



Installation and User Manual



SOLARIS LX

Dear Customer

Thank you for purchasing SOLARIS LX solid fuel boiler. This instruction manual is intended to help you install and operate the product safely, properly and economically. Please read this manual carefully before installation and operation of your product, and keep it during the whole operation life. Do not touch or interfere any part of the product other than those allowed. The installation, maintenance and service of this boiler requires skilled technicians. For the installation of the boiler and proper room selection, installation of water circuit, chimney design, this manual and mandatory regulations must be considered.

Carry out maintenance and cleaning work recommended on your heating system at regular intervals. Details can be found later in the instruction manual. By doing this, you will not only be ensuring the operational reliability of your heating system but also its efficient and low-emission operation

Your boiler's output will vary according to volume of fuel load in the upper chamber between 100% of the boiler's rated power and a reduced value, or your heating system may have a lower demand than the boiler can deliver. For this reason we strictly recommend that an accumulation tank is installed. The accumulation tank ensures operational reliability of the appliance and improves heating response and energy saving, protecting the boiler from condensation due to lower inlet/outlet temperatures and woodgas formation, ensuring efficient and low-emission operation of your boiler. The accumulation tanks must be accomplished with a three-way valve system between inlet and outlet lines of boiler to maintain higher inlet temperatures to boiler at all times.

Manufacturer's Declaration of Conformity (EC)

We, "BOYSIS MAKINE TAAHHUT SANAYI VE TICARET A.S.", located at Şerifali Mahallesi Hüsrev Sokak No.2 Erişkenler Plaza Kat 3 34775 Ümraniye/İstanbul/Turkey (TR) hereby declare under our sole responsibility that

Products : Welded steel boiler for hot water with primary and secondary air regulation, working with gasification process

Models : SLS 25 LX

To which this declaration relates, is in conformity with the following standards;

EN 303/5 of 2013: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking

DIRECTIVE 2015/1189/EC of 28 April 2015; implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers

This declaration will become invalid in case the product has been subject to any modification without prior notice to the manufacturer.

Signed on 05th of February, 2018 by

BOYSIS A.S.

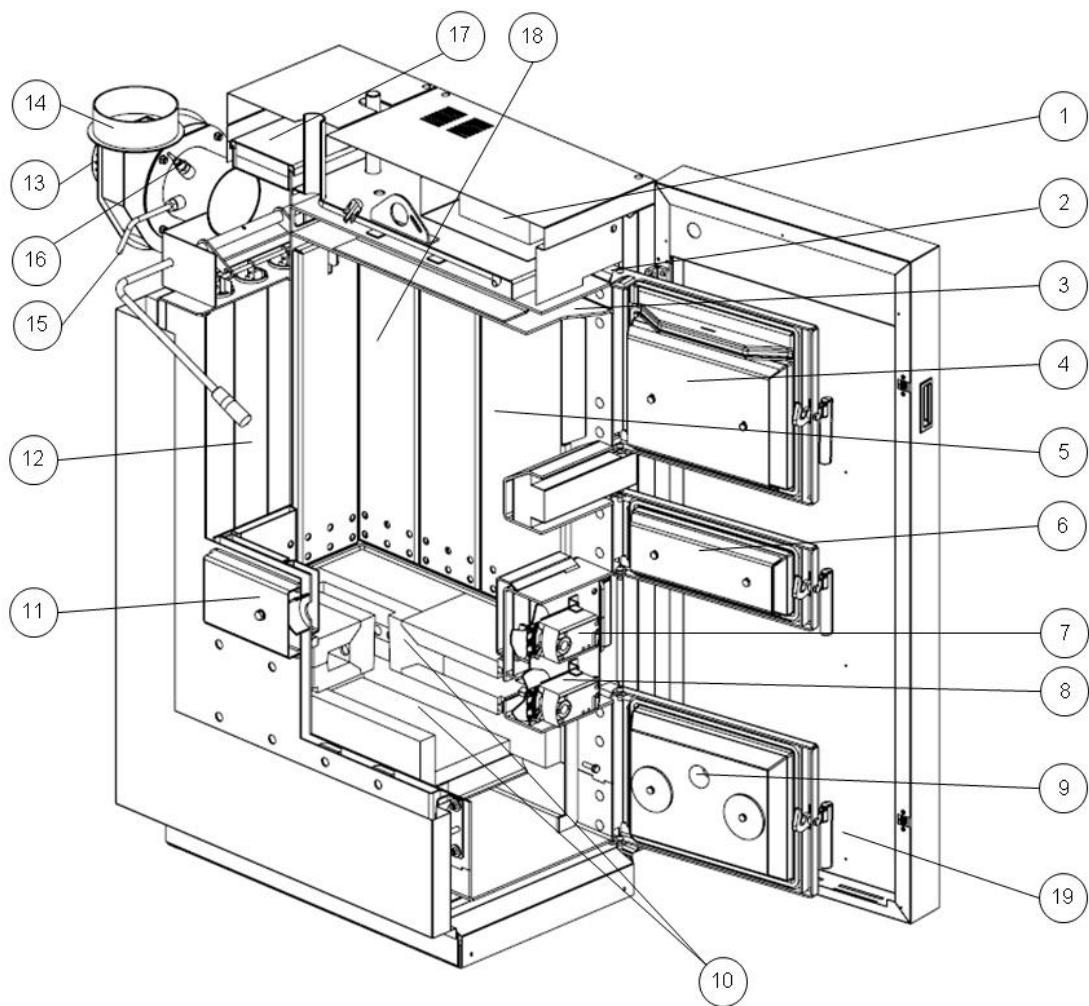
1 INTRODUCTION / WARRANTY CONDITIONS

Solaris is a welded steel boiler designed for efficient burning of woodlogs to be used in hot water heating installations. Therefore, it can not be used for direct sanitary water supply. Main features and advantages of Pyrocal boiler:

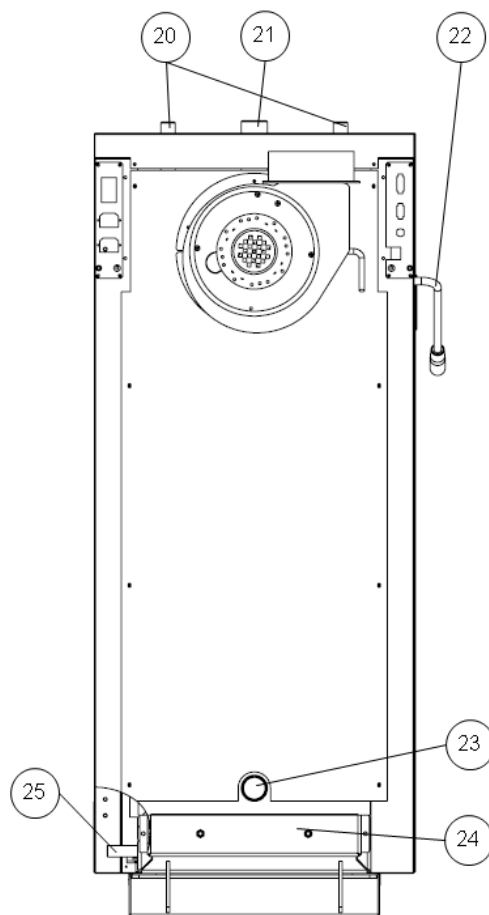
- **Primary and secondary air regulation:** Automatic regulation of primary and secondary air for combustion ensures optimum working conditions with high efficiency through whole operation, thus saving energy. System does not allow fully closed position of air flaps ensuring safety of boiler and its environment
- **Fully electronic boiler control functions:** Boiler operation is controlled by an electronic board and additional lambda unit for optimum performance. With a lambda sonda attached on flue outlet of the boiler, control board measures oxygen level in flue gases, and regulates it between the limits set by the user, adjusting primary and secondary air flaps automatically according to a optimized software.
- **Flue outlet fan modulation:** Speed of the flue outlet fan is accurately adjusted by control board with help of an encoder. Fan speed is modulated to maintain required outlet temperature. If needed, boiler outlet power is also reduced thanks to PID control of main board.
- **Buffer probe:** Application with buffer tank is useful for wood gasification to keep the boiler at high temperatures at all times of operation, increasing efficiency and protecting the boiler, to accumulate the heated water ready for radiator system.
- **Outputs configuraton:** According to design of heating circuit several outputs can be controlled by the boiler, such as two circulating pumps (one for heating, one for domestic hot water supply), one heating pump with either 3-way mixing valve, or diverting valve.
- **Safety features:** Several safety features in line will prevent any mis-use or dangerous situation that may occur. In that case, failure codes are displayed on user panel screen to identify the origin of the problem
 - If water or flue temperatures are over a safety level, fan is modulate or completely switched off to reduce the risk.
 - Cooling loop integrated inside the boiler body (if it is activated by an additional safety valve) will be put into use if water temperature for any reason is above 95 °C. It will cool down the boiler until a safety level is reached by circulating cold water inside the copper serpentine.
 - If oxygen level is above 15%, the boiler will go to shutdown mode to save energy.
- **Advantages of fan at smoke outlet:** Suction fan eliminates firing problems and keeps combustion chamber always in negative pressure. It helps ensure easy control on primary and secondary air, increasing water efficiency of the boiler. Automatic restarting of firewood is performed in presence of a minimum quantity of embers in wood storage.
- **Auto by-pass system:** When fuel loading door is opened, fan is automatically switched to its maximum speed, and all flue gases or flame in loading chamber is delivered directly to flue outlet of the boiler without circulating inside the boiler. This is achieved by the help of a switch positioned on the fuel loading door.
- **Double layer loading chamber:** Dry internal surface by protecting shields in gasification chamber improves gasification process, and extends boiler lifetime.
- **High temperature resistant cast refractory burner:** Special cast low alumina refractory burner with reinforcement additives against thermal stresses and humidity can operate up to 1600 C, and ensures good mixture of wood gas with secondary air, improving combustion and emissions

- **High efficiency with increased heating surface:** Additional water cooled surfaces after combustion, designed as horizontal three pass principle increase heat transfer rate, and automatic regulation of combustion air, reduce flue outlet temperature, with average water efficiency of 92%.
- **Integrated cooling loop for safety against overheating:** A cooling loop made of copper tube is integrated inside the boiler. Inlet and outlet connections of this cooling loop are outboard at the top of the boiler. A safety valve to activate the heating system at high water temperatures should be attached for proper work of safety system. Whether the hydraulic circuit is open vented or pressurised, the safety valve should be utilized within the system for meeting the regulations of related European standard for this product, as well as the safety of whole heating installation and the boiler itself.
- **Smoke pipe cleaning:** Smoke pipes of heat exchanger can easily be cleaned with the help of a lever outboard the boiler body.

Solaris is delivered in one single package on a wooden pallet with control panel, fan, this manual, cleaning brush, and fuel shaker arm included, and external cabinet fit before leaving factory.



- 1 Control panel + Lambda unit
- 2 Door switch
- 3 Smoke by-pass
- 4 Front loading door
- 5 Fuel (gasification) chamber
- 6 Ignition and cleaning door
- 7 Primary air regulating motor
- 8 Secondary air regulating motor
- 9 Front ash door
- 10 Combustion chamber refractories and
- 11 Primary air manifold
- 12 Heat exchanger pipes
- 13 Suction fan
- 14 Flue outlet
- 15 Flue gass temperature sensor
- 16 Lambda sonda
- 17 Cleaning cover -1
- 18 Wood storage protector plates
- 19 Front panel
- 20 Cooling loop connection for safety valve (3/4")
- 21 Delivery (1 1/2")
- 22 Pipe cleaning lever
- 23 Inlet (1 1/2")
- 24 Rear cleaning cover
- 25 Filling / draining outlet (1/2")



WARRANTY CONDITIONS

THE MANUFACTURER guarantees the product, with the exception of elements subject to normal wear (listed below), for a period of 2 (two) years;

- Starting from date of start-up, which is proven by a commissioning document that contains the name of the seller and the date when the sale / first start-up took place
- If there is no service/commissioning report, standard guarantee period starts with the date when the sale took place.

