to 24:00



WARNING!

Values of temperatures for comfortable and economical are set in the "SETTINGS" menu and may be different for each of the circuits. To make the time programme work, you must also enable a timed mode in the "SETTINGS" menu.

10.5 Service password

Access to the service parameters are password protected. After entering the correct password, access is gained. Access to the service parameters will be locked after a period of 10 minutes of inactivity.

The service code is the temperature of the boiler in menu BOILER/SETTINGS and the 3 letters "EST".

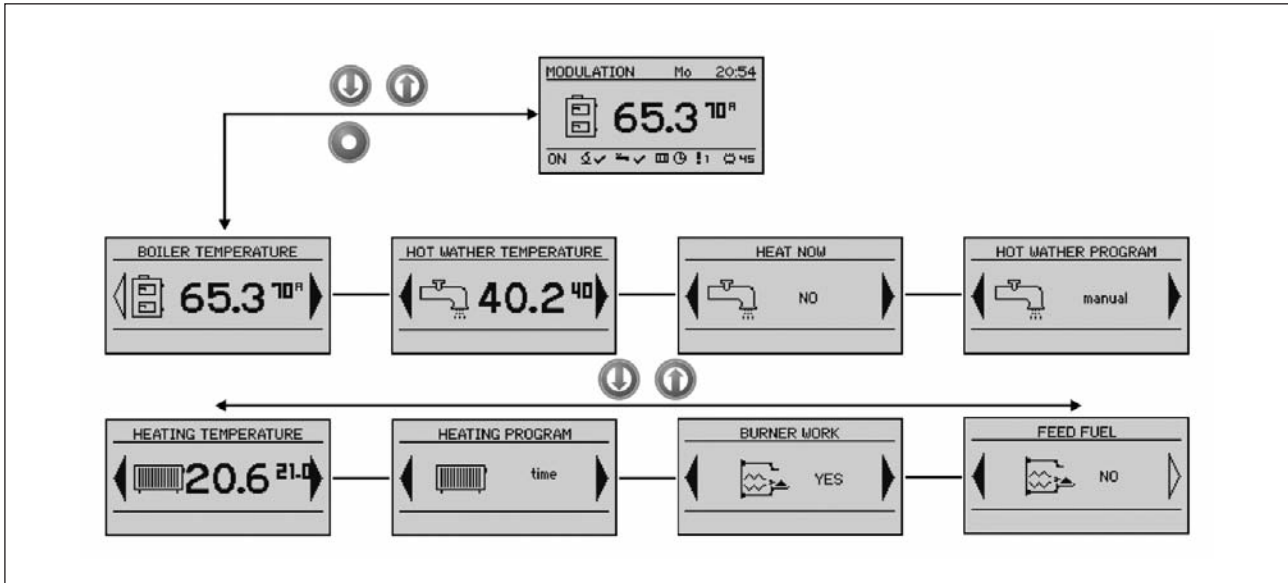
Example: If the temperature of the boiler in menu BOILER/SETTINGS is 60°C, password is: "60EST".



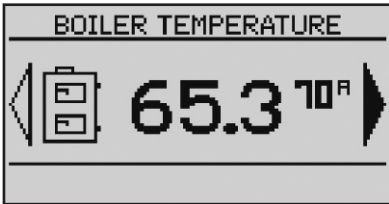
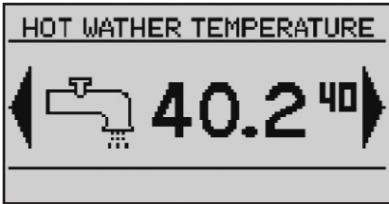
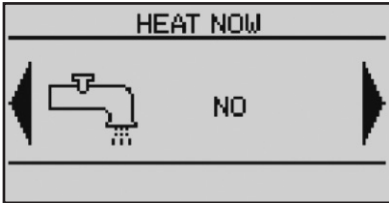

WARNING!

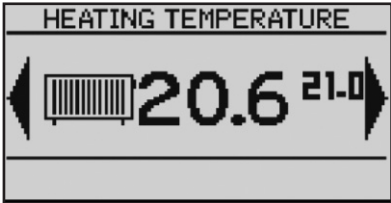

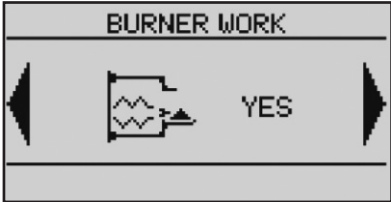
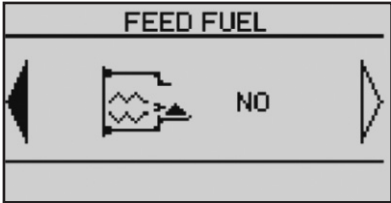
Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

