

KLIMOSZ HEATING BOILER USER'S AND INSTALLATION MANUAL

MODERN SOLID FUELS BOILERS



PART 2



For your comfort and safety
We recommend that you read the instructions
before starting to operation of the boiler.



"KLIMOSZ" is a well-proven and reliable brand, existing on the Polish and European market for years; it is one of the largest distributors of "Viadrus" solid fuel cast iron boilers and "Ling" automatic boilers fired with pea grade coal and biomass.

"KLIMOSZ" also denotes modernity and renewable energy, it is a distributor of "Emmeti" heat pumps, durable and pleasant-looking "Quinn" steel radiators, as well as high-quality "Dražice" water heaters and "Attack" gas boilers.

Dynamic and carefully planned development of the company has been based on creating an offer which is perfectly suited to the customers' needs, which includes top quality products and is supported by highly professional service. The "**Klimosz**" company owes its position and competitive advantage to modern management and its well developed distribution network, with over 500 companies, serviced by 5 wholesale branches and trade representatives in the Czech Republic and in Slovakia.

Moreover, the **Klimosz** family - the company owners - regularly support charity campaigns and cultural events.

Thank you for choosing our product. We guarantee safety and comfort of the boiler operation plus a high professional level of our service personnel and technical support.

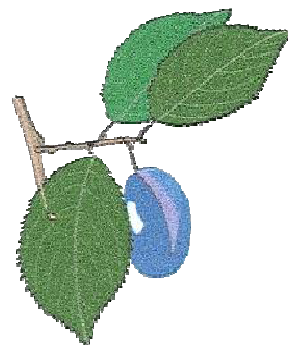
You will find the contact details of our technical consultants on the cover of this manual.



Dear User,

To fully understand the principles of proper and economical operation of the boiler and to make it comfortable and safe, please read this installation and operation manual carefully. In order for the boiler to work properly and serve you for a long time, please follow the information and rules provided in this document.

ENVIRONMENTALLY-FRIENDLY DEVICE



THIS DEVICE MEETS THE REQUIREMENTS OF THE PRESSURE EQUIPMENT DIRECTIVE



Office
Inspection



The figurative mark **KLIMOSZ** is registered mark in Poland and in the European Union; using the sign for any purposes without the prior consent of KLIMOSZ Sp. z o.o. is prohibited. The industrial design of the retort boiler is protected under the Industrial Design Registration Rights no. 9134 as an Automatic Retort Boiler, granted by UPRP to KLIMOSZ Sp. z o.o. Manufacturing or marketing of devices with an appearance similar to that of the KLIMOSZ[®] boiler is prohibited as an act of unfair competition, which may be misleading to customers. The contents of this Boiler Installation and Operation Manual are the property of KLIMOSZ Sp. z o.o.; copying or publishing the contents of this Manual in any form without the prior written consent of KLIMOSZ Sp. z o.o. is prohibited.

The rights to the text, graphic and multimedia content published on the www.klimosz.pl website and in the technical materials, their translations, training and promotional materials of KLIMOSZ Sp. z o.o. are the property of KLIMOSZ Sp. z o.o.; copying or publishing them in any way without the consent of a Member of the Management Board of KLIMOSZ Sp. z o.o. shall constitute a violation of the copyright held by KLIMOSZ Sp. z o.o. and, as a criminal offence, is subject to investigation by a court with jurisdiction over the head office of KLIMOSZ Sp. z o.o.

The manufacturer reserves the right to make alterations in the construction design of the boiler.

Dear boiler user,

For your safety and comfort of operation of the boiler, please return PROPERLY FILLED OUT (WITH ALL THE BOXES FILLED AND BEARING ALL THE RELEVANT STAMPS) the last copy of the Warranty Card and a Certificate of the quality and completeness of the boiler (the last pages of this Installation and Operation Manual) to the following address:



KLIMOSZ Sp. z o.o.
ul. Zjednoczenia 6
43-250 Pawłowice
woj. Śląskie
tel. no. 032 474 39 00

After you have returned the Warranty Card, we will be able to register you in our database of KLIMOSZ DUO boiler users and provide you with prompt and reliable service.

IMPORTANT !!!

PLEASE NOTE THAT FAILURE TO RETURN OR RETURNING AN INCORRECTLY FILLED-OUT WARRANTY CARD AND THE CERTIFICATE OF THE BOILER COMPLETENESS AND QUALITY WITHIN: TWO WEEKS OF THE DATE OF THE BOILER INSTALLATION, BUT NOT LATER THAN 6 MONTHS AFTER THE DATE OF PURCHASE, SHALL RESULT IN LOSING THE WARRANTY RIGHTS FOR THE EXCHANGER AND ALL THE BOILER SUBASSEMBLIES. LOSING THE WARRANTY RIGHTS SHALL RESULT IN DELAY IN REPAIR AND IN THE USER HAVING TO BEAR THE COST OF ALL THE REPAIRS AND OF THE SERVICE PERSONNEL'S TRAVELLING COSTS.

The contents of this Boiler Installation and Operation Manual are the property of KLIMOSZ Sp. z o.o.; copying or publishing the contents of this Manual in any form without the prior written consent of KLIMOSZ Sp. z o.o. is prohibited

Thank you for your understanding

With kind regards,
KLIMOSZ Sp. z o.o.

TABLE OF CONTENTS:

1. Positioning and installation of the boiler in the boiler room	6
1.1 Regulations and standards.....	6
1.2 Requirements for boiler installation in the boiler room	7
1.3 Protecting and regulating accessories	9
2. Diagram of recommended boiler connection to the heating system.....	10
3. Boiler start-up - instructions for the servicing company	12
4. User's Boiler Operation Manual.....	13
4.1 Notes for automatic mode burning (in the lower combustion chamber)	13
4.1.1 Lighting up the boiler and switching to automatic operation	13
4.1.2 Switching off the boiler during automatic operation.....	13
4.1.3 Boiler maintenance and procedures to be followed in case of failure	14
5. Liquidation of a boiler after its life span expires.....	16
6. Power capacity setting in KLIMOSZ boilers (for the User).....	17
7. The principle of operation of a 4-way mixing valve with an actuator	20
8. Troubleshooting.....	22
9. Terms of warranty and liability for product defects.....	25
10. Warranty Card and Certificate of the boiler quality and completeness	30
11. Warranty Card and Certificate of the boiler quality and completeness	32

Warning signs and their meanings



information sign



warning against electric shock



warning against existing threat to your life or health

1. Positioning and installation of the boiler in the boiler room

1.1 Regulations and standards

A solid fuel boiler has to be installed in compliance with the current regulations by an authorised fitting company. A boiler shall be covered by a warranty only when the first start-up is carried out by properly trained manufacturer's service personnel, holding the relevant certificate from the Klimosz company. The company carrying out the start-up shall be responsible for acceptance of the boiler installation and for informing the user about irregularities in the installation process, if any. The company carrying out the first start-up has the right to refuse to carry out the first start-up until corrections in the installation have been made, especially if the installed boiler poses a threat to boiler users. Any tampering with the electrical parts of the boiler or connecting additional control devices may result in voiding the warranty rights. Completion of the boiler installation, its correctness and the heating test must all be recorded on the boiler's Warranty Card.

Central heating and domestic water heating systems should be made according to the design:

- a) **heating system** - in accordance with **PN-91/B-02413** "Protective devices in water heating installations of open arrangement systems. Requirements" or with **PN-99/B-02414** "Protective devices in water heating installations of a closed arrangement system with expansion tanks. Requirements". It is important that a safe distance should be left between the boiler and any flammable substances. The boiler is approved for operation in open and closed arrangement heating systems;
- b) **electrical network** - the boiler can be powered by electric current with the following parameters: 230V/50Hz;
- c) **chimney** - the boiler can be connected to the chimney only after approval of the flue conduit by a chimney sweeping company. The flue conduit must be in accordance with all items of the standard – **PN-89/B-10425**: "Smoke/exhaust flues and ventilation conduits made of brick" or guidelines of the chimney manufacturer for a chimney system. The chimney should consist of several layers; if it consists of a single layer, it is recommended that a special insert should be used, made of fire-resistant steel pipe, approved for the carrying off of flue gas from solid fuel boilers, or ceramic pipes;
ATTENTION! If the chimney draught is too strong, the boiler efficiency is reduced, fuel consumption increases and/or the chimney can overheat. In order to reduce excessive draught in Klimosz Duo and Klimosz Combi boilers, it is recommended that a flap regulator with a weight should be used to regulate the flap opening. **FLUE GAS LEAKING OUT OF A BLOCKED CHIMNEY IS DANGEROUS.** The chimney and smoke conduits should be kept clean.
NOTE: The minimum chimney draught required for the correct operation of a KLIMOSZ boiler is provided in a table: "Dimensions and technological parameters of a KLIMOSZ". If the value is lower, the boiler's operation may be faulty, e.g. flame may recede in the burner or the burner may be covered with fuel. Covering the burner with fuel may result in gasification of excess fuel and its uncontrollable ignition and a fire in the boiler room.
- d) **pressure and exhaust ventilation** – as per standard **PN-87/B-02411**: Solid fuel boilers. **Pressure ventilation up to 25kW** – "there must be a unclosed hole in the boiler room, with an area of at least **200cm²**, which should be situated not higher than **1m** above the floor". **Exhaust ventilation up to 25kW** – "there must be an exhaust flue in the boiler room, with dimensions of at least **14x14cm**". **Pressure**

ventilation in the boiler room from 25kW to 2000kW – “there must be an air supply duct in the boiler room, with cross-sectional area not smaller than 50% of that of the chimney cross-section area, not less however than **20x20cm**”. **Exhaust ventilation in a boiler room from 25kW to 2000kW** – “a boiler room must have an exhaust flue with a cross-sectional area not smaller than 25% of that of the chimney, with the inlet under the boiler ceiling, led above the roof and situated next to the chimney, if possible. The cross-section of the flue should not be smaller than **14x14cm**”;

e) with respect to fire protection regulations related to heating domestic water.

1.2 Requirements for boiler installation in the boiler room

Positioning the boiler in accordance with fire-fighting regulations:

1. Placing the boiler on a non-flammable base.

- place the boiler on a non-flammable, thermally insulating pad, which should extend beyond the boiler's edges by **20 mm** on each side;
- if the boiler is situated in the cellar, it is recommended that it should be placed on an underpinning of at least **50mm** in height.
- the boiler must be positioned vertically, otherwise problems may occur with its correct venting.

2. Safe distance from flammable materials.

- a safe distance of 200 mm from flammable materials should be maintained during boiler installation and operation;
- for flammable materials which burn easily and quickly even after the source of ignition is removed (e.g. paper, cardboard, wood, plastic), the distance should be twice as high, i.e. 400 mm;
- the distance should also be doubled if flammability of materials is not known.

Table 1. Flammability of construction masses and materials.

