Installation and Operating Instructions

ANTTI VULCAN BIO DRYER HEATER (HIPRESS & VACBOOST) 400-800 & 1200

408103 (en) 05-2023

You'll see the difference

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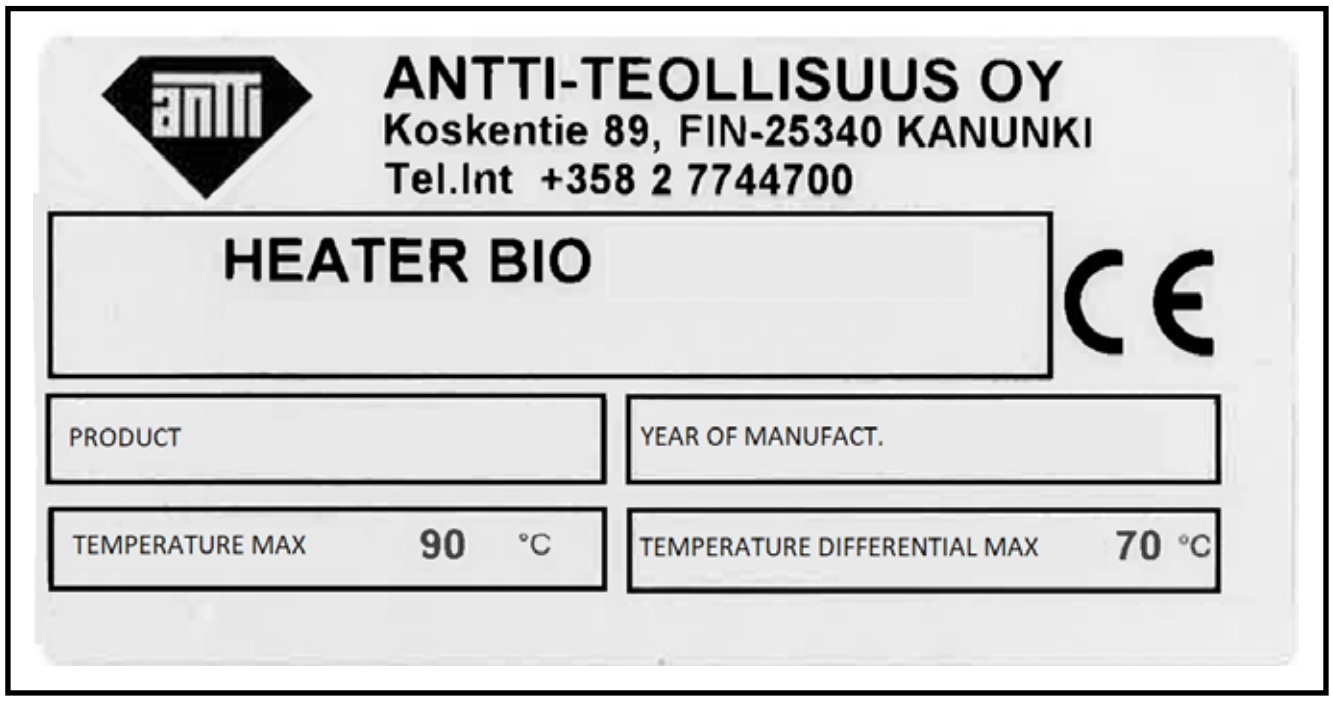
Dryer heater type

This manual deals with the positive pressure and vacuum dryer bioheaters in the ANTTI VULCAN model series. Refer to the nameplate affixed to the side of the machine for detailed information about the type of your heater. Always notify the seller and the service personnel of the information in the nameplate to ensure quick assistance in case of malfunction and when ordering spare parts. To have this data available whenever required, write it down in the corresponding place on this page.



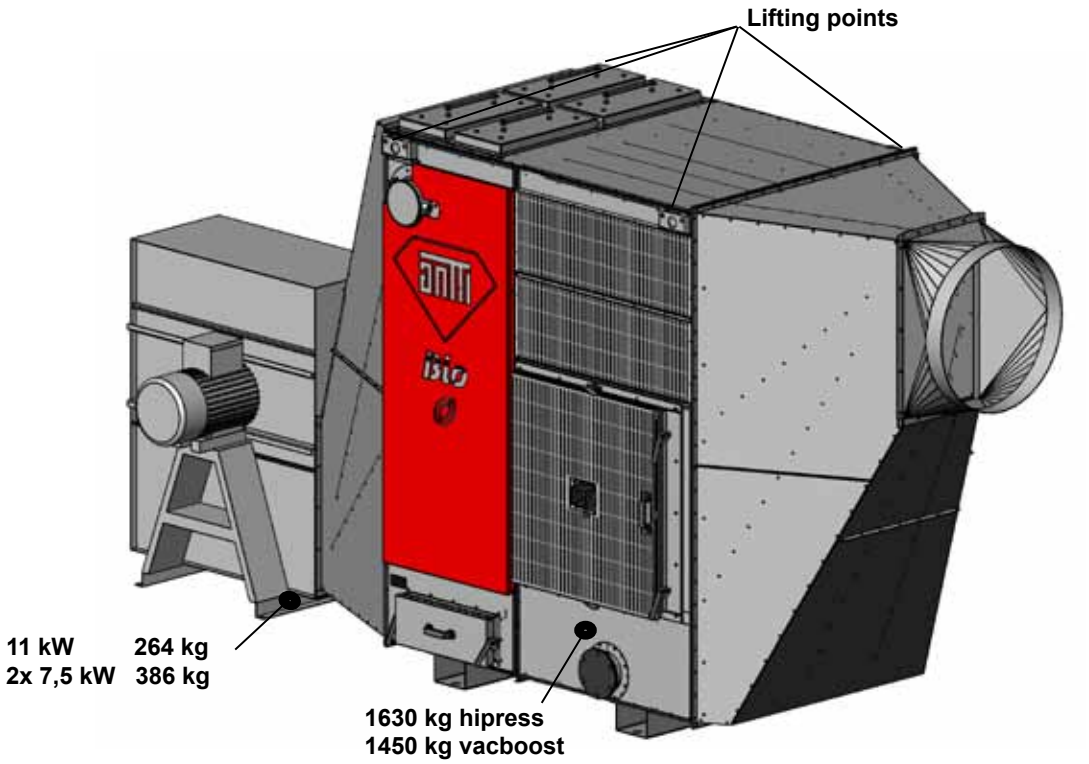
The maximum temperatures given in the nameplate must not be exceeded.

1. Lifting the dryer heater into position

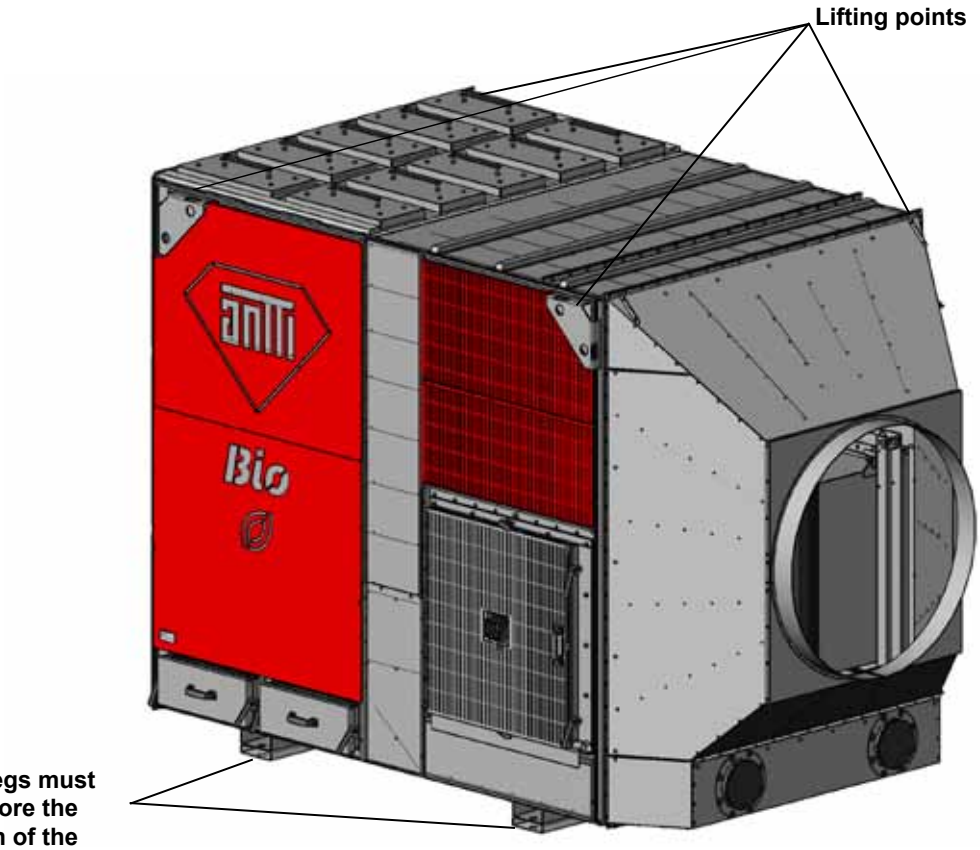
- While lifting the heater, observe the following:
    - use all lifting lugs
    - ensure that the lifting gear stays in position in the lugs
    - only use hoists with sufficient lifting capacity
    - never go under or too near the device to be lifted

- Lift the heater without the burner into place as shown in the installation drawing or plan. We recommended that the burner be attached to the heater before the heater is placed into its final location; because the component is heavy, the installation work goes much easier if the space is sufficiently large.

- Because the foundation must be level and steady, there is no need to attach the heater to its bed. Attach the blower firmly in place.



Weight and lifting points, 400-800 kW



The elevation legs must be installed before the final installation of the heater.

Weight and lifting points, 1200 kW, the weight without sweeping and ash clean-out hatches is 2680 kg.

GENERAL INFORMATION ABOUT DRYING OF GRAIN

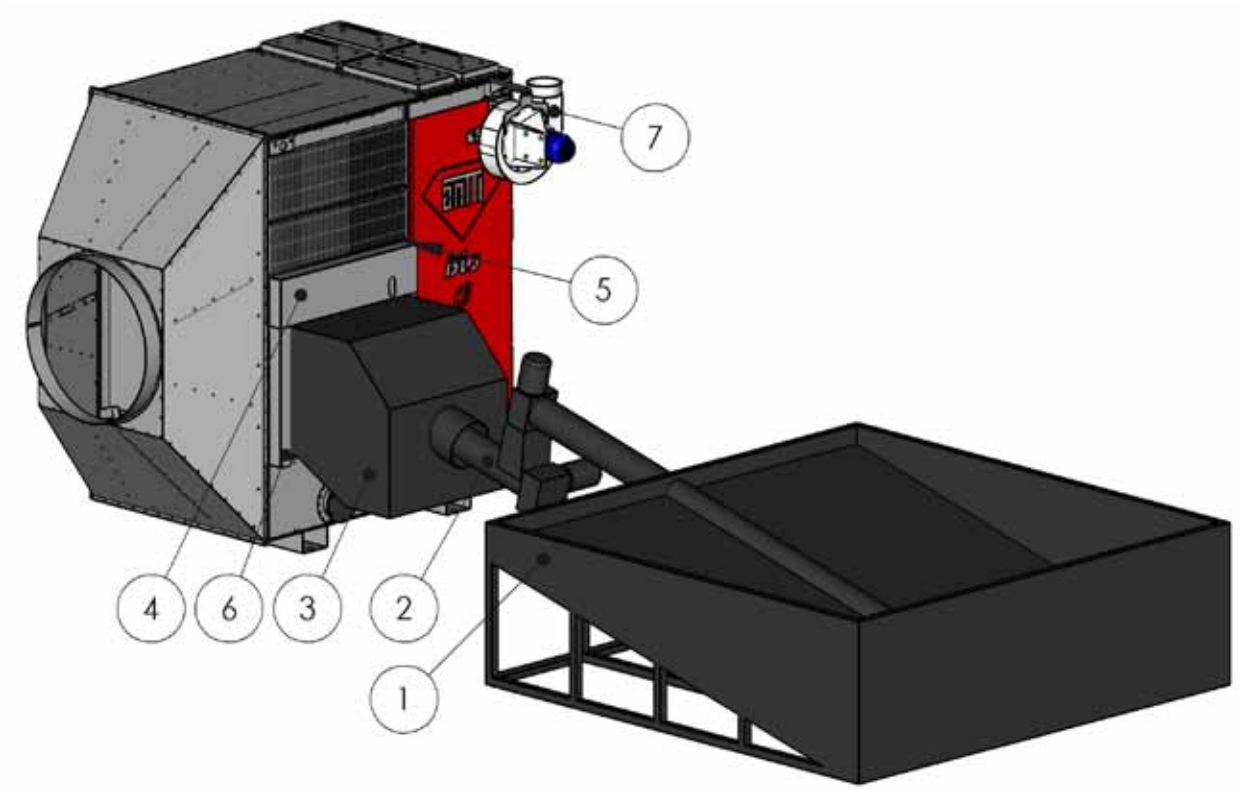
The idea of hot air drying is to conduct warm air through the grain and to evaporate moisture from both the surface and the inside of the corn. The air is routed via pipe or air duct to the drying sections, where the actual drying process takes place. The moist air is led from the drying sections to the outlet air channel, and from there via the pipes to the atmosphere. Either positive pressure drying or vacuum drying can be applied. The maximum temperature of the drying air can be up to 100 C°.

