

# ARITERM

INSTALLATION, OPERATION AND  
MAINTENANCE

♦ Ariterm Hybrid 20



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## ■ General

Ariterm Hybrid 20 is a multipurpose and modern multi-energy boiler. The boiler can be used with oil, gas, pellets or, as a secondary heating option, also with logs. Ariterm Hybrid 20 meets the latest emission and efficiency requirements. The boiler also meets the EN 303-5 safety requirements. The boiler is equipped with a 3+6kW electrical resistance as standard (NOTE! 6 kW factory activated).

The boiler room is not required to meet the highest fire classification, EI 30 is acceptable. In order to benefit from all the boiler features, it is important to follow these instructions.

Logs sized 0.33m are suitable for the boiler furnace. The boiler is equipped with an efficient domestic water coil. The boiler is equipped with a domestic water coil, which can be connected to a safety valve in order to prevent overheating. Ariterm Hybrid comes with an optional flue gas exhauster for use with solid fuel to achieve steady burning. There is no height requirement for the flue pipe. There is a charge coil (hot gas coil) on the lower part of the boiler. A solar collector or a water/air heat pump can be connected to the coil.

## ■ Transport, storage and unpacking

### Receipt and acceptance

The boiler is delivered in a wooden frame. The base is a platform, which can be used to lift the boiler safely. The package should be unwrapped as close to the installation site as possible. The factory has insured the boiler against damage during transport from the factory to the first intermediate storage site. It is important for the person who receives the boiler to verify the state of the boiler before its acceptance. In cases of damage, the dealer must be contacted without delay.

### Storage

The boiler can be stored outside under a rain cover, but the preferred option is to store it inside.

### Opening the package

After opening the package, open the hatches and check the accessories list to make sure that all loose accessories are contained in the package.

Disposing of the package: The plastic cover is recyclable and the boards can be burned.

# ■ INSTALLATION

The boiler must be installed by a company with the proper professional qualifications. The installation must be carried out in such a way that it meets the requirements of at least Standard SFS 3332. Possible electrical and burner installations related to the boiler must be installed by a qualified installation company.

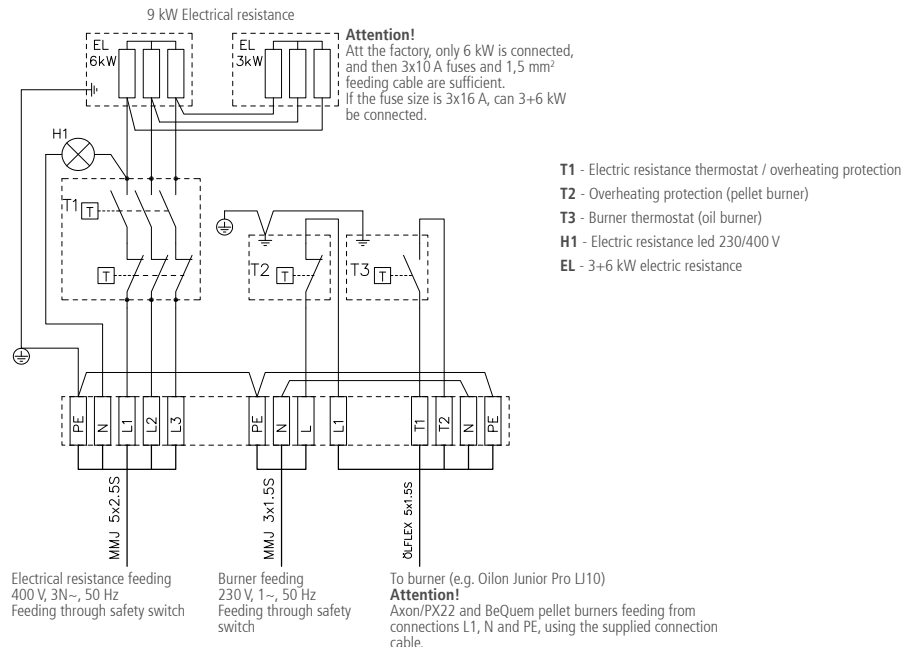
## ■ Space requirement

The boiler room must be rated at fire resistance class EI 30 according to Part E9 of the National Building Code of Finland. Approximately 1 metre of free space must be left in front of the boiler for cleaning and maintenance operations. Pipe connections are located on top of and behind the boiler (see connection diagram)

