

ARITERM ENERGY

INSTALLATION, OPERATION AND MAINTENANCE

- Multijet 40-500 linear motor steering



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■ FOR THE NEW OWNER

In this guide, we have compiled the key facts on installation, operation and servicing. Arterm Energy Oy's bio-burners have been designed to be easy to operate and reliable, and risks such as burn back have been eliminated through the introduction of several safety systems. By observing the instructions in this guide, your burner will achieve optimal operation. The quality of fuel used also fundamentally affects the ease of use.

The model of burner and level of accessories are selected at the order stage to suit the needs of the customer. These instructions are a general guide to the Arterm Multijet range of products. Because of this, there may be differences between the burner delivered to you and these instructions, due to different power ratings. During the installation stage, situations may emerge for which these instructions do not provide a direct answer.

■ INFORMATION ABOUT THE BURNER

Enter the burner's information into the table below. This will mean that we can act quickly for servicing and repair.

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

■ GENERAL

Ariterm's bio-burners meet the most up-to-date operational and safety standards for the burning of bio-fuels. The Multijet is a burner equipped with a moving grate which is installed in the burner compartment of the boiler's firebox. The burner grate is located entirely inside the firebox.

An automation system controls the burner by feeding it fuel and combustion air. The air is divided through separate fans into primary and secondary air, and the fuel is gasified in the burner's grate. The feed system may consist of one or more feed augers and a fuel stoker. The augers and stoker are selected according to the fuel being used. The movement of the grate can be separately adjusted to suit each kind of main fuel.

Between the augers in the multi-auger systems is a sensor, which monitors the fuel feed to the burner. If a conveyor stoker is part of the equipment, the automation system also controls this. When using pellets as fuel, no special control is required.

The burner's automation system controls the equipment based on the boiler's water temperature which is measured by a PT-100 sensor (with 4...20 mA transmitter). With the Arimatic control unit (AM150/151, AM200, AM1000 or AM2000), the burner can be maintained on constant partial power settings and reverts to its inactive mode only when the power requirement falls below the minimum level. In normal operation, the automation system runs the burner based on the power requirement at a level between 20% and 100%.

The equipment must have burn back protection. Such equipment varies depending on the fuel and feed system selected. Please note that the fuel selected also affects other parts of the equipment.

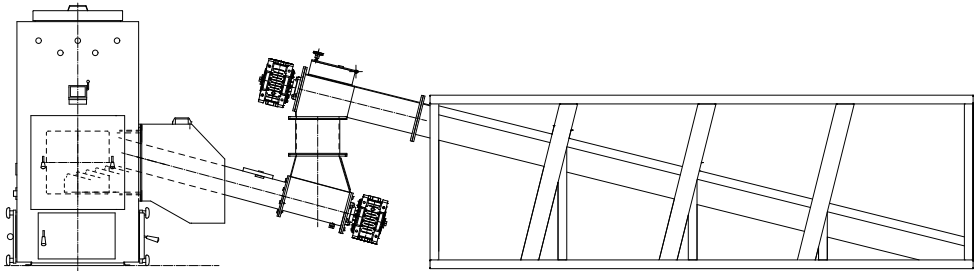
ALWAYS CHECK WITH THE PRODUCT SUPPLIER ON THE SUITABILITY OF THE FUEL FOR YOUR BURNER!

Bio-Fuel table page 30!

■ TRANSPORT, HANDLING AND STORAGE

The burner is packed at the factory for transportation and short-term storage. Depending on the means of transport and place of storage, however, the package may require additional protection to ward off moisture, knocks, etc.

A Multijet burner and T2 stoker base



The burner is often part of a larger entity. If you are transporting the system by itself, in order to avoid transport damage and for the sake of traffic safety it is important to tie the packages together as well as possible and to secure them to the vehicle. The transport company is always responsible for the correct loading and securing of the equipment.

Use caution when handling components in order to prevent damage.

The equipment can be stored in the open air if protected from rain and ground moisture. Long-term storage, however, requires a better storage location. Storage indoors is recommended as the equipment contains sensitive parts such as electric motors, sensors and a control unit.

■ INSTALLATION

■ Receiving delivery and handling

When you receive the delivery, check that the contents correspond to your order and that the final inspection report and list of accessories are included. If anything is unclear, contact the seller immediately.

Before commencing assembly, it is advisable to read not only these burner installation and operating instructions carefully but also the installation instructions for the boiler, automation system and fuel stoker.

This means you can ensure in advance that, from a point of view of successful installation, the main facts and measurements are all satisfactory. Please note: Keep all operating and installation instructions in a safe place where you can easily find them when you need them, for example in their own folder in the boiler room.

The parts of the Arterm bio-heating system should always be installed by an expert and in accordance with requirements. We recommend that you carry out installation in the following order:

1. Put the boiler in position with the burner attached, and ensure that the pipes and flue not yet connected
2. Put the conveyor or other fuel stoker in position.
3. Fit the augers between the stoker and burner.
4. It is advisable not to carry out the final precise positioning of the boiler and fuel stoker until the suitability of the augers has been checked. In the TPYM stoker, the stoker is fitted to the floor and is the checkpoint for the system.
5. Plumbing and electrical work is done last.

■ Requirements concerning the installation and operating environment

- The boiler room must be built in accordance with the relevant regulations (E9 Building Regulations, further information available from your local fire authority)
- Air vent in the boiler room wall. Recommended surface area $5 \text{ cm}^2 / 1 \text{ kW}$
- Installation and operating temperature $0 - +40 \text{ }^\circ\text{C}$
- The humidity of the boiler room should be $20 - 80 \%$ (in order to prevent condensation)

■ Necessary connections

- Electrical supply through the control unit to the actuators and instrumentation
- Flue in accordance with the instructions for the boiler to be used. Remember that the correct negative pressure is important for the system to function properly!
- Water for the automatic extinguishing system (a powder extinguishing system is recommended if pellets are used as fuel)
- Installation of the power unit of the stoker conveyor
- Connecting the hoses of the power unit that move the grates of the Multijet burner to the burner's cylinders

■ Space requirement

Please note that there must be sufficient space for the burner and burner auger between the boiler and boiler room wall. When planning, it is advisable to make allowance for the possible dismantling of the burner and burner auger/motor for maintenance purposes (e.g. door openings). We recommend a distance of at least 1 metre between the boiler and the wall on the sides where sweeping and maintenance work will be carried out.

■ MECHANICAL INSTALLATION

The system delivery usually also includes a boiler, burner auger, auger motors, automation system and stoker. These are selected based on the type of fuel and fuel stoker being used.

■ Installing the burner in the boiler

The burner can be installed in a solid fuel boiler, the power rating of which corresponds to the power of the burner. The negative pressure required for the reliable and correct operation of the burner (25-30 pa in the firebox) can be ensured either by a correctly dimensioned chimney or a negative pressure-controlled flue gas extractor.

