

ARITERM ENERGY

INSTALLATION, OPERATION AND
MAINTENANCE

Bio burners 60-1500 kW



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■ FOR THE NEW OWNER

In this manual, we have gathered the essential information on installation, use and maintenance.

Ariterm Energy Oy devices are designed to be reliable, and the the back burning risk has been eliminated with several safety systems. By following the instructions in this manual, it is possible to achieve the best functionality for the HakeJet or BioJet bio burner. The easy use of the burner is also a function of the fuel quality. A safe and functional heating system saves money and user effort.

The structure and equipment level of the burner is chosen already in the ordering phase to suit the needs of the customer. This manual is a general manual for the whole Ariterm Bio Burner product family. Because of this, there can be differences between the shipped burner and this manual when it comes to accessories. During installation, situations to which this manual does not give straight answers can arise.



Write down the burner data in the table below. This makes it possible to act faster in maintenance and repair situations.

Write the burner model, serial number, date of purchase and date of installation here.	
MODEL	
SERIAL NUMBER / YEAR	
DATE OF PURCHASE	
DATE OF INSTALLATION	
DESIGN FUEL	
INSTALLED BY	

■ GENERAL

Ariterm bio burners fulfil the modern usage and safety requirements of wood chip and pellet burning. The Biojet burner is a pipe-type burner that has a water-cooled housing. The Hakejet is halfopen and is air cooled.

The fuel is fed into the burner via a screw. Inside the burner, the fuel is mixed with primary and secondary combustion air. The feeding system can consist of one or more feeding screws and a fuel storage. The screws and the fuel storage are chosen according to the fuel used.

Systems with more than one feeding screw contain level sensors between the screws to control and maintain a steady fuel flow to the burner. The automation also controls the moving floor silo if installed.

The burner grates are made from durable cast iron or fire proof steel (T). The water-cooled housing of the Biojet burner is connected to the water circuit of the boiler. Its maximum pressure class is 4 bar.

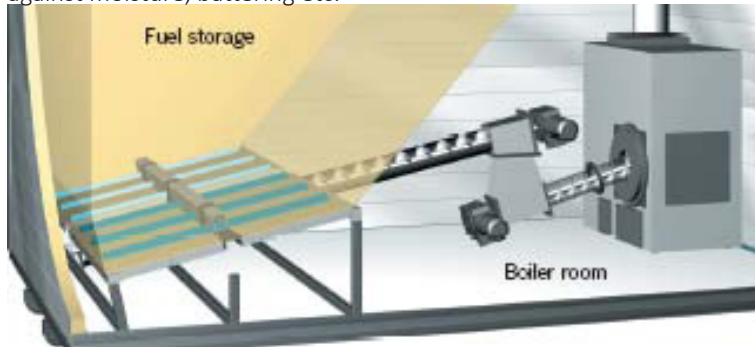
The equipment is controlled by burner automatics according to the signal from the boiler sensor. The automation logic vary depending on the chosen automatics. With the basic automatics, the burner operates on the operating phase and resting phase principle. With the stepless power control automatics the burner power depends on the boiler power output. The burner can operate continuously on partial output, in which case the resting phase is in operation only when the output requirement is below minimum.

The burner needs to be equipped with a back burning protection. This protective equipment varies according to the chosen fuel and feeding system. Note that the chosen fuel also affects the whole system composition.

ALWAYS CHECK WITH THE PRODUCT SUPPLIER THAT THE FUEL USED IS SUITABLE FOR THE BURNER!

SHIPPING, HANDLING AND STORAGE

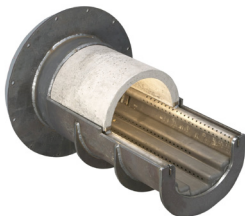
The parts of the burner are packaged in the factory for shipping and short-time storage. However, depending on shipping method and storage, the packages may need extra protection against moisture, battering etc.



Picture shows a Hakejet burner with an T2 fuel storage

In case you are transporting the bio burner system yourself, it is important to fasten the packages to each other and to the transporting vehicle to avoid damage to the equipment and to uphold traffic safety. The driver is responsible for the correct loading and fastening of the equipment. When handling the burner parts, it is recommended to be careful in order to avoid damage. The burner can be lifted either fastened to the shipping platform or from the hoisting bracket above the burner. The burner parts can be stored outdoors if they are shielded from damp earth and rain. For a long storing period, a better storage space is needed. It is recommended to store the equipment indoors because it contains sensitive parts like electric motors, sensors and the control centre.

Ariterm bio burners come in two different models



HakeJet 60-300 kW

- GRRH cast iron grates
- ceramic burning chamber
- 2 fans
- wood chips and pellets



BioJet 60-1500 kW

- GRRH cast iron grates
- ceramic burning chamber
- 2 - 4 fans
- wood chips, wood pellets and briquettes, 700-1500 kW only wood pellets

■ Reception and handling

When receiving the shipment, check that the contents of the delivery match your order and the included final inspection report and equipment list. In uncertain cases, contact Your dealer.

Before starting the installation, it is necessary to read not only this installation and operation manual, but also the installation manuals for the boiler, the automatics and a possible fuel storage. This way, you can be sure that the measurements and all the other things that are critical for the successful completion of the installation are in order.

