ARITERM

INSTALLATION, OPERATION AND MAINTENANCE

- Ariterm Vedo

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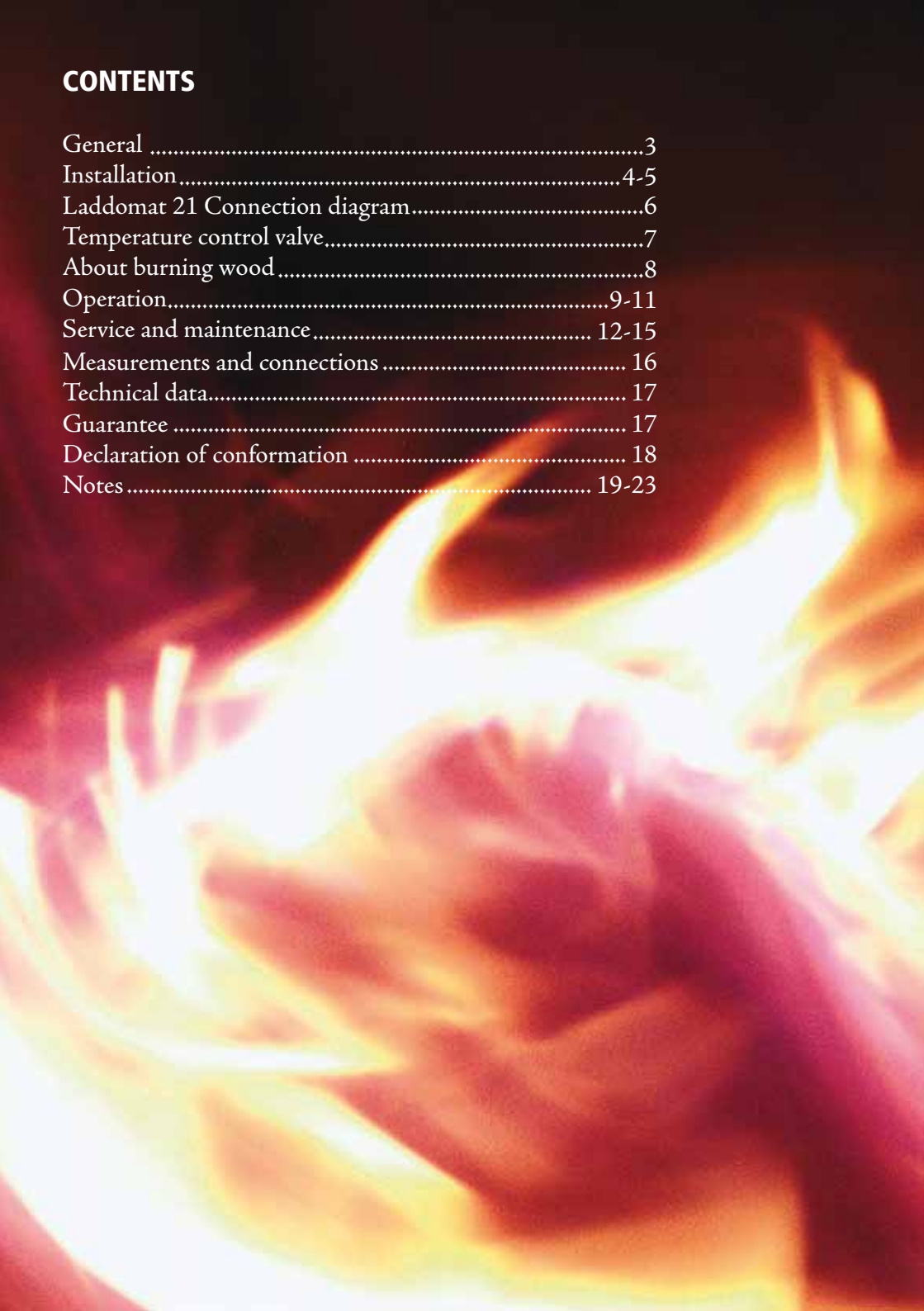


GENERAL

Ariterm Vedo is an efficient, modern wood-fired boiler, which can also be equipped with a pellet or oil burner. It complies with the newest pollution and efficiency requirements laid down in D8. The boiler also meets the safety requirements laid down in EN 303-5.

