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H 635, H 650 HOT WATER BOILER

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The design of H 635 and H 650 hot water boilers makes them suitable for the central heating of family houses and small buildings, such as service providers' facilities, kindergartens, and so on. These boilers feature two chambers, which allow combustion of lignite.

A) Basic features of this boiler line

- a) The large-volume charging shaft which allows maximization of time between individual fuel additions. It also ensures a long-term operation without frequent interventions of operators.
- b) The large refueling hole allowing an easy refueling.
- c) An easy change of the combustion method. Two combustion methods are available: the underburning method and the burn-through method. This feature allows selecting the combustion technology based on the fuel used (see Fig. 6 & 7).
- d) The secondary air supply and its control independent of the primary air ensure virtually smoke-free combustion with the minimum air pollution level and a perfect fuel combustion. Combined with the automatic combustion air supply controller, the unit ensures economical and uniform keeping of the heating water temperature selected.
- e) An easy cleaning of the boiler allows keeping its permanent maximum efficiency. The cleaning may be carried out during operation after opening the cleaning door which provides an access to the primary heat exchanging surfaces. All burning residues fall into the ash tray during cleaning. There is no need to remove them elsewhere.
- f) The system of continuously ascending flues prevents the low-temperature condensation and thus corrosion of the boiler body in its bottom section. This system reduces the demand of the boiler with respect to the chimney effect considerably.
- g) The large-volume ashtray compartment allows a long-term operation with no need of the frequent ash removal.

B) Technical description

The boiler the height of which is 1,606 mm, forms a rectangle when looking from above in the direction from the front face towards the rear section (see Fig. 3 & 4).

Both height and depth (730 mm) of both output models are identical. The width varies based on the type and output of the boiler and it ranges from 390 mm up to 520 mm.

The boiler body is welded of the steel plates. Thickness of the internal walls coming into contact with the fuel is 4 mm, while thickness of the external shell is 3 mm. In addition to this, the boiler body is fitted with the cover plates with the thermal insulation layer placed underneath. When looking at the front, the boiler body is fitted with ashtray, refueling and cleaning doors.

There is a large refueling shaft behind the charging door which is terminated by the sliding grate in the bottom section. The opposite wall of the shaft is a water-cooled underburning partition. This partition is fitted with the tilting flap which allows selection between underburning or through-burning of the fuel. Behind the underburning partition there is a burning chamber. In the bottom section of this chamber there is a narrowed diffuser section into which the secondary air is supplied via two water-cooled pipes.

In the top section of this chamber there is a water-cooled fire bridge. The flue gases flow around the fire bridge onto the main heat-exchanging surface which consists of the vertically arranged segments. The flue gases are fed into the smoke neck through a return flue. This return flue through segments may be disabled by the closing flap which is controlled by a lever on the top side section of the boiler. The heat-exchanging segment surface is accessible for cleaning after opening the cleaning door.

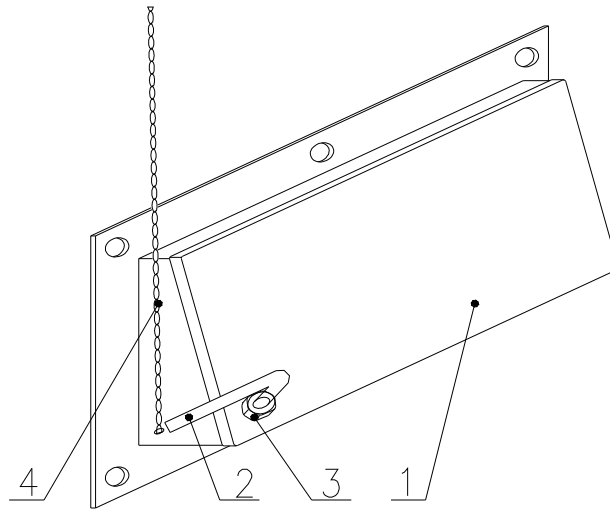


Fig. 1: Controlling the automatic and manual supply of combustion air

1. Firing flap controlling the access of air into the boiler
2. Automatic and manual setting screw
3. Locking nut of the setting screw
4. Automatic controller chain

To allow automatic control of the firing flap by the controller, the screw (2) secures the nut (3) to allow a full closing.

The chain (4) shall be connected to the screw (2). The flap opens when turning screw to the right and closes when turning to the left. Before handling this assembly it is necessary to loose the nut (3).

C) Technical parameters

Parameter	Unit	Model	
		H 635	H 650
Operating flue	(mbar)	0.25	0.3
Water volume	(l)	80	110
Smoke flue diameter	(mm)	160	160
Hydraulic loss of the boiler @ ΔT 20° / 10°	(mbar)	0.7 / 0.2	0.07 / 0.2
Boiler class		1	1
Burning time	(hr.)	4	4
Temperature control range	(°C)	max. 90	max. 90
Minimum temperature of the inlet water	(°C)	65	65
Fuel shaft volume	(l)	67	97
Charging hole dimensions	(mm)	229 x 292	229 x 418
Nominal thermal power	(kW)	35	49.5
Thermal power control range	(kW)	20.8 - 35	29.5 – 49.5
Flue gas temperature at rated / minimum thermal power	(°C)	260 / 218	262 / 215
Mass flow of flue gases at rated / minimum thermal power	(q/s)	26.9 / 15.9	42.7 / 26.6
Efficiency	(%)	71	71.5
Operating overpressure	(bar)	2	2
Heating surface	(m ²)	2.7	3.8
Boiler weight	(kg)	334	413
Fuel consumption	(kg/hr.)	9.8	16.3
Fuel type and water content in the fuel	Lignite b2, H ₂ O max. 20%		
Fuel size	Nut	1	

