



WOOD BURNING STOVES  
BALKAN ENERGY  
INSTALLATION AND MAINTENANCE



## TECHNICAL DESCRIPTION

The fireplaces are intended for heating of private houses and public premises using solid fuel. The variety of models permits the formation of the desired interior with the purpose of creating coziness, aesthetics and heat comfort. For cooking the technology of embers, in an oven, on a plate can be used.

The indicated heat powers of the models have been fixed after investigations according to standardized conditions. Achieving the desired power depends on the selected fuel with the necessary calorificity and humidity; its subsequent kindling and refueling; the regulation of the primary and the secondary air as well as the draught; the organizing of effective air heat exchange etc.

For calculating the necessary power, it must be taken into account that for the heating of one cubic metre, 25 to 180 Watts are necessary, depending on the exposure, the insulation, the outside temperature and the wind.

It is known that the correlation between the price and the calorificity of the chosen fuel indicates that the heating with solid fuel is the most economical method. As a result of the long experience and the tests carried out in the laboratories, optimum characteristics and 60-80 % efficiency for all produced fireboxes, fireplaces and stoves have been achieved.

TECHNICAL CHARACTERISTICS	BIANCA	SUZANA
Distance to combustible materials	rear - 50cm	rear - 40cm
	sides - 50cm	sides - 40cm
	front - 120cm	front - 100cm
CO Emission (O <sub>2</sub> ref=13%)	1054 mg/Nm <sup>3</sup>	1427 mg/Nm <sup>3</sup>
Flue gas temperature at nominal heat output	214 °C	185 °C
Type of fuel	dry wood	dry wood
Dust (O <sub>2</sub> ref=13%)	35,5 mg/Nm <sup>3</sup>	37,3 mg/Nm <sup>3</sup>
NO <sub>x</sub> (O <sub>2</sub> ref=13%)	102 mg/Nm <sup>3</sup>	121 mg/Nm <sup>3</sup>
OGC (O <sub>2</sub> ref=13%)	104 mg/Nm <sup>3</sup>	110 mg/Nm <sup>3</sup>
Nominal heat output	8,5 kW	11,6 kW
Water heating output	-	6,1 kW
Energy efficiency	77,4%	78,1%

## INSTALLATION INSTRUCTIONS

When installing the products, all local laws and regulations must be complied, including those relating with national or European standards.

The fireplace is placed on a stable horizontal fireproof floor with enough carrying capacity. For protecting the floor a stable and fireproof base can be used, which shall stick out before the fireplace at least 50 cm in front and 30 cm at the side.

In the radiating area of the fireplace, at a distance of 80 cm around it there shall not be any objects burnable and damageable by the radiated heat.

Prior to connect (Before connecting) the fireplace to the chimney, consult a skilled worker.

The connecting elements (rosette and smoking pipes) shall be fixed tightly and lasting, so that they may not get into (enter) the passage section of the chimney.

The smoking pipes shall have the same size as the connecting pipe of the fireplace.

It is advisable that the fireplace work with a separate chimney.

Fresh air shall enter (get in) the fireplace at least 4 m<sup>3</sup>/h for each kilowatt from its heat output. When necessary a flow from adjacent premises or outside air is ensured. The burning process of the fireplace shall not feel shortage of air on the action of gravitational or forced aspirations, since this is a prerequisite for insufficient combustion or returning of flue gases in the premises.

