

# VIADRUS

## VIADRUS U 22 C/D MANUAL FOR BOILER OPERATION AND INSTALLATION



## Contents:

page

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|     |  |    |
|-----|--|----|
| 1.  | Usage and advantages of the boiler .....   | 3  |
| 2.  | Technical data of the boiler .....   | 3  |
| 3.  | Description .....  | 5  |
| 3.1 | Construction of the boiler .....   | 5  |
| 3.2 | Regulating and security elements .....   | 6  |
| 4.  | Placing and installation .....   | 9  |
| 4.1 | Regulations and instructions .....   | 9  |
| 4.2 | Placing possibilities .....  | 9  |
| 5.  | Order, delivery and assembly .....   | 11 |
| 5.1 | Order .....  | 11 |
| 5.2 | Delivery and accessories .....   | 11 |
| 5.3 | Assembly techniques .....  | 12 |
| 6.  | Putting into operation – instructions for a contractual service organization .....         | 15 |
| 6.1 | Control operation before starting.....   | 15 |
| 6.2 | Putting the boiler into operation .....  | 15 |
| 6.3 | Boiler transformation from „solid fuels“ to „gas and liquid fuels“ and retroactively ..... | 15 |
| 7.  | User's boiler service.....   | 16 |
| 8.  | IMPORTANT NOTICE .....   | 17 |
| 9.  | Maintenance .....  | 17 |
| 10. | Instructions for product liquidation after its operating life .....                        | 18 |
| 11. | Warranty and defect liability.....   | 18 |

**Dear customer,**  
**thank you for buying the general – purpose VIADRUS U 22 boiler and thus showing belief in the company VIADRUS a.s.**

**At first read this operating manual (especially Chapter Nr.7 – User’s boiler service and Chapter Nr. 8 – Important notice) to get used to a proper usage with your new product from the very beginning. We request to maintain the further mentioned information and particularly to perform the prescribed annual checks by an authorized specialized company by which a long – time failure – free operation of your boiler - to your and our satisfaction - is secured.**

The boiler VIADRUS U 22 is a general – purpose cast iron sectional low – pressure boiler intended for burning of:

- |                |                                       |                                   |
|----------------|---------------------------------------|-----------------------------------|
| - solid fuels  | coke, anthracite, wood                | commercial marking VIADRUS U 22 C |
|                | wood (optionally coke and anthracite) | commercial marking VIADRUS U 22 D |
| - gas fuels    | natural gas                           | commercial marking VIADRUS U 22 P |
| - liquid fuels | boiler oil extra light – TOEL         | commercial marking VIADRUS U 22 N |

**Burning of other materials such as plastic is unallowable.**

## **1. Usage and advantages of the boiler**

Two and three – sectional size of the boiler VIADRUS U 22 is appropriate for heat source reconstruction in self – contained flats, for smaller residential and recreational facilities. Bigger sizes of the boiler meet the requirements of heating the family houses, shops, schools, etc.

The boiler is produced as hot – water with natural and forced circulation of heat water and operational overpressure to 800 kPa (8 bar).

The VIADRUS U 22 D boiler is different from the VIADRUS U 22 C boiler version by its enlargement of the stoke hole so that it is possible to burn even bigger clogs up to the average of 220 mm. By burning wooden logs the heat work difficulty is considerably reduced and the service quality is increased. The amount of ash is also substantially smaller and it is possible to further use it as fertilizer.

### **Advantages of the boiler:**

1. High operating life of cast iron exchanger and all other parts with respect to the quality of used materials.
2. Design approved in the long term.
3. Elaborate production technology on automatic forming lines with consistent and approved quality of the production process (ISO 9001, ISO 14 001).
4. Efficiency of coke and anthracite burning – 75 – 80 %, efficiency of wood burning – 75 %.
5. Simple service and maintenance.
6. Low demandingness for chimney draught
7. Power gradation according to the sections
8. Possibility of boiler transformation of burning of solid fuels to gas or liquid fuels or vice versa.

## **2. Technical data of the boiler**

**Chart Nr.1 Dimensions, technical parameters of the boiler VIADRUS U 22 C**

| Section number                               | pieces    | 2                                    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |  |
|--|-----------|--------------------------------------|------|------|------|------|------|------|------|------|--|
| Weight                                       | kg        | 198                                  | 218  | 252  | 282  | 312  | 347  | 377  | 417  | 448  |  |
| Water space volume                           | l         | 26,1                                 | 31,5 | 36,2 | 40,9 | 45,6 | 50,3 | 55,0 | 59,7 | 64,4 |  |
| Firing chamber volume                        | l         | 21                                   | 34   | 47   | 60   | 73   | 86   | 99   | 112  | 125  |  |
| Firing chamber depth                         | mm        | 149                                  | 244  | 339  | 434  | 529  | 624  | 719  | 814  | 909  |  |
| Diameter of smoke socket                     | mm        | 156                                  |      |      |      |      |      |      | 176  |      |  |
| Boiler dimensions: - height x width          | mm        | 974 x 520                            |      |      |      |      |      |      |      |      |  |
| - depth                                      | mm        | 560                                  | 655  | 750  | 845  | 940  | 1035 | 1130 | 1225 | 1320 |  |
| Water operating overpressure                 | kPa (bar) | 400 (4)                              |      |      |      |      |      |      |      |      |  |
| Testing water overpressure                   | kPa (bar) | 800 (8)                              |      |      |      |      |      |      |      |      |  |
| Hydraulic loss                               | -         | See picture Nr.1                     |      |      |      |      |      |      |      |      |  |
| Recommended heat water operating temperature | °C        | 60-90                                |      |      |      |      |      |      |      |      |  |
| Noise level                                  | dB        | Not exceeding the level of 65 dB (A) |      |      |      |      |      |      |      |      |  |
| Minimum chimney draught                      | mbar      | 0,12                                 | 0,14 | 0,16 | 0,18 | 0,20 | 0,22 | 0,24 | 0,26 | 0,28 |  |
| Boiler connections - heat water              |           | DN 50                                |      |      |      |      |      |      |      |      |  |
| - returnable water                           |           | DN 50                                |      |      |      |      |      |      |      |      |  |