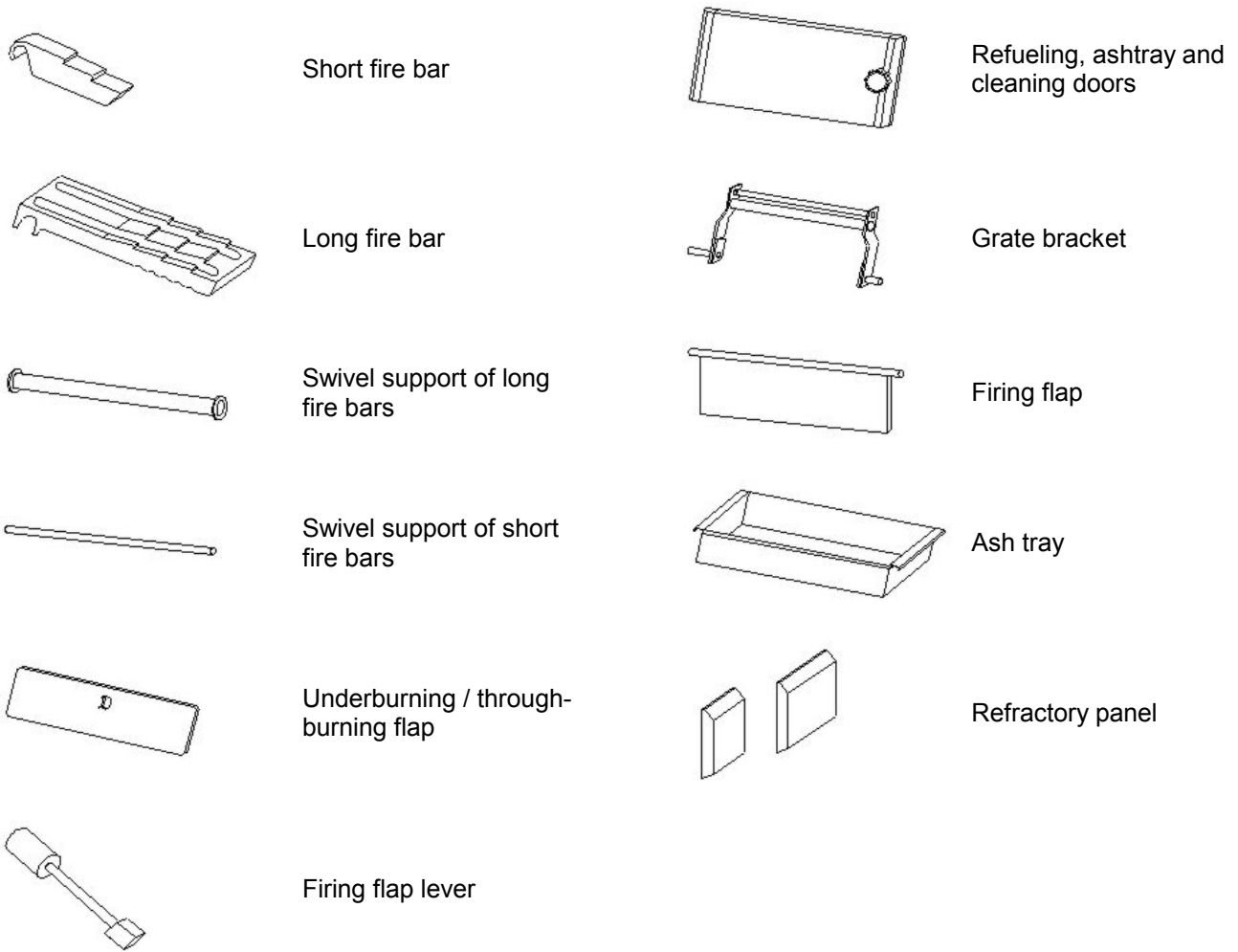
D) Listing of supplied accessories

- 1) Filling and discharge tap, Js ½"
- 2) Hook
- 3) Steel brush
- 4) Scraper for segments
- 5) Scraper
- 6) Ash tray
- 7) Automatic combustion air controller
- 8) Firing flap lever
- 9) Grate mechanism lever
- 10) Secondary air lever
- 11) Flange (2 pcs.)
- 12) Packing (2 pcs.)
- 13) M10 x 30 bolt (8 pcs.)
- 14) M10 nut (8 pcs.)
- 15) Ø 10.5 washer (8 pcs.)
- 16) Underburning / through-burning flap
- 17) Instruction manual

E) Listing of replaceable spare parts

Component	Pieces
1) Cleaning door	1 pc.
2) Refueling door	1 pc.
3) Ash tray door	1 pc.
4) Firing flap	1 pc.
5) Underburning / through-burning flap	1 pc.
6) Long fire bar	5 pcs. for H 635, 7 pcs. for H 650
7) Short fire bar	15 pcs. for H 635, 21 pcs. for H 650
8) Grate mechanism	1 pc.
9) Long fire bar support	1 pc.
10) Short fire bar support	1 pc.
11) Firing flap lever	1 pc.
12) Refractory panel "A"	1 pc.
13) Refractory panel "B"	1 pc. for H 635, 2 pcs. for H 650
14) Hook	1 pc.
15) Steel brush	1 pc.
16) Scraper for segments	1 pc.
17) Scraper	1 pc.
18) Ash tray	1 pc.
19) Grate mechanism lever	1 pc.

Fig. 2: Selected spare parts for H 635 & H650 boilers



F) Instructions for use

Boiler firing

The boiler shall be fired as an ordinary stove. Place paper to the grate through the top door and cover with kindling. Add several bigger pieces of wood. Close the secondary air supply using lever located on the side of the boiler. Moving the lever backwards closes the air supply, while moving the lever forward will open the air supply.

Move the grate backwards, ignite a piece of paper and put it under the grate through a gap formed after moving the grate. Move the grate to a neutral position after ignition. Add wood and other fuel as needed until the fuel level exceeds the lower edge of the underburning partition. Then charge such quantity of fuel which will fill the charging shaft up to the level ensuring a tight closing of door. The quantity of fuel added shall not cause tipping of the underburning / through-burning flap.

Lignite shall be burned by underburning, i.e. the underburning / through-burning flap is in the upright position. Tipping of this flap is carried out by a hook which shall be engaged with an eye welded to the firing flap after opening the charging door.

In case of a low chimney effect during firing we may open the firing flap. This is performed by moving the weight backwards. Immediately after thorough ignition of fuel is reached move the flap towards the front section of the boiler by moving the weight. Keep the flap open for a shortest time possible, since the flue gases do not pass through the heat-exchanging segmented surface, but directly to the chimney when the flap is open and this causes heat losses and uneconomical operation.

Caution

The moisture condensation formed when igniting the boiler for the first time may be of such degree that the boiler could be considered leaking erroneously. This condensation will disappear as soon as the boiler temperature reaches 70 °C.

Adjust the secondary air volume so that no smoke appears at the top of the chimney after the fuel kindles properly. The secondary air volume, however, needs to be adjusted keeping the boiler output into consideration. Excessive secondary air causes supercooling in the heating chamber.

When refueling open the charging door carefully to avoid burning injury, should the flame blast abruptly.

Take care that the fuel level does not fall under the bottom edge of the underburning partition during operation. Should this happen, it is necessary to add wood before coal to avoid fire extinguishing. Due to this, the boiler shall be refueled in a timely manner and charging shaft shall be kept full at all times. This will reduce choking of the boiler and increase the operating economy.

Ash and cinder shall be removed from the grate as needed during operation. This is performed using the grate lever located on the side wall of the boiler. Short motions will make a small ash fall through, while long swings towards the front side of the boiler will remove also bigger cinder pieces. The lever shall always be returned to neutral position after the grate cleaning is completed. Check whether the ashtray compartment is filled with ash completely, since this would obstruct supply of a sufficient air volume under the fire bars. If this check is not performed properly, the fire bars and grate mechanism may overheat and be damaged.

Cleaning the boiler

The boiler shall be cleaned every 14 days based on the heating method. Cleaning of the heat-exchanging surfaces is very important to maintain economical operation. Cleaning of this boiler is very easy, since the main heat-exchanging surface is accessible after opening the cleaning door. Segments shall be cleaned using the wire brush and persistent layer using scraper. Impurities fall through the rear section of segments onto the fire bridge. From there they move through the burning shaft into the ashtray compartment. This shaft can be cleaned through opening in the front wall, however, cleaning is required several times a season only. The secondary air supply pipe shall be cleaned occasionally after removing the lid of the secondary air on the side of the boiler in its bottom section. Cleaning shall be carried out using the steel brush designed for cleaning the segments. Clean the flue gas side also. Impurities will fall into the ashtray compartment when the secondary air supply is open fully. We recommend to knock on the side walls of the ashtray compartment in the place of the secondary air inlet with tools in order to release dust settled on the walls of segments.

The boiler shall be cleaned thoroughly after the heating season and overall check shall be performed. This will extend its service life. Cleaning of boiler, and the heat-exchanging surfaces in particular, is very important for the operating economy. If the boiler is not cleaned properly the temperature of flue gases leaving to the chimney can increase by up to 100 °C, which represents a substantial energy loss. After each cleaning check removal of soot from the fire bridge under the segments (see Fig. 3, pos. 23).

ATTENTION !!! Ash shall be put into incombustible container fitted with a cover.

G) Maintaining the boiler and heating equipment

Prior to commissioning the heating unit it is necessary to prime the water system. Soft water should be used, if possible. The water shall be primed by the filling and discharging valve, which is located next to the return water coupling.

The water shall not be taken from the boiler and heating equipment during operation. Check the water level in the heating equipment occasionally. Refill if needed. To protect the equipment against rust, avoid discharging water from the heating equipment or use anticorrosive agent for example INHIKOR, FRITERM (www.velvana.cz); follow manufacturer's instructions.

Never allow the boiler to **exceed** 90 °C. Fine bubbling when the exiting water exceeds 80 °C does not indicate a defect. However, bubbling at lower temperatures is not allowable. This indicates incorrect assembly of the heating system.

H) Safety instructions for installing and using the boiler

Prior to installation please contact the heating professional, who will adapt the installation to your conditions and perform the installation professionally. The basic installation conditions are provided underneath for your information.

The boiler shall be installed in compliance with the Czech standard CSN 06 1008 (Fire protection during installation and use of heat appliances). The boiler shall be connected to a chimney conforming with the Czech standard CSN 73 4201.

Connection of the warm water boiler may only be carried out based on the approval of the chimney service organization.

