

BURNiT by **SUNSYSTEM®**

SOLID FUEL BOILER

TECHNICAL PASSPORT INSTALLATION and OPERATION MANUAL





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1. EXPLANATION OF SYMBOLS AND SAFETY INSTRUCTIONS

1.1.Explanation of symbols

 **CAUTION!** - Important recommendation or warning concerning safety conditions during installation and operation of the heating boiler

 **DANGER!** - fault or improper use may cause injury or be hazardous to the life of humans or animals.

 **FIRE HAZARD!** - fault or improper installation and operation may cause fire.

 **INFORMATION** - Important information on the proper operation of the product.

1.2.Requirements to boiler installation room

Installation of a Burnit wood or pellet boiler and hopper must be in accordance the following recommendation:

- National Building Regulations and any local Byelaws which you must check with the local authority for the area.
- Model and local Water Undertaking Byelaws.

The installation should also be in accordance with the latest edition of the following standards and codes of Practice;

- BS 715:2005 Metal flue pipes, fittings, terminals and accessories.
- BS EN 12828:2003. Heating systems in buildings. Design for water-based heating

systems.

- BS EN 12831:2003. Heating systems in buildings. Method for calculation of the design heat load.
- BS EN 14336:2004. Heating systems in buildings. Installation and commissioning of water based heating systems.
- BS 7593:2006 Code of Practice for treatment of water in heating systems.
- BS 7671:2008 Requirements for electrical installations, IEE wiring regulations.
- ONORM M7137 standard should be used as a guideline for DIY bulk storage units.

This manual contains important information for the safe and correct installation, start-up and trouble-free operation and maintenance of the heating boiler.


The heating boiler can be used for heating rooms only in the manner described in this manual.

Take note of the boiler type information indicated on the factory sticker and the technical data provided in chapter 11 in order to ensure proper operation of the product.

1.2.1.Instructions to boiler installer


During installation and operation, the country-specific requirements and regulations must be observed:

- local construction regulations on installation, air supply and exhaust gas extraction as well as chimney connection.
- regulations and norms concerning the fitting of the heating installation with safety devices.

 Use only original parts


DANGER of intoxication, suffocation.

Inadequate inflow of fresh air to the boiler room may result in dangerous leak of exhaust gases during boiler operation.

 - Make sure the air inlets and exhaust gas outlets are not clogged or closed.

- If faults are not remedied immediately, the boiler must not be operated, and the user must be provided with written instructions on the fault and the hazard it entails.

DANGER of fire when burning flammable materials or liquids.


 - Flammable materials/liquids must not be left in close proximity of the heating boiler.

- Instruct system user of the allowed minimum clearances from surrounding objects.

1.2.2. Instructions to installation user


DANGER of intoxication or explosion

Toxic gases may be discharged when burning waste, plastics, liquids.

 - Use only the fuels indicated in this manual.

- In case of danger of explosion, ignition or discharge of exhaust gases in the room, stop the heating boiler from operation.

CAUTION! Danger of injury / damage of system due to incompetent operation.

 - The heating boiler must be serviced only by persons familiar with the operation manual.

- As a user, you are only allowed to start the boiler up, adjust the temperature of the boiler, shut the boiler down and clean it.

- Unattended children must not be allowed access to premises with running pellet burner inside.

Safety rules for user operation:

- Operate the heating boiler at a maximum temperature of 85°C, and to that end you must regularly inspect the boiler room.
- Do not use flammable liquids for ignition or increase the fire or increase boiler's output.
- Collect ash in lid-covered fireproof containers.
- Clean the heating boiler surface using non-flammable agents only.
- Do not place flammable objects onto the heating boiler or in its proximity. (see diagram 1 for the minimum clearances)
- Do not store flammable materials in the boiler room.

1.2.3. Minimum clearances for installation and combustibility of construction materials

The applicable minimum clearances in your country may differ from the ones specified below. Please, consult your installer.

The minimum distance from the heating

boiler or exhaust gas pipe to objects or walls must be at least 200 mm.

For general safety considerations, we recommend that the boiler be placed on a foundation with height of 100 mm made of class A material, see table 1.

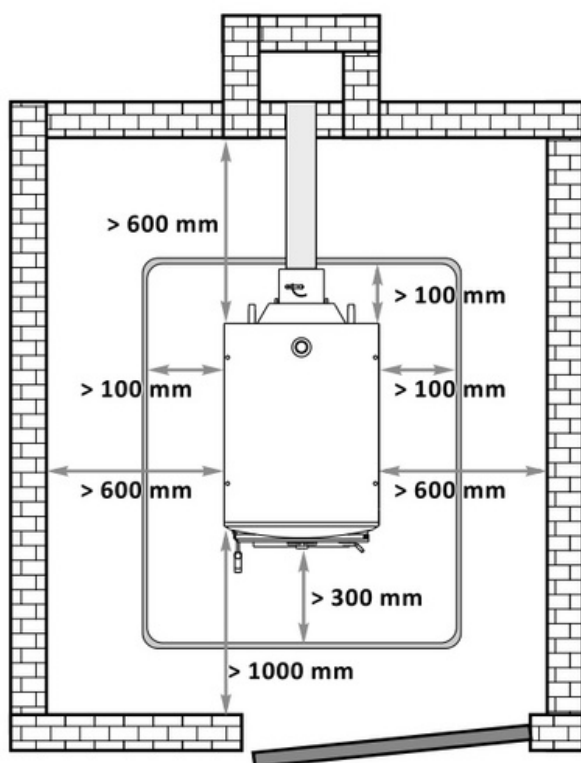


Diagram 1

Recommended clearances between the boiler and walls.

Table 1.

Combustibility of construction materials

Class A – non-combustible	Stone, bricks, ceramic tiles, baked clay, solutions, plaster free of organic additives.
Class B – hard combustible	Gypsum board panels, basalt fiber needled felt, fiberglass board, AKUMIN, Izomin, Rajolit, Lignos, Velox, Heraklit.
Class C1/C2 – Medium combustible	Wood beech, oak Wood softwood, layered wood
Class C3 – easy combustible	Asphalt, cardboard, cellulose, tar, fiberboard, cork, polyurethane, polyethylene.

2. PRODUCT DESCRIPTION

The WBS boiler is designed for firing solid fuel - firewood or Class B wood briquettes.

Designed to satisfy the heating demands of medium to large sized spaces. They are engineered for burning solid fuel only and provide the option for fitting pellet-fired burners.

This appliance complies with EN 303-5.

- **Design.** Boiler body is made of high-quality boiler steel sheets with thickness of 5 mm for the combustion chamber and 3 mm for the water mantle.
- **Conventional.** An entry-level wood firing boiler with basic operation and low operation cost.

The combustion is controlled by thermostatic draft regulator, which is a fully mechanical device boasting ultimate reliability. It controls the intensity of combustion by altering the flow of air intake.

- **Efficient.** The flue gas makes a three-pass movement around three water-filled barriers in the combustion chamber on its way to the chimney. This way the gas is cool when it leaves the boiler and its energy has been transferred to the water in the mantle. The water mantle embraces the combustion chamber in full to utilize the emitted heat most efficiently. To keep from losing heat into the ambience, the boiler is insulated on the outside by 50 mm high-temperature wool.

- **Reliable and safe.** The heat exchanging tubular grill is protected by a replaceable metal grate. A complex of safety devices provide for the safety of the appliance.

- **Versatile.** Designed for firing wood with option for adapting to pellet-fired burner on the specially designated flange located on the lower door.
- **Fuel loading door**
- **Cleaning door (combustion chamber)**
- **Air flaps for feed-in air adjustment**
- **Thermostatic draft regulator**
- **Draft regulating flap, mounted on flue end**
- **Safety heat exchanger**
- **Safety devices of the boiler**

3. FUELS

The heating boiler can utilize only natural and untreated wood. Pressed fuels and briquettes containing only wood may also be used. Log length should be up to 330 mm ÷ 500 mm. Fuel moisture content must not exceed 20%.

For maximum utilization of the wood heating value we recommend to use wood which has dried over a period of 1.5-2 years. High moisture content of the wood decreases its heating value which in turn reduces boiler output.