## ■ Flue pipe connection and combustion air intake

The boiler flue duct is located behind the boiler. Silicon sealant with a temperature resistance of 350°C can be used as a sealing compound for joints. If using a brick flue duct, the boiler must be connected by using the following corner piece. Flue duct requirement: at least Ø 120mm or, if bricked, cross-sectional area 150cm<sup>2</sup> and minimum length 6m. If an oil burner is used, a brick flue duct lined with an acid resistant, thin-walled pipe or an acid resistant component pipe is required. The free surface area of the combustion air intake must be 1.5 times the size of the flue duct. The combustion air intake must not be covered.

## ■ Wiring diagram



## ■ INSTALLATION

### ■ Flue gas exhauster (optional)

The flue gas exhauster can be purchased as an optional accessory, if the draught of the flue pipe is not sufficient. The flue pipe draught must be 25Pa. The required space for the flue gas exhauster behind the boiler is 250mm. Take into account the installation space.

### ■ Pipe installations

Before installing the boiler, the heating network must be flushed and checked by means of a water-pressure test. After installation, make sure that all joints are tight. The factory is not responsible for damages caused by leaking joints.

### ■ Safety valve installation

The valve must be CE marked. Its maximum opening pressure must be 1.5 bar and its minimum size DN 15. The safety valve must be chosen according to the highest pressure class of the combination of devices. Devices that can close the connection must not be installed between the valve and the boiler. The blowdown pipe must be dimensioned and installed in such a way that it does not limit the valve blowdown efficiency and does not cause dangerous situations during the operation of the valve. The volume of the expansion tank must meet the maximum liquid volume change during the operation of the plant. For cyclic heating, the expansion volume must be approximately 10% of the entire system's volume. We recommend only using a closed system (diaphragm expansion vessel).

### ■ Filling the system

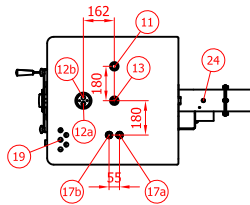
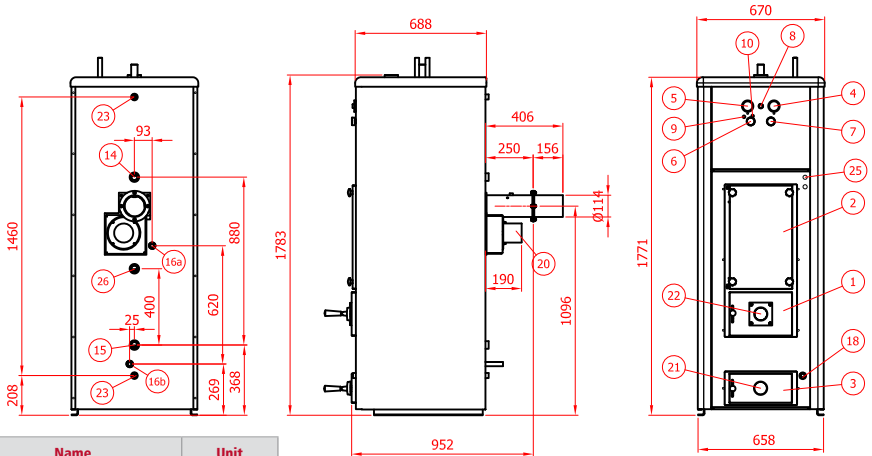
Before switching on the heat, the heating system must be filled with water. The system is filled as follows:

- Open all shut-off valves, including the four-way mixing valve. The pump must be turned off.
- Fill up the heating system.
- Discharge the air.
- When the system is filled up, the circulation pump can be turned on and the heating started.
- When the water in the boiler has reached the set operating temperature, turn the pump off and discharge the air from the radiators again. This must be repeated a few times.

