KELIWOOD

WARNING

- Heater must be under supervision when it is in use
- Read the technical descriptions before installing the heater
- Read the manual before starting the heater
- Improper use of the heater can be dangerous
- The heaters chimney pipes and fire door can become very hot during use.
- Keep children away from the heater.
- Never use damp wood as it drastically reduces efficiency.
- Do not drain the hot tub and heater before all the wood has burned out and the embers have faded.

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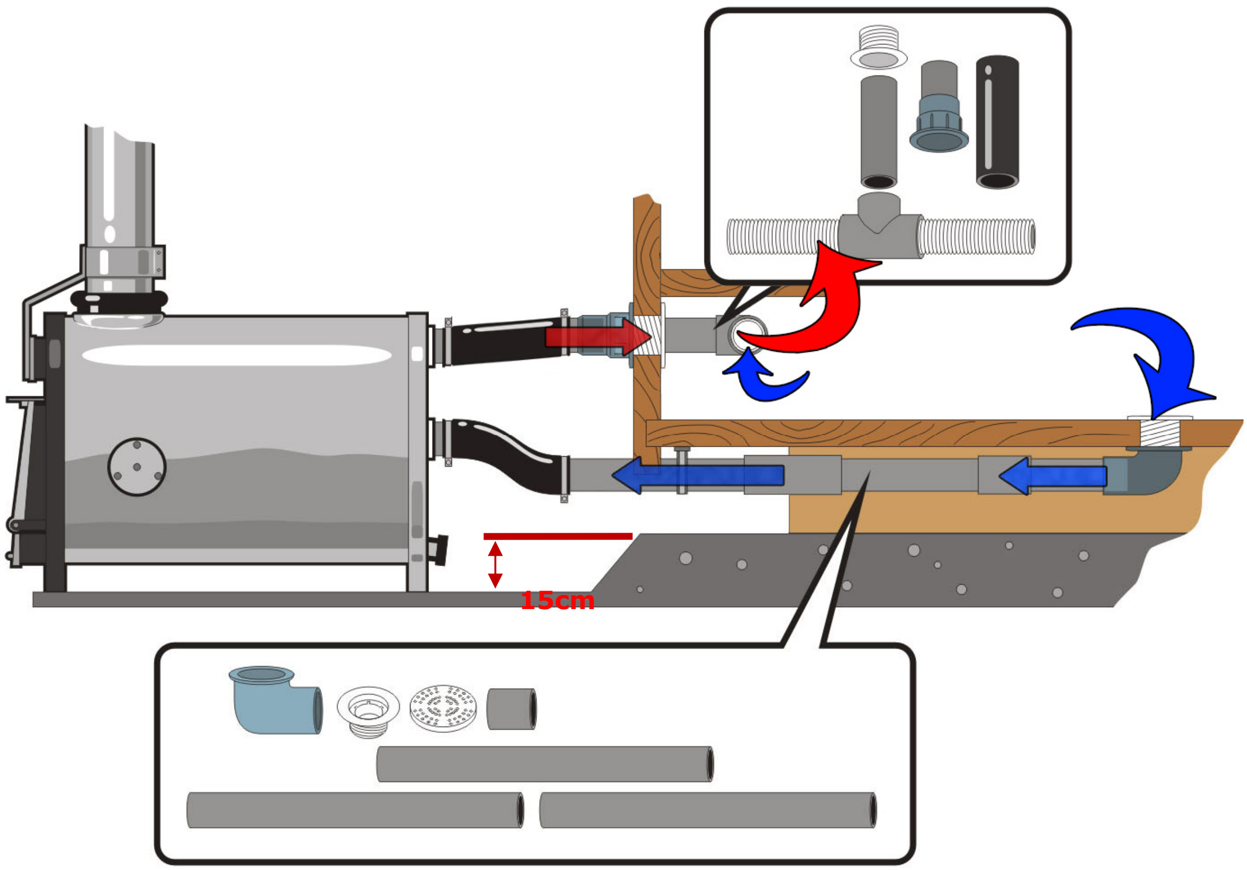
is fired with wood and connected to a hot tub on the outside. For the heater chimney pipes (100cm) and chimney top for effective removal of sparks can be bought separately. Need varies based on location.

