Burner for pellets

USER'S MANUAL

www.pellasx.eu

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1. General information

Read carefully the user's manual before activating burner.

Pellas X burner requires installation according to this user's manual. Following advice included in this USER'S MANUAL will guarantee safe functioning and installation of the device.

All doubts and ambiguities as to condition of equipment or given functions of parts of burner should be reported to the seller in order to get explanations.

Installation of burner should be carried out by a service person who is authorized and trained by the producer.

Improper installation may lead to loss of guarantee.

Every user of heating boiler devices should know and comply to all local rules of law. Particularly before activating a heating installation in accordance with construction law.

The seller does not bear any responsibility for burner installation which is not in accordance to valid local regulations and for lack of required protocols and permissions.

1.1. Transportation

Pellas X type burner is packed in a carton with a divider (burner with a controller, mounting flange and a feeder). The device must be carried in packaging, according to markings on the parcels. During transportation it should be protected against unfavorable environmental conditions (snow, rain, dust) and it should not be exposed to shocks, hits and the packaging should be protected against damages.

Loading and unloading must be carried out in a way which does not expose the devices to shocks. Improper loading, unloading and transportation (throwing, rapture sliding, crushing with other heavy goods) can be a cause of damage to the product.

In case of damage of the packaging or product, the device should be subjected to control in operation. In case when improper work of a fan or feeder motor is observed (loud work, rubbing), possibly other faults, e.g. electronics (vanishing of characters on display of LCD display) the burner should be sent to the service team in order to carry a reparation. **Consignments delivered by forwarding companies should be checked in presence of the courier when the goods are delivered. In case of any incompatibilities a protocol should be prepared.**

1.2. Storage

Pellas X burner should be stored in environmental conditions in accordance to following guidelines:

- Dry and draughty rooms, free from substances like gases, corrosive liquids and fumes, which are harmful to burner. Burner and feeder can not be stored in rooms where artificial fertilizers, chlorinated lime, acids, chemicals etc. are kept.

- Best storage temperature from $+5^{O}C$ to $+40^{O}C$. Relative humidity should not exceed 70%.

- During storage, the device can not have direct contact with the floor. Pellas X burner until final assembly should be kept in carton and on a pallet. Burners can be stored and transported in two layers maximum.

- In case when a burner is stored for over 2 years from its production date or in environmental conditions not similar to above description, before installing it should be subject to activating - test by an authorized service person. To testify proper quality and safety of a burner, the above inspection will be documented by service person in the guarantee card.

1.3. Control of burner delivery

Before commencing assembly activities check the following: condition of packaging, make sure that there are no visible damages and if delivery is complete and not damaged. Possible reservations and problems should be reported to the supplier immediately. He is responsible for insuring the merchandise.

1.4. Free space around burner

According to local safety regulations referring to heating devices, provide free space around burner, at least 0,8 m around boiler. Provide space for service of burner.

The boiler room should be clean, dry and well aired. Airflow to the boiler should be at least equal to exhaust of fumes through the chimney.

ATTENTION! In order to minimize the risk of fire do not store flammable materials near the burner (min. length 0,5 m).

2. PRODUCT DESCRIPTION

Pellas X is a brand under which since 2001 burners for biomass have been produced. These products are characterized with stepless regulation of settings allowing for usage in all types of ovens or heating boilers. In case when exchange of burner is done in an old boiler, then it is not necessary to make changes in existing installation. Firing up, sustaining fire after reaching preset temperature and feeding fuel is automatic.

Unique solutions used in Pellas X burners are patented technologies of overpressured burning, which eliminates problem of back burning, patented system of fuel mixing in burning chamber, which prolongs the time of maintenance-free work, it is also a broadband lambda probe – available for all types of burners – which improves burning process and reduces fuel consumption.

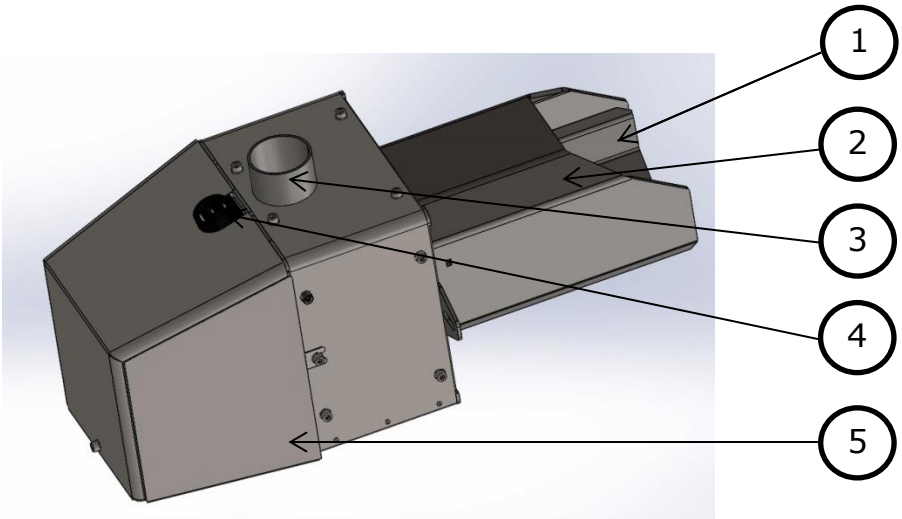
Pellas X burners are used in households, bakeries, hotels, public utilities, schools and production halls or warehouses. They are made of acid-proof steel and they are equipped in best quality parts available on the market. The product which you have at your disposal is the highest quality, most technologically advanced burner available on the market.

2.1. Construction of burner

Pellas X burners are divided into 3 groups:

1. Pellas X Mini
2. Pellas X
3. Pellas X Big

2.1.1. Pellas X Mini



Pic. 1. Construction of Pellas X Mini burner.

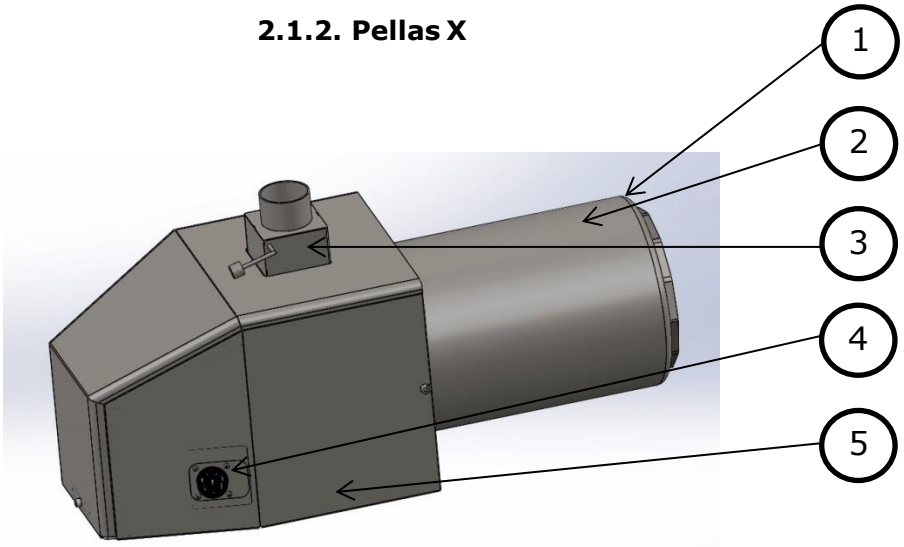
Pellas X burner is built from two parts: inner part - burning chamber (1) and outer part which is covered by steel plate (5). Under the cover the blowing chamber is located, in which igniter for burning up fuel is mounted, together with a fan, socket for electrical connections and electronics. Multi socket (4) is located on top of the burner, plug of the controller is connected into it. In top part of the cover there is a pouring hole (3), to which a pipe connecting burner with fuel hopper is mounted. The cover of burner does not have any protruding nor sharp parts. It does not threat one's health. The

temperature of burner's cover during operation should not exceed 50ºC with exception of places of raised temperature, i.e. bakery.

Burning chamber is made of two parts:

- Removable grate, made of heat-resistant steel, with holes for air intake to grate finished inside with a wall with holes for air supply, a hole for heater which burns up fuel, a hole for flame sensor and inner pipe in which there is a spiral feeding fuel to furnace.
- Covering part (2) made of stainless steel, which serves as a coat, making space for free airflow into furnace, which is cooled and aired.

2.1.2. Pellas X



Pic. 2. Construction of Pellas X burner.

Pellas X burner is built from two main parts: inner pipe, which is a burning chamber (1) and outer part, which is covered with acid-resisting steel plate (5). Under the cover, there is a blowing chamber with an igniter for burning up fuel and a fan, a socket for electrical connections and electronics. On the right side of burner, there is a multi-socket (4) to which the plug of the controller is connected. In upper part of the cover, there is a pouring chimney with valve (3). To the chimney a pipe connecting with fuel feeder is connected. The cover of burner does not have protruding nor sharp parts and does not threat one's health. The temperature of cover during operation should not exceed 50ºC with exception of places of raised temperature, i.e. bakery.

