EN

VIADRUS

Heat for your home
since 1888

VIADRUS U22 Economy

Manual for boiler operation and installation

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Dear customer,
*We thank you that you have bought a **VIADRUS U22 Economy** boiler, thus having shown your confidence in VIADRUS brand.*
To get you accustom from the very beginning to correct handling with your new boiler, please firstly read this manual for its using, especially Chapter No. 7. – Boiler servicing by an user, Chapter No. 8 – Maintenance, and Chapter No. 9 – Important warning. Please observe the below mentioned information, in order to ensure a long-term trouble-free operation to your and our satisfaction.

The **VIADRUS U22 Economy** boiler is a cast-iron sectional gasifying boiler destined for ecological combustion of lump wood.

Combustion of other substances (for example, plastics) is not allowable.

1 Boiler usage and advantages

The **VIADRUS U22 Economy** boiler meets the requirements for heating of one-family houses, shops, etc.
The boiler is manufactured as a warm-water boiler with natural and forced circulation of heating water and work overpressure up to 400 kPa (4 bar). Before dispatching, the unit is tested with the testing overpressure of 800 kPa (8 bar).

Advantages of the boiler:
1. High service life of the cast-iron heat-exchanger and all other parts thanks to the quality of the used materials.
2. Long-term proven structure.
3. Sophisticated production technology on the automatic forming lines with permanent and proven quality of the production process (ISO 9001, ISO 14 001).
4. Combustion efficiency up to 91 %.
5. Low fuel consumption.
6. Simple manipulation and maintenance.
7. Quick warming of the flue channel.
8. Water-tube massive grates
9. Threaded flanges for simple mounting
10. It meets emission class 5 according to ČSN EN 303-5, conditions of „Ecodesign“ and demanding conditions of the German BImSchV Stufe 2 emission norm.
11. Possibility of operation independent on electric energy (without a forced withdrawal of flue gases and without a circulating pump, excepting systems with a storage tank)
12. Patented system of the combustion chamber ViaBurn ™

2 Boiler's technical parameter

Tab. №. 1 Boiler's sizes and technical parameters

Boiler size - type		**16**	**21**	**25**	**30**	**34**	**38**	**41**
Combustion chamber volume	dm^3	32	39	41	51	63	65	67
Water content	l	40.5	46.5	46.5	52.0	58.0	58.0	58.0
Weight	kg	348	410	410	472	534	534	534
Combustion chamber depth	mm	280	370	370	480	590	590	590
Chimney throat diameter Ø D	mm	156						
Boiler sizes: - height x width	mm	1130 x 625						
- depth L	mm	890	1000	1000	1110	1220	1220	1220
Feed port sizes	mm	310x236						
Maximum operation pressure	kPa (bar)	400 (4)						
Minimum operation water pressure	kPa (bar)	50 (0.5)						
Testing water overpressure	kPa (bar)	800 (8)						
Hydraulic loss	-	see Fig. No. 1						
Minimum input water temperature	°C	50						
Recommended minimum output water temperature	°C	70						
Noise level	dB	< 65						
Boiler connections: - heating water		G 2“ or G 1 ½“ (* the size depends on the used type of the flange)						
- return water		G 2“ or G 1 ½“ (* the size depends on the used type of the flange)						
Cooling water temperature for the redundant heat exhaust device	°C	5 – 20						
Cooling water overpressure for the redundant heat exhaust device	kPa (bar)	200 – 600 (2 - 6)						

Tab. №. 2 Technical parameters of VIADRUS U22 Economy, fuel - wood, class A
fuel humidity, max. 20 % calorific value: 14 – 18 MJ. kg^{-1}

Boiler size - type		**16**	**21**	**25**	**30**	**34**	**38**	**41**
Boiler class according to EN 303 – 5	-	5	5	5	5	5	5	5
Nominal power	kW	16	21	25	30	34	38	41
Indicative fuel consumption.	kg/h	3.9	5.1	5.9	7.2	8.5	9.4	10.2
Max. fuel weight in the feeding chamber	kg	13	17	19	22	24	26	28
Flue gases temperature at the nominal power	°C	140 - 190	140 - 190	140 - 190	140 - 190	140 - 190	140 - 190	140 - 190
Flue gases mass flow rate at the nominal power	kg/s	0.012	0.014	0.015	0.016	0.018	0.019	0.022
Chimney draught	mbar	0.13	0.16	0.18	0.21	0.25	0.32	0.32
Combustion time	h	min. 2	min. 2	min. 2	min. 2	min. 2	min. 2	min. 2

Efficiency	%	89.1	89.0	89.0	88.7	91.0	90.4	90.3
Energy efficiency class		A+	A+	A+	A+	A+	A+	A+
Energy efficiency index		116	114	114	114	116	114	114
Season energy efficiency	%	79	78	78	78	79	78	78

Tab. №. 3 Recommended sizes of wood chocks

Chocks diameter	mm	Ø 40 to 120
Chocks length for types of 16, 21, 25, 30	mm	350
Chocks length for types of 34, 38, 41	mm	350 - 500

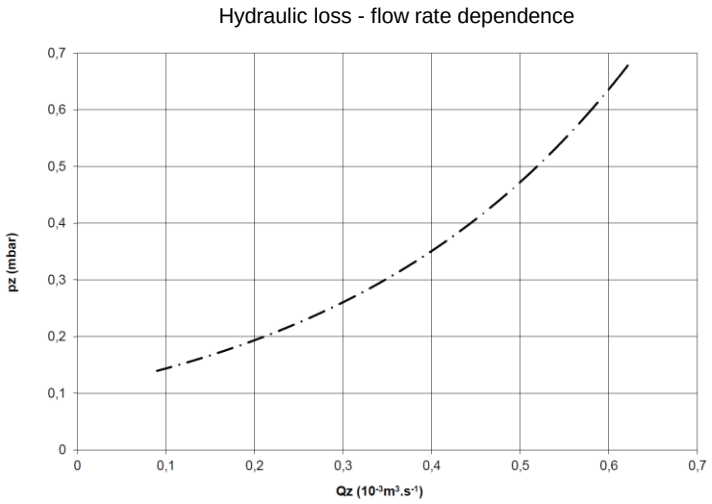
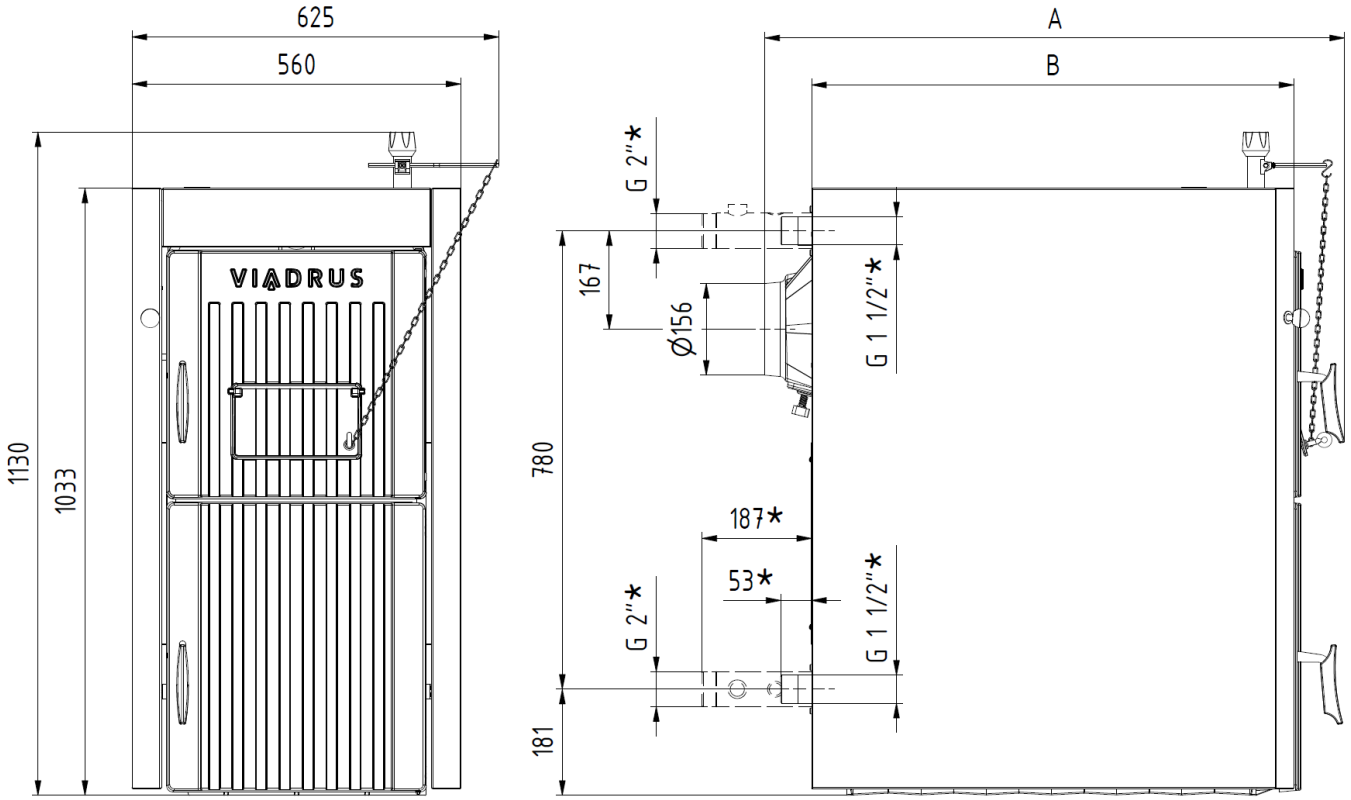


Fig. №. 1 Hydraulic loss of the boiler drum



*** The size depends on the used type of the flange**

Boiler size - type	-	16	21	25	30	34	38	41
Length A	mm	890	1000	1000	1110	1220	1220	1220
Length B	mm	620	730	730	840	950	950	950

Fig. №. 2 Main sizes of the VIADRUS U22 Economy boiler

3 Description

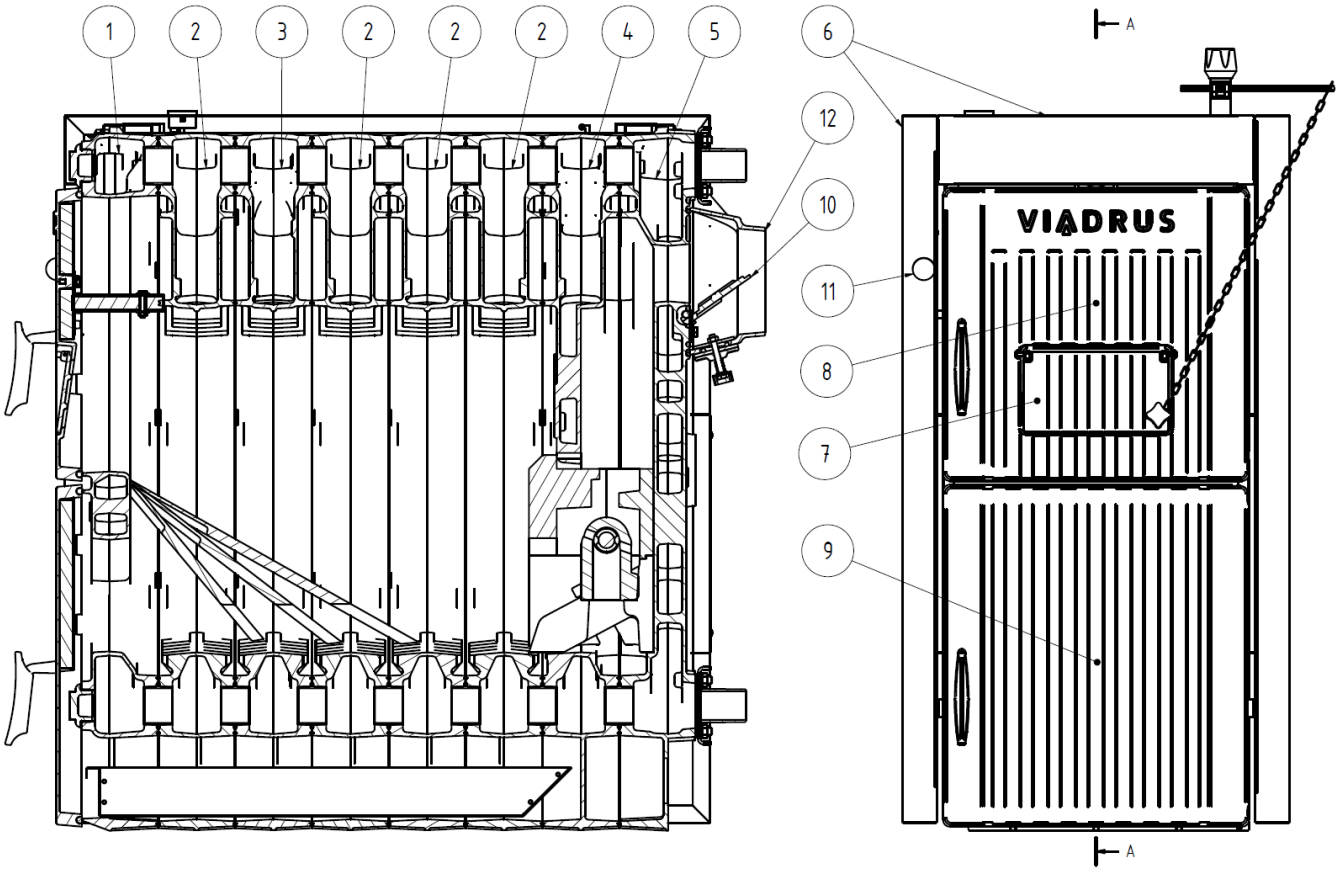
3.1 Boiler structure

The main part of the boiler is a cast-iron sectional boiler drum made of grey cast iron according to ČSN EN 1561, EN-GJL-150.

