



KARHU- 22 T, -30 T, -40 T SAGA-22 T, -30T

instructions for installation and use



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Installation and user instructions for KASTOR T series sauna heaters

Save this manual for later reference.

After installation, the User Manual must be given to the owner of the sauna or the person in charge of its use.

Read and understand the Manual before installation and use.

1. Before installing

Check the product and the package contents straight after delivery. Let the courier know about any transport damage immediately.

1.1. Contents of the package and checking

Contents of the heater package:

- Sauna heater
- In the furnace
 - Installation Guide
 - Grate
 - Connection pipe
 - Adjustment screws (2 pcs)
- Steel cap (installed in the stone compartment)
- Ash pan

1.2. Considerations and instructions

Check the suitability of the heater for the sauna and refer to the maximum and minimum cubic volumes. Table 1

Due to stone and glass walls, 1.5 m³ has to be added to the volume calculations for each square metre of firewall or other stone and glass wall.

In saunas with timber walls, 25% is added to the calculated volume.

In order to avoid damages during transport, the heater must be transported in an upright position.

All sticker labels and packaging material must be removed before the sauna stove is used.

The type plate and the CE marking must not be removed.

The ash pan must be closed during heating.

BURN IN THE HEATER OUTDOORS BEFORE INSTALLING IN THE SAUNA.

In addition to these instructions, all local regulations must be followed, including those referring to local and European standards. They must be complied with when installing the fire chamber.

You must also find out about any necessary building planning permissions and the floor load capacity before installing the heater.

Before installing the chimney, you must also check the chimney's temperature class.

- Average temperature of combustion gas on nominal output. Table 2
- Maximum temperature of combustion gas in safety test. Table 2
- Temperature classification for the chimney is T-600

Check the following issues and choose the location for the heater accordingly:

- Safety distances to flammable and non-flammable structures
- Location of the chimney connection (the height of the old chimney connection, if any, from the floor, or installation route for a new chimney)
- Floor material (flammable, non-flammable, tiled and waterproof).

If the heater will be connected to a divided chimney (another stove has already been connected to the chimney), each connection must have its own damper. The chimney must be sized in line with the larger stove.

Before beginning heating, also make sure that the smoke flue draft is sufficient and that the heater is not damaged.

- Draft in the chimney is -12Pa on nominal output.
- Draft can be roughly checked for example by burning a bit of newsprint in the heater.
- Before starting a fire in the heater, switch off any device that might create a vacuum, such as range hood or forced ventilation system. If the forced ventilation system is equipped with a fireplace switch, use it in line with the instructions supplied with the system.
- If heater has its own external delivery pipe for combustion air, make sure it is open and that there are no items causing a blockage in front of it and that there is a supply of air. The delivery pipe can be located down by the heater on the wall or floor. It must be equipped with a grille which can be closed or something similar. The minimum pipe diameter is 10 cm.

- Kastor heaters are meant to be used for heating a sauna. They must not be used for any other purpose.
- The heater is not meant for continuous 24 hour use.
- Sea water, rainwater or water containing chlorine must not be thrown onto the stones, use clean water only.
- In the proximity of sea water, there is also the risk of corrosion for the heater; operating life may be shorter.
- Decorative or other items must not be placed on the heater. The heater must not be covered when it is heated, or when it is hot. E.g. drying clothes or other flammable material on the heater is forbidden due to fire risk.
- In order to guarantee full output and safety, the fire door must always be kept shut when heating. The fire door can be open during heating only when adding more firewood, and the heater must be continuously observed. Monitor sauna temperature so that the heater will not overheat. If the heater becomes overheated, open the sauna door and allow ventilation.
- Fire doors and glass surfaces must be handled carefully.
- The fire door handle may be hot; use a tool, e.g. a glove, when opening.
- If the heater has not been used for a long time and is located in a damp space (e.g. an unheated holiday house), it must be carefully checked before use for corrosion damage and to make sure the chimney is not blocked, for example by a bird's nest.
- If a chimney fire occurs, or if there is a risk of one, close the fire doors but leave the damper on the flue open.
- Call the fire brigade if you need help with putting the fire out. *After a chimney fire, a local chimney sweep must always check the condition of the flue.*
- A chimney fire, even one that was put out, must always be reported to the fire authorities.
- Take caution. Handles, fire door glass and the surface of the heater as well as recirculated air may be hot!
- Do not let children light fires or stay near a burning fire unless supervised by adults.
- Follow the instructions when heating and installing the heater.
- The heater can only be heated using unprocessed firewood.
- Structural changes must not be made to the heater.
- Only use original equipment and parts approved by the manufacturer.