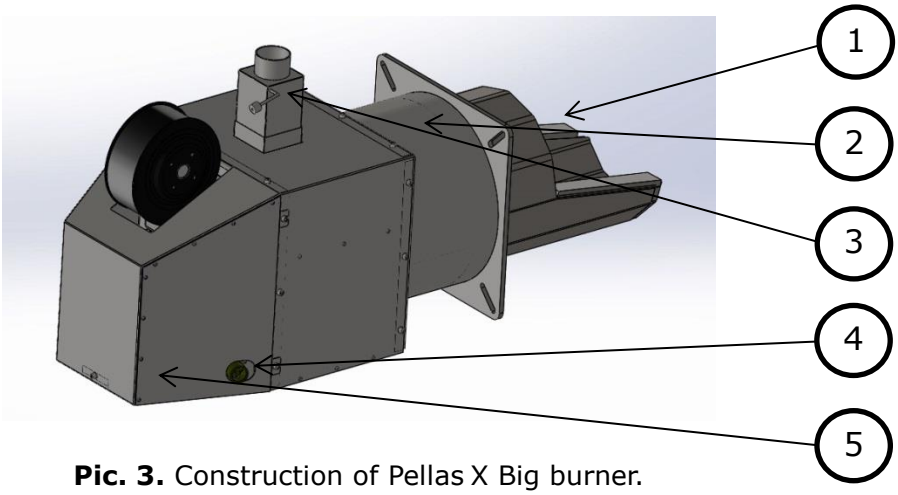
Burning chamber is made of two pipes:

- Inner pipe of furnace, made of heat-resistant steel with holes for airflow to furnace, finished from inside with a wall with holes for air intake, a hole for igniter which burns up fuel, hole for flame sensor and outside pipe, in which there is a coil for feeding fuel to furnace.
- Outside covering pipe (2) made of stainless steel, which serves a role of a coat creating space for free airflow among pipes which cools and airs the furnace.

Pouring chimney is mounted into rectangular hole in upper part of the burner's cover. Inside the chimney there is a steel valve with counterweight. The valve prevents against back burning into the feeder.

It is important that counterweight is not blocked in any way.

2.1.3. Pellas X Big



Pic. 3. Construction of Pellas X Big burner.

Pellas X burner is built from two main parts: inner part, which is a burning chamber (1) and outer part, which is covered with steel plate (5). Under the cover, there is a blowing chamber with an igniter for burning up fuel and a fan, a socket for electrical connections and electronics. On the right side of burner, there is a multi-socket (4) to which the plug of the controller is connected. In upper part of the cover, there is a pouring chimney with valve (3). To the chimney a pipe connecting with fuel feeder is connected. The cover of burner does not have protruding nor sharp parts and does not threat one's health. The temperature of cover during operation should not exceed 50ºC with exception of places of raised temperature, i.e. bakery.

Burning chamber is made of two parts:

- Removable furnace, made of heat-resistant steel with holes for airflow to furnace, finished from inside with a wall with holes for air intake, a hole for igniter which burns up fuel, hole for flame sensor and inside pipe, in which there is a coil for feeding fuel to furnace.

- Covering part (2) made of stainless steel serving as a coat, making space for free airflow to furnace, which is cooled and aired.

Pouring chimney is mounted to rectangular hole in upper part of the burner's cover. Inside the chimney there is a steel valve with counterweight. The barrier prevents against back burning to the feeder.

It is important that counterweight is not blocked in any way.

ATTENTION! The producer reserves the only right to implement changes in construction of burner and feeder, its software and wiring, otherwise he is freed from any responsibilities to the buyer.

2.2. Pellet fuel quality requirements

In table below given requirements as to quality of pellet fuel are shown. Using fuel which complies to **DIN 51731** or **DIN PLUS** extends longevity of burner.

Table 1. Quality requirements of pellet fuel.

Wooden pellets	**Units**	**NORM**	
Quality criteria		**DIN plus**	**DIN 51731**
Diameter	mm	4≤d<10(6)	4≤d<10(6)
Lenght	mm	5 x D(3)	<50
Density	kg/dm³	1,12	1,0<Density<1,4>
Ash	%	<0,5(1);(7)	<1,50
Humidity	%	<10	<12
Humidity when delive-red	%	Not specified	Not specified
Caloric value	MJ/kg	>18(1)	17,5<HW<19,5(2)
Sulphur	%	<0,04(1)	<0,08
Nitrogen	%	<0,3(1)	<0,3
Chlorine	%	<0,02(1)	<0,03
Dust collected	%	<2,3	-
Additives facilitating pressing	%	<2(8)	(4)
Temperature of melting ash	-	Not specified	Not specified
Arsenic	mg/kg	<0,08	<0,08
Lead	mg/kg	<10	<10
Cadmium	mg/kg	<0,5	<0,5
Chrome	mg/kg	<8	<8
Copper	mg/kg	<5	<5
Quicksilver	mg/kg	<0,05	<0,05
Zink	mg/kg	<100	<100
Halogens	mg/kg	<3	<3
(1)	Dry weight		
(2)	Free from water and dust		
(3)	No more than 20% of pellets can be as long as 7,5 x diameter		
(4)	DIN forbids to use additives. This ban is not valid to small heating systems.		
(5)	In warehouse of the producer		
(6)	Tolerance in differences in diameter ± 10 %		
(7)	Allowed content of dust up to 0,8%, if it is naturally higher, specific for given sort of wood		
(8)	Only natural additives from biomass are allowed		

ATTENTION! Change of pellets diameter during using of burner (e.g. from 6mm to 8mm) requires resetting the controller by a qualified installer.

2.3. Technical data of burner

Main properties of Pellas X burner:

Safety

- Patented technology of overpressured burning – no risk of backfiring
- Control over temperature of burner
- Possibility of installing an air filter
- Valve with a counterweight preventing against backburning

Reliability

- Patented system of fuel mixing in burning chamber – significantly prolongs maintenance-free operation
- Automatic start after electricity shortage – last settings memory
- Furnace made of highest quality heat-resistant steel
- Made of the best materials, using latest technologies

Modern controlling system

- Automatic operation: firing up, cleaning, flame control
- Stepless (electronical) power regulation
- Possibility of control over burning process by broadband lambda probe (optional)
- Low emission of CO and CO_2
- Low consumption of electricity
- Low heat inertia
- High burning efficiency – up to 99 %
- Fully compatible with automatics of oil and gas boiler and with bakery oven
- Very precise flame sensor
- Possibility of handling the chimney exhaust fan. The fan works periodically and does not ventilate the boiler.

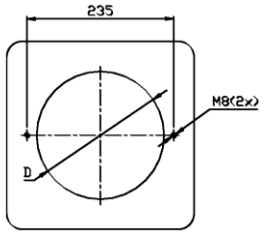
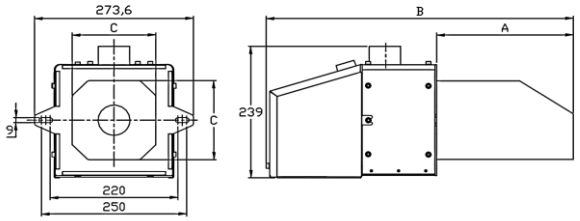
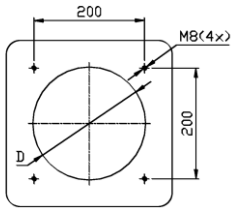
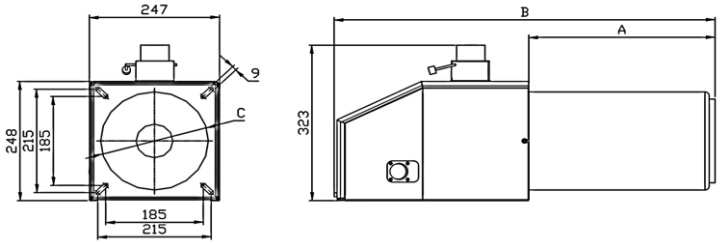
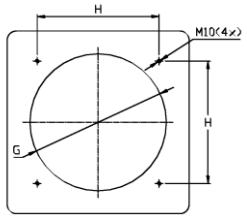
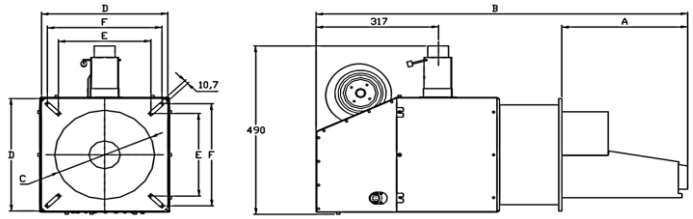
Table 2. Technical data.