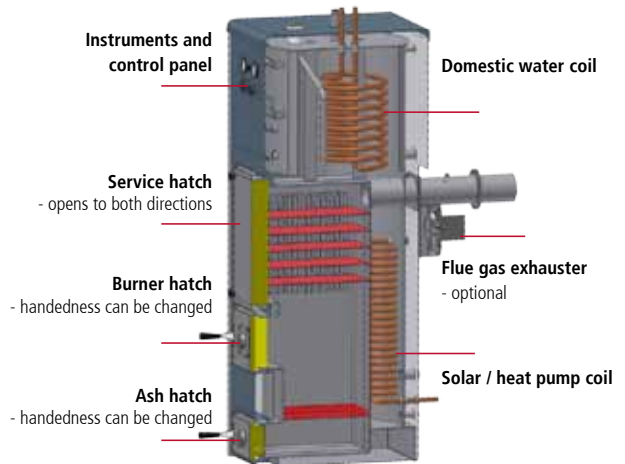
At first, there is a large amount of air in the water (up to 10%), thus it is normal that the pressure decreases, when air is discharged from the system. As a result, it may be necessary to add water in connection with several heating times.

A sufficiently high temperature during the whole heating cycle keeps the convection surfaces clean and burning will take place at a high level of efficiency. Thus, the service life of the boiler will be as long as possible, as erosive acids will not be formed on the heating surfaces.

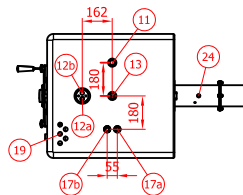
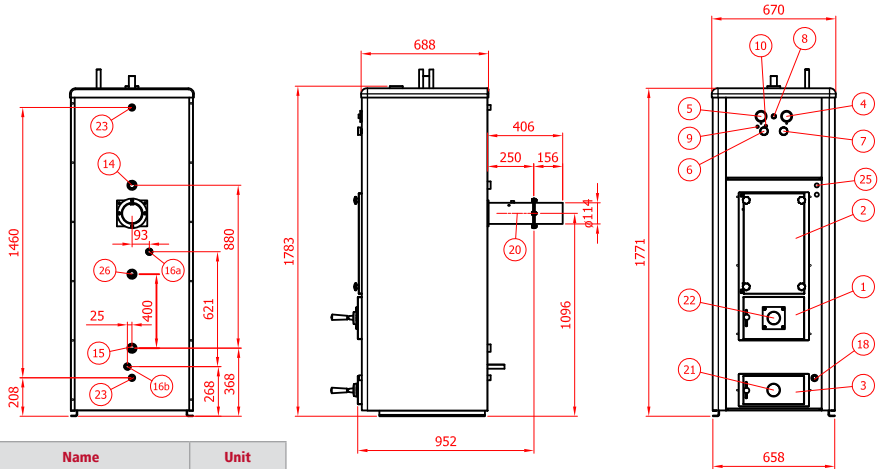
# CONNECTION DIAGRAM



Part	Name	Unit
1	Burnerhatch / Filling hatch	
2	Convector cleanout hatch	
3	Ash hatch	
4	Flue gas thermometer	
5	Pressure / water thermometer	
6	Electrical resistance thermostat	
7	Burner thermostat	
8	Burner overheat protection	
9	Electrical resistance indicator light	
10	Electrical resistance overheat protection	
11	Safety valve unit	DN 15
12a	Heating circuit 4-way mixing valve return	DN 20, Cu 22
12b	Heating circuit 4-way mixing valve outlet	DN 20, Cu 22
13	Expansion unit	DN 25
14	Accumulator / internal circulation unit outlet	DN 25
15	Accumulator / internal circulation unit return	DN 25
16a	Solar collector / charge coil (in)	Cu 22
16b	Solar collector / charge coil (out)	Cu 22
17a	Domestic water coil, in	Cu 22
17b	Domestic water coil, out	Cu 22
18	Discharge unit	DN 15
19	Power supply	
20	Flue gas exhauster unit assembled	
21	Primary air adjustment	
22	Secondary air adjustment	
23	Temperature sensor unit	DN 15
24	Flue gas sensor unit	
25	Pellet burner thermostat feed-through	
26	Solar collector, exchange circuit unit, in	DN 25



