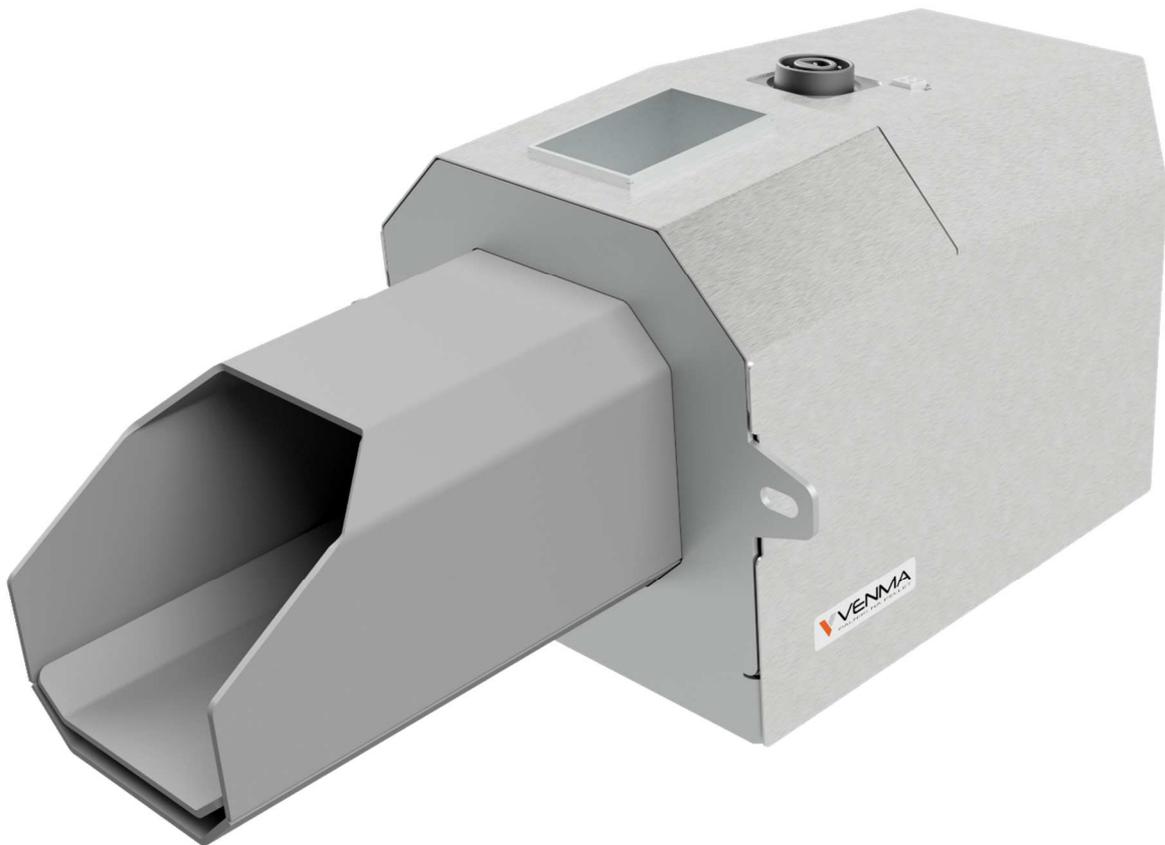




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Operating & Maintenance Manual

COMFORT Series pellet burners



1. Product overview

The Comfort series is state-of-the-art and most advanced biomass fuel combustion units from VENMA. These burners feature a fly and bottom ash removal system.

Firing-up, combustion, quenching and cleaning is contained to the burner and processed automatically for operation without any need for manual interaction. The burner is fired up by supplying a pre-charge of fuel and ignition by an integrated igniter which heats the pre-charged fuel to its ignition point. The combustion and quenching processes are managed by an electronic control unit (ref. the control unit user manual). The burner is cleaned of solid combustion residues by an ash rake. The burner is cleaned periodically which helps with secondary combustion to use 100% of the charged fuel and improve the costs of heating and reduce its environmental footprint. Cleaning of the burner also helps extend the service life of the combustion chamber.

The burners are compatible with central heating boilers fired with solid fuels and certain gas or fuel-oil boilers which feature a combustion chamber and an ash trap.

The VENMA burner is a very green heating solution which can be fuelled with renewable materials, including pellets, fruit stones or oats.