We recommend that compatibility with anything other than an Ariterm boiler is checked by the burner manufacturer.

The burner is fixed by its flange to the boiler with bolts and the seam is sealed with heat-resistant silicon (1). The joints must be sealed so well that they are completely air-tight! The bolts are tightened diagonally. If the boiler opening and burner flange are of different sizes, for the purposes of installation, a suitable installation flange must be made.

CONTENTS OF DELIVERY

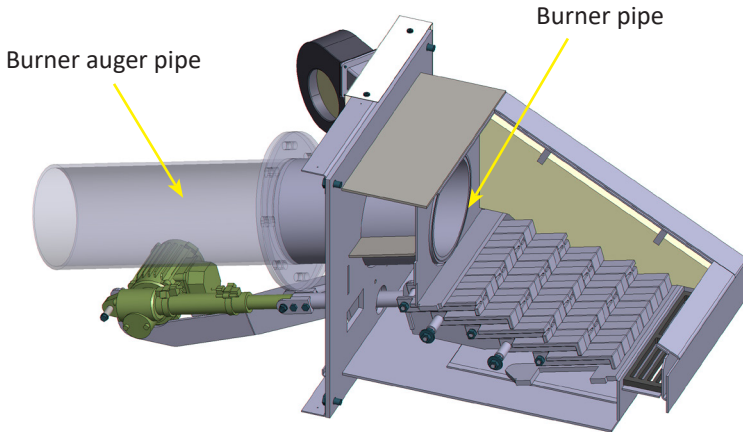
Delivered in a separate packet		Power									
		40	60	80	120	150	200	250	300	400	500
Nr.	Part										
1	MultiJet burner head	1	1	1	1	1	1	1	1	1	1
2	Allen screw M10x20 for fitting burner head	4	4	12	12	12					
3	Washer M10	4	4	12	12	12					
4	Allen screw M12x25 for fitting burner head						16	16	16	16	18
5	Washer, M12						16	16	16	16	18
6	Capacitor housing 1x1, 5µF	2	2								
7	Capacitor housing 1x2µF			2	2	2	4	4			
8	Cleaning scraper rounded 1322						1	1	1	1	1
9	Cleaning scraper, 1353	1	1	1	1	1					
10	Pipe seal	1	1	1	1	1	1	1	1		
11	Heatproof silicone, tube	1	1	1	1	1	1	1	1		

Delivered attached in the burner		Power									
		40	60	80	120	150	200	250	300	400	500
Nr.	Part										
1	Fan Ebmpapst G2E 085-AA01-05	2									
2	Fan Ebmpapst G2E 108-AA01-23		2								
3	Fan Ebmpapst G2E 120-AR77, 2350r/min			2	2	2	4	4			
4	EC-Fan Ebmpapst G3G108BB0103 (used with Arimatic 151 steering cabinet)	2	2	2	2	2					
5	Fan Sodeca CMP-512-2T 3.								4	4	4
6	Fan fastening screw M6x20	8	8	8	8	8	16	16	16	16	16
7	Fan fastening nut M6	8	8	8	8	8	16	16	16	16	16
8	Linear motor Linak LA36AC32-20100B24	1	1	1	1	1					
9	Linear motor Linak LA36AC32-20150B24						2	2	2	2	2
10	Linak middle limit Sick MZT6-03VPS-KW0	1	1	1	1	1	2	2	2	2	2

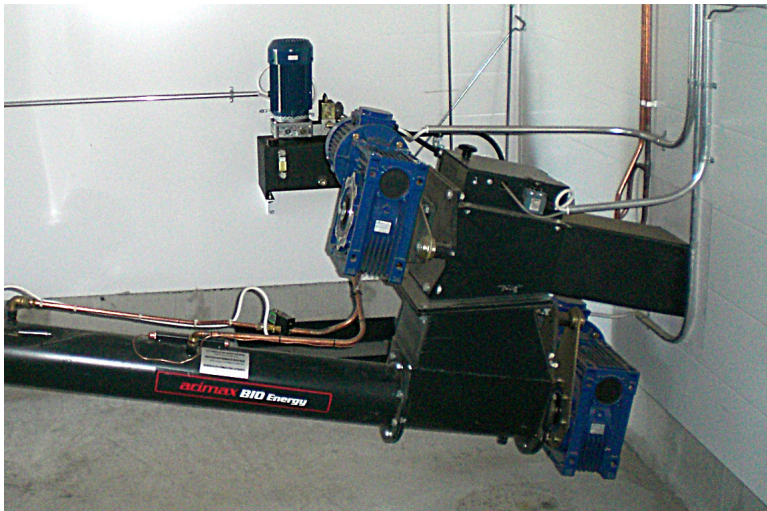
■ INSTALLATION

■ Installing the burner auger in the burner

After attaching the burner, install the burner pipe. The burner pipe must be pushed deep enough so that its end reaches the level of the inner surface of the burner's back wall. The burner pipe is fitted into its position on the burner auger pipe. The gap between the burner pipe and the burner head is sealed with heat-resistant silicon that comes with the delivery.



A drive motor and reduction gear are installed at the end of the burner auger. The permitted positions of the gear can be found at the end of the operating instructions. The picture shows wood chip-burning equipment.



■ INSTALLATION

■ Installation of other equipment

1. Two or four combustion air fans are ready installed on the burner, depending on its size.
2. Install the capacitor housings (10) in a suitable location (concerns 40-250kW burners with single-stage fans). Avoid places where the housing is subject to heat or mechanical shocks. With the Arimatic 151 control cabinet the EC-fans are used and therefore the capacitor housings are not required.
3. 1-2 spindle motors are installed under the burner for the moving grate. The spindle motor(s) have two internal and one external limit switches. Their connections are shown in the wiring diagrams.

■ Electrical installation

The wiring diagrams for the burner's electrical equipment can be found in the automatic control unit instructions.

ELECTRICAL INSTALLATION MUST ONLY BE CARRIED OUT BY A QUALIFIED ELECTRICIAN!