Wood-burning water heater

This is a precision-built water heater, especially designed for Hot Tubs. Water is self-circulating using the "thermo siphon" principle. Hot water rises and creates low pressure, which sucks the water from below. This eliminates the need for a circulation pump and electricity, making it possible to heat the water with the heater placed externally. One great advantage is that there will be more space in the tub, making it possible to choose a smaller model.

Both the outer stove body and firebox are made of stainless steel. The heater must be drained via the drain hole after every use.

The heat from the fire is efficiently transferred to the water through a unique sophisticated construction, making the entire firebox a heat-transferring surface. The
total heating efficiency is 15 kW.



To get a good enough water circulation going the heater must be placed at least 15 cm lower than the foundation the hot tub stands on. This only applies under the condition that the following instructions are followed.

INSTALLING THE WOOD HEATER

WARNING! Read the last page before beginning installation.

Installation

Wood heater is connected to a hot tub (smallest diameter 150cm) with a connection kit (WBRUP, WBRLP) included in a complete hot tub package. It is not included when ordering only the heater but can be ordered separately as an accessory, the kit consists of 50 mm PBC tubing, flexible rubber hoses including clamps, one connection for the side of the hot tub and one 90° for the base. See picutures on previous page.

1. Place the heater on an even wood, brick or concrete surface. The heater should be placed at least 15 cm lower than the Hot Tub to ensure that the upper pipe is leaning upwards. This is important for circulation and to ensure that the water drains out of the heater during cold weather.
2. Drill a 60 mm hole for the upper connection pipe (outflow) in the side of the Hot Tub, 190 mm above the base. Drill a similar hole at the base on the opposite side of the hot Tub for the heater inlet pipe.
3. The angled connection, including pipe, should be screwed tightly to the side and the other connection to the base. Use silicone on the threads to avoid leakage to happen.
4. Connect the black rubber pipes to the heater and pipes. It will be easier to connect the pipes if they are oiled with cooking oil. Tighten using the included hose clamps.

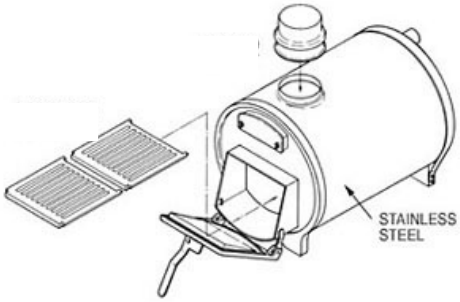
Chimney Pipe holder Fasten the chimney fitting. Then assemble the chimney pipe and put in place. NOTE! Turn the seam on the pipe backwards. **See pictures on last page.**

Operation Wood heater operates as a conventional wood stove, achieving the fastest heating rate from dry wood. The firebox is 46 cm long and 36 cm in diameter. The most efficient heating comes from using dry wood, 40-43 cm long chopped into a thickness of 4 X 4cm. One load bsurns for approximately at 30 min. Wood heater has a high and low-speed draft for controlling the heating rate. It's run with the draft wide open for fast heating, and slowed down to maintain temperature once the water is hot. **See pictures on last page.**

Design The design of the heater is made so that it will lean slightly downwards in the front when it stands on a stable and even base. Never put the heater in sand or any other type of soft foundations as it will cause an air pocket that prevents proper circulation and will damage the heater. If the heater is installed with a pump (for instance for a pool) the connection must be outfitted with an adjustable valve on the suction side that enables you to regulate the water flow and pressure. Too high water flow and pressure can damage the heater. Adjust the valve so that the hot water coming from the heater stays around 50-60 degrees Celsius.

