

# PELLETS BURNER 15-60kW – „MOC”



**Please read those documentation before first start up the unit.  
Improper burner start may lead to its damage and may create a danger for end user !**

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### **1. Admission.**

Thank you for the trust You have given the company. for purchasing our burner and we hope that it will be a long and safe to serve You as a cheap and reliable source of heat. Range of burners “MOC” is recommended for users looking for automated solutions in the combustion of biomass - pellet.

### **2. Purpose burners „MOC”**

“MOC” burners 15-60kW burning wood granules (pellets) are the optimal devices designed for use with solid fuel boilers with outputs ranging from 15 to 60 kW. “MOC” burners are designed so that its use during operation and maintenance costs were relatively low. With a horizontal furnace burner can be mounted in many boilers for solid fuel without major modifications to these devices. With the pellet’s burner using comfort we get closer to the oil boilers.



**All work on the boiler equipment, the mounting position of the burner and its operation must be performed in accordance with applicable standards and regulations !**

#### **Required fuel:**

Wood pellet 6-8mm cross section , length 5-30mm, ash content max. 2%.

The maximum moisture content of pellets should not exceed more then 10%.

The calorific value of the pellets should be greater than 17,5 MJ/kg.

Pellets made in accordance with Standard:

- ÖNORM (M7135) or DIN-Norm (DIN-Norm 51 731).
- Cross section: 6-8 mm, length: 5–30 mm
- Max. Ash content 2%
- Calorific value > 17,5 MJ/kg



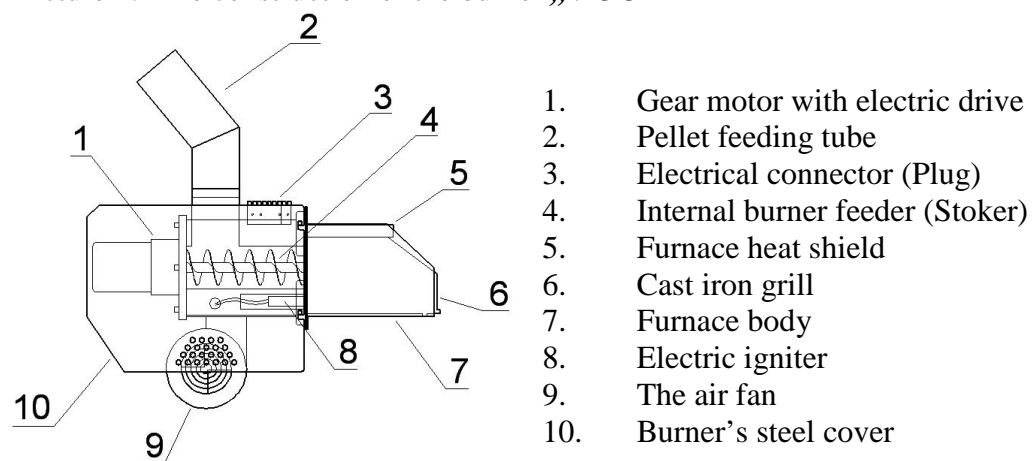
### **3. Design and technical specification.**

The construction enables the exchange of components that are subject to rapid wear without having to replace the entire burner, which significantly reduces equipment maintenance costs. The burner has an automatic ignition system of fuel and flame control.

Fuel is delivered by the feeding screw, which is combined with the flexible wire burner. Additional feeder (called “Stoker”) inside the burner provide the correct dosage of fuel into the combustion chamber and protects the flash fire back into the pellets storage.

The burner in the boiler (depending on its design) is achieved efficiencies of up to 92%.

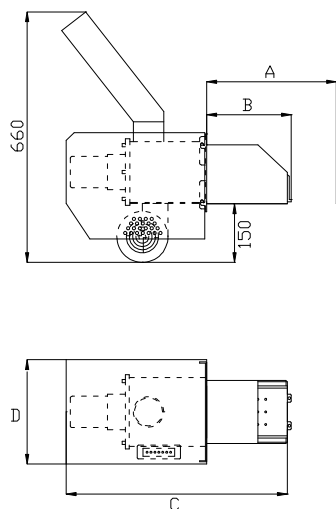
Picture 1. The construction of the burner „MOC”