**Chart Nr.2 Dimensions, technical parameters of the boiler VIADRUS U 22 D**

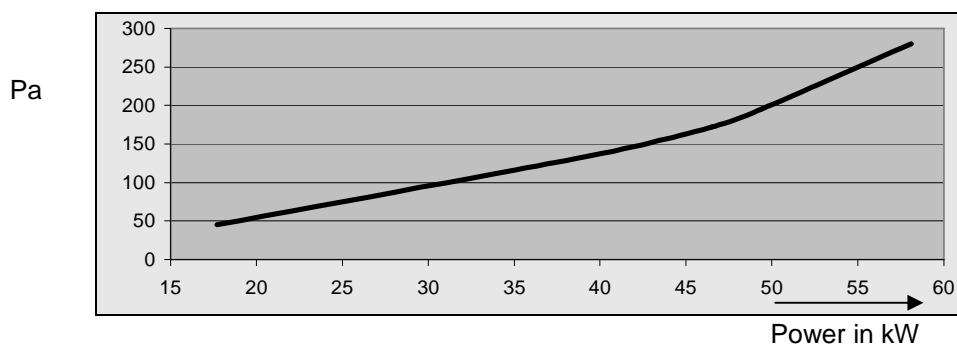
| Section number                               | pieces    | 4                                    | 5    | 6    | 7    | 8    | 9    | 10   |  |
|--|-----------|--------------------------------------|------|------|------|------|------|------|--|
| Weight                                       | kg        | 252                                  | 282  | 312  | 347  | 377  | 417  | 448  |  |
| Water space volume                           | l         | 36,2                                 | 40,9 | 45,6 | 50,3 | 55,0 | 59,7 | 64,4 |  |
| Firing chamber volume                        | l         | 47                                   | 60   | 73   | 86   | 99   | 112  | 125  |  |
| Firing chamber depth                         | mm        | 339                                  | 434  | 529  | 624  | 719  | 814  | 909  |  |
| Lightness of the stove - pipe                | mm        | 156                                  |      |      |      |      | 176  |      |  |
| Boiler dimensions: - height x width          | mm        | 974 x 520                            |      |      |      |      |      |      |  |
| - depth                                      | mm        | 750                                  | 845  | 940  | 1035 | 1130 | 1225 | 1320 |  |
| Water operating overpressure                 | kPa (bar) | 400 (4)                              |      |      |      |      |      |      |  |
| Testing water overpressure                   | kPa (bar) | 800 (8)                              |      |      |      |      |      |      |  |
| Hydraulic loss                               | -         | See picture Nr.1                     |      |      |      |      |      |      |  |
| Recommended heat water operating temperature | °C        | 60-90                                |      |      |      |      |      |      |  |
| Noise level                                  | dB        | Not exceeding tle level of 65 dB (A) |      |      |      |      |      |      |  |
| Minimum chimney draught                      | mbar      | 0,16                                 | 0,18 | 0,20 | 0,22 | 0,24 | 0,26 | 0,28 |  |
| Boiler connections - heat water              |           | DN 50                                |      |      |      |      |      |      |  |
| - returnable water                           |           | DN 50                                |      |      |      |      |      |      |  |

**Chart Nr. 3 Heat - technical parameters of the boiler at COKE and ANTHRACITE burning**  
granularity 30 – 60 mm heating value: 26 - 30 MJ. kg<sup>-1</sup>

| Section number                            |                      | 2        | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
|---|----------------------|----------|------|------|------|------|------|------|------|------|
| Rated power                               | kW                   | 11,7     | 17,7 | 23,3 | 29,1 | 34,9 | 40,7 | 46,5 | 52,3 | 58,1 |
| Efficiency                                | %                    | 75 - 80  |      |      |      |      |      |      |      |      |
| Orientation fuel consumption – coke       | kg.h <sup>-1</sup>   | 1,89     | 2,87 | 3,77 | 4,71 | 5,65 | 6,59 | 7,53 | 8,47 | 9,41 |
| Heating value – coke                      | MJ. kg <sup>-1</sup> | 27,8     |      |      |      |      |      |      |      |      |
| Orientation fuel consumption – anthracite | kg.h <sup>-1</sup>   | 1,98     | 3,0  | 3,95 | 4,93 | 5,92 | 6,9  | 7,88 | 8,87 | 9,85 |
| Heating value – anthracite                | MJ. kg <sup>-1</sup> | 28,31    |      |      |      |      |      |      |      |      |
| Product of consumption temperature        | °C                   | max. 280 |      |      |      |      |      |      |      |      |

**Chart Nr. 4 Heat technical parameters of the boiler at WOOD burning**  
humidity 15 - 25 % heating value: 12 - 15 MJ. kg<sup>-1</sup>

| Section number                     |                      | 4        | 5   | 6    | 7     | 8     | 9     | 10    |
|------------------------------------|----------------------|----------|-----|------|-------|-------|-------|-------|
| Rated power                        | kW                   | 20       | 25  | 30   | 35    | 40    | 45    | 49    |
| Efficiency                         | %                    | 75       |     |      |       |       |       |       |
| Orientation fuel consumption       | kg.h <sup>-1</sup>   | 6,4      | 8,0 | 9,59 | 11,19 | 12,79 | 14,39 | 15,67 |
| Heating value                      | MJ. kg <sup>-1</sup> | 15,01    |     |      |       |       |       |       |
| Product of consumption temperature | °C                   | max. 320 |     |      |       |       |       |       |



**Pict. Nr. 1 Hydraulic loss of the boiler drum**

### **3. Description**

#### **3.1 Construction of the boiler**

The main part of the boiler is the cast iron section boiler drum made of grey cast iron according to:

ČSN 42 2415 Grey iron 42 2415 with luminated graphite, or

ČSN 42 2420 Grey iron 42 2420 with luminated graphite

Pressure parts of the boiler correspond to the demands on solidity according to:

ČSN 07 0240 Warm-water and low-pressure steam boilers

ČSN 07 0245 Warm-water and low-pressure steam boilers. Warm-water boilers up to 50 kW output.

The boiler drum consists of sections with the help of pressured boiler nipples and is secured with boiler screws. The sections create burning and ash space, water space and a convective part. Heat water input and output are situated at the back part of the boiler.

The back section of the boiler has a smoky chimney – pot and a heat water flange in the upper part, and a returnable water flange with a socket for impregnating and clearing plug. Stoker and ash door and a firebox door under them are fixed to the front section.

The whole boiler drum is isolated with a stifling, mineral isolation that reduces losses by sharing heat into the surroundings. The steel jacket is fitted in colour with a quality comaxite paint.

At seven to ten – sectional size of the VIADRUS U 22 C boiler two tapes of medium sections are used: at the front part of the boiler the sections are without a molding and in the back part with a molding. The molding closes the burning space and carries back the flame and product of consumption from the back space to the front part of the boiler, i.e. by the back path in smoky draughts it is perfectly taken advantage of the product of consumption heat.

Number of sections without and with a molding is mentioned in the following chart:

**Chart Nr.5 Medium sections of the VIADRUS U 22 C boiler**

| Size of the boiler in sections   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------------|---|---|---|---|---|---|---|---|----|
| Medium section with a molding    | - | 1 | 2 | 3 | 4 | 4 | 5 | 5 | 6  |
| Medium section without a molding | - | - | - | - | - | 1 | 1 | 2 | 2  |

At the VIADRUS U 22 D boiler three types of medium sections are used: in the front part of the boiler (except the four – section size) there is a section with a recess for easier fuel inserting to the average up to 220 mm, then sections without a molding, in the back part with a molding. The molding closes the burning space and carries back the flame and product of consumption from the back space to the front part of the boiler, i.e. by the back path in smoky draughts it is perfectly taken advantage of the product of consumption heat.

**Chart Nr. 6 Medium sections of the VIADRUS U 22 D boiler**

| Size of the boiler in sections   | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------------------|---|---|---|---|---|---|----|
| Medium section with a recess     | - | 1 | 1 | 1 | 1 | 1 | 1  |
| Medium section with a molding    | 2 | 2 | 3 | 4 | 5 | 5 | 6  |
| Medium section without a molding | - | - | - | - | - | 1 | 1  |

### **3.2 Regulating and security elements**

The smoky flap of the smoky chimney – pot regulates the climb of the product of consumption from the boiler to the chimney. It is regulated with the handle with a rod in the upper left part of the boiler next to the stoker hole.

Stifling of the ash door regulates the inflow of the combustion air under the grate of the boiler. It is regulated by the draught governor or manually with an adjusting screw of the stifling.

The air rose of the stoker door serves for carrying the secondary air to the burning space. To control the rose it is necessary with respect to the higher surface temperature of the stoker door to use an instrument that is part of the delivered tools.