The term 'warranty' refers to the (free-of-charge) replacement or repairs of parts acknowledged to be faulty due to manufacturing defects.

Furthermore, in order for the guarantee to be valid, the product must be installed and calibrated by qualified personnel. Installations that do not meet the current standards, improper use and lack of maintenance as expected by the manufacturer, void the product warranty. The warranty is valid on the condition that the instructions and warnings contained in this manual are observed, and therefore the product is used correctly.

The replacement of the entire system or the repair of one of its components does not extend the warranty period, and the original expiry date remains unchanged.

EXCLUSIONS FROM WARRANTY

Parts subject to normal wear such as gaskets, ceramic glass, cast iron grilles, vermiculite boards, fire bricks, fire stone burners, handles and electric cables, knobs, all parts which can be removed from the firebox, are excluded from the warranty

Any part that may be faulty as a result of negligence or careless use, incorrect maintenance or installation that does not comply with the manufacturer's instructions (see the relative chapters in user manuals of each product).

The warranty will be rendered null and void in the event of damage caused by tampering, atmospheric agents, natural disasters, vandalism, electrical discharges, fire, faults/defects in the electric and/or hydraulic system, and maintenance not being performed at all or as indicated by the manufacturer instructions

Non-regular electrical supplies, and electrical power cuts off too often, can cause severe damage on control system, sensors and actuators of the products carrying those components. We recommend installing 230 V 50 Hz AC voltage regulator for those products. Also installing a UPS for pumps can protect system from electrical cut-offs causing over heating of water.

The warranty does not cover malfunctions and/or damage to the appliance that arise due to the following causes:

- Damage caused during internal transportation and/or handling
- All parts that develop faults due to negligence or improper use, incorrect maintenance, installation that does not comply with the manufacturer's instructions (always refer to the installation manual provided with the product)
- Improper overheating of the equipment, use of fuels not conforming to the types and quantities indicated in the instructions provided
- Further damage caused by incorrect user interventions in an attempt to fix the initial fault
- Worsening of the damage caused by the user continuing to operate the appliance even after the fault has been noticed.
- In case of a boiler/hydro stove, any corrosion, incrustations or breakages caused by water flow, condensation, lack of water in the system, mud or limescale deposits
- Inefficiency of chimneys, flues or parts of the system affecting the appliance.
- Failure to have the annual product maintenance performed by an authorised technician or qualified personnel will result in the loss of the warranty.
- Save for the legal or regulatory limits, the warranty does not cover the containment of atmospheric and acoustic pollution.

THE MANUFACTURER declines all liability for any damage which may be caused, directly or indirectly, to persons, animals or objects as a consequence of non compliance with any provision specified in the manual, especially warnings regarding installation, use and maintenance of the appliance.

SPARE PARTS

Only use original spare parts. The retailer or service centre can provide all necessary information regarding spare parts. We do not recommend waiting for the parts to get worn out before having them replaced. It is important to perform regular maintenance.

The Manufacturer declines all liability if the product and any other accessory is used improperly or modified without authorisation. All parts must be replaced with original spare parts. Warranty cover is valid if the product is installed and tested by a qualified installer, according to the detailed instructions provided in the instruction manual supplied with the product. The term 'warranty' refers to the (free-of-charge) replacement or repairs of parts acknowledged to be faulty due to manufacturing defects.

2 SAFETY WARNINGS

3.1 Basic safety instructions

- Never get yourself into danger; give own safety the utmost priority.
- Keep children away from the boiler room and fuel storage room.
- Observe all instructions related to operation, maintenance, servicing and cleaning.
- The heating system may only be installed and started up for the first time by an authorised installer. Professional installation and start-up are essential for safe and economical operation.
- Never make any changes to the heating system or flue gas system.
- Never close or remove safety valves.
- Air for combustion is automatically supplied and adjusted by two regulating motors. Never block fresh air from reaching to the motors. Never add any item on or around regulating motors.
- Never push the regulating motors completely closed manually
- Never interfere with the settings and working limits of regulating motors on user panel

3.2 Warning signs

DANGER – Risk of poisoning

- Make sure that the boiler is supplied with sufficient combustion air.
- Ventilation systems, central vacuum cleaning systems, extractor fans, air conditioning systems, flue gas blowers, dryers or similar equipment must never be allowed to draw air from the boiler room and cause a drop in pressure.
- The boiler must be connected tight to the chimney using a flue gas tube.
- Clean the chimney and the flue gas tube at regular intervals.
- The boiler room must be sufficiently supplied with air and ventilated.

DANGER – Risk of electric shock

- Switch off the system before performing work on the boiler.
- **THIS APPLIANCE MUST BE EARTHED !**
- Electrical installation of this boiler must be completed in accordance with mandatory regulations, and codes of practice regarding the instructions given in this manual by authorized installer.

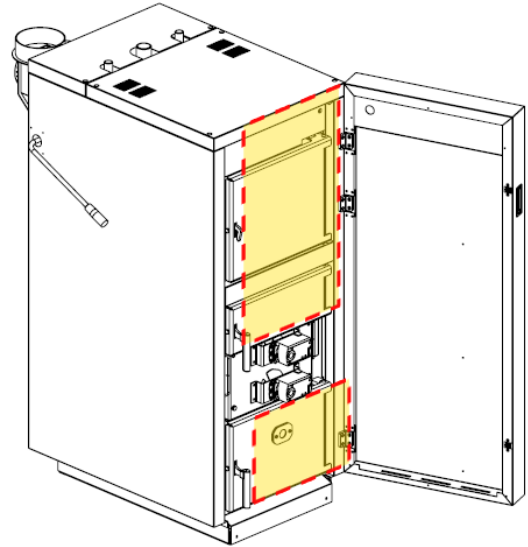
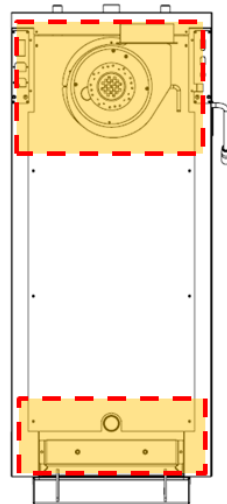
DANGER – Risk of explosion / fire

- Never burn petrol, diesel, or other explosive materials in the boiler or storage room
- Never use liquids or chemicals to ignite the wood
- Do not store any flammable materials in the boiler room.
- Do not hang out any washing in the boiler room.
- Always keep all boiler doors closed
- Store the woodlogs in another room, or leave a minimum distance of 80 cm between the boiler and the woodlog pile.

DANGER – Risk of burns

Risk of burns

- Do not touch the flue spigot or the flue gas tube.
- Do not touch the front door surfaces (except for door opening handles), rear cleaning covers, and smokehood section named as boiler working surfaces when there is fire, which are marked with red rectangle on the right hand side
- Do not reach or clean the boilers inside until it is completely cooled down.



CAUTION – Sharp edges

Risk of cut injuries due to sharp edges.

- Use gloves for performing all work on the boiler.

NOTICE

Damage to property

- Negative external influences, such as insufficient combustion air or non-standard fuel, can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases or flash fires) which can in turn cause serious accidents!

Damage to property

- Do not use the heating system if it, or any of its components, come into contact with water.
- If water damage occurs, have the heating system checked by your authorised service staff or approved technicians, and have any damaged parts replaced in case needed.

3.3 What to do in an emergency

What to do in the event of a fire

- Switch off the heating system.
- Call the fire brigade
- Use approved fire extinguishers.

What to do if you smell smoke

- Switch off the heating system.
- Close the doors leading to living areas.
- Ventilate the boiler room.

3 WARNING ON GASIFICATION AND PROPER FUELS

Wood and gasification: It is very important that wood gasification boilers work in specific conditions. Boiler's average temperature should be around 70 - 80 °C. At lower temperatures gasification process does not take place in a correct way. This will result in more fuel consumption and lower heat outputs

Wood drying in the wood storage (loading chamber or gasification chamber) is an essential stage in gasification process. Wood will not have adequate temperature for wood gas formation at lower boiler temperatures and all of the process is inadequate. Main warming source in loading chamber is gas flame arising during gasification. So, if the main conditions for correct gasification is not achieved, then both quality and quantity of wood gas will not be sufficient.

Proper fuels: In gasification boiler, you can fire only wood, particularly hardwood. Wood must be dry. It is important that thermal value of the wood is primarily dependent upon the moisture content. Water content of the wood must be between 12 - 20%. Water content can be measured easily by a simple device purchased commercially.

Firewood must be split and its size must be adapted accordingly to fit in loading chamber. Unsplit logs and square boards are not suitable for burning. Length of woodlogs should be equal to free length of loading chamber at its best. Bigger logs must be cut into smaller sizes to fit best in the loading chamber. Best way is to split logs before they are prepared for drying.

The calorific value of firewood should preferably be between 15 to 17 MJ/kg. Suggested fuels:

Wood	Heating capacity for 1 kg		
	kcal	MJ	kWh
Spruce	3900	16,2	4,5
Pine	3800	15,8	4,4
Birch	3750	15,5	4,3
Oak	3600	15,1	4,2
Beech	3450	14,4	4

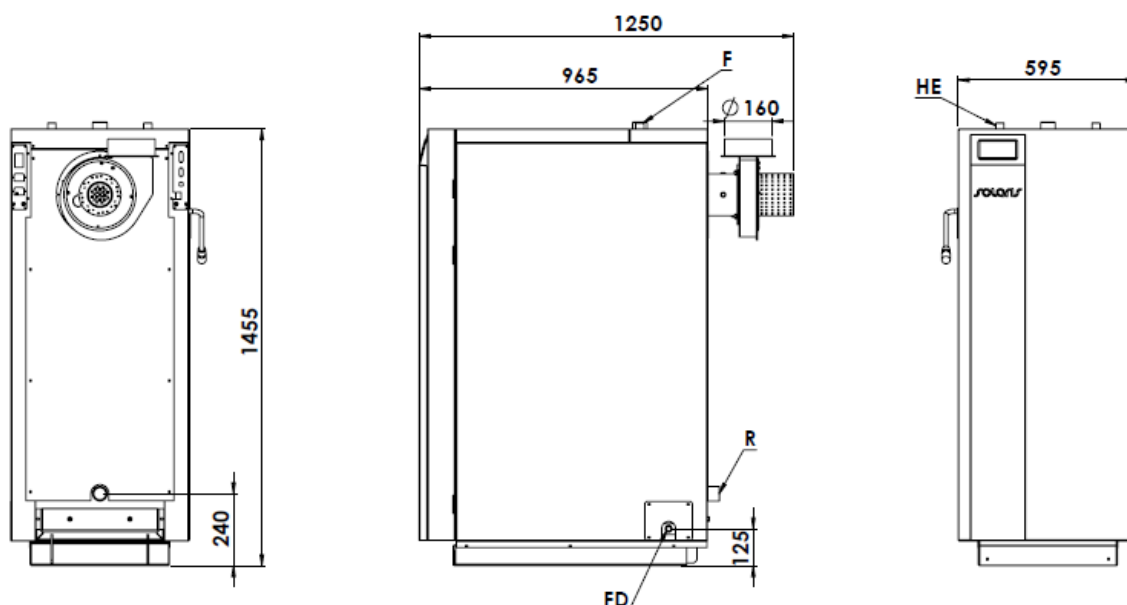
To operate boiler in full gasification mode with optimized efficiency

- Keep inlet and outlet temperatures of boiler at maximum (average should be 70-80°C)
- Use dried woodlogs with parameters suggested above
- Load the fuel chamber fully and operate the boiler at declared maximum output. The boiler must not be permanently operated with output levels lower than 50% of its nominal output. Ecological operation of this boiler at its nominal output.
- Use an accumulation / buffer tank with a proper size for heat output
- Clean boiler surfaces regularly against excessive soot and tarr accumulation which will have negative effect on boiler performance
- All above precautions on boiler system will also minimize the condensation and tarr formation on boiler surfaces particularly inside the loading chamber, thus protecting boiler material against corrosion to reach longer operation lifetime.

