



**FIREPLACES AND FIREBOXES TO BUILD IN
WITH A WATER HEATER
(water jacket)**

TECHNICAL DESCRIPTION

The fireplaces of Prity 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.

MODEL	Maximum heat power of the water heater, kW	Spatial heat flow, kW	Dimensions, cm	Mass, kg
Fireplaces PRITY K1 W8	8	4	45x40x79	67
Fireplaces PRITY K1 CP W8	8	4	46x44x76	74
Fireplaces PRITY K2 CP W10	10	4	51x50x81	94
Fireplaces PRITY K2 CP W13	13	4	51x50x91	105
Fireplaces PRITY K22 CP W10	10	4	51x50x81	95
Fireplaces PRITY SK W10	10	4	47x53x90	98
Fireplaces PRITY SB W10	10	4	47x47x84	92
Fireplaces PRITY S1 W10	10	4	49x46x83	85
Fireplaces PRITY S2 W10	10	4	49x46x83	86
Fireplaces PRITY S3 W13	13	4	49x46x93	93
Fireplaces PRITY S3 W17	17	5	57x53x93	118
Fireplaces PRITY S3 W21	21	5	57x53x93	134
Fireplaces PRITY S3 W23	23	5	57x53x105	142
Fireplaces PRITY S3 W26	26	6	57x53x115	165
Fireplaces PRITY AM W12	12	6	72x55x82	113
Fireplaces PRITY FG W10	10	5	57x53x93	133
Fireplaces PRITY FG W15	15	5	57x53x93	136
Fireplaces PRITY FG W16	16	6	65x55x93	150
Fireplaces PRITY FG W18	18	5	57x53x105	150
Fireplaces PRITY FG W20	20	6	65x55x115	187
Fireplaces PRITY W17	17	6	65x55x116	133
Fireplaces PRITY WD W15	15	5	65x55x78	119
Fireplaces PRITY WD W20	20	5	65x55x93	146
Fireplaces PRITY WD W24	23	6	65x55x93	153
Fireplaces PRITY WD W29	29	8	65x55x115	183
Cooking stove PRITY W10	10	4	93x58x80	110
Cooking stove PRITY W12	12	4	93x58x80	112
Boiler PRITY MA 18	18	1	57x51x89	136
Boiler PRITY GA 26	26	2	57x51x107	163
Boiler PRITY GA 33	33	3	57x51x117	182
Boiler PRITY LB	40	4	57x107x115	291

MODEL	Maximum heat power of the water heater, kW	Spatial heat flow, kW	Dimensions, cm	Mass, kg
Firebox PRITY AW 16	16	5	69x69x73	125
Firebox PRITY AW 20	20	5	109x75x79	175
Firebox PRITY ACW 20	20	4	66x63x88	133
Firebox PRITY ATC W20	20	5	108x75x81	194
Firebox PRITY MW 18	18	4	70x58x71	125
Firebox PRITY MW 22	22	4	70x52x85	146
Firebox PRITY GW21	21	5	85x57x65	138
Firebox PRITY GW28	25	5	85x58x87	186
Firebox PRITY CW18	18	4	66x57x72	144
Firebox PRITY CW28	28	4	66x57x88	161
Firebox PRITY CW35	35	4	66x57x115	175
Firebox PRITY 2CW28	28	5	66x70x84	185
Firebox PRITY 3CW28	28	6	80x73x92	220
Firebox PRITY 3CW35	35	4	80x73x114	251
Firebox PRITY TCW28	28	5	108x59x83	214
Firebox PRITY TCW35	35	4	108x59x99	236

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.

All models are made of basic sheet iron for the body of the fireplace, 2 mm thick, and a plate 3÷4 mm. The water jackets are made of sheet steel 5 mm, 4 mm and 3 mm thick, according to the respective requirements. They are equipped with a cast iron grate, doors for refueling, ash-pan, brick-facing, and a valve for adjusting the draught of the chimney. The fireboxes have a thermo shock glass ceramics pane, and the ovens have a hardened glass pane.

