

## INSTRUCTIONS FOR THE USE OF AUTOMATIC PELLET BOILERS PX



Figure 1. Automatic pellet boiler PX

Dear customer, thank you for purchasing our product. Please follow the manual to be 100% satisfied with its operation and maintenance.

Team MAGA

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## 1 USE AND ADVANTAGES OF THE BOILER

Automatic pellet boiler PX series are designed for heating of family houses, cottages and other objects. The recommended fuel is wood pellets with a diameter of 6 to 8 mm, which are transported from the hopper to the combustion chamber by means of a screw feeder. This allows time-saving and very simple operation and maintenance. Due to the high efficiency, low operating costs can be achieved. In addition, the automatic ignition of the fuel in the firebox guarantees a very low emission load for the surrounding environment (with a correctly adjusted boiler, this is virtually "smokeless" combustion). The kolta controller is adapted for connection to external control (space thermostat, equithermic control, control via internet), including control of the circulation pump.



Figure 2. Automatic pellet boiler PX

### Advantages of the boiler:

- automatic operation

- the boiler burns a renewable energy source - wood pellets
- automatic transport of fuel from the hopper to the burner
- patented burner solution with self-cleaning rotating focus
- automatic ignition as standard
- simple and time-saving operation
- low operating costs
- high-efficiency tubular heat exchanger
- low emissions
- modulation of thermal output over the entire power range
- internet control

## 2 ACCESSORIES

The automatic pellet boiler of the P series consists of the following parts:

### A. Basic line-up

1. Boiler body (ashtray, cleaning tools, filling valve)
2. Electronic controller (control unit)
3. Pellet burner
4. Pellet feeder (oven, motor, plastic knurled hose with steel end to pellet burner)
5. Pellet hopper (250L, 600L, 1000L)
6. Instructions for use of the boiler
7. Operating instructions for the electronic controller
8. Production label of the boiler and burner

### B. Additional accessories:

1. Remote room controller ecoSTER (control of the boiler without physical presence in the boiler room)
2. Online web module ecoNET (boiler control by web online application)
3. Module B (control of charging the storage tank and 2 equithermal circuits)
4. Module C (control of 2 additional equithermal circuits)



*Please check your build for completeness!*

Please keep these installation and operating instructions carefully, as well as all mandatory documentation, so that they can be used whenever necessary. In the event of moving or selling the equipment, it must be handed over to the new user/owner, with all documentation.

### Symbols used

The following graphic symbols are used in the instructions:



- symbol means useful information and news,



- symbol means important information in connection with the protection of life and health of humans and domestic animals or damage to property

NOTICE: the symbols are used to indicate essential information in the instructions. However, this does not relieve the user of the obligation to read and follow the instructions not marked with graphic symbols!

## **3 BOILER CONSTRUCTION**

### **3.1 BOILER BODY**

The pressure parts of the boiler meet the strength requirements according to: STN EN 303-5 : 2012 -Heating boilers. Part 5: Solid fuel-fired boilers with manual and automatic fuel loading with rated output up to 500 kW. Terminology, requirements, testing and marking.

The basic parts of the automatic pellet boiler P series are the boiler body and the pellet burner with accessories. The body is welded from steel boiler plates. All parts of the boiler body that come into contact with the flame or flue gas are made of 5 mm thick sheet metal. The exchanger is tubular with flue gas dampers (economizers). Below the exchanger is the combustion chamber in which the pellet burner is mounted. The unburnt fuel residues fall into an ash pan located at the bottom of the chamber. The automatically controlled pellet burner ensures the air supply, fuel, its burning intensity, ignition and extinction according to the parameters set on the electronic controller. A moderate vacuum in the combustion chamber is a prerequisite for proper combustion. Under the combustion chamber there is an ashtray. Next to the boiler there is a fuel tank. From it, the fuel is fed to the pellet burner by a screw feeder driven by an electric motor.

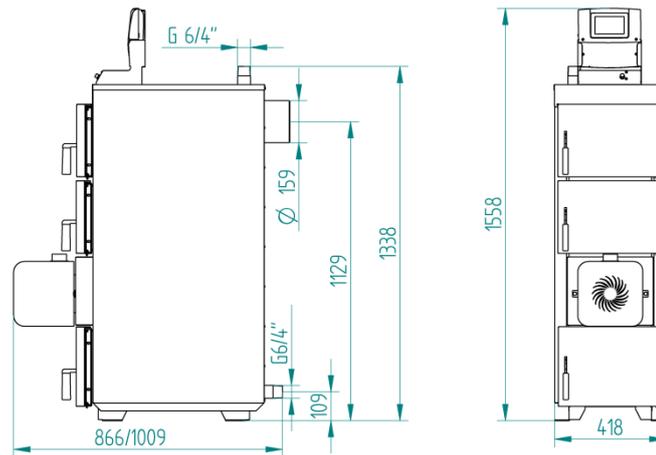
The fan for combustion air is located inside the compact pellet burner.

The heating water outlet is located at the top of the boiler and the inlet is located at the rear of the boiler and consists of two pipes with external thread G 1 ½" for connection to the heating circuit. The outlet with a thread of G 1/2" is used for the installation of the inlet valve. In the rear upper part of the boiler there is a flue pipe for flue gas discharge into the chimney with vertical or horizontal positioning.

The steel heat exchanger and its lid are insulated with non-toxic insulation, which insulates the heat transfer to the surroundings. The steel outer shell of the boiler is colour-treated with comaxite powder coating.

PX series boilers are designed for closed heating system.

Detailed technical parameters are given in Table Tab.1



Boiler name	Automatic pellet boiler			
Type of boiler		PX 20	PX 28	
Adjustable power	kW	6-20	7-28	
Rated thermal output	kW	20	28	
Fuel consumption	kg/h	4,652	6,169	
Prescribed chimney draft	Pa	15	15	
Diameter of the chimney pipe	mm	160	160	
Flue gas mass flow rate at Qmax	g/s	11,26	12,01	
Connect		6/4"	6/4"	
Weight of the boiler without burner	kg	221	270	
Volume of water	l	64	71	
Transfer area	m <sup>2</sup>	2,4	3,2	
Efficiency (thermal)	%	91,04	90,65	
Efficacy seasonal	%	77,18	77,09	
Fuel combustion efficiency	%	99	99	
Storage volume	l	250,600,1000		
Prescribed fuel		Wood pellets 6 mm, A1		
Maximum permissible operating pressure	MPa	0,2		
Test pressure	MPa	0,4		
Recommended prev. heating water temperature	°C	65-80		
Maximum operating water temperature	°C	85		
Minimum inlet water temperature	°C	55		
Connection voltage		1 PEN 230 V/16 A/50 Hz		
Max. electrical input during ignition	W	250	250	
Electrical input at rated power	W	63	69	
Electrical input at minimum power	W	60	60	
Electrical input power in STAND BY mode	W	4	4	
El. Cover		IP 20		
Boiler emission class		5		
Boiler efficiency class		5		

Table No.1 Technical parameters of automatic pellet boiler of P series X

### **Prescribed fuel for boilers:**

The prescribed fuel for boilers is wood pellets according to STN EN 303-5: 2012 Type C1, diameter 6 mm, max. length 35 mm, ash content max. 1,5 %, calorific value min. 17 MJ/kg, water content max. 12 %.

Alternatively pellets according to DIN 51731 / DIN plus,  
ÖNORM M7135

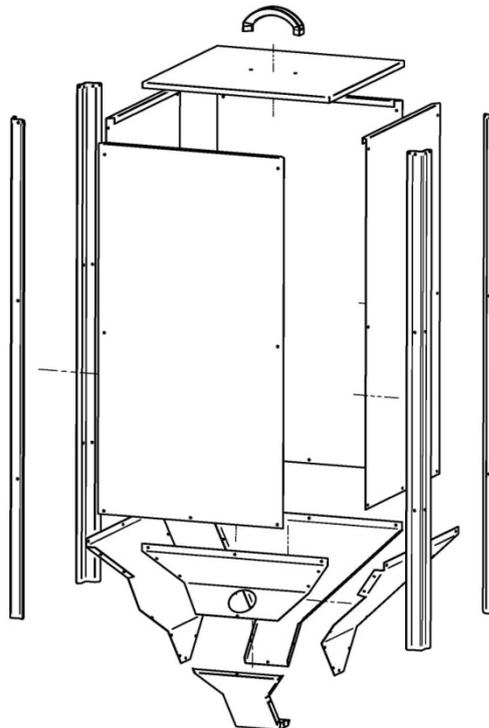


#### **ATTENTION:**

- **poor fuel quality can significantly affect the performance and emission parameters of the boiler.**
- **Changing the pellets while the burner is in use requires recalibration of the feeder by a qualified installer.**

### 3.2 PELLETT HOPPER

Volumes of 250L,600L,1000L or other according to customer's requirements are available.



