

1. EXPLANATION OF SYMBOLS AND SAFETY INSTRUCTIONS

1.1. Explanation of symbols



CAUTION! - Important recommendation or warning concerning safety conditions during installation and operation of boiler.



DANGER! - fault or improper use may cause injury or be hazardous to life of humans or animals.



FIRE HAZARD! - fault or improper installation and operation may cause fire.



INFORMATION – Important information on the proper operation of the product.

1.2. Requirements to boiler installation room

This manual contains important information for the safe and correct installation, start-up and trouble-free operation and maintenance of the boiler.

The Pellet boiler can be used for heating rooms only in the manner described in this manual.

The application and any other was the area of operation is not recommended by the manufacturer and is not responsible for the occurrence of defects or failures.

Note the boiler type data on the factory rating label and the technical data provided in chapter 13 in order to ensure proper operation of the product.

1.2.1. Instructions to boiler installer

During installation and operation, the country-specific requirements and regulations must be observed:

- Local construction regulations on installation, air supply and exhaust gas extraction as well as chimney connection.
- Regulations and norms concerning the fitting of the heating installation with safety devices.
- Required installation of a smoke detector in the boiler room.



Use only original BURNiT parts



WARNING! Installation and setup of the boiler should be done by an authorized specialist / service shop and must follow the safety instructions and rules of operation.



It is mandatory to assure a backup power generator of corresponding rated power! (see table 1)



DANGER of intoxication, suffocation.

Inadequate inflow of fresh air to the boiler room may result in dangerous leak of exhaust gases during boiler operation.

- Make sure the air inlets and exhaust gas outlets are not clogged or closed.

- If faults are not remedied immediately, the boiler must not be operated.

- The user must be provided with written instructions on the fault and the hazard it entails.



DANGER of fire when burning flammable materials or liquids.

- Flammable materials/liquids must not be left in close proximity of the burner and heating boiler.

- Instruct system user of the allowed minimum clearances from surrounding objects.



Customer must undergo boiler operation/maintenance training by authorized installer/service shop.

Table 1.

Electricity consumption of the boiler

Maximum electrical input	780 W
Electrical input at nominal heat output	80 W
Electrical input at minimum heat output	60 W

1.2.2. Instructions to installation user



DANGER of intoxication or explosion

Toxic gases may be discharged when burning waste, plastics, liquids.

- Use only the fuels indicated in this manual.

- In case of danger of explosion, ignition or discharge of exhaust gases in the room, stop the pellet burner from operation.



CAUTION! Danger of injury / damage of system due to incompetent operation.

- The boiler must be serviced only by persons familiar with the operation manual.

- As user, you are only allowed to start the boiler up, adjust the temperature of the boiler, shut the boiler down and clean it.

- Unattended children must not be allowed access to premises with running boiler inside.



It is mandatory to assure a backup power generator of corresponding rated power! (see table 1)



Customer must undergo boiler operation/maintenance training by authorized installer/service shop.

Safety rules for user operation:

- Operate the pellet burner on recommended fuel only, and to that end you must regularly inspect the boiler room.
- Do not use flammable liquids for ignition or increase of burner output.
- Clean the burner surface using non-flammable agents only.
- Do not place flammable objects onto the burner housing and heating boiler cabinet or in their proximity. (see diagram 1 for the minimum clearances)
- Do not store flammable materials in the boiler room.
- It is mandatory to strictly observe instructions for connecting the burner to power network as well as to all peripherals.
- Structural changes to Dual-chamber boiler by user can cause damage to equipment or injury.
- Do not allow contact transmission of electrical wire or touch any part of the boiler, where the surface temperature can exceed 70°C.
- This manual should be kept throughout the lifetime of the boiler.



CAUTION! Hot surface!
Risk of burns if you touch the running system. Burner housing, body and flange are hot surfaces during burner operation.

*It is strictly prohibited to open boiler inspection doors with the burner running.
 The hopper hatch cover is not allowed to remain open for longer periods of time.
 Also, exercise caution when touching the observation port for monitoring the burning process. It may be hot.*

1.2.3. Minimum clearances for installation and flammability of construction materials

The applicable minimum clearances in your country may differ from the ones specified below. Please, consult your installer.

The minimum distance from the burner, heating boiler or exhaust gas pipe to objects or walls must be at least 200 mm.