As fuel in the Bioheater can be used almost all energy sources in solid form. the most popular are: wood chips, wood and peat pellets, sod peat, energy grain.

Average consumption of chips at various outputs, dry wood chips:

Output kW	Consumption in an hour m³/h			
kW	1h	2h	10h	20h
1200	1,4	2,8	13,8	27,6
1000	1,2	2,3	11,6	23,2
800	0,9	1,9	9,4	18,8
700	0,8	1,7	8,3	16,6
600	0,7	1,4	7,1	14,2
500	0,6	1,2	5,9	11,8
400	0,5	0,9	4,7	9,4
300	0,4	0,7	3,5	7,0

In a bioheater, the heater with the heat exchanger comprises a separate set-up. The components for storing and transferring the fuel and the burner are supplied by a third party.
The most common system comprises a bioheater and a burner to which the feeding screw reclaims fuel from the discharge bottom. In addition, the equipment for transferring ash from the combustion chamber to a larger fire-safe container. The next picture illustrates the basic configuration of the machinery.

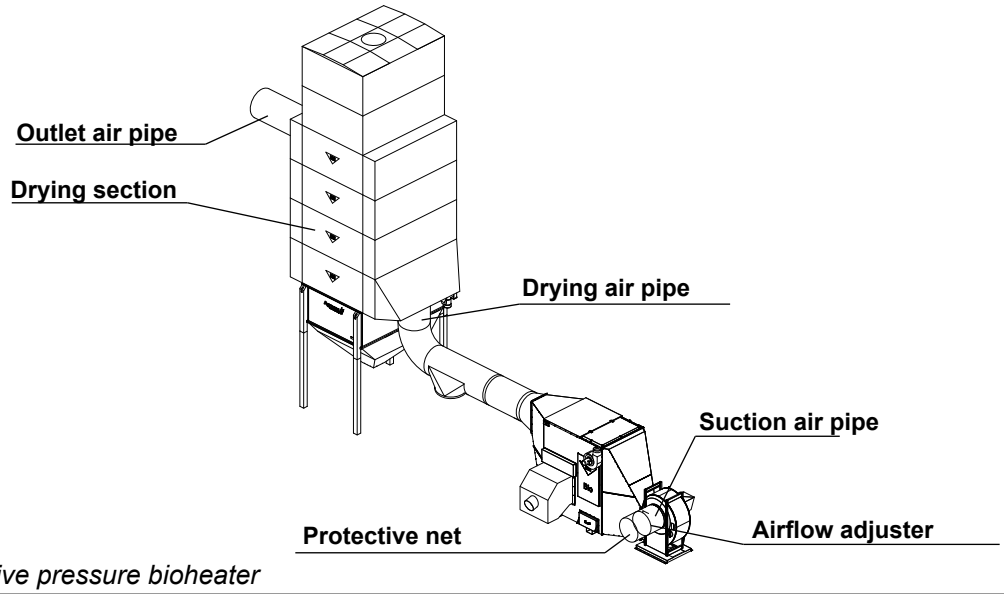


Bio outfit

Part	Item	Denomination	Kpl
1		RECLAIMER BOTTOM	1
2		FEEDING SCREW	1
3		BURNER	1
4	A73316	BIOHEATER BURNER FLANGE HEAT SHIELD 300-650 KW M11	1
5	107720	SCREW PLATE SELF-TAP HEX 6K 4,8x13	9
6	A75116	BIOHEATER BURNER FLANGE HEAT SHIELD SIDE 300-800 (optional)	2
6	A75373	BIOHEATER BURNER FLANGE HEAT SHIELD SIDE 1200-1600 (optional)	2
7		COMBUSTION GAS FAN	1

POSITIVE PRESSURE DRYING

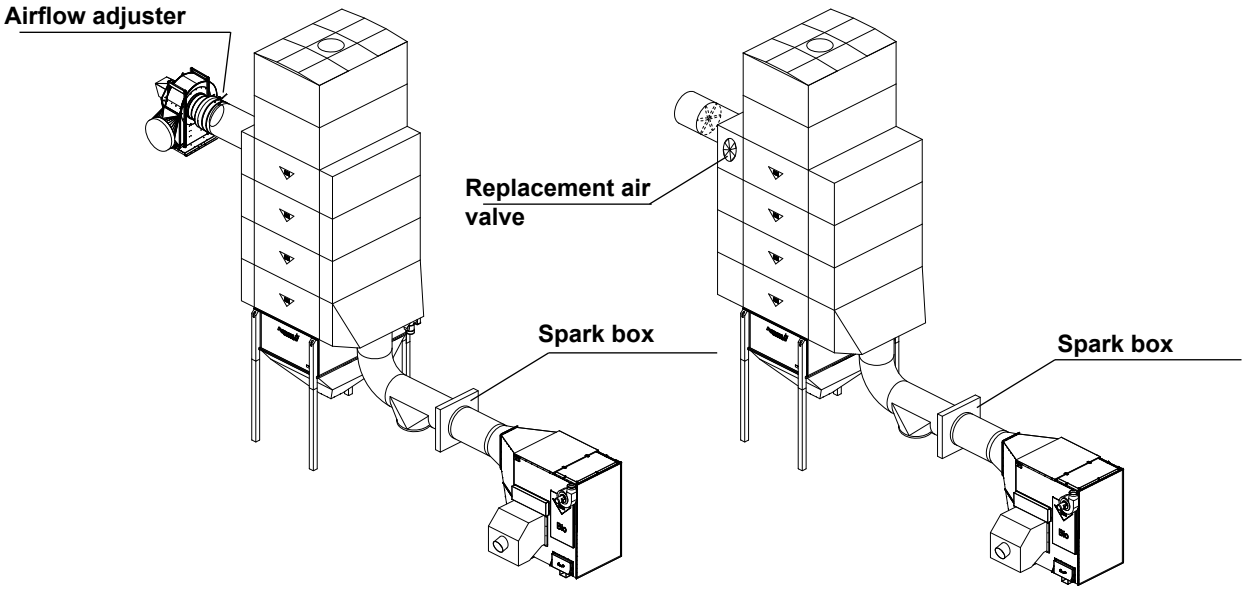
- The positive pressure heater is intended for warming up the drying air and blowing it under pressure through the dryer.



Dryer and positive pressure bioheater

VACUUM DRYING

- The vacuum heater is intended for warming up the drying air in a grain dryer. The blower unit or units generate an airflow through the heater and the dryer.



Dryer and vacuum bioheater

PURSUED CONFIGURATION

The normal operating environment is an element silo dryer made of steel with a vacuum heater or a positive pressure heater for the generation of heat. A grain dryer of section type is placed inside the building and the inlet and outlet air pipes are located on the opposite sides of the dryer building.

The debris pipe from the pre-cleaner must be equipped with a cyclone or equivalent for separation of debris. The separator must be located on the same side with the outlet air pipe or ingress of dust or debris into the suction opening of the heater/blower must be prevented by some other means.

The inlet air is heated by means of either a vacuum heater or a positive pressure heater located in a separate masonry heater room. This heater room can be built either right beside the dryer or near it, but only if the following requirements are met:

- Where wall of the heater room abuts the dryer building, it must meet the requirements of class EI60. Structural details that face outward can be of class EI130, and the roof can be of class EI160.

- Where the heater room wall faces the dryer building from a distance of at least one (1) metre, the wall can be of class EI30. Note! See also the requirements for the flue pipe and the door opening.

- If protected against rain, the heater can be placed at least three (3) metres from the grain dryer and other buildings.

- To ensure sufficient intake of air, the front wall of the heater room must be provided with an opening for replacement air (see table below). The suction air for the blower of a positive pressure heater, is usually taken from outside of the heater room via air pipes. The heater room must be located in a dust-free area. Sufficient space must also be provided above the heater so as to make sweeping of the heater possible; the free height above the heater must not be less than 1.2 metres. An even dust-free area must be provided in front of the heater room's air intake; preferably it should be concreted and as wide as the heater room.

- The flue pipe of the heater must be located at least 3 metres from any flammable wall of the dryer building and at least 1.5 metres from any non-flammable wall of the dryer building.

- The heater is provided with a flue gas aspirator, which means that there are no specific requirements for the height of the flue pipe as regards to draught. The sufficient safe distances to flammable materials must, however, be observed.

- Consult the municipal fire authorities for the local requirements

The above-mentioned distances apply also when an existing dryer is updated to meet the latest requirements. Primarily the same regulations apply to insulated and clad with sheet metal StandAlone dryers installed out of doors as to silo element dryers constructed of steel.

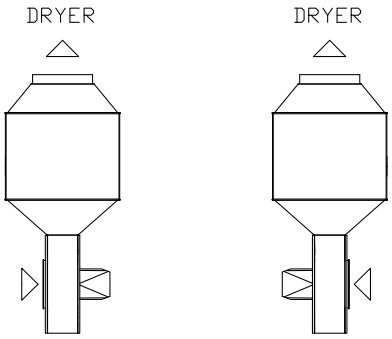
PRESENTATION OF THE MACHINERY

The heater is delivered in several parts; the centre-part of the heater comprises the blower and outlet cones as well as the service door for the burner. The following parts are delivered separately:

- blower with equipment,
- heat shield for burner flange,
- flue gas aspirator with the accessories required for the installation.
- adapter-plate for the burner depending on the supplier.

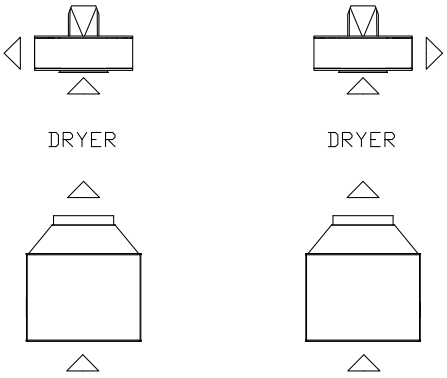
In addition the air pipe/pipes must also be fixed. The electric installation in the control centre of the grain dryer must be performed by an electrician. In addition are required the fuel storage and the feeding screws to the burner including the burn back protection.