**Figure 3.** Pellet hopper assembly

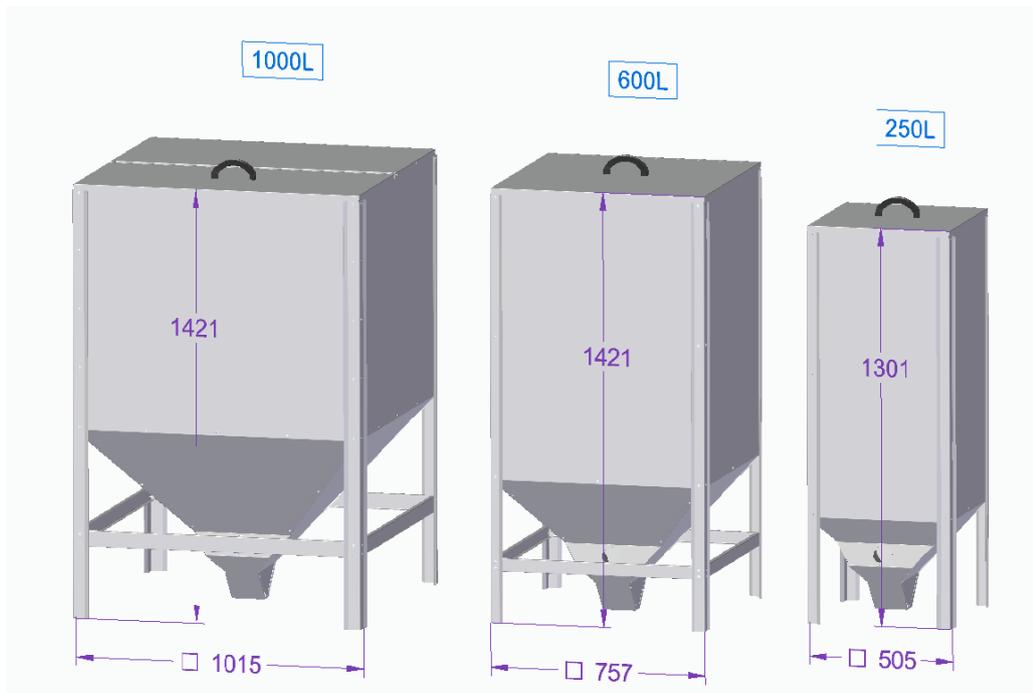


Figure 4. Pellet trays



during operation, the container must be covered.



The tank is not designed for liquid fuel. The hopper is designed for pellets with a diameter of 6-8mm. In the case of using fuel that does not meet the standard, the manufacturer is not responsible for the functionality of the device and is not liable for any damages caused by the operation of the boiler.

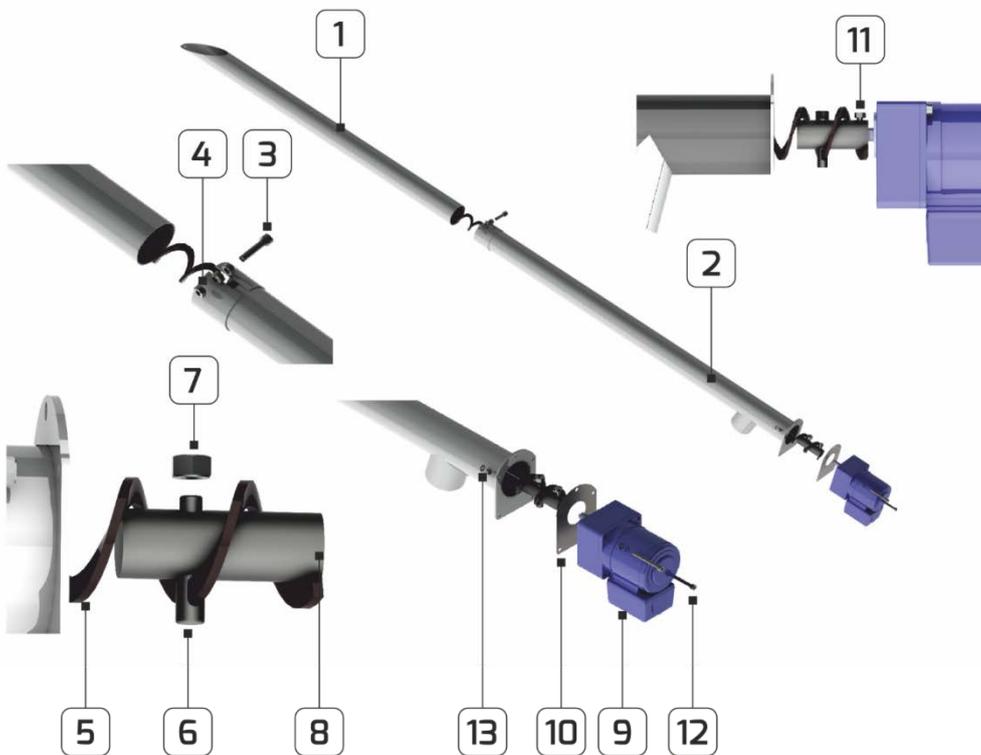


Figure 5. Fuel feeder

The fuel feeder connects the fuel tank to the burner. It is made of galvanized steel tubes with a diameter of 60mm. Inside the tube there is a steel spiral driven by a 230 AC electric motor with gearbox.

The motor is plugged into the appropriate socket located on the burner control using the power cord. The lower part of the feeder is inserted into the fuel tank and the upper part is

connected to the burner by a flexible polypropylene pipe.

#### Assembly diagram of the feeder:

1. Connect the two pipes (1) and (2) via the M8 screw (3) and the M8 nut (4);
2. Insert the mandrel (6) into the shaft hole (8), then thread the spiral (5) through the mandrel (6) and screw the mandrel with the nut (7);
3. Insert the feeder cap (10) onto the motor shaft (9);
4. Slide the shaft (8) and the screwed spiral onto the motor shaft (9) and secure it by means of the clamping screw (11)
5. Insert the straight spiral into the inside of the pipe so that it extends halfway to the mouth opening (figure below) and bolt the motor (9) to the pipe flange using the bolts (12) and nuts (13). For proper operation of the feeder, it must be pushed into the bottom through the hole (9) so that it is secured by the bracket (4). the feeder must be turned with the cut side up.

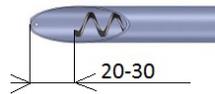


Figure 6. Pellet feeder end cap

**NOTE:** For proper feeder function, the end of the auger (spring) must be 20 to 30 mm from the end of the cut tube of the feeder. The hole at the lower end of the pellet feeder (Fig. 9) must be oriented upwards. If it is turned to one side, the amount of fuel dosed is reduced and the boiler performance is thereby reduced. With a large turn, the fuel supply can be completely stopped.

Fuel dosing is automatic. The feeder operates cyclically and is controlled by a control unit. The feeder must be positioned with a maximum inclination angle of 45° to the floor. The flexible anti-static polyurethane pipe must be at least 30 cm away from the axis of the burner. If the pipe overheats (flame reversal) and melts, the pellets will stop being fed into the burner. Lack of fuel will cause the burner to burn out. This prevents the fire from spreading to the fuel tank and starting a fire in the boiler room.

**ATTENTION:** Before starting the burner it is necessary to fill the hopper with pellets and fill the feeder until the pellets start to fall into the burner for about 10 min.

### 3.3 PELLET BURNER

The standard part of the boiler is a pellet burner of the R series.

Installation of the burner must be performed by **an authorized service technician** trained by the manufacturer.

The pellet burner must be slid into the boiler door and fastened with the screws provided. The feeder tube is slid into the top of the burner.