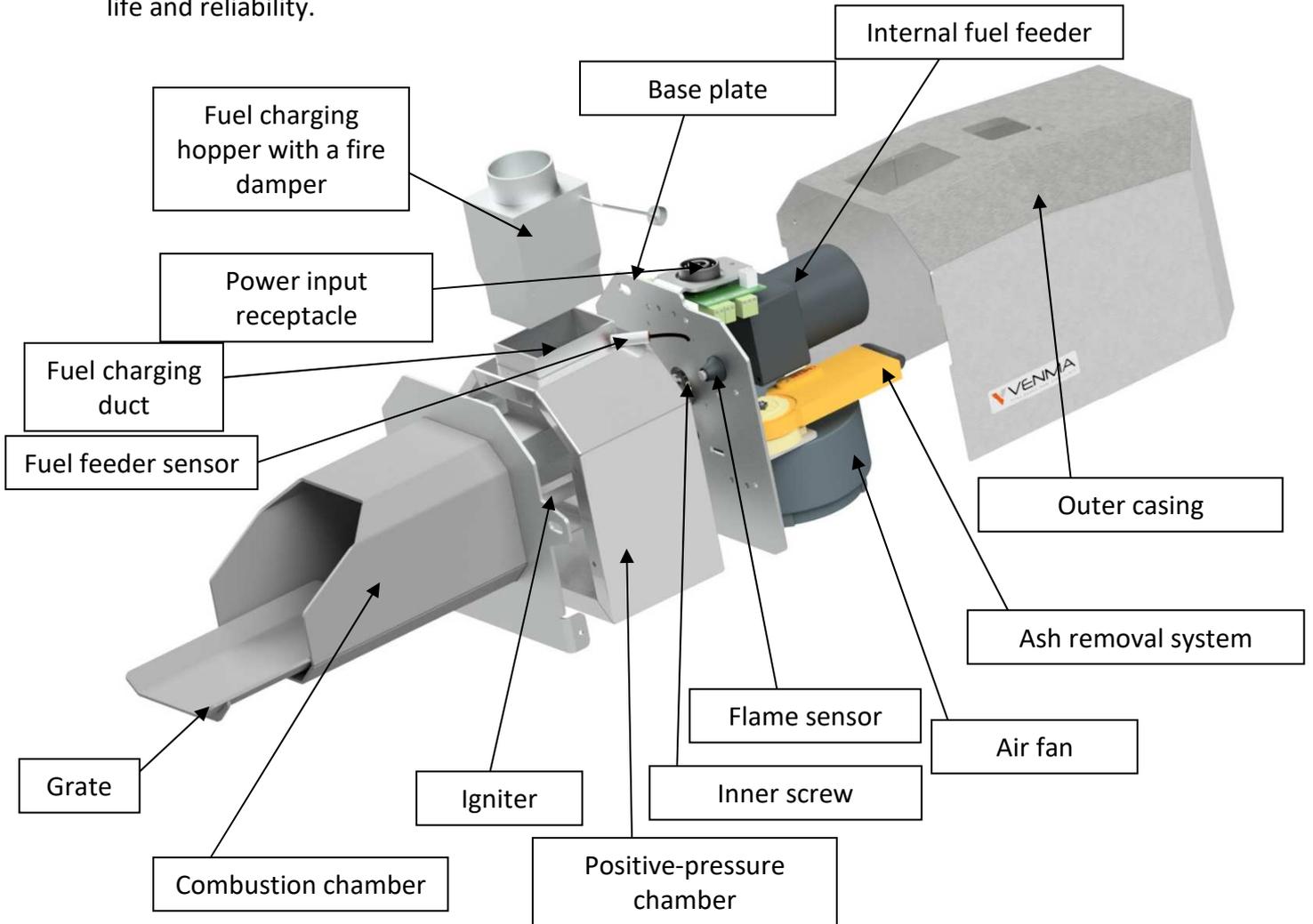
The burner is managed by the included control unit which provides stepless adjustment of the fuel and air mixing ratio to control the heat output to the heat demand. The control unit can support up to 4 circulation pumps and 3 mixing valves. The control unit also supports up to 6 temperature sensors (to accept outputs from a space heating cycle temperature sensor, a DHW temperature sensor, a valve operation sensor, a return temperature sensor, and thermal buffer sensors). The control unit features multiple convenience and management features, including a PID flue gas sensor, a room temperature controller, or an oxygen sensor to make operation of the burner easy and with much comfort.

The burner features multiple fire protection features which, in the event of a failure or overheating, isolate the fuel supply to prevent propagation of flames and a fire outside of the combustion chamber. No electrical power blackout can harm the burner, since the fuel charge present at any time in the burner's combustion chamber is relatively small.

The fuel to be charged to the burner must be kept in a solid, sealed container (a bunker) and handled to the burner via a screw (auger) fuel feeder from VENMA with properly selected length and power output.

2. Burner design

The VENMA burner comprises steel components and electrical parts. The combustion chamber and the grate of the burner are made of heat-resistant stainless steel. The steel material has been tested for resistance at temperatures above 1,000°C. The fuel feeder duct is made from galvanized black steel for corrosion protection throughout the operating life. The design prevents overheating of the burner electrical components for maximum service life and reliability.