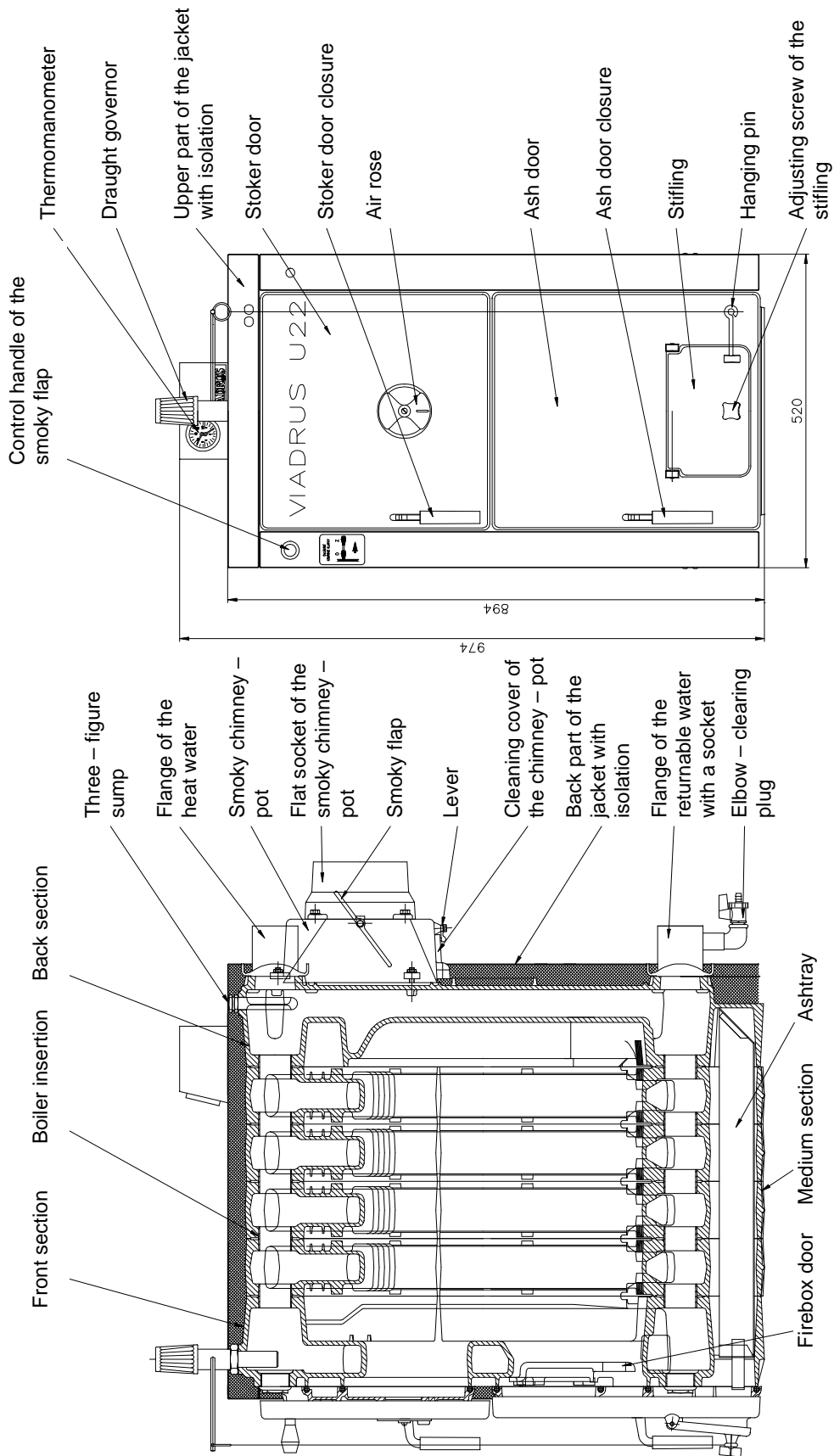
The cleaning cover of the smoky chimney – pot located in its bottom part serves for cleaning the embedded waste product caused by burning.

There are barriers of the smoky channel between the front and medium sections above the stoker hole of the boiler VIADRUS U 22 C. It serves for reducing the draw – away cross - section and for a better utilization of the product of consumption at the boilers of smaller power (2 – 5 sectional). They are used with a various cross – section width according to the sizes of the boilers in conformity with this chart:

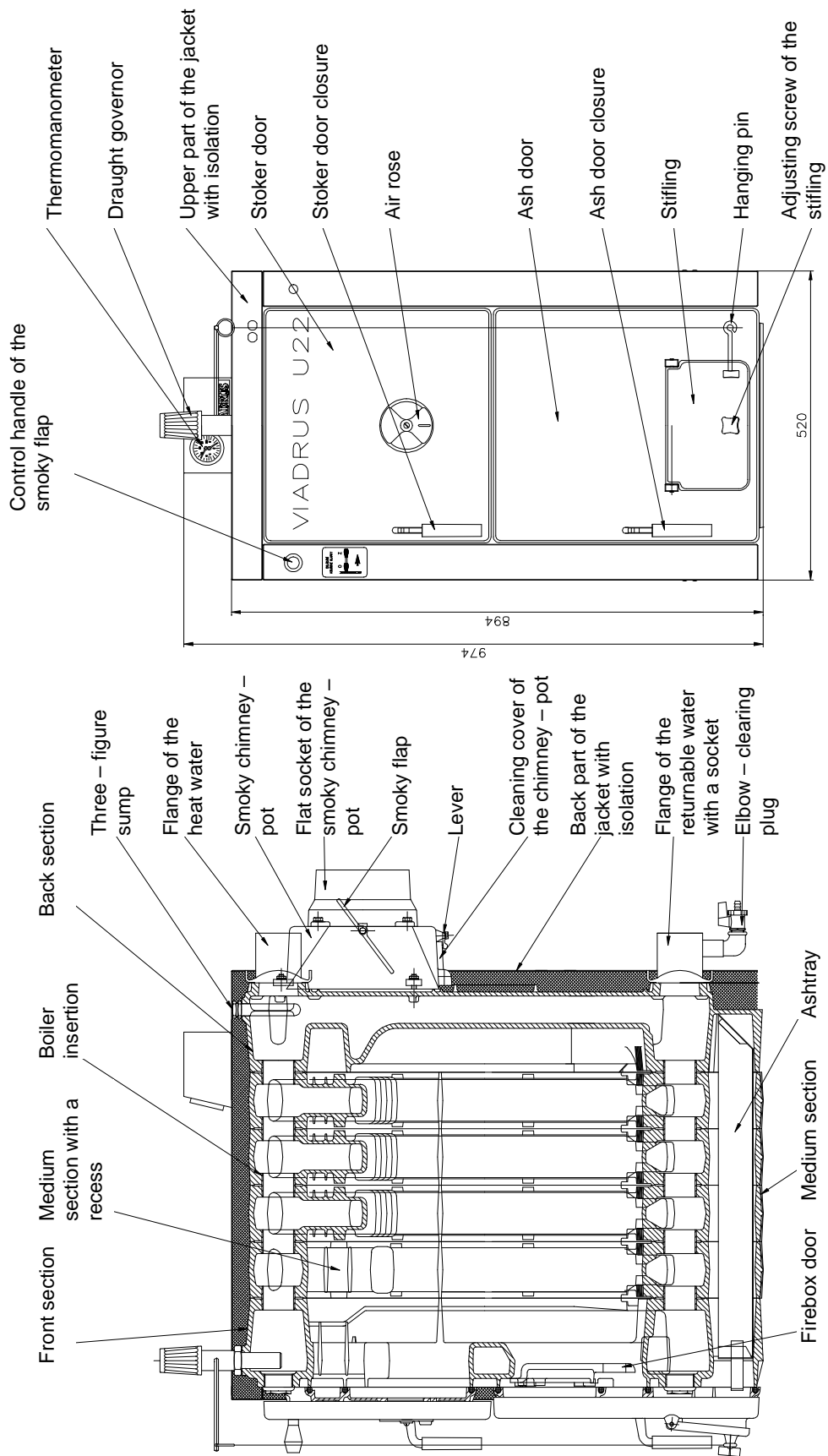
**Chart Nr.7 Barriers of the smoky channel of the VIADRUS U 22 C boiler**

| <b>Boiler section number (pieces)</b> | <b>Cross – section of the smoky channel width (mm)</b> | <b>Barrier number (pieces)</b> |
|---------------------------------------|--|--------------------------------|
| 2                                     | 12   | 2                              |
| 3                                     | 24   | 2                              |
| 4                                     | 36   | 2                              |
| 5                                     | 48   | 2                              |