ANTTI HIPRESS



A, C **B, D**

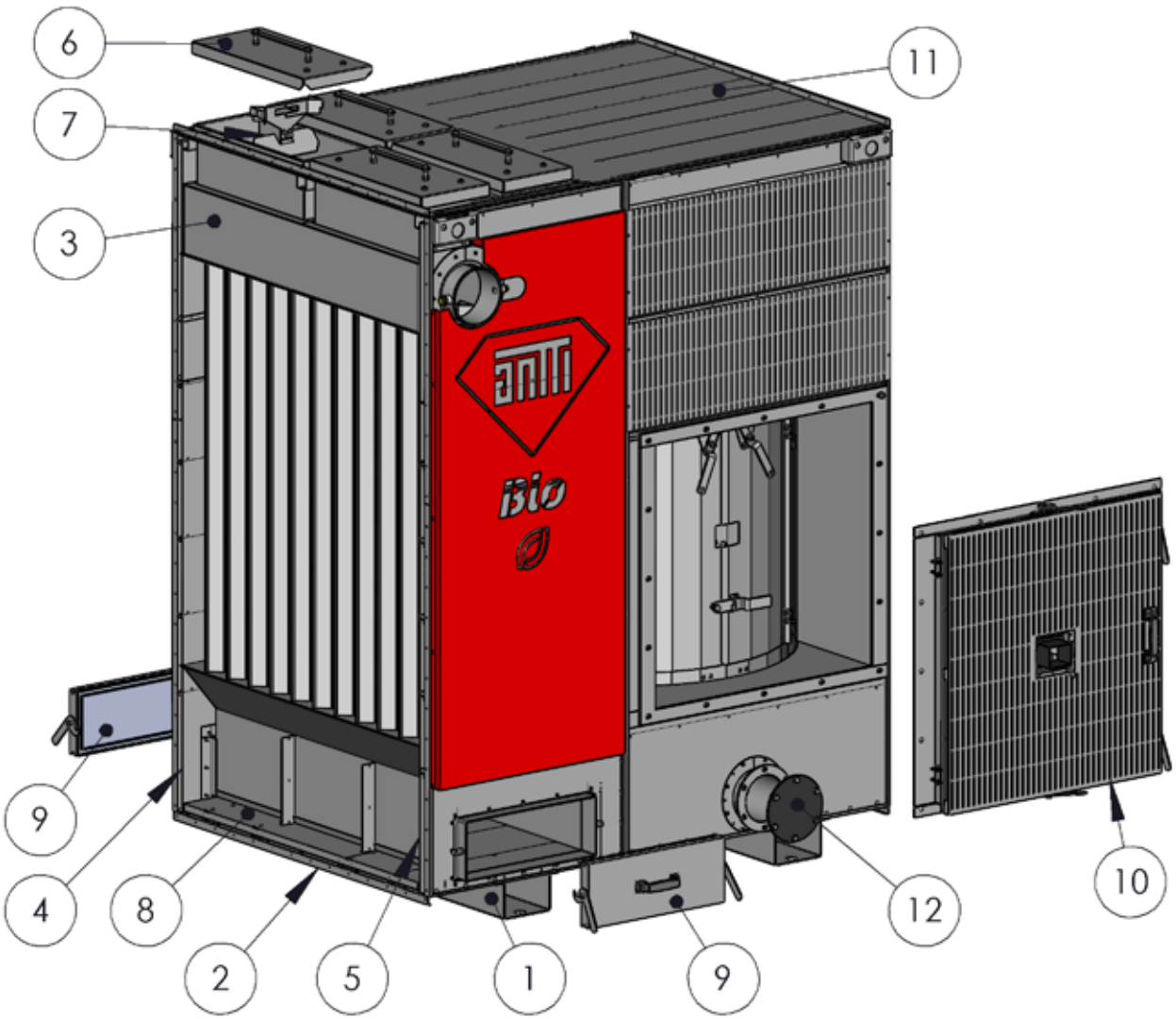
ANTTI VACBOOST



A, C **B, D**

The handedness of the blowers in Antti Bio

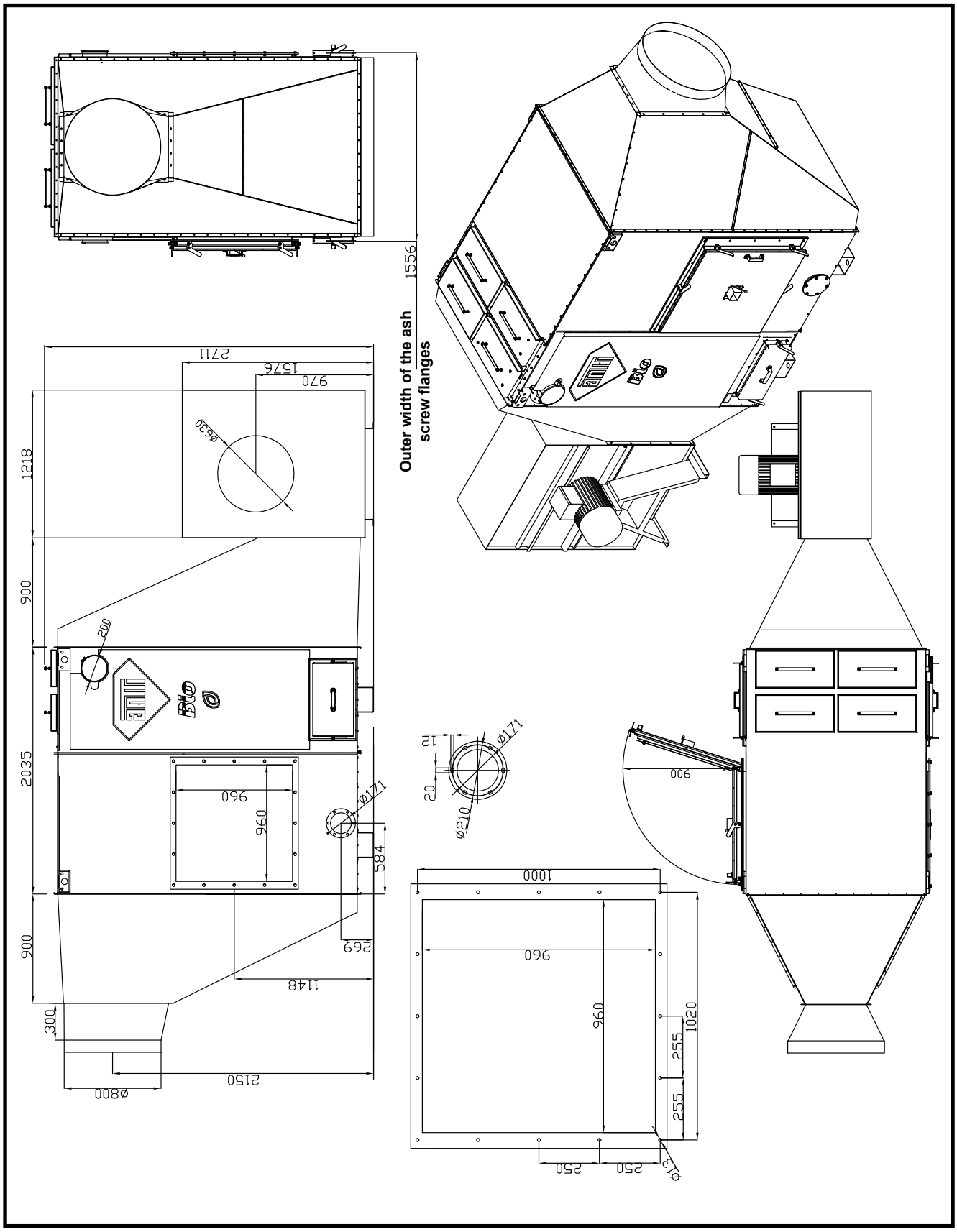
A73089 SPARE PARTS DRAWING



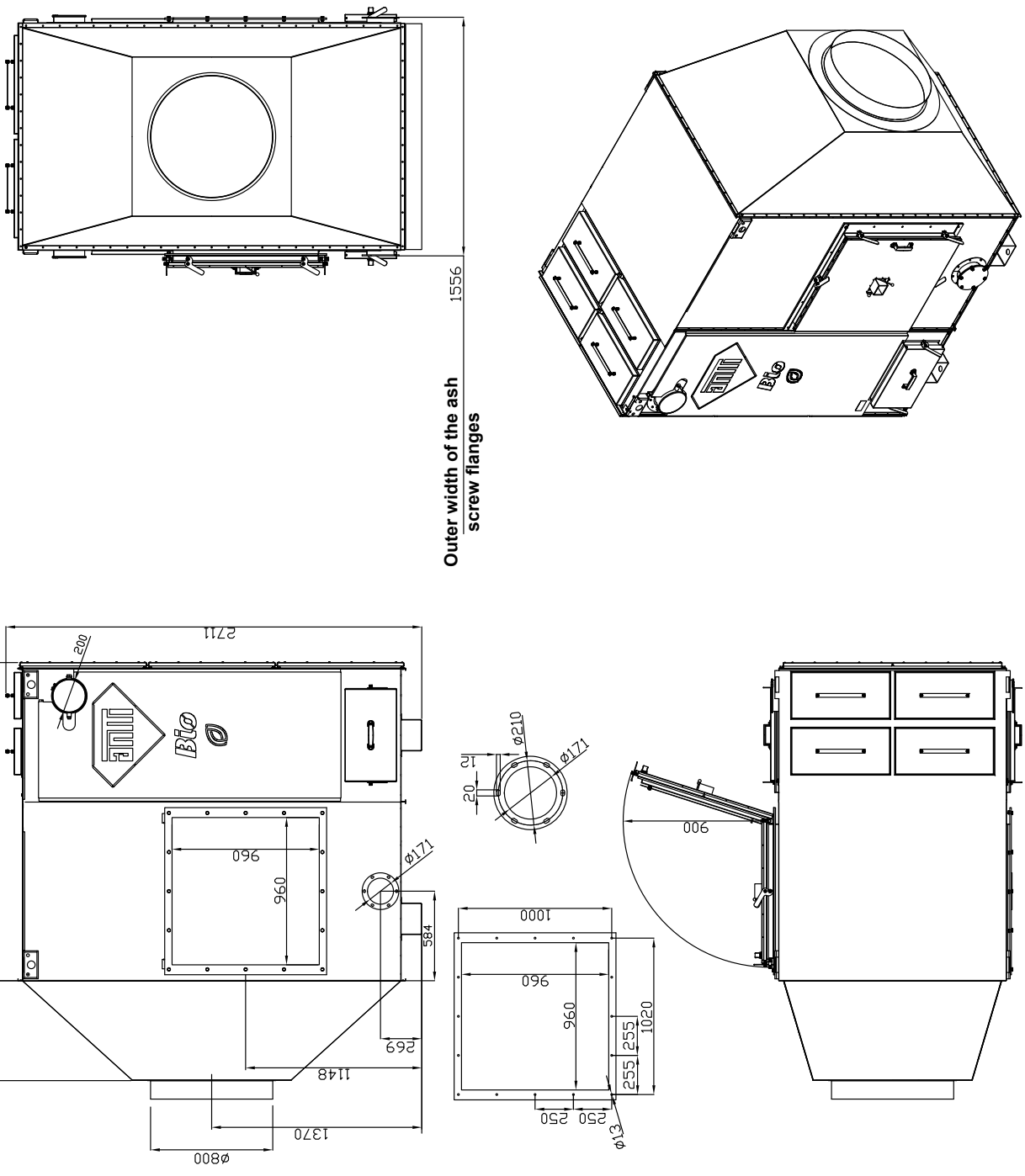
A73089 Spare parts drawing

Part	Item	Denomination	Dwg. no.	Pcs.	Weight
1	A73238	BIOHEATER JACKET LEG	A73238	2	18,5
2	A73211	BIOHEATER BOTTOM PLATE	A73211	1	58
3	A73091	BIOHEATER HEAT EXCHANGER WELD	A73091	1	665
4	A73221	BIOHEATER LEFT SIDE	A73221	1	82,5
5	A73230	BIOHEATER RIGHT SIDE	A73230	1	83,9
6	A73200	BIOHEATER HEAT EXCH DOOR	A73200	4	18,8
7	A75173	BIOHEATER SMOKE BLOCK	A75173	21	3,3
8	A73250	BIOHEATER AIR RESTRICTOR PLATE	A73250	1	2,2
9	A75176	BIOHEATER ASH BOX ASSY	A75176	2	8,1
10	A73184	BIOHEATER BURNER DOOR ASSY	A73184	1	70
11	A75448	BIOHEATER TOP	A75448	1	38
12	A73433	BIOHEATER ASH COVER PLATE	A73433	2	2,1
13	115550	GLASS FIBRE BAND 6X 15 MM		12	
14	115579	CERAMIC BAND KERABAND 3x9		46	