Pressurized parts of the boiler meet requirements for the stiffness according to ČSN EN 303-5.

The boiler drum is compiled from sections with help of pressed boiler inserts with a diameter of 56 mm and is fixed by boiler screws. The sections create a filling well, combustion chamber and ash-pan, water space and convective part of the boiler. The input and output of heating water is situated in the rear part of the boiler.

The rear section of the boiler, in its upper part, has a chimney pot and a heating water flange; and its bottom parts - a return water flange. Stocking and ash-pan doors are fixed to the front section. An inclined grate is placed in the feeding chamber. The entire boiler drum is insulated with health harmlessness mineral insulation that decreases losses by heat transmission into the environment. The steel cladding of the boiler is painted with high-quality komaxit spray-type painting.



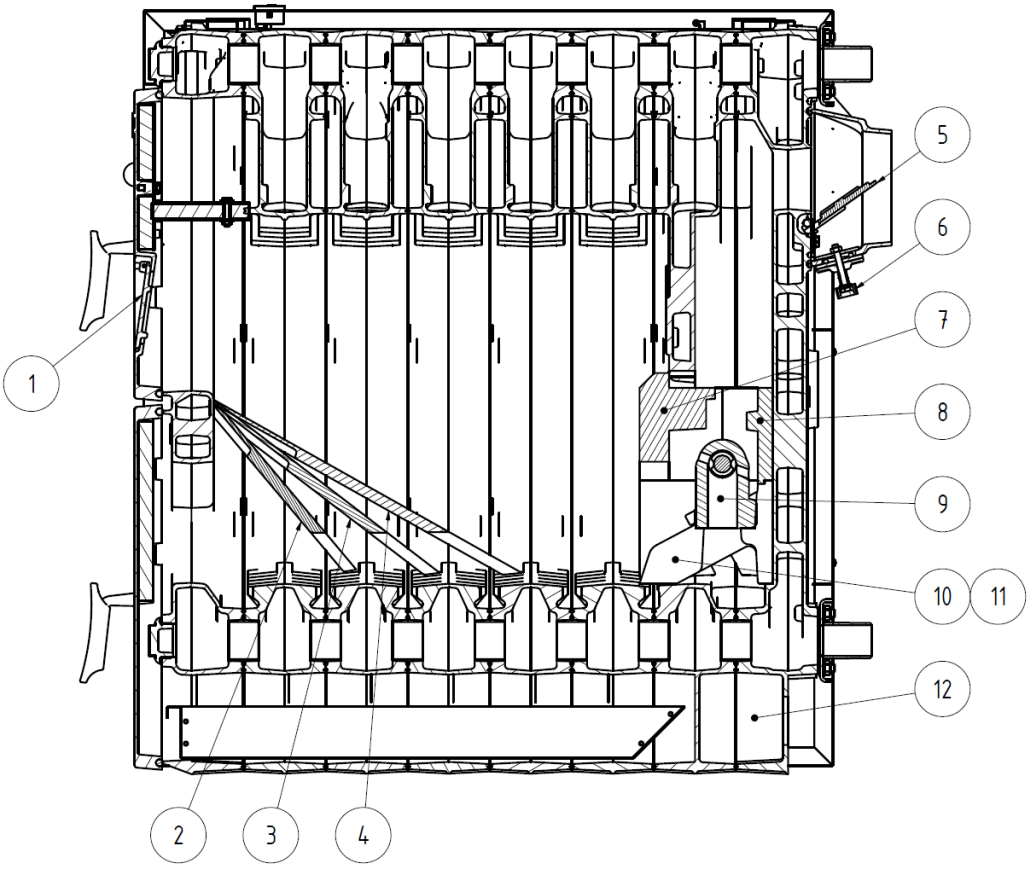
1. Front section
2. Middle section
3. Single-pass middle section
4. Penultimate section
5. Rear section of the combustion chamber
6. Cladding
7. Stocking door throttle valve
8. Stocking door
9. Ash-pan door
10. Shorting shutter
11. Shorting shutter control
12. Chimney pot

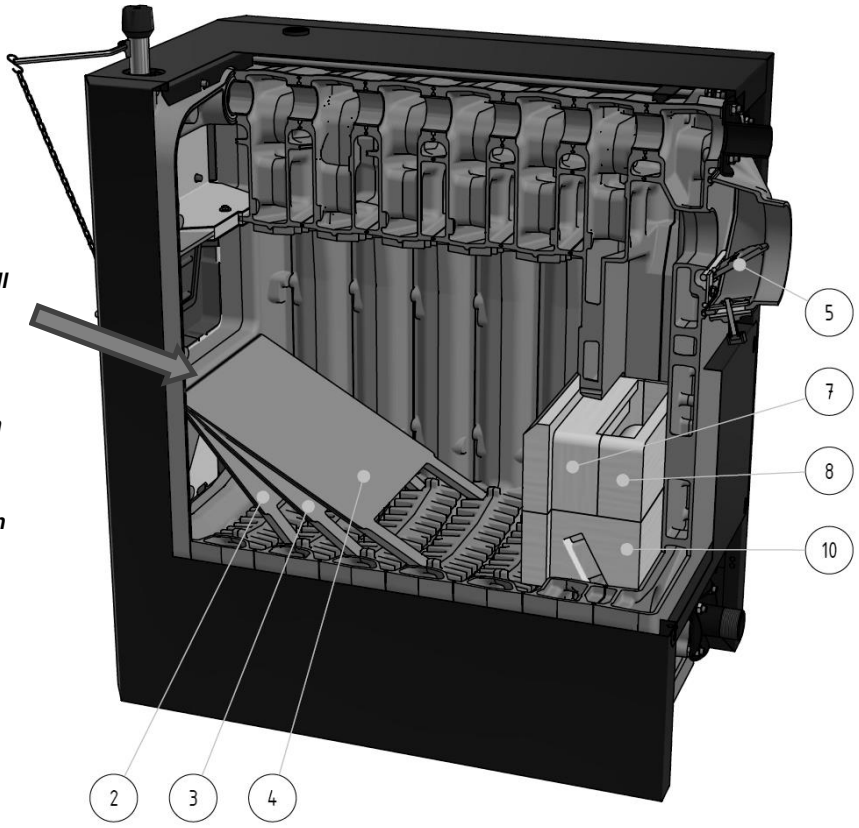
Fig. №. 3 Main parts of the VIADRUS U22 Economy boiler

3.2 Regulating and safety elements

The stocking door throttle valve regulates the supply of the primary combustion air above the fuel. It is controlled with a draught regulator or manually with help of a throttle valve set screw.

The combined device, thermo-manometer, is designed for the determination of heating water temperature as well as for water pressure in the heating system. The well of the thermo-manometer sensor is situated in the upper part of the boiler front section.





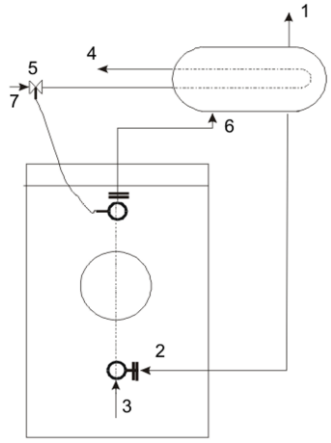
After inserting, the upper part of the fire grate for all types of the boilers have to be leaned on the inner side of the frontal section under the stocking hole and in its bottom part - on the overcasts of the respective section see Fig. No. 4

1. Stocking door throttle valve
2. Diagonal fire grate (the size differs depending on the boiler type)
3. Diagonal fire grate (the size differs depending on the boiler type)
4. Diagonal fire grate (the size differs depending on the boiler type)
5. Shorting shutter
6. Cleaning cover of the chimney pot
7. Upper front shaped piece
8. Upper rear shaped piece
9. Tertiary air supply nozzle
10. Left bottom shaped piece with an inlet of secondary air
11. Right bottom shaped piece with an inlet of secondary air
12. Chamber for the inlet of secondary and tertiary air

Fig. №. 4 Assembly of the VIADRUS U22 Economy boiler

3.3 Excessive heat exhausting device

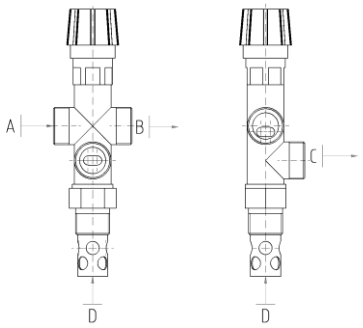
The final-cooling loop or the DBV 1 - 02 two-way safety valve is designed for the exhaust of excessive heat in the case that water temperature is exceeded over 95 °C. The final-cooling loop is connected to the boiler flanges according to Fig. No. 5; the two-way safety valve - according to Fig. No. 7).
In the case of boiler overheating (input water temperature is higher than 95 °C), a thermostatic valve will be initiated, and surplus heat is exhausted through the final-cooling loop.



1. Heating water output into the system 2“
2. Return water input from the final-cooling loop 1 1/2 “
3. Return water input into the boiler from the system 2“
4. Cooling water output
5. Thermostatic valve TS 130 (STS 20)
6. Heating water output from the boiler 2“
7. Cooling water input

Fig. №. 5 Hydraulic scheme of final-cooling loop connection

In case that the system is equipped with the DBV 1 - 02 two-way safety valve and the boiler is overheated (output water temperature is higher than 95 °C), then the two-way safety valve creates a cool water circuit until the temperature decreases under the limit temperature. In this moment, there will simultaneously closed the discharge cooling device and the input of cool water which is refilled into the system.



A – cooling water input
B – output into the boiler
C – output into the sewage
D – input from the boiler

Fig. №. 6 DBV 1 - 02 Two-Way Safety Valve

A safety valve with the maximum overpressure of 400 kPa (4 bar), the dimensions of which have to comply to the nominal power of the boiler, has to be installed in the system. The safety valve must be positioned directly behind the boiler. No shut-off valve can be placed between the safety valve and the boiler. In case of other questions, please contact our contractual mounting companies and service organizations.

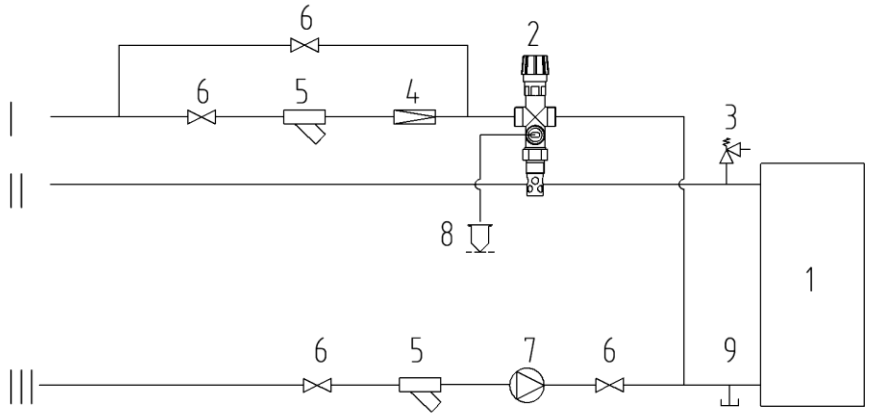
Technical data of the DBV 1 – 02 two-way safety valve (from Regulus Company)

Opening temperature (limit):	100 °C (+0° - 5 °C)
Maximum temperature:	120 °C
Maximum pressure at the boiler side:	400 kPa (4 bar)
Maximum pressure at the water side:	600 kPa (6 bar)
Nominal flow rate at △p 100 kPa (1 bar):	1,9 m^3/h

Usage

The DBV 1 – 02 two-way safety valve is destined for the protection of the central heating against overheating. The discharge and refill valve in the valve body is controlled by a thermostatic block. When reaching the limit temperature, the discharge and refill valve is simultaneously opened; it means that cool water flows into the boiler, and at the same time hot water is drained from the boiler. While lowering the temperature under the limit one, the discharge and refill valve will be closed.

WARNING!!! It does not replace a safety valve
In case of triggering the two-way safety device, when water which does not comply with requirements of ČSN 077401 can be refilled, it is necessary to prepare water in the system so that it met the requirements of this standard.



1. Boiler
2. DBV 1 - 02 Two-Way Safety Valve
3. Safety valve
4. Pressure control valve
5. Filter
6. Ball-valve
7. Pump
8. Excessive heat removal
9. Discharge valve

I. – Cooling water input
II. – Heating water output
III. – Return water input

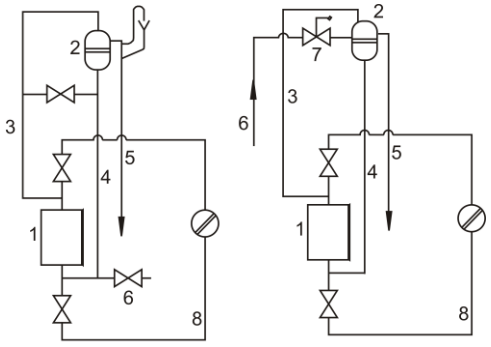
Fig. №. 7 Recommended Wiring Diagram of the DBV 1 - 02 Two-Way Safety Valve

Installation

Only qualified person may perform installation. To ensure correction functionality of the thermostatic two-way safety valve, it is necessary to follow prescribed conditions for its installation and respect marking of the flow rate directions marked on the valve body. The safety valve is always mounted into the output pipeline of the boiler or directly on the boiler in a place of its upper part, where heated water leaves the boiler and is conveyed into the heating system. While installing the valve, it is necessary to check whether the use of the 3/4" mouthpiece (which can be either in the pipeline or on the boiler) ensures full submersion of the thermostatic module of the valve. After having mounted into the mouthpiece, connect the draining pipeline in the place „C" (Fig. No. 6) in which hot water will outflow from the boiler. In the place „A" (Fig. No. 6), connect (according to Fig. No. 7) the cooling water supply line which - after putting the valve into operation - will ensure boiler cooling-down. It is necessary to install a filter for capturing mechanical impurities on the cooling water supply line. In the place „B" (Fig. No. 6), connect the pipeline and - according to Fig. No. 7 - lead it into the return line of the system near the boiler.