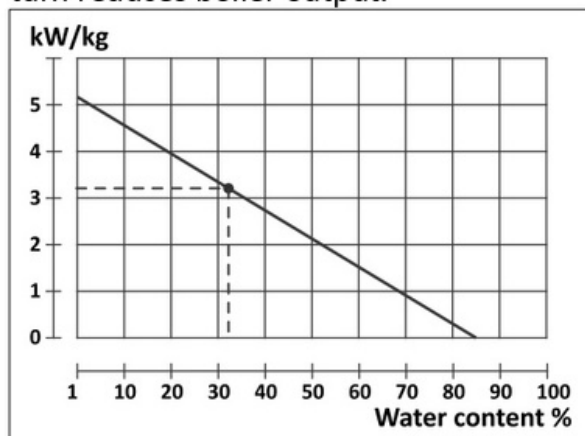


Diagram 1
Relation between wood heating value and water content.

Table 2. Heating value of the most common wood species

Wood species	Energy contained in 1 kg		
	kcal	kJoule	kWh
Spruce	3900	16250	4,5
Pine	3800	15800	4,4
Brich	3750	15500	4,3
Oak	3600	15100	4,2
Beech	3450	14400	4,0

4. TRANSPORTATION OF THE BOILER

We recommend to transport the heating boiler to the installation site in its packaging placed on the pallet. During transport and installation, depending on the weight, appropriate safety equipment must be used in accordance with Directive 2006/42/EC.

When transporting items weighing more than 30 kg, the use of pallet jack, fork truck or other hoisting devices is a must.

The boiler body and boiler housing are pack separately. The boiler housing has to be mount when the boiler body is placed into the boiler room.



Important: When installing the boiler, the wooden pallet onto which the boiler is placed must be removed by unscrewing the bolted connections using flat ring wrench S13.

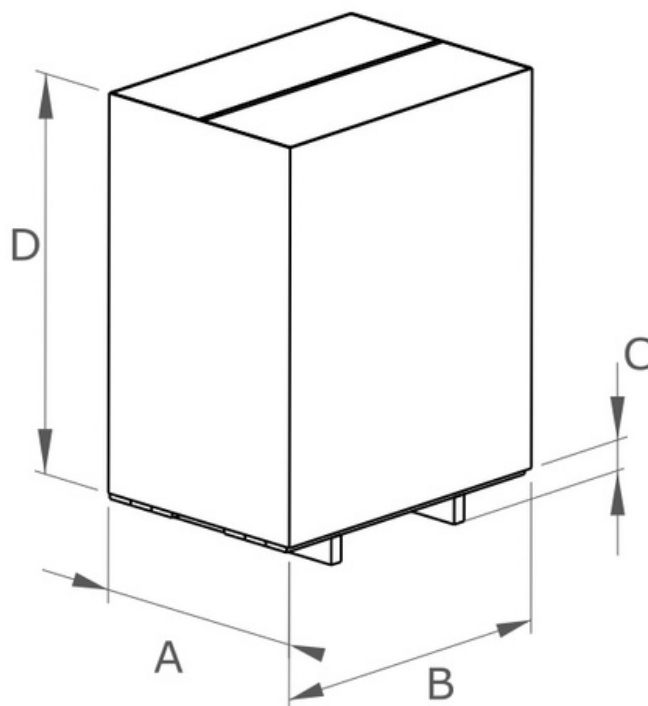


Diagram 2.1
*Overall dimensions of boiler body and pallet,
model WBS*

Table 3.

Model WBS	A, mm	B, mm	C, mm	D, mm	Weight, kg
20 kW	560	1020	125	1225	210
25 kW	560	1020	125	1225	230
30 kW	560	1020	125	1225	250
40 kW	660	1080	125	1225	290
50 kW	660	1080	125	1225	315
70 kW	720	1200	125	1375	385
90 kW	720	1200	125	1375	420
110 kW	780	1200	125	1375	450

5. DELIVERY OF THE BOILER

- Inspect the integrity of the packaging upon delivery.
- Check whether all components have been delivered to you. Boiler scope of delivery includes:

- 1) Boiler body with boiler doors
- 2) Boiler housing with insulation
- 3) Safety valve 3 bar

- 4) Fire irons
 - 5) Cleaning brush for flue pipes
 - 6) Technical passport. Installation and operation manual
 - 7) Service booklet and Warranty card
- If any of the above items are missing, contact your supplier.

6. INSTALLATION OF THE HEATING BOILER



The assembly, installation and setup of boiler must be performed by a technician authorized for such operations. Installer must indicate to the user of the installation the minimum clearances from flammable materials and liquids.

6.1. Requirements:

- The ventilation area provided must be in accordance with the requirements of The Building Regulations Approved Document J – Section 2: Appliances burning solid fuel.
- For a boiler with a draught stabilizer, a permanent air vent with a total free area of at least 850mm² per kW of appliance rated output is required. To achieve this, the following minimum vent opening areas are required.
- The above clearances are as specified in Building Regulations Approved Document J. Also refer to Approved Document J of either the England and Wales or Irish building regulations for further requirements on the installation of flue systems for solid fuel appliances.

Steps to assemble the panels of the boiler housing

Step 1: Fix the side panels 1 to Foundation 6 by using Rivet M8 x 16 mm – 2 pcs.

Step 2: Fix the Back panel 2 to Foundation 6 by using Rivet M8 x 16 mm – 2

pcs. And fix the the Back panel 2 to Side panels 1 by using Screw M5 x 16 mm – 2 pcs.

Step 3: Fix Front lower panel 3 to side panels 1 by using Screw M5 x 16 mm – 2 pcs.

Step 4: Fix Front upper panel 4 to side panels 1 by using Screw M5 x 16 mm – 2 pcs.

Step 5: Mount thermometer 9 - place the probe 10 into sensor sleeve 11

Step 6: Fix the Cover panel 5 to side panels 1 by using Screw M5 x 16 mm – 4 pcs.

* Necessary tool when assembling boiler housing - screwdriver (screwdriver with cross tip).

Make sure the boiler housing is assembled stable.

6.2. Assembly / disassembly of the boiler housing

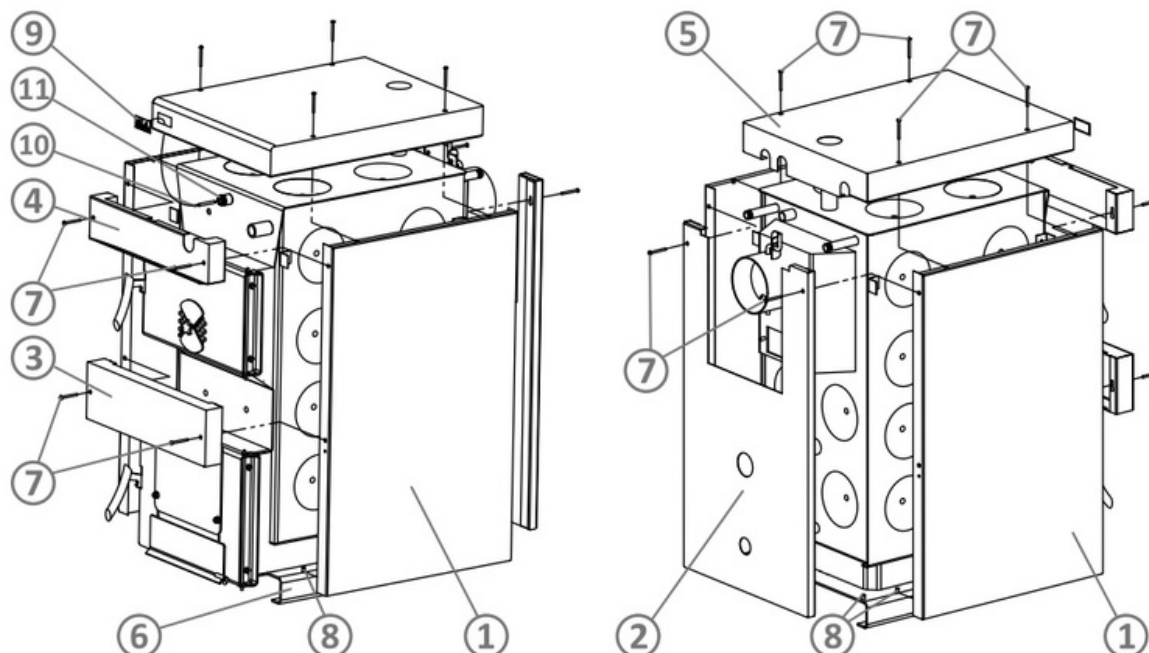


Diagram 3. Elements of boiler housing, model WBS

Table 4

No	Element	pcs
1	Side panel with insulation	2
2	Back panel with insulation	1
3	Front lower panel with insulation	1
4	Front upper panel with insulation	1
5	Cover panel and thermometer, with insulation	1
6	Foundation	1
7	Screw M5 x 50 mm	10
8	Rivet M8 x 16 mm	6
9	Thermometer	1
10	Probe	1
11	Sensor sleeve	1

6.3. Check door tightness

Open boiler doors.