The PB Premium type also requires the connection of the appropriate cables and a water temperature sensor. The control unit with touch screen display is placed either in a bracket on the boiler or on the wall next to the boiler.



**Figure 7.** Control unit display for R series burners



**Figure 8.** Burner for PX boiler

## Description of the burner

### R series burners

Their advantage is the rotary combustion chamber, which also allows automatic cleaning of ash generated during combustion and provides high stability of the combustion process.

However, the rotary combustion chamber does not replace the manual cleaning of the burner, which we recommend to perform once a month, and when using a lower quality fuel, we recommend to shorten the cleaning interval.

The unique solutions used in the R series burners are:

- Hybrid propulsion system - fuel and air are fed synchronously - fuel is added in proportion to the air and vice versa;
- The air vane system ensures precise air entry into the combustion chamber and prolongs its life;
- Compensation pipe system - eliminates kinking and blockages due to temperature stresses;

- pressurised combustion system - air is fed centrally into the combustion chamber which causes greater flame swirl and limits the possibility of backfiring

## 4 CONTROL, REGULATION AND SAFETY ELEMENTS

### 4.1 REGULATORY ELEMENTS

The **ecoTOUCH850P** automatic pellet boiler controller allows you to set:

- boiler outlet water temperatures
- automatic fuel feeder and fan mode
- parameters for attenuation mode
- control of the feeder and fan manually
- circulator start-up temperatures (UK)
- Temperatures of the DHW storage tank
- control of the DHW pump

The controller is equipped with an input for a room thermostat.

**See separate operating instructions for the control unit.**

### 4.2 SAFETY FEATURES

#### 1) STB emergency thermostat

The STB safety thermostat is a protection of the boiler against overheating. When the boiler heats up to a temperature above 95 °C, the thermostat switches off, thus interrupting the supply of electricity to the fuel feeder. This immediately reduces the boiler output. To restart the boiler it is necessary to unscrew the cover and mechanically push in the safety pin.

#### 2) Burner thermal protection

A temperature sensor connected to the burner control unit is located in the burner body. In case of overheating above 65 °C (the temperature setting can be modified - only qualified service), an alarm condition occurs and the fuel supply to the burner is interrupted. The burner goes into extinguishing mode.

#### 3) Optical sensor

An optical sensor monitors the intensity of the flame in the combustion chamber. If the light intensity decreases, the burner is extinguished and cleaned. Subsequently, when heat is required, a restart occurs.

#### 4) Engine thermal protection

It is part of the engine and serves to protect it from burning in the event of a fuel feeder blockage.

#### 5) Fuel injection pipe (only for burners over 40 kW)

In the upper part of the burner there is an oven equipped with a check valve with a counterweight. During backfiring, the flap locks the fuel inlet and also prevents the fire from entering the fuel tank.

### 6) Flexible fuel spreading pipe

The flexible fuel spreading pipe is a flexible coupling between the external feeder and the burner itself. Its main function is to supply fuel to the burner, additionally it also serves as a backfire protection. Due to the high temperature, the pipe starts to deform and coil, which makes it impossible to pour fuel into the burner.

#### **Warning:**

The boiler cannot operate without maintaining the prescribed chimney draft.  
(in case of high chimney draught, a chimney draught regulator must be used)

## 5 POSITIONING AND INSTALLATION

### 5.1 REGULATIONS AND GUIDELINES

The solid fuel boiler can be installed by a company with a valid installation licence for this equipment. The installation must be designed in accordance with the applicable regulations.

The heating system must be filled with water that meets the requirements of STN 07 7401: 1992 and its hardness must not exceed the required parameters.

**Table 3** Water hardness

Hardness	mmol/l	1
Ca <sup>2+</sup>	mmol/l	0,3
concentration of total Fe + Mn	mg/l	0.3 (recommended value)

a ) to the heating system

STN 06 0310 Central heating, design and installation.

STN 06 0830 Safety installations for central heating and DHW heating.

STN 07 7401 Water and steam for thermal energy installations with working steam pressure up to 8 MPa.

STN EN 303-5 : Central heating boilers - Part 5: Solid fuel-fired central heating boilers, manually or automatically fired, with a rated thermal input not exceeding 300 kW - Terminology, requirements, testing and marking.

b ) on the chimney

STN 06 1610 Parts of flues of domestic appliances.

STN 73 4201 Design of chimneys and flues.

(c ) with regard to fire regulations

STN 06 1008 Fire safety of thermal installations.

STN 73 0823 Fire-technical properties of materials. Degrees of combustibility of building materials.

STN 73 0861 Fire safety of buildings. Flammability testing of building materials. Non-combustible materials.

EN 60 335-1A55 : 1997 Electrical safety Appliances for household and similar use - Safety requirements for household appliances  
d ) to the electricity grid

STN 33 0160 Electrotechnical regulations for marking terminals of electrical objects. Implementing rules

STN 33 2000-4-41 Protection against electric shock.

STN 33 2000-5-51 Electrotechnical regulations. El. equipment. Part 5: Construction of electrical installations. 5.5 Electrical installations.

STN 33 2030 Electrotechnical regulations. Protection against the dangerous effects of static electricity.

STN 33 2130 Electrical regulations. Internal electrical wiring.

STN 33 2180 Connection of electrical apparatus and appliances.

SNT 33 2320 Electrical codes. Regulations for electrical installations in places where flammable gases and vapours are explosion hazards

STN 33 2350 Prescriptions for electrical installations in difficult climatic conditions.

STN EN 60 335-1 Safety of household and similar electrical appliances.

## 5.2 PLACEMENT OPTIONS

### 5.2.1 Positioning of the boiler in relation to the mains

The boiler must be positioned so that the fork to the 230V/50Hz socket is always accessible. The boiler shall be connected to the mains by a fixed connection to the moving lead terminated by a standardised plug.

Protection against electric shock must be ensured according to the valid EN

### 5.2.2 Positioning of the boiler in relation to fire regulations

Placement on a floor made of non-combustible material:

Place the boiler on a non-combustible heat-insulating pad extending 20 mm beyond the boiler footprint on the sides.

If the boiler is located in a cellar, we recommend placing it on a concrete slab at least 50 mm high. The boiler must stand horizontally.

#### Safe distance from combustible materials

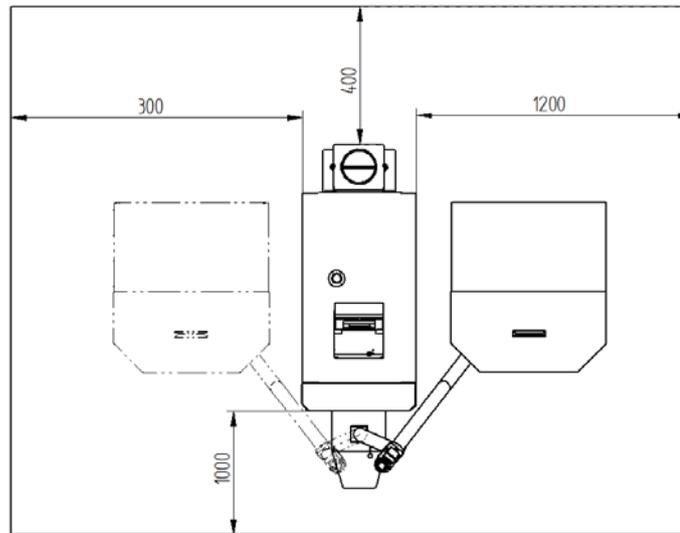
when installing and operating the boiler, a safety distance of 200 mm from combustible materials of flammable degree B, C, and D (according to STN EN 13501-1) must be observed (Table 2)

for easily combustible substances of E, F which burn quickly and burn themselves even after the ignition source has been removed (e.g. paper, cardboard, cardboard, asphalt and tar paperboard, wood and fibreboard, plastics, floor coverings), the safety distance is doubled, i.e. to 400 mm

the safety distance must also be doubled if the degree of flammability of the building material is not proven

**Table 4** Flammability ratings of construction materials and products

Degree of flammability building materials and products	of	Building materials and products classified in flammability classes (selection from EN 13501-1)
A1 - non-combustible		granite, sandstone, concrete, bricks, ceramic tiles, mortar, fireproof plaster,.....
A2- not readily combustible		acuminum, isuminum, heraclite, lignos, slabs and basalt felts, fiberglass sheets,.....
B - severely flammable		beech, oak, OSB, plywood, umakart, sirkolit,....
C,D - medium flammable		spruce wood, chipboard and cork, rubber flooring, .....
E,F - slightly flammable		asphalt board, fibreboard, cellulosic materials, polyurethane, polystyrene, polyethylene, PVC, ....



