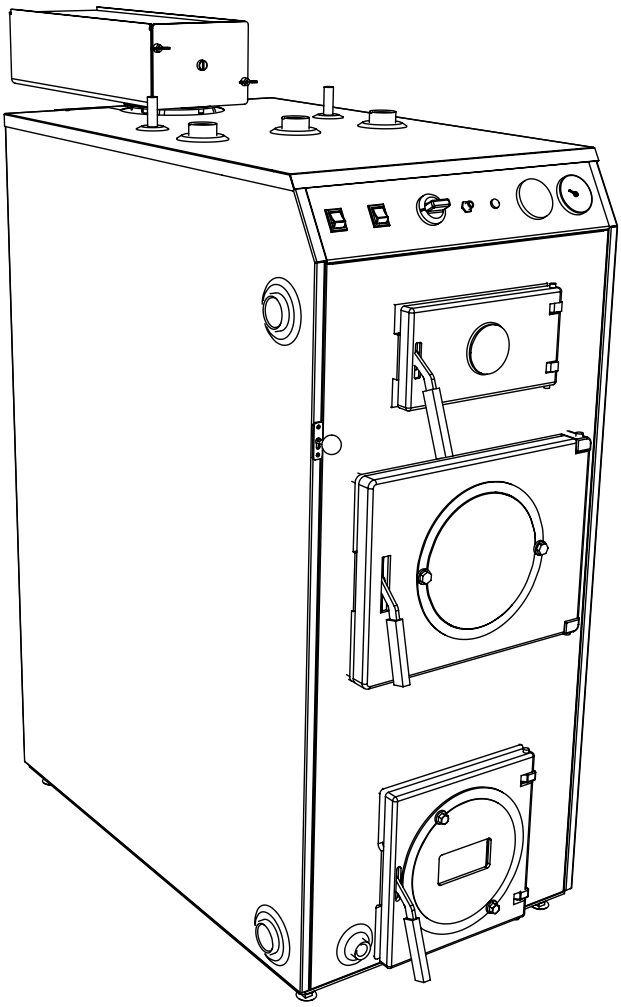
Installation, operation and maintenance
Firewood boiler
Vedolux 37



VÄRMEBARONEN

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General

**Read this document carefully before carrying out any installation,
adjustment or service – and follow the instructions.**

Keep these instructions close to the boiler!

The boiler must not be modified, changed or rebuilt.

To guarantee high reliability, all installation, adjustment and ongoing service must be carried out correctly.

The correct settings are important for economical heating.

The type and serial number of the boiler must be quoted whenever you contact your retailer, see the rating plate.

For service issues, contact your installer.

Värmebaronen AB retains the right to change the specification without prior notice, as part of its policy of continuous improvement and development.
Illustrations may differ from the actual product
Allowing for printing errors and errors on proofs.

This manual describes the installation and operation of the Vedolux 37. This heater meets the 2020 U.S. Environmental Protection Agency's cord wood emission limits for wood heaters sold after May 15, 2020. Under specific test conditions, the heater has been shown to deliver heat rates as specified in the technical data in this manual.

You may see the following symbols in these instructions and on the product:



Information that is important for optimum function.



Tells you what you must – or must not – do in order to avoid personal injury.



Tells you what you must – or must not – do in order to prevent damage or disturbance to the component, the burner, the process or the surroundings.

Notes

To be completed when the Vedolux 37 is installed!

Serial number: .....

Installation date: .....

Installer: .....

Tel: .....

Other: .....

.....

.....

.....

.....

.....

Function

Vedolux 37

- is a firewood boiler with a suction fan, designed for heating houses and smaller properties.
- is environmentally-approved for firewood burning with an accumulator tank.
- is designed for 20 in. firewood.
- is designed to be connected to an external water heater.
- is primarily designed to be fired by firewood, but can also easily be modified for use with an oil or pellet burner.
- has an output of 126 kbtu when burning firewood and 143 kbtu when burning oil/pellets.

Ceramic combustion chamber

The combustion chamber is designed for reverse combustion. The depth of the combustion chamber is 21.7 in. A bypass damper prevents smoke entering the room when firewood is added.

Flue cleaning

All flue ducts in the boiler are cleaned from the same hatch at the front of the boiler. The hatch is hinged and is opened with a single operation. The flue ducts are round, which means there are no awkward corners when flue cleaning.

Chimney

The Vedolux 37 has a suction fan minimising the chimney requirements of the boiler.

Accumulator tank

To optimise combustion and efficiency, and to meet environmental requirements relating to firewood burning, the boiler must be connected to an accumulator tank. The accumulator tank is dimensioned according to the requirements of the building.

Delivery

The product is delivered with the following components:

- flue pipe.
- flue cleaning tool with bracket.
- flue gas thermometer.
- gas lighter.
- 1.5 bar pressure relief valve.
- NPT adapters: NPT G15 (½") x 1 pcs.
  NPT G25 (1") x 2 pcs.
  NPT G32 (1¼") x 2 pcs.

Accessories

- Stand to make firewood burning more convenient.
- Accumulator Control 3.
- accessory for oil/pellet firing (cover plate with draught hatch for fan).

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

Warranty; please contact your local dealer, you find the contact information and warranty details in the warranty manual.

The boiler must be installed in a way to prevent problems caused by smoke, the general recommendation is that the chimney shall be one meter higher than the highest part of the roof. Avoid installation in highly urbanized areas, or if the surrounding buildings are higher than the chimney.

The efficiency test is performed with the boiler connected to a partial storage, due to that the boiler can be operated at nominal output even when the heat demand is low. The efficiency for the combustion will be the same even if the heat demand is high or low.

The heat demand may affect the efficiency for the complete installation by the heat losses, the heat losses will be the same regardless the heat demand; but will be a greater part compared with the used heat if the heat demand is low.

The location of the boiler and storage tank will affect the heat losses and thereby the efficiency, if the installation is located in a heated area the heat losses will be smaller and if the heat losses can be used to heat a living area the efficiency will increase. If the installation are located in a cold building the heat losses will be both greater and there will not be any use for the heat losses.

The efficiency can be calculated from higher (HHV) or lower heat value (LHV). An efficiency calculated from LHV will give a higher result in percent compared with a calculation from the HHV. The efficiency for Vedolux is calculated from the HHV.

The highest efficiency for the boiler will be found when it is operated at nominal output, all attempts to increase or reduce the output from the boiler risk to affect the efficiency in a negative way. The output from the system shall be controlled by the output from the accumulator.

During start up and end phase the content of CO in the flue gas can be significant, but when the combustion temperature is high and the combustion is normal there will only be a small content of CO in the smoke, less CO if the fuel are well seasoned but it can be a quite high content if the fuel are damp. CO is invisible, odorless gas. CO are toxic and can be deadly. Pay attention to leakage from the boiler or flu gas duct. Smoke monitors are recommended to detect leakage.