Place paper strips on the four sides of the doors and close leaving part of the strips protruding outside.

Pull the paper strips. If the strips tear upon pulling, doors seal tightly.



Caution! Inadequate adjustment of the hinges may result in air being sucked in through the doors and the boiler burning uncontrollably.

7. SETUP OF THE HEATING BOILER

7.1. Pipework Materials

Burnit boilers are compatible with both copper and plastic pipe. Where Plastic pipe is used it must be of the oxygen barrier type and be the correct class (to BS 7291: Part 1:2001) for the application concerned.

On either sealed or open-vented systems; where plastic pipe is used a minimum of ONE meter of copper pipe **MUST** be connected between both the boiler flow and return connections and the plastic pipe.

DO NOT CONNECT PLASTIC PIPE DIRECTLY TO THE BOILER.

We do not accept any responsibility for any damage, however caused, to plastic piping or fittings.

Sealed Systems

If plastic pipe is to be used, the installer must check with the plastic pipe manufacturer that the pipe to be used is suitable for the temperature and pressures concerned. Plastic pipe must be Class S to BS 7291:Part1:2001.

7.2. Connecting the boiler to a chimney

- The flue terminal should be located in a draught free area, i.e. above the roof, where it can discharge freely and not present a fire hazard whatever the wind conditions.
- The flue outlet positions shown in the diagram (taken from Approved Document J – Section 2) can meet the above requirement.
- The heights and separation distances shown in the diagram may have to be increased in particular cases, e.g. where

high wind exposure, surrounding tall buildings, or adjacent trees can cause adverse wind effects.

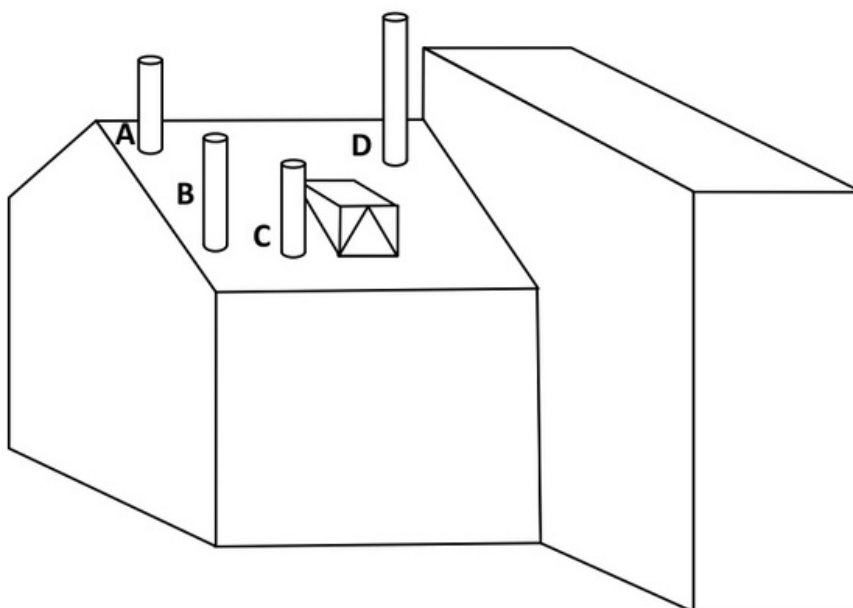
- The boiler flue cannot terminate into an existing brick or clay lined chimney. All masonry flues must be lined using the stainless steel flexible flue liner.
- No other appliance can be connected to the boiler line.
- The minimum clearance between the outer flue surface and any combustible material is 60mm.
- Any condensate in the flue can run back into the boiler. A condensate drain at the base of the flue system is not required.

The above clearances are as specified in Building Regulations Approved Document J. Also refer to Approved Document J of either the England and Wales or Irish building regulations for further requirements on the installation of flue systems for solid fuel appliances.



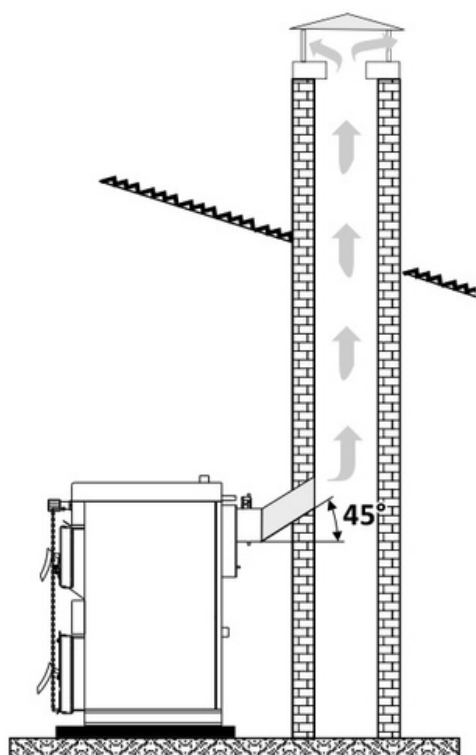
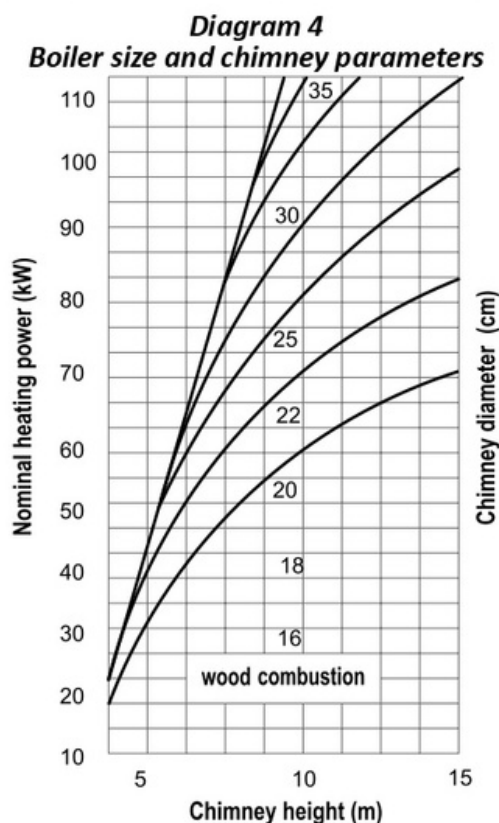
Data in the tables are for indicative purposes.

Draught depends on the diameter, height, uneven sections along the chimney surface and differences in temperature of combustion products and outside air. We recommend that you use chimney fitted with flue terminal. Heating specialist must calculate the precise sizing of the chimney.



Point where flue passes through weather surface (Note 1,2)	Clearance to flue outlet
A At or within 600mm of the ridge	At least 600mm above the ridge
B Elsewhere on a roof (whether pitched or flat)	At least 2300mm horizontally from the nearest point on the weather surface and; a; at least 1000mm above the highest point of intersection of the chimney and the weather surface; or b; at least as high as the ridge
C Below (on a pitched roof) or within 2300mm horizontally to an openable rooflight, dormer window or other opening (Note 3)	At least 1000mm above the top of the opening
D Within 2300mm of an adjoining building, whether or not beyond the boundary (Note 3)	At least 600mm above the adjacent building
Notes	
1) The weather surface is the building external surface, such as its roof, tiles or external walls.	
2) A flat roof has a pitch less than 10°.	
3) The clearance given for A or B, as appropriate, will also apply.	

The inner diameter of the chimney depends on its real height and the power capacity of the boiler (see diagram 4).



7.3. Connecting the thermostatic draft regulator - air flow regulator

Remove the lever and bolt and tight the thermostatic regulator to the boiler as shown in the diagram. Connect the chain to regulator lever and to bottom door flap. Adjust the flap (*diagram 5*). (see 9.2.).

7.4. Connecting the safety heat exchanger



Such connection must be performed by a technician / service shop authorized for such operations.

The heating boiler is equipped with safety heat exchanger (cooling circuit). It connects to the water system through a thermostatic valve. In case of overheating, the thermostatic valve feeds in cold water from the water mains which passes through the heat exchanger and absorbs the heat in the boiler. The water is then discharged into the sewage system. This arrangement ensures safe evacuation of the excess heat without the need for additional energy. This guarantees that the water in the boiler will not exceed the maximum safe level of 95°C.