Due to the boiler's excellent burning properties and good insulation, it is highly efficient and has low environmental emissions. Carefully designed convection channels store the heat efficiently. Vedo should be connected to a warm water accumulator.

In proportion to its efficiency, Vedo is small and therefore easy to fit in available spaces. The boiler room is not required to have the highest fire safety classification; EI 30 is sufficient. To make optimal use of the boiler's properties, it is important to follow the instructions provided in this manual.

The firewood used in Vedo should be at most 0.5 m long. Vedo is a reverse combustion boiler in which wood is combusted in a firebox lined inside a water jacket upon a ceramic grate. The fuel gasifies on the ceramic grate. The gas compounds burn at a high temperature in the bottom part of the boiler, in a afterburning chamber which is made of fireproof material. The boiler does not have its own water tank, as it must be connected to a warm water accumulator to operate properly. Instead, the boiler has a cooling spiral, on which a temperataure control valve is installed to prevent overheating. It also has an exhaust fan that enables even combustion, and there is no height requirement for the chimney.

TRANSPORTATION, STORAGE AND OPENING THE PACKAGE

Receiving the goods

The boiler is delivered in a wooden frame. On the bottom is a pallet, which can be used to lift the boiler safely. It is advisable to open the package as close as possible to the installation location. The factory insures the boiler against transport damage, which includes transport from the factory to the first intermediate storage point. It is important that whoever receives the boiler should check its condition before accepting it. In cases of damage, the seller must be contacted immediately.

Storage

The boiler can be stored in the open air if protected from rain, but storage indoors is recommended.

Opening the package

After opening the package, open up all the hatches and check the equipment to see that all loose equipment has been supplied. Disposal of packaging: plastic cover can be recycled, wooden planks can be burned.

INSTALLATION

Installation of the boiler can only be done by a company or individual with the necessary professional accreditations. Installation should be performed so that it meets the minimum requirements of the SFS 3332 standard. Electrical and burner installations must be done only by a qualified company or individual.

Space requirements

An area of 1 metre must be reserved in front of the boiler for cleaning and maintenance procedures. Plumbing connections are located on top of the boiler with the exception of the return from the accumulator, which is on the side.

Flue connection and combustion air opening

The boiler can be directly connected to a vertical flue. The seams can be sealed with 350 °C silicon paste. If the flue is made of bricks, use the supplied square elbow to connect the boiler. Flue requirements: Minimum Ø 140 mm, and for a masonry flue, free cross-sectional area of at least 200 cm^2. If an oil burner is used as well, the flue requirement is a brick flue lined with acid-proof thin-walled pipe tube or an acid-proof flue element. The free surface area of the combustion air opening must be 1.5 times the diameter of the flue. The combustion air opening must never be covered.

Flue gas fan

The Vedo has versatile assembly options that allow it to be fitted with different chimney solutions. The standard delivery always includes a flue gas fan. The standard connection to the chimney is straight up (image 1). Make sure to leave enough space for cleaning when installing the pipe. A chimney elbow piece also comes as a standard accessory. It allows the boiler to be connected to a brick chimney (image 2).

Pic 1

Pic 2

INSTALLATION

Plumbing connections

Before installation of the boiler, the heating system must be flushed and a water pressure test carried out. The tightness of connections must be ensured after installation. The factory is not responsible for damage caused by leaking connections.

Relief valve installation

The pressure relief valve must be CE-approved with a maximum opening pressure of 1.5 bar and a minimum size of DN 15. It must correspond to the highest pressure class of the equipment assembly. Between the valve and the boiler, no equipment may be installed, the connection of which could be closed. The exhaust pipe must be dimensioned and installed so that it neither restricts the exhaust efficiency of the relief valve, nor causes a hazardous situation when the valve is working.

The capacity of the expansion vessel must correspond to the greatest possible fluid volume change in the boiler system. In periodic heating, the expansion capacity must be approximately 10% of the system volume. We recommend that only a closed system is used (membrane expansion vessel).