11. Simple menu

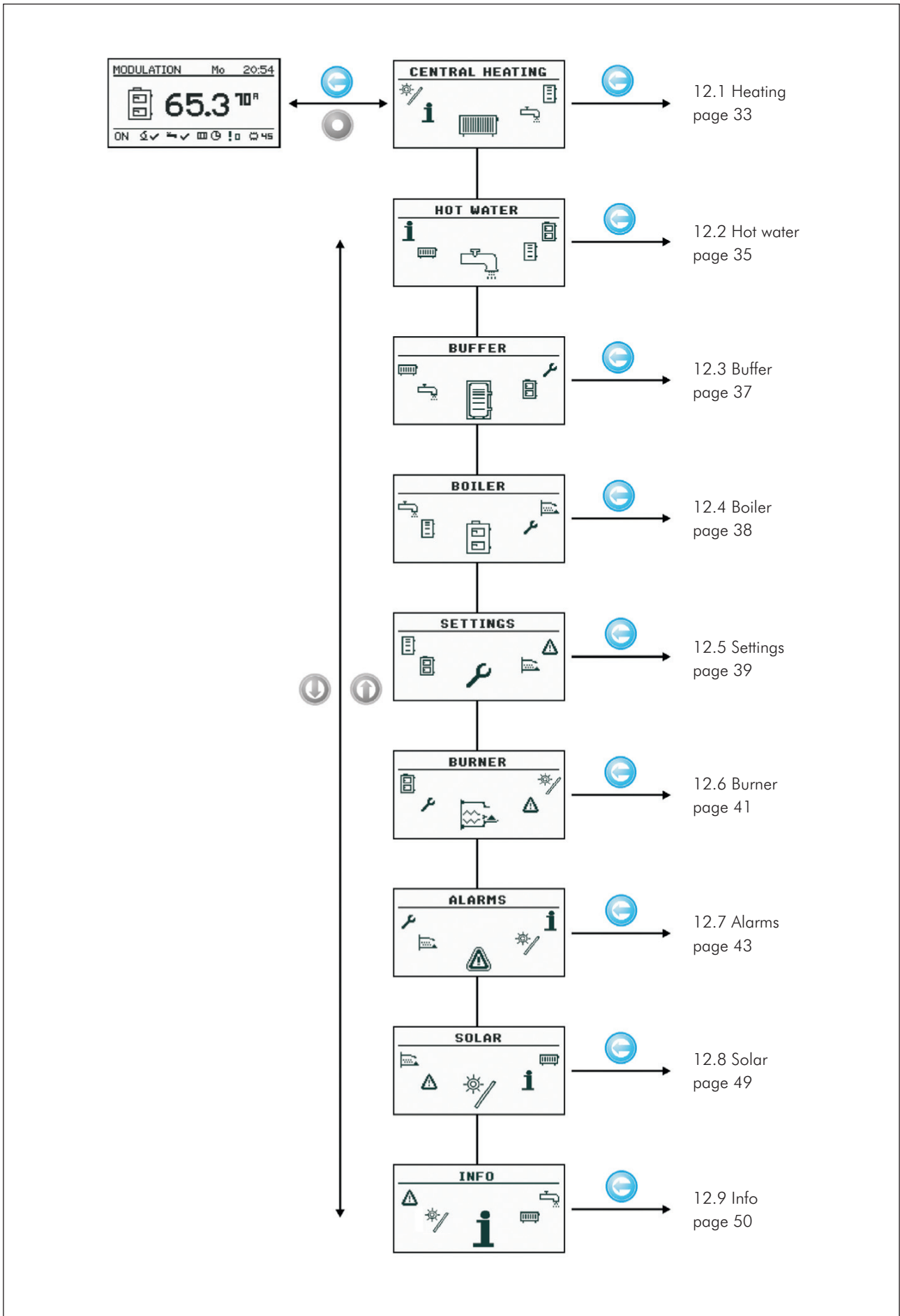


11.1 Simple menu displays

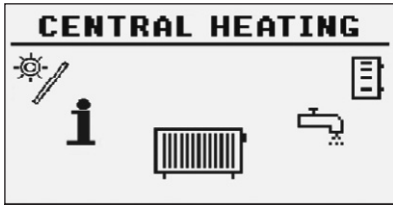
Screen	Description
	Shows the current temperature of the boiler (large font) and the desired temperature (small font). After pressing "ENTER" set the desired temperature of the boiler.
	Shows the current temperature of hot water (large font) and the desired temperature (small font). After pressing "ENTER" set the desired temperature for hot water. <i>Menu relates to the circuit No. 1</i>
	Disposable heating hot water to a comfortable temperature regardless of the programme. <i>Menu relates to the circuit No. 1</i>
	Set the mode a hot water: a. time – according to the programmed timescales b. constant – regardless of the time intervals a constant temperature is maintained c. disabled – off the heat <i>Menu relates to the circuit No. 1</i>

Screen	Description
	<p>Shows the current temperature in the room No 1 (large font) and the value of the desired temperature (small font). After pressing "ENTER" set the desired room temperature.</p> <p><i>Menu relates to the circuit No. 1</i></p>
	<p>Set the mode a heating circuit:</p> <ul style="list-style-type: none"> a. time – according to preset ranges b. constant – regardless of the time intervals a constant temperature is maintained c. disabled – off the heat <p><i>Menu relates to the circuit No. 1</i></p>
	<p>Allow for operation of the burner. When not consent to the burner operation, regulator controls the heating system, but do not attach the burner.</p>
	<p>Manual start of the fuel feed from the tray. Useful function after the exhaustion of fuel from the cartridge. After refilling the fuel cartridge, run the "enter fuel" until the fuel gets into the burner.</p>

12. Main menu



12.1 Heating



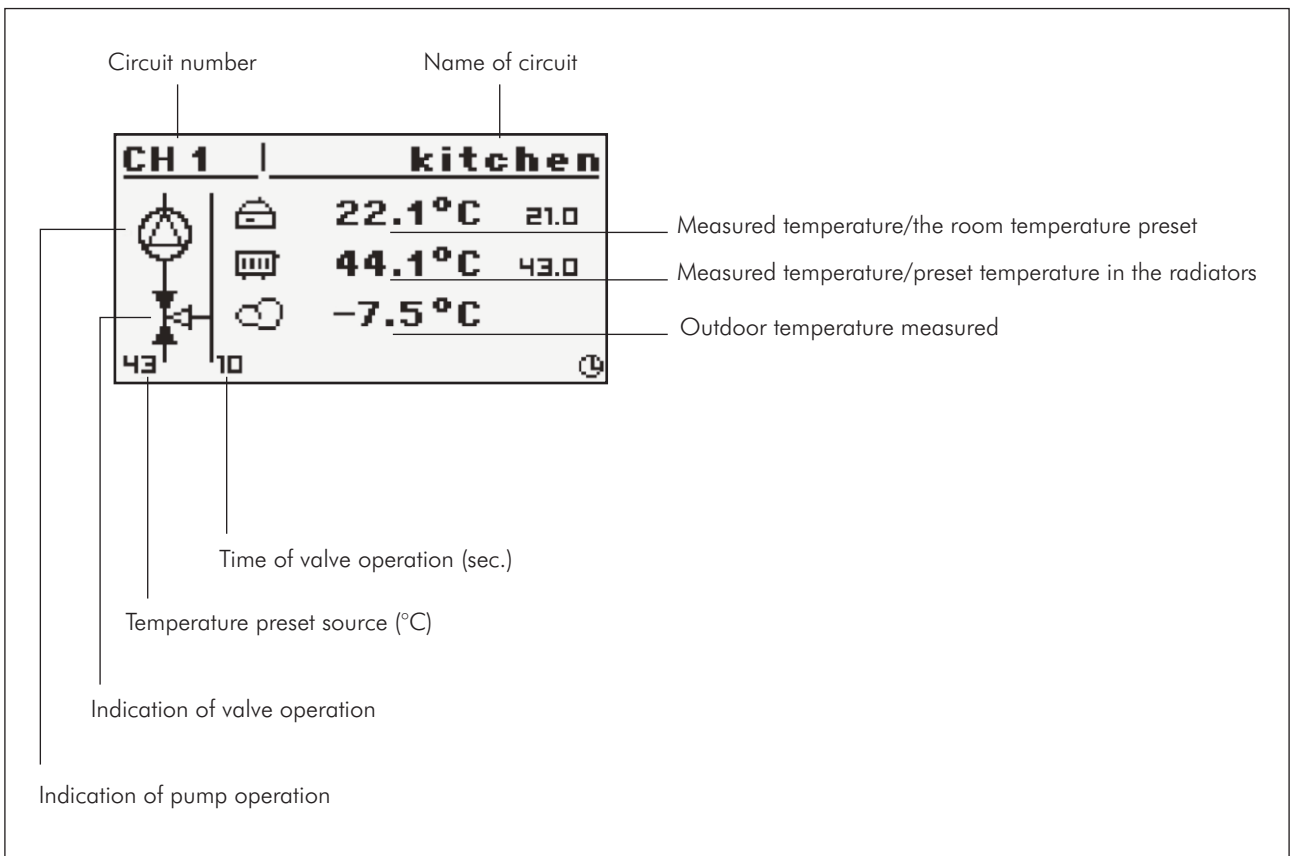
12.1.1 Selection of circuit

Allows you to select a number of central heating circuits. The selection of the circuit using arrows.



