

# VIADRUS

## **VIADRUS EKORET** MANUAL FOR BOILER OPERATION AND INSTALLATION



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Dear customer,

We thank you that you have bought VIADRUS EKORET automatic solid fuel boiler and thus having shown your confidence in ŽDB GROUP a. s., VIADRUS division.

For you to get used to a correct way of handling your new product from the beginning, please read at first this manual for usage (mainly chapter no. 6 – Boiler operation by user and chapter no. 7 – Important cautions). Please follow the bellow stated information at once – and respect the producer's, eventually assembly company's which installed the boiler, instructions to be provided a longterm failure-free boiler operation to your satisfaction.

## 1. Boiler usage and advantages

The hot-water automatic solid fuel boiler VIADRUS EKORET is designated first of all for heating the houses, weekend houses, small premises, ect.

### Boiler advantages:

- Boiler automatic operation controlled by an indoor device providing a convenience
- HWS (hot service water) preparation possibility
- Possibility to burn the biomass in form of wooden pellets
- Mechanical fuel supply from the built-in reservoir
- Simple, time saving operation and maintenance
- Low operating costs
- Low emissions
- High efficiency

## 2. Boiler technical data

Tab. no. 1 Boiler dimensions, technical parameters

		VIADRUS EKORET 45	VIADRUS EKORET 25
Boiler weight including small reservoir	kg	359	385
Boiler weight including large reservoir	kg	392	418
Water space volume	dm <sup>3</sup>	34,125	45,5
Diameter of smoke socket	mm	150	150
Fuel reservoir capacity – small	dm <sup>3</sup>	269	269
Fuel reservoir capacity – large	dm <sup>3</sup>	528	528
Boiler dimensions (including small fuel reser.): width x depth x height	mm	1218 x 693 x 1592	1218 x 693 x 1592
Boiler dimensions (including large reser.): width x depth x height	mm	1867 x 693 x 1592	1867 x 693 x 1592
Filling hole dimensions – small reservoir	mm	422 x 545	422 x 545
Filling hole dimensions – large reservoir	mm	422 x 1210	422 x 1210
Working water overpressure	kPa	250	250
Testing water overpressure	kPa	500	500
Recommended operating temperature of heating water	°C	65 - 80	65 - 80
Minimum return water temperature	°C	60	60
Hydraulic resistance collector		2,015	2,015
Noise level	dB	Doesn't exceed level 65 dB (A)	
Chimney draught	Pa	10 – 20	10 – 20
Boiler connections – heating water	Js	G 1 1/2"	G 1 1/2"
– return water	Js	G 1 1/2"	G 1 1/2"
Connecting voltage		1/N/PE AC 230 V ~ 50 Hz TN - S	
Electric input (fan + motor)	W	230	
Electric coverage		IP 20	

**Tab. no. 2a) Heating technical parameters of VIADRUS EKORET 15 boiler**

		HARD COAL	SOFT COAL	WOOD PELLETS
Nominal output	kW	15	15	15
Fuel consumption	kg.h <sup>-1</sup>	2,58	3,34	3,8
Fuel efficiency	MJ.kg <sup>-1</sup>	25,16	19,17	16,78
Fuel consumption in the holding regime	kg.h <sup>-1</sup>	0,13	0,10	0,70
Burning time at nominal output – small reservoir	h	67 h 40 min	52 h 30 min	41 h 50 min
Burning time at nominal output – large reservoir	h	132 h 49 min	103 h	82 h 7 min
Efficiency	%	Up to 83,2	Up to 84,3	Up to 84,7
Flue gas temperature	°C	160	160	160
Flue gas mass flow at nominal output	g.s <sup>-1</sup>	15,97	18,00	18,01
Feeding (parameter u 1)/ afterburning (parameter u 2) nominal output		5/38	5/35	6/30
Feeding (parameter c 2)/afterburning (parameter u 3) for holding regime		5/30	5/30	15/5
Boiler class		3	3	3

**Tab. no. 2b) Heating technical parameters of VIADRUS EKORET 25 boiler**

		HARD COAL	SOFT COAL	WOOD PELLETS
Nominal output	kW	25	25	22
Fuel consumption	kg.h <sup>-1</sup>	4,14	5,35	5,45
Fuel efficiency	MJ.kg <sup>-1</sup>	25,16	19,17	16,78
Fuel consumption in the holding regime	kg.h <sup>-1</sup>	0,13	0,10	0,70
Burning time at nominal output – small reservoir	h	40 h 30 min	31 h 20 min	25 h 10 min
Burning time at nominal output – large reservoir	h	79 h 30 min	61 h 30 min	49 h 24 min
Efficiency	%	Up to 86,4	Up to 87,7	Up to 86,6
Flue gas temperature	°C	190	160	200
Flue gas mass flow at nominal output	g.s <sup>-1</sup>	16,04	17,64	16,18
Feeding (parameter u 1)/ afterburning (parameter u 2) nominal output		5/25	5/20	10/20
Feeding (parameter c 2)/afterburning (parameter u 3) for holding regime		5/30	5/30	15/5
Boiler class		3	3	3

**! Important notice:**

The above mentioned values vary according to the type, quality and moisture of the fuel used. Therefore there may be necessary corrections at setting of feeding time (proportion of fuel feeding and fuel afterburning time). For example, if there occur the sliver parts of fuel on the fire grate and in the ash pan, it is evident, that the speed of feeding is higher than the speed of afterburning, in this case it is necessary to decrease the feeding cycle.

**Specified fuel parameters – fuel which was tested by SZÚ:**

- Granularity 5 - 25 mm
- Recommended heating value > 15 MJ. kg<sup>-1</sup>
- Ash content max. 15 %
- Water content max. 12 % (hard coal, wood pellets), max. 20 % (brown coal)
- Volatile combustible content 28 - 40 %
- Ash deformation temperature by melting > 1150 °C
- Low agglutinating power
- Low creeping

Values state in fig. no. 1 and Fig. no. 2 were measured out by using the specified fuel in tests.

**Tab. no. 3 Specified fuel**

Fuel	Type of fuel	Granularity [mm]	Heating value [MJ.kg <sup>-1</sup> ]
Hard coal	Bean	10 - 18	21 - 27
Soft coal	Nut 2	10 - 25	16,5 – 19,5
Biomass	Wood pellets	Ø 6 - 8	15 - 19

**Tab. no. 4 Specified fuel – lignite (automatic operation)**

Fuel	Granularity [mm]	Heating value [MJ.kg <sup>-1</sup> ]	Ash content [%]	Water content [%]	Content of sulphur [%]	Specific sulphur content [g/MJ]	Content of tar in dry matter [%]	content of tar in combustible matter [%]
Soft coal - Nut 2	10 - 25	17,6	9,8 (in anhydrous condition)	max. 20	0,77	0,44	15,1	15,71

**The pellets must comply at least with on of the following directions or standards:**

- Direction no. 14-2000 MZP ČR
- DIN 517 31
- ÖNORM M 7135

Specified pellets granularity: between 6 and 8 mm

Maximum fuel water content. 12%.

Ash content max. 1,5 %

**WARNING! A poor quality of fuel can markedly negatively affect the boiler output and emission parameters**

### **3. Description**

#### **3.1 Boiler construction**

The pressure parts of boiler correspond to the strength requirements according to:

EN 303-5 Heating boilers – Part 5: Heating boilers for solid fuele, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking

The main part of the boiler is a boiler body (3-sectional, 4-sectional), that stands on a welded pedestal made from steel sheets. There are 8 pcs. of turbulators in the channels of the cast iron body. In case of any necessity of boiler draught increase, for flue gas temperature reduction a number of turbulators can be reduced. The burner with a mixer is placed under the cast iron body (fig. no. 3), that is formed by cast iron grate, ceramic plates and retort. Fuel supply is provided from reservoir with a screw feeder through retort on the cast iron grate. Ceramic plates regulate burning, they reduce a dustness, they baffle a heat back to the burner and abet to a complete combustion. The retort for fuel supply is equipped with outlets for equalization of pressure of combustion air inside the burner, whereby they protect any flashover into the feeder at burning process. In case of using the wooden pellets as the fuel you must blind these holes by using 4 pc setscrews M12 x 16.

There is place under the combustion chamber the ashtray. Beside the boiler there is placed the fuel reservoir, joining to the screw conveyor equipment.

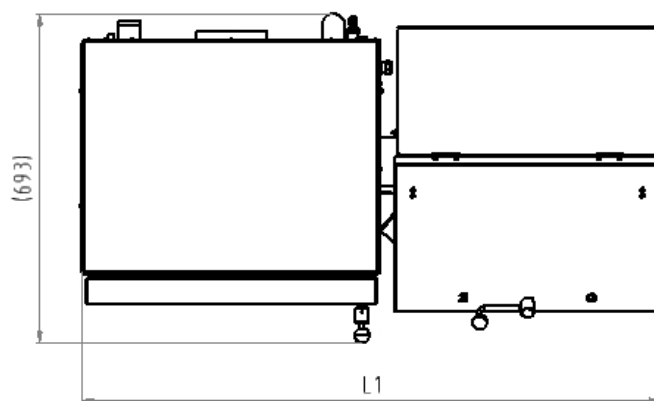
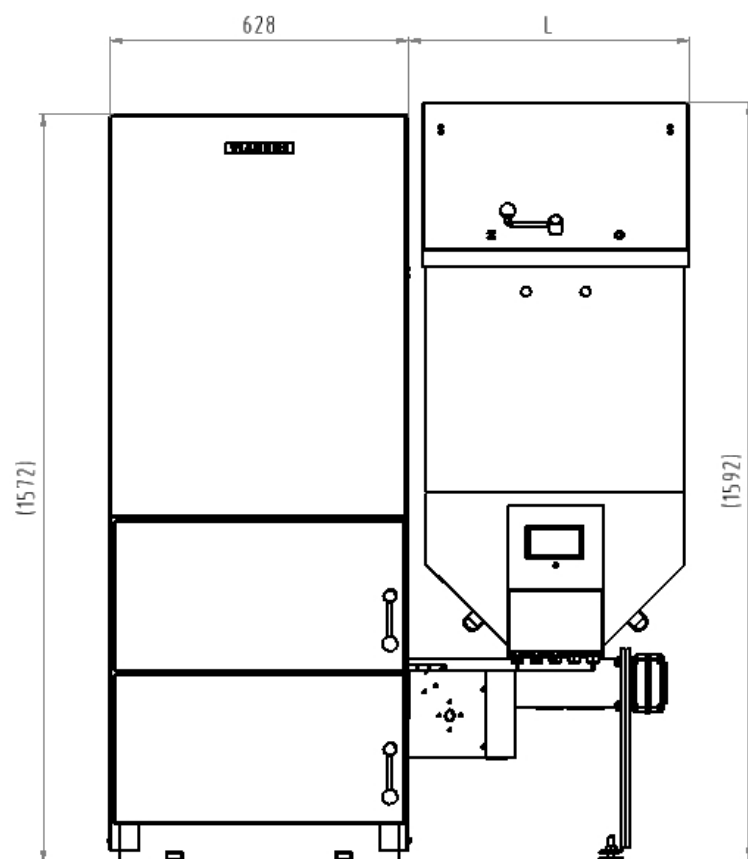
The combustion air fan is placed in front of the fuel reservoir and is connected to the burner. By using the choking valve it is possible to regulate the combustion air quantity.

The heating water inlet and outlet is placed in the back part of boiler and it is made of two flanges with external threads G 1 ½", for the connection to the heating system. There is a sealing between the boiler and flange made from temafast Ø 60 x 48 x 2 mm. The threaded terminal G ½" serves for installation of discharging cock. The smoke adapter to flue gas exhaust to the chimney is placed in the back upper part of boiler.

All parts (boiler shell, pedestal) are insulated by health harmless mineral insulation which reduces the losses caused by the heat transmission to the environment.

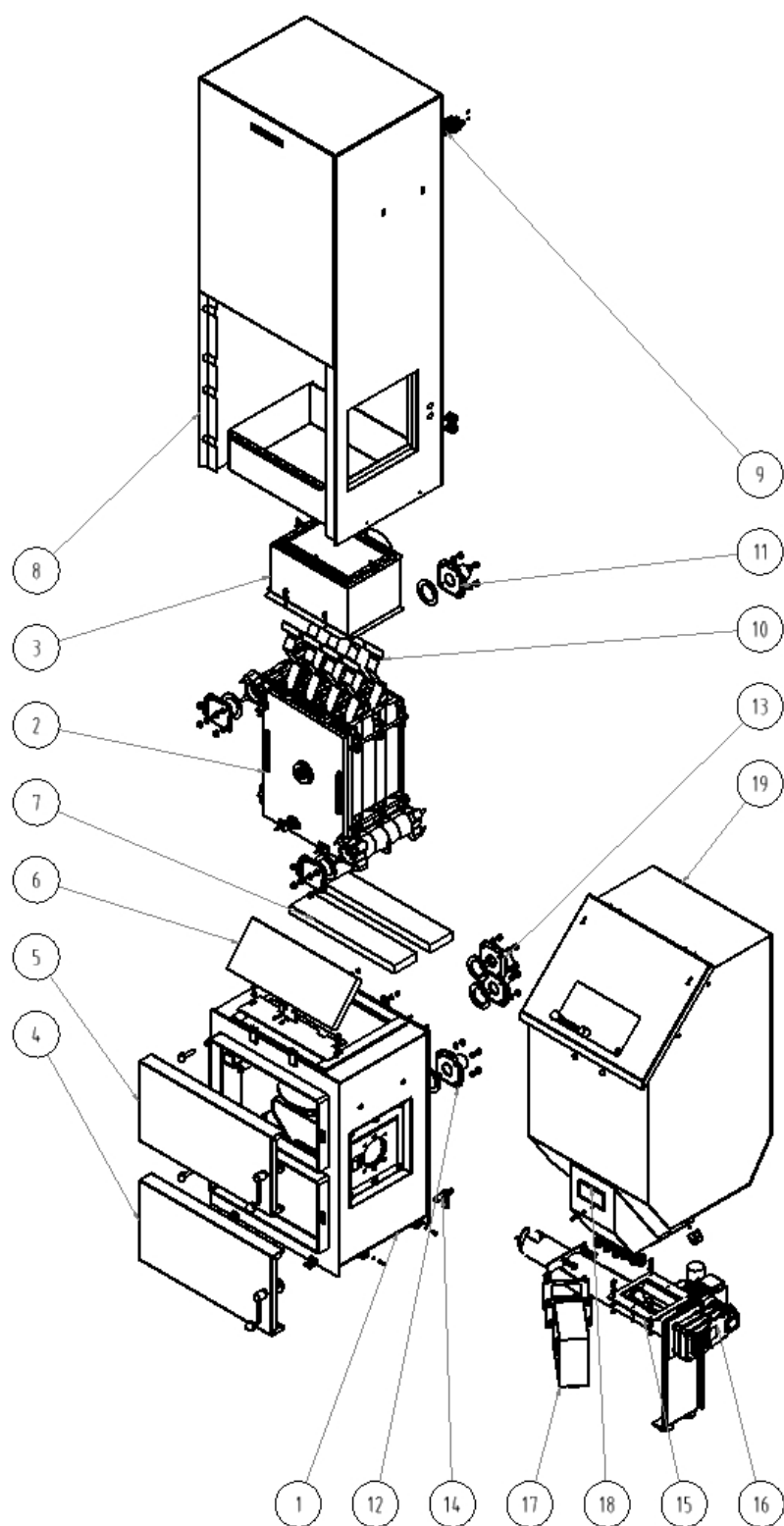
The boiler shell is coated by the high quality komaxit.