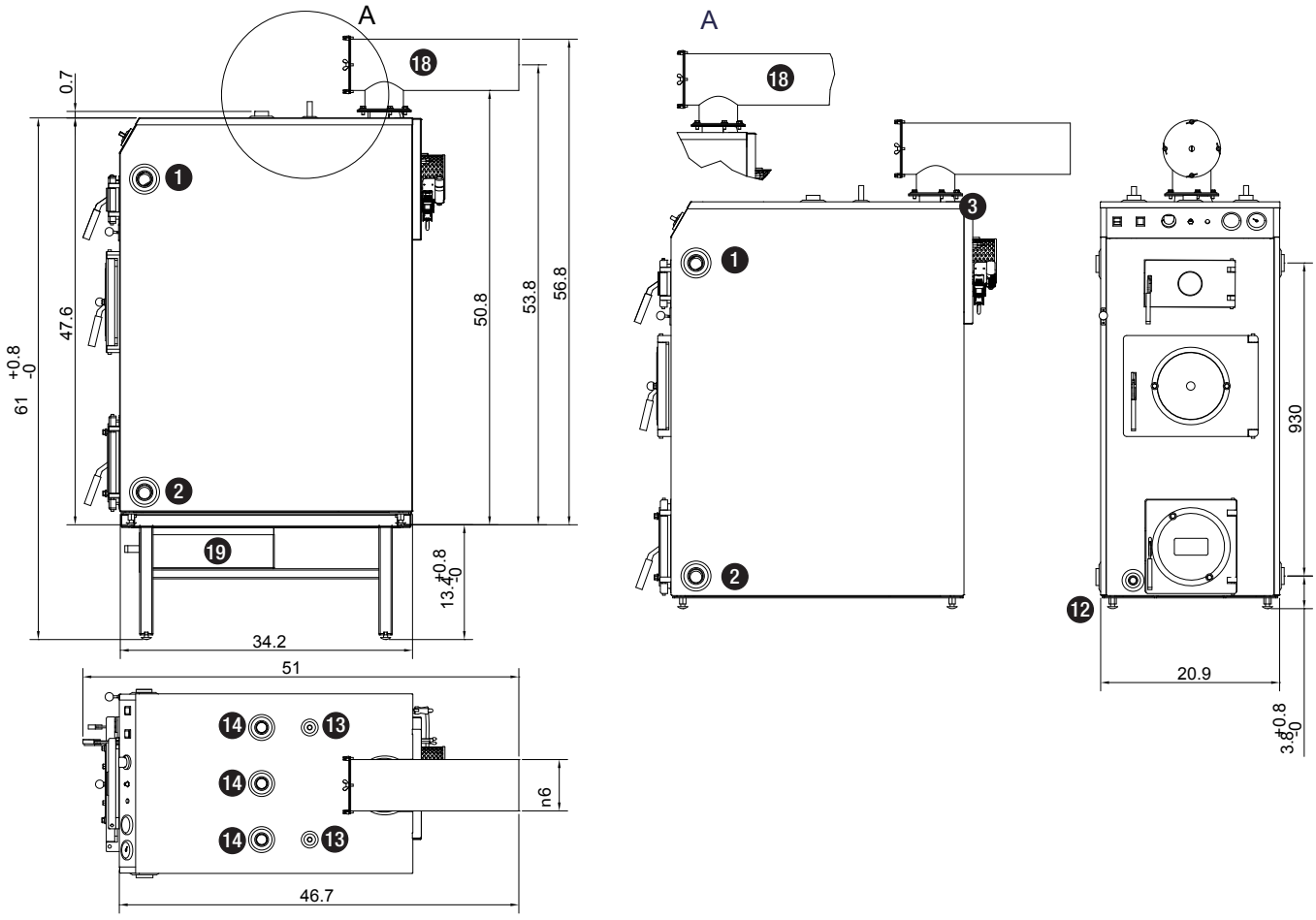
CO, average in dilution tunnel:

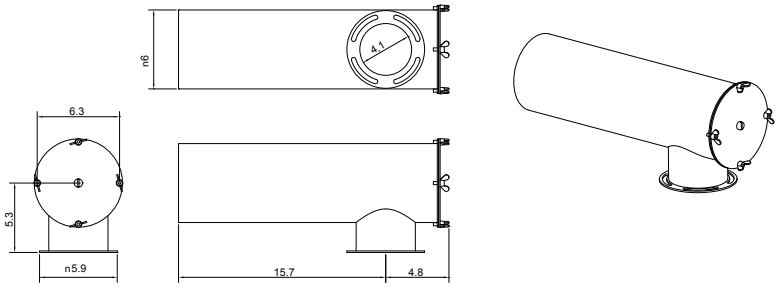
Boiler	Cat I >15% load	Cat IV 100% load	Unit
Vedolux 37	0.11	0.10	g/min

Technical data

Weight, empty	705 lb
filled with water	970 lb
Volume	32 gal
Pressure, design	22 psi
test	31 psi
Pressure drop, water flow 0.14 gal/s	0.145 psi
Temperature, design	220 °F
operating max	220 °F
Output wood, moisture content 16 ±4%	126 kBTU/h
Output, pellets	143 kBTU/h
Combustion chamber, volume	25.9 gal
depth	21.7 in
Wood, length	20 in
diameter	6 in
Burning cycle, combustion chamber full, moisture 16±4%	2.5-3 h

Firewood hatch, w x h	11.4 x 9.3 in
Chimney requirement, height	11.5 ft
flue duct recommended	Ø 5.71 in
	25.6 in^2
flue duct min	Ø 4 in
	12,6 in^2
draught	0.04 in H_2O
Flue gas temperature	355 °F
Accumulator volume, min	400 gal
Voltage	115 V~, 60 Hz
Current	0.3 A
Protection class	IP 21
Boiler group as per EN 303-5	3
UL391, CSA-B366.1, ETLM78-1	
Certified by Guardien Fire Test Labs	
Tested according to method 28 WHH PTS	





1. *Hot water outlet, riser, 1¼" BPT*.*
2. *Hot water outlet, return, 1¼" BPT*.*
3. *Flue pipe, standard.*

12 Base bolts, adjustable.

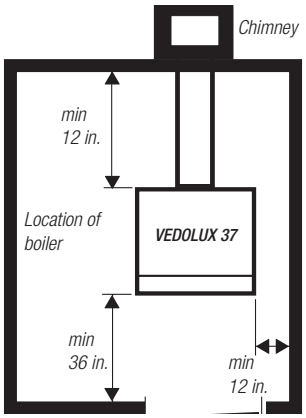
13. *Connections for cooling coil, 0.6 in Cu.*
14. *Expansion connection, 1" BPT*.*
19. *Base frame, accessory.*

**Use the delivered NPT adapters for these connections. The NPT adapter builds 2.2".*

Clearance to combustibles.
12" sides and rear, 18" top and 36" front.

Installation

The installation must comply with the applicable regulations and standards.



The boiler must be installed indoors in a cellar or on the ground floor. The installation site must be able to support the combined weight of the boiler, the accumulator tank and any chimney.

The boiler can support up to 330 lbs of the weight of the chimney. Adjust the base bolts to make the boiler level.

A temperature limiter must always be installed with the boiler.

The boiler must be connected to an accumulator tank, and the installation must include an accumulator control.

You must contact the chimney sweep before changing to a different form of energy.

