

Automatic self-cleaning wood pellet boiler "compact" TOBY B
14-19-23-32-42-52

DIRECTIONS for use and maintenance



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Type	Width B (mm)	Height H (mm)	Depth L (mm)
B 14	610	1450	775
B 19	610	1450	825
B 23	640	1545	905
B 32	750	1545	905
B 42	790	1595	960
B 52	790	1595	1005

1.1 Technical Data Chart

Boiler type TOBY B	14	19	23	32	42	52
Total power	13.1 KW	18,5 KW	22,1 KW	31,1 KW	41,1 KW	51,2 KW
Power transmitted to the central heating system	3.6-13.1 KW	4.8 - 18.5 KW	6.3 - 22.1 KW	9,6 - 31,1 KW	9,6 - 41,1 KW	9,6 - 51,2 KW
Min power pellet consumption	min 0.86 kg/h	min 1.14 kg/h	min 1.5 kg/h	min 2,3 kg/h	min 2,5 kg/h	2,83 kg/h
Max power pellet consumption	max 3.1 kg/h	max 4.4 kg/h	max 5.2 kg/h	max 7,4 kg/h	max 9,7 kg/h	12,1 kg/h
Width (mm)	610	610	640	740	790	790
Height (mm)	1450	1450	1545	1545	1595	1595
Depth (mm)	775	825	905	905	960	1005
Flue gas height (mm)	130	130	130	130	130	130
Boiler total weight	225 kg	245 kg	285 kg	315 kg	375 kg	405 kg
Pellet magazine capacity	80 kg	90 kg	100 kg	125 kg	145 kg	160 kg
Flow/Return (inch)	1"	1"	1"	1"	5/4"	5/4"
Filling Tap (inch)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Flue gas diameter ((Φ))	80 mm	80mm				
Air inlet diameter ((Φ))	50 mm	50mm				
Exit flue gas temperature at total power	160 °C					
Necessary draught	10 Pa	10 Pa	10 Pa	10 Pa	11 Pa	12 Pa
Water volume	33 lit	44 lit	58 lit	78 lit	88 lit	98 lit
Electrical network connection	220 V 50 Hz					
Electric energy consumption during start-up	400 W					
Energy consumption in operation	100 W					
Efficiency	90 %	90 %	90 %	90 %	90 %	90 %
Boiler class	5	5	5	5	5	5

1.2 On Product

- Hereby we thank you for purchasing TOBY B boiler. TOBY represents one of the most sophisticated solutions for automatic combustion of wood pellets to be found on the market. It is completely adapted to burn wood pellet as a primary fuel, achieving maximum efficiency level up to 92 % and a very low exit temperature for flue gases (below 160 °C). Emission levels of this boiler fulfill the most rigorous norms of European countries.

Main features include:

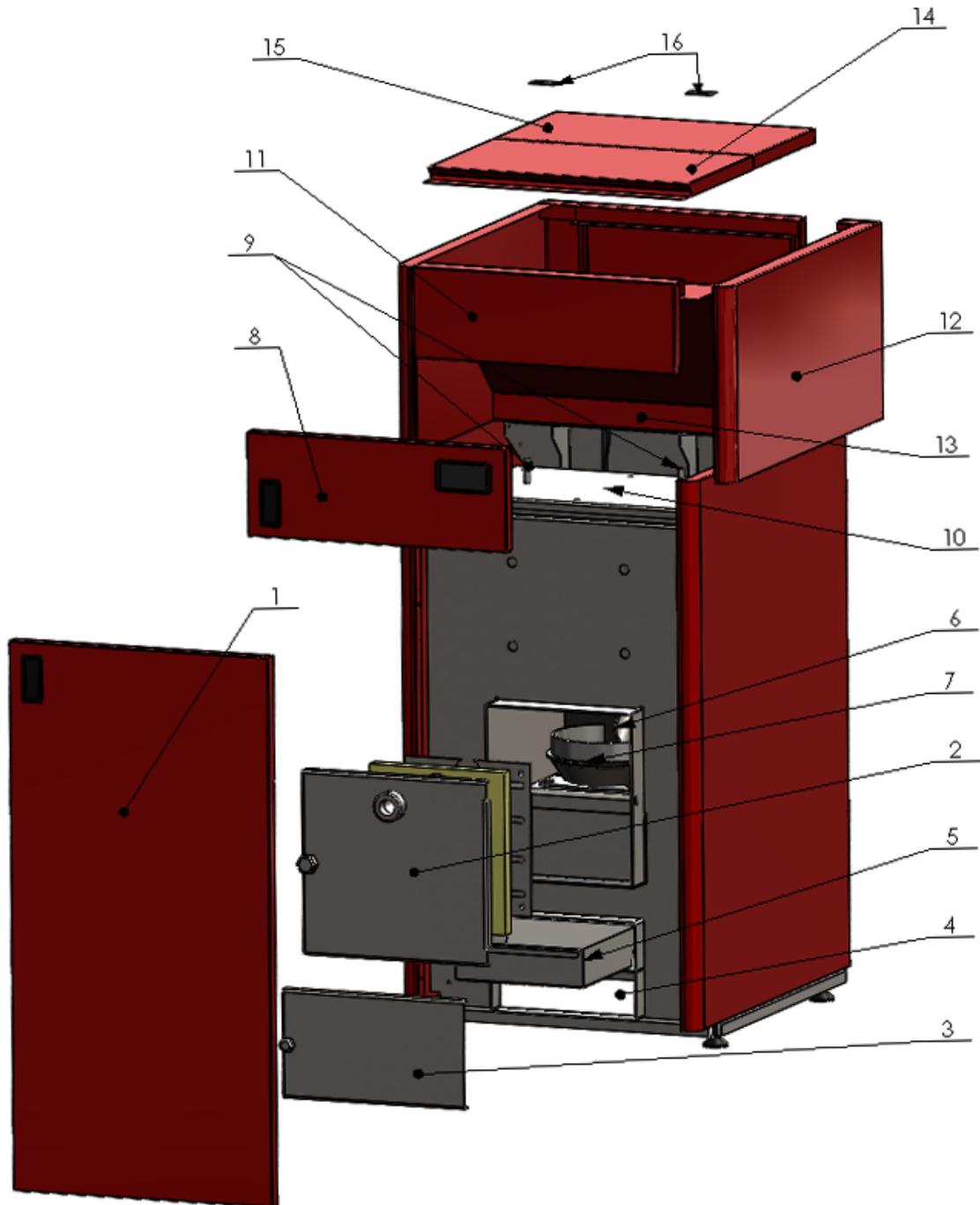
1. New burner (patented design!) with primary and secondary air-flow to ensure best combustion results and highest efficiency