12.1.2 Status

Allows you to monitor the status of central heating system.



12.1.3 Settings

Function	Description
Comfortable temperature	Desired temperature in the room during the heating.
Programme	Programmes: a. time – according to preset intervals. b. constant – regardless of the time intervals a constant temperature is maintained. c. disabled – off the heat. d. economy – temperature in the rooms is maintained.
Economy temperature	Desired temperature in the room outside of the period of heating.

12.1.4 Time programme

Used to configure the time programme steering the central heating.

Description of the adjustment time programme – refer to Chapter 10.4.

12.1.5 Service



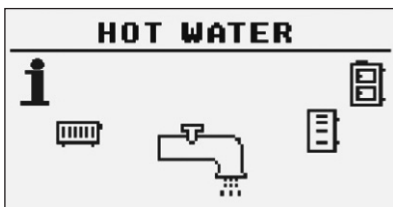
WARNING!

Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

Function	Description
Conf. MAX pump temp.	Maximum outdoor temperature at which the circulating pump can work in a comfortable range.
Econ. MAX pump temp.	Maximum outdoor temperature at which the circulating pump can work in a economic range.
MIN Tch pump	Minimum temperature calculated for central heating at which the circulating pump can be operated.
Source	Specifies the source of energy for central heating circuit.
Temperature MAX	Maximum temperature for central heating.
Mixer time	Time of full opening of the mixer.
Hot water priority	Priority for hot water of the heating circuit. During heating hot water the central heating pump is not working.
Pump test	Starts the pump regardless of any other conditions.
Mixer test	Starts the mixer motor independently of the other conditions.
Circuit name	Displays name of the central heating circuit.
CH temp. for -20°C	The point of the heating curve for -20°C.
CH temp. for 0°C	The point of the heating curve for 0°C.
CH temp. for 10°C	The point of the heating curve at 10°C.

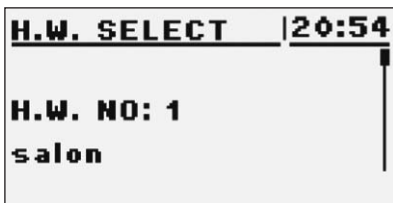
Service	
CH temp. for corr. factor	Central heating temperature correction required the desired room temperature for 1°C. For example, if the correction factor is set at 6°C, room temperature set at 20°C and measured in the room is 20.5°C then the temperature calculated at will be reduced by 3°C.
Mode type	Specifies the input mode central heating temperature: manual – the temperature of central heating inflicted manually, weather – the temperature of central heating calculated from the heating curve.
Manual Tch	The desired temperature of central heating when the mode is set to manual.
Room temp. sensor	Specifies whether the system uses a room sensor.
CH temp. sensor	Specifies whether the system uses a heating sensor.
Permanent pump	YES: the pump runs at a given temperature in the room, reduced the temperature for heating (only with the use of a sensor for central heating and room sensor). NO: after reaching the set temperature in the room the pump is turned off.

12.2 Hot water



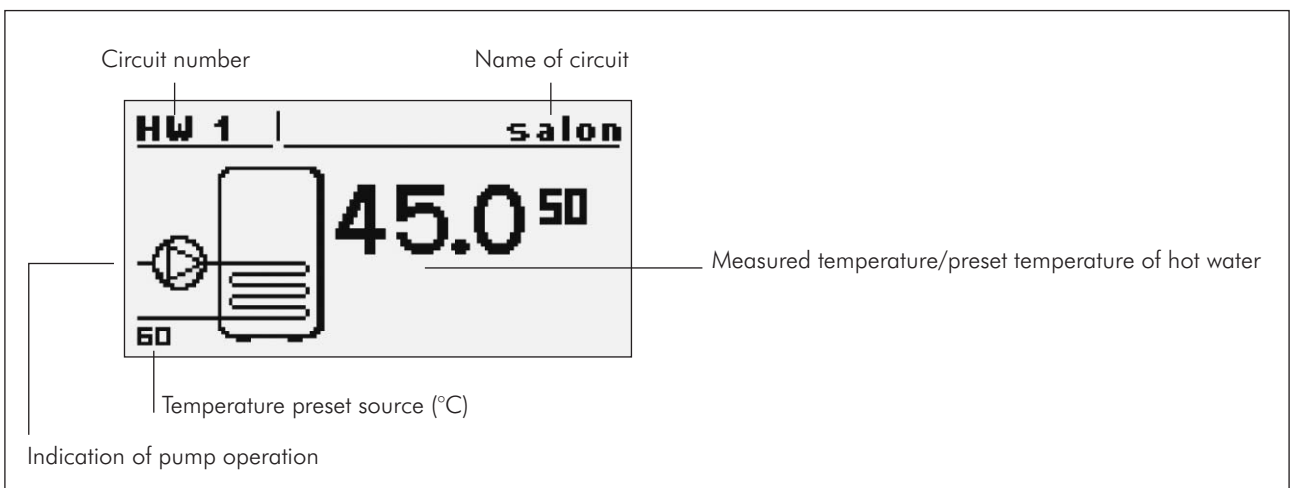
12.2.1 Selection of circuit

Allows you to select the number of hot water circuits.



12.2.2 Status

Allows you to monitor the status of hot water.



12.2.3 Settings

Function	Description
Comfortable temperature	Desired temperature of hot water during heating.
Programme	Set the mode a circuit: a. time – according to preset ranges. b. constant – regardless of the time intervals a constant temperature is maintained c. disabled – off the heat.
Heat now	Heats hot water once to a comfortable temperature regardless of the program.
Hysteresis	The value of which you can reduce the temperature of hot water.
Economical temperature	Desired temperature of hot water outside the period of heating.

12.2.4 Time programme

Used to configure the time steering the hot water preparation.

Description of the adjustment time – refer to Chapter 10.4.

12.2.5 Service



WARNING!