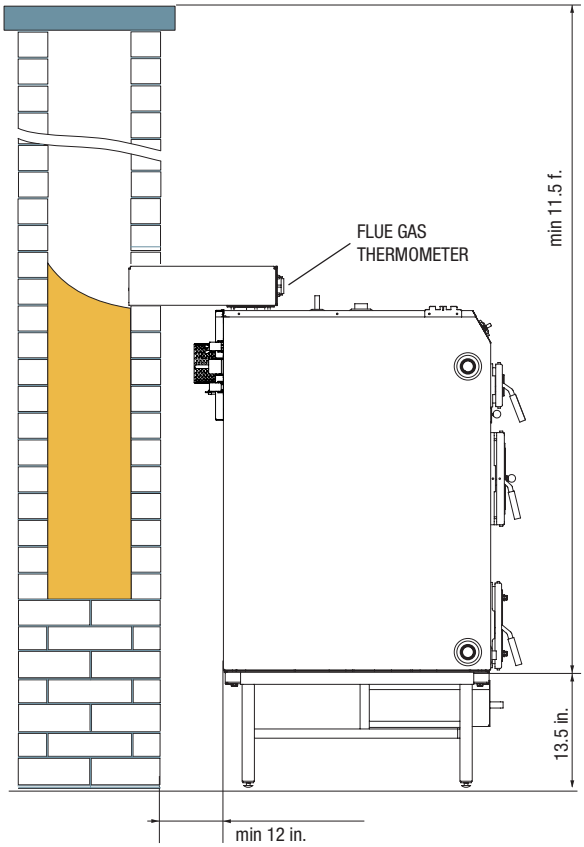
Contact the municipality to find out about restrictions on the use of solid fuels in built-up areas.

The fresh air intake of the boiler room must have at least the same cross sectional area as the chimney, and it must be designed so it is impossible to close it by mistake.

The boiler must be installed in a way to prevent problems caused by smoke, the general recommendation is that the chimney shall be one meter higher than the highest part of the roof. Avoid installation in highly urbanized areas, or if the surrounding buildings are higher than the chimney.

Chimney

Vedolux 37 has a suction fan minimizing chimney requirements.

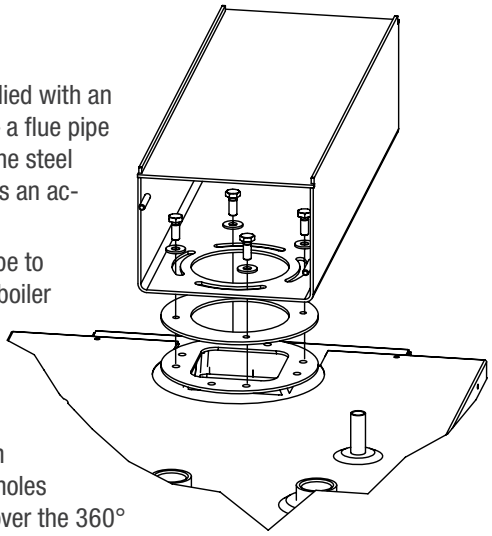


Clearance to combustibles.
12” sides and rear, 18” top and 36” front.

Flue pipe

The boiler is supplied with an angled flue pipe – a flue pipe running up from the steel pipe is available as an accessory.

Fasten the flue pipe to the flange on the boiler using the 4 x M8 screws supplied, with washers. Remove the cleaning hatch first. Two sets of holes are provided to cover the 360° angle of rotation.



Flue gas thermometer

Install the supplied flue gas thermometer in the outlet of the flue pipe, see the illustration above.

Connection to accumulator system

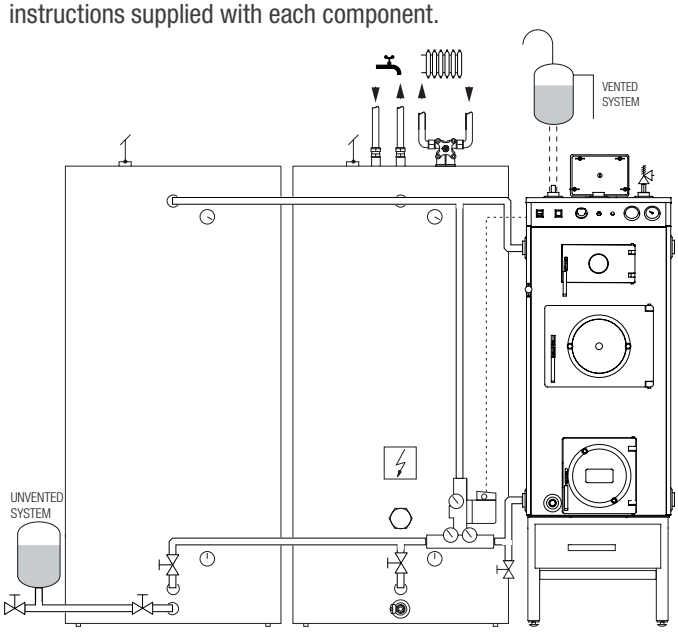
The boiler must always be connected to an accumulator tank with an accumulator control.

The accumulator volume is dimensioned according to the surface area to be heated. Allow for 2 – 3 gal of tank volume per 10 ft² of heated surface area.

The schematic diagram below shows the Vedolux 37 with the Aqualux CU and Aqualux UB accumulator tanks plus Accumulator Control 3. For more details, refer to the documentation supplied with the relevant product. Follow the installation instructions in the documentation.

The pipe dimension between the boiler and the tank should be 1” to 1¼” for copper pipe or equivalent.

This diagram illustrates the system principle – the actual system will be designed according to the applicable standards and the instructions supplied with each component.



Function of accumulator control

The accumulator control ensures that the boiler reaches a high working temperature before it starts charging the accumulator tank. It also prevents the return temperature to the boiler falling too low, helping to minimise the risk of condensation in the combustion chamber.

The charging pump of the accumulator system is controlled by a flue gas thermostat.

Expansion system

The boiler is connected to a vented or unvented expansion system.

The volume of the expansion vessel is dimensioned according to the circumstances. The guideline values for volume are approx. 5 % of the total system volume for vented systems, or 13- 15 % for unvented systems.

Vented The distance between the top of the highest radiator and the expansion vessel must be at least 8.2 ft in order to prevent oxygen saturation of the water in the heating system.
The expansion vessel is connected in a continuous and unisolatable rise from the boiler's expansion connection.
To prevent damage occurring if the expansion system fails, for example because of freezing, the boiler should be fitted with a type approved safety valve, 21.8 psi.

Unvented In unvented systems, the boiler must be fitted with a type approved safety valve, 21.8 psi, connected using an unisolatable pipe from the connection at the top of the boiler, as well as a bleed valve.
The expansion vessel is best connected using ½" copperpipe, as shown in the diagram on the previous page.

The opening pressure of the safety valve is based on the lowest maximum pressure that any system component can withstand.

Cooling coil - temperature limiter

The boiler system must be equipped with a temperature limiter in accordance with the applicable regulations.

The boiler has a cooling coil which, combined with a suitable thermal valve, is used to prevent the boiler temperature exceeding 230°F if the water boils. Follow the instructions of the valve manufacturer.