A thermomanometer in the control box serves as an associated device for measuring the temperature of the heat water and water pressure in the heat system. The sump of the thermomanometer sensor is located in the upper part of the back boiler section.



Pict. Nr. 2 Design of the VIADRUS U 22 C boiler



**Pict. Nr. 3 Design of the VIADRUS U 22 D boiler**



## **4. Placing and installation**

### **4.1 Regulations and instructions**

The boiler for solid fuels can be installed by a company with a valid authorization to perform its installation and maintenance. For installation a project in accordance with valid regulations must be executed.

The heating system must be filled with water, that meets the ČSN 07 7401 requirements, especially its harness must not exceed the required parameters.

| Recommended values             |        |        |
|--------------------------------|--------|--------|
| Hardness                       | mmol/l | 1      |
| Ca <sup>2+</sup>               | mmol/l | 0,3    |
| Concentration of total Fe + Mn | mg/l   | (0,3)* |

\*) recommended value

**WARNING!!! The use of anti-freeze mixture is not recommended by the manufacturer.**

#### **a) to the heating system**

- ČSN 06 0310 Heating systems in buildings – Designing and installation
- ČSN 06 0830 Heating systems in buildings – protecting device
- ČSN 07 0240 Warm-water and low-pressure steam boilers
- ČSN 07 0245 Warm-water and low-pressure steam boilers. Warm-water boilers up to 50 kW output.
- ČSN 07 7401 Water and steam for thermal energy equipments with working pressure up to 8 MPa.

#### **b) to the chimney**

- ČSN 73 4201 Chimneys and flue gas ducting– designing, implementation and connection of fuel consumers.

#### **c) regarding the fire regulations**

- ČSN 06 1008 Fire safety of heat installations.
- EN 13501-1 + A1 Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests

#### **d) to the system of HWS heating**

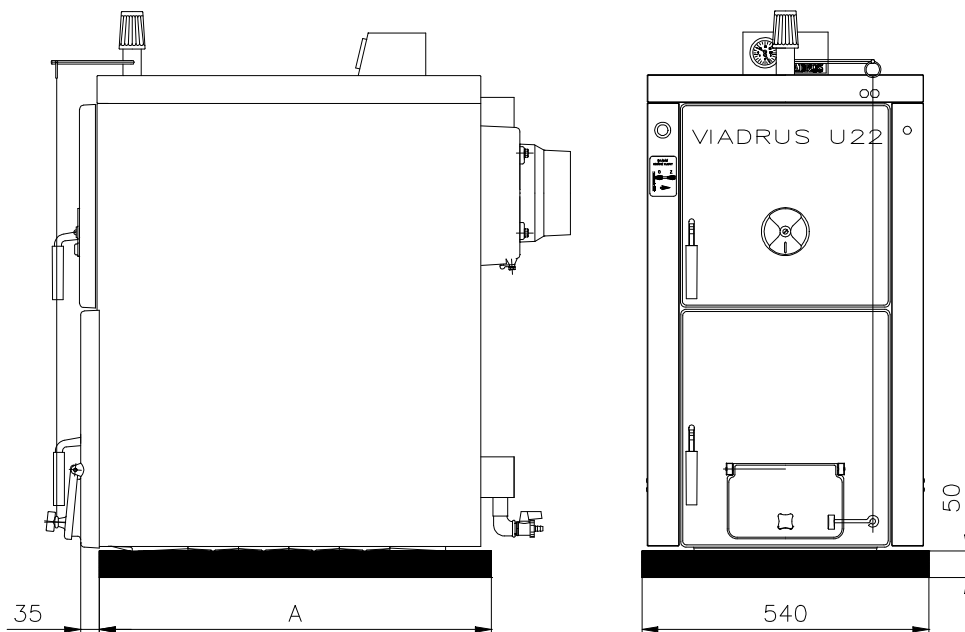
- ČSN 06 0320 Heating systems in buildings – Hot water preparation – Designing and planning
- ČSN 06 0830 Heating systems in buildings – Safety devices.
- ČSN 73 6660 House water plumbing

## **4.2 Placing possibilities**

The is approved for installation in non – residential spaces (for example – (cellar, corridor, etc.). The installation of the boiler must comply with all requirements of ČSN 06 1008.

#### ***Boiler placing with regard to fire regulations:***

1. Placing on floor of flame resistant material (Pic.4)
  - boiler to be put on a flame resistant backing exceeding the boiler platform over 20 mm at sides and only on the boiler drum depth.
  - if the boiler is situated in a cellar we recommend to place it on a bedding of minimum 50 mm height.
2. Safety distance from the 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 A1, A2, B and C (D);
  - for easily combustible materials of combustibility grade E (F), which quickly burn and burn themselves even after removal of ignition source (such as paper, cardboard, asphalt and tar paper, wood and wood-fiber boards, plastics, floor coverings) the safe distance has to be doubled, i.e. to 400 mm;
  - safe distance should be doubled as bulb where the grade of reaction to fire has not been proved.



| Section number | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10   |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| A [mm]         | 325 | 420 | 515 | 610 | 705 | 800 | 895 | 970 | 1085 |

Pict. Nr. 4 Bedding dimensions

Chart Nr. 8 Grade of reaction to fire

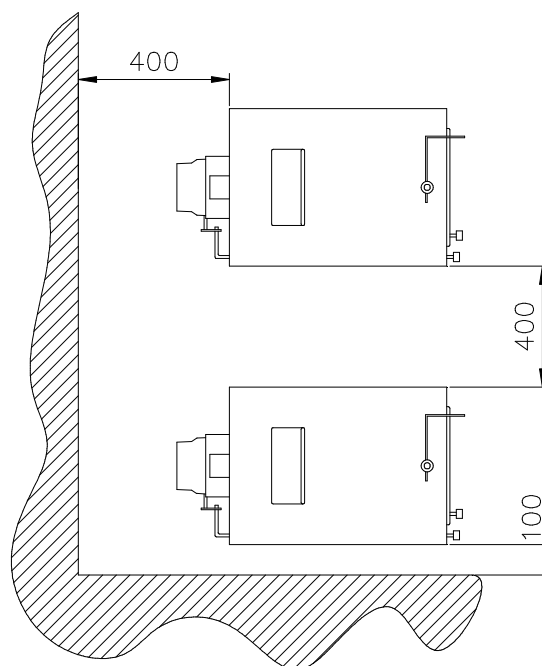
| Grade of reaction to fire        | Examples of building materials and products included in the reaction to fire<br>(Extract from EN 13 501-1 + A1) |
|----------------------------------|---|
| A1 – incombustible               | Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters, ...                           |
| A2 – combustible with difficulty | acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...                                 |
| B – hardly combustible           | Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...                                     |
| C (D) – medium combustible       | Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...                                      |
| E (F) – easily combustible       | Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...                |