# TEMPERATURE CONTROL VALVE



Part	Name	Unit
1	Burnerhatch	
2	Convector cleanout hatch	
3	Ash hatch	
4	Flue gas thermometer	
5	Pressure / water thermometer	
6	Electrical resistance thermostat	
7	Burner thermostat	
8	Burner overheat protection	
9	Electrical resistance indicator light	
10	Electrical resistance overheat protection	
11	Safety valve unit	DN 15
12a	Heating circuit 4-way mixing valve return	DN 20, Cu 22
12b	Heating circuit 4-way mixing valve outlet	DN 20, Cu 22
13	Expansion unit	DN 25
14	Accumulator / internal circulation unit outlet	DN 25
15	Accumulator / internal circulation unit return	DN 25
16a	Solar collector / charge coil (in)	Cu 22
16b	Solar collector / charge coil (out)	Cu 22
17a	Domestic water coil, in	Cu 22
17b	Domestic water coil, out	Cu 22
18	Discharge unit	DN 15
19	Power supply	
20	Flue duct $\phi$ 114.3mm	
21	Primary air adjustment	
22	Secondary air adjustment	
23	Temperature sensor unit	DN 15
24	Flue gas sensor unit	
25	Pellet burner thermostat feed-through	
26	Solar collector, exchange circuit unit, in	DN 25

# PIPE INSTALLATIONS

## Temperature limiting valve installation, if the boiler is heated with wood

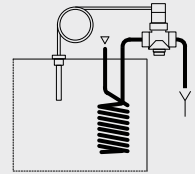
The Pressure Equipment Directive requires that manually filled wood boilers be equipped with a safety device to prevent overheating. We recommend using temperature limiting valve SYR 3065 with this boiler. This does not replace other safety devices, such as the safety valve.

### Installation

The temperature limiting valve is attached to the domestic water coil so that when the valve is operating, it empties hot water into the drain. The temperature sensor is installed into a coupling on the upper part of the boiler by using DN 15 x 150 cover pocket.

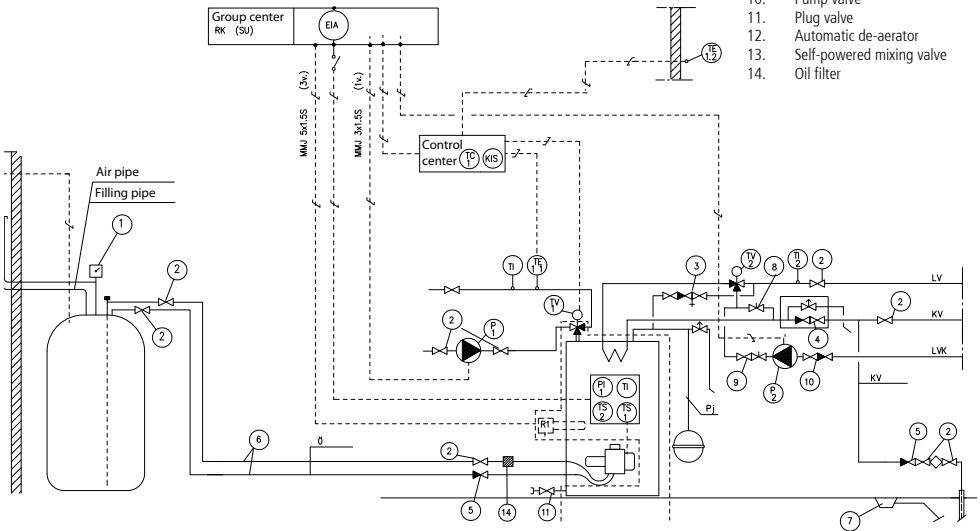
#### TEMPERATURE LIMITING VALVE

Max water inflow pressure	10 bar
Opening temperature	97° C
The valve is available at Arterm.	Product number 5012921



- R Electrical resistance
- TI Thermometer
- TG Heating network control centre
- TE Temperature sensor
- PI Pressure sensor
- EY Overfill protection
- TIA Alarm thermometer
- PIA Alarm manometer

1. Oil level gauge
2. Shut-off valve (ball valve)
3. Heating network filling valve
4. Supply valve group
5. One-way valve
6. Oil pipe (Fincuplast)
7. Floor drain V75
8. Line control valve
9. Pump control valve
10. Pump valve
11. Plug valve
12. Automatic de-aerator
13. Self-powered mixing valve
14. Oil filter



## ■ OPERATION

Before starting the boiler, the following should be checked:

- the heating network and the boiler are full of water, pressure at least 0.5 bar
- the flue damper (if any) is open
- network pump is running
- the network valves are open
- boiler room ventilation air intake is open
- the combustion air intake is open (wood)
- the safety valve is in working order and there are no obstacles between it and the boiler
- ensure that the flue gas guide plates are placed correctly (see page 11)

### ■ Oil / gas heated

The Ariterm Hybrid boiler can be equipped with an oil / gas burner that corresponds to the boiler power. The burner is mounted on the burner hatch. The burner thermostat/overheat protection is pre-installed in the boiler. NOTE! The connection must be carried out by a qualified electrician.