The minimum operating pressure of the cooling water in the safety heat exchanger must be 1 bar.

Discharge flowrate at 110°C and Δp 1 bar. up to 3000 l/h.

Connect the safety heat exchanger according to the hydraulic diagram using thermostatic valve. Install a filter on the inlet before the thermostatic valve.

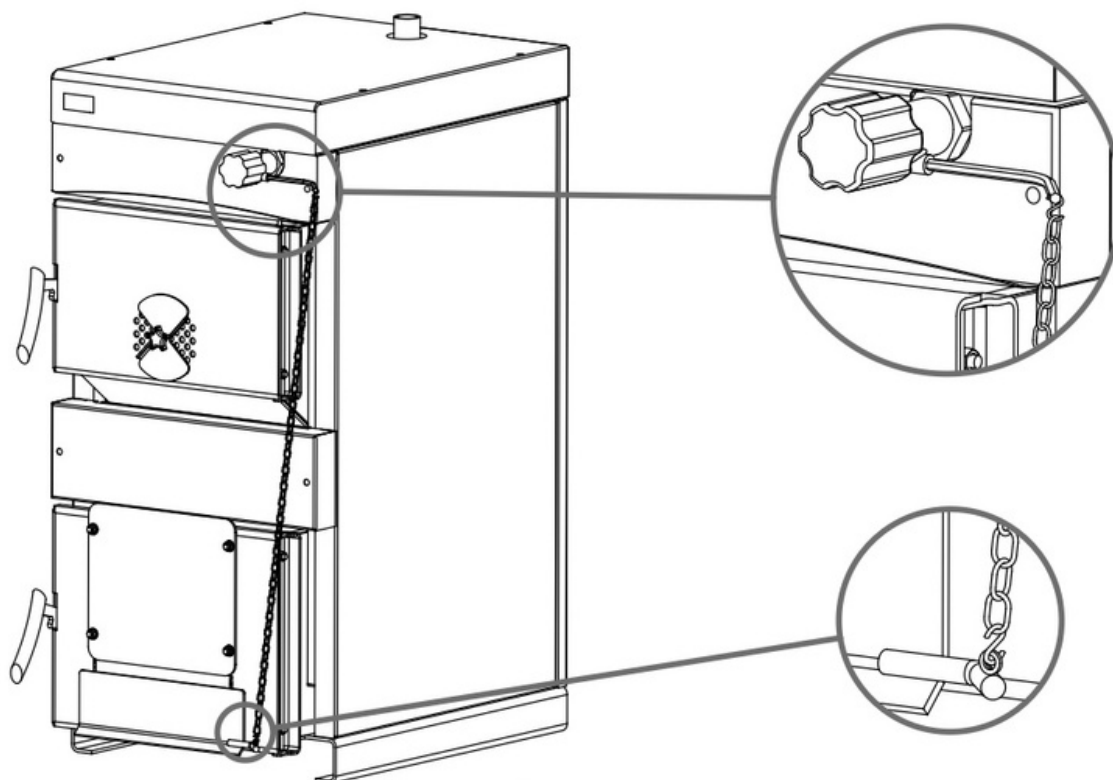
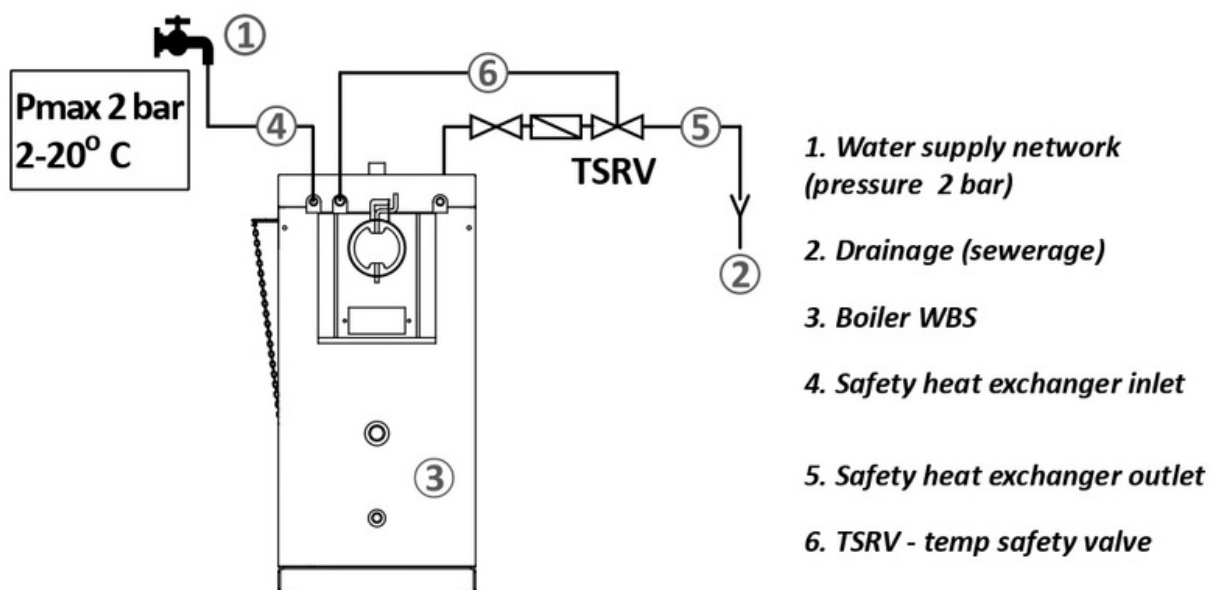


Diagram 5

Diagram 6.
Connecting the safety heat exchanger



The temperature safety relief valves limit the temperature of water in multifuel or solid fuel boilers with either a boiler incorporated or an emergency heat exchanger. Its use is specified by I.S.P.E.S.L. regulations (collection "R", issued in 2005, chapter R.3.C, paragraph 1, point G2). The valve complies with BS EN 14597. It can be coupled with solid fuel generators (with thermal power lower than 100 kW) used according to system prescriptions by standards BS EN 12828, BS EN 10412-2 and BS EN 303-5.

7.5. Connecting the boiler to the heating installation.



Such connection must be performed by a technician / service shop authorized for such operations.

Sealed system requirements

All Burnit boilers are suitable for use with sealed systems complying with the requirements of BS5449.

Diaphragm expansion vessel complying with BS 4814.

Ensure that the expansion vessel used is of sufficient size for the system volume. Refer to BS 7074:1:1989 or The domestic Heating design Guide for sizing the required vessel.

The pressure relief valve (provided with the boiler) is set to operate at 3 bar. It should be fitted in the flow pipework near to the boiler.

The pipework between the pressure relief valve and boiler must be unrestricted, i.e. no valves. The pressure relief valve should be connected to a discharge to be seen, but cannot cause injury to persons or property.

All fittings in the system must be able to

withstand pressures up to 3 bar. Radiator valves must comply with the requirements of BS 2767(10):1972.

One or more drain taps (to BS 2879) must be used to allow the system to be completely drained.



It is mandatory to install a three-way valve (Laddomat or similar) or a four-way mixing valve which to ensure that the temperature of the heating medium fed into the boiler from the heating installation is at least 65°C.

7.6. Carbon Monoxide Alarm

The Building Regulations Approved Document J requires a Carbon Monoxide alarm to be fitted in the room where the boiler is located.

This should be positioned between 1 and 3m horizontally from the boiler either:

- a) on the ceiling at least 300mm from any wall, or
- b) on a wall as high up as possible (above any windows or doors) at least 150mm from ceiling.

Table 5. TROUBLE-SHOOTING TABLE

Installation damage

Cause	Solution
1. Due to unsealed connections	1. Install the connecting piping strain-free to the boiler connections.
2. Due to accumulation of deposits. Condensate and tar formation may reduce the performance and life of the heating boiler. The temperature at the boiler inlet must not be less than 65°C, boiler water temperature at the outlet must be between 80 °C and 85°C.	2. It is mandatory to install a three-way thermostatic valve which will prevent the temperature dropping under 65°C at the inlet. - In order to increase the operational life of the boiler it is recommended to install a buffer vessel with capacity of 55 l per 1 kW of installed power.
3. Due to freezing	3. Ensure that the heating installation, including the piping network, has been built frost-proof. Use of a liquid which has low freezing point, corrosion protection and antifreeze agent is permitted.