**The boiler placing with respect to the necessary handling space:**

- basic surroundings of AA5/AB5 according to ČSN 33 2000-3
- handling space of minimum 1000 mm in front of the boiler must be maintained
- a minimum distance of 400 mm between the back part of the boiler and the wall
- to maintain space for access to the back part of the boiler of minimum 400 mm at least from one lateral face
- a minimum distance of 100 mm from the side wall

**Fuel placing:**

- it is disallowed to store fuel behind the boiler or to unload it beside the boiler in the distance smaller than 400 mm
- it is disallowed to store fuel between two boilers in a boiler room
- the producer recommends to keep distance of minimum 1000 mm between the boiler and fuel or to place the fuel to a another room than that where the boiler is installed



Pict. Nr.5 Boiler placing in a boiler room

## **5. Order, delivery and assembly**

### **5.1 Order**

**In the order the following is needed to be specified:**

1. Boiler design - VIADRUS U 22 C boiler  
- VIADRUS U 22 D boiler
2. Boiler size.
3. Demands on optional accessories.

### **5.2 Delivery and accessories**

The boiler is delivered according to the order in a manner that a complete boiler drum is located on the palette and a covered boiler jacket is fixed on the side. The accessories are stored inside the boiler drum and is available after opening the stoker hole. The boiler is covered in the transfer packing and must not be turned over during the transit, only a declination into sides for taking down of the boiler drum packing is allowed.

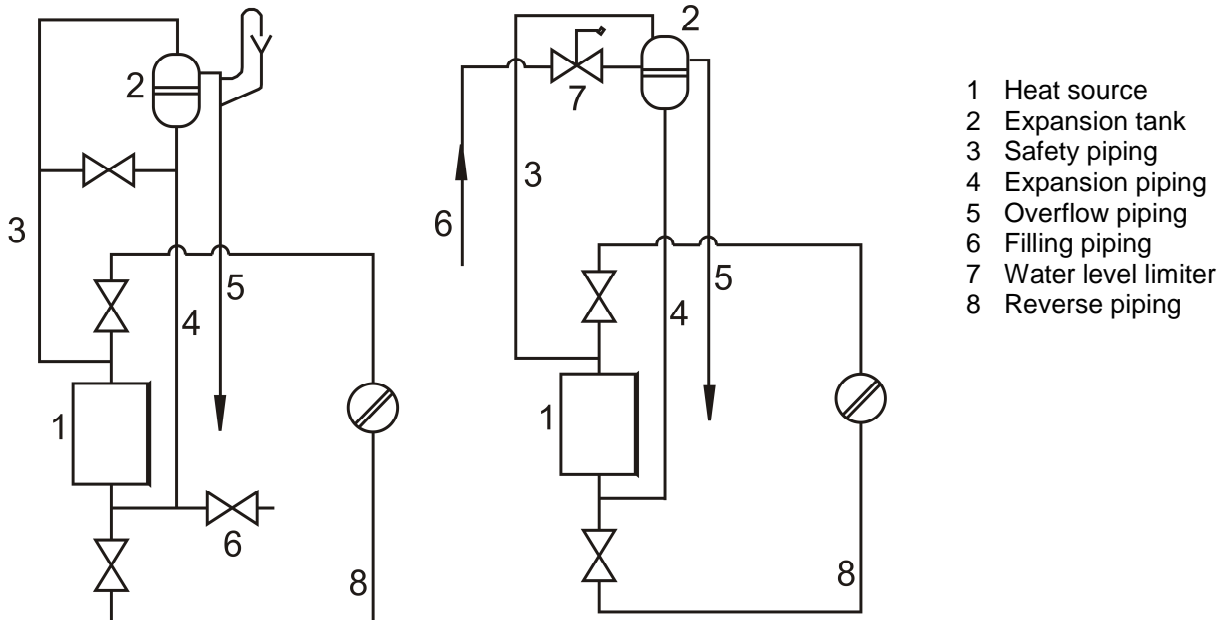
#### ***Standard accessories for the boiler:***

- cleaning tools (hook, brush with shaft, point, hanger)
- control box 1 piece
- thermomanometer 1 piece
- impregnating and clearing plug Js 1/2" 1 piece
- draught regulator complete 1 piece
- closure Js 6/4" 2 pieces
- rod with a control handle of the smoky flap 1 piece
- control label of the smoky flap 1 piece
- stifling screw 1 piece
- connecting pin of the jacket 4 pieces
- fan-shaped washer 5 4 pieces
- nut M5 4 pieces
- washer 10,5 8 pieces
- nut M10 8 pieces
- flexible pins 3 x 26 1 piece
- split pin 2,5 x 32 1 piece
- washer 10,5 3 pieces
- bushings HEYCO 2 pieces
- blind flanges 6 pieces
- screws into metal C 4,8 x 13 4 pieces
- flange of heat water DN 50 1 piece
- flange of returnable water DN 50 with a socket Js 1/2" for impregnating and clearing plug 1 piece
- well of thermostat 1 piece
- sealing  $\phi$  90 x 60 x 3 2 pieces
- operating key 1 piece
- hook 2 pieces
- socket 8 mm 2 pieces
- boiler operation and installation manual
- list of contract service organization

### 5.3 Assembly techniques

Every heat source in an open heat system must be connected with an open expansion tank positioned at the highest point of the heat system. The expansion tanks must be rated in the way that they can contain the changes in water volume resulting from heating and cooling.

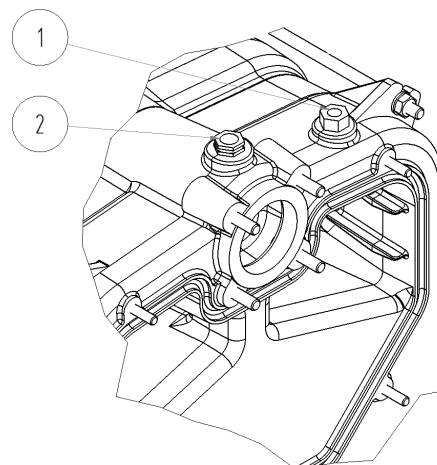
The open expansion tanks must be equipped with non-closable bleeder and a overflow pipes. The overflow pipe must be designed in the way that it safely drains off the maximum flow volume entering the system. This can be achieved by rating the overflow pipes by one DN higher than that of the filling piping. The expansion tanks and their connecting pipes must be designed and positioned in the way that freezing is reliably inhibited.