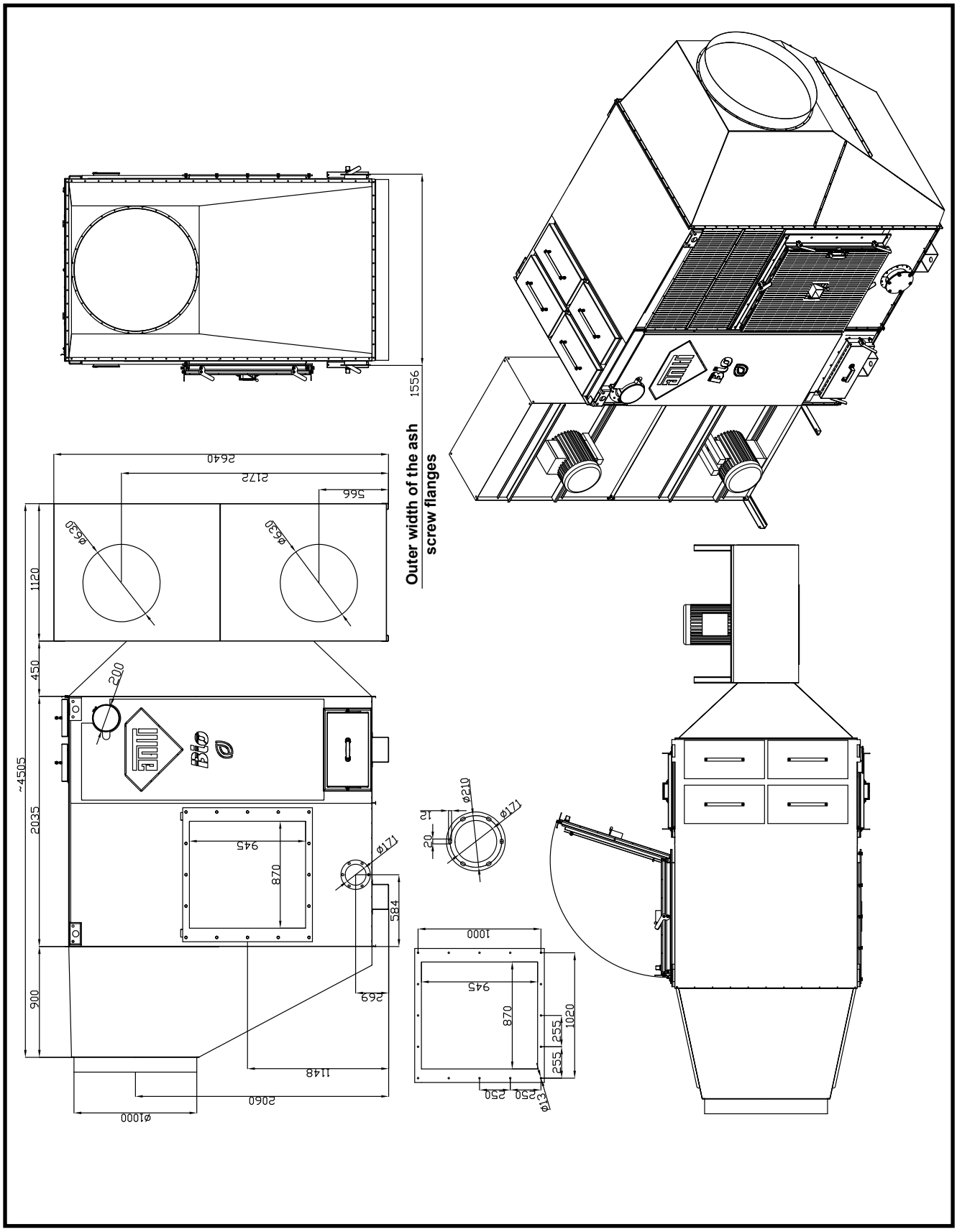
Dimension drawing 500 kW, Hipress



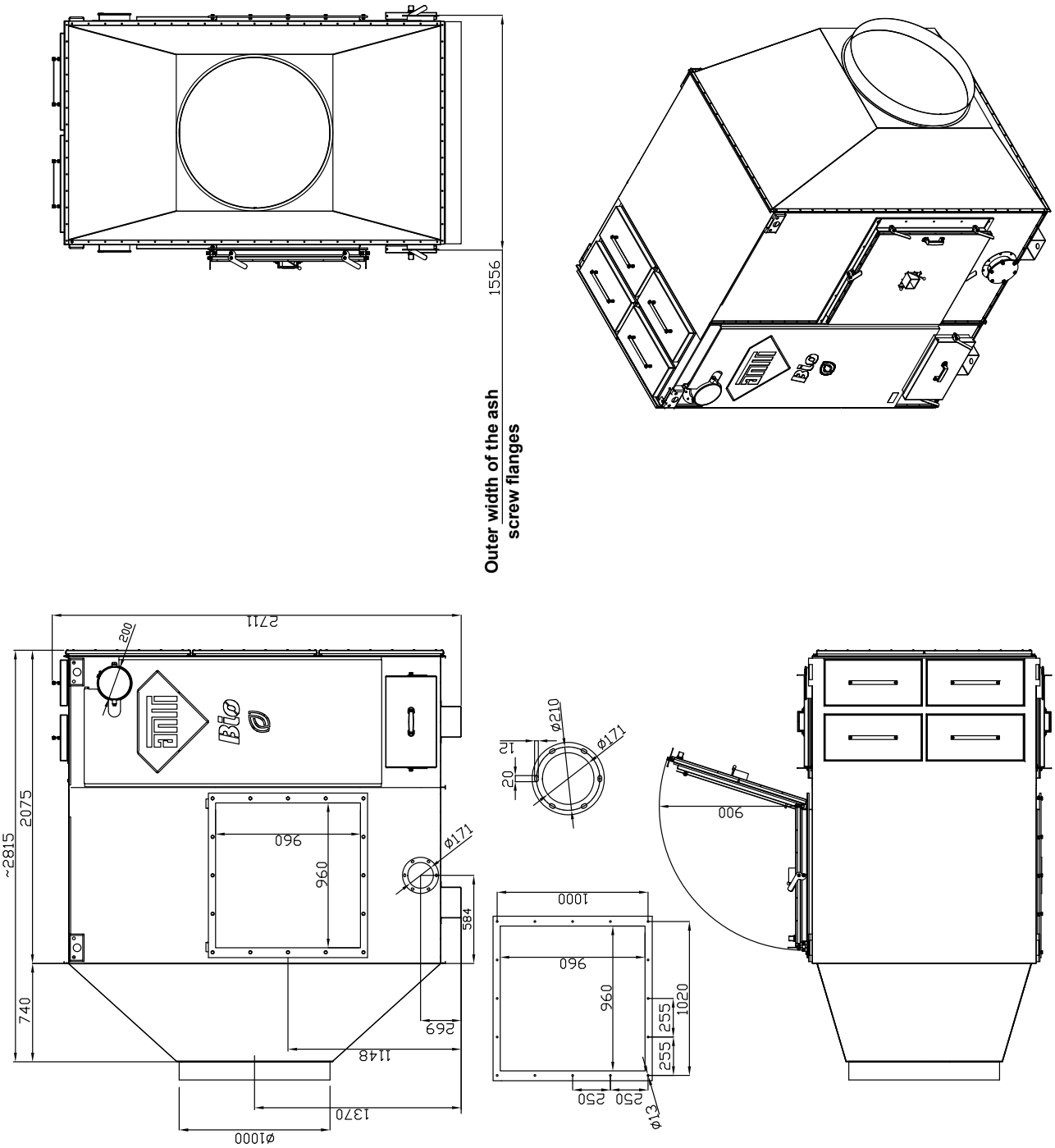
Dimension drawing 500 kW, Vacboost



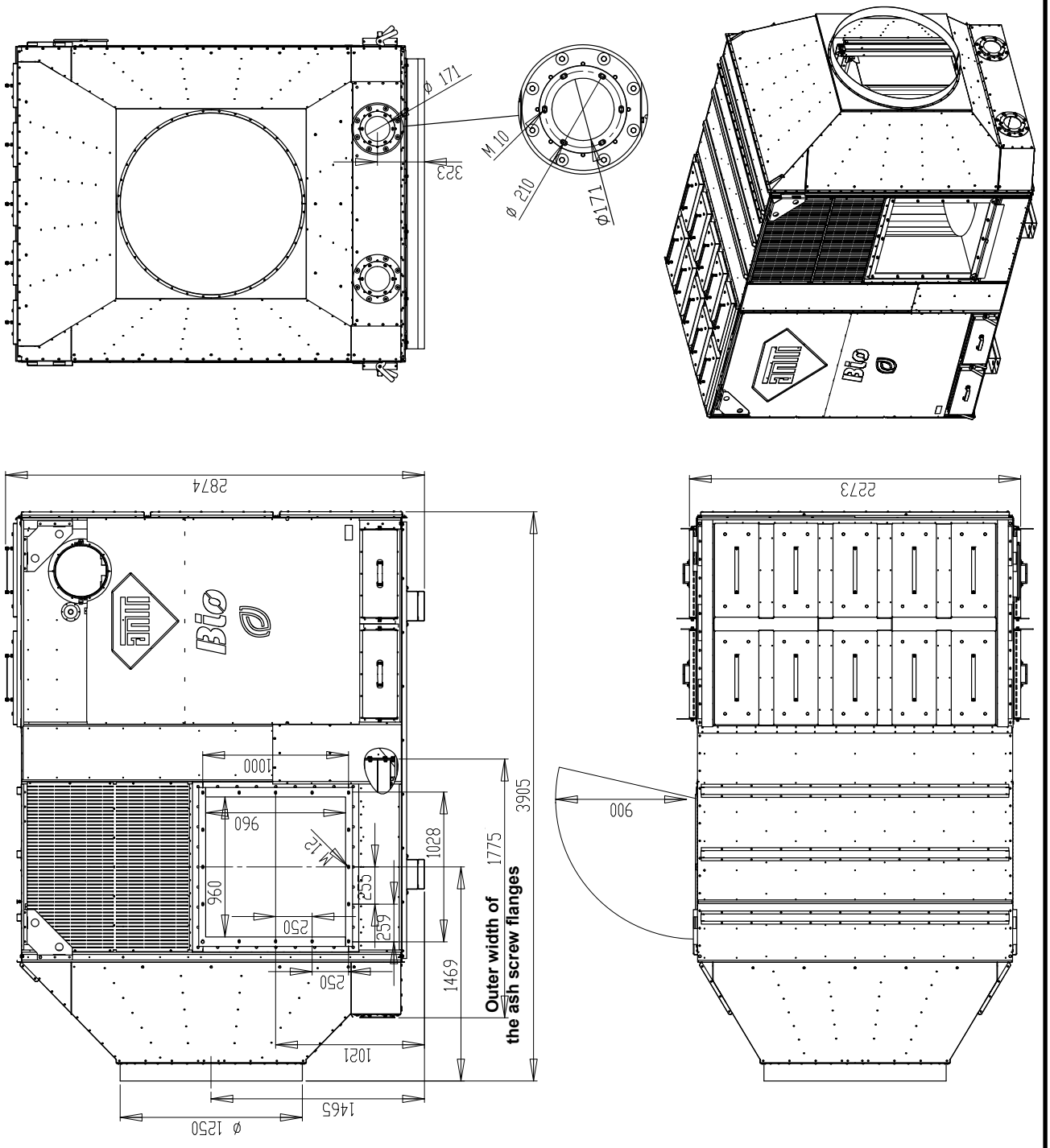
Dimension drawing 800 kW, Hipress



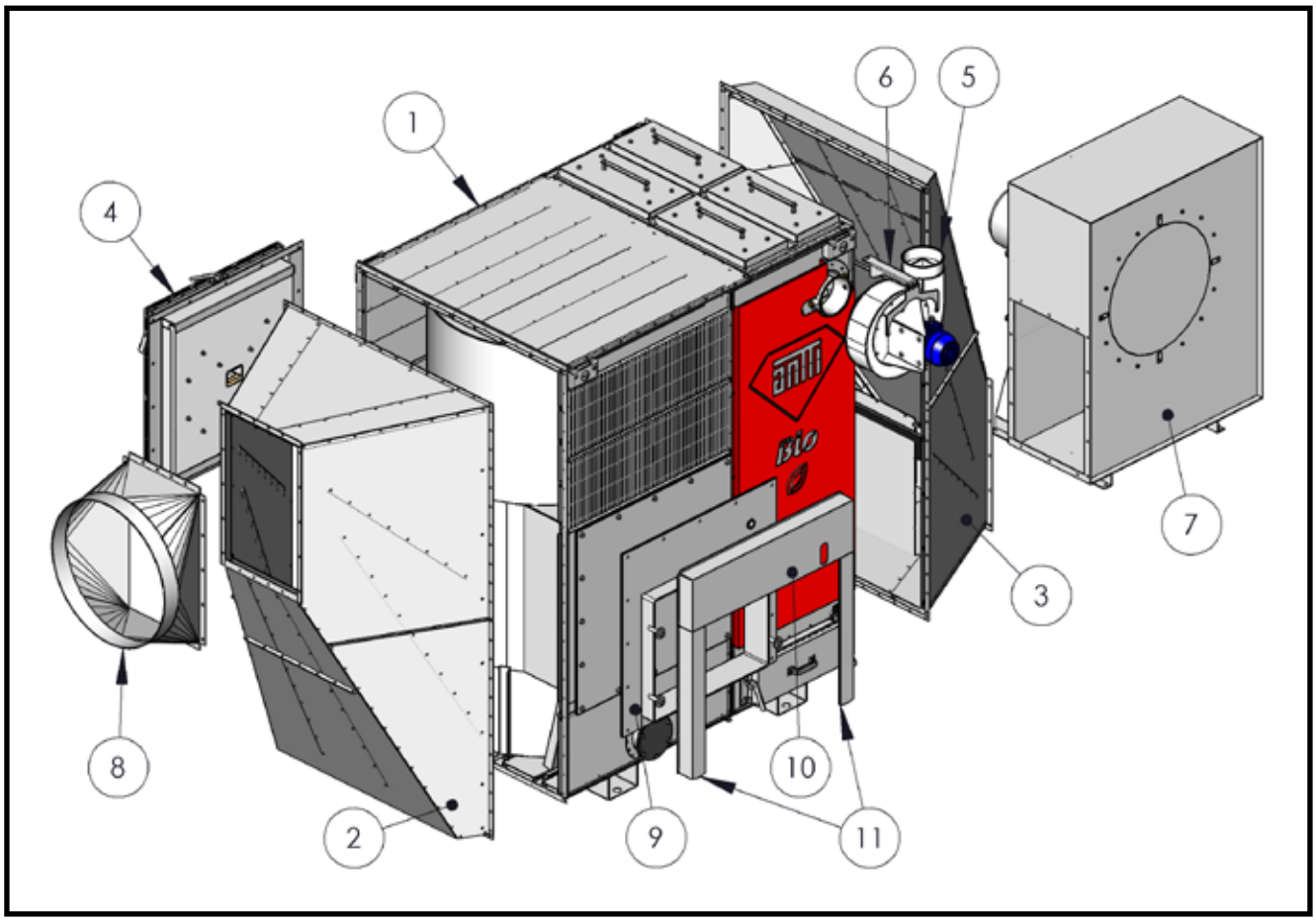
Dimension drawing 800 kW, Vacboost



Dimension drawing 1200 kW

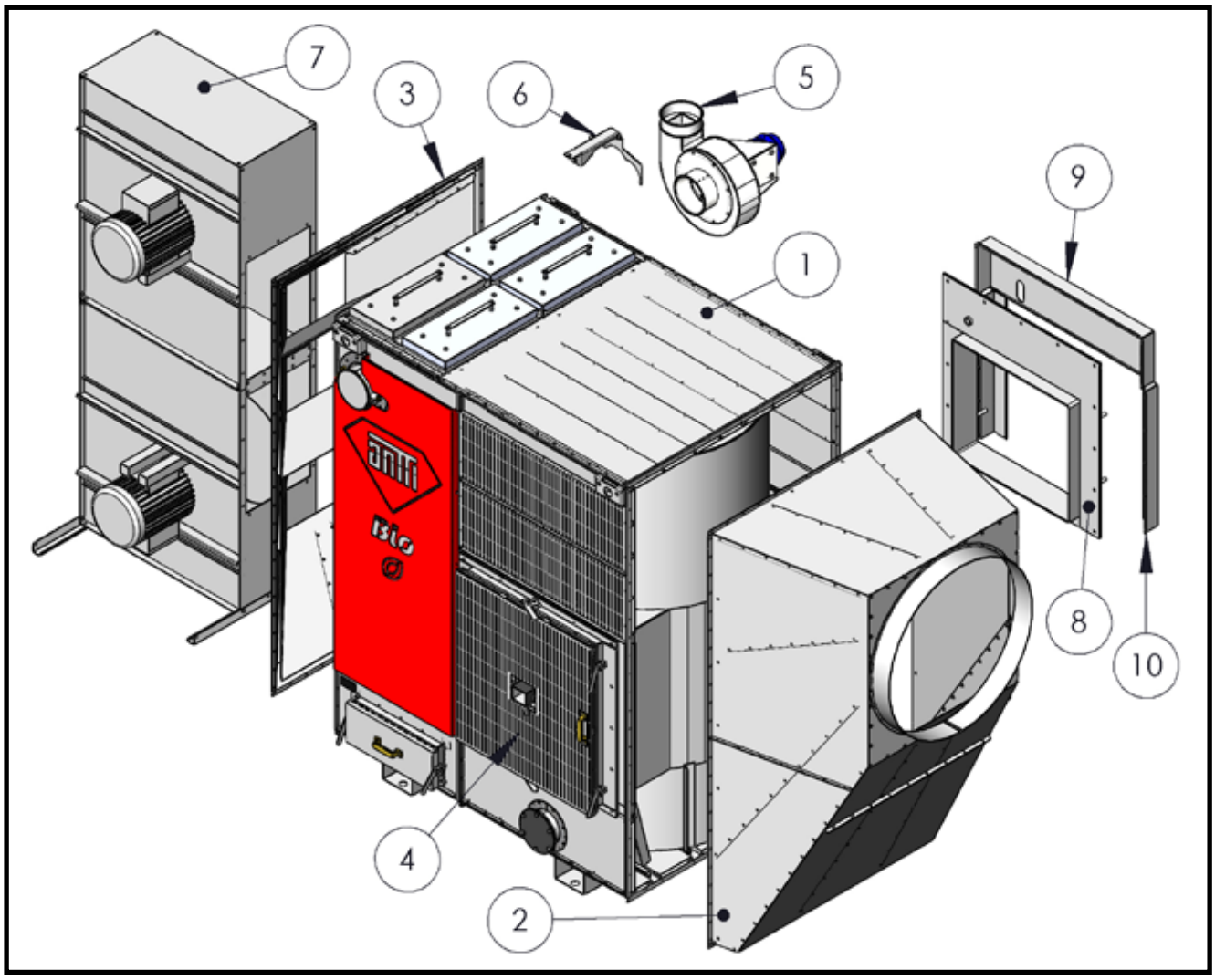


Basic parts of the heater 500 kW



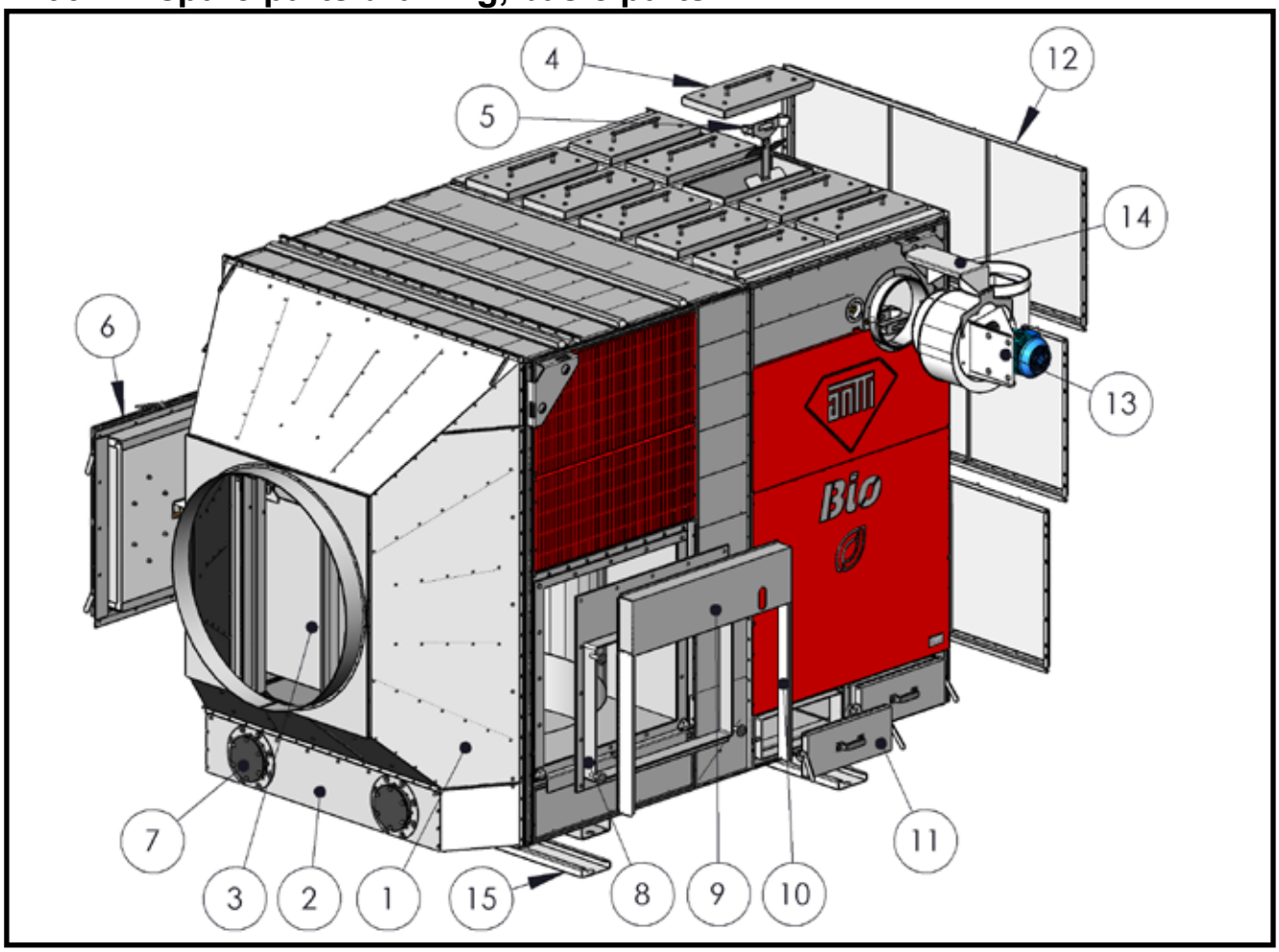
Part	Item	Denomination		Dwg no	Pcs	Weight (kg)
1	A73089	BIOHEATER centre-part		A73089	1	1290
2	A73281	BIOHEATER outlet cone 300-650		A73281	1	131
3	A76899	BIOHEATER blower cone		A76899	1	164
4	A73184	BIOHEATER burner door assy		A73184	1	111
5	114590	Flue gas aspirator 2,2 KW D200/200			1	25
6	A75046	BIOHEATER flue gas aspirator support 2,2 KW		A75046	1	1,5
7	403143	RADIALFAN ÅKERSTEDTS 11kW LEFT	optional		1	264
7	403140	RADIALFAN ÅKERSTEDTS 11kW RIGHT	optional		1	264
8	22474	Adapter blower pipe D800		22474	1	13,4
9		Adapter flange in accordance with the dimensions of the burner			1	
10	A73316	BIOHEATER burner flange heat shield		A73316	1	5,9
11	A75116	BIOHEATER burner flange heat shield side 300-800 KW		A75116	2	1,8

Basic parts of the heater 800 kW



Part	Item	Denomination		Dwg. no	Pcs.	Weight (kg)
1	A73089	BIOHEATER centre-part		A73089	1	1290
2	A74885	BIOHEATER outlet cone 800 KW M13		A74885	1	131
3	A76918	BIOHEATER blower cone 2 X 7,5 KW		A76918	1	87
4	A73184	BIOHEATER burner door assy		A73184	1	111
5	114591	Flue gas aspirator 2,2 KW D200/200			1	25
6	A75046	BIOHEATER flue gas aspirator support 2.2 KW		A75046	1	10,6
