Compact-size wood pellet boiler

TOBY B

Technical manual for use and maintenance

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1 General data

Type	Width B (mm)	Height H (mm)	Length (mm)
B 8	565	1435/1465	700
B 12	565	1435/1465	725
B 17	615	1435/1465	775
B 21	635	1495/1525	905
B 30	735	1525/1555	905
B 40	790	1545/1575	960
B 50	790	1545/1575*	1020

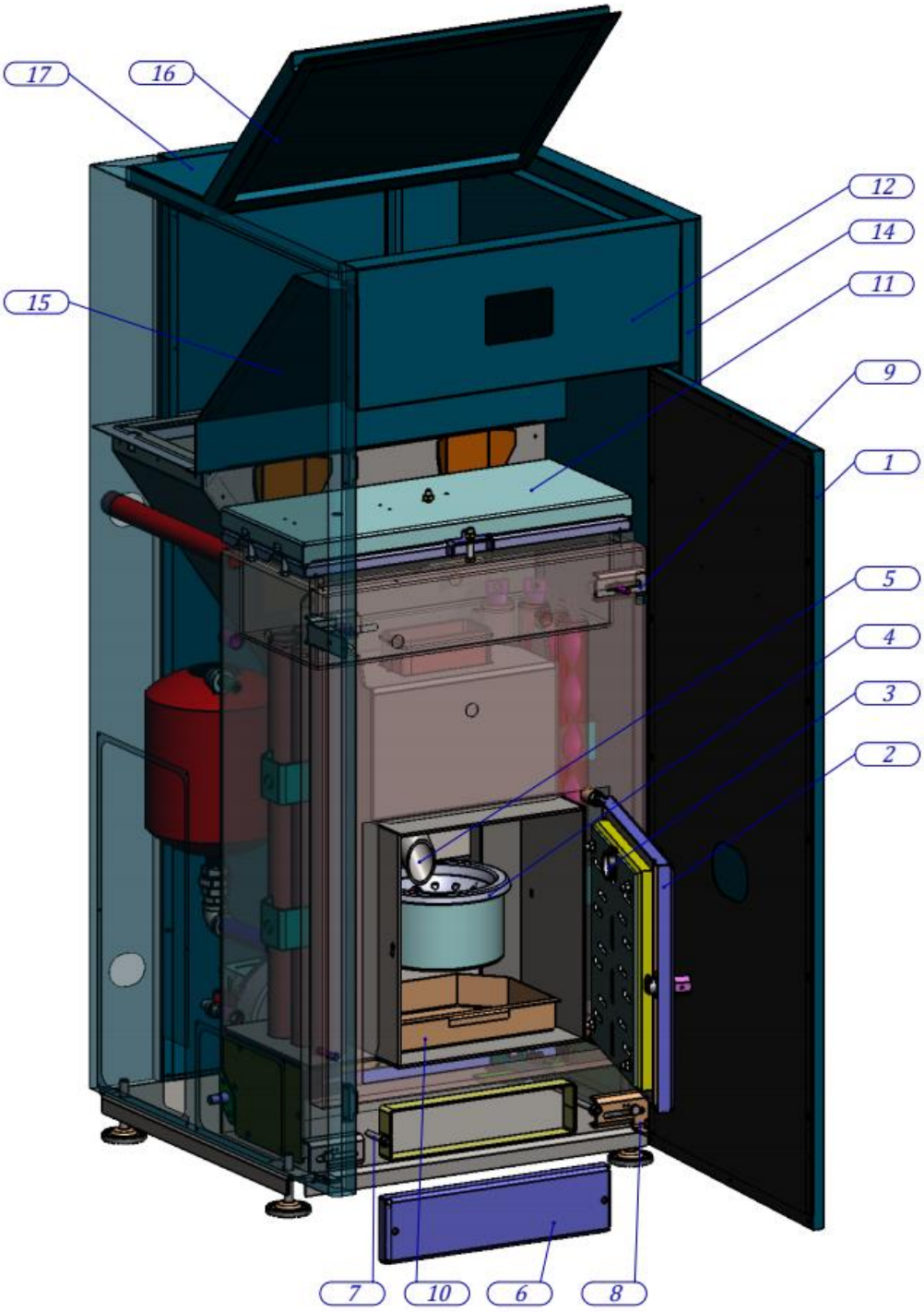
***height can be adjusted within this range**

1.1 Technical data according to EN 303-5

Type	**8**	**12**	**17**	**21**	**30**	**40**	**50**
Nominal power	8 kW	12 kW	17 kW	21 kW	30 kW	40 kW	50 kW
Power range	2-8.5 kW	4-12 kW	5-17 kW	6-21 kW	9-30 kW	9-40 kW	10-50 kW
Fuel consumption at minimum power	min 0.65 kg/h	min 0.8 kg/h	min 1.1 kg/h	min 1.3 kg/h	min 1.4 kg/h	min 2.7 kg/h	3 kg/h
Fuel consumption at maximum power	max 2.5 kg/h	max 2.5 kg/h	max 3.6 kg/h	max 4.5 kg/h	max 6 kg/h	max 9 kg/h	max 10 kg/h
Flue gas exit height	190 mm	190 mm	190 mm	190 mm	190 mm	190 mm	190 mm
Overall boiler weight	185 kg	190 kg	210 kg	265 kg	290 kg	330 kg	375 kg
Pellet storage capacity	70 kg	80 kg	90 kg	100 kg	125 kg	145 kg	150 kg
Flow / Return line	1"	1"	1"	1"	1"	5/4"	5/4"
Fill / Drain tap (inch)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Flue gas exit diameter	80 mm	80 mm	80 mm	80 mm	80 mm	80 mm	80mm
Air inlet diameter	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm	50mm
Flue gas exit temperature	160 °C	160 °C	160 °C	160 °C	160 °C	160 °C	160 °C
Necessary draught	10 Pa	10 Pa	10 Pa	10 Pa	10 Pa	11 Pa	12 Pa
Boiler water content	33 lit	33 lit	41 lit	58 lit	78 lit	96 lit	104 lit
Energy consumption at start-up	220 V 50 Hz	220 V 50 Hz	220 V 50 Hz	220 V 50 Hz	220 V 50 Hz	220 V 50 Hz	220 V 50 Hz
Energy consumption at steady-state	400 W	400 W	400 W	400 W	400 W	400 W	400 W
Boiler class efficiency	100 W	100 W	100 W	100 W	100 W	100 W	100 W
Boiler class emissions	90 %	90 %	90 %	90 %	90 %	90 %	90 %
Energy consumption at start-up	5	5	5	5	5	5	5