■ INSTALLATION

■ Installation of safety systems guarding against burn back

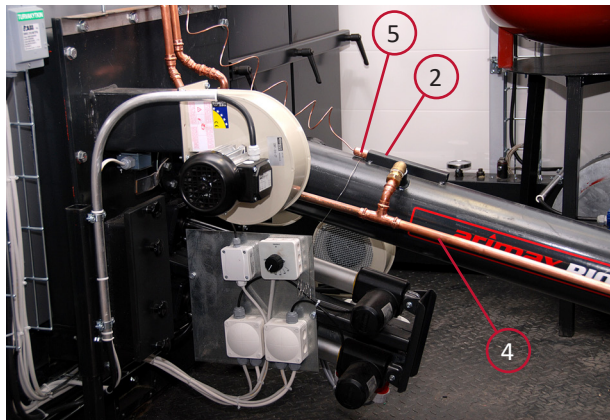
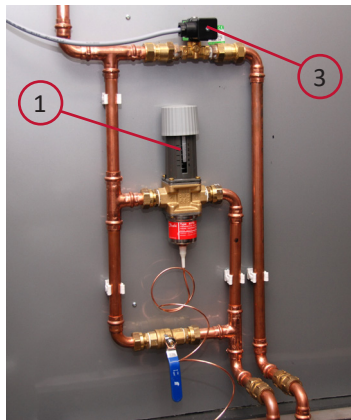
The Ariterm bio-burner must be equipped with an extinguishing system to prevent burn back. To ensure safe use of the equipment, it is important to install all extinguishing systems before the equipment is started. The extinguishing systems are as follows (a-d):

a. Connecting the AVTA safety valve to the water supply system (wood chip-burning systems)

- The Danfoss AVTA15(50—+90 °C) thermostat valve (1) is connected to the burner auger pipe and intermediate tank. The valve sensor is manually pushed above the sensor pocket (2) (see picture), and the valve is connected to the water supply system. In order to avoid possible network pressure loss, you can fit an expansion tank (4) equipped with a non-return valve and a pressure warning gauge (PIA).
- Through manual override, the water can be sprayed into the fuel system manually.
- The AVTA valve must be adjusted to about 80 °C (on scale no. 4).

Please pay attention to the installation instructions for the valve sensor!

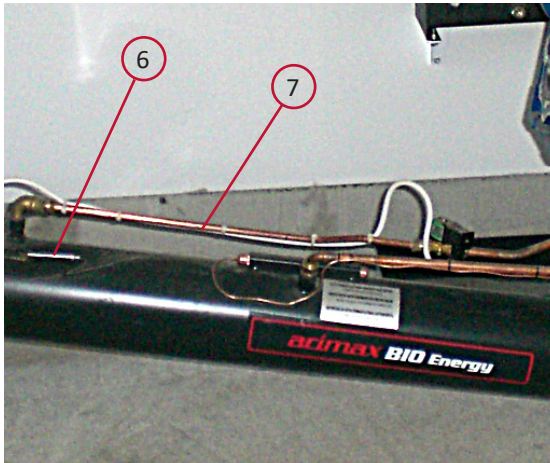
- The burn back thermostat sensor and AVTA valve sensor are each installed in their own sensor pocket on the surface of the auger pipe. Please note that the sensors must be tight against the auger pipe housing. If necessary, use heat-conducting material or screws. The screws must not, however, damage the sensor! The burn back thermostat is connected to the burner's automation system. The AVTA operates on water pressure.



■ INSTALLATION

b Pulse-controlled extinguishing system connected to the water supply system

- The magnetic valve pipe (5) is connected to the feed auger pipe. The valve is controlled by the Arimatic automatic control system. The pulse-controlled burn back protector is adjusted to a temperature of 60 – 70°C, where it operates before the AVTA valve. SEE OPERATING INSTRUCTIONS SECTION 12 – PULSE EXTINGUISHING
- The operation of the magnetic valve during power cuts can be ensured using UPS equipment.
- Possible loss of supply pressure can be avoided by installing an expansion tank and pressure warning gauge (PIA).
- The sensor of the pulse-controlled burn back system is installed close to the burner head so that it is tripped first.
- The pulse-controlled burn back system is no substitute for an AVTA or powder extinguishing system!



PLEASE NOTE! We recommend that water-powered extinguishing systems are fitted with a 50-litre membrane expansion tank (RST), non-return valve and pressure warning gauge. This means that a possible drop in supply pressure does not jeopardise the operation of the safety equipment.

c. Burn back thermostat

- The burn back thermostat sensor is installed in the burner auger pipe, under the visor beside the AVTA sensor. In a burn back situation, the automation system drives the burner auger with an extra pulse, sets off an alarm and the equipment stops. The automation system maintains flue gas extractor operation. Adjustment range 60-70 °C.

d. Other safety systems

- A manual connection with a shut-off valve is fitted from the water supply system.
- A fire alarm monitoring the fuel stoker temperature can be fitted as an option.

4. AVTA system extinguishing pipe

5. AVTA system temperature sensor

6. Pulse-controlled system temperature sensor

7. Pulse-controlled system extinguishing pipe

■ INTRODUCTION INTO USE

Operational testing

The operation of the equipment is tested before use as follows:

Start the motors (augers and fans) one at a time and check the following:

- directions of rotation of the augers
- operation and direction of rotation of the combustion air fans and flue gas extractor
- countermanding of fuel augers
- pump operation
- check the direction of rotation of the pump of the power unit
- operation of moving grate

Check the safety equipment

- Adjust the tripping temperature of the burn back thermostat to a level low enough to set off an alarm.
- Turn the thermostat of the AVTA valve so that it trips and check that the nozzles are open. Please note that this may create a large volume of water, and we recommend that you direct it into a separate receptacle.
- Adjust the tripping temperature of the pulse-controlled burn back thermostat to a level low enough that it trips.
- If necessary, carefully heat the sensors.
- Check the over-heat protection, boil-dry protector and other connected safety equipment.
- Check the alarm function and that a remote alarm is set off, if it has been connected

Read the operating instructions for the automatic control system before starting the system!

Adjustment

The burner and boiler should be run slowly up to operating temperature in order to minimise the heat stress on the structures. Automatic control should be shut off and a suitably low power level selected while the temperature is rising (about 1 hour).

Once the burner and boiler have been warmed up, the burner must be adjusted for clean and economic operation. An experienced burner operator can adjust the burner visually. The flame must be pale yellow and combustion must be even. Precise adjustment, however, requires the use of a flue gas analyser and this is recommended.

The excessive movement of fuel in the grate can be reduced by restricting the movement of the grate. If ash sticks to the grate, increase its movement.

Notice!

Target values for combustion	
Oxygen (O ₂)	7-9%
Carbon monoxide (CO)	100-400 ppm, chip
Carbon monoxide (CO)	50-200 ppm, pellet

■ INTRODUCTION INTO USE

The temperature of the flue gas does not have a direct impact on combustion, but it has a significant impact on overall efficiency. At low power settings, the fan power must be sufficiently great to ensure that the burner's air ducts stay clean. The above-mentioned guidance values can then be exceeded.

The quantity and consistency of the ash is a good indication of the cleanliness of combustion. A large amount of ash or ash mixed with unburned substances is a sign of impure combustion.

PLEASE NOTE! The quantity of ash can fluctuate up to ten times depending on the fuel selected!

The lower burner fan acts as a primary air fan. Adjusting the primary air adjusts the power of the burner. Fine adjustment of the secondary air fan adjusts combustion. Burners of 150 kW or more have two primary air fans.

