



BOILER OPERATION AND INSTALLATION GUIDE

BENEKOV K14

BENEKOV K20

BENEKOV K25

- **Dear customer,**

Thank you for purchasing an automatic wood pellet boiler BENEKOV models K14, K20 and K25 and thus showing confidence in the company BENEKOVterm Ltd. Horní Benešov.

To get used to the correct handling of your new product right from the start please read these operating instructions, mainly chapters 7 and 8. Please be advised to observe the following information and observe the instructions of both the manufacturer as well as the service company that installed the boiler.

An initiation test of the boiler type was conducted by Vysoká Škola Báňská - Technical University of Ostrava, authorized person 260 (Certificate No. 3-17 dated 25th August 2017).

In accordance with Government Directive no. 176/2008 of the “Col.”, appendix 1, point 1.7.4. these are

ORIGINAL USER’S INSTRUCTIONS.

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1. Boiler use and advantages

Use of the boiler:

The BENEKOV K14 hot water boiler is designed to heat small or low-energy houses, chalets and other buildings whose thermal loss does not exceed 15 kW.

The BENEKOV K20 hot water boiler is designed to heat small or low-energy houses, chalets and other buildings whose thermal loss does not exceed 20 kW.

The BENEKOV K25 hot water boiler is designed to heat small or low-energy houses, chalets and other buildings whose thermal loss does not exceed 25 kW.

BENEKOV K14, K20 and K25 boilers are designed to burn wooden pellets.

Boiler advantages:

- the boilers meet the requirements of boiler class 5 and ECODESIGN
- high efficiency of the boilers
- minimal environmental impact
- automatic boiler operation
- patented burner solution with self-cleaning furnace
- automatic boiler ignition and extinguishing
- mechanical delivery of the fuel from external feeder to the furnace
- simple, time-efficient use and maintenance
- low operating costs
- modern design

2. Boiler technical specifications

Chart 1 Dimensions and technical parameters of the boilers

Boiler type		BENEKOV K14	BENEKOV K20	BENEKOV K25
Weight	kg	215	310	
Volume of the water tank	dm ³	45	70	
Diameter of the flue pipe	mm	115	145	
Boiler heat exchange surface	m ²	1,71	2,16	
Fuel store capacity	dm ³	200	370	
	kg	120	222	
Boiler dimensions: width	mm	889	1256	
depth	mm	1035	1186	
height	mm	1453	1453	
Diameter of the fuel store replenishing aperture	mm	542x388	635x690	
Highest allowed operating pressure	bar	2,0		
Testing pressure	bar	4,0		
Recommended heating water operating temperature	°C	65 - 80		
Temperature controller setting range	°C	60 - 85		
Hydraulic loss of the boiler: $\Delta T = 10 K$	mbar	5,72	19,07	23,84
$\Delta T = 20 K$	mbar	1,64	4,71	5,89

Lp _A sound pressure level	dB	54,7 ± 3,2		
Required chimney draught	mbar	0,05 – 0,08	0,05 – 0,09	0,05 – 0,10
Boiler connections: - heating water	Js	G 1"		
- return water	Js	G 1"		
Connection voltage		1 PEN 230V / 16A / ~ 50 Hz		
Maximum electrical input power	W	395	429	
Electrical rating		IP 20		

Chart 2 Thermal-technical parameters of the boilers

Boiler type		BENEKOV K14	BENEKOV K20	BENEKOV K25
Rated output	kW	15	20	25
Adjustable output	kW	4,5 – 15	6 – 20	7,5 – 25
Fuel consumption	kg . hr ⁻¹	1,0 – 3,2	1,3 – 4,5	1,7 – 5,8
Output in inhibition mode	kW	1	1	1
Fuel consumption during inhibition	kg . hr ⁻¹	0,25	0,25	0,25
Burning time at rated output and full fuel store	hr	40	28	22
Boiler class according to EN 303-5		5	5	5
Eco design		Yes	Yes	Yes
Flue gas temperature				
- at rated output	°C	115	135	150
- at minimum output	°C	90	90	90
Efficiency at rated output	%	91,3	90,4	89,5
Efficiency at minimum output	%	88,1	89,1	90,0
Mass flow rate of flue gases at exit point				
- at rated output	kg . s ⁻¹	0,007	0,008	0,013
- at minimum output	kg . s ⁻¹	0,003	0,004	0,005
Electrical input power at rated output	W	45	55	64
Electrical input power at minimum output	W	29	29	29
Electrical input power in STAND BY mode	W	3	3	3

3. Boiler fuel specifications

Chart 3 specifies required (warrantied) types of fuel for BENEKOV K14, K20 and K25 boilers:

Chart 3 Required fuels

Fuel type according to EN 303-5		C1 – wooden pellets
Grain (average)	[mm]	φ 6 - 8
Length	[mm]	max. 30
Bulk density	[kg/m ³]	600 - 650
Water content	[%]	max. 12
Ash content	[%]	max. 1,5
Calorific value	[MJ.kg ⁻¹]	min. 17

WARNING! Poor fuel quality can significantly affect the performance and emission parameters of the boiler.

The pellets must meet the requirements of standard EN ISO 17225-2 Solid biofuels – Specification and fuel grades – Part 2: Sorted wooden pellets.

4. Boiler description

4.1. Construction of the boiler

The boiler design meets the requirements of:

EN 303-5: 2013 - Boilers for central heating - Part 5: Boilers for central heating for solid fuels, with manual or automatic delivery, rated thermal outputs up to and including 500 kW - Terminology, requirements, testing and marking.

The main part of the boiler is a boiler body welded from steel boiler plates. All parts of the boiler body at the interface flue gas/heating water are made of 5 mm thick sheet metal. The combustion chamber with a burner is at the front part of the boiler body, the 3-level plate fin exchanger is at the back of the boiler body. This is the critical point of heat transfer between the flue gases and the heating water. The side walls of the combustion chamber of the boiler body are protected by ceramic plates which regulate the flow of the flue gases and assist in perfect combustion.

On the upper wall of the boiler body in the front part is a hollow where the heating water temperature sensor and the emergency thermostat sensor are located.

The burner is attached to the side wall of the boiler body. Its rotary part (the furnace), in which the combustion itself takes place, is made of heat-resistant stainless steel. Other burner elements are galvanized or painted for protection.

Under the burner in the boiler there is an ash drawer.

The fuel store is next to the boiler. The fuel is delivered from here via the stainless feeder upwards and falls through the overflow (flexible hose) into the burner. Depending on the position of the fuel store in relation to the boiler body, the boiler is manufactured in two versions:

- **right version** – the fuel store is to the right of the boiler body when viewed from the front
- **left version** – the fuel store is to the left of the boiler body when viewed from the front

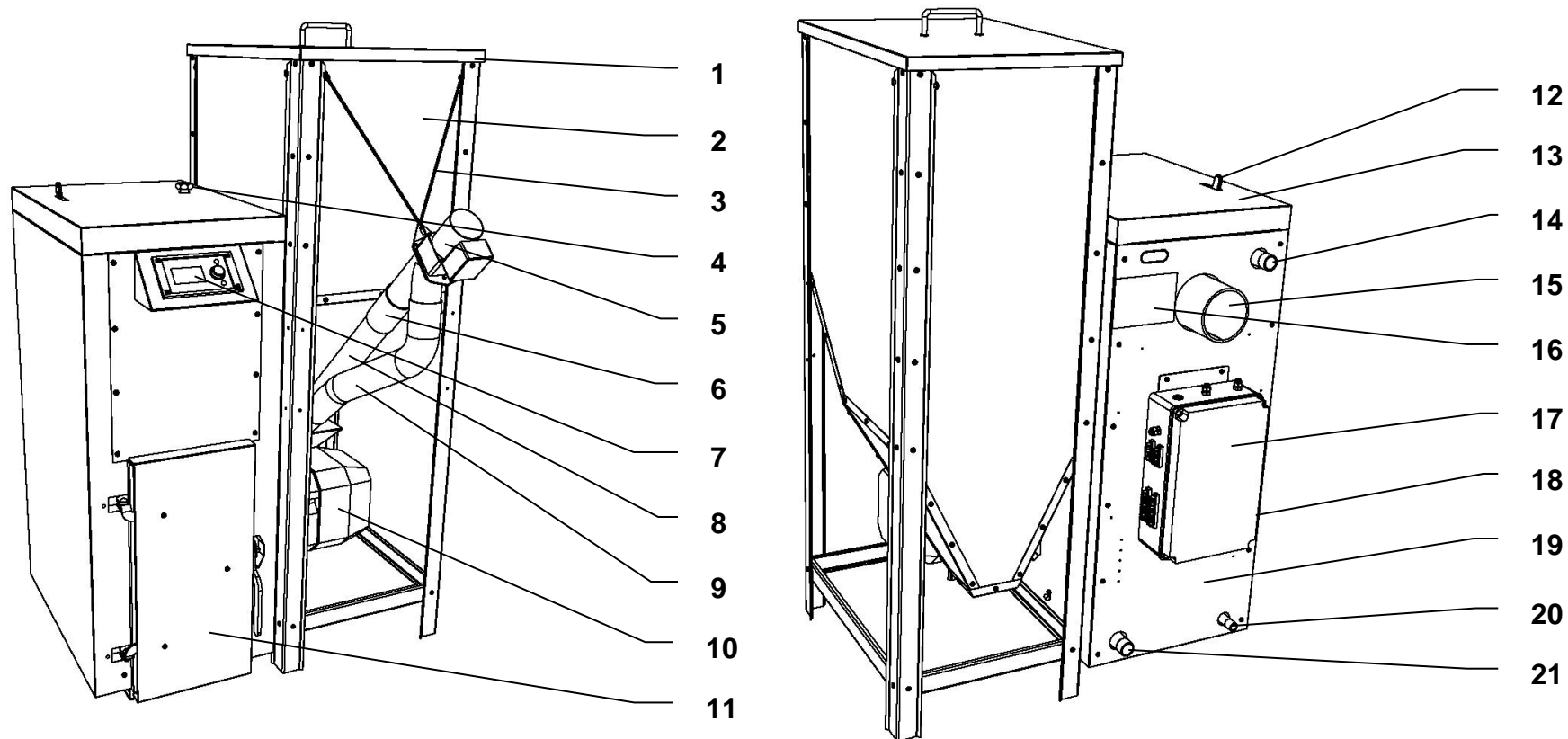
The burner fan is integrated into the burner assembly. The amount of combustion air is regulated by the boiler programmer.

The heating water inlet and outlet for connection to the heating system are located at the back of the boiler and are made of two outlets with G 1" internal thread. The outlet with G 1/2 " thread at the bottom on the right is for installation of the drain valve. There is an exhaust pipe to discharge the flue gases into the chimney at the rear of the boiler at the top.

The boiler body, its lid and door are insulated with harmless insulation which reduces heat loss to the surrounding area.

The steel cladding is colour-treated by high-quality powder coating.

Fig 1 Front and rear view of the BENEKOV K14 boiler

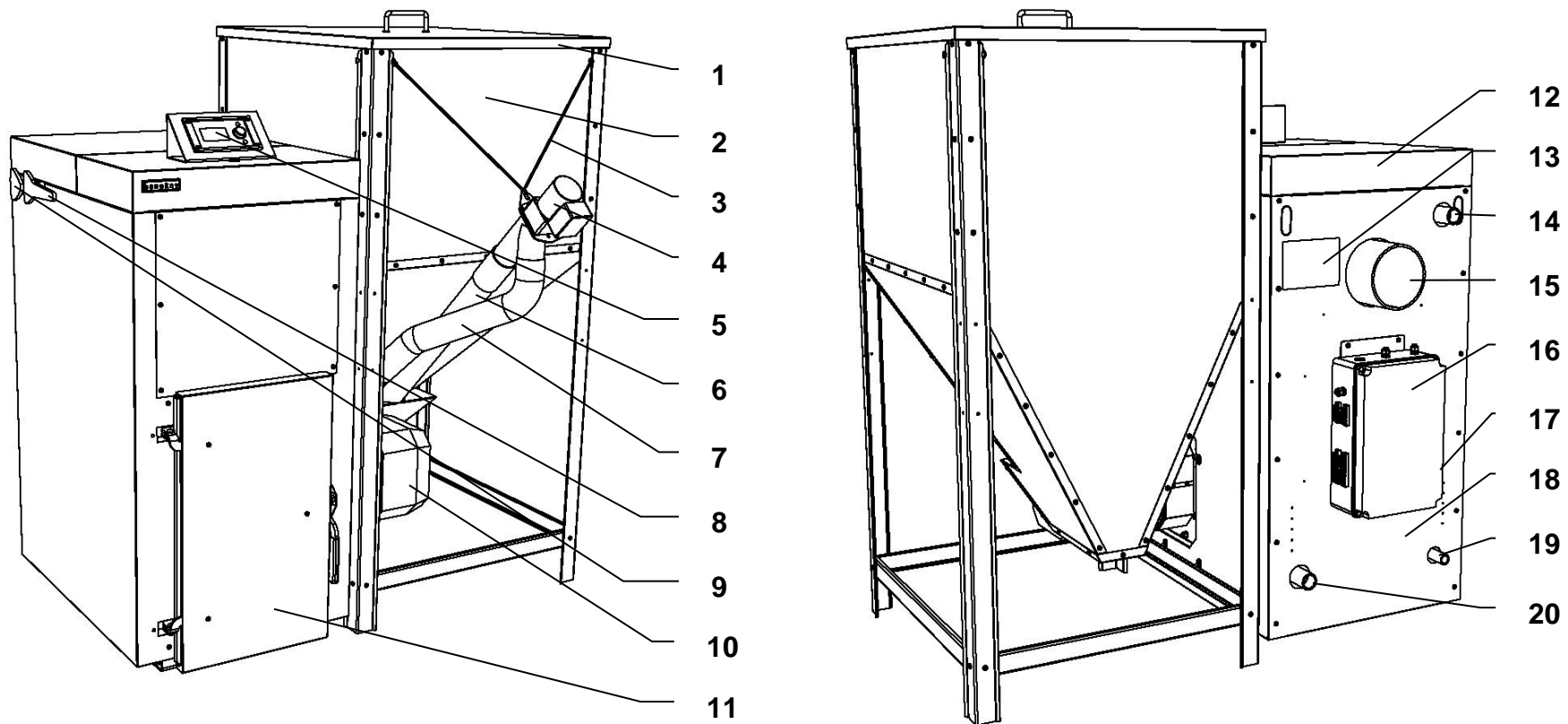


- 1. fuel store lid
- 2. fuel store
- 3. chain to secure the feeder
- 4. throttle flap locking bolt
- 5. store feeder drive
- 6. fuel feeder inspection window
- 7. control panel of the boiler control unit
- 8. fuel store feeder