Table 2. Flammability of construction materials

Class A – non-flammable	Stone, bricks, ceramic tiles, baked clay, solutions, plaster free of organic additives.
Class B – hardly flammable	Gypsum board panels, basalt fiber needled felt, fiberglass board, AKUMIN, Izomin, Rajolit, Lignos, Velox, Heraklit.
Class C1/ C2 – Medium flammable	Wood beech, oak. Wood softwood, layered wood
Class C3 – easy flammable	Asphalt, cardboard, cellulose, tar, fiberboard, cork, polyurethane, polyethylene.

For general safety considerations, we recommend that the boiler be placed on a foundation made of class A material, see table 2.

Diagram 1. Recommended clearances between boiler and walls /see page 59/

2. PRODUCT DESCRIPTION

Ecological and highly-efficient pellet boiler PelleBurn is designed for firing wood pellets. The mantle fully covers the combustion chamber. Efficiency rate reaching 91%. Approved in accordance with EN 303-5, class 5. Set includes pellet boiler, pellet burner, auger and pellet fuel hopper (option).

2.1. Design structure of boiler PelleBurn.

Cylindrical body design is made of high-quality boiler steel sheets with thickness of 4 mm for the combustion chamber and 3 mm for the water mantle.

- **Ecological.** A high-end pellet boiler. The wood pellets used for fueling the boiler are a renewable fuel with minimum carbon emissions and ultimate burning efficiency.
- **Automated.** Owing to an improved algorithm with optional adjustment of a wide variety of parameters, the system may be finely tuned to any particular heating system to achieve optimum efficiency and fuel consumption.

Controller functions:

- 1) fully automated ignition and pellet feed;
- 2) exhaust fan ensures stable operation of the boiler;
- 3) boiler-and-burner self-cleaning function;
- 4) controls the operation of central heating circulation pump;
- 5) controls the operation of DHW (domestic hot water) pump;
- 6) controls by room thermostat;
- 7) flue gas sensor

- **Efficient.** To keep from losing heat into the ambience, the boiler is insulated on the outside by 100 mm high-temperature wool. With its state-of-the-art combustion control system and cylindrical body design construction the PelleBurn boiler achieves efficiency rate of as much as 91%.

2.2. Design of pellet burner Pell

The burner is made of high-quality stainless steel able to withstand temperatures of up to 1150°C. The burner must be installed on a heating boiler.

The burner consists of two parts: combustion chamber tube and external tube with sheet metal mantle. Longitudinally, under the housing, there are blow chamber, fuel ignition heater, fan and power supply. On the upper part of the burner there is a feeder chute to which the pellet auger is attached. The combustion chamber consists of two tubes:

Ember resistant steel tube inside the burner with holes for air intake along its entire length, opening for the hot air from the fuel ignition heater, opening for photosensor.

Outer stainless steel tube. Between the two tubes there is a gap which provides for free circulation of the air necessary both for cooling and oxygen supply into the combustion chamber.

The feeder chute allows 360° rotation for its best convenient positioning when connecting the pellet auger to the hopper.

Diagram 2. Design of Pellet Burner Pell /see page 59/

Other elements of the burner are

- **Internal auger.**
- **Dry contactless resistance heater** assuring ignition of fuel.
- **Pneumatic cleaning system** of the combustion chamber.
- **Feed fan**, smooth regulation (0% to 100 %).
- **Telescopic pull-out system of burner Pell** for easy maintenance.

2.3. Safety devices of pellet boiler-and-burner

A complex of safety devices provide for the safety of the appliance. Air-feed fan, step –regulated, controls the combustion according to energy needs and is maintained in optimal working order. Independent STB thermostat shut-off the burner and shut off the air feeding in the combustion chamber in case of rising boiler temperature.

- **Elbow-shape feeder chute.** The geometrical shape of burner feeder chute prevents backfire entry from burner into pellet hopper. The flexible tube is melted at a temperature above 80°C. Thus prevent access to the hopper of the fire.

- **Thermostatic protection (80°C).** The thermostatic protection is fitted on the feeder chute. When the surface of the feeder chute reaches 80°C, the control stops the feeding of pellets into the burner and signals for fault (BB Alarm).

- **Fuse.** In case of electrical fault in the system of the burner (short circuit, current overload, etc.), the overload is borne by the electrical fuse fitted on the main control panel of the burner (10 A).

- **Power interruption. Innovative controller.** In case of power interruption, all parameter settings are stored in the memory of the controller. Upon the subsequent restart of the burner, the controller resumes the execution of the program from the point when the power interruption occurred.

2.4. Design of pellet auger

The auger transports pellets from fuel hopper to burner. Auger elements are: auger pipe, auger hose, motor, conveyor belt for moving the pellets.