Output too low

Cause	Remedy
1. Insufficient draught	1. Check chimney condition and measure draught. (must be performed by an authorized service)
2. Heating value of the fuel is too low.	3. If the heating installation, including the piping network, has not been built frost-proof, we recommend that you fill the heating installation with a liquid which has low freezing point and corrosion protection and antifreeze agent.
3. Presence of soot deposits and/or tar on the flue damper in the upper chamber which prevent its tight closure.	3. Clean the flue damper and make sure that when moving its closing/opening lever it provides adequate sealing of the flue gas outlet in the upper chamber. (must be performed by an authorized service)
4. Presence of soot deposits and/or tar in the flue pipes in water jacket in the back of the boiler	4. Clean the heat exchange surface of the flue pipes using the brush from the cleaning tools set. After the cleaning is completed, remove any soot through the inspection opening in the back of the boiler. Must be performed by an authorized service.

Boiler water too hot, heating bodies too cold

Cause	Solution
1. Hydraulic resistance is too high. 2. Air in the system 3. Inoperable circulation pump	Make sure the circulation pump has been properly selected and the heating installation is of the proper dimensions. (You must contact your installer.)

7.7. Connection diagrams



Such connections must be performed by a technician / service shop authorized for such operations.

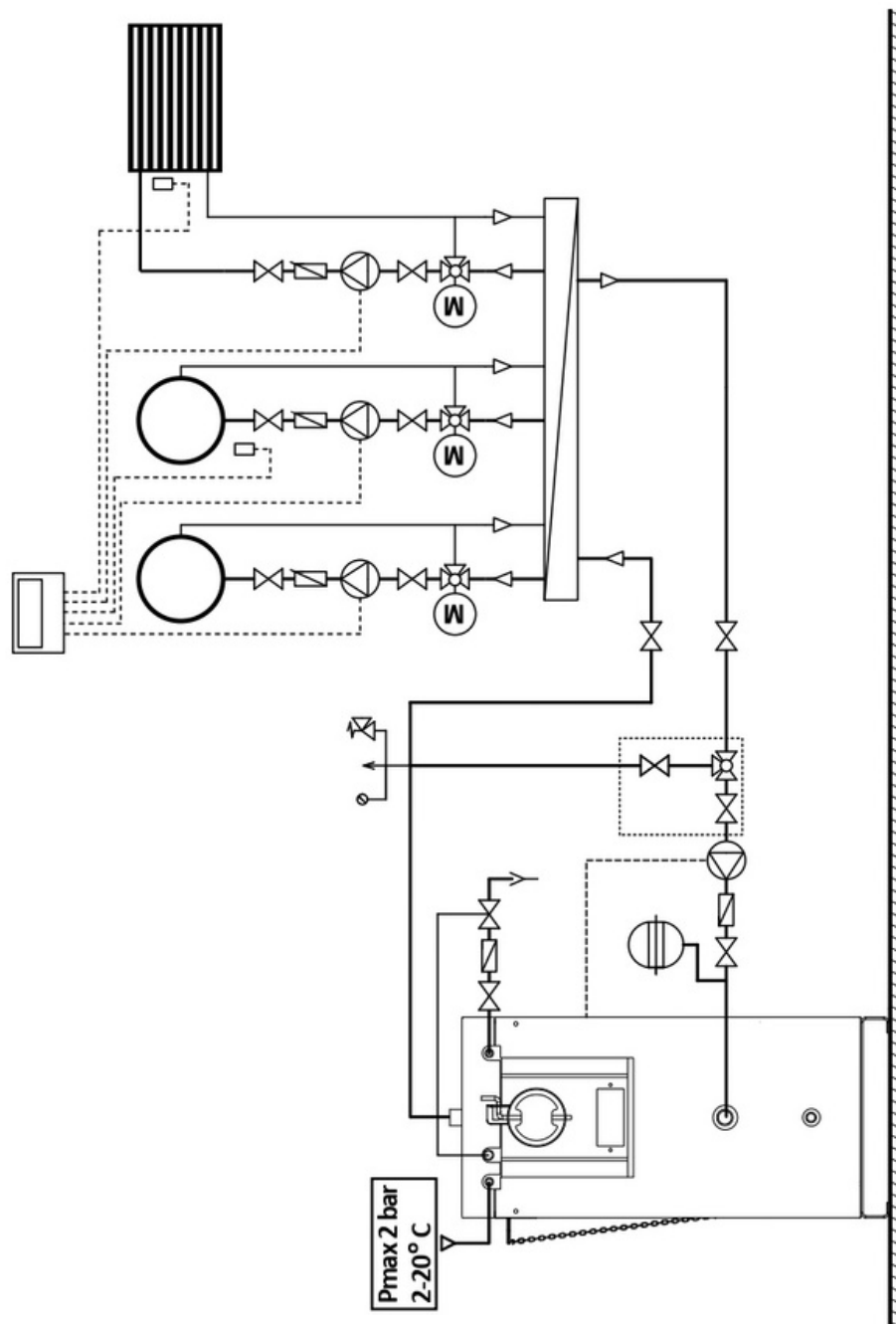


Diagram 7.