The Ariterm bio burner parts must always be installed professionally and according to the requirements.

Recommended installation order:

1. Burner is installed into the boiler which is in its final place. Do not connect piping or flue duct.
2. Place the fuel storage in its final place.
3. Install the fuel feeding screws between the burner and the storage.
4. Adjust the boiler and/or the fuel storage so that the screw connections fit together.
5. Fasten the components and finish the installation with pipe and electrical installations.

■ Requirements for Installation and Operating Environment

- The boiler room must be constructed according to the relevant regulations in the destination country
- Installation and operating temperature 0–+40 °C
- Combustion air intake to the boiler room. Recommended area 5 cm² / installed kW
- The moisture content of the boiler room air 20–80 % (to prevent moisture condensation)

■ Required Connections

- Electric feed via automation cabinet
- Connecting the cooling circuit of the BioJet burner to the boiler
- A chimney duct, according to the boiler requirements
- Water for the automatic extinguishing system. With pellet, a dry powder installation is recommended

■ Space Requirement

Note that there needs to be room for both the burner and the burner screw between the boiler and the boiler room wall. A distance of at least one metre between the boiler and the wall is

recommended for the sides on which sooting and maintenance tasks will be done.

Please take into account that for service reasons the burner can be unfastened. Also take into

account feeding screws and replaceability and door openings.

■ CONTENTS OF THE BIOJET BURNER DELIVERY

Nro.	Part	MODEL	
		HakeJet	BioJet
1	Silicon pipe, heat resistant	X	X
2	Sealing ring (plate)		
3	Ceramic wool 50x80x600mm2 pcs	2	2
4	---		
5	Cover plate	X	X
6	2-4 fans	X	X
7	Limit switch (transition limit)	X	X
8	Limit switch fastener	X	X
9	Limit switch striking plate	X	X
10	Condensator box (1-phase fans only)	X	X
11	Bag of screws	X	X
12	Cleaning tool	X	X
13	Secondary air fan duct	X	X
14	Overheat protector	X	X

A burner delivery normally comes with a burner screw, screw motor, automation and storage. They are chosen according to the used fuel and the type of the fuel storage. Images of parts in the delivery are at the end of this manual.

■ BURNER INSTALLATION

The burner can be installed into a solid fuel boiler that has a power range equivalent to the output of the burner. To ensure a correct under pressure (25-30 Pa) in the fire chamber the chimney must be according to boiler requirements or be equipped with a flue gas fan. This instruction covers the BioJet burner and the HakeJet burner. Note that all instructions do not apply to the HakeJet burner.

The burner is connected to the boiler with bolts and the seam is sealed with heat-resistant silicone (1). The connection seam has to be sealed well. No air may leak out! If the burner opening of the boiler is square, a fitting flange (accessory) must be used.

The BioJet burner is water cooled and shall be connected to the boiler water circulation. The burner's overheating shield shall be connected to a DN 15 t-branch installed into the pipe ascending from the top of the burner (see picture). The shield stops the system in case there is a malfunction in the burner cooling for some reason. A pump (see table on page 16) is installed into the return pipe. If shutter valves are installed into the circulation, the handles must be removed. See the installation chart on page 17.



■ INSTALLATION OF THE BURNER SCREW

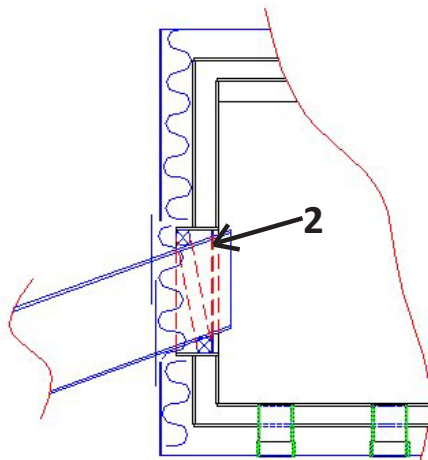
The burner screw shall be attached to the burner. The burner screw is usually installed after the burner is installed.

1. Insert the sealing ring (2) into the burner. Do not fasten yet.
2. **Wood chip systems:** Assemble the screw and the drop funnel and attach the drop funnel to the fuel storage flange. The burner screw insertion should be approx. 15 mm. Adjust the insertion by moving the boiler.

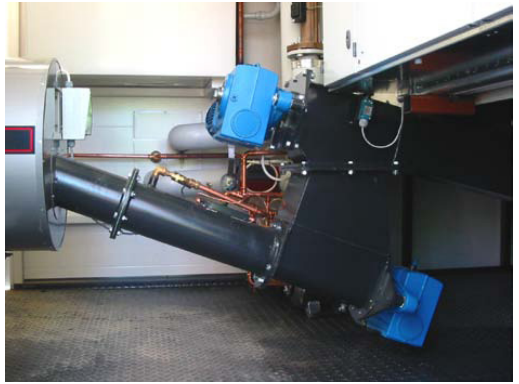
Pellet systems: Assemble the burner screw leg and place the screw into the burner hole. Do not mount the screw too steep as this will cause fuel to pile in the burner.