- 1. Gear motor with electric drive
- 2. Pellet feeding tube
- 3. Electrical connector (Plug)
- 4. Internal burner feeder (Stoker)
- 5. Furnace heat shield
- 6. Cast iron grill
- 7. Furnace body
- 8. Electric igniter
- 9. The air fan
- 10. Burner's steel cover

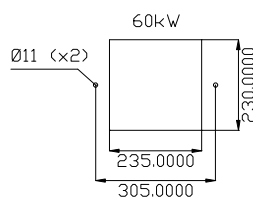
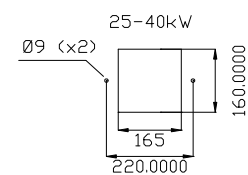
Picture 2. Burner's dimensions:

Burner:



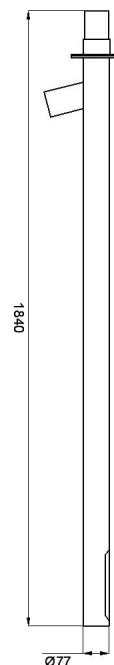
Burner's mounting holes:

OTWORY MONTAZOWE PALNIKÓW



	A	B	C	D
25kW	400	220	580	270
40kW	440	260	620	270
60kW	490	310	650	350

Feeding Screw (feeder):



Technical specification:

12/03/12

	Unit:	Type:		
		MOC 20	MOC 40	MOC 60
Nominal power output (> 17,5 MJ/kg)	kW	25	40	60
Power modulation range (min.-max.)	kW	8-25	15-40	20-60
Recomended chimney's under pressure	Pa	10-20		
Min. diameter of the chimney	mm	140	160	180
Min. height of the chimney	m	8	8	8
Burner's efficiency	%	> 92 %		
The stream of fuel for maximum power	kg/h	5,59	8,94	13,42
The stream of fuel for minimum power	kg/h	1,69	3,35	4,47
Fuel		Pellet 6-8 mm		
Power consumption	kW	0,442		
Weight	kg	--	--	--

**Delivery** – Burner and controller are delivered in one box (nr1) and feeding screw is in separate box (nr 2)



Picture 3 – Transportation package.

#### **4. Safety.**

##### **Safety Tips:**

1. Starting the burner and its operation can be effected only by adults after having regard to the technical and user documentation.
2. Near the operating unit should not accommodate children without adult supervision
3. Before starting it is necessary to validate the burner to the boiler installation against electrical and mechanical.
4. To ignite the fuel does not use solvents, gasoline, etc.
5. During the fire the fuel is not allowed to look inside the chamber because it may explode.
6. The ash must be removed for non-combustible container with a tight lid.



7. Do not store near combustible materials boiler.
8. The device is powered by electricity 230V/50Hz. Improper repair or improper installation can cause danger to life by electric shock.
9. Do not block ventilation openings or close the supply and exhaust boiler room.
10. Regularly clean the boiler, burner and the exhaust.

Failure to follow these guidelines risk damage to health or life threatening.

#### Safe distance from flammable materials.



- during installation and use of the burner must be kept 200 mm distance from the mid-combustible materials.
- during installation and use of the burner must be kept 400 mm distance from flammable materials, especially C3 (paper, wood, plastic, etc.;
- if the flammability of materials is very large distances must be doubled.

Table:

Flammability class:	Materials
A – Non-flammable	Sandstone, concrete, bricks, plaster made of non-combustible material, ceramic tiles, granite
B – Slow-burning	The surface of cement-wood, fiberglass
C <sub>1</sub> – hard-burning	Beech, oak wood, plywood
C <sub>2</sub> – medium-burning	Pine, larch wood, spruce wood, cork, rubber base
C <sub>3</sub> – easy-burning	asphalt, celluloid, polyurethane, polystyrene, plastic, PVC

### **5. Burner's installation and requirements.**

#### Tips for Installer:

During the installation of the burner as well as its use must comply with applicable rules:

- supply and exhaust ventilation, boiler room,
- flue gas canals
- technical equipment and water heating systems security.
- technical conditions of boiler rooms .

#### Location and mounting requirements

“MOC” burner is designed for installation in solid fuel boilers or oil boilers installed in rooms that meet the conditions of the boiler room built for solid fuel.