4 TECHNICAL DATA

Model		SLS 25 LX
Fuels		Dry log wood - A (to EN 14961-5)
Boiler class		5
Heat output	kW	25
Efficiency	%	92
Water content	lt	87
Total heating surface	m ²	3,10
Fuel container volume	dm ³	120
Maximum wood log length	cm	50
Fuel loading clearance (H x W)	mm	280x370
Flue gas temperature	°C	120,0
Flue gas mass flow	kg/sec	0,018
Required draft at chimney (min-max)	Pa	8 - 12
	mbar	0,08 - 0,12
Temperature control range	°C	60 - 90
Maximum operating temperature	°C	90
Minimum return temperature	°C	55 (recommended)
Maximum operating pressure (boiler)	bar	3
Safety system activated at	°C	95
Maximum operating pressure (cooling loop)	bar	6
Cold water temperature for cooling loop	°C	10 < t < 25
Water flow/return connections (F/R)	R	1 1/2"
Cooling loop connections (HE)	R	3/4"
Filling / draining connection (FD)	R	1/2"
Waterside resistance (ΔT 10K / 20K)	mbar	4,8 / 2,2
Electrical supply		230 V / 50 Hz / 0,5 A
Power consumption at nominal heat output	W	65
Stand by power	W	4
Airborne noise level	dB	< 65

Fuel type		Wood - A
Combustion period at max load	h	6 to 8
Requested fuel parameters		Allowable water content 12 - 20%
		Average calorific value 15.000 - 17.000 kJ/kg
Allowable wood log size		Diameter between 7 cm - 15 cm



5 INSTALLATION

5.1. Handling the product

Solaris is a heavy product, and care should be taken when carrying the boiler to the room where it is going to be installed. To avoid damage during transport, boiler should be moved with forklift or transpalet. Use the transport feet on the wooden pallets.

NOTICE – Damage to property

- Do not use hard and sharp objects while removing the package around the boiler to prevent damage of the painted jackets.

5.2 Room selection

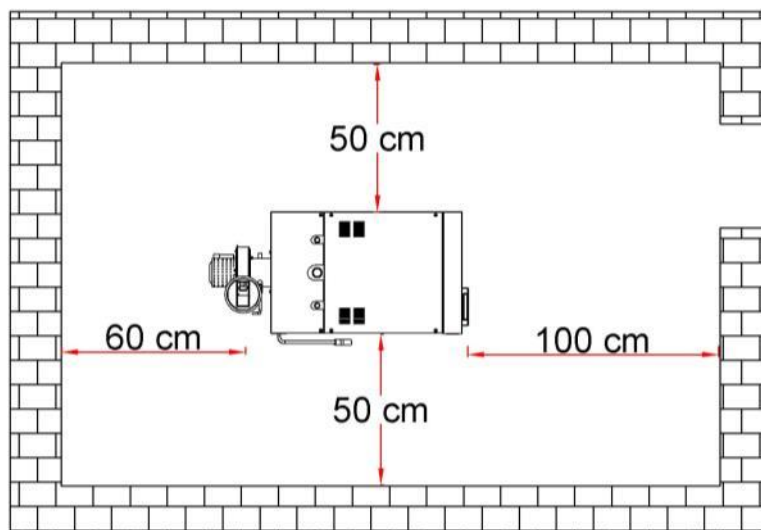
Boiler must be installed in an individual boiler room particularly organized for heating. The boiler room should be of enough volume for installation, firing, and maintenance of the boiler. There should be enough fresh air circulation for combustion, the chimney design must ensure an adequate draught for related boiler type, and must comply with construction criteria given further in this manual and in mandatory regulations. Your boiler must never be installed in open spaces or balconies, in spaces occupied by people like kitchen, living room, bathroom, bedroom, in spaces where there are explosive and combustible materials.

The boiler room should have air ventilation holes, one must be built maximum 40 cm below the ceiling, the other must be built maximum 50 cm above the floor level. These ventilation holes should always be kept open. The upper hole should be at least 40x40 cm in size, the lower hole at least 30x30 cm. All hydraulic and electrical circuits must be arranged by authorized staff in accordance with mandatory regulations. Solid fuels should be stored by keeping minimum 80 cm distance from the boiler. We recommend you to keep the solid fuel in another room. Boiler should be installed on a concrete plinth made of a fireproof material. For minimum sizes of the plinth, following table should be referred

Model		SLS-25 LX
Plinth height	mm	50
Plinth width	mm	600
Plinth length	mm	900

5.3 Clearances around boiler

At least the following clearances (in cm) should be achieved around the boiler:



5.4 Circulation pump

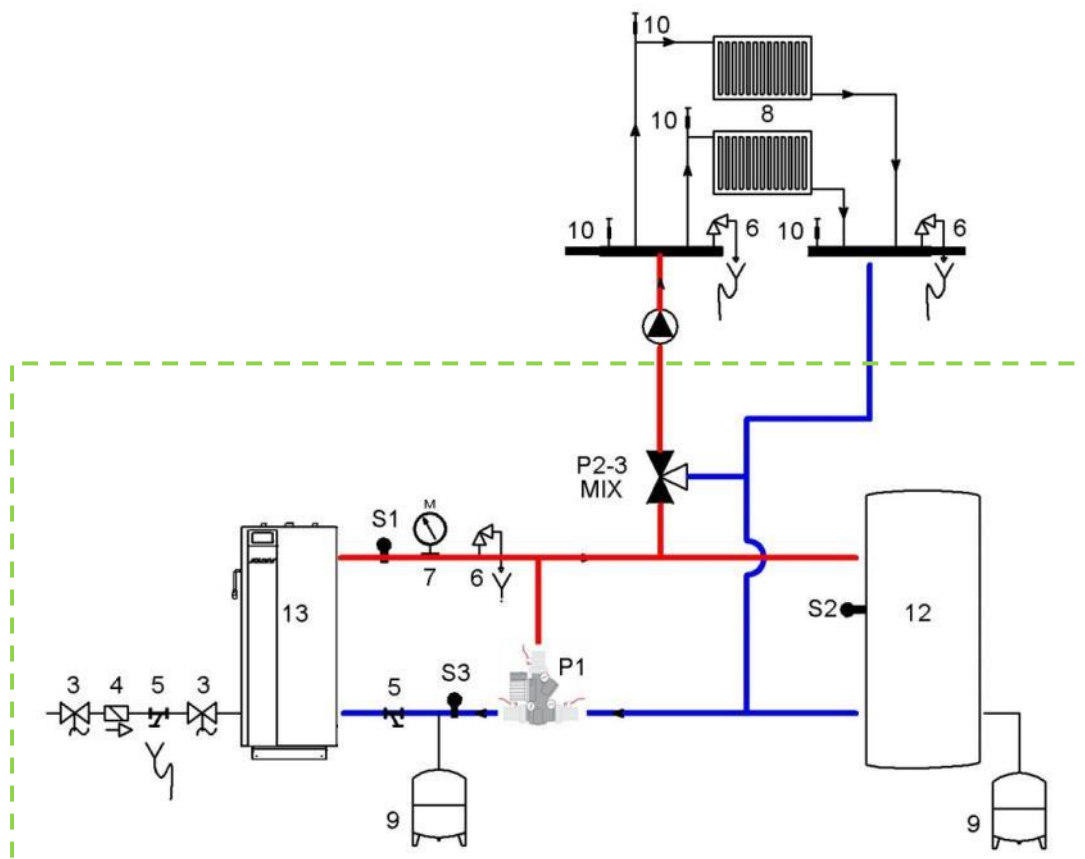
We recommend building a forced water circulation system with a sufficient pump. Refer to the system diagrams given further in this manual to find the right position of the pump within the hydraulic circuit. Your boiler automatically switches the pump on and off according to the program stored in its PCB. That is why the pump of the primary circuit must be driven by the control panel. Wiring to the pump is supplied at the back of the boiler. Pump will automatically start when boiler outlet water temperature exceeds set value for pump and will automatically switch off when temperature falls below this value. This feature will help prevent boiler from condensation in flue.

5.5 Rules for hydraulic circuit

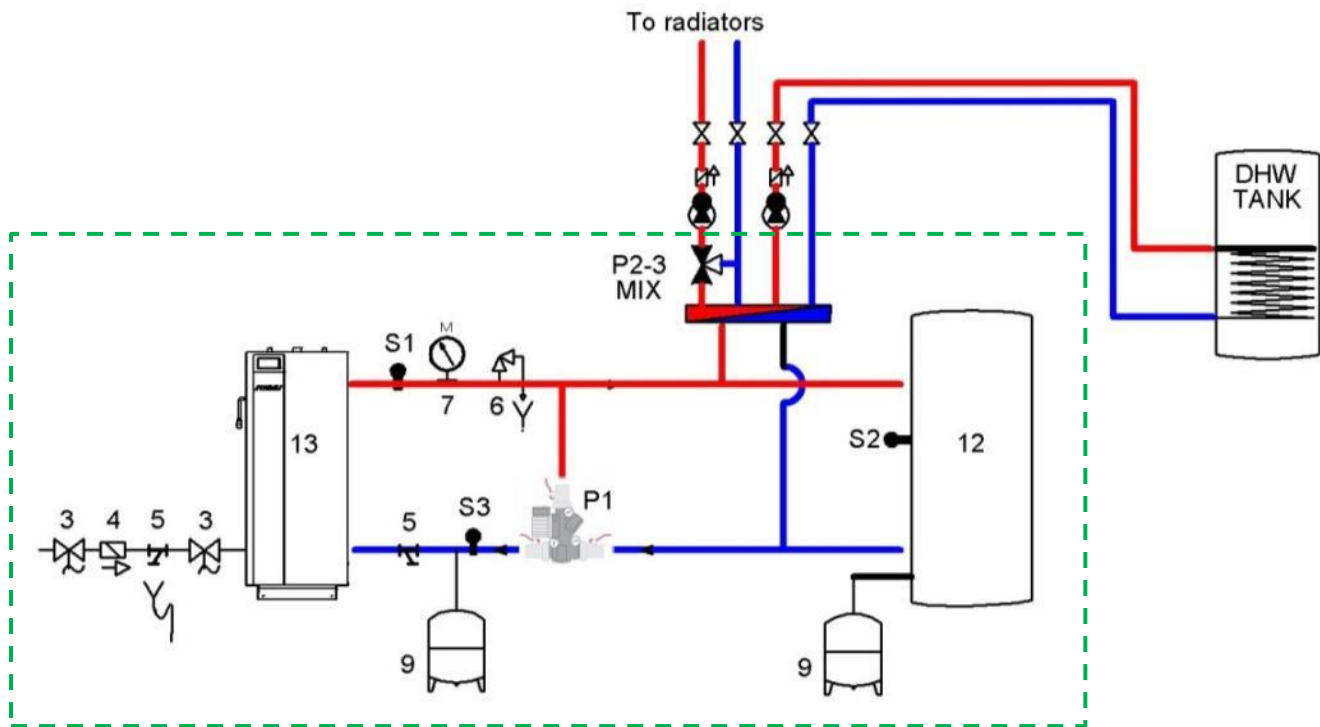
Boiler is installed in a pressurized heating circuit with a buffer tank in respect with the following scheme. If you install your boiler together with a buffer tank with a help regulation device with integrated by-pass flow control, you will have higher field efficiency from your heating system installation together with higher comfort and better protection of system components. For this reason we recommend following installation scheme with regulation control units that can be found in the market (such as Laddomat-21, Regulus Thermovar LK810). For proper sizing regulation unit and buffer tank according to your boiler and total heated area size, please refer to the instructions supplied by the manufacturers of regulation unit.