2. Installation and preparations for use

2.1. Bringing into service condition and burn-in

- Place the heater on a non-flammable surface outdoors, without stones.
- Remove all extra stickers and protective plastic (excluding type/CE mark stickers).
- Make sure that the grate is in place.
- Install the included connecting pipe to the flue opening above the heater, the shorter section into the heater.
- Check the caps for the soot hatches and the flue opening.
- BURN-IN: The purpose of burn-in is to burn the protective agents off the stove outdoors, and cure the heater finish. Burn a furnace-full of small chopped wood. Continue burning the heater outdoors until the heater emits no odour.
- Let the heater cool down and move it indoors to the sauna.
- Make sure there's ample ventilation during the first heatings.

2.2. Installation through a wall

Kastor-T heaters may only be installed through a wall made of non-flammable material. If the floor in the front of the fire door is flammable, the floor must be protected at the distance of 400 mm to the front and 100 mm to the sides, as measured from the fire door. The protective base must be made of non-flammable material.

The sauna room floor must be higher than or at the same level as the floor onto which the fire door will be placed. The heater (including the fire door component) is installed horizontally on a non-moving and stable fireproof base, such as a minimum of 60 mm thick concrete or brick base). The base must extend 100 mm beyond the sides of the heater. The concrete base can be moulded so that it slants forward. The heater's front corners have slots for adjustment screws for adjusting the heater to a level position (the screws are supplied in the accessory bag). Note: check the floor's load-bearing capacity before installation (refer to the table for the combined weight of heaters and stones.)

DO NOT INSTALL THE HEATER ON A FLOOR MADE OF FLAMMABLE MATERIAL WITHOUT A PROTECTIVE BASE

Measuring from the sauna room, make a 440 mm wide and 560 mm high opening to a wall. This leaves approximately 20 mm around the extended fire door on each side, so that the opening can be insulated with fireproof material (take the pipe's location into account).

Remove the ash pan the extension component on the fire door side. Push the heater into place from the sauna room and reinstalled the components removed from the fire door side without attaching the extension component to the wall. Install the front frame component supplied with the heater. Install the frame to the door-side extension component using 13-mm drill screws. The extension component has holes for four screws. Install the heater as well as the extension component and insulate the gap between the wall and the extended door opening on the sauna room side using fireproof insulation wool. The extension component can be secured with drill screws. Screws are drilled to the outermost extension component on the heater frame from the inside by opening the door (two holes on each side in the middle of the extension component). Centre and secure the ash pan cover pipe using drill screws (below in the front). If the ash pan needs to be extended, use the extension component shipped inside the pan. Secure to the ash pan from the outside towards the inside using drill screws.

2.3. Heater stones, placing the stones

Use peridotite or olivine stones or semi dark natural stones over 10 cm in diameter in the heater. Wash the stones before placing them into the stone compartment. Do not place the stones too tightly or pile them too high. Leave enough space between the stones. Place the stones vertically instead of horizontally to allow hot air flow from underneath all the way to the top stones. Fill the entire stone compartment, place flat stones vertically and pay attention to the maximum amount of stones. Table 1

More balanced heat properties can be reached by using a mix of differently sized and different types of stones and adjusting the amount of stones. As stones and layouts are unique, there are no generally applicable rules. Try placing the stones in different ways to find the ideal layout for your needs.

In order to operate properly, it is vital that the hot flue gases can flow freely in between the stones and heat them up quickly. If the stones are too small or incorrectly laid, the air in the sauna room will heat up, but the stones won't.

3. Safety distances and protection

3.1. safety distances

Safety distance to a stone wall is 50 mm from the outer surface of the heater. 100 mm is preferable to allow sufficient air flow.

Therefore, a heater can be installed in a bay corresponding to the heater's width + 200 mm.

Refer to Table 1 for heater-specific safety distances to flammable materials.

To allow enough space for heat radiation and for operating and servicing the heater, the recommended safety distance in front of the fire door is 1000 mm.