The boiler is made either in left-hand or right-hand version.



Length	Small reservoir	Large reservoir
L [mm]	590	1239
L1[mm]	1218	1867

**Fig. no. 1 Main dimensions of VIADRUS EKORET boiler (right version)**



- 1 – The stand with the burner-
- 2 – Cast iron boiler drum
- 3 – Smoke adapter
- 4 – Ash door
- 5 – Ash door
- 6 – Ceramic plate
- 7 – Ceramic plate 1
- 8 – Boiler shell
- 9 – Safety thermostat
- 10 – Turbulators

- 11 – Heating water flange
- 12 – Return water flange
- 13 – Arch welder
- 14 – Filling and discharge cock 1/2"
- 15 – Fuel feeder
- 16 – Motor with gearbox
- 17 – Ventilator
- 18 – Boiler regulator
- 19 – Fuel reservoir

**Fig. no. 2 Main parts of VIADRUS EKORET boiler (right version)**

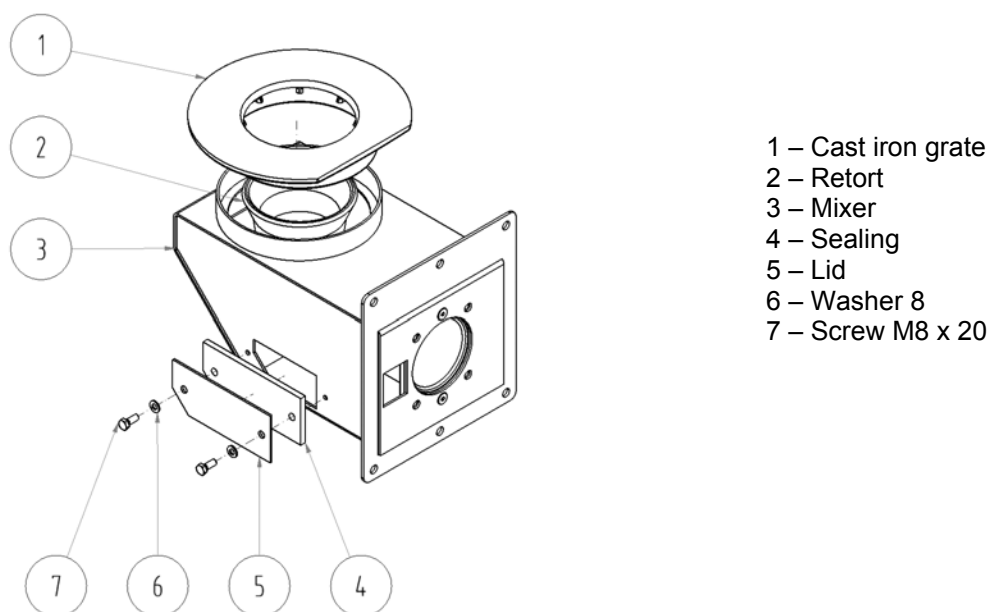


Fig. no. 3 Burner with a mixer

### 3.2 Control, regulation and safety elements

**Boiler regulator** G-403-M12340T-P02 (display specification G-403-P02RB) is intended for the boiler regulation and it is equipped with

- Temperature sensors for
  1. the outlet water temperature measurement.
  2. fuel feeder temperature measurement – **ATTENTION! It must be activated!!!**
  3. water temperature in water heater measurement.
- Control (digital) input:  
For thermostat connection that can control an element transition to the state of keeping with a circulation pump
- four outlets:  
enabling direct connection of appliances working under 230 V voltage, f. e.:
  1. fan with choking flap
  2. fuel feeder
  3. circulating pump (Central Heating – CH)
  4. water heater pumping device

**Regulator technical data:**

Working voltage	-	230 V + 10 % - 15 %
Temperature	-	from +5 °C to + 40 °C
Moisture	-	from 20 % to 80 % RH
Coverage	-	IP 65 on front side of control element

**The total load on the additional appliances cannot exceed 10 A**

**Emergency thermostat** is placed on the back part of shell and it serves for boiler shut-down when exceeding the safety temperature. It must be set to temperature of 100 °C, it means the higher temperature than is possible to set as required boiler temperature. When the boiler thermostat switches on there is lights the signaling pilot-light of emergency thermostat (H1). The fuel feeder and fan is stopped. The emergency thermostat de-locking must be done manually.

In case of repeated emergency thermostat switch-off it is necessary to shut-down the boiler and the reason of repeated boiler overheating must be investigated. After the emergency thermostat switch-on the circulating pump keeps working.

**Programmable regulator** - the digital programmable indoor device (f.e. HONEYWELL CM 707) designed for automatic regulation of heating the houses and flats.

- 7-day heating schedule
- 4 limited times during the day with an individual temperature, setting range 5 – 35 °C with a step of 0,5 °C
- Programmable anti-freeze protection during the period when the object is not used
- Holiday program for 1 – 99 days



- Information on the actual and required room temperature
- Supply by batteries
- Installation on the wall

**CAUTION! Only a potential-free contact can be used for the boiler control.**

**Temperature sensor on the screw tube** – as soon as the fuel burns in the screw, the sensor instructs the boiler regulator which disconnects the fan and simultaneously makes the screw feed (10 min.) so that the burning fuel in the screw is pushed out into the ash-tray. In case of sensor failure this state comes namely by reason of security. This security systems works only if the boiler is fed by electricity.

The pressure gauge must be installed in the system. We recommend a manometer – type 50 (400 kPa) with a back connection from the company Regulus.

### **3.3 Accessories**

#### ***Standard accessories:***

- Boiler shell with a pedestal
- Fuel feeder set
- Fuel reservoir
- Electron tube cover with a regulator
- Choking fan
- Screw with a cup head and cross-slot M6 x 16 (4 pc.) for fan gripping to the flange of feeder
- Washer 6,4 (4 pc) for ventilator mounting to the flange of feeder
- Nut M6 (4 pc) for ventilator mounting to the flange of feeder
- Safety thermostat
- Screw with a cup head and cross-slot M4 x 6 (2 pcs.) for safety thermostat gripping
- SK tape (2 pcs.)
- Boiler jacket including ash-tray
- Screw ST 4,8 x 13 (11 pcs.) for gripping of jacket back part
- Ceramic plates (3 pcs.)
- Clearing brush
- Binding material
- Distance clamp (2 pcs.)
- Screws ST 4,8 x 13 (4 pcs.) for distance clamp gripping
- Inlet Spiroflex SFM 20 (2 pcs.)
- Inlets PG 9 (2 pcs.)
- Plugs Ø 15,9 (3 pcs.)
- Hexagon screws M10 x 20 (4 pcs.) and washers 10 (4 pcs.) for gripping of fuel feeder set to the pedestal
- Hexagon screws M8 x 20 (4 pcs.) and washers 8 (4 pcs.) for gripping of fuel reservoir to the fuel feeder
- Inlet and outlet valve 1/2 "
- Setscrew with integral hexagon M12 x 16 (4 pcs)
- Silicon sealant – a tube 310 ml
- Boiler operation and installation manual, a guarantee list is its part
- List of contract service organization
- Thermostatic valve TS 130 (STS 20) (1 pc)

#### ***Optional:***

- Digital indoor device (according to VIADRUS division offer)
- Circuit pump UPS 25-40
- Water heater (see the VIADRUS division offer)
- HWS sensor (2,4 kΩ/23 °C) - sensor GECO
- manometer type 50 (400 kPa) with a back connection from the company Regulus

**The optional boiler equipment is not included in the boiler standard price.**

## **4. Positioning and installation**

### **4.1 Rules and regulations**

A solid fuel boiler can only be installed by a firm holding a valid concession for boiler installation and maintenance.

A project according to the valid regulations must be prepared for the installation.

The heating system must be filled with water, that meets the ČSN 07 7401 requirements, especially its hardness 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 7401	Water and steam for thermal energy equipments with working pressure up to 8 MPa
EN 303-5	Heating boilers – Part 5: Heating boilers for solid fuele, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking

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

ČSN 73 4201	Chimneys and flue gas ducting– designing, implementation and connection of fuel consumers.
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#### **c) regarding the fire regulations**

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

#### **d) to the electrical network**

ČSN 33 0165	Electrical regulations. Marking the conductors with colours or digits. Implementing regulations.
ČSN 33 1500	Electrical regulations. Electrical equipments revision
ČSN 33 2000-3	Electrical regulations. Electrical equipments Part 3: Setting the basic characteristics.
ČSN 33 2000-4-41	Electric equipments: part 4: Safety chap. 41: Protection against electrical accident.
ČSN 33 2000-5-51 ed.2	Electrical regulations. Electrical equipments construction.
ČSN 33 2130	Electrical regulations. Internal wiring.
ČSN 33 2180	Electrical regulations. Connection of electrical devices and appliances.
ČSN 34 0350	Electrical regulations. Regulations for mobile connections and cord extension sets.
EN 60079-10	Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas.
EN 60 252-1	AC motor capacitors – Part 1: General – Performance, testing and rating – Safety requirements – Guide for installation and operation.
EN 60 335-1 ed.2	Household and similar electrical appliances – Safety – Part 1: General requirements.
EN 60 335-2-102	Household and similar electrical appliances – Safety – Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections.
EN 60445 ed. 3	Basic and safety principles for man – machina interface, marking and identification – Identification of equipment terminals and conductor terminations
EN 60446	Basic and safety principles for man – machina interface, marking and identification – Identification of conductors by colours or numerals

#### **e) 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 Positioning possibilities

The boiler is equipped with a movable mains supply and a plug. The boiler must be according to EN 60 335 – 1 ed. 2 Art. 7.12.4 positioned in a way making sure that the plug is accessible.

*Boiler positioning with regard to the fire regulations:*

### 1. Positioning on the floor made of incombustible material

- The boiler can be installed on a fireproof and thermally insulating bottom which exceeds the boiler platform by 20 mm on the sides.
- If the boiler is installed in a cellar, we recommend to install it on a minimum 50 mm high retaining wall (bedding). The boiler must be installed straight, possible unevenness of the retaining wall can be eliminated by means of the engine bed regulation screw.

**Tab. no. 5 Combustibility grade of building materials and products.**

Combustibility grade of building materials and products	Building materials and products ranked in combustibility grade (EN 13 501-1 selection)
A – incombustible	Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters,....
B – combustible with difficulty	Acumin, izumin, heraklit, lignos, boards and basalt wools, fiberglass boards,.....
C <sub>1</sub> – hardly combustible	Beech and oak wood, hobrex boards, plywood, werzalit, formica, sirkolit,....
C <sub>2</sub> – medium combustible	Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,.....
C <sub>3</sub> – easily combustible	Asphaltboard, fireboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,....

### 2. Safety distance from the combustible materials

- When installing and operating the boiler it is necessary to keep a safety distance 200 mm from combustible materials with combustibility grade B, C<sub>1</sub> a C<sub>2</sub> (dle ČSN 06 1008)
- For easily flammable materials with combustibility grade C<sub>3</sub>, which burn quickly and by themselves, also after the ignition source removal (like. Paper, millboard, stiff paper, asphalt and tar boards, wood and fireboards, plastics and flooring materials) the safety distance is doubled, it means to 400 mm
- The safety distance it is necessary to double also in case that the combustibility grade of building material wasn't proved.

*Boiler positioning with regard to the necessary handling space:*

- Basic environment AA5 / AB5 according to ČSN 33 2000-3
- In front of the boiler there must be left a minimum handling area of 1000 mm
- The minimum distance between the rear part of boiler and wall 400 mm.
- On the side of fuel reservoir there must be left min. space 800 mm in case of screw feed removal
- Minimum distance from the left side wall 100 mm
- Above the boiler in min. 450 mm to clean the convection part of boiler exchanger.