- 9. fuel overflow
- 10. rotary burner
- 11. boiler body door
- 12. throttle flap lever
- 13. boiler body lid
- 14. heating water outlet
- 15. boiler flue outlet
- 16. manufacturer's label

- 17. boiler control unit distribution board
- 18. emergency thermostat
- 19. boiler body
- 20. drain valve outlet
- 21. heating water inlet

Fig 2 Front and rear view of BENEKOV K20 and K25 boilers



- 1. fuel store lid
- 2. fuel store
- 3. chain to secure the feeder
- 4. store feeder drive
- 5. control panel of the boiler control unit
- 6. fuel store feeder
- 7. fuel overflow
- 8. throttle flap lever

- 9. throttle flap locking bolt
- 10. rotary burner
- 11. boiler body door
- 12. boiler body lid
- 13. manufacturer's label
- 14. heating water outlet
- 15. boiler flue outlet
- 16. boiler control unit distribution board

- 17. emergency thermostat
- 18. boiler body
- 19. drain valve outlet
- 20. heating water inlet

Fig 3 BENEKOV K14 boiler basic dimensions

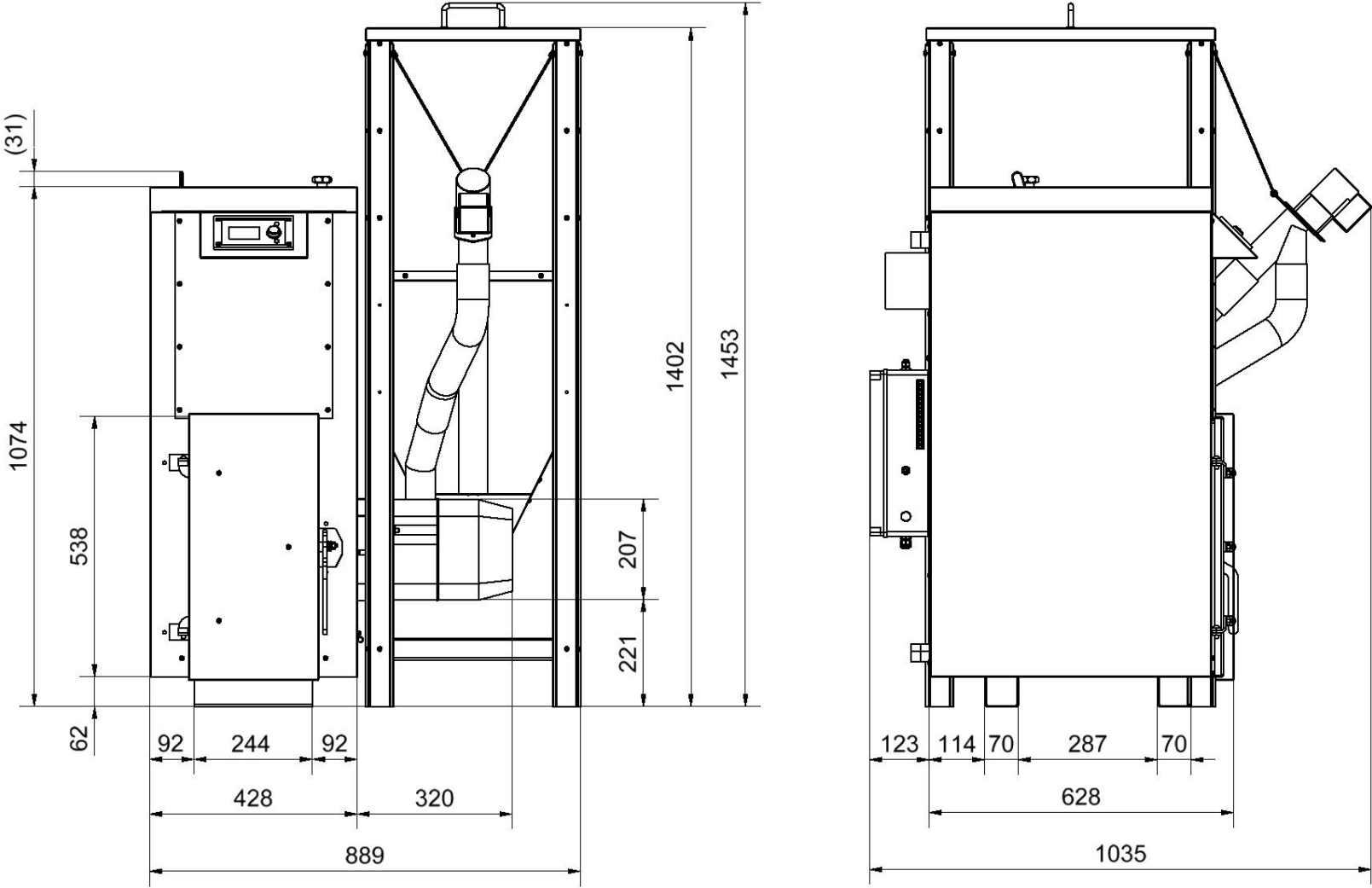
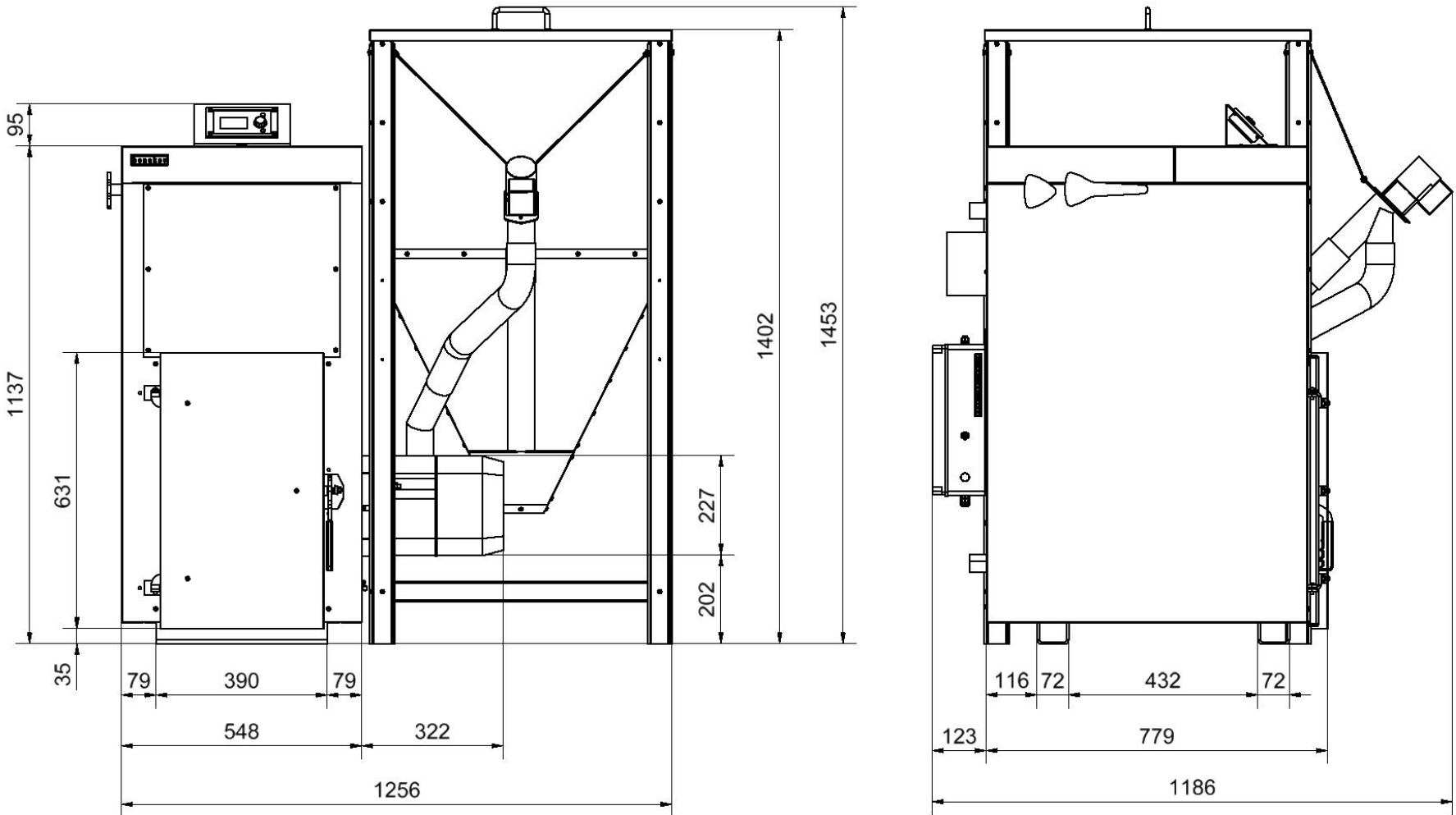


Fig 4 BENEKOV K20 and K25 boiler dimensions



4.2. Burner description

The burner is designed to burn solid fuel in the form of pellets. These must meet exact requirements - see chap. 3. Burner operation is automatic and does not normally require supervision. The system of the refractory rotary furnace prevents the slag, one of the components of the burning process, to adhere to it. By rotating the furnace the ash and slag are moved forward until they are completely removed from the burner. As the adhesion is eliminated the burner cleaning process is easier and the service life of the burner is significantly prolonged.. The burning fuel is aerated and stirred along the furnace which intensifies the burning process and enables perfect combustion of the delivered fuel.

The burner has a very low power consumption.

In cooperation with the modern programmer the burner is equipped with a safety device which interrupts the fuel supply in the event of system overheating, flame loss in the furnace or fan failure. When the power supply is interrupted the fuel feed is automatically switched off so the fuel that remains in the furnace does not cause damage to the burner.

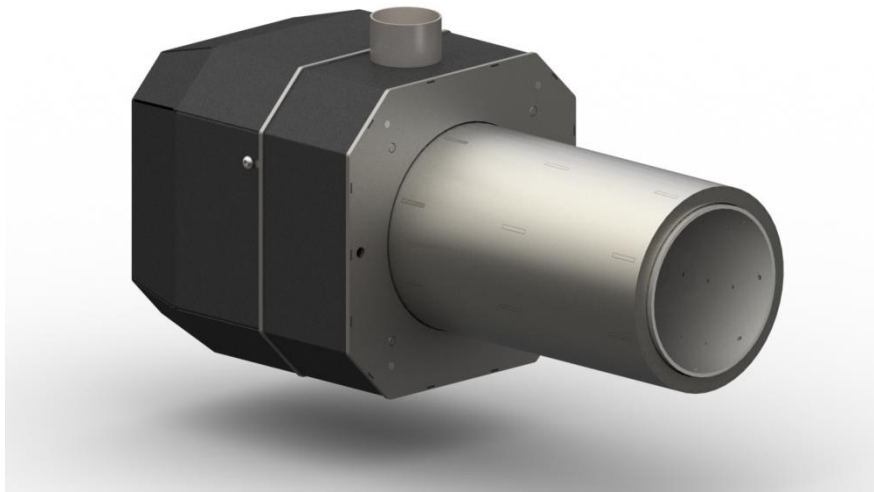


Fig 5 Basic view of the rotary burner

4.3. Burner operation

The operation of the burner starts by supplying the fuel from the store (9) via a screw feeder (8) connected to the burner itself by means of a flexible hose (7) and a connecting elbow (6). Subsequently, the fuel dose is moved by the screw feeder in the burner (12) into the rotary furnace (1). After there is sufficient supply of the fuel to the burner ignition by a coil (13) follows. After the ignition the burner switches to normal operation mode according to pre-set parameters. The air necessary to burn the fuel is supplied via the fan (10) through the aeration chamber (2) to the rotary furnace (1) and a certain amount of air flows through the chamber (5) onto the ignition coil (13). The air inlet to the burner is located at the bottom of the burner. During the operation of the burner a mechanism (11) rotates the furnace (1) and the aeration chamber (2). The rotation speed is adjustable. The combustion residue is moved to the front of the burner where it falls into the boiler ash drawer.