We recommend a buffer storage tank capacity of 50 to 70 litres per kW boiler output if the system is based purely on wood and not combined with an oil or gas-fired heating. You can refer following hydraulic circuits diagrams with basic parameters attached:

P1	Primary circuit pump / return (boiler protection line) pump	8	Radiator
P2	DHW circuit pump / 3-way diverter valve	9	Expansion tank
P2-3	Mixing valve	10	Air relief valve
3	Globe valves	12	Buffer tank
4	Check valve	13	Boiler
5	Strainer	S1	Boiler probe
6	Safety valve	S2	Buffer probe
7	Manometer	S3	Return probe / Flow probe



Configuration 1



Configuration 2

NOTICE – Boiler accessories

- S1 boiler probe is delivered together with boiler.
- S2 buffer probe, and S3 return probe should be purchased if they are going to be used in the system. Probe specifications are given further in this manual
- According to above scheme, pumps on secondary and DHW circuits must be driven externally. Boiler should drive P1 pump on primary circuit.
- You can drive P2 pump on secondary circuit for radiator system, instead of using a P2-P3 mixing valve.

NOTICE – Safety of heating circuit

- Install a ½" safety valve with a maximum relief pressure of 3 bars.
- Install a manometer to follow and check water pressure in the system. When water is cold, system pressure should be set at 1 - 1,5 bars.

WARNING – Risk of corrosion

- Your boiler is of quite a strong design against corrosion. However, all metal surfaces in whole heating circuit should be protected against corrosion like piping and radiators. The oxygen in heating water will cause rust and then material loss on iron-based metal surfaces by means of oxidation.
- During the first water make-up, oxygen must be fully discharged from the system. Generally, oxidation will not be a problem, if all measures are taken into account during first water make-up. Oxidation will take place because of fresh water addition to the system during operation of the boiler. Leak points in a system will cause oxygen to be absorbed inside the heating water. For this reason, minimum water pressure in a pressurized heating circuit must be above atmospheric pressure.

CAUTION – For new installations

- System should be sized and designed accordingly, in order to minimize fresh water addition. Make sure that no part of the system is made of material that is permeable to gases. The original system filling and any topping-up water must be filtered (using synthetic or metal mesh filters with a filtration rating of no less than 50 microns) to prevent sludge from forming and triggering deposit induced corrosion. Minimum water pressure in heating circuit must always be kept above atmospheric pressure

CAUTION – For a new boiler installed on an old heating circuit

- In old systems used for a long time, a protective coating (black magnetite) has been built on all metal surfaces contact with water. This coating protects the system against further corrosion. When a new boiler is installed in such an old system, new parts with clean metal surfaces, particularly boiler surfaces will inevitably become sacrificial anode for the entire heating system, in other words, they come in the first place where corrosion starts. That is why, following precautions should be added to those given above, for a new boiler in an old system:
- If the old system has an open expansion tank, this may be converted to pressurized system with all necessary safety measures.
- The old system must be fully washed up from all substitutes and particles contained on the surfaces.
- An air separator with manual vent should be installed at the highest level of the circuit.

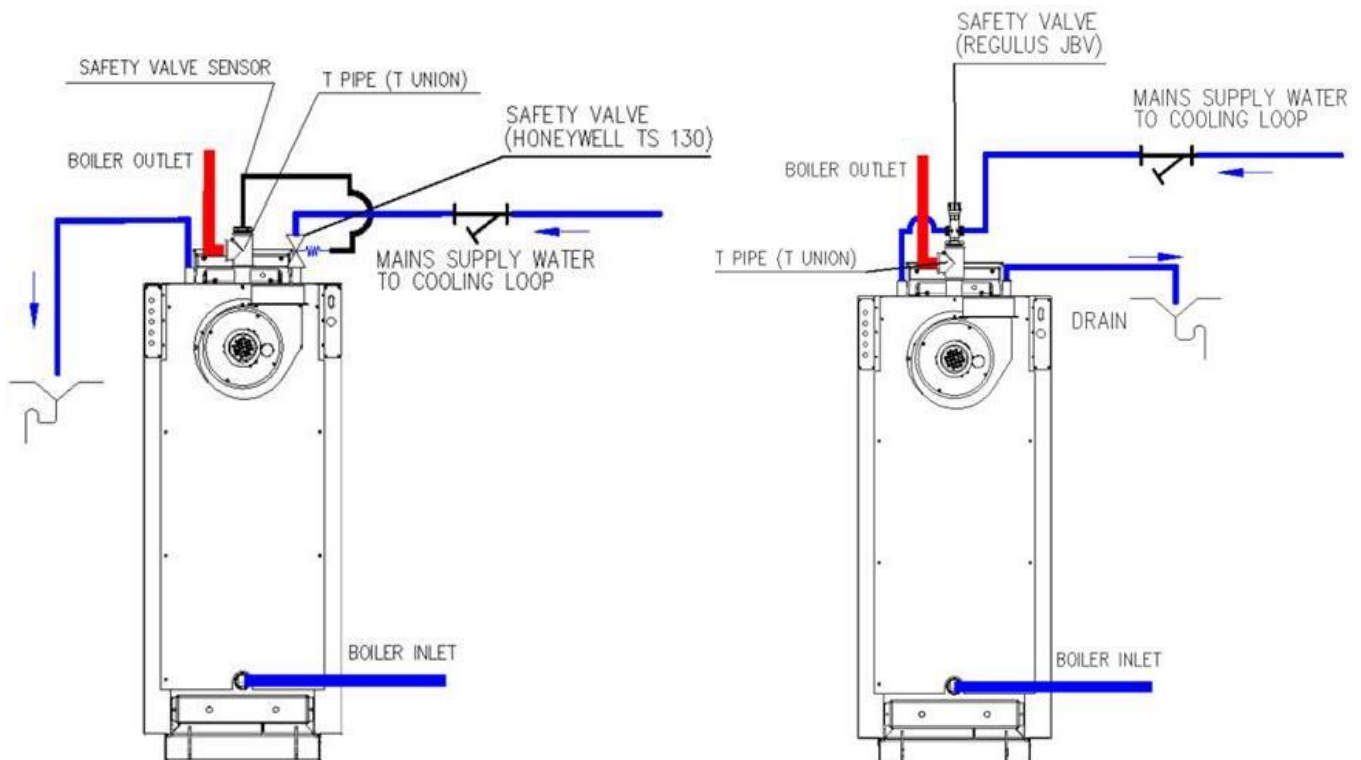
5.6 Safety against over-heating

Boiler has an integrated cooling loop made of copper against overheating. During the installation of the boiler, 3/4" connections of cooling loop at the top of the boiler must be used for safety circuit. A safety valve must be purchased separately and installed according to the schemes below.

If boiler water temperature exceeds 95 °C, thermostat of the safety valve lets cold sanitary water flows through the serpentine of the safety cooling loop. Serpentine with cold water circulating inside cools down the boiler water temperature. When boiler temperature decreases below the safe degree, safety valve shuts the cold sanitary water circulation, and the boiler goes back to normal operation. The valves on the sanitary connections of safety heat exchanger must always be kept open. Cold water must never be delivered directly to boiler inlet in order to solve overheating problems as this will result in serious damage on boiler body. That application will end warranty of the boiler.

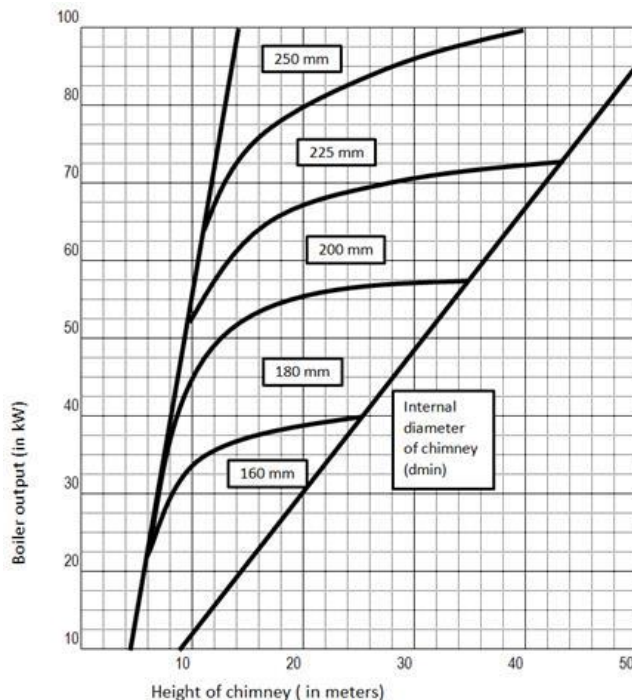
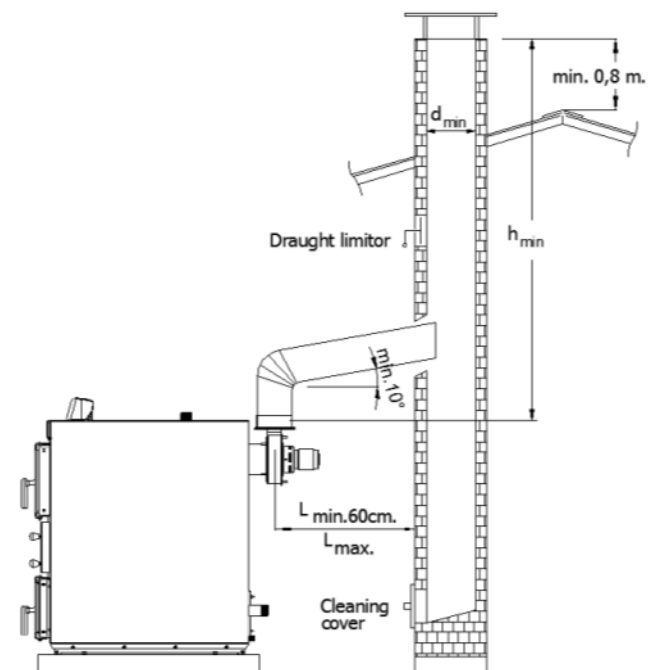
NOTICE

- Cold water pressure for safety heat exchanger must be reduced to 2 bars before safety valve inlet.



5.7 Chimney connection

Boiler must be connected to an individual chimney that will provide at least the minimum draught requested. The flue channel between the boiler and the chimney should be insulated. The flue channel to chimney and chimney must be made of steel or an equivalent material that can be used at temperatures around 400 °C. All connections on the flue system must be sealed in order to perform a good combustion and efficiency. The flue channel must be connected to the chimney using the shortest way and in accordance with the dimensions given in the following scheme. Horizontal connections and equipments that will increase the pressure loss such as elbows should be avoided.