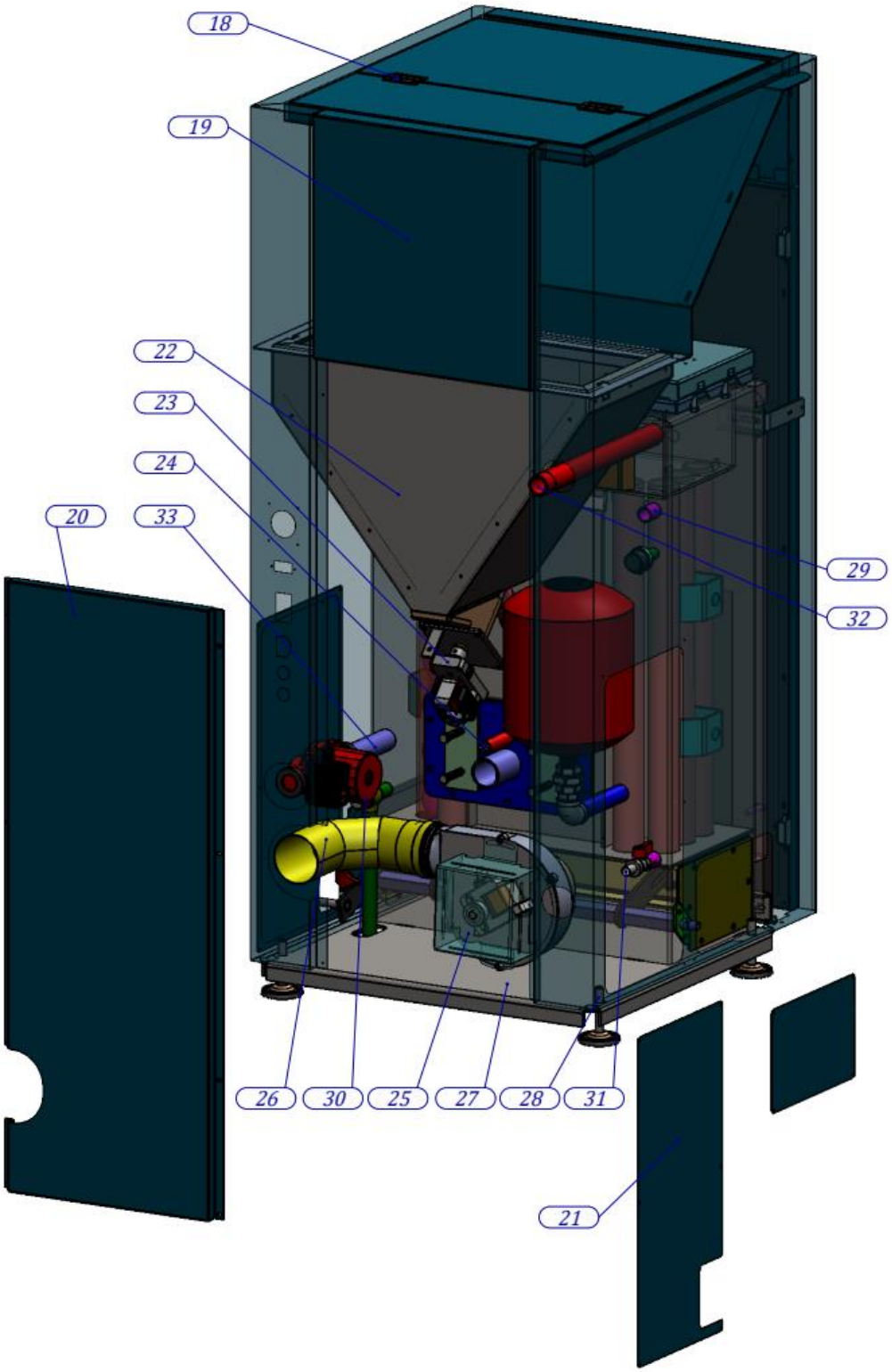
1.2 Description of the product

- This boiler is aimed for boiler rooms, not living areas. Boiler has a thermal insulation coat. Boiler dimensions and adaptable pellet storage make it suitable for placement in smaller areas. Product is also offered as “SET version”: in that case, circulation pump*, expansion vessel and safety valve are built-in.
- **TOBY B** wood pellet boiler is made according to EN 303-5 and fulfills Eco-design criteria 2015:1189.
- The boiler can only be fed and fired with **wood pellets that fulfill EN 14961 norm**, pellet quality A1 or A2, pellet diameter 6mm or 7mm.
- 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 the desired and reached temperature decreases.
- Boiler regulation is equipped with two sensors (hot-water, flue gas).
- Boiler chamber is made by welding 5mm-thick steel plates (all surfaces in touch with fire). Other parts are made of 4mm steel.
- The working principle of this boiler is based on the “sub-pressure” of the heating chamber. The chamber is completely air-proof so that air flow in the boiler is fully controlled by the exhausting fan mounted on the back. Boiler regulation completely controls the quantity of the air inside the heating chamber: optimum combustion comes as a result.
- 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 melting area (the 'actual' embedded burner of the boiler). Storage and combustion area are physically divided. There is a safety thermostat to prevent back-fire.