Recommended chimney sections for central heating boilers

Boiler output kW	Chimney section [cm]		
	Chimney height: 8 m	Chimney height: 12 m	Chimney height: 15 m
12	15 x 15		
18	15 x 20		
24			
30		Ø 180 mm	
35		Ø 180 mm	
49,5			Ø 200 mm

The boiler shall be connected to a separate chimney shaft which will provide a sufficient draft for practically all operating conditions possible.

The pipe exhaust fixed in the smoke uptake and slid on the smoke neck of the appliance shall be assembled and installed securely to avoid its accidental or spontaneous release.

Individual pipes of the smoke flue shall be slid into each other with at least 80 mm overlap. We recommend that the distance from the boiler to the chimney be less or equal to 1 m. The smoke flue should ascend towards the chimney (approx. 1:20).

The hot water system shall be installed in compliance with the Czech standard CSN 06 0830 – Safety equipment for the central heating and non-drinking water heating systems.

The boiler and the smoke flue shall be installed in compliance with the Czech standard CSN 06 1008 in a safe distance of 200 mm from class B, C1 and C2 flammable substances.

The flammability level of building materials and products with respect to the fire safety is specified in the Czech standard CSN 73 0823.

The safe distance of 200 mm mentioned above shall be doubled if the appliances and smoke flues are installed in the vicinity of class C3 flammable substances. The safe distance shall be doubles even in case that the flammability level of the substance is not proven.

The safe distance can be reduced to a half if class A incombustible thermal insulating board is used, the thickness of which shall be at least 5 mm and the minimum distance from the combustible substance protected (air space insulation) shall be 250 mm.

Classification of materials into flammability groups (to CSN 73 0823)

- A) Incombustible
- B) Slight flammability
- C₁) Low flammability
- C₂) Medium flammability
- C₃) High flammability

- A) Incombustible** : Stone, granite, sandstone, concrete, porous concrete, foamed concrete, bricks, fire clay, mortars, plasters, metals, glass and other mineral melts, asbestos cement boards
- B) Slight flammability** : Akumin, Izomin, plasterboards, woodwool board, Lignos, Rajolit, Velox, Novodur, Durufof B, Duroplast H, Dekorplast, Rotizol, basalt felt, Haver, glass mats
- C₁) Low flammability** : Hardwood, beech, oak, plywood, Hobrex, Sirkolit, Werzalit, Ecrona, Umakart
- C₂) Medium flammability** : Softwood, pine, European larch, particleboards, spruce, Piloplat, Duplex, Solodur, SP cork boards, cork parquets
- C₃) High flammability** : Laminated particleboards, sawdust boards, Pilolamit, fiberboards, hardboards, Sololak, Sololit, BA cork boards, polystyrene, polyurethane

The boiler can be used in compliance with the Czech standard CSN 33 2000-3:1995 in the basic AA5/AB5 environment provided that the appliance is deactivated sufficiently before the risk of fire occurs under circumstances, when temporary formation of flammable gases or vapors might occur and during activities which may lead to a temporary risk of fire or explosion (e.g. sticking of linoleum, PVC, and so on).

If the floor is made of flammable material, the boiler shall be placed on the fire-resistant thermal insulating mat, which shall overlap the boiler by at least 300 mm on the refueling and ashtray door side and by at least 100 mm on all other sides.

To keep the operating safety and economy the appliance shall be used in compliance with instructions provided in this manual.

The boiler may be left unattended provided that the output is set to a level when overheating of the system cannot occur (reduced operation) or if the boiler is fitted with preset and functional output controller. Despite this, the boiler shall be kept under the operator's control occasionally.

The boiler shall be operated by mature persons only. It is forbidden to left children unattended in the vicinity of the boiler. In addition to this, it is forbidden to use flammable liquids for firing the boiler and to increase in any way the rated output of the boiler during operation (overheating). The user may perform a standard maintenance only and/or replacement of spare parts. The user shall not modify the boiler design in any way, change its function nor continue operating the boiler with damaged functional parts.

Caution:

Objects made of flammable materials shall not be placed on the appliance nor in the distance smaller than the specified safe distance from the appliance.

Flammable objects shall not be deposited and thrown away nearby the refueling and ashtray doors. The ash shall be put into incombustible containers fitted with a cover.

It is necessary to consider several important principles that shall be met to ensure a reliable and economical operation of the boiler.

- Conscientiousness of the operators
- Dry fuel
- Adequate operating chimney effect
 - for H635 boiler: 25 Pa (2.5 mm W.C.)
 - for H650 boiler: 30 Pa (3,0 mm W.C.)
- Clean boiler (flues and vents)
- Tight boiler
- Correct output selection for a particular installation building
- Perfectly and carefully adjusted product

Recommendation

When using forced circulation with the pump it is desirable to fit the boiler with the TH 163 thermostat located on the outlet pipe from the boiler. This thermostat will switch the pump on as soon as the water temperature in the boiler reaches 70 °C. The pump will be deactivated should the water temperature fall below 60 °C.

If the boiler is installed in the forced circulation heating system (with circulation pump), the boiler shall be secured against pump failure or power outage for the pump motor respectively. This shall be carried out in compliance with the Czech standard CSN 060830, Securing the central heating equipment.

I) Installation and operating instructions for the pressure expansion vessels

designed for the steel boilers of up to 50 kW according to CSN 07 0245

The pressure expansion vessels have been used increasingly in the level and central heating systems recently. Their utilization brings a number of benefits, the most important of which is preventing the air ingress into the system. Some pressure expansion vessel based systems experienced an excessive pressure buildup due to an incorrect design. Another size calculation method for pressure expansion vessels for the steel boilers of up to 50 kW to CSN 07 0245 with respect to the max. pressure difference which cannot damage the boiler body during dynamic loading has been proposed based on the long-term testing of boiler bodies. This pressure difference (B) has been determined to 50 kPa for the steel boilers.

The main principles that shall be met during installation of the pressure expansion vessels for the steel boilers of up to 50 kW are given underneath. Should any of these principles not be met, warranty shall not apply to the damaged boiler with the pressure expansion vessel.

- 1) The supply pipe of the pressure expansion vessel shall be as short as possible without closures and it should allow extension. The expansion vessel shall be positioned so that heating of the vessel by radiant heat cannot occur.
- 2) Each heating system shall be fitted with at least one safety valve positioned on the discharge pipe or on the boiler and the pressure gauge. Location, installation and inside diameter of the safety valves shall meet provisions of the Czech standards CSN 06 0830, ON 06 0830.
- 3) Correct overpressure setting (200 kPa) of the safety valve shall be checked during installation. This is the pressure, the safety valve shall open at. Please readjust the safety valve if it is set incorrectly.
- 4) Installation and setting of the safety valve, check and adjustment of the gas pressure in the pressure expansion vessel shall be performed by qualified organization only. The gas pressure in the expansion vessel shall be measured prior to priming the system with water. Check whether it is higher than the hydrostatic height in the system.
- 5) The heat source shall be fitted, among others, with the flue controlled in compliance with the Czech standard CSN 06 0830. This applies to solid fuel boilers of up to 50 kW output. The higher admissible operating temperature is limited to 95 °C.
- 6) The pressure expansion vessel as well as the supply pipe shall be protected against water freezing.
- 7) The gas filling overpressure in the expansion vessel shall be adjusted by releasing to the hydrostatic pressure of the system in cold condition. This shall be performed using the tire valve installed on the pressure expansion vessel. The overpressure should be measured by the pressure gauge which is normally used for checking the tire pressure. Adjust the pressure by adding water to the system to the value which is max. 10 kPa higher than the hydrostatic height in the system.
- 8) After priming the system with water, mark the adjusted hydrostatic height and max. pressure in the system after reaching the water temperature of 90 °C. Mark these values by lines on the pressure gauge.
- 9) If the pressure difference changes during operation (i.e. minimum or maximum pressure is exceeded), the system shall be checked, bled, water shall be refilled in cold condition and/or increase the gas pressure in the pressure expansion vessel as per manufacturer's instructions.
- 10) The maximum hydrostatic height for boilers according to CSN 07 0245 when using the pressure expansion vessel may reach 12 meters.