2. Self-cleaning bottom of the burner to automatically remove the ash residues from the burner pot

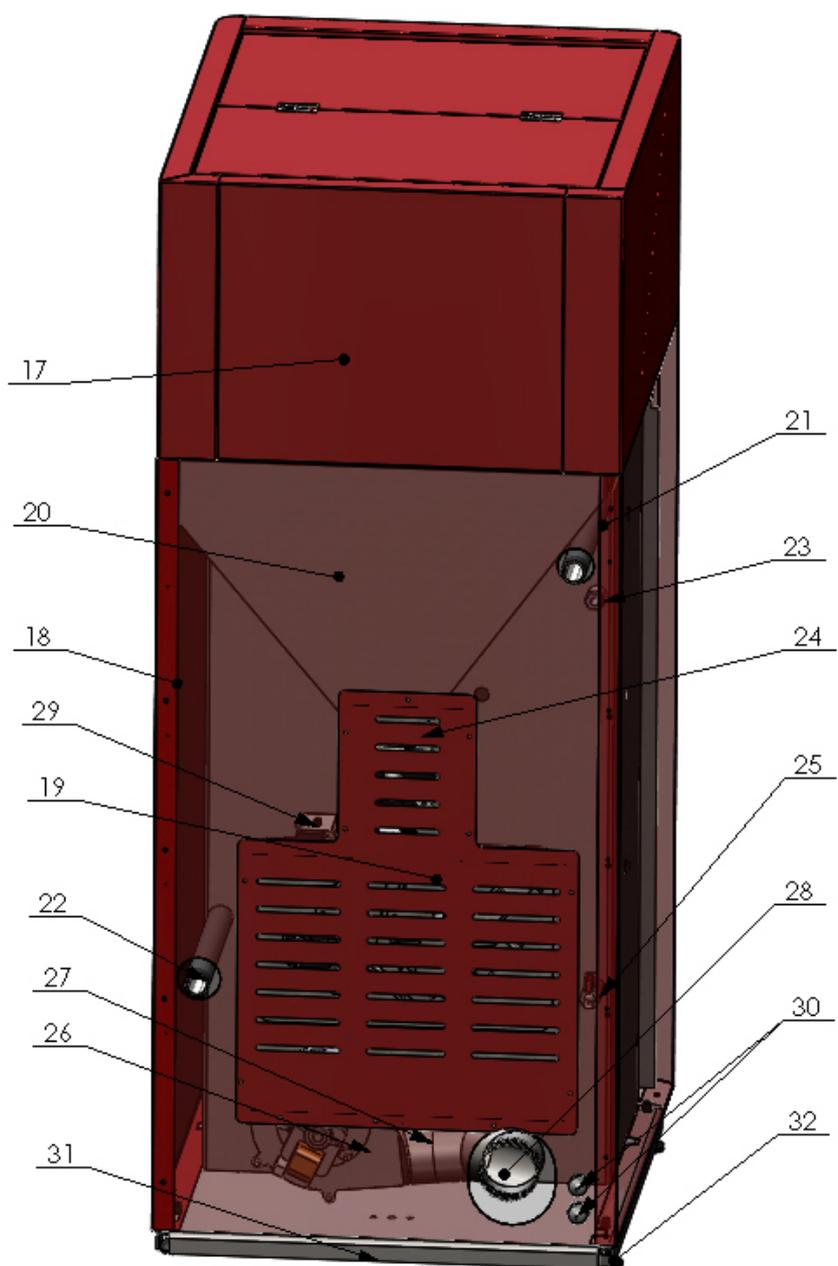
- Ignition, start-up and turning-off are fully automatized. Combustion control is optimized using algorithms such as 'modulation' which automatically decreases pellet dose as the difference between desired and reached temperature is decreasing.
- Boiler is easily connected to a room wi-fi thermostate.
- As required by the European norm EN 303-5 boiler chamber is made by welding 5mm thick steel plates (all surfaces in touch with fire). Other parts are made of 4mm steel.
- Safety features:

Pellets are fed to boiler via internal transporter screw inside the storage tank. From there pellets are fed over to heating chamber where they fall free to the designated combustion area (the 'actual' embedded burner of the boiler). Storage and combustion area are physically divided. There is a safety thermostat to prevent back-fire. There is also an anti-explosion safety device on the right side of the heating chamber.