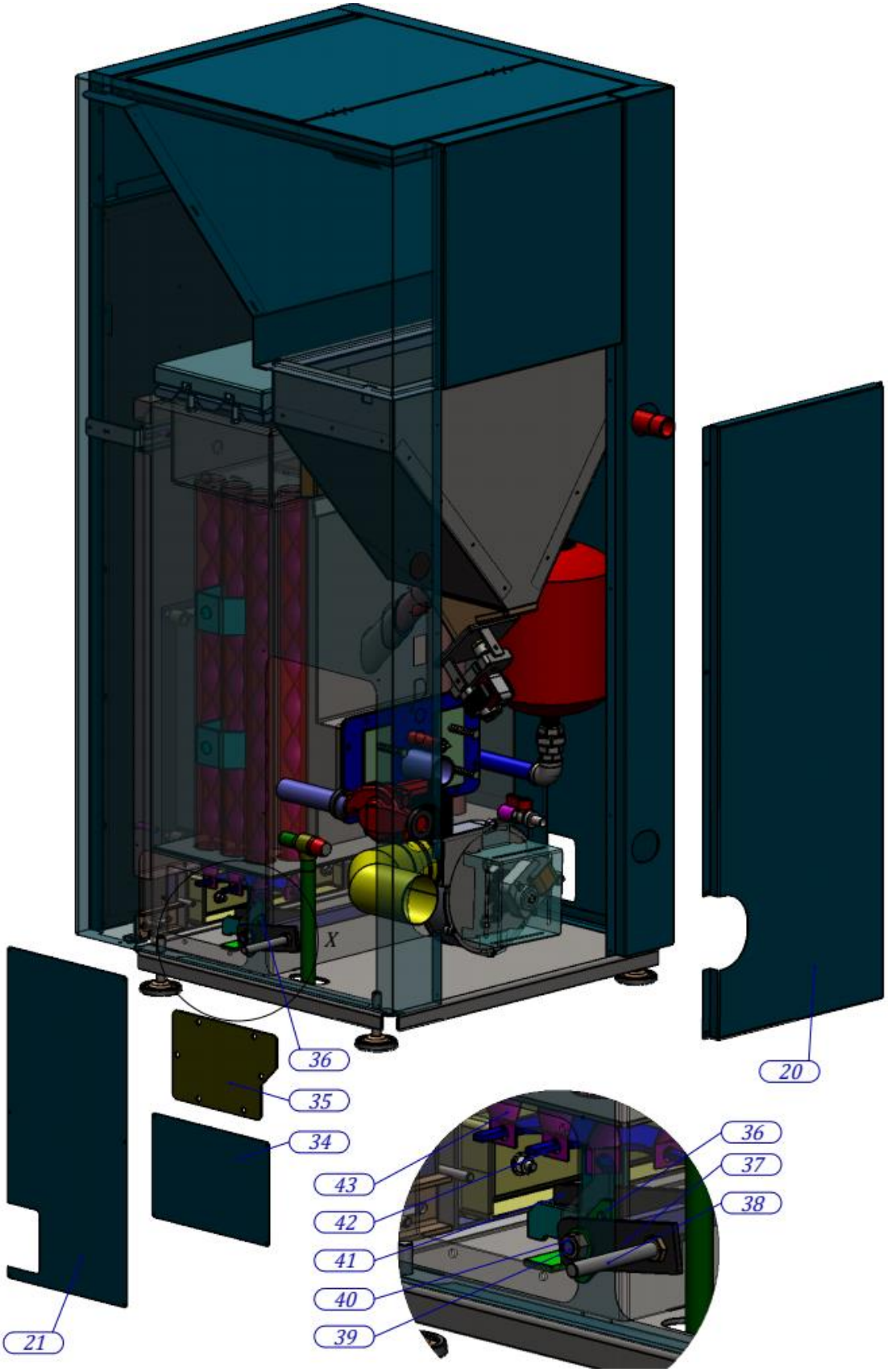
1.3 Boiler parts

1. Boiler cover 2. Boiler door 3. Visor 4. Boiler burner 5. Pellet doser 6.
Cover for cleaning access 7. Fixation points of the cover 8. Boiler cover lower holder 9. Boiler cover lower holder 10. Ash-tray 11. Cover 12. Boiler cover logo front 13. Side cover 14. Upper side cover 15. Slope of the pellet storage 16. Pellet storage top loading 17. Fixed holder of the boiler cover



18. Pellet load access 19. Upper back cover 20. Back cover 21. Service access 22. Lower part of the pellet storage 23. Pellet dosing tube 24. Igniter 25. Fan 26. Flue gas elbow 27. Basement 28. Adjustable boiler legs. Expansion vessel, safety valve and circulation pump are OPTIONAL („SET Version“).

1.4 Boiler parts – cleaning mechanism detail



34. Expansion vessel (optional) 35. Cover of the mechanism 36. Fixed point of the lever 37. Lever of the mechanism for cleaning the turbulator 38. Lever for cleaning the turbulator 39. Shaft of the turbulator 40. Nut of the turbulator 41. Lever of the turbulator 42. Plate of the turbulator. 43. Turbulator

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.

 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)
- Electrical cable with socket for connection to the mains and for connecting the boiler and circulation pump
- The boiler comes with a special tool with which it is possible to unscrew the nuts on the lower door.

 Along the boiler following parts are NOT INCLUDED:

- Thermo-manometer
- Mixing valve
- Air vent or boiler valves

3 Introductory remarks

 The end user must follow the guidelines from this manual all time. In the 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.**

 When heating the boiler, there is a possibility of wetting and dripping in the area of the chimney and in the firebox itself. If the pressure in the installation is constant, this phenomenon represents condensation and not a boiler leak. The cause of condensation is a large temperature difference between the distribution and return lines, and occurs as a result of the following design errors:

- If a boiler is installed whose power exceeds the size of the installation
- No mixing valve installed to protect the cold end of the boiler.
- The boiler door is not closed or the ashtray is not properly installed (more air is coming in than necessary).

 In the event that the boiler leak is reported to the service and it turns out that it is condensation, the arrival of the service team is charged.

 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

U toku rada delovi određeni kotla su vreli. Prilikom kontakta obratiti pažnju da je obezbeđena zaštita od opekotina.

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

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

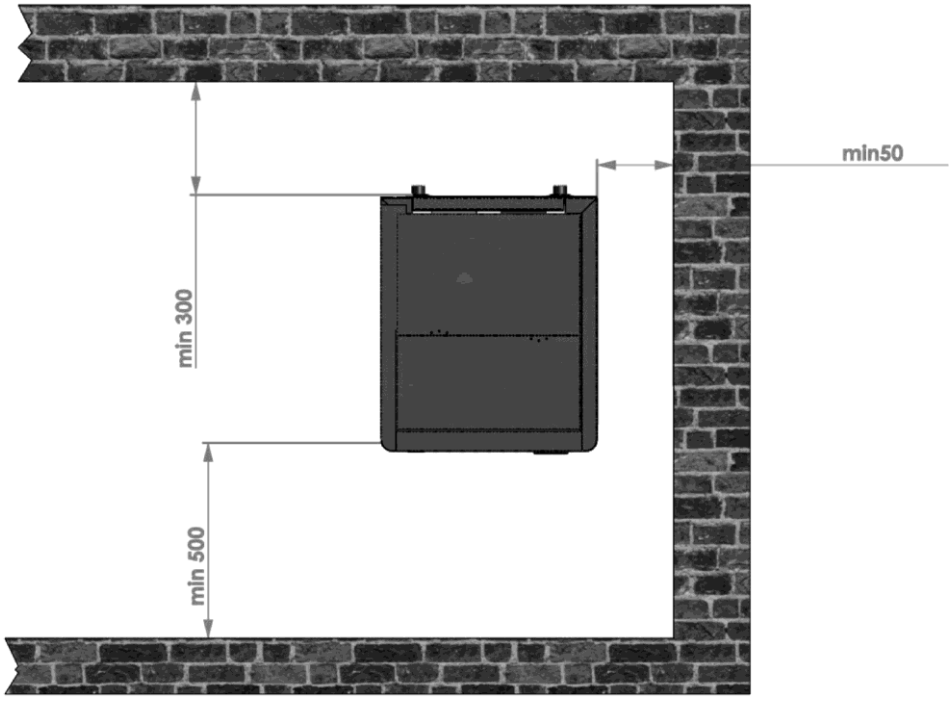
Eectric connections must be made according to 73/23 CEE and 93/98 CEE and properly dimensioned.