Type:	Pellas X Mini	Pellas X Mini 35	Pellas X 44	Pellas X 70	Pellas X 100	Pellas X 120	Pellas X 150	Pellas X 190	Pellas X 260	Pellas X 350
Power output:	5 - 26 kW	8 - 35 kW	10 - 44 kW	15 - 70 kW	30 - 100 kW	40 - 120 kW	50 - 150 kW	65 - 190 kW	80 - 260 kW	100 - 350 kW
Currency:	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz
Average consumption of electricity:	60 W	60 W	60 W	75 W	75 W	75 W	75 W	120 W	120 W	150 W
Weight:	11 kg	15 kg	19 kg	20 kg	25 kg	27 kg	35 kg	55 kg	61 kg	80 kg
Feeder lenght:	2 m	2 m	2 m	2 m	2 m	2 m	2 m	3 m	3 m	3 m
Fuels:	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit	pellet6-8mm Oat Dry pit
Burning efficiency:	to 96 %	to 96 %	to 99 %	to 99 %	to 99 %	to 99 %	to 99 %	to 99 %	to 99 %	to 99 %
Efficiency in boiler:	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %	to 96 %
Power modulation:	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Lambda probe:	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES	YES	YES
CH pump service:	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
HUW pump service:	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Mixer service	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Buffer service	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)
Additional feeder service (silo)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)
Room temperature sensor:	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)
Weather automatics:	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)
Solar collectors service:	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)	YES (optional)

Pellas X burner has simple and compact construction, which allows for easy assembly in boiler's door. Below in the table: the dimensions and drawings of mounting holes for given types of burners. There are 3 groups of burners:

- Pellas X Mini group:
  - Pellas X Mini
  - Pellas X Mini 35
- Pellas X group:
  - Pellas X 44
  - Pellas X 70
  - Pellas X 100
  - Pellas X 120
  - Pellas X 150
- Pellas X Big group:
  - Pellas X 190
  - Pellas X 260
  - Pellas X 350

Table 3. Dimensions of burners.

Type of burner	Drawings of mounting holes	Dimensions	
Pellas X Mini group			
Pellas X Mini	**D - Ø155**	**A - 215**	
		B - 508	
		C - 125	
Pellas X Mini 35	**D - Ø173**	**A - 235**	
		B - 529	
		C - 140	
Pellas X group			
Pellas X 44	**D - Ø173**	**A - 250**	
		B - 619	
		C - Ø169	
Pellas X 70	**D - Ø173**	**A - 250**	
		B - 619	
		C - Ø169	
Pellas X 100	**D - Ø210**	**A - 285**	
		B - 654	
		C – Ø204	
Pellas X 120	**D - Ø210**	**A - 355**	
		B - 724	
		C – Ø204	
Pellas X 150	**D - Ø225**	**A - 355**	
		B - 724	
		C – Ø219	
Pellas X Big group			
Pellas X 190	**G - Ø260** **H - 268**	**A - 339**	**D - 327**
		B - 963	**E - 240**
		C - Ø250	**F - 297**
Pellas X 260	**G - Ø270** **H - 268**	**A - 356**	**D - 327**
		B - 1022	**E - 240**
		C - Ø260	**F - 297**
Pellas X 350	**G - Ø310** **H - 287**	**A - 356**	**D - 357**
		B - 1057	**E - 259**
		C - Ø300	**F - 316**

2.4. Safety systems of burner

Pellas X burner is equipped with following safety systems, which effectively protect the user against backburning. The main protections are:

1. **Burner temperature sensor**
   The sensor, once it detects temperature over 90^{O}C (setting: alarm temperatures may be modified depending on the conditions in which the device operates i.e. bakery ovens or dryers; please note that such changes can only be done by an authorized service person) goes from work mode into burning off mode, at the same time it switches off the external feeder and sets the fan for 100% power.
2. **Patented technology of burning in overpressure**
   Burning in overpressure is founded on physical phenomenon which takes place in inner feeder of burner
3. **Chimney for pouring fuel**
   In upper part of the burner there is a chimney for pouring fuel. It is equipped with a barring hatch with a counterweight. In case of backfire the hatch closes inlet and also prevents fire against reaching the fuel hopper.
4. **Flexible pouring pipe**
   Flexible pouring pipe is an elastic connection between external feeder and burner. Its main function is delivering fuel to burner, additionally it also protects against backfiring. Under influence of high temperature pipe starts to deform and extend which makes fuel delivering impossible.

2.5. Technical data of controller, description of functions and burner settings

See User's manual of controller.

3. Installation

3.1. Chimney

The parameters of chimney should be adjusted to requirements of heating device, of which fumes are led away to chimney. The chimney can be made of ceramics or steel. Chimney should be clean, and its draft sufficient for Pellas X burner operating with heating device in scope of preset power output. In case when chimney draft is not sufficient, it is possible to install a mechanical fumes exhaust. Before operation chimney should be checked and approved by a qualified chimney-sweeper.

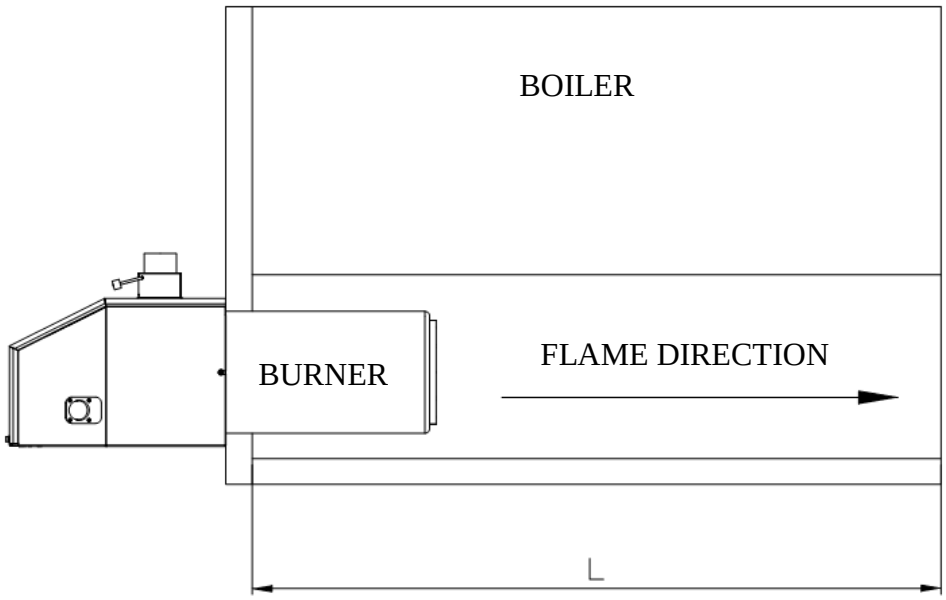
It should be remembered that a high chimney with big capacity of fumes needs more heat and temperature of inner part of it should not be lower than 80ºC, 1m below the top to avoid condensation on top of the chimney. To reduce the inner profile of the chimney, a steel pipe with proper diameter can be installed. All advice referring to chimney duct should be taken from a professional company. Strong wind, too high or too low chimney have influence on efficiency of burner and its settings. In such cases it is advised to install a stabilizer of chimney draft which will ventilate chimney and help in maintaining stable draft. If chimney is too small, then burner may not work correctly, in such case it is necessary to install a mechanical fumes exhaust.

Table 4. Minimum chimney draft.

TYPE OF BURNER	MINIMUM CHIMNEY DRAFT [Pa]
Pellas X Mini	15
Pellas X Mini 35	20
Pellas X 44	25
Pellas X 70	30
Pellas X 100	30
Pellas X 120	30
Pellas X 150	35
Pellas X 190	35
Pellas X 260	40
Pellas X 350	40

3.2. Boiler / oven

Pellas X burner can be installed in majority of boilers with efficiency of about 80%. The power of burner in relation to boiler power must be adjusted by installer. It is best to mount the burner in boiler's door, just above grate or in side wall if it is possible. The diameters of mounting holes of Pellas X burner are given in table 3. The length of pipe in boiler is regulated by installer with usage of a connector – mounting flange – similar as in oil boilers or directly into door of boiler with 4 M8 screws. Thanks to connector it is possible to regulate length of furnace pipe of burner in boiler. If boiler chamber is too small, burner may operate incorrectly.



Pic. 4. Positioning of burner and direction of flame

Table 5. Minimum dimensions of furnace chamber.