*Boiler positioning with regard to electricity network:*

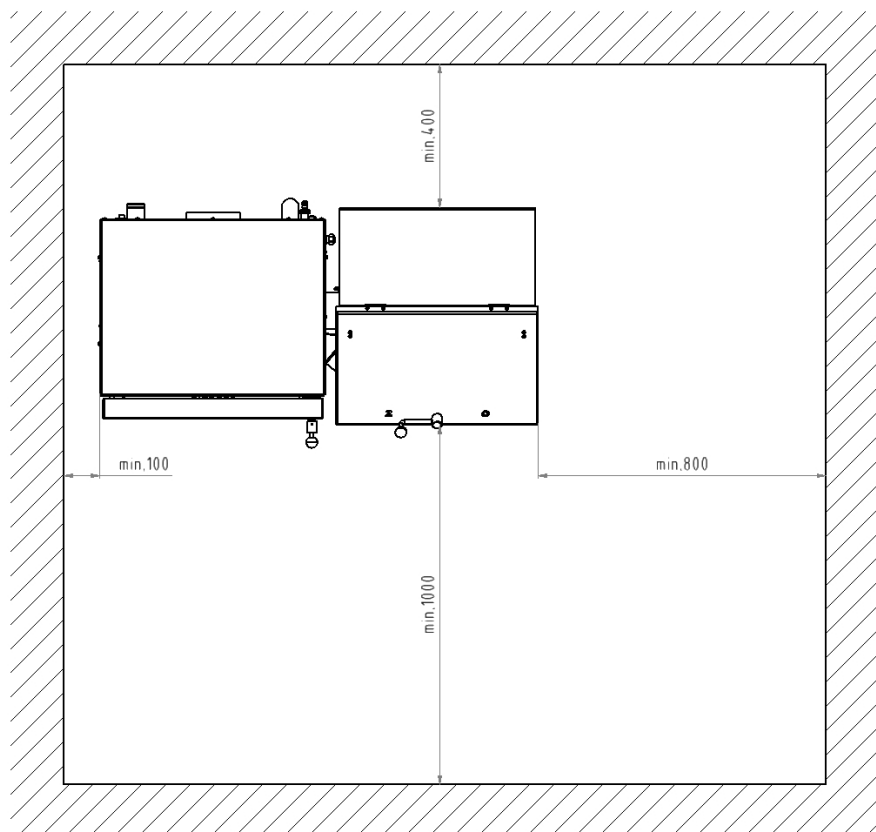
- The boiler must be placed so that the plug in socket (230V/50Hz) is always accessible.

*Fuel positioning:*

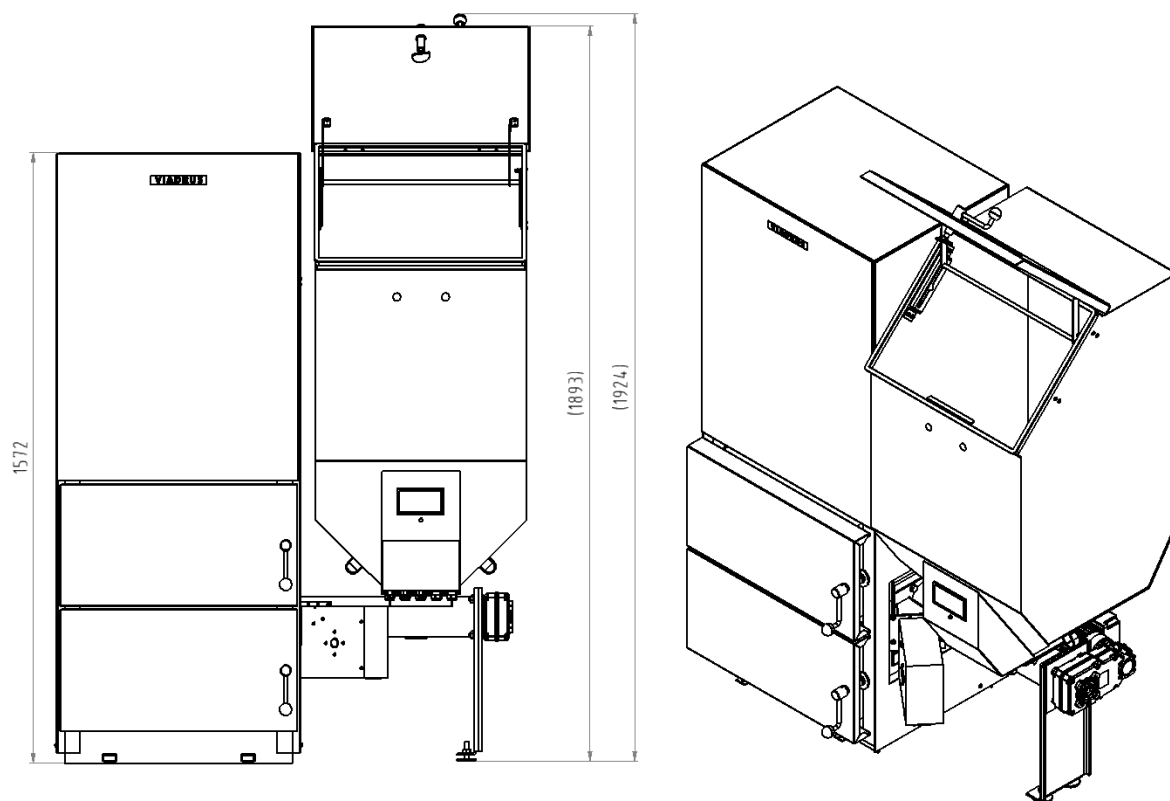
- **For the right burning in the boiler it is necessary to use the dry fuel.** The producer recommends to store the fuel in the cellar area or at least under the shelter.
- It is interdicted to store the fuel behind the boiler or next to the boiler within a distance smaller than 400 mm,
- The producer recommends to keep the distance between the boiler and fuel min. 1 000 mm, or to store the fuel in a different room that where the boiler is installed.

It must be ensured the continuous air supply into the room, where the boiler is installed for burning and eventual ventilation (the air consumption of VIADRUS EKORET boiler makes for 15 kw boiler 45 m<sup>3</sup>. h<sup>-1</sup>, and for 25 kW boiler 75 m<sup>3</sup>. h<sup>-1</sup>). The heating system pipe connection, eventually the heater heating insert connection, must be done by the authorized person.

**CAUTION: When connecting the boiler to the heating system there must be installed a drain tap in the lowest point and as near as possible to the boiler.**



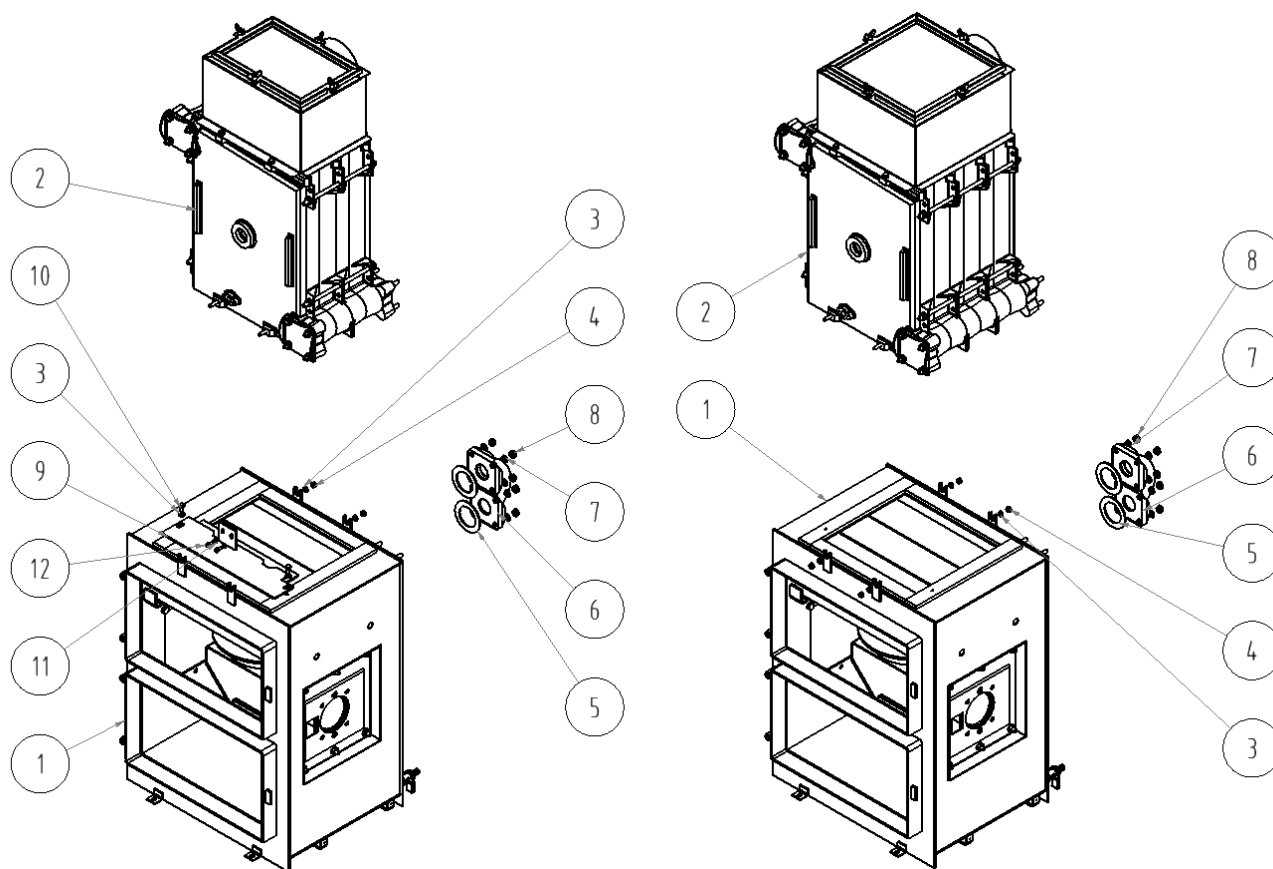
**Fig. no. 4 VIADRUS EKORET boiler positioning in the boiler room**



**Fig. no. 5 VIADRUS EKORET boiler (the right version with a small reservoir) with the open fuel reservoir**

In case the assembled body boiler with boiler pedestral can not be placed into the boiler room there is necessary to proceed by the following method (see Fig. no. 6):

- Disassemble arch welder including sealing by unbolting the nuts M10 and washers.
- Unbolt nuts M8 with washers, that connect the boiler body with the boiler pedestral together. At 15 kW boiler unbolt boiler body by the help of screw M6 x 16 and washers from distance plate.
- Take off boiler body (shell).
- Clean boiler body and boiler pedestral from old boiler binding material.
- This way ready pedestral place in the boiler room.
- Apply binding material on the boiler pedestral and placet the boiler body. Tightness of the pedestral with boiler body is very important.
- Than screw up the arch welder including sealing.
- Screw up the boiler body to the pedestral by the help of nuts M8 and at 15 kW boiler vision screw up the boiler body to the distance plate by the help of the screws M6 x 16.



1 – Boiler pedestral with a burner  
 2 – Boiler shell with a smoke adapter  
 3 – Washer 8,4  
 4 – Nut M8  
 5 – Sealing 60x48x2  
 6 – Arch welder  
 7 – Washer 10,5

8 – Nut M10  
 9 – Check plate  
 10 – Screw M8x16  
 11 – Washer 6,4  
 12 – Screw M6x16

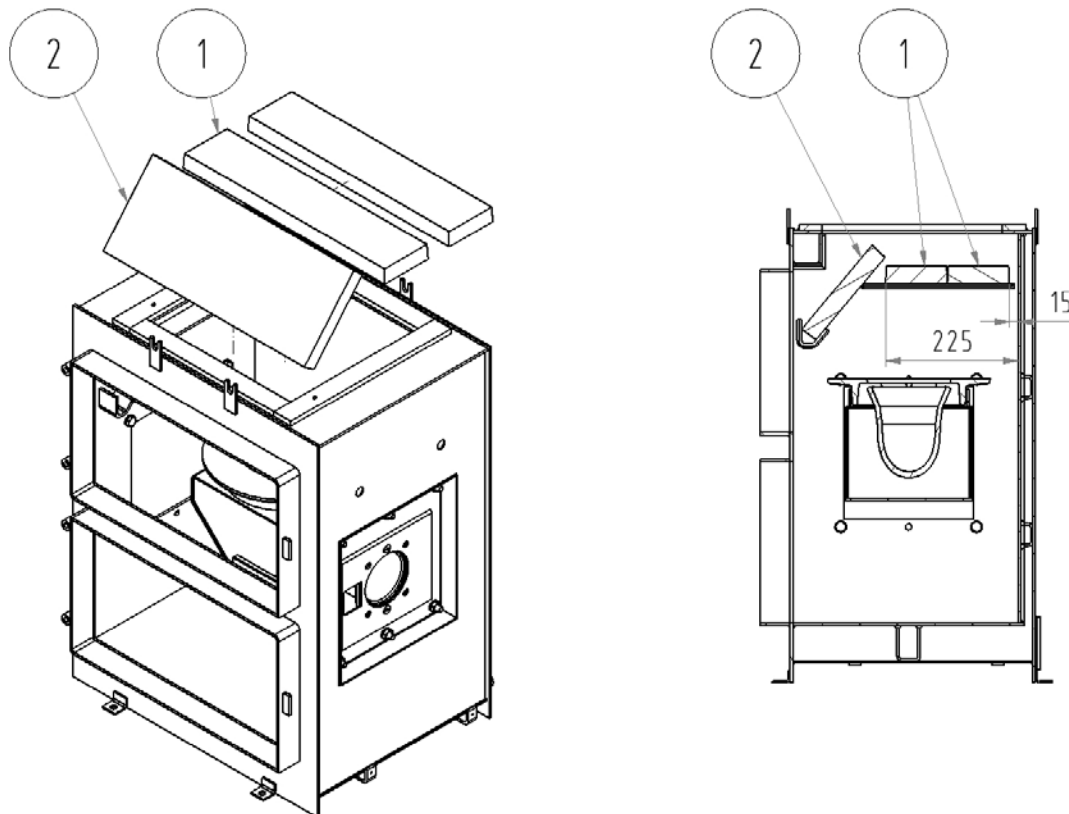
**Fig. No. 6 Boiler pedestral and boiler body disassembly**

## **5. Boiler commissioning – instructions for the contracting service organization**

Boiler commissioning must be only done by a contracting service organization authorized to do this activity.

### **5.1 Boiler assembling**

- a) Position horizontally the boiler shell with the pedestal on a sockle.
- b) Apply the binding material on the bottom of cast iron grate and settle the mixer down. There is necessary a tightness of cast iron grate and mixer.
- c) ***The ceramic plates mounting***  
Insert the ceramic plates (2 pcs of ceramic plates, 1 pc of ceramic plate 1), which are delivered out of boiler, above the burner space in the boiler.  
The ceramic plates mounting is evident from fig. no. 7.