The minimum safety distance in the front is 500 mm

4. Heater connection to a smoke flue

4.1. Top connection

Install the heater's own connection pipe to the upper flue opening and the shorter section into the heater.

Make a hole in the brick chimney which is 2–3 cm bigger than the connecting pipe.

Top connection is made by using a bended pipe, which can be turned to match the chimney.

Bended pipes are available at hardware stores. A bended pipe can be extended, when necessary. Install the heater's own connecting pipe to the upper flue opening on top of the heater. The bended pipe in question is installed on top of the heater's connecting pipe. Use a saw to adjust the length of the bended pipe and extension, if any. Make sure the pipe goes deep enough into the chimney (not too far; the chimney may be blocked).

Seal the empty space between the pipe and the brick chimney by using flexible, fire-resistant material, such as fire wool.

The connection is finished by using a cover plate, available from a hardware store. Fix the cover plate to the chimney using metal fixtures or fire-resistant putty.

4.2. Connection to a ready-made flue

The heater can be connected from the top to a ready-made flue.

Select the correct ready-made flue in accordance with factors such as the heater model, the height of the flue, external conditions and temperature class T-600. A damper plate must be installed in the flue.

- Install the heater's own connection pipe to the upper flue opening on top of the heater, the shorter section into the heater.
- On top of the connection pipe, install a non-insulated interconnecting pipe and an extension, if needed. Use a saw to adjust the length of the interconnecting pipe and extension, if any.
- Install the damper between the non-insulated and insulated part, or alternatively, into the first insulated chimney flue module
- Continue using insulated modules on top of the damper. There should be at least 400 mm of insulated chimney flue below the ceiling. Follow the installation and user instructions for ready-made flues.

Adhere to the above mentioned safety distances to flammable and non-flammable materials.

Sauna360 Oy is not liable for suitability or performance of other manufacturers' ready-made flues used in connection with Kastor heaters.

Sauna360 Oy is not liable for the quality of other manufacturers' ready-made flues.

The temperature classification for the chimney must be T 600.

5. Heater door and changing left/right-handedness

The side on which the handle is installed cannot be changed.

6. Grate

There is a grate in the heater's stove. Place it on the brackets on the bottom of the stove. Keep the grate clean and empty it before the next heating to allow air to flow from below the grate into the furnace.

7. General advice on preventing damage

When you bring the heater into the sauna room, burn another full batch of wood before placing the stones and make sure that there's plenty of ventilation. This way any residual protective agents will burn off and the finish is properly cured.

Read the instructions below and make sure to follow them:

- Wood quantities can be found in table 2
- In cold conditions, avoid heating at full power. The brick chimney may crack.
- Do not heat the sauna heater so that the cover is constantly red-hot.
- Exposure to saltwater will shorten the heater's life cycle significantly. Please note that even water from a well can contain salt in the vicinity of sea.
- The warranty is void if saltwater is used in the heater.

- Other factors contributing to the heater life-cycle are correct size for the space, the fuel used, the number of heating cycles, failure to follow instructions when using the heater, and general diligence.
- Kastor heaters are carefully designed and tested. If a heater becomes damaged in use in an unreasonably short time (e.g. the covers or top part are torn or burned through etc.), it can be fairly said on the basis of research data that the heater has not been used as instructed. Sauna360 Oy will not be liable for damage resulting from misuse or use against instructions.

If several full batches of wood are burned in the heater consecutively, the heater and the pipe will become overheated, which might result in an increased risk of fire.

8. Using the heater

8.1. Fuels

Only unprocessed wood can be used as fuel in heaters, preferably chopped, birch or alder (refer to Table 2 for batch sizes). The length of firewood is approximately 33 cm. Dampness 12–20%. NOTE! Damp or decayed wood does not provide heat very well and emissions are higher. Do not burn any wood still in the extension component; wood must only be burnt in the furnace proper.

The amounts of wood mentioned in Table 2 correspond to the values of a nominal output test in compliance with EN-15821, where the volume of the sauna room is the maximum volume. When heating the sauna for the first few cycles, use smaller amounts of wood than listed in the table to find the ideal batch size for your sauna.
Do not exceed the amounts of wood mentioned in the table

The following materials are not allowed in the heater furnace: impregnated wood, wood containing nails, chip board, plastic, plastic coated board or paper.