3. Operating principle

The burner starts operating by firing up, followed by sustained combustion of fuel. The operation ends by quenching the fire and cleaning of the burner.

The external screw fuel feeder handles the fuel from the bunker to the burner.

The first firing-up of a brand-new burner must be started manually; each next firing up process will be managed automatically by the control unit following the user-defined settings.

Before each firing-up, the burner is blown through to clean the combustion chamber of any residues left from prior quenching. Next, a fuel pre-charge is fed, meanwhile the igniter

heats up to approx. 1,000°C, heating up the stream of air forced in by the fan until the pre-charged fuel ignites.

Next a flame sensor (which is a photo-sensitive device) detects the illumination growing from the flame inside the combustion chamber and de-energizes the igniter; the control unit enters the Flame Stabilization stage to heat up the burner for maintained combustion.

Further operating modes depend on the algorithm and may include: (Ref. the control unit user manual for detailed information about the operating modes.)

- Heat modulation (between the minimum output and the maximum output)
- PID control
- Automatic operation

The burner is cleaned of ash during combustion or after quenching; the sequence for ash removal can be selected on the control unit (ref. the control unit user manual).

The burner is quenched automatically; it can also be done manually with the control unit (ref. the control unit user manual). This operating mode provides secondary combustion to consume the remaining fuel in the combustion chamber.

4. Product delivery contents

The product includes:

Part designation:	Indicative figure:
VENMA pellet burners	
VENMA control unit with a complete wiring and sensor package	
Standard 2 m long galvanized steel fuel feeder (a longer option is available on request)	
Flex tube, 1 m long	
Installation flange (optional)* <small>* Standard feature for 100 kW or higher-rated burners</small>	
Fuel charging hopper with a fire damper	
Ceramic gasket	
VENMA Operating & Maintenance	

Manual	
VENMA Control Unit Operating & Maintenance Manual	

5. Installation and commissioning



The burner shall be installed by a licensed and qualified professional. VENMA shall not be liable for any defective installation of the burner.

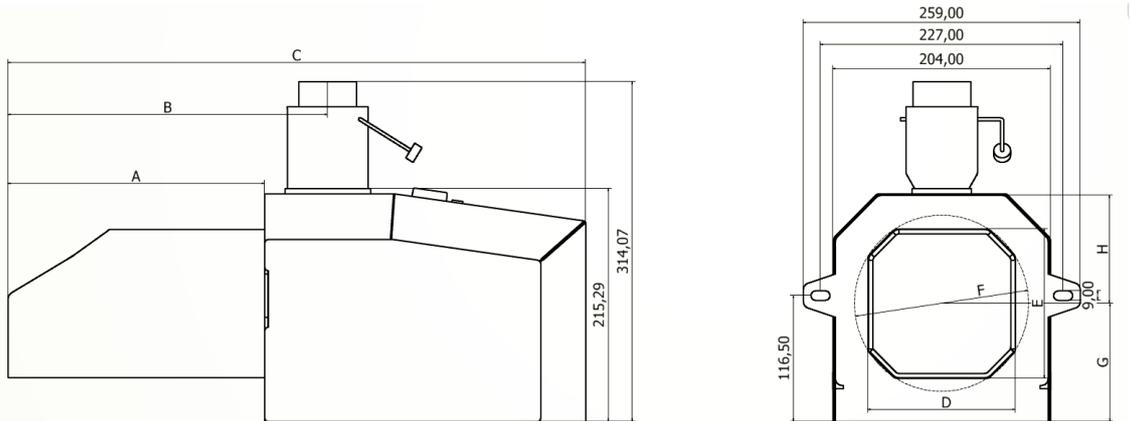
The VENMA burner is intended for integration with central heating boilers, as well as most types of gas or fuel-oil boilers. The installation location of the VENMA burner may vary with the boiler configuration; however, it is usually recommended to install it on the fuel charging door. When measuring the size of installation openings to be made, mind that the VENMA burner will require periodic inspection. The installation openings must be located so as to keep the boiler's original fuel charging and other doors operable.

The VENMA burner has been designed for relatively easy installation: the combustion chamber and installation openings are factory-made.

If you want to retrofit a regular boiler with the VENMA burner, the combustion chamber and installation openings must be sized carefully. The table further in this Manual shows the combustion chamber dimensions and the spacing and size of the installation openings. The VENMA burner heat output must be compatible with the boiler's heat rating.