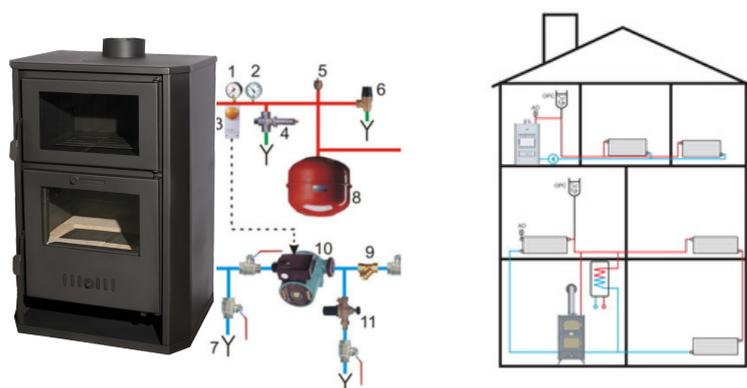
### EXEMPLARY DIAGRAM OF OPERATION OF A FIREPLACE WITH A WATER JACKET IN A CLOSED SYSTEM

### EXEMPLARY DIAGRAM OF OPERATION OF A FIREPLACE WITH A WATER JACKET IN AN OPENED SYSTEM

*An opened water heating system with an opened expansion vessel and a pump*

*An economical opened gravity self-controlled water heating system with an opened expansion vessel without a pump.*

1. Manometer
2. Thermometer 120° C.
3. Electric(al) thermostat.
4. Thermal safety valve.
5. Automatic deaerator.
6. Safety hydraulic valve
7. Drainage, draining.
8. Closed expansion vessel.
9. Filter.
10. Circulation pump.
11. Automatic supplementing group



## GENERAL RULES AND RECOMMENDATIONS

1. Before the installation building, it is recommended the heat losses to be calculated by a specialist for the concrete case.
2. We recommend the fireplace to be connected to an open heating system. When connected in a closed system, it must be safeguarded (foolproof) with a safety hydraulic valve.
3. De-aeration of each branch and element of the installation in each moment of its operation has to be ensured.
4. All elements of the installation must be ensured against freezing, especially if the expansion vessel or other parts of it are located in non-heated premises.
5. In the installations with forced circulation the pump must be provided with UPS - an accumulator with a transducer 12 V/220V/50 Hz on autonomous regime. **It is recommended that the circulation pump be switched on and off by a thermostat, duplicated with a manual electrical switch.**

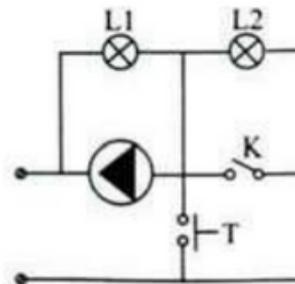
Diagram: L1 and L2 - signal lamps  
K - Ordinary switch  
T - Thermostat

\* Operating conditions (mode). L1 is on, the circulation pump runs.

\*\* Readiness regime/mode. L2 is on. The pump DOESN'T run.

There is electrical tension.

\*\*\* Emergency operation. L1 and L2 are Off. There is no electrical tension.



6. The first service cleaning of the pump filter must be done immediately after testing the installation.
7. If an old installation is used, then it shall be repeatedly sluiced to remove the accumulated (lodged) residue, which would precipitate on the surfaces of the water jacket.
8. Coal with increased sulfur content must not be used and don't allow the coal get wet.
9. Fresh and wet wood or vegetation shall not be used. The logs shall be stored at least two years in a dry and airy place.
10. The circulating water shall not be drained out during the non-heating season.

### During the 3-4 kindlings it is possible to:

- form condensation on the surfaces of the water jacket. The forming soot decreases the sudden temperature difference and the quantity of the condensation.

- Baking up of the paint on all painted surfaces including the oven, as well. It is recommended airing of the premises.

After setting up the installation a 72-hour trial of the installation must be carried out in operation conditions. The attestation (notarization) by the installer for its implementation is an integral part of the warranty card.

The facing of the fireboxes to build in with decorative elements shall be done only after carrying out the 72-hour trial.

## OPERATION INSTRUCTIONS

The fireplace with a water jacket functions on the principle of a water heating boiler. The advantage of this kind of heating systems is the maximum use of the heat released during the burning process. With this method the warmth from the firebox is lead away to premises which are distant and difficult to access for a usual heat exchange, with the purpose of maintaining a uniform temperature and heat comfort. The fireplace with water jacket must not operate without water in the heating system.