5 Boiler placement

5.1 Boiler room

Room where the kamin is placed, must possess ventilation windows.

$A(cm^2) = 6,\ 02 \cdot P\ (KW)$ where P is the rated power of the boiler in kW.



The TOBY boiler is designed to take up minimal space. The flue gas outlet is located at the back. The supply and return lines as well as access to the boiler burner are also at the rear of the boiler..

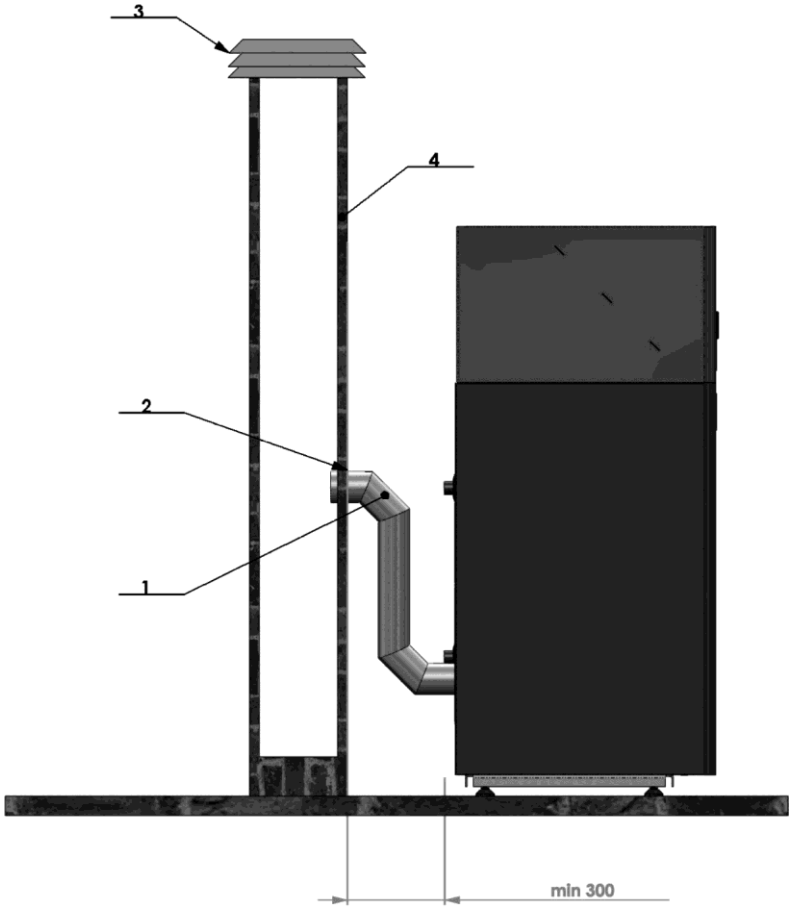
Take care of the space around the boiler, and be sure to leave enough space on all sides according to the dimensions given in the manual (top photo).

Boiler base must be stable and made of fireproof material.

5.2 Connecting to the chimney

Boiler TOBY B is a boiler with forced draft, the boiler fan is the one that creates traction through the boiler, however, for completely correct and smooth operation in all situations (wind, high air pressure from the outside, el. power outage) we advise the existence of a vertical chimney constructed with a resistance of 10-12 Pa depending on the model.

In order to reduce heat losses and due to safety and environmental factors, it is necessary that there is a vertically oriented chimney connected to the picture and, if possible, that the chimney is of high quality (made of ceramic segments with insulation up to 5 cm thick). Chimney and flue pipes need to be cleaned regularly, at least once a 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.

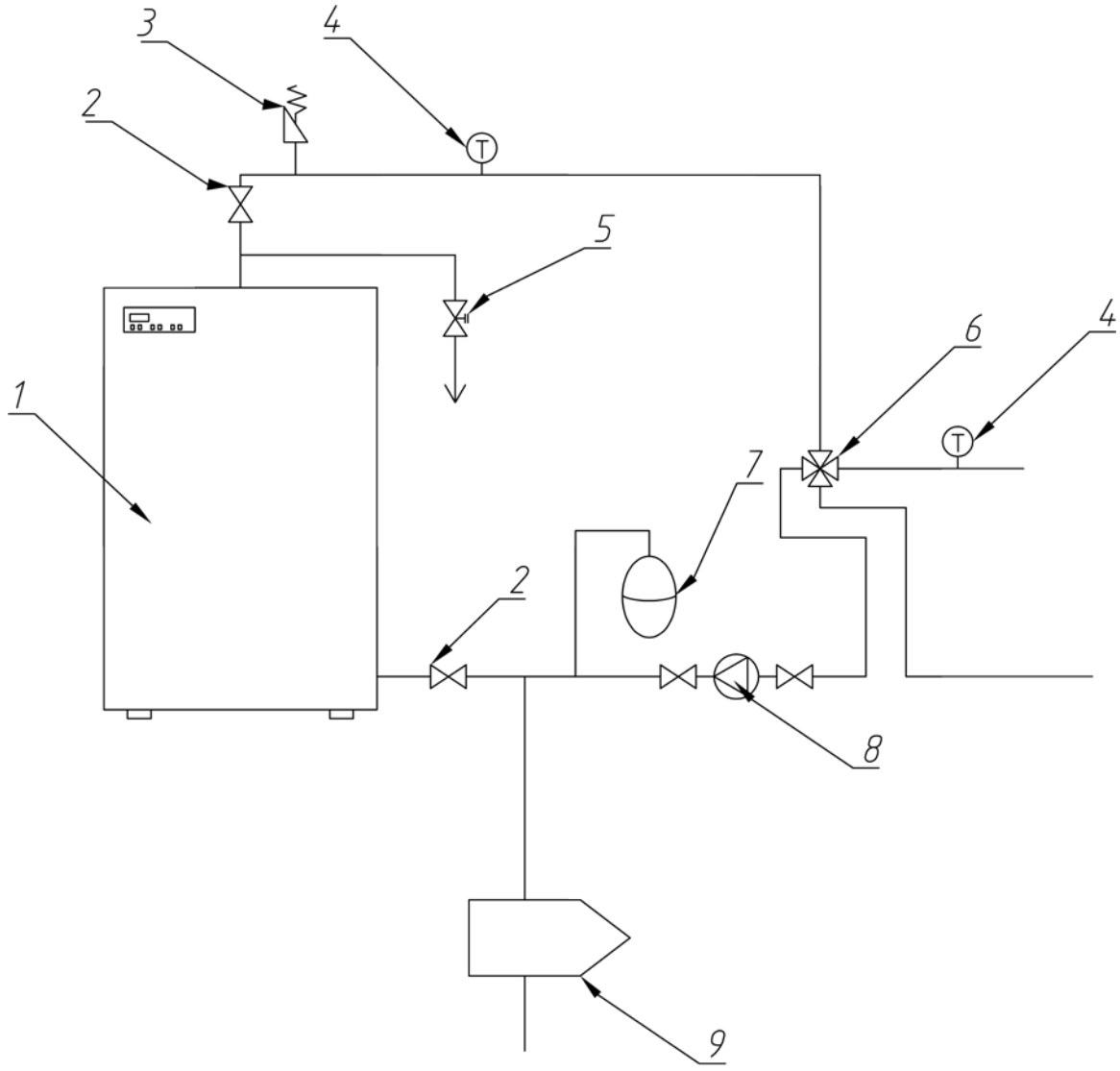
When filling the system with water take care that no air remains in the boiler.