**Pic. Nr. 6 The examples of open expansion tanks connection**

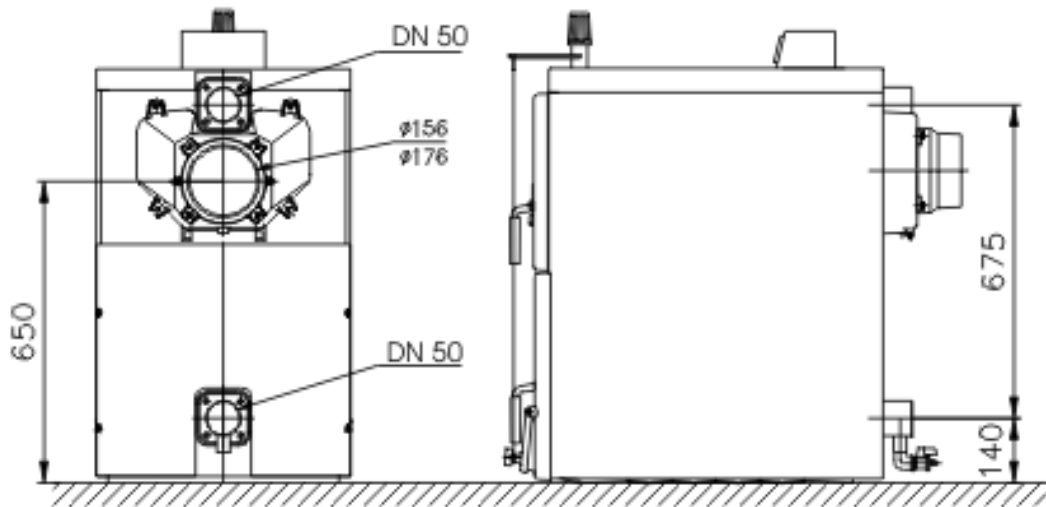
#### **Boiler drum installation**

1. Put the boiler drum on an embedding
2. Put a sealing  $\phi 90 \times 60 \times 3$  on the upper flange part of the back section and fix the flange of the heat water. The flange to be welded to the distribution of the heat water in advance.
3. Put a sealing  $\phi 90 \times 60 \times 3$  on the bottom flange part of the back section and fix the flange of the returnable water with a socket for impregnating and clearing plug. The flange to be welded to the distribution of the returnable water in advance.
4. An elbow with an impregnating and clearing plug to be screwed to the flange socket of the returnable water after connection of the boiler to the heat system.
5. Screw the well of thermostat into the hole in the top part of the rear section.



- 1 Check valve for the manometer
- 2 Well of thermostat

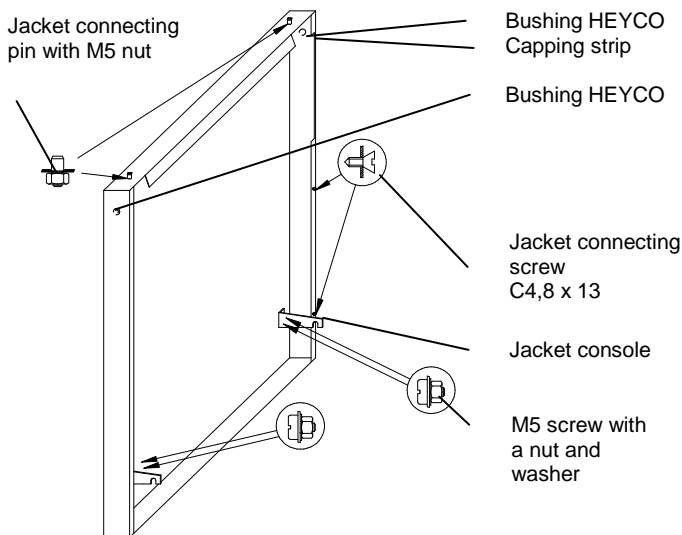
6. To put the stove – pipe to the smoky chimney - pot and penetrate it into the chimney hole
7. To screw the draught controller to the hole in the upper part of the front section
8. Two holes with a Js 6/4“ thread in the front section to blind with Js 6/4“ closures



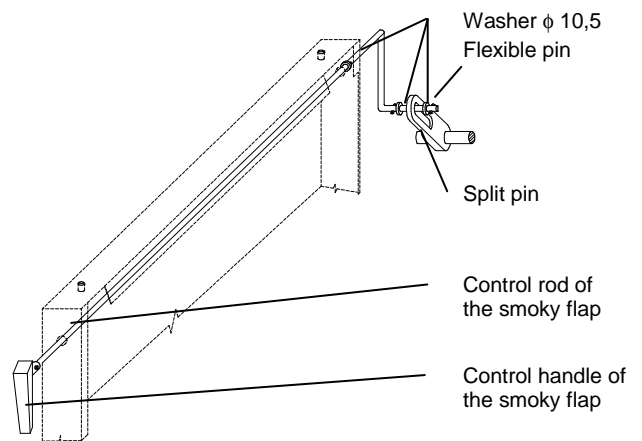
**Pic. Nr. 7 The boiler connecting dimensions**

### ***Jacket assembly***

1. Take the jacket off the cardboard packing
2. To sink the jacket side parts with an enclosed connecting material and fix it with brackets according to the picture nr. 8
3. To unloose the bottom anchor screws and put on the side jacket brackets. Insert the front brackets between the backings with nuts and front section body, the back brackets to be inserted directly to anchor screws.

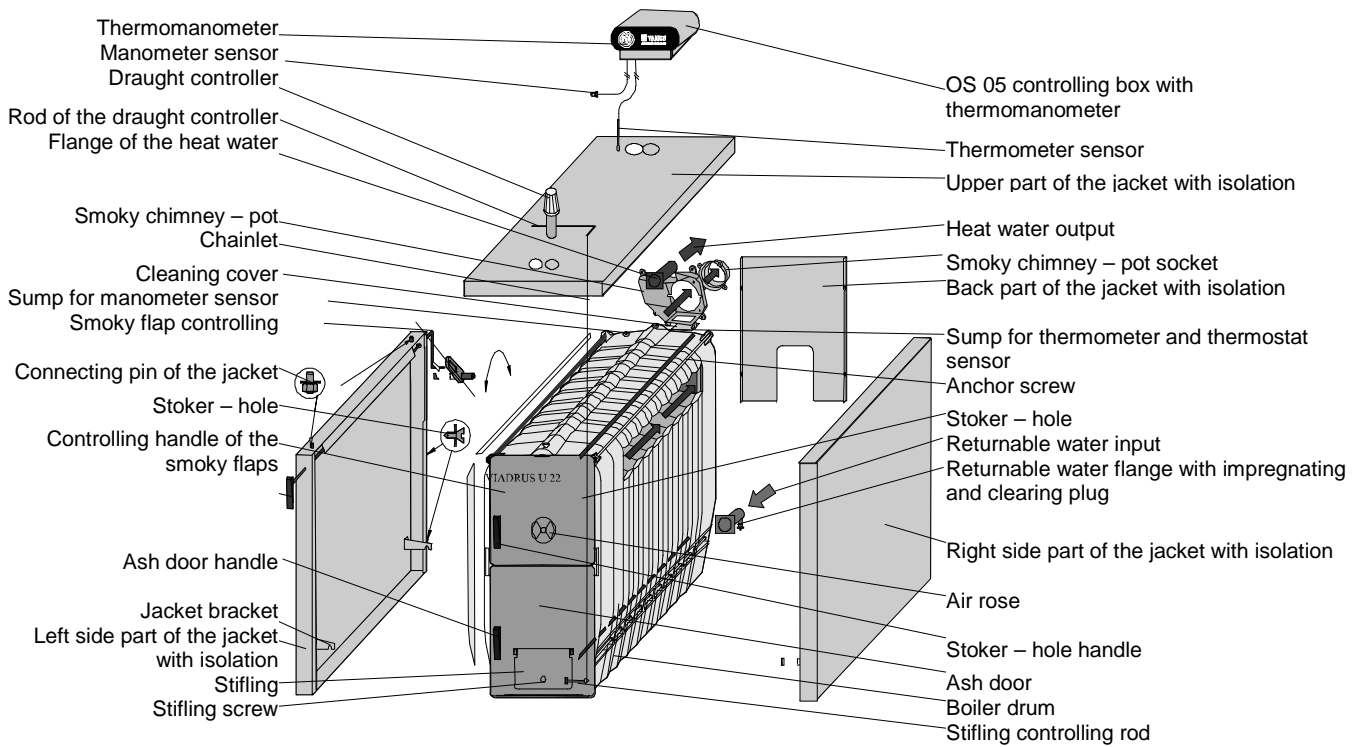


**Pict. Nr.8 Jacket side part**



**Pict. Nr.9 Smoky flap control**

4. Take out the isolation from the upper part of the jacket. Thermomanometer to be built – in to the control box and the aggregate to be screwed to the upper part of the jacket. Before putting on of the upper part of the jacket to the boiler it is necessary to put on the isolation back, insert the thermometer sensor to the thermometer sump and the manometer sensor to be screwed to the manometer sump.
5. To put on the back part of the jacket with isolation behind the screw – knobs C 4,8 x 13.
6. To complete the smoky flap control according to the pict. Nr. 9.
7. To screw the brush to the shaft socket.