Regular Maintenance

Once a year rotate the head of the safety valve to remove possible impurities deposited in it. Clean-up the filter on the cooling water input.
In the case of the use of an opened expansion tank, there is no need in a safety device against overheating.
Each heat source in the opened heating system has to be connected with an opened expansion tank which is situated in the highest point of the heating system. Expansion tanks have to be dimensioned so that they can cover changes of the water volume which occurred as a result of heating and cooling.
Opened expansion tanks have to be equipped with non-lockable de-aerating and overflow pipelines. The overflow pipeline has to be proposed so that it reliably lead away the highest supply rate incoming into the system. It can be achieved by dimensioning of the overflow pipeline by one DN higher than the feeding pipeline has. The expansion tanks and their connecting pipelines have to be designed and placed in order to reliably avoid their freezing.



1. Heat source
2. Expansion tank
3. Safety pipeline
4. Expansion pipeline
5. Overflow pipeline
6. Feeding pipeline
7. Water lever limiter
8. Return pipeline

Fig. №. 8 Examples of connection of opened expansion tanks

3.4 Heat Removal Device - Accumulating Tanks

Boilers of VIADRUS U22 Economy series meet conditions of the emission class 5 according to EN-305. They match the requirements of this class while being operated with the nominal power.
If the nominal power is higher than the immediate request of the facility for heating, it is necessary to exhaust the excessive heat into the accumulating tank.
If the tank is fully charged, it is necessary to shut down the boiler and heat up with heat from the accumulating tank. After the heat in the tank is spent, put the boiler into operation again. The accumulating tank enables you to ensure thermal comfort and at the same time a quality operation of the boiler.

Calculation of the smallest volume of the tank heat-exchanger.

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

where:

V_{sp}	accumulation tank volume in l	Q_H	thermal load of buildings in kW
Q_N	nominal heating power in kW	Q_{min}	smallest heating power in kW
T_b	combustion time in hours		

Dimensions of the accumulating tank must be determined according to the boiler power and used fuel. It is necessary to consider the highest calculated volume, whereas **the minimal used volume of the accumulating tank has to be 300 l.**

The hydraulic scheme of connection of the boilers with the accumulating tanks are available in the project supporting documents of Viadrus, at http://www.viadrus.cz/projekcni-podklady-76.html.

4 Positioning and installation

4.1 Regulations and directives

A solid fuel boiler may be only installed by a company with a valid authorization to perform its installation and maintenance. A project according to the valid regulations must be prepared for installation. Before installation of the boiler in an old heating system, installation companies have to perform rinsing (cleaning-up) of the whole system. **The heating system has to be filled up with water, which complies with requirements of ČSN 07 7401, and mainly its hardness mustn't exceed the required parameters.**

Tab. №. 4

Recommended values		
Hardness	mmol/l	1
Ca^{2+}	mmol/l	0.3
concentration of total Fe + Mn	mg/l	(0,3)*

*) recommended values

WARNING!!! The manufacturer doesn't recommend using of antifreeze mixtures.

In case of the use of non-freezing or anticorrosive additive into heating water, the manufacturer/supplier of the additive has to guarantee harmlessness of the originated mixture. In case of damage of the boiler or its part as a result of action of the originated mixture, the manufacturer is not responsible for the occurred damages, and this damage cannot be solved within the warranty.

In case of triggering the two-way safety device, when water which does not comply with requirements of ČSN 077401 can be refilled, it is necessary to prepare water in the system so that it met the requirements of this standard.

a) for the heating system

ČSN 06 0310	Heat systems in buildings – Design and mounting
ČSN 06 0830	Heat systems in buildings – Securing devices
ČSN 07 7401	Water and steam for heat energetic equipment with steam operation pressure up to 8 MPa
ČSN EN 303-5	Boilers for central heating - Part 5: Solid fuel boilers for central heating, with manual and automatic supply, with nominal heating power at most of 500 kW – Terminology, requirements, testing and marking.

b) for the chimney

ČSN 73 4201	Design of chimneys and flue gas ducts – Design, fulfillment and connection of fuel consumers

c) regarding to fire-fighting regulations

ČSN 06 1008	Fire safety of heat equipment.
ČSN EN 13501 -1 + A1	Fire classification of building products and building structures – Part 1: Classification according to results of tests for reaction to fire.

d) for the hot water heating system

ČSN 06 0320	Heat systems in buildings – Preparation of hot water – Development and design
ČSN 06 0830	Heat systems in buildings – Securing devices
ČSN 75 5409	Indoor water distributions

4.2 Possibilities of placement

Boiler placement in dwelling premises (including corridors) is prohibited!
It is necessary to ensure permanent supply of air for combustion and ventilation to the room where the boiler will be installed. Each solid fuel boiler requires a certain quantity of air for combustion. If it is not ensured by natural infiltration of the facility, it is necessary to ensure it through a hole from the outdoor environment with a cross section of at least 100 cm^2.
Upon installation and usage of the boiler, it is necessary to observe all requirements of ČSN 06 1008.

The boiler in the central heating system has to be connected to a separate venting unit. The chimney with a correct draught is the basic assumption for a good function of the boiler. It influences both boiler power and its efficiency. It is nut suitable to use flue gas elbows. The flue gas ducting from the boiler to the venting unit must be as short as possible, preferably without elbows with a slope from the boiler upwards. The chimney has to have a prescribed draught (depending on the boiler size - see manual). It must be well tightened and insulated to avoid condensation of water steam and tar.

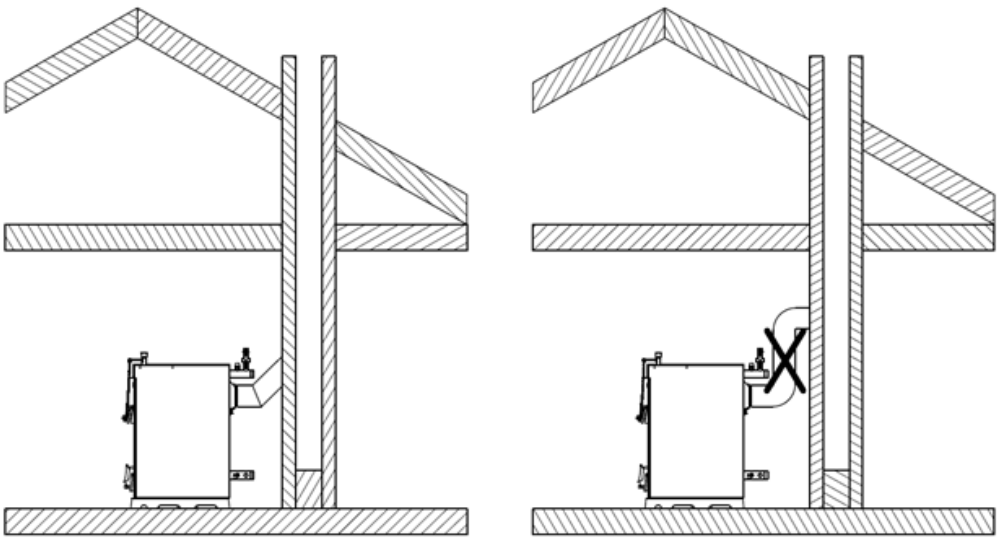
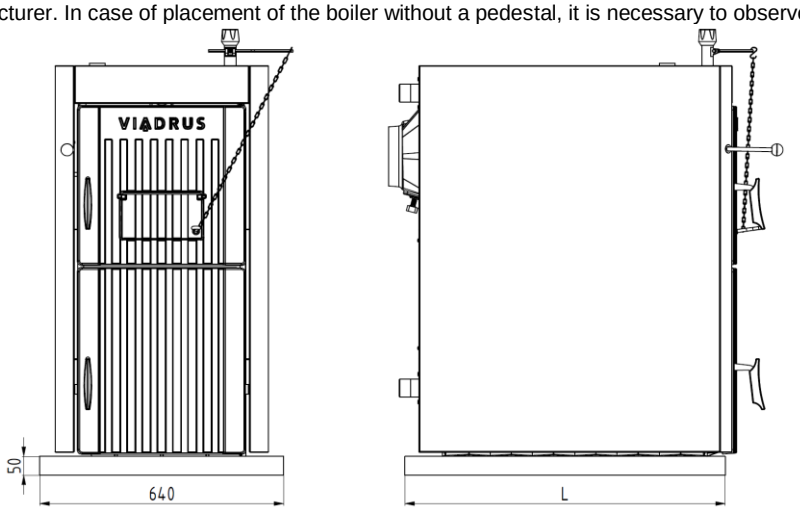


Fig. №. 9 Connection of the boiler to the chimney.

Boiler positioning with regard of fire-fighting regulations:

While installing a boiler of 16, 21, 25, 30 types, we recommend that you to use original cast-iron pedestal (see Fig. No. 11) supplied by the manufacturer. In case of placement of the boiler without a pedestal, it is necessary to observe conditions specified in Art. 1.



Boiler size - type	-	16	21	25	30	34	38	41
Length L	mm	620	730	730	840	950	950	950

Fig. №. 10 Bedding sizes

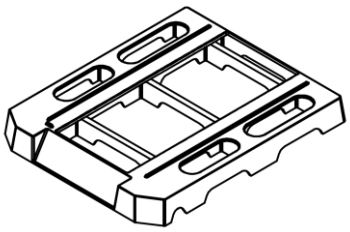


Fig. №. 11 Cast-iron pedestal of the boiler

1. Positioning on the floor made of non-flammable material (Fig. No. 10):
   - place the boiler on the non-flammable pad exceeding the boiler layout on all sides by 20 mm and just on the depth of the boiler drum;
   - If the boiler is installed in a cellar we recommend installing it on a bedding at least 50 mm high.
   - the boiler has to be placed in the center of the pedestal.
2. Safety distance from flammable materials:
   - when installing and operating the boiler, it is necessary to keep a safety distance of 200 mm from the

     materials of combustibility grade of A1, A2, B and C (D);
   - for lightly combustible materials with the combustibility grade E (F), which quickly burn and burn themselves even after removal of the ignition source (for example, paper, paste-board, cardboard, asphalt- and tarboard, wood and fiberboards, plastics, floor cloths) the safety distance is doubled, it means to 400 mm;
   - the safety distance is to be also doubled in case when the grade of reaction to fire is not proven.

Tab. №. 5 Grade of reaction to fire

Grade of reaction to fire	Examples of building materials and products included in the reaction of fire (extract from ČSN EN 13501-1+A1)
A1 – incombustible	Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters,...
A2 – hardly combustible	Acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...
B – heavily combustible	Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...
C (D) – moderately combustible	Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...
E (F) – lightly combustible	Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...

Positioning of a boiler with regard to the necessary handling space:

- basic environment AA5/AB5 according to ČSN 33 2000-1 ed. 2;
- in front of boiler there the handling space at least 1000 mm must be left;
- minimum distance between the rear part of boiler and the wall is 400 mm;
- at least from one side part, the space for accessing the rear part of boiler (minimum 400 mm) must be kept.

Placement of fuel:

- **<u>to ensure correct combustion in the boiler, it is necessary to use dry fuel</u>**. The manufacturer recommend that you stock fuel in basement premises or at least under a shelter;
- it is prohibited to lay fuel behind the boiler or stock it near the boiler in a distance lower than 400 mm;
- it is prohibited to lay fuel between two boilers in the boiler-room;
- the manufacturer recommend that you observe distance between the boiler and fuel at least 1000 mm or place fuel in other room than the room where the boiler is situated.

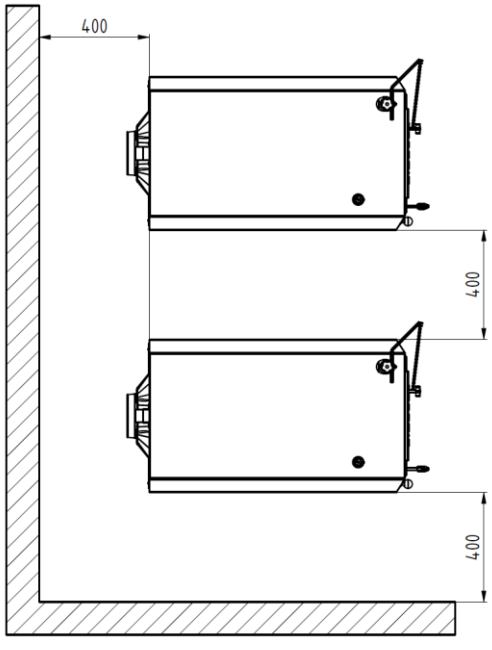


Fig. №. 12 Positioning of boilers in a boiler room

5 Delivery and assembly

5.1 Delivery and accessories content

The boiler is supplied according to a purchase order so that a boiler drum and boiler cladding are placed on a pallet. The lining of the combustion chamber is packed separately. Accessories is placed inside the boiler drum, and is available after opening the stocking door. The boiler is packed in transport package and it is not allowed to tip it during transportation.