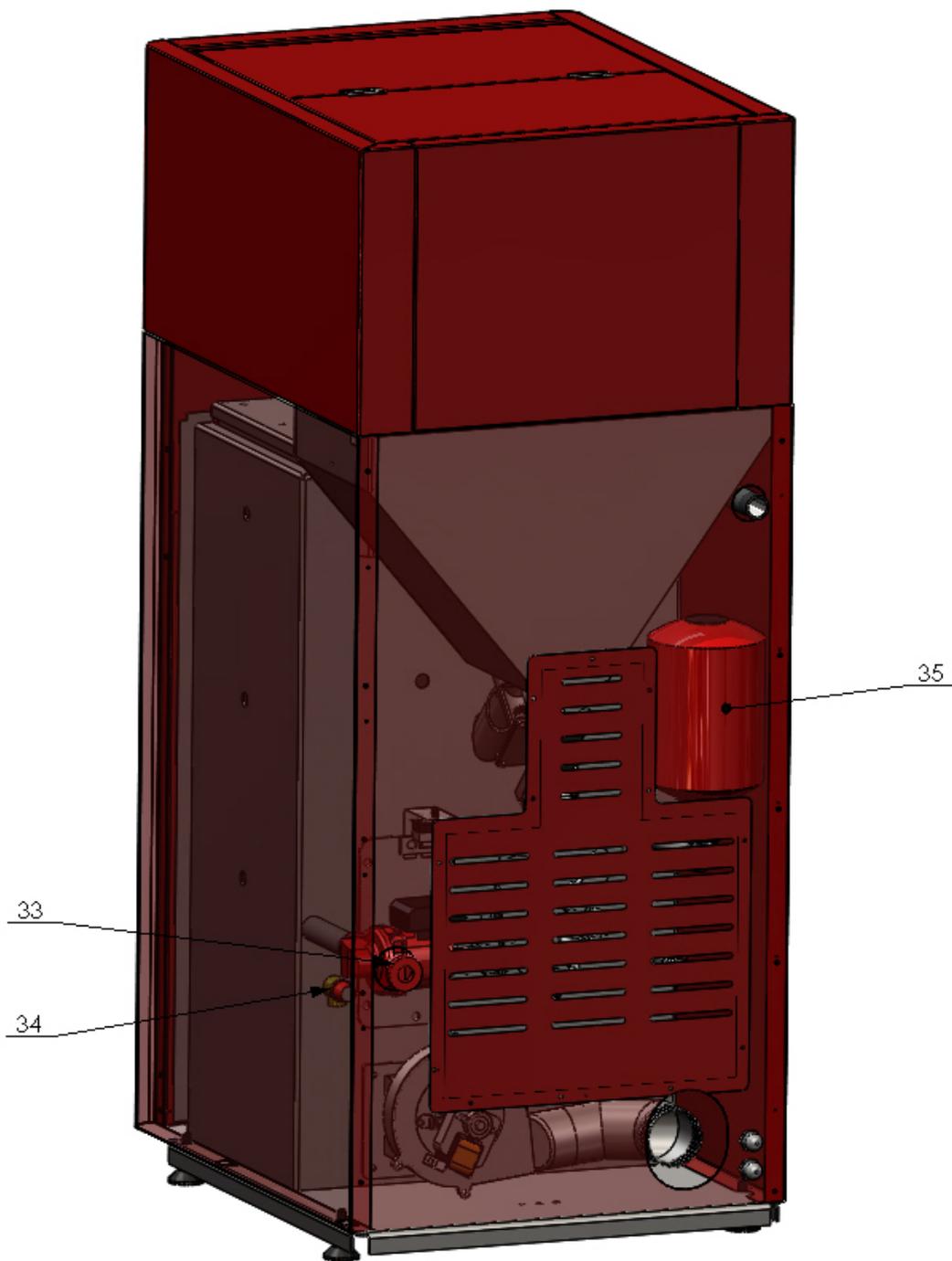
1.3 Boiler parts



Delovi kotla: 1. Boiler door (external) 2. Inner boiler door (including visor and insulation) 3. Inner door for cleaning 4. Ash cleaning area of the tubulators 5. Ash-tray of the burner 6. Pellet doser 7. Embedded pellet burner 8. Upper external door with display 9. Tubulator handles 10. Cover of tubulators handles 11. Boiler housing-upper part 12. Boiler housing -lateral part 13. Pellet magazine 14. Pellet magazine cover - mobile part 15. Pellet magazine cover - fixed part 16. Covering hinges



Delovi kotla posmatrano sa zadnje strane: 17. Back housing-upper part 18. Back housing 19. Back revision opening lid 20. Small pellet magazine 21. Start line 22. Return line 23. Water probe 24. Spiral dispenser with motor 25. Fill/drain tap 26. Boiler fan 27. Fumes probe 28. Flue line element 29. Spisal dispenser probe 30. Electrical cable lead 31. Boiler basement 32. Boiler legs (adjustable)



SET VERSION: 33. Circulation pump 34. Safety valve 35. Expansion vessel

2 Directions for storage and transport

2.1 Delivery form

Boiler is shipped with plastic protection sleeve on a europallet.



Boiler must be in its upright position all the time.



The rotation of the boiler during the shipment or installation represents a serious risk and can lead to damaging the boiler.



It is forbidden to place one boiler onto another.



The boiler can be stored only in closed rooms with no atmospheric influence. The humidity in the storing room also must not exceed the critical value of 80%, so as not to create any condensate. The temperature of the storing room must be in the range from 0 °C to 40 °C.



When unpacking the boiler, you must check whether the paint on the boiler coating has been scratched somewhere and whether all parts of the boiler stand in their proper position.

2.2 Delivery range



Together with the boiler, also the following parts are supplied:

- Cleaning kit
- Warranty paper and this boiler manual
- Boiler regulation (built-in already)
- Tap valve (to be found below the housing on the return line)
- circulation pump, expansion vessel, safety valve



Along the boiler following parts are NOT INCLUDED:

- Thermomanometer
- Mixing valve
- Air vent or boiler valves

3 Introductory remarks



The end user must follow the guidelines from this manual all the time. In contrary case the warranty won't be acknowledged.



Boiler chamber is tested on test pressure of 6 bar in our own facility.



Pay strict attention that boiler valves are always open while boiler in use.



Don't forget to do a mechanical reset of the circulation pump at start of every heating season.