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 of "Prity 95" Ltd., optimum characteristics and 60-80 % efficiency for all produced fireboxes, stoves and boilers have been achieved.

Specific Models of Fireplaces:

With these models no marked decorative effect is sought, because of which no glass ceramics is inserted. In return for this it is stressed (emphasized) on their functionalism.

- Solid fuel cookers suitable for households which rear domestic animals;

- Boilers – they are intended for setting up in ground floor premises with a possibility to store coal.

The boilers are provided with a capillary thermostat for control and regulation of the air necessary for the burning process. In this way, a uniform and economical combustion of the fuel is achieved, as the water is heated till a fixed desired temperature, adjusted beforehand by means of turning the switch of the thermostat. When turning the switch clockwise the temperature increases, at which the thermostat breaks the primary air flow off.

INSTALLATION INSTRUCTIONS

The fireplace is placed on a stable horizontal fireproof floor. 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 her shall not be there any objects burnable and damageable by the radiated heat.

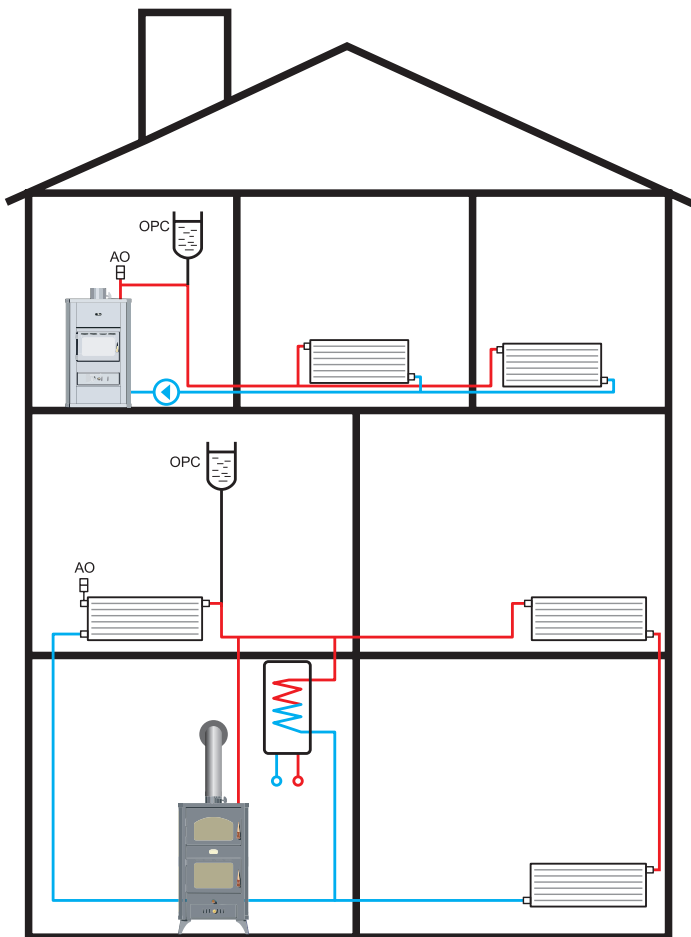
Prior to connect (Before connecting) the fireplace to the chimney, consult a skilled worker.

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. If other appliances are connected to the same chimney, it shall be calculated for that.

Fresh air shall enter (get in) the fireplace at least 4 m³/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.