Standard content of the boiler supply:

- boiler on a pallet
  - heating water flange with a thread 2 pcs
  - sealingϕ 90 x 60 x 3 2 pcs
  - washer 10,5 8 pcs
  - nut M10 8 pcs
  - complete draught regulator 1 pc
  - plug Js 6/4“ blind 1 pc
  - sealingϕ 60 x 48 x 2 1 pc
  - capillary spring 1 pc
  - bakelite ball 1 pc
  - eye screw 1 pc
  - screw M5x30 1 pc
  - nut M5 1 pcs
  - washer 5,3 1 pcs
- assembly of combustion chamber lining 1 pc
- inclined grate depending the boiler size 1 pc
- cladding including ash-pan and insulation
  - lowered bracket 2 pcs
  - washer 10,5 4 pcs
  - nut M10 4 pcs
  - screw 4,8 x 13 8 pcs
  - thermo-manometer 1 pc
  - inclined bushing 1 pc
- cleaning tools
  - hook 1 pc
  - brush 1 pc
  - extending stick 1 pc
- commercial and technical documentation (boiler type plate, energy label, instructions)

Additional accessories (it is not a part of supply):

- Cast-iron pedestal for the type 16 boiler (ordering code 17 659)
- Cast-iron pedestal for the type 21, 25 boiler (ordering code 17 751)
- Cast-iron pedestal for the type 30 boiler (ordering code 17 569)
- Turbulators depending on the boiler size

Necessary accessories (it is not a part of supply):

- Final-cooling loop (1 pc), including a flange, or two-way safety valve DBV 1 - 02, including siseal (10 g). This equipment doesn't need to be used in the case of an opened heating system.
- Thermostatic valve TS 130 (STS 20) – TV 95°C – can be bought in supermarkets (only in case of delivery with the final-cooling loop)
- Safety valve 1 pc

Accessories delivered by user's request (it is not a part of supply):

- Filter 3/4“ (for the boiler with a two-way safety valve DBV 1 – 02)
- Filling and discharge cock

Boiler equipment ordered as "additional accessories, necessary accessories and accessories delivered by user's request" in not included into the basic price of the boiler.

5.2 Mounting procedure

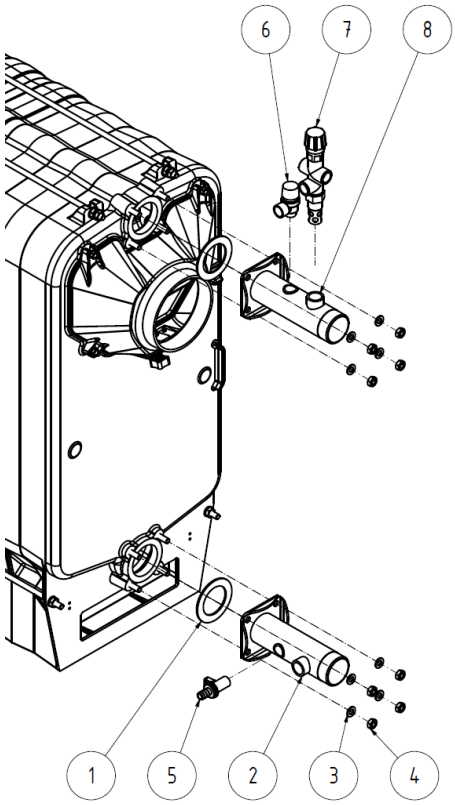
5.2.1 Boiler drum installation

5.2.1.1 Boiler drum installation - final-cooling loop

1. Install the boiler drum on the pedestal or bedding (pad).
2. Weld the flange heating water of the final-cooling loop to the weldment of the final-cooling loop (depending on the boiler-room layout); insert a sealing Ø 90 x 60 x 3 between the flange and boiler; afterwards mount the weldment with help of 4 pcs of the nuts M 10 and 4 pcs washers 10,5 to the boiler. Interconnect the upper output of heating water by a weld-joint with to the heating system.
3. Interconnect the bottom output from the final-cooling loop by means of welding of 1 1/2“ tube with the return water output (return water flange) to the boiler.
4. Mount a thermostatic valve on one of the outputs of the final-cooling loop (mount the sensor into the well and connect the 1/2“ cold water input). Beware of water flow direction marking with help of an arrow; it must be equal with the one according to Fig. No. 5.
5. Interconnect the second 1/2“ output of the final-cooling loop with the sewage (warning: in order to check function of the thermostatic valve, we recommend that you interconnect the water discharge with the waste pipe with help of a hopper).
6. After having connected the boiler to the heating system, screw the discharge valve to the boiler according to Fig. No. 13.
7. Put the chimney pipe on the chimney pot and insert it into the chimney hole. The chimney pipe diameter is 160 mm.
8. Screw the draught regulator into the hole in the upper part of the front section. The procedure of setting of the boiler draught regulator is specified in the manual which is attached in the corresponding regulator
9. Blind the hole with a JS 6/4“ thread in the front section with a JS 6/4“ plug. Place a sealing of Ø 60 x 48 x 2 under the plug.
10. It is recommend that you use shut-off valves for the heating water input and output, because in case these valves are not used, while cleaning the filter it would be necessary to clean the whole system.

5.2.1.2 Boiler drum installation – DBV 1 - 02 two-way safety valve

1. Install the boiler drum on the pedestal or bedding (pad).
2. insert a sealing Ø 90 x 60 x 3 between the heating water flange and boiler; afterwards mount with help of 4 pcs of the nuts M 10 and 4 pcs washers 10,5 to the boiler. (depending on the boiler-room layout). Interconnect the output of heating water by a weld-joint with to the heating system.
3. insert a sealing Ø 90 x 60 x 3 between the return water flange and boiler; afterwards mount with help of 4 pcs of the nuts M 10 and 4 pcs washers 10,5 to the boiler.
4. According to Fig. No. 7, interconnect the DBV 1 – 02 two-way safety valve with the return water flange, heating water flange and cooling water input and excessive heat output.
5. Mount the discharge valve to the return water flange.
6. Put the chimney pipe on the chimney pot and insert it into the chimney hole. The chimney pipe diameter is 160 mm.
7. Screw the draught regulator into the hole in the upper part of the front section. The procedure of setting of the boiler draught regulator is specified in the manual which is attached in the corresponding regulator
8. Blind the hole with a JS 6/4“ thread in the front section with a JS 6/4“ plug. Place a sealing of Ø 60 x 48 x 2 under the plug.
9. It is recommend that you use shut-off valves for the heating water input and output, because in case these valves are not used, while cleaning the filter it would be necessary to clean the whole system.



1. Sealingϕ 90 x 60 x 3
2. Return water flange
3. Washer 10.5
4. Nut M10
5. Filling and discharge cock *(is not part of standard delivery)*
6. *(is not part of standard delivery)*
7. DBV 1 -02 two-way safety valve *(is not part of standard delivery)*
8. Heating water flange

Fig. №. 13 Boiler drum installation

5.2.1.3 Placement of the shaped pieces set, tertiary air nozzle and inclined grate (Fig. No. 16)

1. Place the bottom left shaped piece (1) and bottom right shaped piece (2) to the bottom part of the combustion chamber. Place the upper rear shaped piece (4) on it

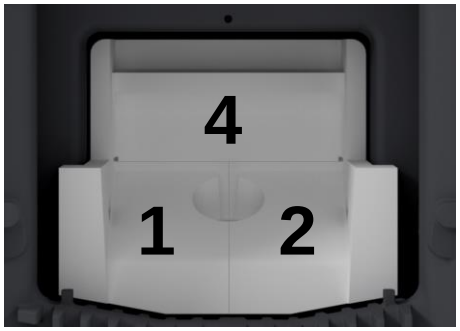


Fig. №. 14

2. Insert the tertiary air nozzle (3) into the round hole of the bottom shaped pieces (1) (2) The correct placement of the nozzle is secured by the groove in the rear part of the round hole.

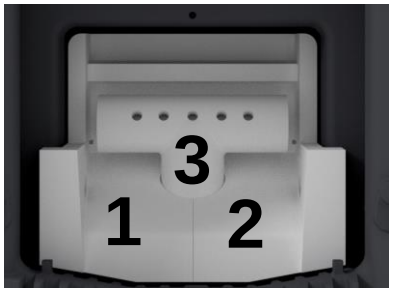
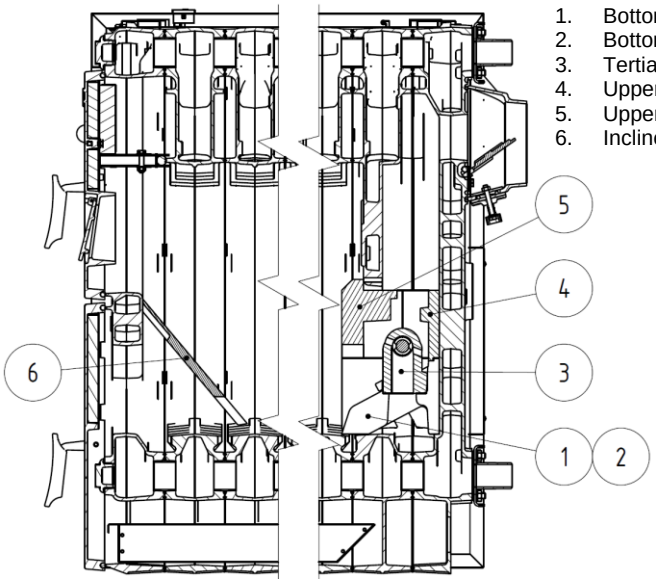


Fig. №. 15

3. Close the combustion chamber by inserting the upper front shaped piece (5).
4. Insert carefully the inclined grate (6) into the fuel chamber. Lean its bottom part on the risers of the boiler section, and lean its bottom part on the front section.



1. Bottom left shaped piece
2. Bottom right shaped piece
3. Tertiary air nozzle
4. Upper rear shaped piece
5. Upper front shaped piece
6. Inclined grate

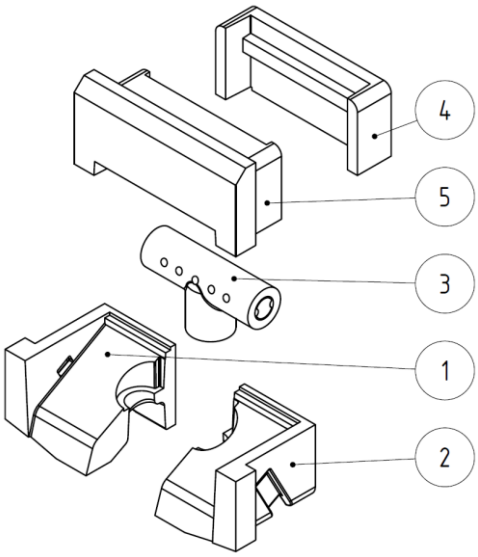
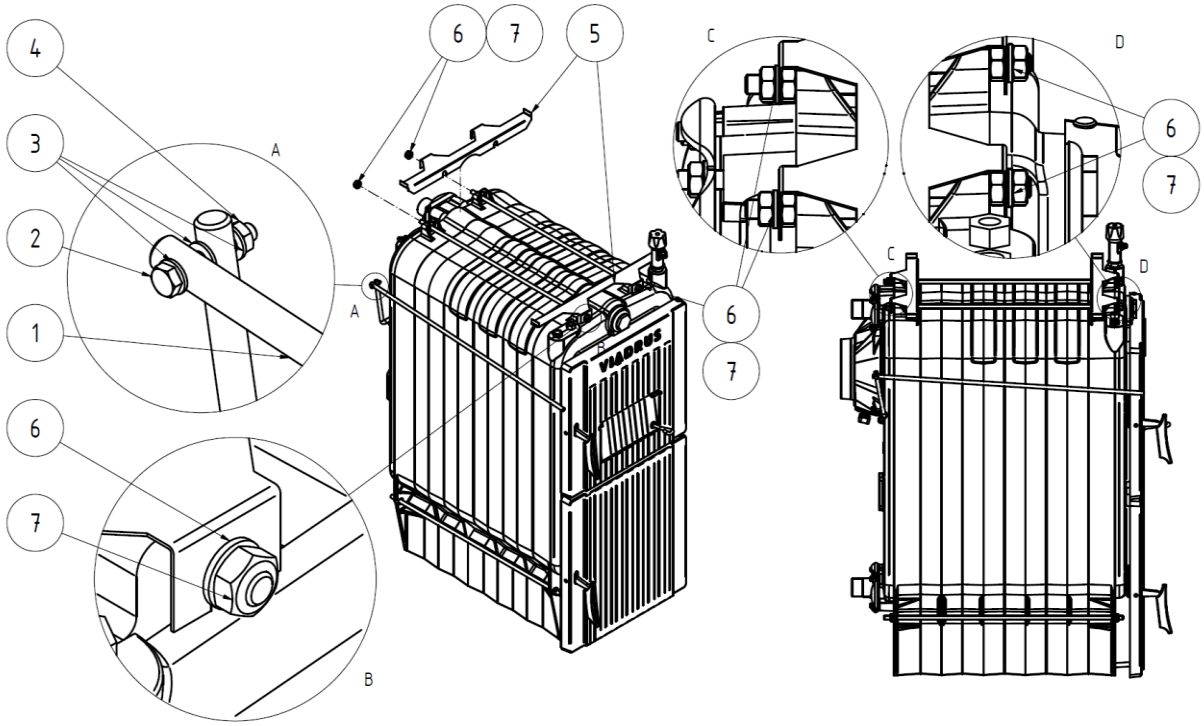