Features

- Stove body of stainless steel
- Doors of special steel
- Connection parts to the Hot Tub
- Large fire place
- Discharging vent for the water in order to protect the heater from frost



Specifications

- 43 cm (height) x 56 cm (length) x 41 cm (width)
- Weight: 20 kg
- Firebox: 43 x 35 x 23 cm
- Heat exchanger surface: 0.85 m²

Heating

The heating effect varies according to the quality of the wood and how often you put in more wood. The approximate heating effect is 14,9 kW.

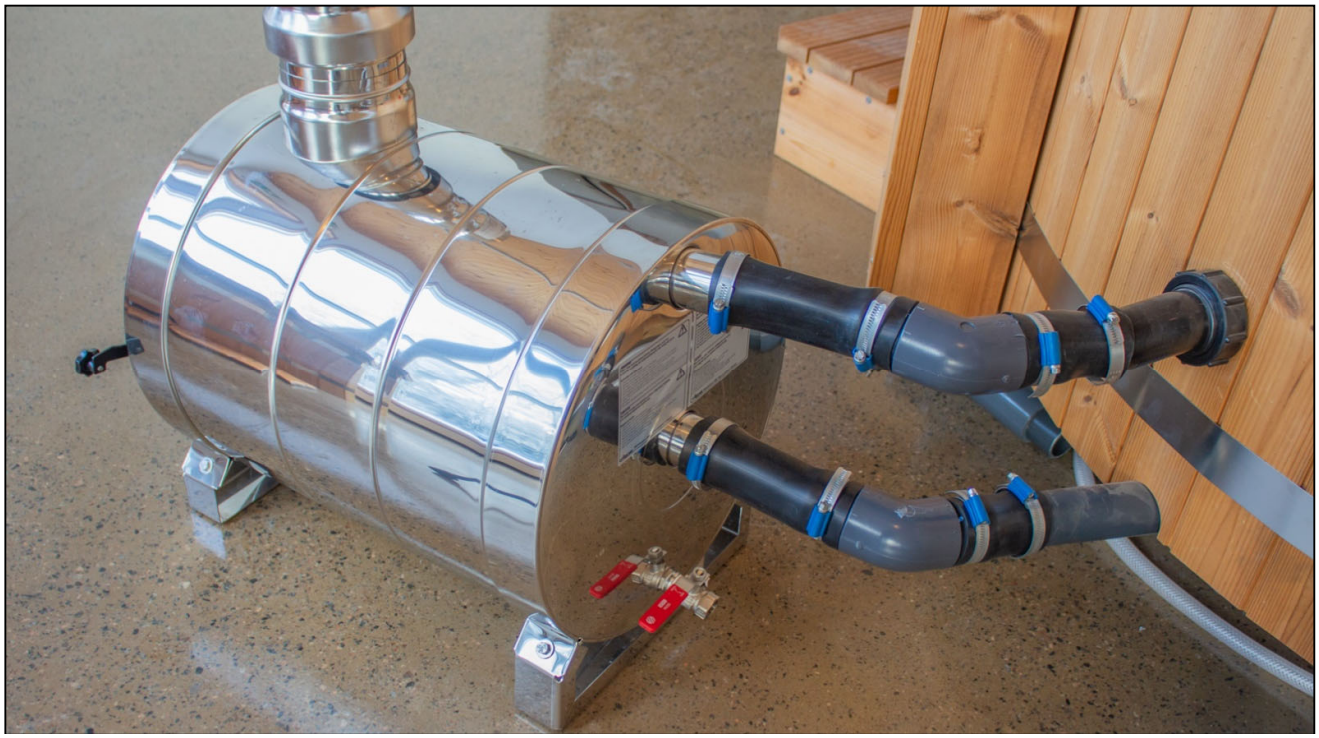
Model	Water amount	Starting temperature	Approximate heating time to 37 °C
VP1	1200 L	10 °C	About 3 hours

WINTER USE

If there is a risk of freezing damage then the heater must be drained of water after use. Self circulation will cease when the wood has burnt out and the small amount of water remaining in the heater can easily freeze and cause damage to the heater.