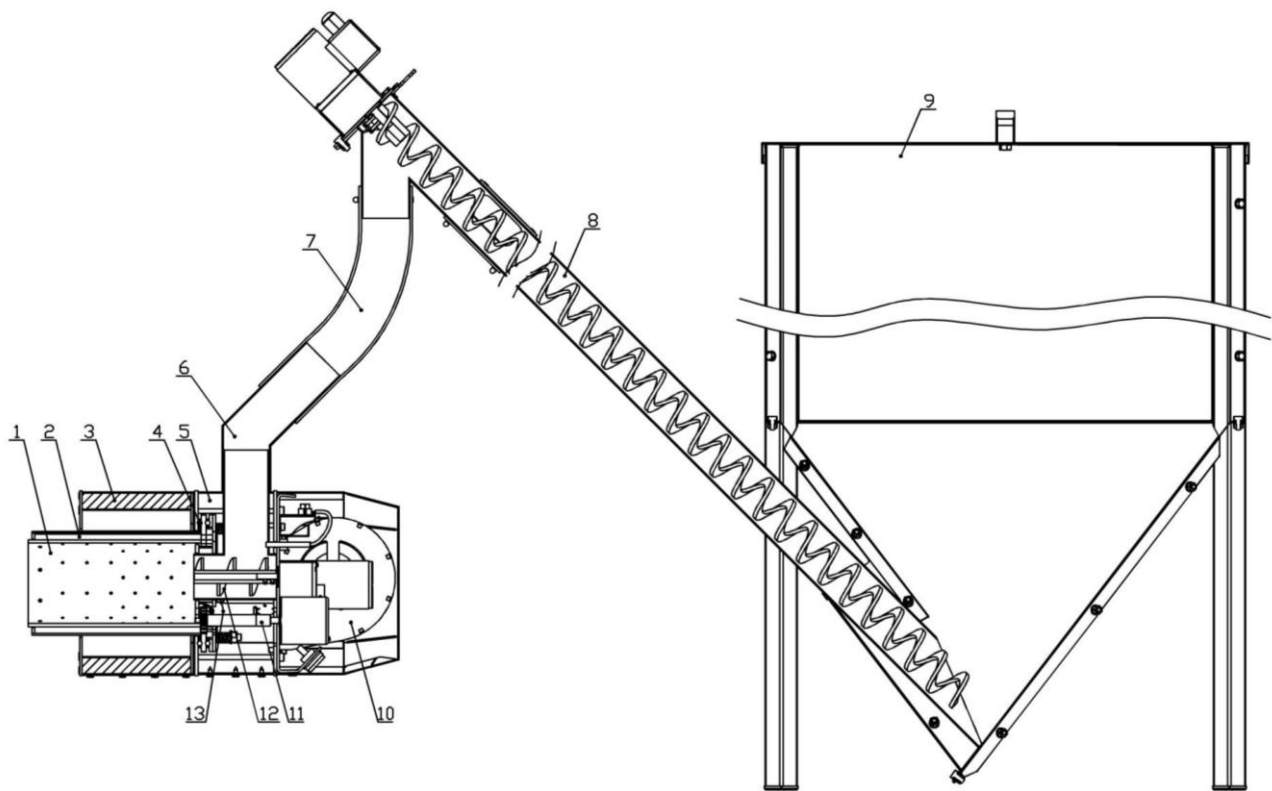


Fig 6 Feeder and burner scheme

- kde:
- 1 – rotary burner
 - 2 – rotary aeration chamber
 - 3 – insulation
 - 4 – bearing
 - 5 – aeration chamber
 - 6 – connecting elbow to the fuel feed
 - 7 – fuel overflow (flexible hose)
 - 8 – screw feeder from the fuel store
 - 9 – fuel store
 - 10 – fan
 - 11 – burner rotation mechanism
 - 12 – screw fuel feeder in the burner
 - 13 – ignition coil

The burner operation is fully automatic and adjustable. The fuel is dispensed from the fuel store depending on the desired heat output. When the set temperatures are reached the burner automatically goes through controlled extinguishing and goes into standby mode. Switching from stand-by mode to ignition mode is also fully automatic.

The user therefore only needs to set the parameters correctly, replenish required fuel amount and remove ash from the ash drawer.

4.4. Operation, control and safety features of the boiler

Boiler operation and control is provided by **programmer** – see separate user's instructions.

Safety features, which ensure safe operation of the boiler:

- **Emergency thermostat** is used to prevent the heating system against overheating. It is set by the manufacturer to a temperature of about 95 to 100 ° C which is higher than the desired boiler temperature. The emergency thermostat is located on the back wall of the boiler in the distribution board of the programmer.
- **Throttle flap** is located between the second and third levels at the top of the fin plate heat exchanger and is used to control the temperature of flue gases at the boiler outlet.

Boiler K14:

When operating the boiler where the temperature of the flue gases is above 100 ° C, the throttle flap must be closed which means the flap lever on the top of the boiler must be moved as far back as possible and secured with the locking bolt. At the beginning of the boiler operation (when the chimney is cold) or during long-term operation of the boiler at lower output it is recommended to operate the boiler with a partially open flap so that the temperature of the flue gases does not drop below 90 ° C. In this case the throttle lever must be moved forward and secured by the locking bolt.

Boilers K20 and K25:

When operating the boiler where the temperature of the flue gases is above 100 ° C, the throttle flap must be closed which means the flap lever on the side of the boiler must be turned as far as possible upwards (forwards) and secured by the locking bolt. At the beginning of the boiler operation (when the chimney is cold) or during long-term operation of the boiler at lower output, it is recommended to operate the boiler with a partially open flap so that the temperature of the flue gases does not drop below 90 ° C. In this case the throttle lever must be rotated downwards (backwards) and secured by the locking bolt.

- **Optical sensor** (photodiode) detects the presence of the flame in the furnace. If there isn't enough flame in the furnace, the programmer starts automatic ignition, i.e. it will deliver a small amount of fuel to the burner and the ignition spiral is activated. The ignition mode lasts for about 2 to 3 minutes and then the boiler goes into normal operation mode. However, if the ignition does not occur, the whole process is repeated (3 attempts in total). After an unsuccessful ignition a corresponding alarm appears on the display of the programmer, and the burner will not work further until the fault is rectified.
- **Fuel feeder temperature sensor** is located in the aerial chamber of the burner. In the event the fuel burns through inside the screw feeder in the burner, the programmer interrupts the fuel supply from the fuel store. This sensor is activated at the temperature of 60 ° C. This is a non-returnable alarm that can only be removed by the user.
- **Fuel overflow** is another safeguarding feature against the fuel burning through into the fuel store. This is a design where both screw feeders (the feeder from the store and the feeder in the burner) are connected by a fusible flexible hose and a connecting elbow. This creates an air gap in the fuel feed path between the burner and the store which protects the fuel in the store against the ignition.

- **The Hall probe** is a part of the fan and it detects its revolutions. If there is an unscheduled stop of the fan the programmer immediately interrupts the fuel supply from the store. This is a non-returnable alarm that can only be removed by the user.

4.5. Boiler accessories

Standard accessories:

- the boiler operating and installation manual which includes the Warranty Certificate
- operating instructions for the boiler programmer
- addendum to the BENEKOV boiler operating and installation instructions - Installing the fuel store for the BENEKOV K14, K20 and K25 boilers
- list of contractual service organizations
- ceramic parts - see chap. 6.2.
- ash drawer
- cleaning rake

Optional accessories:

- Boiler remote control with ecoSTER200 room panel function

Optional accessories are not included in the basic price of the boiler!

5. Boiler placement and installation

5.1. Regulations and directives

The solid fuel boiler may only be installed by a company with valid installation licence. The heating project must be designed in accordance with valid regulations.

The heating system must be filled with water that meets the requirements of ČSN 07 7401: 1992; in particular the hardness of the water must not exceed the required parameters.

Chart 4 Heating water parameters

Parameter	Unit	Value
Hardness	mmol/l	1
Ca ²⁺	mmol/l	0,3
Fe + Mg total concentration	mg/l	0,3 (recommended value)

Regulation and directive relating to:

A) heating circuit

ČSN EN 303-5:2013

Boilers for central heating - Part 5: Boilers for central heating using solid fuels, with manual or automatic delivery, with a rated thermal output not exceeding 500 kW - Terminology, requirements, testing and marking

ČSN 06 0310:2014

Heat systems in buildings – Design and Installation

ČSN 06 0830:2014

Heat systems in buildings – Safety devices

ČSN 07 7401:1992

Water and steam for thermal power equipment with working pressure up to 8 MPa

B) chimney

ČSN 73 4201:2010	Chimneys and flues - Design, implementation and connection of fuel appliances
C) <u>fire regulations</u>	
ČSN 06 1008:1997	Fire safety of thermal equipment
ČSN EN 13 501-1+A1:2010	Fire classification of construction products and building structures - Part 1: Classification according to the results of reaction to fire tests
D) <u>power supply</u>	
ČSN 33 0165: 1992	Electro technical regulations. Colour or number wire markings. Implementation regulations
ČSN 33 1500: 1990	Electro technical regulations. Inspection of electrical equipment
ČSN 33 2000-1 ed.2: 2009	Low voltage electrical installations - Part 1: Basic aspects, determination of basic characteristics, definitions
ČSN 33 2000-4-41 ed.2: 2007	Low voltage electrical installations - Part 4-41: Safety precautions - Protection against electric shock
ČSN 33 2000-5-51 ed.3: 2010	Building electrical installations - Part 5-51: Selection and construction of electrical equipment - General regulations
ČSN 33 2000-7-701 ed.2:2007	Low voltage electrical installations - Part 7-701: Single-purpose and special-purpose appliances - Areas with bath or shower
ČSN 33 2030:2014	Electrostatics - Static electricity elimination directive
ČSN 33 2130 ed.2:2009	Low voltage electrical installations – Internal electrical wiring
ČSN 33 2180:1979	Electro technical regulations ČSN. Connecting electrical devices and appliances
ČSN 33 2350:1982	Electro technical regulations. Regulations for electrical installations in difficult climatic conditions
ČSN 34 0350 ed.2:2009	Safety requirements for mobile leads and cords
ČSN EN 55 014-1 ed.3:2007	Electromagnetic compatibility - Requirements for household appliances, power tools and similar appliances - Part 1: Emissions
ČSN EN 55 014-2:1998	Electromagnetic compatibility - Requirements for household appliances, power tools and similar appliances - Part 2: Resistance – The standard of the group of appliances
ČSN EN 60079-14 ed.3:2009	Explosive atmospheres - Part 14: Design, selection and installation of electrical systems
ČSN EN 60335-1 ed.2:2003	Household and similar electrical appliances - Safety - Part 1: General requirements
ČSN EN 60335-2-102:2007	Household and similar electrical appliances - Safety - Part 2-102: Particular requirements for appliances burning gaseous, petroleum and solid fuels containing electrical connections
ČSN EN 60445 ed.4:2011	Basic and safety principles for human-machine interface, marking and identification - Colour or letters and number wire markings
ČSN EN 61000-3-2 ed.3:2006	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions of devices with input phase current ≤ 16 A
ČSN EN 61000-3-3 ed.2:2009	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage, voltage fluctuation and flicker changes in low voltage distribution systems for rated phase current ≤ 16 A which is not subject to a conditional connection
E) <u>noise</u>	
ČSN EN ISO 3746:2011	Acoustics - Determination of acoustic power levels and sound power levels of noise sources by means of acoustic pressure - Operation method with
ČSN EN ISO 11202:2010	Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at the operator's station and other specified locations using approximate environmental corrections

F) machinery

CSN EN 614-1 + A1: 2009	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles
ČSN EN 953 + A1: 2009	Safety of machinery - Protective covers - General requirements for the construction and manufacture of fixed and movable guards
EN 1037 + A1: 2008	Safety of machinery - Prevention of unexpected start-up
ISO 12100: 2011	Safety of machinery - Basic concepts, general principles for construction
ISO 13857: 2008	Safety of machinery - Safe distances to prevent reach of dangerous places by upper and lower limbs

5.2. Boiler location options

Boiler location in regards to the electric supply:

- the boiler must be positioned so the plug in the socket (230V / 50Hz) is always accessible.
- the boiler needs to be always connected to the mains by a flexible secure lead with a standardized plug.
- protection against electric shock (including earth connection of individual metal parts) must be ensured in accordance with valid regulations ČSN EN (see chapter 5.1.)

Boiler location in regards to fire regulations:

1. Location on a base made of non-flammable material

- Place the boiler on a non-flammable heat insulating mat which exceeds the size of the boiler by 20 mm on each side.
- If the boiler is located in a basement it is recommended to place it on a structure at least 50 mm high off the floor level. The boiler must be positioned horizontally.

2. Safe distance from flammable materials

- The smallest permissible distance of the external contours of the boiler and the smoke flue from any flammable materials (see more specifications in ČSN EN 13 501-1 + A1: 2010) is 400 mm during installation as well as during the operation of the boiler.

