Mareli Systems

SMB 35 with auto-cleaning Pellet burner

Assembly and exploitation manual



- "Mareli Systems" expresses its gratitude towards the clients who purchased the manufactured products.
- "Mareli Systems" provides the present manual as an aid to the team, which will install, adjust and maintain the device, as well as to the client which will exploit it.
- "Mareli Systems" requires that the technicians who will carry out the above mentioned procedures have passed a training course on the activities, associated with this product.

ATTENTION! For Your safety, it's necessary to read carefully this manual as well as the exploitation and installation manual of the automated pellet burner before attempting any installation, adjustment and exploitation activities. Also read the installation and exploitation manual of the pellet bunker if the device is provided with one. The non-fulfillment of prescriptions and violation of active regulations and directives may lead to damage and unexpected consequences for which "Mareli Systems" accepts no responsibility.

Do not discharge into garbage container!!!

This sign on the burner means that the product must be disposed of only in an a specially designated for that purpose space for the collection and recycling of waste. Disposal of this device falls under the regulation of the Directive on waste of electrical and electronic equipment (EEE) of the European Union. Dear customers, let us contribute to the preservation of the environment!

- *This appliance is not intended for use by persons (including children) with limited physical, sensory or mental abilities or lack of experience and knowledge. The installation must be performed by a qualified expert in the field of heating installations or authorized by "Marelli Systems' service. The place and way of connecting the stove should be selected carefully in accord with the safety instructions. Install away from flammable objects!*
- *Never try to make changes to the torch! It is forbidden to use flammable liquids for ignition! Servicing the burner decorating your done by an adult who is familiar with the operating conditions!*
- *Introduction of inflammable liquids in room with a working burner is strictly prohibited!*
- *Children should not be left unattended in the room where the product is installed!*
- *Safe distances: When installing the product a safe distance of at least 200 mm must be respected. This distance applies to the product located near materials of B or C flammability level. The safe distance is doubled if the product is close to materials of C3 combustion level.*

1. Description and advantages of pellet burner "SMB 35 Kw"

Pellet burners of this series are designed to utilize wood pellets. It has a welded steel construction. The resulting heat is absorbed by the heat exchange surface of the boiler body and transmitted the heating system. These boilers used for heating in local heating systems, but also for heating domestic water.
Automated pellet burner is part of the system and can utilize the following types of fuel: Wood pellets size 6 and 8 mm Class A;

The facility comprises: pellet burner equipped with a control panel;

Advantages of the product:

- Designed to utilize pellets, making it cleaner for the environment;
- Price of pellets as a local energy source is lesser influenced by world prices of fuel and thus the value of the extracted heat is highly competitive in comparison to using conventional heat sources;
- Product is highly automated and can be used in systems with programmable room thermostat ensuring maximum thermal comfort and fuel economy;
- Efficiency;
- Low emissions;
- Compact design allowing for simple installation and easy maintenance and cleaning;
- Opportunity for domestic hot water (DHW);
- Minimal operating costs;

Basic information of pellet burner:

- The pellet burner is mounted horizontally secured by M8 screws.
- The pellet burner is an independent module that can be mounted on already installed boilers making it compatible with wood pellets as a fuel source.
- The burner is equipped with a control panel.
- Wood pellets allow easy automation of the process of combustion and give high efficiency. However, the wood pellets and any other solid fuel also live ash, but its amount is less than what remains from firewood or coal.

The pellet burner is a compact modular design with integrated electronic control unit, consisting of the following components:

1. Combustion chamber made of high quality stainless steel;
2. Grill in the combustion chamber that is easily removed and allows for easy ash removal;
3. Air duct, which ensures an even supply of air for combustion and cooling elements of the burner;
4. Electric heater, which ignites the fuel, positioned beneath the inclined portion of the combustion chamber;
5. Fan, equipped with a sensor for adjusting speed;
6. Photo-sensor, which monitors the combustion process and applies a corresponding program;
7. Emergency temperature sensor to prevent "Backfire" in the pipe of the unit;
8. Controller, which monitors and controls the burner and indicates its mode of operation;
9. Connector auger, which realizes the power of the auger;
10. Interface panel equipped with indicator lights;
11. Transparent panel that shows the operation of the controller;



Electrically powered auger that transports fuel to the burner depending on the operating mode of the burner. The screw consists of a compact geared motor with a built-in protection against overheating tube which transports fuel until it reaches the hole through which is supplied to the flexible tube. The flexible tube is made of special heat-resistant material (which in the case of combustion does not emit toxic substances) and connects the auger and pellet burner.