**Figure 9.** Boiler location

Location of the boiler in relation to the required handling *space*:

- basic environment AA5 / AB5 according to STN 33 2000-3
- there must be a handling space of min. 1000 mm in front of the boiler
- the minimum distance between the back of the boiler and the wall is 400 mm
- on the side of the fuel hopper, a gap of min. 1200 mm for removing the feed auger
- minimum distance from the left side wall 300 mm
- at least 450 mm above the boiler for cleaning the exchanger and refuelling

Location of the boiler in relation to the power grid:

- the boiler must be positioned so that the plug in the socket (230V/50Hz) is always accessible.
- the boiler is connected to the el. to the mains through a fixed floating lead terminated with a standardized fork
- protection against electric shock must be ensured according to the applicable EN STN (see chapter 4.1.)

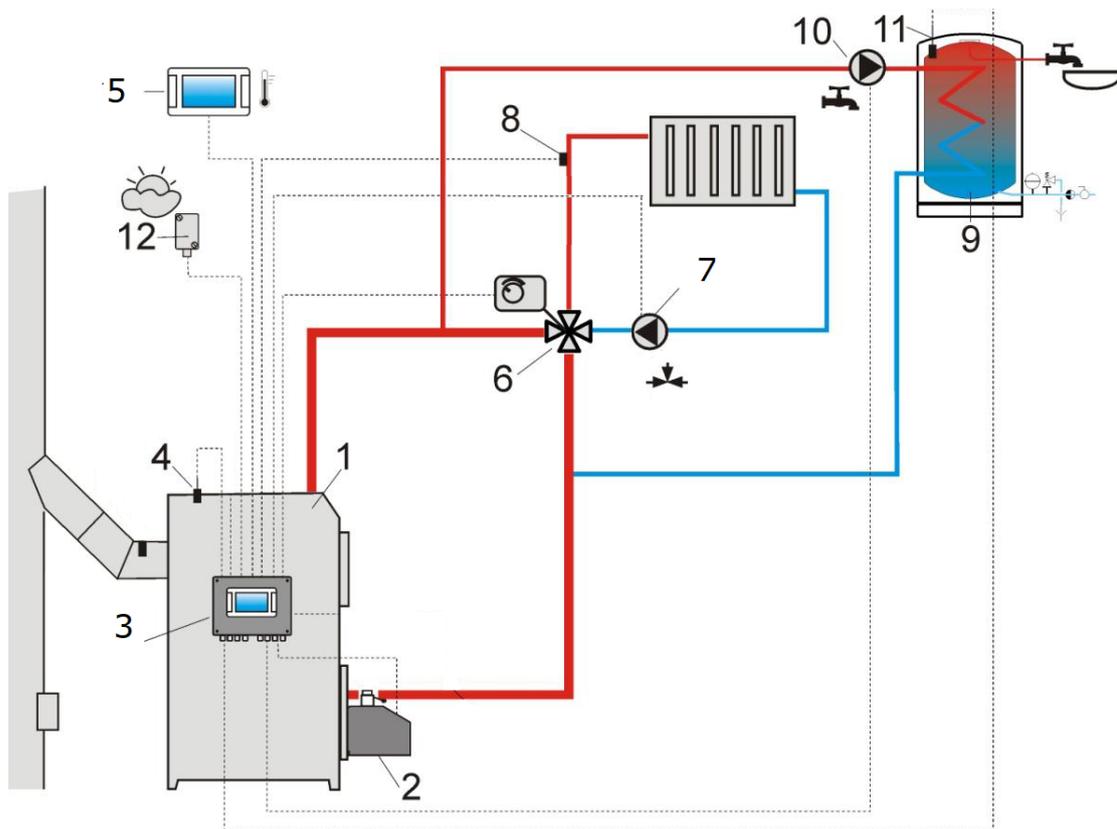
**Fuel location:**

- for proper combustion in the boiler it is necessary to use dry fuel. We recommend storing the pellets in their original packaging from the manufacturer (PET bags) in a dry place.
- it is forbidden to store fuel behind the boiler, to store it next to the boiler at a distance of less than 400 mm

- the manufacturer recommends to keep the distance between the boiler and the fuel at least 1 000 mm or to place the fuel in a different room than the installed boiler
- The room where the boiler is to be installed must be provided with a permanent supply and exhaust air for combustion and ventilation. Connection of the heating system pipework or DHW heater pipework must be carried out by a person authorised to do so.

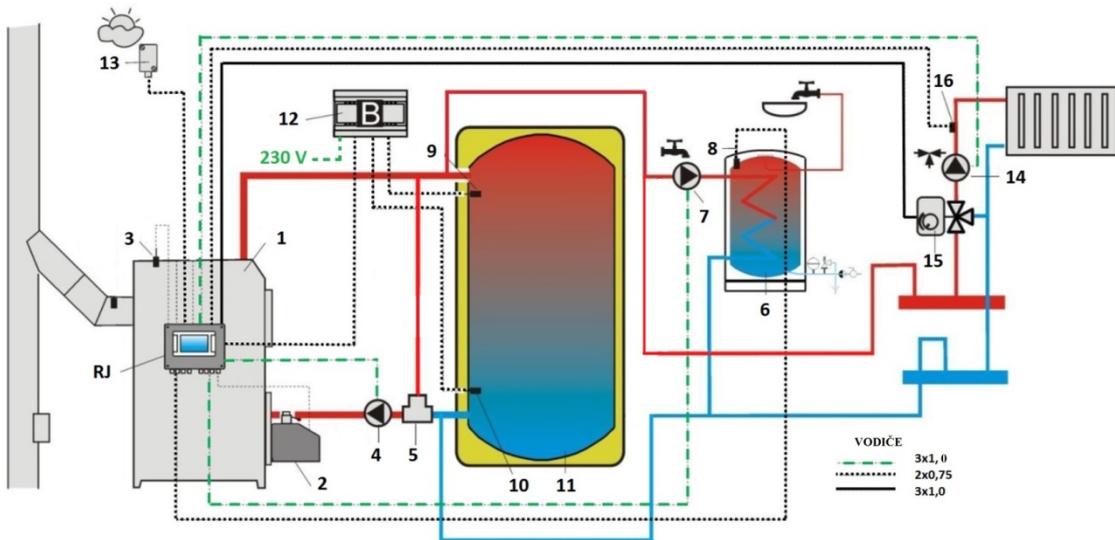
 When connecting the boiler to the heating system, a drain valve must be placed at the lowest point and as close to the boiler as possible. **PX series boilers are designed for closed heating system.**

### 5.3 Recommended wiring diagrams

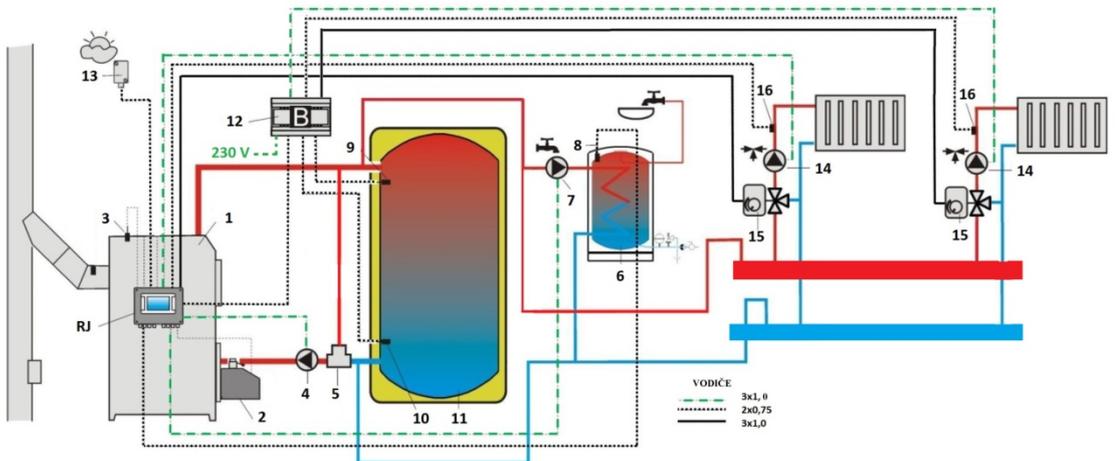


1. kotol
2. horák
3. riadiacka
4. snímač teploty kotla
5. izbový termostat
6. štvorcestný ventil