**Pict. Nr. 10 Boiler jacket design**

### ***Filling of the heat system with water***

Water for filling of the boiler and the heat system must be pure and colourless, without suspended substances, oil and chemically aggressive substances. Its hardness must correspond to ČSN 07 7401 and in case it does not correspond it is necessary the water to be adjusted. Even multiplying heating of the water with higher hardness does not prevent from excluding of soils on the boiler drum walls. The precipitation of 1 mm of limestone reduces in the given place the heat transfer from metal to water by 10 %.

Heat systems with an open expansive tank allow direct contact of the heat water with atmosphere. In the heat period the expansive water in the tank absorbs oxygen that increases the rust effects and at the same time a considerable vaporization of water occurs. Only water adjusted to values according to ČSN 07 7401 can be used for fill – up. The heat system is needed to be rinsed so as all impurities have been washed out.

During heat period it is necessary to keep consistent water volume in the heat system. While filling – up of the heat system with water it is necessary to prevent the air from leeching onto the system. The water from boiler and heat system must never be impregnated or taken out for use except for cases necessarily needed such as repairs, etc. By draining the water and filling with new one the risk of rust and scale creation is increased. **If it is needed to fill water into the heat system we fill it only to a cooled down boiler to prevent section cracking.** After filling of the boiler and heat system checking of tightness of all joints is needed.

**The finishing of assembly and the heat test performance must be recorded in the warranty card.**

## **6. Putting into operation – instructions for a contractual service organization**

Putting the boiler into operation can be performed only by a contractual service organization authorized for performing of this operation.

### **6.1 Control operation before starting**

*Before starting the boiler it is needed to check:*

- a) filling the heat system with water (thermomanometer check) and system tightness.
- b) connection to chimney – **this connection can be performed only with consent of a relevant chimney company according to ČSN 73 4201.**

### **6.2 Putting the boiler into operation**

1. Performance of fire in the boiler.
2. Setting the boiler on the necessary operating temperature. The recommended temperature of the output water is 80 °C.
3. Adjustment of the draught controller chainlet length (according to the enclosed draught controller instruction).
4. Operating of the boiler in the operating condition according to the competent standards.
5. Repeatedly check the boiler tightness.
6. Introduction of the user with servicing.
7. Making a record into the Warranty card.

### **6.3 Boiler transformation from „solid fuels“ to „gas and liquid fuels“ and retroactively**

In case the user decides according to the situation to perform a transformation of its boiler from solid fuels to gas or liquid fuels, such transformation can be required only at contractual service company – organization approved for performing the operation that provides him with performance of such transformation with an appropriate operating test. Parts for transformation are delivered by the producer.

## **7. User's boiler service**

### **COKE, ANTHRACITE**

The optimal fuel is coke with granularity of 40 – 60 mm but it is possible to burn even coke and anthracite with granularity of 20 – 40 mm (nut 2). In case of sufficient chimney draught (0,15 to 0,25 mbar) it is possible to burn even non – caking anthracite with granularity of 30 – 50 mm (nut 1) and 50 – 80 mm (cobble)

### **WOOD**

To reach the rated power of the boiler it is necessary to keep a maximum humidity at wood of 20 %.

Cleaning of the grate is performed so as the hot fuel would not get through to the ashtray.

The fuel needs to be stored in dry conditions.

**Chart Nr. 9 Recommended dimensions of wooden logs**

| Section number   | 4           | 5   | 6   | 7   | 8   | 9   | 10  |
|------------------|-------------|-----|-----|-----|-----|-----|-----|
| Log average [mm] | φ 40 to 100 |     |     |     |     |     |     |
| Log length [mm]  | 270         | 360 | 450 | 540 | 630 | 720 | 810 |

Other sorts of wood such as wood clips, wood shavings, sawdust, granules or coal – cakes can be used as additional fuel. In case of heating with smaller clogs (wood clips, wood shavings, sawdust, granules) it is necessary to put logs in the bottom part of the burning chamber so as the fuel would not get through to the ashtray. It is possible to reach smoother burning by further interlaying of the fuel.

These sorts of fuel must have heating power in the range of 12 to 15 MJ.kg<sup>-1</sup> and humidity to 20 % to prevent from reducing of the mentioned boiler power.

### **Heating up**

1. Check the water volume in the heat system on the thermomanometer.
2. Open the closing armatures between the boiler and the heat system.
3. Clean out the grate, ashtray, smoky channels and boiler walls.
4. Spread out the kindling through the ash door with the stoker – hole on a cleaned grate along its entire depth.
5. Set the smoky flap in the chimney – pot to position – open and close the stoker door.
6. Set the kindling afire through open ash door and stoker door.
7. Close the stoker hole and ash door and fully open the stifling
8. Thinner layout of the basic fuel to be put up on the burning wood.
9. After its good burning up more fuel to be put up to the bottom part of the stoker hole, the fuel to be stacked to a uniform layout along its entire boiler depth.
10. As soon as the fuel grades to a dark red flame the air rose of the secondary air input on the stoker hole to be opened with an instrument.
11. After flames become yellow the air rose of the secondary air input to be closed.

### **Operation**

1. After reaching the heat water temperature the burning air input to be adjusted. The boiler power in rough limits is regulated with a chimney draught change with a help of the smoky flap in the chimney – pot. Smooth power regulation is performed by a stifling by which the air output under the grate is regulated, either manually or with a help of draught controller. The draught controller to be adjusted so as the stifling in the ash door is almost closed at the time when the heat water required temperature is reached.
2. According to heat needs and burning intensity the boiler is needed to be supplied with fuel during the operation. Feeding the fire so as the fuel layout was equally high along the entire boiler depth.
3. When using the anthracite it is necessary the air rose of the secondary air input in the stoker hole to be partly opened for the whole time of the build – up of gases and flames out of freshly fed fuel (the air rose of the secondary air input with regard to the surface temperature is necessary to be controlled with an instrument).
4. At change over to night still operation the grate to be cleaned out, the freshly fuel to be let well burnt up and then the boiler power to be suppressed by throttling of the chimney draught with chimney flap in the chimney – pot and by turning down the air rose of the secondary air input. The smoky flap and air rose opening level is necessary to be tried out, it is always necessary to make sure that the product of consumption did not get away to the boiler room. In this case the draught controller to be disconnected.
5. The morning boiler operation reconditioning to be performed by opening of the smoky flap and air rose and with grate raking after opening the ash door.
6. The ash door must be during the operation permanently closed.
7. The ashtray to be emptied according to needs (gloves need to be used).