Liquid fuels are not allowed, not even when starting the fire because of the risk of a flash fire. Do not burn large amounts of small pieces of wood, such as chips or small pieces because of their high temporary heating effect.

Firewood must not be stored immediately next to the heater. Pay attention to the heater's safety distances.

8.2. Adjusting the air flow

The heater has been designed to perform best when the negative pressure of the flue is approximately –12 Pa. If the chimney is long, this optimal negative pressure limit may be exceeded. Adjust the draft and combustion air flow using a damper so that it is suitable. Be careful of carbon monoxide. The damper must not be closed too far!

When lighting the fire, the door may be kept slightly open for a moment. The ash pan must be closed and it may not be opened during burning.

Combustion air comes from another source.

8.3. Adjusting heating efficiency

The amount of wood when stoking determines the heating efficiency. For the correct amounts of wood that ensure that the wood burns in line with the CE marking, refer to Table 2.

The heating efficiency depends on the quality and the amount of fuel.

8.4. Lighting

- Place the first batch of wood loosely in the furnace. Table 2
- Add kindlings between the logs and light them.
- You can keep the fire door ajar for a moment while the logs start to burn.
- Do not burn any wood still in the extension component.

8.5. Stoking the furnace

Add another batch of wood when the fire has nearly burned down to embers. Table 2

Add the wood lengthwise, i.e. parallel to the grate opening. Close the fire door.

The sauna room is normally ready for bathing in 40 to 60 minutes.

If several full batches of wood are burned in the heater consecutively, the heater and the pipe will become overheated, which might result in an increased risk of fire.

9. Maintenance and repairs

9.1. Cleaning the heater

The surface of the heater may be cleaned with mild detergent and moist, soft cloth.

Clean the fire door glass with a soot cleaner agent (e.g. Noki Pois) available from hardware stores.

Clean the stone compartment and check the condition of the stones approximately once every six months.

9.2. Removing the ashes

Excess ash will shorten the grate's life cycle and weaken burning. Fresh air enters the furnace through the heater back wall under the grate, which is why it is important to remove ashes from the heater before using it again (Figure 3).

Always remove the ash before using the heater, unless the ash is still hot.

9.3. Chimney sweeping

The opening in the stone compartment is a soot hatch (covered with a cap).

The inner parts of the heater are cleaned through the soot hatch 2 to 6 times a year according to use.

Empty and clean the stone compartment and check the condition of the stones at the same time. Soot hatches open when they are lifted upward parallel to the surface.

If the cap has stuck because of temperature fluctuation, use a bending iron or a hammer.

9.4. Cleaning the fire chamber glass

Handle the glass door carefully. Do not bang the door shut or use it for pushing wood into the furnace. Clean the glass with Noki Pois or similar soot cleaning agent.

10. Troubleshooting

If the heater or the sauna doesn't perform as you think it should, check it following the below list. Make sure you have selected the correct heater to match the sauna room's volume.

The heater is too hot (red-hot)

The draft exceeds -12Pa

- lower the draft with the damper

The stones are laid too tightly or they are too small.

- place the stones more loosely and use stones that are min. 10 cm in diameter.

There's too much wood, or the pieces are too small.

- Table 2 has the maximum amounts of wood for the heater, do not use more.

- Do not burn large amounts of small pieces of wood, because their temporary heating effect is high.

- let the previous batch of wood become embers before adding the next batch

There's smoke in the sauna room, the draft is bad.

Turn off all equipment that may cause low pressure.

Is the damper open?

Is the connection pipe sealed against the heater and the flue?

Is the alternative flue opening sealed with the included cover?

Are the heater's soot hatches securely shut?

Is there ash in the heater channels?

Is the interconnecting pipe from the heater to the flue free from ash?

Is the flue completely open? Is it unswept, filled with snow, covered with winter cover etc.

Is the chimney in good condition? Cracks, weathering.

Is the draft height (chimney height) sufficient for the surrounding environment?

- If there are trees close by, a steep hill etc., the chimney needs to be over 3.5 m measured from the floor.

Is the flue size correct?

- the minimum diameter is half a brick for brick flues or 115 mm for round flues

The stones do not become hot enough.

Have you burned enough wood in the furnace?

Burn enough wood in the heater, refer to the amounts of wood in Table 2.

Is the draft too weak?

Is the amount of stones correct?

- At the sides, there should be stones to the level of the sides, and in the middle, only half a stone can raise above the side level.

