



A.D. METALNA INDUSTRIJA VRANJE  
Radnička br: 2

**SOLID FUEL-BURNING FURNACE  
FOR CENTRAL WARM WATER HEATING SYSTEM**

**TYPE: CENTRAL 23**



**INSTRUCTIONS FOR USE**  
ENG\_v.2.0

1612033

## TECHNICAL DATA

|   |                                     |
|---|-------------------------------------|
| HEATING POWER:                                      |                                     |
| Rated heating power (wood/coal)                     | 18,4 kW/ 19,9 kW                    |
| Heating power of furnace emission (wood/coal)       | 5,4 kW/ 5,8 kW                      |
| Thermal power of delivered water (wood/coal)        | 13 kW/14,1 kW                       |
| REQUIRED FLUE DRAFT                                 | 20 Pa                               |
| DIAMETER OF FLUE EXTENSION                          | 150 mm                              |
| HEIGHT FROM FLOOR TO AXIS OF FLUE EXTENSION         | 635 mm                              |
| FURNACE DIMENSIONS:                                 |                                     |
| Width   | 365 mm                              |
| Height  | 850 mm                              |
| Depth   | 600 mm                              |
| CONNECTIONS OF DISCHARGE AND RETURN LINE            | R5/4" RS                            |
| CONNECTIONS OF THERMO VALVE AND SAFETY VALVE        | R1/2" RU                            |
| CONNECTIONS OF COOLING PIPES                        | R1/2" RS                            |
| BOILER VOLUME                                       | 16 (l)                              |
| HEATING VOLUME (wood/coal)                          | 276 – 460 / 296 - 497m <sup>3</sup> |
| Heating volume of furnace emission (wood/coal)      | 81 – 135 / 87 - 145m <sup>3</sup>   |
| Heating volume of hot water (radiators) (wood/coal) | 125 – 195 / 211 - 352m <sup>3</sup> |
| MAXIMAL OPERATING PRESSURE                          | 1,9 bar                             |
| MAXIMAL OPERATING TEMPERATURE                       | 90 °C                               |
| WEIGHT (gross/net)                                  | 140/153 kg                          |
| FLUE GAS TEMPERATURE (wood/coal)                    | 335 / 345 °C                        |
| CONTENT OF CO (13% O <sub>2</sub> )                 | 0,45 / 0,36 %                       |
| ENERGY EFFICIENCY                                   | 72 / 74 %                           |

### NOTE

With its aesthetic design, solid fuel furnace type 23 fits perfectly in any kitchen ambient and in the rest of the household. It could be used for heating both apartments and houses.

These furnaces – stoves have a built- in coil (copper pipe) connected to the thermoregulation valve (Fig. 9, pos. 13), that works as a safety thermostat and keeps from overheating the furnace – stove.

Installation of the thermoregulation valve into closed central heating system is **MANDATORY**.

In case of an open central heating system, installation of the thermoregulation valve is not mandatory.

In order for a furnace to work properly, follow this instructions manual carefully.

|  |
|--|
| <b>Thermoregulation valve is not included.</b> |
|--|

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# 1. FURNACE ASSEMBLY

Unpack the furnace and assemble it before mounting on the chimney.

Basic parts of the furnace:

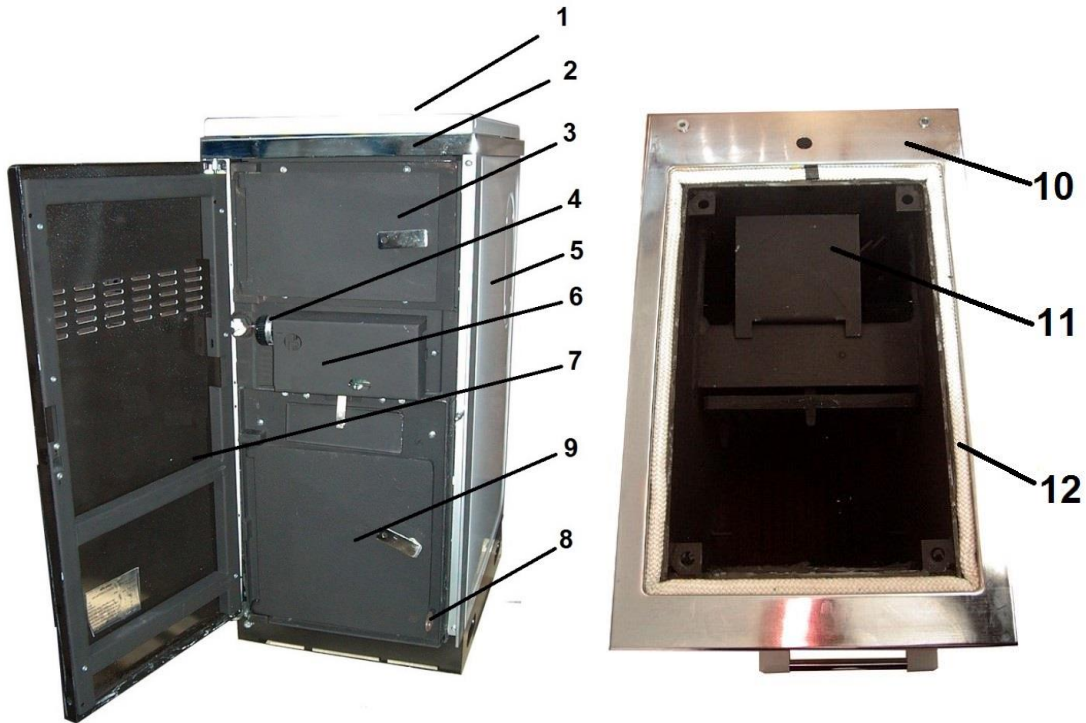


Figure 1

Figure 2 (Top view with an open hob – position 2.)

1. Furnace lid
2. Hob
3. Filling door
4. Draught regulator (thermostat)
5. Lateral side
6. Regulator lid
7. Outer door
8. Grate shaker handle
9. Door for kindling and ash pan
10. Border batten
11. Sheet metal for smoke emission direction
12. Asbestos-free door for hob sealing



Figure 3

Furnace handling and cleaning kit

1. Auxiliary handling tool
2. Cleaning spatula
3. Fire hook

## 2. AUXILIARY HANDLING TOOL AND POSSIBILITIES FOR ITS USE



Figure. 4 Furnace lid lifting



Figure. 5 Hob lid lifting



Figure 6 - Opening of the filling door



Figure 7 Grate shaking



Figure 8 Opening of the fixed (vertical) grate

1. Fixed (vertical) grate
2. Grate
3. Auxiliary handling tool
4. Ash pan

Unpack the furnace and check for all the parts and equipment, especially pay attention to the following:

- Asbestos-free cord for sealing the hob (Fig. 2, pos. 12) should be spaced equally around the circumference of the furnace and it should fit perfectly in its channel;
- Furnace hob (Fig. 1, pos. 2) should be placed over the asbestos-free cord in order to ensure proper sealing;
- Filling door and kindling door (Fig. 1, pos. 3 and pos. 9) should be equipped with asbestos-free cord that ensures complete sealing when the door is closed;
- Fixed (vertical) grate (Fig. 8, pos. 1) should be in its bearing and it should be easy to open;
- Using control switch on airflow regulator (Fig. 1, pos. 4) should enable easy opening/closing of fly nut on combustion air intake opening;
- If it is correctly installed, airflow regulator enables adjusting and automatic maintaining of set water temperature inside furnace;
- Remote control thermostat used for measuring the temperature in the boiler (Fig. 1, pos. 6) is properly installed only if the airflow regulator temperature probe is located in special opening in the front;
- Grate (Fig. 1, pos. 2) should be placed inside the fire box and it should be connected to grate shaker handle (Fig. 1, pos. 8) via shaker's central cog which fits into conical opening on the bottom side of the grate;

- Chimney pot is factory mounted on the back side, but it could be installed laterally, on the left or on the right, depending on the position of the furnace compared to the chimney, as well as regard to the available space;
- During lateral installation, lateral opening lid should be taken off prior to mounting the chimney pot and than the lateral opening lid should be used to close the back opening;
- When mounting, make sure that asbestos-free cord seals completely;
- Sheet metal for smoke emission direction (Fig. 2, pos. 11) should be placed in accordance to the chimney pot. If the chimney pot is in the back, than the sheet metal is mounted symmetrically to the furnace (in the middle), and if it is mounted laterally, than the sheet metal is placed strictly to the lateral side next to the chimney pot.