At the lowest level of chimney, there should be a cleaning cover, sealed for any leakage. The length of flue channel between the boiler and the chimney should not exceed ¼ height of chimney. The size of flue channel and chimney should not be less than the size of the boiler flue gas outlet connection.

5.8 Electrical installation and wiring

The boiler is fed with 230 V. A regulator must be used in installations where the power supply is below 205 V or above 230 V. Control panel should be connected to a wall plug with an efficient ground system, which is placed not far more than 50 cm. to boiler with a circuit breaker which has at least 3 mm gap between contacts. For this reason, if a new electrical installation is required, 3x1,5 TTR cables must be used.

Boiler is supplied with the terminal on the right, outboard rear panel. Mains cable with a female connector is supplied together with boiler. For CH pump or diverting mixing valve wiring, only male connectors are supplied in the package.



Connecting the power cord

Control panel should be connected to a wall plug with an efficient ground system, which is placed not far more than 50 cm. to boiler with a circuit breaker which has at least 3 mm gap between contacts. Use the power cord supplied with the boiler.



CAUTION

- If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

Connecting the pump

Use the socket given attached with the boiler to make the pump connection. Incorrect core termination can cause severe injuries and damage to the equipment. Take care not to interchange wires "L1" and "N". Recommended connecting cable H05VV-F3G 0.50 mm2

3-way valve or mixer valve connection

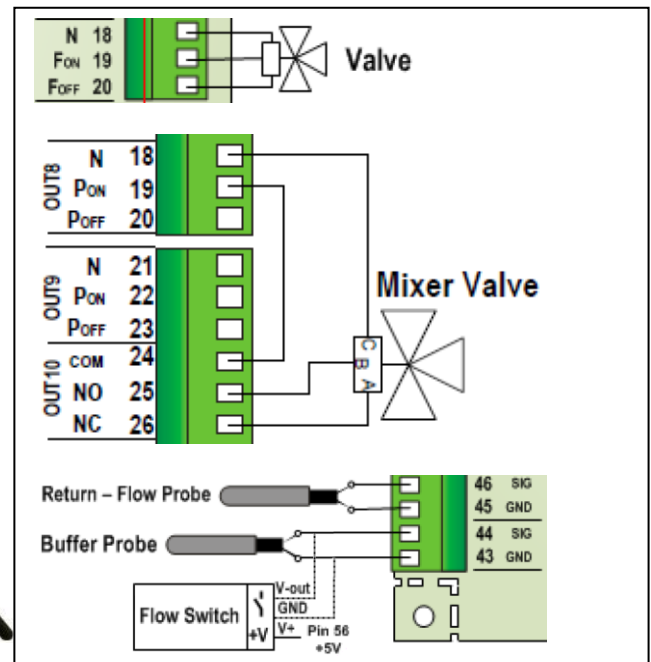
If the 3-way valve connection is wanted remove the DHW pump cable connections from the pins 22-23 and connect the 3-way valve as seen in the diagram.

Buffer and return NTC probes

Buffer and DHW probes are not supplied with the boiler. In case of buffer or DHW tank installation the probes should be purchased separately.

NTC probe specifications:

NTC 10K @25 °C: 120 °C Max

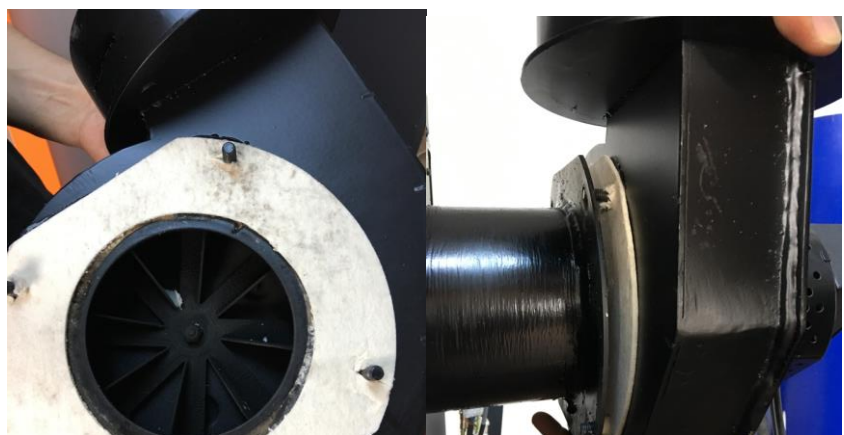


WARNING

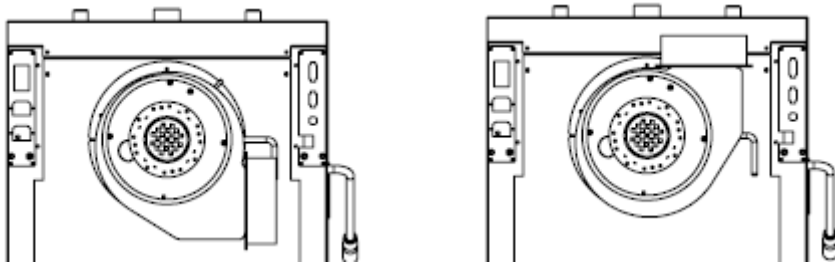
All electrical installations must be carried out by authorized agen in accordance with mandatory regulations and codes of practice. Only qualified personnel may open the control panel on the boiler. Any interference with the wiring in the control panel will invalidate the warranty.

5.9. Suction fan installation

Fix the fan + fan protective shield group on the smokehood as shown in the following pictures. Between fan protective shield and smokehood, first place the gasket supplied with the boiler package.



You can choose flue outlet direction during fan scroll installation as seen in the following pictures. Default connection for fan scroll flue outlet is vertical as shown on the right picture. But it is also possible to make horizontal connection for flue outlet:

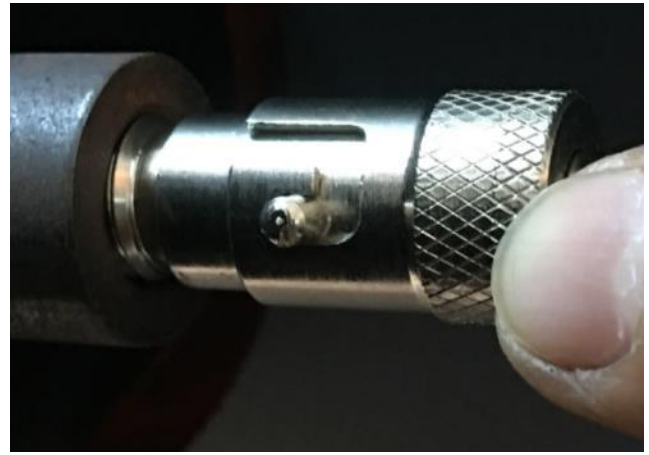
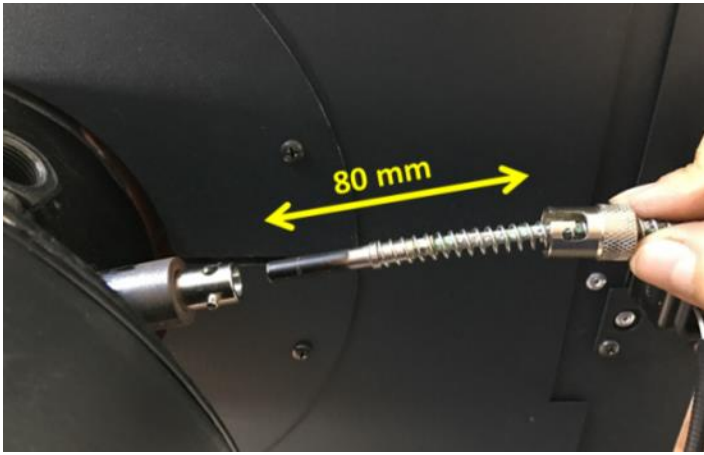


5.10. Flue Gas Temperature Sensor and lambda sonda installation

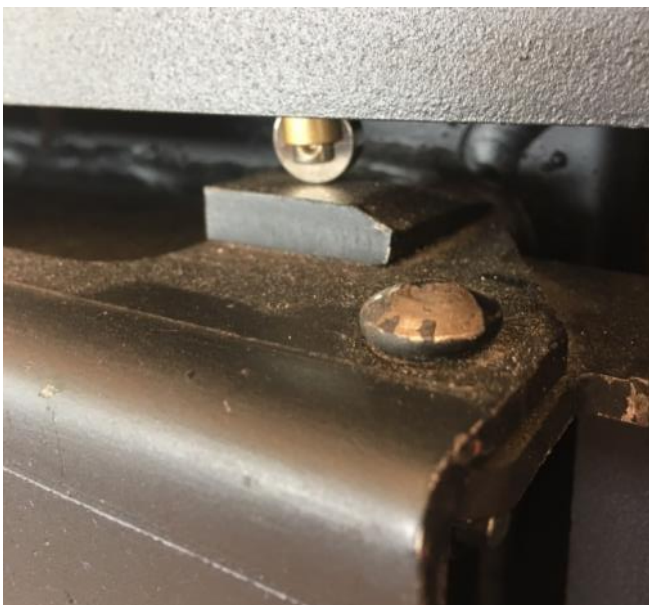
The thermocouple used in the boiler is "K Type".

1. Remove the terminal cover at the back of the boiler to reach probes of flue gas thermostat and lambda sonda. Remove the flue gas sensor outside through the hole on the side panel. Take the pocket phial attached on the flue gas sensor, and screw it into the housing on the fan scroll
2. By rotating the nut on flexible part of sensor bulb, move the nut away from the sensor head. The distance should be at least 80 mm. Then move the sensor into the pocket phial, press and lock the nut to secure both. Make sure that the sensor is mounted tightly.
3. Fixing port for lambda sonda is positioned above flue thermostat. First take the lambda probe from its package, connect lambda probe connector coming from controller, then insert connector group onto the port on rear terminal cover as shown on following pictures. Screw the lambda probe into its port at the flue spigot.





5.11. Position of door switch



(1)



(2)

1. Switch is on top of the ramp fixed onto fuel loading door, when the door is closed
2. When door is opened switch roll is released, and by-pass function is activated

6 OPERATION

6.1 Before first fire make-up

Before the first operation of boiler, the hydraulic circuit must be ready for operation. To fill a pressurised circuit, feed fresh water from main supply line using either filling/draining tap, or the return line constructed within the circuit. To purge the air contained in the system, use air relief valves on the hydraulic circuit, on the radiators, and also spring pressure relief valve at boiler hot water outlet. During filling the system all valves and accessories on the lines must be checked for leakage. Before every firing make sure that;

- Boiler and circuit are filled with water, and the hydraulic pressure is in the required range.
- All valves on the line are in open position.
- There is enough draught in chimney.
- You can leave the main switch at the back of boiler at “ON” position

6.2 Firing up

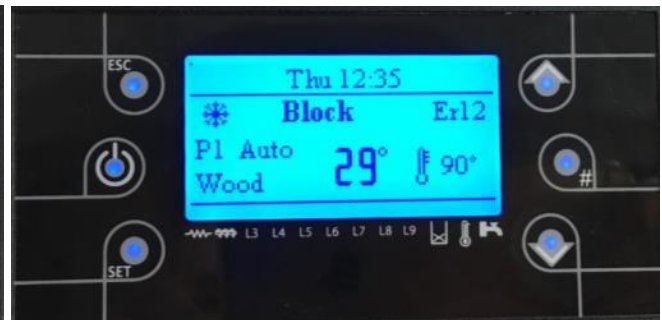
- When boiler is at OFF or STAND-BY mode, regulating motors will be at CLOSED position as seen on the following picture.
- Open fuel loading (upper) door. Through the upper door, put small sizes woodlogs (two layers) on the burner by keeping burner nozzle open as shown in the picture. Then place some cardboard over them. After cardboard you can put some more some small sizes woodlogs.
- Then fill the rest of loading chamber with firewood, but do not fill to the top (always leave space at least 10 cm from the top of the chamber)



- Open the middle door (ignition door) and insert some paper to ignite the woods. Then ignite the woods.