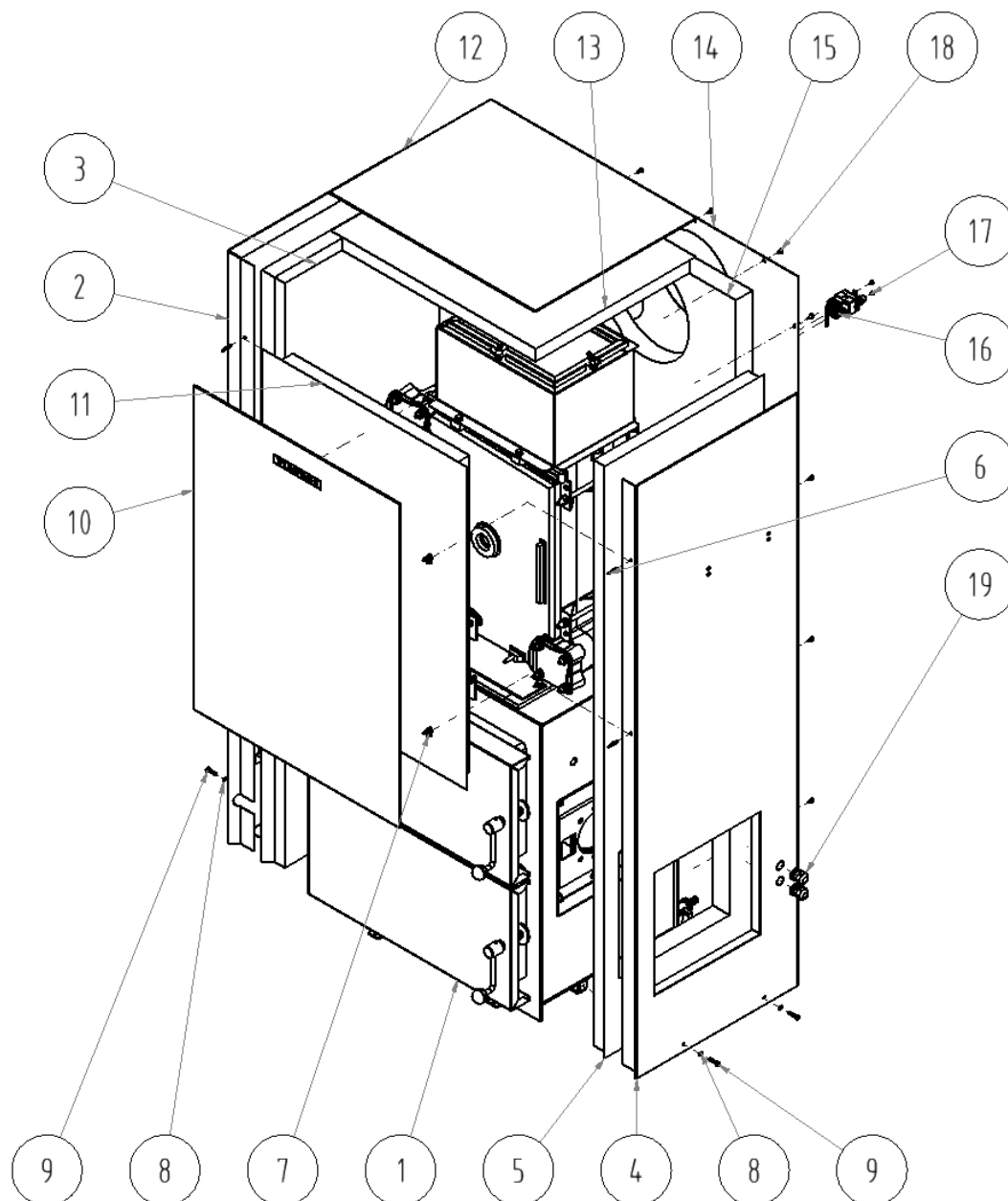


- 1 ceramic plate (2 pcs)
- 2 ceramic plate 1 (1 pc)

**Fig. no. 7 The burner space cut of boiler 15 and 25 kW**

**d) Boiler jacketing of VIADRUS EKORET (see. Fig. no. 8)**

Take out the shells from the cardboard package



- 1 – Boiler without shell
- 2 – Left side part of shell
- 3 – Insulation of shell left side part
- 4 – Right side part of shell
- 5 – Insulation of shell right side part
- 6 – Connecting spindle
- 7 – Spring clamp
- 8 – Washer 5,3
- 9 – Screw M5x25
- 10 – Front part of shell

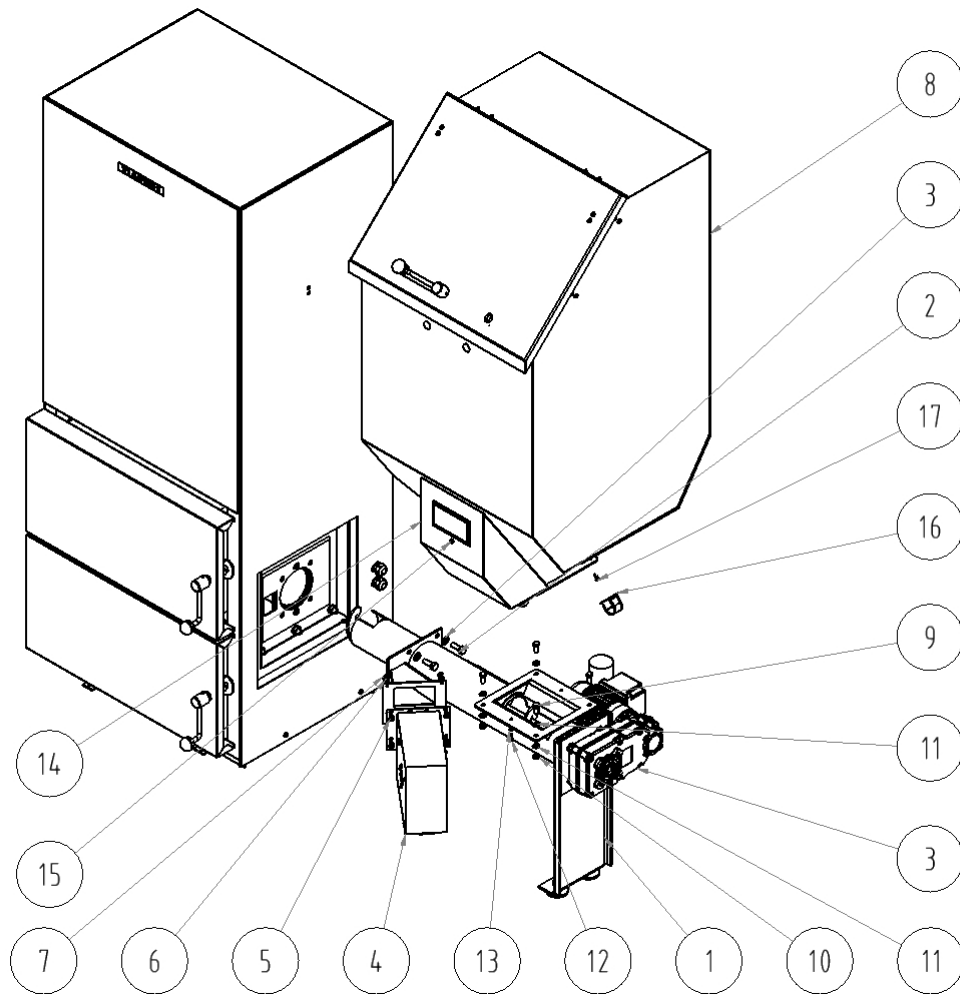
- 11 – Insulation of shell front part
- 12 – Cover of the shell
- 13 – Cover of the shell insulation
- 14 – Back part of shell
- 15 – Insulation of shell back part
- 16 – Emergency thermostat
- 17 – Screw M4x6
- 18 – Screw ST 4,8x13
- 19 – Bushing for tube SFM20

**Fig. no. 8 VIADRUS EKORET boiler jacketing**

Mount 4 pcs of connecting spindles into the left and right side part of shell and insert the insulation.

Set the left and right side part of shell incl.the insulation on the anchor bolts of exchanger (fix the bushing for tube SFM20 according to connection) and screw be means of 4 pcs of screws a 4 pcs washer 5,3 to stand. Mount the spring clamps into the front shell and insert the insulation. Fix the front part of the shell incl.the insulation and to the side parts of shell. Fix the emergency thermostat by use of 2 pcs of screws M4 x 6 to the back part of shell and screw it to the side parts of shell by means of 11 pcs screws ST 4,8 x 13. Insert the insulation into the shell cover and the whole set prepared in this way put on the boiler.

**e) Fuel reservoir and feeder assembly**



- |                    |  |
|--------------------|--|
| 1 – Fuel feeder    | 10 – Nut M8  |
| 2 – Screw M10x20   | 11 – Washer 8,4                                      |
| 3 – Washer 10,5    | 12 – Washer 5,3                                      |
| 4 – Ventilator     | 13 – Screw M5x14                                     |
| 5 – Screw M6x16    | 14 – Spacing clip                                    |
| 6 – Washer 6,4     | 15 – Screw ST 4,8x13                                 |
| 7 – Nut M6         | 16 – Electronics cover incl. regulator               |
| 8 – Fuel reservoir | 17 – Pilot light of the safety thermostat signalling |
| 9 – Screw M8x20    |  |

**Fig. no. 9 Fuel reservoir and feeder assembly**

**Notice:**

**At assembly of fuel feeder to the pedestral and fuel reservoir to the fuel feeder position everything horizontally and afterwards provide a final drawing up the screws and nuts.**

Apply binding material on the boiler pedestral, afterwards assembly a set of fuel conveyor to the boiler pedestral. Further assembly a fan with butterfly valve and secure by screw. There is necessary to check tightening the butterfly valve to do not come to its self-closing.

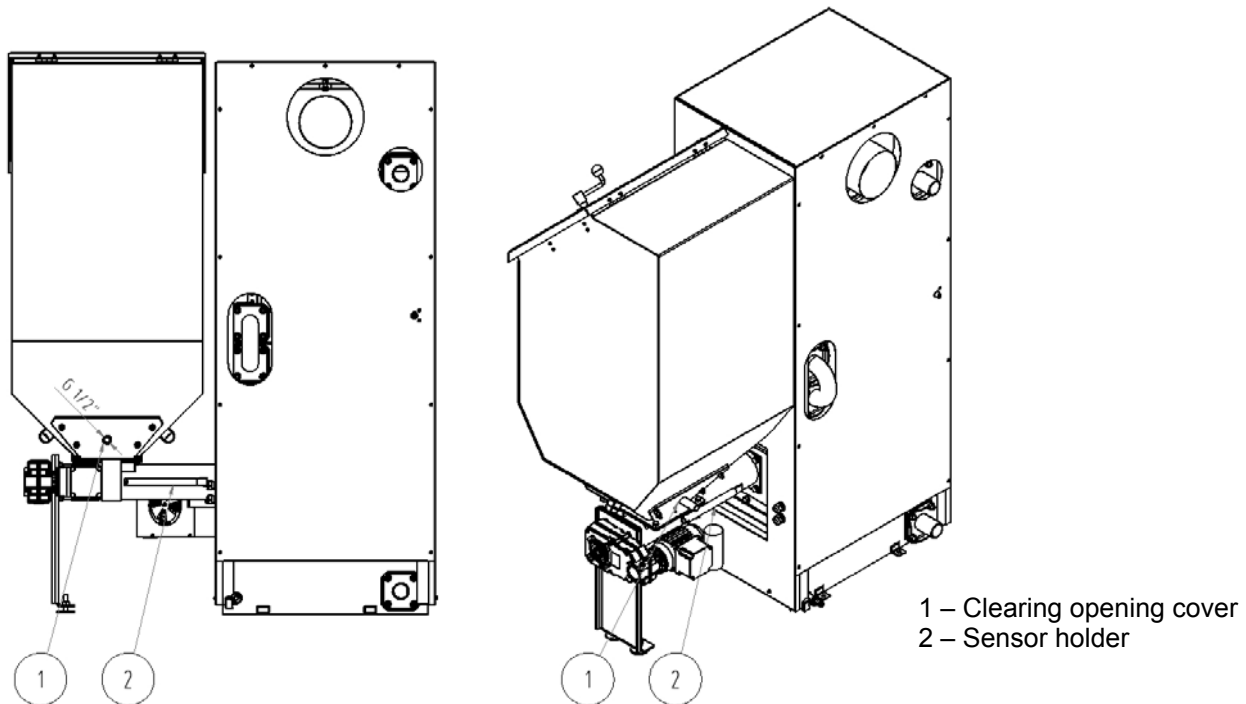
Apply the binding material on set of fuel conveyor on the surface of fuel reservoir binding face. Settle the fuel reservoir and tighten the screw.

At view from the front hang the metal case with regulator on the screws (see Fig. no. 9). Provide electro installation according to the scheme. Fix distance clamps for caballing on the sides of fuel reservoir and lead the cables.



#### **f) Assembly of the emergency fire extinguishing equipment**

In the cover of the cleaning opening there is a pipe for water supply with 1/2" connection which serves for TS 130 (STS 20) valve interconnection. The interconnection is to be carried out by means of a flexible (stainless) hose. It must regard a detachable connection of the valve with a pipe in the cover of the cleaning opening by reason of the possibility of disassembly. The valve sensor is to be installed in the sensor holder which is positioned on the fuel feeder.



**Fig. no. 10 Assembly of the emergency fire extinguishing equipment**

#### **The function of the emergency fire extinguishing equipment :**

In case of fire penetration to the feeder (temperature on the feeder reaches 95 °C), TS 130 (STS 20) valve switches on the cold water supply to the hopper and the burning fuel is extinguished; then the water supply is stopped. Then it is necessary to dismantle the engine with the worm shaft and stainless insert and clean them. It is followed by the reassembly. Check the valve: if it still lets water into the reservoir replace the valve.