7	A76930	RADIALFAN ÅKERSTEDTS 700 KW 2x7,5 RIGHT M22	optional	A76930	1	386
7	A76931	RADIALFAN ÅKERSTEDTS 700 KW 2x7,5 LEFT M22	optional	A76931	1	386
8		Adapter flange in accordance with the dimensions of the burner			1	
9	A73316	BIOHEATER burner flange heat shield		A73316	1	5,9
10	A75116	BIOHEATER burner flange heat shield side		A75116	2	1,8

1200 kW spare parts drawing, basic parts



Part	Item	Denomination	Dwg. no	Pcs.	Weight (kg)
1	A75340	BIOHEATER outlet cone D1250	A75340	1	119
2	A75337	BIOHEATER outlet cone bottom	A75337	1	26
3	A75246	BIOHEATER heat exchanger	A75246	1	1237
4	A73200	BIOHEATER hact heat exchanger	A73200	10	18
5	A75173	BIOHEATER smoke block	A75173	49	3,4
6	A73184	BIOHEATER burner door assy	A73184	1	110
7	A73433	BIOHEATER ash cover plate	A73433	4	2,1
8	A75359	BIOHEATER adapter flange Ala-Talkkari 990	A75359	1	49
9	A73316	BIOHEATER burner flange heat shield	A73316	1	5,9
10	A75373	BIOHEATER burner flange heat shield side narrow	A75373	2	1,1
11	A75176	BIOHEATER ash box assy	A75176	4	8,1
12	A75330	BIOHEATER suction net 1200-1600 KW	A75330	3	10,9
13	114592	Flue gas aspirator 4 KW D350/350		1	70
14	A75183	BIOHEATER flue gas aspirator support 4 KW	A75183	1	4
15	A75181	BIOHEATER raise leg H=45	A75181	2	15,6
16	115550	Glass fibre band 6X 15 MM		14	
17	115579	Ceramic band keraband 3x9		37	

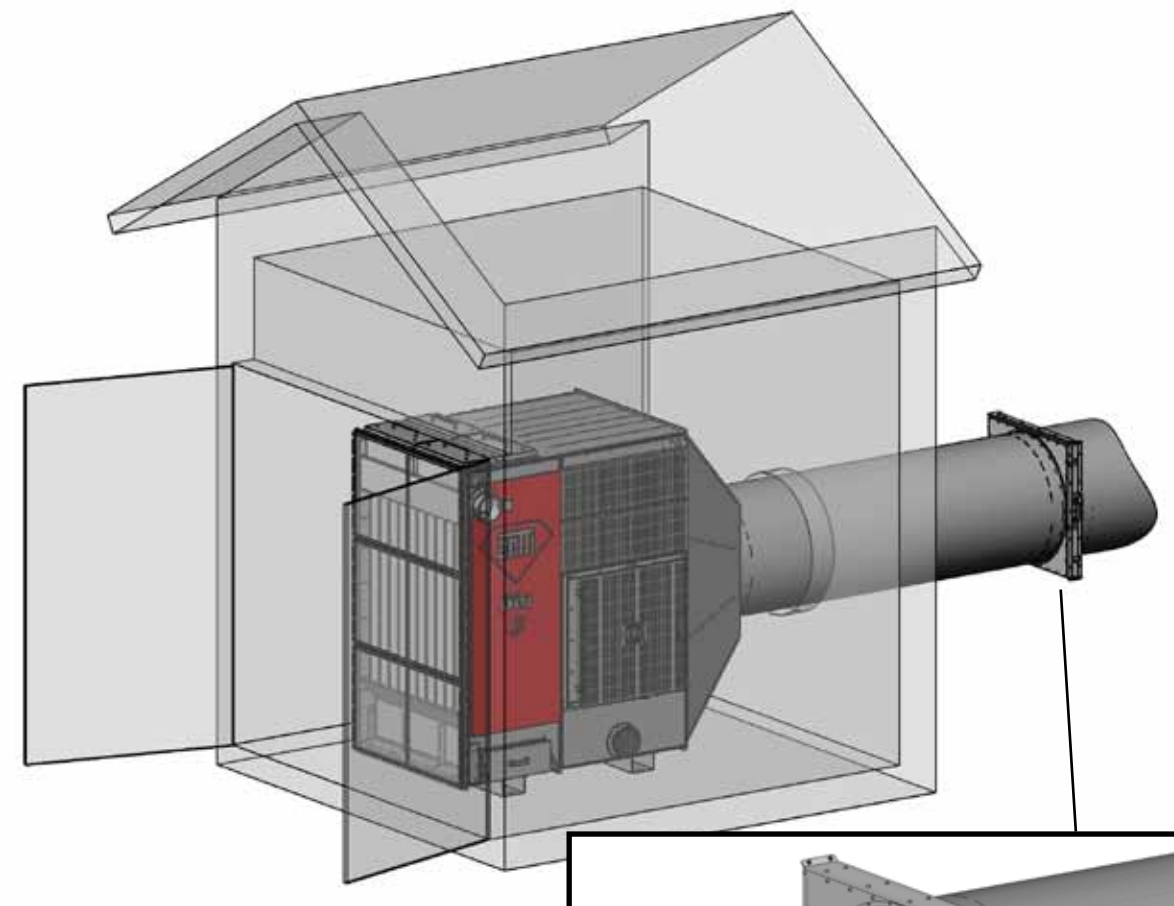
INSTALLATION

Installation of the dryer heater must be carried out by a skilled electrician and oil burner fitter with relevant authorisation as well by a person who is familiar with the installation of the dryer machinery and the fuel systems.