Clean the boiler on a regular base.



An expert should be entrusted with the mounting of the heating and the initial operation. This must be a person who will take over the responsibility and guarantee the correct operation of the boiler and of the complete central heating system. In the case of an incorrectly planned system with manifesting deficiencies caused by the respective person's incorrect installation of the system, which can again lead to an incorrect operation of the boiler, the complete liability for the material damage and potential new costs arising in relation to it is borne exclusively by the person who was entrusted with the mounting of the central heating system, and not by the boiler manufacturer, sales representative or seller.

4 Safety remarks



While in use, some parts of the boiler may be hot. Don't touch the boiler without appropriate hand protection against heat.



If some parts of the boiler occur to be damaged it is strictly forbidden to continue using the boiler.



Do not touch electrical wires with wet hands



Electric connections must be made according to 73/23 CEE i 93/98 CEE and properly dimensioned.



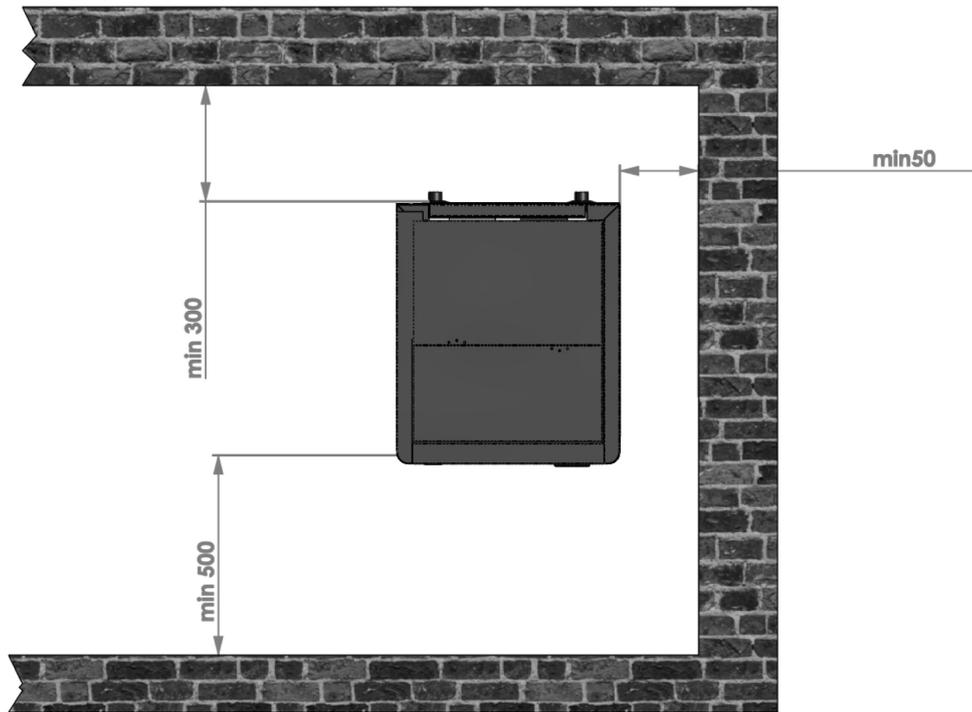
Use of the temperature relief valve is **OBLIGATORY** with this boiler to ensure safety in heating systems using solid fuels.

5 Boiler placement

5.1 Boiler room



Room where kamin is placed, must possess ventilation windows.



Front side should have free access.



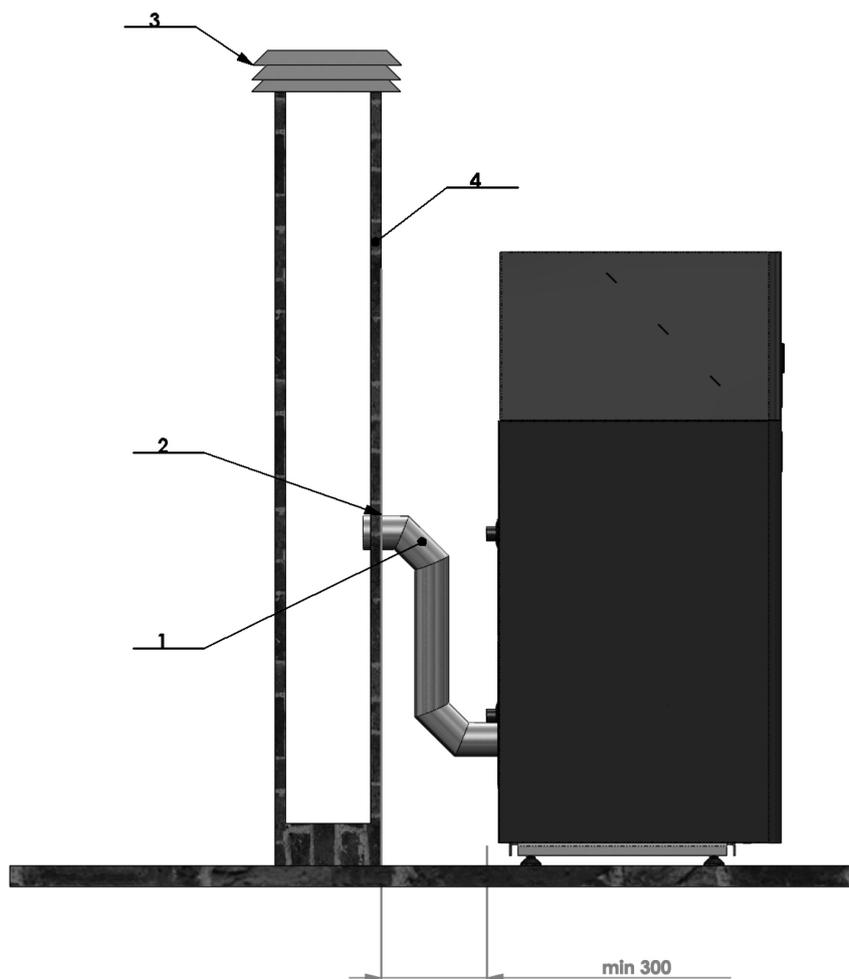
Boiler base must be stable and made of fireproof material.