### **5.2 Checking activities before commissioning**

***Before the boiler is put into operation it is necessary to check:***

#### **a) Filling the heating system with water**

Water for filling the boiler and heating system must be clear and colourless, without any suspended substances, oil and chemically aggressive substances. Its hardness must comply with ČSN 07 7401 and in case of dissatisfactory hardness the water must be treated. Even a multiply heating of water with an exceeded harness does not prevent the salts from segregation on the exchanger walls. By precipitation of 1 mm calcacite at a given point the heat transfer from metal to water is reduced by 10 %.

The heating systems with an open expansion tank allow a direct contact between the heating water and the atmosphere. During the heating season the expanding water in the reservoir absorbs the oxygen which increases the corrosive effects and at the same time lot of water evaporates. Only the water treated to the values according to ČSN 07 7401 can be used for refilling. The heating system must be thoroughly flushed out in order to wash out all impurities.

During the heating season it is necessary to keep a constant water volume in the heating system. When refilling the water in the heating system it is necessary to make sure that no air is sucked into the system. The water from boiler and the heating system must never be discharged or be taken for use except the emergency cases like the repairs, ect. The water discharge and new water filling operations increase the danger of corrosion and the scale formation.

**If it is necessary to refill water in the heating system, we only do it when the boiler has cooled down so that the exchanger cannot be damaged.**

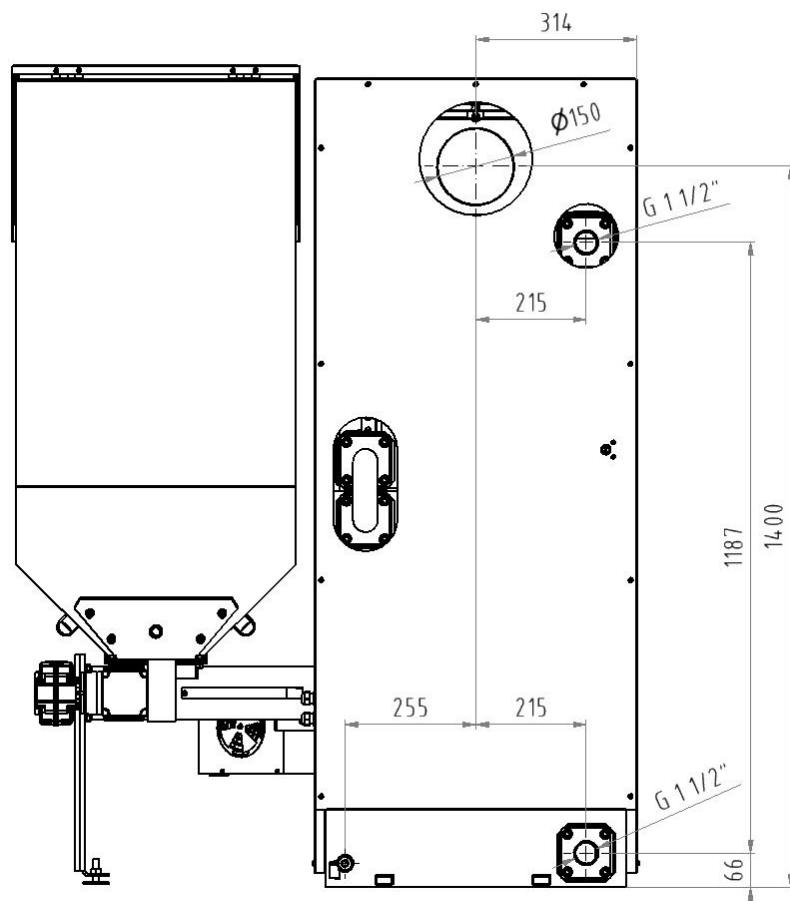



Fig. no. 11 Connecting dimensions of VIADRUS EKORET boiler

**b) Heating system tightness**

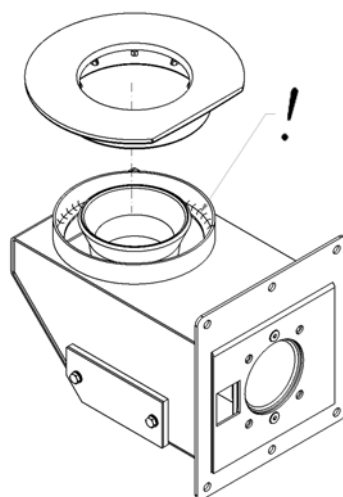
**c) Connection to the chimney – must be approved by a chimney-sweepers' organization**

**d) Burner tightness**



By starting up the fan (the button  on the regulator) the burner tightness is checked. All air must flow into the combustion are in a retort and boiler grate. The check must be focused on the seating faces:

- Of the fan in the mouthpiece
- Around the burner cleaning opening
- Of boiler grate with the burner. If any leakages appear, the fire grate must be taken out, the old boiler mastic must be removed from the seating faces and an adequate quantity of new mastic must be applied to them and the fire grate must be installed back into the burner. (Note: At the boiler front view the fire grate trim must be done on the left-hand side on the left and on the right-hand side on the right). Repeat the control.



! To the point marked with a caterpillar apply the boiler cement and lay up the grate. It is necessary to ensure the tightness between the burner and the grate.

**e) Connection to the electricity network**

The boiler is connected through a movable connection by means of a plug standardized socket 230 V/50 Hz/10 A. The protection against electric shock must be ensured according to ČSN 33 2000 - 4 - 41.

### 5.3 Boiler commissioning

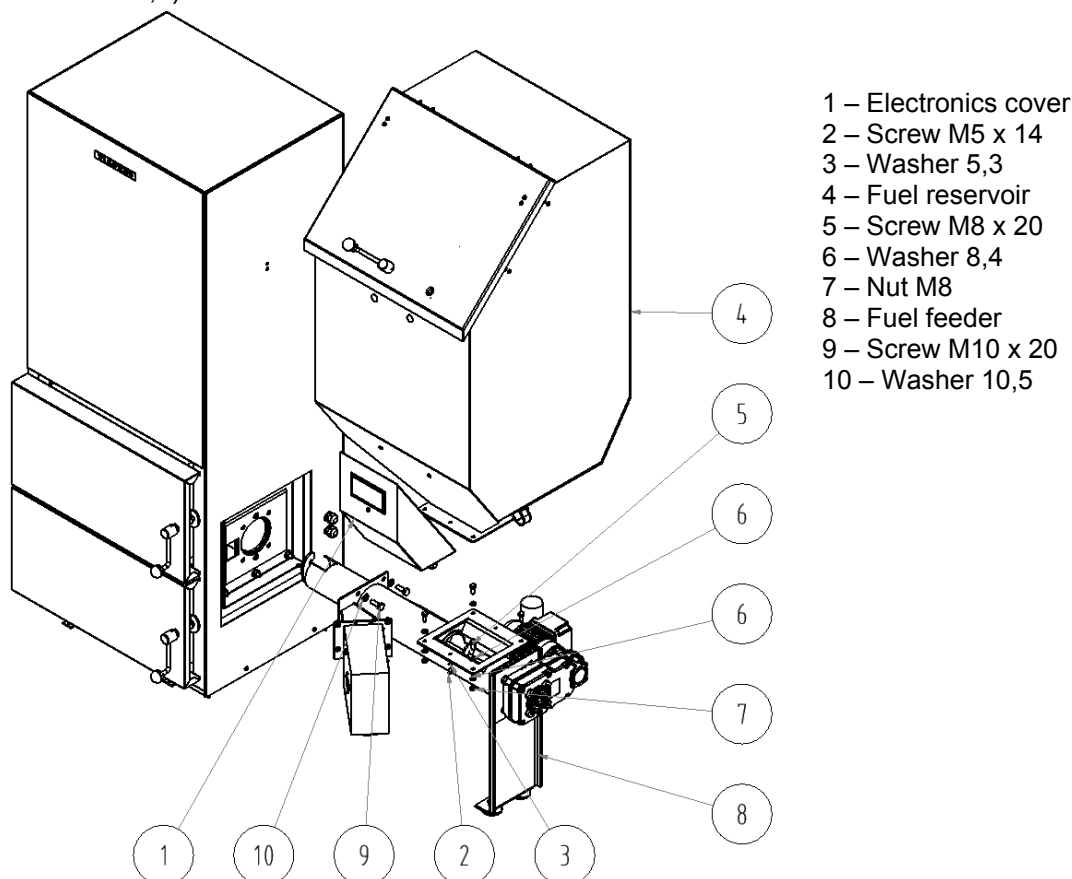
1. Fill the emergency fire fighting system reservoir.
2. Fire the boiler – see. Chap. 6.1. Appliance starting.

3. Bring the boiler to the necessary operating temperature. The recommended output heating water temperature is above 65 °C.
4. Check again the boiler tightness.
5. Do the stoking test according to the relevant standards (see the Guarantee certificate)
6. Make the user acquainted with operation.
7. Make a note in the Guarantee certificate.

**Assembly determining and heat proving must be noted in the „Letter of Guaranty“.**

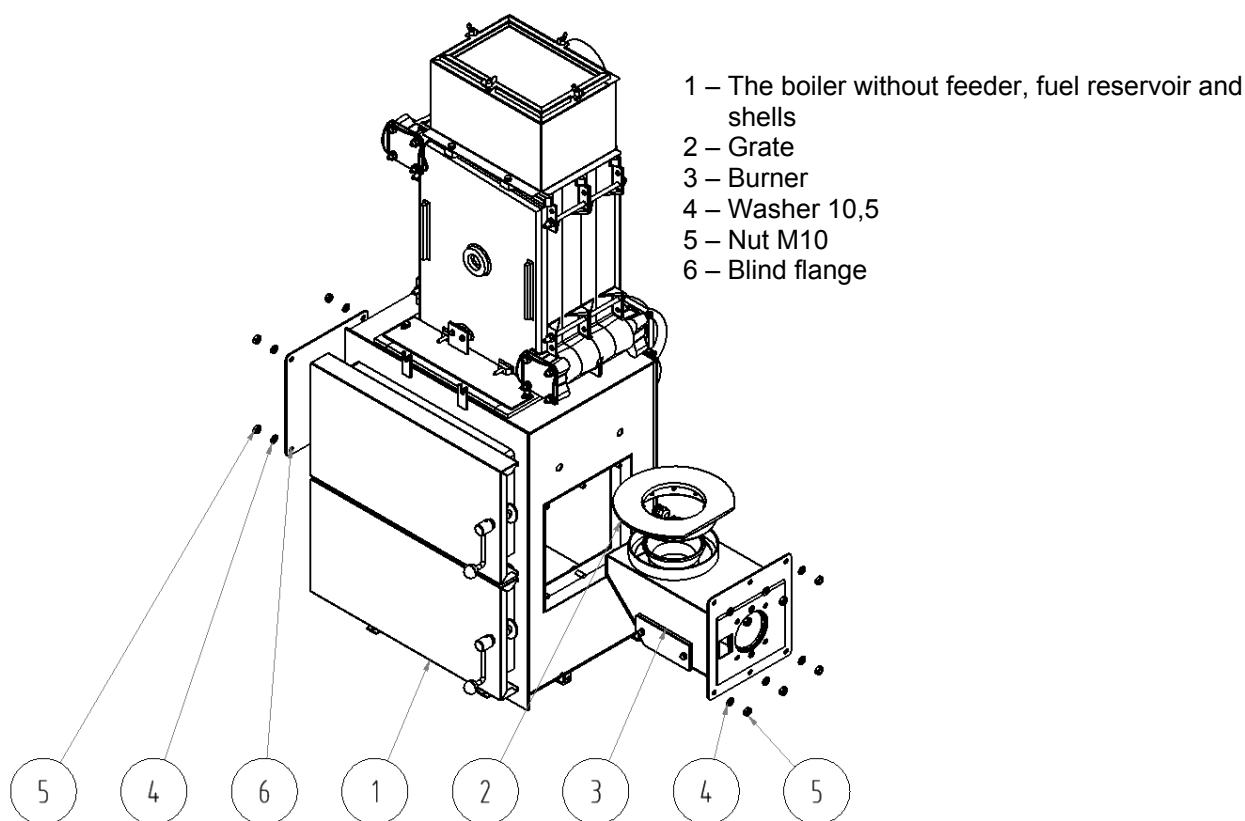
#### **5.4 Boiler conversion from the right to the left version**

- We carry out the boiler burning out.
- We disconnect the boiler from the mains.
- We remove the electronics cover incl. the regulator (the electronics cover is secured with screw M5 x 14).
- We disconnect the engine with gearbox, ventilator, safety thermostat from regulator and we pull out the fire penetration sensor from the reservoir, the outlet sensor from the boiler reservoir (we disconnect HW sensor if it is used).
- We disconnect the emergency fire extinguishing equipment.
- First of all we empty the reservoir. We dismantle the fuel reservoir from the fuel feeder (the connection accessories are: 4 pc screw M8 x 20, 4 pc washer 8,4 and 4 pc nut M8).
- We disconnect the fuel feeder from the boiler base (connection accessories are: 4 pc screw M10 x 20, 4 pc washer 10,5).



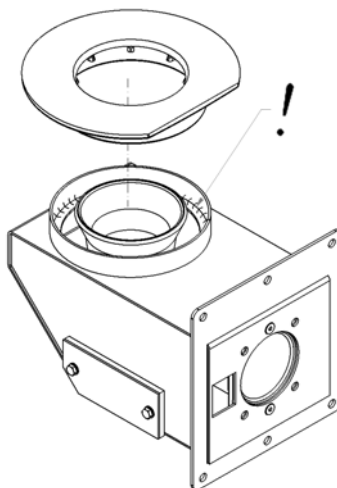
**Fig. no. 12 Boiler conversion from the right to the left version– fuel reservoir and feeder disconnection**

- We remove the boiler shell.
- We remove the grate and pull out the burner with mixer from the base (connection accessories are: 6 pc screw M10 x 30, 12 pc washer 10,5, 6 pc nut M10).
- From the left side of the base we unscrew the blind flange and screw it to the right side (connection accessories are: 4 pc screw M10 x 30, 8 pc washer 10,5, 4 pc nut M10). Blind flange with the base must be sealed with a sealant.