3. Fit the centering sealing ring (2) on the burner screw so that it stays against both the burner and the burner screw as tightly as possible. Position the screw as low as possible in the opening. Attach the ring to the screw pipe by tack welding. NOTE! The burner is a pressure vessel. Avoid attaching the plate into it. HINT: A temporary handle can be welded onto the ring to make installation easier.

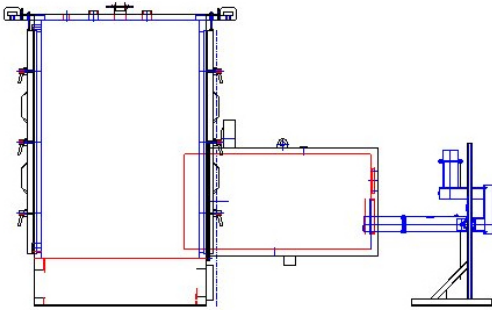
4. Seal the gap with ceramic wool. The sealing work must be done with care.
5. Align the cover plates (5) around the burner screw and fasten them with plate screws (11).
6. A drive motor and reduction gear are installed at the end of the feeding screw. Gear positions are described at the end of the manual. Picture shows a wood chip screw.



■ INSTALLATION OF THE BURNER SCREW



■ INSTALLATION OF A PELLET FEEDER



The burner screw can be replaced by a PS-10 pellet feeder when using wood pellets. It has a built-in cell feeder and a level sensor to control the silo screw(s). The pellet feeder gives a more steady fuel flow compared to the traditional system. PS-10 contains a back fire thermostat. It also has an extra back fire safety device.



PS-10 installed against a BJ700 burner.

Back fire thermostat and transition limit switch installed.

The PS-10 is installed in the same manner as the traditional burner screw.

■ INSTALLATION OF OTHER EQUIPMENT

1. Two combustion air fans (6) are included in the burner delivery (BJ 700-1000 3 pcs, BJ 1500 4 pcs).

Install the fans so that the incoming air is not disturbed. An extra air duct belongs to the secondary air fan (the upper) in order to prevent combustion gases to flow in the wrong direction.

2. The limit switch (7) is installed between the burner and the burner screw so that the switch cuts off the power in case of a transition between the screw and the burner. The switch is attached with the aid of a limit switch fastener (8). Finally, install the limit switch striking plate (9).

3. Install the condensator box (10) to a suitable location. Avoid places where the box would be exposed to heat or mechanical shock. Only 1-phase fans.



The burner pictured is a BioJet with combustion air fans, limit switch, condensator boxes, back fire thermostat and pulse operated back fire protection.

■ INSTALLATION OF OTHER EQUIPMENT

■ Electric Assembly

Wiring diagrams are delivered with the chosen automation. Changes and additions made on site

which require updating of diagrams are not Arterm Energy's responsibility unless otherwise agreed. **THE ELECTRIC ASSEMBLY MUST BE DONE BY A PROFESSIONAL ELECTRICIAN.**

■ Installation of the Safety System to prevent backfire

The Arterm Bio burners need to be equipped with a sufficient safety system to protect it from backburning. To make the operation of the system safe, it is important to have all the extinguishing systems installed before the burner is started. The systems consist of the following (a-e):

See pattern on page 11.

a. AVTA safety valve, to be connected to the water supply network (wood chips):

- A Danfoss AVTA 15 (50→90 °C) thermostat valve (3) is connected to the burner screw pipe and drop funnel (in a 2-screw system). The valve sensor is pushed into the sensor pocket (see image) and the valve is connected to the water supply network. To avoid the possible loss of network pressure, an expansion tank (SS) with a back-pressure valve (4) and an alarm pressure gauge (PIA) can be installed.
- After the manual bypass has been installed, water can also be sprayed into the fuel system manually.
- The AVTA valve is adjusted to the temperature of approximately 85 °C.
- Note the installation instructions of the valve sensor!

The backfire thermostat sensors and the AVTA valve are installed into their own sensor pockets on the surface of the feeding pipe. Note that the sensor needs to be set tightly against the screw pipe box. If necessary, use a heat conductive adhesive mass or a tightening screw. The screw must not damage the sensor! The backfire thermostat is connected to the burner automatics. AVTA functions with pressurised water



b. Pulse operated extinguishing system, to be connected to the water supply network:

- The pipe of the magnetic valve (5) is connected to the feeding screw pipe. The valve is controlled by a pulse-controlled backburning protector (6). The backburning protection is adjusted to a temperature of appr. 80 °C so that it will start to operate before the AVTA valve.
- The operation of the magnetic valve during a power failure can be assured with an UPS (7).
- To avoid the possible loss of network pressure, an expansion tank with a back-pressure valve (4) and an alarm pressure gauge (PIA) can be installed.
- When used with pellets use only short settings (0,1-0,5 s)

A pulse operated backfire protection can be delivered as an accessory. The sensor is installed closest to the burner head and/or so that it will be the first one to go off. NOTE! A pulse-controlled backfire system cannot replace an AVTA or dry powder system!