Flammability of construction masses and products	Construction masses and products
non-flammable	sandstone, concrete, bricks, fire-resistant plaster, mortar, ceramic tiles, granite
hardly flammable	wood-and-cement planks, glass fibre, mineral insulation
hardly flammable	beech wood, oak wood, plywood
medium flammable	pinewood, larch and fir wood, cork, planks, rubber floor covering
flammable	asphalt fibreboard, celluloid, polyurethane, polystyrene, polyethylene, plastic, PVC

NOTE: It is recommended that there should be an operable/certified fire extinguisher, suitable for extinguishing electrical devices, wood, plastic, and that everybody who operates the boiler should be trained in using the extinguisher in the case of fire.

Positioning the boiler in terms of the space needed to operate it:

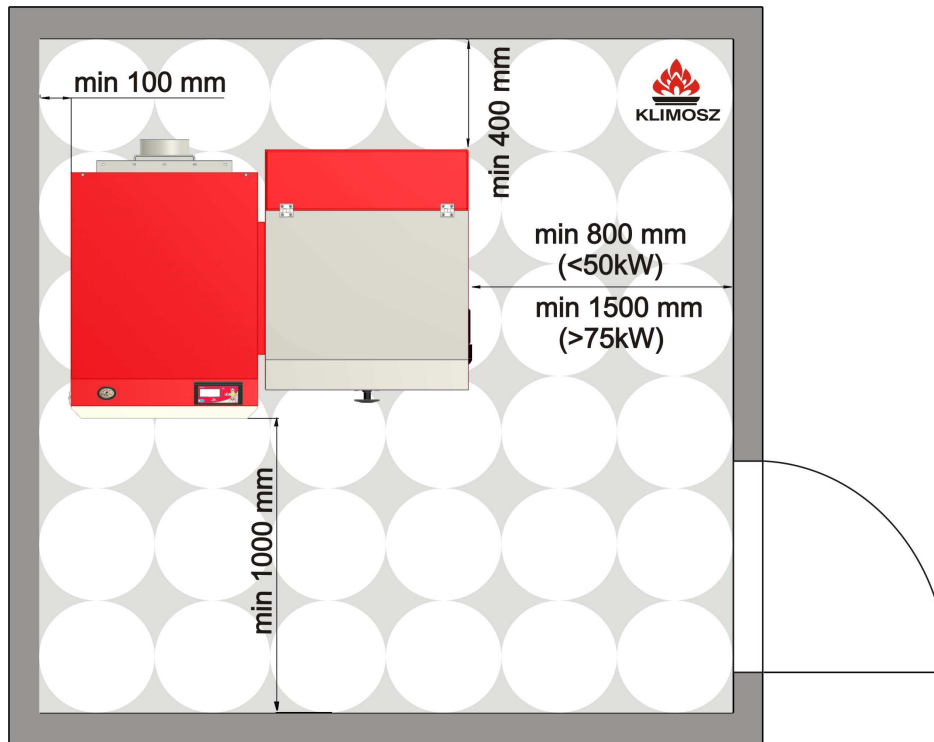


Fig. 1. Positioning of the KLIMOSZ DUO, KLIMOSZ COMBI, KLIMOSZ COMBI B boiler in the boiler room in terms of the space needed for its maintenance.

The manufacturer recommends careful analysis of the different options for positioning the boiler in the boiler room and keeping the minimum distances shown in Fig. 1. Failure to keep the recommended distances may in future result in serious trouble in operating the boiler, and even in having to disconnect it in order to carry out any maintenance or repair activities, greatly raising the cost of servicing. If you do not have sufficient space to install the boiler, please contact our technical consultants in order to choose the best possible solution.

Connecting the boiler to the power supply network:

- the boiler should be positioned such that a 230V/50 Hz socket is permanently accessible;
- the boiler should be connected to the power supply network such that any voltage drops are excluded;
- it is recommended that the boiler, or the boiler room at least, should be supplied via a separate electric fuse on the building's switchboard;
- **connection of the boiler to the power supply network and electrical connection of the heating system and the boiler can be made by a fitter with general qualifications to carry out electrical installations. The cost of making electrical connections is borne by the user;**

Storage of fuel

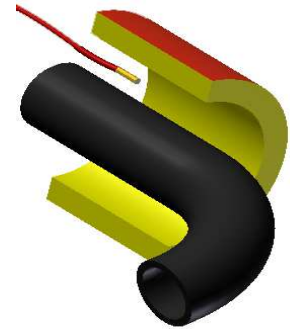
- **efficient combustion will be ensured when the fuel is dry.** MOISTURE CONTENT IN FUEL MUST NOT EXCEED 15%. USING MOIST FUEL RESULTS IN CONSIDERABLE REDUCTION OF THE BOILER'S POWER CAPACITY (EVEN BY AS MUCH AS 50%) AND REDUCTION OF THE LIFE-SPAN OF THE PARTS OF A BOILER WHICH ARE IN CONTACT WITH MOIST FUEL;
- coal must not be stored closer to the boiler than 400 mm;
- it is recommended that the distance between the boiler and fuel should be at least 1,000 mm, or that fuel should be kept in another room.

Additional requirements for pressure and exhaust ventilation:

No exhaust devices may be used in the boiler room if no air supply is provided that is sufficient to balance the draught made by the exhaust device. Additional air supply should also be used if any other devices are situated in the boiler room, such as an open fireplace, etc.

Air consumption by boilers should be calculated multiplying the power of the boiler by number 3. For example **KLIMOSZ DUO 15 kW: $15 \times 3 = 45 \text{ m}^3/\text{h}$** .

ATTENTION! The central heating system, which is connected to the boiler, must be fitted with a drain plug, which must be situated at the lowest point of the system and as close to the boiler as possible, but in a place which ensures convenient access to the valve and to the pipe for connecting a drain hose.



All sensors should be insulated to the proper functioning of the boiler

1.3 Protecting and regulating accessories

STB thermal protection of the boiler - protects the heating system from overheating. After the boiler is switched off by STB and cools down TO A TEMP. OF ABOUT 60°C, it is automatically unblocked. The overheating alarm state signal is shown on the regulator display together with a description of its cause. *After STB is activated, the circulation pump is working.* If the boiler is repeatedly switched off by **STB**, stop the boiler and find the cause of its overheating.

Rapid fuse 3.15 A - protects the boiler from momentary current overload in the electric network. **WARNING**

Programmable room thermostat (optional) - (e.g. EUROSTER, AURATON) - programmable digital room thermostat, used in automatic regulation of heating in detached houses or flats. The thermostat controls the central heating pump operation, or, if an actuator is installed on the mixing valve, it controls the operation of the actuator which regulates the central heating temperature.

The burner temperature sensor - if the flames (embers) retreat into the fuel feeder, it passes on a signal to the boiler regulator, which in turn switches off the fan forcing the feeder action, pushing the embers out of the feeder screw. The protection is active only when the boiler is powered by electricity.

The central heating pump - operates in continuous mode in a system without a room thermostat. If the system is fitted with a room thermostat and it is blocked, the pump works in on/off mode. If an actuator is installed on the mixing valve, the central heating pump works in continuous mode and the actuator regulates the temperature of the heating system. When the room thermostat with an actuator installed is blocked, the central heating pump works and the mixing valve is opened and closed.

Hot domestic water pump - operates in an on/off mode. Depending on the operation mode, it can also work in a mode for priority heating of hot domestic water.

Screw – hardness class 8.8 - situated at the end of the feeder screw shaft. Blocking the feeder screw results in the screw shearing and protecting the engine from overloading. Replacing the screw with a drill or another part may adversely affect the operation of the safety device and may result in engine damage, which goes beyond the scope of warranty maintenance of the boiler.

Paraffin fuse - *required when pea grade coal is used as fuel* - is situated in the fuel bin near the feeder screw. It is part of the emergency extinguishing device. It protects the boiler from fuel burning through to the fuel bin, e.g. when power supply is shut off for a long time.

Thermostatic valve - *required when biomass is used as fuel (optional) and in all boilers with power more than 50 kW* - is substitute protection for the paraffin fuse. The thermostatic valve is connected to the water supply system. The thermostatic valve sensor should be installed on the fuel feeder pipe (when a pellet boiler is ordered). When fire gets to the fuel feeder pipe, the valve opens and tap water is poured into the fuel bin. The protection is activated in a non-electric way.

Limit switch - *required when biomass is used as fuel (optional)* - is installed on the cover of the fuel bin by an authorised fitter. It prevents fire from getting to the fuel bin. If the fuel bin door is not fully closed the fan and the feeder screw are switched off - the circulation pump still works.

2. Diagram of recommended boiler connection to the heating system

For the optimum conditions of boiler operation, the heating system must be fitted with thermal protection against too cold water returning from the system; for example, a 4-way mixing valve, set to prevent the water returning to the boiler from being colder than 55°C.

ATTENTION!!! The minimum capacity of water heater working together with the boiler should be 150 litres. When fewer than 4 people use domestic hot water, using the boiler to heat domestic water during the summer is not recommended. Such solution is not economically justified and it lowers the comfort of using the system due to having to make frequent changes in the boiler settings and to clean the boiler which quickly becomes soiled.

In such cases, it is recommended that combined water heaters are used, that is, ones fitted out with a coil pipe and an electric heater. Using an electric heater to prepare hot domestic water for 1-3 people in summer is much less costly than using a boiler for the purpose.

Requirements for boiler installation in a closed arrangement system:

1. Safety valve.
2. Expansion tank and a safety valve (selected in accordance with current regulations).
3. A device for carrying off excess thermal power - up to 100 kW.

A THERMAL PROTECTION DEVICE HAS TO BE INSTALLED IN THE BOILER, SUCH AS A 4-WAY MIXING VALVE OR CIRCULATING PUMP; FAILURE TO INSTALL SUCH A DEVICE MAY RESULT IN FORFEITING THE WARRANTY RIGHTS. SUCH DEVICES DO NOT NEED TO BE INSTALLED IN SYSTEMS WITH A PLATE HEAT EXCHANGER OR WITH FLUID COUPLING.