TYPE OF BURNER	MINIMUM DIMENSIONS OF FURNACE CHAMBER	
	MIN. DIMENSIONS OF FURNACE CHAMBER [m^3]	MIN. LENGTH OF FURNACE CHAMBER [mm]
Pellas X Mini	0,023	400
Pellas X Mini 35	0,030	520
Pellas X 44	0,038	520
Pellas X 70	0,070	790
Pellas X 100	0,099	790
Pellas X 120	0,109	995
Pellas X 150	0,119	995
Pellas X 190	0,160	1200
Pellas X 260	0,260	1200
Pellas X 350	0,313	1400

Table 6. Exemplary minimum dimensions of rectangular furnace chamber.

TYPE OF BURNER	EXEMPLARY MINIMUM DIMENSIONS OF RECTANGULAR FURNACE CHAMBER		
	WIDTH A [mm]	HEIGHT H [mm]	MIN LENGHT OF FURNACE CHAMBER L [mm]
Pellas X Mini	218	262	400
Pellas X Mini 35	218	262	520
Pellas X 44	273	327	520
Pellas X 70	273	327	790
Pellas X 100	324	388	790
Pellas X 120	324	388	995
Pellas X 150	324	388	995
Pellas X 190	324	388	1200
Pellas X 260	417	500	1200
Pellas X 350	417	500	1400

Table 7. Exemplary minimum dimensions of cylindrical furnace chamber.

TYPE OF BURNER	EXEMPLARY MINIMUM DIMENSIONS OF CYLINDRICAL FURNACE CHAMBER	
	MIN. DIAMETER OF CHAMBER [mm]	MIN LENGHT OF FURNACE CHAMBER [mm]
Pellas X Mini	270	400
Pellas X Mini 35	270	520
Pellas X 44	337	520
Pellas X 70	337	790
Pellas X 100	400	790
Pellas X 120	400	995
Pellas X 150	400	995
Pellas X 190	400	1200
Pellas X 260	515	1200
Pellas X 350	515	1400

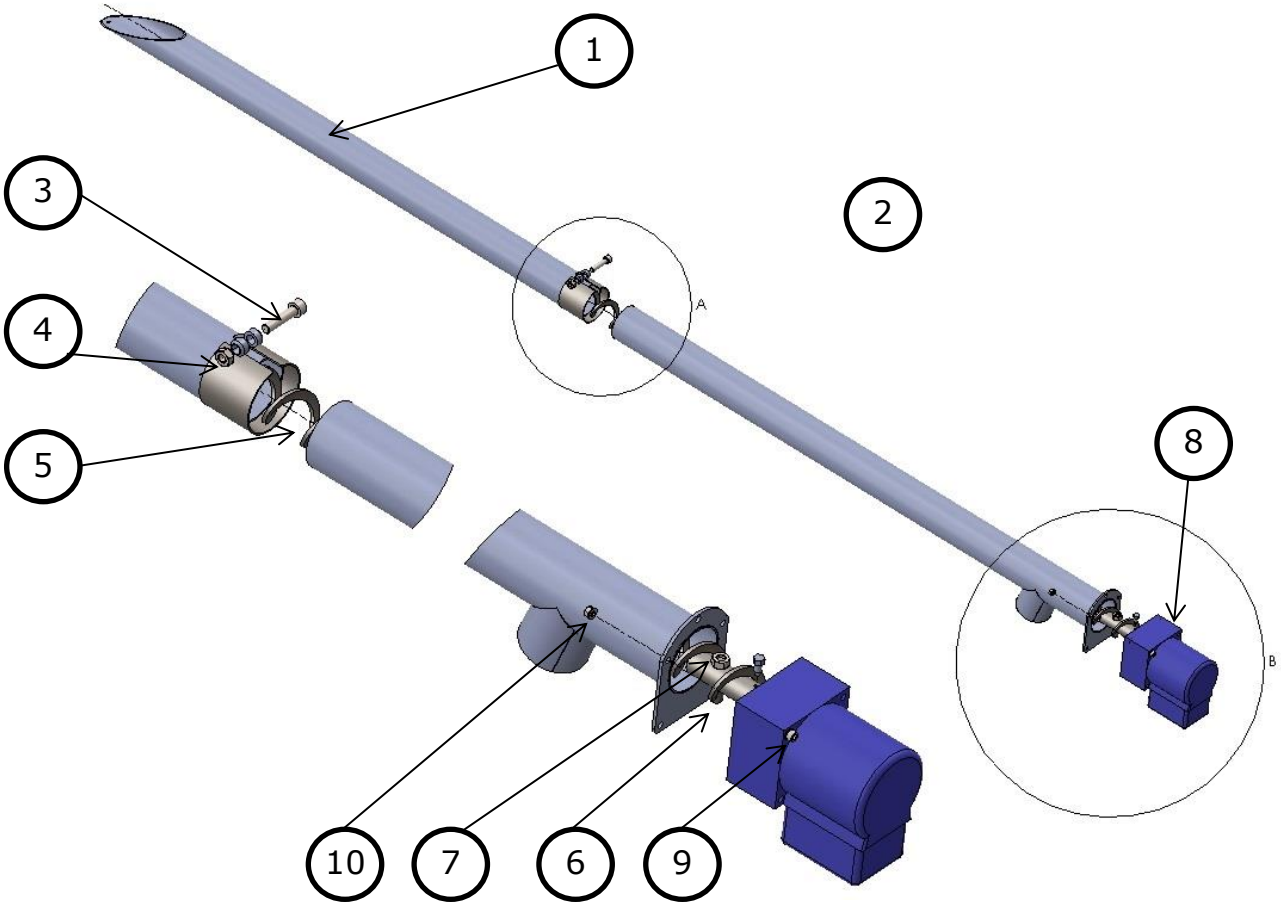
Table 8. Pressure in burning chamber.

TYPE OF BURNER	PRESSURE IN BURNING CHAMBER [Pa]
Pellas X Mini	10
Pellas X Mini 35	15
Pellas X 44	20
Pellas X 70	25
Pellas X 100	25
Pellas X 120	30
Pellas X 150	30
Pellas X 190	30
Pellas X 260	35
Pellas X 350	35

3.3. Fuel hopper

Fuel hopper can be made of any non-flammable material, i.e. steel. It can have any capacity and should be located in proper distance from burner. In lower part of fuel hopper a spiral feeder in covering pipe is mounted. The slope of feeder should not be bigger than 45^{o} in relation to the floor. Fuel hopper must be covered with a lid which would protect rotating screw of the feeder against damage by leftovers. It is forbidden to manipulate on the bottom of the hopper during operation of feeder. It is a threat to body injury – particularly to fingers. It must be remembered to refill the fuel hopper with pellets type fuel before activating the burner. Never pour the fuel hopper with damp or disintegrating fuel. It can cause difficulties in operation of burner – burner blockade.

3.4. Auger

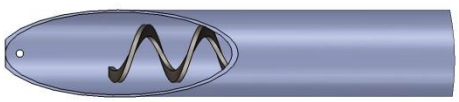


Pic.5. construction of feeder.

Fuel feeder connects fuel hopper with burner. It is made of steel pipes, galvanized or stainless steel with diameter 60mm or 76mm and 2m or 3m long (it is related to the size of burner). There is a steel spiral inside the pipe driven by electrical engine 230V AC with gearbox. Engine is connected by power cord to appropriate socket located on burner's controller. Lower part of feeder is mounted in lower part of fuel hopper, and the upper part is connected with burner via polyurethane pipe.

Feeder assembly:

1. Connect both pipes (1) and (2) with screw M8 (3) and nuts M8 (4);
2. Screw the spiral (5) on pin (6) and screw it with a nut (7);
3. Insert spiral into pipe and by using screws (9) and nuts (10) screw the gearbox (8) with flange of pipe