■ INSTALLATION OF OTHER EQUIPMENT

NOTE: Extinguishing systems based on water are recommended to be equipped with a stainless steel pressure vessel, back pressure valve and alarming pressure meter. This way a possible lack of pressurized water does not affect the safety.

c. Dry powder extinguishing system:

- The dry powder extinguishing system consists of a bottle (plus spare bottle), a valve, an extinguishing hose and a red plastic hose.
- Mount the 3 hoses between the bottle, screw pipe and drop funnel.
- The red plastic hose is installed to the bottle with care. Air tightness is important. The other end is installed on the screw pipe (see picture).
- NOTE! Open the bottle set off valve slowly and with a few pauses. The pressure holding the bottle pressure valve will then slowly flow in to the red pipe. A too fast drop of pressure will cause the bottle to go off.
- The red hose will melt in case of backburning, release the pressure and set off the valve.

- NOTE! The dry powder extinguishing system is an accessory. When using pellet as fuel, the water extinguishing system has to be replaced with a dry powder system.
- The red, gas-filled hose is installed so that it will melt in an overheating situation and set off the dry powder extinguisher device. The powder will burst into the burner screw and extinguish the fire.
- Replacement bottles will be supplied by Your reseller.

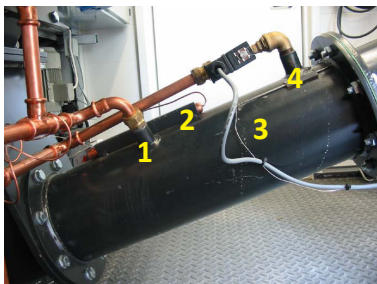


d. Backfire thermostat:

The backfire thermostat (2) is installed onto the burner screw pipe. Location next to the AVTA-valve sensor. In a situation where it goes off, the system is switched off, the burner screw drives forward with an extra pulse and the automation sends an alarm. Set the temperature to approximately 75 °C.

e. Other safety arrangements:

- Manual bypass with a shut-off valve installed from the water supply network.
- Alarm sensor monitoring the silo temperature (9 on page 16) can be installed as an accessory.

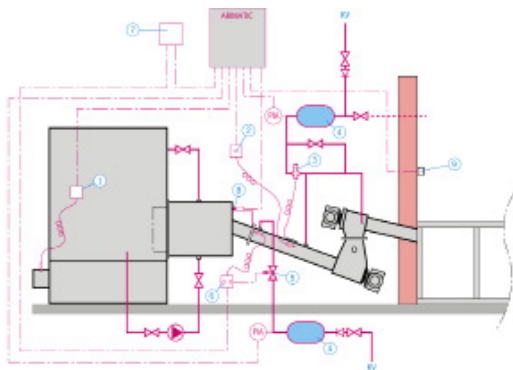


1. AVTA system extinguishing pipe
2. AVTA system temperature sensor
3. Temperature sensor of the pulse operated extinguishing system
4. Extinguishing pipe of the pulse operated extinguishing system

BACK FIRE PROTECTION, CONNECTIONS

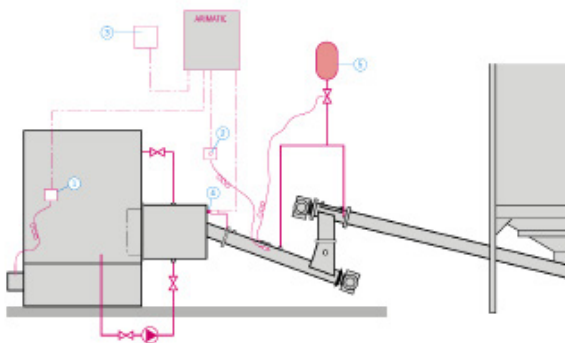
In Wood chip Systems

1. Flame control thermostat
2. Back fire thermostat
3. AVTA valve, self-operated DN 25
4. Expansion tank 35-50 l, prepressure 100 kPa
5. Electromagnetic valve, 230 V
6. Pulse controlled burn back protection
7. UPS device
8. Limit switch (transition)
9. Alarming temperature sensor of the silo



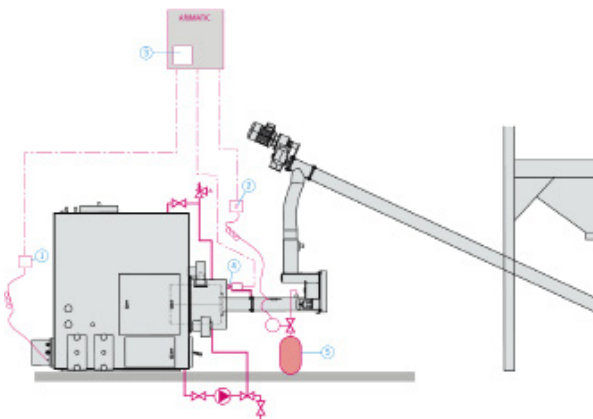
In Pellet Systems

1. Flame control thermostat
2. Back fire thermostat
3. UPS device
4. Limit switch (transition)
5. Powder extinguishing system