- 11) Each pressure expansion vessel shall be checked visually at least once a year. This check shall be accompanied by the charge pressure check.
- 12) A project shall be worked out and approved for every heating system.
- 13) The pressure difference in correctly selected pressure expansion vessel shall not exceed 60 kPa at the system water temperature of from 10 up to 90 °C. This pressure difference can be checked during heating test, when the system water heats up from the cold condition. If the pressure difference is bigger than 60 kPa, the pressure expansion vessel has not been selected correctly and the pressure body may be damaged.

Calculation:

(based on proposed amendment of Art. 122, CSN 06 0830)

Volume of the pressure expansion vessel:

$$O = V \times \frac{P_1 + B}{B}$$

Where:

B - Pressure difference determined for steel boilers at 50 kPa

P₁ - Absolute value of the hydrostatic pressure (kPa)

V - Increased volume of water in the whole system (dm³)

$$V = G \cdot \Delta v$$

Where:

G - Weight of water in the heating system (kg)

v - Increase of the specific value of water at certain temperature difference (dm . kg⁻¹)

Δt	°C	60	80	90
Δv	dm ³ . kg ⁻¹	0.0224	0.0355	0.0431

The actual pressure difference can be higher than the calculated value by not more than 10 kPa. In case of boundary calculated values and due to the gas pressure increase in the pressure expansion vessel by the water pressure as per section 7.

Example:

Weight of water in the heating system	G = 180 kg
Hydrostatic height of water in the system	9.5 m
	P ₁ = 195 kPa
Temperature difference in the system	Δv = 80 °C
Volume change for Δv of 80 °C	Δv = 0.0355 dm ³ . kg ⁻¹
Safety valve set to	180 kPa
Pressure difference	B = 50 kPa

Waver volume increase in the whole system:

$$V = G \times \Delta v$$

$$V = 180 \times 0.0355$$

$$V = \underline{6.39 \text{ dm}^3}$$

The minimum required volume of the expansion vessel:

$$O' = V \times \frac{P_1 + B}{B}$$

$$O' = 6.39 \times \frac{195 + 50}{50} = 33.311 \text{ dm}^3$$

$$O' = 35 \text{ dm}^3 \text{ (selected value)}$$

The actual volume O the pressure expansion vessel shall be determined using the calculated volume of the pressure expansion vessel O' as the next higher size manufactured.

J) Fitting the boilers with overheating safety device

The H6 line boilers are fitted with the safety heat exchanger for removing the excessive heat complying with the Czech standard CSN EN 303-5 and the Government Decree No. 163/2000 Coll. This exchanger shall ensure that the highest permitted temperature of water in the boiler (i.e. 110 °C) is not exceeded. The safety heat exchanger is designed as the through-flow water heater which is controlled by the safety relief valve on the outlet. The connection sizes of couplings allow utilization of the TS 130 discharge fitting with a double sensor manufactured by Honeywell. Our product is certified for this valve type.

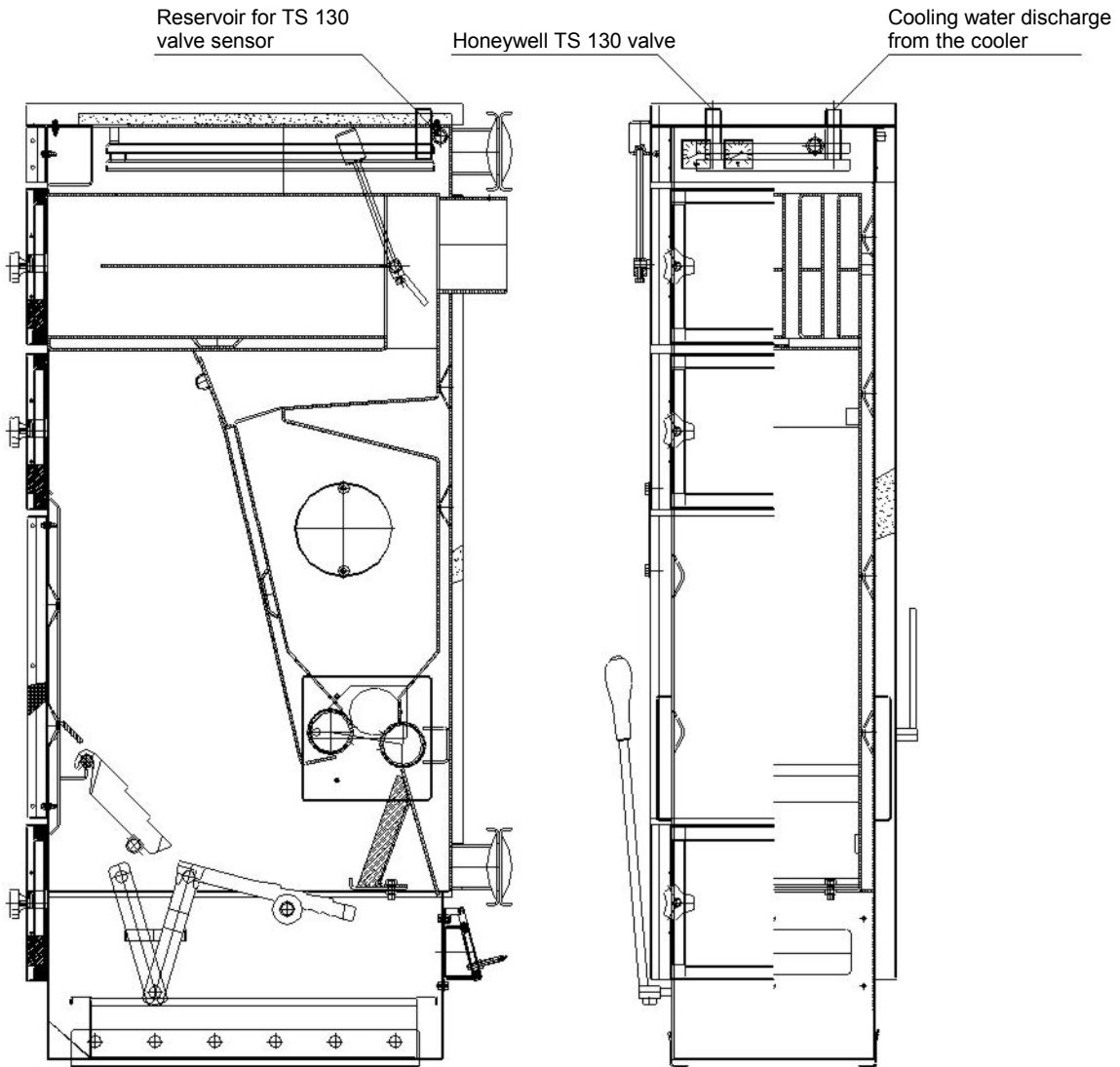
Functional principle:

The sensor in the tank installed in the rear section of the boiler monitors the water temperature in the boiler. If the water temperature in the boiler exceeds 95 °C, the valve starts opening automatically and supplies water to the inbuilt safety exchanger which takes out the heat. This way the boiler overheating is avoided. As soon as water in the boiler cools down, the valve starts closing automatically and the cold water supply to the safety exchanger is closed completely after all. This activity may take place several times. This depends on the fuel quantity in the charging shaft or on the time for which the reduced heat consumption by the heating system took place respectively.