Filling the system

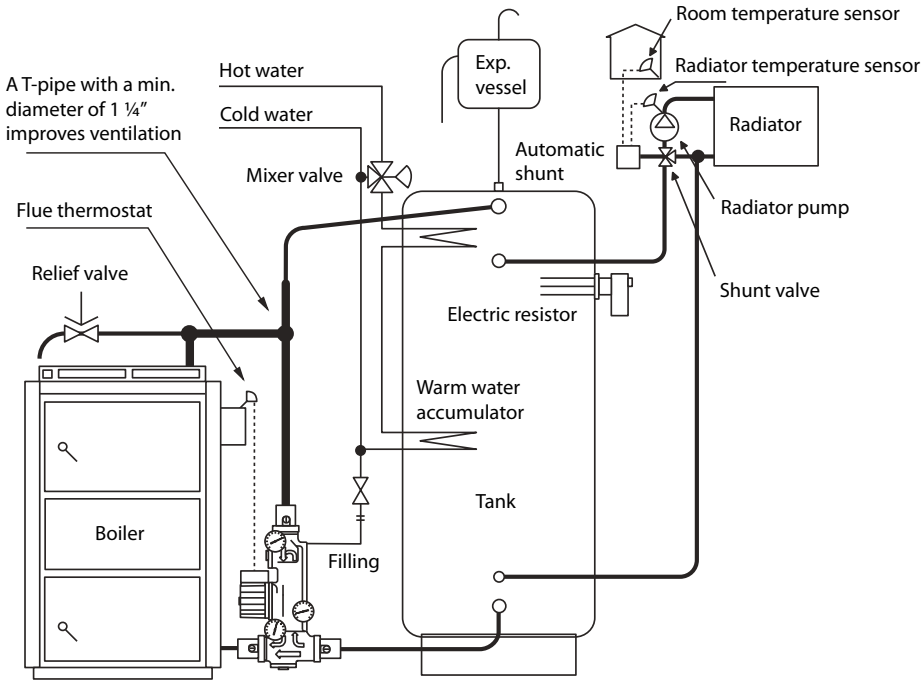
Before heat is turned on, the storage tank and heating system must be filled with water.

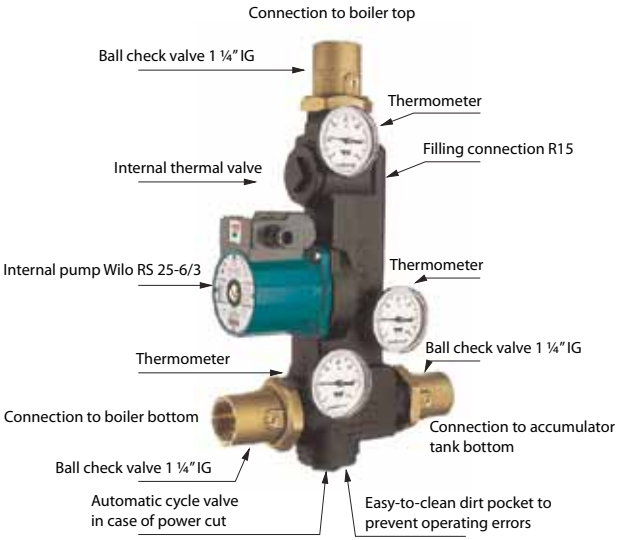
Instructions for filling

- Open all shutter valves, including the four-way mixing valve.
- The pump must be switched off. Fill in the heating system.
- Remove air through the accumulator and radiators.
- When the system is filled, you can switch on the circulation pump and start heating.
- When the water in the boiler has reached the set operating temperature, switch off the pump and remove air from radiators again. This has to be repeated a few times.

Since there is a lot of air in the water at the start (up to 10%), it is normal for the pressure to drop as air leaves the system. Therefore it may be necessary to add water on several occasions when operating the boiler. The temperature of water returning to the boiler should be around 70°C, which is achieved through a by-pass connection illustrated in the connection diagram. A sufficiently high boiler temperature throughout the operation keeps the convection surfaces clean and achieves highly efficient combustion. This also enables a long service life for the boiler, since no corroding acids will form on the fire surfaces.