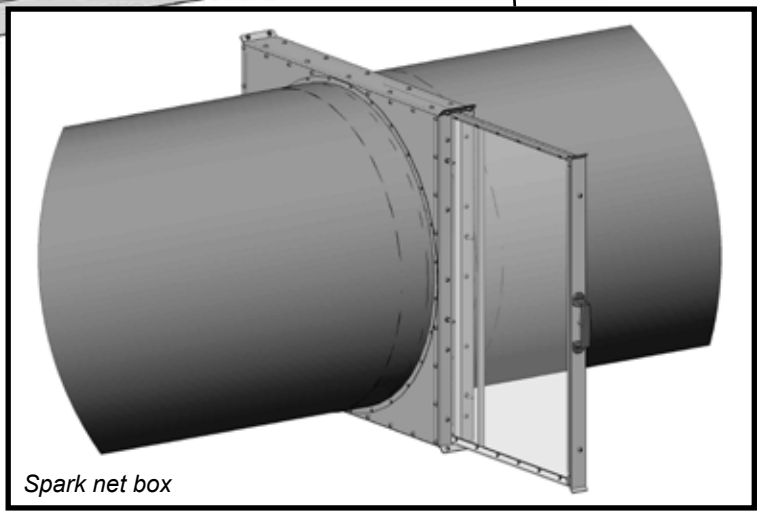
NOTE! DEBRIS IN THE SUCTION AIR OF THE HEATER CONSTITUTES A FIRE HAZARD!

NOTE! CHECK AND CLEAN THE SPARK NET BOX DAILY!

THE HEATER MUST BE LOCATED IN A PLACE, WHERE THE ACCESS OF DEBRIS IS PREVENTED AND THE AIR SUPPLY TO THE HEATER IS UNOBTRUCTED.



AN EXAMPLE CONFIGURATION PROVIDING ADEQUATE SUPPLY OF AIR



Spark net box

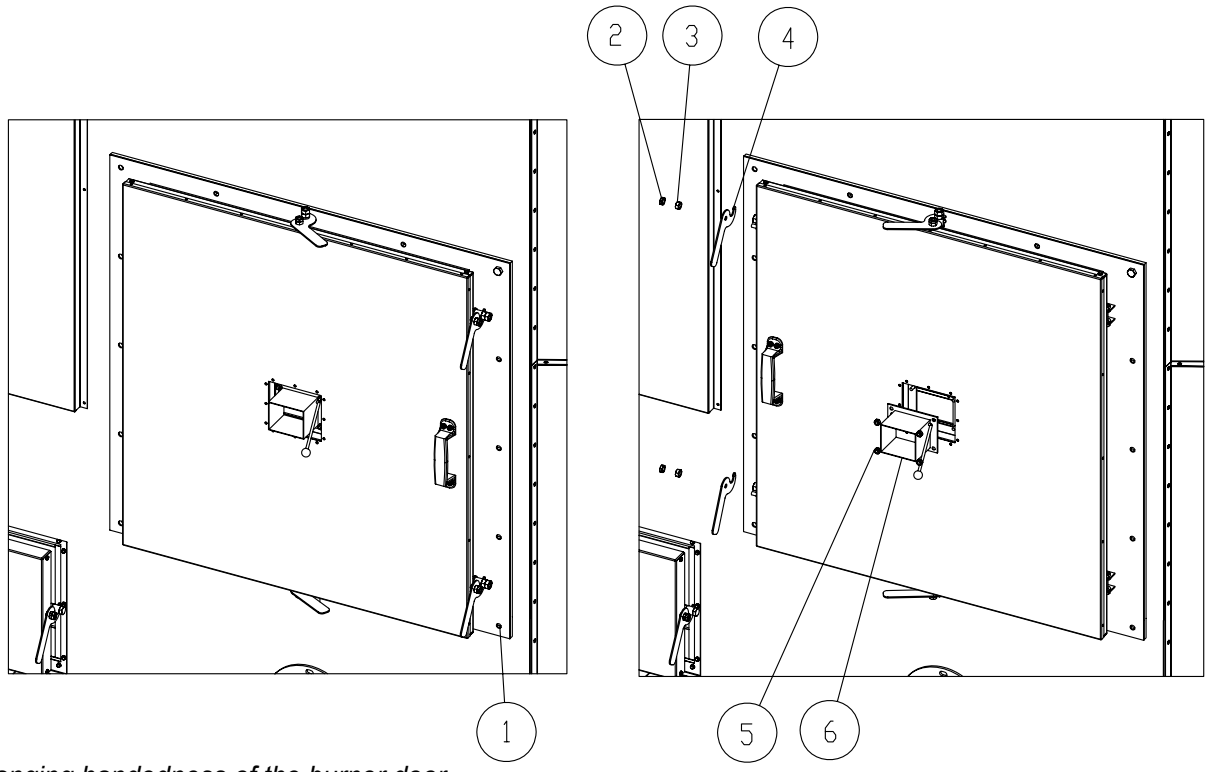
Changing handedness of the burner's service door

The burner's service door can be transferred to the opposite side of the heater, or its handedness can be changed as desired.
When removing the door, bear in mind that it is heavy, weighing about 111 kg.

If you only want to change the handedness of the door, remove the hinges (2 pcs. of M12 nuts) from the frame of the door, which remains in place against the burner flange. Remove the counter-pieces for the latch from the sides and attach the door by its hinges to these holes. After that, you only have to turn the control door and the latches (2 pcs.) on the side and attach the counter rollers for the latches. Fitting the door against the frame shall be commenced from the side of the hinges. The door must fit tightly, but it must not press the gasket too much at the side of the hinges. After this, the counter rollers for the latches shall be adjusted to a suitable distance. Check that the gasket is in contact with the door frame, when the latches are closed.

When you use the door while the flue gas aspirator is running, bear in mind that there is vacuum inside the burner chamber. The large surface area affects the opening of the door. The vacuum "sucks" the door, so be careful not to put your fingers between the door and its frame.

WARNING! When the heater is in operation, the door must not be opened -> risk of burns/danger to life.



Changing handedness of the burner door

Part	Item	Denomination	Dwg. no.	Pcs.	Weight
1	A73184	BIOHEATER BURNER DOOR ASSY 400-650 KW M11	A73184	1	100
2	110588	NUT M10 LOW DIN936		2	
3	110560	NUT M10 DIN934		2	
4	A73188	BIOHEATER LATCH		2	
5	110616	NUT AISI 304 M8 DIN934		4	
6	800027	FLAME CONTROL DOOR		1	0.5

Changing handedness of the 800 kW blowers

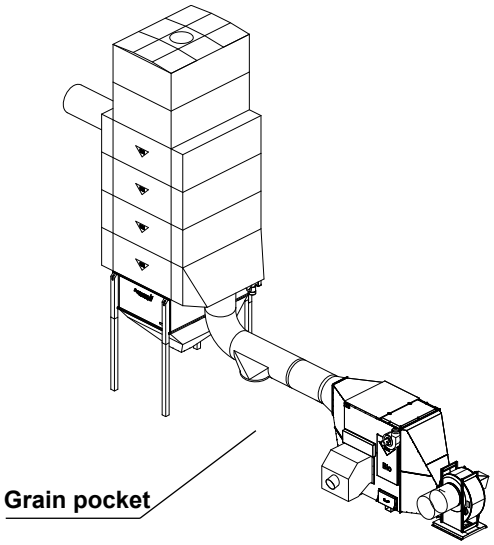
2. Installing the air and flue pipes

- The air piping between the dryer heater and the dryer is assembled of air piping parts.
- Normally the inlet air pipe from the heater is conducted into the lowest drying sections.
- The air piping shall be installed so that neither loose grain nor debris can slide directly into the heater from the air channel end of the drying section.
- Before installing the pipes and the blower, make sure that no foreign particles have entered the heater.

WARNING! Foreign particles inside the heater are a fire hazard!

Grain pocket in the air pipe

Occassionally, some loose grains can fly out of the openings in the air ducts to the air channel end. If the dryer heater is connected to the heater as illustrated in the picture, the air pipe must absolutely be provided with a grain pocket. The purpose of the grain pocket is to gather up the loose grains, and prevent them from ending up in the heater. The grain pocket must always be emptied before it fills up.



Install the grain pocket in the horizontal part of the air pipe to ensure its operation is efficient, see the picture.

Carry out the installation as follows; lift the part tight against the pipe and tighten it to the pipe using straps. Draw a pattern for cutting through the opening; remove the part and make the opening using a nibbler or plate shears. Lift the part back in place and tighten its against the pipe using straps. Fix the part to the pipe using self-tapping screws and pop-rivets. Finish the work by applying sealing mastic. Provide the outlet sleeve for the pipe at the grain pocket with a plug and, as necessary, ensure that it stays in position using self-tapping screws.

- The delivery of the dryer heater comprises a flue gas aspirator, a set of flue pipes, and a rain cap for the flue pipe. The flue gas aspirator shall be installed as close to the heater as possible, so it does not have to be supported separately. Ensure, however, that the other parts of the flue pipe system are properly supported, so that the aspirator connector, the flue pipe flange or the aspirator will not be subjected to excessive load. The parts included in the delivery are sufficient for most vertical pipe installations.

- The ceramic seal strip, which is included in the delivery, comes between the flanges of the heater's flue pipe. The strip is squeezed between the flanges under the band.

- Often the flue pipe is led horizontally through the heater room wall and the parts of the vertical pipe are installed in a vertical position outside the heater room. In this case, a straight pipe is required between them.
  Because the installation practice varies from case to case based on the design of the heater room and the way the fire regulations are locally applied, it is advisable to submit the installation plan in advance to the municipal fire authorities for approval.

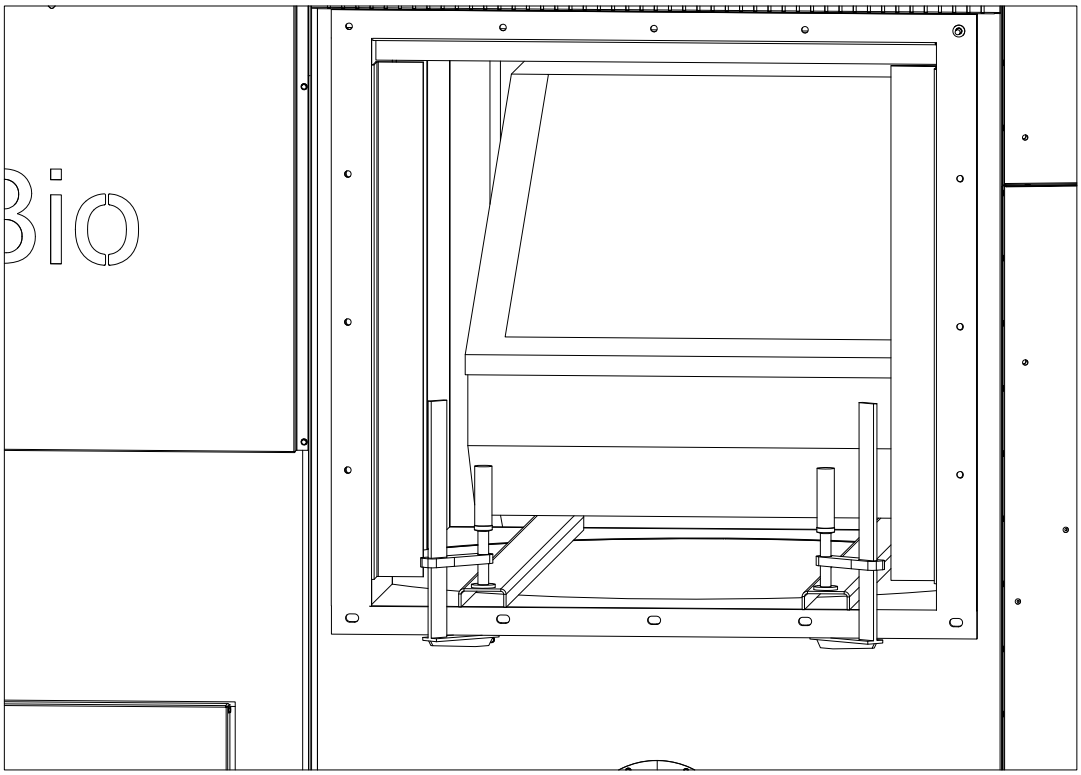
- The flue pipe parts made of thick material are quite heavy. Make sure the pipe is sufficiently supported. No load shall be subjected to the flue gas aspirator. A separate supporting structure is required under a pipe longer than this and its elbow. A vertical pipe, over 3,0 metres in length, must be supported also laterally either using stay wires or support bars.