In pellet systems PS-10

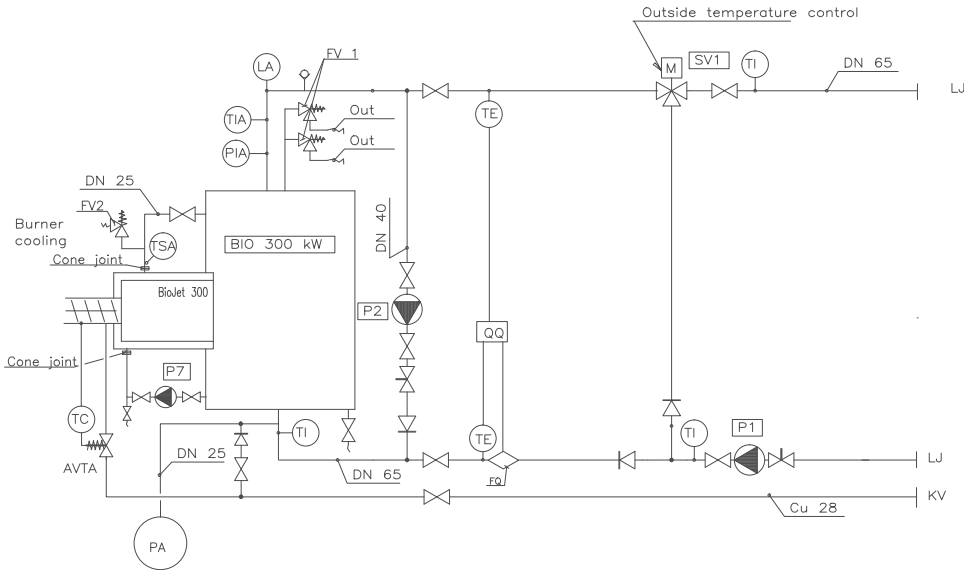
1. Flame control thermostat
2. Back fire thermostat
3. UPS device
4. Limit switch (transition)
5. Powder extinguishing system



CONNECTING THE BIOJET BURNER TO THE BOILER WATER CIRCUIT

The BioJet burner is connected to the boiler water circuit according to the pattern below.

Example of pipe connections, 300 kW boiler and BioJet burner.



Burner cooling pump table (not included in delivery)

Burner	Pump	Connection
BJ 60-120	Grundfos UPS 25-40	DN 20
BJ 150	Grundfos UPS 25-40	DN 25
BJ 200-250	Grundfos UPS 25-60	DN 25
BJ 300	Grundfos UPS 25-60	DN 32
BJ 400-700	Grundfos UPS 25-80	DN 32
BJ 1000	Grundfos UPS 32-80	DN 32
BJ 1500	Grundfos UPS 32-80	DN 32

The boiler circulation pump ensures that the return water is not too cold (min 60 °C). Too cold return water will worsen the burning process and cause corrosion on the boiler body!

Note! The safety valve must be 4 bars at maximum.

The shutter valves between the burner and the boiler are left in the open position and the operating handles are removed.

■ COMMISSIONING AND ADJUSTMENT

■ Testing System Operation

The operation of the system is tested before commissioning as follows:

Switch on the motors (screws and fans) one by one and check the following:

- rotational directions
- combustion air fan operation and rotational direction, flue gas extractor operation
- reverse operation
- pump operation

Check the safety devices:

- Turn the backfire thermostat down so that it goes off and check function
- Turn the AVTA valve thermostat until it goes off and check the function. Note that the water flow can be strong, prepare to direct the water to a bucket or floor drain
- Set the pulse operated backfire trigger point down until it goes off and check the function
- Check other installed safety devices such as dry boiling apparatus, over heating thermostats etc
- Check the alarm functions and that a remote alarm is sent, if applicable.

See also manual for chosen burner automation!

■ Adjustment

The burner and boiler shall be heated up slowly so that the thermal stress can be minimized. Set off the automatic burner control and run the boiler manually on a low power set point. This can take about 1 hour.

After the burner and the boiler have been warmed up, the burner is set to a clean and costeffective operation.

Normally the combustion air fans are adjusted by the automation but can also be adjusted by the damper plate in the fan air intake. All burner adjustments by visual estimation.

The flame must be pale yellow and burning evenly. However, more accurate adjustments require the use of a flue gas analyser.

Burning set values	
Oxygen(O ₂)	7-9 %
Carbon monoxide (CO)	100-400 ppm, wood chips
Carbon monoxide (CO)	50-200 ppm, pellets

Flue gas temperature has no direct impact on the burning process but has a significant effect on the total efficiency of the system.

The amount and consistency of the ash are also indicative of the cleanness of the burning. Large amounts of ash or unburned materials are signs of unclean burning.

Note! The amount of ash can vary even tenfold depending on the chosen fuel!

■ COMMISSIONING AND ADJUSTMENT

The lower combustion air fan(s) in the burner functions as the primary air fan. When adjusting the primary air, the power and the fuel flow are adjusted. The secondary combustion air fan is used to fine-tune the burning.

Note! Changes in the adjustments need at least a few minutes to take effect.

Adjustment Tips

- If there is too much unburned fuel on the fire grate and/or in the ash, it is necessary to reduce burner screw feed and/or to increase primary air fan power.
- If the tip of the flame is black and the boiler gets dirty fast, it is necessary to increase secondary air fan power and/or to reduce fuel feed.
- If the flame is bluish and uneven, it is necessary to reduce secondary air fan power.
- If the fuel contains lightweight particles, some of them will flow out of the burner on the air current before burning fully. Sparks in the fire chamber and an increased amount of ash are signs of this. To avoid flying particles, reduce air flow (fans).
A change in fuel consistency requires new adjustment values.