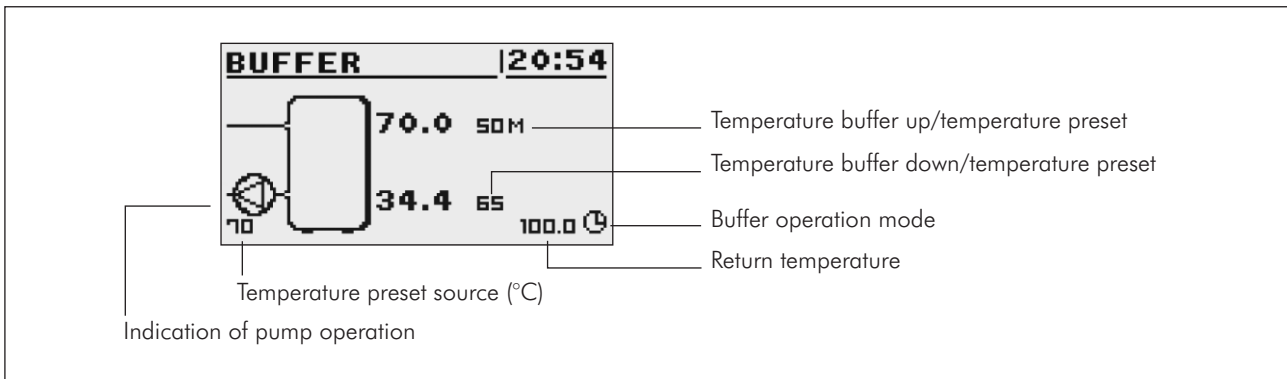
Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

Function	Description
Source delta	Increasing the temperature of the source of the desired temperature of hot water during heating.
Source	Specifies the source of energy for hot water.
Max. temperature	Maximum temperature of hot water.
Delta MIN temp.	The minimum temperature difference between the source and the hot water at which the pump can work.
Pump test	Starts the pump regardless of other conditions.
Circuit name	Gives name for the hot water circuit.

12.3 Buffer (option available only with external module CAN)



12.3.1 Status



12.3.2 Settings

Function	Description
Upper set temperature	Below this temperature the upper part of the buffer starts charging.
Lower set temperature	Above this temperature the bottom of the buffer completes the process of charging.
Programme	Constant – the buffer is charged regardless of the time – the buffer is charged only at specified intervals. Intervals are set in the “time programme”, disabled – off charging buffer.

12.3.3 Time programme

Used to configure time programme to controlling charging buffer.

Description of programme adjustment time – refer to Chapter 10.4.

12.3.4 Service

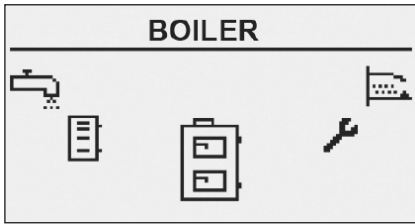


WARNING!

Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

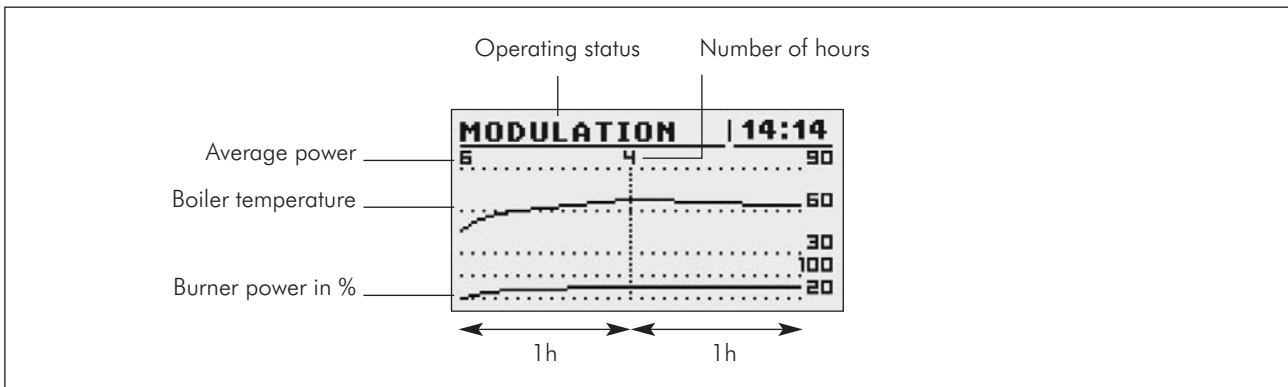
Function	Description
Minimal pump temperature	The minimum temperature in the upper part of the buffer at which the circulating pump can work for central heating.
Auto upper temperature	Specifies whether the upper temperature buffer (minimum) is requested manually or automatically. Automatically based on the needs of other power consumers in the buffer.

12.4 Boiler



12.4.1 Status

Shows the statistics of the boiler in the past 24 hours. The graph shows the temperature of the boiler and power of burner. "Hours" refers to how many hours ago the boiler behaved these operating parameters. Across the screen are displayed statistics of 2 hours. Screens switching buttons "up" and "down".



12.4.2 Settings

Function	Description
Boiler temperature set	Heating water temperature in the boiler which will be maintain the controller. Menu is active only in continuous work mode.

12.4.3 Service



WARNING!

Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

Function	Description
MIN pump temperature	The temperature above which the controller can start the pumps.
Mode	Operating mode of boiler: a. auto – temperature calculated automatically. b. continuous – the temperature is kept constant.
Hysteresis	The temperature of the boiler must be reduced by this value to launch the burner.
MIN return temperature	Minimum return to boiler temperature maintained by mixer.
Return mixer time	Specifies the time of full opening of the return mixer.
Boiler pump test	Starts boiler pump regardless of other conditions.
Return mixer test	Starts actuator of the return mixer regardless of other conditions.

12.5 Settings



12.5.1 Date and time

Use this menu to set the date and time of the driver.

12.5.2 Language

Use this menu to select language of the menu.

12.5.3 General settings

12.5.3.1 Alarm buzzer

We define here, if the driver shall notify of alarms by acoustic signal.



WARNING!

Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

12.5.4 Service

12.5.4.1 Module configuration

Menu is used to configure the CAN network. In the menu, select the modules that are connected to the system.



WARNING!

A detailed description of the modules and their destination are described in the manual of expansion modules.

SUMMARY OF THE EXPANSION MODULES	
Module	Explanation
Module no. 0	3 heating circuits for numbers 2, 3 and 4. Outdoor temperature sensor.
Module no. 1	3 heating circuits for numbers 5, 6 and 7.
Module no. 2	3 heating circuits for numbers 8, 9 and 10.
Module no. 3	3 heating circuits for numbers 11, 12 and 13.
Module no. 4	3 heating circuits for numbers 14, 15 and 16.
Module no. 5	Buffer. Solar collectors. Hot water no. 2. Return temperature sensor.
Module no. 6	Not used.
Module no. 7	Not used.
Module Lambda	Module of the Lambda sensor.