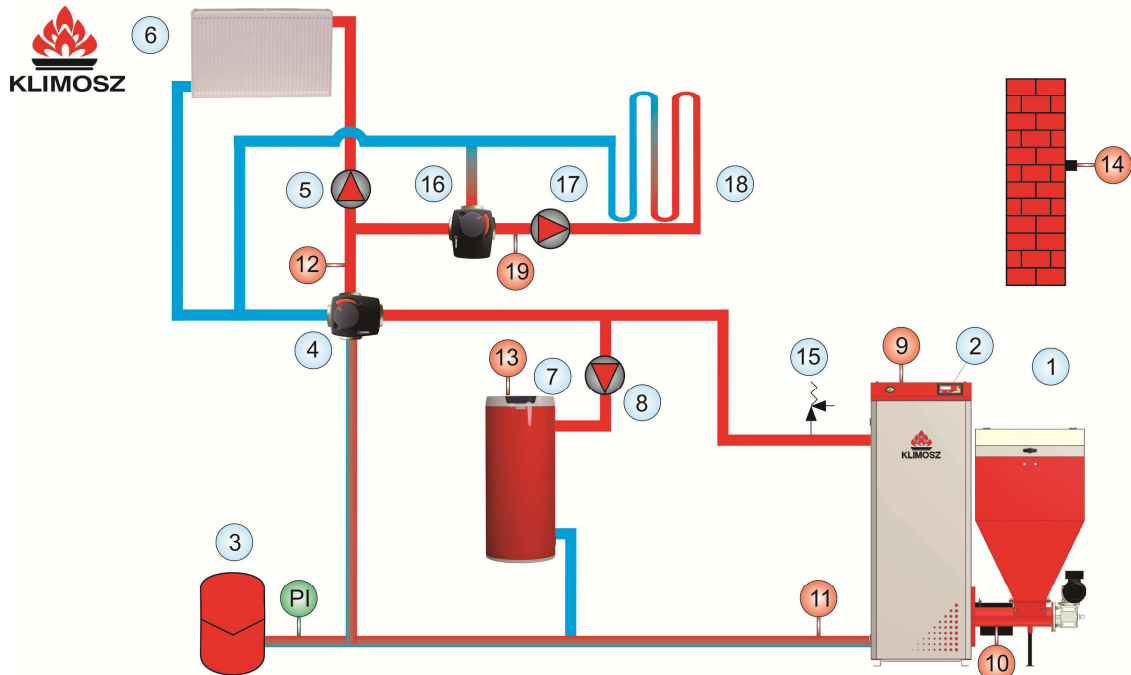


Fig. 2. Connection of the boiler to the heating system and domestic water tank in a closed arrangement system.

LEGEND - CLOSED ARRANGEMENT SYSTEM 1. Boiler, 2. Regulator, 3. Closed expansion tank, 4. 4-way valve with an ESBE actuator, 5. Central heating circulation pump, 6. QUINN, VIADRUS radiators, 7. Domestic water heater – DRAŽICE, 8. Domestic hot water pump, 9. Boiler temperature sensor, 10. Feeder temperature sensor, 1. Return water temperature sensor, 12. Central heating temperature sensor (only for systems with an actuator), 13. Domestic water temperature sensor, 14. External temperature sensor, 15. Safety valve, 17. 3-way valve with an ESBE actuator, 18. Central heating circulation pump, 19. Floor heating system temperature sensor PI – manometer.

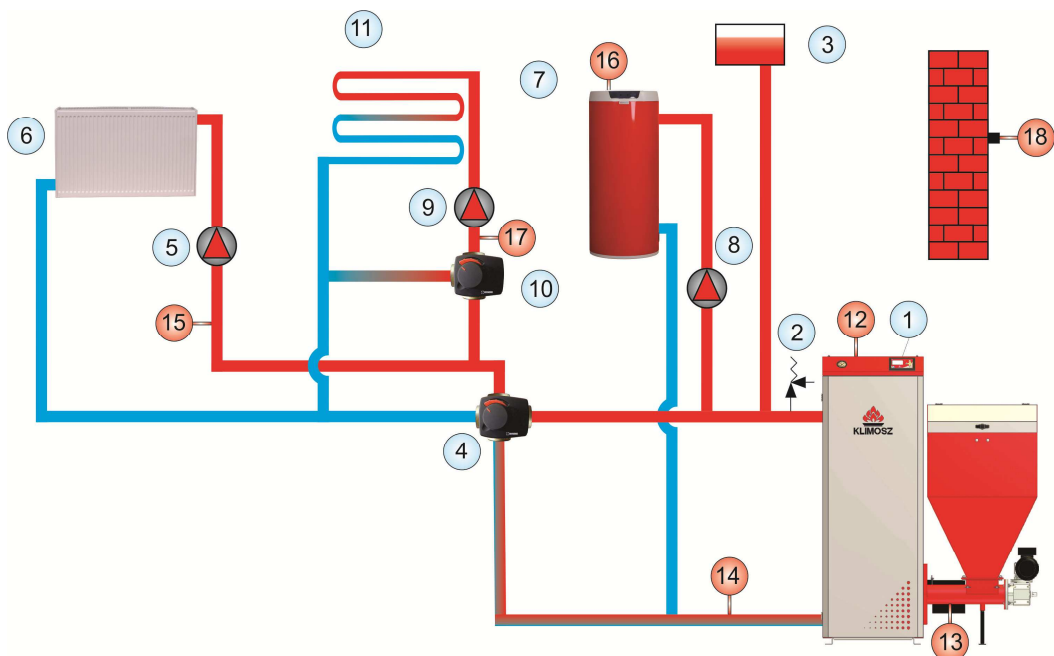


Fig. 3. Connection of a boiler to the heating system and a floor heating system in an open arrangement system.

1. Regulator, 2. Safety valve, 3. Open expansion tank, 4. 4-way valve with an ESBE actuator, 5. Circulation pump, 6. QUINN, VIADRUS radiators, 7. Domestic water heater – DRAŽICE, 8. Domestic hot water pump, 9. Floor heating feeding pump, 10. 3-way mixing valve, with an actuator or thermostatic one, 11. Floor heating system, 12. Boiler temperature sensor, 13. Feeder temperature sensor, 14. Return water temperature sensor, 15. Central heating temperature sensor, 16. Domestic water temperature sensor, 17. Floor heating system temperature sensor, 18. External temperature sensor.

Recommendations for installation of a 4-way mixing valve and the minimum pipe diameters.

The minimum diameter of the boiler circulation:

1. Power capacity 15 ÷ 25 kW: copper min 35 mm, steel 5/4", 4-way valve DN32 (recommended DN40).
2. Power capacity 26 ÷ 49 kW: copper min 42 mm, steel 6/4", 4-way valve DN40.
3. Power capacity above 50 kW: pipes and a 4-way valve min. DN50.

ATTENTION!

By-passing the central heating pump with a differential valve is not required under the warranty. Installation of a differential valve depends on the system configuration and the way of controlling the 4-way valve. A room thermostat without an electric actuator will work properly if the system does not have a differential valve.

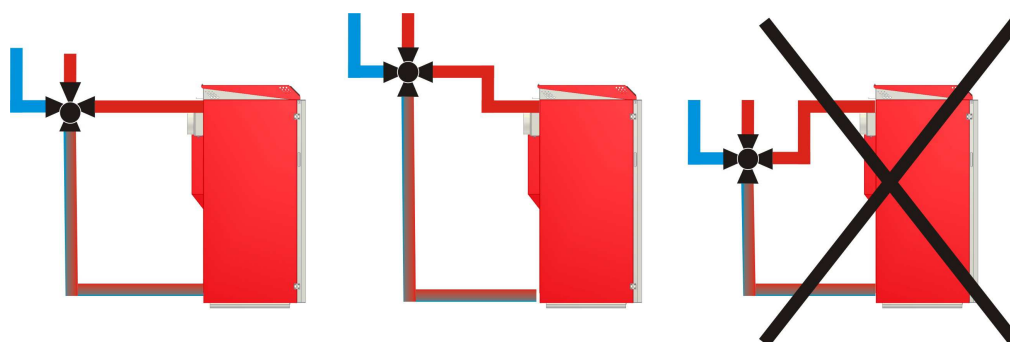
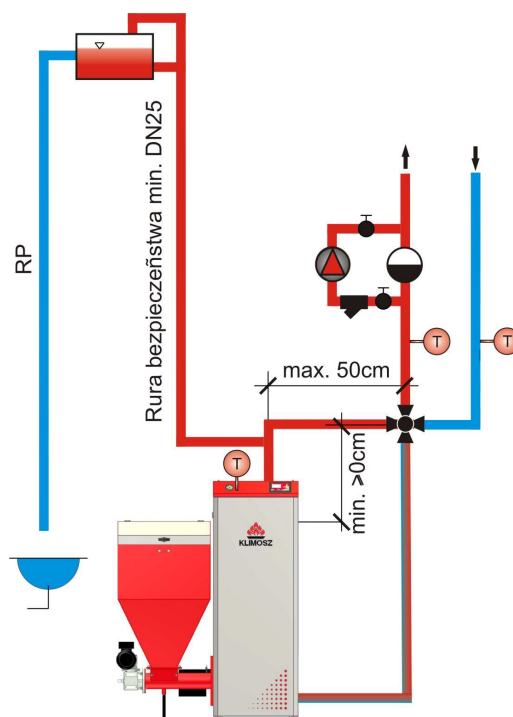


Fig. 4. Installation of 4-way valves

3. Boiler start-up - instructions for the servicing company

For the boiler to be covered by the manufacturer's warranty, the boiler start-up must be executed by service personnel

ATTENTION!!! It is recommended that the factory settings of the regulator are restored immediately after connecting the boiler to the power supply network.

Familiarise the user with the operation of the boiler and accessories in the boiler room, and with the relationship between changing the settings on the boiler/accessories and the reaction of the system. Enter the data in the Warranty Card and in the Boiler's First Start-up Report. The user signs both of the documents to confirm the data entered in them.

Completing the installation and carrying out a heating trial must be recorded on the Warranty Card.

4. User's Boiler Operation Manual

4.1 Notes for automatic mode burning (in the lower combustion chamber)

4.1.1 Lighting up the boiler and switching to automatic operation

- check whether there is sufficient water in the central heating system - on the manometer in the boiler room and by checking the de-aeration of the system parts;
- fill the emergency extinguishing tank with water (when pea grade coal is used as fuel). When biomass is used, the use of a valve, for example STS Watts, is required;
- fill the fuel bin with fuel, paying attention to its quality; fuel should be dry, without dust, hard (it should not crumble when squeezed in the hand), light, with no bark or varnish; its diameter should be constant - 6 or 8 mm;
- switch on the boiler's controller. **Restore the factory settings of the regulator to avoid any problems when configuring the settings!!!** Switch the boiler to hand-firing mode (lighting). Fuel will appear in the retort after 5 to 8 minutes. Switch off fuel feeding when the fuel reaches the level of the cast-iron grate (and has not formed a hill);
- put dry paper on fuel in the grate and small dry pieces of wood or good quality grill firelighting wood on top. Set fire to the paper and switch on the fan when the firelighter catches fire. The fan capacity can be regulated by adjusting its rotation speed or with a movable closing flap on the fan;
- switch to automatic mode when fuel in the retort catches fire;
- the principles of operation of the boiler in automatic mode (**user settings**) should be communicated by the fitting and servicing company carrying out the first start-up of the boiler;
- details of the regulator operation are provided in the **Regulator Operation Manual**, supplied with the boiler;
- **in order to prevent boiler operation stopping, it is recommended that fuel should be regularly topped up so that it never runs out;**
- **the lid of the fuel bin must be closed during boiler operation.**

ATTENTION!!! It is recommended that a boiler in a newly constructed building, at the finishing stage, should operate without an actuator on a 4-way valve. Operation of a boiler with a 4-way valve controlled by an actuator in such conditions may pose some problems. One must take into account the fact that demand for heat in new buildings is increased due to plaster drying and to constant cooling down due to the finishing work. It may happen that the **“NO FUEL”** alarm will appear. The alarm is triggered by the absence of a temperature increase of at least 1°C during the detection time set in the regulator or by a too low power capacity set on the retort burner (fuel feeding, break in fuel feeding).