### ■ Pellet heated

The Ariterm Hybrid boiler is ideally suited for use with Ariterm BeQuem and Axon pellet burners. The burner is installed by replacing the filling hatch with pellet equipment suitable for Ariterm pellet burners. Ensure that the flue gas guide plates are installed correctly by referring to page 11. More detailed instructions for the installation and use of the pellet burner are provided with the burner. The boiler temperature sensor that controls the burner is connected to the sensor pocket located below the front panel. The BeQuem burner's flue gas sensor must be attached to the sensor holder located in the boiler flue duct. The voltage supply of the pellet burner is connected to the terminal block below the front panel (see wiring diagram). NOTE! The connection must be carried out by a qualified electrician (see wiring diagram).

Pellet burner equipment kits:

- BeQuem with burner (25044), includes burner hatch and flue gas guide plates.
- Axon with burner (25043), includes burner hatch and flue gas guide plates.

### ■ Electrically heated

The Ariterm Hybrid boiler with a 3+6kW electrical resistance and thermostat / overheat protection installed.

**NOTE!** 6kW has been activated at factory. If the fuse size is 3x16A and the supply cable is 2.5mm<sup>2</sup>, 3+6 kW can be activated. The wires are provided with resistance.

### ■ Wood heating with Ariterm Hybrid

Solid fuel, such as logs, can be used with Ariterm Hybrid. Ariterm Hybrid operates on an upper combustion principle.

An equipment kit for solid fuel is available as optional equipment for heating with wood. The kit includes the following parts:

- Furnace bed
- Ash box
- Flue gas guide plate kit (ensure correct installation by referring to page 11)
- Filling hatch air control valve
- We recommend flue gas exhauster heating with food

## ■ OPERATION

### ■ Start, ignition:

- Open the flue damper.
- Open the upper air control valve by 10mm.
- Open the lower air control valve by 15mm.
- Start the flue gas exhauster (if installed).
- Open the filling hatch.
- Fill 2/3 of the furnace with logs.
- Place the kindling on the logs. Set fire to them.
- Close the filling hatch.
- The flue gas temperature should be 150-200 °C during combustion.

### ■ Adding wood

Add more wood only when the old load has burned so that only charcoal is left. Open the filling hatch slowly to prevent a potential carbon monoxide residue from causing a puff of smoke. Add logs so that the heat energy produced from burning them is suitable for the accumulator.

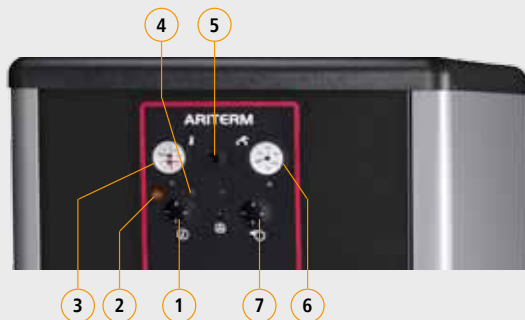
### ■ Connecting solar collectors to the boiler

A charge coil is pre-installed in the boiler. Connect the solar collector pipes directly to the charge coil. The control automation of the collectors must be purchased separately. The temperature measurement places needed for the control automation are located on the back of the boiler, on the upper and lower part.

### ■ Connecting a water/air heat pump to the boiler

Connect the water/air heat pump pipes directly to the charge coil. The pump control automation must be purchased separately or it is supplied with the pump. The temperature measurement places needed for the control automation are located on the back of the boiler, on the upper and lower part.

- 1 Electrical resistance thermostat
- 2 Electrical resistance indicator light
- 3 Pressure / water thermometer
- 4 Electrical resistance overheating protection acknowledgment button
- 5 Oil burner overheating protection acknowledgment button (under cover plug)
- 6 Flue gas thermometer
- 7 Oil burner thermostat



## SERVICE AND MAINTENANCE

The boiler operates faultlessly and is durable, when the following instructions are followed:

- the boiler must be kept in a dry environment
- the boiler operates continuously based on the set control values
- clean the boiler and convection when the temperature of flue gases has increased by about 20 - 30 °C with respect to the temperature of a clean boiler.
- replace the damaged part with a new one in due time.
- check to make sure that no condensed water or water coming from pipe leaks can damage the boiler.
- when heating with wood, remove the ash and charcoal from the furnace bed.
- ensure sufficient air supply below the furnace bed.
- when heating with pellets, check the amount of ash that has accumulated on the flue gas guide plates and in the ash pan after one week. Remove the ash. Based on this, set a suitable maintenance interval for preventing clogging.