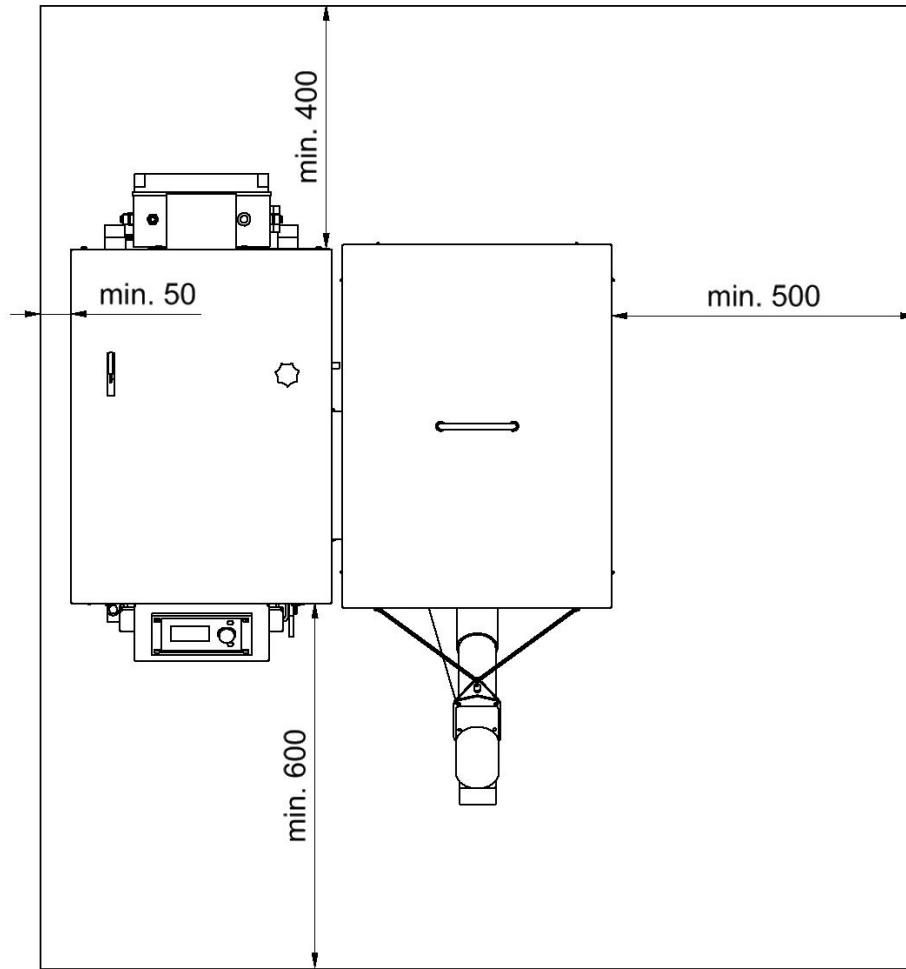


Fig 7 Position of the K14 boiler in a boiler room

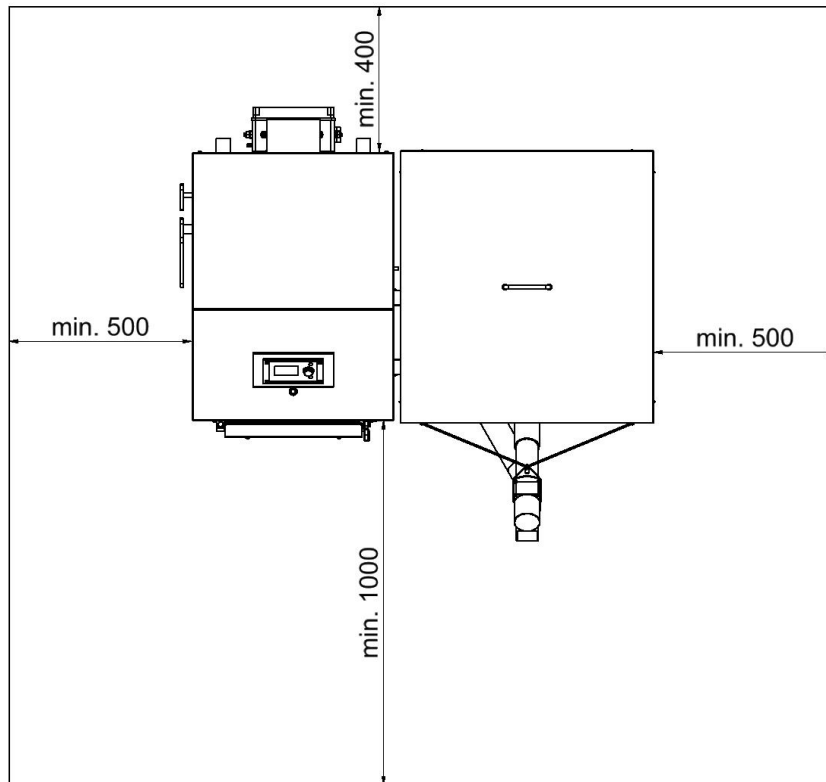


Fig 8 Position of the K20 or K25 boiler in a boiler room

Boiler location in regards to required handling space:

- AA5 / AB5 basic setting rating according to ČSN 33 2000-1 ed.2:2009
- minimum of 600 mm handling space must be left in front of the boiler (applies for K14 boiler) and 1000 mm (applies for K20 and K25 boilers)
- minimum distance between the back of the boiler and the wall must be 400 mm
- minimum 500 mm clearance on the side of the boiler body (applies for K20 and K25 boilers) to enable cleaning of the exchanger convection surface
- minimum 500 mm clearance on the side of the fuel store to enable easy replenishment
- minimum 350 mm clearance above the fuel store to enable easy replenishment

Fuel store installation and positioning:

- To install the fuel store to the K14, K20 and K25 boilers follow separate appendix to BENEKOV boiler operating and installation instructions.
- The fuel store must be, in regards to the boiler body, positioned in such way as to ensure **reliable fuel overflow** without the risk of clogging the flexible hose. The flexible hose can be shortened accordingly.
- The angle of inclination between the feeder and the horizontal floor must be between 0 and 60 °, the optimal inclination is 45 °.

Fuel location:

- It is recommended to store the pellets in a dry place in their original manufacturer's packaging (PET bags or „big bags“).
- The pellets must not be stored behind the boiler or next to the boiler at a distance of less than 400 mm.
- The manufacturer recommends keeping the distance between the boiler and the fuel to a minimum of 1 000 mm or place the fuel in a room separate to where the boiler is located.

Permanent supply and drawing of air to enable the burning and ventilation must be provided to the room which the boiler is installed into.

Air consumption at rated output for:

- BENEKOV K14 boiler is approximately $45 \text{ m}^3 \cdot \text{hr}^{-1}$
- BENEKOV K20 boiler is approximately $55 \text{ m}^3 \cdot \text{hr}^{-1}$
- BENEKOV K25 boiler is approximately $75 \text{ m}^3 \cdot \text{hr}^{-1}$

Only qualified personnel are allowed to carry out the connection of the heating system pipework or the internal heating element.

WARNING: **When connecting the boiler to the heating system, the drain valve must be located at the lowest point and as close to the boiler as possible.**

5.3. Connection to the chimney

The chimney cross-section shall not be less than 200 cm^2 .

Extraction by a flue pipe that is only secured in the flue and attached to the extraction outlet must be of secure construction in order to prevent accidental or spontaneous disconnection of the pipes.

Should the extraction be longer than 2 m it must be secured. The flue pipe must be made of non-flammable materials.

It is recommended that any leaks in the flue pipe (seams) are sealed with a sealant designed for this purpose or covered by aluminium tape.

It is recommended that the chimney vents are sufficiently heat-insulated and protected from getting cold. This can be ensured by suitable positioning within the building. If chimney is cooled too much it must be lined in such a way as to prevent condensation of the vapours contained in the cooled flue gases and subsequent absorption of the condensate into the chimney structure.

It is not recommended to have the flue pipe longer than 1 m. The cooling of the flue gases occurs in the part which is not insulated. Furthermore, if the boiler runs at low output the condensation of the moisture in the flue gasses could occur.

The connection of the boiler to the chimney must be carried out in compliance with the requirements set in ČSN 73 4201:2010 Chimneys and flue pipes.

- Connect BENEKOV K14 boiler to the chimney by a metal pipe with a diameter of 118 or 120 mm.
- Connect BENEKOV K20 and K25 boilers to the chimney by a metal pipe with a diameter of 145 or 150 mm.

6. Commissioning the boiler - for contractual service companies

The commissioning of the boiler may only be carried out by a contractual service companies authorized to carry out this activity.

6.1. Connection dimensions

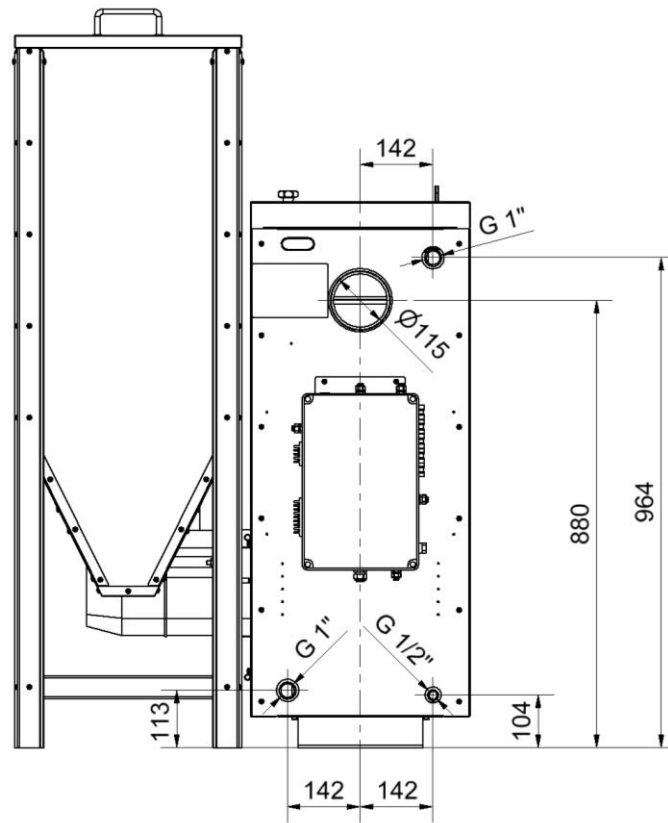


Fig 9 BENEKOV K14 boiler connection dimensions

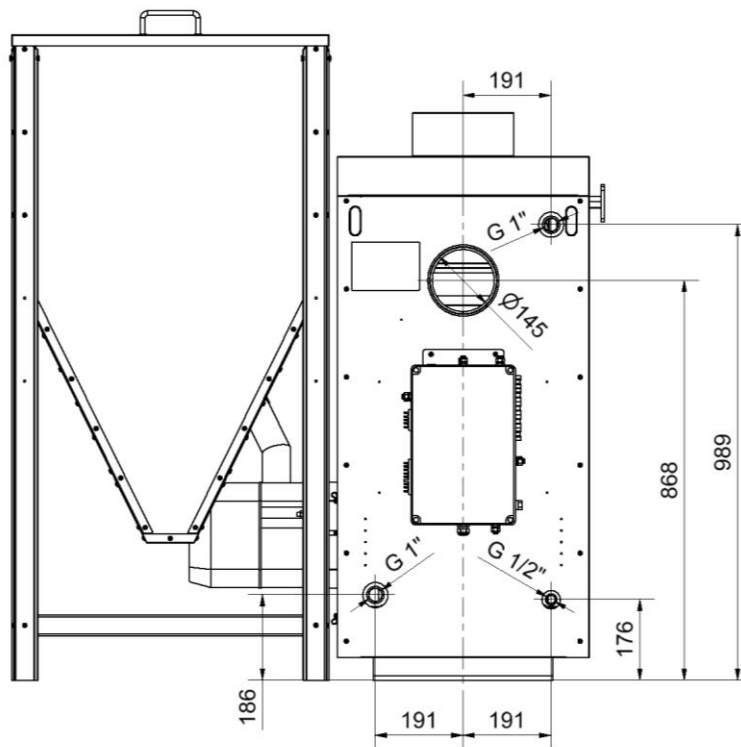


Fig 10 BENEKOV K20 and K25 boilers connection dimensions

6.2. Installation of the ceramic parts into the combustion chamber

WARNING: Only authorised service company trained by the manufacturer can install the ceramic parts of the boiler into the combustion chamber. The initial installation of the ceramic parts into the combustion chamber can be carried out exclusively by a service company with valid authorization to service and commission the BENEKOV boilers. The boiler user is authorized to install and dismantle the ceramic parts in the combustion chamber as instructed by the service company only after the first commissioning of the boiler and subsequent heating test.

It is forbidden to operate the boiler without the ceramics! Risk of thermal damage to the boiler or fire!

BENEKOV K14 boiler (2 ceramic plates 230 x 160 x 25 mm):

- Place the first plate vertically on the beam into the lower part of the combustion chamber so it covers its rear wall.
- Place the second plate vertically into the combustion chamber to cover its side wall (opposite wall to the burner). Press this plate as far back as possible closely to the first plate and secure it against falling.

BENEKOV K20 and K25 boilers (1 x ceramic fitting + 1 x ceramic plate):

- Place the ceramic fitting on the beams into the lower part of the combustion chamber to cover its side wall.
 - Place the ceramic plate vertically into the lower part of the combustion chamber to cover its rear wall. The chamfer on this plate rests on the chamfer of the ceramic fitting.
-

6.3. Checks before commissioning the boiler

The following needs to be checked before the boiler is commissioned:

a) Filling the heating system with water

The water used to fill the boiler and the heating system must be clear and colourless, without any oil, suspended or chemically aggressive substances.

Its hardness must be in accordance with ČSN 07 7401: 1992 and it is necessary that it is softened if its hardness is not suitable.

Not even multiple boiling of the water with higher hardness prevents condensation of salts on the walls of the heat exchanger. 1 mm thin layer of limestone condensation reduces the transfer of heat from the metal to water by about 10% at the given location.

Heating systems with an open expansion tank allow direct contact of the heating water with the atmosphere. In the heating season, the expanding water in the tank absorbs oxygen which increases the corrosive effects and at the same time considerable amount of water evaporation occurs.

