



USER'S MANUAL

Pellet burners

M-line

2019/05

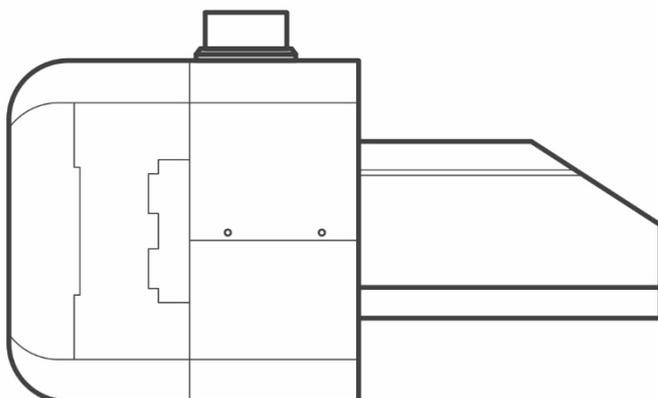


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**The author of this Manual is the company BURNPELL
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written permission of the author.**

1. GENERAL INFORMATION

Read carefully the user's manual before activating burner.

BurnPell 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

BurnPell 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

BurnPell 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 +5°C to +40°C. Relative humidity should not exceed 70%.

- During storage, the device can not have direct contact with the floor. BurnPell burner until final assembly should be kept in carton and on a pallet. Burners can be stored and transported in three 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's 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 1 m around boiler and 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 is not allowed to store flammable materials near the burner (minimal length 1m).

ATTENTION!

Controller and all devices cooperating with it should be installed on the boiler or its area, in places where the temperature is the lowest (below 50°C). Electronic devices operating at high temperature may be damaged or not work properly.

2. PRODUCT DESCRIPTION

BurnPell is a brand under which since 2001 burners for biomass have been produced. These products are characterized with step less 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.

The uniqueness of the M solution is the number of the design improvements used as compared to the burners available previously with the movable combustion chamber. This makes the operation of M line burners reliable and free of technical problems. Significant changes in the technological parameters and the components used have been introduced which makes the economic attractiveness and the environmental usability of the technology considerably better with the burner being one of the most modern solutions in the world.

Movable combustion chamber allows the automatic and constant removal of ash being the residue of the combustion process to ensure high stability of the combustion itself. With such a solution not just the pellets, but also oat* or fruit stones are high-efficiency fuels. The chamber structure ensures higher durability of the bearings and facilitates the quick bearings replacement. The unique solutions employed in the M line burners include:

- Movable Grate System – provides self-cleaning process through grate' dividing into two parts: upper (constant) and lower, performing reciprocating movement with possibility of use different types of solid fuel.
- Hybrid Drive System. Fuel and air are supplied in a synchronized manner i.e. the fuel is supplied according to the air supply rate and vice versa;
- Overpressure Combustion System. Air is supplied into the combustion chamber at the central point to increase the flame spin and reduce the backfire.
- Wide range Lambda probe available for all units to improve the combustion process and reduce the fuel consumption.

BurnPell 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 M Micro, M Mini and M Mini 35 burners



Pic. 1. Construction of M Micro, M Mini and M Mini 35 burners.

The burner is composed of the following subassemblies:

- Combustion chamber including: furnace (1) made of the highest quality steel heat-resisting steel and a covering pipe (2),
- Blowing assembly including a cover made of steel (3), X.PLUG socket (4) located to the right of the burner where the controller plug is to be connected,
- Blowing system (5) located between the blowing assembly and the combustion chamber with a quick-coupling in the upper part (6) to be attached to the feeding pipe by turning it clockwise (detaching is carried out in the reverse direction). Afterwards the pipe which connects the burner with the fuel feeder is connected to the quick coupling.

The cover of burner does not have any protruding nor sharp parts. It does not threaten one's health. The temperature of burner's cover during operation should not exceed 60°C with exception of places of raised temperature, i.e. bakery.



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

2.2. Quality requirements for pellets fuel

In table below given requirements as to quality of pellet fuel are shown. Using fuel which complies to **DIN 51731** or **DIN PLUS** certification or meet the rules of EN-14961-2 norm, extends longevity of burner. The pellet storage location should be dry and well-ventilated. It is important that before the hopper filling the pellet temperature is equal to the boiler room temperature.

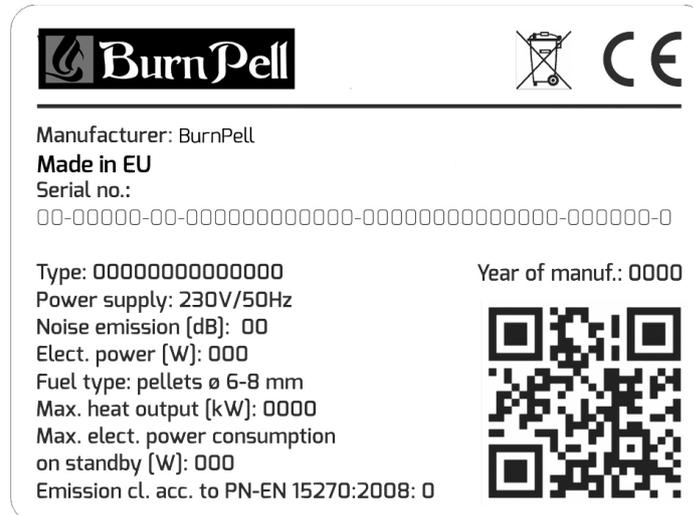
Table 1. Quality requirements of pellet fuel.

Wooden pellets Quality criteria	Units	NORM	
		DIN plus	DIN 51731
Diameter	mm	4≤d<10(6)	4≤d<10(6)
Lenght	mm	5 x D(3)	<50
Density	kg/dm ³	1,12	1,0-1,4
Ash	%	<0,5(1);(7)	<1,50
Humidity	%	<10	<12
Humidity when delivered	%	Not specified	Not specified
Caloric value	MJ/kg	>18(1)	17,5 - 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. The pattern of the burner nameplate



Pic. 2. The pattern of the burner nameplate.