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) Termo-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).

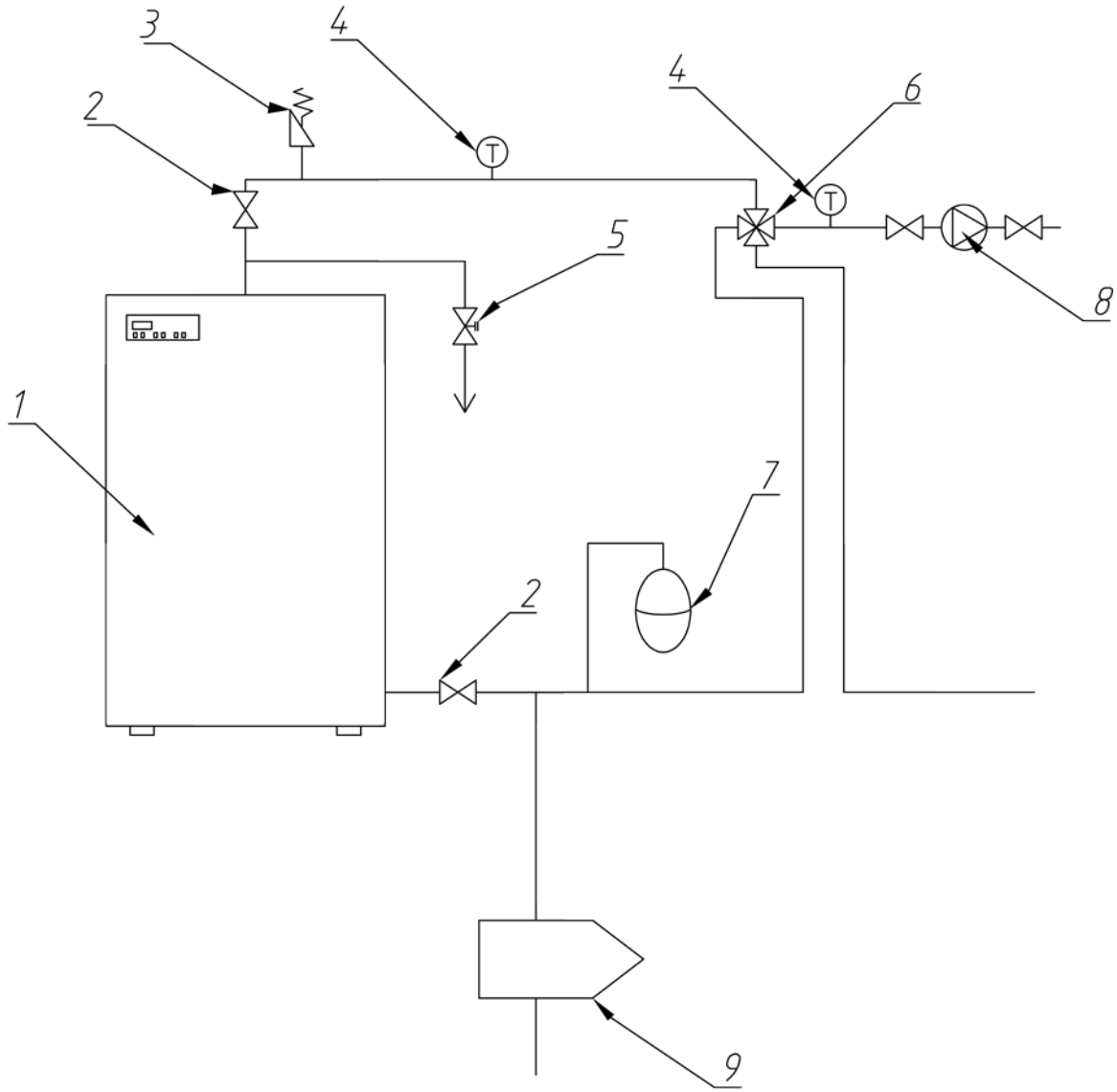
It is essential to have a thermometer and a manometer installed to the system (Position 4 on upper scheme)

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

CLosed expansion vessel (position 7) should be mounted close to the boiler. The vessel must be positioned so that its membrane is in a horizontal position. The volume od 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) Termo-manometer 5) Safety valve 6) Mix valve 7) Expansion vessel 8) Circulation pump 9) Dirt catcher

Boiler regulation is compatible with most room thermostat products (wired or wireless). Be aware that wireless signal strength is depending on the geometry of the house, thickness of the walls, position of the boiler

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

It is recommended to install a dirt catcher

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

5.6 Use of temperature relief valve with obligatory filling

The temperature relief valve (example is 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.

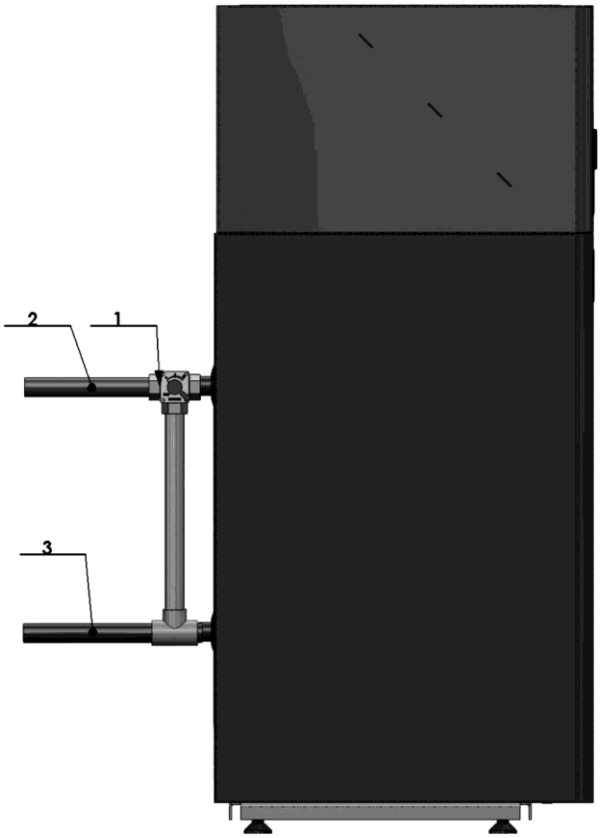
The role of this valve (the picture serves as an illustration) is that if for some reason the temperature of the water in the boiler rises and reaches a critical value of 95-100 °C, open the supply of cold water from the tap and directly cool the water in the boiler and thus prevent a possible failure. When the set temperature is reached, the cold water supply and the discharge port open at the same time until the temperature drops below the marked value, when the cold water supply and the discharge port are closed at the same time. The method of mounting the thermal drain valve is described in detail in the manufacturer's instructions that come with this product and it is necessary to adhere to it.