To replenish the water use only water treated in accordance with ČSN 07 7401: 1992. The heating system must be rinsed thoroughly to remove all impurities.

It is necessary to maintain constant volume of water in the heating system.

When replenishing the heating system with water care must be taken not to let air into the system. Water from the boiler and the heating system must never be drained or taken out except when absolutely necessary, i.e. during repairs, etc. By draining and re-filling the water risk of corrosion and scale formation is increased.

Should it be necessary to add water to the heating system we do so when the boiler is cooled down to avoid damage to the steel heat exchanger.

- b) airtightness of the heating system
- c) connection to the chimney – must be approved by a chimney-sweeping company
- d) installation of the ceramic parts in the combustion chamber
- e) power supply connection

The sockets are connected so that the protective pin is at the top and the phase wire is connected to the left side when viewed from the front. The same applies to double sockets.

- f) The emission check must be carried out after the first installation in accordance with valid legal requirements of the country where the boiler is installed.

„Warranty Certificate“ must contain the completion date of the installation as well as information that a heating test has been carried out.

6.4. Commissioning the boiler

1. Perform the feeder performance test – see chapter 7.1.
2. Light the boiler up.
3. Bring the boiler to the operating temperature. Recommended operating temperature of the heating water at the exit point is 65 to 80 ° C.
4. Repeatedly check the airtightness of the boiler.
5. Perform heating test according to the relevant standards (see Warranty Certificate)
6. Inform the user about the operation of the boiler – see chapter 7.
7. Make entry into the Warranty Certificate.

7. Boiler operation by the user

7.1. Feeder calibration

WARNING! This is a very important activity. Correct and accurate measurement and setting of ‚Test fuel quantity‘ in the drive determines the reliability of the boiler operation. Entering an incorrect value will cause the boiler to malfunction.

The value *Test fuel quantity* defines the amount of fuel that the feeder can deliver to the burner during continuous operation per unit of time (specifically 6 mins) according to a particular setting and inclination. To set the value follow the below:

1. Check that the screw feeder is correctly positioned against the tray. The angle between the feeder and the horizontal floor must be between 0 and 60°, the optimum is 45°.
 - Installation of the feeder at an angle of less than 45° increases the amount of fuel delivered.
 - Installation of the feeder at an angle of more than 45° reduces the amount of fuel delivered.
2. Fill the tank with the required fuel – see chapter 3.

3. Connect the boiler to the mains (230V/50Hz) via a cable with plug.
4. Remove the flexible hose including the connection elbow (see Fig 6) from the top of the burner and place it in a suitable container.
5. Press the **START** button (*Main menu → Boiler settings → Feeder Calibration → Feeder filling*) to fill the screw feeder with the fuel from the tank. Stop the feeding of the screw feeder by pressing the **STOP** button for about 30 seconds after the pellets begin to fall from the feeder into the container. Empty the container with the pellets and return it under the disconnected elbow. Press the **NEXT** button to move directly to the *Calibration test* (alternatively follow: *Main menu → Boiler settings → Feeder Calibration → Calibration test*).
6. Press the **START** button to start running the feeder calibration test (*Main menu → Boiler settings → Feeder Calibration → Calibration test*). The feeder starts to pour the fuel into the container and a countdown of the test is shown on the display. It is automatically terminated after 6 minutes.
7. Weigh the amount of fuel that has been delivered into the container.
8. Enter the amount (in grams) into the boiler control unit (*Main menu → Boiler settings → Feeder Calibration → Test fuel quantity*). This value determines the feeding quantity during the boiler operation. Incorrect value will cause malfunction of the burner. Entering lower value than the actual amount acquired during the test will cause more fuel to be delivered to the burner during normal boiler operation. Entering a higher value than the actual amount acquired during the test will cause less fuel to be delivered to the burner during the normal boiler operation.

The boiler feeder value for BENEKOV K14 must not be less than 4 kg/hr.
 The boiler feeder value for BENEKOV K20 must not be less than 5 kg/hr.
 The boiler feeder value for BENEKOV K25 must not be less than 6 kg/hr.

9. Push the flexible hose including the connection elbow back into the upper pipe of the burner.

7.2. Lighting up the boiler

1. Check the amount of water in the heating system.
2. Check that the shut-off valves between the boiler and the heating system are open.
3. Check that the circulation pump is working.
4. Clean the burner and the ash drawer.
5. Fill in the fuel store with the required fuel type – see chapter 3. When finished **close the fuel store properly** to prevent possible fumes being sucked into the burner via the screw fuel feeder.
6. Connect the boiler to the mains (230V/50Hz) via a cable with plug.
7. If not done yet, select the manual control in the programmer to fill the screw feeder up from the fuel store.
8. Switch the programmer on (see separate user's instructions for operating the programmer). The programmer evaluates the status of the boiler and lights it up. First, the fan is switched on and blows through the burner. Subsequently, the fuel feeder is activated and the amount of fuel required is delivered to the burner. Then an ignition spiral is activated to ignite the fuel. The ignition period is different and dependant of the type of fuel, it usually takes about 2 – 3 minutes. When the fuel is ignited (meaning the value of the parameter measured by the optical sensor reaches pre-set value), ignition mode ends and the boiler enters the automatic running mode.

7.3. Running mode of the boiler

During this mode the fan as well and the screw feeder cycle are in operation. The basic information relating to the running of the boiler is shown on the programmer display. This mode lasts till the boiler (or room) temperature reaches pre-set value (see separate user's instructions for operating the programmer).

In case of power outage (230 V, 50 Hz) the programmer remembers its setting, when the power supply is renewed the programmer goes back into the remembered setting.

If the temperature of the heating water reaches 95 to 100°C the emergency thermostat responds by shutting the boiler off separately from the programmer. The programmer then displays signal overheating.

The emergency thermostat can be switched back on by unscrewing the black emergency thermostat cover and pressing the colour button only when the temperature drops below the set value by approx. 20 °C. The black cover then needs to be put back into its original position.

To avoid unwanted response of the emergency thermostat it is recommended the heating water on the exit is set to 80°C.

In case of repeated response of the emergency thermostat the boiler must be shut down and the cause of the repeated overheating of the boiler must be investigated.

7.4. Shutting the boiler down

The boiler is shut down automatically by the programmer (see separate user's instructions for operating the programmer). There is no need for an intervention by the user.

IMPORTANT:

- **It is not safe to use this appliance by people (including children) with physical, sensory or mental disability or by people with lack of experience and knowledge.**
- **It is unacceptable to leave children unattended near the boiler whilst in operation.**
- **The boiler must be decommissioned if there is a danger of formation and presence of flammable gasses in the boiler room or during works (such as gluing of flooring, using flammable paint, etc.) with interim danger of fire or explosion.**
- **Special attention must be paid to the lower part of the fuel store where the screw feeder is located. The free (rotating) end of the screw feeder must be covered by the fuel at all times and secured so it cannot be touched by hand. Rotating screw feeder can cause serious injuries.**
- **It is forbidden to use flammable liquids to ignite the boiler.**
- **If there is need to observe the flame during the boiler operation, this must be done by opening the door. If it is necessary to open the boiler door during the boiler operation (i.e.: to remove ash from the ash drawer) there is increased risk of sparks or smoke entering the boiler room. In this instance it is necessary to immediately close the boiler door. To open the door during the boiler operation the user must take great care and follow these steps: open the door slightly, wait until the flue gases disperse from the combustion chamber and then open the door fully.**
- **The fuel store lid must be carefully closed during the boiler operation.**
- **The fuel store is filled with fuel up to the height of maximum approx. 30 mm below the lower edge of the store to ensure the lid can be closed securely.**
- **It is forbidden to overheat the boiler during its operation.**
- **Do not place flammable objects on the boiler and closer than the specified safe distance (see chapter 5.2.)**
- **When removing the ash from the boiler no flammable materials must be closer than 1500 mm from the boiler. The ash must be placed into a non-flammable container with lid.**
- **If the boiler is operated at temperatures lower than 60°C condensation forms on the steel boiler body. This is called low-temperature corrosion which shortens the life span of the boiler. The boiler should therefore be operated at temperatures higher than 60°C.**
- **After the end of the heating season the boiler as well as the flue pipe must be thoroughly cleaned. The boiler room must be kept clean and dry.**
- **It is forbidden to interfere with the construction and electrical installation of the boiler.**
- **It is forbidden to use the burner without its housing.**
- **The boiler is operated with a fan.**
- **The boiler is operated with negative pressure at the flue gases outlet.**
- **The boiler operates in conditions without condensation.**
- **The burner must not be used as a separate appliance.**

7.5. Residual risks and preventing them

The risks arising from the use of the boiler under anticipated conditions and logically predictable incorrect use have been minimized by available technical means.

Despite implemented construction and technical measures some residual risks are still present during the boiler operation. These residual risks arise from analysis of risks determined by the technological process during the various stages of the service life of the product.

These include in particular the risks of lack of concentration by the boiler user and failure to observe safety precautions during operation.

To further reduce the risks and ensure greater security efficiency attention is drawn to possible occurrence of residual risks that cannot be eliminated by any technical solutions.

a) Electrical risks

- connection, maintenance and repair of electrical parts of the boiler must be carried out only by qualified personnel in accordance with applicable technical regulations and standards
- the electrical wiring must comply with applicable regulations
- the power cable and wiring of the boiler must be regularly checked and maintained at required standards
- should there be any damage to the electrical part, the boiler must be shut down, disconnected from the power supply and a repair by a qualified person must be ensured
- it is forbidden to interfere with the security circuit connections or tamper with parts that ensure safety and reliability of the appliance

b) Thermal risks

- the boiler must not be exposed to higher operating pressure than specified
- it is forbidden to overheat the boiler
- the boiler must be protected against low-temperature corrosion by appropriate connection with automatic return temperature protection
- only specified fuel can be burnt in the boiler
- it is prohibited to store flammable materials in close vicinity of the boiler
- when operating the boiler maximum attention must be paid to the risk of burns caused by heat source

c) Risks caused during fuel manipulation

- Solid particle emission occurs whilst handling the fuel. It is therefore recommended to use appropriate protective equipment according to the dustiness of the fuel.
- relevant fire regulations must be followed and a suitable fire extinguisher must be available

d) Ergonomic risks

- the boiler must be positioned in the boiler room horizontally
- it is forbidden to reach into the screw feeder
- during boiler operation all doors, lids and covers must be closed properly

8. Boiler maintenance

The boiler maintenance can be carried out only by a trained authorized service company that is familiar with these instructions.

- 1.) It is necessary to re-fuel the store in a timely manner. If there is only small amount of fuel remaining in the store it must be immediately re-filled to avoid „fake“ air intake or smoke entering the fuel store. Attention needs to be paid so the fuel store lid is closed properly!
- 2.) If the boiler is set up correctly, the fuel is completely burnt when it reaches the edge of the rotary part of the burner. The ash then falls into the ash drawer. The combustion chamber is self-cleaning and the ash drawer needs to be emptied on average once a week if the boiler operates at average output (safety gloves must be worn). Occasionally, a piece of slag might get stuck on the edge of the rotary part of the burner. It is then necessary to remove it by using the rake.

- 3.) During continuous operation of the boiler it is recommended to clean the heat exchanger surface of the boiler body once a month. The heat transfer surfaces can become clogged, which can greatly affect the heat transfer and thus the efficiency of the boiler. After the end of heating season the boiler must be thoroughly cleaned.
- 4.) The minerals contained in wood pellets may produce hard deposits in the furnace on the rotary part of the burner during the boiler operation. This can subsequently negatively affect the reliability and quality of the combustion. It is therefore advisable to check the burner area at least once a week. Should there be any hard deposits found on the burner, it needs to be removed and the deposits removed manually.
- 5.) Occasional external cleaning of the burner and the feeder is also recommended. This must be done by a dry brush. **The boiler must be disconnected from the power supply during this activity!**
- 6.) The heat-resistant ceramic parts placed in the combustion chamber near the burner must also be cleaned during the boiler cleaning.
- 7.) Slight excess pressure is generated in the burner area during the fan operation, it is therefore important to ensure the boiler is fully sealed (boiler door, boiler top cover, fuel store lid, etc.).
- 8.) The fuel feeder gearbox is filled by synthetic oil by the manufacturer, its maintenance is therefore not necessary.
- 9.) Any maintenance and service must be carried out when the boiler power supply is disconnected and the boiler is cold.

9. Maintenance, setting and service of the burner

9.1 General instructions

To ensure malfunction free operation and achieve high life span of the burner, observe the following guidelines:

- The furnace and the burner should be kept clean by regular cleaning. The frequency of cleaning depends on the fuel quality, ash and humidity, the number of ignitions and the size of the ash drawer. On average, cleaning should be done once a week.
- Use only specified fuel. Burning of other fuels is prohibited.
- Ensure sufficient fresh air supply to the boiler room.

9.2 Cleaning the tubular aeration rotary chamber

During the boiler operation some products of combustion can pass through the aeration holes into the space between the furnace pipe and the outer pipe. Depending on the type of fuel used, it is recommended to clean the area on average every 6 months of the burner operation. To remove the burner follow these steps - see Figures 11 and 12:

1. Disconnect the power supply to the burner and feeder external cable from the programmer
2. Open the boiler door to gain access to the furnace pipe.
3. Loosen the screws (6) that secure the cover - 2 pcs.
4. Remove the burner cover (9).
5. Unscrew the locking bolts (7) - 4 pcs.
6. Carefully remove the flange with drives and fan (8).