5.2 Connecting to the chimney

TOBY H kamin is a boiler with natural draught so it requires a chimney not just to transport flue gases out of the boiler but also to create negative pressure necessary for boiler function.

Boiler requires pressure drop of 10 Pa.

Chimney is to be connected as depicted below and it is necessary to clean the chimney 1-2 per year.



1) Flue pipe 2) Gasket 3) Fireproof protection cap 4) Chimney diameter not greater than 200x200mm with max height 5-6 meters.

5.3 Filling the system with water

Filling the system with water is to be done using the tap valve connection of the boiler.



When filling the system with water take care that no air remains in the boiler.

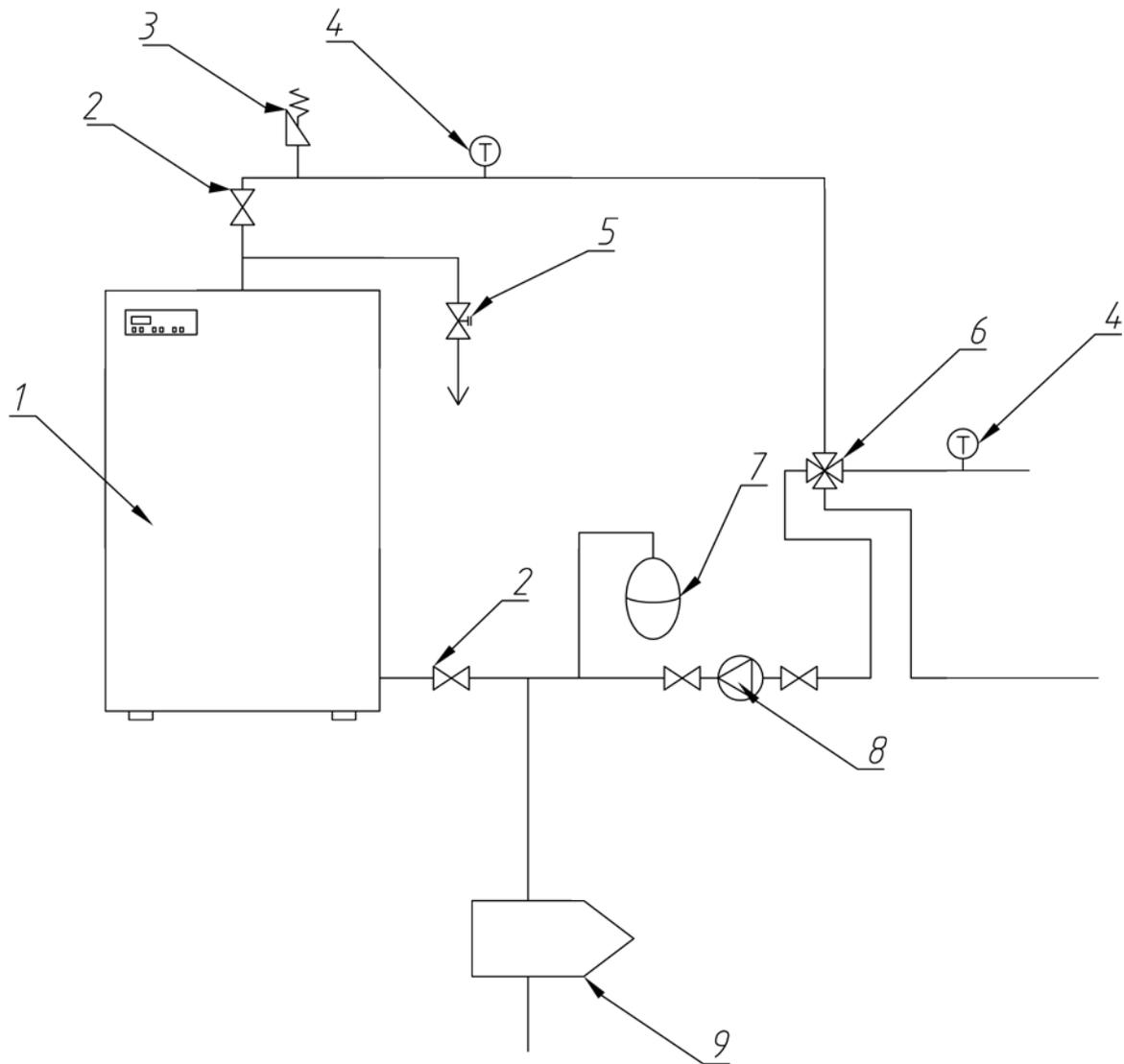
The filling process is done when no air is coming out through automatic air vent and pressure gauge is showing the value between 1,5 and 2,5 bar (closed systems). Air vent is to be set at the highest point of the (closed) central heating system. If the pressure is below 1,5 bar the filling process must be repeated.

For open systems, working pressure depends on the overall height of the system and the open expansion vessel (1 bar for each 10 m is an estimate).

After the filling process is done, it is obligatory to close the drain tap valve, close the water supply to the water-filling pipe and detach the water-filling pipe.

5.4 Connecting the boiler with a closed central heating system with circulation pump on the return line

Recommended connection scheme is depicted below:



- 1) Boiler TOBY B 2) Boiler valve 3) Automatic air vent 4) Thermo-manometer 5) Safety valve 6) Mix valve 7) Expansion vessel 8) Circulation pump 9) Dirt catcher



The safety valve (with preset 2,5 bar threshold) should be mounted closed to the boiler (Position 5 at the image above).