Notice:

- carry out the assembly and connection according to the picture on page 12 and instructions by manufacturer
- it is always necessary to connect the withdrawal safety valve to water inlet into cooling loop so that the cooling loop would not be under the constant pressure of service water
- we do not recommend any other cooling loop connection – see. picture Boiler connection
- in case of non-observance of the recommended cooling loop connection to the boiler according to the instruction manual, an over-pressuring of the cooling loop and thus its leakage may occur, **a loop damaged in this way does not fall within the conditions for guarantee**
- the valve attachment to a permanent source of cooling water with the pressure of min. 1 bar (preferably public water pipes) with the temperature of ca. 15°C is necessary for the correct operation of the valve
- recheck the correct operation of the valve at least once a year
- in case of unclearness of the cooling loop connection contact a service worker at the manufacturer under tel. 571 675252 or 602 743970

Boiler connection



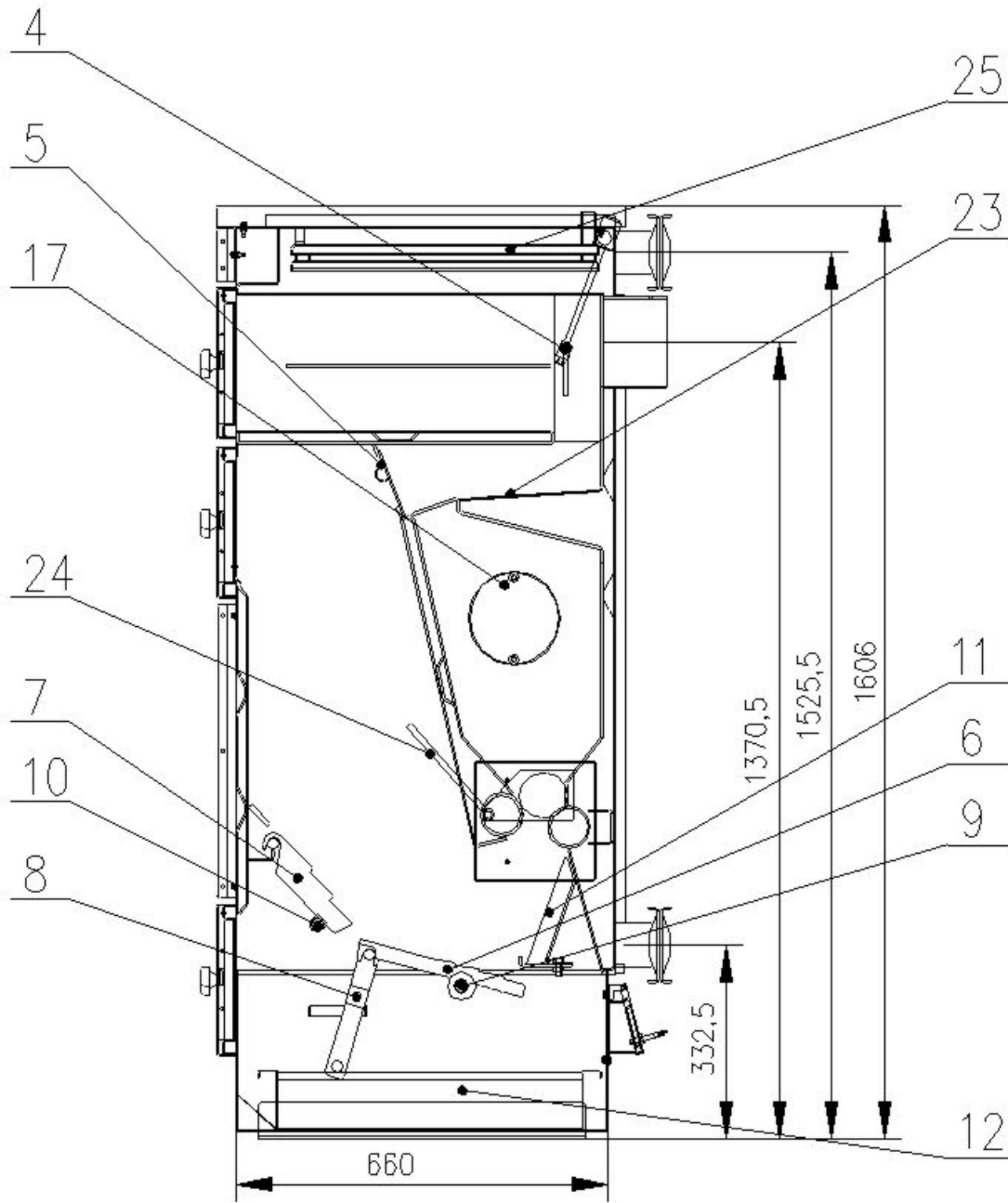


Fig. 3: Boiler section

- | | | | |
|----|-------------------------------------|----|---------------------|
| 4 | Firing flap | 11 | Fire clay panel |
| 5 | Underburning / through-burning flap | 12 | Ash tray |
| 6 | Long fire bar | 17 | Burner hole plug |
| 7 | Short fire bar | 23 | Fire bridge |
| 8 | Grate mechanism | 24 | Secondary air lever |
| 9 | Long fire bar support | 25 | Hot water exchanger |
| 10 | Short fire bar support | | |

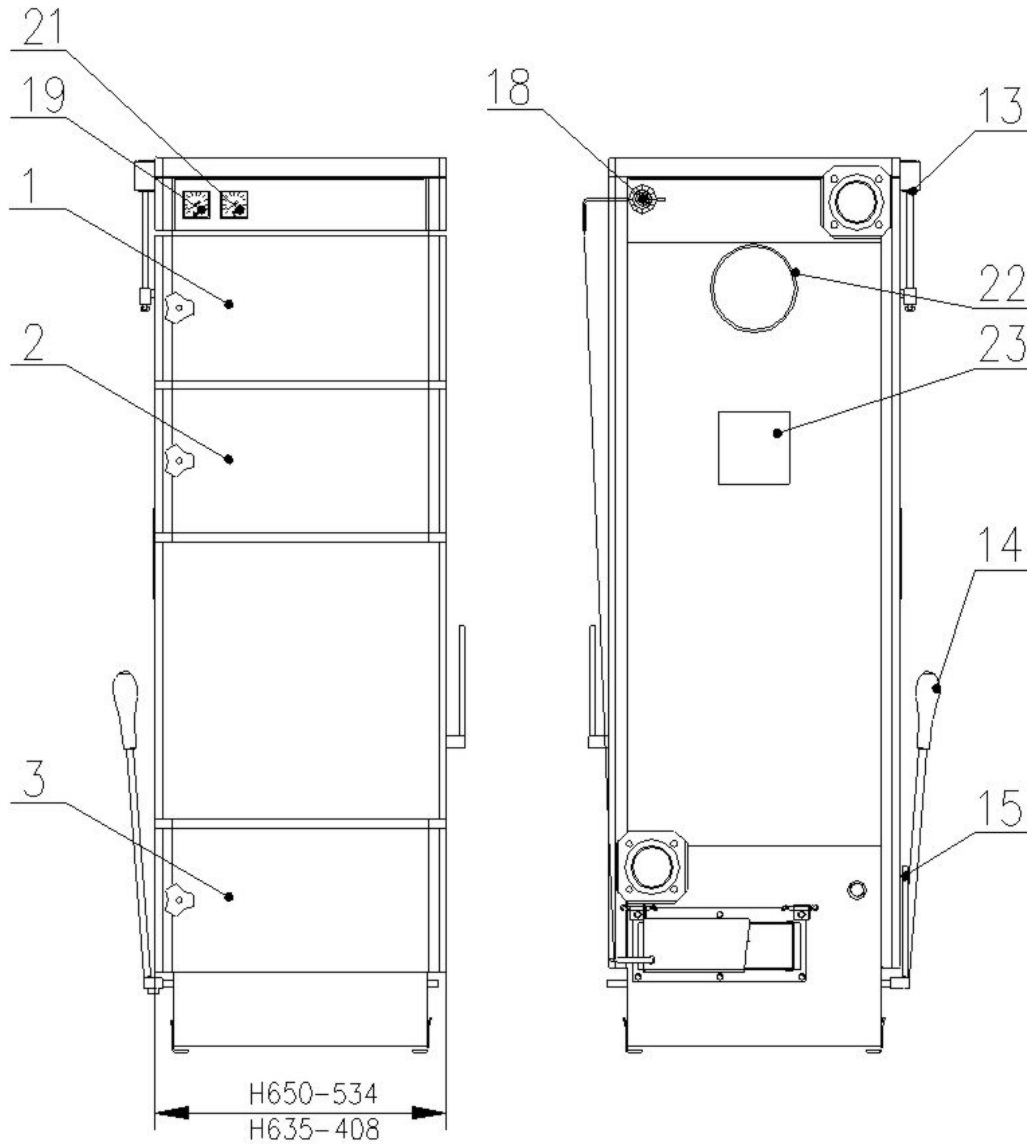


Fig. 4: View of the boiler

- | | | | |
|----|---------------------|----|-----------------------------|
| 1 | Cleaning door | 16 | Firing flap |
| 2 | Refueling door | 19 | Pressure gauge |
| 3 | Ashtray door | 20 | Filling and discharge valve |
| 13 | Firing flap lever | 21 | Thermometer |
| 14 | Grate control lever | 22 | Flue duct, Ø 160 mm |
| 15 | Secondary air lever | 23 | Nameplate |