PLEASE NOTE! Any changes to the settings will take at least a couple of minutes to take effect.

Adjustment tips

- If too much unburned fuel has accumulated on the grate and/or in the ash, the feed rate of fuel to the burner auger should be cut and/or the fan revolutions increased. The movement of the grate should be shortened.
- If the tip of the flame is black and the boiler is getting dirty quickly, the secondary fan revolutions should be increased and/or the fuel feed rate cut.
- If the flame is bluish and burns unevenly, the secondary fan revolutions should be reduced.
- If the fuel includes lightweight particles, some of them may fly out of the burner with airflow before the fuel has burned completely. This is evidenced by sparks in the firebox and increased ash production. Some of this fly-out can be avoided by reducing the air flow (fans).
- When the fuel or its consistency changes, the settings must be readjusted.
- At low power settings, depending on the fuel being used, it is possible to ventilate the combustion air openings in the burner and prevent them from clogging. In that case, the adjustment value of the primary air blower must be raised, then the increased airflow keeps the holes open.

Please note! For the adjustments to be made, the equipment should be run with an almost full load.

An under-loaded boiler reaches its set temperature quickly and the burner moves into an inactive stage, so the time required for adjustment can easily be too short. If the boiler is introduced into use in the summer (under-loaded), it should be re-adjusted as soon as it can be properly loaded.

Burner shutdown

The fuel in the burner, burner auger and intermediate tank must be burned away before the device is shut down. The shutdown function in Arimatic automatic systems can be activated from the USE menu. This function stops the operations of the stoker auger and stoker conveyor (if in use). Other functions of the system continue to work normally and will stop at the flame control alarm when the fuel in the burner auger and hopper has burned out.

PLEASE NOTE! Ensure that the fuel is completely extinguished before you leave!

■ BURNER OPERATION

■ Information about risks concerning operation

If burn back occurs, the fire has spread from the burner to the burner auger. Preventive measures:

- The firebox of the boiler must constantly have sufficient negative pressure, even during combustion
- The automatic extinguishing systems must always be kept in operating condition
- This risk can be minimised in design by making the burner auger sufficiently long for the safety systems to have time to trip in a burn back situation
- A short (< 1,000 mm) burner auger requires a fire-resistant fan-wheel lift for permanent burn back protection.
- Fill the fuel tank in good time before the fuel runs out, so that the airflow cannot be sent off in the wrong direction.
- This solid fuel heating unit always generates heat, even when it is in inactive mode.
- Do not keep the unit running, if there is insufficient need for heat.
- A risky situation develops when the unit is kept running when it is under-loaded: **these risks include burn back, corrosion of the boiler and reduced efficiency.**
- Before you open the boiler hatches or begin servicing the boiler, switch off the automatic sweeping!
- Use hearing protection!
- Do not open the boiler hatches during a power failure. Danger of carbon monoxide explosion!
- Check whether there is a healthy flame in the burner before opening the hatches. If not, air the boiler by raising the revolutions of the flue gas extractor for about two minutes prior to opening the hatches.

■ Injuries caused by power transmission or fuel stoker moving parts

Preventive measures:

- Always keep the covers of mechanical moving parts in place during operation.
- Always turn the power off at the mains before carrying out servicing on the equipment.
- Do not open the fuel tank when the equipment is running.

■ Exposure to harmful dust

Preventive measures:

- Do not use wood chip that has gone mouldy.
- Re-fill the tank in good time before the fuel runs out
- Use a breathing mask.

WARNINGS!

- **Do not enter an unventilated fuel stoker. The enclosed space can be oxygen-free and so highly dangerous. Do not work alone in the fuel stoker.**
- **BEWARE OF THE HOT BURNER SURFACES! The burner is insulated, but certain steel parts are connected to the burner flange and so may be hot.**
- **THE SAFETY SWITCH MUST BE LOCKED OPEN DURING MAINTENANCE WORK!!**
- **THE EQUIPMENT MUST NOT BE USED UNTIL IT HAS BEEN FULLY INSTALLED, THE SAFETY EQUIPMENT HAS BEEN TESTED AND CERTIFIED AS FUNCTIONAL, AND THE OPERATOR HAS BEEN TRAINED IN ITS USE AND UNDERSTANDS HOW TO OPERATE IT CORRECTLY.**
- **THE EMERGENCY STOP BUTTON DOES NOT STOP THE FLUE GAS EXTRACTOR IN ARIMATIC AUTOMATIC SYSTEMS**
- **NEVER INSERT YOUR HANDS INTO THE HOPPER HATCH – THE HOPPER'S LIMIT SWITCH DOES NOT STOP THE BURNER AUGER IN ARIMATIC AUTOMATIC SYSTEMS**

SERVICING

Maintenance and inspection

PLEASE NOTE! Cut power to the equipment before starting repair or maintenance work!

In order to guarantee fault-free operation and a long service life, the following maintenance procedures must be carried out:

Procedure	Interval
Lubrication of feed auger bearings during first use	Twice a year
Operational testing of flame control thermostat Raise the setting value of the thermostat until an alarm is set off	Twice a year
Operational testing of burn back thermostat Lower the setting value of the thermostat until an alarm is set off	Twice a year
Operational testing of AVTA valve Immerse the sensor in hot water (°C over the setting value) until the valve opens Recommendation: disconnect the water pipe from the burner auger and intermediate tank and direct the water down a floor drain, for example.	Twice a year
Operational testing of pulse-controlled burn back protector. Adjust the settings value to a lower temperature until the magnetic valve opens. Recommendation: disconnect the water pipe from the burner auger and direct the water down a floor drain, for example.	Once a year
Check that the powder extinguisher system bottle is pressurised.	Weekly
Check that the use-by date on the bottle has not expired.	Weekly
In principle, the fan motors do not require servicing. The auger motor gearboxes are lubricated for life.	
Other devices installed in the equipment in accordance with the relevant instructions	

Burner cleaning	Interval
Inspection of condition of grate surfaces and ceramics. Open the airholes from grate blocks and remove the ash from grate surfaces. Check the condition of side ceramics. If ceramics are worn out, those must be changed.	Twice a month or, if necessary
Inspection and cleaning of bottom of the grate. This action is very important to do, otherwise hardened ash can prevent the movement of grate and that can damage the actuators. Quarantee doesn't compensate the damages which comes from bad maintenance. Multijet 40 - 150 once / month, or more often if necessary - Open the hatch under the burner. Hatch handles are located under the burner cover. - Remove the ash under the grate by compressed air or ash extractor. - Check that moving grate can move free and close the hatches. Multijet 200 - 500 twice / month, or more often if necessary - Open the service hatches (7) from end of the burner. Hatches are taken off with fan. - Remove the ash under the grate by ash extractor or with scraper. - Check that moving grate can move free and close the hatches.	
Operational inspection of the actuator motor and fans	Once a month