Are the stones too tightly packed?

- Place the stones loosely, so there will be enough space between the stones.

Are the stones of good quality and the right size?

- use peridotite or olivine stones with a minimum diameter of 10 cm. Place flat stones vertically.

The sauna room won't become warm enough.

Are the doors, windows and air conditioning closed, and the combustion air opening open?

Is the sauna new, are the wooden structures damp for some other reason?

Is the heater used correctly?

Have you burned enough wood in the furnace?

- Burn according to instructions.

Is the draft too strong?

- Use the damper to adjust the draft.

Is the draft too weak?

Has the heater been sized correctly?

Is the draft height (chimney height) sufficient for the surrounding environment?

- If there are trees close by, a steep hill etc., the chimney needs to be over 3.5 m measured from the floor.

Is the amount of stones correct?

- At the sides, there should be stones to the level of the sides, and in the middle, only half a stone can raise above the side level.

Are the stones too tightly packed?

- Place the stones loosely, so there will be enough space between the stones.

Are the stones of good quality and the right size?

- use peridotite or olivine stones with a minimum diameter of 10 cm. Place flat stones vertically

The sauna heats up quickly, but the stones are not hot.

Is the amount of stones correct?

- At the sides, there should be stones to the level of the sides, and in the middle, only half a stone can raise above the side level.

Are the stones too tightly packed?

- Place the stones loosely, so there will be enough space between the stones.

Is the heater too big?

- Keep the ventilation valve open to keep extra heat out. This way the stones will have time to heat up as well.

There are black flakes under the heater.

The stones may be weathered.

The flakes can be metallic anvil cinder, fallen off the heater. The heater has been heated too much red-hot; the metal will flake and the heater will break prematurely.

Do not heat the sauna heater so that the cover is constantly red-hot

There's a smell of sulphur in the sauna.

The stones have sulphur residues from blasting, or the stone includes sulphur naturally.

11. Manufacturer's declaration

This product fulfils claims mentioned in the certificate of approval and documents related to it.
www.Sauna360.com

12. Warranty and manufacturer identification

WARRANTY

Sauna360 products are reliable and of high quality. Sauna360 grants a 2 year factory warranty to its wood-burning sauna heaters covering manufacturing defects. For products in public and commercial use, the warranty is valid for three months.

Damages caused by incorrect use or use which is not in accordance with instructions will not be covered by the warranty.

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Table 1

Model	Volume of the sauna room m ³	Output (kW)	Dimensions (mm)			Safety distance to flammable material (mm)				Weight (Kg)	Amount of stones (Kg)
			width	depth	height	Front	Side	Back	Up		
KARHU-22 T	12-22	14	450	485	785	500	300	-	1240	95	25-30
KARHU-30 T	20-30	17	490	485	915	500	300	-	1310	120	35-40
KARHU-40 T	30-40	15	580	585	925	500	300	-	1300	160	50-55
SAGA-22 T	12-22	16	600	585	825	500	250	-	1400	115	130 – 140
SAGA-30 T	20-30	17	675	585	930	500	250	-	1300	140	180 - 190

When there's stone, tile or glass surfaces, add 1.5 m³ to the volume for each square metre.

If the sauna walls are uninsulated log, add 25 % to the volume.

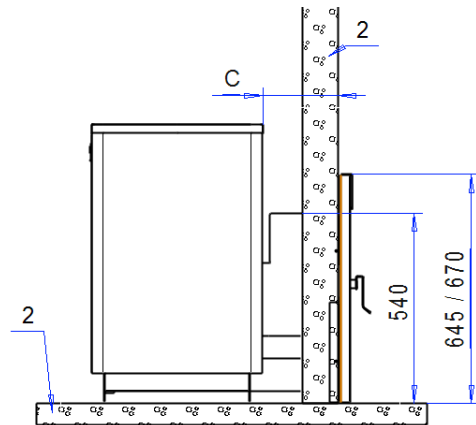
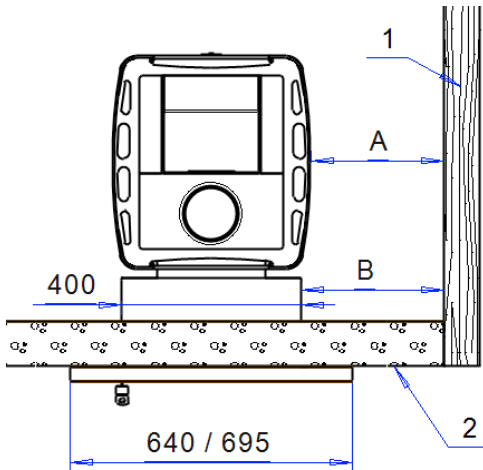
Model	Flue opening, inside diameter (mm)	Front frame width (mm) paint / cr	Distance from the back of the heater to the centre of the flue opening (mm), top connection	Front frame height (mm) paint / cr	Sauna room min. height (mm)	Max. length of fire wood (mm)
KARHU-22 T	115	640 / 695	126	645 / 670	2100**	380
KARHU-30 T	115	640 / 695	126	645 / 670	2300**	380
KARHU-40 T	115	640 / 695	126	645 / 670	2300**	450
SAGA-22 T	115	640 / 695	150	645 / 670	2300**	380
SAGA – 30 T	115	640 / 695	150	645 / 670	2300**	380