### 3. MOUNTING TO THE CHIMNEY

Furnace Central 23 reaches its nominal thermal capacity if the value of the chimney draught is 20 Pa (2 mm VC). We recommend following dimensions of the chimney in order to reach these values of chimney draught:

| FURNACE MODEL | Nominal thermal capacity (KW) |      | Chimney height (m)                   |           |           |           |           |
|---------------|-------------------------------|------|--------------------------------------|-----------|-----------|-----------|-----------|
|               |                               |      | 6                                    | 7         | 8         | 9         | 10        |
|               | Coal                          | Wood | Light-coloured chimney surfaces (mm) |           |           |           |           |
| 23            | 19,9                          | 18,4 | 145 x 200                            | 145 x 145 | 145 x 145 | 145 x 145 | 145 x 145 |

#### Special notes:

- Chimney connector should be placed in an ascending manner;
- Chimney pot, chimney duct and chimney itself should not have tapered parts, otherwise narrowing could result with lower nominal thermal capacity;
- Chimney and all the joints should seal perfectly, without soot and grime in ducts.

Recommended chimney features and other properties are necessary for seamless operation of the furnace. During installation, be sure to use technical data given in the table concerning diameter of the chimney pot and of the chimney pot axis height.

This furnace is designed for installation in the kitchen area, as well as in any other available household space. At the same time, make sure, that the surface bellow the furnace is inflammable, and in the case of wooden flooring, put the tin plate underneath the furnace that will prevent damages on the floor, as well as the fire.

### 4. FURNACE INSTALLATION INTO THE WARM WATER HEATING SYSTEM

Furnace model Central 23 is primarily intended for warm water heating systems for only one storey, but in exceptional cases it could be installed as source of central heating for multiple floors in accordance with regulations SRPS.M.E7:201 (JUS M.E7:201) and SRPS.M.E7:202 (JUS M.E7:202).

For the above-specified reasons, in further text of this Instruction, we will display connecting measures and schemes for furnace installation into central warm water heating system for one storey.

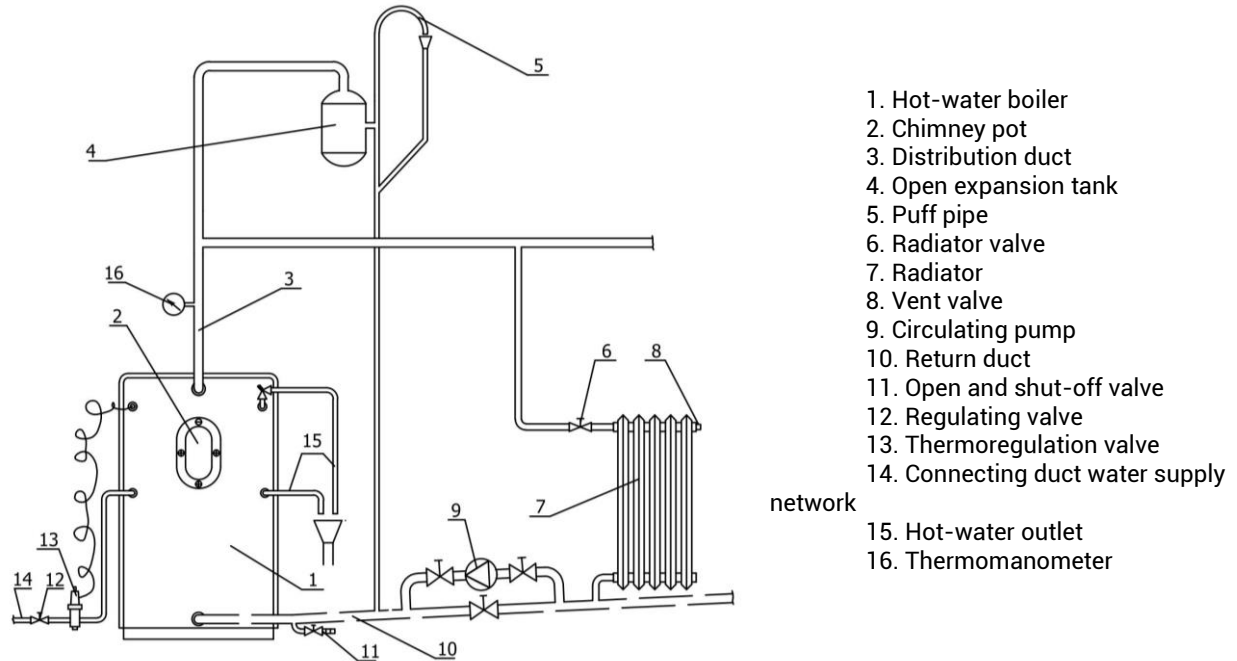
#### IMPORTANT!