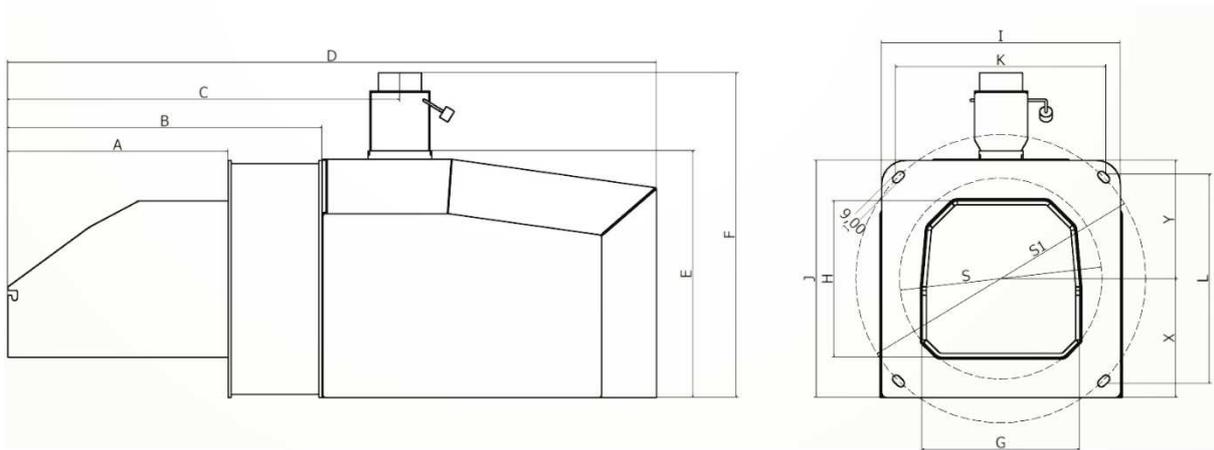
1. Measure and make the opening for the burner's combustion chamber.
2. Measure and make the installation openings for the burner bolts.
3. Install the burner on the fuel charging door of the boiler by securing both components with the bolts.
4. Set up the pellet fuel bunker.
5. Measure and adjust the pellet fuel feeder length; the angle between the floor and the fuel feeder duct must not be higher than 45°. (Ref. Fig. 2)
6. Suspend the fuel feeder on a chain sling. (Ref. Fig. 2)
7. Connect the burner to the fuel feeder with the spiral flex pipe. Note that the flex pipe run cannot be too long and its bending radius must be long enough to permit a gravity-assisted flow of the pellet fuel without clogging or bridging.
8. The control unit's actuator module can be installed anywhere; however, choose an installation location not directly exposed to the heat from the boiler or CH piping and with easy access for operation of the control unit.
9. Install the control unit display and the wiring for pumps, valves and other system components.
10. Install the sensors from the package in respective locations.
11. Connect the power cable and the grate cable to the burner.
12. Fill the bunker with fuel.
13. With the bunker full, power on the control unit and wait for the initialization screen to be displayed.
14. Prime the fuel feeder (the galvanized steel duct which houses the screw) with the pellet fuel. The fuel feeder is primed in full when the pellet fuel starts flowing down the flex pipe (ref. the control unit user manual).
15. If the flex pipe is full of fuel, select Manual Operation and Internal Fuel Feeder. Wait for the pellet fuel to flow into the combustion chamber; next, remove the pellet from the combustion chamber or move it to the ash trap. **DO NOT SELECT "FIRING UP" IF YOU ARE NOT SURE THAT THE COMBUSTION CHAMBER AND THE FLEX PIPE ARE EMPTY.**
EXPLOSION HAZARD!
16. With the foregoing steps completed, you may operate your VENMA burner; ref. the control unit user manual for the configuration settings.

VENMA Comfort 16-35 burners



Model:	Power range:	Max. current input: (Firing-up / Combustion)	Weight:	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]
Comfort 16	4-16 kW	300/70 W	11 kg	185	244	485	110	110	131	109	100
Comfort 25	5-26 kW	300/70 W	13 kg	215	274	515	125	125	150	113	96
Comfort 35	6-35 kW	300/70 W	15 kg	240	299	540	138	138	163	109	100

VENMA Comfort 46-300 burners



Model:	Power range:	Max. current input: (Firing-up / Combustion)	Weight:	A* [m]	B [m]	C [m]	D [m]	E [m]	F [m]	G [m]	H [m]	I [m]	J [m]	K [m]	L [m]	X [m]	Y [m]	S [m]	S1 [m]
Comfort 46	10-46 kW	450/150 W	24 kg	198	301	377	665	286	385	178	178	274	274	236	236	137	137	223	325
Comfort 58	12-58 kW	450/150 W	30 kg	238	341	417	705	286	358	178	178	274	274	236	236	137	137	223	325
Comfort 70	15-70 kW	450/150 W	36 kg	228	342	443	765	312	411	198	198	300	300	265	265	150	150	255	365
Comfort 85	20-85 kW	450/150 W	40 kg	277	395	493	815	312	411	198	198	300	300	265	265	150	150	255	365
Comfort 100	25-100 kW	510/210 W	64 kg	277	441	600	997	383	467	250	260	360	370	314	314	184	186	326	435
Comfort 125	35-125 kW	510/210 W	70 kg	327	495	650	¹⁰⁴⁷	383	467	250	260	360	370	314	314	184	186	326	435
Comfort 150-300	Consult a reseller																		

* Optional feature on the Comfort 46-85 burners; standard feature on Comfort 100 and higher-rated burners.