■ TROUBLE-SHOOTING

■ Instructions when malfunctions may arise

Malfunction	Cause	Action
The safety apparatus has stopped the equipment.	The motor guard has tripped owing to excessive resistance.	Remove the obstacle preventing movement of the auger by turning the auger backwards and check that the auger turns freely. Reset the alarm.
	The motor guard has tripped owing to lack of phase.	Check the power supply. Reset the alarm.
	The boiler or burner head overheat protection has tripped as a result of boiler overheat.	Find out the reason for the overheat. Remove the causes of the malfunction. Reset the overheat protection. Reset the alarm.
	The flame control thermostat has tripped because the flue gas temperature has fallen below the settings value.	Check fuel feed: Restart the unit. If necessary, reduce the flame control thermostat settings value.
	The burn back thermostat has tripped because the surface temperature of the auger pipe has risen above the settings value.	Find out the causes of the burn back. Start up the unit if it is safe to do so. If necessary, change the adjustment values (e.g. the temperature of the unit may cause a false alarm).
	The AVTA valve has tripped owing to auger pipe overheat, and has filled the intermediate tank with water.	Drain the water out through the drain hole in the bottom of the water tank. Send the wet fuel through the burner head to the ashbox. Feed dry fuel into the burner head and start the unit.
	The displacement limit has tripped because the boiler or burner auger has been displaced.	Remove excess fuel from the boiler and burner. Check the pipe- and other connections of the unit as well as the operation of the flame control.
	The limit switches of the hatches have tripped because one of the hatches was open.	Find out the reason for the tripping. Shorten the conveyor operating time. Check the operation of the intermediate tank photocell.
	The flue gas extractor has stopped.	Find out the cause of the malfunction, in the power supply or the frequency converter.

■ TROUBLE-SHOOTING

Malfunction	Cause	Action
The AVTA valve is leaking water.	Impurities in the valve.	Remove and clean.
The pulse-controlled burn back protector valve is leaking water.	Impurities in the valve or the flow direction of the valve is wrong.	Remove and clean, check flow direction.
The pulse-controlled burn back protector valve does not open.	Network pressure too high.	Reduce pressure to 3 bar.
Insufficient heat.	Stoker auger feed insufficient, smoke entering the intermediate tank and disturbing the photocell.	Ensure sufficient negative pressure in the boiler.
	Dust from the fuel disturbing the photocell in the intermediate tank.	Hopper filling time must be shortened to 8-12 secs.
The unit has stopped. Alarm.		Check what is causing the alarm. Find out the reason for the alarm..

■ INSTRUCTIONS IN CASE OF EMERGENCY

The Arterm bio-burner is a safe piece of equipment, if it is used correctly and serviced according to the instructions.

Here we describe some possible emergencies and give instructions for dealing with them.

■ Burn back (fire has spread from the burner to the burner auger)

The burn back protectors react to a rise in temperature of the burner auger as follows:

1. The pulse-controlled burn back protector sprays water onto the fuel, increasing its moisture content and the fire is doused before it has time to spread further. The unit does not stop and does not emit an alarm. Protection can be extended with a non-return valve, pressure tank and pressure warning gauge. FOR MORE INFORMATION SEE THE AUTOMATION SYSTEM OPERATING INSTRUCTIONS!
2. The burn back thermostat emits an alarm for the burn back, the burner auger and hopper are forced to empty. The combustion air fans are stopped and flue gas extractor continues to function. The objective of the safety measures is to force the fire pocket back to the burner and bring the equipment to a halt. The stoker auger does not move and does not transport new fuel to the burner auger.
3. The AVTA valve trips and fills the auger pipe and hopper with water. Protection can be extended with a non-return valve, pressure tank and pressure warning gauge. Only for wood chip systems!

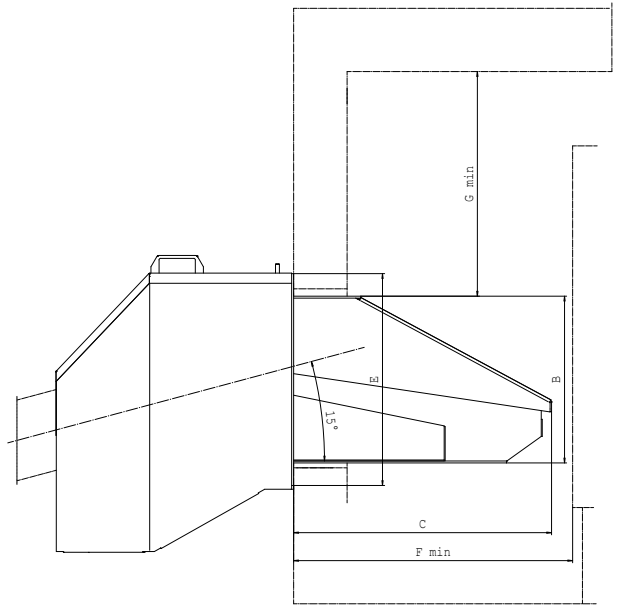
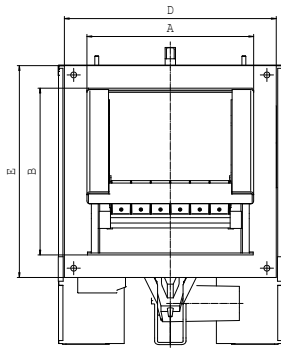
If the fire has spread to the fuel stoker, DO NOT open the stoker door or hatch. CALL THE FIRE BRIGADE! Open the stoker sprinkler system valve slowly (if fitted).

TECHNICAL SPECIFICATIONS

	40 kW	60 kW	80 kW	120 kW	150 kW	200 kW	250 kW	300 kW	400 kW	500 kW
Power supply	Through the control centre. The parameters of the main fuse must be checked on a case-by-case basis.									
Power supply cable	See wiring diagram									
Spindle motor	Linak LA36 100 mm					Linak 2x LA36 150 mm				
Combustion air fan	2x Ebmpaps 1v G2E-85	2x Ebmpaps 1v G2E-108	2x Ebmpaps 1v G2E-120/AR77-90	2x Ebmpaps 1v G2E-120/AR77-90	2x Ebmpaps 1v G2E-120/AR77-90	4x Ebmpaps 1v G2E-120/AR77-90	4x Ebmpaps 1v G2E-120/AR77-90	4x Sodeca 3v CMP-512-2T	4x Sodeca 3v CMP-512-2T	4x Sodeca 3v CMP-512-2T
Combustion air fan	NOTICE! With Arimatic 151 G3G108BB0103, 40-150 kW									
Max. Auger angle	Auger diameter \varnothing 114mm 15° 40-400kW (pellet use) Auger diameter \varnothing 139mm 10° 40 kW (other fuels) Auger diameter \varnothing 159mm 15° 60-300 kW (other fuels) Auger diameter \varnothing 194mm 15° 400 kW (other fuels) NOTICE! Briquet fuels, auger diameter according to pice size.									