It is essential to have a thermometer and a manometer installed to the system (Position 4 on upper scheme)



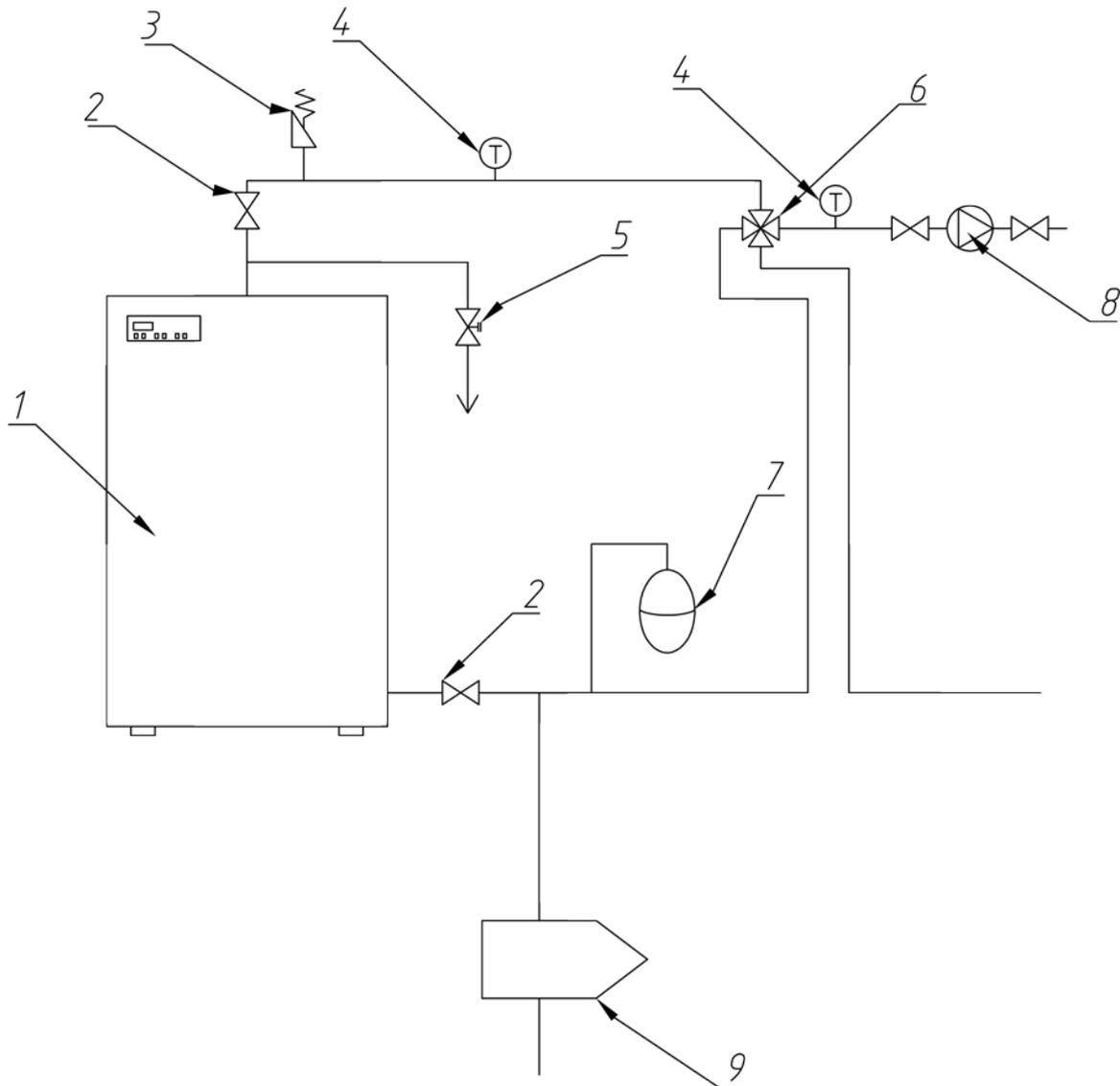
It is recommended to install a dirt catcher and also an anticondensation valve on the return line. (3-way mixing valve).



Closed expansion vessel (position 7) should be mounted close to the boiler. Vessel must be positioned so that its membrane is in horizontal position. The volume of the vessel is calculated using the ratio 1 KW : 1 l.

5.5 Connecting the boiler with a closed central heating system with circulation pump on the flow line

Recommended connection scheme is depicted below:



1) Boiler TOBY B 2) Boiler valve 3) Automatic air vent 4) Thermo-manometer 5) Safety valve 6) Mix valve 7) Expansion vessel 8) Circulation pump 9) Dirt catcher



The safety valve (with preset 2,5 bar threshold) should be mounted closed to the boiler (Position 5 at the image above).



It is essential to have a thermometer and a manometer installed to the system (Position 4 on upper scheme)



It is recommended to install a dirt catcher and also an anticondensation valve on the return line. (3-way mixing valve).