12.5.4.2 System configuration

This menu is used to configure the heating system (hydraulic). The range of settings is dependent on the number of expansion modules connected to the system.



WARNING!

You must first configure the modules.

SYSTEM CONFIGURATION	
Function	Description
Number of CH circuits	Specifies the number of heating circuits in the system.
Number of HW circuits	Specifies the number of hot water circuits in the system.
Number of buffers	Specifies the number of buffers in the system.
Outside temperature sensor	Specifies if the system has an outside temperature sensor (module 0).
Return temperature sensor	Specifies if the system has a return temperature sensor (module 5).
Solars	Specifies if the system is equipped with solar collectors.

12.5.4.3 Restore to factory settings

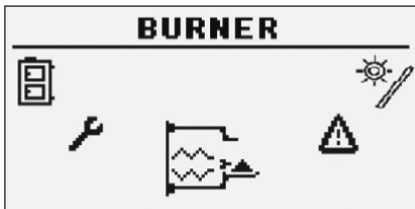
This function allows the controller to restore the factory settings.



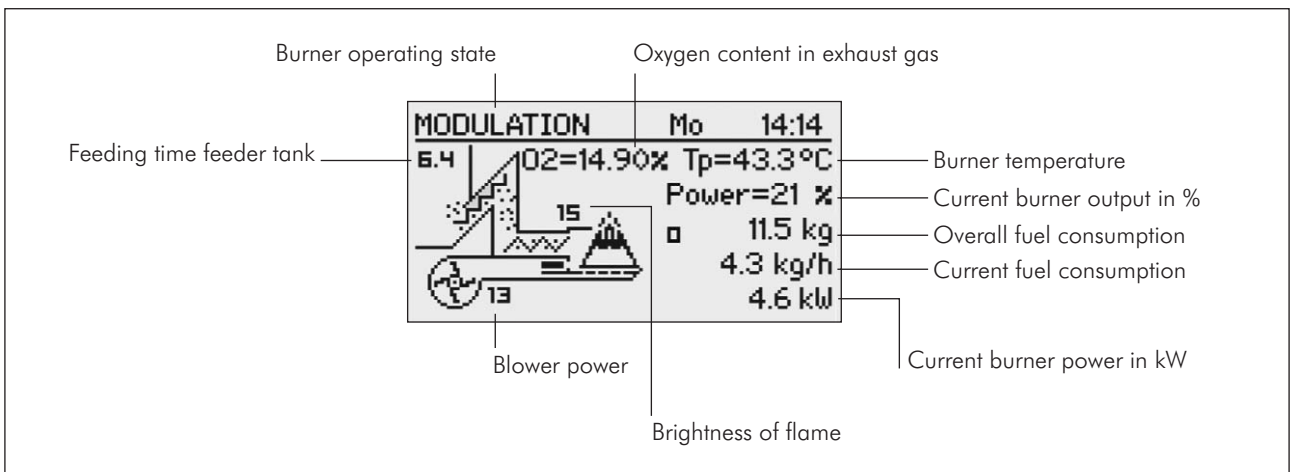
WARNING!

Will restore all factory settings, which can cause your system to malfunction. After restoring the factory settings you may need to reconfigure the controller settings.

12.6 Burner



12.6.1. Status



12.6.2. Settings

Function	Description
Feed fuel now	Starts fuel feeding screw regardless of other features.
Burner on	Consent to work of the burner.
Fuel type	Specifies the type of fuel.

12.6.3. Service



WARNING!

Access to the service parameters is intended only for qualified technical personnel. Any changes by non-qualified technical personnel may cause a malfunction of the system.

Function	Description
Air MIN (20%)	Minimum amount of air during modulation where power of burner is 20% or power number is 1.
Air MAX (100%)	Maximum amount of air during modulation where power of burner is 100% or power number is 2.
Feeding MAX (100%)	Maximum time during fuel feeding when power of modulation is 100% or power number is 2 every 20 seconds.
Power MIN (FL2)	Minimum burner power during modulation.
Power MAX (FL2)	Maximum burner power during modulation.
Modulation type	Burner mode, power modulation or two power levels.
Photo threshold	Brightness in the burner over which is recognized as a fire.
Igniter test*	Turn on igniter for testing.
Heater feeder test*	Turn the burner tray for testing.
Storage feeder test*	Turn on storage feeder for testing.
Blower test*	Turn on blower for testing.
Test fuel mass	Fuel mass obtained during continuous fuel feeder work through 1 hour (in kg).
Fuel calorific value	Fuel calorific value (in kWh/kg).
Lambda control	Determine whether regulator consider or not oxygen concentration.
Oxygen MIN (20%)	Oxygen target for minimum power.
Oxygen MAX (100%)	Oxygen target for maximum power.

*Testing equipment in the menu "BURNER" is only possible when the controller is in the OFF mode.

12.7 Alarms



This menu contains a history of up to 20 alarms that happened during the controller work. The importance of alarm codes is presented in the table below.

12.7.1 Alarm codes

Code	Short description	Explanation
1	Processor overheating	Processor overheating. The reason may be improper installation location of the controller.
2	No fire/fuel	The controller detected a lack of flame in the burner. The reason could be no fuel or the flame has gone out.
3	Burner overheating	The temperature of the burner has reached its maximum value
4	Boiler sensor shorted	The controller detected shorted boiler temperature sensor. The reason may be a damaged sensor or connection cable.
5	Boiler sensor open	The controller detected open boiler temperature sensor. The reason may be a damaged sensor or connection cable.
6	Burner sensor shorted	The controller detected shorted burner temperature sensor. The reason may be a damaged sensor or connection cable.
7	Burner sensor open	The controller detected open burner temperature sensor. The reason may be a damaged sensor or connection cable.
8	Boiler overheating	Boiler temperature has exceeded the maximum value
9	Processor reset	Probable damage the controller. Possible loss of power supply.
10	STB	
11	Communication with module 0	
12	Communication with module 1	
13	Communication with module 2	
14	Communication with module 3	
15	Communication with module 4	
16	Communication with module 5	
17	Communication with module 6	
18	Communication with module 7	
19	HW sensor shorted	