CONNECTION DIAGRAM





TEMPERATURE CONTROL VALVE

The Ariterm Vedo boiler must be installed in connection with a warm water accumulator. This improves its functionality and extends its life span substantially.
By installing the boiler as presented here, it is possible to make the boiler temperature rise quickly and to maintain a steady, high temperature when the boiler is being used. The fact that water is layered in the accumulator ensures a quick supply of warm water soon after heating starts. The heating circuit and household water circuit are connected to the accumulator.

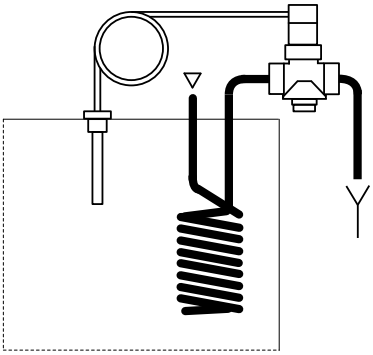
Installing a temperature control valve to wood-fired boiler with a cooling spiral

The Pressure Equipment Directive requires that manually-filled wood-fired boilers must be equipped with a safety device, which prevents the boiler from overheating. We recommend the SYR 3065 temperature control valve for this boiler. This does not, however, replace other safety devices, such as a pressure relief valve.

Installation

The temperature control valve is connected to the cooling spiral so that, when the valve is activated, it sends hot water down the drain. The temperature sensor is installed on the sleeve on the upper part of the boiler, using a DN 15 x 150 well.

TECHNICAL DATA	
Max pressure of incoming water	10 bar
Opening temperature	97° C
Temperature control valves are available from Ariterm	Product Number 5012921



ABOUT BURNING WOOD

Before starting the boiler, check the following:

- Heating network and boiler are filled with water, pressure at least 0.5 bar
- If there is a smoke pipe damper, make sure that it is open
- The heat supply pump is switched on
- The accumulator or network valves are open
- The combustion air outlet is open
- The relief valve is in unhindered contact with the boiler and is in working order.

Firewood

Fresh firewood contains 80–90% water during the growing season and 70% in winter. Wood must be allowed to dry before it can be combusted. It is best to fell the trees in winter when their wood contains less water. It is important to cut firewood to the appropriate length for the boiler's combustion chamber. Good firewood should contain no more than 15-25% water. Raw wood must be cut and split to a suitable size to allow it to dry well and fit in the firebox. If the wood is from a small tree and not split, strips of bark should be removed lengthways. Large, damp pieces of wood burn poorly and carbonise slowly. This causes a lot of tar and soot to form in the boiler and burns inefficiently. You can check the water content of wood by weighing it. Cut a test piece from freshly-cut wood. It is fit for combustion when its weight has decreased by about 60%. If the fresh piece of wood weighs 1,000 g, it is fit for combustion when it weighs 400 g.