**Fig. no. 13 Boiler conversion from the right to the left version – dismantling of burner and blind flange**

- Break out an opening in the left side shell.
- We assemble the boiler shell (see chapter 5.1, paragraph Shell assembly).
- We apply the sealant to the flange of burner with mixer and we insert the burner into the base from the left side and screw it (connection accessories are: 6 pc screw M10 x 30, 12 pc washer 10,5, 6 pc nut M10).
- We remove the old boiler sealant from the grate. We apply a reasonable amount of new sealant to the bearing surface and we mount the grate in the burner. *(Note: At the boiler front view the fire grate trim must be done on the left-hand side on the left and on the right-hand side on the right).*



! To the point marked with a caterpillar apply the boiler cement and lay up the grate. It is necessary to ensure the tightness between the burner and the grate.

- We apply the sealant to the flange of fuel feeder and connect it to the boiler base (connection accessories are: 4 pc screw M10 x 20, 4 pc washer 10,5). We turn the engine so that it is at the back in the front view of the boiler.
- We apply the sealant to the flange of fuel feeder and we connect the feeder with the fuel reservoir (connection accessories are: 4 pc screw M8 x 20, 4 pc washer 8,4 and 4 pc nut M8).
- We connect the emergency fire extinguishing equipment.
- We reconnect the components.
- We hang the electronics cover with regulator on the front part of the fuel reservoir and secure it with screw M5 x 14.

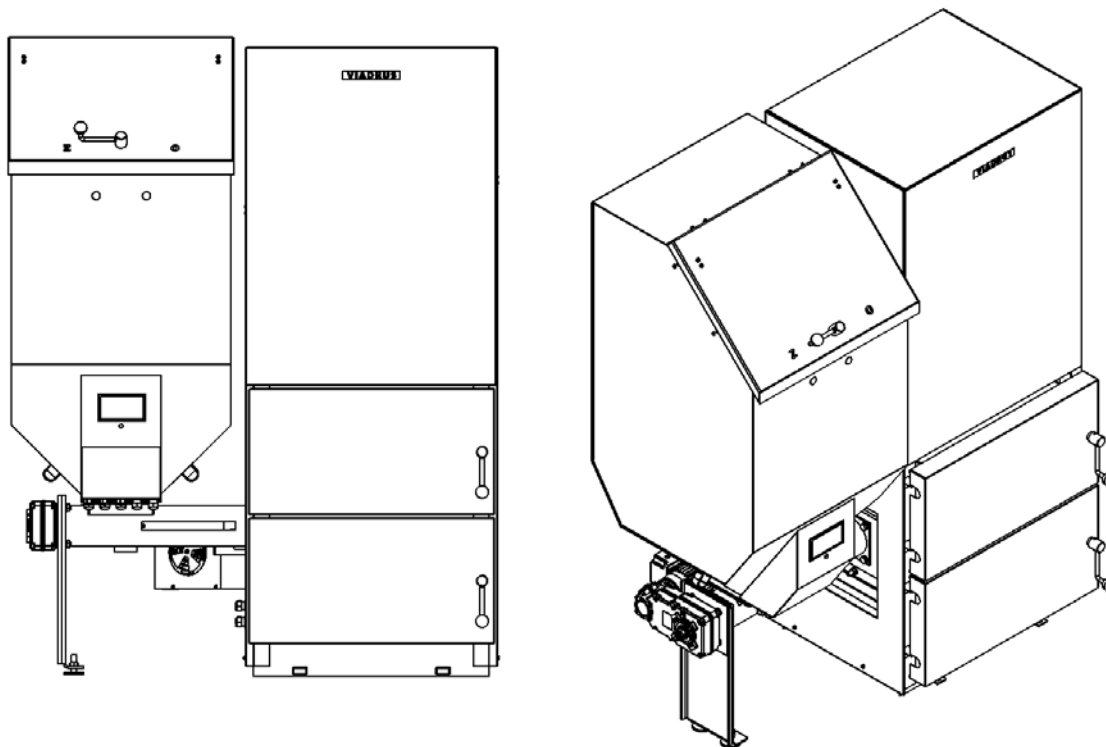






Fig. no. 14 Boiler VIADRUS EKORET (left version)

## 6. Boiler operation by user

### 6.1 Appliance starting

1. Connect the equipment to the supply network (insert the plug into the socket). Four horizontals appear on the display.
2. Switch the control member by pressing the button . The control member after having been pressed goes over into the CH boiler manual operation and reads the latest setting of boiler operation parameters programmed by user (see chap. 6.6.).
3. Check the water volume in the heating system.
4. Check whether the stop valves between the boiler and heating system are open.
5. Check the circulating pump functionality.
6. Clean the burner and ash-tray. The ash door must be during the firing and boiler operation permanently closed.
7. Fill the reservoir with the prescribed fuel. After filling close the reservoir carefully in order to prevent the false air intake into the feeder and burner throughout the hopper.
8. For the boiler commissioning it is necessary the manual operation of the fuel feeder and fan. By means of button  on the regulator transport the fuel into the combustion space. Keep the button  switched on until the fuel appears on the bottom of the retort (approx. 2 cm under the boiler grate). By pressing this button again the feeder switches off. Put the kindling (like paper, wood chips, PEPO, solid alcohol, etc.), on the fuel, fire it and let it flare properly (approx. 1 – 2 min). Then shovel a small amount of prescribed fuel on the burning kindling and by pressing button  on the control regulator switch on the fan for a short time. By pressing this button again switch off the fan. Repeat this procedure 2 – 3 times.
9. Close the door and let the fire flare properly (approx. 3 – 5 min.)
10. Select the automatic regime.

## 6.2 Manual operation




After pressing the button the control member goes over to boiler manual operation status. All equipments connected to the control member are switched off. The display shows the temperature of water in the boiler measured by means of the sensors.

In this system of operation the following equipments can be put into operation by user:

### 1. Fuel feeder:




Pressing the button induces the activation of coal feeder which is connected to the control

member and illumination of corresponding **bottom** indicator lamp on the button . By pressing this button again the feeder switches off and the indicator lamp goes out.

### 2. Fan:



Pressing the button induces the activation of fan connected to the control member and illumination

of corresponding **upper** indicator lamp on the button . By pressing the button again the fan switches off and the indicator lamp goes out.

In this operation regime the fuel feeder and fan can be switched on and switched off independently from each other.




Pressing the button induces the control member transition from the automatic into the manual operation regime (heating, stand-by) and the fan, fuel feeder and pump are stopped immediately.

## 6.3 Automatic operation



Pressing the button induces the control member transition into the automatic operation regime.



1. This status is signalized by ighting up the **upper** indicator lamp on the button . The automatic operation consists in fuel feeder and fan control in a way making sure that the water temperature in boiler is kept on the value set by the user. (Note: If a room thermostat is not used.)
2. Moreover the control member in this status signals whether the fuel feeder or fan switch on by lighting



up the relevant indicator lamps on the button

3. After the automatic operation has been activated the CH pump is switched on by the control member if the boiler water temperature is equal or higher than the value set by the manufacturer (service parameter "d2"). Also the pump operatin indicator lights up – the pump indicator lamp is a vertical line on the left side of the display.
4. The control member switches off the pump in case the water temperature drops to the pump switch on temperature minus 4 °C.
5. The control member switches on and off the fuel feeder according to set parameters of feeding and delaying.
6. The way in which the control member recognizes that the boiler combustion chamber burnt out:
  - If during the automatic operation the water temperature in boiler drops by 10 °C and during the decrease it does not grow by more that 4°C, the pump is kept switched off. The control member remembers the temperature and waits for the time set by the manufacturer (service parameter "c3") and then it investigates whether the temperature has increased. If not, it means that the boiler combustion chamber has burnt out.
  - If the control member transmited to the automatic operation during the thermostat blockage, it isn't checked if the combustion chamber has burnt out.



7. The display indicates the measured water temperature. Pressing the button induces the equipment switching off the automatic operation (return to the manual operation).



8. Pressing the button induces the transition to the programming regime, which does not influence the automatic operation.

**If the temperature has reached the value set by the user, the control member moves to the stand-by regime.**

## 6.4 Standby regime

In this regime the display indicates the measured boiler water temperature, also the **lower** indicator lamp



on the button lights thus signaling the operation **stand-by** regime.

The pump is switched on, until the temperature exceeds or equals the temperature set by the producer (service parameter "d2").

After the transition to the stand-by regime, the fans is switched on for the time "c2" multiplied by "c4", to flare up the fuel and then it will be switched off.

After the stand-by regime termination (user's parameter "u3", the control element switches on the feeder and fan for the time set by producer (service parameter "c2") independently of the thermostat activity. The fan will be in function longer (parameter "u4") than feeder, because of flaring up the added fuel.

If the temperature decreases below the value equal to user's set value minus parameter "d3", the control member transits back to the automatic operation.



Pressing the button , induces the transit to the programming regime, as well as in case of automatic operation.



Pressing the button induces the switching off the stand-by (return to the manual operation).

## 6.5 Emergency conditions

The control member differs 6 emergency condition. In each of them it will be displayed the emergency condition number and the acoustic outlet will be switched on for 2 seconds. Afterwards this outlet will be switched off for 2 seconds. The emergency condition exit (except "AL4") is only possible by pressing the



button .

Types of emergency conditions:


- **AL1** – Damage of outlet water temperature sensor.
- **AL2** – Damage of feeder temperature sensor (in case that parameter **c1** = 1).
- **AL3** – Damage of heater thermal sensor.
- **AL4** – The outlet water temperature achieved 95 °C (causes the switch-off of the emergency thermostat).
- **AL5** – a) The combustion chamber has burnt out.  
b) There is set short time for temperature increase in parameter **c3** (cause f. e. by big volume of heating medium in heating system).
- **AL6** – The maximum feeder temperature is exceeded or the feeder sensor breakdown.

In case of emergency condition AL4, there is displayed the measured temperature and the information about emergency condition (notice "AL4"), and in case of manual operation regime the CH pump will be switched on. This emergency condition will be automatically switched off as the temperature in the boiler has dropped 95 °C. After temperature reduction in the boiler under set outlet temperature "u0" minus "d3" (bottom hysteresis of temperature) the boiler comes back into the automatic regime. If the temperature reaches accurate 100 °C, **00** will be displayed. If boiler overheating comes to 100 °C the safety thermostat will switch-off the boiler operation. By the help of light signalization – overheated (**H1**). In this case there is necessary to provide manually unlocking.





The engine is protected by a thermal protection. In case of an excessive engine overheating (approx. 115 – 120 °C) it stops.

After cooling down the engine again starts to supply the fuel in case no **AL5** fault is signalled.

If during the engine stoppage the temperature of water in boiler drops (coupling to **c3** paramete ) the **AL5** fault will be signalled. The fault must reset (the end of **AL5** emergency status is possible after





depressing the button  ). In case the combustion chamber burns out we make a fire again. If the engine temperature drops below the set limit (approx. 115 – 120 °C) the engine again starts to feed fuel. If it be to the contrary the engine hasn't been sufficiently cooled down yet or it regards a mechanical prevention from the movement of the worm shaft e.g. caused by foreign bodies in the fuel. In this case it is necessary to remove the mechanical fault and then to make a fire.

## **6.6 Configuration of users parameters**





When pressing button  , the control member changes for programming regime, which is signaled by lighting up the indicator lamp on the button  . The programming does not influence the actual operation of the control member. During the programming process the transition between the manual and automatic operation is impossible (the control member does not respond to the buttons  and  ).

### **6.6.1 Boiler output water temperature (u0)**

The changes in values of a given temperature  $\{T^{zad}\}$  are made in the following way:





1. Press the button .
2. Lightening of the diode on the button signals the start of temperature setting. The display indicates the temporarily set temperature.
3. Set the required temperature by means of buttons  (down),  (up).
4. The admissible range of their changes is programmed by the boiler manufacturer. Once this temperature has been achieved, the control member switches over from the automatic operation to the standby regime.
5. Press again button  , and the new value of temperature will be set.
6. At the same time the control member passes to the next **u1** parameter programming.

#### **Notes:**


- If the button  is not pressed twice, the changes will not be saved.
- If during the new temperature setting none of buttons    is pressed during 20 s, the new temperature won't be saved and the control member leaves the programming regime.

### **6.6.2 Boiler feeding time (u1)**

This is the parameter informing how long the fuel feeder will be switched on in the automatic operation. The parameter modification is made as the modification of parameter **u0**.

1. Press the button  . The control member displays the **u0** parameter value.
2. Press the button  againg. The control member saves the **u0** parameter value **u0** and pases to **u1** parameter.
3. Set the required value by means of buttons  (down),  (up).  
The admissible range of this parameters changes between 5 and 250 seconds.



- Press the button  again and the new value will be saved.  
At the same time the control member passes on to the next **u2** parameter programming.

### **6.6.3 Fuel feeder detention time (u2)**


This regards the time between the successive fuel charges in CH boiler in automatic operation. The range of its changes is between 5 seconds and 250 seconds. This parameter modification runs in the same way as described in chapter 6.6.1 and 6.6.2.

### **6.6.4 Keeping time (u3)**

This regards the time after switching on the fuel feeder and fan for the time set by producer (service parameter "c2") during the keeping time, to prevent the boiler from burning out. The range of this parameter is between 5 to 250 min. The modification of this parameter is made in the same way as described in chapter 6.6.1 and 6.6.2.













### **6.6.5 Late switching off the fan at operation during stand-by mode (u4)**

The admissible range of this parameter changes is from 5 seconds to 250 seconds. The modification of this parameter is made in the same way as described in chapter 6.6.1 and 6.6.2.