3. Installing the burner and the equipment for fuel storage

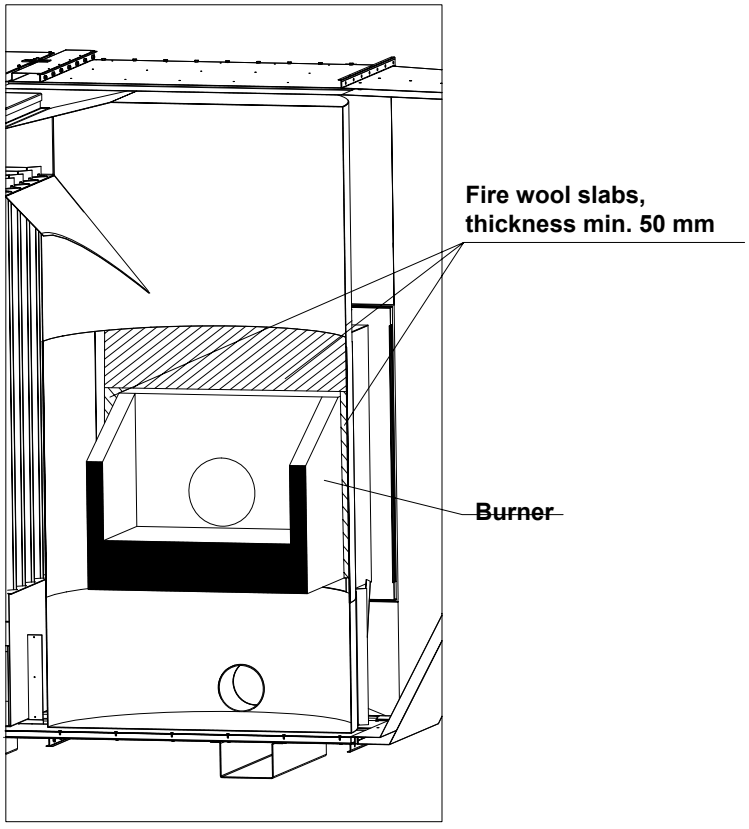
To the mechanic and electric installations of the burner equipment apply the instructions issued by the supplier of the burner.The electric installation shall be carried out by a skilled electrician with relevant authorisation.

The maximum temperatures given in the nameplate must not be exceeded.

- The heater (400-800 kW) comes with installation rails, along which the burner can be pushed to inside the heater. The rails shall be placed between the openings in the heater and removed after the installation.

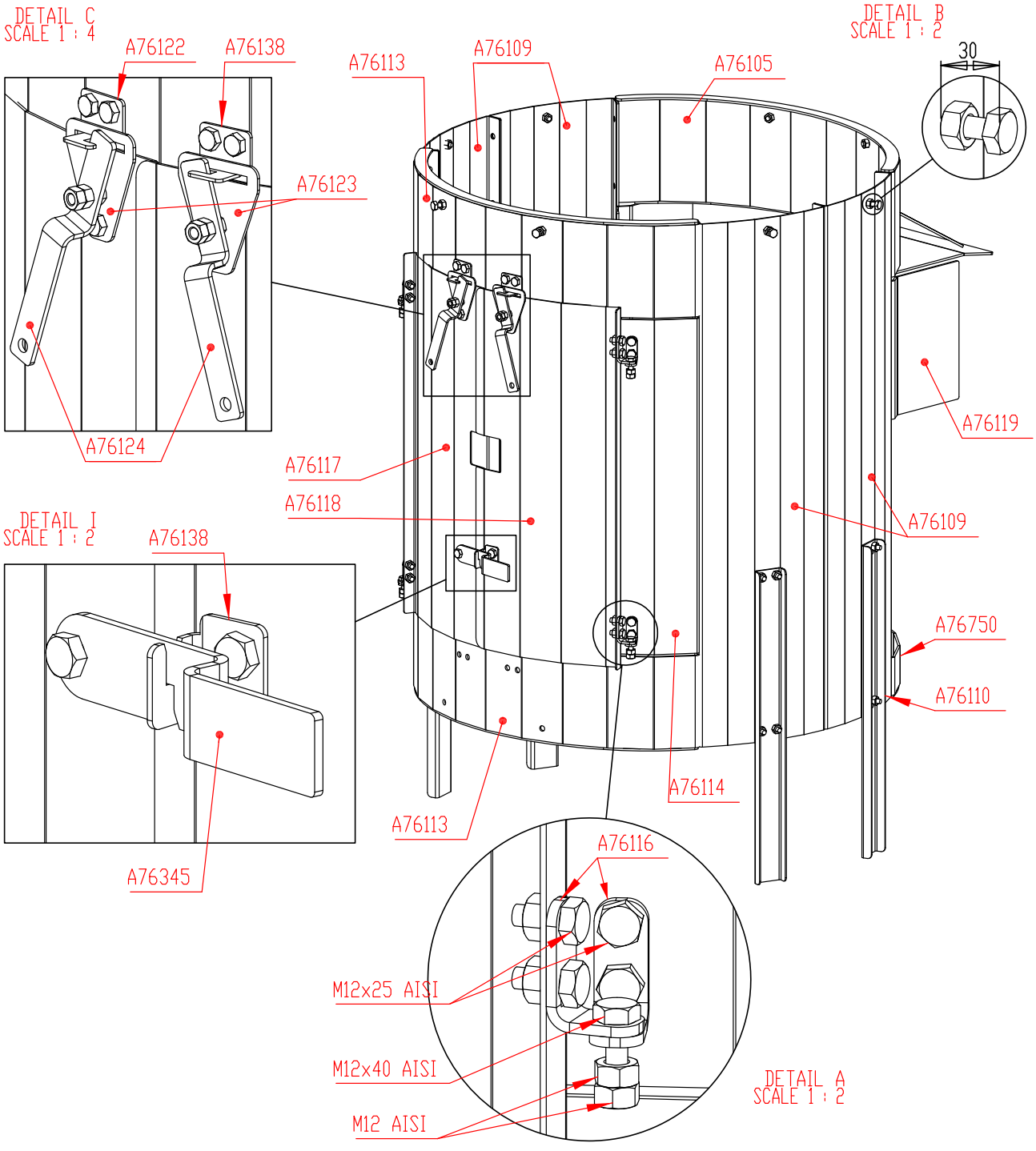


Installing the burner by means slide rails 400-800 kW



Fire wool is used for insulation in the space between the burner and the furnace. Thickness 50 mm.

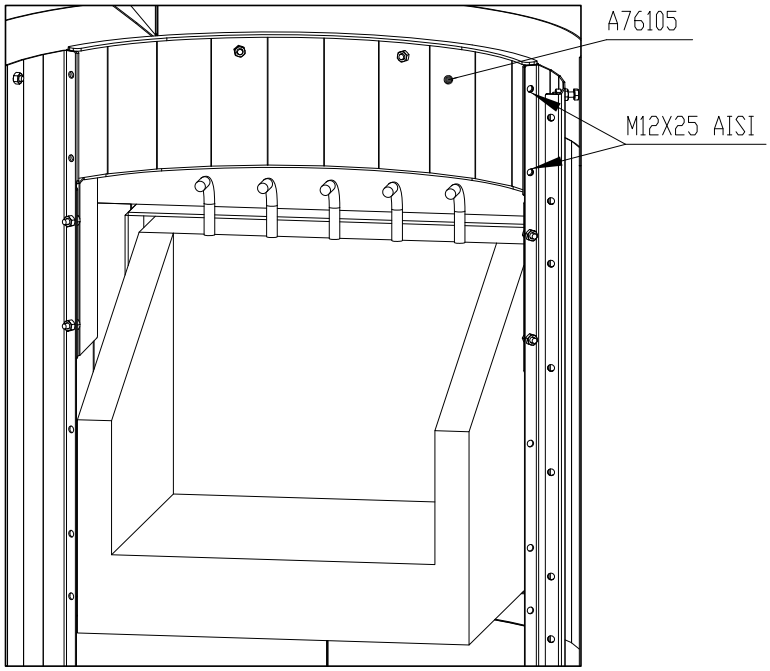
Wear shields for 400 - 800 kW furnace



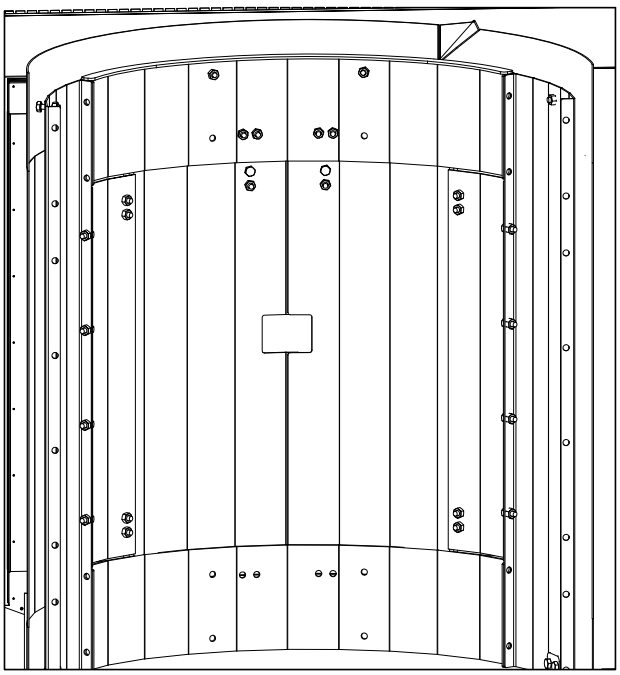
Spare parts drawing: Wear shield

Item	Denomination	Pcs	Weight
A76105	BIOHEATER WEAR PLATE FOR FIRE SURFACE WELDED 400-800 KW M18	1	18,9
A76109	BIOHEATER WEAR PLATE FOR FIRE SURFACE BOW 400-800 KW M18	4	11,2
A76110	BIOHEATER WEAR PLATE FOR FIRE SURFACE LEG 400-800 KW M18	4	2,0
A76113	BIOHEATER WEAR PLATE2 FOR FIRE SURFACE WELDED 400-800 KW M18	2	10,9
A76750	BIOHEATER WEAR PLATE3 FOR FIRE SURFACE WELDED 400-800 KW M18	1	5,3
A76114	BIOHEATER WEAR PLATE FOR HINGED FIRE SURFACE 400-800 KW M18	2	4,0
A76116	BIOHEATER WEAR PLATE FOR FIRE SURFACE HINGE 400-800 KW M18	8	0,1
A76117	BIOHEATER WEAR PLATE FOR FIRE SURFACE DOOR LEFT 400-800 KW M18	1	7,7
A76118	BIOHEATER WEAR PLATE FOR FIRE SURFACE DOOR RIGHT 400-800 KW M18	1	8,2
A76119	BIOHEATER WEAR PLATE FOR FIRE SURFACE SIDE 400-800 KW M18	2	2,0
A76122	BIOHEATER WEAR PLATE FOR FIRE SURFACE SUPPORT 400-800 KW M18 LEFT	1	0,1
A76138	BIOHEATER WEAR PLATE FOR FIRE SURFACE SUPPORT 400-800 KW M18 RIGHT	2	0,1
A76123	BIOHEATER WEAR PLATE FOR FIRE SURFACE BRACKET 400-800 KW M18	2	0,2
A76124	BIOHEATER WEAR PLATE FOR FIRE SURFACE LATCH 400-800 KW M18	2	0,3
A76345	BIOHEATER WEAR PLATE LATCH HORIZONTAL M19	1	0,4
102336	HEXAGON BOLT AISI 316 12X25 AM DIN933	84	
102627	HEXAGON BOLT AISI 304 12X40 AM DIN933	14	
110619	NUT M12 DIN934 AISI 304	114	

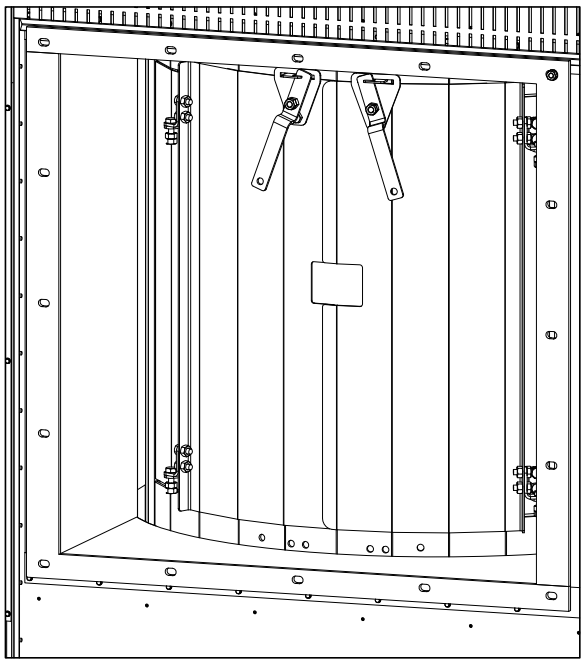
Installation of the shield on the burner side



Installation of the shield on the door side, inside the furnace



Installation of the shield on the door side, outside



Installing the shields

4. Electric installation

Assign an authorised electrician to all electrical installation work, installation of thermostats and connections to the control centre of the dryer!

The sensors of the burner shall be installed in accordance with the burner supplier's instructions.

Instructions for the electrician on installation of the thermostats and sensors (see also Fig. "Location of the thermostats in the dryer"):

- On the inlet side, the thermostats and the sensor are installed in the air pipe inside the building (if there is a building) in a straight part of the pipe (not near curves) where the airflow is smooth. Furthermore, the sensors must not have a direct "line of sight" to the rear part of the combustion chamber so as to prevent the red glow im the combustion chamber from affecting the values measured by the thermostats.

  If the sensors transmit the wrong information, shifting one of them to the other side of the pipe may help. Hot and cool air have probably not yet been mixed completely at this stage. Another option is to measure the true temperature of the drying air and to raise the setting of the thermostats from their rated values by the difference between the true and the wrong measurement results (applies to the LTM thermostat).

- On the outlet side, the thermostats and the sensors shall be installed in the outlet air pipe.

- The electric conductors must be at a distance of at least 50 mm from the surface of the heating pipe so as to avoid the risk of overheating.

- Carry out the electric connection of the heater in accordance with the wiring diagrams for the electric centre.