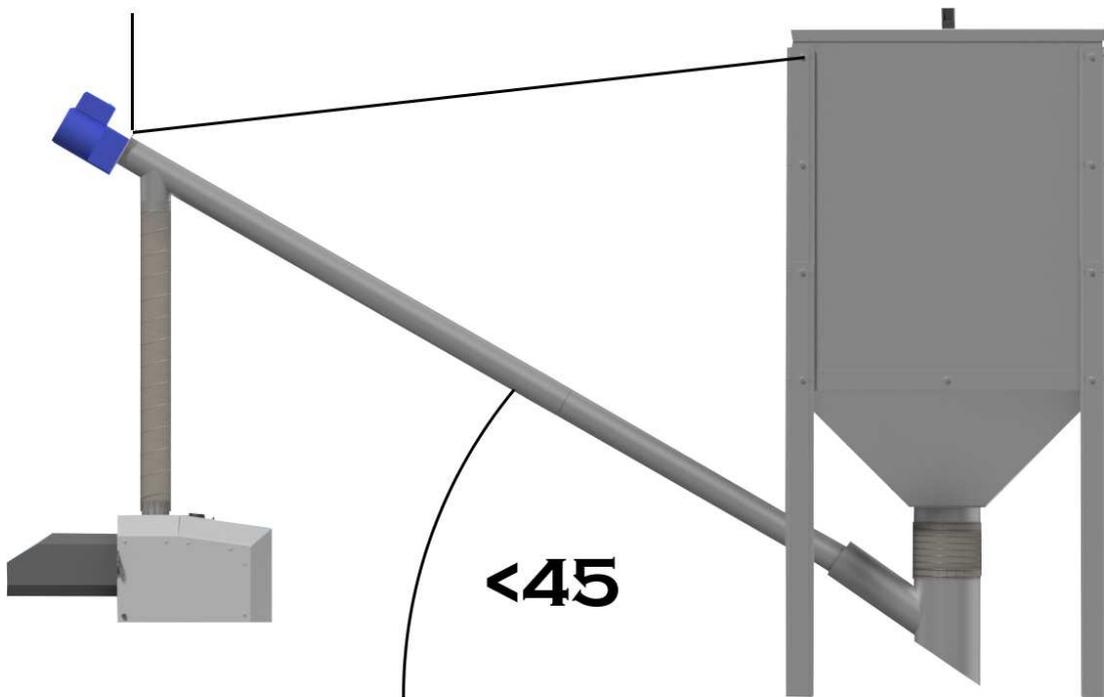


FIG. 2

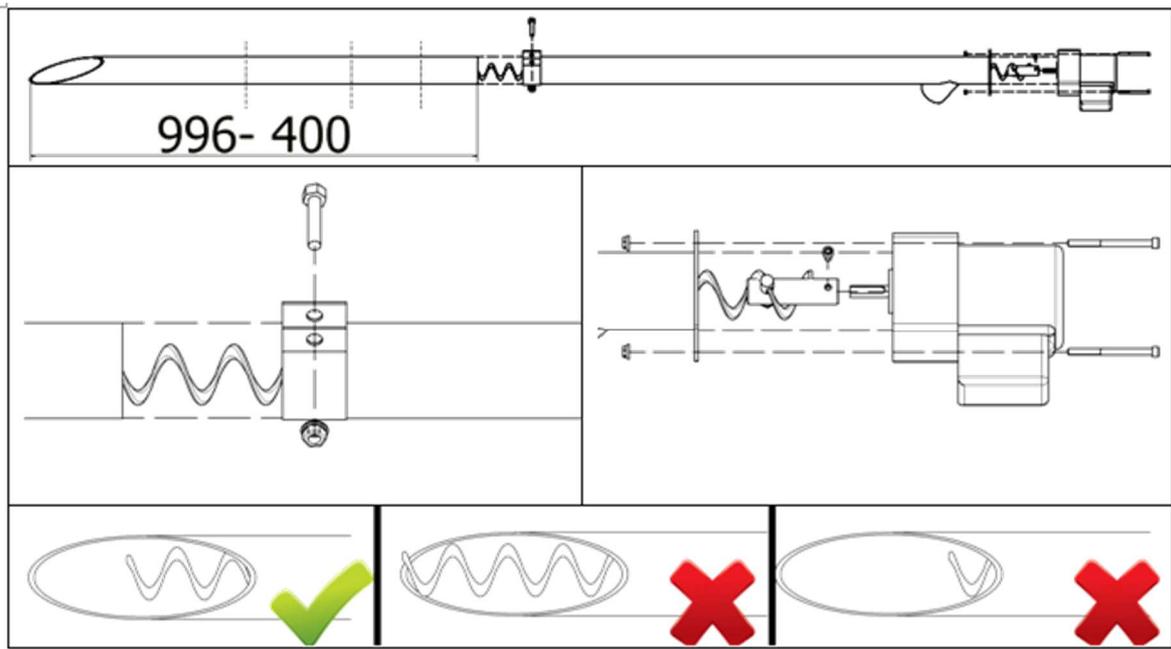
6. Fuel specifications

The fuel for the burner shall conform to the following specifications:

Form	Granulated
Diameter	6-8 mm
Length	3-40 mm
Dust fraction	≤1%
Fuel density	≥620 kg/m ³
Moisture content	<8%
Calorific value	16-20 MJ/kg
Ash	≤0.7%

7. Screw fuel feeder

The screw fuel feeder connects the fuel bunker with the burner. The screw fuel feeder comprises a galvanized steel or stainless-steel duct 60 mm in diameter. The duct houses a steel screw (auger) driven by an 230V AC motor over a gear. The motor is wired with a power cable to the respective power output receptacle of the burner control unit. The burner is fed automatically with fuel and automatically managed. If the fuel feeder duct fails e.g. by overheating with a flame flashback, the fuel feeder stops operation which quenches the burner. This prevents flames from propagating to the outside and a risk of fire in the boiler room.



8. Operating the burner