7. When removing the flange (8) remove the ignition coil (12) from the bushing.
8. Place the disassembled parts in a safe place taking extra care with the ignition coil.
9. Locate and loosen the locking bolt (5). If you cannot see the bolt, manually rotate the outer pipe (1) in direction marked "Z" until you see it.
10. To remove the pipe (1) turn it in the direction marked "O".
11. Remove the pipes (1) and (2) from the burner.
12. Clean both pipes. If necessary clean also the aeration holes in the pipe (2).
13. After the pipes are clean proceed with installation of the burner.
14. Place the combustion pipe (2) into the outer pipe (1) – ensure the catch (4) is correctly positioned into the groove (3) with indentation.
15. Place both pipes into the burner and ensure the pipe catches (1) fall into the hooks (11).
16. Turn the pipe in the direction marked "Z" until it stops.
17. Position the pipes so the locking bolt (5) can be tightened.

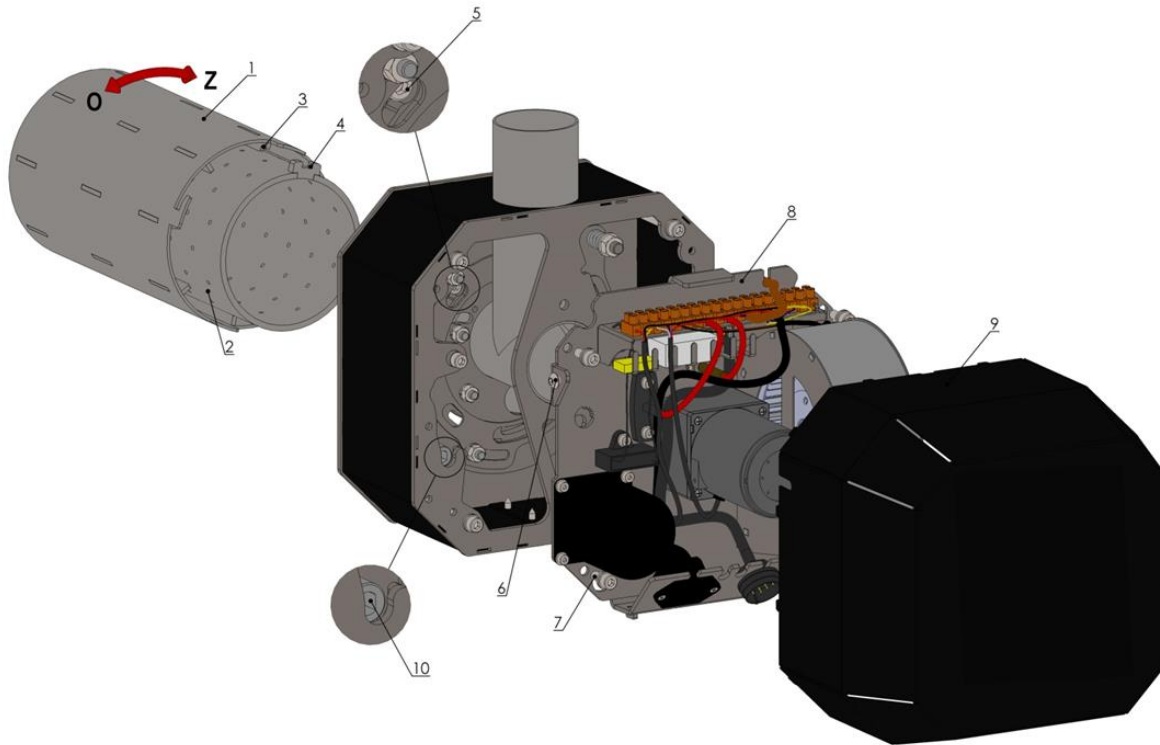


Fig 11 Cleaning of the tubular aeration rotary chamber – view 1

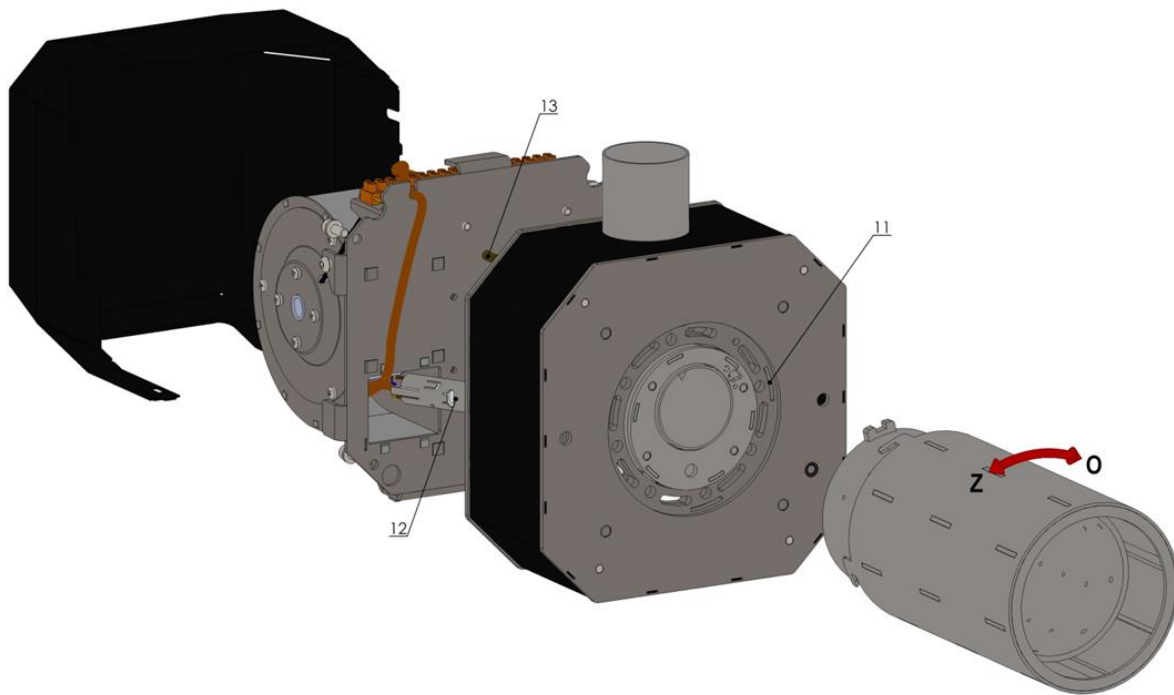


Fig 12 Cleaning of the tubular aeration rotary chamber – view 2

18. Tighten the locking bolt (5) – it is important to ensure the bolt is positioned outside the pipe ribs (1) and is fully tightened.
19. Attach the flange with the drives. (8). Whilst doing this place the ignition coil (12) into the bushing so that it is properly secured. The aperture for the drive shaft (10) must be aligned with the position of the drive shaft itself – the shaft can be rotated by turning the pipe (1) in the direction marked "Z". The temperature sensor (13) must be placed in the hollow which is positioned in the fuel supply pipe. Tighten the screws (7).
20. Replace the cover (9).
21. Tighten the screws (6).
22. Close the boiler door.
23. Re-connect the power supply.
24. The burner is ready for further operation.

9.3 Setting up airflow into the furnace

If necessary (depending on fuel type, installation conditions, etc.) it is possible to manually control the amount of air for combustion and its distribution to primary and secondary. To use this setting, follow these instructions – see Figure 13:

1. Loosen the bolts (1) that secure the burner cover - 2 pcs.
2. Remove the burner cover (2).
3. Using Allen key size 5 (4) turn the bolts (3). Turn counter clock wise to reduce the air flow, turn clock wise to increase it. The range of the airflow from minimum to maximum is 90°.
4. When finished replace the burner cover (2) and tighten the bolts (1).

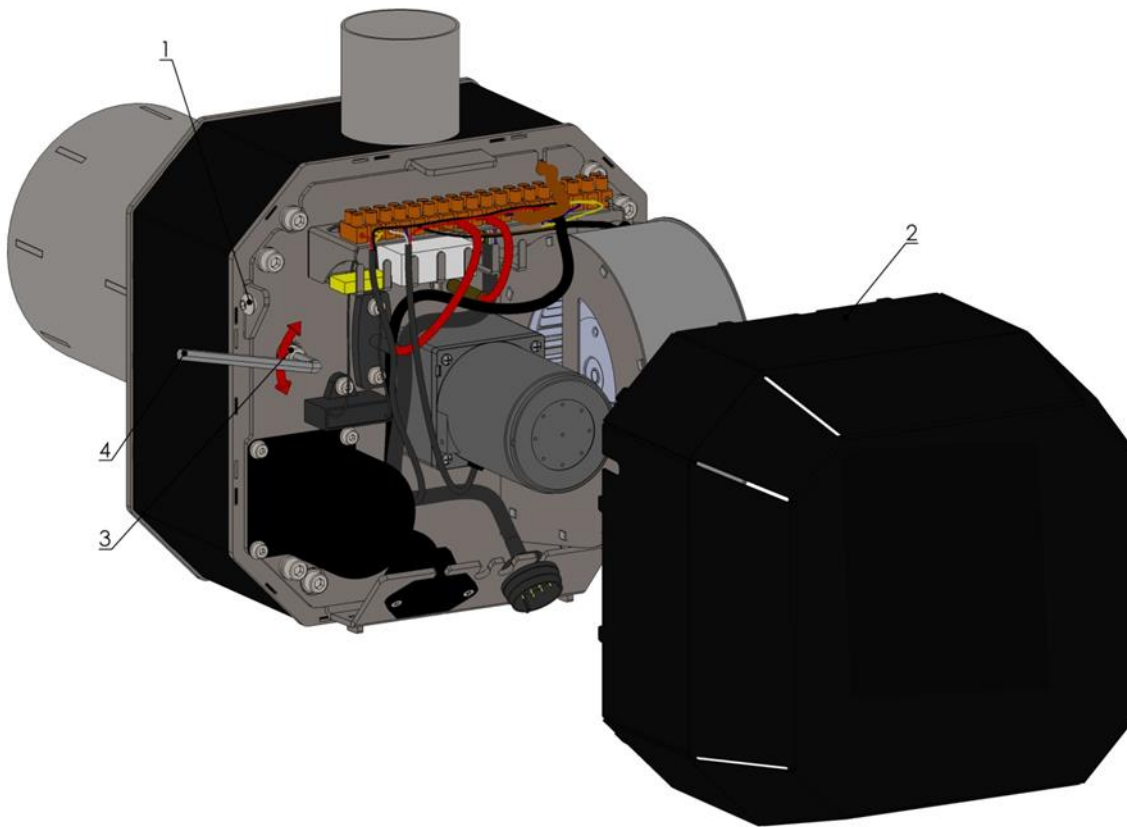


Fig 13 Setting up airflow into the furnace

9.4 Lubrication of the furnace bearings

To ensure longer burner life regular lubrication of the furnace bearings is recommended. Depending on the frequency of the burner operation it is recommended to lubricate the bearings every 6 – 12 months. Follow these instructions – see Fig 14 and 15.