Qualified expert should install the furnace according to the project plan:

- During installation, make sure to follow our recommended scheme and regulations SRPS.M.E7:201 and SRPS.M.E7:202 .

# INSTALLATION SCHEME OF OPEN CENTRAL HEATING SYSTEM FOR CENTRAL

## 23



1. Hot-water boiler
2. Chimney pot
3. Distribution duct
4. Open expansion tank
5. Puff pipe
6. Radiator valve
7. Radiator
8. Vent valve
9. Circulating pump
10. Return duct
11. Open and shut-off valve
12. Regulating valve
13. Thermoregulation valve
14. Connecting duct water supply
- network
15. Hot-water outlet
16. Thermomanometer

Figure 9

## 5. OPERATION AND REGULAR MAINTENANCE

Fill the furnace and heating installation with water and release air from it. Before commencing operation, check if the furnace and installation are functioning properly and if all the latches, vents, measure and regulation instruments are correctly set.

Put the circulating pump into operation when using the circulating pump heating system. If the chimney is new, the furnace should not constantly be under full load until the chimney is completely dry.

### IMPORTANT!

Before and during operation follow the instructions provided by the furnace manufacturer:

- After checking the proper functioning of the furnace and installation, fully open the door for kindling and ash pan (Fig. 8, pos. 4), open the fixed grate (Fig. 8, pos. 1), disperse paper and wood kindling over the grate (Fig. 8, pos. 2), ignite it and wait for the fuel to catch fire.
- Add a small amount of coal and wood and allow flaring. Close the kindling door (Fig. 1, pos. 9), and set the airflow regulator (thermostat) to flow position 7.
- Fill the furnace with fuel up to one third of the firebox area's height and allow it to stir up again until the upper layer of coke, coal or wood catches fire. Set the desired temperature on the thermostat.
- Fill the furnace with fuel up to the lower ledge of the filling door (Fig. 1, pos. 3). If the fuel emits several gases, the use of the bottom of the fuel layer is recommended as well as frequent refilling. When the fuel emits larger amounts of swelling gases, slightly open the filling door, the ash pan door and the hob lid to enable releasing of the accumulated gases and to prevent flaming.
- Additionally fill (refill) the furnace once the fuel has burnt out up to one fourth or one third of the firebox area's height. Before refilling, use the fire hook for stoking (Fig. 10) through the fixed grate or the furnace grate (Fig. 8, pos. 2), and then shake through the grate shaker handle (Fig. 1, pos. 8) by moving the handle forward and back. Refill with fuel after shaking.
- In order to regulate constant combustion when using coke as fuel, set the thermostat to positions 6 to 9 and allow fully loaded furnace to burn for half an hour, and then set the thermostat to positions 4–5.

Heating instructions are only guidelines and could vary depending on the installation type, chimney's draught strength, and type of fuel and outside air temperature.

### IMPORTANT:

Regularly check the level of furnace sealing (boiler kit and asbestos-free materials). Special attention should be paid to the water amount in the installation, since the improper amount would disrupt the heating system. In case of such disruptions, the installation should always be filled, but only when the boiler cools down.

## 6. CONTROLS

Set the controls to the recommended operating modes in order to achieve nominal thermal capacity and furnace efficiency level. Desired water temperature is set via regulator – thermostat (Fig. 1, pos. 4). Control switch on airflow regulator (thermostat) has following positions:

The air lid (shutter) attached to the airflow regulator (thermostat) regulates the combustion air feed entirely, if all the other openings are closed.

The air lid (shutter) operates automatically and depends on the selected temperature as well as the boiler temperature, which is signalled by sensitive temperature probe. Approximate values for setting the airflow regulator (thermostat) depending on the outside air temperature:

### IMPORTANT:

Water temperature in the furnace when using wood, brown coal and briquettes for heating should not fall below 70°C, in order to prevent condensation and corrosion of the furnace. Heating the area where the furnace is located can be regulated by the furnace lid (Fig. 1, pos. 1), which has good insulating properties and by opening/closing it, the furnace heating properties are increasing/decreasing.