Code	Short description	Explanation
20	HW sensor open	
21	Room temp. sensor shorted	
22	Room temp. sensor shorted	
23	Quenching error	
24	Lambda communication	
25	Solars overheating	
26	Solars freezing	
The codes of the modules		
33	Shorted IN1 Module 0	
34	Shorted IN2 Module 0	
35	Shorted IN3 Module 0	
36	Shorted IN4 Module 0	
37	Shorted IN5 Module 0	
38	Shorted IN6 Module 0	
39	–	
40	–	
41	–	
42	–	
43	Shorted IN11 Module 0	
44	–	
45	Open IN1 Module 0	
46	Open IN2 Module 0	
47	Open IN3 Module 0	
48	Open IN4 Module 0	
49	Open IN5 Module 0	
50	Open IN6 Module 0	
51	–	
52	–	
53	–	

Code	Short description	Explanation
54	–	
55	Open IN11 Module 0	
56	–	
57	–	
58	Overheating Module 0	
65	Shorted IN1 Module 1	
66	Shorted IN2 Module 1	
67	Shorted IN3 Module 1	
68	Shorted IN4 Module 1	
69	Shorted IN5 Module 1	
70	Shorted IN6 Module 1	
71	–	
72	–	
73	–	
74	–	
75	–	
76	–	
77	Open IN1 Module1	
78	Open IN2 Module 1	
79	Open IN3 Module 1	
80	Open IN4 Module 1	
81	Open IN5 Module 1	
82	Open IN6 Module 1	
83	–	
84	–	
85	–	
86	–	
87	–	
88	–	

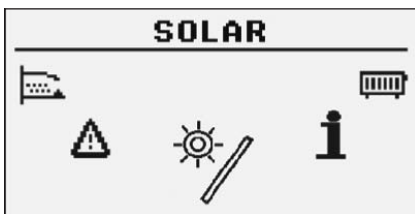
Code	Short description	Explanation
89	–	
90	Overheating Module 1	
97	Shorted IN1 Module 2	
98	Shorted IN2 Module 2	
99	Shorted IN3 Module 2	
100	Shorted IN4 Module 2	
101	Shorted IN5 Module 2	
102	Shorted IN6 Module 2	
103	–	
104	–	
105	–	
106	–	
107	–	
108	–	
109	Open IN1 Module 2	
110	Open IN2 Module 2	
111	Open IN3 Module 2	
112	Open IN4 Module 2	
113	Open IN5 Module 2	
114	Open IN6 Module 2	
115	–	
116	–	
117	–	
118	–	
119	–	
120	–	
121	–	
122	Overheating Module 2	
129	Shorted IN1 Module 3	

Code	Short description	Explanation
130	Shorted IN2 Module 3	
131	Shorted IN3 Module 3	
132	Shorted IN4 Module 3	
133	Shorted IN5 Module 3	
134	Shorted IN6 Module 3	
135	–	
136	–	
137	–	
138	–	
139	–	
140	–	
141	Open IN1 Module 3	
142	Open IN2 Module 3	
143	Open IN3 Module 3	
144	Open IN4 Module 3	
145	Open IN5 Module 3	
146	Open IN6 Module 3	
147	–	
148	–	
149	–	
150	–	
151	–	
152	–	
153	–	
154	Overheating Module 3	
161	Shorted IN1 Module 4	
162	Shorted IN2 Module 4	
163	Shorted IN3 Module 4	
164	Shorted IN4 Module 4	

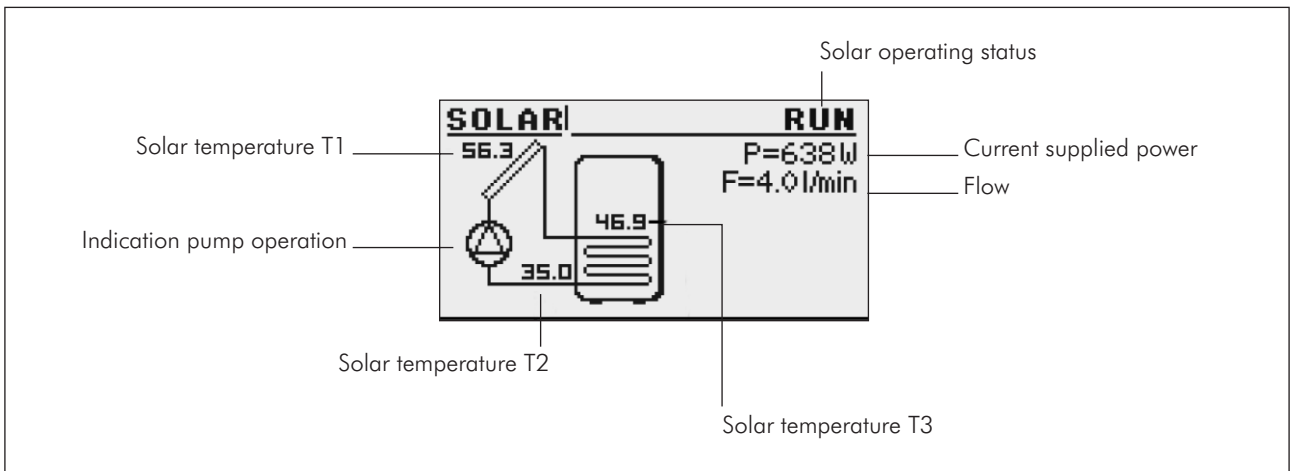
Code	Short description	Explanation
165	Shorted IN5 Module 4	
166	Shorted IN6 Module 4	
167	–	
168	–	
169	–	
170	–	
171	–	
172	–	
173	Open IN1 Module 4	
174	Open IN2 Module 4	
175	Open IN3 Module 4	
176	Open IN4 Module 4	
177	Open IN5 Module 4	
178	Open IN6 Module 4	
179	–	
180	–	
181	–	
182	–	
183	–	
184	–	
185	–	
186	Overheating Module 4	
193	Shorted IN1 Module 5	
194	Shorted IN2 Module 5	
195	Shorted IN3 Module 5	
196	Shorted IN4 Module 5	
197	–	
198	Shorted IN6 Module 5	
199	Shorted IN7 Module 5	

Code	Short description	Explanation
200	Shorted IN8 Module 5	
201	Shorted IN9 Module 5	
202	–	
203	–	
204	–	
205	–	
206	Overheating Module 5	

12.8 Solar (option available only with external module CAN)



12.8.1 Status



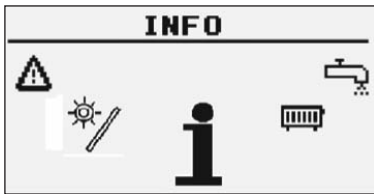
12.8.2 Settings

Function	Description
Turn on delta	Temperature difference between solar and accumulator required for solar pump to turn on.
Turn off delta	Temperature difference between solar and accumulator required for solar pump to turn off.