7. čerpadlo kúrenia
8. snímač teploty vykurovacej vody
9. zásobník TÚV
10. čerpadlo TÚV
11. snímač teploty TÚV
12. snímač vonkajšej teploty



- |                         |                                       |
|-------------------------|---------------------------------------|
| 1. kotol                | 9. snímač teploty AKU - horný         |
| 2. horák                | 10. snímač teploty AKU - dolný        |
| 3. snímač teploty kotla | 11. AKU nádrž                         |
| 4. čerpadlo kotla       | 12. B-MODUL                           |
| 5. laddomat             | 13. snímač vonkajšej teploty          |
| 6. zásobník TUV         | 14. čerpadlo mixu                     |
| 7. čerpadlo TUV         | 15. trojcestný ventil so servopohonom |
| 8. snímač teploty TUV   | 16. snímač teploty vykurovacej vody   |
|                         | RJ riadiaca jednotka                  |



- |                         |                                       |
|-------------------------|---------------------------------------|
| 1. kotol                | 9. snímač teploty AKU - horný         |
| 2. horák                | 10. snímač teploty AKU - dolný        |
| 3. snímač teploty kotla | 11. AKU nádrž                         |
| 4. čerpadlo kotla       | 12. B-MODUL                           |
| 5. laddomat             | 13. snímač vonkajšej teploty          |
| 6. zásobník TUV         | 14. čerpadlo mixu                     |
| 7. čerpadlo TUV         | 15. trojcestný ventil so servopohonom |
| 8. snímač teploty TUV   | 16. snímač teploty vykurovacej vody   |
|                         | RJ riadiaca jednotka                  |



hanging the boiler. Before hanging the boiler on the hanging eye it is necessary to remove the top lid of the boiler.

## 6 COMMISSIONING - Instructions for Contract Service Organisations

 **Start-up of the boiler can only be carried out by a contractual service organization authorized by the manufacturer, i.e. MAGA, s.r.o. If the boiler is put into operation by an unauthorised person, the warranty for defects caused by unprofessional installation will not be valid! The manufacturer is not liable for defects caused by unprofessional commissioning of the boiler!**

### 6.1 PRE-LAUNCH INSPECTION ACTIVITY

***Before putting the boiler into operation it is necessary to check :***

- a) filling the heating system with water

The water for filling the boiler and heating system must be clear and colourless, free of suspended matter, oil and chemically aggressive substances. Its hardness must comply with STN 07 7401 and it is essential that, if the hardness of the water is unsatisfactory, the water is treated. Even repeated heating of water with a higher hardness will not prevent the elimination of salts on the walls of the exchanger. Precipitation of 1 mm of limestone reduces the heat transfer from the metal to the water by about 10 % at a given location.

Heating systems with an open expansion vessel allow direct contact of the heating water with the atmosphere. During the heating period, the expanding water in the tank absorbs oxygen, which increases the corrosive effects, and at the same time there is considerable evaporation of the water. Only water treated to the required value according to STN 07 7401 may be used for replenishment. The heating system must be flushed thoroughly to wash out all impurities.

During the heating period it is necessary to maintain a constant volume of water in the heating system. When refilling the heating system with water, care must be taken to avoid air being sucked into the system. Water must never be discharged from the boiler and heating system except in cases of necessity such as repairs, etc. Draining water and filling new water increases the risk of corrosion and scale formation.



**If it is necessary to add water to the heating system, it should only be added to a cooled boiler to avoid damaging the steel heat exchanger.**

Before the boiler is put into operation, it is necessary to check

- a) tightness of the heating system
- b) connection to the chimney - must be approved by the chimney sweep
- c) connection to the electricity grid



**Completion of installation and first heating must be recorded on the "Warranty Certificate".**

## **6.2 FIRST COMMISSIONING AND SERVICE TRAINING (performed by the service technician)**

1. Attach the fuel hopper to the boiler, folded as shown in Figure 1 - insert the screw conveyor into the hopper
2. Slide the hose onto the conveyor and secure with SK tape.
3. Pour the pellets into the hopper
4. Plug the conveyor's power plug into an electrical socket (leave in operation for about 10 min until the conveyor fills up and the pellets start to fall through the hose)
5. Perform fuel feeder calibration and set parameters to the control unit
6. Tuck the other end of the hose into the burner
7. Now the boiler is ready for operation
8. Start the boiler using the control unit - see the operating instructions for the control unit
9. Heat the boiler to the required operating temperature. The recommended outlet water temperature is 65-80 °C.
10. Check the boiler for leaks.
11. To familiarise the user with the boiler operation
12. Make an entry in the Letter of Guarantee.

## **7 OPERATION of the automatic pellet boiler**

### **Start-up (heating in the boiler)**

- 1) Plug the device into the mains (insert the plug into the socket)
- 2) Check the amount of water in the heating system.
- 3) Check the functionality of the circulation pump
- 4) Check that the shut-off valves between the boiler and the heating system are open.
- 5) Fill the tank with the prescribed fuel. After refilling, close the container.
- 6) Switch on the electronic control by pressing the Touch & Play button, select Boiler On.

When the control unit is switched on, the boiler is in automatic mode.

### **IMPORTANT NOTICE**



**The boiler may only be operated by adults familiar with these operating instructions. It is not permissible to leave children unsupervised with the boiler in operation.**



If there is a danger of flammable vapours or gases entering the boiler room, or during work where there is a risk of fire or explosion (gluing floor coverings, painting with flammable paints, etc.), the boiler must be shut down before work begins.



Objects made of combustible substances must not be placed on the boiler and at a distance less than the safe distance from it.



When removing ash from the boiler, there must be no combustible substances within a distance of at least 1500 mm from the boiler. The ash must be deposited in non-combustible sealable containers.

 When the boiler is operated at a temperature below 60°C, the steel heat exchanger dew occurs and thus low-temperature corrosion occurs, which shortens the lifetime of the heat exchanger. Therefore, the boiler must be operated at 60°C and above. It is recommended to use a device to ensure a minimum return water temperature to the boiler of 55°C (thermovalve, Laddomat, etc.).

 After the end of the heating season it is necessary to thoroughly clean the boiler - exchanger, burner and flue.



It is forbidden to interfere with the construction and electrical installation of the boiler.

 The container lid must be closed during operation.

## 7.1 BOILER CLEANING

The combustion efficiency of the automatic pellet boiler P series is high around 97%. This means that only 1-1,5 % of ash is produced in relation to the weight of burnt pellets when the boiler control is set correctly and the combustion process is optimal. For less efficient combustion, the amount of ash produced increases proportionally. The 4 main parts of the boiler must be cleaned of ash every 7-14 days:

- Pellet burner ( internal burner chamber)
- Exchanger (remove the flue gas turbulators and remove the ash with a cutlass or brush )
- Inner walls of the boiler body (scrape the inner walls with a sharp cutlass)
- Chimney outlet

Always switch off the boiler before cleaning. Press the Touch&Play button and select to turn off the control. The shutdown process takes approximately 20 min. Cleaning can then begin.