- The room where the burner is to be installed must be dry, free from the vapors of flammable and corrosive substances.
- In the surroundings of the burner temperature should not exceed 50 ° C and should not be less than 0 ° C.
- The air humidity should be in the range from 10% to 80% without condensation.

Installation of the burner should be preceded by checking the possibilities of adapting the boiler to the burner and the fulfillment of the requirements:

- Location of the burner assembly must take into account conduct maintenance and service. It should provide about 50 cm. free space around the burner.

- Boiler, to which the burner is mounted should have sufficient size combustion chamber allowing the free distribution of flame from the burner.
- Minimum distance of the burner from the rear wall of the combustion chamber are given in Fig dimensions as dimension "A". On the sides of the burner must be provided at intervals of at least 5 cm., And the burner 15-20cm. The distances from the burner boiler walls can vary in the boilers of various designs
- Feeder should be mounted external to the tank at an angle of about 45% relative to the ground.
- Feeder hose connecting an external burner should provide the gravitational fall of fuel to the burner.

#### Installation of the burner:

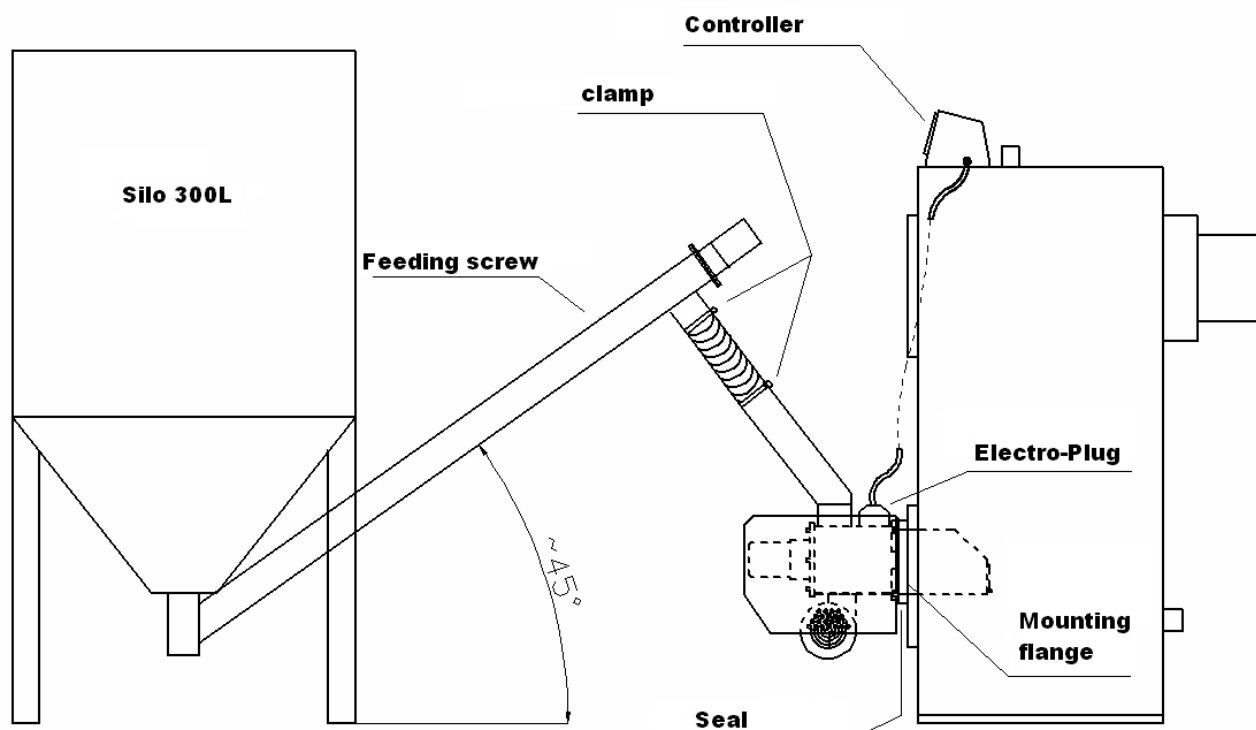
1. Follow the burner mounting hole in existing door or additional mounting plate. Opening dimensions in Picture 2 - dimensions of the burner.
2. Seal the space between the burner and door gasket with non-combustible material (high-temperature insulating boards, mineral fiber gaskets, etc.).
3. Remove the burner housing (cover).
4. Mount the burner on the door. Tighten it with screws. Bolt holes are located on the sides of the mounting flange of the burner.
5. Connect the burner to the controller and mount the temperature sensor of the measuring tube boiler in the boiler.