Connection of WBS boiler to three-way valve

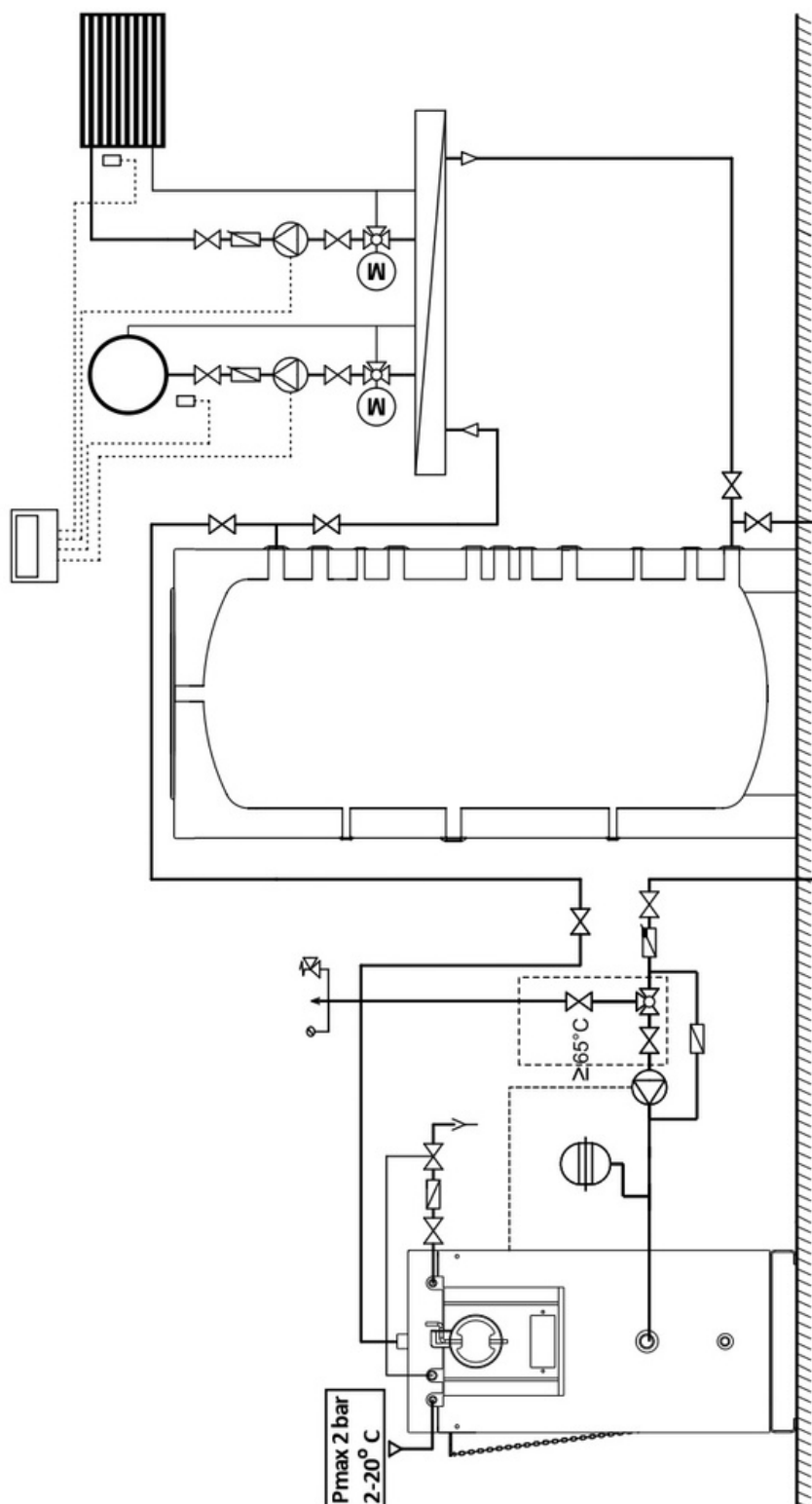


Diagram 8.
Connection of WBS boiler to P type buffer tank and three-way valve

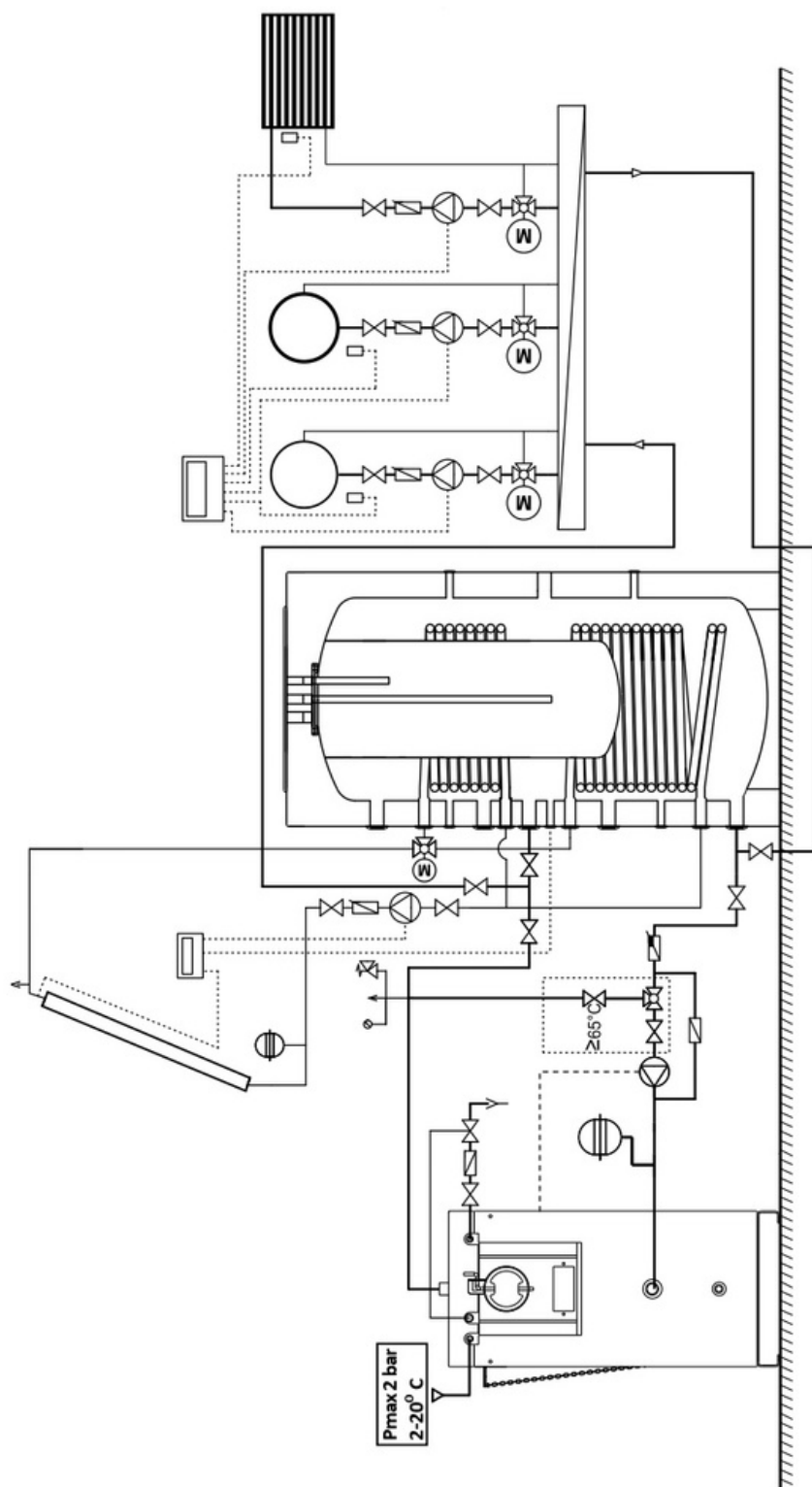


Diagram 9.

Connection of WBS boiler to combi tank KSC2, flat plate solar collector PK and three-way valve

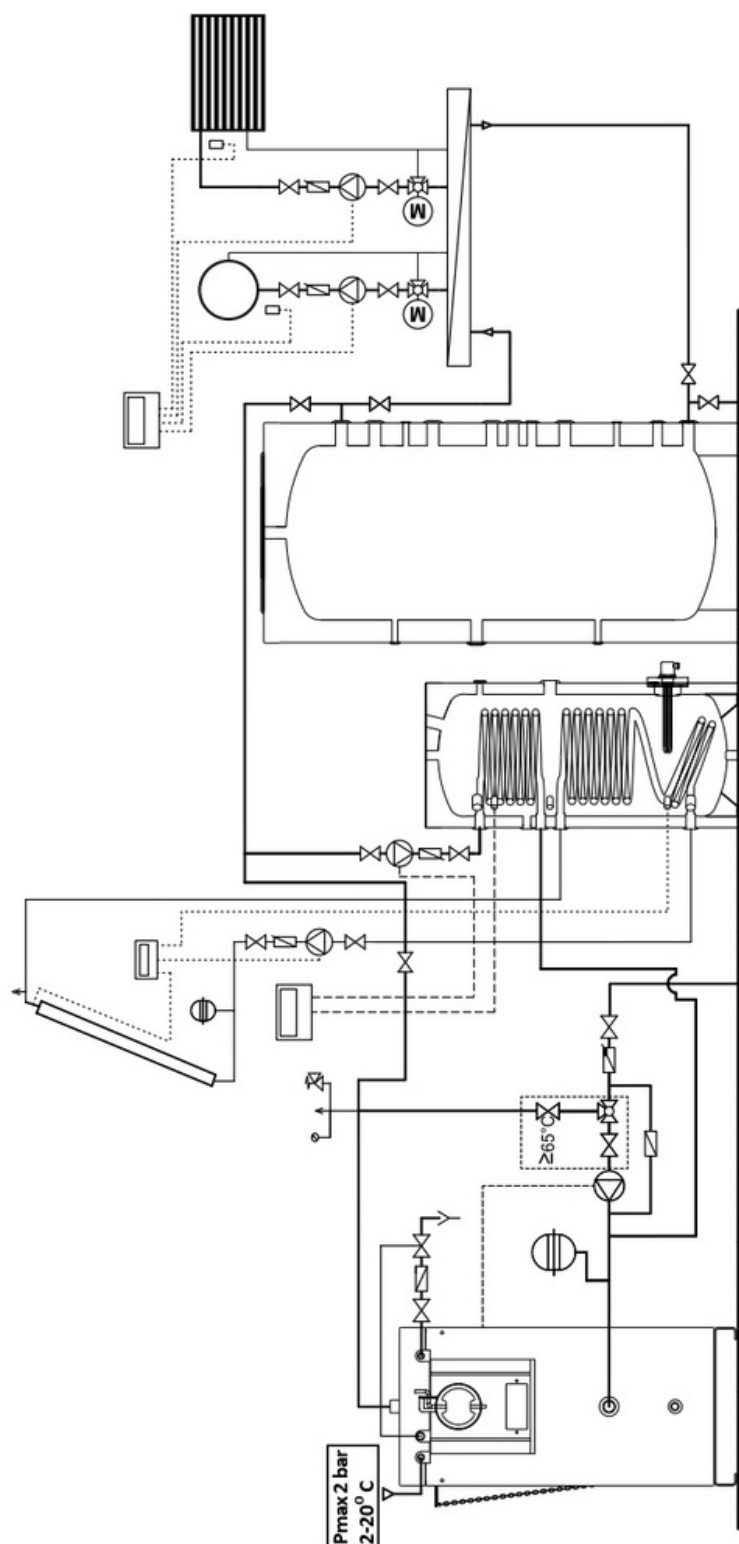


Diagram 10.