Turbulators

The five turbulators are installed in the flue gas pipes as shown in the diagram. The purpose of the turbulators is to introduce turbulence to the flue gases, causing more heat to be transferred to the boiler water.

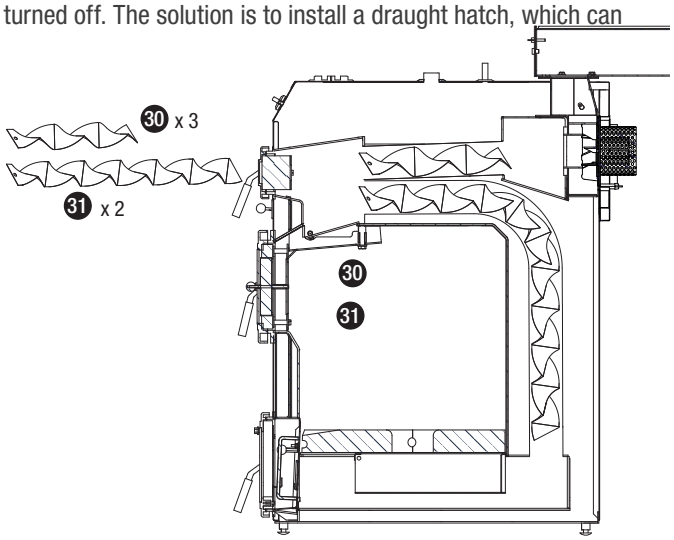
If the flue gas temperature falls too low (with a wide and long chimney), there is a risk of condensation in the flue duct. To increase the temperature, the three upper turbulators can be removed, or cut to a length that produces a suitable flue gas temperature The draught hatch is another way of reducing condensation problems.

Bracket for cleaning tool

The bracket for the cleaning tool can be fitted to either side of the boiler or any suitable place close to the boiler.

Draught hatch

An extremely high chimney and/or strong winds can create a draught that is strong enough to allow combustion with the fan turned off. The solution is to install a draught hatch, which can



reduce the draught to 0.04 - 0.06 in. water.

Pellet burner/oil burner

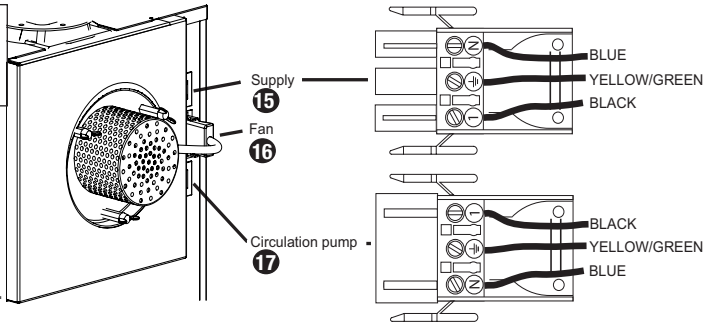
The Vedolux 37 is primarily designed to be fired by firewood, but can also be modified for pellets using a pellet burner.
When the pellet burner is used, the accessories supplied with the pellet hatch set must be installed:

- Hatch, designed for the Viking Bio pellet burner.
- Cover plate with draught hatch, instead of the fan on the rear of the boiler.
- Cover plates for the primary damper behind the plate on the front of the boiler.
- Cover plate for the secondary damper.

It is possible to install an oil burner in the pellet hatch set. Fittings

Electrical connection

Electrical installation must be in accordance with the applicable regulations, under the supervision of an authorised installer.



Electrical connection

The boiler is connected directly to the mains.

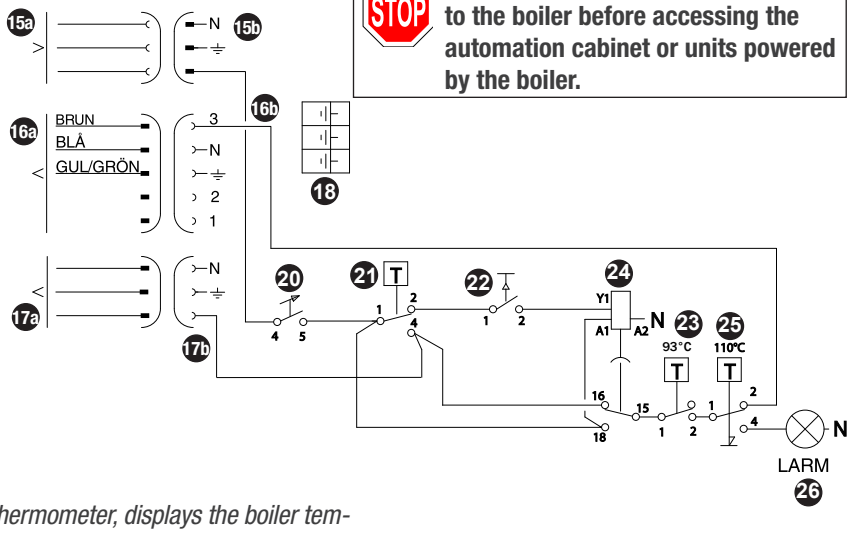
The electrical connections are at the rear of the boiler, in the form of three quick connectors:

15. Mains connection, 115 V~, cable with quick connectors supplied.
16. Fan.
17. Circulation pump, for charging the accumulator system.

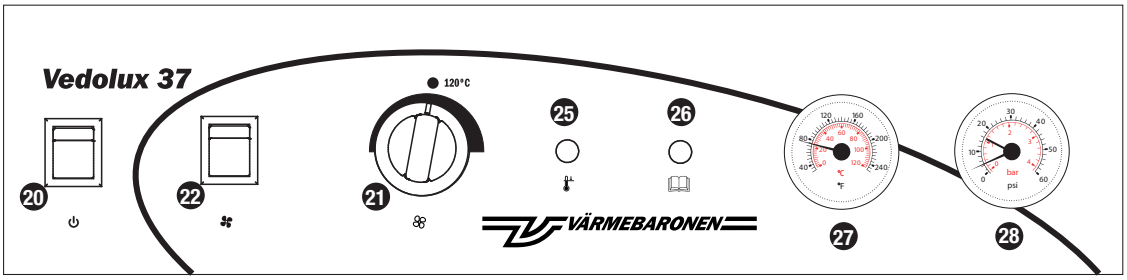
Wiring diagram and control panel

15. Supply connection, 3-pole connector.
a. cable part, socket.
b. chassis part, plug.
16. Fan connection,
5-pole connector.
a. cable part, plug.
b. chassis part, socket.
17. Connection for charging pump, 3-pole connector.
a. cable part, plug.
b. chassis part, socket.
18. Terminal block for internal earth connections.
20. Main switch.
21. Thermostat for fan and charging pump.
22. Fan start, cold boiler.
23. Limit thermostat.
24. Time relay, delayed cutoff.
25. Overheating protection.
26. Indicator showing triggered overheating protection.

Always disconnect the power supply to the boiler before accessing the automation cabinet or units powered by the boiler.



27. Thermometer, displays the boiler temperature.
28. Pressure gauge showing the water pressure in the heating system.



Function

Start with the boiler cold.