4.1.2 Switching off the boiler during automatic operation

- switch to the manual mode. Switch on the feeder screw to push embers out of the retort. You can cautiously remove embers from the grate to the ash pan with a poker;
- **after embers are completely removed from the retort and from the grate, put a protective plate on the burner to shut off air access and to eliminate the danger of fuel ignition. Also, close the flap on the fan to shut off air flow to the furnace;**
- remove embers from the ash pan to a fire-resistant container with a lid;
- switch off the boiler;

- after several or several dozen minutes check that fuel has not reignited (for example from an incompletely cooled down grate - especially when biomass is used as fuel);
- whenever a break in the boiler's operation lasts more than 2 days and each time after the end of a heating season, remove fuel from the boiler and from the fuel bin and leave the boiler and the fuel bin with the door and lid ajar.

4.1.3 Boiler maintenance and procedures to be followed in case of failure

1) It is recommended that fuel should be topped up regularly to ensure continuous boiler operation. If there is little fuel in the bin, it should be topped up immediately.

2) During ordinary boiler operation, the ash pan should be emptied every two days (it is necessary to wear protective gloves). Sometimes, a piece of unburnt coal may stick between the edge of the retort and the boiler wall. It should be removed with a poker.

3) During continuous automatic boiler operation **the heat exchanging surface of the boiler body should be cleaned at least once a month** (plates, side walls of the combustion chamber, combustion tube, etc.). **IT IS RECOMMENDED THAT THE EXCHANGER SHOULD BE CLEANED ONCE A WEEK, WHICH WILL REDUCE BOILER FUEL CONSUMPTION.**

4) **The boiler can be cleaned only after it has been extinguished.** At least one hour before cleaning, the boiler should be switched off with the main switch. Remove the ceramic plates before cleaning the boiler and protect the retort against any impurities which may get into it. Remove the front part of the casing which is fixed with snap fasteners. There is an inspection hatch, covered with a door, under the casing. Open it and clean thoroughly the inside of the boiler with a brush. During the boiler's operation, heat exchanging surfaces become soiled, which diminishes the heat exchanging rate and, in consequence, the boiler's efficiency.

After the boiler has been cleaned, the smoke conduit should also be cleaned; to do this, unscrew the plate which covers the hole in the lower part of the smoke conduit. The pipe which connects the smoke conduit with the chimney should also be cleaned. After cleaning is completed, clean the grate, as some of the impurities removed during the boiler cleaning operation could deposit on it. Do not forget to clean the mixer. Deposits in it diminish air flow to the burner nozzles and the combustion process.

5) After the flue gas carrying channels are cleaned thoroughly, close the inspection hatch.

6) **CLEANING THE PELLET BURNER-** depending on the types of pellets it is possible to sinter accumulation or other substances after burning of pellets. It is mandatory to clean the burner from generated sinter which later may worsen the quality of combustion. **The burner can be cleaned only after it has been extinguished!!! It is recommended to clean the burner when necessary (depending on the quality of**

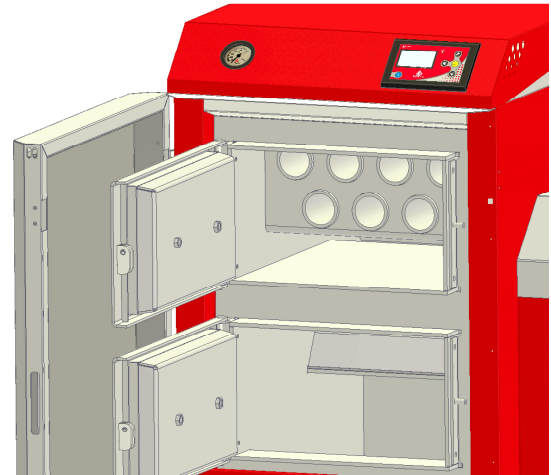


Fig. 5. Inspection hole in KLIMOSZ DUO boilers

pellets), but not less than one time per week. FOR CLEANING AND MAINTENANCE THE BURNER DO NOT DISASSEMBLE BURNER FOR A SINGLE ITEMS.

7) It is recommended that the motor and fan should be cleaned from the outside. A user cannot remove the fan cover. This can be done only by a servicing company technician. Cleaning should be done with a dry brush. The boiler must be disconnected from the power supply during this procedure.

8) There is a catalyst above the boiler which does not require any special attention. Any ash which deposits on the upper surface of the catalyst can be removed regularly; however, this does not affect the boiler operation.

9) If pieces of stone, metal or wood are found in fuel, it may result in blocking the feeder screw. The motor is connected to the feeder screw with a gear. A class 8.8 screw in the plane perpendicular to the screw axis connects the screw (rod) with the gear (a ring with the screw), protecting the motor from overloading. If the screw is blocked, the cotter pin shears off (the motor is working, but the screw is not).

ATTENTION! Disconnect the boiler from the power supply network before performing the actions mentioned below!

In order to establish the reason why the cotter pin has sheared off, try making 2-3 counter clockwise rotations of the screw using a wrench for the purpose (grabbing the screw end). If the screw has sheared repeatedly, switch off the boiler, remove the fuel from the bin and remove the obstacle. Use a wrench to set the screw axis in such a position that a new cotter pin can be put into the hole in the screw axis and in the gear ring.

10) Take care to keep the boiler leak-tight (combustion chamber door, ash pan door, mixer cleaning hole, fuel bin cover, etc.) in order to avoid flue gas being blown out of the boiler into the boiler room. Leak-tightness of the fuel bin is ensured by closing its lid with an auto-locking device and by the presence of an undamaged rubber seal. If any leaks appear, loosen 2 screws at the back of the fuel bin, lower the pawl and refasten it with screws. Check leak-tightness. It is recommended that chamotte sealing elements are periodically replaced.

11) If the boiler does not in use for more than 2 days (for example, after the heating season), it must be cleaned and the fuel bin and the fuel feeding system emptied of fuel.

12) MOISTURE CONTENT IN FUEL MUST NOT EXCEED 15%. USING MOIST FUEL RESULTS IN A CONSIDERABLE REDUCTION OF THE BOILER'S POWER CAPACITY (EVEN BY AS MUCH AS 50%) AND REDUCTION OF THE LIFE-SPAN OF THE PARTS OF THE BOILER WHICH ARE IN CONTACT WITH MOIST FUEL. THE BOILER PARTS DAMAGED AS A RESULT OF USING MOIST OR LOW QUALITY FUEL WILL NOT BE COVERED BY THE WARRANTY.

13) The emergency extinguishing water tank should be periodically inspected visually and refilled if needed.

14) In an emergency (prolonged power shutdown, etc.) and fuel burns through to the bin, the increased temperature will melt the paraffin fuse and water from the tank will extinguish the fuel. If biomass is burnt, the STS valve is activated and the bin will be flooded with tap water.

15) When emergency extinguishing has been activated (water tank or thermal valve), remove the moist fuel from the fuel bin, replace the paraffin fuse with a new one, refill the extinguishing tank and light up the boiler.

GENERAL:

- The boiler may be operated only by adults familiar with this Operation Manual. Unattended children should not be allowed near the boiler.
- When approaching the boiler, exercise extreme caution as external boiler surfaces may be hot.
- If any flammable gas or vapour gets into the boiler room or during work when there is increased risk of fire or explosion (gluing, varnishing, etc.), the boiler must be extinguished before beginning such work.
- The heating water temperature should not exceed 85°C during the boiler operation. If the boiler becomes overheated, open all the containers previously closed (radiators, water heaters) and close all the boiler doors and switch off the fan.
- Water in the heating system should be topped up only when the boiler is not working and it is cold (to avoid damaging the exchanger due to thermal stress). Water in the boiler and in the system should not be replaced unless required due to repair or rebuilding of the system.
- Draining water from the heating system increases the risk of corrosion and boiler scale formation on the heat exchanger walls, which in turn results in reduced boiler efficiency by disturbing the exchange of heat between flue gas and water and to burning through the heat exchanger walls at the place where boiler scale has accumulated.
- In no case should you put your hands inside the combustion chamber - there is a risk of injury caused by the rotating feeding screw.
- No flammable liquids can be used to light the boiler.
- The flame can be controlled visually by slightly opening the upper door. However, it should be borne in mind that there is a risk of sparks being scattered in the boiler room. Close the door immediately after performing visual inspection of the flame.
- No flammable objects can be put on the boiler or near it.
- There can be no flammable objects at a distance closer than 1,500 mm from the boiler when ash is being removed. Ash should be removed to heat resistant containers with a lid.
- When the boiler operates at temperatures below 65°C, vapour from flue gas may condense on the steel walls of the exchanger, which may cause corrosion due to low temperature, which shortens the life-span of the exchanger. Therefore, the boiler's temperature during operation must not be lower than 65°C.
- After the heating season, the boiler and the smoke conduit must be cleaned thoroughly. The boiler room must be kept clean and dry. Fuel should be removed from the boiler, the feeder pipe, the burner and from the fuel bin. The boiler and the fuel bin should be left with doors (lids) slightly open.
Any tampering with the boiler's electrical system or making any alterations to the boiler's construction by unauthorised individuals will result in the user forfeiting their guaranteed rights with respect to the boiler.

5. Liquidation of a boiler after its life span expires

Since the boiler's parts are made of different materials, they can be sold to recyclable waste collection points, which ensure the appropriate disposal of steel, plastics, etc.



6. Power capacity setting in KLIMOSZ boilers (for the User)

KLIMOSZ boilers should be set individually in each case. The following have a significant effect on combustion: calorific value, **caking propensity RI<20 (max 30)**, moisture content in fuel, chimney draught and the amount of air supplied relative to the amount and type of fuel (also, leak-tightness of the mixer and grate).

The correct boiler setting should include the values for fuel feeding and breaks in fuel feeding and only then the right amount of air for combustion. The following table shows approximate values of settings for KLIMOSZ boiler burner power capacity. It is recommended that the power capacity should be regulated only by changing the timing of breaks in fuel feeding. The timing of fuel feeding should not be changed. The amount of air supplied is regulated by changing the fan rotation rate on the regulator and/or with a factory installed flap on the fan. The right air amount supplied to the burner manifests itself by good combustion, i.e. completely burnt fuel in the ash pan. If the amount of air is too low, it may result in incomplete fuel combustion and excessive smoking as well as accelerated soiling of the heating surfaces of the boiler. Too large amounts of air may cause excessive carrying of small fractions of fuel as well as sparking or caking (slagging) of fuel, mainly coal. Caking (slagging) is a frequent symptom observed for fuels with a high caking propensity, i.e. RI >30. Therefore, it is recommended that the caking propensity of the fuel should be checked; it should be **RI<20 (max30)**.