Attach the main feeder outside the fuel tank and connect it to the controller.

Note the notch on the part of the feeding tube which is mounted in the tank and set it so that pellets fell into this hole.

Install flexible tube connecting the burner with a feeder outside and secure it with straps.

Picture nr 4 - connection



Electrical connection:

Electrical connections should be made by the person with the appropriate permissions. Output power external devices are located on the controller housing (see the driver) and must be connected as indicated. Wiring diagram is also in the manual controller.

- Power supply: 230 V/50Hz.
- Outputs for external devices : 230V

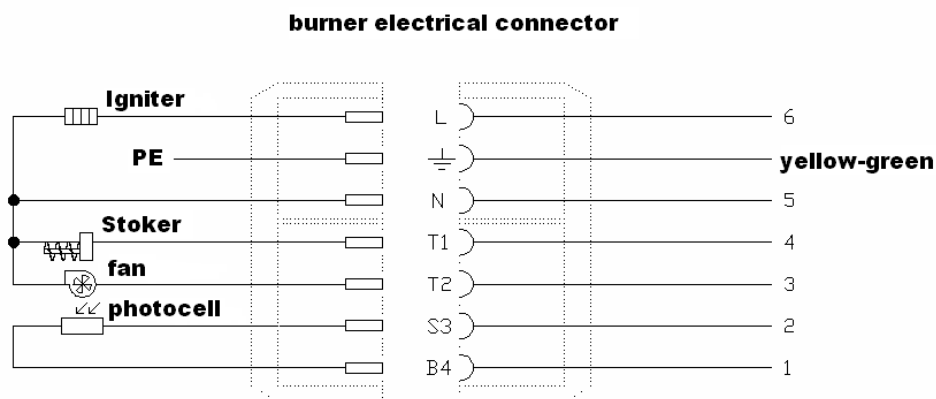


**Caution:**

The device must be connected to the supply line run separately secured properly selected circuit breaker or fuse over-current and residual current circuit breaker. For this line, do not connect any other electrical appliances!

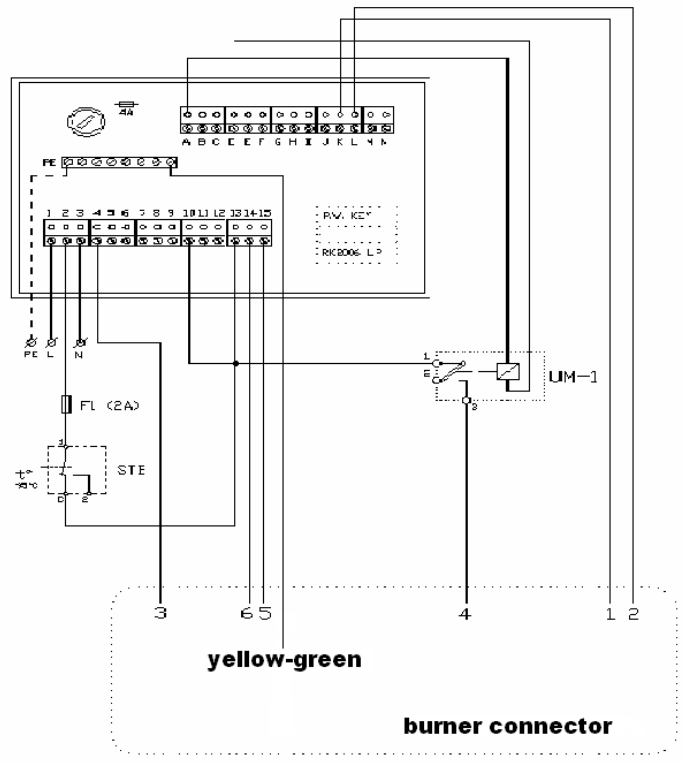
- Power burner must be connected via an additional switch of the boiler temperature, for example STB, which in case of damage control will turn off the burner and will not allow the temperature of the boiler.
- Electrical cables must be the entire length of exactly fixed and can not touch the “water coat” of the boiler, flue pipe and other hot items.
- Any repairs or installation can be performed only when a voltage is disconnected.