2.4. Technical data of burner

Main properties of BurnPell burners from M-line:

Safety

- Technology of overpressured burning and the built-in firewall with counterweight – no risk of backfiring
- Burner temperature sensor
- Flexible pellet feeding pipe – is melted when backfire occurs and fuel is not fed to the burner

Reliability

- Movable Grate System – removal of excessive amount of ash from grate without human intervention.
- Hybrid Drive System – lower electricity consumption costs and full synchronization of fuel feeding into the air.
- Automatic start after voltage failure – memory of recent settings
- Furnace made of highest quality heat-resistant steel

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 CO₂
- Low consumption of electricity
- Low heat inertia
- High burning efficiency – up to 99%
- Very precise flame sensor
- Fully compatible with automatics of oil and gas boiler and with bakery oven
- Possibility of handling the chimney exhaust fan (the fan works periodically and does not ventilate the boiler)

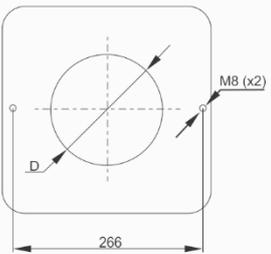
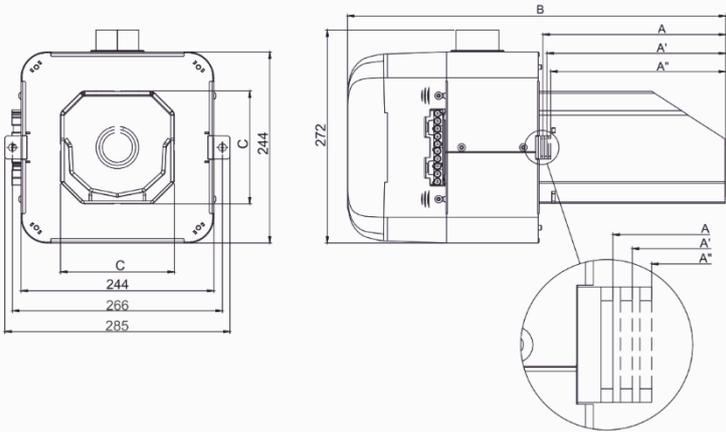
Table 2. Technical data.

Type:	BurnPell M Micro	BurnPell M Mini	BurnPell M Mini 35
Power output:	4 - 16 kW	5 - 26 kW	8 - 35 kW
Currency:	230 V AC / 50Hz	230 V AC / 50Hz	230 V AC / 50Hz
Average consumption of electricity:	35 W	35 W	35 W
Weight:	14 kg	15 kg	17 kg
Noise emission	63 dB	63 dB	63 dB
Feeder length:	2 m	2 m	2 m
Fuels:	Pellet 6-8 mm Oat*	Pellet 6-8 mm Oat*	Pellet 6-8 mm Oat*
Burning efficiency:	to 96 %	to 96 %	to 99 %
Efficiency in boiler:	to 96 %	to 96 %	to 96 %
Power modulation:	YES	YES	YES
Lambda probe:	YES (optional)	YES (optional)	YES (optional)
CH pump service:	YES	YES	YES
HUW pump service:	YES	YES	YES
Mixer service:	YES	YES	YES
Buffer service:	YES (optional)	YES (optional)	YES (optional)
Additional feeder service (silo):	YES (optional)	YES (optional)	YES (optional)
Room temperature sensor:	YES (optional)	YES (optional)	YES (optional)
Return temperature sensor:	YES (optional)	YES (optional)	YES (optional)
Fumes temperature sensor:	YES (optional)	YES (optional)	YES (optional)
Weather automatics:	YES (optional)	YES (optional)	YES (optional)

*Oat combustion reduces burner's maximum power, yield in increasing fuel consumption (up to 50% more) and creates large amounts of ash.

BurnPell 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.

Table 3. Dimensions of burners.

Type of burner	Picture of mounting holes	Dimensions
Group M Mini		
M Micro	D - Ø155	A - 178,3 A' - 173,4 A'' - 168,5 B - 427 C - 126
M Mini	D - Ø155	A - 208,5 A' - 203,6 A'' - 198,7 B - 456 C - 126
M Mini 35	D - Ø173	A - 231 A' - 226,1 A'' - 221,2 B - 477 C - 144

2.5. Safety systems of burner

BurnPell burner is equipped with following safety systems, which effectively protect the user against backburning:

1. Burner temperature sensor

The sensor, once it detects temperature over 90°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. 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.

Safety systems control- see chapter 6.2: Specification of the inspection intervals

2.6. 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 BurnPell 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 80°C, 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	MIN CHIMNEY DRAFT [Pa]
BurnPell M Micro	15
BurnPell M Mini	15
BurnPell M Mini 35	15

3.2. Boiler / oven

BurnPell burner can be installed in majority of boilers. The power of burner in relation to boiler or oven power must be adjusted by installer. It is the 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 BurnPell 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. 3. Positioning of burner and direction of flame

Table 5. Minimum dimensions of furnace chamber.

TYPE OF BURNER	MINIMUM DIMENSIONS OF FURNACE CHAMBER	
	MIN. SIZE OF FURNACE CHAMBER [m ³]	MIN LENGTH OF FURNACE CHAMBER [mm]
BurnPell M Micro	0,020	350
BurnPell M Mini	0,023	400
BurnPell M Mini 35	0,030	520

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 LENGTH OF FURNACE CHAMBER L [mm]
BurnPell M Micro	218	262	350
BurnPell M Mini	218	262	400
BurnPell M Mini 35	218	262	520

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. LENGTH OF FURNACE CHAMBER L [mm]
BurnPell M Micro	270	350
BurnPell M Mini	270	400
BurnPell M Mini 35	270-	520

Table 8. Pressure in burning chamber.