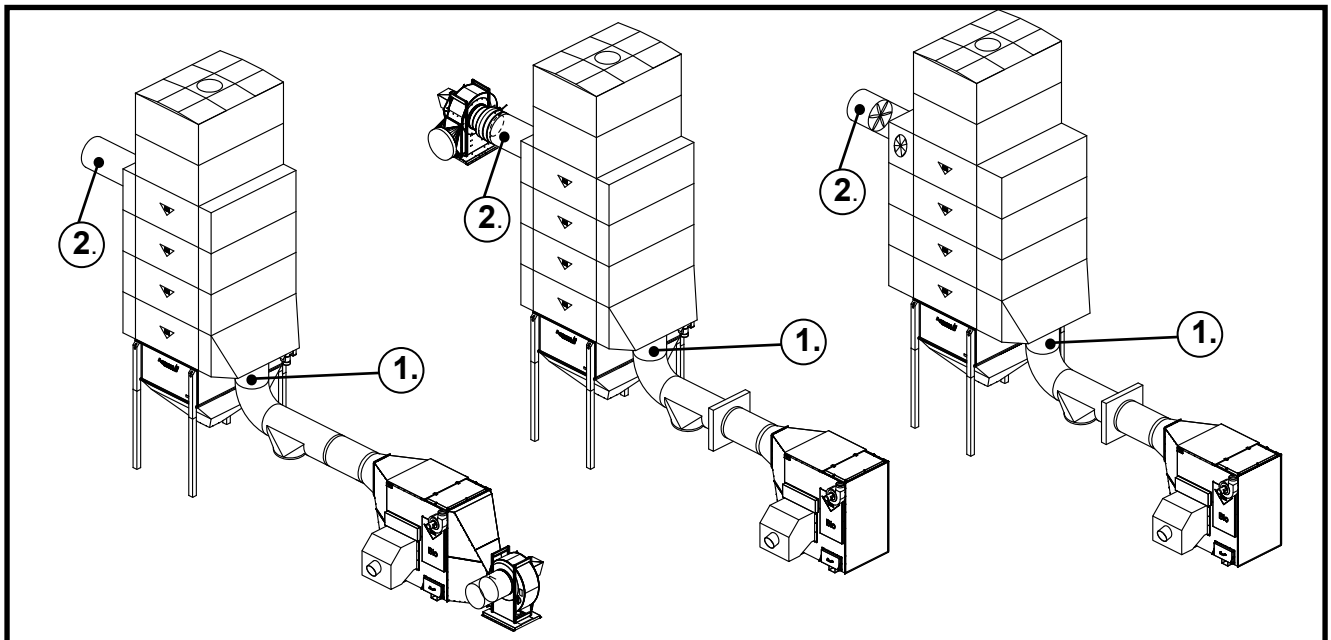
Thermostats and their initial settings:

- Temperature regulator LTM -thermostat. If a Logic Control Centre is being used, there is no need for a separate LTM thermostat. If the maximum drying temperature of 100 °C is applied, the "limit" value for the thermostat must be raised to 130 °C, so that the burner will be switched off if this temperature for any reason will be attained (malfunction). The standard setting is 110 °C and it is intended for standard positive pressure heaters. The thermostat in question also prevents the blowers from stopping until the drying air temperature has dropped to 45 °C, i.e. to the "fan" value of the thermostat. There are two discs inside the thermostat for adjusting the "fan" and "limit" settings. The sticker under the openable cover indicates that the terminal blocks in the system 1 are multiplexer, etc. Drill a D19 mm hole in the air inlet pipe for the capillary pipe of the thermostat to be inserted into the air pipe and fix it by its holder on the pipe, for example, using self-tapping screws.

- The sensor for the drying temperature is included in the Bioheater delivery. Connect the sensor to the control centre of the burner – not to the control centre of the dryer. The sensor shall be inserted about 100 mm into the air pipe, see the picture below. The control centre of the dryer may be equipped with a thermostat for the drying air temperature, but in the case of bioheater, it will remain unused. The sensor can naturally be installed in the pipe, and used for monitoring prevailing temperature on the thermostat's display, but otherwise it is useless. The desired drying temperature is adjusted in the control centre of the Bioheater.

- The purpose of the outlet air thermostat is to switch off the drying procedure as the outlet air temperature reaches the desired value. The sensor shall be installed in the lower outlet air pipe. The cut-off temperature is normally about 35-50°C; it depends on the cereal being dried and the drying temperature applied. If drying temperatures higher than normal are applied, the cut-off temperature will also be higher. Install the sensor in the pipe in the same way as the drying air sensor that was described earlier in this manual.

- The fire thermostat shuts down all the operations of the dryer immediately after the pre-set temperature has been reached, for example, as a result of fire inside the dryer. The fire thermostat is delivered with the blower. The fire thermostat shall be installed in the outlet pipe. Normally the thermostat is adjusted to 60 °C. The thermostat comes with a 2-metre-long capillary pipe, which makes it possible to install the thermostat box in a location where it is easy to access. The manually operated reset button at the side of the thermostat box must always be reset after the temperature has risen to the switch-off limit. In normal operation the temperature never rises to such a high level. Such an exceptional situation may occur while the dryer is being test run empty whereupon the temperature may easily rise to the pre-set switch-off value.



Location of the thermostats in the grain dryer including the sensors, delivered by the burner supplier

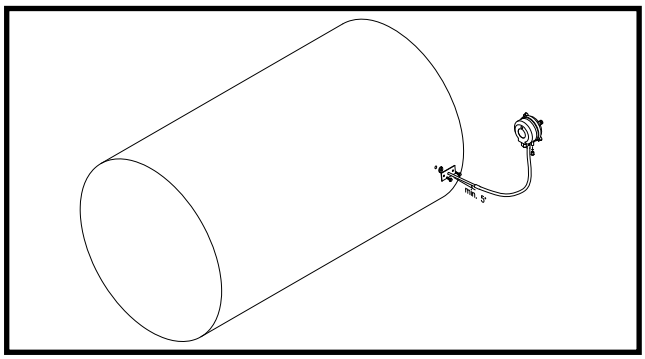
1.

- Drying temperature sensor (in a bioheater only for monitoring the temperature)
- LTM thermostat
- Air temperature sensor delivered by the burner supplier

2.

- Outlet air thermostat
- Fire thermostat

On the inlet side the sensors are installed in the air pipe inside the building in a straight pipe part (not near curves). The sensors must not be in direct line of sight of the rear part of the combustion chamber. The heat radiation from the chamber transmits wrong measurement result to the thermostats.



Vacuum sensor: Installation and setting

To be observed before start-up

- The oil burner fitter and the electrician have completed the test run.
- The operation of the safety devices needs to be tested in practice to ensure their proper operation.
- That the amount of fuel in the fuel storage is sufficient.
- There are no objects in the heater room that do not belong there.
- That exclusively clean air is blown through the heater.
- Check once more that the main switches and possible safety switches are in the operating position.
- That there is a fire extinguisher outside the heater room during drying.
- That the slab in the front and at both sides of the suction nets is clean and, for example, the wind cannot blow debris or withered plants near to the suction cone opening of the heater.

OPERATING INSTRUCTIONS FOR THE DRYER HEATER

Adjusting the output

- In vacuum dryers equipped with axial blowers, the flow of the drying air is as necessary restricted by means of the adjuster for replacement air to the blower in the outlet air channel. In dryers equipped with radial blowers, the suction air flow to the blowers is restricted by means of an adjuster..

- You can only monitor the temperature of the drying air with the digital gauge in the electric centre of the dryer. In the heaters fuelled by oil, this gauge is used as a digital thermostat for the 2nd stage.

- The pre-set drying temperature setting of the electric centre of the dryer may switch off the heater in case the temperature exceeds the set value. Set the temperature sufficiently high.

- The target value of the drying temperature is set in the electric centre of the burner.

- Carry out the adjustment of the burning air in accordance with the instructions in the manual. Make sure, however, that the maximum temperature marked on the heater's nameplate is not exceeded. It is also recommended not to operate the heater at too low an output, because if the temperature of the flue gases drops too low, water starts to condense.

- When moving from the drying stage to the cooling stage after the drying, the thermostat of the drying automation stops the burner automatically or switches it to maintenance mode (depending on the burner supplier) as soon as the pre-set outlet temperature, i.e. the cut-off point, has been reached (if the heater is connected to an automatic centre). NOTE! Depending on the fuel, the time required for shutting down will be quite long (on energy grain). Keep an eye on the lower outlet temperature.

- The heater fan cannot be switched off even from its operating switch before the heater has cooled down below the "fan" temperature of the LTM thermostat (nor shall the heater blower be switched off from the mains switch until the heater has cooled down).

  Familiarise yourself with the instructions issued by the burner manufacturer before use!

- Check the amount of ash in the furnace regularly, and empty it as required.

SERVICING

Annual service

- The flue pipe of the heater must be swept yearly immediately after the drying season. The heat exchanger must be swept frequently to prevent reduction of the heater output. If the temperature of the flue gas has risen notably over its normal value, it is time to sweep. The hinged hatch at the top shall be opened, and after that the heat exchanger doors (4 or 10 pieces) shall be lifted away. The smoke blocks shall be removed from the convection channels of the heat exchangers, and after that, the convection channels shall be cleaned using a tube brush. A "rapid" sweeping can be carried out by swinging the smoke blocks up and down a few times.

- Before you close the cleaning doors, check that the fire wool in the door is intact and in every respect in order. If air leakage is possible, renew the wool.

- The burner shall be serviced in connection with the sweeping. Check the measures required by the instructions issued by the burner manufacturer.

- Check before the start of the drying season using a flashlight that there are no mouse, rat or bird nests, which might constitute a fire hazard, between the surfaces of the heat exchanger inside the heater.

- Ensure that the inlet air piping to the dryer is clean. Some runoff of grain from the dryer may have occurred in connection with filling.

- Remove the ash from the furnace and the ash box after the drying season.

Service during the operation

- If all annual services have been performed with care, the dryer heater only requires daily visual checking during the operating season. Even when the operation of the heater is controlled from the electric centre of the dryer/ burner, it is advisable to go and look at and listen to the heater a few times a day to ensure its normal operation.

- It is advisable to always look at the upper end of the flue pipe when passing by: the exhaust gases should be colourless and invisible. When a cold heater is started, visible water vapour may come out with the flue gases. Dark, visible smoke indicates incomplete burning of the fuel. In this case the flowrate of the burning air must be checked immediately to prevent the heat exchanger from getting sooted.

- The net in front of the suction opening must be clean. Observe the fire risk. If you have to clean the net on a regular basis, you have to do something about the surroundings as well; otherwise, the risk of fire will be too high.

- The amount of ash in the furnace under the burner must be checked daily; in particular, if the fuel that you have been using is grain, because grain leaves behind plenty of ash.

WARNING! **If the surface of the ash rises to the level of the burner, the burner may be damaged because of the impaired cooling.**

- If the settings of the burner are correct, the amount of ash gathering in the ash box is not great. The amount of ash in the boxes must be checked regularly, and if necessary, the boxes must be emptied. If the surface of the ash in the box rises too high, the flow of the flue gas will be restricted. In the worst case, the flue gas does not flow properly, and then the settings of the burner will change, and the combustion will be incomplete.

WARNINGS!

- Do not go into the fuel storage, if it has no ventilation. A closed space can be devoid of oxygen, and thus dangerous to life. Do not work alone in the fuel storage.
- BEWARE OF THE BURNER'S HOT SURFACES! The burner is insulated, but certain of its steel parts can be hot as they are in contact with the jacket of the burner.
- THE SAFETY SWITCH MUST BE LOCKED IN THE OPEN-POSITION FOR SERVICING!
- THE SYSTEM MUST NOT BE BROUGHT INTO OPERATION BEFORE ITS INSTALLATION HAS BEEN COMPLETED, ITS SAFETY DEVICES HAVE BEEN TESTED AND ESTABLISHED TO BE FUNCTIONING PROPERLY, AND THE OPERATOR HAS FAMILIARISED HIMSELF WITH THE CORRECT USE OF THE SYSTEM AND UNDERSTANDS HOW IT WORKS.
- NEVER PUT YOUR HANDS THROUGH THE OPENING INTO THE FREE FALL FUNNEL

GUARANTEE

The guarantee period for the Antti-heaters is one (1) operating season. A five-year guarantee is granted to the fire surfaces of the heater. The guarantee covers defects in material and workmanship. For the electric motors, the separate guarantee terms, issued by the respective manufacturers and importers, apply.
The guarantee matters on the burner and the rest of the bioheater set-up shall be agreed upon with the manufacturer/supplier.
The guarantee does not cover the wear parts of the bioheater, such as the wear shields of the furnace, flue gas brakes or door of the bioheater. For the burner equipment, the equipment manufacturer’s guarantee terms apply and their personnel are responsible for handling the guarantee claims.

A prerequisite for validity of the guarantee is that the instructions issued by the manufacturer and the valid regulations have been followed during installation, use and service of the dryer heater.

All matters related to the guarantee shall be agreed upon with the manufacturer before any action is taken.

EU Declaration of Conformity

ANTTI-TEOLLISUUS OY
Koskentie 89
FI-25340 KANUNKI
Tel. +358 2 7744700

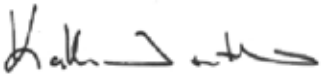
declares that

ANTTI VULCAN BIOHEATER

conform with the provisions of the following directives:

- **Machine Directive 2006/42/EC**

Salo 02.05.2023



Kalle Isotalo
Managing Director