*The re-pressing the button  induces the return into the condition from which the programming regime was invoked and the extinction of programming indicator lamp.*

## **6.7 Service parameters configuration**

The following steps must be taken in order to make the changes of the service parameters:

- Switch off the control member by pressing the button .  
Four horizontals appear on display.
- At the same time press **simultaneously** the buttons: ,  and  and hold them depressed for approximately 3 seconds. The control member passes on to the programming regime, which is signaled by lighting up the ignicator lamp on the button  and the first service parameter **c0** will be displayed.
- Set the required parameter value by pressing the buttons  (down),  (up).  
If we hold the arrow depressed for a longer time the value will automatically grow or drop depending on the selected direction. The values are in a loop it means after the end of the admissible range of a given parameter has been reached the value from the opposite end of the range will be accepted.
- Press the button  again and the new parameter value will be saved.  
At the same time the control member passes on the next parameter **c1** programming and so on.
- After the **d4** parameter has been programmed, press the button  again.  
This induces the return of the control member switched off status and the programming indicator lamp on the button  goes out.
- Switch on the control member by pressing the button .  
**The control member starts working with the newly set and saved service parameters.**  
Pressing the button  at any time will induce the return to the switched off control member condition without storing the parameter and the programming indicator lamp goes out.

**Tab. no. 6 Service parameters indication and the range of their changes**

Parameter	Parameter description	Min	Max	Jump	Factory Setting
<b>c0</b>	Time for switching off the fuel feeder at dismantling of safety pin (parameter does not need to be set, leave the factory setting)	0	99	1s	0 s
<b>c1</b>	Parameter switching on/switching off the control of sensor for fuel ignition in feeder (1 – sensor installed, 0 – sensor is missing)	0	1	1	1
<b>c2</b>	Time for which the control member activates the feeder and fan, when the keeping time in standby regime set by user has elapsed	2	250	1s	5 s
<b>c3</b>	Waiting time for a growth in water temperature when the control member checks whether the boiler furnace hasn't burnt out, if „c3“=0 detects the burnt out boiler and AL5 alarm is switched off (time must be adjust according to the size of heating systém)	0	250	1 min	20 min
<b>c4</b>	The coefficient used for multiplying the ventilator operation time immediately after the control member transition into an upkeep condition (to make the fuel flare).	1	5	1	1
<b>c5</b>	The time after which the pump switches on for 30 seconds when the blockage by the indoor thermostat lasts. If „c5“=0, the pump will not switch on.	0	100	1 min	0 min
<b>c6</b>	Mixing pump control <b>0</b> Only pump – CH (there are not connected other pumps to the boiler) <b>2</b> HWS pump	0	2	1	0
<b>d0</b>	Min. temperature which can be set by client	40	60	1 °C	40 °C
<b>d1</b>	Max. temperature, which can be set by client	61	90	1 °C	80 °C
<b>d2</b>	Pump switch on time – Central heating (CH)	25	80	1 °C	40 °C
<b>d3</b>	Lower temperature hysteresis	0	10	1 °C	2 °C
<b>d4</b>	Parameter for setting the value of HWS (in parameter c6 = 2)	35	60	1 °C	40 °C

For a proper boiler function it is important to set an optimal stoking cycle, it means the proportion between the time when the fuel feeder is switched on and the time when the fuel feeder is switched off.

The listed values in tab. no. 2 are orientation. Depending on kind, quality and moisture of used fuel there are necessary the certain corrections of feeding time setting (the proportion between the fuel feeding time and fuel burning time). For example, if the slivers appear in the ash-tray, it is obvious that the feeding speed is hibher than the burning speed and it is necessary to reduce the feeding cycle.

## **6.8 Hot service water preparation operation**

Regulator G-403-P02, enables the connection of additional pump for hot service water preparation (HWS).

### **6.8.1 Parameter configuration**

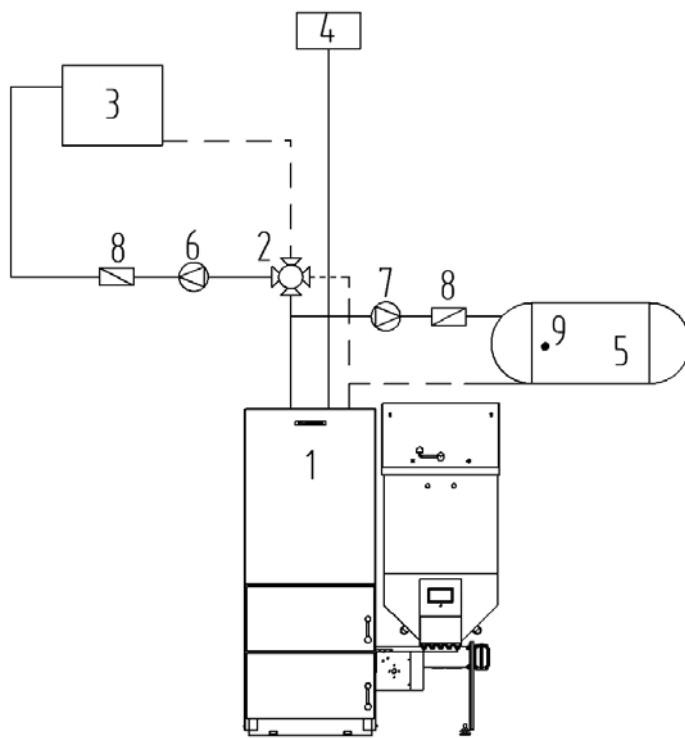
The control member makes it possible to regulate the min. boiler temperature by help of the pump in the mixing circuit, which is possible to configure in the service regime (see tab. 6), by setting these parameters:

1. Parameter value **c0**="0"
2. Parameter value **c6**="2"
3. Set the parameter „**d4**“ value in interval between 35 °C-60 °C.

For a proper cooperation of room thermostat and HWS circulating pump there must be set boiler temperature (parameter **u0**) at least 3 °C in excess of the HWS temperature in the cylinder (service parameter **d4**). If the temperature in the heater is higher or same as the boiler temperature the HWS pum will not work to do not cool the heater.

### **6.8.2 Assembly and connection**

1. Connect the boiler according to fig. no. 15.
2. Install the HWS<sup>(\*)</sup> sensor inside the water heater, if it is used. Connect according to the ~~Electrical connection~~ install the temperature sensors in wells filled with oil or another fluid !!!
3. Set the required parameters in regulator G-403-P02 (see. Chapter 6.8.1).



- Legend:
- 1. Boiler VIADRUS EKORET
  - 2. Four-way mixing valve
  - 3. Heating bodies
  - 4. Expansion tank
  - 5. Water heater
  - 6. Pump
  - 7. HWS pump
  - 8. Back flap
  - 9. Water heater temperature sensor \*

**Fig. no. 15 Installation block scheme of central heating system with four way valve and HWS pump**

**Notes:**

(\*) Is not a part of delivery. (**The sensor cable length – 4m, resistance 2,4 kΩ/23 °C**)

**Sensor cables** can be shortened or prolonged as necessary while observing the following instructions:

- Do not cut the sensor cable in a distance shorter than 0,5 m from the wrapping;
- Prolongation of a cable by more than 10 m is not recommended;
- Use the CMSM – H 2 x 0,5 mm conduit for cables prolongation;
- In case of prolongation connect the cables very carefully, solder every pair of cores separately and wrap them in a thermo-shrink wrap (spaghetti insulation).

We recommend to work the boiler VIADRUS EKORET with a circulation pump. If it be to the contrary an adjusted temperature can be passed in the reference room. Great temperature swing will happen in the room.

## **6.9 Room thermostat**

The regulator G-403-P02 is adjusted to the control by an indoor thermostat.

The regulator is controlled in automatic operation. If the connection with indoor thermostat fails, the control member switches the boiler off until the achieving of set temperature.

Room thermostat is connected through collapsing contact.

### **6.9.1 Transition of control unit to maintenance regime by means of room thermostat**

By achieving the required temperature in a reference room the regulator G-403-P02 transits to the blockage status.

This will induce the following changes in equipment operation:

- In the stand-by regime the control element switches off the CH pump and displays the notice „blo“.
- In automatic operation the control element passes on to the standby regime, displays the notice „blo“ and after 4 minutes it switches off the CH pump.
- After the keeping time has elapsed the control element switches on the feeder and fan for the operation time determined by the manufacturer (service parameter „c2“) through the thermostat function. The fan will work longer for a value set in parameter „u4“ than the feeder because of added coal flaring.
- The CH pump function depends on the value of service parameter „c5“.

- The thermostat blockage does not cause the control element programming regime exit in the stage of automatic or standby operation.
- During the blockage the control member will activate the CH pump for 30 seconds which is the time determined by the manufacturer (service parameter „c5“) for water flowing in the system.  
**If the parameter is set up as “c5” = 0, the pump will not be switched on.**
- Under the other circumstances the blockage will be ignored.

## **6.10 Fuel admissible temperature excess in the feeder**

The control member is equipped with a sensor alarming the admissible temperature excess in the feeder.

It functions on the basis of temperature measured on the surface of feeder. If this temperature reaches 98 °C, the control member signals the emergency condition AL6, it switches off the fan and the fuel feeder will be switched on for 10 minutes in order to remove the burning fuel from the feeder and to put out the fire.

### **CAUTION !!!**

**If the service parameter „c1“ = 1, then in case of this sensor absence or its damage the control member will behave as if the fuel was set on fire in the feeder and it will control the feeder in the way making sure that the “burning fuel” is removed from the feeder and the boiler furnace goes out. This function is required by the safety reasons.**

In the system of manual operation the feeder temperature is not verified so that the temperature sensor failure causes the **AL2** alarms.

If it is not used in the boiler the sensor for excess of admissible temperature in feeder, we can switch it off by setting the service parameter “c1” = 0.

## **6.11 Supply voltage failure**

In case of supply voltage failure, the control element will do the activity depending on the status in which it had been before the failure. The control member holds for 1 minute and then it comes back into the operation with parameter values that had been programmed before (in case of supply voltage recovery).

During the holding time there is displayed the time in seconds that are left by its termination and it indicates the status in which it had been before the supply failure:

- Flashing letter „A“ corresponds to the automatic operation,
- Letter „P“ corresponds to the standby regime,
- Letter „r“ corresponds to the manual operation.

Together with the letters there are flashing the relevant indicator lamps (automatic or standby operation).

If the control element was in manual operation, it comes back into this status with the switched off equipments, but if it was in automatic operation status it returns into the automatic status.

If the control element was in standby regime, it comes back into this operation and then it switches on the feeder and fan for the time determined by the manufacturer (service parameter „c2“), in order to prevent the boiler combustion chamber extinction.

## **6.12 Boiler shut-down**

Before shutting down the boiler this must be switched over into the manual operation by pressing the button



and the glowing fuel must be pushed out from the retort into the ash-tray by pressing the button



. This activity is not necessary only in case of short-time repairs when the operator is present.

## 6.13 Elementary wiring diagram

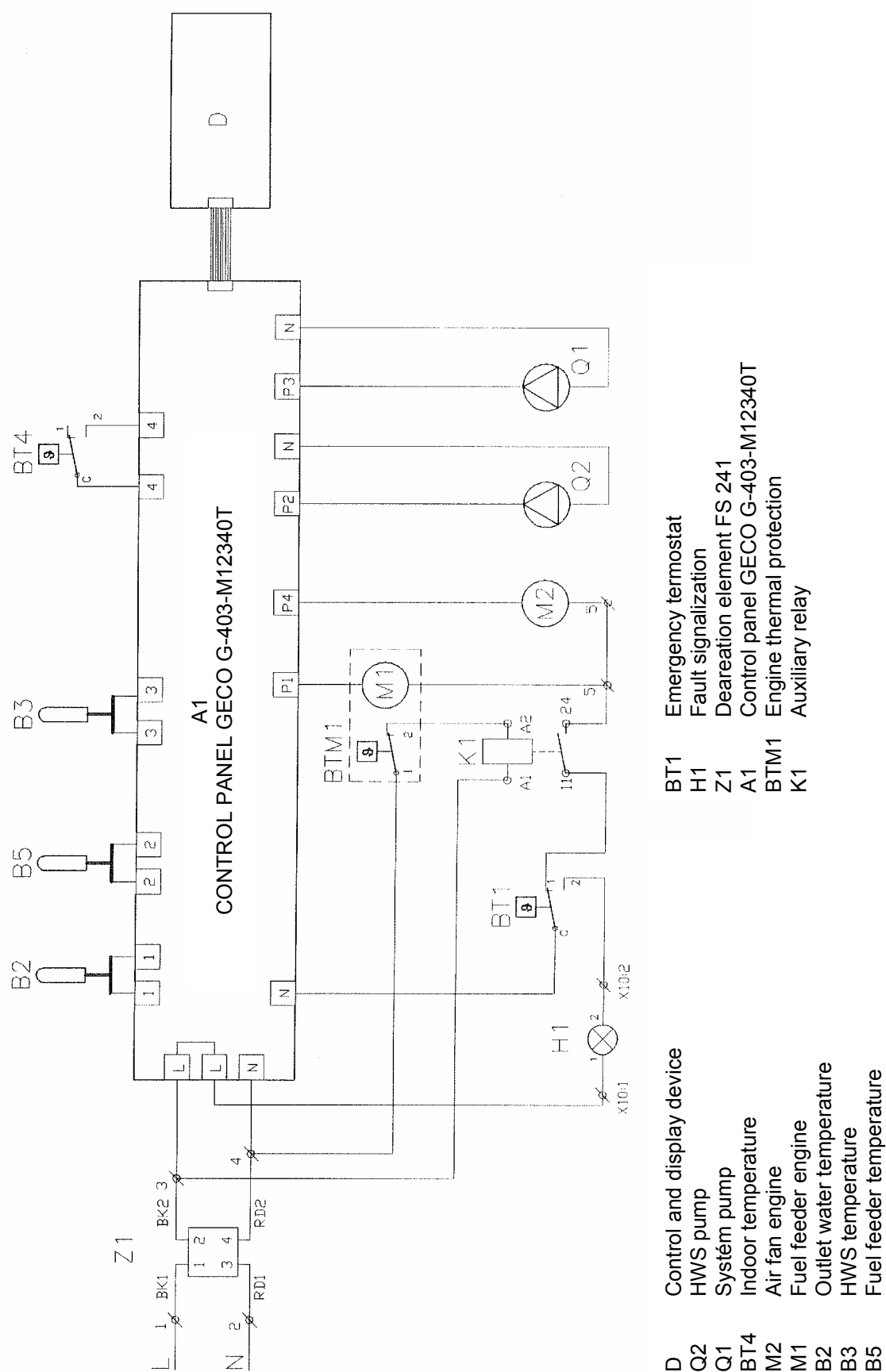


Fig. no. 16 Elementary wiring diagram of appliance and sensors connection to G-403-P02 regulator