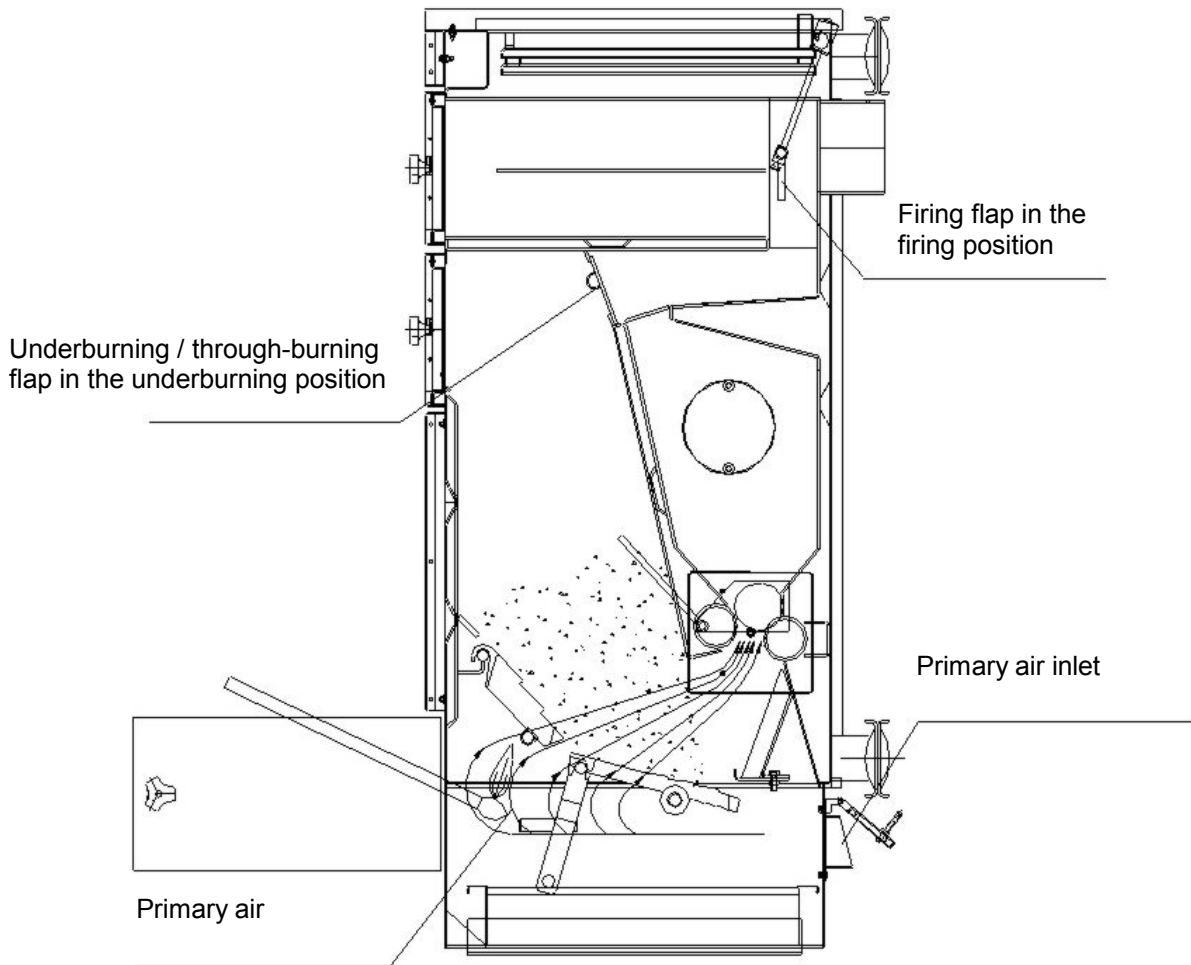


Fig. 5: Boiler section during firing

- 1 Open the firing flap.
- 2 The underburning / through-burning flap can also be set to through-burning.
- 3 Set the flap to underburning before refueling the coal.
- 4 Please the firing flap immediately after proper firing takes place and adjust a correct volume of the secondary air.

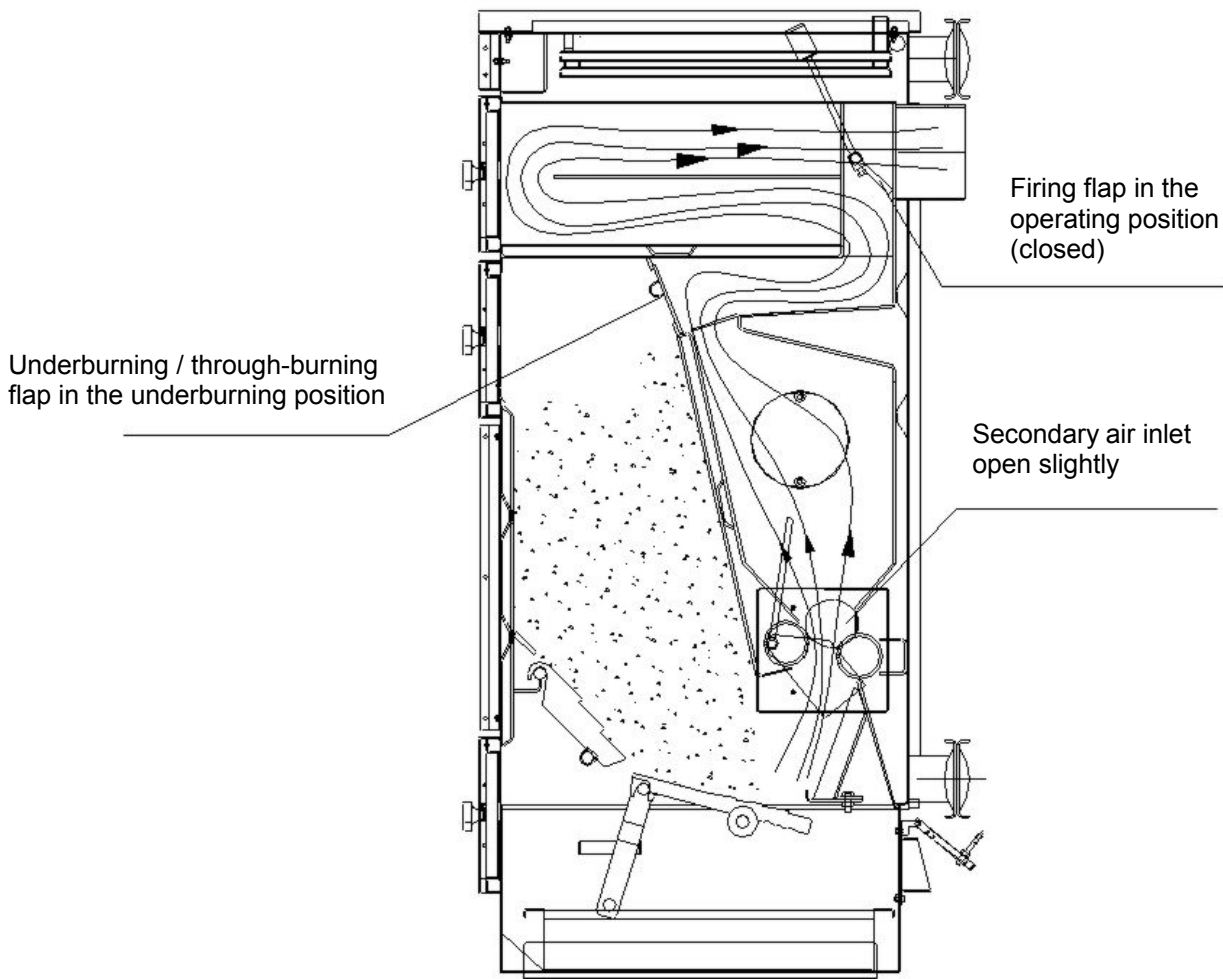


Fig. 6: Boiler section – fuel underburning

The underburning method is used for the following fuel types:

- Lignite
- Anthracite
- Small wooden waste

Close the firing flap immediately after a proper burning is obtained and set an adequate volume of the secondary air.