For instance changing from 8 to 6mm wood pellets will change the fuel mix and this requires a new adjustment for best performance.

Note! To make the adjustments, the system should be driven with an almost full load. On a smaller load, the boiler reaches the set temperature too quickly, the burner moves into the rest phase, and the adjustments are left incomplete. If the boiler is being commissioned during summertime (small load), the adjustments must be remade when the boiler can be fully loaded.

■ Shutting down the burner

Turn the silo screw off. Remaining fuel in fuel hopper and burner screw must be burned away before shutting down the system.

NOTE! Ensure that the fire is completely down before leaving!

■ USE OF THE BURNER

■ Description of burner automation: See accurate manual

■ Information on the Risks Related to Use

In a backburning situation, the fire moves backwards through the burner screw(s)

Preventive measures:

- There needs to be enough under pressure in the boiler, also during burning.
- The automatic extinguishing systems must always be kept in good condition.
- The risk has been minimised in design by making the burner screw so long that the safety systems have enough time to go off in a backburning situation. In 1-screw systems, 1,5 metres is a recommended minimum length.
- A short (< 1 000 mm) burner screw requires an air tight cell feeder for a constant backfire protection.
- An airtight fuel container is an absolute requirement in 1-screw systems
- Refill the container early before the fuel runs out to avoid air flow in the wrong direction.
- A solid fuel operated system generates heat all the time, also during the rest phase.

DO NOT HAVE THE BOILER RUNNING IF ENERGY REQUIREMENT IS TOO LOW

Injury caused by power transfer or moving parts in the container

Preventative measures:

- Always keep on the shield covering the moving mechanical parts during operation
- Switch off the main switch before system maintenance operations
- Do not enter the fuel container while the system is in operation

Exposure to harmful dust

Preventative measures:

- Do not use mouldy wood chip
- Refill the container early before the fuel runs out
- Use a breathing mask

WARNING! Do not enter an unventilated fuel container. A closed area can be oxygen free and thus cause a life threat. Do not work alone in the fuel container. Tools used must be fit for the purpose!

WATCH OUT FOR HOT BURNER SURFACES! The burner is insulated, but certain steel parts are in contact with the burner body and may be hot!

THE SAFETY SWITCH HAS TO BE LOCKED OPEN DURING MAINTENANCE!

THE SYSTEM CAN BE COMMISSIONED ONLY AFTER THE INSTALLATION IS FINISHED AND AFTER THE SAFETY DEVICES HAVE BEEN TESTED AND FOUND OPERATIONAL!

MAINTENANCE

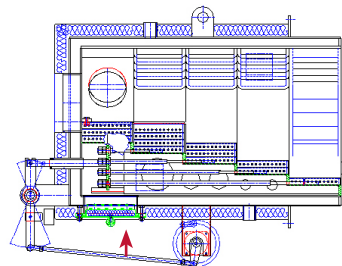
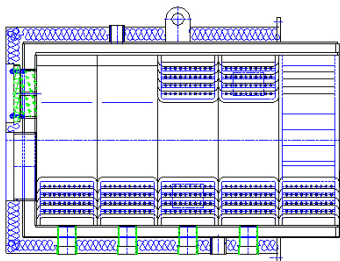
Note! Switch the power off the system before repair and maintenance operations!

Maintenance Operations

To ensure faultless operation and a long product life expectancy, the following maintenance operations have to be performed:

MAINTENANCE OPERATIONS	
Operation	Time
Ball bearing lubrication	during commission + twice / year
Flame control thermostat operation testing Turn the thermostat down until the alarm goes off	twice / year
Backfire thermostat operation testing Turn the thermostat down until the alarm goes off	twice / year
AVTA valve operation testing Dip the sensor in hot water (°C over set temperature) until the valve opens. Recommendation: Detach the hose(s) and direct the water into a drain	twice / year
Pulse operated back fire protection operation testing Turn the thermostat down until magnetic valve opens	once / year
Dry powder extinguishing system operation testing Check that there is pressure in the bottle and the bottle has not expired.	every week
The fan motors do not usually need maintenance. Screw motor gearboes need no maintenance.	
Burner cleaning Clean the fire grate surfaces of ash and cinder. Clean the fire grate bottom with a Hoover	weekly / or as needed 1-3 times / year (see image)

The cleaning interval may vary a lot depending on the chosen fuel and load.



The bottom of the fire grate of the BioJet burner is cleaned with a suitable vacuum cleaner. The hose is put in through the opening under the burner. The grate elements closest to the burner opening can only be cleaned after they have been loosened. This must be done from inside of the boiler or by taking the burner off.

■ MAINTENANCE

■ HakeJet

HakeJet burner grates are cleaned by taking them off. First remove the ceramic vault. Then loosen the secondary combustion air pipes by lifting and pulling. At last lift the grate so it can be cleaned underneath.