The burner shall be installed and operated according to this Manual and the Warranty Certificate. VENMA shall not be liable for any damage resulting from improper use of the burner.

The burner shall be cleaned and maintained according to the sound judgement of the user. The obligatory annual inspection of the burner shall be scheduled with the authorized technical service at least two weeks in advance.

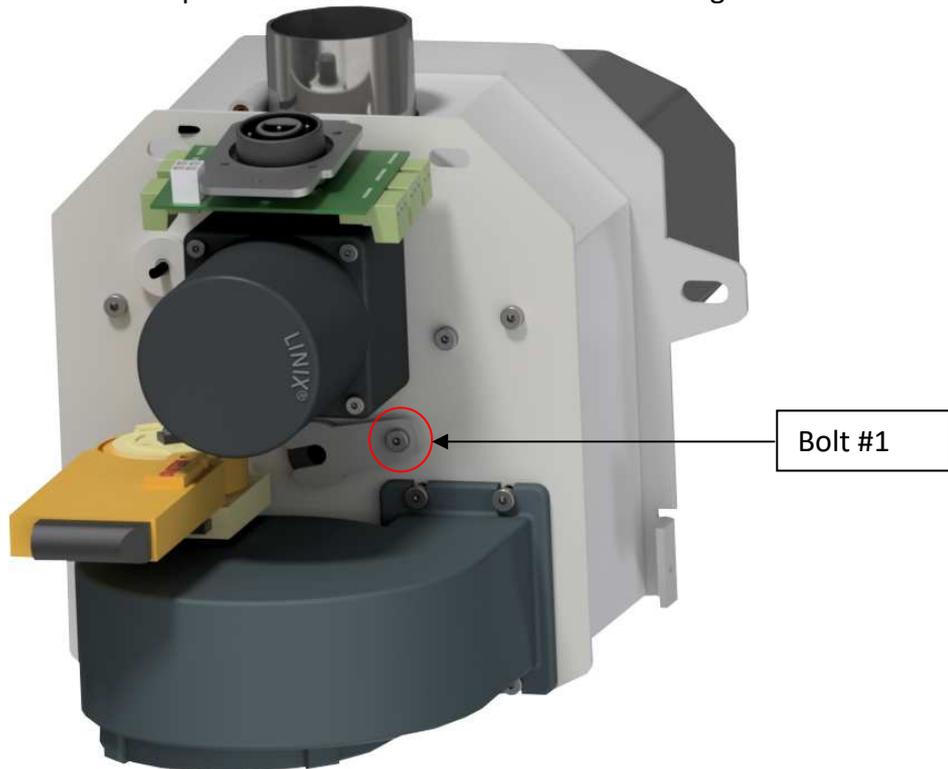
The heating equipment safety regulations require a minimum clearance of 0.8 m around the installed burner. Provide a sufficient clearance for service access to the burner. The boiler room shall be a dry and well-ventilated indoor location. No flammables shall be present near the burner

9. Inspection of the burner

To ensure trouble-free operation of the burner for many years, proper maintenance must be performed. It is highly recommended to order an authorized technical service for an annual inspection of the burner after each heating season. However, if it is undesirable or impossible to have authorized technical service perform the annual inspections, the user must perform them anyway.