Pic.6. Position of auger at the front of the feeder

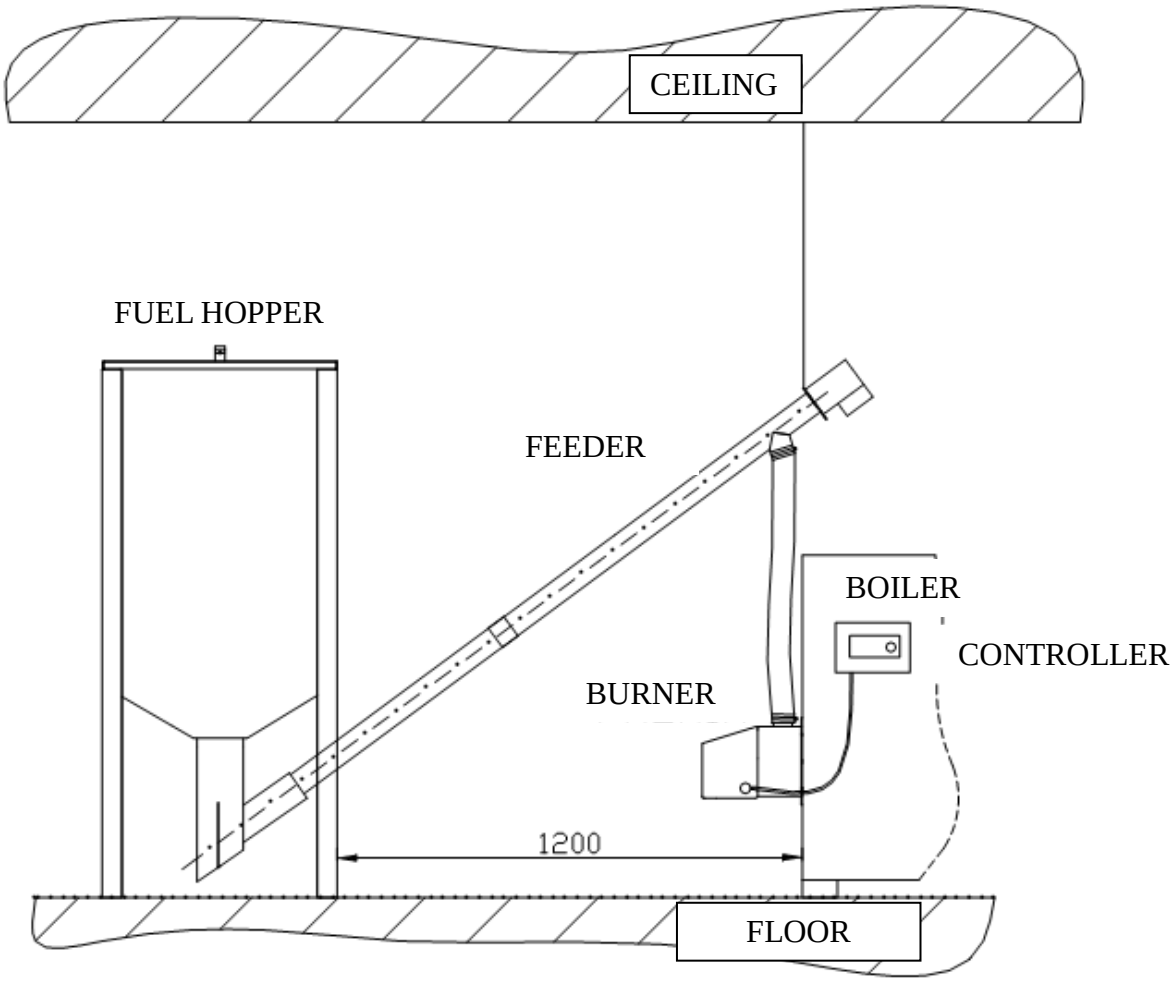
Fuel dosing is done automatically. Feeder operation is cyclic and is operated by outer controller. Feeder should be positioned at maximum 45^{o} angle in relation to the floor. Flexible, antistatic polyurethane pipe must not be directed vertically above the pouring chimney of burner, but at least 30 cm away from it. In case of pipe overheating (back burning) or its melting, pellet fuel will not be falling onto burner. Lack of fuel supply will cause burning off. It prevents against spreading fire on fuel hopper and on the rest of boiler room.

3.5. STB protection

In case when oven or boiler does not have its own STB protection, a thermostat with a capillary on clips is added to the set. Capillary sensor should be permanently mounted in water coat of the boiler. After reaching critical (95^{o}C) temperature of boiler, fuel feeder is cut off. In case of restarting the burner the switcher on housing should be reset, before that the cause of switching off due to boiler overheating should be checked, assessed and right steps to solve the cause of the problem should be taken.

3.6. Boiler temperature sensor

Burner is provided together with boiler temperature sensor. Its task is to control firing up and burning off process in burner. ***It does not refer to burner version destined for bakery ovens.***



Pic. 7. Scheme of installation in boiler room

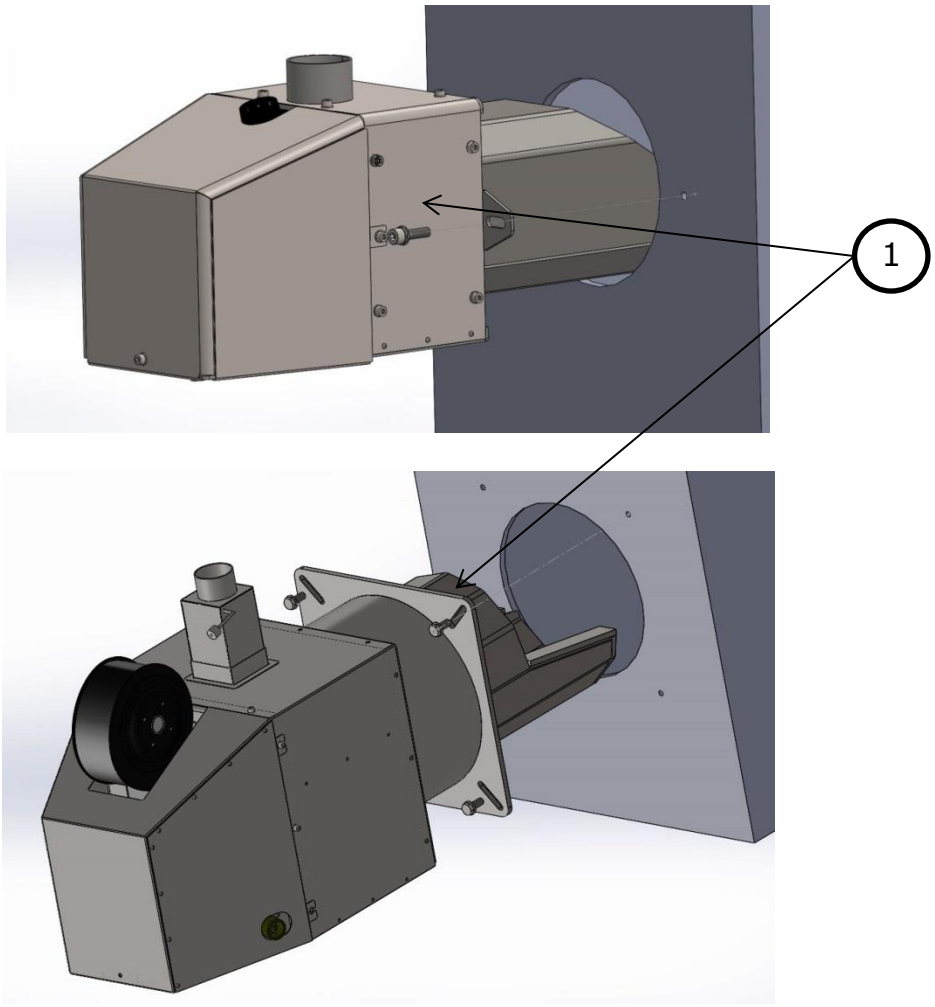
Burner and feeder are delivered in ready-made state, good for installing. They are packed in cardboard boxes, which are to be unpacked with care.

1. Burner installation in boiler

ATTENTION! Before starting dismantling or disassembly entire power supply must be disconnected.

In order to carry a proper assembly, burner must be thermally sealed from boiler's door.