Burner auger motors used in the systems	
Burner screw 114 mm	Motovario CS 052, 19.2 rpm, 0.55 kW
Burner screw 139, 159 and 194 mm	1.1 / 1.5 kW

40 - 500 kW DIMENSIONS

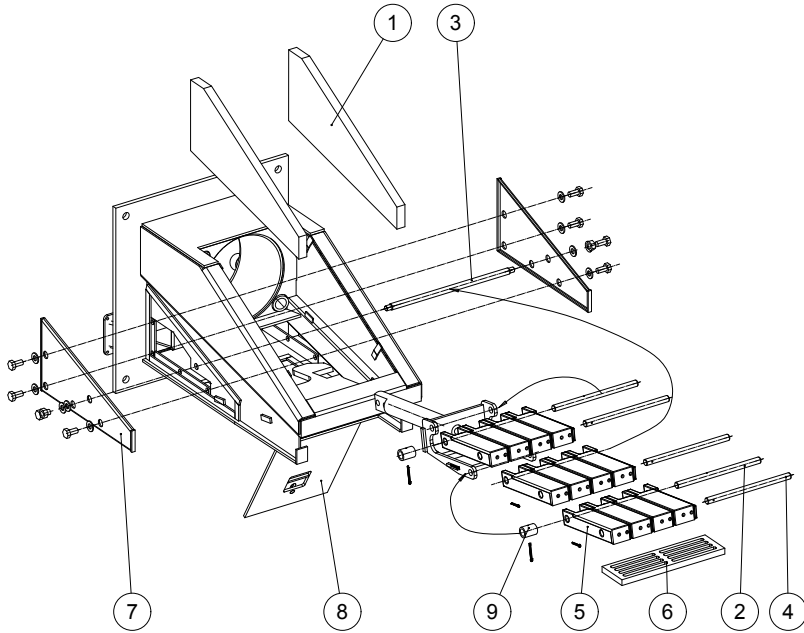


Burner kW	A	B	C	D	E min	F min	G min	Weight kg
40	230	240	441	322	322	465	350	54
60	340	340	526	432	432	555	400	84
80	380	380	623	482	482	650	500	110
120	420	380	623	522	522	650	600	120
150	440	440	738	562	562	770	650	145
200	500	640	1019	592	732	1050	750	390
250	570	640	1019	662	732	1050	850	440
300	640	640	1019	732	732	1050	950	490
400	710	685	1206	802	777	1240	1050	650
500	850	685	1216	942	777	1240	1200	800



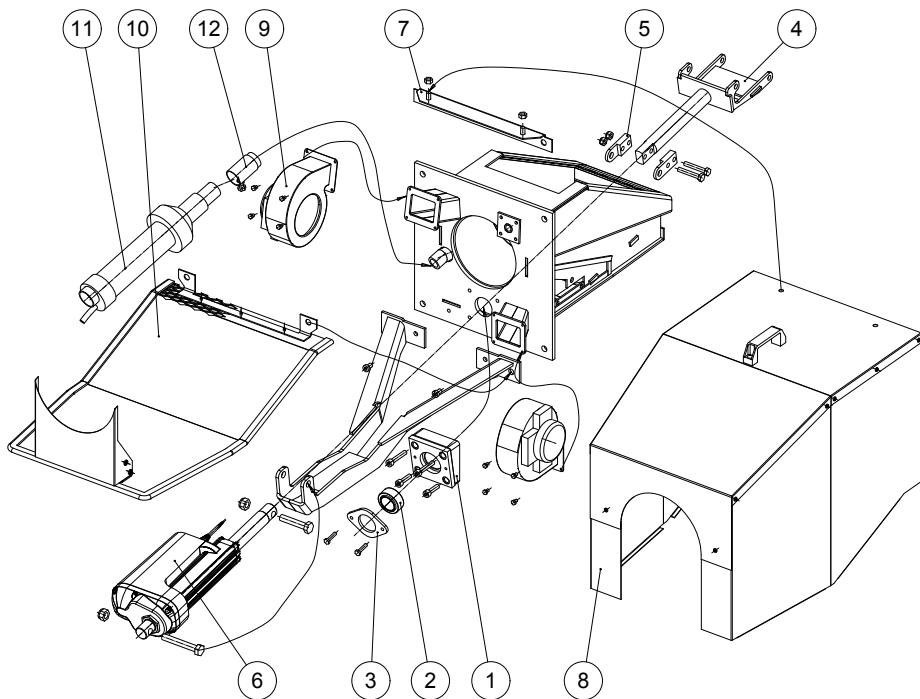
40 kW INTERNAL PARTS EXPLODED VIEW

Burner kW	Blocks in a row	Block rows	Blocks total	Long shafts	Short shafts
40	4	2	8	1	2



Parts in burner pcs			
No	Part	40 kW	Spare part
1	Side ceramic Productnumber	2 13853	X
2	Grate shaft short Productnumber	2 13718	X
3	Grate shaft long Productnumber	1 13717	X
4	Grate shaft short	3	X
5	Grate block Productnumber	12 13459	X
6	End grate (Accessorie) Productnumber	1 13849	X
7	Lower side hatch	2	
8	Cleaning hatch	1	X
9	Lock bushing	2	

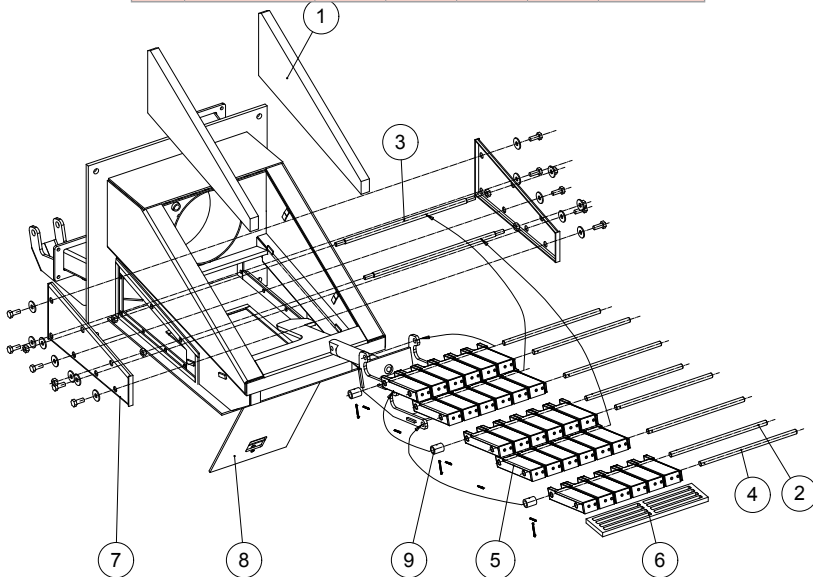
40 kW SURFACE PARTS EXPLODED VIEW



Parts in burner (Pcs)			
No	Part	40 kW	Spare part
1	Bearing housing	1	
2	Articulation bearing Productnumber	1 13468	X
3	Articulation bearing flange	1	
4	Rammer	1	
5	Rammer bracket	2	
6	Linear actuator Linak 100mm Productnumber	1 14356	X
7	Cover support	1	
8	Protective housing	1	X
9	Combustion fan Productnumber	2 13722	X
10	Bottom plate	1	