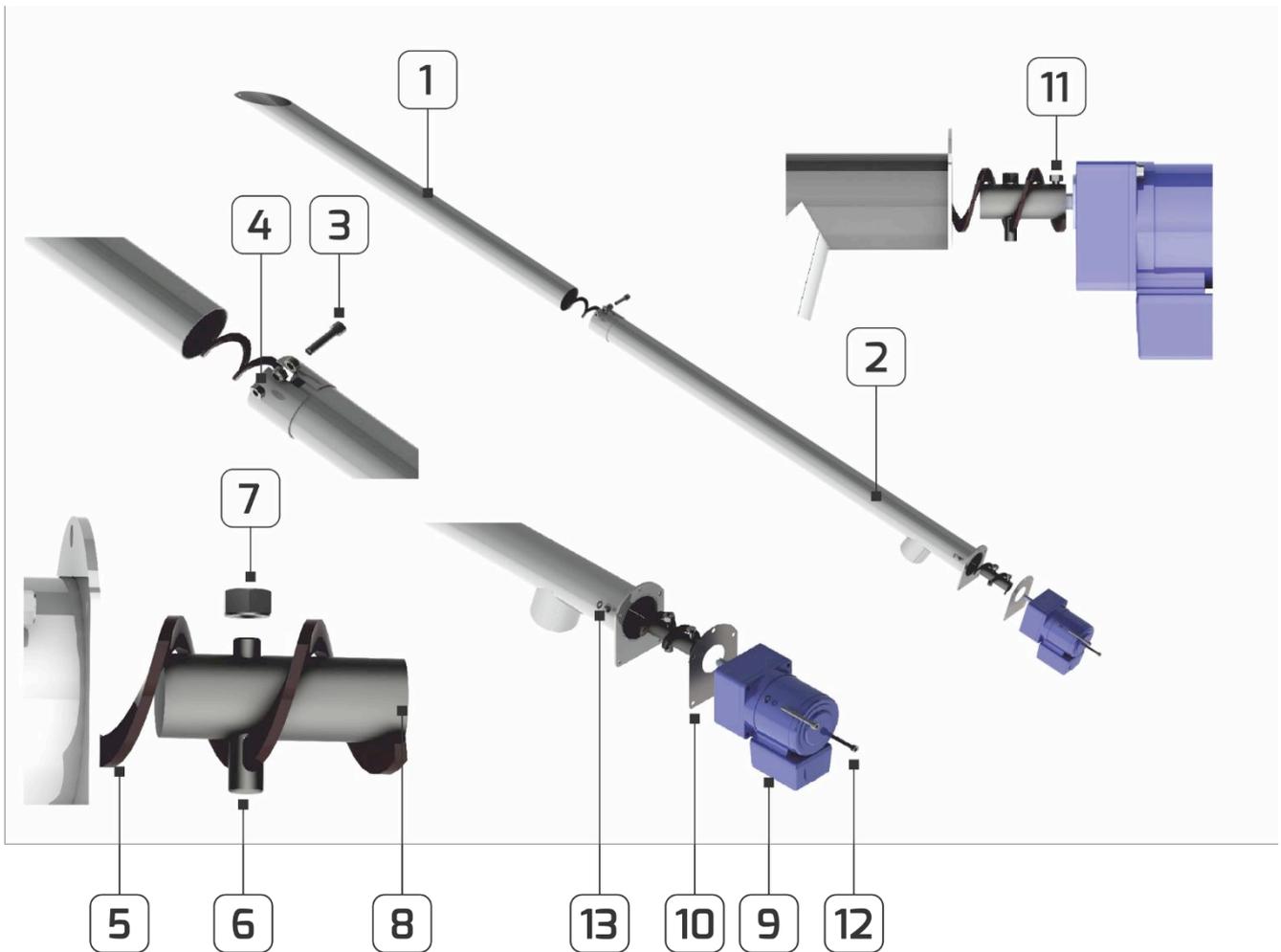
TYPE OF BURNER	PRESSURE IN BURNING CHAMBER [Pa]
BurnPell M Micro	10
BurnPell M Mini	10
BurnPell M Mini 35	15

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 (Pic.7). In lower part of fuel hopper a spiral feeder in covering pipe is mounted. The slope of feeder should not be bigger than 45° 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. External feeder



Pic.4. Feeder's construction.

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. The motor is connected using the power suitable socket located on the burner's controller. The feeder lower part is mounted in the lower part of the fuel hopper and its upper part is connected to the burner with the flexible polypropylene pipe.

Feeder assembly:

1. Connect both pipes (1) and (2) with the bolt M8 (3) and nut M8 (4);
2. Insert the pin (6) in the shaft hole (8), and then screw the spiral (5) onto the pin (6) and tighten with the nut (7);
3. Put the feeder's cap (10) onto the motor pin (9);
4. Slide the shaft (8), including the mounted spiral, onto the motor pin (9) and secure with the set screw (11);
5. Slide the spiral into the pipe inside so that it terminates at the half of the inlet hole (figure below) and screw the motor (9) to the pipe flange with the bolts (12) and nuts (13).



Pic.5. Feeder's auger installation.

Fuel dosing is done automatically. Feeder operation is cyclic and is operated by outer controller. Feeder should be positioned at maximum 45° 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.

NOTE: Before starting the burner, fill the hopper with pellets and fill the feeder until pellets will start falling into the burner.

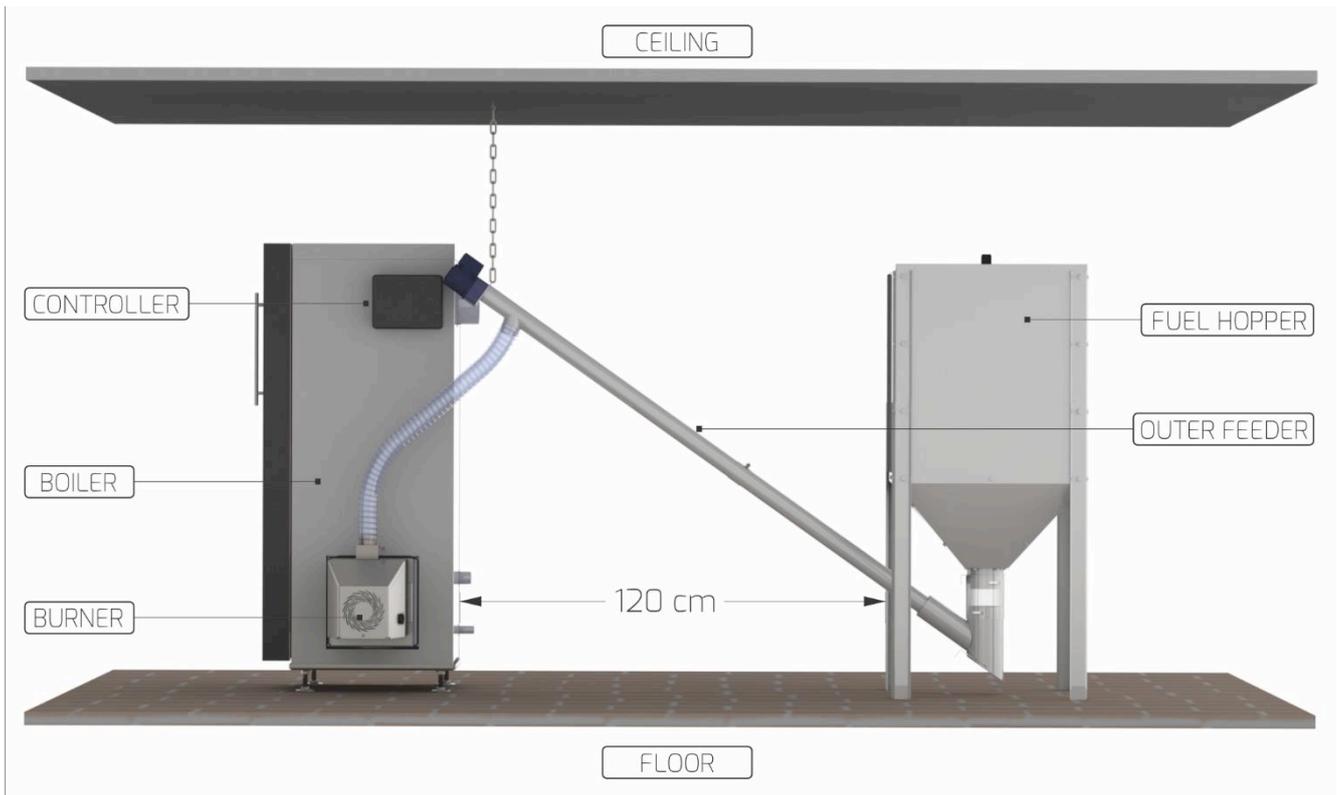
3.5. STB protection

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°C) temperature of boiler, fuel feeder is cut off. In case of restarting the burner the switcher on cover 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.**

4. BURNER AND FEEDER ASSEMBLY



Pic. 6. Scheme of installation in boiler room.