**Use personal protective equipment when cleaning: we recommend protective gloves against burns and a respiratory protection against dust.**

## Cleaning the exchanger

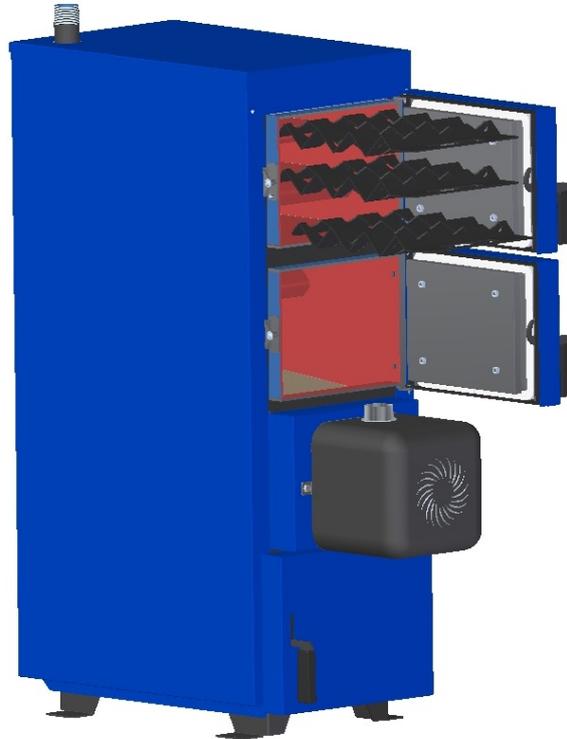


Figure 10. Exchanger of automatic pellet boiler PX series

### Ashtray

Empty the ash regularly (every time the fuel tank is refilled). Ash binds moisture which causes surface degradation of metal materials.



**Pull the ashtray out with a cutlass! This will prevent burns! Always use refractory material designed for hot ashes!**

The chimney outlet should be cleaned once a month or as required.



**Note: Regular cleaning is necessary to maintain optimum boiler efficiency, preventing problems with poor combustion and boiler operation.**

## 7.2 CLEANING THE PELLET BURNER

The necessity to clean the burner depends on the type of pellets burned. Burning DIN+ quality pellets produces less ash. When burning pellets containing bark, the burner must be cleaned more often. The burner is self-cleaning as standard.



### ATTENTION!

Servicing of the equipment may only be carried out when the power supply is switched off burner and boiler.

#### 7.2.1 Cleaning the photosensor

The photosensors in the burner should be cleaned once in a while with a damp soft cloth, similarly to diesel or gas burners. For this purpose it is necessary to remove the cover by loosening the screws. Then remove the photosensor from the socket, clean and refit. Once the above steps have been carried out, the burner cover must be fitted in reverse order.



Regular cleaning of the photosensor at least once every 3 months.

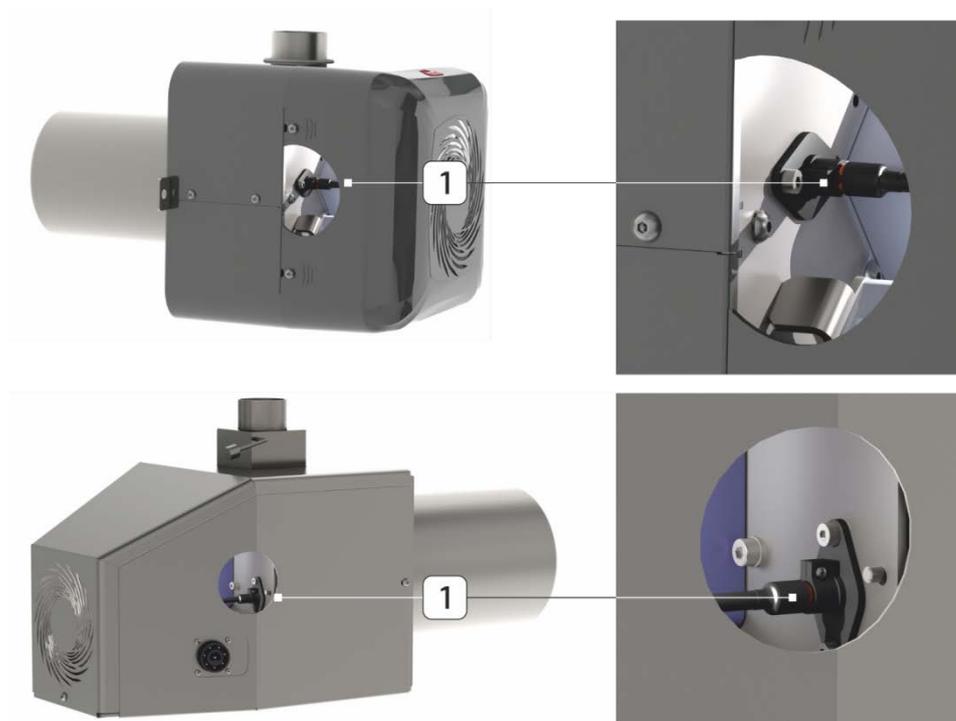


Figure 12. Location of the photosensor on the burners

#### 7.2.2 Replacing the lighter

If the igniter does not heat up despite the "ignition" message, then it is possible to admit that it is damaged. To replace the igniter, remove the burner cover. On the right side of the fan there is a steel housing with an electric igniter. Disconnect the electrical wires of the igniter from the electrical terminal, loosen the screw holding the steel housing cover and pull out the igniter. Reinstall the new igniter and burner cover in reverse sequence.

### 7.2.3 Cleaning the feeder tube

If a fuel bag string or other object gets into the feeder tube and blocks the feeder operation, the feeder motor will overheat and trip the fuse via the temperature sensor located in the motor. To remove the object from the feeder tube it is necessary to pull the power cord from the socket in the actuator unscrew the screws securing the actuator gearbox to the feeder tube pull the spring from the pipe and remove the object that was the cause of the malfunction. Reassemble it and check that it works.

### 7.2.4 Burner cleaning

One of the causes of the burner not igniting may be the chips lying in the burner chamber. The lighter will not ignite the fire when it comes into contact with the tinder because tinder is non-flammable. When we are not sure of the quality of the fuel, it is necessary to clean the burner combustion tube of swarf and ash at the beginning of each day and every once in a while thereafter. When the burner is pulled out, remove the ash and cinders preferably with a wire brush or small cutlass. A common cause of swarf build-up is the burner being switched off by the main switch. Suddenly stopping the air (oxygen) supply to the firebox causes insufficient combustion of fuel residues. If the burner is relighted without cleaning it of swarf and ash, the burner may smoke as insufficient swarf can pass through the holes blocked by swarf.

the amount of oxygenating air.

**HOWEVER, before turning off the electrical power to the burner, an extinguishing process must be performed.**



**ATTENTION!**

**Always carry out burner maintenance on cold burner!**

**In case of more serious malfunctions, please contact a service technician**

**ATTENTION!** During the service inspection (every 12 months), the service technician performing the inspection must remove the combustion tube from the protection tube, clean the protection tube of ash and bleed the air nozzles in the heating tube.

**The boiler door must not be opened while the burner is operating.**

**Otváranie of the boiler door is only allowed after the burner has been extinguished and disconnected.  
power supply.**

#### **Overview of service inspection activities:**

- checking the automation settings
- checking of safety devices (STB, boiler and burner temperature sensors)
- checking and cleaning the flame sensor
- checking the condition of the counterweight flap (if any)
- recording the status of service counters

- cleaning of the injection nozzles and the burner combustion tube
- checking the attachment mechanism and the condition of the combustion tube
- calibration of the lambda sensor (if any)
- burner leak check
- checking the condition of electrical connections
- checking the condition of the lighter

## **Safety regulations for the installation and use of the burner**

- **the burner may only be operated by adults after prior familiarisation with operating instructions.**
- **Children must not be allowed near the burner.**
- **it is forbidden to put your hands into the feeder tube and the burner's hopper tube, there is a risk of injury.**
- **the boiler door must not be opened while the burner is operating.**
- **opening the boiler door is only allowed after the burner has been extinguished and disconnected power supply.**

The burner is designed for burning pellets in boilers operated in the central heating system. The electrical installation must be made in accordance with the applicable regulations and safety rules. The electrical installation supplying the burner must be made in the TN-S system and secured by a 6A/30 mA fuse. A qualified electrician must be responsible for the installation.

**The first start-up and installation of the burner must be performed by an authorized service technician. The service technician will make an entry in the warranty card, which is located in the operating instructions.**

Any work or repairs to the burner or feeder must be carried out with the power cord disconnected from the mains. The room in which the burner is operated must be well and constantly ventilated. The burner must not be used in an environment with unsuitable conditions, e.g. excessively high temperature above 45°C, presence of aggressive compounds, poor ventilation, etc.