- Close the upper loading door. Switch the boiler ON by pressing ON/OFF (P2) button on front display. Boiler automatically starts at IGNITION mode. When boiler switches to IGNITION mode, air flaps will be opened to 50% automatically by regulating motors.
- Keep the ignition door open for about 5 - 10 minutes to have enough fire in the chamber. According to factory settings, if flue temperature stays below 45°C after 15 minutes of IGNITION mode, boiler goes to BLOCK mode with Er12 error display. In this case, check the fire inside the boiler, and reset by pressing ON/OFF button twice. Each time you press ON/OFF button, keep the button pressed for three seconds.



- After 15 minutes later from switching the boiler ON, if flue temperature is between 45 and 65°C, boiler goes to STABILIZATION mode to improve combustion for a 10 minutes period. If flue temperature exceeds 65 °C, boiler will switch to RUN MODE and continuous regulation will start.



- If flue temperature does not reach 65 °C, boiler will start another IGNITION sequence. During this second attempt, if flue temperature does not reach 65 °C again, boiler will go to EXTINGUISH MODE. In that case, loading should be checked and wood pile should be re-ignited.

NOTICE

If the underpressure from exhaust fan is too strong for the first ignition, the fire may go out. In that case;

- You can leave the boiler at STAND-BY mode for a while after you ignite the paper pile in order to allow a small fire bed with small pieces of woods
- Or, you can reduce the fan speed at IGNITION mode to have an improving flame. This modification should be done during the first operation of the boiler by authorised installer / service agent

WARNING

- Regulating motors must not be touched, or their settings must not be changed manually when the boiler is in operation

6.3. Door switch function and Re-fuelling

When the loading door is opened, fan starts running in its maximum speed to allow flame and hot gases inside the loading chamber directed to the chimney, and, ensuring very easy and safe re-fuelling of wood logs. For re-fuelling, open the middle door and check the fuel in the boiler. If the fuel in the boiler has burned up open the loading door and fill the boiler with firewood and close the door.

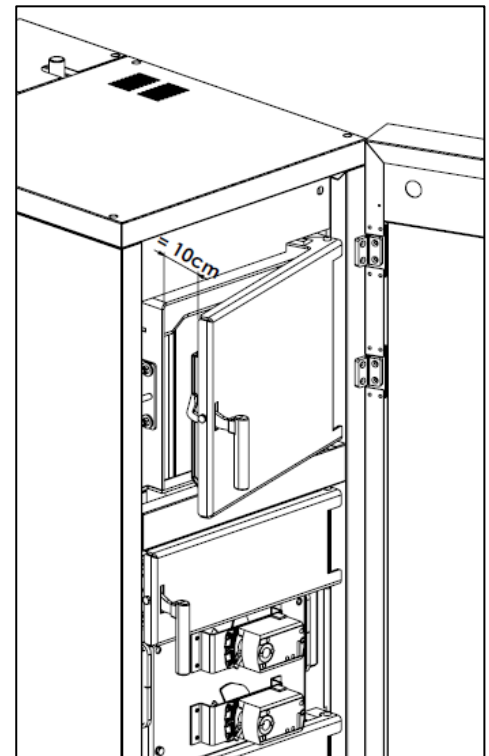
WARNING

When re-fuelling, do not open the door completely. First, keep the door little opened for 3-4 seconds to activate door switch and let the accumulated smoke gas leave out the boiler from the bypass passage. Then open the door completely.

Never open the bottom door when the boiler is operated.

It is important to pay attention on both depth of fuel loading chamber and thickness of upper door refractory while loading the chamber. If wood logs sizes are not matched with the elements mentioned above, it may be difficult to close and secure loading door. Make sure that you close the loading door without applying extra force. Otherwise door itself maybe damaged.

Always use the right size of wood logs when re-fuelling the chamber. For recommended size of fuel, refer to technical data section. When loading, place the wood logs always align with the depth of the chamber



6.4. Determination of fuel to be added / loaded

You can fill up the loading chamber or estimate the fuel needed to warm the buffer tank up to the requested temperature. As factory setting the boiler outlet thermostat is set to 90°C, and the buffer thermostat should be preferred to set 90°C as well. The amount of fuel to be loaded in kg can be calculated as:

$$M = (T_{S_{Buffer}} - T_{A_{Buffer}}) \times V_{Buffer} \times 1,163 / 4$$

Where;

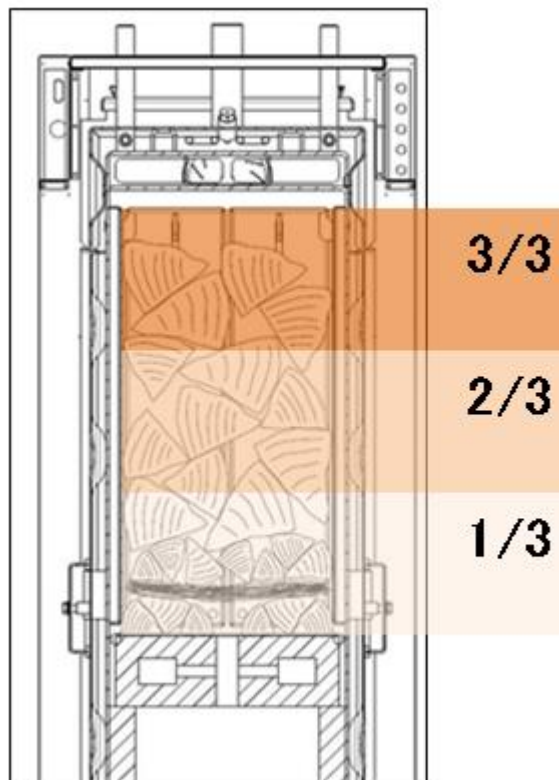
$T_{S_{Buffer}}$ = Requested temperature in buffer (buffer thermostat set value)

$T_{A_{Buffer}}$ = Actual water temperature in buffer

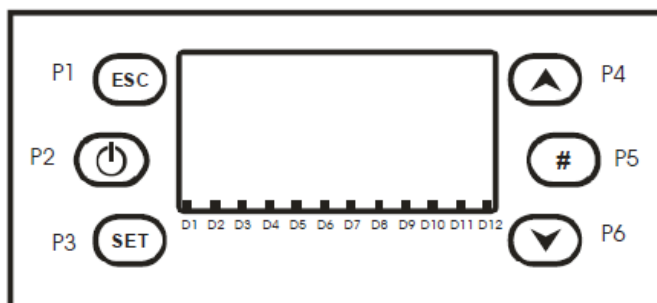
V_{Buffer} = Volume of buffer tank in liters

To give an idea how much you should fill the loading chamber; refer to following table:

FILL LEVEL	APPROX. WEIGHT
1 / 3	15
2 / 3	30
3 / 3	45



6.5. Control Panel Buttons And Leds

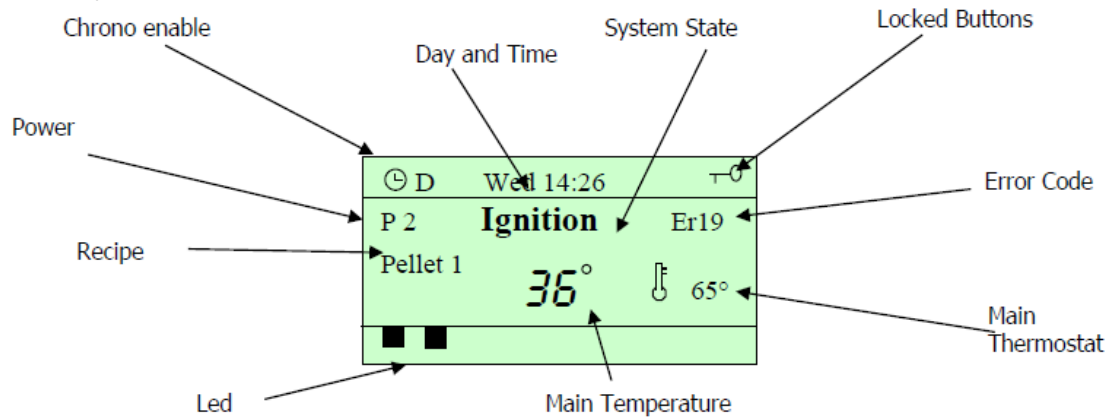


Function	Description	Button
On/Off	Ignition and Extinguishing of the boiler by pushing the button for 3 seconds until the acoustic signal	P2
Unblock	Unblocked of system pushing the button for 3 seconds until the acoustic signal	
Modify Menu Values	In modify mode change parameter's value	P4 P6
Run on Menu and Submenu	Run on Submenu and Menu	
Visualizations	Enter and run in Visualization Menu	P1
Esc	Function exit	
Menu	Function enter in Menu or Submenu	P3
Modify	Enter in modify mode into a Menu	
Set	Save data	P5
Edit Function (local key only)	In Off allows you to change the operation of the system if P11 = 2, 3, 4	

Function	Description	Led
Heating Resistance	Led On: Heating Resistance On	D1

Auger	Led On: Auger On	D2
Pump	Led On: Pump On	D3
Valve	Led On: Valve On	D4
Chrono Thermostat	Led On: Contact open	D11
Flow Switch	Led On: Sanitary Water Demand (contact closed)	D12

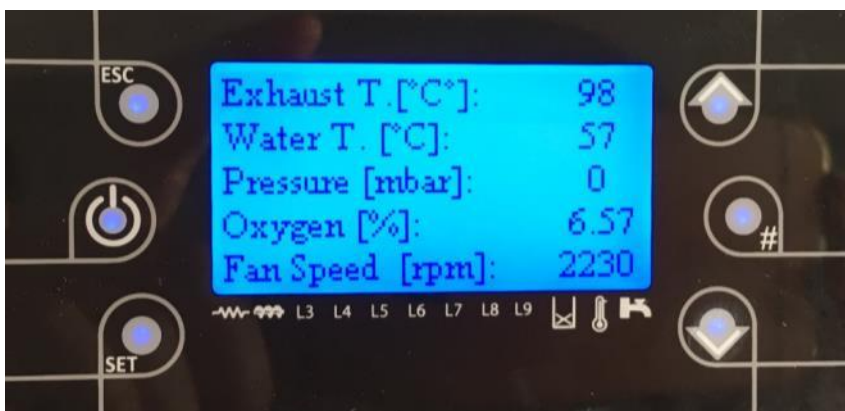
6.6. Values displayed in the main screen:



6.7. Operating States and views

Ignition, Stabilization, Run Mode, Modulation, Standby, Extinguishing, Block. Press **P4/P6**