12.8.3 Service

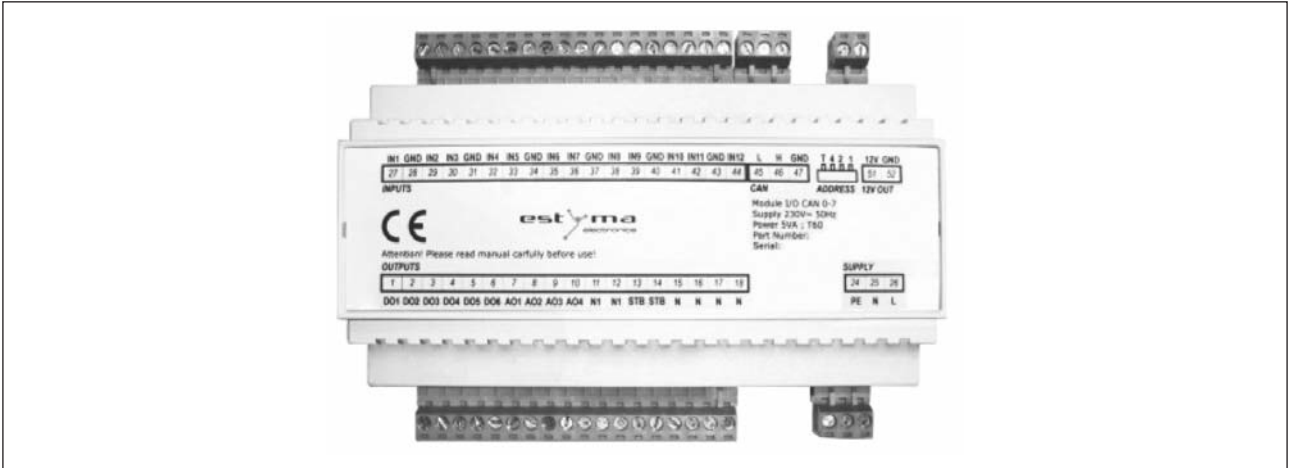
Function	Description
Schematic	Solar system schematic.
Flow [l/min]	Heating fluid flow in l/min.
Fluid specific heat	Specific heat of heat-transfer fluid [kJ/(kg*K)].
MAX HW temperature	Over this hot water temp. solar pump is turn off.
Solar alarm temperature MAX	Maximum temperature of solar collector. Alarm and damage preservation procedure are taken over this temperature.
Solar alarm temperature MIN	Minimum temperature of solar collector. Alarm and antifreeze procedure are taken under this temperature.
Solar pump test	Allow for solar pump testing.

12.9 Info



Here you will find useful information about the controller, including the version of software.

13. Expansion of the system – CAN bus



The controller is equipped with a high bandwidth CAN bus used to communicate with the modules. They are well-known for their reliability and are widely used in automotive bus systems – expandable to the highest level.

The use of a CAN bus carries several advantages. Above all the possibility of using broadband.

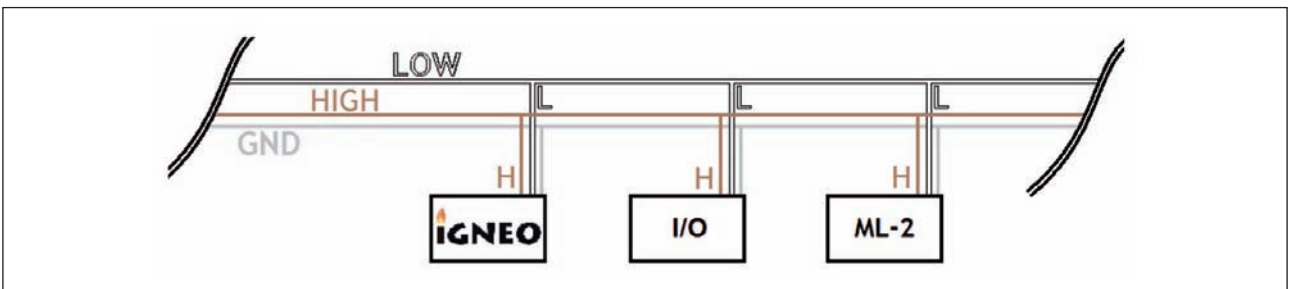
Lambda oxygen sensor and the using of additional expansion modules that we can install throughout the system:

- Up to 16 heating circuits.
- 2 hot water circuits.
- Heat storage tank (buffer).
- Solar system (solars).

The socket CAN bus is on the left side of the device. A connecting cable must be connected according to the following designation.

Cable connection
L – line LOW (white)
H – line HIGH (brown)
GND – ground (grey)

For connections on the CAN bus should be only used cable **LiYCY 2x0,25**. Only this type of cable gives the proper work of devices. Connections perform in a serial manner, this represents a figure below.



When plugging in expansion modules you need to remember to correctly set the terminator, which should be attached only at the last module throughout the system, even if the module is the only one.