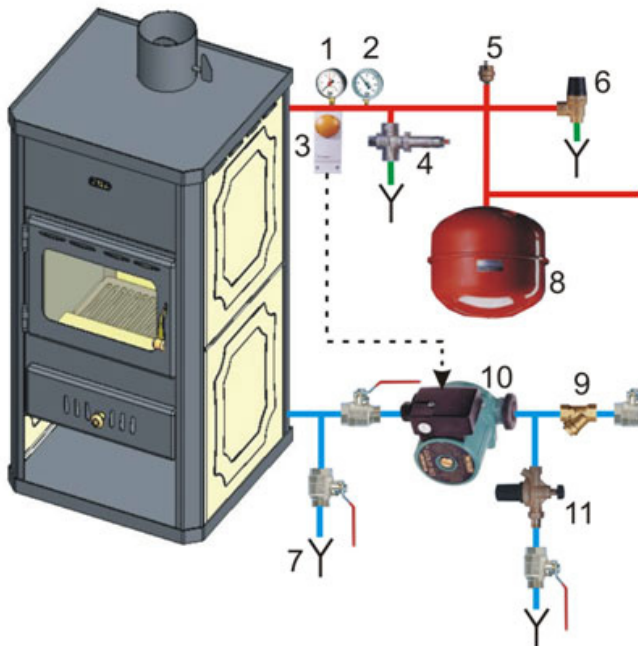


EXEMPLARY DIAGRAMS OF OPERATION
OF A FIREPLACE WITH A WATER JACKET
IN AN OPEN SYSTEM

Open water heating system with an open expansion vessel and a pump.

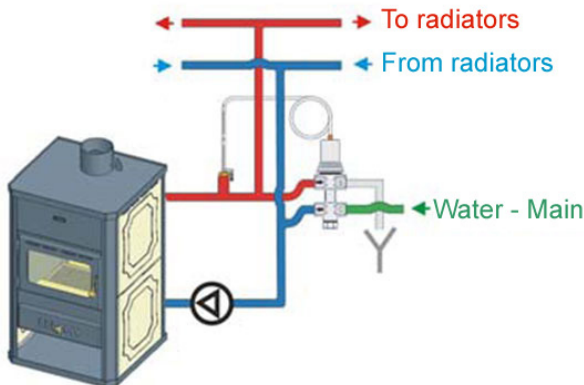
Economical open gravitational self-adjusting water heating system with an open expansion vessel without pump.

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



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

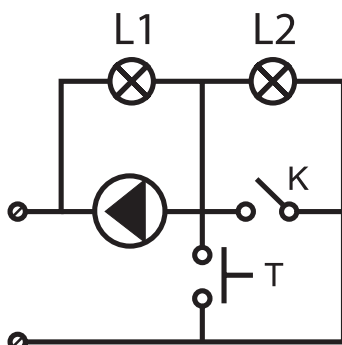
Another possibility to protect the system from inadmissible increase of the temperature is the use of a safety thermal valve.



In emergency cases (e. g. cut of the electricity supply of the pump), when the temperature of the liquid reaches the adjusted value ($90 \div 100^\circ\text{C}$), the valve operates and the cold water from the water-main enters the system and a part of the hot water is drained in the sewerage.

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. The installation must be connected to the atmosphere with an open expansion vessel, when the system is open.
3. De-aeration of each branch and element of the installation in each moment of its operation has to be ensured.
4. All of the 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.



L1 and L2 - signal lamps
K - 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 sulphur 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.

OPERATION INSTRUCTIONS

The fireplace with a water jacket functions on the principle of a water heating boiler. The advantage of this kind of heating system 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.

❑ FUEL

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

It is important that the wood be dry. 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?

1. 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.
2. 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, glass ceramics, pipes and the chimney.
3. 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.

1. Before kindling clean the ash off the grate.
2. Open the valves for the primary air and for the flue gases completely.
3. Put two chopped pieces of wood in the combustion chamber, parallel to one another, from both sides of the grate.
4. Crush a paper and put it on the front part of the grate among the logs. Don't use glossy or impregnated paper.
5. 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.
6. Kindle the paper. When the paper burns up, close the door of the combustion chamber.
7. 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.

❑ 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

1. 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.
2. If there are fireproof bricks in the fireplace, they shall maintain their natural colour in yellow-brown, not in black.
3. With dried logs and sufficient primary air an immediate kindling must be achieved on each new refueling.
4. The glass ceramics of the door (if there is any) must remain clean.
5. 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 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 cooking stoves are switched over in regime “baking” through pulling out the valve over the oven.
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- ☑ 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 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 by the producers shall be used.
- ☑ Да не се извършват неоторизирани изменения в конструкцията!
- ☑ При ремонт да се използват оригинални резервни части от производителя.

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.**
- It is recommended that the installation be done by a skilled specialist.