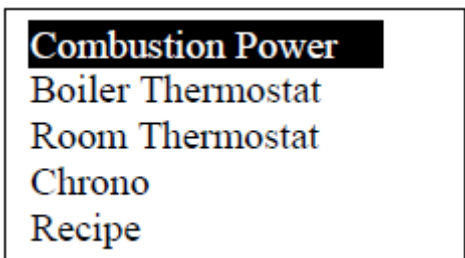
Exhaust T: 103	Exhaust Temperature [°C]
Boiler T: 55	Boiler Temperature [°C]
Boiler Return T: 51	Boiler Return Temperature [°C] (only visible if P42=0 and P26=7 or 8)
Flow T: 45	Flow Temperature [°C] (only visible if P42=0 and P26=9)
Buffer T: 52	Buffer Temperature [°C] (only visible if P42=0 and P26=2, 3, 4, 8)
External T: 21	External Temperature [°C] (only visible if P74=1)
Oxygen: 12.00	Oxygen [%]
Fan speed: 1850	Combustion Fan speed [RPM]
Product Code 489-1111	Product Code
FSYSB01000201.0.1	Code and Firmware version of the base
FSYSF01000220.0.1	Code and Firmware version of the keyboard



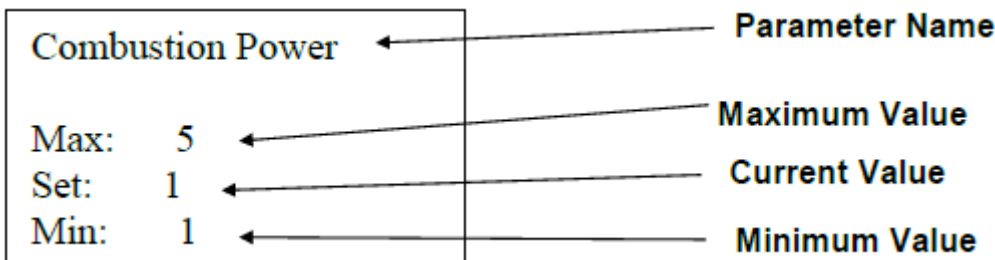
6.8. The Menu:

The menu of control panel consists of a User Menu and a Technical Menu in which you can modify the operating parameters, test the outputs, check the history of the system.

Browsing Menu: Push **P3** button to enter in the User Menu.



Using **P4** and **P6** buttons it is possible to select desired Menu or Submenu. Push **P3** button to enter in the desired Menu or Submenu.



The Setting menu consists of the parameter names (first/second row), the minimum, the maximum and the value ("Set") current. By pressing again button **P3** you enter edit mode (the "Set" field flashes); to decrease or increase value, push the buttons **P4** or **P6**; to save the new value, push the button **P3**; to cancel the modified and restore the old parameter's value push the button **P1**. If a parameter value is changed, the new value is sent to the control board; if the transmission

failure appears the message. In that case modify again the parameter's value

Transfer
not successful

Combustion Management	Wood Power	Menu to modify the combustion visible if P94=0 and P11 is different from 0.
Heating Management	Wood Boiler Thermostat	Menu to modify the Boiler Thermostat value in Wood functioning. Is not visible if P74=1 and climatic is enabled or if A66=0 or P11=0 .
	Buffer Thermostat	Menu to modify the Buffer Thermostat value. Only visible if the parameter P42=0 and P26=2, 3, 4, 8 .
	Flow Thermostat	Menu to modify the Flow Thermostat value. Is visible if P42=0 and P26=9 .
	Summer-Winter	Menu to select the Winter or Summer mode. Only visible if the parameter P42=0 .
	Climatic Function	Menu to manage the climatic function. Is only visible if P74=1 .
	Mixer Valve	Menu to manage the Mixer Valve. Is only visible if P26=7, 8 .
Chrono		Menu to select the Chrono's program modality and the timers of Ignition/Extinguishing of the boiler
Load		Menu to load the Auger
Service Reset		This menu allows you to reset the message of Function 2 Maintenance System

6.9. Summer - Winter

Menu for modifying the plumbing plant functioning according to the season. On display appears one of these symbols: ❄️ or ☀️ .

6.10. Language Selection Menu

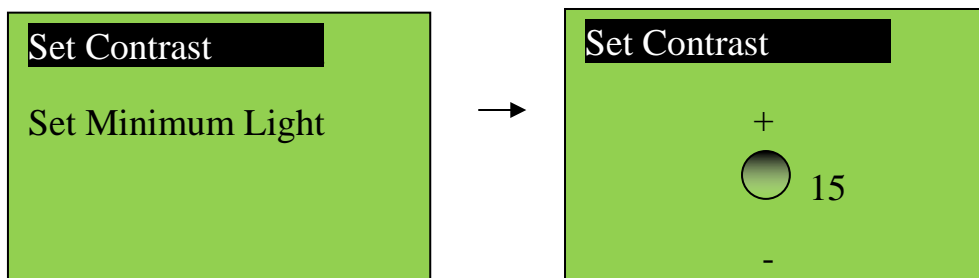
This Menu allows changing the language of LCD panel. The highlighted language is currently set.

6.11. Keyboard Menu

MENU	DESCRIPTION
Set Contrast	Menu to set the contrast of LCD panel
Set Minimum Light	Menu to set the light of LCD panel

6.12. Set Contrast

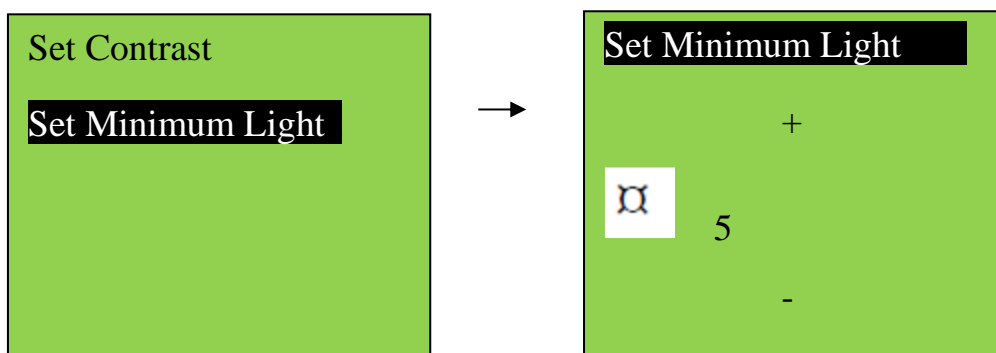
This Menu allows to set the display contrast.



Push the buttons **P4** and **P6** to increase or decrease the contrast; **P3** to save and exit, **P1** to exit without save.

6.13. Set Minimum Light

This Menu allows setting the display light when any button is pushed.



Push the buttons **P4** and **P6** to increase or decrease the light (minimum 0, maximum 20); **P3** to save and exit, **P1** to exit without save.

6.14. Supply Voltage Lack Management

In case of supply voltage lack, the system saves the most important functioning data. With the return of the supply voltage, the system evaluates the saved data and:

- If the lack is less than 60 s the system returns to the state in which it was previously
- If the system was in a On state and lack of voltage is less than 50 min and greater than 60 s, the system goes in Recover Ignition
- In case of prolonged absence of Supply Voltage the systems goes in Block with error message **Er15**

6.15. Pump and Valve Anti-Lock Function

If the Pump is off for 10 hours, it will switch on for 20 second. If the Valve is off for the time 10 hour it will switch on for the time 30 second.



6.16. Switch OFF the boiler

Switch OFF the boiler with a long pushing of the button P2.

Words status when the boiler is switched OFF:

1. The Extinguishing is signalled by **Extinguish.**
2. The Extinguishing finished = OFF state is **OFF** signalled by

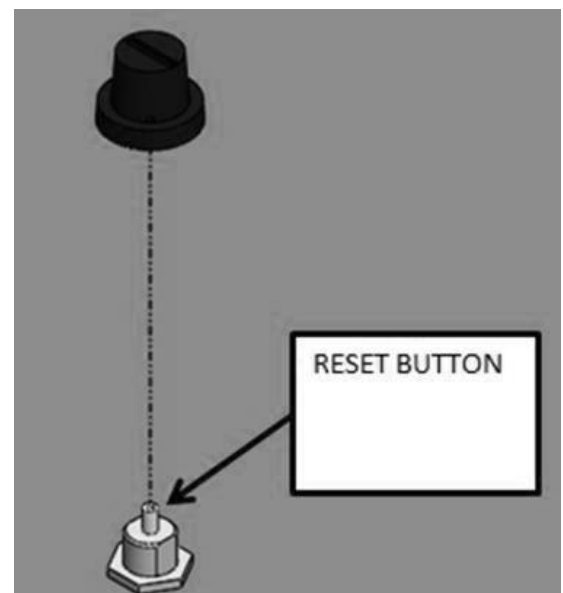
NOTICE

- When the boiler is switched OFF, the fan continues running until the flue gas temperature falls below the set trash hold and then the fan is turned off.



6.16 Safety shut-offs

If boiler temperature reaches 110 °C, it means that there is a problem on control panel's PCB or sensors. In that case, an additional safety thermostat stops the boiler operation for an external safety. Sensing bulb of safety thermostat is attached on top of the heat exchanger, under the top panel of the boiler, and its reset button is outboard on top panel under a plastic cap. If boiler temperature is above 110 °C, fan is switched OFF, but pump is kept ON in order to protect the system against very high temperatures. In this case, we recommend you to call for a service agent to check the control panel and its associated equipments. The safety thermostat is of manual reset type, and therefore it must be manually reset right after the problem is solved.



7 HEALTH AND SAFETY INFORMATION

7.1 Control of substances hazardous to user health

For the type of material and where used in your boiler refer to the following chart

PAINTS:	
General purpose black undercoat	NOT APPLICABLE
High temperature black coating	Boiler body
Powder coating	All jackets
INSULATION AND SEALS	
Rock-wool insulation board	NOT APPLICABLE
Glass-wool insulation board	Boiler body
Ceramic fibre rope and tape	Front door
	Burner
Ceramic-fibre board	Front door
CFC free polyurethane spray/foam	NOT APPLICABLE
High alumina cast refractory	Burner
	Ash pan
Asbestos products	NOT APPLICABLE
ADHESIVES	
High temperature adhesive compound	Front door
	Smokehood
	Burner
Fire cement	NOT APPLICABLE
Gas jointing compound	NOT APPLICABLE

Specific data sheets are available on request from the manufacturer for those materials but the following material handling and first aid procedures should in all cases be observed.

7.2 Paints, sealants, ceramic-fibre boards

- These materials contain organic solvents and should be used in a well ventilated area away from naked flames. Do not allow to come into contact with the skin, eyes, inhale or swallow. Use barrier cream or gloves to protect the skin, and goggles to protect the eyes from accidental contact.
- Small quantities can be removed from clothes or skin with a proprietary paint remover or hand cleaning product. If inhaled, remove sufferer into fresh air, if swallowed clean mouth with and drink fresh water but do not induce vomiting. If in the eye, irrigate the eye with clean water and seek medical attention.

7.3 Sharp edges

- Care should be taken when handling sheet metal panels that do not have safety or folded edges

7.4 Lifting boiler body

- Care should be taken when lifting boiler body as they can weigh up to a few hundred kilograms and the manufacturer can confirm the weight of each individual boiler if required

7.5 Thermal insulation

- Avoid contact with skin, eyes or inhaling dust.
- If cutting insulation then do so in a well ventilated area using gloves to protect the hands, goggles to protect the eyes, and a disposable dust mask
- If a skin reaction or eye irritation is experienced then discontinue working with the material and seek medical advice.

7.6 Devices under pressure

- Avoid contact with the parts of heating system under pressure during operation of boiler. These dangerous parts are such that:
 - Boiler body
 - Boiler inlet and outlet lines
 - Safety lines
 - Accumulation tank
 - DHW tank
 - Pressure relief devices installed on heating system
- Never attempt to drain water from heating system when the boiler is being operated
- Never feed the boiler directly with cold water to cool it down for any reason, when the boiler is hot.