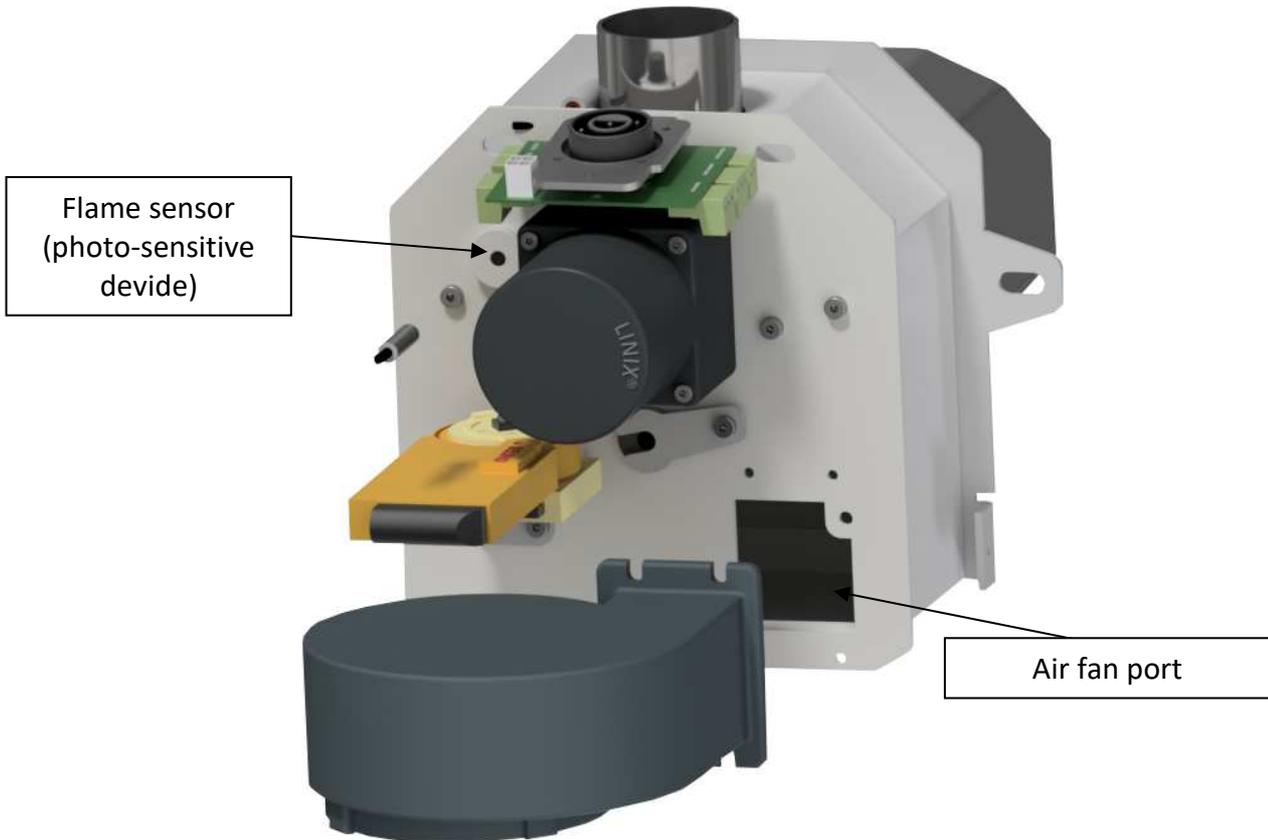
CAUTION! Power off the control unit and disconnect the power supply wiring from the burner!

The burner internal components are shown below with the casing removed.



- Replacing the igniter: remove bolt #1 (with a 4 mm hex key) and remove the igniter assembly with the tube shield; remove the rubber gland and release the small bolt (with a 3 mm hex key) from the tube shield until the igniter can be freely removed. Install the new igniter and reassemble in the reverse order of disassembly.





- Cleaning the flame sensor (photo-sensitive device): remove the flame sensor carefully by pulling it out towards you and clean with a dry cloth. Reinstall the flame sensor in the rubber gland.



- Cleaning the positive-pressure chamber: remove the air fan and use its port to access and thoroughly clean all dust and ash.