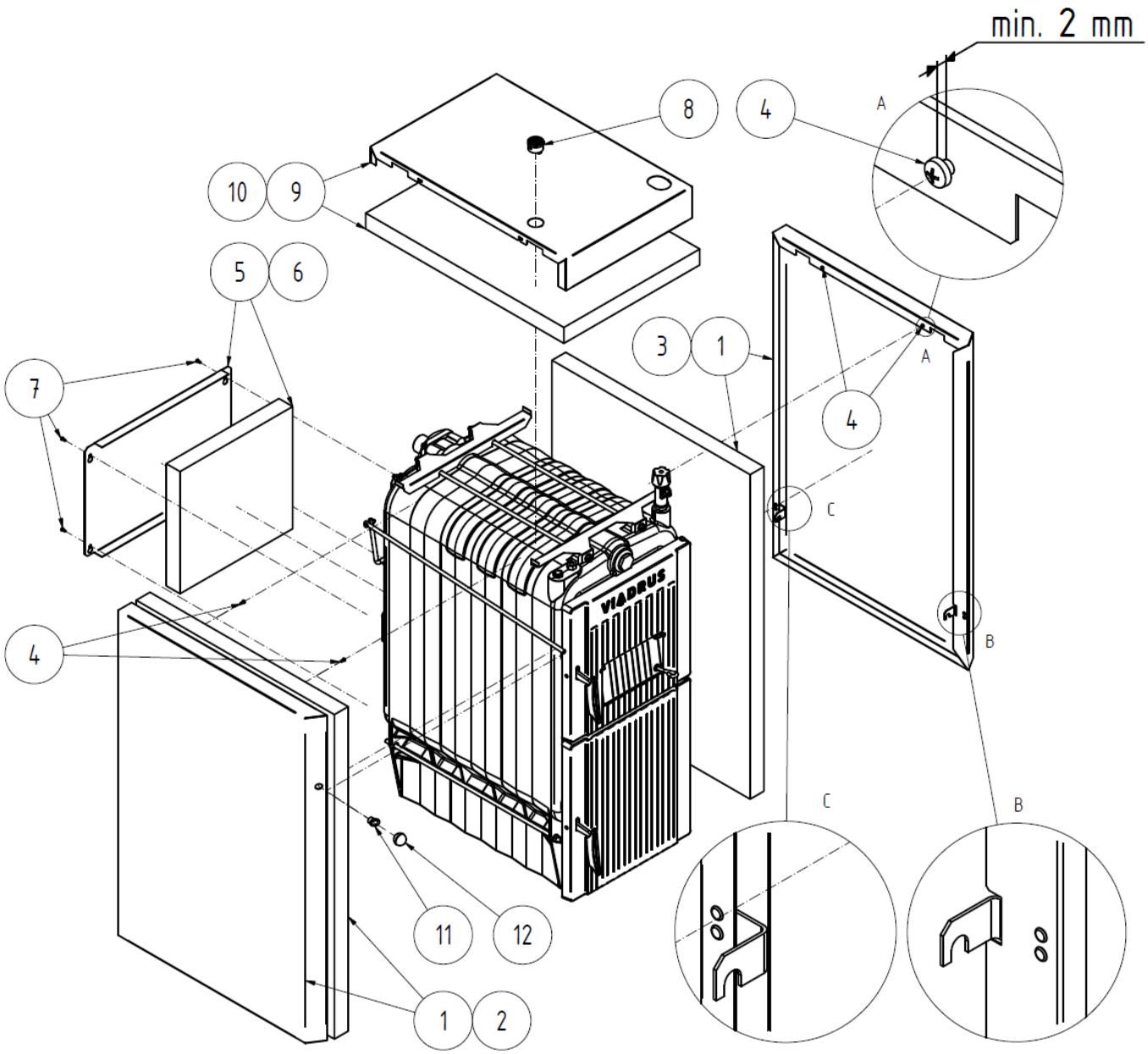
Fig. №. 16 Placement of the shaped pieces into the combustion chamber of the VIADRUS U22 Economy boiler

5.2.2 Mounting of claddings



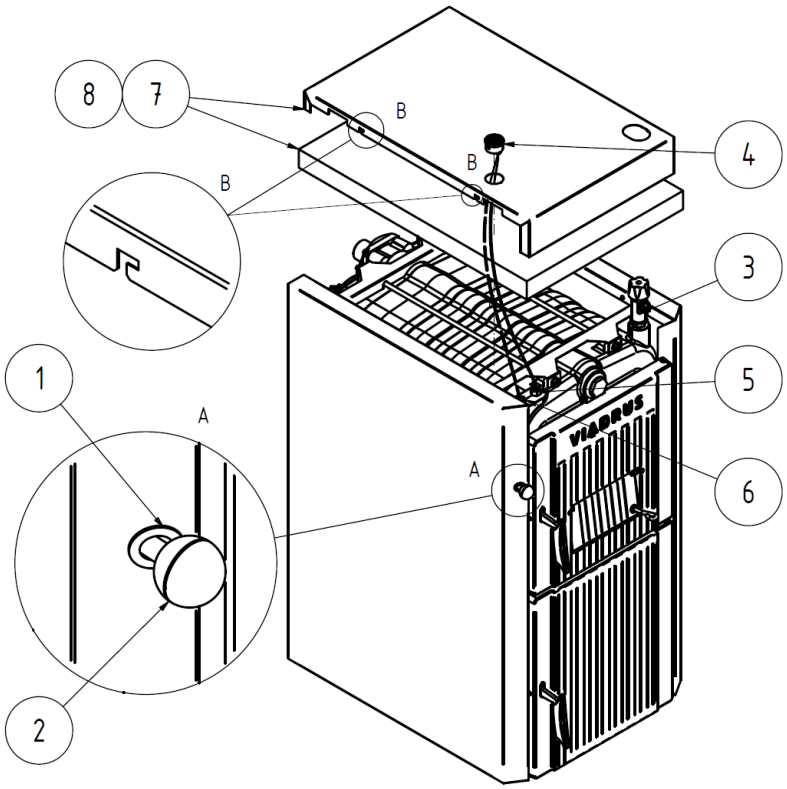
1. Shorting shutter connecting rod
2. Screw M5 x 30
3. Washer 5.3
4. Nut M5
5. Lowered bracket
6. Washer 10.5
7. Nut M10

Fig. №. 17 Mounting of the connecting rod and the cladding bracket



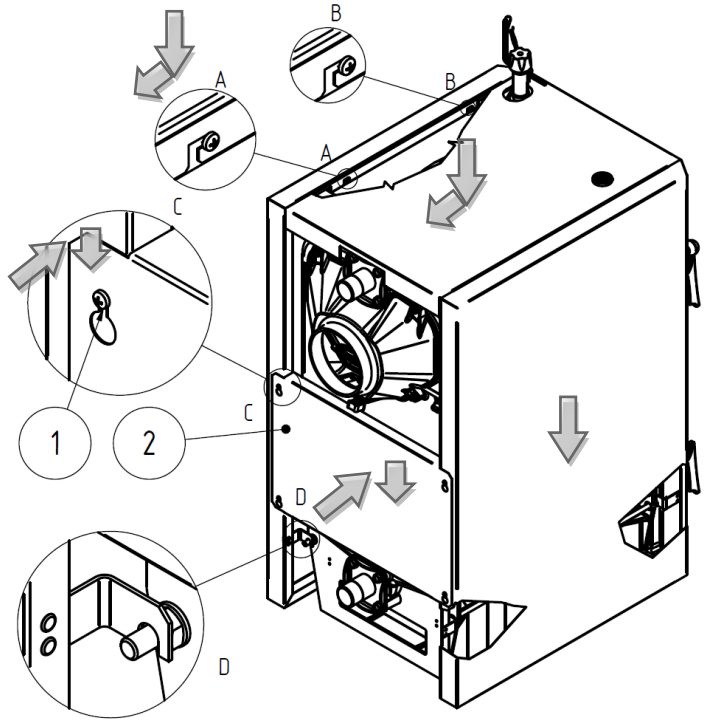
1. Left side part of the cladding
2. Insulation of the side part of the cladding
3. Right side part of the cladding
4. Screw 4,8 x 13
5. Rear part of the cladding
6. Insulation of the rear sheet-metal cover
7. Screw 4,8 x 13
8. Thermo-manometer
9. Upper part of the cladding
10. Insulation of upper part of the cladding
11. Inclined bushing
12. Bakelite ball

Fig. №. 18 Mounting of the side parts of the cladding



1. Inclined bushing
2. Bakelite ball
3. Draught regulator
4. Thermo-manometer
5. Thermometer well
6. Manometer well
7. Insulation of upper part of the cladding
8. Upper part of the cladding

Fig. №. 19 Mounting of the upper part of the cladding

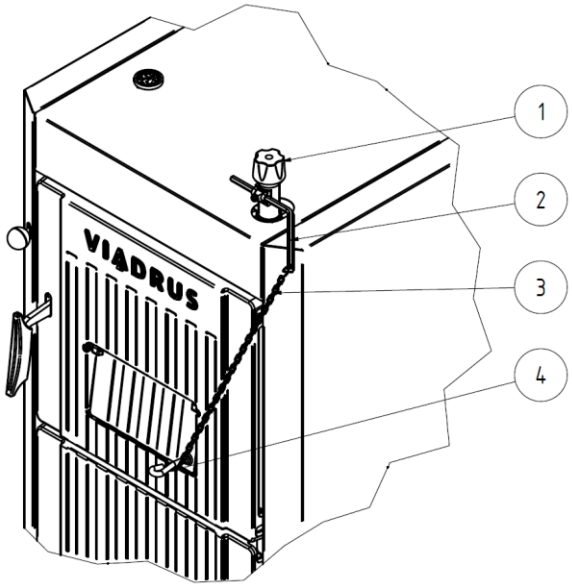


1. Screw M5 x 12
2. Rear part of the cladding

Fig. №. 20 Mounting of the rear part of the cladding and slipping-over of the upper part of the cladding

5.2.3 Draught regulator

The procedure of setting of the boiler draught regulator is specified in the manual which is attached in the corresponding regulator



1. Draught regulator
2. Draught regulator lever
3. Chain
4. Suspension split plug

Fig. №. 21

5.2.4 Mounting of the cleaning tool

Use usual mounting tools and leather gloves for the mounting or demounting of the brush.

5.2.5 Filling the heating system with water

Water hardness has to comply with ČSN 07 7401 and it is necessary to ensure its preparation according to Chapter No. 4.1 in the case that water hardness does not meet requirements.
Heating systems with an open expansion tank enable direct contact of heating water with the atmosphere. Within the heating period, expanding water in the tank absorbs oxygen that increases corrosion effects and at the same time water is being significantly evaporated. Only water prepared to the valued according to ČSN 07 7401 may be used for addition.
It is necessary to thoroughly rinse out the heating system to ensure washing-up of all impurities.
During the heating season, it is necessary to maintain a constant water volume in the heating system. While refilling water into the heating system, it is necessary to avoid air suction into the system. Water from the boiler and the heating system mustn't be discharged or withdrawn for using, except the necessarily needed cases, such as repairs and so on. Emptying heating water and filling-up of new water increases a danger of corrosion and creation of water stone. **If it is necessary to add water into the heating system, please only add it to the cooled boiler, in order to prevent bursting the section.**
After having filled the boiler and heating system, it is necessary to check tightness of all connections.
In case of using the DBV 1 - 02 two-way safety valve, cooling water is filled gradually into return water.

The finish of mounting and performance of the heating test have to be recorded in "Warranty certificate". (It is placed in Chapter No. 17)

6 Commissioning - instructions for contractual service organizations

Only professional mounting companies authorized to the performance of this activity may perform commissioning of the boiler.

6.1 Verification activities before commissioning

Before the boiler commissioning it is necessary to check:

1. Filling of the heating system with water (a check of the thermo-manometer) and tightness of the system.
2. Connection to the chimney – **this connection can be only performed with the agreement of a corresponding chimney-sweep company (chimney revision).**
3. Functionality of the draught regulator and thermostatic valve.

6.2 Commissioning the boiler

1. Perform boiler kindling.
2. Put the boiler to the needed operation temperature. Recommended temperature of output water is 80 °C.
3. Adjust the draught regulator, including the chain length (according to the attached manual of the draught regulator).
4. Carry out a check of functionality of the safety device against overheating (of the final-cooling loop or DBV 1 - 02 two-way safety valve).
5. Operate the boiler in a operational state according to the corresponding standard.
6. Check repeatedly boiler tightness.
7. Acquaint the user with servicing.
8. Perform record into the warranty certificate.

7 Operating the boiler by user

Wrong servicing and incorrect fuel combustion brings to damaging the product and possible loss of warranty.

While first kindling of a cold boiler, water condenses in it and streams down by its inner walls. This fogging of the boiler drum will end as soon as the boiler achieves the operation temperature.
While operating the boiler at temperature lower than 50 °C can occur fogging of the boiler drum, so called low-temperature corrosion, which shortens the service life of the boiler heat-exchanger. That's why we recommend that you operate the boiler at temperature of 70 °C and higher.

WOOD

To reach the nominal power of the boiler, it is necessary to observe maximum wood humidity of 20 %.
Fuel has to be stored in dry place.

Tab. №. 6 Recommended sizes of wood chocks

Chocks diameter [mm]	Ø 40 to 120
Chocks length for types of 16, 21, 25, 30 [mm]	350
Chocks length for types of 34, 38, 41 [mm]	350 - 500

The guarantee of clean and good combustion is the use of only dry and in-natural-state-kept wood.

It is necessary to observe maximum wood humidity of 20 %. As far as wood humidity is higher than 20 %, boiler power is declining. During combustion of wet wood, water is separated and condensed on walls of the proper boiler drum and chimney body; it causes increased creation of tar and water steam, which decreases the service life. Insufficient combustion also causes corrosion of cast iron, so called "metal dusting", when carbon is diffused into material, and - by this - material decomposes to powder (dust). This process is gradual and long-term. The flow of flue gases with solid particles then causes wearing or erosion of the material from the surface, and by this the thickness of the section wall gradually attenuates, and this can cause perforation of the boiler drum.

Fuel has to be stored in dry place.

Do not use for combustion: plastics, domestic waste, chemically treated remnants of wood, old paper, wood chips, pilers, waste from boards pressed from bark or from chipboards.