5.7 Positioning the Cleaning Mechanism Drive

After positioning the boiler in the boiler room, it is necessary to place the mechanism lever on the side of the boiler that is easier to access. The turbulator lever is positioned. 37 is factory mounted on the left side of the boiler, but by unscrewing the lock nut pos.40, the lever is removed from the shaft pos.39 and placed on the other side of the shaft or boiler. Then the lever lever pos.38 is installed.

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.

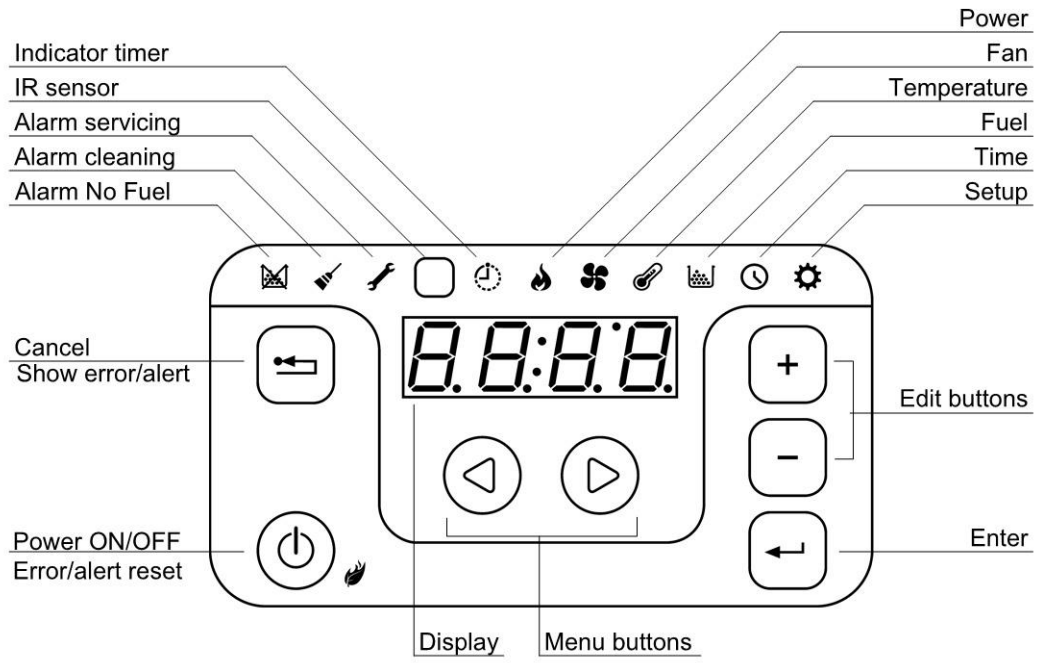
Due to its necessity, the installation of a mixing valve is a condition of the boiler warranty!

Its installation is MANDATORY.

7 Boiler regulation

On the front of the boiler there is a control display. It is possible to choose between the basic capacitive sensor and a touch (additional fee). Manual for the touch screen is available in a separate document. Basic display is explained below.

The meaning of the signal lights as well as the description of the keys are shown below:



The display must be clean. In case of grease or dirt, some buttons can be activated by themselves.

7.7 Adjusting the temperature in the boiler

Postoje dve opcije za regulaciju temperature u kotlu: Jedna je putem sedmodnevnog tajmera, druga putem ručno postavljanje temperature.

There are two options for regulating the temperature in the boiler: One is via a seven-day timer, the other via manual temperature setting. Using a seven-day timer, you can fully automate the boiler operating time. If a weekly timer is set, manual setting allows you to temporarily override the settings set by the timer. The timer set values are returned when the appropriate conditions specified by the timer are established (if the timer-defined extinguishing time is reached, the boiler then shuts down).
To view the current temperature of the water in the boiler, press the Menu button to enter the Temperature menu. The current temperature will be displayed on the display. To set the desired boiler water temperature, press Enter in the Temperature menu. The display will show the target temperature set in Edit mode (value flashing). You can increase and decrease the value with the Edit keys. When you're done, press Enter to confirm the temperature setting. The display will then show the current temperature of the water in the boiler again.

7.8 Combustion power and modulation principle

The boiler control regulates the combustion to achieve optimal performance. Combustion power (1-5) refers to the amount of dosing/running of the fan on a scale of 1-5. The power of the boiler is set by the

service technician when adjusting the boiler parameters. Once the set water temperature is reached, the dosing power is automatically reduced. For instance, if the dosing power is set to 3, the boiler will not dose at that power but will software-vary the power between values 1 and 3 depending on the difference between the current and desired temperature - this principle of operation is termed modulation. To check the current combustion power of the boiler, press the Menu button to enter the Power menu. The current power will be displayed on the screen.

To heat the room faster, you can increase the default combustion power. In the Power menu, press Enter. The display will show the combustion power that will flash. You can increase or decrease the value by pressing the Edit keys. When you're done, press Enter to confirm. The display will then show the current combustion power. If a higher power is set, the pellet dispenser will pour more pellets and the fan will accelerate the speed towards a higher set combustion power. On the contrary, it is possible to manually reduce the combustion power, then the dosing motor or fan will work more slowly, a smaller amount of pellets will be delivered to the combustion chamber as a consequence.

7.9 Setting the Seven-Day Timer

Boiler automation allows you to set weekly programmes. You can set 6 different programmes and choose 3 programmes for each day of the week. The programme determines the start time, end time and the desired temperature.

7.9.1 Daily programme

Press the Menu button to enter the Time menu and then press Edit to select the Weekly timer periods setting. The display will show (3). Press Enter for Program 1, the display will show (P1), then press Enter again to enter the edit mode for Program 1. Start time hour value is now flashing. With the help of the Edit key, set the desired start time. Then press the right Menu button. Start time minute value is now flashing. In the same way as for hours, set the desired start minute. Press the right Menu button and set the desired end time. Then press the right Menu button once more to set the desired temperature for the selected time period. Confirm the program settings by pressing Enter. Repeat the process to set up other programs.