**Less than min. height, use a protective plate in the ceiling

Table 2

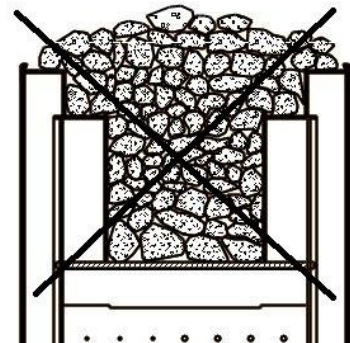
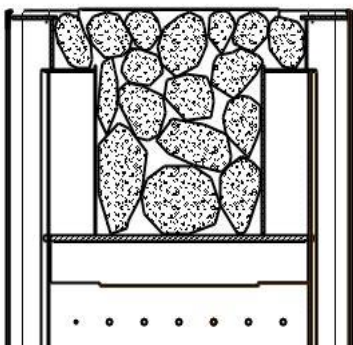
	Karhu- 22 T	Karhu-30 T	Karhu-40 T	Saga-22 T	Saga- 30 T
Fuel	Wood	Wood	Wood	Wood	Wood
Fire safety	Pass	Pass	Pass	Pass	Pass
Mean flue gas temperature	390°C	401.5°C	338°C	421°C	410 °C
Total heat output	14 kW	17 kW	15 kW	16 kW	18 kW
Carbon monoxide emissions at 13%O₂	0.44 %	0.34 %	0.33 %	0.25 %	0.65 %
Efficiency	70.2 %	72.3 %	74.6 %	70 %	70 %
Flue draft	12 Pa	12 Pa	12 Pa	12 Pa	12Pa
Ignition load	6 kg	7 Kg	8 Kg	6 Kg	7 Kg
Refuelling loads	4.5 kg	6.5 Kg	5 + 4 Kg	4 + 2.5 Kg	4.5 + 4.5 Kg
Temperature class of chimney	T – 600	T – 600	T – 600	T-600	T-600
Safety distances to combustible materials	Table 1	Table 1	Table 1	Table 1	Table 1
Combustin gas maximum temperature	505°C	508°C	427°C	541.9 °C	522 °C
Surface temperature	Pass	Pass	Pass	Pass	Pass
Durability	Pass	Pass	Pass	Pass	Pass

Figures

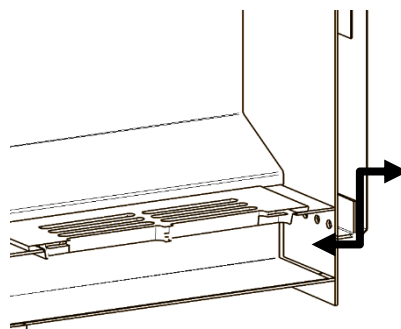


	A	B	C min / max
Karhu-22 T	300	320	220 / 350
Karhu-30 T	300	345	220 / 350
Karhu-40 T	300	385	220 / 350
Saga-22 T	250	350	200 / 330
Saga 30 T	250	385	200 / 330

1. Flammable material
2. Non-flammable material



Placing the stones, a cross-section of the heater stone compartment
Place the stones loosely, so there will be enough space between the stones.



For best performance, it is important to empty the heater's ash pan after every use to keep the air opening under the grate open, allowing air to flow freely into the furnace.