Open the convection cleanout hatch.



Remove all flue gas guide plates.



The boiler convector is cleaned by brushing the convection surfaces. The flue gas channel must be cleaned to maintain sufficient draught.



Re-install all the flue gas guide plates. **NOTE!** The lowest plate is installed on the right side, the next one on the left side etc. Flue gas circulates alternately from the left side and the right side of the plates.

**NOTE!** When BeQuem is used, the lowest plate can be removed to provide enough space for the flame.

## ■ SERVICE AND MAINTENANCE



Tighten the 4 screws on the cleanout hatch evenly to achieve the required tightness.

### ■ Other maintenance procedures

Hatch tightness must be checked. Tighten the filling / ash hatches by adjusting the latch and hinge piece. Check the tightness of the convection cleanout hatch carefully and adjust if required. Tighten as required during the first weeks of use.

### ■ Adjusting hatches



It is important for the correct operation of the boiler that the hatches are tight.

Adjusting the locking handle:

Loosen the screw on the locking handle so that the eccentric bushing in the handle hole can be turned.

- Turn the eccentric bushing so that the handle moves outwards from the boiler.
- Tighten the screw slightly.
- Test whether the hatch is tight on the latch side.



If a pellet burner is used or if the boiler is heated with logs, the ash box must be emptied, if necessary.

**NOTE!** The ash level must not rise to touch the furnace bed when heating with wood. This reduces the service life of the furnace bed.

### ■ Adjusting the hinge



Loosen both screws on the hinge piece so that the hinge can be moved.

- Move the hinge piece slightly towards the boiler.
- Tighten the screws slightly and test whether the hatch is tight on the hinge side.
- When the hatch is suitably tight, tighten all screws properly.
- If the hatch cannot be adjusted properly, the hatch sealant must be replaced.

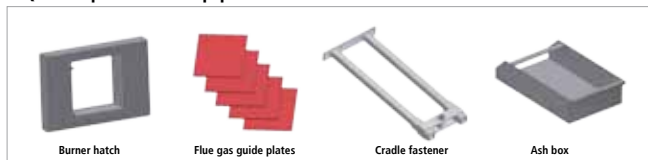
# STANDARD EQUIPMENT AND ACCESSORIES

Part	Standard equipment	Number
1	Oil burner hatch (Hyb-75B)	25089
2	Brush (round) Ø30x130	5932
3	Brush handle L=1200	8632
4	Brickwork support Ø127x2x140	
5	Four-way mixing valve esbe tm 20 + gasket	5362
6	Hexagonal screw M8 X 20, 2pcs	
7	Washer Q8, 2pcs	
8	Hexagonal screw M12 X 25, 4pcs	

Part	Accessories	Number
1	Axon pellet burner equipment	25043
2	BeQuem pellet burner equipment	25044
3	Solid fuel equipment	25045
4	Flue gas exhauster	25079
5	Flue gas exhauster control centre	13750