Set the main switch, 20, to the ON-position – the green area must be visible.

Set the thermostat, “FAN STOP”, 21, to 120° (250°F). The thermostat detects the flue gas temperature.

Press “FAN START”, 22, the time relay, 24, is activated and the fan starts.

When the time set for the time relay, 30 minutes, is reached, the contact changes, which means that the fan and the charging pump for the accumulator system are controlled by the thermostat, 21.

When the firewood is burnt out and the flue gas temperature falls below the value set for the thermostat, 21, the fan and charging pump stop running.

If the boiler temperature exceeds 220°F, the overheating protection is triggered. The fan stops running and the charging pump continues to operate. If the overheating protection, 25, is triggered, the “ALARM” indicator, 26, is lit.

An thermostat limits the boiler’s working temperature.

Checks

After installation, check with the installer that the system is in perfect condition.
Ask the installer to demonstrate the settings and functions so you know how to operate and care for the system.

Checks

Before putting the system into operation, check that:

- the system is filled with water
- all connections are watertight
- flue gas connections to the boiler and to the chimney are tight
- the filling/drain valve has been closed properly.
- the safety valves are working correctly
- the necessary valves are open
- the circulation pump is working and the direction of flow is correct
- the correct temperature has been set on the charge thermostat

Firewood

Firewood as a fuel

Vedolux 37 has a ceramic grate and an afterburning chamber made of high-temperature resistant stainless steel. The boiler works on the principle of reverse combustion. If the boiler is correctly operated, it burns firewood and gases very effectively, with high efficiency and low environmental impact.
Using firewood as a fuel is not simply about burning the wood – the techniques used have a decisive effect on the result.

Firewood

Hardwoods generally have a higher energy content than conifers. However, the most important thing is that the wood must be dry – moisture content 12-25 %.
If the wood is damp, much of the energy is wasted on drying it out, combustion is impaired and the risk of tarring increases.

Oak should be well dried, for more than three years, and or mixed with other wood types to avoid the negative factors of high acidity.

The blocks of wood must be the correct size for the combustion chamber, around 20 in. long and around 6 in. wide, allowing three blocks to fit the width of the grate.

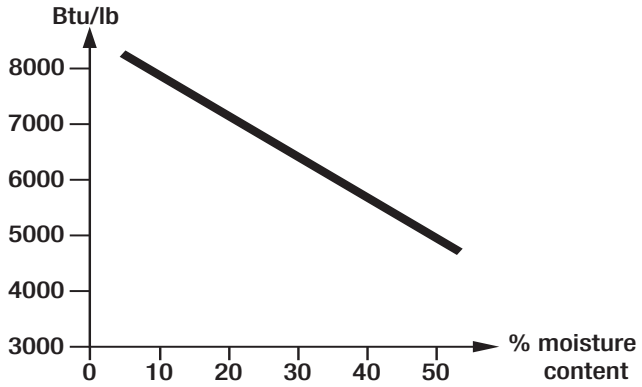
To allow the wood to dry out, the tree should be felled at least one season in advance. An alternative method is to fell the tree in spring just after the leaves have come out, then wait a few weeks before trimming and splitting the wood. During these weeks, the leaves wilt and draw out the moisture. After another few weeks of drying, the wood has 25-30 % moisture content.

After cutting, the wood must be split. The more it is split, the faster and easier it will dry. If logs are difficult to split, the bark can be stripped to speed up drying. Fresh wood is easiest to split.

The wood should not be in direct contact with the ground, as this causes the wood to take on moisture instead of drying out. Ideally the wood should be kept under a roof but in a place where the sun and wind can help dry it. The best place for final drying is the boiler room, for 2-3 weeks before the wood is used. The moisture content after drying is around 20 %.

Heat content

The heat content is the amount of heat that can be extracted by the boiler and transferred to the boiler water. Heat content should not be confused with energy content, which increases with the size of the block of wood. The heat content increases with the dryness of the block of wood, because less heat is wasted on drying the wood. Newly cut wood has a moisture content of around 55 %. Firewood that has been dried out following our instructions has around 20 % moisture.



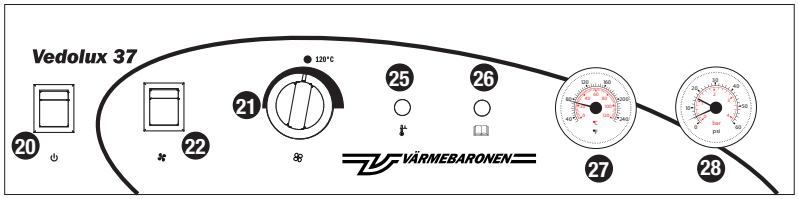
The chart illustrates how the heat content changes.
If a building uses 880 ft^3 of newly cut firewood (55 % moisture), around 495 ft^3 of water needs to be dried through the chimney. In other words, the energy needed to vaporize 3700 gal is wasted. Other problems using damp wood include poor combustion and dirty emissions, which in turn impair efficiency.

First burning cycle

In the first burning cycle, or if the boiler has not been used for a while, it is important to just light a small fire. The ceramic parts of the boiler may contain moisture, which must be vaporized slowly so as not to crack the ceramic. Once the ceramic parts are dry, you can light a full-size fire. The ceramic does not take on moisture when the boiler is being used. See “Operation and care”.
This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

DO NOT BURN:
(1) Garbage;
(2) Lawn clippings or yard waste;
(3) Materials containing rubber, including tires;
(4) Materials containing plastic;
(5) Waste petroleum products, paints or paint thinners, or asphalt products;
(6) Materials containing asbestos;
(7) Construction or demolition debris;
(8) Railroad ties or pressure-treated wood;
(9) Manure or animal remains;
(10) Salt water driftwood or other previously salt water saturated materials;
(11) Unseasoned wood; or
(12) Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.”

Firewood as a fuel



20. Main switch.
21. Thermostat for fan and charging pump.
22. Fan start when the boiler is cold.
25. Overheating protection.
26. Indicator showing triggered overheating protection.
27. Thermometer, displays the boiler temperature.
28. Pressure gauge showing the water pressure in the heating system.

Startup

1. the bypass damper must be in the closed position.
2. place kindling in the boiler, with paper if you are using it.
3. the main switch must be set to on (the green area must be visible).
4. thermostat, FAN STOP, set to 120°C (250°F).
5. press “FAN START”, the fan starts.
6. light the boiler – gas is recommended.

First burning cycle

The first fire to be lit should be started carefully so that any remaining moisture in the ceramic can vaporise slowly. Lighting a fierce fire may crack the ceramic Only light a small fire the first time. Once the ceramic parts are dry, you can light a full-size fire. The ceramic does not take on moisture when the boiler is being used.

Lighting - start

- Place kindling in the boiler, followed by crumpled newspaper.
- Press “FAN START”, the fan starts. Light the paper. Leave the firewood hatch slightly open.
- Wait a while before closing the firewood hatch. The wood must have properly ignited (flue gas temperature approx. 250°F). Leave it to burn until there is a layer of vigorous embers.