### Fuel

Use only raw chemical natural wood, as well as wooden briquettes without adhesives.

It is important that the wood be dry - with humidity  $16 \pm 4\%$  according to Annex B table, B.1 from EN 13240:2001, EN 13229:20012, EN 12815:2006. Dry are called those logs which have humidity under 20 %. This is achieved when they stay in a dry and airy place at least for 2 years. The wood shall be kept chopped and arranged, as their thickness shall be between 5 and 15 cm. Why humid wood shall not be used?

The humidity in the wood decreases their warmth when burning. A big part of the heat is spent on evaporation of the water, and the rest can turn out insufficient to ensure the necessary heating. For example, 20 kg humid wood can mean 10 kg dry wood and 10 litres water, added to the fire.

The water vapour decreases the combustion temperature and contributes to the formation of soot which accumulates and forms a black hard layer on the walls of the combustion chamber, the glass ceramics, the pipes and the chimney. The pollution of the environment increases because the gases leave the chimney unburnt

### Kindling

The destination of the kindling is to warm the walls of the combustion chamber, the pipes and the chimney up to create draught through a stable blazing fire without being necessary to open the door often to finish its preparation.

Before kindling clean the ash off the grate.

Open the valves for the primary air and for the flue gases completely.

Put two chopped pieces of wood in the combustion chamber, parallel to one another, from both sides of the grate.

Crush a paper and put it on the front part of the grate among the logs. Don't use glossy or impregnated paper.

Put small dry twigs or sticks on the paper. It is preferable easy burning kindling of softwood. Arrange the kindling, so that they may not fall down and stifle the arising fire. Put some finely chopped logs on the kindling.

Kindle the paper. When the paper burns up, close the door of the combustion chamber.

Leave the valve of the primary air entirely open, while the flame spread all over the whole combustion chamber.

The thermo resistant paint, with which the fireplaces have been painted, is dried by compulsion in the producer's factories, and during the first one or two kindles it self- bakes and becomes mechanically stable. During self baking of the paint, the premises must be aired from the released fumes.

### Fuelling with wood

The radiated heat from the fire is not permanent in time, since the logs burn in the best way in cycles. Cycle is the time from the kindling of the logs put on the embers till their reduction to a new layer of embers. Each cycle can ensure heating for various periods of time depending on how much logs and how big they are and how they are fuelled.

The finely chopped logs, flung about crosswise burn more quickly because the entering air is able to reach all the pieces simultaneously. Such arrangement is suitable when the heat is necessary to be given off intensively.

To achieve a long stable fire, gather the embers on the grate and put bigger logs compactly on them. The close and parallel arrangement of the logs prevents penetrating of air and flames among them and preserves the interior of the pile to burn later. Open entirely the primary air. When the logs, most outside kindle, decrease the air to achieve the intensity of burning desired by you.

How many logs are necessary depends on the output (power) of the fireplace and the desired heating. The amount of dry logs to fuel is 0.36 to 0,5 kg per hour for each kilowatt useful heat output. The smaller number is for drier logs.

### Signs of right burning

Burning shall run in the presence of flames till the logs convert into embers. The purpose is not to allow any smouldering and smoking. The smoke is no normal product during the burning of the logs, and it is a consequence of bad combustion.

If there are fireproof bricks in the fireplace, they shall maintain their natural colour in yellow-brown, not in black.

With dried logs and sufficient primary air an immediate kindling must be achieved on each new refueling.

The glass ceramics of the door (if there is any) must remain clean.

The gases going out of the top of the chimney must be transparent or white. The grey smoke indicates that there is smouldering or bad burning.

### Chimney

The chimney is intended to draw the combustion products out of the fireplace and to throw them away in the atmosphere beyond (outside the limits of) the abode.

The upward draught or the "pulling" of the chimney is a result of the combination between its height and the difference in the temperatures of the flue gases and the air outside. The column of hot flue gases in the chimney has smaller weight than the equivalent column cold air outside, so that the pressure in the lower end in the warm chimney is smaller than the atmospheric (air) pressure outside. This quite small difference in the pressures creates the draught.