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



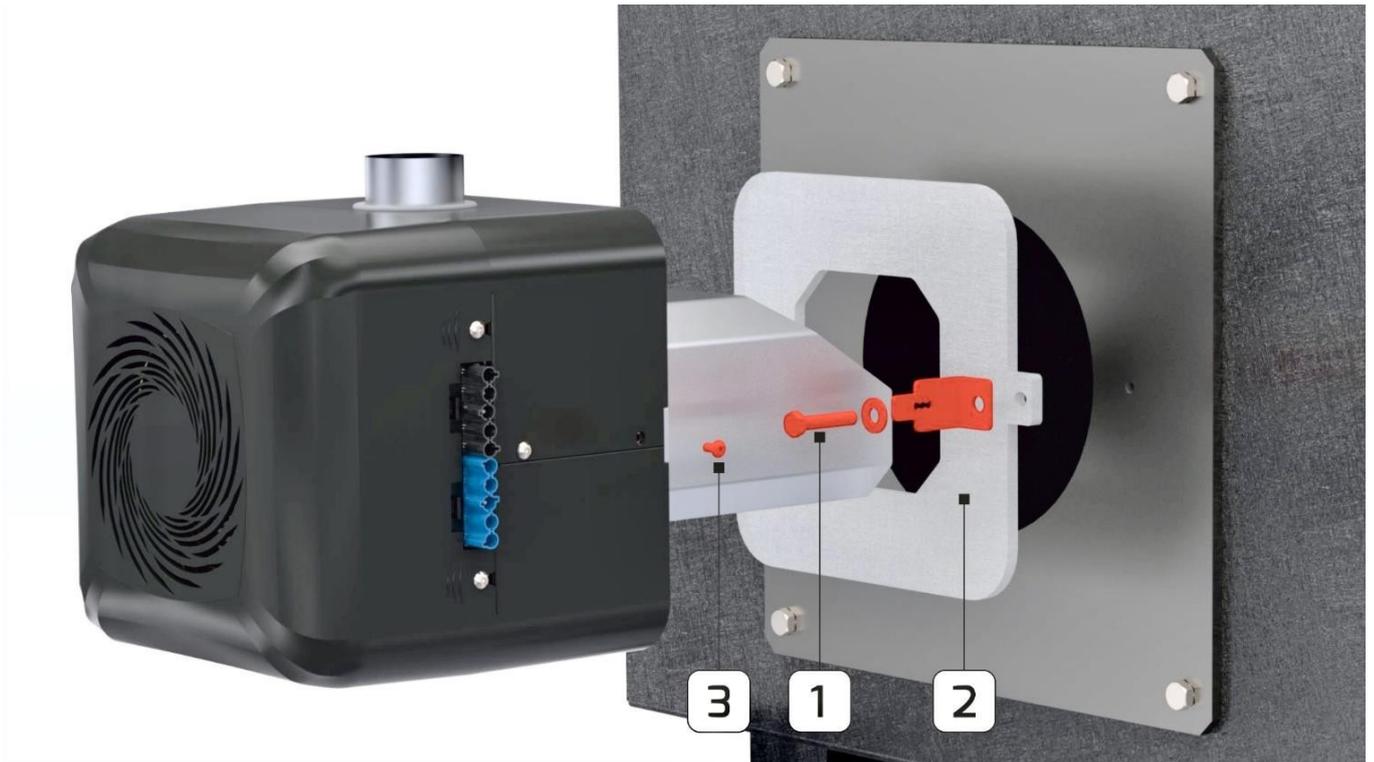
ATTENTION!
**Before starting dismantling
or disassembly entire power supply
must be disconnected.**

1. M-line burners installation in boiler

To perform correct installation, isolate thermally the burner from the boiler door (2) [isolation pad is not a part of the set].

Scheme of assembly M line burners in a boiler:

- Insert the burner's furnace pipe in the boiler mounting hole and fix with the bolts M8 (1). To disassembly a burner from the boiler, remove M5 screw (3), then remove the burner without unscrewing the screws (1).



Pic. 7. Installation of M Micro, M Mini and M Mini 35 burners.



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 feeder Pic. 5

- Attach with joint flexible pouring pipe, long enough to connect with upper part of the feeder, no less however than 30 cm 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

3. 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 AND FIRST START-UP

1. Additional connections of the burner are described in the controller manual.
2. Determination of the supplied pellet capacity
 - a) Before starting the balancing procedure, make sure that the feeder is filled with pellets.
 - b) Put an empty bag (e.g. pellet bag) under the feeder and start the feeder for 15 minutes. The pellet amount collected in the bag must be weighed.
 - c) The value being the result should be used in the FEEDER EFFICIENCY PARAMETER since the value is required by the controller during the initial start-up.
 - d) Enter the maximum operating power of the burner in the next step.
 - e) The controller will adjust the necessary pellet quantity automatically.

6. EXPLOITATION AND SAFETY REGULATIONS

6.1. Exploitation



ATTENTION!
BurnPell 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.

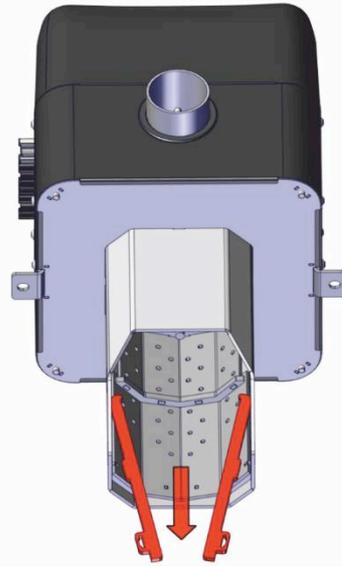
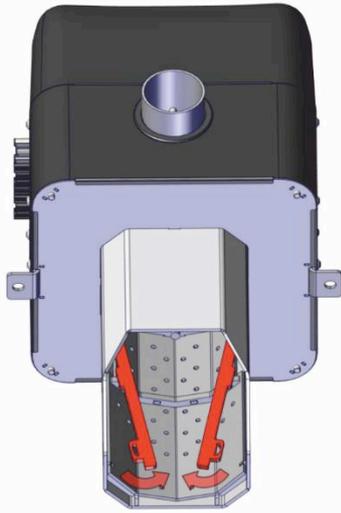
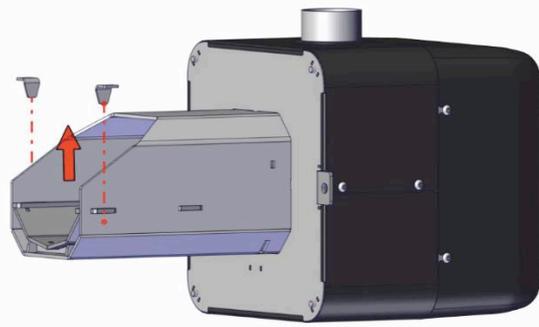
Depending on a group of burners, there are different ways of conducting the maintenance of furnace plate:

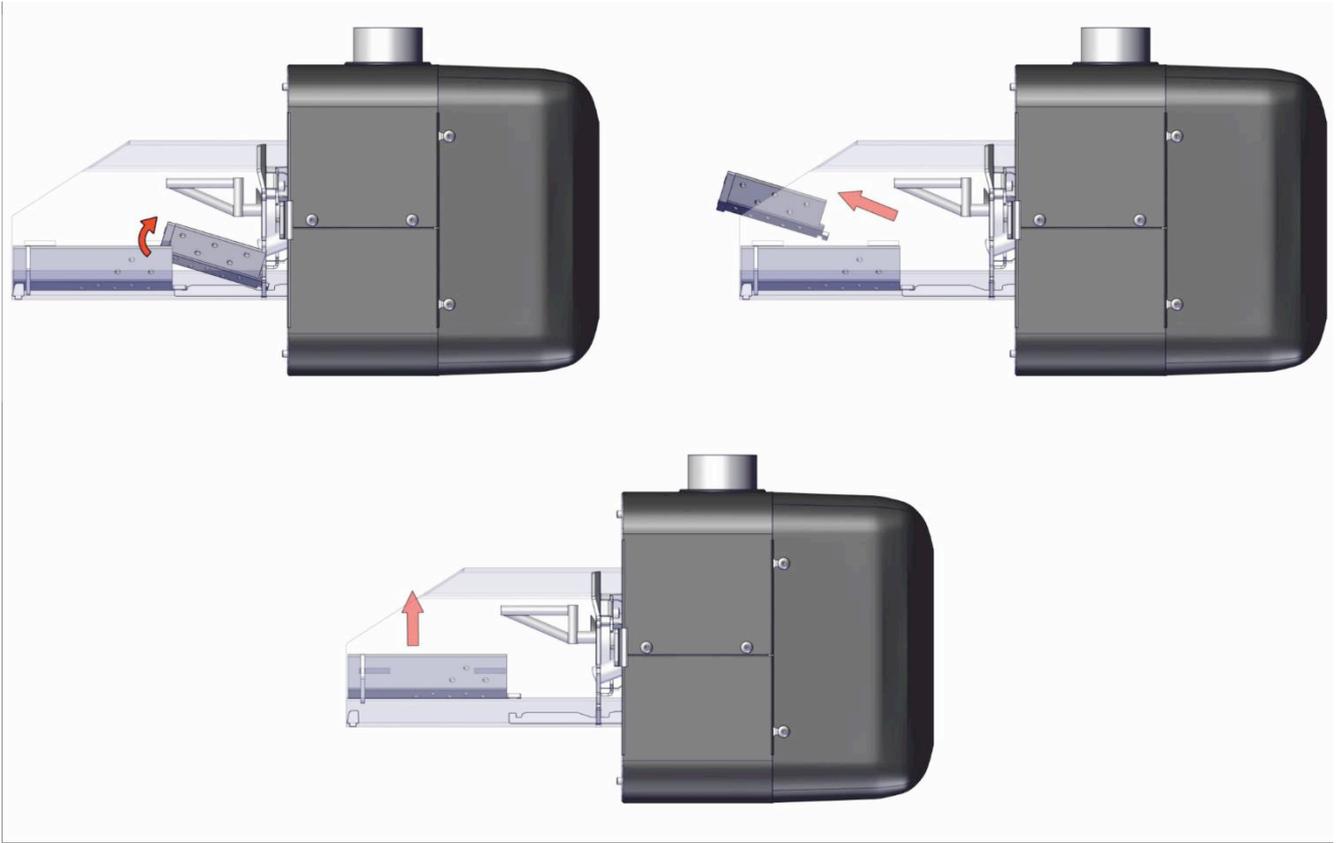
Maintenance of furnace plate in M Micro, M Mini and M Mini 35 burners

The Mini-series burners are equipped with the removable furnace.

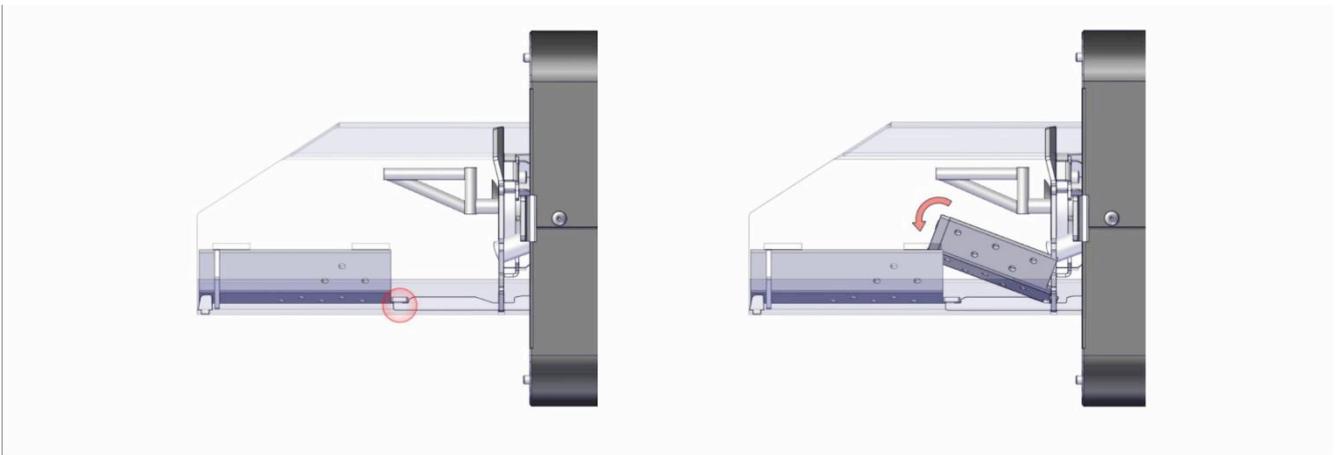
Grate's cleaning has to be done every time after burning off.

Before removing the furnace, clean it thoroughly to prevent ash from getting into the airflow chamber during its removal, then you can remove the furnace and clear the airflow holes. After cleaning the furnace, insert the furnace correctly in the burner. The furnace lock must be precisely located in the burner seat. It is presented in figure below.