Note:

This combustion method offers the best economy and cleanness, since it ensures perfect and practically smoke-free burning of fuel and thus its maximum utilization.

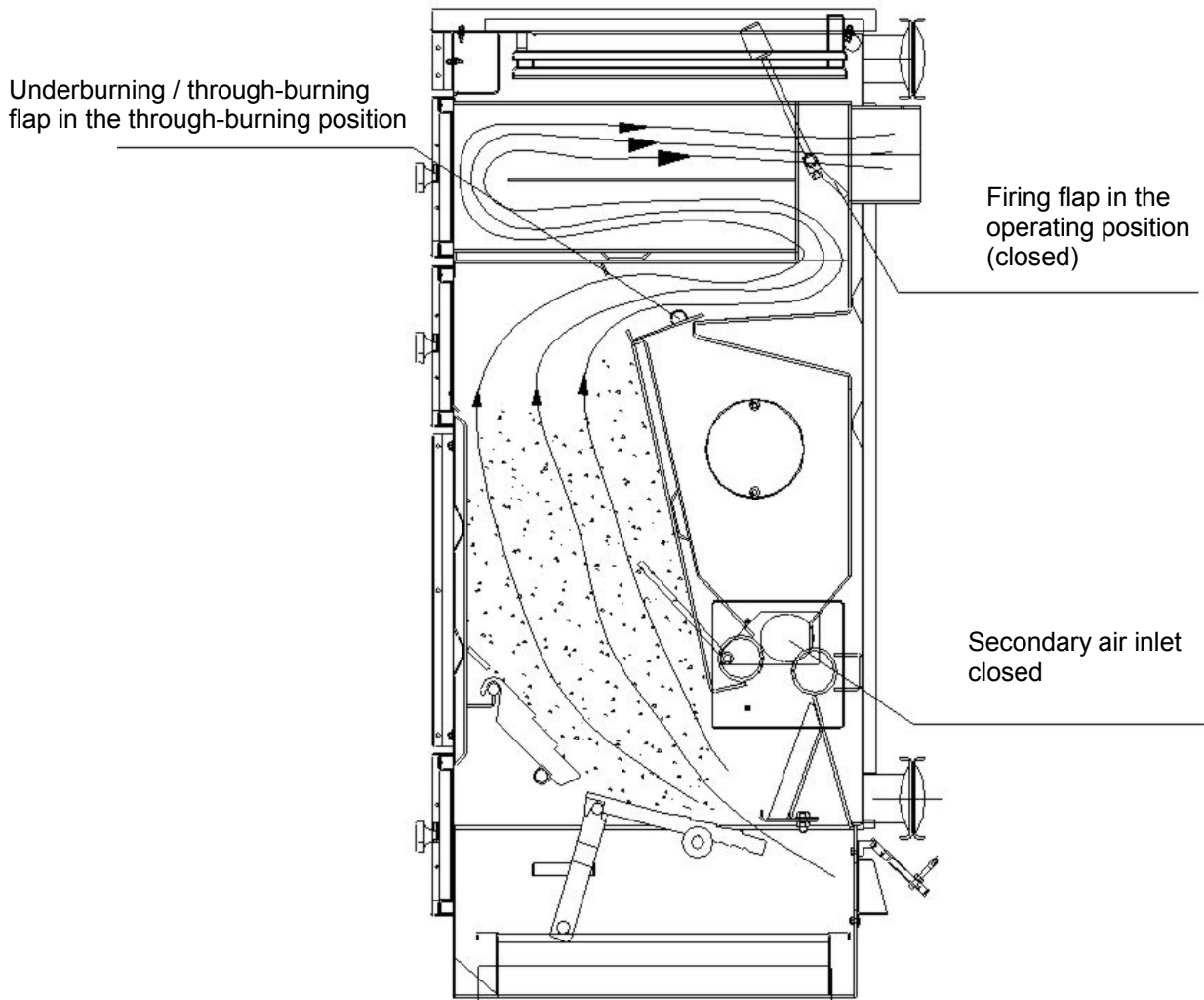


Fig. 7: Boiler section – fuel through-burning

The through-burning method is used for the following fuel type:

- Wood – large pieces only

K) Waste disposal

It is possible to burn packing material (paper and wood) in a stove, to liquidate PP binder, unburned rests and ash as household refuse. Metal parts are to be given over in a junk storage place.

After termination of the product operating life, cover and grates shall be liquidated as metal waste, insulation material and fireclay shall be given in waste collecting yard.

Wooden crating is designed for single usage and it cannot be further used as a product. Its liquidation is subject to Act No.185/2001 St. Book, Act on waste and change of some other acts, in a word of subsequent regulations. Used packing materials fulfil the conditions of wrapping market introduction, set out by Act No. 477/2001 St. Book, Act on waste and change of some other acts, as amended.

L) Determination of the storage reservoir size

Calculation of the minimum accumulator cubature:

$$V_{sp} = 15 T_b \times Q_n (1 - 0,3 \times (Q_H / Q_{min}))$$

Where:

V_{sp} storage reservoir cubature in l

T_b burning time in hrs

Q_n rated heat output in kW

Q_H heat load of buildings in kW

Q_{min} ... minimum heat output in kW

Dimensions of the storage reservoir have to be determined after the output according to the fuel used, according to the one with the biggest storage reservoir. This storage reservoir is not necessary in case when the calculated cubature is smaller than 300 l.

M) Warranty certificate

Hot water boiler H 635 650* Serial No.: _____

Output: _____ kW

Manufacturer: OPOP spol. s r.o., Zasovska 750 , 757 01 Valasské Mezirici, Czech Republic
Phone: +420 571 675-589, **Fax:** +420 571 611-225

Shipping date (EXW): _____

Warranty conditions:

This warranty certificate provides a proof of quality and completeness. The manufacturer confirms that the product has been inspected and its workmanship complies with the technical conditions and the Czech standard CSN EN 303-5.

The manufacturer guarantees quality, function and workmanship of the boiler for 24 months after the sale date to the customer, however, not more than 30 months from the EXW shipping date. Defects caused demonstrably by the defective materials, design flaws or defective workmanship will be repaired as soon as possible at our expense provided that the boiler:

- is in the normal technical condition as per the instruction manual;
- the chimney flue has been connected in compliance with CSN 73 4201;
- has not been damaged mechanically (no unauthorized modification has been made with the exception of activities permitted in the instruction manual);

- the chimney flue shall meet values of technical parameters specified for the boiler;
- the customer submitted properly filled warranty certificate when claiming the product;
- manufacturer's instructions for using the pressure expansion vessels have been fulfilled.

Note:

Any claim shall be accompanied by the warranty certificate. In addition to this, an exact address shall be provided as well as circumstances under which the defect occurred. The manufacturer will decide on the method and place of repair.

Technical inspection date: _____ Sale date: _____

Caution:

The steel weldment - the tightness of the steel weldment is guaranteed for 60 months from the EXW shipping date. This guarantee is subject to the fact that the pressure expansion vessel has not been used in the heating system and leakage was caused by the inferior quality material and/or welding. The warranty will not apply if defects were caused by improper use. If a claim in the scope of the extended warranty is acknowledged, we will deliver a new weldment. This will be sent by the parcel service or it will be available for pickup by customer. All costs connected with the transport, replacement and return of the defective weldment shall be borne by the customer. If the defective weldment is not returned to the production plant within 30 days after shipment or handover of the replacement weldment, the new weldment sent will be charged fully. The guarantee of 24 months from the date of takeover will apply to the replaced weldment within the extended guarantee period.