To keep the water in the hot tub there is a rubber plug complete with accessories. See images below. You can also supply the pipes with valves that can be opened and closes. Depending on how this is arranged it can become necessary to insulate the pipes and valves for the bath.

If electricity is available then a freezing guard can be installed in the heaters firebox to avoid freezing damages when it's not in use. Upper and lower connection pipes must then be insulated.



HINT! The wood heater has a large external surface that is in direct contact with air and therefore it is recommendable to insulate the exterior with, e.g. some kind of "flexible insulation material" which helps to shorten the warming up phase considerably.

WARNING!

- The white "distributor pipes" has to be connected when the heater is in use.
- Don't put fingers or toes in the "distributor pipe".
- The heater may not be used till the water level rises above the highest pipe.
- Get used to empty always the heater when it won't be used especially when the temperature sinks below 0. You can also raise the front of the heater to drain the very last of the water.
- When using salt water the heater should always be rinsed with fresh water after each use.
- The same applies for chlorinated water or something similar when chemicals are used.

ASSEMBLE CORRECTLY or the heater can end up like this. The heater have here been in the same height as the bath which caused disruptions in the water circulation and the heater was destroyed. See page 2 for more information. **Note! This is an older model, but with the same function.**

NOTE! Completely open air draft setting as shown in picture 4 gives an even better draft, but at the same time higher smoke temperatures.

Remove lower draft completely when heater is in use**, see picture 9.**

Proper burning

To get as rapid a heating of the bath temperature as possible, it is important to follow some basic principles.

1. Use dry wood, preferably below 10% moisture, split into smaller parts. High humidity reduces the effectiveness considerably because it creates deposits on the stove's heat transfer surface. Also avoid Alder and especially if it's wet. Wet firewood can also lead to steam development which can be mistaken for leakage.

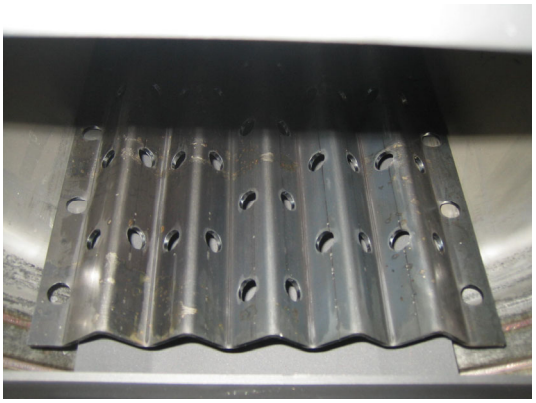
2. The wood that is split should preferably be 40-42 cm long to cover all of the heat-carrying surface.

3. Open the draft in the fuel door to the max and remove lower draft completely when the stove is in use. Start by filling the heater only half full or less, to get efficient heating from the start.

4. Fill the heater in 20-30 minute intervals.

5. Observe how the grate is placed so it's not swung the wrong way. Properly placed it produces less ash which can affect the draft.

If these conditions are met, then the heating rate to be around 12 ° per hour to 1000 liters of water. Due to incorrect usage, the heating time may be extended by several hours.



PS! It is also possible to increase the draft by opening tabs on the chimney holder. See instructions, last page.

TIP! The heater has a large exterior surface that's in direct contact with the air, so it's a good idea to insulate the outside with "flexible insulation" or put the heater in a box. Warm-up time in the winter can be significantly reduced.

USE DRY WOOD!

Our heater is optimized to provide a good energy yield when dry wood is used as fuel. This will also reduce fuel consumption. The stove cannot be compared with stoves where the focus is on great effect without considering efficiency. For the wood burner to work well, it requires the wood to be dry. This is mentioned in the manual.

Firewood containing much moisture causes poor draft and combustion. Moisture can also begin to leak out in front of the stove. Even a single heating with such wood can produce a coating on the inner surface, extending the heating time. If the surface is not cleaned, the coating will build up and further reduce efficiency and prolong the heating time significantly. The pictures show what it can start to look like.

Examples of deposits caused by sour/wet wood. Use of improper firewood can easily double the heating time, or even more.