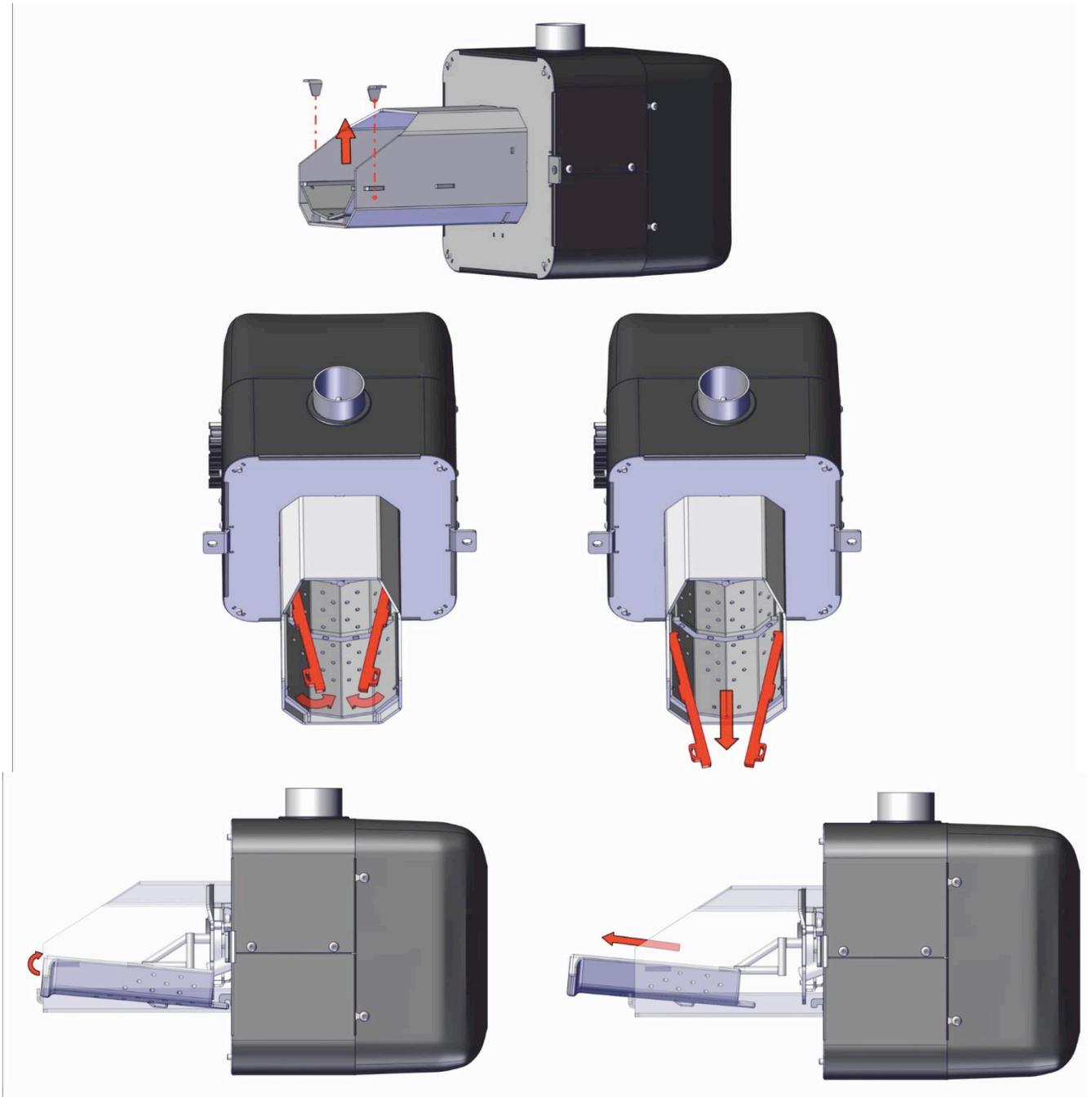




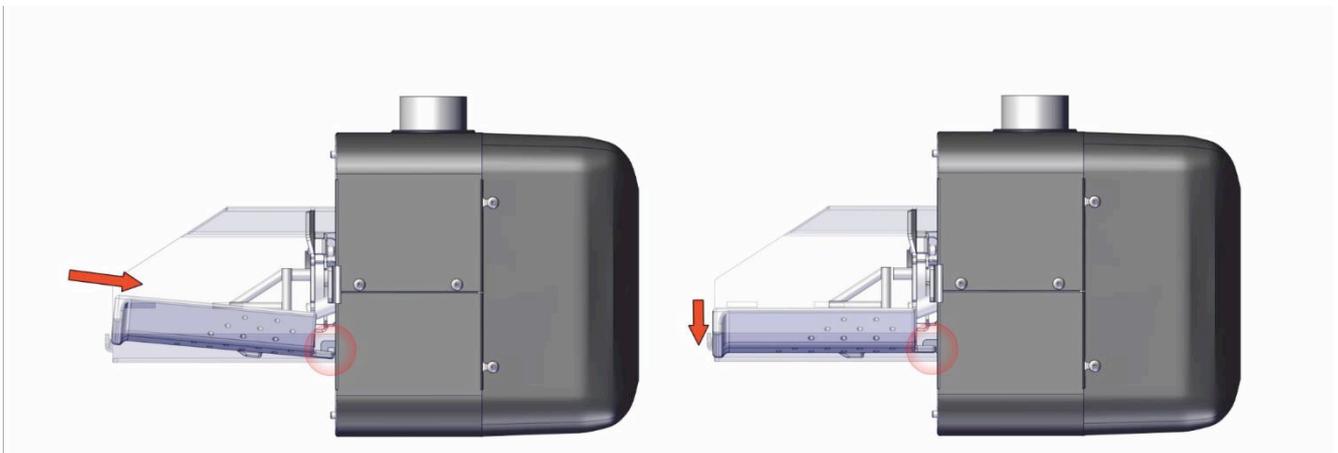
Pic. 8. How to remove furnace in burners M Mini and M Mini35.



Pic. 9. Correct positioning of furnace in burner M Mini and M Mini 35.



Pic. 10. How to remove furnace in M Micro burner.



Pic. 11. Correct positioning of furnace in M Micro burner.



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



**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.

6.2. Specification of the inspection intervals.

Table 9. Specification of the inspection intervals.

Power rating	6 months from installation date	12 months from installation date	18 months from installation date	24 months from installation date	30 months from installation date
4 – 50 kW		1. Expanded		2. Expanded	

The inspection interval date starts from the installation and start-up of device by the authorised service company having the suitable manufacturer's certificates. The inspections must be performed not earlier than one month before and not later than one month after its scheduled date.

Scope of operational activities:

For basic operation inspection:

- Check of setting of the automatic
- Check of safety devices (STB, boiler and burner temperature sensors)
- Check and cleaning of the flame sensor
- Check of the firewall with counterweight condition (if any)
- Fumes analysis and chimney draught measuring
- Record of service counters status
- Cleaning of the blowing nozzles and burner furnace
- Check of the fixing mechanism and furnace condition
- Calibration of lambda probe (if any)

Additional operations when extended inspection is performed:

- Test of transmitters
- Check of the burner tightness
- Check of the electrical connections condition
- Check of the igniter condition

6.3. 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 (see page 13). 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.**
- **Opening the door of the boiler is allowed only after extinguishing the burner and disconnect of electric power.**
- Burner is designed for burning dry biomass, i.e. "pellets" in boilers operating in central heating system.
- Obligatorily burner must be electrically zeroed and connected to a socket with zeroing 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 BURNPELL sp. z o.o. sp. k. (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 improper environmental conditions, i.e. too high temperature, above 45°C, 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 – BURNPELL sp. z o.o. sp. k. 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 authorized installer and confirmed with the signature of the user, then he or she loses the right to warranty for burner faults. Also the guarantee is lost then.

