

KELIWOOD

EXTERNAL WOOD BURNER FOR HOT TUB INSTALLATION AND USER MANUAL



Thank you for purchasing our product – an external wood burner. We wish you to enjoy swimming in the tub when using this wood burner. Please follow the requirements and recommendations provided in the installation and user manual.

PURPOSE OF THE WOOD BURNER

This wood burner, heated by firewood and mounted on the tub exterior, is designed to heat water in the tub.

BENEFITS OF THE WOOD BURNER

- A considerably more compact tub which would accommodate the same number of people as a larger tub containing a submersible wood burner could be used;
- A smaller tub requires a smaller amount of water which heats up quicker;
- When a wood burner is mounted on the tub exterior, the human safety increases due to a possible contact with hot surfaces compared to submersible wood burner in a tub;
- Compact;
- Patented design;
- Better water circulation, heat is evenly distributed in the tub;
- Water circulation is running naturally and does not require a water pump and an electrical inlet;
- A safe temperature for water inlet into the tub is $\leq 45^{\circ}\text{C}$;
- High efficiency factor;
- During combustion, a small amount of ash is produced;
- Manufactured of high quality alloy stainless steel resistant to atmospheric exposure;
- Long lifetime;
- Easy maintenance;
- Simple installation;
- Easy transportation.



PLEASE NOTE:

- **Before installing a wood burner, please read a technical description of a wood burner;**
- **Prior to using a wood burner for the first time, please thoroughly read this Operation Manual;**
- **Before using a wood burner, distribution pipes should be connected;**
- **A wood burner cannot be used until a water level in the tub does not raise above the highest pipe;**
- **Do not leave a functioning wood burner unattended;**
- **Children can stay nearby a functioning wood burner only under the adult supervision;**
- **When a wood burner is functioning, a wood burner, a door, chimney elements and distribution pipes may result in excessive heating. Therefore, do not touch them by hand or other parts of the body as you can get burned;**
- **Never use wet firewood as it significantly decreases the efficiency of a wood burner;**
- **Do not discharge water from the tub and wood burner until firewood is completely burnt out and embers go off in a mouth of the wood burner;**
- **When not in use, always discharge water from the wood burner, especially when the temperature drops below 0 °C;**
- **If salty is used, a wood burner should be washed with fresh water after each use.**
- **Do not use chlorinated water or water mixed with other chemicals.**

TECHNICAL DESCRIPTION OF A WOOD BURNER

This is a precisely made wood burner designed for water tubs. Water circulates in the system by itself due to a natural circulation effect. Hot water while ascending upwards generates a low pressure zone and thus water from the bottom is pumped. Therefore, a circulation pump and power supply for such a system is not required, and the wood burner that heats water may be mounted outside. The main benefit of such type of a wood burner is more space in the tub and a possibility to choose a smaller tub model due to it.

The outer housing of a wood burner and a mouth of the wood burner are made of a stainless steel. A door is made of special steel. These materials ensure a long-term equipment use without any problems.

The heat from burning firewood is efficiently transferred to water through a unique construction which changes the entire mouth of a wood burner into a surface transmitting heat to water. A wood burner capacity is about 15 kW. To ensure a sufficient water circulation, a wood burner should be installed no less than 5 cm below the base for placing a tub.

Specification

- 498 mm (height) x 600 mm (length) x 410 mm (width)
- Weight: 20 kg
- Fireplace: 430 x 350 x 230 mm
- Heat carrier volume: 20 L
- Heat exchanger surface: 0.75 m²

Properties

- Construction is designed to be kept outside
- Wood burner construction is made of stainless steel
- Wood burner door is made of special steel
- Large mouth of a wood burner

Heating

Wood burner thermal capacity varies depending on the wood quality and fuel loading frequency.

Quantity of water	Initial temperature	Approximate water heating time up to 37 °C when using dry firewood (less than 10% moisture content)
1100 L	10 °C	About 3 hours

WOOD BURNER INSTALLATION

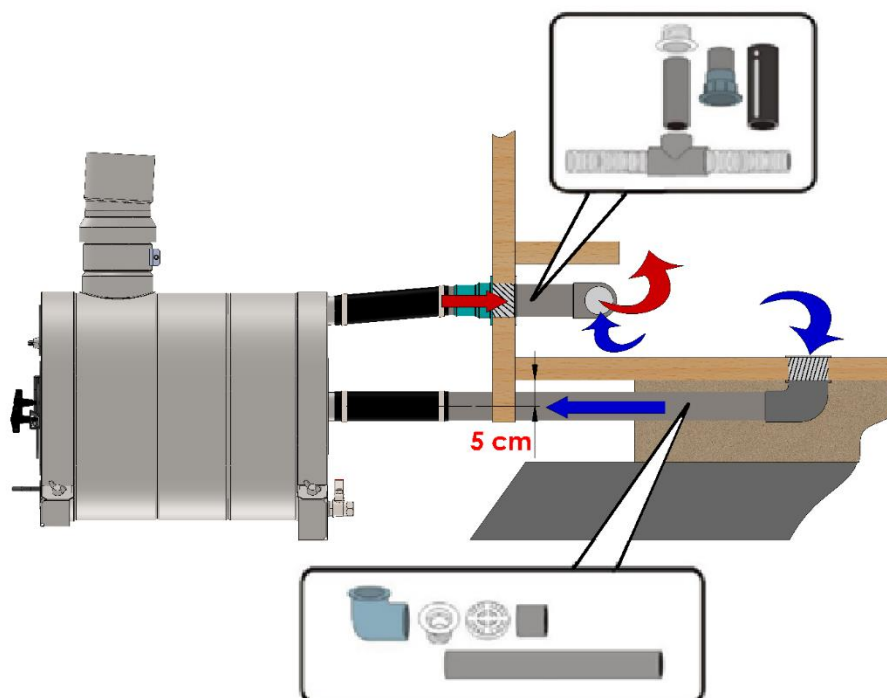
A wood burner is connected to the tub (minimum diameter of the tub is 150 cm) by using a connection kit. A connection kit is not completed when ordering only a set of a wood burner with a chimney but it can be optionally ordered as an additional set which consists of 50 mm diameter plastic pipes, flexible rubber hoses with straps, one of which is used for connection to the side of the tub and the other 90° to the tub basis. See the connection diagram below.