Apart from time settings of fuel supply and fuel feeding breaks, the height of the fuel stack on the retort should be considered; it should be constant during boiler operation (heating), except in the state of maintenance. The level of coal on the retort should be as shown in the drawing below (for pellets - see the drawing under description of fuel switching to pellets) Its height from the upper edge of the retort is 30 – 50 mm depending on the boiler power capacity. When a larger than recommended amount of fuel is accumulated, there is a risk of incomplete combustion due to poorer air inflow from the bottom upwards. The recommended height in small boilers is up to about 30 mm.

ATTENTION!!! In order to achieve complete burning of fuel on the retort after each change of fuel, fuel feeding time or duration of breaks in fuel feeding, the suiting amount of air supplied for burning should be set.

Also, it should be borne in mind that fuels purchased by users have different properties. Some fuels require a longer time for burning, which should also be taken into account when setting the burner power capacity. In such cases, increased amount of blown-in air may make the fuel cake instead of burn faster. The right reaction is to extend the duration of breaks in fuel feeding.

REGULATION OF THE BOILER POWER CAPACITY - the boiler power capacity is regulated by the burner power capacity, depending on the fuel dose supplied within a specific period of time. Therefore, in order to achieve the desired burner power capacity relative to the exchanger size and demand for heat in the building, one must properly set the fuel feeding time and, depending on it, the duration of breaks in fuel feeding. The correct settings, shown in the table, increase the probability of fault-free boiler operation. The air

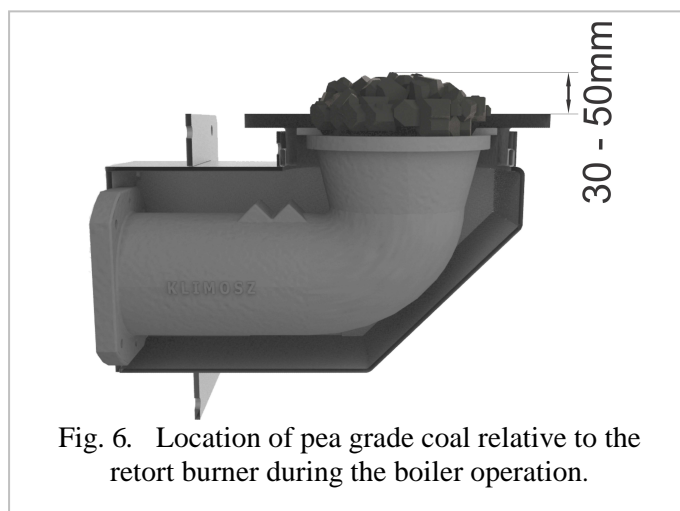


Fig. 6. Location of pea grade coal relative to the retort burner during the boiler operation.

dose should be preferably suited to combustion by measuring the flue gas temperature and comparing it to the value provided by the manufacturer.

The height of the fuel layer on the grate is also important. The air needed for burning is supplied from the bottom upwards, which means that it has to overcome the resistance of the fuel layer. If the layer is too high, it may result in incomplete burning of the fuel in its upper parts. Increasing the amount of air in such cases is not always effective because if the fuel layer is too thick, it may result in its caking.

Simple regulation of retort burners should start with adjusting the settings which depend on the boiler's power capacity and type of fuel (provided in the Operation Manual), such as duration of fuel feeding and breaks in fuel feeding. Then the amount of air should be set, which will, depending on the type of fuel, guarantee good burning (with no ember recession or [unburnt fuel dropping into the ash pan]). After the level of burning fuel is equalised with that of the grate (flat layer of fuel) and the burner door is closed, the level of burning fuel can be checked after about 15-20 min. If the fuel pile is growing, it usually means that the fuel is burning too slowly. In that case, the amount of air for combustion should be increased slightly, the fuel in the grate should be levelled (flat layer of fuel); this should be repeated after closing the burner door for about 15-20 minutes. After the set time, the quality of burning should be checked again. If improvement is visible and the pile is smaller, repeat the actions until a satisfactory quality of burning is achieved. If the fuel layer is burnt lower and lower on the retort burner, the amount of air for burning may be too large. It is then recommended that the blow-in should be reduced by performing the regulation actions as described above.

One may also encounter a problem of formation of caked fuel on the burner. One of the reasons for its formation is the temperature of combustion caused by excessive amount of air supplied. To put it simply, for qualified coals, caked fuel formation is caused by supplying overly large amounts of air. For large fuel piles, when burning is incomplete, this may be the reason for supplying too large amounts of air, which is supposed to guarantee better combustion in the upper layers. It is then an error to increase the amount of air, causing slagging at the air nozzles. The coal recommended by boiler manufacturers should have a caking temperature above **1200°C**. However, the threshold is lowered for poor quality fuels, which intensifies caking. When using such fuel, burning should be slowed down by reducing the dose of coal (extending breaks in fuel feeding is recommended) and the amount of air, with consequent lowering of the burner (boiler) power capacity. Fuel caking in automatic retort boilers does not only reduce fuel efficiency, but it may also increase the resistance of the feeder screw which feeds the fuel, which increases the probability of shearing the pin protecting the conveyor's motor and the boiler's failure.

Table 2. Approximate power settings for KLIMOSZ boilers for burning of pea grade coal, with a calorific value of 27 MJ/kg.

Kotly Klimosz: Moc 8 - 35kW pea grade coal																	
Fuel feeding [s]	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Break [s]	60	50	45	37	32	27	24	22	21	20	19	18	17	15	13	12	11
Power capacity [kW]	8	10	11	13	15	17	19	20	21	22	23	24	25	28	30	32	35
Vent.																	

Kotly Klimosz: Moc 8 - 35kW pellets																	
Fuel feeding [s]	7	7	7	7	7	7	7	7	7	7	7	7	7	9	9	9	9
Break [s]	60	49	39	32	27	23	20	18	17	16	15	14	13	14	12	11	10
Power capacity [kW]	8	9	11	13	15	17	19	20	21	22	23	24	25	28	31	32	34
Vent.																	

Kotly Klimosz: Moc 45 - 55kW pea grade coal														
Fuel feeding [s]	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Break [s]	60	55	50	45	40	38	35	34	33	32	31	30	29	28
Power capacity [kW]	30	32	35	38	42	44	47	48	49	50	51	53	54	55
Vent.														

Kotły Klimosz: Moc 45 - 55kW pellets														
Fuel feeding [s]	20	20	20	20	20	20	20	20	20	20	20	20	20	-
Break [s]	60	55	50	45	40	35	30	25	20	18	15	12	10	-
Power capacity [kW]	21	22	24	26	28	31	34	37	42	44	48	53	53	-
Vent.														

Kotły Klimosz: Moc 75kW pea grade coal															
Fuel feeding [s]	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Break [s]	60	55	50	45	40	35	30	28	25	24	23	22	21	20	18
Power capacity [kW]	30	32	35	38	42	47	53	55	60	62	64	66	68	70	75
Vent.															

Kotły Klimosz: Moc 75kW pellets														
Fuel feeding [s]	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Break [s]	60	50	45	40	35	30	28	25	22	20	18	15	14	12
Power capacity [kW]	21	24	26	28	31	34	35	37	40	42	44	48	50	56
Vent.														

Kotły Klimosz: Moc 100kW pea grade coal															
TIMES FOR BOILERS WITH ONE BURNER															
Fuel feeding [s]	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Break [s]	60	55	50	45	40	35	30	28	25	22	20	18	15	14	11
Power capacity [kW]	30	32	35	38	42	47	53	55	60	66	70	75	84	88	100
Vent.															

Kotły Klimosz: Moc 100 - 150kW pellets															
TIMES FOR BOILERS WITH ONE BURNER															
Fuel feeding [s]	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Break [s]	60	50	45	40	35	30	28	25	22	20	18	15	14	12	8
Power capacity [kW]	21	24	26	28	31	34	35	37	40	42	44	48	50	53	60
Vent.															

Kotły Klimosz: Moc 150kW eko-groszek															
TIMES FOR BOILERS WITH ONE BURNER															
Fuel feeding [s]	10	10	10	10	10	10	10	10	10	10	10	10	10	20	20
Break [s]	60	55	50	45	42	39	37	34	32	30	28	25	23	22	10
Power capacity [kW]	30	32	35	38	41	43	45	48	50	53	60	70	64	100	140
Vent.															

Notes for fuel switching from pea grade coal to biomass:

USING PELLETS AS FUEL – when pea grade coal is replaced with pellets as fuel, no changes should be made before boiler start-up, aimed at its reconstruction, except for changing the position of the ceramic plate. The boiler grate, installed by the manufacturer, is used both for burning pea grade coal and pellets. Ceramic plates should be situated on the lower (if 2 are present) "shelf" of the combustion chamber. It is recommended that the fan should provide such amount of air that pellets are not blown and carried around the combustion chamber and at the same time combustion is complete, without formation of any tarry substances which would soil the heat exchanging surfaces. Usually, the amount of air needed for pellet combustion is smaller than for pea grade coal. When pellets are used as fuel in the boiler, it is to be expected that a small amount of ash is produced. Before the boiler start-up, the maintenance time on the boiler regulator should be changed to about 10 - 20 min. and fuel feeding in the maintenance state should be increased to prevent flame recession to the fuel feeder. Failure to follow these guidelines may result in faulty operation of the boiler.

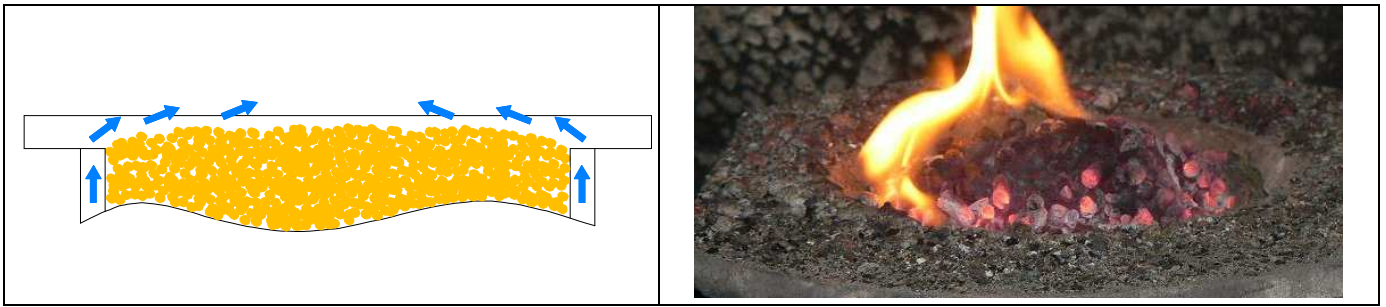


Fig. 7-8. Position of pellets relative to the burner during the boiler operation.