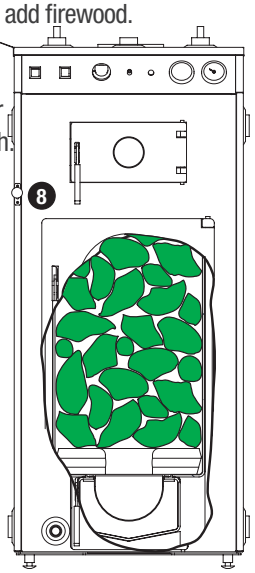
Lighting a fire with the gas lighter

- Arrange medium size blocks of wood over a layer of kindling, then fill the rest of the combustion chamber with large blocks.
- Close the firewood hatch.
- Ignite the gas lighter and insert it into the nozzle in the hole at the top of the inner ash hatch. Move the flame from side to side, and the wood should have ignited after about a minute.

Adding wood

When the time comes to add more wood, open the bypass damper before the firewood hatch. This prevents smoke entering the room and the risk of flames exiting the boiler when you add firewood.
Even out the layer of embers. Add more firewood. The amount of firewood added depends on the temperature in the accumulator – do not allow the temperature to get too high. Filling the boiler with firewood increases the temperature of the boiler and a 400 gal. accumulator by about 110- 120°F. Stack the wood carefully.
Close the firewood hatch followed by the bypass damper.
If the flue gas temperature increases, you know that the firewood has ignited.

When the firewood has burnt and the flue gas temperature has fallen to below 250°F, the fan and charging pump to the accumulator stop running.



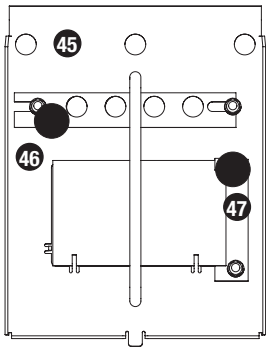
STOP

RISK OF BURNS
Do not open the boiler hatches if the fan is not running and a fire is burning in the boiler. If you are not sure whether a fire is burning in the boiler, first open the bypass damper then open the firewood hatch a couple of centimetres very carefully.
There is a risk of flames exiting through the hatch, so take the greatest possible care!

Bypass damper

The boiler’s bypass damper must only be used for adding wood during a burning cycle, in order to prevent smoke entering the room. When the bypass damper is open, the boiler works like an updraught burner with shorter flue gas paths. This increases the flue gas temperature and reduces efficiency.
Do not forget to close the damper after adding firewood!

Controlling combustion



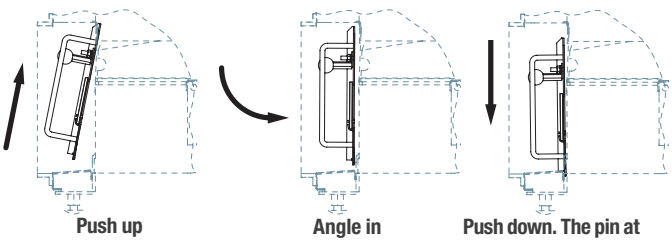
All air passes into the boiler through the draught hatch in the ash hatch. Combustion is controlled by the draught created by the fan, and by the addition of oxygen in primary, secondary and tertiary air through the inner ash hatch. To optimise combustion and efficiency, the flue gas temperature should be 350- 400°F.

45. Hole for gas lighter.
46. Secondary damper, normally closed.
47. Tertiary damper.

The tertiary air, 47, can be adjusted so that the flame is light yellow. The soot indicates the quality of combustion. If it is very dark or black, the combustion process is not receiving enough air. In this case, the damper should be opened more. Efficient combustion gives the soot a grey-brown colour. If you are burning wood with a moisture content of 18%, the opening should be about 4 mm. The smoke from the chimney shall (except for the start-up phase) be white or invisible during the combustion, if the smoke is dark or yellow it is an indication that the combustion is poor or that the fuel is improper for the boiler.

Inner ash hatch

The diagram below shows how to insert the inner ash hatch. Follow the steps in reverse to remove it.

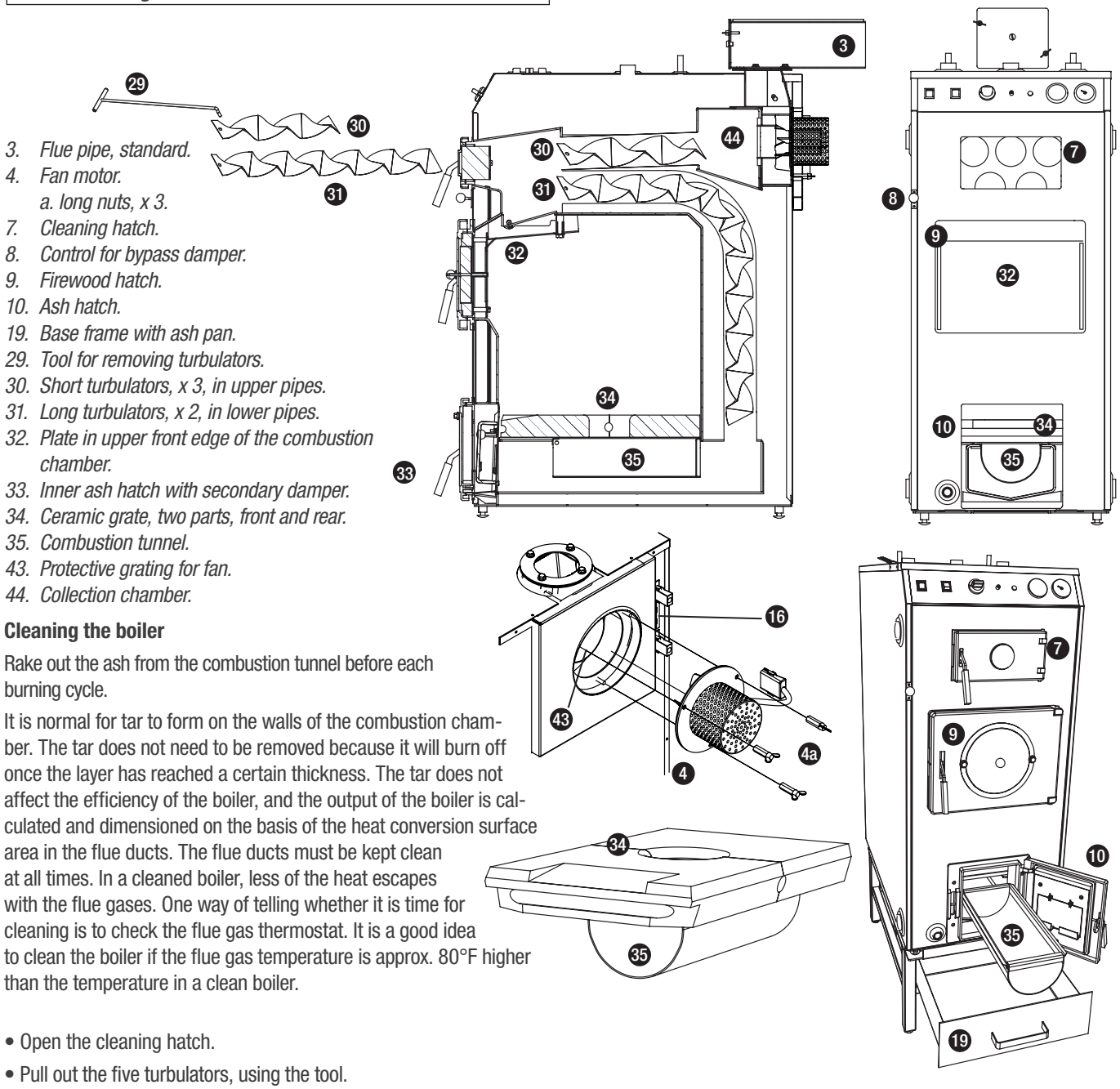


Push up | **Angle in** | **Push down. The pin at the bottom of the ash hatch engages with the hole in the ash plate.**

Cleaning

When cleaning, do not leave any remains of wood or embers on the grate.
Disconnect the power supply to the boiler before cleaning.