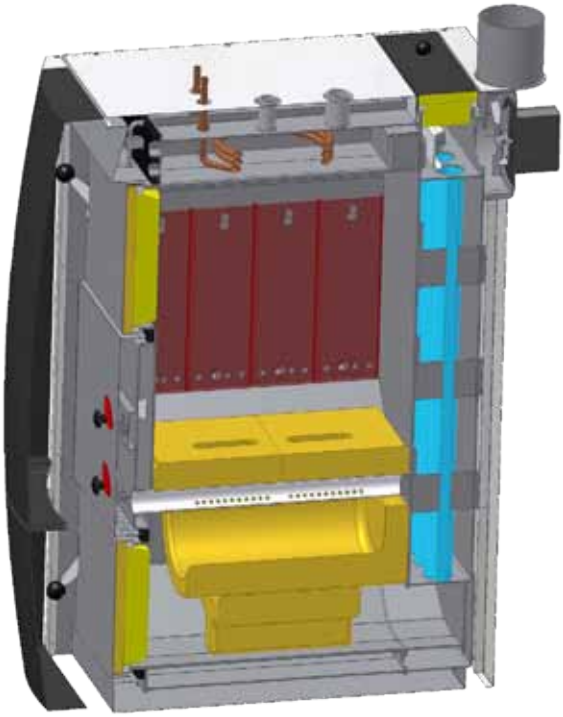
Burning

Wood is an organic material. Its combustible constituents are carbon and hydrogen. When wood heats up, these constituents are released and gasify. If the burning process is efficient (with sufficient primary and secondary air available), the combustion temperature rises sufficiently high to cause clean burning. Wood also contains some minerals, which result in impurities. In order to achieve good burning performance and energy production and as few polluting and sooty emissions as possible, bear the following in mind: Dry firewood. The water must evaporate before the wood is fit for combustion. If the water content is too high, the combustion is incomplete.

A sufficient supply of air and a sufficiently high temperature in the combustion chamber are needed. Appropriate air flow is important. If the wood is damp, a lot of heat goes to waste. Damp weather, a cold chimney pipe and insufficient cross-sectional flue surface area have a negative impact on the draft. A good supply of oxygen is required in the ignition stage to achieve a good layer of charcoal and efficient combustion.

The use of wood in the Ariterm Vedo

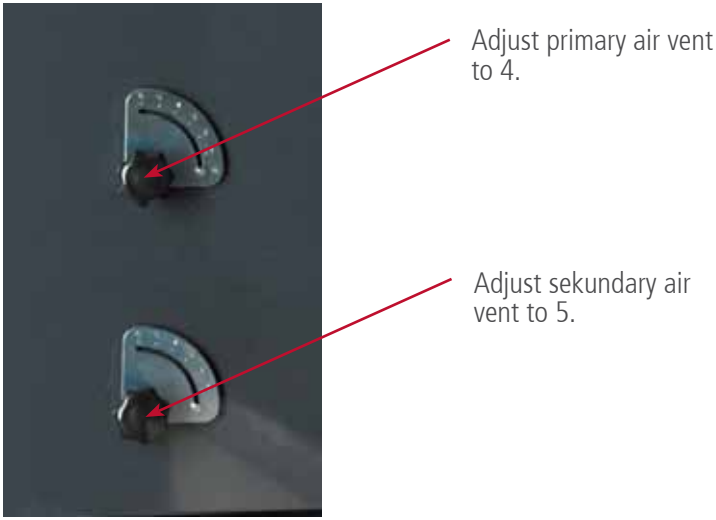
Ariterm Vedo is designed for the combustion of solid fuels in densely populated neighbourhoods. It has been tested and approved in accordance with the latest wood-fired boiler requirements. The approval requires both ceramic grates and transfer of heat into an accumulator. Ariterm Vedo is a reverse combustion boiler in which combustion occurs downwards through the ceramic grate.



OPERATION

Starting the fire:

- Open the smoke pipe damper. Adjust primary air vent to 4 and secondary air vent to 5 (on 1 to 7 scale).



- Start up the exhaust fan.
- Open the feeding hatch, which causes the fire door damper to open automatically.
- Stack with small firewood, enough to cover the bottom of the chamber.
- Apply kindling on top of the wood. Start a fire.
- Close the feeding hatch.
- When the fire is properly burning and a layer of charcoal has formed, fill the firebox up no higher than to the top of the air vents.
- After the fire is going well, adjust the secondary air vent approximately to position 2. Flue gas temperature should be 150…180°C

OPERATION

Adding firewood

Do not add firewood until after the first load has burnt down to a small amount of charcoal. Open the feeding hatch slowly to avoid a cloud of smoke caused by the carbon monoxide that may remain in the firebox. Add firewood. The amount of firewood should not be excessive so that the accumulator can capture all the thermal energy released from the wood. The maximum load of wood is to the top of the air vents.

Pellet use

Ariterm Vedo is compatible with an KMP PX21 pellet burner. Replace the stoking hatch with a hatch with an PX21 pellet stoker. If you use a pellet burner, remove the ceramic grates and secondary combustion chamber and close primary and secondary air vents. Specified instructions on the installation and use of the pellet burner come with the burner.

Oil use

Ariterm Vedo is also compatible with using oil as fuel. The oil burner is installed on the pellet burner hatch using an oil burner flange, which is available as an accessory.