Picture 5 - WIRING DIAGRAMS:

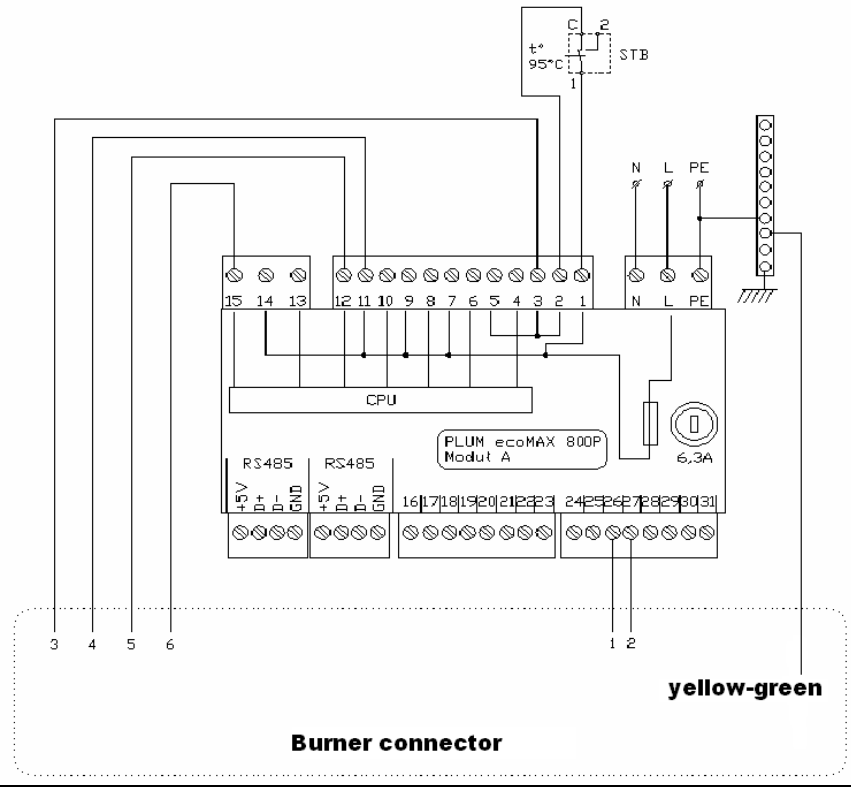


L	<b>Igniter</b>
$\perp$	<b>protective cable</b>
N	<b>Neutral</b>
T1	<b>Stoker</b>
T2	<b>Fan</b>
S3	<b>Photocell.</b>
B4	<b>Photocell.</b>
1,2... - <b>The numbering of the core conductors</b>	

**Installation schema : burner-controller RK 2006LP**



**Electric schema : Burner - controller Plum Ecomax 800P**

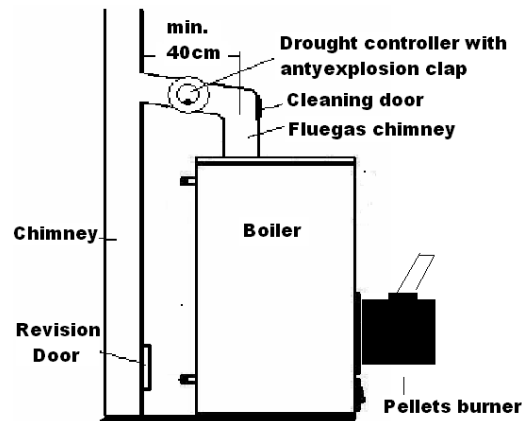


Electrical wiring diagrams of other external devices are in manual book of each controller..



## Connecting the boiler to the chimney and boiler room ventilation.

Picture 6- Chminey connection:



Chimney should be made in accordance with applicable regulations. The under pressure in the chimney should be maintained at the level recommended in the table. The manufacturer recommends the use of chimney systems resistant to penetration of condensate. The chimney should be made of acid-resistant materials and be warmed throughout. Allowed brick chimneys provided a good thermal insulation of the chimney.

Section of the flue from the boiler to the chimney flue should have called a slight raising in the direction of the chimney. To reduce the flow resistance of the exhaust section should be run in a straight line and the possible change of direction made with gentle curves (elbows). At the bottom of the stack of about 30 cm from the floor should be cleaning hole.