- **Follow instructions for boiler operation.**
- **While operating the boiler, follow recommended operational temperature.**
- **Operated the boiler with the approved fuel.**

7.1 Kindling

1. Check water quantity in the heating system on the thermo-manometer.
2. Open the stop valve between the boiler and heating system.
3. Clean up the space in the bottom part of the combustion chamber (the space in front of the nozzle), fire grate, ash-pan, flue channels and boiler walls.
4. Insert the kindling and wood chippings through the stocking door onto the bottom grate and kindle them.
5. Before kindling, it is necessary to open the shorting shutter to the position **B** Fig. No. 22, 23; by this flue gases are exhausted by the shortest flue channel to the chimney, and the chimney, consequently, warms). After the chimney is warmed-up, it is necessary to close the shorting shutter back into the position **A** according to Fig. 22, 23.

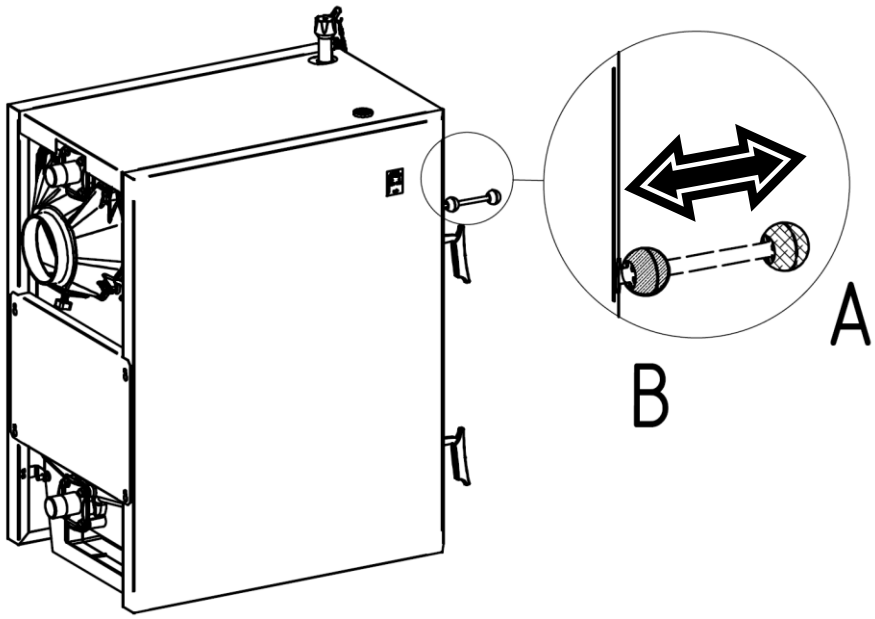


Fig. №. 22 Kindling of the VIADRUS U22 Economy boiler

6. Adjust the upper throttle valve of primary air in the front part into a position of the maximum opening.
7. Close the stocking door of the boiler and let fire burning.
8. When flame is missing and glowing base remains, open slowly the stocking door and insert fuel where necessary. We recommend approximately 10 - 15 cm under the upper part of the stocking chamber. See Fig. No. 23
9. Let newly stocked fuel burning out, close the shorting shutter (into position **A** according to Fig. No 22a.and Fig. No. 23) and adjust the upper throttle valve of the primary air supply with the power intensity regulator where necessary.

   By reason of thermal properties of cast iron, the operational characteristics of the boilers differs from the boilers with a steel boiler drum. Burning to the operation temperature lasts longer, but boilers after heating-up have higher thermal inertia.

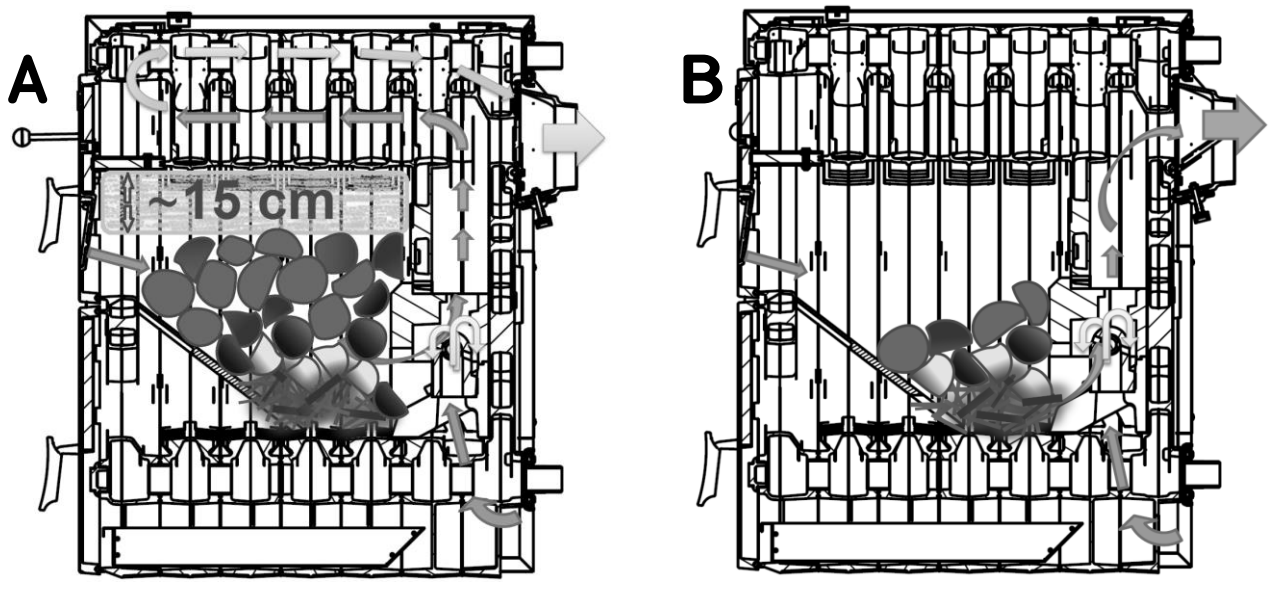
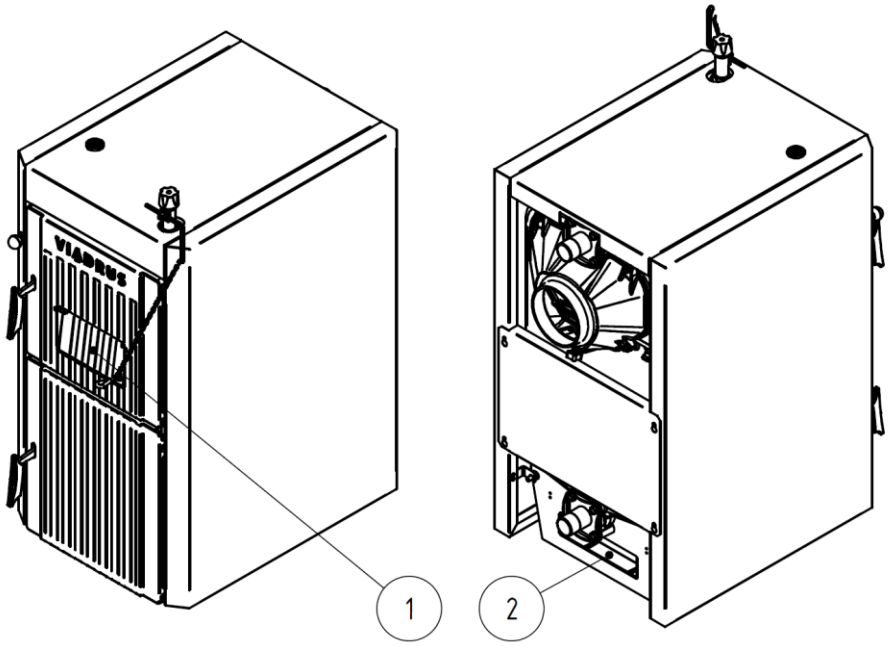


Fig. №. 23 Kindling of the VIADRUS U22 Economy boiler



1. Primary air intake
2. Secondary and tertiary air inlet

Fig. №. 24 Flow of combustion air

7.2 Boiler settings for measuring emissions

Before measuring emissions, it is necessary to clear thoroughly the boiler and its flue channel.

The boiler must be operated for at least 3 hours.

During the measurement it is necessary to operate the boiler with the rated power.

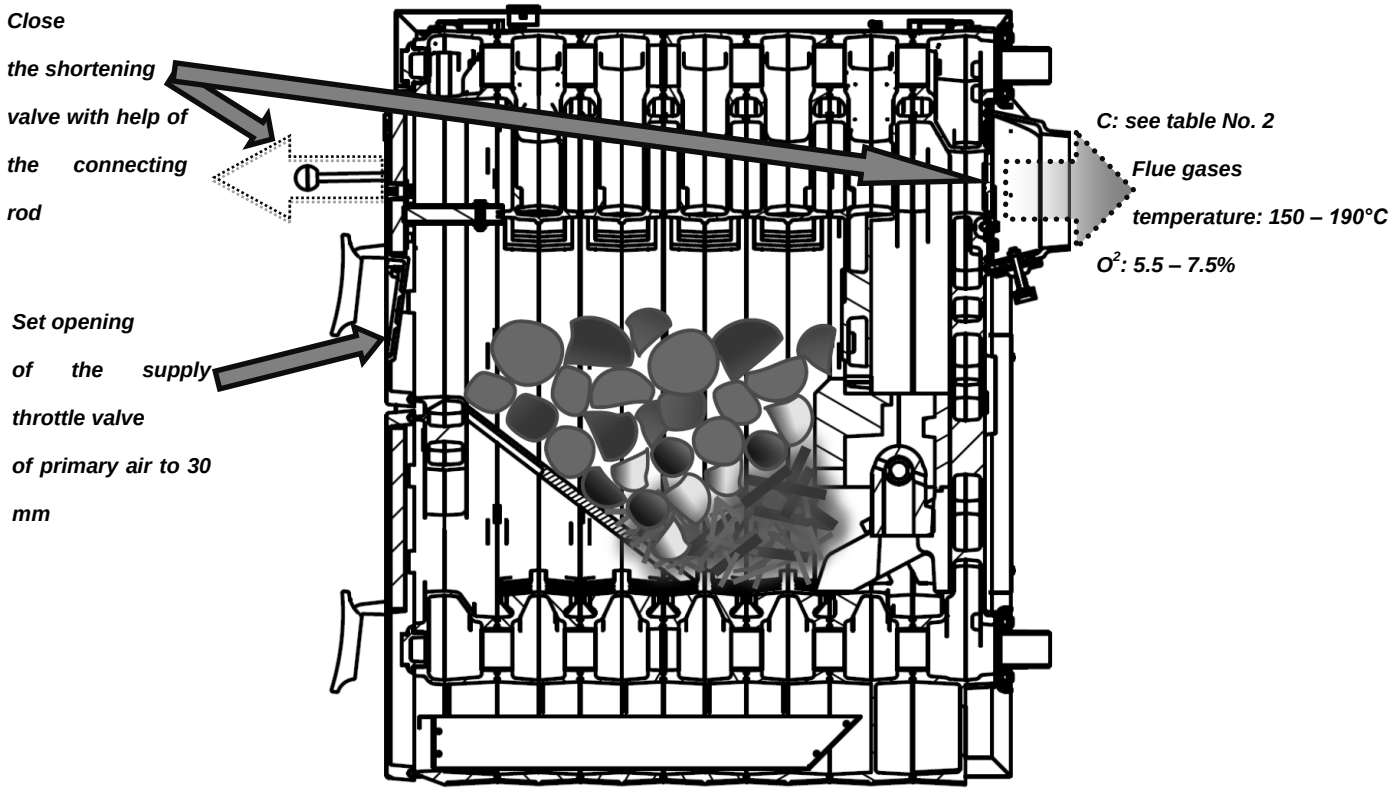


Fig. №. 25 Boiler settings for measuring emissions

7.3 Operation

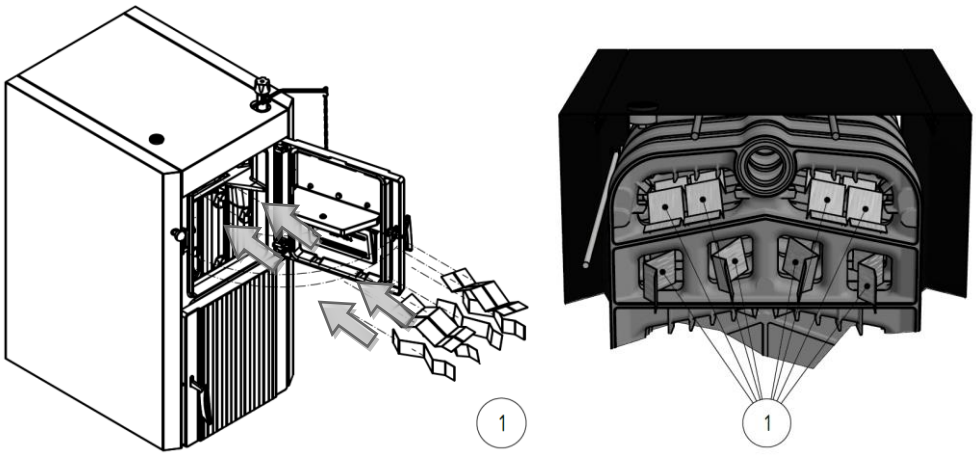
1. After having reached of heating water temperature, modify the combustion air supply. Power regulation is performed with help of the throttle valve on the stocking door, by which air supply is regulated above fuel with help of the draught regulator or by the set screw of the proper throttle valve. The draught regulator has to be adjusted so that the throttle valve, in a moment when the required temperature of heating water, was throttled to 8 to 10 mm.
2. Depending on the needs in heat and burning intensity, it is necessary to repeatedly add fuel during boiler operation. Add fuel on the glowing layer with a thickness of about 15 cm. Before the next stocking, make manual grating of combustion wood from up through the stocking door. We recommend you to stock approximately 10 - 15 cm under the upper part of the stocking chamber. Before adding fuel, release the orifice of the hole in the bottom part of the combustion chamber lining so that it was possible to smoothly burning of fuel.
3. The ash-pan door has to be permanently closed during operation.
4. The control of the shorting shutter during boiler operation at the nominal power (exclusive of kindling and fuel stocking) has to be in position **A** according to Fig. 22 and Fig. 23.
5. Where necessary, empty ash-pan (it is necessary to use gloves).
6. In the case of using of the shut-off valve, it is necessary to mount a safety valve between the boiler and shut-off valve.
7. We recommend that you clean up the filter after having performed a heating test and consequently before beginning of the heating season.
8. Flue gases are collected in the stocking chamber during combustion. That's why don't open the stocking door during combustion and before stocking the next combustion wood wait till just a glowing layer remains in the stocking chamber, which only creates minimum quantity of smoke.