7.9.2 Establishing a programme for each day of the week.

Program 1		Program 2		Program 3		Program 4		Program 5		Program 6	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
5:30	7:30	8:00	11:30	12:00	23:00	17:00	23:00	20:00	22:30	4:00	7:00
16°C		18°C		19°C		18°C		17°C		15°C	

Press the Menu button to enter the Time menu, and then press the edit button to select the Weekly timer days setting. The display will show (4). Press Enter to select the first day, (Monday), the display will show (d1). Then press enter again to enter edit mode for Monday. Value for 1. The program is now flashing. With the help of the edit buttons, select the desired program. Then press the right menu button. Value for 2. The program is now flashing. In the same way as for the first day, set the program for the second. Press the right menu button. Value for 3. The program is now flashing. Set the desired program and confirm by pressing Enter. Repeat the procedure for the other days of the week. In case you do not want to use all 3 programs, for certain days of the week, you can select OFF instead of the program number.

DAY/HOUR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
(d1) Monday							16°C													18°C					
(d2) Tuesday							16°C													18°C					
(d3) Wednesday							16°C													18°C					
(d4) Thursday							16°C													18°C					
(d5) Friday							16°C													18°C					
(d6) Saturday						15°C				18°C										17°C					
(d7) Sunday						15°C				18°C										19°C					

To activate/deactivate the timer: enter the Time menu and press the edit button to select the Weekly timer ON/OFF setting. Pressing Enter switches between ON and OFF. If you disable the weekly timer, the oven operates manually.

Program overlap: In case of overlapping programs, the program with the higher number takes precedence (e.g. P2 takes priority over P1; P4 over P3, P2 and P1; P6 takes precedence over P5, P4, P3, P2 and P1).

7.10 Errors and alarms

 In the event of an alarm, the control system alerts you by turning on the signal light in the upper left corner.

 When the Cancel button is pressed, an error alarm code is displayed. Each alarm and error also has its own code, which is used to identify the problem. The alarm starts with the letter A, while the error starts with the letter E. The meaning of the alarm code is given in the table below.

 By pressing the POWER ON-OFF button, if the type of error allows, and after eliminating the problem, it can be reset; if there is a more serious failure, the reset will not be possible and then you should call the service.

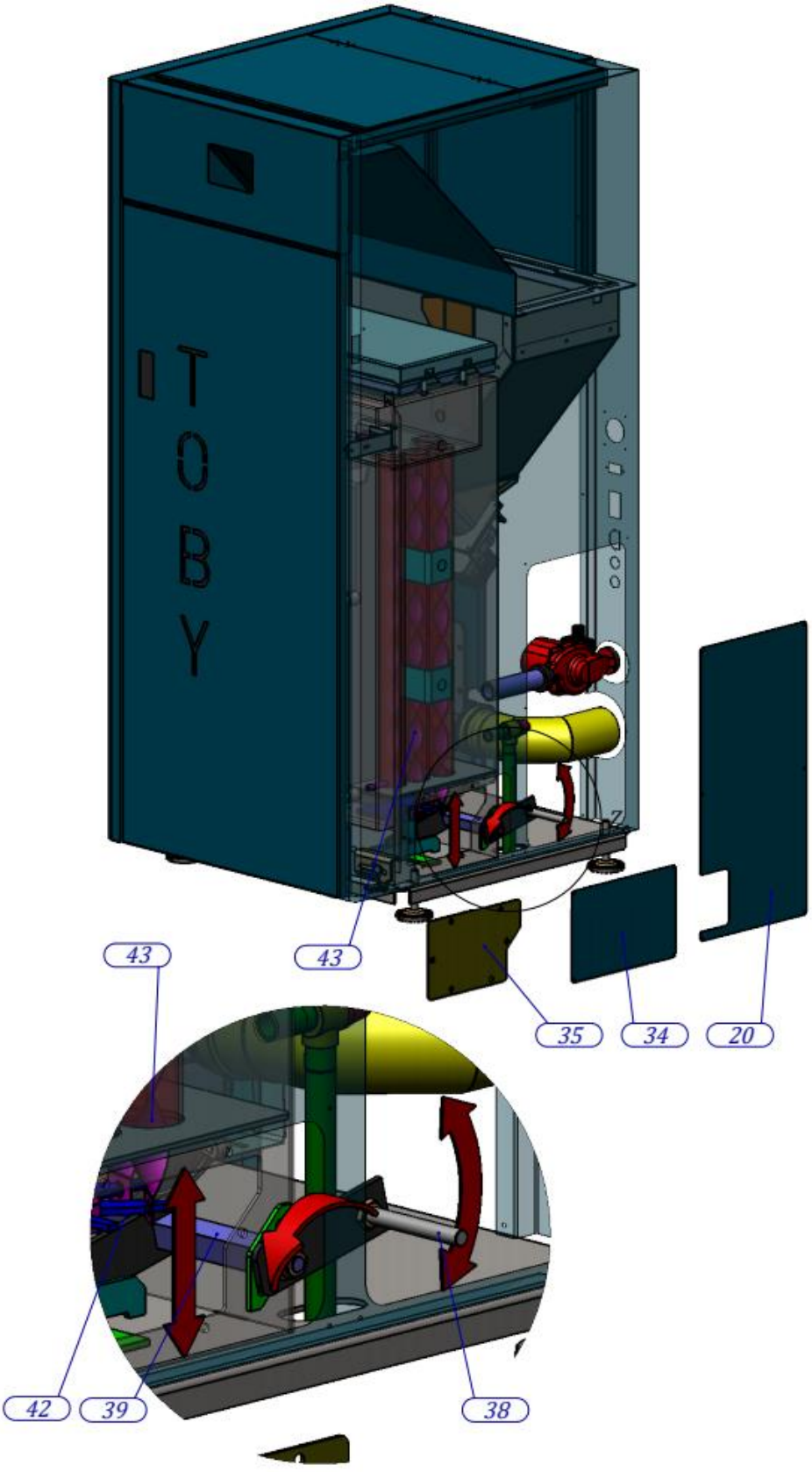
Alarm/Error CODE	Alarm/Erorr Description	
A001	There's no fuel	Fuel level warning - refill the tank
A002	Servis	Time to service has expired, call the service for regular maintenance
A003	Cleaning	Flue gas temperature warning. It is necessary to clean the chimney or heat exchanger.
A004	Low battery	Battery discharged - call for service
A005	Sensor speed	Call for service
A006	Open door	Close the door
A007	Pressure-Air Flow Sensor	Call for service
E002	IR Communication Error	Call for service
E004	MB Communication Error	Call for service

E101	Flame Error	Error caused by: 1. Failed ignition, 2. Overheating Juice Temp. Water 3. Protection against flame return.
E102	Chimney dirty	Error, caused by: 1. Chimney, inlet pipe A glass or a cup of water is dirty. 2. Boiler manually stopped before flame detection..
E105	NTC2	Call for service
E106	NTC3	Call for service.