**The manufacturer also requires the drought pressure regulator assembly and the damper on the chimney anti explosion .**



## **Ventilation of the boiler's room**

Under the legislation law of each boiler must have a built-in supply ventilation of air to ensure proper boiler operation and safety of users. No ventilation supply air or obstruction is the most common cause of abnormal operation of the boiler (smoking, retting of the boiler, the impossibility of obtaining a higher temperature). LEV is the task of waste discharges from the room air and harmful gases. In the boiler room with the natural drought chimney can not be used mechanical ventilation.

### **Supply air ventilation.**

Ventilation of the channel should have a size of 50% cross-sectional area of the chimney, not less than 20 x 20 cm. Its outlet should be located 1 m above the floor. The air-supply opening or duct shall be a device for adjusting the air flow, but such is not allowed to reduce the cross section more than 1/5. The flue should be made of noncombustible material.

### **LEV – outlet ventilation.**

Channel should be brick with min 25% of the cross section of the chimney not less than 14 x 14 cm. Inlets can not have any cross section of the closing device. The outlet should be near the ceiling space, led to the roof of at least 1.5 m flue should be made of noncombustible material.

## **6. Operation**

### **Start-up burner.**

Preparation for start-up should include a general overview of the technical condition of the boiler room and installation involving, among others: check the boiler equipment and installation, check the tightness of exhaust ducts, control, circulation pumps, etc..

1. Fill the fuel into the hopper (silo)
2. Attach the feeder to fill it to full with pellets (manual mode in controller).
3. Connect the unit to the mains (plug socket), and turn on the manual work of the feeder.
4. Set working times of the feeder at boot up and during burner operation, the power fan and the other parameters of the burner.
5. Set the desired temperature on the controller.
6. The unit will start automatically when you enable the START



Boilers require supervision every 8 hours, which includes checking the fuel level and the flame of the burner and boiler water.



Adjust the burner can be performed only by qualified personnel or persons with the necessary knowledge and experience.

When you first start up or as well change quality of the fuel, adjust the time of the fuel feed mode (power min. and max.). And the firing mode and adjust the air.

Regulators have their factory settings but because of the varying quality of the pellet and the draft should adjust them.

**Starting dose.**

For a normal ignition is needed about 0,20-0,3 L pellets. Time must be chosen so the feeder at the start that the amount of pellet was appropriate.

**Firing time.**

This is the time after which the controller if you do not see the flame on the burner complete the process of firing, ie, off lighter. Please set it as short as possible because it increases the life of the heater. As a rule, is 6-10 min.

**Number of attempts to ignite.**

Number of attempts to ignite after which it will not ignite if the driver will go into alarm. Standard setting 2 sample. Do not set more because too much fuel to the burner may cause interference to the device.

**Photocell.**

The task of the photocell (photocell) is to show the initiation of the ignition burner as well as being a source of information for the controller that the burner is extinguished.

Photocell settings depending on the type of controller are:

- The threshold of firing, ie, the reading lights above which the regulator considers that the ignition,
- The type of photocell,
- Its sensitivity.

**The amount of fuel and power fan**

Time of the feeder as well as fan power should be chosen so that the flame was stable, and its colour should be bright red. White flame indicates too much aeration chamber of the burner, a dark red to a lack of air.

Each time after changing settings in the controller must wait a few minutes to observe the changes.

The fine adjustment is recommended for analysis of exhaust. To adjust the power of the burner, set working hours and time off work enough to feed pellet was delivered within 1 hour to the burner.

From 1 kg of pellets can be obtained within 4-5kW. So for example, 25 kW power must give at least 5 kg of fuel during 1h. Regulators are adjustable by the minimum and maximum employment as well as modulated.

**Startup and shut down the burner.**

Starting the burner will start automatically when you press START button on the controller. Combustion will take place automatically, ie, he will seek to maintain a preset temperature is exceeded after a self-extinguish. When the boiler temperature drops below the histeresis value set will restart the burner.

To switch off, go to the stop function on or off the controller.

The detailed methods of setting and description of the parameters refer to the manual controller (RK 2006LP or Ecomax 800P).

**7 Maintenance.**

Cleaning the outside cover.