1. Place a wood burner on a flat, solid and non-combustible surface. A wood burner should be placed in 5 cm below the water tub basis in order to ensure that the upper pipe would rise upwards toward the tub. It is essential for water circulation and water discharge from the wood burner in cold weather.
2. Connect the rubber hoses to the wood burner and tub. It is easier to connect the rubber hoses and pipes if you lubricate them with the nutritional oil.
3. Then collect chimney elements and place them into place. **Please note!** Turn a welding seam of a pipe into the opposite direction.

The wood burner is designed so that its front when it is placed on a stable and even surface is slightly tilted downwards. Never place a wood burner on the sand or other soft ground because an air lock may occur in the wood burner which will stop water circulation and damage the wood burner. If the wood burner is installed together with a circulation pump (e.g. in the swimming pool), the connection from the pumping side should be equipped with an adjustable valve water flow and pressure adjustment. A valve should be set in such a way that hot water outgoing from the wood burner would be 50 – 60 °C.

Recommended diagram of the chimney connection

Water heated by using a natural convection principle which means that hot water goes upward to the top of the tub, while cold water goes down to the bottom of the tub and from there flows to the wood burner to be heated.



Water temperature spreads evenly due to efficient circulation and remains same all over the tub. In this case, forced water mixing is not necessary.

WOOD BURNER OPERATION

The wood burner operates as a conventional solid fuel wood burner, and the maximum heating power is achieved when combusting dry firewood (less than 10 % of moisture content). The fireplace is 43 cm long and 35 cm in diameter. The most efficient operation is reached when using dry 40 - 42 cm long, 4 x 4 cm thick firewood. One firewood load burns out in approximately 30 minutes. Small and large traction positions may be set in the wood burner to adjust the heating power. Maximum heating power is achieved by fully opening air outlets, and when the water is hot and it is necessary only to maintain the temperature of the water, heating power is reduced by partly closing air-intakes.

ATTENTION!!! Do not heat the wood burner which is not connected to the tub and unfilled with water. This may damage the wood burner.

Water from the wood burner should be discharged after each use through a drainage pipe by observing hygiene requirements and in order to gain smaller generation of deposits and sediments on inner walls.

USE DURING WINTER SEASON

If there is a risk to damage the wood burner due to freezing, water should be discharged from the wood burner after using it. When firewood burns out in the mouth of a wood burner, a natural circulation stops and a small amount of water remaining in the wood burner can easily get frozen and thus cause damage to the wood burner.

Note! The wood burner has a large outer surface which comes in contact with the outside air, thus it is recommended to heat wood burner exterior with e.g. flexible insulating material which will help to shorten the water heating time significantly.

HOW TO STOKE CORRECTLY?

In order to heat up the water in the tub quicker, it is essential to follow the basic principles below:

1. Use dry firewood, preferably lower than 10% of moisture content, cut into smaller pieces. High humidity of firewood will significantly reduce the efficiency of the wood burner because deposits will appear on the heating surfaces of a wood burner. Also, avoid alder wood, particularly if it is wet. Combustion of wet wood can result in vapour which can lead to a false presumption that the wood burner started leaking. Even one time of combustion with such wood can contaminate the inner surface of a wood burner and thus prolong heating time. If the surface is not cleaned, a sediment layer is increasing and significantly reduces the efficiency and considerably prolongs heating time.
2. For combustion, cut firewood into the pieces of 40-42 cm long. Even distribution of firewood which covers the whole surface of the mouth of the wood burner grates allows reaching the maximum heating capacity.
3. When a wood burner is not in use, open air supply in the mouth of a wood burner to the maximum and completely remove an ash arrester. Before starting to heat the wood burner, put only a half or a smaller amount of firewood input in order to ensure efficient combustion at the beginning.
4. Put firewood into the wood burner every 20-30 minutes.
5. Observe whether the grates have not shifted. Properly positioned grates ensure a smaller generation of ash that may affect the traction.

When these conditions are met, heating speed of 1100 L volume water is about 9 °C per hour. Improper use can prolong water heating speed for several hours.

PS! Also, there is a possibility to additionally increase traction by fully unbending traction barrier plates.

EXTERNAL WOOD BURNER FOR HOT TUB SET

1. External wood burner
2. Ash arrester
3. Fireplace grates
4. Connecting clamp for a traction barrier
5. Traction barrier- chimney coupling
6. Chimney 1.0 m – 2 pcs.
7. Rain cap