## Accessory kits

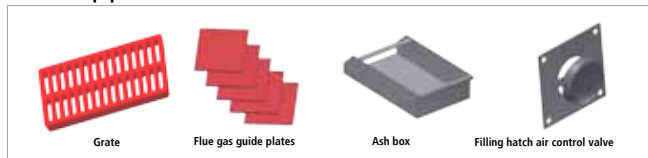
### BeQuem 20 pellet burner equipment



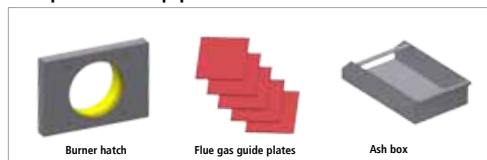
### Flue gas exhauster



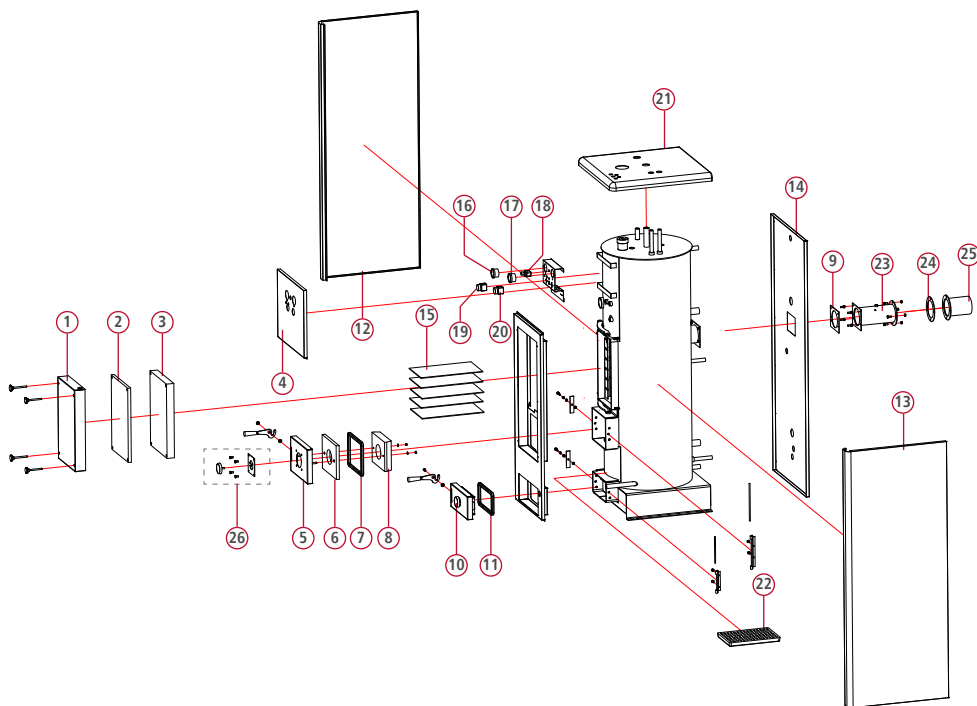
### Solid fuel equipment



### Axon pellet burner equipment



# SPARE PARTS



Part	Spare parts	Number	Part	Spare parts	Number
1	Cleanout hatch	25087	15	Flue gas guide plates (pellet)	25074
2	Cleanout hatch sealant (16x16x)	5138	15	Flue gas guide plates (oil)	25075
3	Cleanout hatch insulating wool(HT 900 50x)	5162	15	Flue gas guide plates (logs)	25076
4	Front plate	25070	16	Boiler thermometer/manometer	5889
5	Oil burner hatch	25089	17	Flue gas thermometer	5887
6	Oil burner hatch insulating wool	14189	18	Oil burner overheat protection	5358
7	Oil burner hatch sealing strip 16x16	5138	19	Electrical resistance thermostat / overheat protection	5352
8	Oil burner hatch cover tile50x195x246	14090	20	Oil burner thermostat	5351
9	Flue duct sealant	14182	21	Cover plastic	14184
10	Ash hatch	25088	22	Grate 25x245x345 (heated with logs) optional	14269
11	Ash hatch sealing strip (16x16)	5138	23	Flue duct	25077
12	Side plate left	25071	24	Flue duct extension piece sealant	14183
13	Side plate right	25072	25	Flue duct extension piece	25078
14	Back plate	25073	26	Filling hatch air control valve	

## ■ TECHNICAL DATA

TECHNICAL DATA		
<b>Performance values</b>	Power with wood Power with pellets Power with oil Power with electricity	20kW 20kW 20kW 3+6kW (3x16A, 5x2.5)
<b>Dimensions</b>	Width Depth Height Empty weight Water volume Flue pipe connection Domestic water production (with oil) Combustion efficiency	670mm 938mm 1783mm 270kg 260L Diameter 114.3mm (outside measure) 1 shower (12l/min), 380l/+40C 2 showers (20l/min), 240l/+40C with oil 93%, with pellets 87%
<b>Design and adjustment values</b>	Boiler operating pressure Allowable boiler temperature Suitable accumulator size Max. length of used logs Min. vacuum in the flue pipe	0.5-1.5 bar Max 120°C 500 – 1000L 0.3m 25Pa. wood and pellets
<b>Flue pipe recommendations</b>	<ul style="list-style-type: none"> <li>oil, gas</li> <li>wood, pellets</li> <li>bricked</li> </ul> With flue gas exhauster: <ul style="list-style-type: none"> <li>wood, pellets</li> </ul>	100mm, acid resistant pipe or ceramic 120mm, 6m, acid resistant pipe or ceramic 150cm <sup>2</sup> , 6m, lined with acid resistant pipe  100mm, 4m, acid resistant pipe, ceramic flue pipe or a brick chimney lined with acid resistant pipe