6.4. Guarantee

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

7. SERVICE OF DEVICES



ATTENTION!

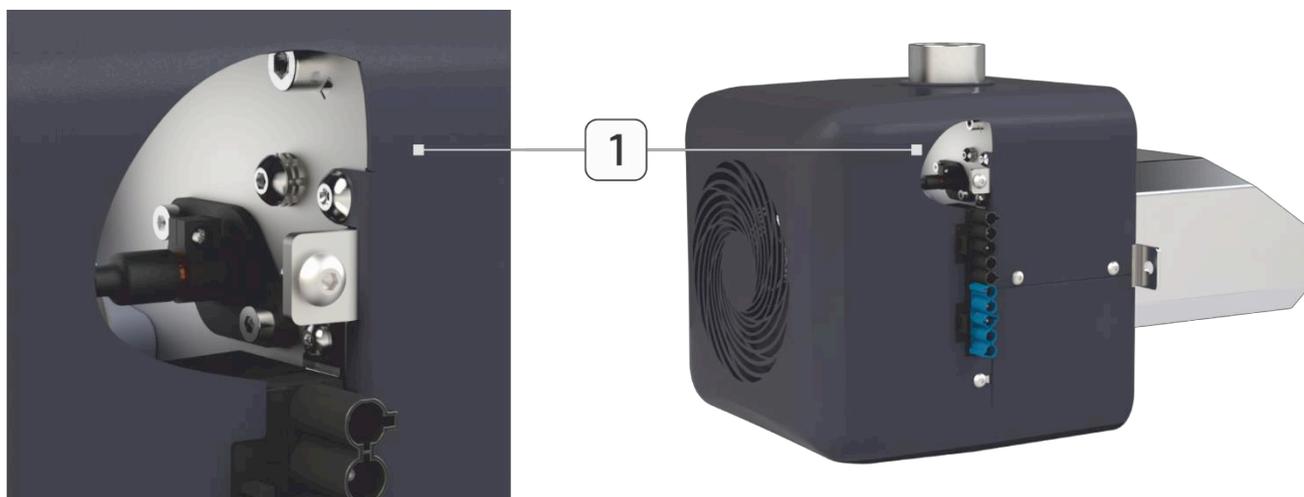
Servicing of devices can only be executed by switched off electrical powering of a burner and a boiler.

7.1. Photosensor

Photosensor 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:

- Bakeries- once a month
- Boiler rooms – every 3 months



Pic. 12. Position of photosensor in M-line burners.

7.2. Electrical igniter replacement.

When the igniter does not heat even though the "firing up" message is shown, it is probably damaged. To replace the igniter, remove the burner cover. On the right side of the fan, there is a steel sheath, where the electric igniter is located. Disconnect the igniter electric cables from the terminal block, loosen the bolt mounting the steel sheath case and remove the igniter. Follow the above procedure in reverse order to mount a new igniter and the burner cover.

7.3. Feeder pipe cleaning

If a string from the pellet bag or other object clogging the feeder operation gets into the feeder pipe, then the feeder motor will overheat and circuit-breaker will be switched off by the temperature sensor located in 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 and checked.

7.4. Burner cleaning

One of the reasons of lack of firing-up of a burner may be 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 every day, 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 (oxygen) 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. **Therefore: Before switching off the power of a burner, burning off process should be conducted.**

In case of serious breakdowns an installer should be contacted.

8. REASONS OF IMPROPER OPERATION

Burner does not fire up the fuel:

Reasons:

- No fuel – check the fuel hopper and the feeder, if it is not blocked
- Too small startup dose – check the startup dose
- Burnt igniter – check the igniter
- Defective drive motor - check motor thermistors

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

Photosensor checking

See page 24.

Measuring readings:

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

Overheating of inner feeder.

Reasons:

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

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 k Ω .

Feeder filling

The inner feeder is 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)