Removing the vault



Removing air pipes



Cleaning the grate

Instructions for Possible Operational Malfunctions

Malfunction	Cause	Action
A safety device has stopped the system	The motor protector has gone off due to too big resistance.	Remove obstacles from the screw and check that the screw can rotate freely. Reset the alarm.
	The motor shield has gone off due to a missing phase	Check that all phases are in condition. Reset the alarm.
	The overheating protector of the boiler or the burner has gone off	Check the boiler temperature. Remove the cause of the malfunction. Reset the overheating protector. Reset the alarm.
	The flame control thermostat has gone off, due to low temperature of the flue gas.	Check the fuel feed. Restart the system. If necessary, decrease the flame control thermostat set value.
	The motor protector for burner cooling pump has gone off	Check the set value for the motor protector.
	Back fire thermostat has gone off due to feeding screw's surface temperature increasing over the set value.	Check the cause of the back fire. Start the system if it is safe. If necessary, change the set values (exterior temperature may cause a faulty alarm)
	AVTA valve has gone off due to increased temperature on feeding screw's surface, and filled the funnel with water.	Drain the water out through the drain hole at the bottom of the funnel. Run the wet fuel trough the burner head to the ash compartment. Feed dry fuel to the burner head and start the system.
	Transition limit switch has gone off because the boiler or the burner screw has moved from its position.	Remove excess fuel from the burner and boiler. Check the pipe- and other connections and check the operation of flame control.
	Level switches of the hatches have gone off because one of the hatches is open.	Determine the cause of hatch alarm. Shorten the bar discharger's operation time. Check the operation of feeding funnel's photo cell sensor.
	The flue gas fan has stopped.	Determine the cause of the fault, in power supply or the frequency converters.
AVTA valve is leaking through	Dirt in valve	Open and clean
Magnetic valve is leaking through	Dirt in valve or installed with flow in wrong direction	Open and clean, remount if needed
The valve of pulse operated back fire protection doesn't open	The network pressure is too high	Reduce the pressure to app. 3 bars.
Heat output is not enough	Feed from the storage is not enough, smoke gets in the funnel and disturbs the photo cell sensor.	Ensure high enough underpressure in the boiler
	Dusty fuel disturbs the photo cell sensor in feeding funnel.	Feeding funnel's filling delay has to be shortened to app. 8-12 seconds.
System has stopped Operation alarm		Check what is causing the alarm.

■ INSTRUCTIONS FOR EMERGENCIES

The Arterm bio burner is a safe device when it is used correctly and maintained according to instructions.

Some possible emergencies and instructions for action in those cases are described below.

■ **Back fire** (the fire has spread from the burner to the burner screw)

The backfire protection reacts to the rise in the burner screw temperature as follows:

1. The pulse operated backfire protector sprays water into the fuel, which causes its moisture content to rise and the backfire to be extinguished before it can spread further.

The system will not stop or set off an alarm. Protection can be increased with a backpressure

valve, a pressure tank and an alarming pressure gauge.

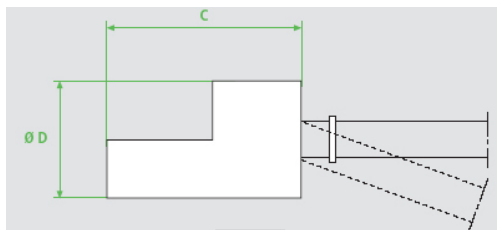
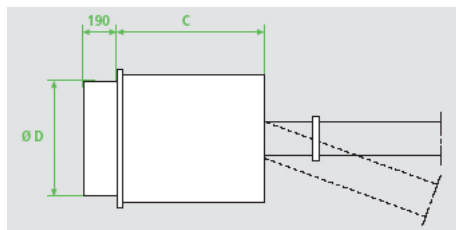
2. The backfire thermostat sets off a backfire alarm, stops the system and drives the burner screw for one minute to drive the burning matter back to the burner. The storage screw does not move or transfer more fuel into the burner screw.

3. The AVTA valve goes off and fills the screw pipe and the free fall funnel with water.

Protection can be increased with a back-pressure valve, a pressure tank and an alarming pressure gauge (wood chip systems only). Pellet systems are equipped with a powder extinguisher system.

If the fire has spread into the fuel storage, **DO NOT** open the storage door or hatch. **CALL THE FIRE BRIGADE!** Open the storage sprinkler system valve slowly (if installed).

TECHNICAL SPECIFICATION



BIJET

MAIN MEASUREMENTS OF THE BIJET BURNER. BIJET T 150-400 kW HAVE THE SAME MEASURES THAN BASIC MODEL

	40	60	120	150	200	250	300	400	500	500 T	700	1000	1500	
Measure C (mm)	330	420	520	630	710	790	880	1030	1260	1030	1264	1535	1612	
Diameter D (mm)	335	375	415	460	510	560	630	710	710	710	852	852	1004	
Weight (kg)	84	106	143	201	280	330	420	519	605	548	780	920	1540	
Pipe connection DN	20	20	20	25	25	25	32	32	32	32	32	32	32	
Electric feed	240 V 50 Hz 1 x 10 A (1-phase fans) 400 V 50 Hz 3 x 10 A (3-phase fans)													
Feeding cable	5 x 1,5 S													
Fan motor	Ziehl G2E-120/AR77-90, 2 x 80 W (1-phase fans) Sodeca CMP 512/514/616/718/820, 2-3 x 80-1100 W (3-phase fans)													
Ziehl-combustion air fan	2x G2E 120-AR77-90 (6001)			-----										
Sodeca-combustion air fan (primary/secondary)	-----				2x CMP-512-2T (13370)	2x CMP-514-2T (13346)			2x CMP-616-2T (13372)			2x CMP-514-2T CMP-718-2T	2x CMP 616-2T CMP 820-2T	2x CMP 616-2T, 2x CMP 718-2T
Max screw angle °	Screw diameter ø114mm 20° 60-500kW Screw diameter ø159mm 15° 60-120kW Screw diameter ø159mm 20° 150-500kW Screw diameter ø194mm 20° 400-500kW													