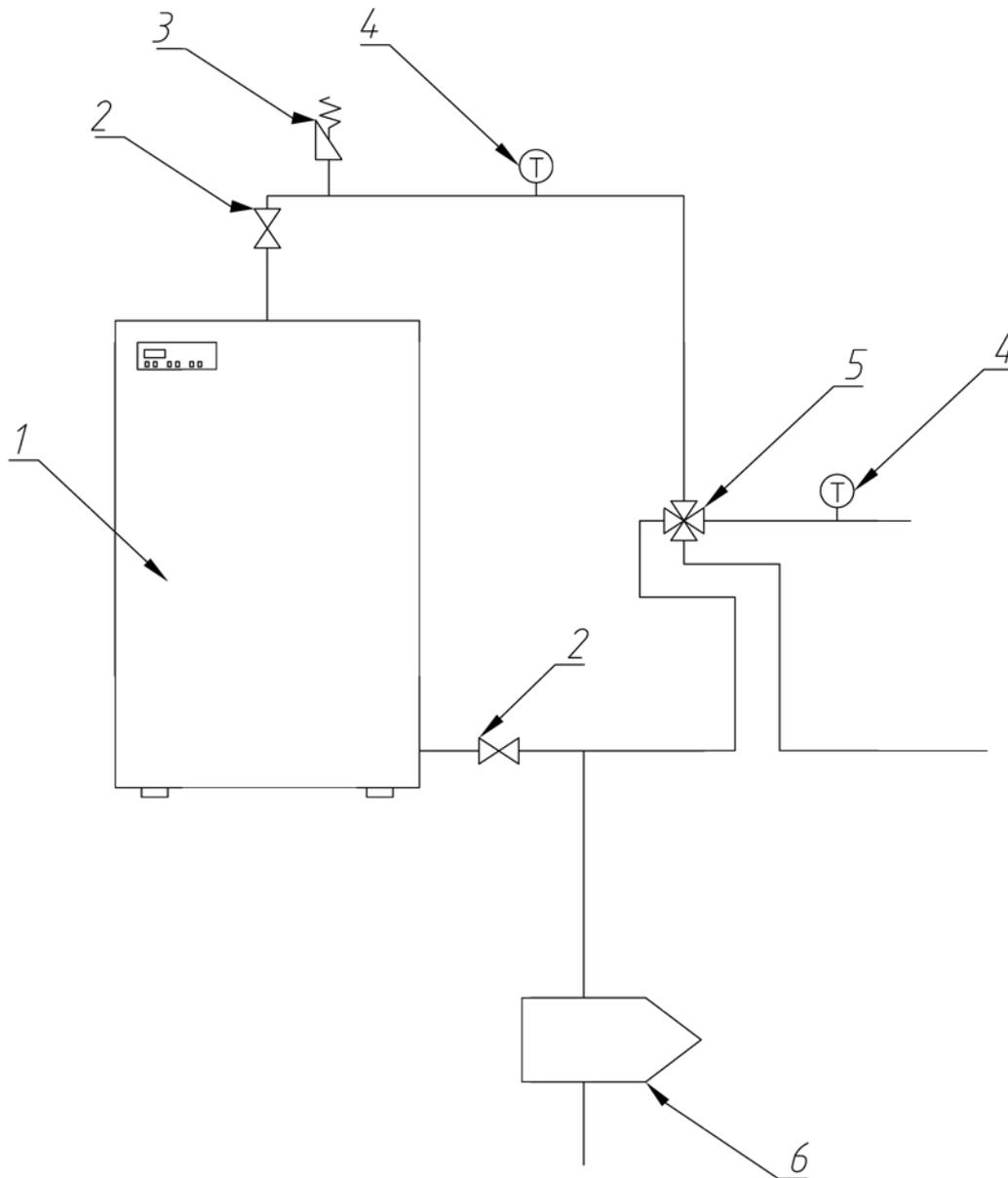


Closed expansion vessel (position 7) should be mounted close to the boiler. Vessel must be positioned so that its membrane is in horizontal position. The volume of the vessel is calculated using the

ratio 1 KW :1 l.

5.6 Connecting the boiler with a closed central heating system SET version

Recommended connection scheme is depicted below:



- 1) Boiler TOBY H 2) Boiler valve 3) Automatic air vent 4) Termo-manometer 5) Mix valve 6) Dirt catcher



The safety valve (with preset 2,5 bar threshold) is already mounted on the backside of the boiler and its connected directly to the boiler water jacket (Position 18, drawing in Chapter 1)



Sigurnosni ventil (sa pragom otvaranja podešenim na 2,5 bar) je već montiran na samom kazanu kotla (Poglavlje 1, Pozicija 18 na crtežu kotla).



It is essential to have a thermometer and a manometer installed to the system (Position 4 on upper scheme)



It is recommended to install a dirt catcher and also an anticondensation valve on the return line. (3-way mixing valve).



Please note that air-vent is not pre-mounted with the boiler. It should be connected externally.

5.7 Use of temperature relief valve with obligatory filling

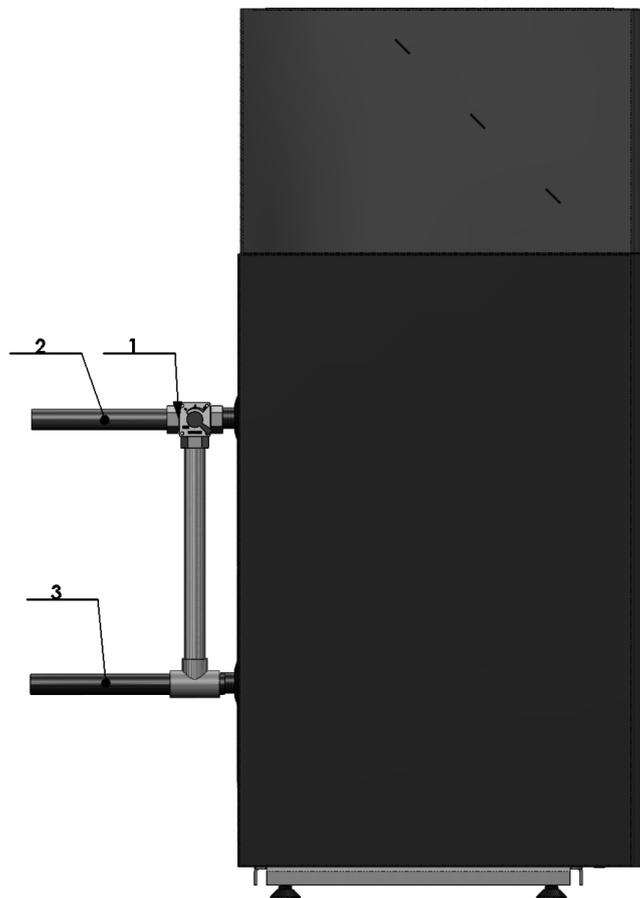


The temperature relief valve (shown below) must be present in the system. The valve must be installed by a qualified technician in accordance with the instructions given in the manual from the producer of the valve. We recommend the CALEFFI 544501 valve depicted below.