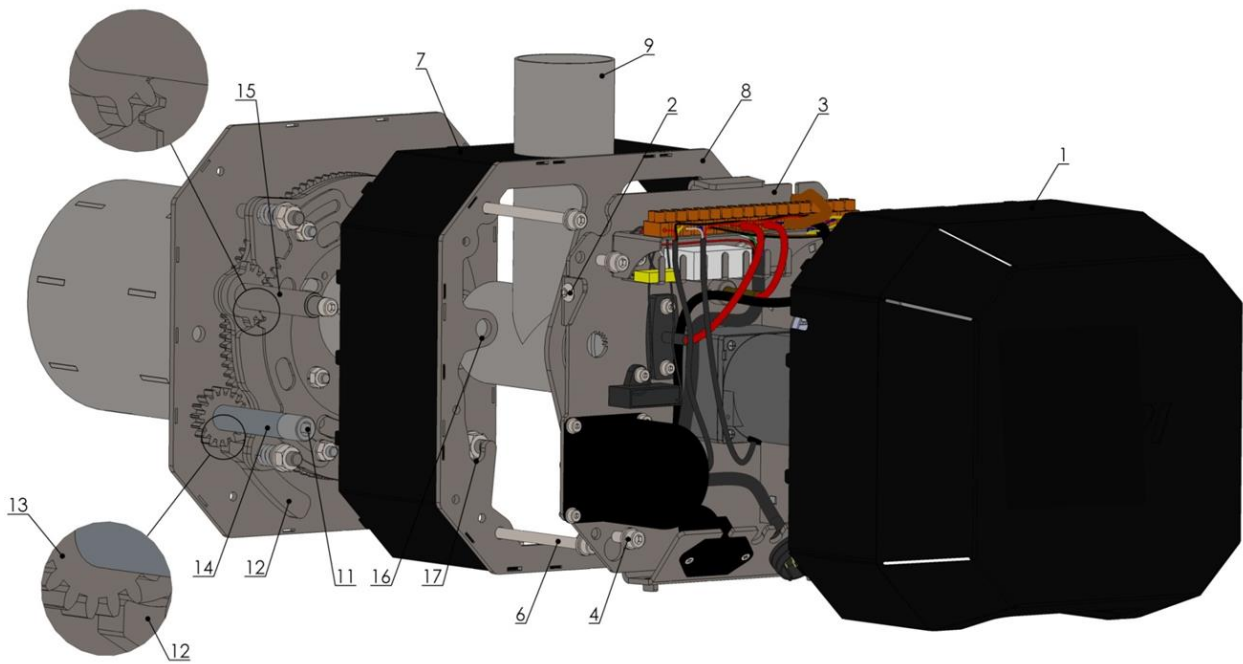


Fig 14 Furnace bearings lubrication - view 1

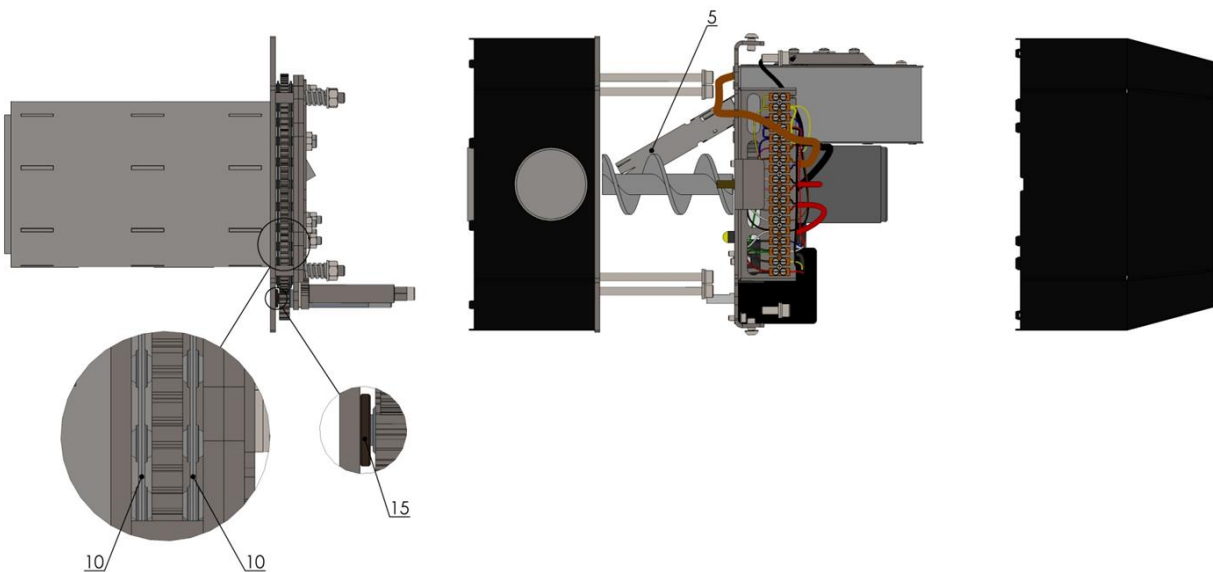


Fig 15 Furnace bearings lubrication - view 2

1. Disconnect the power supply to the burner and feeder external cable from the programmer.
2. Loosen the screws (1) that secure the burner cover - 2 pcs.
3. Remove the burner cover (2).
4. Unscrew the locking bolts (4) - 4 pcs.
5. Carefully remove the flange with drives and fan (8).
6. Whilst removing the panel (3) remove the spark plug (5) from the housing.
7. Place the disassembled parts in a safe place taking extra care with the spark plug.
8. Unscrew the bolts (6).

9. Remove the air chamber cover (7) together with the frame (8), the T-piece (9), the drive shaft (14) and the rotating partition shaft (15). If necessary remove the locking bolt of the T-piece.
10. Lubricate the bearings of the combustion chamber (10) at several points along the entire circumference by applying grease between the race and the cage of the bearings. Use solid lubricant (i.e. Towot, LT 43).
11. Place the shaft (14) into the housing (18) of the front burner cover. The latch (12) must be positioned between the cogs of the wheel (13) as shown in the detail.
12. Position the shaft (15) into the aperture of the bearing plate. Set the clogs as shown. This is setting for closing the air partition which means minimum air flow.
13. Align the partition of the air chamber (7) together with the T-piece (9) and the frame (8). The spigots in the lip of the partition must correctly align with the holes; T-piece must be placed into the panel aperture. Replace the frame (8); ensure its spigots are also correctly located in the holes. If necessary tighten the T-piece locking bolt (2). The end of the drive shaft (14) must also be correctly located into the hole (17), while the partition rotating shaft (15) into the hole (16).
14. Tighten the bolts (6).
15. Attach the flange with the drives (3). During this step place the spark plug (5) into the housing so it is properly seated. The aperture for the drive shaft (11) must be aligned with the position of the drive shaft itself – the shaft can be rotated by turning the pipe (1) in the direction marked "Z". The temperature sensor (13) must be placed in the hollow which is positioned in the fuel supply pipe. Tighten the screws (4).
16. Replace the cover (1).
17. Tighten the screws (2).
18. Close the boiler door.
19. Connect the disconnected cables.
20. The burner is ready for further operation.

9.5 Replacing the ignition coil

The ignition coil must be replaced only by a trained service technician or a person with appropriate electrical certification (SEP up to 1 kV). To replace the ignition coil follow these instructions – see Fig 16:

1. Disconnect the power supply.
2. Loosen the screws (1) that hold the cover (2) - 2 pcs.
3. Remove the burner cover (2).
4. Disconnect the spark plug from the terminals Z2 and Z4.
5. Remove the end cap (4) from the ignition tube (5).
6. Remove the spark plug (6) from the ignition tube (5).
7. Place new spark plug (6) back into the ignition tube (5). Ensure it is entered into the tube along its grooves (5). The spark plug should protrude from the ignition tube by approx. 20 mm (5).
8. Replace the end cap (4) on the ignition tube (5) and secure the catches (2 pcs) which are positioned on the edge of the ignition tube (5).
9. Connect the spark plug to the terminal blocks (3).
10. Replace the cover (2).
11. Tighten the screws (1).
12. Connect the disconnected cables.
13. The burner is ready for further operation.

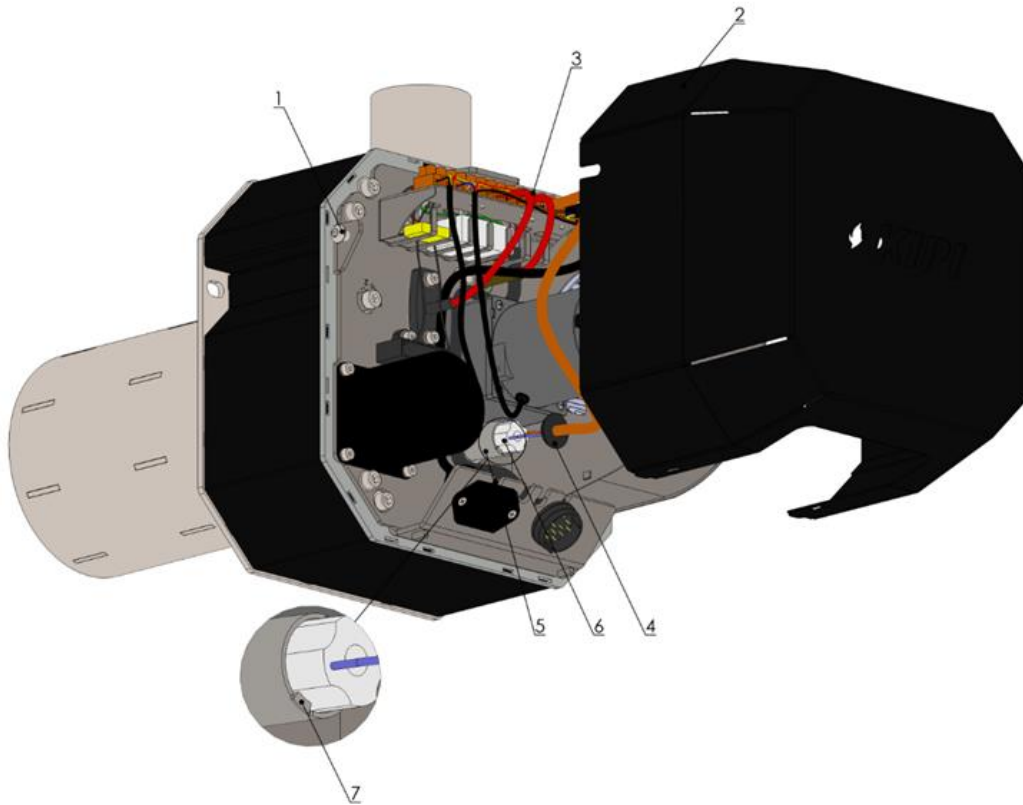


Fig 16 Replacement of the ignition coil

9.6 Diagram of burner electrical connection

R2, R4	- rotary burner cleaning
S2, S4	- feeder in the burner
W2, W4	- fan
F2, F4	- optical sensor
F4, C4, Z2	- Hall probe
C2, C4	- feeder temperature sensor
Z2, Z4	- ignition
P2, P4	- fuel store feeder
PE	- earth connection
N	- Neutral wire