E107	TC2	Call for service.
E108	Protective El Switch	The circuit breaker connected to I01 is turned off. Reset the alarm and reset the boiler. If the alarm still sounds, call for service.
E110	NTC1	Call for service.
E111	TC1	Call for service.
E113	Too high a temperature of flue gases.	Too high a theme. Flue gases. Necessary cleaning chimneys and turbulators.
E114	There's no fuel.	Timed out for ignition (clean the burner cup I restart the boiler) or the tank is empty (fill the tank).
E115	General error	Call for service

8 Boiler cleaning and maintenance

The condition for the proper functioning of a pellet boiler is regular cleaning and maintenance of the boiler.



Regular cleaning includes:

- Dispersion of ash in the boiler heat exchanger (detailed explanations follow in the continuation of this article). The boiler does not need to be opened, but only 5-7 times to move the lever up and down by hand or by foot, at least 3 times a week, when the boiler is cold. The handle raises and lowers the spiral turbulators that are located in the tubes of the heat exchanger, forcing the ash that has accumulated there to fall into the lower part of the boiler.
- Emptying the boiler ashtray
- Removal of ash deposits in the lower part of the firebox
- Cleaning the cast cup in which the pellets are burned and the heater pipes.

In addition to the operations described above, seasonal cleaning of the boiler includes opening the boiler firebox from the top and thorough cleaning of the available parts and surfaces.

Depending on the quality of the pellets, external factors (weak or severe winter), the amount and frequency of burning, seasonal cleaning should be carried out several times during the heating season, and not only at the end of the heating season..

Regular maintenance is a prerequisite for proper functioning and is also a guarantee of a long service life of the boiler. The boiler comes with a cleaning kit that facilitates access to the boiler parts. The cleaning work is facilitated by the use of an ash vacuum cleaner (it is not supplied with the boiler, but purchased separately).

How often do I have to clean the boiler? It depends entirely on the quality of the pellets. It is necessary to clean the boiler once a week and thoroughly clean the boiler once a month and after the end of the heating season. With worse pellets, cleaning the boiler is also necessary 2-3 times a week.

If low-quality pellets containing impurities of inorganic origin (soil, sand) are used, they will gradually settle as 'silicate' deposits. The boiler will not operate correctly. Deposits can be removed manually, which in practice means cleaning the boiler every day.

 Not cleaning the boiler leads to rapid deterioration, i.e. corrosion of the boiler components, which in turn contributes to worse combustion and heat loss.

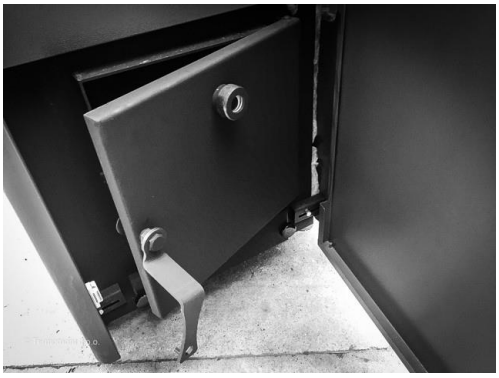
 This boiler is designed for pure wood pellets without any impurities. Combustion is of better quality and the service life of the boiler burner is longer.

 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.

8.7 Regular weekly cleaning of the firebox.

Open the outer main boiler door.



Open the lower, chamber door with the boiler KEY.

Open the main boiler door and remove the ash-tray outside the boiler

Also remove burner pot, remove the ash from the pot int the ash-tray first, then empty the ash-tray.
CAUTION: SOME PARTS MAY BE HOT!

Clean the area where burner pot is placed. Dont forget to clean the top of the tube where resistance heater is placed. When putting parts back to its place make sure the position is the same as before. Otherwise, boiler will not operate properly.

Unscrew the nuts that secure the cover of the lower part of the firebox.

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.

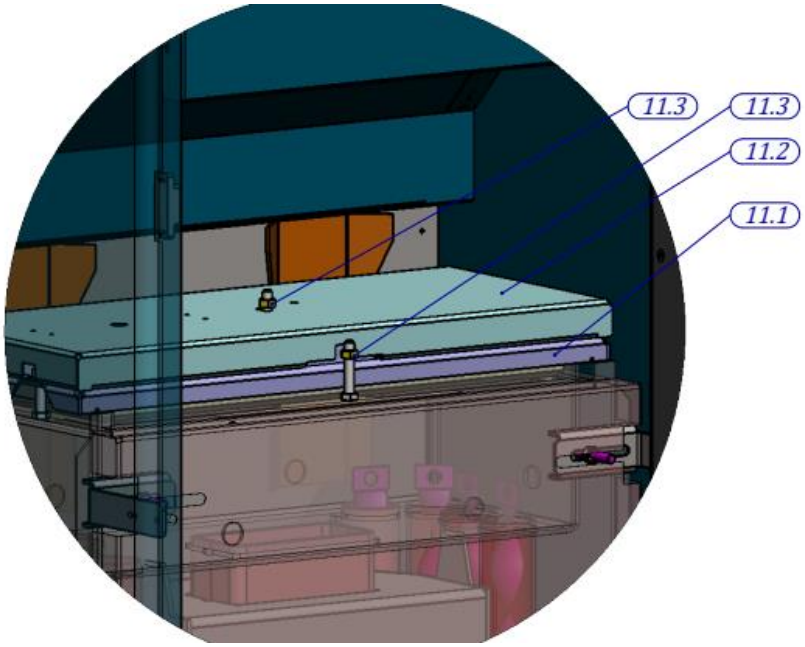
8.8 Regular weekly cleaning of turbulators

IMPORTANT: Clean the boiler turbulators at least 3 times a week by shaking the lever off the side of the boiler with your foot or hand. Move the boiler turbulators only when the boiler is completely cooled..

The lever for moving the turbulators at the side of the boiler needs to be kicked. The boiler does not need to be opened, but the handle should be moved up and down manually or with a foot 5-7 times, at least 3 times a week, when the boiler is cold. The handle raises and lowers the spiral turbulators located in the pipes of the heat exchanger, forcing the ash that has accumulated there to fall into the lower part of the boiler.

8.9 Seasonal cleaning of the boiler

Seasonal cleaning of the boiler consists of regular weekly cleaning of both the furnace and the turbulators, which are described in the previous chapters, and the cleaning of the upper part of the furnace, which is the subject of this chapter.



11.1 Cover Plate 11.2 Cover Insulation Bracket 11.3 Nut

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 outter 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 unsrew the cap use boiler KEY

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 is completed, we return the cover to its place and screw on all the screws again. We're going to put the insulation back in its original place.

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