Connection of WBS boiler to solar tank SON, buffer tank P, flat plate solar collector PK and three-way valve

8. FILLING THE HEATING INSTALLATION

Table 6

Problem	Prevention
Possible installation damage due to strains in the material caused by temperature differences	Fill the heating installation only in cold conditions (inlet temperature must not exceed 40 °C).
Danger of installation damage due to accumulation of deposits Condensate formation and tar deposits may shorten boiler's operational life.	<ul style="list-style-type: none">- Do not operate the heating boiler for a long period of time in partial load mode- The temperature at the boiler inlet must not be less than 65°C, boiler water temperature must be between 80 °C and 85 °C.- Use the boiler for a short period to heat warm water in the summer.

9. BOILER OPERATION**9.1. Loading and ignition the boiler**

When ignition the boiler for the first time, a condensate is formed which is later drained (this is not a fault in the boiler).

Fuel is loaded in the combustion chamber and it is recommended to load logs of length equal to the combustion chamber length and stack them tight inside with least possible air gaps. The chamber door as well as all inspection openings must be closed and sealed. Open the thermostatic draft regulator and chimney flap to ignite the boiler. When boiler temperature reach 85°C, adjust intake air by the chimney flap and boiler air-intake door flap. The position of boiler air-intake door flap adjust by thermostatic draft regulator.

When burning wood with moisture content more than 20%, results in:

- significantly increases fuel consumption;
- not reach the desired power;
- lifetime of the boiler and chimney fall.



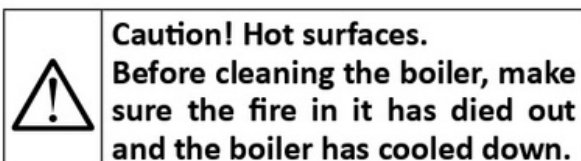
Do not open the flue damper during boiler operation!
Maintain operating temperature between 80° C and 90° C.

9.2. Adjust the boiler combustion by thermostatic draft regulator

Adjusting. Heat the boiler up to 80°C. Control valve is placed in a position to meet the temperature reading on the thermometer. Red numbers and red indicator point are valid for vertical mounting.

Thermostatic regulator test. Through the control valve set temperature reading of thermometer in the boiler. The flap must be close whet the temperature reach 95°C.

9.3. Cleaning of the boiler



Boiler cleaning must be carried out periodically and adequately every 3 to 5 days. Ash accumulated in the combustion chamber, condensed moisture and tar deposits significantly reduce the life span and performance of the boiler and result in deterioration of the properties of the heat exchange surface. In case of larger ash accumulation there is not enough space for fuel combustion which may result in damage of the ceramic nozzles and the boiler as a whole. Regular cleaning is important to ensure the optimal performance and long operational life of the boiler.

We recommend cleaning of the ash container in 3 to 5 days interval in accordance with the fuel used

If needed, clean the ash in the flue pipes. Use the paddle

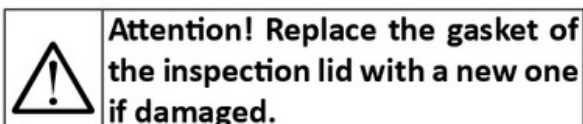
Warning! It is possible presence of smoldering coals. Dispose the ash only in specific adopted for this purpose places. It can cause a fire in garbage container.

9.3.1. Preparation for new heating season. Recommended procedures for boiler's maintenance.

1. Dispatch the internal safety doors in the boiler's combustion chamber. Clean the boiler's combustion chamber with metal brush from the set. Remove the tar and soot. They cause non-effective heating.
2. Clean well water ribs. Remove accumulated ash and soot by using the

paddle and the brush from the set.

3. Remove the inspection lid under the boiler's chimney and clean the accumulated ash in it.



4. Clean well the metal grate at the boiler's bottom. Check if the gaps between the smoke tubes are well cleaned. The presence of tar or inflammable materials in the combustion chamber of the boiler cause non-effective heating.

5. Check door tightness:

- Open boiler doors.
- Place paper strips on the four sides of the doors and close leaving part of the strips protruding outside.
- Pull the paper strips. If the strips tear upon pulling, doors seal tightly.

If regulating of the boiler's doors or is needed or insulation rope replacement must be done, please contact your installer.

9.4. Important recommendations for long-lasting and correct operation of the boiler.

9.4.1. Please perform periodic maintenance of the boiler as described in instructions, section 9.3.1.

9.4.2. The allowed moisture content of the fuel used must not exceed 15% ÷ 20%.

9.4.3. Gas emission in the combustion chamber may result in the formation of tar and condensate (acids). Therefore, a mixing valve must be installed and it must be adjusted so that the minimum temperature of the water returning in the boiler is 65° C. This extends the life

span of the boiler and its warranty. The operating temperature of the water in the boiler must be within the 80 ÷ 90°C range.

9.4.4. It is not recommended to operate the boiler for a long period of time at an output lower than 50%.

9.4.5. When using circulation pump, boiler operation must be controlled via a separate thermostat in order to ensure the prescribed rated temperature of the return water.

9.4.6. The eco-friendly operation of the boiler is realized at rated output.

9.4.7. It is recommended to install a storage/buffer tank and pump type group with thermostatic mixing valve to the boiler. The capacity of the storage tank is 55 L of water per 1 kW installed boiler power.

9.4.8. Maintenance and operation training for the boiler is conducted by an authorized installer



Failure to observe the installation and operating requirements described in the manual and the service booklet voids the warranty.

10. WARRANTY TERMS

The warranty terms are described in the Service booklet included in the supply.

11. TECHNICAL PARAMETERS OF SOLID FUEL BOILER WBS

11.1. General features

- Simple installation and handling;
- Combustion chamber with large heat exchanging surface and low chamber resistance;
- Large firebox door ensures easy loading even with bigger wood chunks (length up to 50 cm);
- Ribbed chamber surface and three-pass flue gas flow for improved heat exchange ;
- Exchangeable metallic ash grate protects the pipe grid from the flame;
- Burner flange on lower door for fitting pellet, gas or oil burners ;
- Removable boiler housing with insulation;
- Safety devices:
 1. Thermostatic draft regulator
 2. Pressure relief valve 3 bar
 3. Safety heat evacuator (safety heat exchanger) integrated in the upper part of the water mantle, to which may be associated with thermostatic valve.