Clean the exterior cover of the burner with a slightly damp cloth and detergent agents.

**Ash removal:**

Empty the ash, as few or several days depending on the load at which the boiler is working, ash content in the fuel, the size of the ash in the boiler.

If the burner creates a gangrene ("ash stone") should be removed because it may hinder the lighting and proper combustion. With poor quality pellets this should be checked every 1-3 days.

With good quality pellets on the burner should not create a gangrene (lumps of molten ash) and then control and cleaning can be done every few weeks.

**Maintenance photocell.**

If the reading lights on the controller starts to drop it, disconnect the electrical plug burner, remove the cover of the burner, remove the Photo element of the sleeve and clean the surface with a dry soft cloth. This action is performed at least once during the 1-2 heating season, or more frequently if necessary.

**Cleaning the air duct burner.**

To do this:

- Remove the burner or open the door of the burner.
- Remove the heat shield and sealing of the furnace grate.
- Remove and clean the cast iron grate blowing holes in the surface
- Remove ashes from the air duct under the grate and clean the vents holes on the back burner chamber around the internal screw (Stoker).
- Reinstall the grate, burner plate and seal.

Cleaning the burner must be made with a disconnected electrical connector from the burner at least 1-2 times during the heating season, or more frequently if necessary.

**Cleaning the fan.**

Before each heating season, remove the burner and fan with a brush or compressed air to clear the shoulders of pollution.

**Replacing the igniter.**

Electric igniter is used to fire the pellet is a consumable item, and its lifetime depends on the number ignitions, their duration, power fan with ignition or correct adjustment. The life expectancy is one to three heating seasons. If damaged replace it.

To do this:

- Disconnect the electrical connector and disassemble the burner housing.
- Disconnect heater wires from the electrical connector (see wiring diagram)
- disassemble the internal screw drive and the back cover of the burner.
- In the auger tube is mounted ignition (heat). Is screwed to the side of the set crew, which unscrew and remove the lighter.
- Install a new nut and tighten the screw.
- Connect the wires to the electrical connector lighter burner.
- Mount the enclosure and drive.

**Elements of performance.**

Torch building elements such as ignition, cast iron grate, burner heat shield, gasket, sealing cords are consumable and they have only guarantee the boot. They should be replaced as wear every 1-3 heating seasons.

## 8. Problems and Troubleshooting.

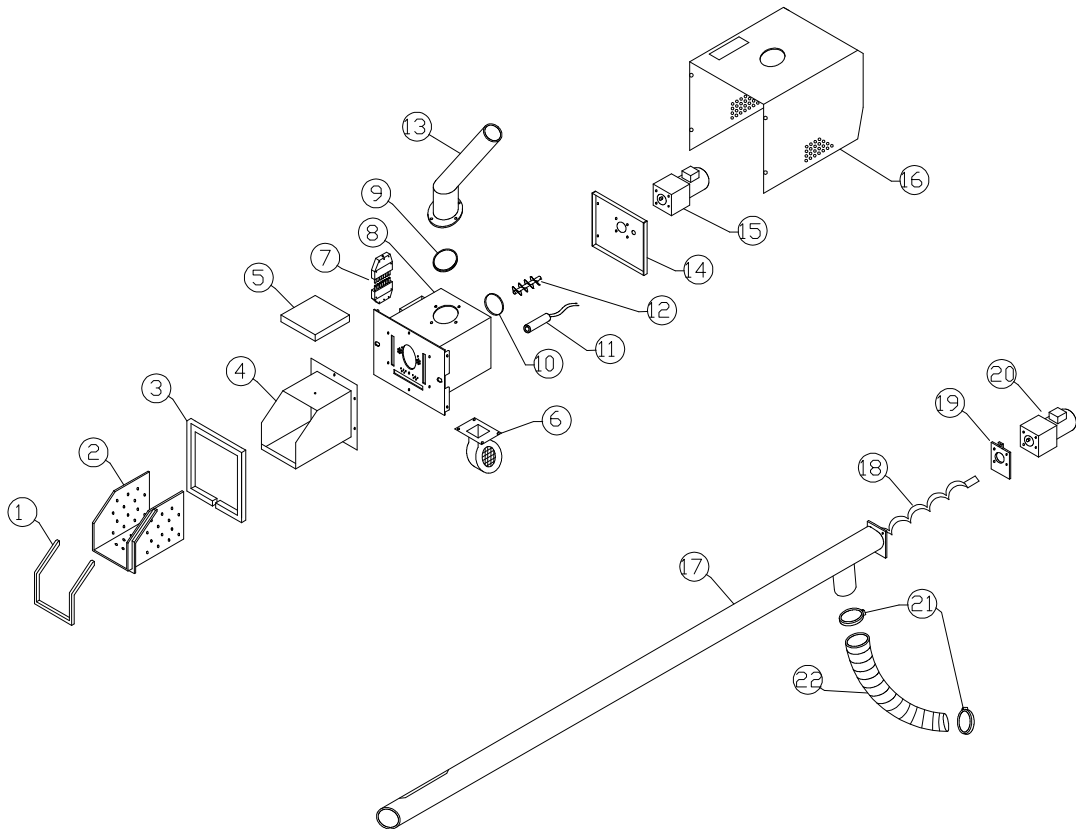
BEFORE CALLING FOR SERVICE.....