8 Maintenance

1. Check and if necessary remove ash from the ash-pan. All fuel remnants in the heating chamber and in the combustion output hole in the lining before each new kindling. Ash has to be put in non-flammable vessels with a cover. **Use protective equipment while working** and be particular about personal safety.
2. With using a brush, once a month clean up walls inside the heating chamber, boiler flues, and chimney pot (cooled boiler, when its temperature does not exceed 40 °C). A cleaning cover in the bottom part of the chimney pot serves for the removal ash from it. To demount the cleaning cover, push and slightly rotate the screw in its bottom part. **After having cleaned-up the chimney pot, mount back the cleaning cover and be particular about its thorough tightness.**
3. As far as during the use of fuels with higher generation of gas, a tar deposit is sedimented on the walls of the combustion space, remove it by a scraper or with help of burning with help of dry hardwood which operating the boiler at the maximum operational temperature.
4. After having finished the heating season, clean up the space behind the throttle valve of tertiary air supply (the hole in the rear part of the boiler, pos. No 2 in Fig. No. 24, treat pivots of the shorting shutter and all doors.
5. Cracks caused by tensioning or light corrosion of the fire-resistant lining are caused by thermal fluctuations and temperature above 1000 °C in the combustion chamber. But what is decisive for the functionality of the device is shape stability of the structural parts. Cracks do not affect functionality and they can be considered, the same as in case of tiled stove, to be normal. If incorrect manipulation from the user's party causes small mechanical damage of any part of the lining, then its repair is only allowed to perform after its cooling-down. Carry out repair with help of a suitable heat-resistant glue determined for these purposes.
6. In the case of impurities on covering parts and control elements, remove them with a soft wet cloth. We recommend slight cleaning agents without dissolution reagents. Dissolution reagents such as alcohol, petrol or solvents cannot be used because they can damage the device surface.

9 Use of turbulators

In case of higher chimney draught, we recommend - to ensure more intensive and effective heat-exchange to the combustion heat-exchanger - that you use original turbulators of the U22 Economy boiler. Turbulators are to be placed into the output passages of the combustion heat-exchanger. Their use is not suitable in places where the chimney is not resistant against flue-gas condensate. The turbulators are not part of the basic equipment of the boiler, but they might be whenever additionally installed.



1. Turbulators depending on the boiler size

Fig. №. 26 Placement of turbulators in the boiler

10 IMPORTANT WARNINGS

1. **The boiler may only operate persons familiarized with this instruction manual. It is not allowed to leave children beyond control of adults near the boiler. Interventions into the boiler structure which could threaten the health of the servicing person or his/her inmates are not allowed.**
2. **The boiler is not determined for using by persons (including children), whose physical, sensible or intellectual inability or absence of experience and knowledge prevents from safety using of the consumer, until they are under supervision or until they are instructed of using of the consumer by a person responsible for their safety.**
3. **You should watch the children to ensure that they don't play with the consumer.**
4. **In case there is a danger of creation and intrusion of flammable steams or gas into the boiler room, or at work during which there is a transition danger of fire or explosion (floor coating cementing, coating with flammable paintings), the boiler has to be timely shut-down prior the start of such works.**
5. **IT IS prohibited to use flammable liquids for kindling.**
6. **DURING OPERATION, IT IS prohibited to overheat the boiler.**
7. **Don't put any objects made of flammable material on the boiler and within a distance smaller than the safe distance from it.**
8. **While taking out ash from the boiler, no flammable materials can be placed on the distance less than 1500 mm from the boiler.**
9. **While operating the boiler at temperature lower than 50 °C can occur fogging of the boiler drum, so called low-temperature corrosion, which shortens the service life of the boiler drum. That's why we recommend that you operate the boiler at temperature of 50 °C and higher.**
10. **In case of the use of an accumulating tank, it is possible to kindle the boiler again or to add fuel to it again provided the boiler is burnt up to the base of the furnace and the accumulating tank is discharged or cooled.**

    WARNING!!! Failure to respect brings to extremal pollution of the heat-exchanger.
11. **After having finished the heating season, it is necessary to thoroughly clean up the boiler, flue gas ducting and chimney pot. Lubricate with graphite grease as follows: pivots, flue gas shutter mechanism and other movable parts on the boiler. It is necessary to maintain the boiler room in clean and dry conditions.**
12. **In case that the heating system is not used daily during the winter period, it is necessary to pour out water.**
13. **Possible signs of corrosion on the boiler drum are not a defect and do not affect boiler functionality.**
14. **A safety valve with the maximum overpressure of 400 kPa (4 bar), the dimensions of which have to comply to the nominal power of the boiler, has to be installed in the system. The safety valve must be positioned directly behind the boiler. No shut-off valve can be placed between the safety valve and the boiler. In case of other questions, please contact our contractual mounting companies and service organizations.**
15. **In case of triggering the two-way safety device, when water which does not comply with requirements of ČSN 07 7401 can be refilled, it is necessary to prepare water in the system so that it met the requirements of this standard.**
16. **During assembly, installation and operation of the appliance it is necessary to comply with**

    standards applied in the relevant country of destination.

In case of violation of these conditions, no warranty repairs can be required.

The list of contractual service organizations is at your disposal at the web-pages of www.viadrus.cz.

11 Instructions for product liquidation after the lapse of its service life

VIADRUS a.s. is a contractual partner of company EKO–KOM a.s. with the client number F00120649.
The packages comply with ČSN EN 13427.
We recommend liquidating packages by the following method:
- plastic film, cardboard cover – please use salvage points
- metal tightening tapes – please use salvage points
- wooden basement, it serves for one use, and it cannot be further used as a product. Its liquidation is a subject of the law 477/ 2001 Sb. and 185/2001 Sb., subsequently amended.

We recommend liquidating separate parts of the boiler as followed:
- the heat-exchanger (grey cast-iron) – please use salvage points,
- pipeline distributions, claddings – please use salvage points,
- other metal parts – please use salvage points,
- insulation materials – by means of a company acting in collection and liquidation of waists.

On loss of useful features of the product, you can use backward withdrawal of the product (if implemented), in case of a declaration of the producer that this is a waist; manipulation with this waist is to be according to the valid legislation of a corresponding country.

12 Warranty and responsibility for defects

After its filling-up, the "Certificate of boiler quality and completeness" serves as a "Warranty certificate". It is placed in Chapter No. 17.

In case of a reclaim of the cladding, the customer is obliged to present the package sheet of the boiler cladding. It is placed on the cardboard box in which the cladding is transported.
The user is obliged to put a professional contractual service accredited by VIADRUS a.s., the boiler manufacturer in trust with defects elimination, otherwise the boiler proper function isn't guaranteed.

The user is obliged to perform boiler's regular maintenance.

Each announcement of faults has to be carried out immediately after their location always in a written form. and by phone agreement.

In case of violation of the mentioned instructions, the warranty provided by the manufacturer is not admitted.

The manufacturer reserves the right for a change performed within an innovation of the product, which doesn't need to be included in this manual.

The manufacturer holds no responsibility for possible damages unless the product is being used in accordance with the conditions specified in these service instructions.
The warranty doesn't relate to:
- **defects caused by a wrong mounting and incorrect operation of the product and defects caused by incorrect maintenance – see chapter 8;**
- **damage of the product during transportation or other mechanical damage;**
- **defects caused by insufficient storage;**
- **damage occurred as a result of non-observance of water quality in the heating system - see chapter 4.1 and 5.2.5, or due to using anti-freeze liquids;**
- **defects occurred due to nonobservance of instructions specified in this manual;**
- **defects caused by natural disaster or other unpredictable event.**

13 Recommended procedure for mounting and putting into operation (Instruction for mounting companies)

Only qualified company trained by the manufacturer may perform mounting and putting into operation.

1. Select boiler power (size) depending thermal losses of the facility and project documentation.
2. The boiler and flue channel have to be evaluate from the point of view of the level and economy of operation as one whole. By this reason, before proper mounting, require a report of revision of the flue channel with the determined chimney draught.
3. Observance of the required chimney draught is a base condition for the correct boiler operation.

Required chimney draght in Pa for particular boiler sizes	
Boiler size [kW]	Draught [Pa]
16	13
21	16
25	18
30	21
34	25
38	32
41	32

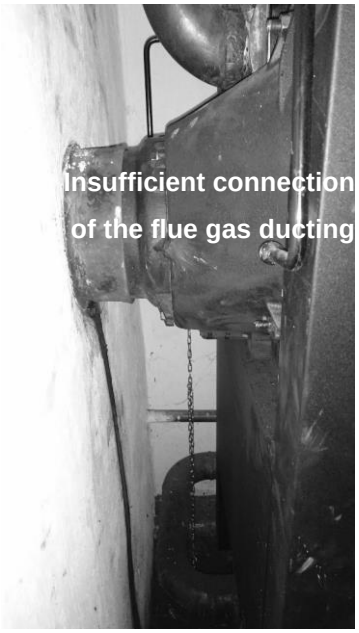
4. Depending on the boiler-room layout, select the boiler placement to enable comfortable servicing, cleaning and maintenance of the boiler.
5. Carry out a check of the supply of a sufficient quantity of combustion air into the boiler room.
6. Perform connection of the boiler to the heating system in accordance with the legal legislation and according to the approved project documentation.
7. Check performance of the connection of the fume-extraction system of the boiler to the smoke uptake.
    - due to low temperatures of flue gases, we recommend that you isolate the connection
    - perform connection preferably directly (without other elbows); if it is impossible, use elbows of 45°
    - connection must be structurally adapted for cleaning and maintenance.
    - fulfillment of the proper connection of the fume-extraction system to the smoke uptake has to enable dilatation
    - with regards to the flue-gases quantity and temperature, we recommend the fume-extraction system of 160 or 180 mm (preferably insulated multi-layer stainless-steel or ceramic chimney systems)

8. Verify tightness of the whole flue channel:
    - tightness of the cleaning hole of the chimney pot
    - tightness of all joints of the chimney pipe
    - tightness of all cleaning holes in the chimney pipes
    - tightness of the input of the chimney pipe into the smoke uptake
    - tightness of all revisions and cleaning holes of the boiler drum
    - the close of the inter-space between the chimney liner and breast for the limitation of intrusion (of outdoor) air, which brings to cooling the chimney liner and by this to undesirable decreasing of the flue-gases temperature.
9. Depending on type of the heating system and project documentation, carry out installation of the safety valve and safety device against overheating.
10. In case of installation of a temperature sensor for the control of the circulating pump, adjust switching temperature to 55 °C.
11. In the case of installation of a three-way thermostatic valve, select fulfillment of 55 °C.
12. Insert correctly ceramic lining according to the instruction manual of the boiler. A video instruction is available online on YouTube. (https://www.youtube.com/user/Viadruscz)
13. Before the heating test, check the setting of the shutter of primary air.
14. Carry out a heating test by burning of the whole heating system to the required operation temperature, and that is including accumulation tank and boiler (provided it is installed).
15. Adjust the draught regulator during burning of the heating system to 60 °C. The pump must be tied up, it mustn't cycle, and the boiler must keep the required temperature of 60 °C.
16. Train the customer (personnel) for servicing, cleaning and maintenance of the boiler. Train them also for the control of all other functions of the heating system and instruct them about necessity of observation of the prescribed fuel, including maximal allowable fuel humidity. With help of thorough training of the customer, you will prevent from unprofessional handling with the boiler, additional questions and complaints.