Summing up these guidelines, the power capacity setting during a boiler start-up should include, in the following sequence:

1. **Setting the fuel feeding time [s]** – recommended constant value, for example 5 s (boilers of up to 50 kW when pea grade coal is used as fuel).
2. **Setting the duration of breaks in fuel feeding [s]** – variable, depends on the boiler's power capacity (approximate values are provided in the tables above).
3. **Setting the amount of air supplied for complete burning** (with a flap installed on the fan and/or by adjusting the fan rotation rate on the regulator) – depending on the dose of fuel supplied relative to the duration of breaks in fuel feeding.

In order to achieve complete burning of fuel after each change of fuel, the fuel feeding time or duration of breaks in fuel feeding, the matching amount of air supplied for burning should be set.

4. **Correction of the amount of air blown in for burning (recommended) or duration of breaks in fuel feeding in order to achieve satisfactory results.**
5. **Setting the time of maintenance (smothered fire)** – set the value at at least 30 minutes for pea grade coal and at about 10 - 20 minutes for biomass. The value does not affect the burner power capacity in the heating mode.
6. **Temperature measurement and flue gas analysis** – in order to check the amount of air supplied for burning and estimation of the boiler discharge loss.

7. The principle of operation of a 4-way mixing valve with an actuator

1. BOILER PROTECTION MODE

Mixing valves, installed in heating boilers, both in automatic ones and in those with manual fuel feeding, perform a number of functions. One of the most important, especially for steel boilers, is protection of a boiler against low-temperature corrosion. It is eliminated during boiler operation when the return water temperature is about 50°C. The flue gas produced in the furnace is not cooled down excessively by cold water inflow to the lower part of the boiler, which prevents condensation of vapour, contained in flue gas, in the burner, where the temperature difference between the flame and water returning from the system is the highest. The most harmful

to steel are those condensates which are formed from fuels containing some corrosive elements, such as sulphur (coal) and chlorine (some types of pellets).

Contrary to what might seem, maintaining a high temperature on the return to the boiler reduces fuel consumption. This is because flue gas produced during combustion does not adhere to the exchanger with an elevated temperature of inflow water. This keeps the exchanger clean and makes it unnecessary to clean it too often. In order to prevent corrosion, that is, to increase the exchanger durability, and to keep the exchanger clean, regulators in KLIMOSZ boilers are equipped with a BOILER PROTECTION function. It is a priority function of the actuator of a 4-way valve, which means that the boiler will be heated up primarily by automatic closing of the 4-way valve. Only after the BOILER PROTECTION TEMPERATURE, set on the regulator (see advanced settings), is achieved, will the mixing valve let the hot water from the boiler flow into the heating system. The process may be repeated whenever, during the system heating, the boiler protection temperature drops below the value set on the regulator. Prolonged problems with opening and closing of the actuator may indicate too low burner power capacity set on the boiler regulator.

2. OPERATION MODE WITH AN EXTERNAL ROOM THERMOSTAT

In order to improve user comfort and to reduce operating costs by lowering fuel consumption, regulators of KLIMOSZ boilers work together with any type of room thermostat in COM, NC connection. Actions taken by the user are limited to setting the desired temperature in a room on an external thermostat; the boiler maintains the set temperature to an accuracy of 0°C. The room temperature is adjusted by means of an electric actuator on the 4-way valve. When the room temperature on the external thermostat is achieved, the actuator is closed to the temperature value set in THERMOSTAT REDUCTION (see advanced parameters). The parameter can be used to adjust the reduction of temperature in a room during blockade by the thermostat, which depends on the degree of thermal insulation and thermal loss of the building. Boiler operation that does not achieve the required room temperature may indicate a too low burner power capacity relative to demand for heat and/or reducing the set temperature of central heating (HEATING TEMPERATURE in the mode with electric actuator). Blocking by the room thermostat after the temperature set by the user has been reached is displayed on the regulator screen as a symbol of a thermostat. Absence of such information during thermostat blocking may be a sign of its wrong connection to the boiler regulator.

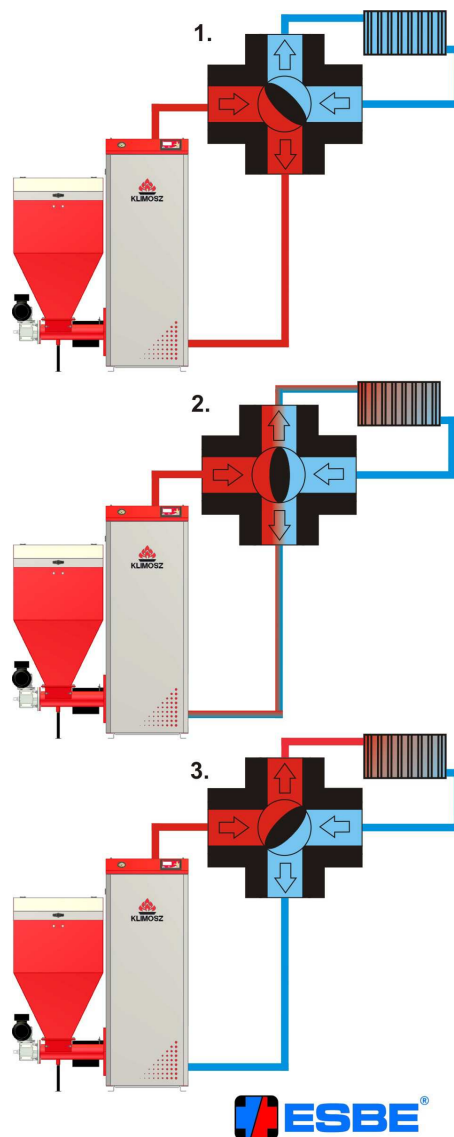


Fig. 9. Principle of operation of a 4-way mixing

3. CENTRAL HEATING TEMPERATURE LOWERING MODE

If a heating system is fitted out an electric actuator on the 4-way mixing valve, the HEATING TEMPERATURE parameter is used to set the temperature of the system behind the 4-way valve, rather than that of the boiler; the temperature is read out by the heating system temperature sensor installed after the mixing valve.

ATTENTION! The central heating sensor must not be connected to the boiler regulator without correct connection of the electric actuator of the mixing valve.

In such a case, the boiler temperature will be higher than the set HEATING TEMPERATURE by the value of the advanced setting of the MIXING VALVE - BOILER TEMPERATURE. The boiler maintains (and does not exceed) the set central heating temperature by automatic closing of the mixing valve.

4. CONNECTING THE ACTUATOR OF THE 4-WAY MIXING VALVE

In order to ensure proper operation of the mixing valve with electric actuator, it should be properly connected to the boiler regulator. The most important part is to connect the actuator in such a way that it can open and close. That is, when opened, it should let boiler water out into the system. The correctness of the connection can be checked in the REGULATOR TEST. Diagram 3 describes complete opening of the actuator.

8. Troubleshooting

Failure	Causes	Repair
The display does not work although the boiler is connected	No voltage on terminals N and L	Check terminals N and L - call service Check the boiler's connection to a power source (electric socket)
	Wrong connection of the module with the control panel	Check the module connection - call service
	Cutting off power supply by direct thermostat STB (or ZTK)	Restart the STB thermostat (wait until the temperature drops to the appropriate value)
	Regulator failure	Regulator replacement - call service
One of the buttons on the display does not work	Regulator failure	Regulator replacement - call service
The STB thermostat switches off the boiler at a temperature below 90°C	STB (or ZTK) thermostat failure	Check the position of the capillary tube of the STB thermostat sensor Replace the STB thermostat - call service
The fuel feeder is not switched on although the signal shows otherwise	No voltage on the control panel	Check terminals N and L - call service Check the boiler's connection to a power source (electric socket)
	Wrong connection of the module with the control panel	Check the module connection - call service
	Fuel feeder failure	Check the correctness of fuel feeder connection - call service
		Check whether the fuel feeder is blocked - unblock
		A cotter pin has sheared off - replace
	Loss of capacitance of the motor's condenser	Replace electric cable of the motor - call service Replace the motor condenser - call service

	Regulator failure	Replace regulator - call service
The fan is not switched on although the signal shows otherwise	No voltage on the control panel	Check terminals N and L - call service
		Check the boiler's connection to a power source (electric socket)
	Wrong connection of the module with the control panel	Check the module connection - call service
	Fan failure	Check the correctness of fan connection - call service
		No connection between the plug and the fan socket - check the connection
		Defect of an electric cable of the fan - call service
	Regulator failure	Replace regulator - call service
The STB thermostat switched off the fan	Reset the STB	
The pump is not switched on although the signal shows otherwise	No voltage on the control panel	Check terminals N and L - call service
		Check the boiler's connection to a power source (electric socket)
	Wrong connection of the module with the control panel	Check the module connection - call service
	Regulator failure	Replace regulator - call service
	Pump failure, pump electric cable damaged	Replace pump - call service
Check the correctness of pump connection - call service		
Check water filter at the pump		
Wrong temperature read-out	Wrong connection of the temperature sensor	Check connection of the temperature sensor - call service
	Failure or defect of the temperature sensor	Replace sensor - call service
Abnormal operation of the regulator	Irregularities in the electric system and in the devices connected to the same phase as the boiler	Check the correctness of the electric system and the way boiler is connected - call service
	The executive module, ribbons or terminals of the regulator got damp	Check the module connection - call service
	Wrong connection of the module with the control panel	Check the module connection - call service
	Regulator failure	Replace regulator - call service
The display is blinking and it cannot be switched on	Wrong voltage of the boiler power supply	Check the electric system - call service
		Check the boiler's connection to a power source (electric socket)
	Wrong connection of the module with the control panel	Check the module connection - call service
	Incorrect connection of supply connectors	Check the executive module - call service
	Regulator failure	Replace regulator - call service
The boiler overheats the chimney	Chimney draught too strong	Measure chimney draught
		Install <u>flap</u> draught regulator on the chimney duct
		Check that the flue gas temperature is correct - from 110°C to 200°C
	Incorrect position of the boiler relative to the chimney (see operation and maintenance documentation of the boiler)	Follow the recommendations of the operation and maintenance documentation