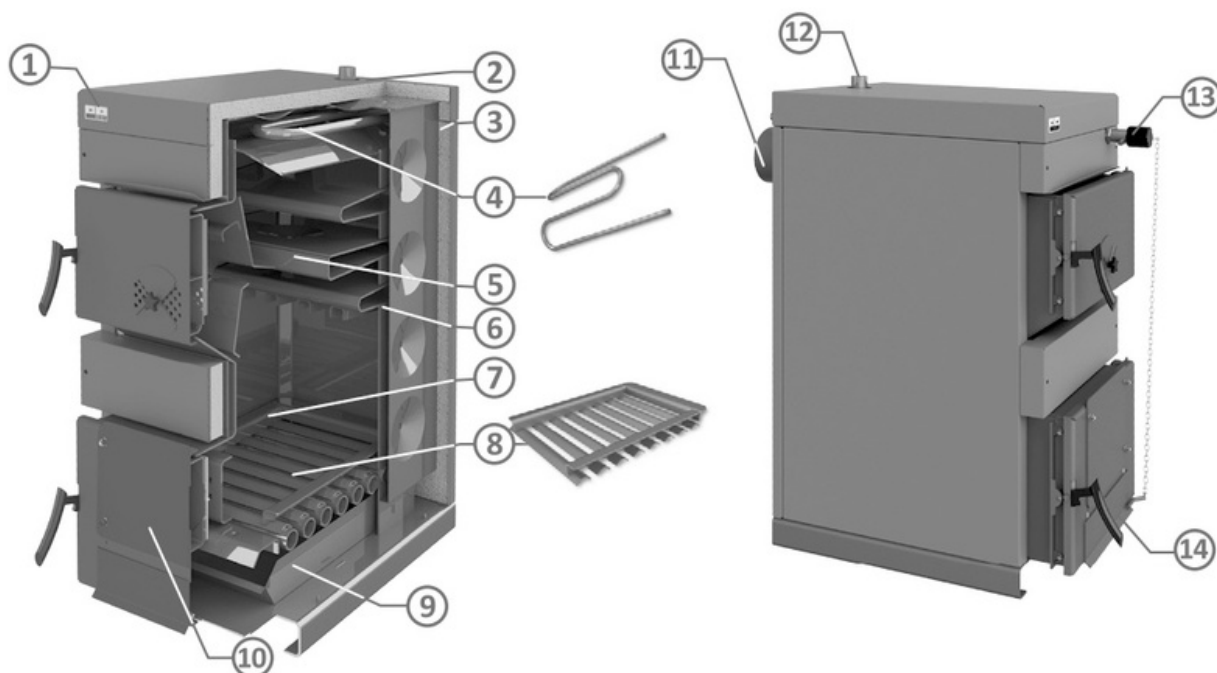
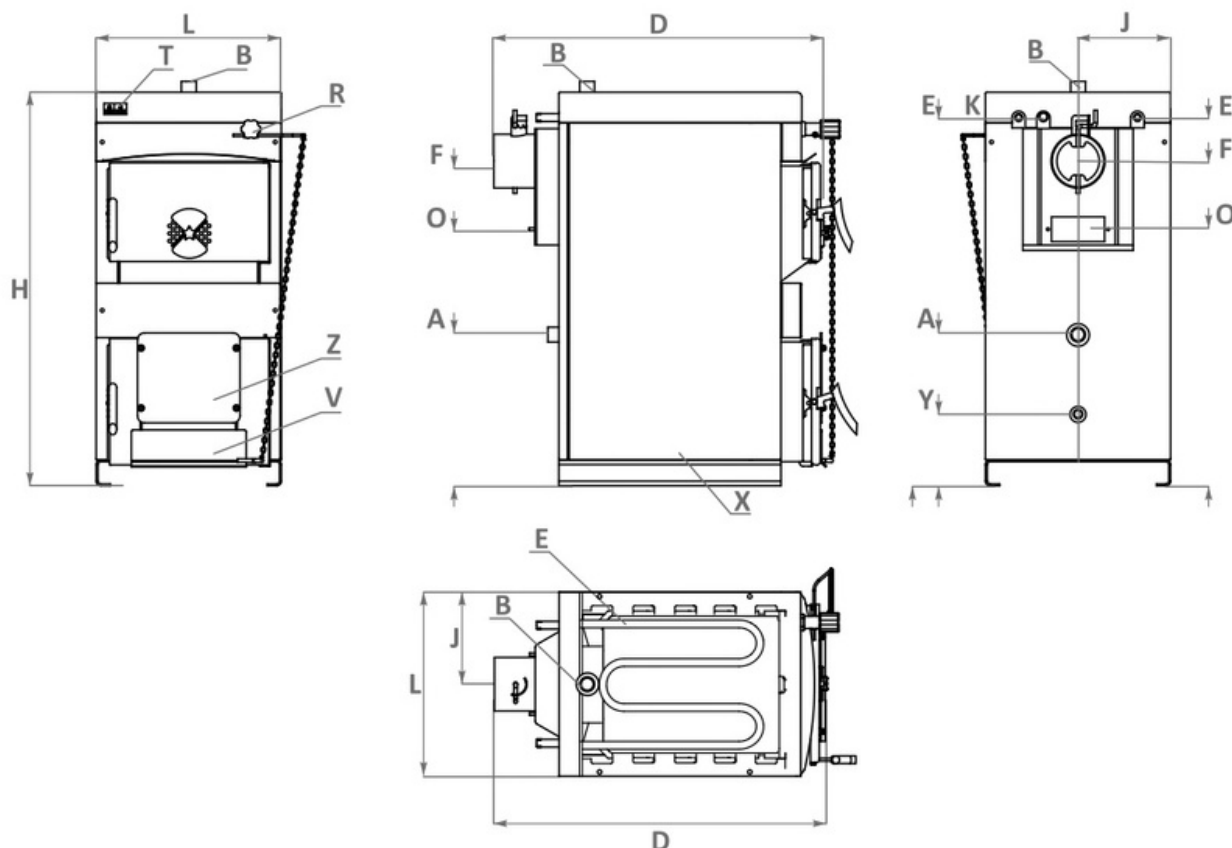


Diagram 13. Elements of WBS

- | | |
|--|---|
| 1. Temperature indicator | 8. Metal ash grate |
| 2. Housing | 9. Ash-andsoot-container |
| 3. High efficiency thermal insulation | 10. Burner flange (option) |
| 4. Safety heat evacuator (exchanger) | 11. Flue |
| 5. Three-pass flue gas flow | 12. Hot water outlet |
| 6. Water mantle | 13. Thermostatic draft regulator |
| 7. Combustion chamber | 14. Air intake flap |

11.2. Technical parameters

		WBS 20	WBS 25	WBS 30	WBS 40	WBS 50	WBS 70	WBS 90	WBS 110
Heat output	kW	20	25	30	40	50	70	90	110
Heating surface	m ²	90÷120	100÷150	120÷180	140÷250	160÷340	250÷410	350÷480	400÷650
Height H	mm	1145	1145	1145	1145	1145	1285	1285	1285
Width L/ Depth D	mm	464/870	464/930	524/930	624/930	624/990	624/1110	684/1110	744/1110
Mantle volume	l	60	75	82	96	106	134	145	160
Combustion chamber volume	l	55	62	74	94	103	170	191	212
Combustion chamber resistance	Pa/mbar	10/0.10	11/0.11	12/0.12	15/0.15	26/0.26	41/0.41	54/0.54	54/0.54
Required chimney draught	Pa/mbar	16/0.16	20/0.20	21/0.21	23/0.23	24/0.24	38/0.38	47/0.47	47/0.47
Insulation	Boiler Doors	high-efficiency thermal wool high-efficiency thermal wool							
Recommended fuel		wood, humidity 20%; wood briquettes							
Loading door size	mm	330/250	330/250	390/250	490/310	490/310	490/310	550/310	610/310
Max. length of firewood logs	mm	400	400	400	400	500	600	600	600
Exhaust gas temperature (operation mode)	°C	<150	<150	<150	<150	<150	<250	<250	<250
Operating temperature range	°C	65-85	65-85	65-85	65-85	65-85	65-85	65-85	65-85
Max. temperature	°C	95	95	95	95	95	95	95	95
Min. return water temperature	°C	60	60	60	60	60	60	60	60
Operating pressure	bar	3	3	3	3	3	3	3	3
Weight	kg	225	245	265	310	330	410	445	475
Cold water inlet	A, mm	R1¼/450	R1¼/450	R1¼/450	R1¼/450	R1¼/450	R1½/430	R1½/430	R1½/430
	J, mm	232	232	262	312	312	312	342	372
Hot water outlet	B, mm	R1¼/1165	R1¼/1165	R1¼/1165	R1¼/1165	R1¼/1165	R1½/1315	R1½/1315	R1½/1315
	J, mm	232	232	262	312	312	312	342	372
Safety line sleeve	K, mm	G½/1074	G½/1074	G½/1074	G½/1074	G½/1074	G½/1225	G½/1225	G½/1225
Safety heat evacuator inlet/outlet	E, mm	R½/1072	R½/1072	R½/1072	R½/1072	R½/1072	R½/1220	R½/1220	R½/1220
Flue	F Ø	150	150	150	180	180	206	206	206
	mm	940	940	940	925	925	1050	1050	1050
	J, mm	232	232	262	312	312	312	342	372
Flue cleaning opening	O, mm	150/70	150/70	150/70	150/70	150/70	150/70	150/70	150/70
Drain	Y, mm	G½/232	G½/232	G½/232	G½/232	G½/232	G1/232	G1/232	G1/232
	J, mm	232	232	262	312	312	312	242	272
Temperature indicator	T	✓	✓	✓	✓	✓	✓	✓	✓
Thermostatic regulator	R	✓	✓	✓	✓	✓	✓	✓	✓
Air intake flap	V	✓	✓	✓	✓	✓	✓	✓	✓
Burner flange (optional)	Z, Ø mm	176	176	176	176	176	176	215	215
Ash-and-soot container	X	✓	✓	✓	✓	✓	✓	✓	✓



12. RECYCLING AND WASTE DISPOSAL

12.1. Recycling of boiler packaging

Parts of the packaging made of wood or paper can be used as combustible for the boiler. Submit the rest of the packaging material for recycling according to the local regulations and requirements. Replaced heating installation components must be submitted for processing to an authorized factory which complies with the environmental protection regulation.

12.2. Recycling and waste disposal

At the end of life cycle of each product its components are due to be disposed of in conformity with regulatory prescriptions.

Obsolete equipment shall be collected separately from other recyclable waste containing materials with adverse effect on health and environment.

Metal details, as well as non-metal ones shall be sold to licensed recyclable metal or non-metal waste collection organizations. Those should not be treated as domestic waste.





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