## 6.14 PROBLEMS AND THEIR ELIMINATION (service)

Failures symptoms	Necessary to check
1. Display isn't lighting even with the control element plugged in	Check: <ul style="list-style-type: none"> <li>• 230 V voltage on the supply connectors</li> <li>• Disconnect and connect data cable</li> </ul>
2. The feeder does not switch on even if the green LED signals its connection.	Check: <ul style="list-style-type: none"> <li>• 230 V voltage on connectors according to the description on the upper cover of the implementation module</li> <li>• Feeder functionality (the safety pin stripped)</li> <li>• correct connection of indoor thermostat to the control panel</li> </ul>
3. The fan does not switch on even if the red vertical LED signals its connection.	Check: <ul style="list-style-type: none"> <li>• 230 V voltage on connectors according to the description on the upper cover of the implementation module</li> <li>• Fan connection</li> <li>• Correct connection of indoor thermostat to the control panel</li> </ul>
4. The pump does not switch on even if the red vertical LED signals its connection.	Check: <ul style="list-style-type: none"> <li>• 230 V voltage on connectors according to the description on the upper cover of the implementation module</li> <li>• pump connection</li> <li>• correct connection of indoor thermostat to the control panel</li> </ul>
5. Faulty temperature indicator	Check: <ul style="list-style-type: none"> <li>• sensor connection</li> <li>• correct sensor clamping</li> <li>• sensor cable status, the cable <b>must not</b> be damaged</li> <li>• the appearance of external surface of sensor covering, whether it wasn't mechanically damaged</li> </ul>
6. False function of control member	Check: <ul style="list-style-type: none"> <li>• 230 V voltage on supply connectors</li> <li>• supply connectors status</li> <li>• electric installation status and the number of equipments connected to a single phase</li> <li>• moisture or sudden temperature changes effect</li> </ul>
7. The display is flashing, it cannot be switched off:	Check: <ul style="list-style-type: none"> <li>• supply voltage value</li> <li>• supply connectors status</li> <li>• terminal board screws tightening</li> <li>• correct connection of indoor thermostat to the control panel</li> </ul>

## 6.15 Choking flap

The volume of dozed combustion air can be regulated by choking flap on the fan. This volume depends on the fuel quality. Generally it applies: the higher heating value (depends on the type of fuel, granularity, moisture, quality, ect.), the lower the supplied air consumption.

The most optimum air supply regulation depends on the flue gases temperature. During the ordinary operation (the boiler isn't exceedingly choked with the fly-ash and tar) the flue gases temperature should not exceed 300 °C limit. In an opposite case it is necessary to choke the volume of supplied air and feeded fuel.

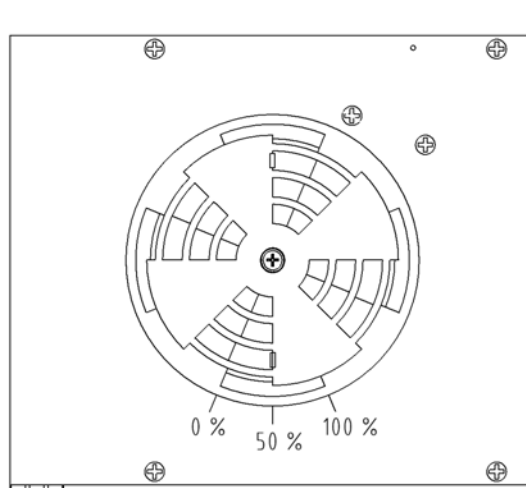


Fig. no. 18 Ventilator – ventilator choking

## **7. IMPORTANT CAUTIONS**

- The boiler only can be used for the purpose that it is destined for.
- The boiler can only be operated by adults who are acquainted with this operation manual. It is not permitted to leave the children unattended by adults at the boiler being in operation.
- 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.
- Children should be supervised in order to ensure that they do not play with the appliance.
- If there occurs a danger of combustible vapours or gases development and penetration into boiler room or at the works with a temporary fire or explosion risk (gluing the floorings, painting works using the combustible paints, etc.) the boiler must be in time before these works initiation put out of operation.
- When transporting the fuel into the combustion space before firing check visually the volume of fuel in the retort, don't put your hand into the boiler furnace. There is a danger of an injury caused by rotating worm shaft.
- It is forbidden to use the flammable liquids for firing the VIADRUS EKORET boiler.
- The flame is to be observed by opening the upper door ajar. But you must keep in mind that in this situation there is an enhanced risk of sparks outlet into the boiler room space. Immediately after the visual control of the flame the door must be properly closed.
- During the operation of VIADRUS EKORET boiler it is forbidden to overheat it in any way.
- It is forbidden to put any objects made of flammable materials on the boiler and within a distance smaller than the safe distance from it.
- It is forbidden to keep any flammable materials within minimum 1500 mm distance from boiler when clearing the ashes from it. The ashes must be put aside into inflammable vessels with cover.
- Having finished the heating season the boiler including the smoke flue must be thoroughly cleaned. The boiler must be kept clean and dry.
- It is forbidden to interfere with construction and boiler electric installation.
- **WARNING!** A poor quality of fuel can markedly negatively affect the boiler output and emission parameters

## **8. Maintenance**

- 1.) It is necessary to refill the fuel in time. When only a small volume of fuel is left in the reservoir it must be refilled immediately. **Mind out that you close properly the fuel reservoir cover afterwards!**
- 2.) If the boiler is properly adjusted the fuel is fully burnt out once it has reached the edges of the combustion grate. The ashes and cinder fall into the ash tray. The combustion space is self-cleaning and in time of an average output the ash-tray must be cleaned every other day (the protective gloves must be used). Occasionally a piece of cinder sticks between the edge of combustion grate and the boiler wall. Then it must be removed by means of a poker.
- 3.) In time of a continuous operation it is recommended to clean once a month the convection surface of boiler drum. (lamellas, combustion chamber side walls etc.). The heat transfer surfaces are getting choked which can substantially influence the heat transfer thus the boiler efficiency. These surfaces are accessible after disassembly of cowl cover. **When burning the pellets the fuel gets agglomerated in the retort. Therefore this cake must be mechanically removed once a month otherwise the screw movement stops.** The mixer must also be cleaned from time to time. The mixer choke deteriorates the combustion air flow into the burner. Minimally one hour before the cleaning process the boiler must be shut down.
- 4.) Then we recommend to do occasionally an **external** cleaning of the engine with the transmission and fan. **(The operator must not remove the cover from ventilator neither interfere in any other way with these units. It can only be done by a qualified service worker.)** A dry brush is to be used for cleaning. The boiler during the cleaning process must be disconnected from the electricity supply.



- 5.) Above the boiler burner the ceramic plates are placed. These do not require any special attention. Any fly-ash deposited on the catalyst surface can be regularly removed, but it does not influence its function. Taking off the ceramic plates is not allowed by not using the suitable protective equipments.
- 6.) If the pieces of stone, metal or wood occur in the fuel the feeding screw, it can get blocked. If this situation happens and the engine is overheated and stopped the boiler must be switched off and the obstacle removed.

**CAUTION: Before you carry out this operation you must make sure that the boiler is disconnected from the electricity supply(it is unplugged).**

- 7.) Because a slight overpressure develops in the combustion chamber with ventilator in operation it is necessary to mind a perfect tightness of boiler (the combustion chamber door, ash-pan door, mixer cleaning opening, fuel reservoir cover etc.) The fuel reservoir tightness is given first of all by closing its cover properly by means of a pivot cap and undamaged rubber sealing of the seating faces. If some leakages occur they must be eliminated by loosening two M10 screws, adjusting the latch vertically and tightening these screws again – see Fig.6. Check the tightness visually.
- 8.) If there occurs the emergency condition (the electric supply voltage failure for a longer time, ect.) and the fuel burns to the fuel hopper, owing to the temperature increase the valve TS 130 (STS20) responds and the fuel is smothered.

## **9. Instructions for product disposal after its service life**

**ŽDB GROUP a.s., is a contracting partner of the firm EKO-KOM a. s. with the client number EK-F00060715.** The packages comply with EN 13427.

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.

Whereas the boiler is constructed from common metal materials, we recommend to dispose the individual parts as follows:

- the heat exchanger (grey cast-iron), use a junk
- distribution pipes, shells, use a junk.
- other metal parts, use a junk
- insulation material ROTAFLEX, through a firm engaged in waste collection and disposal.

**In case that the product has lost its serviceability, you can use the back collection service (if this is introduced). If the originator has declared that it is the waste and it will be handled according to the legislative provisions valid in the particular country.**

## **10. Guarantee and liability for defects**

**ŽDB GROUP a. s., VIADRUS division provides the guarantee:**

- 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 entrust the installation to the professional **assembly firm** and a commissioning and fault rectification exceeding the frame of chap. 6 and 8 to a **contractual service organization accredited by the boiler manufacturer ŽDB GROUP a. s., VIADRUS division**, otherwise the guarantee for a boiler proper function does not apply

If the boiler is operated according to the instructions mentioned in this “Operation and installation manual”, the boiler does not require any special technical interference of service.

The „Quality and completeness certificate of VIADRUS EKORET boiler” serfes after its filling as a “Guarantee certificate”.

**A regular boiler maintenance, according to chap. 8. must be done by its user.**

**In case of non-performance of mentioned instructions, the guarantee provided by manufacturer, won't be admitted.**

**Every notification of fault must be conveyed immediately after its detection, always in writing or via the telephonic advice.**

The guarantee does not apply to

- faults caused by improper assembly and improper attendance of the product and faults caused by improper maintenance see chap. 8
- faults and damage caused by failure to observe water quality in heating system see chap. no. 4.1 and 5.2 or by using the anti-freeze mixture
- faults caused by failure to observe instructions stated in this manual
- product damage arising during the transport or other mechanical damage
- faults caused by rough storage
- faults caused by boiler operation with unspecified fuel (see. tab. 3 and 4)

The producer reserves the right to make changes related to the product innovations, which must not be mentioned in this manual.

## Information for customer

Packaging identification	Assessment reference
PE Plastic sacks, foil, 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 terms of 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 compostability 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.

## Guarantee certificate and Quality and completeness certificate for VIADRUS EKORET boiler

Boiler serial number ..... Boiler output .....

User (Surname, name) .....

Address (street, town, postcode) .....

Telephone/Fax .....

Boiler complies with requirements

EN 303-5 Heating boilers – Part 5: Heating boilers for solid fuel, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking

**ŽDB GROUP a. s., VIADRUS division provides the guarantee:**

- 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.

**Adjustment according to the operation and installation manual will be carried by a contracting service organization.**

**The completeness including the standard accessories and the output adjustment according to the “Operation and installation manual” guarantees the manufacturer by the contracting service organization.**

**The guarantee certificate isn't valid without having been filled in.**

Measured values	Numeric value
Chimney draught (Pa)	
Flue gases temperature (°C)	

The user declares that:

- the boiler adjusted by the qualified assembly firm didn't show out any fault during the testing:
- Received the “Operation and installation manual” with properly filled Guarantee certificate and Quality certificate
- Has been acquainted with the boiler operation and maintenance

Date of production:                      Manufacturer's stamp:                      Checked by (signature):

.....

Installation date:                      Contracting service organization                      User's signature:  
 (stamp, signature):

.....

**Annex to the guarantee certificate for customer- the user**

Record of accomplished guarantee and post-guarantee repairs and regular product checks			
Record date	Carried out activity	Contracting service organization stamp, signature)	Customer's signature

## Guarantee certificate and Quality and completeness certificate for VIADRUS EKORET boiler

Boiler serial number ..... Boiler output .....

User (Surname, name) .....

Address (street, town, postcode) .....

Telephone/Fax .....

Boiler complies with requirements

EN 303-5 Heating boilers – Part 5: Heating boilers for solid fuel, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking

**ŽDB GROUP a. s., VIADRUS division provides the guarantee:**

- 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.

**Adjustment according to the operation and installation manual will be carried by a contracting service organization.**

**The completeness including the standard accessories and the output adjustment according to the “Operation and installation manual” guarantees the manufacturer by the contracting service organization.**

**The guarantee certificate isn't valid without having been filled in.**

Measured values	Numeric value
Chimney draught (Pa)	
Flue gases temperature (°C)	

The user declares that:

- the boiler adjusted by the qualified assembly firm didn't show out any fault during the testing:
- Received the “Operation and installation manual” with properly filled Guarantee certificate and Quality certificate
- Has been acquainted with the boiler operation and maintenance

Date of production:                      Manufacturer's stamp:                      Checked by (signature):

.....

Installation date:                      Contracting service organization                      User's signature:  
(stamp, signature):

.....



## Guarantee certificate and Quality and completeness certificate for VIADRUS EKORET boiler

Boiler serial number ..... Boiler output .....

User (Surname, name) .....

Address (street, town, postcode) .....

Telephone/Fax .....

Boiler complies with requirements

EN 303-5 Heating boilers – Part 5: Heating boilers for solid fuel, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking

### ŽDB GROUP a. s., VIADRUS division provides the guarantee:

- 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.

**Adjustment according to the operation and installation manual will be carried by a contracting service organization.**

**The completeness including the standard accessories and the output adjustment according to the “Operation and installation manual” guarantees the manufacturer by the contracting service organization.**

**The guarantee certificate isn't valid without having been filled in.**

Measured values	Numeric value
Chimney draught (Pa)	
Flue gases temperature (°C)	

The user declares that:

- the boiler adjusted by the qualified assembly firm didn't show out any fault during the testing:
- Received the “Operation and installation manual” with properly filled Guarantee certificate and Quality certificate
- Has been acquainted with the boiler operation and maintenance

Date of production: ..... Manufacturer's stamp: ..... Checked by (signature): .....

Installation date: ..... Contracting service organization (stamp, signature): ..... User's signature: .....

Service center stamp: .....

# VIADRUS

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