Electric use

The boiler is not compatible with electric use. If electric resistors are required, they should be installed on the accumulator.

SERVICE AND MAINTENANCE

The boiler will function properly and have a long service life when the following matters are taken care of:

- The boiler should be located in a dry space.
- The boiler should always be operated within the recommended limits.
- The boiler should be cleaned up when the flue gas temperature has risen 20–30°C above that of a clean boiler.
- If any part is damaged, it must be replaced with a new one as early as possible.
- Check that condensation water or water from pipe leaks cannot damage the boiler.

Before each heating season

Check that the holes of the grate are unblocked and that there is no combustion residue left from previous use.

Also check and, if necessary, clean the blades of the flue gas fan. Remove ash from the secondary combustion chamber through the ash box door.

Once a week and as required in the heating season

Always clean the convector after the flue gas temperature has risen by 30°C from clean boiler value, or the draft has weakened.

Open the convector cleaning door.

Remove all turbulators.

Clean the boiler convector by brushing the convector pipes clean.

Make sure that the fire door damper opens and closes as you use the feeding hatch.

Make sure that the fire door damper closes when you close the feeding hatch.

Other maintenance procedures

Check that the hatch sits tightly. A leaky feeding hatch will cause wood to combust in the wrong place. Tighten the hatches by adjusting the lock handle and hinge pieces.

From time to time, you should check that the gap between the deflectors and the storage chamber is unblocked. Lift the deflectors from their supports to clean them. Also clean the walls of the storage chamber.

Adjustment of the hatches

The tightness of the hatches is important for the proper functioning of the boiler.

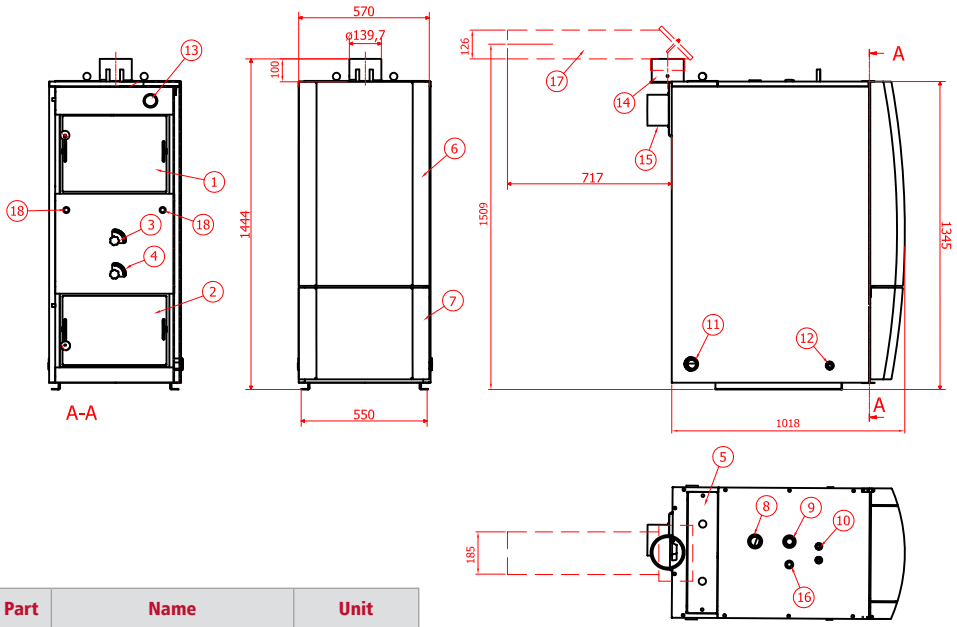
Adjusting the lock handle:

- Unscrew the screw of the lock handle enough to be able to turn the eccentric sleeve in the hole.
- Turn the sleeve to make the handle move away from the boiler. Tighten the screw slightly.
- Test whether the hatch now sits more tightly on the handle side.

Adjusting the hinge:

- Unscrew both mounting screws of the hinge piece enough to move the hinge.
- Move the hinge piece slightly in the direction of the boiler.
- Tighten the mounting screws slightly and test whether the hatch now sits more tightly on the hinge side.
- Once the hatch is sitting properly, tighten all the screws. If the adjustment tolerance on the hatch runs out, its seal will have to be replaced.