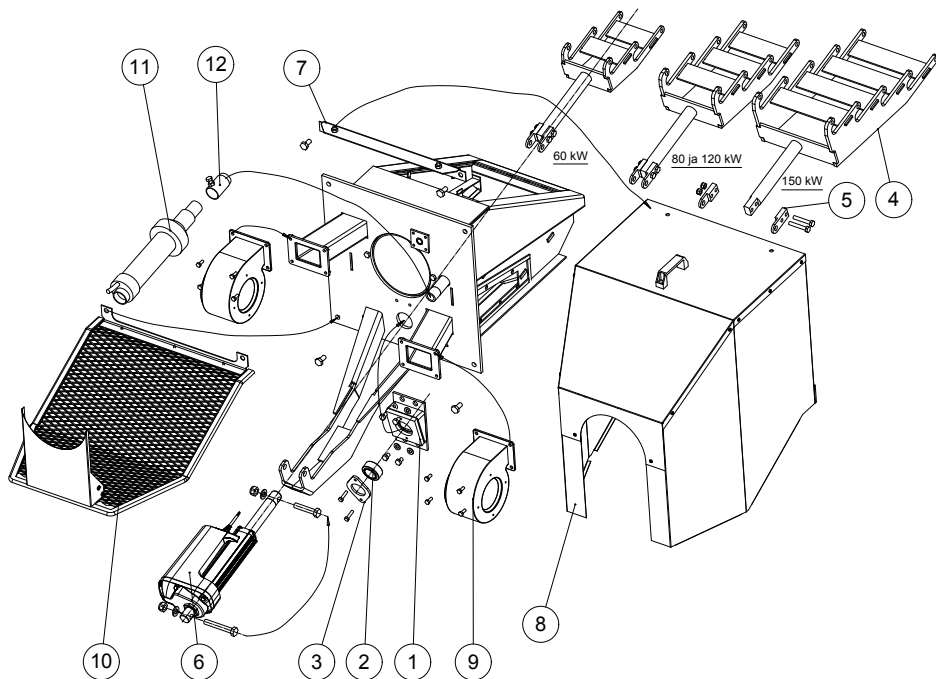
60 - 150 kW, INTERNAL PARTS EXPLODED VIEW

No	Part	Parts in burner pcs				Spare part
		60 kW	80 kW	120 kW	150 kW	
1	Side ceramic Productnumber	2 13418	2 13637	2 13737	2 13654	X
2	Grate shaft short Productnumber	3 13309	4 13634	4 13309	5 13319	X
3	Grate shaft long Productnumber	2 13308	3 13636	3 13656	4 13318	X
4	Grate shaft short	3	4	4	5	X
5	Grate block Productnumber	30 13459	49 13459	56 13459	72 13459	X
6	End grate (Accessorie) Productnumber	1 13417	1 13850	1 13655	1 13655	X
7	Lower side box	2	2	2	2	
8	Cleaning hatch Productnumber	1	1	1	1	X
9	Lock bushing	3	4	4	5	



Burner kW	Blocks in a row	Block rows	Blocks total	Long shafts	Short shafts
60	6	5	30	2	3
80	7	7	49	3	4
120	8	7	56	3	4
150	8	9	72	4	5

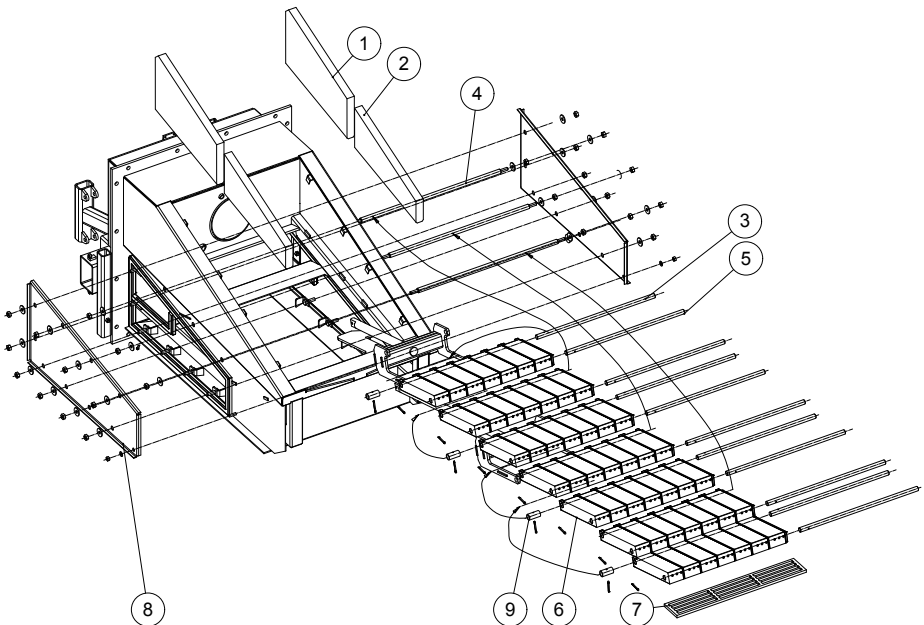
60 - 150 kW SURFACE PARTS EXPLODED VIEW



Parts in burner (Pcs)						
No	Part	60 kW	80 kW	120 kW	150 kW	Spare part
1	Bearing housing	1	1	1	1	
2	Articulation bearing Productnumber	1 13468	1 13468	1 13468	1 13468	X
3	Articulation bearing flange	1	1	1	1	
4	Rammer	1	1	1	1	
5	Rammer bracket	2	2	2	2	
6	Linear actuator Linak 100mm Productnumber	1 14356	1 14356	1 14356	1 14356	X
7	Cover support	1	1	1	1	
8	Protective housing	1	1	1	1	X
9	Fan Productnumber	2 13906	2 6001	2 6001	2 6001	X
10	Cover support	1	1	1	1	
11	Hot air fan (accessorie)					
12	Ignition adapter (accessorie)					