Figure 10

|                               |                  |              |    |               |    |    |    |    |
|-------------------------------|------------------|--------------|----|---------------|----|----|----|----|
| Regulator switch position     | 0                | 3            | 4  | 5             | 6  | 7  | 8  | 9  |
| Boiler water temperature (°C) | Closed regulator | 30           | 40 | 50            | 60 | 70 | 80 | 90 |
| Outside air temperature (°C)  | from 20 to 10    | from 10 to 0 |    | from 0 to +15 |    |    |    |    |
| Regulator switch position     | 9                | 8            |    | 7             |    |    |    |    |
| Furnace water temperature     | 90               | 80           |    | 75            |    |    |    |    |

### 6.1. NIGHTTIME OPERATION

Clean the grate from slag and ash and refill the furnace with fuel as described above. When using fuels rich in volatile gases, set the regulation switch to night-time operation, only after combustion gases are emitted, and then set airflow regulator (thermostat) to position 4–5.

#### IMPORTANT:

Do not fill the firebox with fuel that emits many gases and then close the airflow regulator – thermostat.

## 7. MAINTENANCE

Live coal should be stirred with the fire hook through the fixed grate or furnace grate prior to each filling of the furnace with fuel. Use the grate shaker handle with the closed door, shake the bottom grate so that ash may fall through the grate into the ash pan. At least once a day, clean the ash from the ash pan, and remove other residue (slag) by opening the door for kindling and ash pan, as well as the fixed grate.

All furnace areas exposed to flue gases should be maintained regularly and cleaned with a cleaning spatula, and a cleaning brush (Fig. 2). Clean heating surfaces guarantee economical operation of the furnace.

Furnace should be cleaned at least once a month, and in case of higher contamination of the inner surfaces, it should be cleaned more often.

### 7.1. CLEANING STEPS

1. Remove and clean the hob (Fig. 1, pos. 2).
2. Remove the sheet metal for smoke emission direction (Fig. 2, pos. 11), clean it and place it back according to furnace assembly instructions.
3. Clean the area around the airflow regulator (thermostat), making sure not to damage the electronics.
4. Clean the chimney pot.



5. Clean the furnace combustion chamber area.

## 7.2. MAINTENANCE OF FURNACE'S EXTERIOR

Clean the enamelled areas and the stainless frame of the furnace with a wet cloth and gentle detergents. Clean the furnace hob periodically with fine sandpaper, and if the hob is not used for heating for longer periods, coat it with vegetable oil.

Check the water quality and the amount needed to fill the furnace and installation.

There should be no litter in the furnace after the heating season.

### IMPORTANT:

Do not cool the furnace using artificial draught after heating.

Do not wet firebox for cooling purposes.

## 8. PRESERVING THE FURNACE

At the end of the heating season, furnace should be cleaned from ash and soot, as well as the installation filled with water. Water should be drained only if repairs to the installation are required.

If the installation will not be used during the heating season, replace water with an anti-freeze liquid or drain it in order to prevent freezing.

## 9. USING THE TOP GRATE

Use the top grate for cooking and cleaning during change of seasons (Fig. 11 b, pos. 2), so that flame is directed to the hob, thus ensuring cost savings in cooking and heating.

- After checking the proper functioning of the furnace and installation, open the filling door (Fig. 1, pos. 3) and use the handle to place the top grate (Fig. 11 b, pos. 2) in a horizontal position. After that, light the furnace as per above instructions.

- Once there is enough live coal, fill the firebox with fuel through an opening in the hob, while it is best to fill the firebox to the maximum and use the airflow regulator to control the amount of generated heat.

### IMPORTANT:

- When using the furnace for heating during the heating season, deactivate the top grate by placing the handle (Fig. 11 b, pos. 1) in a vertical position.

- Simultaneous use of the top and bottom grate is not recommended.

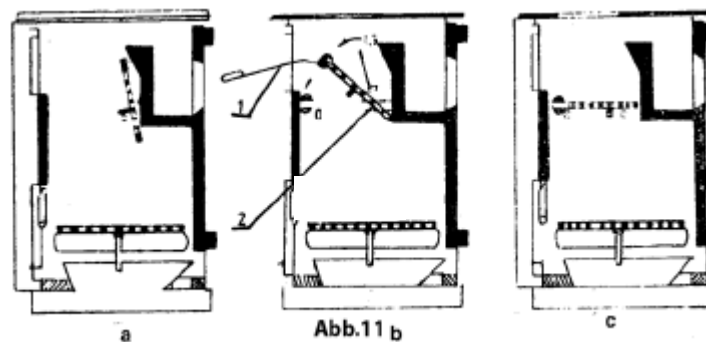


Figure 11b