## ■ Guarantee

Arterm Oy gives a two-year (2) guarantee on the boiler starting from the date of installation. The guarantee covers the faults related to work and raw materials that may appear in the boiler.

The manufacturer assumes no guarantee liability if the defect has been caused by an installation fault, leaks outside the boiler, faulty operation, freezing, overheat or overpressure. If the repair operations have been started without the manufacturer's permission or the guarantee card has not been returned to the factory, the guarantee is not valid. The factory is not responsible for the possible consequential damages and costs caused by the boiler.

Arterm Oy reserves the right to decide the way in which the guarantee repair is carried out. Arterm Oy is not liable for damages occurred after the expiration of the guarantee period. However, compensation for such damages may be separately agreed on a case-by-case basis.

## ■ Decommissioning

An end-of-life boiler is suitable for scrapping. Plastic covers can be disposed of either with energy waste or mixed waste.

## ■ FLUE GAS EXHAUSTER INSTALLATION (optional)



1. Fit the flue gas exhauster in the flue duct behind the boiler.



2. Fit the sealant and attach the flue duct in place with 4 screws.



3. Fit the flue duct extension piece sealant and mount the extension piece in place with 4 screws.



4. Pre-installed flue gas exhauster.



5. Insert the flue gas temperature sensor and cover spring into the sensor pipe.



6. Fit the rubber cover plug around the capillary pipe.



7. Fit the sensor cover spring and rubber cover plug in place according to the image.

# DECLARATION OF CONFORMITY



## VAATIMUSTENMUKAISUUSVAKUUTUS

Valmistaja: ARITERM OY  
Osoite: PL 59, 43101 SAARJÄRVI  
Laite: **Arimax keskuslämmityskattila**

Valmistaja vakuuttaa,

- että tämän yksilön valmistuksessa on huomioitu Euroopan yhteisön neuvoston painelaitedirektiivin (97/23/EY) olennaiset turvallisuusvaatimukset,
- että vaatimustenmukaisuuden arviointimenettelynä on käytetty H - moduulia, (ilmoitettu laitos 0424)
- että riskinarviointimenettely on suoritettu konedirektiivin 2006/42/EY mukaisesti (standardi SFS-EN ISO 14121-1)
- Toimitukseen ei sisälly varolaitteet.

## DECLARATION OF COMFORMITY - MANUFACTURERS DECLARATION

Manufacturer: ARITERM OY  
Address: P.O.BOX 59, FIN-43101 SAARJÄRVI  
Equipment: **Arimax central heating boiler**

Manufacturer assures,

- that in production of above mentioned example has been observed the essential safety demands of EC council's directive for pressure vessels (97/23/EY),
- as estimation method of conformity has been used H - module, (notified body 0424)
- that estimation method of risks has been carried out according to the machinery directive 2006/42/EY (standard SFS-EN ISO 14121-1)
- Safety device are not included in the delivery.

## FÖRSÄKRAN OM ÖVERENSSTÄMMELSE - TILLVERKAREDEKLARATION

Tillverkare: ARITERM OY  
Adress: P.O.BOX 59, FIN-43101 SAARJÄRVI  
Apparat: **Arimax centralvärmepanna**

Tillverkare försäkrar,

- att vid tillverkningen av ovan nämnda exempel har man iakttagit väsentliga säkerhetskrav av EG rådets direktiv för tryckkärl (97/23/EY),
- som värderingsmetod av överensstämmelse har använts H - modul, (notified body 0424)
- att riskanalysmetod on utförd i enlighet med maskindirektiven 2006/42/EY (standard SFS-EN ISO 14121-1),
- Säkerhetsutrustning ingår inte i leveransen.

30.3.2010 Ariterm Oy

  
Petteri Korpioja  
Toimitusjohtaja  
Managing director  
Verkställande direktör













# ARITERM

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