Product claim procedure:

1. Submit (personally, by post or fax) properly confirmed warranty certificate together with the sale receipt.
2. Indicate exact address and/or phone and circumstances under which the event had occurred.
3. The claim settlement method will be advised by the manufacturer's service technician.
 - a) Send the part claimed for replacement.
 - b) If it is impossible to proceed as per point a), the manufacturer is entitled to specify the method, date and performance of the repair by its service personnel or contractual partner.
 - c) The user shall allow the manufacturer to perform a repair as per point b).
 - d) If the user does not allow access to carry out the repair, the manufacturer will consider such claim settled.
 - e) In case that the defect cannot be repaired, the user has a right for replacement of the defective part.
 - f) If an urgent settlement of the claim is needed, please contact the manufacturer's service personnel at **+420 571 675-252** or **+420 602 743-970**.

Vážený zákazníku,

jsme velmi rádi, že jste se rozhodl zakoupit si náš výrobek. Toto rozhodnutí Vás opravňuje k získání 10% slevy na náhradní díly a slevy při nákupu uhlí od Mostecké uhelné společnosti. Podrobnější informace, týkající se nákupu uhlí naleznete v příloženém letáku. K tomu, abyste získal výše uvedené výhody, je potřebné vyplnit registrační kartu a zaslat ji na naši adresu:

OPOP spol s r.o.
Obchodní oddělení
Zašovská 750
757 01 Valašské Meziříčí

Po obdržení vyplněného formuláře Vám obratem zašleme Zákaznickou kartu, která Vás opravňuje k získání slev u výrobce na náhradní díly. Při objednávání náhradních dílů je nutné vždy uvádět číslo Vaší Zákaznické karty na ní uvedené.

Děkujeme za Vaši důvěru.

Zde odstříhnete a zašlete na naši adresu

.....
REGISTRAČNÍ KARTA

Jméno..... výrobní číslo výrobku.....

Příjmení..... prodejce.....

Ulice a č.p. typ výrobku.....

Město.....

PSČ.....

Telefonní číslo(nepovinné).....

Podpis.....

List of organizations servicing the solid fuel boilers

1 M V T - Tomášek - Pekárenská 109 - Trhové Sviny T. 386 322936 - 602 474189	Č. BUDĚJOVICE
2 KTK KOVOSTAV - Jar. Kratochvíl - Svatokřížská 37 - Ronov nad Doubravou T 469 690417	ČÁSLAV
3 Montážní Domažlická - Horáček - Janáčková 490 - T 379 724011- 602 882440	DOMAŽLICE
4 Václav Klejšmíd - Poděbradova 1170- Dvůr Králové T 499 620626 - 603 868404-5	DVŮR KRÁLOVÉ
5 THERMONA KRKONOŠE - M. Polák - U pivovaru 123 - T 499 440329 - 604 731000	RUDNÍK u VRCHLABÍ
6 THERMONA KRKONOŠE - M. Hronek - U pivovaru 123 - T 499 440329 - 604 861368	RUDNÍK u VRCHLABÍ
7 INSTALATERSTVÍ - M. Svítal - Přemyslova 225 - T 495 264323 - 736 247480	HRADEC KRÁLOVÉ
8 Oldřich Horáček - Loudátová 245 - Chrastava T 485 143001 - 777 720232	HRÁDEK nad NISOU
9 PROGRES - Luboš Birner - P. Bezruče 9 - T 379 422705, 602 429117	HORŠOVSKÝ Týn
10 Oskar Schovánek - Jílové u Držkova 109 T 608 807041	Železný Brod
11 I T P - p. Zeman - Bavlňářská 360 - Semily T 481 622265 - 606 613964	JIČÍN
12 Vodoinstalatérství Zd. Vodsedálek - Kněžnice 30 - Libuň T 493 591097- 732 254748	JIČÍN
13 HRON - Zdeněk a Miloš Hronovi - Krajířova 23/1 Dačice T 384 423003	JINDŘICHŮV HRADEC
14 ÍNPROS - Slavík - Klenovice 174 - Soběslav T 381 521476 - 603 572515	JINDŘICHŮV HRADEC
15 Antonín Škvařil - Jakuba Jelínka 385 - T 565 434029 - 728 080497	KAMEN. nad LIPOU
16 Böse Frant. THERMOMONT - Jáchymovská 89 - T 353 222545 - 604 212400	KARL. VARY
17 INTOP - Jaroslav Abík - Poláková 84 - Zámuky T 321 796129 - 603 451265, 603 451261	KOLÍN 3
18 KINTOP - Pavel Měchýř - Nerudova 407 - T 321 728552	KOLÍN 3
19 TEVORS - Novotný - Česká 190 - T 327 514402 777 870060	KUTNÁ HORA
20 Jan Šneiberk - Vyhlídková 311 T 485 133564 - 603 257639	LIBEREC
21 Mačkal Topení-voda-plyn Wolkerova 441 - T 58 5341826 603 993849	LITOVEL
22 Kučmín Josef - Měník 3 - Bíla Lhota T 58 5340503 - 737 583317	LITOVEL
23 Svoboda Jiří - Havlíčková 996 - T 326 323779, 604 942834	MLADÁ BOLESLAV
24 Mixed Velebudice - Stavbařů 39 - T 476 709124 - fax.476 703419 - 777 283460	MOST
25 SINTOP - Jiří Řezníček - Jirásková 599 - T 495 493693 - 491684 - 603 220057	Nový Bydžov
26 Vladimír Ficenc - Půlická 953 - Dobruška T 494 623310- 605 169324	NÁCHOD
27 František Kubálek - Zabrdovice 22 - Křinec T 325 588264 - 724 180739	NYMBURK
28 TECHMONT - Jaroslav Novák - Dražkovice 58 - T 466 612218	PARDUBICE
29 Vlastimil Antoš - U pošty 53 Choltice - T 466 972625 - 603-313991	PARDUBICE
31 Václav Brábník - Naklov 8 - poš.Lišťany T 377 915314 - 723 652300	PLZEŇ
32 TEZA - Šedivý - Pražská 346 - Hořovice 268 01 - T 311 513881 - 603 439354	PŘÍBRAM
33 TOPPLAST - Vladimír Blecha - Rpety 3 - Hořovice T 311 514334 - 603 766102	PŘÍBRAM
34 Václav Calta - Panská Tisovice 45 - Petrovice T - 603 213176	PŘÍBRAM
35 Votoka-Plast Na čihadle 983 - Dobříš T 318 523269 - 723 280124	PŘÍBRAM
36 Kokta - Smečenská 22 - Slaný T 312 521001 - 602 347842	SLANÝ
37 Petr Ditrich - Komenského 36 - T 312 520909 - 606 634043	SLANÝ
38 Jiří Novotný - Korouhev 195 - T 606 143336	SVITAVY
39 Vodo-topo-plyn - Paclík - Borová 7 - T 461 746164 - 603 560070	SVITAVY
40 ENTES Consulting - 8. Května 41A - Šumperk - T 583 213407	ŠUMPERK
41 TOPEN - Ladislav Sobotka - Obránců Míru 454 - T 568 824364 - 607 940561	TŘEBÍČ
42 Herbert Baumgartl - Petrovice 20 - Dolní Čermná T 465 393197 - 603 818326	ÚSTÍ nad ORLICÍ
43 Teplo - Heranova 76 - T 465 521065	ÚSTÍ nad ORLICÍ
František Adam - Zámecká 1497 - Vlašim - T 317 845039, 607 619930	VLAŠIM
44 ZOS Tvrdoň Josef - Cihelny 228 - Kelč T 571 641428	VSETÍN
45 Kovo Zdice - František Johan - Komenského 59 - Zdice T 311 685383, 602 625750	ZDICE
46 Jaroslav Cígl - Karla IV. - Žatec - T 415 712148 - 608 952233	ŽATEC
47 Josef Kepřta - Lišnice 110 T 465 612395 - 603 311521	ŽAMBERK
48 I W A - Jan Slanina - Brněnská 758 - Žďár nad Sázavou T 566 299101 - 737 288277	ŽĎÁR nad SÁZAVOU