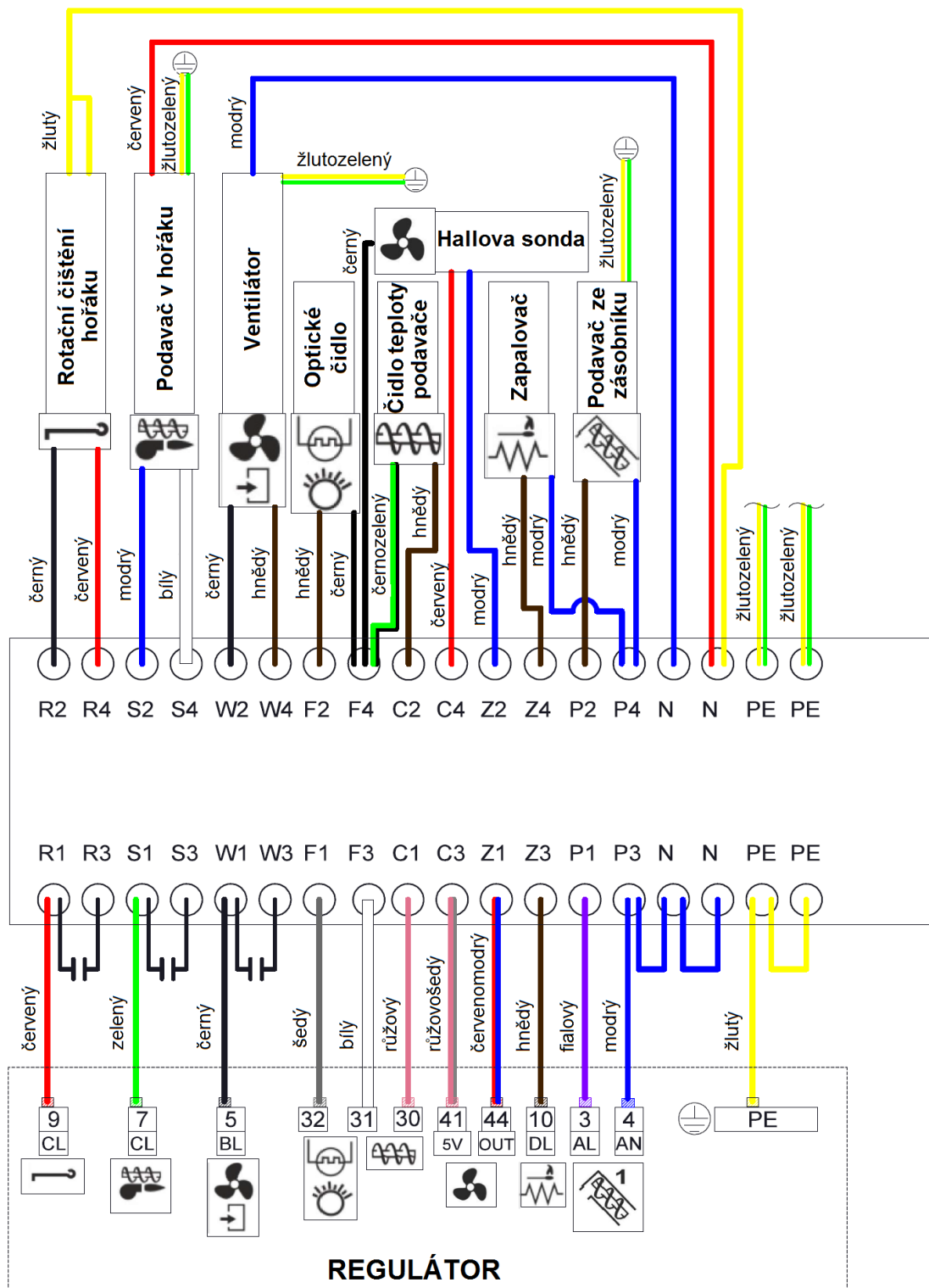


Fig 17 Diagram of electrical connection of XS20 burner of the K14 boiler

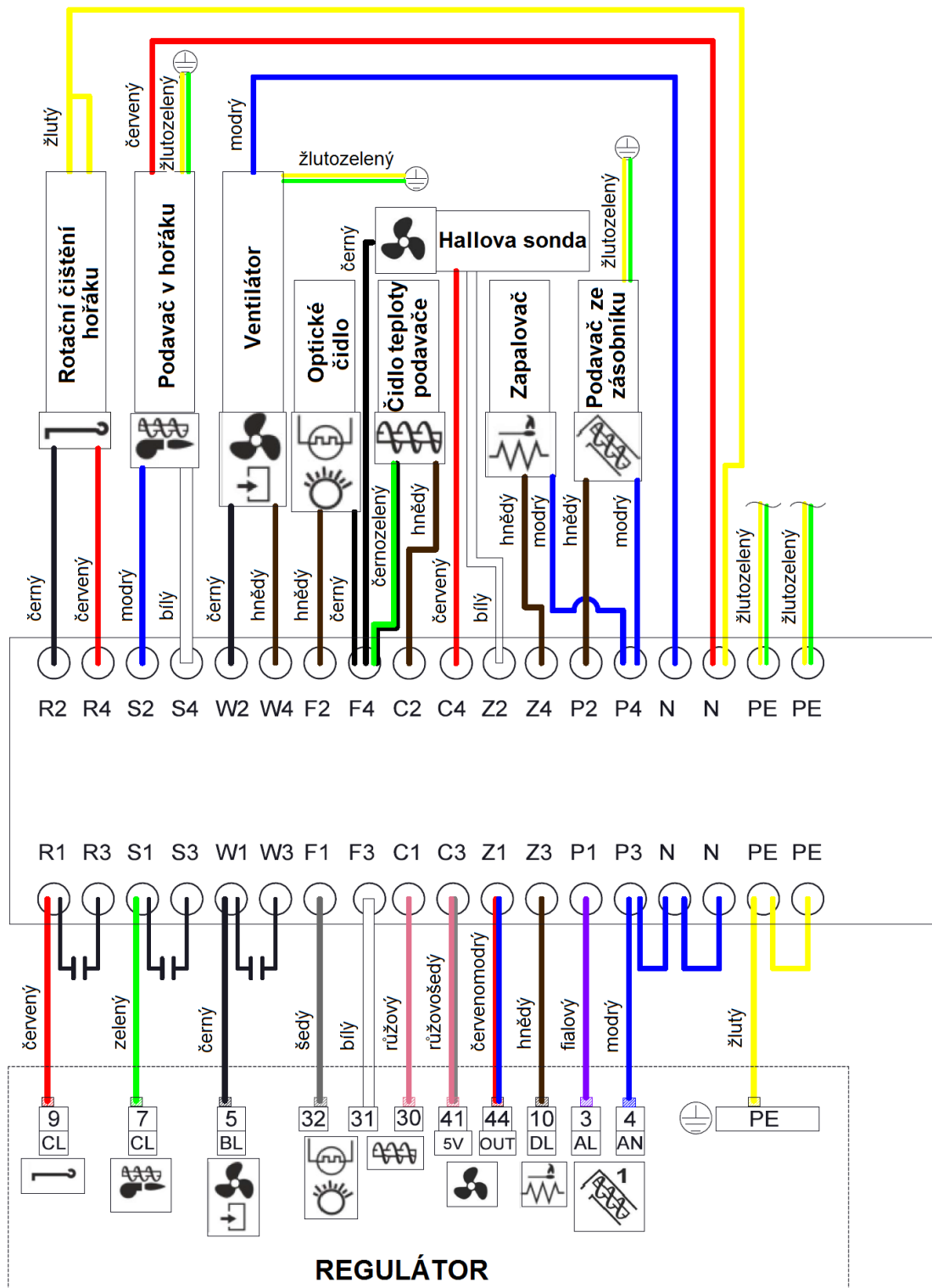


Fig 18 Diagram of electrical connection of XS26 burner of the K20 and K25 boilers

10. Troubleshooting

If there are problems operating the boiler try using this reference chart:

PROBLEM	CAUSE	SOLUTION
The display is not showing any data.	The boiler is not connected to the power supply.	Connect the boiler to the mains (230V/50Hz) via a cable with plug.
	Boiler programmer failure	Replace boiler programmer. *
The fuel screw feeder is not working.	The boiler drive supply is disconnected (or damaged).	Connect (or replace) the boiler drive supply. *
	The feeder drive is damaged.	Replace the damaged feeder drive. *
The fuel feeder gets repeatedly blocked.	There is an obstacle in the fuel feeder (stone, etc.).	Remove the fuel screw feeder then the obstruction. Replace the feeder. *
	The fuel contains significant amount of dust.	Remove unsuitable fuel, re-fill with specified fuel.
The feeder is working yet the fuel is not delivered into the burner.	The fuel store is empty.	Replenish the store with specified fuel.
	The screw has worn off.	Replace the screw shaft. *
The fan is not working.	The boiler fan supply is disconnected (or damaged).	Connect (or replace) the boiler fan power supply.
	The fan is damaged.	Replace the fan. *
The fan is very noisy during operation.	The fan has been clogged with dust.	Clean the fan. *
	The fan bearings have worn off.	Replace the whole fan. *
The boiler cannot reach the rated output during operation.	Short period from the boiler ignition.	Allow the boiler to burn for longer time.
	The fuel feed is set to lower value.	Adjust the fuel amount according to the programmer operating instructions.
	Different fuel is used in the boiler (high humidity, lower calorific value, etc.).	Replenish the store with specified fuel.
The flue gases temperature is higher than that specified in the operating instructions.	The boiler is clogged with soot.	Clean the heat exchange surfaces of the boiler body.
	The boiler is overheating.	Adjust the fuel amount according to the programmer operating instructions.
	High chimney draught.	Install chimney draught regulator (this can be done by a specialist company only).
	The throttle flap in the boiler body is open.	Close the throttle flap by the throttle flap lever and secure it with locking bolt with plastic top.
Smoke appears in the boiler room or in the fuel store.	Low chimney draught.	Check the chimney draught value with the chimney-sweeping company. If the value measured is lower than value required (see operating instructions) it might be necessary to adjust the construction of the chimney.
	Boiler door and/or boiler top cover and/or fuel store lid are not closed properly.	Ensure boiler door and/or boiler top cover and/or fuel store lid are closed properly.
	The sealing line of the boiler and/or boiler top cover is worn (damaged).	Replace worn (damaged) sealing line. *
	The fuel store is empty.	Fill the store with specified fuel.
The boiler body is clogged after a short while.	Low amount of combustion air.	Increase the fan output (see the programmer operating instructions).
	The boiler is being overheated.	Adjust the actual boiler output to be in line with the rated output (see programmer operating

		instructions.
	The burner is clogged by ash and dust.	Clean the burner.
	The fan is damaged.	Replace the fan. *
The ash in the burner is being baked in.	Other than specified fuel is used for burning.	Replenish the store with specified fuel type (see chapter 3).
	Damage to the burner rotation drive.	Replace the drive. *
Significant proportion of unburnt fuel appears in the ash drawer.	The fuel feeding is set incorrectly.	Lower the amount of the fuel delivered to the burner (see programmer operating instructions).
	Wet fuel is used.	Replenish the store with specified (dry) fuel.
	The fan output is set incorrectly so the air flow blows the fuel from the burner.	Reduce the fan speed (see programmer operating instructions).
The burner has not ignited, information „Failed ignition“ is displayed.	The fuel store is empty.	Replenish the store with specified fuel. Remove the information by pressing the control button.
	There is an obstacle in the fuel feeder (stone, etc.).	Remove the fuel screw feeder then the obstruction. Replace the feeder. *
	The ignition coil is damaged.	Replace the ignition coil. *
	The feeder driver is damaged.	Replace the drive of the damaged feeder.
	Slag or ash in the furnace.	Clean the furnace.
	Damage or contamination of the optical sensor.	Clean or replace the optical sensor. *
	Incorrect setting of the fan output.	Adjust the fan speed (see programmer operating instructions).
	Incorrect fuel amount before ignition.	Adjust <i>Fuel amount during ignition</i> parameter (see programmer operation instructions).
Alarm „Exceeding maximum feeder temperature“.	Nadměrný nárůst teploty pláště hořáku způsobený prohořením plamene z ohniště (nastavená hodnota 90°C).	The programmer automatically enters the extinguishing mode. The alarm can be re-set only by the user.
	Low chimney draught.	Check the chimney draught value with the chimney-sweeping company. If the value measured is lower than value required (see operating instructions) it might be necessary to adjust the construction of the chimney.
	Slag or ash in the furnace.	Clean the furnace.
Alarm „Damage to the feeder temperature sensor“.	Damage to the feeder temperature sensor.	Replace the feeder temperature sensor. *
Alarm „Exceeding maximum boiler temperature“.	Exceeded maximum boiler temperature.	Wait till the temperature drops below set value. Press the control button to clear the alarm.
	The boiler operating temperature has been set too low.	Increase the boiler operating temperature.
	The critical boiler operating temperature has been exceeded (95°C) – emergency thermostat activated.	Determine the cause of the alarm. Clear the alarm by pressing the button under the emergency thermostat cover.
Alarm „Boiler temperature sensor damaged“.	Damage to the boiler temperature sensor.	Replace the boiler temperature sensor. *
The fan does not turn off in extinguishing mode.	Damage or contamination of the optical sensor.	Clean the optical sensor. Replace the optical sensor. *

* - can be carried out only by a service company trained and authorized by company BENEKOVterm Ltd.

11. Guidelines for compliance with the environmental parameters of the product

For the permanent environmentally friendly operation of the boiler it is necessary to follow the provisions of these instructions exactly, especially:

- burn only fuel with parameters guaranteed by the fuel manufacturer within the range shown in chart 3, chapter 3
- fully comply with the provisions of chapters 7 to 9

12. Instructions for disposal of the product after its service life.

Since the product is constructed of conventional metallic materials, it is recommended to dispose of individual parts as follows:

- | | |
|--------------------------------|----------------------------|
| - boiler body, casing | - through KOVOŠROT company |
| - other metallic parts | - through KOVOŠROT company |
| - SIBRAL insulation material | - general waste |
| - ORSIL T insulation material | - general waste |
| - TECHROCK insulation material | - general waste |

13. Warranty and defect liability

The manufacturer warrants the boiler for a period of 24 months from the date of purchase to the end user, provided it is used and operated in accordance with the conditions in this user's guide.

The boiler installation, commissioning and any troubleshooting exceeding the scope of chapters 7 and 8 must be carried out by a qualified contractual service company which is accredited by BENEKOVterm Ltd, the manufacturer of the boiler. Otherwise any warranty for the correct boiler operation is void.

The primary condition to acknowledge a claim against the warranty is that the boiler is connected to the heating system so that the return water temperature into the boiler is monitored AUTOMATICALLY and it is set to a minimum of 53 °C. This can be achieved by means of various hydraulic connections depending on the boiler used. For more information – see „Technical documentation for installation of automatic boilers“.

The heating project should be designed by a designer with knowledge of the complete heating system.

If the boiler is used in accordance with this „Boiler operating and installation guide“, no specialist service is required.

„Certificate of quality and completeness of BENEKOV boiler“ serves as “Warranty Certificate” after it is filled in by the service company.

The boiler must be serviced regularly – see chapter 8.

The manufacturer does not accept any liability for the loss of profit, good reputation or work nor any accidental, special or consequential damage that arises in connection with the use or the impossibility of use of this product.

Any notice of defects must be made immediately upon their discovery in writing and by telephone. The boiler serial number must be stated whilst making a claim.

Failure to comply with these conditions the manufacturer voids the warranty.

The warranty does not apply to instances resulting from improper use of the equipment, non-compliance with technical conditions for the equipment operation, normal wear and tear, intentional damage and damage caused by inevitable situation and force majeure (fire, floods, theft, intentional damage, etc.)

The warranty is also void if the “Warranty Certificate” is filled incorrectly by the vendor.

The manufacturer reserves the right to make changes within innovation of the product that may not be included in this guide.

ATTENTION!

This Warranty Certificate is for the manufacturer of BENEKOV K14, K20 and K25 boilers. Fill in properly and send by return to the following address:

BENEKOVterm Ltd.
Masarykova 402
793 12 Horní Benešov

Appendix to the „Warranty Certificate“ for the customer – user

Record of warranty and post-warranty repairs and product checks			
Date of repair or check	Works carried out	Contractual service organization (signature, stamp)	Customer signature

Declaration of Conformity for K14, K20 and K25 boilers

Declaration of Conformity

in accordance with the provisions of § 13, Para 2, of Act No 22/1992 of "Coll.", regarding technical requirements for products, as amended by later legislation and in accordance with the provisions of § 13 of Government Order No 163 of "Coll.", which sets out the technical requirements for selected construction products, as later amended

Company: BENEKOVterm Ltd.
Masarykova 402, 793 12 Horní Benešov, Czech Republic
Business ID: 25839811, Tax ID: 358-25839811

As the manufacturer of following products: Automatic hot water boiler using wooden pellets
BENEKOV K14, BENEKOV K20, BENEKOV K25

Description and function of the product: Automatic hot water boiler with steel welded heat exchanger, rotary burner, external screw feeder and fuel store. Wooden pellets are used as fuel for these boilers. BENEKOV K14 boiler is intended to heat buildings with heat loss up to 15 kW. BENEKOV K20 boiler is intended to heat buildings with heat loss up to 20 kW. BENEKOV K25 boiler is intended to heat buildings with heat loss up to 25 kW.

I hereby declare and confirm that:

- the conformity assessment was carried out in accordance with the procedure laid down in provisions of § 7 of Government Order No 163/2002 of "Col.", as amended based on "Report on initiation test of the product type" no. 13/17 dated 25th August 2017 and valid until 25th August 2019.
- Vysoká Škola Báňská - Technical University of Ostrava, authorized person 260 issued "Report on initiation test of the product type" no. 13/17 dated 25th August 2017.
- the properties of the product meet the essential requirements of the Government Order No 163/2002 of "Col.", specified in EN 303-5 directive and the requirements of other technical regulations that the product is safe when used according to general and manufacturer's conditions.
- the manufacturer has taken measures to ensure compliance of all products that are introduced to the market with the technical documentation and essential requirements.

Stamp and signature

In Horní Benešov, 29th August 2017

Leopold Benda,
Executive Director of BENEKOVterm Ltd.



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