10. FAQ (Frequently Asked Questions)

Error Alarm / Notification	Potential cause
<p>The burner failed to ignite; the display reads Firing Up Failed.</p>	<ul style="list-style-type: none"> - No fuel left in the bunker; restock and prime the fuel feeder duct in manual control mode; - Run a functional test of the igniter in manual control mode. If the igniter has failed, contact the authorized technical service. - Check the burner grate for clogging with ash. Clean the grate manually if required; reduce the ash removal interval in the service menu of the display. - Switch to manual control mode and run a functional test of the external fuel feeder. If the fuel feeder runs but it still fails to charge a sufficient dose of fuel, clean the charging hopper of the fuel bunker and the fuel feeder duct. - Check that the igniter's tip (heat output aperture) is clearly visible. Poor pellet fuel grades may obstruct the igniter. - Clean the flame sensor (do this carefully with a dry cloth).
<p>The control unit's display reads Feeder Overtemperature</p>	<ul style="list-style-type: none"> - Check that the flue gas duct and the chimney connection for clogging. - Carefully inspect the boiler chambers, the heat exchanger and the smoke breeching for deposits of ash and soot which may obstruct correct draught. - Check the burner grate for excessive deposits of ash. Remove the ash manually if required; reduce the ash removal interval.
<p>The air fan and the external fuel feeder are inoperative.</p>	<p>Most likely the bi-metallic thermal cut-out was tripped. Wait approximately 60 minutes. If the error persists, contact the authorized technical service.</p>
<p>The burner failed to fire up despite DHW demand or a room temperature controller.</p>	<ul style="list-style-type: none"> - Weekly Schedule Control is active; - Burner Quenched Manually by User.
<p>The CH circulation pump fails to start when it reaches the start temperature.</p>	<ul style="list-style-type: none"> - The control unit operates in the Summer Mode. Change the Running Mode to Parallel

	<p>Pumps or Space Heating.</p> <ul style="list-style-type: none"> - The CH Pump Room option is enabled.
<p>The DHW pump fails to start when it reaches the start temperature.</p>	<ul style="list-style-type: none"> - The control unit operates in the Summer Mode. Change the Running Mode to Parallel Pumps or Boiler in Priority. - The actual DHW temperature is above the DHW temperature. - The DHW Schedule is enabled.
<p>The control unit fails run.</p>	<p>Replace the power fuse in the actuator module (locate the white power terminal box to which all wiring is connected).</p>
<p>The burner smokes heavily and leaves soot inside the boiler.</p>	<p>Insufficient oxygen or too much fuel in the mix:</p> <ul style="list-style-type: none"> - Reduce the fuel dosage or increase the oxygen; - - Check the grating slots and the combustion chamber panel vents for obstructions. If there is obstruction, unclog with e.g. a chisel less than 4 mm in diameter.
<p>The combustion process leaves much slag.</p>	<p>The fuel grade is poor:</p> <ul style="list-style-type: none"> - Use a fuel grade optimum for the burner.

11. Installation Report

Buyer's data:		
Location:	Postal code:	City:
Street address:	Phone:	E-mail:
Reseller's data:		
Location:	Postal code:	City:
Street address:	Phone:	E-mail:
Burner installer's data:		
Location:	Postal code:	City:
Street address:	Phone:	E-mail:
Burner specifications:		
Standard operation:	Automatic operation:	PID operation:
Min. heat output:	Fuel specific weight:.....	Max. fuel feeder ratio:.....
Fuel feeder running time:.....	Calorific value:.....	Min. fuel feeder ratio:.....
Fuel feeder stop time:.....	Max. air fan:.....	Max. air fan ratio:.....
Combustion air supply:.....	Min. air fan:.....	Min. air fan ratio:.....
Max. heat output:		
Fuel feeder running time:.....		
Fuel feeder stop time:.....		
Combustion air supply:.....		

.....
 Installer's legible signature:

.....
 Buyer's legible signature:



13. Warranty Terms & Conditions

1. VENMA grants this Warranty for the product with a warranty period of 12-36 months and the warranty period shall not exceed 36 months past the product's production date (provided that the product passes an periodic inspection after every 12 months of operation).
2. All workmanship defects found in the product will be removed at VENMA's cost in 21 business days from filing the warranty claim.
3. The scope, method and terms of warranty repair are solely at VENMA's discretion.
4. The Warranty shall remain valid if the Warranty Certificate signed and retained with the proof of original purchase of the product.
5. Each defect of the product shall be claimed immediately upon discovery.
6. The Warranty does not include mechanical failure of the product.
7. The Warranty does not include the installation, commissioning, control unit configuration programming, cleaning or maintenance.
8. Excluded from this Warranty are:
 - incorrect configuration settings of the burner;
 - damage caused during transport or handling;
 - installation and/or operation of the product in departure from the Operating & Maintenance Manual;
 - unauthorized alteration or modification of the burner or control unit;
 - insufficient flue duct draught;
 - unauthorized repair of the product;
 - damage caused by defective electrical power wiring on site;
 - feeding incompatible fuel types (e.g. pelletized MDF).
9. The Warranty holder shall be charged with the costs of technical service claimed for defects excluded from this Warranty.
10. The igniter of this product is covered by a 12-month warranty only.
11. File your warranty claim with the Claim form on VENMA's official website, e-mail, post, or fax.

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