Ashes may contain embers for a long time after the burning cycle, so keep them in a non-flammable container with a cover.



3. Flue pipe, standard.
4. Fan motor.
a. long nuts, x 3.
7. Cleaning hatch.
8. Control for bypass damper.
9. Firewood hatch.
10. Ash hatch.
19. Base frame with ash pan.
29. Tool for removing turbulators.
30. Short turbulators, x 3, in upper pipes.
31. Long turbulators, x 2, in lower pipes.
32. Plate in upper front edge of the combustion chamber.
33. Inner ash hatch with secondary damper.
34. Ceramic grate, two parts, front and rear.
35. Combustion tunnel.
43. Protective grating for fan.
44. Collection chamber.

Cleaning the boiler

Rake out the ash from the combustion tunnel before each burning cycle.

It is normal for tar to form on the walls of the combustion chamber. The tar does not need to be removed because it will burn off once the layer has reached a certain thickness. The tar does not affect the efficiency of the boiler, and the output of the boiler is calculated and dimensioned on the basis of the heat conversion surface area in the flue ducts. The flue ducts must be kept clean at all times. In a cleaned boiler, less of the heat escapes with the flue gases. One way of telling whether it is time for cleaning is to check the flue gas thermostat. It is a good idea to clean the boiler if the flue gas temperature is approx. 80°F higher than the temperature in a clean boiler.

- Open the cleaning hatch.
- Pull out the five turbulators, using the tool.
  Clean the pipes with the pipe brush.
  When cleaning the three upper pipes, be careful not to push the pipe cleaner through the grating, damaging the fan. Do not push the pipe cleaner further than the end of the pipe. You can feel when you have reached the end from the difference in the amount of force needed to push the cleaner.
  Replace the turbulators.
- Open the firewood hatch and the bypass damper.
  Remove the ash on the plate in the upper front edge of the combustion chamber. There should always be a small quantity of ash on the ceramic grate in order to extend the service life of the grate.
- Open the ash hatch and remove the inner ash hatch.
  Rake out the ash from the combustion tunnel but leaving a protective layer of a couple of centimetres.
  Clean the chamber around the combustion tunnel.
  Close all hatches and dampers.

Chimney sweeping

After the chimney has been swept, unscrew the wingnuts on the front of the flue pipe, 3 and 18, and remove the cover. Remove soot and ash. Before restarting the boiler, remove any soot and ash that has fallen onto the fan and into the collection chamber 44.

Cleaning the fan

If necessary the fan can be removed and cleaned, You should handle the fan with care.

- Remove the fan connector, 16, from the boiler plug.
- Unscrew the long nuts, 4a, securing the fan.
- Clean the fan blades carefully so they keep their shape. You are recommended to use a paintbrush.
- Replace the fan and connect the cables.

Operation and care

Ceramic - combustion tunnel

The ceramic grate and combustion tunnel are wearing parts that will have to be replaced over time. Wearing parts are not covered by any guarantee. Small cracks in the ceramic are not abnormal and no action is necessary.

To increase the service life of these parts, follow these instructions:

- Do not remove the ceramic when cleaning the boiler combustion chamber.
- Scrape the ceramic gently and carefully when removing ash from the boiler.
- Leave a couple of centimetres of ash as a protective layer on the grate and the combustion tunnel.
  Pieces of charcoal from the previous burning cycle can be left for the next cycle.
- Only use “real” wood, avoiding plastic, treated timber, refuse, etc.
- Place the wood in the boiler, do not throw it in.
- If the boiler/ceramic is new or if the boiler has not been used for a while, light a small fire to heat the ceramic and remove any moisture.

Safety valves

In order to preserve the safety function, the safety valves for the domestic hot water system and the heating system must be operated regularly, around four times a year.

Open and close the safety valve manually around four times a year, checking that a small amount of water escapes and that the valve closes again properly.

Also check that there is sufficient pressure in the system. If necessary, add more water.

Venting

Regularly check that there is sufficient water in the heating system.

Air may remain in the system for a while after installation, so bleeding should be repeated a few times. After bleeding, check the pressure and add water if necessary.

Water pressure in the system

The pressure required in the heating system depends on the height difference between the lowest and highest points in the system, the static head. If the difference is 16.4 ft., the pressure is 7.3 psi, if it is 32.8 ft., the pressure is 14.5 psi.

The necessary pressure in the heating system depends on the height difference between the highest and lowest points in the system, the static head.

The pressure in a heating system varies with the temperature, so only add water if it is necessary.

The volume of water changes with the temperature, and the change in volume affects the pressure in the system. The higher the temperature the greater the volume and the higher the pressure. The expansion vessel takes up the changes in volume. The flow temperature – and therefore also the pressure – is higher in the summer than the winter.

Unvented expansion system

The pressure in the unvented expansion vessel should be checked at intervals of several years. The vessel must not be exposed to any pressure from the heating system.

Overheating protection

The overheating protection, which stops the fan if the boiler temperature is too high, is reset on the boiler control panel. It is not possible to reset until the boiler temperature has dropped below 200°F.

If there is a risk of freezing

In severe cold weather, no part of the heating system should be turned off as this would involve a risk of burst pipes.

Never start a burning cycle if you suspect that any part of the heating system might be frozen. Call the installer.

If the heating system will be turned off for an extended period, the water should be drained.

Draining the boiler

The boiler must not be running while it is being drained.

Close the valves to the heating system.

Run the water to a floor drain via a hose connected to the boiler drain valve.

Allow air into the system by opening the boiler safety valve.

The drain valve for the heating system must be located in a convenient place.

Boiler cleaning

Keep the boiler clean and tidy.

Alkaline cleaning agents are useful for removing soot marks from the boiler. Do not use strong solvents.

Pellet burner

For optimum reliability and efficiency, it is essential to check and adjust the burner regularly.

Power failure

If there is a power failure, the fan will stop and the output of the boiler will fall. In around 20 minutes, the output drops from 100% to approximately 10%. If Värmebaronen’s instructions were followed when the accumulator tanks were connected, this output can circulate naturally to the accumulator tanks.

RISK OF BURNS
Do not open the boiler hatches if the fan is not running and a fire is burning in the boiler. If you are not sure whether a fire is burning in the boiler, first open the bypass damper then open the firewood hatch a couple of centimetres very carefully.