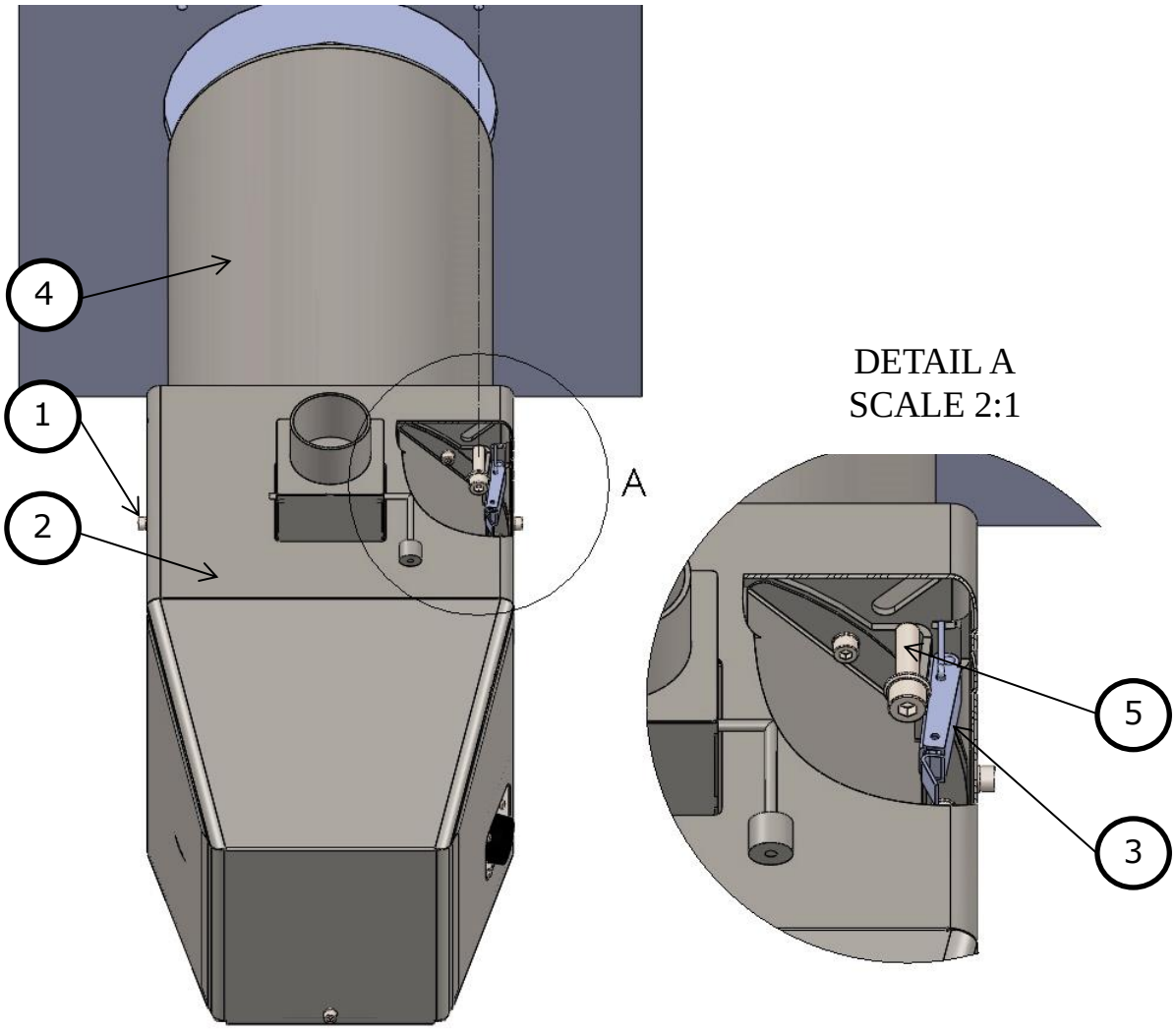
Place furnace pipe of burner in mounting hole of boiler and attach it with M8 screws (1) for X.mini burners, or M10 screws for Big version.



Pic. 8. Installation of Pellas X Mini and Pellas X Big burners in boiler's door.

Scheme of assembly of Pellas X burner in a boiler:

- Unscrew M5 screws (1) and remove the cover (2);
- Undo 4 buckles (3) and remove burner from covering pipe (4)
- Roll-on the isolating rope on covering pipe (4):
- Assembly the covering pipe in boiler's hole and screw it with 4 M8 screws (5);
- Insert the burner again into covering pipe and clasp 4 buckles (3);
- Assembly the burner cover (2) and screw the screws (1).



Pic. 9. Installation of Pellas X burner in boiler door.

ATTENTION! When assembling burner in boiler which does not have outer thermo-isolation in place of mounting, isolation pad should be used to protect burner against influence of boiler temperature.

2. **Assembling the chimney for pouring fuel**
   In top part of Pellas X burner, insert the chimney in vertical position and press it until it properly fits in the socket.
3. **Assembling the feeder Pic. 5**

- Attach with joint flexible pouring pipe, long enough to connect with upper part of the feeder, no less however than 30cm from vertical pouring axis of burner. Second part of flexible pipe insert onto vertical pipe of chimney for pouring fuel of burner and tighten it with a band.
- **Insert lower part of feeder pipe in fuel hopper, remember that hole for sucking granulate must be directed upwards.**

ATTENTION! Feeder should be positioned at angle no bigger than 45° in relation to the floor.

- Fill the hopper with fuel. Approval for fuel should be made available by the seller. Specification of fuels is shown in Table 1.
- Join feeder with burner by electrical wire providing power to feeder and stick plug into proper socket on the controller. Remember about zeroing wiring for cover of burner, it can not be damaged and must be tightly screwed to the cover.
- In case when oven or boiler does not have its own STB protection, a capillary thermostat with fastener should be added to the set. A capillary sensor should be installed permanently in water coat of boiler, together with temperature sensor of boiler.

4. **Connecting the controller**

   Attach the cover of controller by screws on isolated wall of the boiler or on the wall of the boiler-room. The wire of a multicoupler should be attached to proper socket on the right side of burner.

5. Additional connections

Additional connections of burner are described in user’s manual of controller.

6. Exploitation and safety regulations

6.1. Exploitation

ATTENTION! Pellas X burners can only be handled by adults. It is mandatory to be acquainted with user's manual before servicing the burner.

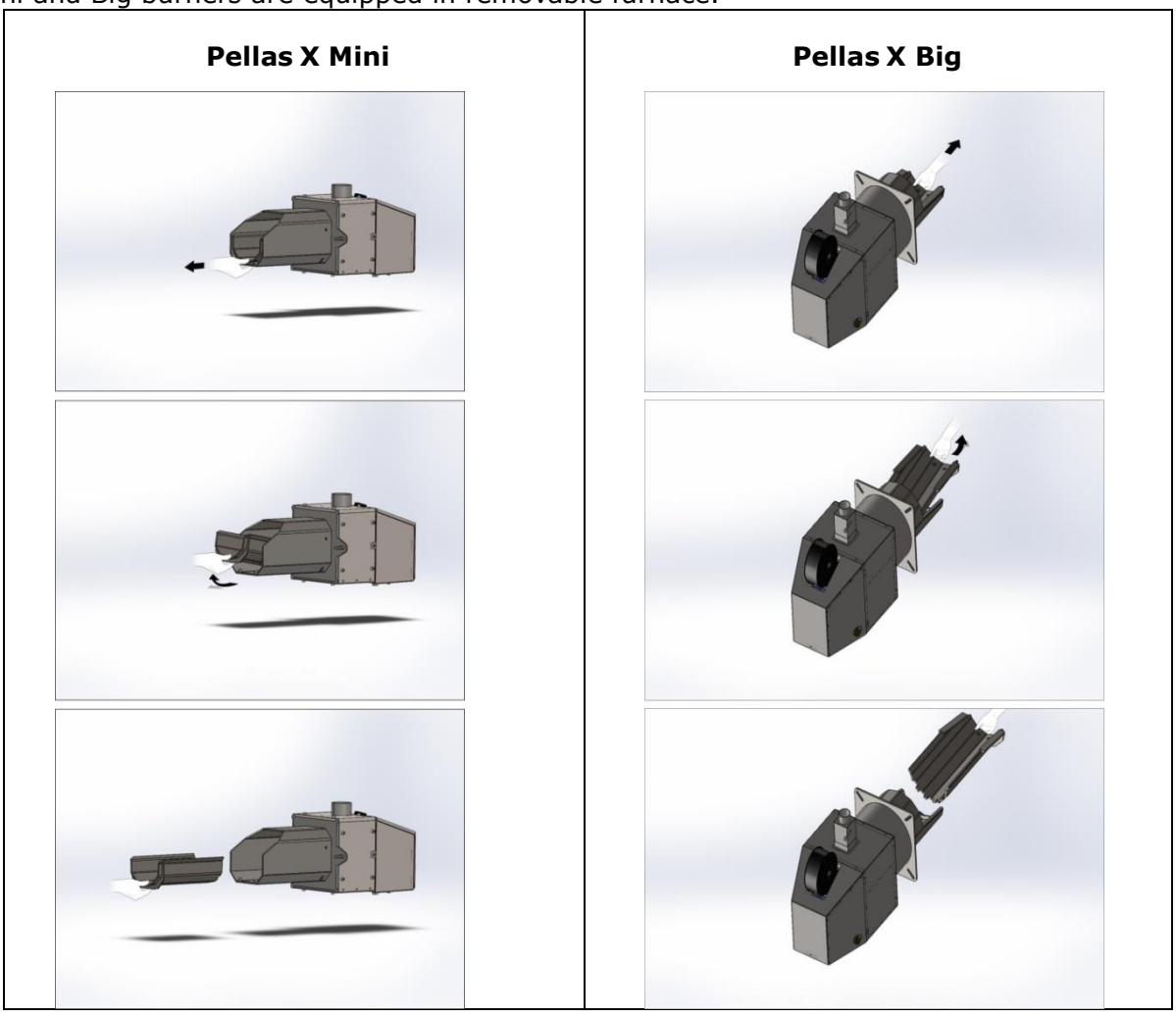
Before starting up burner's operation all connections and joints with feeder should be checked. Mounting screws, which join burner with boiler should be checked, as well as thermal seals between burner and boiler.

Burner is started up according to user's manual after connection to electricity by power cord with zeroed plug. In order to ensure correct operation of burner, depending on quality of fuel, the inside of burner should be cleaned from fouling and slag.