6 Return line protection against condensation

Every boiler is sensitive to condensation if the return line water temperature is too low. In order to avoid it is necessary to mount the mixing valve to this boiler.



1. 3-end mixing valve
2. Circulation pump
3. Thermostate

The purpose of this valve is to transmit a portion of the hot water to the return line cold water in order to compensate the temperature difference between the flow and return line.

7 Boiler cleaning and maintenance

Regular maintenance and cleaning of pellet boilers is necessary to ensure product functionality and long-life operation.

Regular weekly cleaning consists of following operations (detailed steps are explained in text below).

1. Emptying the ash from the bottom of the boiler (using the ash tray delivered with boiler)
2. Removing ash layers in the heating chamber if such
3. Cleaning the retort burner (round plate where pellets are falling in)
4. Cleaning the plate which is carrying the retort burner
5. Moving the bar in the heat exchanger of the boiler. This would force the ash to fall down from the difficult-to-access heat exchangers area.

Occasional (seasonal) cleaning consists of regular weekly cleaning plus detailed cleaning of the heating chamber from above.

How often do I need to clean the boiler? This depends on several factors, most important is the quality and purity of the wood pellets used. Weekly cleaning has to be performed 1-2 per week, seasonal cleaning 1-3 times during the heating season.

However if pellets of extremely bad quality are used, the cleaning frequency can change dramatically. Boiler would not last long.

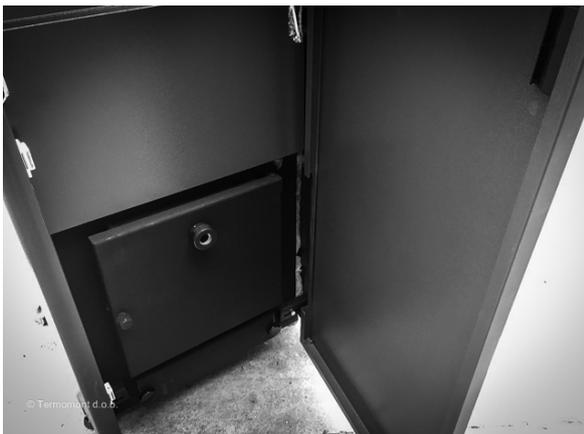
What tools do I need to clean the boiler? Simple cleaning set is delivered with the boiler. However, ash-vacuum-cleaner would make things faster and easier.

Before performing any of the steps described below, boiler must be turned off and completely cold. This is especially important for heat-exchanger cleaning. If they are still hot while bar is moved up and down, they will be damaged.

It is obligatory to wear gloves for any operation described below.

7.1 Regular weekly cleaning

Necessary equipment: Gloves, Ash removing vacuum cleaner OR manual cleaning set (delivered with boiler).



Open the outter main boiler door.



Open the lower, chamber door with the boiler KEY.



Release the upper mobile part of the burner pot.



Attention: Some boiler parts may be hot!



Clean the area around the burner.



Clean the area around the burner. If you don't have an ash vacuum cleaner, use the manual tools that are delivered with the boiler.



Burner is now free of ash.



Put the upper burner part back in place.



Release the screw-balls that hold the plate below.



Clean the area inside with the ash cleaner or using manual tools. When screwing back the holders, screw completely, so that no air can pass inside.



If no vacuum cleaner is present, use the hand tools as shown below.

7.2 Weekly cleaning of the heat exchangers

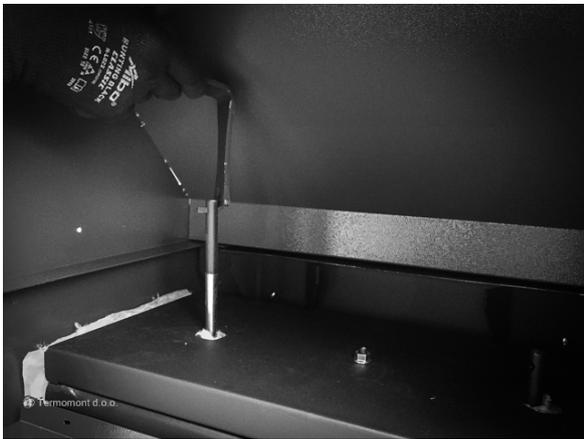
Necessary equipment: Gloves, boiler KEY (delivered with the boiler).



Make sure you perform this operation while boiler is cold.



Open the doors on the top panel of the boiler. There are two bars coming out.



Now take the boiler KEY, mount on the bar and move up-down to release the ash from the heat exchanger tubulators. Do this for both bars.

7.3 Occasional (seasonal) cleaning

Necessary equipment: Gloves, Ash removing vacuum cleaner OR manual cleaning set (delivered with boiler). Boiler KEY (delivered with the boiler) or fork key 13.



Open the upper outer door of the boiler.



Metal cap with tubulator lifters and one screw in the middle is visible.



The insulation coat is attached below this metal cap. To unscrew the cap use boiler KEY.



Put the metal cap aside.



make sure you make no damage to the stone-wall insulation below.



With fork-key size 13 or boiler KEY, unscrew the upper cover of the heating chamber.



Lift the cover and put it on side.



Perform detailed cleaning of all parts that can be accessed. Remove the ash.



The use of the ash-vacuum cleaner would make this job faster and easier.



After the cleaning put back the cover and screw the holders.



Put everything back in its place.



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