We remind that in the event of unjustified customer service call arrival and covers the cost of operating a service technician. So before you call your service, please be familiar with these symptoms interfere with the boiler independent of the manufacturer:

<u>Symptoms of the burner fault</u>	<u>Possible cause</u>	<u>Methods of its removal</u>
Burner does not start	Controller is “off” or the controller can wait for heat requirement.	Turn on the controller, increase the temperature of the boiler and room thermostat, wait to start automatically
	No fuel...	Fill up the fuel In the fuel Silo.
	Improper adjustment of start pellet amount, time, lighting, power fan.	Readjust.
	Dirty burner	Clean the combustion chamber of the burner
	Defective igniter or the controller	Replace damaged items.
Burner starts but then goes into alarm	Dirty Photo element (photocell)	Clean photocell
	Dirty Burner (ash in combustion chamber)	Clean combustion chamber of the burner.
	Improper adjustment of the pellets amount or fan speed	Readjust the burner
	Improperly installed cast iron grill or burner grate seal.	Install properly.
I can not get a high temperature	Wrong burner’s settings	Readjust the burner
	Wrong quality of the fuel.	Refill fuel recommended by producer
	Contamination of the boiler or burner	Clean the boiler and burner
	Too little power boiler or burner	Consult the local seller or installer to validate the choice of boiler and burner

Alarms and messages related to the driver are described in the instructions for controllers.

## **9. The list of components (parts) of the burner.**



1. Grate seal
2. Cast iron grate
3. mounting hole seal
4. Combustion part (Burner's exchanger)
5. Combustion heat shield
6. Fan blower type: G2E097-HD01-02
7. Electrical connector
8. Back part of the burner
9. Sealing of the stoker tube
10. Sealing the back cover
11. Igniter
12. Internal burner's feeder (stoker)
13. Feeding tube (pipe)
14. Back Cover
15. Gear motor with electric drive type: 4GN180K 4 IK25GNC
16. Outside cover of the burner
17. Outer tube feeder
18. Snail feeding tray
19. Mounting plate for feeding tray
20. External screw drive
21. Hose clamp
22. Flexible hose feeder.

## **10. Warranty card.**

### Warranty conditions:

1. The manufacturer provides 24 months warranty on the proper operation of the burner MOC but not longer than 36 months from the date of its sales agent.
2. During the warranty period end user is entitled to free repair service problems arising from the fault of the manufacturer within 14 days from the date of delivery of equipment to the place of.
3. Repairs during the warranty period at the customer is charged. Are free of charge, while the parts that are replaced under warranty.
4. The warranty does not cover:
  - Use elements : sealing cords, gaskets, thermal plate burner grate and burner ignition.
  - Damage to mechanical, thermal, chemical, caused by improper operation, or failure to maintain control of the boiler.
  - Damage caused by electrical surges, flooding the unit.
  - Damage caused by improper installation or improper selection of equipment.
  - Maintenance and control of the burner.
5. The complaint should contain the minutes of the start-up, invoice of purchase, description of damage and the applicant.



**Changes made unlawful in the mechanical or electrical burner design will be treated as a violation of the guarantee, which will result in immediate termination there of.**



**The manufacturer reserves the right to change some of the technical data contained in this manual due to the continuous improvement of products.**