The lower draught is a prerequisite for difficult kindling or returning of flue gases, and it is overcome through quick kindling and burning of dry, thin and fast-burning sticks and paper. After kindling of the fire and warming up of the chimney, its draught increases. For economical regime and high efficiency after the warming up of the chimney, the draught must be decreased to 5-10 Pa, so that there may be no return of the flue gases (smoking) with a closed door.

#### The main causes of insufficient draught are the following:

layering of soot inside the chimney, which decreases its diameter and increases the resistance of the rising flue gases;

a cracked wall of the chimney or a loose rosette;

loose smoke pipes, or pipes pushed deeply in the chimney, as in this way they decrease the diameter or plug up the chimney;

The use of a single chimney with a small draught by several stoves on the same level (in close proximity);

Smoking also appears when the weather outside has suddenly got warmer - The warm gases from the kindling of the fire can't escape through the cold chimney. In this case a bigger amount of quickly burning sticks and paper is used. The same effect takes place while attempting to kindle a fire on the first (ground) floor, provided the same or an adjacent chimney is already being used by a fireplace on the top floor;

when the ceiling is not air-tight or there are open windows on an upper floor, the effect "staircase-chimney" takes place, creating a reverse draught;

When a chimney is located in an area of overpressure caused by a wind.

On right connection, servicing and maintenance the fireplace doesn't give off smoking emissions in the premises. If nevertheless this occurs, the premises are aired and the cause of the filling with smoke must be found out and removed.

Don't burn: garbage, stuck or painted softwood, plywood or boards of wooden parts, wooden sleepers or other refuse containing artificial chemical admixtures, since poisons don't burn, but only change their composition and when they are thrown away in the atmosphere, they lead to unpredictable consequences.

### Cleaning, maintaining and preservation

During operation the door of the fireplace must be closed. On opening of the door to refuel, the openings for the primary air are closed and one shall be careful not to drop down fuel and to prevent it from falling out of the fireplace.

The power of the fireplace is regulated with the help of the valves for the primary air and on the outlet for the flue gases.

The fume valve of the chimney adjusts the quantity of flue gas leaving the appliance. It is controlled by the handle located in the upper part of the connecting pipe for the chimney stacks.

Don't touch the fireplace with your bare hands, while it is hot.

The ash-pan shall be cleaned daily. Don't throw the ash in plastic vessels.

Clean regularly the passage sections of the flue gases in the fireplace and the pipes.

The painted surfaces are cleaned with a damp cloth. Don't use cleaning detergents. If you want to freshen up the paint, use a suitable phial of sprayer.

To clean easier the cavities in the cooking stove the movable bottom of the oven is raised.

The glass pane is wiped with a damp towel, and when necessary it can be washed with cleaning detergents or water. The hardened glass panes are washed and dried when cold.

To prevent the condensation and a possible corrosion, when the fireplace is not operated for a long time (for example during the non-heating period), it must be cleaned from the ash and remainders of fuel, and the adjusting elements - open, for a better circulation around and through the fireplace.

Do not perform any unauthorized modifications in the design!

During repairs only original spare parts from the producer shall be used.

The company operates a guarantee and post-guarantee service and can replace water jackets.

The guarantee is not valid for fireplaces with bulging water jackets, which are a result of the increased pressure in the system beyond the admissible one on incorrect installation.

### THE INSTALLATION HAS BEEN PERFORMED BY:

Company: .....

Address: .....

The system has been installed in accordance with the regulations for safe operation. A 72-hour trial has been carried out in operation conditions.

Installer: .....

**The installation and start-up of the heating system must be carried out by an authorized person to ensure the faultless operation of the entire system.**

**In case the installation is carried out by a person, who is unauthorized, material responsibility is borne by the person, who installed the heating system, and not a manufacturer, representative or retailer.**