Diagram 3. Design of pellet auger /see page 59/

2.5. Design of fuel hopper FH 500

Pellet hopper, designated to serve biomass pellet-fired boilers. Pellet hopper design allowing installation by choice on either side of boiler. Made of cold-rolled steel sheets with PVC coating. Comfortable pellet charging hatch. Pellets inside hopper are fed into auger in order of reception. Precision leveling of hopper possible via screw-in legs. Elevated foundation with drain holes and container for separation and removal of pellet powder.

The hopper capacity is determined using as calculation base the daily or weekly fuel consumption rate of burner. The pellet hopper usable volume of 500 liters allows charging of 280-300 kg of pellets with diameter 6 mm, and top-up/refill once a week (for burner of rated power up to 40 kW).

Diagram 4. Design of fuel hopper FH 500 /see page 59/

3. FUEL

All pellets are biomass manufactured from common low-growing plants and trees. The most common household type pellets are made of sawdust and milled wood chippings which are waste material from wood used in the production of logs, furniture and other products. Wood is the richest raw material which does not have any impact on the production costs of food products or ethyl alcohol (ethanol). The raw material is processed under high-pressure and temperature and is pressed to produce small-size cylindrical pellets. The production process may utilize soft wood material (such as softwood, pine), hardwood (oak) as well as recycled waste wood. Wood pellets are produced in hammer mills or wood pellet plants.

Advantages of wood pellets:

Convenient storage.

Pellet bags can be stored on a small area in a dry garage, basement, service room or shed.

Easy loading.

In most cases the boiler hopper needs loading only once a week – this depends on the hopper capacity.

Better control of fuel quantity.

The small size of the pellets allows for precise fuel feeding. On the other hand, the supply of air for reaching optimal combustion efficiency is easier to adjust since the fuel quantity in the combustion chamber remains constant and predictable.

Fuel efficiency.

High combustion efficiency is also determined

by consistently low moisture content of pellets (consistently under 10% as opposed to 20% to 60% moisture content of the logs). Low moisture content, controlled fuel portions and precise air setting means high combustion efficiency and very low carbon oxides in the flue gases.



When purchasing pellets, ask for conformity declaration and certificate issued by an accredited laboratory and make sure the fuel meets the requirements indicated in the manual. If you purchase large amount of pellets (bulk supply for the entire heating season for example), ask your supplier to provide accurate and true information about the storage conditions.

We recommend to use pellet with size of 6 - 8 mm. Density 600 - 750 kg/m³ heating value 4.7-5.5 kWh/kg. Ash content – less than 1% and moisture content up to 8%, EN 14961-2:2011.

The optimal density of the pellets which guarantees their quality is 605-700 kg per cubic meter.

Pellet moisture content must not exceed 10%. Make sure you store your fuel in a dry and well-ventilated place.

The optimal pellet ash content is ≤ 1%. This also provides for less frequent cleaning intervals for the burner.

The table below contains the parameters which we recommend that you take into consideration when choosing fuel for your Pell burner.

Table 3. European Certification of Wood Pellets for Heating Purposes

Parameters	Units	ENplus-A1	ENplus-A2	EN-B
Diameter	mm	6 (± 1) 8 (± 1)	6 (± 1) 8 (± 1)	6 (± 1) 8 (± 1)
Length	mm	15 ≤ L ≤ 40 ¹⁾	15 ≤ L ≤ 40 ¹⁾	15 ≤ L ≤ 40 ¹⁾
Bulk density	kg / m ²	≥ 600	≥ 600	≥ 600
Calorific/heating value	MJ / kg	≥ 16,5-19	≥ 16,3-19	≥ 16,0-19
Humidity /moisture	Ma .-%	≤ 10	≤ 10	≤ 10
Dust	Ma .-%	≤ 1 ³⁾	≤ 1 ³⁾	≤ 1 ³⁾
Mechanical durability	Ma .-%	≥ 97,5 ⁴⁾	≥ 97,5 ⁴⁾	≥ 96,5 ⁴⁾
Ash	Ma .-% ²⁾	≤ 0,7	≤ 1,5	≤ 3,5
Melting point of ash	°C	≥ 1200	≥ 1100	-
Chlorine content	Ma .-% ²⁾	≤ 0,02	≤ 0,02	≤ 0,03
Sulfur content	Ma .-% ²⁾	≤ 0,03	≤ 0,03	≤ 0,04
Nitrogen content	Ma .-% ²⁾	≤ 0,3	≤ 0,3	≤ 1,0
Copper content	mg / kg ²⁾	≤ 10	≤ 10	≤ 10