End view of the system for pellet burner auger

- The installation must be performed by a qualified expert in the field of heating systems. The place and way of connecting the burner must be chosen carefully, follow the safety instructions!!!
- Never try to make changes to the torch! It is forbidden to use flammable liquids for ignition! Maintenance should be done by an adult who is familiar with the operating conditions! Introduction of inflammable liquids in room with a working burner is strictly prohibited! Children should not be left unattended in the room where the product is installed!

Table degrees of combustibility	
Degrees of flammability of construction materials	Building materials with a degree of flammability
A - non-flammable	Granite, sand, concrete, ceramics
B – not easily flammable	Acuminata, isomin, Heraclitus, basalt tiles, fiberglass, novodur.
C1 - hardly flammable	Deciduous. lumber, plywood, werzalit and others.
C2 - medium inflammable	Coniferous wood, cork boards, rubber flooring
C3 - inflammable	Chipboard, cellulosic materials, polyurethane, polystyrene and others.

2. Measures to improve safety

- The burner is controlled by a microprocessor.
- The process of ignition is monitored by a photo sensor, if there is no ignite the first time, the microprocessor feeds a second dose of pellets and ignition starts again. If after 2 attempts ignition does not take place burner goes into standby mode.
- If the hopper has no more pellets, the burner will not ignite.
- Flexible pipe for transporting the pellets is made from heat-resistant material. If during operation temperature sensor detects a temperature higher than 90 ° C, the auger conveyor stops and the burner is turned off. The temperature has to fall below 90 ° C, for the safety measures to stop .

3. Connection (installation) to the boiler:

The pellet burner can be attached to a steel or cast-iron boiler with power from 10 to 35kW. The minimum depth of the combustion chamber should be 450 mm. Pellet burner without secondary air supply.



- Distance between the flame and the cooling surface of the boiler 150mm.
- The unit is located so that there is enough space for cleaning, removing ash from the burner, boiler and exhaust pipes.
- Putting objects on the unit is forbidden, so as not to break the seal. There is a danger of breaking and violating the integrity of the burner.
- The opening for installation of the burner must have a width 128 mm and height of 121 mm. The size of the door, to be joined must allow for the incision of the above-described mounting hole (if there is none).
- The burner is installed in the boiler door with the corresponding seal. Secured tightly with screws M8. The relationship between the burner and boiler should be well sealed in order not to get gas leaks into the room. When installing the equipment is in optimal horizontal position and the inlet hose pellets should be straight and clamps must be properly tightened.

Appendix 1

Reconstruction of hot water boiler with automated burner

- Cut a hole in the available door (if there is no such planned). The sizes described in the instructions should be respected.
- Thoroughly clean the interior walls of the boiler from ash residue, soot, etc., which would have led to appearance of thermal resistance during operation. After cleaning, the drawer for collection of the ash from the combustion chamber must also be taken out.
- Then, mount and securely attach a pellet burner to the door through M8 screws (which are screwed, where the thread is made on the door itself), which holds the burner to the door.

Explanation: It must be checked whether sealing ropes of the doors fit snugly to the boiler housing. If any gaps are found, the corresponding sealing rope must be replaced and ensure the density of this zone;

- Install the fuel supply conveyor, which feeds the automated pellet burner.

CAUTION: Before installation of the valve must be drained circulating water from it!

- Install the fuel transport auger that feeds the pellet burner.

The fuel supply conveyor must be installed in such a way so that fuel can be freely extracted from the hopper – from its lowest point. In the event that the hopper is made/assembled on site, it is recommended to make a manhole for servicing the rowing area of the screw conveyor. The screw conveyor pipe itself also must be fastened, so as to ensure against upheaval and possible change of the screw conveyor axis angle against the horizontal plane.

Explanation: The tilt angle (between the screw conveyor axis and the horizontal plane) of the screw conveyor has a direct effect on its performance, i.e. the fuel flow which it will provide at a specified operating mode. That is why adjustment of the burner settings is likely to be required upon change of this angle, in order to insure specific heating power.