Depending on a group of burners, there are 2 ways of conducting the maintenance of furnace plate:

a) Maintenance of furnace plate in burners Pellas X Mini and Pellas X Big:

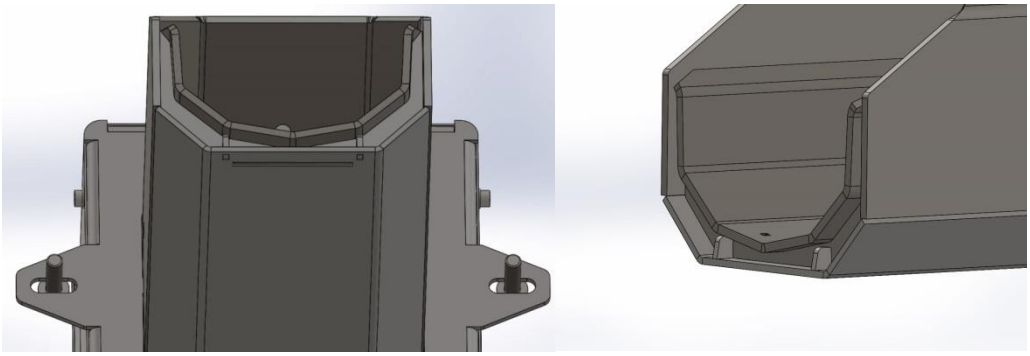
Mini and Big burners are equipped in removable furnace.



Pic.10. How to remove furnace in Pellas X burners?

After cleaning the furnace, it should be properly put again in burner. The lock in furnace

must be precisely put in the nest of burner. It is shown on the picture below.



Pic. 11. Correct positioning of furnace.

ATTENTION! After burning off, furnace can still be hot. That is why you should always use tools, i.e. pliers for removing it

b) Maintenance of furnace plate in Pellas X burner

Pellas X group of burners is equipped in furnace pipe which is installed in covering pipe. In order to get to furnace, operation **1** and **2** should be repeated from the scheme of installation of Pellas X burner in boiler's door (see page 23).

ATTENTION! Maintenance of burner must always be conducted on cold burner.

After termination of warranty period, and afterwards once a year, the technical condition of burner should be checked by a professional service person.

ATTENTION! External covering pipe should be periodically (depending on amount of ash in fuel), ideally once a month, disconnected from a burner's body in order to remove ash.

Remember about cleaning nozzles inside the furnace pipe and removable furnace. Before switching off the burner power, the burning-off process should be conducted.

6.2. Safety regulations referring to installation and exploitation of burner.

Before starting installation and exploitation of burner, the chimney shaft and boiler to which burner will be connected should be thoroughly cleaned. Check if there is enough liquid in heating installation, and if pouring device works correctly.

- **Burner can only be handled by adults who are acquainted with user's manual.**
- **Children can not be allowed to be close to the burner**
- **It is forbidden to put a hand inside the feeder pipe and burner pouring pipe, this is a risk of an injury and disability.**
- **It is forbidden to open boiler's door during operation of burner**
- Burner is designed for burning dry biomass, i.e. "pellets" in boilers operating in an open system of central heating.
- Obligatorily burner must be electrically zeroed and connected to a socket with zeroeing pin 230V AC.
- Electrical installation must be done accordingly to current safety rules and regulations. Electrical installation powering a burner must be done in TN-S system and protected by a RCD – residual current device 6A/30mA. For making an installation a professional electrician must be responsible.
- **Installation of a burner must be executed by an authorized installer trained by P.H.U. ISOL S.C. (The Producer) and the Acceptance Report should be written – which is included in User's Manual.**
- Any sort of works and reparations of a burner or a feeder must be done with disconnected powering cable from electricity.
- The room in which a burner works must be well and constantly aired.
- Exploitation can not be done in inproper environmental conditions, i.e. too high temperature, above 45ºC, in presence of aggressive compounds, dirt, bad ventilation, etc.
- Following items must be connected to the boiler: capillary safety sensor STB and boiler temperature sensor outgoing from a burner.

Failure in observing by the user – owner of a burner the above SAFETY REGULATIONS releases The Producer – P.H.U. ISOL S.C. from any responsibility for improper work of a burner and results in loss of the warranty.

If the user executes the installation of a burner not in accordance with instructions and recommendations of the producer or when he does not have the „collection report" written during first firing-up of a boiler by authorised installer and confirmed with the signature of the user, then he or she looses the right to warranty for burner faults. Also the guarantee is lost then.

6.3. Guarantee

Details in the GUARANTEE CARD attached to the User's Manual.

7. Service of devices

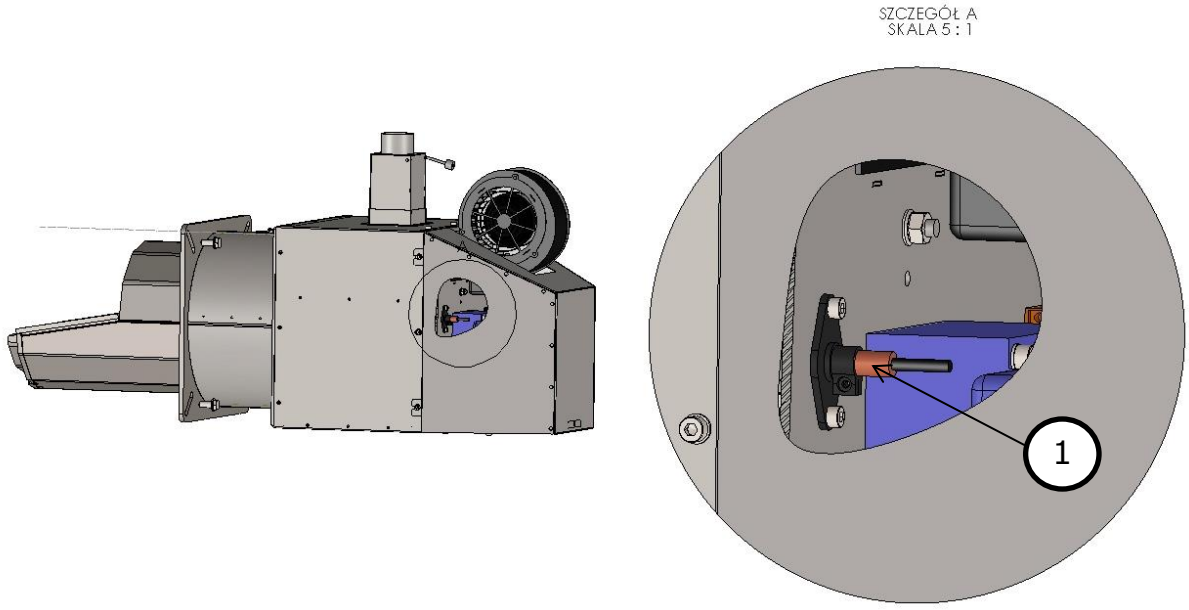
ATTENTION! Servicing of devices can only be executed by switched off electrical powering of a burner and a boiler.

7.1. Photosensor

Photosensors in a burner should be cleaned from time to time with a damp, soft rug, similarly to oil or gas burners. After removing the cover of a burner, the photosensor should be removed from the socket (1), then it should be cleaned and installed again. After executing the above activities, the cover of a burner should be mounted.

Frequency of cleaning the photosensor:

- Bakery – every month
- Boiler rooms – every 3 months



Pic. 12. Position of photosensor in Pellas X burner.

7.2. Electrical igniter replacement

If an igniter, despite the message „firing-up" does not heat-up, then most probably it is damaged. In order to replace the igniter, the cover of a burner should be removed. On the right side of the fan, there is a steel covering of igniter, in which there is an electrical heater. It should be disconnected from the electricity by removing clasps on wires, and then twist it and remove.
In reverse order a new igniter and cover of a burner should be installed.

7.3. Feeder pipe cleaning

If a cord from a fuel bag or other object gets inside the feeder pipe, which would block the work of a feeder, then feeder motor will get overheated, burn the fuse or it will be switched off by the thermical sensor which is inside the motor.
In order to remove an object from the feeder pipe, the powering wire should be removed from the socket inside the controller, unscrew the screws mounting the gear motor to feeder pipe, remove the spring from the pipe and remove the object which was the cause of breakdown. Then the feeder should be assembled.

7.4. Burner cleaning

One of the reasons of lack of firing-up of a burner is a slag filling in the burner chamber. The igniter will not ignite the fire when there is a slag in its way. Slag does not burn itself. As we are unsure as to the quality of fuel, that is why initially everyday, later every now and then we clean furnace pipe of a burner from slag and ash. After removing a burner, the remnants of slag and ash should be cleaned with a wire-brush or a small poker. Common cause of accumulating a slag is switching off a burner with the main switch. Too abrupt removal of air-flow (oxygene) to the furnace causes unburning of fuel remnants. By another firing up of a burner, without cleaning it from slag and ash, a smoke can come out from a burner as the openings in it are blocked with slag. Burner is not aired enough.