MEASUREMENTS AND CONNECTIONS



Part	Name	Unit
1	Feeding hatch	
2	Stoking hatch	
3	Primary air vent	
4	Secondary air vent	
5	Convector door	
6	Top door	
7	Bottom door	
8	Outlet to accumulator	DN 32
9	Expansion vessel outlet	DN 25
10	Cooling spiral	Cu 15
11	Return from accumulator	DN 32
12	Draining outlet	DN 15
13	Water thermometer / pressure gauge	
14	Flue connection	
15	Flue gas fan	
16	Control valve	DN 15
17	Horizontal flue pipe	
18	Burnet thermostat / sensor assembly	DN 15

TECHNICAL DATA

TECHNICAL DATA		
Capacity	With wood With pellets With oil	30 kW 30 kW 30 kW
Dimensions	Width Depth Height Weight (empty) Water capacity Flue connection	570 mm 1016 mm 1345 mm 415 kg 125 L diameter 140 mm (external)
Design values	Boiler pressure Permitted boiler temperature Size of warm water accumulator Maximum length of firewood	0,5-1,5 bar Max 20-120 °C 1100 – 2500 L 0,5 m

Guarantee

For Warranty Issues Ariterm Sweden AB refers to our local Distributor.

Removal from use

A boiler that has reached the end of its useful life can be used for scrap.

MANUFACTURES DECLARATION

ARITERM

VAATIMUSTENMUKAISUUSVAKUUTUS

Valmistaja: ARITERM OY
Osoite: PL 59, 43101 SAARIJÄRVI

Laite: **Ariterm Vedo**

Valmistaja vakuuttaa,

- että tämän kattilan valmistuksessa on huomioitu Euroopan yhteisön neuvoston painelaitedirektiivin (97/23/EY) olennaiset turvallisuusvaatimukset ja noudatettu seuraavia direktiivejä: Konedirektiivi 2006/42/EY, Pienjännitedirektiivi 2006/95/EY, EMC direktiivi 2004/108/EY.
- Vaatimustenmukaisuuden arviointimenettelynä on käytetty H - moduulia. (Ilmoitettu laitos 0424)
- kattila täyttää standardin EN 303-5 vaatimukset (luokka 3)

DECLARATION OF CONFORMITY - MANUFACTURERS DECLARATION

Manufacturer: ARITERM OY
Address: P.O.BOX 59, FIN-43101 SAARIJÄRVI

Equipment: **Ariterm Vedo**

Manufacturer assures,

- that in the production of the boiler the essential safety requirements of EC council's directive for pressure boilers (97/23/EY) have been complied with. Following directives have been applied: Machinery directive 2006/42/EC, Low voltage directive 2006/95/EC, EMC directive 2004/108/EC.
- As estimation method of conformity has been used H - module. (Notified body 0424)
- the boiler fulfill the requirements of standard 303-5 (class 3)

FÖRSÄKRAN OM ÖVERENSSTÄMMELSE - TILLVERKAREDEKLARATION

Tillverkare: ARITERM OY
Adress: P.O.BOX 59, FIN-43101 SAARIJÄRVI

Apparat: **Ariterm Vedo**

Tillverkare försäkrar,

- att vid tillverkningen av denna panna har man iakttagit väsentliga säkerhetskrav av EG rådets direktiv för tryckkärl (97/23/EY). Tillverkare har även iakttagit följande direktiven: Maskindirektiv 2006/42/EG, Lågspänningsdirektiv 2006/95/EG, EMC direktiv 2004/108/EG.
- Som värderingsmetod av överensstämmelse har använts H - modul. (notified body 0424)
- pannan uppfyller krav för EN 303-5 (klass 3)

Ariterm Oy, 9.3.2011

Petteri Korpioja
Toimitusjohtaja
Managing director
Verkställande direktör

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ARITERM

ARITERM SWEDEN AB | Flottiljvägen 15
39241 Kalmar | www.ariterm.se | 0771-442850

Inspectan arvioima Paineastia-valmistaja
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