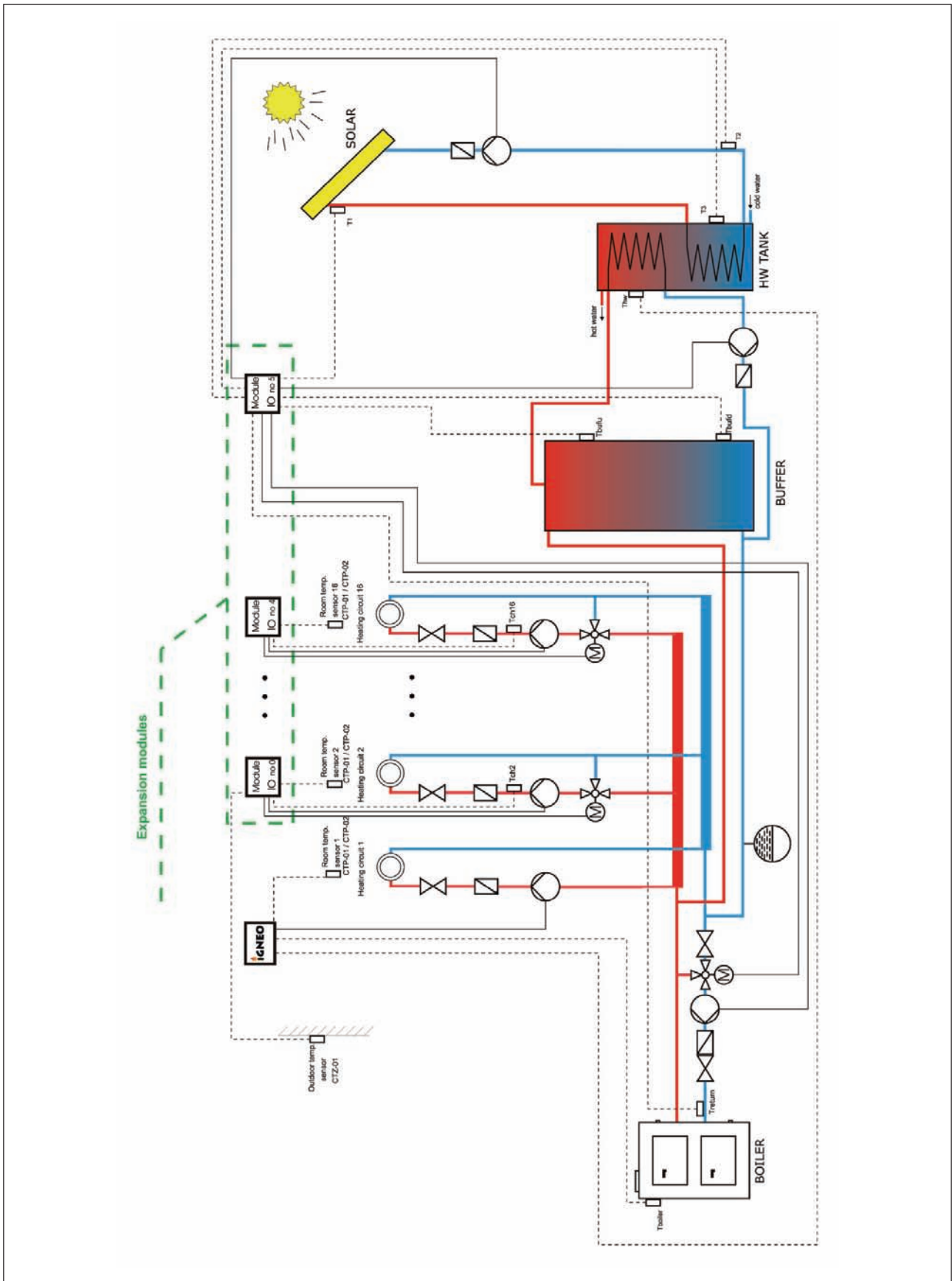
After performing all of the connections you must then configure the module settings. Do this by selecting the modules that are connected to the network. More about the configuration each of expansion modules can be found in chapter 6.5.4.1 and instruction of the enlargement module I/O.

After finishing configuration of expansion modules to do remains only a change the system settings. Menu is used to configure the heating system and the possibility of settings is dependent of number of arranged expansion modules. The table describing the functions – refer to Chapter 6.5.4.2.

On the next page is a sample diagram of the system. Please note that this is only an overhead view, not containing all the elements of the system.

IMPORTANT!

Scheme does not include all elements of the system.



13.1 Sonda Lambda

The Lambda sensor can connect to the system in two ways:

- Directly to the controller, if the entire system with CAN bus module will only be using the Lambda oxygen sensor
- Through enlargement module I/O with the number 5, if in the system there are other modules enlargement.

After connecting the module configure the controller yet. For this purpose, proceed as explained below.

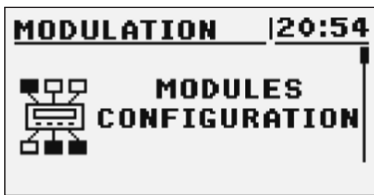
From the main menu select **SETTINGS**.



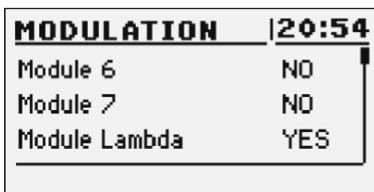
Then in **SERVICE** mode enter the access code.



After inputting the correct code, run the **MODULES CONFIGURATION**.

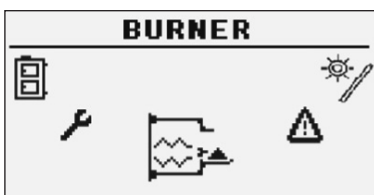


Scroll to **Lambda Module** and turn it on by changing the option to **YES**.

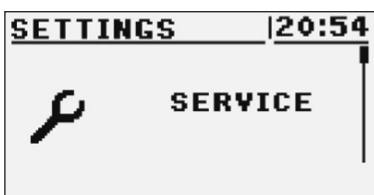


At this stage the Lambda module is on. The second step is a change the configuration settings for the burner.

From the main menu select **BURNER**.



Here you can enter the mode **SERVICE** and if required, enter the access code.



In the list, you can locate the position **Lambda control**, which switches on **YES**.

It is also possible to work with the Lambda control when switched off. Then the Lambda oxygen sensor module will be responsible only for displaying the measurements.

BURNER		20:54
Test fuel mass	0.0	
Fuel calorific value	0.0	
Lambda control	YES	

13.2 Solars

Solar collectors are supported only by enlargement module I/O number 5. After performing all the connections you must configure the controller to work with collectors as described below. The first step is to enable module number 5.

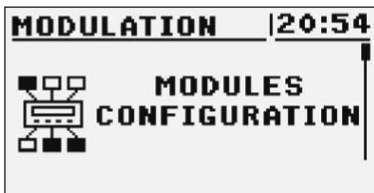
From the main menu select **SETTINGS**.



Then in **SERVICE** mode enter the access code.



After inputting the correct code, run the **MODULES CONFIGURATION**.



Find **Module 5** and activate it by changing the setting to **YES**.

MODULATION		20:54
Module 4	NO	
Module 5	YES	
Module 6	NO	

Now enable the solar handling. In the main menu select **SETTINGS** and then enter the access code in the **SERVICE** mode.

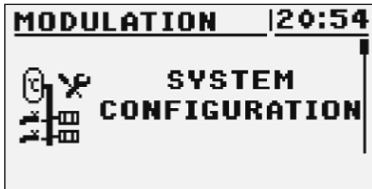


Now enable the solar handling.

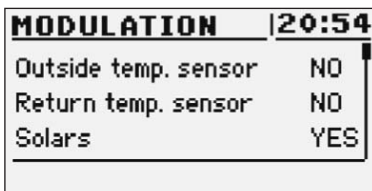
In the main menu select **SETTINGS** and then enter the access code in the **SERVICE** mode.



After entering the code run **SYSTEM CONFIGURATION**.



Scroll to **Solars** and activate by changing the setting to **YES**.



After finishing configuration of the controller we can start to change the adjustment and settings for Solars. The description of the configuration of this can be found in Chapter 12.8.

14. Specification

Technical Data	
Module supply voltage	~230V/50Hz ±10%
Power input (module)	<6VA
Temperature measurement accuracy	±4°C
Sensors	NTC 10kΩ B25/85=3877K±0,75% VISHAY BC components
Ambient temperature	0-60°C
Moisture	5-95% non-condensing
Software class	A
Module output load capacity	
CH pump	100W
HW pump	100W
Igniter	400W
Blower	150W
Burner feeder	150W
Feeder tank	150W



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