IMPORTANT: Before switching off the power of a burner, burning off proces should be conducted.

ATTENTION! Outer covering pipe in Pellas X burners group should be periodically (depending on amount of ash in fuel) – ideally once a month – unscrew from burner body in order to remove ash between pipes.

In case of serious breakdowns an installer should be contacted.

8. Reasons of improper work

1. Burner does not fire up
   Reasons:

- No fuel – check the fuel hopper and the feeder, if it is not blocked;
- Too small start up dose – check the start up dose;
- Burnt igniter – check the igniter

2. Burner fires up but does not go into the first power
   Reasons:

- Improper start-up dose – check the start-up dose
- Dirty or faulty photosensor – clean it or replace it
- Damaged outer thermostat in oil boilers or bakery ovens

3. Photosensor checking
   See page 31.
   Measuring readings:

- In darkness 0-5 units
- In full light 100 units

4. Overheating of inner feeder.
   Reasons:

- Burner dirty with slag
- Weak chimney draft – chimney exhaust fan should be used

5. Damage of the feeder sensor– alarm can not be cancelled
   Reasons:
   The most common reason of this breakdown is damage of thermo protection of a sensor, which results in overheating of measuring part. Despite burner cooling off, the fault can not be cancelled, in this case the measuring sensor should be replaced. In order to verify if the sensor is faulty indeed, its resistance should be checked, it should be between 1-5 Ω. The resistance of a damaged sensor is about 100 kΩ.

6. Feeder filling
   The inner feeder is so designed to mix and feed fuel evenly. The reason of filling the inner feeder can be:

- Bad setting of the inner feeder in relation to outer feeder – increase capacity of inner feeder (service menu / burner feeder)
- Gearmotor damage – replace the gearmotor
- Badly adjusted interval of feeder work – this value should not exceed 20s. (service menu / burner interval)

7. Blower damage
   Reasons:

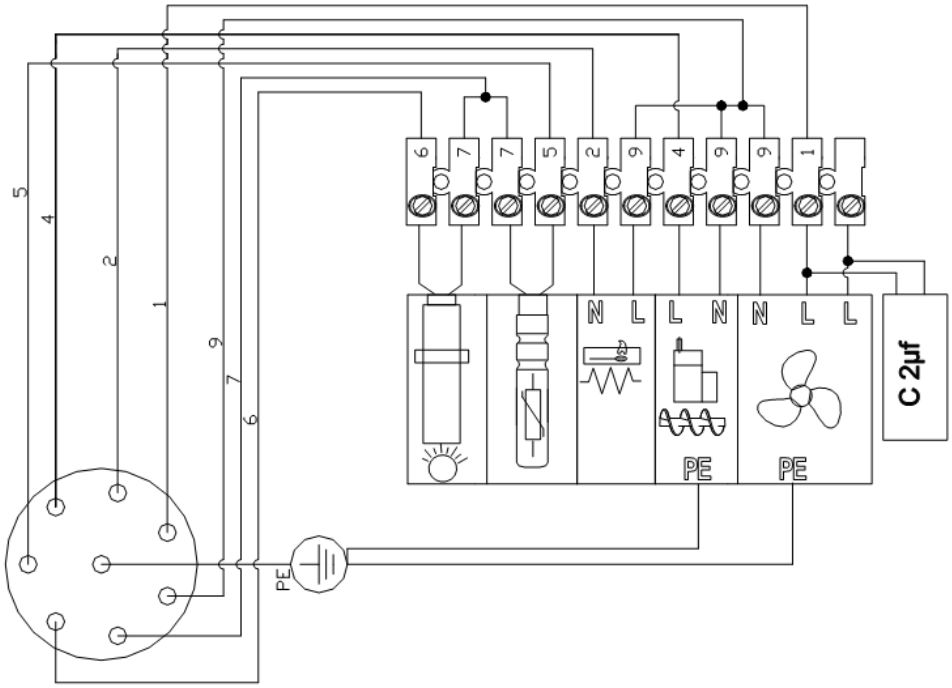
- Blockade of blower blades – unscrew the blower cover and check if they are not blocked mechanically
- Check the voltage on blower wires
- Check the capacitor of blower motor

9. Electrical schemes

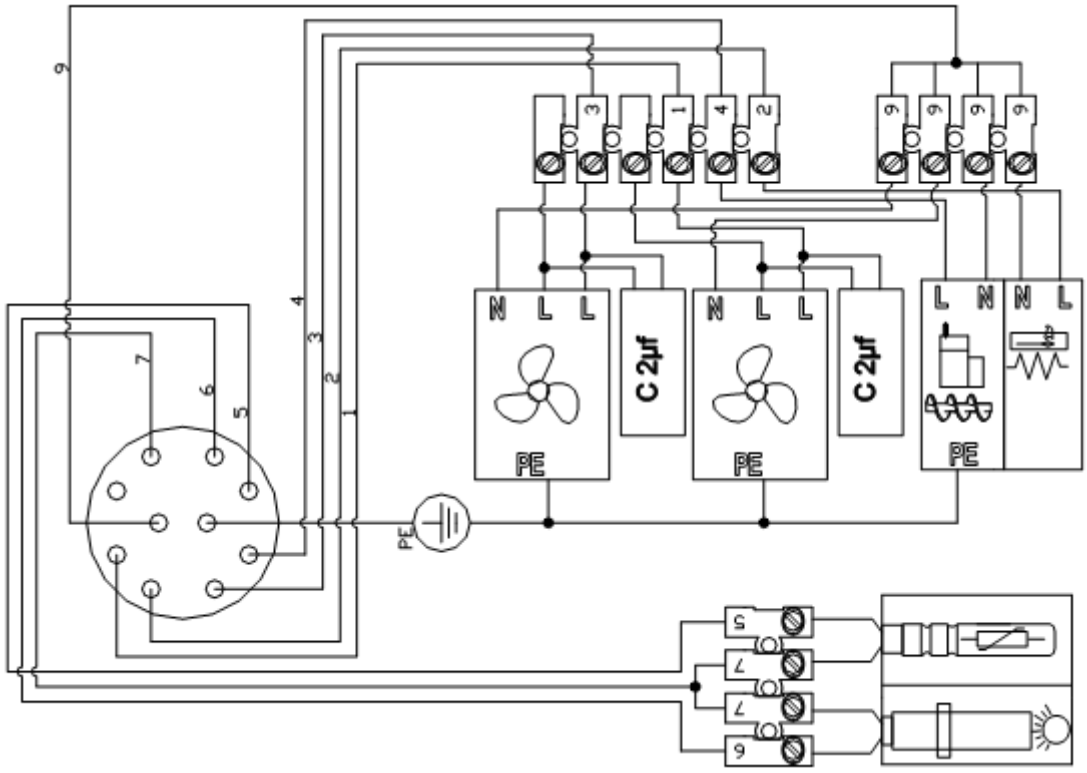
Electrical scheme of the Pellas X R.Control

See controller's user's manual

Electrical scheme of the Pellas X burner



Pic. 13. Electrical schemes of Pellas X Mini and Pellas X burners.



Pic. 14. Electrical scheme of Pellas X Big burner.

10. Acceptance report

Sheet no: 002

	ACCEPTANCE REPORT AFTER INSTALLATION OF BURNER	**Number:** **Date:**

INVESTOR	
Customer's data:	Place of servicing:

TECHNICAL DATA OF DEVICE		
Name	Type of device	Serial number

Diagnostics									
Settings						**Burning - up**		**Service**	
Power 1		**Power 2**		**Power 3**					
Feeder work (seconds)	**Fan revolutions**	**Feeder work (seconds)**	**Fan revolutions**	**Feeder work (seconds)**	**Fan revolutions**	**Start-up dose**	**Burning-up time in min.**	**Inner feeder work (%)**	**Operation in thermostat mode***
									☐ YES ☐ NO
Pause		**Fumes analysis**				**Lambda Sensor (O_2)**	**Feeder efficiency kg/h**	**Nozzles permeability***	**Boiler room ventilation***
Feeding time	**Pause time**	**CO (ppm)**	**O_2 (%)**	**Chimney draft (hPa)**	**Fumes temperature**				
								☐ Permeable ☐ Non-permeable	☐ Bad ☐ Average ☐ Good
Notes after installation									

.....
Signature and stamp of Service person

I declare that condition of the device and quality of provided service is known to me, and that I do not have any reservations	..... **Customer's signature**

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12. Notes

PELLASX Sp. z o.o. Sp. k.
ul. Szybowników 39/10, 64-920 Piła, Poland
tel. +48 67 214-71-32, fax +48 67 252-27-69
biuro@pellasx.pl, www.pellasx.pl