The boiler does not reach the set temperature	The central heating system is made improperly	Check the central heating system
	Chimney draught too strong	Install <u>flap</u> draught regulator on the chimney duct
	Boiler selected incorrectly for the building	Obtain an (abbreviated) energy performance certificate for the building
	Failure or defect of the temperature sensor	Check the position of the temperature sensor
	Incorrect settings of the boiler operation	Change the parameters of the boiler operation
Oil leaks from the gear	Gear sealing not tight enough	Replace gear - call service
Fuel consumption too high	The installation performed incorrectly	Check the central heating system
	Boiler selected incorrectly for the building	Obtain an (abbreviated) energy performance certificate for the building
	Fuel with low calorific value	Try fuel from a different producer
	Incorrect settings of the boiler operation	Configure the boiler settings correctly
	Low boiler efficiency caused by high discharge loss	Too high temperature of flue gas in the smoke conduit, caused by too strong draught or too large amount of air for combustion
The cotter pins have sheared off	Blocking the fuel feeder (low quality fuel) for example moist pellets	When topping up the fuel, check visually for any rubbish which may block the feeder.
		Replace the cotter pins
		After the cotter pin has sheared off again, remove fuel from the bin through the hole for emergency emptying of the bin, remove fuel from the feeder pipe by moving back the feeder screw (use wrench no. 22), inspect the fuel and install new cotter pins.
The paraffin stopper has melted	Flame recession to the feeder pipe	A cotter pin has sheared off - replace
		Set correctly the time of fuel feeding in the heating up state and the maintenance state
		Replace the paraffin stopper
The flame recession sensor has melted	Flame recedes to the feeder pipe	Close tightly the bin lid
		A cotter pin has sheared off - replace
		Set correctly the time of fuel feeding in the heating up state and the maintenance state
		Replace the flame recession sensor - call service
Smoke is getting out of the fuel bin	The fuel feeding time is set wrongly	Set correctly the time of fuel feeding in the heating up state and the maintenance state
		Clean anti-smoke holes in the retort - call service
		Check moisture and quality of fuel
	Poor chimney draught or poorly performed pressure and exhaust ventilation in the boiler room	- Measure chimney draught - Check performance of the fan and exhaust in ventilation.
Formation of carbon deposit during the boiler operation	Flame in the retort is set too low	Set correctly the time of fuel feeding (fuel should burn not in the retort but on it)
		Remove mechanically any deposit in the retort.

	Too large amount of air supplied for burning	Reduce the fan capacity by changing the rotation rate on the regulator. Reduce the fan capacity by changing the position of the flap on the fan
Poor fuel burning	Too little air supplied for burning	Too strongly tightened flap on the fan - loosen Blocked flap on the fan outlet - unblock by moving the flap axis which sticks out of the fan casing or call service
	Mixer is full of ash	Clean the mixer
	The furnace grate is not tight enough	Seal the grate with silicon (up to 1200°C)
	Low quality fuel	Check moisture and quality of fuel, try fuel from a different producer
The motor is running but the feeder screw is not rotating	A cotter pin has sheared off	Replace the cotter pins
	Gear failure	Replace gear - call service
	Feeder screw failure	Replace feeder screw - call service
Ceramic plate cracked	Poor fuel burning	Set correctly the fuel feeding time
	Physical damage	Replace the ceramic plate
	Too much air supplied for burning	Reduce the fan capacity by changing the rotation rate on the regulator. Reduce the fan capacity by changing the position of the flap on the fan
	Wrong settings of fuel feeding and feeding breaks in the heating-up state	The settings should be close to those recommended by the manufacturer, preferably short (for example, for Klimosz 25 kW: 5 seconds fuel feeding and 12 seconds break in fuel feeding)
A lot of carbon deposit and caked fuel has formed on the plates	Low quality of fuel	Check moisture and quality of fuel
	Too moist fuel	Store fuel in a warm room as far as possible; fuel must be dry.
	Poor fuel burning	Set correctly the fuel feeding time and feeding breaks time

9. Terms of warranty and liability for product defects

1. The Klimosz Sp. z o.o. Company (hereinafter referred to as the Manufacturer) hereby grants the buyer of the boiler a warranty on the boiler under the terms and conditions specified in these Terms of Warranty.
2. The VCS Sp. z o.o. company (Tel. 032 474 39 53) performs service work for KLIMOSZ brand boilers.
3. The Klimosz Sp. z o.o. company guarantees correct boiler operation and removal of irregularities in boiler operation subject to warranty free of charge, but only in cases where the boiler is installed and used in accordance with valid regulations and standards and with all the terms and conditions contained in the Boiler Instruction Manual, Controller Instruction Manual, and if no boiler element exhibits signs of mechanical or thermal damage, contact burning, flooding, traces of action of an aggressive atmosphere (including fumes from sewer wells), traces of corrosion from use of wet or moist fuel (fuel dispenser, screening tube of the feeding screw), chemical agents, signs of the presence of overvoltage and a strong electromagnetic field.
4. The Boiler Instruction Manual, Controller Instruction Manual, and Detailed Terms of Warranty are available for perusal before boiler purchase and the documents assigned to a given boiler are issued to the Buyer at the time of boiler purchase. The Buyer has the responsibility of becoming acquainted with the principles of boiler installation and operation, as in the Boiler Instruction Manual and Terms of Warranty.
5. The Klimosz Sp. z o.o. company grants:
 - a **10-year** warranty on the integrity (leakproofness) of the cast iron boiler exchanger counting from date of boiler start-up (at most, **126 months** from the date of purchase) for the **KLIMOSZ BOILERS: COMBI, COMBI B, MULTICOMBI,**

- a **5-year** warranty on the integrity (leakproofness) of the steel boiler heat exchanger (water base) counting from date of boiler start-up (at most, **66 months** from the date of purchase) for the **KLIMOSZ BOILERS: COMBI, MULTICOMBI (with electronically controlled actuator on the four-way valve or circulating pump)**,
 - a **5-year** warranty (up to 75kW) and **4-year** warranty (over 80kW) on the integrity (leakproofness) of the steel boiler heat exchanger counting from date of boiler start-up (at most, **66 months** from the date of purchase) for the **KLIMOSZ BOILERS: KLIMOSZ, DUO, DUO PELLETS, ULTIMATE, MAXI, EKO, MULTIDUO (with electronically controlled actuator on the four-way valve or circulating pump)**,
 - a **2-year** warranty for boiler fittings (at most **30 months** from the date of boiler production),
 - a **2-year** guarantee on boiler electronics and automation, i.e. the controller (according to the Terms of Warranty written in the Controller Instruction Manual), fan, motor, motoreducer - (at most **30 months** from the date of boiler production).
6. Parts repairs or replacements do not extend the warranty by another 2 years from the date of replacement or repair.
 7. Wearing elements are **not subject to warranty** (screws, caps, bolts, ceramic elements (chamottes), and sealing elements, uncooled grate of the manual furnace, flame deflector with catch, additional secondary air nozzles, pins, cotters, wedges, condensers, lighters (heaters), feeding screws, paint coats, dispenser flap, paraffin cork, sealing cord).
 8. Only original spare parts purchased from the Manufacturer are to be used. The Manufacturer is not liable for incorrect boiler operation resulting from the installation of improper parts.
 9. Damage of the lacquer coat inside of the boiler does not have an influence on correct boiler operation, efficiency, or the life of the exchanger.
 10. Electronic boiler elements **are not subject to warranty** if they exhibit signs of mechanical or thermal damage, contact burning, flooding, signs of action of an aggressive atmosphere (corrosion), chemical agents, signs of the presence of overvoltage and a strong electromagnetic field.
 11. Installation of the boiler in a heating system may only be performed by an installer possessing general installation and electric authorization (his entry and stamp in the **Warranty Card** is required). Boiler installation includes connection to the hydraulic system, exhaust system, and the performance of all low-voltage electrical connections (sensors, thermostats) and high-voltage electrical connections (pumps, four-way valve actuator), filling of the heating system with the heating agent, deaeration of heat receivers, pumps, and distributors.
 12. **Zero start-up of the boiler** is mandatory (does not apply to the **KLIMOSZ COMBI B** boiler delivered as a kit for do-it-yourself installation) and it must be performed by a serviceman with a valid Klimosz Authorized Serviceman Card. The cost of travel of the serviceman according to the current Price List of Services is covered by the Buyer. The scope of zero start-up does not include inspection activities before start-up described earlier, and if they have not been conducted by the installer, the Authorized Serviceman may refuse to carry out Zero start-up of the boiler or perform these activities at additional charge. The Authorized Serviceman is obligated to abandon performance of boiler zero start-up in the event that:
 - a. the boiler has been installed inconsistently with valid regulations and standards,
 - b. the boiler has been installed inconsistently with the requirements and recommendations given in this Boiler Instruction Manual,
 - c. the heating system does not fulfil the requirements given in the Boiler Instruction Manual and in the appropriate regulations,
 - d. the heating installation, hot water installation, or electric installation does not fulfil requirements in the scope of safe operation,
 - e. boiler power is too low or too high relative to calculated demand for heat in the building according to the Authorized Serviceman,
 - f. the chimney draught is too low for correct boiler operation according to the Authorized Serviceman,
 - g. the central heating and hot water installation do not possess the appropriate protection, vents, etc.
 - h. the numbers of fittings installed on the boiler are not compliant with those entered in the Boiler Passport attached to the Boiler Instruction Manual,
 - i. the Boiler Passport is missing from the Boiler Instruction Manual,
 - j. the user does not possess the documentation of a given boiler specimen,
 - k. there are traces of mechanical damage, signs of action of chemical agents, or traces of flooding on the boiler.
 - l. fuel supplied by the User does not fulfil requirements, that is, it is wet, moist, has incorrect granulation, dust or powder content, has incorrect hardness, contains non-standard additives (applies to pellets).
- Boiler zero start-up that is performed despite the presence of one of the above conditions may result in voiding of the boiler warranty and voiding of the authorization of the Serviceman performing start-up.