7.7 High temperature surfaces

- Avoid contact with parts and surfaces having high temperatures which will be hazardous for human such as:
 - Boiler front doors
 - Water delivery and return lines (even if isolated), safety lines
 - Smokehood
 - Connection between flue outlet and chimney
 - Circulator pumps, expansion vessels

7.8 Boiler room

- Ensure that the boiler room has an easy access to outside in case of danger in heating system. Do not leave the solid fuels and auxiliary substances (chips, paper etc) to ignite the boiler, with the distance less than 800 mm from the boiler
- Do not cover the fresh air openings of the boiler room, as it is very important for the combustion

7.9 Flue gases

- There could be a little gas release from the front side of the boiler, when the front loading door is opened. Never breathe this gas flow.
- When adding solid fuel when there is active fire bed inside the loading chamber, protect your hands and face.
- If needed wear protective gloves.

7.10 Firing fuel

- Do not take the firing fuel out from the loading chamber while it is still burning
- Do not try to put the firing fuel off using water or any other liquids.
- Do not leave the front doors open when there is fire inside the boiler
- Your boiler can only be fired with the solid fuels whose characteristics have been given in Technical data section.
- Never use any other solid fuel that would be harmful for boiler section design, any liquid or gaseous fuels.

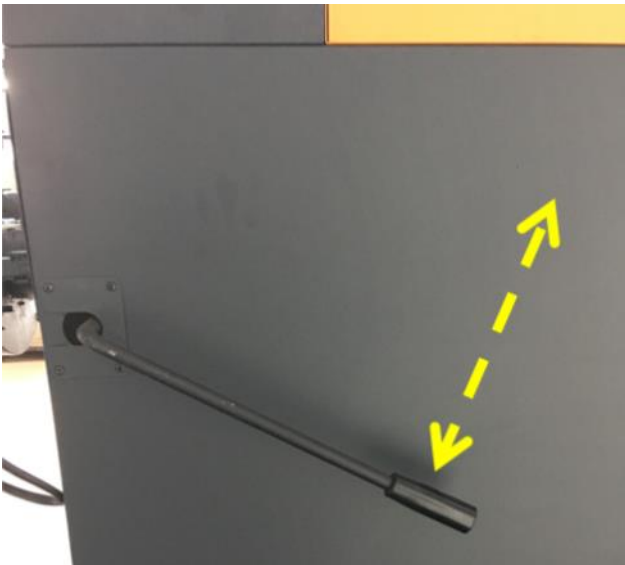
8 CLEANING AND MAINTENANCE

8.1. For end users:

WARNING

When carrying out cleaning and periodic maintenance, always wait boiler to cool down sufficiently after being shut down before opening the ash pan door. Always wear heat resistant gloves and protective clothing when handling ash.

Prior to each heating-up period, move smoke pipe cleaning lever up and down (5 to 10 times) to clean heat exchange surfaces



Every 2-3 days, open upper and middle doors, wipe the ash down through the opening on the burner using ash shaker supplied with the boiler. Close upper and middle doors, and open front lower door. Move the ashes inside combustion chamber to the front, and collect them in the ash pan.



Clean the ash accumulated down on the bottom using the ash-shaker supplied with the boiler. Clean all surfaces in fuel loading chamber if there is any tarr accumulation

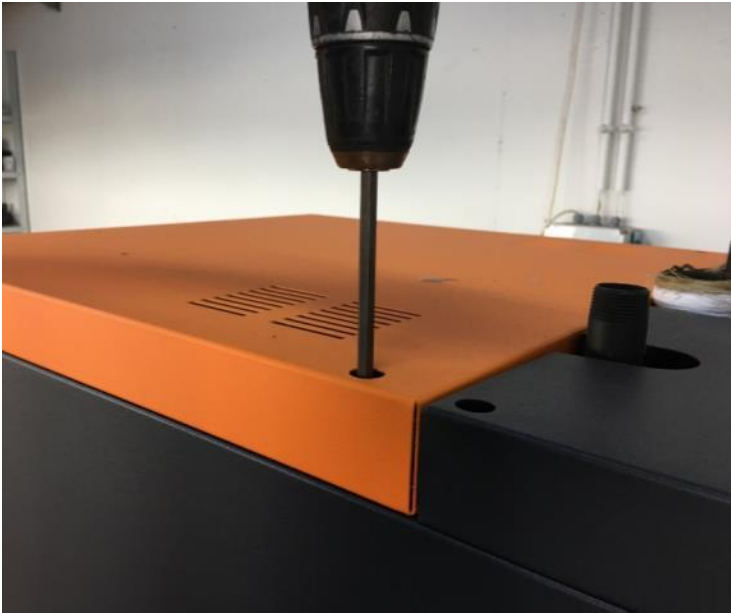
WARNING

Do not move or remove the combustion chamber refractories.

During gasification process tar occurs, and its quantity depends on wood, its humidity, boiler inlet and outlet temperatures. That is why, fuel loading (gasification) chamber should be cleaned with the scraper at least once a week

8.2. For installers / service agents

Following cleaning operations should be made after each heating season, or regularly every 3 months. Remove both top panels of the boiler, loose nuts fixing top cleaning cover to the boiler body, and reach top of smoke pipes after removing top cleaning cover.



Loose two pieces of setscrews that fix cleaning springs group onto cleaning lever, and pull the lever outside to the boiler.



Take cleaning springs group out, and clean the smoke pipes with supplied brush.



Remove hanging steel plates in fuel loading chamber, clean them with a hard metal brush. Check primary air inlets close to bottom lever of fuel loading chamber. All air entrance openings must be clear.



Take fuel loading chamber protective shield, behind the middle door, clean it with a hard metal brush.



Remove the exhaust fan from its compartment, clean the blades using a paint/smooth brush

Clean the by-pass canal with supplied brush if necessary.



8.3. Maintenance instructions for installers / service agents

Regular maintenance is necessary to ensure safe and efficient operation of the boiler through its lifetime. Maintenance to be performed once a year (before or after any heating season) (Annual maintenance must be performed by authorized and experienced service agent referred by the manufacturer or related sales agent).

- Exercise the safety relief valve at least once a year
- Front doors of the boiler should be checked for properly closing. Ceramic fibre ropes must be replaced if necessary. When replacing rope, first apply high temperature resistant adhesive onto the surface where you will place the rope.
- Check the condition of refractory inside the front doors. If it is damaged, you will have higher surface temperatures on front doors. In this case the refractory should be replaced to save energy and prevent further crack.
- Check the condition of pre-cast burner and combustion chamber stones (ash pan). Replace any damaged part.
- Check the condition of ropes under top cleaning cover, and rear cleaning cover.
- Inspect chimney, flue pipes, flue pipe joints, and flue pipe seals regularly to ensure that smoke and flue gases are not drawn into, and circulated by, your home's air circulation system. If you observe rust or smoke leakage, replace the pipe immediately.
- Check wiring to control panel, and wiring from control panel to heating circuit pump and fan, and system components.
- Check operation of regulating motors.
- Clean flue thermostat and lambda probe sensing elements, sensor cables.
- Check gasket in front of the fan

9 TROUBLESHOOTING

9.1. Boiler

Error Code	Cause	Remedy
ER 01	The boiler safety thermostats have tripped due to high water temperature in the boiler	Check the boiler and heating system is full of water. Check the boiler pump is working Check that there are no valves in the boiler primary circuit that may have been closed inadvertently. Reset high limit thermostats. (remove black caps and press red button with the tip of a ballpoint pen or similar until it clicks) Reset the boiler by pressing on-off button (P2) for 3 seconds for the error to clear. If error does not clear call your installer
ER 03	Accidental extinguishing due to low flue gas temperature of high oxygen level Insufficient combustion due to lack of burning conditions, bad of wet fuel, unproper loading of fuels.	Ensure the boiler is cool, and there is no flame Re-load the fuel in accordance with the information given in this manual Reset the boiler by pressing on-off button (P2) for 3 seconds for the error to clear. Restart the boiler.
ER 04	Water over temperature The water in the boiler has reached over temperature of 95°C	Check that the boiler is full of water by: Checking that the system is at the correct operating pressure (sealed systems only) Check the pump is working. Reset the boiler by pressing in the manual high limit thermostat. Reset the boiler by pressing on-off button (P2) for 3 seconds for the error to clear. If error does not clear call your installer
ER 05	Exhaust over temperature Flue gas temperature has exceeded pre-defined value.	IF the flue temperature has reached this high level it is likely that the heat exchanger is damaged or not working. Check when the boiler was last serviced. If the boiler was serviced less than 1200 hours ago check the target board for damage. In either case call your installer

9.2. Lambda controller and the probe

Error Code	Cause	Remedy
EL 00	Generic error	Turn OFF and Turn ON the board
EL 01	Heater sensor of lambda probe shorted to Ground	Turn OFF the board and check lambda sensor wiring. Replace the sensor if necessary
EL 02	Heater sensor OPEN	Turn OFF the board and check lambda sensor wiring. Replace the sensor if necessary
EL 03	Heater sensor shorted to +12V	Turn OFF the board and check lambda sensor wiring. Replace the sensor if necessary
EL 04	Lambda probe shorted to Ground	Turn OFF the board and check lambda sensor wiring. Replace the sensor if necessary
EL 05	Heater supply voltage too low	Disconnect the lambda module from the 230Vac line and check all the fuses on the board. Check that the line voltage is within to 230Vac +/- 20%
EL 06	Lambda probe supply voltage too low	Disconnect the lambda module from the 230Vac line and check all the fuses on the board. Check if there are shorts on the board caused by dirt. Check that the line voltage is within to 230Vac +/- 20%
EL 07	Heating sensor failed	Verify that the sensor is heated Turn OFF, and turn ON the board, try a new heating procedure

START-UP / COMMISSIONING FORM

1/2

END-USER INFORMATION

NAME / SURNAME	:	_____
ADDRESS	:	_____
CITY / PROVINCE	:	_____
COUNTRY	:	_____
E-MAIL / GSM	:	_____
SIGNATURE	:	_____

PRODUCT INFORMATION

PRODUCT MODEL	:	_____
EXTRAS 1	:	_____
EXTRAS 2	:	_____
INVOICE DATE and NUMBER	:	_____
SERIAL NUMBER	:	_____

COMMISSIONING OF THE DEVICE

DATE OF COMMISSIONING	:	_____
AUTHORIZED COMPANY for COMMISSIONING	:	_____
ADDRESS	:	_____
E-MAIL / GSM	:	_____
SERVISER NAME / SURNAME	:	_____
SERVISER STAMP and SIGNATURE	:	_____

- Warranty period is 2 (two) years, and starts with signing of this document
- One copy of this document shall be handed to end-user
- General checks on next page should be completed for future reference

START-UP / COMMISSIONING FORM

2/2

General Checks	Check	Comments
Wall plug voltage measurement	_____ V (AC)	
There is no damage because of transportation		
Chimney is clean, functioning well and meets the requirements defined in manuals		
Outputs are tested before start-up and working correctly		
Plumbing plant installation is made according to manuals, and necessary sensors are installed		
Optimization for auger / chimney calibration (if needed) is made		
Purchased optional elements are installed correctly, and tested		

End-User Notification	Check	Comments
User is informed about boiler/stove cleaning and service cycles		
User is informed about errors and how to act when they are shown		
User is informed about combustion power selection and setting necessary thermostats		
User is informed about boiler/stove functioning, operating, fuel quality and warranty conditions		

REMARKS / DIFFERENCES