There is a risk of flames exiting through the hatch, so take the greatest possible care!

Problems burning firewood

Poor combustion.	Damp wood.	A ceramic boiler requires a high combustion temperature. To achieve this, the wood must be dry, moisture content 12- 25%.
	Incorrect handling.	Read the instructions.
	The wood is not suitable for the boiler.	The firewood should be approx. 20 in. long, with a width allowing three blocks to fit the width of the grate.
	Constant “topping up”	Constant “topping up” lowers the combustion temperature and reduces the boiler output.
	Shaped wood, rectangular wood.	If uniform blocks of wood are stacked on each other, a sold mass of wood is created with limited surface area for the fire to act on. Arrange the wood so there are gaps between the blocks.
	Fails to burn.	The wood is bent and/or not suitable for the boiler. This is not the same thing as the firewood burning to a different extent in different parts of the boiler, which is normal.
	Not enough air.	Check that the air valve is open. The fresh air intake of the boiler room must have at least the same cross sectional area as the flue duct.
	Damper too open.	If the damper is too open, the air will not be correctly distributed in the boiler. Start with the damper fully closed.
	The chimney runs downwards from the boiler connection.	The turbulence created takes away some of the draught. Fill the lower part with sand or similar material.
	No accumulator control.	A ceramic boiler is at its most efficient when the ceramic is hot. The temperature in the boiler therefore needs to be increased quickly before charging begins. The service life of the boiler is shortened if there is no control system. Add a control system.
	Ceramic not correctly positioned.	If the boiler is new, check that the ceramic has not moved during transport. Also check the seal with the combustion chamber walls.

High flue gas temperature.	Tar and soot in the pipes.	Incorrect combustion. Check the firewood, the draught, the air intake and the handling. Clean the boiler.
	Bypass damper open.	Close the damper. The bypass damper must only be opened for adding wood.
	Combustion tunnel in wrong position.	The combustion tunnel must be inserted fully.
	Faulty flue gas thermometer.	The thermometer may have been damaged by cleaning or by long periods of up draught burning.

Tar and soot in the pipes.	Incorrect combustion.	See the section about high flue gas temperature.

Heat is not transferred from the boiler to the accumulator.	Wrong connections.	Check.
	Circulation pump in accumulation control.	Check that the pump is operational. Most pumps have a speed control – check that the speed is not too low.
	Air.	Vent. Check the installation. If installation is carried out according to “Connection to accumulator system”, the system will not be sensitive to air problems.
	Wrong connection of accumulator.	See the points above.

Boiling noises.	Low pressure head.	Check the pressure, which should be about 14.5 psi. The expansion vessel must be dimensioned for the volume and for the temperature variations that occur.

Fan fails to start.	Main switch in position 0.	Set the main switches to position I.
	Forgotten to connect the instant connector.	Connect the instant connector.
	Overheating protection triggered.	Reset the overheating protection.

The safety valve opens when the system is warm.	Expansion vessel too small.	See the section about the “Expansion system” on page 5.
	Initial pressure in the expansion vessel too high/low.	Check the pressure in the vessel, see the section about the “Expansion system”.

Component specification

item	prod.no.	name	qty.
25	12 00 17	Overheating protection 1-pole, alt. 110°C	1
21	12 00 53	Thermostat 1-pole 100-500°C	1
23	12 00 06	Limit thermostat	1
	12 00 09	Handle thermostat	1
22	13 00 31	Switch 2-pole, auto-return	1
20	13 00 32	Switch 2-pole	1
18	16 00 01	Terminal block 3-pole	1
	16 00 06	End plate	1
24	17 00 22	Time relay	1
26	19 00 06	LED 230 V, red, pin	1
	23 00 75	Damper arm	1
	23 00 76	Damper arm lock	1
31	23 22 52	Turbulator 1000 mm	2
30	23 22 53	Turbulator 436 mm	3
	24 00 10	NPT G15 (½")	1
	24 00 11	NPT G25 (1")	2
	24 00 12	NPT G32 (1¼")	2
	24 40 25	Bushing, brass, G25/20	1
	24 55 05	Safety valve, 1,5 bar (21.76 psi)	1
11	24 03 50	Drain valve. R15ext	1
5	29 50 05	Cleaning tool bracket	1
	30 00 09	Glass fibre cord 6mm (m)	0.6
	30 00 11	Glass fibre cord 10mm (m)	1.4
	30 00 30	Ceramic fibre paper 1x25mm (m)	2
34	3104 00	Grate front, V-37	1
34	31 04 01	Grate rear, V-37	1
9	32 00 07	Firewood hatch	1
10	32 00 18	Draught hatch, V-37	1
	37 00 60	Handle knob 25 mm	2
28	38 00 11	Manometer	1
27	38 00 10	Thermometer	1
	38 00 30	Flue gas thermometer 50-500°C	1
	44 00 02	Pipe cleaner 89 mm	2
	44 00 05	Pipe cleaner 595x80x60/30mm	1
	44 00 11	Spring steel shaft 1500 mm	2
15b	44 01 53	Inlet 3-pole female	1
	44 01 54	Panel fixing 3-pole	2
17a	44 01 59	Plug 3-pole	1
16b	44 01 66	Outlet 5-pole for panel	1
16a	44 01 67	Plug-on contact 5-pole	1
17b	44 01 68	Inlet 3-pole male	1
15a	44 01 69	Plug 3-pole	1
	44 02 25	PowerJet gas lighter	1
4	50 00 11	Fan V-37F	1
	70 00 75	Insulation for cover of flue gas fan	1
	70 00 86	Fan gasket	1
	71 01 90	Base plate of ash hatch	1
35	71 01 95	Combustion tunnel	1
	71 01 98	Bypass damper	1
	71 02 00	Damper arm	1
	71 02 57	Inner ash hatch	1
29	71 02 60	Turbulator tool	1
	71 02 61	Inner damper of draught hatch	1
	904 56	Ash rake	1
7	909 21	Cleaning hatch	1
	71 11 33	Flue pipe	1

Weight, empty	705 lb
filled with water	970 lb
Volume	32 gal
Pressure, design	22 psi
test	31 psi
Pressure drop, water flow 0.14 gal/s	0.145 psi
Temperature, design	220 °F
operating max	220 °F
Output wood, moisture content 16 ±4%	126 kBTU
Output, pellets	143 kBTU
Combustion chamber, volume	29.9 gal
depth	21.7 in
Wood, length	20 in
diameter	6 in
Burning cycle, combustion chamber full, moisture 16±4%	2.5-3 h
Firewood hatch, w x h	11.4 x 9.3 in
Chimney requirement, height	11.5 ft
flue duct recommended	Ø 5.71 in 25.6 in2
flue duct min	Ø 4 in 12,6 in2
	draught
0.04 in H2O	
Flue gas temperature	355 °F
Voltage	115 V, 60 Hz
Current	0.3 A
Protection class	IP 21
Boiler group as per EN 303-5	3

UL391, CSA-B366.1, ETLM78-1
Certified by Guardien Fire Test Labs
Tested according to method 28 WHH PTS

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