13. Warranty repair does not include activities that the user is obligated to perform on his own according to this Boiler Instruction Manual, such as: firing up the boiler, cleaning heat exchange surfaces and the boiler furnace, replacement of broken screws, wedges, and safety pins, programming of boiler operating parameters as described in the controller instruction manual, sealing of the contact of the grate with the ring on the air mixer. In the case of the **KLIMOSZ COMBI B** boiler, warranty repair activities do not include installation and disassembly of the motoreducer, fan, and boiler controller.
14. All repairs and activities exceeding the scope of user activities described in the Instruction Manual may only be performed by the Klimosz Authorized Service.
15. All independent changes in boiler design void the warranty agreement.
16. The boiler is not subject to warranty if a copy of a correctly completed warranty card, containing all required information, is not sent to VCS Sp. z o.o. by a deadline of 21 days from the date of zero start-up, or if the **warranty card** is missing boiler data, stamps of the installer and Authorized Serviceman with signatures, or user data (name, surname, address, telephone number), parameter values of boiler settings, the chimney draught, emissions temperature, fuel type, a completed part concerning the user's training in the scope of boiler operation and regulation.
An incomplete Warranty Card without a set of stamps and signatures is void. Emissions temperature must be measured and entered into the table absolutely. Entering the values of the chimney draught is recommended but not mandatory. This value will only be required in the case where claims or doubts concerning correct boiler operation are reported.
 The manufacturer reserves the right to suspend payment for zero start-up of a boiler performed without conclusion in the form of delivery of the required documents to VCS Sp. z o.o.
17. The boiler is **not subject to warranty** if the numbers of the boiler, controller, or motoreducer are not compliant with the numbers found in the boiler passport.
18. **Boiler corrosion is not subject to warranty** if it results from excessive air humidity in the boiler room or installation of the boiler under conditions of an aggressive atmosphere, e.g. in workshop rooms, near vent outlets and sewage inlets or industrial ventilation, in freshly plastered room or with fresh poured concrete.
19. The Manufacturer is not liable for malfunctions caused by:
- service and operation not compliant with the **Boiler Instruction Manual**,
 - the application of **incorrect fuel quality (with excessive sinterability)** or moist fuel,
 - connection of the boiler to the heating system that is non-compliant with standards,
 - mechanical damage to the boiler,
 - intake-exhaust ventilation that is not compliant with standards,
 - an incorrect chimney draught corresponding to the power of the boiler,
 - boiler pollution resulting from a low boiler operating temperature, that is, below 55°C,
 - loss of electrical voltage.
20. The user is obligated to return the costs of Service call in the case of:
- unjustified Service call,
 - repair of damage resulting from the fault of the User,
 - situation of the boiler in a boiler room not compliant with the **Boiler Instruction Manual**,
 - no possibility to perform repairs for reasons independent of the Service (e.g. lack of fuel, no chimney draught, leaks in the central heating installation).
21. The warranty is void, if:
- a **periodical inspection** by an Authorized Serviceman is not conducted (with an entry into the **Table of repairs and inspections in the Boiler Instruction Manual**). An inspection is only considered to be valid if it is conducted before the expiration of **12 months** from the date of zero start-up of the boiler and is certified at VCS Sp. z o.o. by delivery to VCS Sp. z o.o. of a copy of the inspection card by a deadline of 14 days from the date of inspection conduct,
 - repairs have been performed by unauthorized persons,
 - the safety valve or a device for reception of excess heat or a diaphragm vessel has not been installed during installation in a closed system - **IT IS PROHIBITED TO CONNECT THE BOILER TO A HEATING INSTALLATION WITHOUT AN INSTALLED SAFETY VALVE. THE VALVE IS TO BE SELECTED IN ACCORDANCE WITH STANDARD: PN-B-02414 Protection of water heating installations in a closed system with diaphragm vessel, PN-81/M-35630 Safety valves, or if the cooling installation is not connected to a source of cold water providing continuity of water supply,**
 - the installation was performed as non-compliant with installation practice,
 - a **four-way mixing valve with an actuator and return sensor** or **other electronic thermal protection of the boiler** guaranteeing the return water temperature required by the manufacturer

- has not been installed (**does not apply to the KLIMOSZ COMBI B boiler**).
22. Any information on defects must be reported immediately after their detection in writing to the company or to VCS Sp. z o.o.
 23. During the warranty period, the user is entitled to:
 - free repairs performed by the Klimosz Authorized Service (apart from user activities described in the Instruction Manual),
 - replacement of the device to one that is free from defects after statement by the manufacturer of no possibility for repair.
 24. The feeding screw is a naturally wearing part during boiler operation. A corroded feeding screw is not subject to warranty. The main factor causing corrosion is moist fuel (coal) or an environment with excessive air humidity.
 25. The Manufacturer of the boiler is not liable for incorrectly selected boiler power or for incorrect cooperation of the boiler and heating installation.
 26. During the warranty period for a given boiler, the manufacturer assumes the obligation of delivering fully serviceable spare parts subject to justified warranty replacement. The manufacturer reserves the right to use parts or entire devices that have been regenerated in a factory with equivalent functionality for use in repairs, with maintenance of the warranty period for their serviceability until the end of the warranty period on a given boiler. This item excludes parts subject to natural wear, listed in the table under these Terms of Warranty. For applications in which continuous boiler operation is necessary, it is recommended for Users to purchase a spare set of naturally wearing elements to prevent any damage.
 27. **It is prohibited to check leakproofness (integrity) of the boiler and installation using compressed air.**
 28. **The Manufacturer is not liable for:**
 - **damages cause by the product during its operation or as a result of failure,**
 - **freezing of the installation and other building elements as a result of boiler failure, particularly when boiler standstill is caused by a lack of a spare part subject to natural wear,**
 - **the cost of substitute heating during the time of removal of the malfunction in a device subject to claims,**
 - **the Manufacturer is not liable for damages sustained as a result of boiler standstill.**
 29. The predicted time of boiler operation is 10 years and more after the conduct of additional boiler strength tests during the 10th year of life.
 30. The following must be given mandatorily in the claim report to VCS Sp. z o.o.:
 - personal data of the boiler user,
 - address and contact data of the boiler user,
 - type, power, and factory number of the boiler,
 - date and place of purchase of the boiler,
 - data of the installer and serviceman performing zero start-up,
 - description of boiler damage, with attached photographs of the installation and damaged part, if possible.
 31. In the case of claims regarding incorrect combustion in the boiler, tarring of heat exchange surfaces, emission of smoke from the boiler door, a xeroxed copy of a chimneysweep's expertise is to be attached to the claim and signed by the Master Chimneysweep, and it should state the fulfilment by the chimney draught of all conditions contained in the instruction manual for the given power of the boiler and should contain a confirmation of cleaning of the chimney draught within one year before the failure is reported.
- Damage sustained as a result of failure to meet the following conditions cannot be subject to claims for damages. If the boiler operates according to the principles presented in this Boiler Instruction Manual, it does not require special or specialized interference from a service company.**
- The "Statement of boiler quality and completeness" serves as the Warranty Card after it is filled out by the service company. The Manufacturer reserves the right to possible changes in boiler design within the framework of product modernization and development, and these changes may not be accounted for in this copy of the Instruction Manual.**
- The above Terms of Warranty do not exclude user rights resulting from non-compliance of the goods with the contract.**

We respectfully inform that possible replacement of a boiler subassembly subject to claims by the user with a serviceable one is not equivalent to acknowledgement by Klimosz Sp. z o.o. of the warranty claims of the boiler user and does not conclude the claim service procedure. Klimosz Sp. z o.o. reserves the right to charge the boiler user with costs of subassembly replacement/repair by a deadline of 90 days from the date of repair, if, during the expert opinion conducted after the repair, it was deemed to have been damaged by factors independent of the boiler manufacturer (e.g. short-circuit in the electrical installation, overvoltage, flooding, mechanical damage invisible to the naked eye, etc.), and which damage the service performing repairs was not able to assess during repair at the site of boiler operation. Klimosz Sp. z o.o. will issue the appropriate invoice for replacement/repair of the objective subassembly along with the attached protocol from the expert opinion. We simultaneously inform that a lack of payment of the invoice including the above costs by a deadline of 14 days from its issuance will result in irrevocable voiding of the warranty on the boiler, and this information will be registered in our computerized boiler supervision system during the warranty period. The deadline for payment is accepted to be the date of arrival of the user's payment to the bank account given in the invoice referred to above.

For the user
KLIMOSZ Sp. z o.o.
ul. Zjednoczenia 6
43-250 Pawłowice
tel. no. 32 474 39 00
www.klimosz.pl

VIADRUS SERVICE CENTRE
ul. Zjednoczenia 6
43-250 Pawłowice
tel. no. 32 474 39 00
e-mail address: *serwis@klimosz.pl*

10. Warranty Card and Certificate of the boiler quality and completeness

Boiler type	
Burner type	
Production number	
Boiler capacity	
Name, Surname	
Street	
Town, postcode	
Tel. / Fax	
E-mail	

Completeness of the boiler and the accessories is guaranteed by Klimosz Sp. z o.o.

A service technician may, in accordance with the Detailed Warranty Terms and Conditions, refuse to perform a boiler start-up procedure, which should be recorded as a note in the Warranty Card.

Only a Warranty Card which is filled in and has all the stamps and signatures, is valid. The flue gas temperature has to be measured and entered in the table. Recording the value of chimney draught is recommended, but not obligatory. The value will be required only if a complaint is made or if there are any doubts related to the boiler operation.

Measurement type	Measured value
Flue gas temperature [°C]	
Chimney draught [Pa]	

Customer's declaration	Training duration	Signature
I hereby confirm that I have been trained in the boiler operation		

By signing this declaration the user confirms that:

- no defect of the boiler was revealed during the start-up procedure performed by the servicing company;
- he has received the **Boiler Installation and Operation manual** with the Warranty Card properly filled in as well as the Certificate of quality and completeness of the boiler;
- he has been trained and understands the principles of the boiler's operation and the procedures for making complaints, if any.

.....
Date of boiler manufacture:

.....
Technical inspection (signature):

.....
Seller's stamp:

.....
Date of installation:

.....
Installation company (stamp,
signature):

.....
User's signature:

By signing this document, the customer and the installation and servicing company grant their consent to their personal data being processed for the purpose of maintaining service records, pursuant to the Personal Data Protection Act of 29.08.1997, J. of Laws No. 133, item 883.

For Klimosz Company
 KLIMOSZ Sp. z o.o.
 ul. Zjednoczenia 6
 43-250 Pawłowice
 tel. no. 32 474 39 00
 www.klimosz.pl

VIADRUS SERVICE CENTRE
 ul. Zjednoczenia 6
 43-250 Pawłowice
 tel. no. 32 474 39 00
 e-mail address: *serwis@klimosz.pl*

11. Warranty Card and Certificate of the boiler quality and completeness

Boiler type	
Burner type	
Production number	
Boiler capacity	
Name, Surname	
Street	
Town, postcode	
Tel. / Fax	
E-mail	

Completeness of the boiler and the accessories is guaranteed by Klimosz Sp. z o.o.

A service technician may, in accordance with the Detailed Warranty Terms and Conditions, refuse to perform a boiler start-up procedure, which should be recorded as a note in the Warranty Card.

Only a Warranty Card which is filled in and has all the stamps and signatures, is valid. The flue gas temperature has to be measured and entered in the table. Recording the value of chimney draught is recommended, but not obligatory. The value will be required only if a complaint is made or if there are any doubts related to the boiler operation.

Measurement type	Measured value
Flue gas temperature [°C]	
Chimney draught [Pa]	

Customer's declaration	Training duration	Signature
I hereby confirm that I have been trained in the boiler operation		

By signing this declaration the user confirms that:

- no defect of the boiler was revealed during the start-up procedure performed by the servicing company;
- he has received the ***Boiler Installation and Operation manual*** with the Warranty Card properly filled in as well as the Certificate of quality and completeness of the boiler;
- he has been trained and understands the principles of the boiler's operation and the procedures for making complaints, if any.

.....
 Date of boiler manufacture:

.....
 Technical inspection (signature):

.....
 Seller's stamp:

.....
 Date of installation:

.....
 Installation company (stamp,
 signature):

.....
 User's signature:

By signing this document, the customer and the installation and servicing company grant their consent to their personal data being processed for the purpose of maintaining service records, pursuant to the Personal Data Protection Act of 29.08.1997, J. of Laws No. 133, item 883.