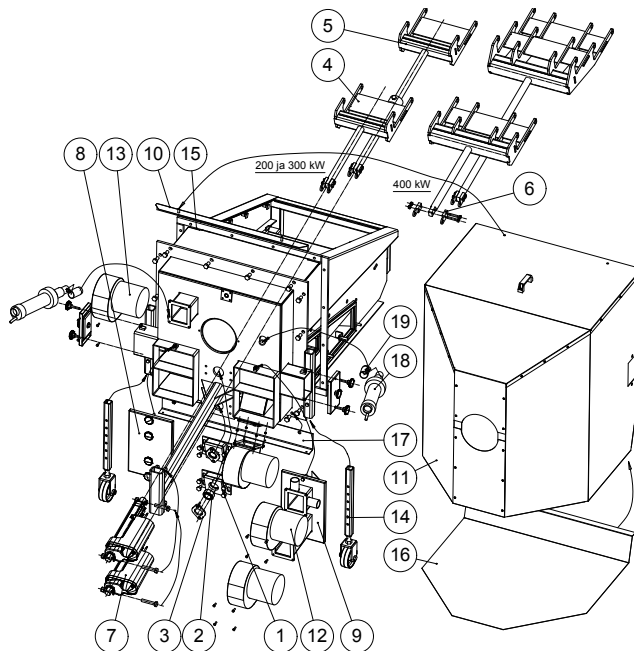
200 - 500 kW INTERNAL PARTS EXPLODED VIEW

Nro	Tuotenimike	Parts in burner (Pcs)					Varaosa
		200 kW	250 kW	300 kW	400 kW	500 kW	
1	Side ceramic upper Productnumber	2 13580	2 13580	2 13580	2 13896	2 13896	X
2	Side ceramic lower Productnumber	2	2	2	2 13897	2 13897	X
3	Grate shaft short Productnumber	4 13422	4 13325	4 13576	4 13939	14 13893	X
4	Grate shaft long Productnumber	3 13423	3 13324	3 13575	4 13940	4 13892	X
5	Grate shaft short	5	6	7	8	8	
6	Grate block Productnumber	35 13294	42 13294	49 13294	72 13911	90 13911	X
7	End grate (accessorie) Productnumber	1 13851	1 13852	1 13578	1	1	X
8	Lower side housing	2	2	2	2	2	
9	Lock bushing	4	4	4	4	4	



Burner kW	Blocks in row	Block rows	Blocks total	Long shafts	Short shafts
200	5	7	35	3	4
250	6	7	42	3	4
300	7	7	49	3	4
400	8	9	72	4	5
500	10	9	90	4	14

200 - 500 kW SURFACE PARTS EXPLODED VIEW



No	Part	200 kW	250 kW	300 kW	400 kW	500 kW	Spare part
1	Bearing housing	2	2	2	2	2	
2	Articulated bearing Productnumber	2 13467	2 13467	2 13467	2 13467	2 13467	X
3	Articulated bearing flange	2	2	2	2	2	
4	Rammer, upper	1	1	1	2	1	
5	Rammer, lower	1	1	1	2	1	
6	Rammer bracket	4	4	4	8	4	
7	Linear actuator Linak 150mm Productnumber	2 14357	2 14357	2 14357	2 14357	2 14357	X
8	Cleaning hatch	1	1	1	1	2	X
9	Fan hatch	1	1	1	1	2	
10	Cover support	1	1	1	1	1	
11	Protective housing	1	1	1	1	1	X
12	Fan, primary	2 6001	2 6001	2 13370	2 13370	2 13370	X
13	Fan, secondary Productnumber	2 6001	2 6001	2 13370	2 13370	2 13370	X
14	Foot	2	2	2	2	2	X
15	Counter-flange	1	1	1	1	1	
18	Hot air fan (accessorie)						
19	Ignition adapter						

PROPERTIES OF BIO-FUELS

Property	Density	Size of piece	Moisture	Power rating	Amount of ash	Temp. softening	Temp. melting	Suitability
Unit	kg / 1-m ³	mm	%	kWh / t-m ³	% (of ka)	C	C	to MJ burner
Wood chip, dry	180 - 300	20 - 50	20 - 25	800 - 1000	0.5 - 2.0	1200 - 1400	1300 - 1600	Suitable
Wood chip, moist	250 - 350	20 - 50	45 - 50	700 - 900	0.5 - 2.0	1200 - 1400	1300 - 1600	Suitable
Bark, mixed	200 - 400	(60 - 200)	40 - 60	400 - 700	1.5 - 3.5	950 - 1050	1400 - 1450	Suitable
Wood pellet	550 - 670	ø 6 - 12	6 - 12	2900 - 3200	0.5 - 1.0	1120 - 1350	1250 - 1550	Suitable
Peat pellet	650 - 750	ø 6 - 25	5 - 20	3100 - 3800	1.0 - 4.0	1000 - 1250	1100 - 1400	Suitable
Sod peat	350 - 400	30 - 100	35 - 40	1200 - 1350	3.0 - 6.0	1030 - 1300	1150 - 1500	Suitable
Sawdust	250 - 300	1 - 5	45 - 55	400 - 700	0.4 - 1.0	1120 - 1350	1250 - 1550	Suitable with reservations (must be tested on case-by-case basis)
Cutter chips	80 - 120	-	5 - 15	450 - 550	0.4 - 0.5	1120 - 1350	1250 - 1550	Suitable with reservations (must be tested on case-by-case basis)
REF pellets	300 - 500	ø 6 - 15	2 - 5	2000 - 3000	5.0 - 10.0	1150 - 1250	1200 - 1300	Suitable with reservations (must be tested on case-by-case basis)
Grain (oats)	550 - 650	-	10 - 20	2300 - 3000	2.0 - 4.0	1050 - 1150	1350 - 1500	Suitable
Straw (loose)	70 - 90	-	15 - 25	300 - 400	4.0 - 6.0	750 - 1000	1150 - 1400	Suitable with reservations (must be tested on case-by-case basis)
Olive stone								Suitable with reservations (must be tested on case-by-case basis)
Field biomass								Suitable with reservations (must be tested on case-by-case basis)

The quality and properties of fuels vary greatly, even when they go by the same name. In order to determine fuel quality, standards and other quality guidelines exist for different substances. A Pan-European guideline for all bio-fuels is ready and awaiting final approval. There is also a lot of quality information on fuels available in print and also from fuel suppliers.

■ WARRANTY

■ Warranty terms

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 is 5 years from the date of delivery.

Ariterm 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 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.

■ DECLARATION OF COMFORMITY



The logo for ARITERM ENERGY features the company name in a bold, white, sans-serif font. To the right of the text is a stylized graphic composed of several overlapping rectangular blocks in red, orange, and green, arranged in a pattern that suggests energy or a digital interface.

ARITERM ENERGY

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