HAKEJET

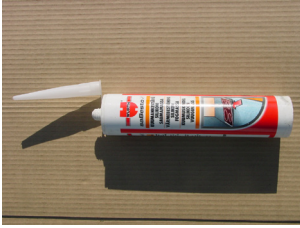
MAIN MEASUREMENTS OF THE HAKEJET BURNER

	60 kW	80 kW	120 kW	150 kW	200 kW	250 kW	300 kW
Measure C (mm)	515	605	705	825	905	980	1080
Diameter D (mm)	330	370	410	450	500	550	600
Weight (kg)	67	88	103	125	169	208	260
Electric feed	240 V 50 Hz 1 x 10 A (1-phase fans) 400 V 50 Hz 3 x 10 A (3-phase fans)						
Feeding cable	5 x 1,5 S						
Fan motor	Ziehl G2E-120/AR77-90/G2E-140: 2 x 80-185W W (1-phase fans) Sodeca CMP 512/514: 2 x 80- 180W (3-phase fans)						
Ziehl-combustion air fan	2x G2E-120/AR77-90 (6001)		2xG2E140/P128		-----		
Sodeca-combustion air fan	-----				2x CMP-512-2T (13370)	2x CMP-514-2T (13346)	
Max screw angle °	Screw diameter ø114mm 20° 60-300kW Screw diameter ø139mm 0° 40kW Screw diameter ø159mm 10° 60kW Screw diameter ø159mm 20° 80-300kW						

SCREW MOTORS USED

Burner screw 114mm	Motovario CS 052, 19.2 rpm, 0,55 kW
Burner screw 139mm	Transtecno TS90L14 B14, 11 rpm, 1,5 kW
Burner screw 159mm	Transtecno TS90L14 B14, 11 rpm, 1,5 kW
Burner screw 193mm	Transtecno TS90L14 B14, 11 rpm, 1,5 kW
Storage screws and burner screws above 3m designed case by case.	

CONTENTS OF THE DELIVERY



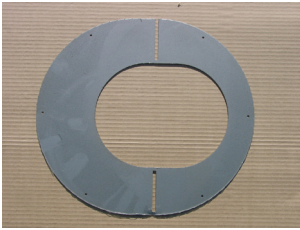
Tube of silicone



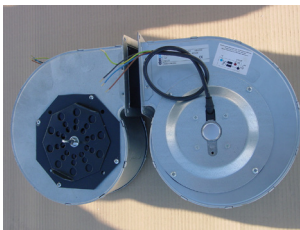
Sealing ring



Ceramic wool



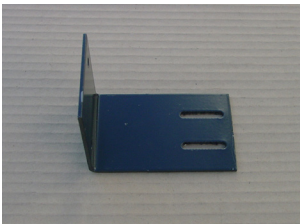
Cover plate



Fans (2-3 pcs)



Limit switch (transition limit)



Limit switch fastener



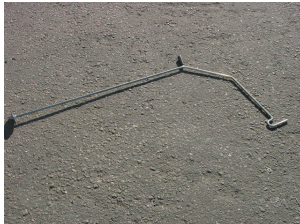
Limit switch striking plate



Condensator box (1-phase)



A bag of screws



Cleaning tool

■ WARRANTY

■ Warranty

Ariterm Energy Oy grants the equipment it delivers a one-year warranty. The warranty is valid for one year from the commissioning date or at maximum 18 months from the delivery date. The warranty for the pressure vessels manufactured by Ariterm Energy is 5 years from the date of delivery.

Ariterm Energy will deliver new parts to replace the faulty ones and the warranty applies to possible manufacturing and material defects. The warranty does not cover consumables or travel costs.

The warranty does not cover faults caused by incorrect designing, installation, maintenance or operation, or faults caused by off-specification fuel.

Spare part warranty is 12 months. Ariterm Energy will deliver new parts to replace the damaged ones. Unless there are mandatory laws, no other warranty is included in the contract. This paragraph determines exhaustively the Seller's liability for defects and buyer's legal remedies in defect situations.

UK Smoke Control Instructions

These instructions are intended for use when using any of the below appliances in a Smoke Control Area, when fitted with the correct burner.

- Arimax 300: Fitted with Biojet Burner 300
- Arimax 400: Fitted with Biojet Burner 400
- Arimax 500: Fitted with Biojet Burner 500

Fuel, the fuel type that the appliances have been tested on and exempted are wood pellets meeting the below criteria:

- Diameter 6 – 8 mm
- length 5 – 40 mm
- Moisture < 10 %
- Ash content < 0,5 %

Net caloric value 4,6 – 4,9 kWh/kg



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