The following must be connected to the boiler: the capillary safety sensor STB and the boiler temperature sensor coming from the burner

**Failure of the user - owner of the burner to comply with the above SAFETY Manufacturer's REGULATIONS k. liability for improper operation of the burner and will void the warranty.**

**If the user installs the burner contrary to the manufacturer's instructions and instructions because will not have an acceptance report drawn up during the first commissioning of the burner by an authorized installer and confirmed by the user's signature, the user loses the right to repair of burner faults at the same time as the loss of warranty.**

## **8 POSSIBLE MALFUNCTIONS AND THEIR ELIMINATION**

1. The burner does not ignite the fuel.

Causes:

- Insufficient fuel - check the hopper and feeder for blockages.
- Very small starting dose - check the starting dose.
- Damaged lighter - check the ceramic lighter.
- Damaged drive motor - check motor temperature.

2. The burner ignites but does not achieve power.

Causes:

- Very large or very small dosage - check dosage.
- Dirty or malfunctioning photosensor - clean or replace the photosensor.

3. Burner overheating.

Causes:

- The burner's clogged with cinders.
- Weak chimney draught - use flue extraction.
- Clogged boiler heat exchanger or clogged chimney

4. Damage to the burner sensor - it is not possible to cancel the warning.

Causes:

- The most common cause of failure is damage to the thermal protection of the sensor, which ultimately leads to overheating of the measuring component. If the fault cannot be cleared despite cooling the burner, the measuring sensor must be replaced.

5. Clogging of the feeder.

The internal feeder is designed to add fuel evenly.

The reason for the clogging of the internal feeder may be:

- Incorrect adjustment of the internal versus external feeder - increase the operating time of the internal feeder (service menu /burner feeder).
- Gearbox damage - gearbox replacement .
- Incorrectly selected interval of feeder operation - the value must not exceed 20s. (service menu / burner interval).

6. Damage to the fan

Causes:

- Fan blade locking - unscrew the fan cover screws and check that they are not mechanically blocked.
- Check the voltage in the fan cables.
- Check the fan motor capacitor.

## **9. INSTRUCTIONS FOR THE DISPOSAL OF THE PRODUCT AFTER ITS USEFUL LIFE**

Since the product is constructed of common metal materials, it is recommended to dispose of the individual parts as follows:

- Boiler body, cladding - through KOVOŠROT
- Other metal parts - via KOVOŠROT
- Insulating material SIBRAL - for general waste
- KNAUF insulation material - for general waste

## 10. IMPORTANT NOTICES

-  This appliance is NOT intended for use by persons (including children) whose physical, sensory or mental incapacity or lack of experience and knowledge prevents them from using the appliance safely.
-  Leaving children unsupervised by adults near a boiler that is operating is not acceptable.
-  If there is a danger of flammable vapours or gases entering the boiler room, or during work that creates a temporary fire or explosion hazard (gluing floor coverings, painting with flammable paints, etc.), the boiler must be shut down in good time before the start of the work.
-  When transporting the fuel to the combustion chamber before smoking, it is necessary to check the amount of fuel in the burner visually, not by inserting your hands into the screw feeder. There is a risk of injury from the rotating check shaft
-  For ignition in the boilers is prohibited to use flammable liquids.
-  Opening the door during operation is prohibited
-  When operating the boiler it is necessary to keep the lid of the storage tank carefully closed.
-  The fuel is filled into the container up to a maximum height of approx. 30 mm below the bottom edge of the filling opening so as to ensure reliable closure of the fuel container lid.
-  Objects made of combustible materials must not be placed on the boiler or at a distance less than the safe distance from it.
-  When removing ash from the boiler, there must be no combustible substances within a distance of at least 1500 mm from the boiler. The ash must be deposited in non-combustible containers with lids.
-  When the boiler is operated at a temperature below 60°C, the steel boiler body dews, thus causing low temperature corrosion, which shortens its service life. Therefore, the boiler must be operated at a temperature of 60 °C and above.
-  After the end of the heating season it is necessary to thoroughly clean the boiler, including the flue pipe. The boiler room must be kept clean and dry.



It is forbidden to interfere in any way with the construction of the boiler electrical installation.

## 11. Risk analysis

The risks arising from the operation of the boiler under conditions of expected use and reasonably foreseeable misuse have been minimised by available technical means.

In spite of the implemented design and technical measures, certain residual risks remain in the operation of the boiler resulting from the risk analysis, which are determined by the technological process at different stages of the lifetime of the plant.

These are mainly risks caused by inattention of the boiler operator and non-compliance with the safety principles of operation.

In order to further reduce risks and to ensure a more effective safety protection, we draw attention to the possible occurrence of certain residual risks that cannot be eliminated by any technical solution.



### Electrical risks

- connecting, maintenance repair of electrical parts of the boiler may only be carried out by qualified personnel in accordance with applicable technical regulations and standards
- the supply wiring must comply with the applicable regulations
- the supply cable and the boiler wiring must be regularly checked and maintained in the prescribed condition
- In case of any damage to the electrical equipment, the boiler must be taken out of operation, disconnected from the power supply and qualified repairs must be arranged
- it is forbidden to interfere with the wiring of safety circuits or to carry out any unauthorised interference related to the safety and reliability of the equipment



### Temperature risks

- the boiler must not be subjected to a higher working overpressure than prescribed
- it is forbidden to overheat the boiler
- the boiler must be protected against low-temperature corrosion by suitable wiring with automatic return flow protection
- only prescribed fuel may be burned in the boiler
- storage of combustibles in the vicinity of the boiler is prohibited
- when operating the boiler, maximum attention must be paid to the danger of burns



### Risks caused by fuel handling

- the handling of the fuel results in the emission of particulate matter, therefore the operator should use appropriate protective work equipment according to the degree of dustiness
- as it is a fuel, the relevant fire regulations must be complied with



### Ergonomic risks

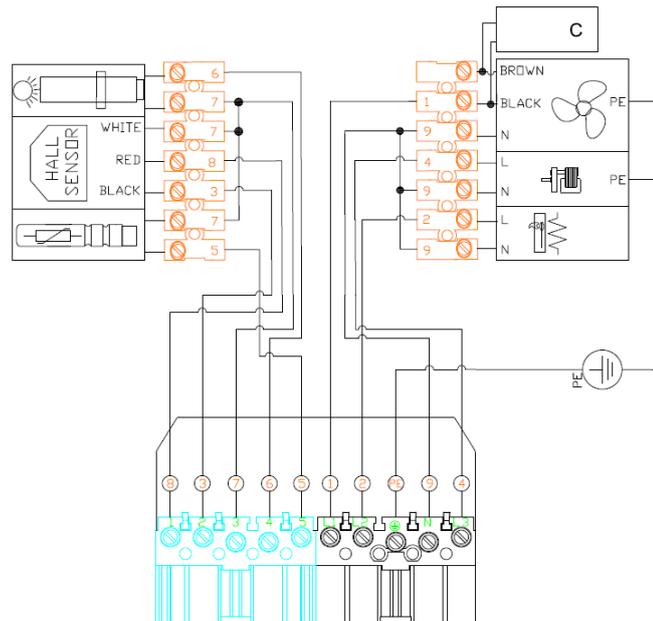
- the boiler must be in a horizontal position
- it is forbidden to insert your hands into the screw feeder
- all doors, lids and covers must be properly closed and secured when the boiler is in operation

## Risk analysis

Risk	Cause	Remove
- excessive fuel dosing	- wrong fuel dosing setting - faulty dosing motor - defective control unit	- set the dosage  - replace the engine - replace the control unit
- slow dosage	- wrong fuel dosing setting - faulty dosing motor - defective control unit	- set the dosage  - replace the engine - replace the control unit
- loss of air supply	- wrong fan setting - broken fan - defective control unit	- adjust the fan speed - replace the fan - replace the control unit
- loss of power	- incorrect fuel and air dosing - unsuitable fuel - lack of fuel in the tank	- set dosage and fan - use the prescribed fuel - refuel the tank
- open door	- wrong fit of the handle	- fixed door closure
- empty fuel tank	- unrefuelled	- refuel
- unsuccessful attempt at inflammation	- fuel shortage - defective ignition coil	- refuel - replace the ignition coil
- backfiring	- insufficient chimney draught	- use a chimney with the required draft