14 Wrong methods of the connection of the boiler to the chimney

Wrong connection to the smoke uptake – it doesn't tighten and cannot be cleaned-up

Wrong connection of the flue gas ducting and there is no dilatation of the smoke uptake



15 Boiler information sheet

VIADRUS U22 Economy 16

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]:	**79**
Energy efficiency index *EEI*:	**116**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	16	kW	- at nominal thermal power	η_n	89.1	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 21

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]: **78**

Energy efficiency index *EEI*: **114**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	21	kW	- at nominal thermal power	η_n	89.0	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 25

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]:	**78**
Energy efficiency index *EEI*:	**114**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	25	kW	- at nominal thermal power	η_n	89.0	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 30

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]: **78**

Energy efficiency index *EEI*: **114**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	30	kW	- at nominal thermal power	η_n	88.7	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 34

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]:	**79**
Energy efficiency index *EEI*:	**116**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	34	kW	- at nominal thermal power	η_n	91.0	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 38

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]: **78**

Energy efficiency index *EEI*: **114**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	38	kW	- at nominal thermal power	η_n	90.4	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

VIADRUS U22 Economy 41

Condensing boiler	no	Solid fuel combined heat and power boiler	no	Combined boiler	no

Fuel	Preferable fuel (only one):	Other suitable fuel/fuels
Wood chunks, content of humidity ≤ 25 %	YES	no
Wood chips, content of humidity 15 - 35 %	no	no
Wood chips, content of humidity > 35 %	no	no
Pressed wood in a form of pellets or briquettes	no	no
Saw dust, content of humidity ≤ 50 %	no	no
Other wood biomass	no	no
Non-wood biomass	no	no
Pit-coal	no	no
Brown coal (including briquettes)	no	no
Coke	no	no
Anthracite	no	no
Briquettes from a mixture of fossil fuels	no	no
Other fossil fuel	no	no
Briquettes from a mixture of biomass (30 - 70 %) and fossil fuels	no	no
Other mixture of biomass and fossil fuels	no	no

Properties during operation with preferable fuel:

Season energy efficiency of heating of indoor premises η_s [%]:	**78**
Energy efficiency index *EEI*:	**114**

Name	Marking	Value	Unit	Name	Marking	Value	Unit
Useful heating power				**Useful efficiency**			
- at nominal thermal power	P_n	41	kW	- at nominal thermal power	η_n	90.3	%
- at [30%/50%] of nominal thermal power, if applicable	P_p	-	kW	- at [30%/50%] of nominal thermal power, if applicable	η_p	-	%
Solid fuel combined heat and power boilers				**Auxiliary electric energy consumption:**			
Electric efficiency at nominal thermal power	$\eta_{el,n}$	-	%	- at nominal thermal power	el_{max}	-	kW
				- at [30%/50%] of nominal thermal power, if applicable	el_{min}	-	kW
				- of integrated secondary device for decreasing emissions, if applicable			kW
				- in standby mode	P_{SB}	-	kW

Contact data	VIADRUS a.s. Bezručova 300 Bohumín 735 81

English

A	Name		
B	Type		
C	Serial number		
D	Fuel type	*(WOOD / BLACK COAL /BROWN COAL)	
E	Number of sections	L	Boiler class
F	Nominal heat output Heat output range [kW]	M	Fuel class
G	Maximum allowable operating pressure [bar]	N	Electrical connection [V / Hz / A]
H	Maximum allowable operating temperature [°C]	O	Wattage [W]
J	Year of production		
K	Water volume [l]		

Hrvatski

A	Naziv		
B	Tip kotla		
C	Serijski broj		
D	Vrsta goriva	*(DRVA / KAMENOG UGLJENA / LIGNIT)	
E	Broj članaka	L	Klasa kotla
F	Nazivn toplinski učin Raspon izlaza topline[kW]	M	Klasa goriva
G	Maksimalni dozvoljeni tlak vode [bar]	N	Električni priključak [V / Hz / A]
H	Maksimalna dozvoljena temperatura vode [°C]	O	Potrošnja energije [W]
J	Godina proizvodnje		
K	Količina vode u kotlu [l]		

Italiano

A	Nome		
B	Tipo		
C	Numero di serie		
D	Tipo Combustibile	*(LEGNO / CARBONE NERO / LIGNITE)	
E	Numero elementi	L	Classe di caldaia
F	Potenza Termica Nominale Rendimento termico [kW]	M	Classe di carburante
G	Sovrappressione desercizio massima ammissibile delfacqua [bar]	N	Collegamento elettrico [V / Hz / A]
H	Temperatura D'eserciyio Permessa Massima [°C]	O	Wattaggio [W]
J	Anno Di Produzione		
K	Contenuto acqua [l]		

Čeština

A	Název		
B	Typ		
C	Výrobní číslo		
D	Druh paliva	*(DŘEVO / ČERNÉ UHLÍ / HNĚDÉ UHLÍ)	
E	Počet článků	L	Třída kotle
F	Jmenovitý tepelný výkon Rozsah tepelného výkonu [kW]	M	Třída paliva
G	Nejvyšší dovolený provozní tlak [bar]	N	Elektrická přípojka [V / Hz / A]
H	Nevyšší dovolená provozní teplota [°C]	O	Příkon [W]
J	Rok výroby		
K	Obsah vody [l]		

Slovenčina

A	Název		
B	Typ		
C	Výrobné číslo		
D	Druh paliva	*(DREVO / ČIERNE UHLIE / HNEDÉ UHLIE)	
E	Počet článkov	L	Trieda kotla
F	Menovitý tepelný výkon Rozsah tepelného výkonu[kW]	M	Trieda paliva
G	Najvyšší prípustný prevádzkový pretlak vody [bar]	N	Elektrické pripojenie [V / Hz / A]
H	Najvyššia prípustná prevádzková teplota vody [°C]	O	Výkon [W]
J	Rok výroby		
K	Obsah vody [l]		

Polski

A	Nazwa		
B	Typ		
C	Nr. Produkcyjny		
D	Rodzaj paliwa	*(DREWNO / WĘGIEL KAMIENNY / WĘGIEL BRUNATNY)	
E	Liczba elementów	L	Klasa kotła
F	Nominalną moc cieplną Zakres mocy cieplne [kW]	M	Klasa paliva
G	Maksymalne dopuszczalne ciśnienie robocze [bar]	N	Zasilanie elektryczne [V / Hz / A]
H	Maximalna dopuszczalna temperatura robocza [°C]	O	Pobór mocy [W]
J	Rok produkcji		
K	Pojemność wodna [l]		

Românesc

A	Nume		
B	Tip		
C	Numar serie		
D	Tip de combustibil	*(LEMN / HUILA / CĂRBUNE)	
E	Numar de elementi	L	Clasa cazanelor
F	Putere utila de incalzire Domeniul de căldură [kW]	M	Clasă de combustibil
G	Suprapresiunea maxima de lucru a apei [bar]	N	Conexiune electrică [V / Hz / A]
H	Temperatura maxima de lucru a apei [°C]	O	Putere [W]
J	An de fabricatie		
K	Volum de apa [l]		

Deutsch

A	Name		
B	Typ		
C	Herstellungsnum.		
D	Brennstofftyp	*(HOLZ / STEINKOHLE / BRAUNKOHLE)	
E	Gliederanzahl	L	Kesselklasse
F	Nennwärmeleistung Heizleistungsbereich [kW]	M	Kraftstoffklasse
G	Max. Wasserarbeitsüberdruck [bar]	N	Elektrischer Anschluss [V / Hz / A]
H	Max. Betriebstemperatur vom Heizwasser [°C]	O	Leistung [W]
J	Baujahr		
K	Wasserraumvollumen [l]		

Slovenščina

A	Naziv		
B	Tip kotla		
C	Serijska številka		
D	Vrstva goriva	*(LES / ČRNI PREMOG / LIGNIT)	
E	Število členov	L	Razred kotla
F	Nazivna toplotna moč Območje oddajanja toplote [kW]	M	Razred goriva
G	Maksimalni dovoljeni tlak vode [bar]	N	Električni priključek [V / Hz / A]
H	Maksimalna dovoljena temperatura vode [°C]	O	Moč [W]
J	Leto izdelave		
K	Količina vode v kotlu [l]		

РУССКИЙ

A	Название		
B	тип		
C	Заводской №		
D	Вид топлива	*(ДРЕВЕСИНА/ КАМЕННЫЙ УГОЛЬ/ БУРЫЙ УГОЛЬ)	
E	Число секций	L	Класс котла
F	Номинальная тепловая мощность Диапазон теплоотдачи [кВт]	M	Класс топлива
G	Максимально допустимое рабочее давление воды [бар]	N	Электрическое подключение [В / Гц / А]
H	Максимально допустимая рабочая температура воды [°C]	O	Мощность [Вт]
J	Год выпуска		
K	Объем воды [l]		

Français

A	Nom		
B	Type		
C	N° prod.		
D	Combustile	*(BOIS / HOUILLE / LIGNITE)	
E	Nombre déléments	L	Classe de chaudière
F	Puissance nominale Plage de sortie de chaleur [kW]	M	Classe de carburant
G	Pression de service eau maxi [bar]	N	Connexion électrique [V / Hz / A]
H	T°de service eau maxi [°C]	O	Puissance en watts [W]
J	Année de production		
K	Contenance en eau [l]		

English

A	Name		
B	Type		
C	Serial number		
D	Fuel type	*(WOOD / BLACK COAL /BROWN COAL)	
E	Number of sections	L	Boiler class
F	Nominal heat output Heat output range [kW]	M	Fuel class
G	Maximum allowable operating pressure [bar]	N	Electrical connection [V / Hz / A]
H	Maximum allowable operating temperature [°C]	O	Wattage [W]
J	Year of production		
K	Water volume [l]		

Information on packages for customers

VIADRUS a.s.,
Bezručova 300
735 81 Bohumín

declares that the below specified package comply with conditions for introduction of packages into the market specified in law No. 477/2001 Sb., "On packages and on changes of several laws", as amended.

The below specified package is designed and manufactured according to the specified technical norms.

VIADRUS a.s. keeps at disposition all technical documentation related to the declaration of compliance and is able to present it to a corresponding control authority.

Package description (constructive type of the package and its parts):

a) steel band
b) PP b PET band
c) LDPE heat-shrink wrap
d) LDPE and BOPP heat-shrink wrap
e) LDPE stretch foil
f) acrylate BOPP sticking tapes
g) PES Sander tapes
h) corrugated paste-board and paper
i) wooden pallet and logs
j) microten bags
k) PP bags

1.	Prevention of reduction of resources	ČSN EN 13428, ČSN EN 13427	YES
2.	Repeated use	ČSN EN 13429	NO
3.	Material recycling	ČSN EN 13430	YES, NO-i
4.	Energy evaluation	ČSN EN 13431	YES, NO-a
5.	The use by composting and biodegradation	ČSN EN 13432, ČSN EN 13428	NO
6.	Danger matters	ČSN EN 13428, ČSN 77 0150-2	YES
7.	Heavy metals	ČSN CR 13695-1	YES

Information on fulfillment of back withdrawal obligation

Dear customer,
let me acquaint you with fulfillment of back withdrawal obligation in accordance with law No. 477/2001 Sb., "Packages Law", as amended, § 10, § 12 within products manufactured by VIADRUS a.s.
VIADRUS a.s. has concluded an agreement of associated fulfillment of back withdrawal obligation and the use of wastes from packages with the authorized packaging company EKO-KOM a.s. and participates in the system of associated fulfillment of EKO-KOM a.s. under the client identification number of **F00120649**.

In case of obscurities, please contact us at:
VIADRUS a. s.
Quality and Ecology Manager
Bezručova 300
735 81 Bohumín

or directly at EKO-KOM a.s.
Na Pankráci 1685/17,19
140 21 Praha 4
or on web-pages www.ekokom.cz

PRESERVE IT CAREFULLY!

17 Warranty certificate and certificate of quality and completeness for the VIADRUS boiler

Production number of the boiler .....

Boiler name / power .....

User (name, surname) ....

Address (street, town, postal code).....

Telephone .....E-mail .....

Seller ..... Id. No.: .....

Place of business (street, town, postal code) .....

Telephone .....E-mail .....

Boiler manufacturer: VIADRUS a.s., Id. No.: 29400082, VAT No.: CZ29400082, with registered office: Bezručova 300 | 735 81 Bohumín, Czech Republic

The boiler meets requirements of corresponding standards.

The seller provides basic warranty period for the boiler for 24 months from the date when the boiler is handed-over to the User.

The following conditions have to be kept for the validity of the Basic warranty:

- mounting will be performed by a qualified mounting company or by a service company authorized by the manufacturer for this activity (see www.viadrus.cz),
- commissioning of the product will be performed by a service company authorized by the manufacturer for this activity; for certain types of boilers, commissioning can be also performed by an authorized mounting company (see www.viadrus.cz),
- observation of instructions specified in the Operation and installation manual of the boiler.
- performance of regular service inspections in a range specified by the manufacturer (see Manual for boiler operation and installation), by a service company authorized by the manufacturer for this activity.
- the use of only original spare parts specified by the manufacturer.
- sending information on commissioning of the boiler to the manufacturer (to be sent by the service or mounting company). Mainly, it is necessary to specify when and who commissioned the boiler and specify the precise address of the boiler operation.

The seller provides extended warranty period for the cast-iron heat-exchanger of the boiler for 10 years from the date when the boiler is handed-over to the User.

The following conditions have to be kept for the validity of the extended warranty:

- observance of the conditions for the validity of the basic warranty period for the whole period of the extended warranty,
- implementing of regular service inspections in a range specified by the manufacturer (see Manual for boiler operation and installation), by a service company authorized by the manufacturer for this activity.

The seller guarantees completeness of the boiler delivery.

The blank warranty certificate is not valid.

The user hereby confirms that:

- the commissioned and adjusted boiler showed no defect during a heating test,
- he/she received "Manual for boiler installation and operation" with a properly filled-in Warranty certificate and Certificate of quality,
- he/she was acquainted with servicing of the boiler.

……	……....	……
Sell-by date	Name, Id. No., signature and stamp of the seller	User's signature
……	……....	……
Date of mounting	Name, Id. No., signature and stamp of the seller	User's signature
……	……....	……
Date of boiler commissioning	Name, Id. No., signature and stamp of the service company	User's signature

Information on personal data processing

Company VIADRUS a.s., based in Bezručova 300, 735 81 Bohumín, Id. No.: 29400082, hereby, in accordance with the regulation of the European Parliament and the Council (EU) No. 2016/679 dated 27th April 2016, General regulation on protection of personal data (hereunder referred as the "GDPR Regulation"), informs that it processes personal data of the User as an administrator according to the GDPR Regulation.

Information on processing your personal data is presented in the Internet pages of www.viadrus.cz in Section "Personal data protection", namely in document "Principles of personal data protection for business partners and other persons".

The annex for the warranty certificate for the customer – the user

A record of performed warranty and after-warranty repairs			
Record date	**Performed activity**	**Qualified contractual service organization (signature, stamp)**	**Customer signature**

VIADRUS

Heat for your home
since 1888

VIADRUS U22 Economy

VIADRUS a.s.
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