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 BurnPell controller

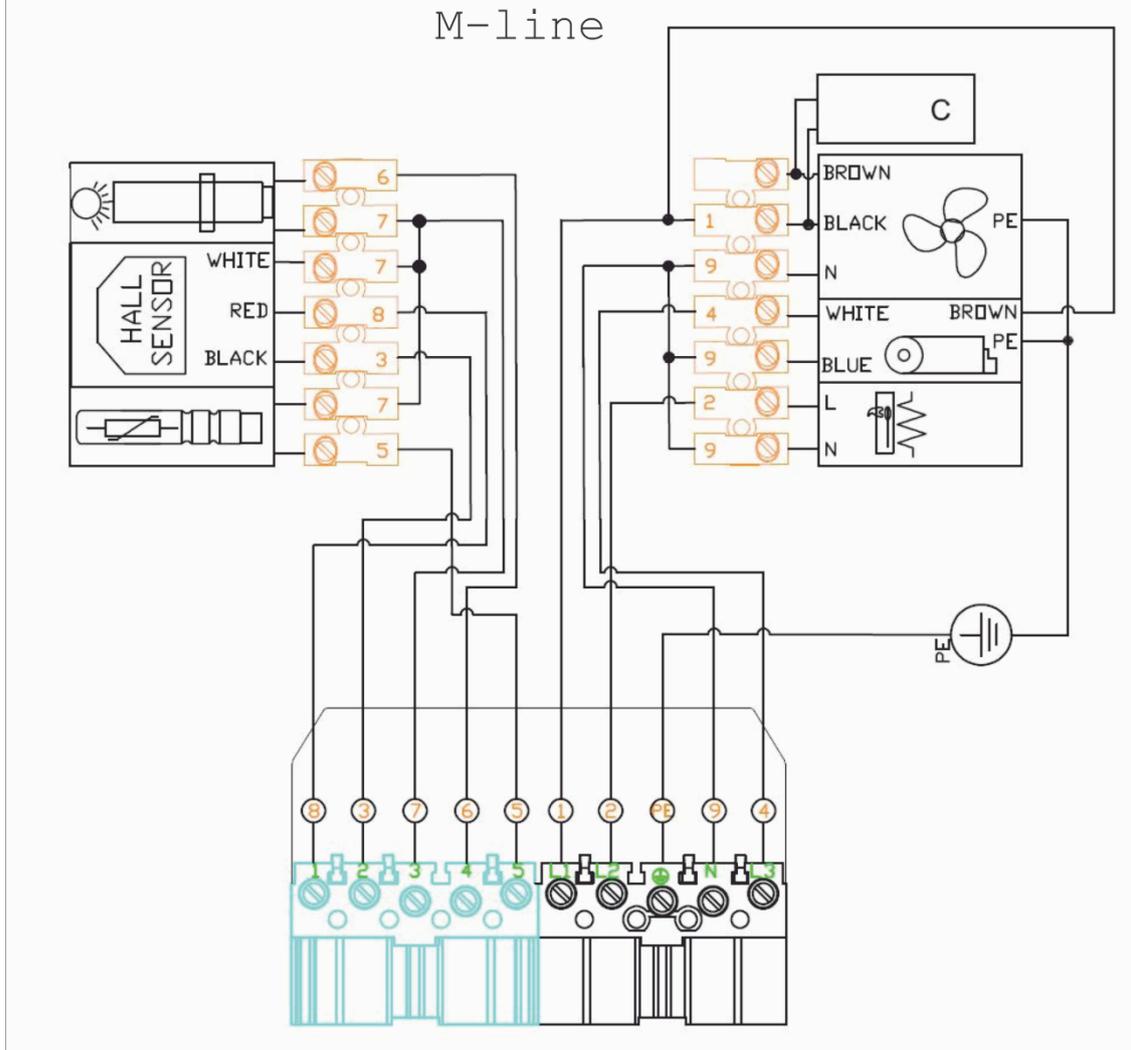
See controller's user's manual

Electrical scheme of M-line burners

Wires in the socket connected by numbers

8	3	7	6	5	1	2	⌚	9	4
1	2	3	4	5	1	2	⌚	N	3
BLUE					BLACK				

Numeration from socket



Pic. 13. Electrical scheme of M-line burners.

10. REPORTS

10.1. First start-up report

Table 10. The pattern of the first start-up.

FIRST START-UP (to be re-sent to UAB Komerta company)

First start-up was carried by company *:

Installation was carried by company*:

Name:.....

Name:.....

Street:.....

Street:.....

Town:.....

Town:.....

Tel.:.....

Tel.:.....

*filling this data is a condition of accepting guarantee claims.

Diagnostics of R.Control settings									
power 30% (power 1)		power 50% (power 2)		power 100% (power 3)					
feeder operation [s]	fan power [%]	feeder operation [s]	fan power [%]	feeder operation [s]	fan power [%]				
firing-up		work		supervision (pause/maintaning)					
starting dose [s]	firing-up time [min]	burner feeder fill [%]	operation in thermostat mode	supervision time [min]	feeding time [s]				
			<input type="checkbox"/> YES <input type="checkbox"/> NO						
Diagnostics of S.Control settings									
minimum power		middle power		maximum power					
minimum burner power [kW]	blowing correction min. power [%]	middle burner power [kW]	blowing correction middle power [%]	maximum burner power [kW]	blowing correction max. power [%]				
firing-up		work		supervision (pause/maintaning)					
stabilization time [min]	firing-up time [min]	burner feeder fill [%]	operation in thermostat mode	supervision time [min]	boiler power [kW]				
			<input type="checkbox"/> YES <input type="checkbox"/> NO						
fumes analysis (by maximum power)				operation with lambda probe	feeder efficiency [kg/h]	ventilation of boiler room	burner temp. by oper. 100% [°C]	fuel type	
CO [ppm]	O ₂ [%]	chimney draft [Pa]	fumes temp. [°C]					<input type="checkbox"/> wooden pellet	<input type="checkbox"/> agripellet
				<input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> poor <input type="checkbox"/> average <input type="checkbox"/> good		<input type="checkbox"/> 6mm <input type="checkbox"/> 8mm	<input type="checkbox"/> pits <input type="checkbox"/> oats
REMARKS AFTER INSTALLATION:									

Hereby I declare that the device was installed and started according to PN, technical rules and constructional directions of UAB Komerta company. All operational parameters and protections were checked. The device works correctly.

CONFIRMED BY AUTHORISED COMPANY

Installer's authorization number:

Customer's data:

Street:

date:..... / /

City:

Tel./ e-mail:.....

.....
Serial No.

.....
stamp and signature

10.2. Inspection report

Table 11. The pattern of first inspection report.

FIRST INSPECTION (to be re-sent to UAB Komerta company)

- | | |
|--|---|
| <p style="text-align: center;">BASIC</p> <ul style="list-style-type: none"> <input type="checkbox"/> control over settings of automatics (fill in the table) <input type="checkbox"/> control over protecting devices (STB, boiler and burner temperature sensors) <input type="checkbox"/> control and cleaning of flame sensor <input type="checkbox"/> control over valve with counterweight (if equipped) <input type="checkbox"/> fumes analysis and chimney draft measurement (fill in the table) <input type="checkbox"/> service counters status recording (fill in the table) <input type="checkbox"/> blowing nozzles and burning chamber cleaning <input type="checkbox"/> mounting mechanism check and burning chamber check <input type="checkbox"/> lambda probe calibration (if equipped) | <p style="text-align: center;">EXTENDED</p> <ul style="list-style-type: none"> <input type="checkbox"/> relays check <input type="checkbox"/> burner tightness check <input type="checkbox"/> electrical connections check <input type="checkbox"/> igniter check <p>Replaced parts:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
|--|---|

Diagnostics of R.Control settings									
power 30% (power 1)		power 50% (power 2)		power 100% (power 3)					
feeder operation [s]	fan power [%]	feeder operation [s]	fan power [%]	feeder operation [s]	fan power [%]				
firing-up		work		supervision (pause/maintaning)					
starting dose [s]	firing-up time [min]	burner feeder fill [%]	operation in thermostat mode	supervision time [min]	feeding time [s]				
			<input type="checkbox"/> YES <input type="checkbox"/> NO						
Diagnostics of S.Control settings									
minimum power		middle power		maximum power					
minimum burner power [kW]	blowing correction min. power [%]	middle burner power [kW]	blowing correction middle power [%]	maximum burner power [kW]	blowing correction max. power [%]				
firing-up		work		supervision (pause/maintaning)					
stabilization time [min]	firing-up time [min]	burner feeder fill [%]	operation in thermostat mode	supervision time [min]	boiler power [kW]				
			<input type="checkbox"/> YES <input type="checkbox"/> NO						
fumes analysis (by maximum power)				operation with lambda probe	feeder efficiency [kg/h]	ventilation of boiler room	burner temp. by oper. 100% [°C]	fuel type	
CO [ppm]	O ₂ [%]	chimney draft [Pa]	fumes temp. [°C]					<input type="checkbox"/> wooden pellet	<input type="checkbox"/> agripellet
				<input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> poor <input type="checkbox"/> average <input type="checkbox"/> good			
SERVICE COUNTER:				REMARKS AFTER DIAGNOSTICS:					
operation with max. power 100%									
operation with middle power 50%									
operation with min. power 30%									
number of fire-ups									
feeder work									
burnt fuel									
number of resets									

CONFIRMED BY AUTHORISED COMPANY

Customer's data:

Installer's authorization number:

Street /City:

date:..... ___ / ___ / ___

Tel./ e-mail:.....

.....
Serial No.

.....
stamp and signature

11. LIST OF PICTURES AND TABLES

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