	<ul style="list-style-type: none"> <li>- broken burner temperature sensor</li> <li>- stuck check damper only PX20</li> <li>- clogged boiler exchanger</li> </ul>	<ul style="list-style-type: none"> <li>- replace the sensor</li> <li>- release the flap</li> <li>- clean the heat exchanger regularly</li> </ul>
- leakage of flue gases into the space	<ul style="list-style-type: none"> <li>- door leakage</li> <li>- chimney leakage</li> <li>- insufficient chimney draught</li> </ul>	<ul style="list-style-type: none"> <li>- replace the sealing cords in the door</li> <li>- fixed door closure</li> <li>- seal the joints</li> <li>- use a chimney with the required draft</li> </ul>
- vacuum in the room	- insufficient air supply from outside	- ensure sufficient air
- blocked boiler (STB)	- boiler overheating above 95°C	- after the boiler has cooled down, push in the STB
- malfunctioning burner	- broken burner	- emergency heating with wood
- short-term power outage		- the burner continues to operate after the outage is over
- long-term power outage		<ul style="list-style-type: none"> <li>- the burner goes out , after the burner failure is over starts automatically</li> <li>- we recommend a backup power supply</li> </ul>
- possible injuries to the operator	- hot surfaces	<ul style="list-style-type: none"> <li>- do not open the burner door while the appliance is running</li> <li>-hot ash and ashtray shortly after the burner is extinguished</li> </ul>

**Electrical diagram**



**Figure 13.** Electrical diagram of the burner for boiler P X

## 11. WARRANTY AND LIABILITY FOR DEFECTS

**Warranty and post-warranty repairs are carried out by:**

MAGA s.r.o.  
S. Kollára 86  
979 01 Čerenčany

tel/fax: 047/56 34798  
Mobile: 0917/179 359  
E-mail: servis@magasro.sk  
www.magasro.sk

### WARRANTY LETTER

#### automatic pellet boiler PX series

This warranty certificate replaces the certificate of quality and completeness of the product. The manufacturer certifies that the boiler meets the conditions of the required quality, is complete within the scope of the documentation and complies with STN EN 303-5.

Product:.....

Manufacture ID:.....  
.....

Date of manufacture: .....

Manufacturer's stamp and  
signature

Sell by date:.....

Stamp and signature of the seller

Date of launch:.....

Stamp and signature

The warranty card becomes invalid unless it is duly filled in and confirmed by the dealer, or is overwritten !!!

(in this case the warranty is void.)

The customer is obliged to check all documents!!!

**By purchasing the product, the customer fully agrees to the warranty and warranty conditions of the product.**

**An integral part of the guarantee letter are also instructions for the customer - complaint and guarantee conditions.**

**Instructions to the customer - complaint and warranty conditions:**

- 1) Claims for completeness of delivery shall be made in accordance with the Commercial Code and the Civil Code with the Supplier.
- 2) The manufacturer warrants the product for 24 months from the date of sale to the end consumer, with a minimum return temperature of 55 °C during operation. The boiler body is guaranteed for 36 months from the date of sale of the product to the final consumer (the 36-month guarantee covers manufacturing defects in the boiler body if the boiler has been operated in a system with a storage tank).  
The warranty period begins on the date of sale of the product, regardless of when the product was put into operation.
- 3) The warranty does not cover defects that have occurred:  
Failure to follow the boiler operating and maintenance instructions, improper maintenance and operation, or the product has been used for a purpose other than that for which it is normally intended, low temperature corrosion of the boiler, poor or unprofessional handling or burning of unauthorized fuels, to failures caused by the use of components of others, other than those recommended by the manufacturer or supplier, as well as repairs or modifications by persons other than those authorised by the manufacturer or supplier, as well as defects caused by accidental or deliberate ingress of liquids, insects, animals or foreign objects into the product.
- 4) Should a component fail, it will be repaired or replaced under warranty, upon delivery of the defective part and payment of the eligible shipping costs.
- 5) The warranty remains valid as long as the product is used as written and specified in the warranty card, if the relevant instructions are not followed, the warranty will be void, as well as for damage caused during transport that was not provided by the manufacturer's means of transport and its drivers. For this reason, it is necessary to inspect the product properly when taking delivery and to report any shortcomings or defects to the dealer when taking delivery of the product.
- 6) The customer loses the warranty in case of malfunctions caused by improper wiring of the product (failure to follow the wiring specified in the instruction manual), in case of overload due to high voltage or voltage changes, or due to the use of fuel that is not intended for this type of product.  
All materials subject to normal wear and tear are excluded from the warranty: gaskets and sealing cords, reinforced concrete fittings and fillers, sibral fillers. The guarantee will not be granted and acknowledged in the event that the customer fails to meet the agreed payment terms when due to the retailer.  
Minor variations in colour, paintwork or dimensions are not grounds for complaint.  
Transportation of the service technician is not covered by the warranty and is fully paid by the customer.
- 7) The warranty is void if the service inspections specified by the manufacturer are not complied with.
- 8) Any complaints of any kind must be made **in writing** by the end user of the product, **but** no later than three working days from the date on which the end user became aware of the defect, by post or by fax or electronic means, and provide the supplier with all the information required; reports of defects sent otherwise than by post must be confirmed in writing by letter within three days at the latest. The person entitled shall be obliged to provide the Supplier with proper proof of the damage

caused by the defect in the product without undue delay, but at the latest within three working days of the Supplier's request. The manufacturer is obliged to take a position within 30 days of the user reporting the complaint in writing and, if the complaint is accepted, to rectify the defect.

The costs of unjustified claims, defects caused by the user's failure to comply with the instructions for use, improperly performed installation resulting in faulty operation of the product, or reduced performance, shall be borne in full by the user of the product.

Product liability rights for defects in the product for which the warranty period applies shall be extinguished if they have not been exercised within the warranty period.

When purchasing the product, the customer was familiar with the operation and operation of the boiler.

The manufacturer disclaims any liability for damages to health or property, whether direct or indirect, including consequential damages.

Claims arising from product defects are without prejudice to claims for compensation for damages caused causally in connection with a product defect. The manufacturer reserves the right to change the design as part of product upgrades that may not be included

in this manual.

In the event of tampering with the boiler's electrical parts by anyone other than a service technician or a professionally trained employee, the warranty is void.

All products of MAGA, s.r.o. are certified according to valid standards and decrees. Technical or design changes are reserved. MAGA, s.r.o. is not responsible for printing errors.





## DECLARATION OF CONFORMITY

issued in accordance with the Machinery Directive No. 2006/42/EC of 17 May 2006  
(Slovak Government Regulation No. 436/2008 Coll.)

The manufacturer and the person responsible for compiling the technical file:

MAGA s.r.o.  
Samuela Kollára 86  
979 01 Čerenčany  
VAT NUMBER: SK 2020075904

declares under its full responsibility that the products listed above meet the requirements of the technical regulations, that the products are safe under the conditions of their intended use, and that we have taken all measures to ensure the conformity of the products listed below with the technical documentation and the requirements of the relevant government regulations.

**Product : PX series hot water pellet boilers**

**Type : PX 20 and PX 28**

**Description : Hot water pellet boiler for central heating of buildings**

**Relevant government regulations (NV)**

NV No. 436/2008 Coll. - Machinery Directive (2006/42/EC)

NV No. 576/2002 Coll. - Pressure Equipment Directive (2014/68/EU)

NV No 308/2004 Coll. - Low Voltage Directive LVD (2014/35/EU)

NV No 194/2005 Coll. - EMC (2014/30/EU)

**Harmonised standards used in conformity assessment**

STN EN 303-5, STN EN 60335-1, STN EN 60335-2-102/A1, STN EN ISO 12100

STN EN 61000-6-3/A1/AC, STN EN 55014-1/A2

STN EN 61000-3-2/A2

STN EN 61000-3-3, STN EN 61000-6-2

**Additional data:**

Certificate No.0009/104/2022 dated 28.01.2022 and

Conformity assessment report No 2105000387 dated 27.01.2022

Issued according to EN 303-5

Place of issue of the declaration: Čerenčany

Name: Ing. Miroslav Müller

Date of issue: 28.01.2022

Function: managing director

Caption:

**MAGA s.r.o.**  
S. Kollára 86, Čerenčany  
979 01 PIMAVSKÁ SOBOTA