## **8. IMPORTANT NOTICE**

1. The boiler only can be used for the purpose that it is destined for.
2. The boiler must be operated only by adults who are introduced to these operating instructions. It is unallowable to let children at the boiler unattended of adults. Interventions into the boiler design that could threaten the health of the operating staff, eventually the inmates, are disallowed.
3. The boiler is not destined for the use by persons (incl. children) whose physical, sensual or mental disability or lack of experience and knowledge prevent them from a safe use of the appliance unless they are supervised or if they were not instructed on the use of appliance by a person responsible for their safety.
4. Children should be supervised in order to ensure that they do not play with the appliance.
5. If there is a risk of rise and getting away of flammable steams or gas into the boiler room or at operations by which there is an intermediate risk of fire or blast (sticking of floor coverings, paintings with flammable colours), the boiler must be disabled from operation before the beginning of operations.
6. Using of flammable liquids is **DISALLOWED** for firing the boiler.
7. It is **DISALLOWED** to overheat the boiler during its operation.
8. Objects of flammable materials must not be put on the boiler and to a distance smaller than that of a safety distance from it
9. Flammable materials must not be in the minimal distance of 1500 mm from the boiler when emptying the ash at the boiler.
10. The space at the point of choking valve rotation of the ashtray door must be cleaned in case of clogging with fuel, ashes or other impurities in order to avoid its rubbing thus wrong functioning.
11. When the boiler operates at a lower temperature than of 60 °C the retting, or the so called low – temperature rust, of the boiler drum may occur that reduces the operating life of the boiler drum. Therefore we recommend to operate the boiler at a temperature of 60 °C or higher.
12. After finishing of the heating period it is necessary to properly clean the boiler, smoke stack and chimney – pot. The fulcrum pin, smoky flap mechanism and other movable parts to be covered with graphite grease. And the boiler room to be kept clean and dry.
13. In case the heating system is not daily used in winter season, then the water from boiler must be drained.
14. It is necessary to install a safety valve for maximum overpressure of 400 kPa (4 bar) on the system and its dimension must correspond to the rated boiler output. The safety valve must be located directly behind the boiler. Any stop valve must not be located between the safety valve and boiler. If you have any questions, please contact our contractual assembly firm and service organizations.
15. During assembly, installation and operation of the appliance it is necessary to comply with standards that apply in the relevant country of destination.

If you fail to meet these conditions you cannot requisite the guarantee repairs.

## **9. Maintenance**

1. The ash from the ashtray to be emptied during the operation of the boiler even several times per day according to the sort of used fuel because a full ashtray hampers the right distribution of the burning air under the fuel and causes unequal burning process of fuel on the grate. All remains in the firebox especially the clinker are removed before each new burning up and at morning boiler operation reconditioning. The ash is needed to be put away into the fire – resistant tanks with a cover. **It is necessary to use protective facilitations and to pay attention to personal safety while operating.**
2. The boiler walls inside the firebox, smoky boiler draughts and smoky chimney – pot to be cleaned 1x per month if heating with coke. The cleaning to be performed 1x per week when heating with anthracite.
3. If there is a settlement of tar silt on the walls of the burning space while using fuels with higher gas build – up it can be removed with a scraper or by burning out with a help of dry wood (eventually coke) when setting the boiler to the maximum operating temperature.

## **10. Instructions for product liquidation after its operating life**

**VIADRUS a.s. is contractual partner of firm EKO – KOM a.s. with client number F00120649.**  
The packages comply with ČSN EN 13427.

With respect to the fact that the product is designed out of common materials the individual parts are recommended to be liquidated in the following manner:

- exchanger (grey cast iron), by a company engaged in salvage and liquidation of waste
- tube distributions, jacketing, by a company engaged in salvage and liquidation of waste
- other metal parts, by a company engaged in salvage and liquidation of waste
- ROTAFLEX sealing materials in common waste

We recommend to dispose the packages in the following way:

- plastic foil, cardboard cover, use a salvage point
- metal strapping tape, use a salvage point
- wooden base, is designated for a single usage and no longer can be used as a product. Its disposal is subject to Act. 477/2001 Sb. a 185/2001 Coll.as amended.

**In case that the product has lost its manufacture qualities there can be taken the advantage of product taking back (if this is established), in case that the originator has declared that this is a waste and it must be handled according to the valid legislation of the relevant country.**

## **11. Warranty and defect liability**

**VIADRUS a.s. grants a warranty:**

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 5 years after the date its dispatch from the manufacturing factory.

The user is obliged to leave the boiler installation to an assembly company, putting into operation and defect removing only to a professional contractual service accredited by the boiler producer VIADRUS a.s. otherwise the warranty for proper boiler operation is not valid.

If the boiler is operated according to the instructions mentioned in the "Instructions for the boiler operation and installation", the boiler does not require any special professional service interventions.

"Certification of the quality and completeness of the VIADRUS U 22 boiler" serves for filling in by a contractual service organization as the "Warranty card".

For an eventual jacket reclamation is the customer obliged to submit a packing label of the boiler jacket. It is placed on the cardboard in which the jacket is expedited.

**The user is obliged to perform a regular control of the boiler – see Chapter 9.**

**Failing to keep the mentioned instructions the warrants provided by the producer are not granted.**

**Each notice of defect must be made immediately after its finding always in written form and by a phone agreement.**

**The grant does not apply for:**

- faults caused by improper assembly and improper attendance of the product and faults caused by improper maintenance see chap. 9;
- faults and damage caused by failure to observe water quality in heating system see chap. no. 4.1 and 5.3 or by using the anti-freeze mixture;
- faults caused by failure to observe instructions stated in this manual;
- defects caused by a wrong assembly or incorrect operation of the product;
- damage of the product during transfer or other mechanical damage;
- defects caused by improper storage.

**The producer grants the right for changes performed within the frame of product innovation that may not be included in this instruction.**

## Information for customer

|  |                      |
|--|----------------------|
| Packaging identification   | Assessment reference |
| PE Plastic sacks, folie, corrugated board, iron and plastic fix line |                      |

Identification of principal materials used. Paper, Polyethylene, iron, wood

### Part 1: Summary of assessment

| Standard/Report                        | Assessment requirement  | Claim | Note      |
|--|---|-------|-----------|
| 1.1 Prevention by source reduction     |   | YES   |           |
| 1.2 Heavy metals and                   | ensure below maximum permitted levels for components (CR 13695-1:2000)                                | YES   |           |
| 1.3 Other noxious/hazardous substances | ensure in compliance with (CR 13695-2:2002, EN 13428:2000)  | YES   |           |
| 2 Reuse                                | ensure reusability in all terms of the standard for the functional packaging unit (EN 13429:2000)     | NO    |           |
| 3.1 Recovery by material recycling     | ensure recyclability in all term sof the standard for the functional packaging unit (EN 13430:2000)   | YES   |           |
| 3.2 Recovery in the form of energy     | ensure that calorific gain is achievable for the functional packaging unit (EN 13431:2000)            | YES   | Iron - NO |
| 3.3 Recovery by composting             | ensure compost ability in all terms of the standard for the functional packaging unit (EN 13432:2000) | NO    |           |

NOTE Conformity with EN 13427 requires affirmative responses to sections 1.1; 1.2; 1.3 and to at least one of 3.1; 3.2; 3.3. In addition, where a claim of reuse is made section 2 should also record affirmative responses.

### Part 2: Statement of conformity

In the light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427:2000.









# VIADRUS

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