- Provide the power supply directly through a plug. Before connecting to the power the burner must be earthed through a 4 mm2 copper wire with yellow-green insulation.

Power supply is provided through a Shockproof type plug directly in the mains.

CAUTION! The burner control unit should be plugged into an outlet, which must be earthed. There is a risk of electric shock in the absence of earthed plug! The manufacturer bears no responsibility!

Pellets are stored in a hopper. Mareli hoppers have a 45-degree tilt. The screw conveyor pipe must be placed therein. The Screw conveyor draws pellets from the hopper and feeds the burner through a flexible connection. Dosing is controlled by the control unit by changing the operating time of the screw conveyor. The initial loading of the screw conveyor with pellets (filling the screw conveyor pipe) is carried out when the screw conveyor plug is connected to a normal 230V/50Hz outlet. As pellets start to fall through the flexible connection, the plug is shifted to the burner.

Important: For ensuring normal operation of the burner a 20 Pa chimney draught is required. After starting the burner, wait for about 3 hours for the chimney to be warmed up and measure the draught. Install additional chimney fan (controlled by the control unit of the burner) if necessary.

The heat exchange surface is made of high quality low-carbon stainless steel. Wear is extremely slow, and cleaning is done with a soft damp cloth without any cleaners.

4. Maintenance and operation of the pellet burner

Requirements for the characteristics of the fuel, which is used for operation of a pellet burner SMB 35
The following table shows the requirements for the types of wood pellets utilized in automated pellet burner.

Table 1

Parameter	uom	Value
Typical grain size	mm	6-8
Recommended calorific value of fuel (lower calorific value)	MJ/kg	>17.2
	kWh/kg	>4.7
Category of wood pellets	A	
Ash content	%	See Table 2
Humidity	%	Max 8-10%

The following table shows classification of wood pellets depending on their physical parameters - according to an evaluation methodology applied by Mareli Systems:

Pellets are stored in a pellet hopper at a dry and ventilated place.

Table 2

Pellet types	A^d	DU
A	$A^d \le 0.6\%$	$DU \ge 97.0\%$
AB	$A^d \le 0.6\%$	$DU < 97.0\%$
B	$0.6 < A^d \le 1.0\%$	$DU \ge 97.0\%$
BC	$0.6 < A^d \le 1.0\%$	$DU < 97.0\%$
C	$1.0\% < A^d \le 2.0\%$	$DU \ge 97.0\%$
CD	$1.0\% < A^d \le 2.0\%$	$DU < 97.0\%$
D	$2.0\% < A^d \le 3.0\%$	$DU \ge 97.0\%$
DE	$2.0\% < A^d \le 3.0\%$	$DU < 97.0\%$
E	$A^d > 3.0\%$	$DU \ge 97.0\%$
EF	$A^d > 3.0\%$	$DU < 97.0\%$

Ad - ash content in dry mass
DU - Mechanical resistance

Appendix 2
Technical data

MAXIMAL CAPACITY	KW	10 - 35
POWER CONSUMPTION	W	60/350
HEIGHT H	mm	315
WIDTH W	mm	230
DEPTH D	mm	693
FEEDER	mm	1400/63
EFFICIENCY	%	92
THE CHIMNEY DRAFT	Pa	20
WEIGHT	kg	24
FUEL		pellet Φ6-Φ8
MIN/MAX FUEL CONSUMPTION PER H	kg/h	2.0 – 10.0
NOISE LEVEL	dB	56 ±3 dB
ELECTRIC POWER SUPPLY	V/Hz	230/50
WORKING ENVIRONMENTAL TEMPERATURE	C	5-40
HUMIDITY LEVEL, WORKING RANGE 30 C	%	85

The joint operation of the system which the automated pellet burner applies to / depends on:
- Heat output to which the burner is set;
- The heating surfaces of the heater, for which it is intended.
- The seal degree of the door and covers of the combustion chamber (condition of sealing ropes);
- Chimney draught;

Good chimney draught is essential for proper functioning of the heating system. Boiler capacity and economical operation depend largely on it. The heater can only be connected to a chimney with a good draught.

Attention: Suffocation hazard due to lack of oxygen in the installation room.
- Ensure sufficient fresh air supply through holes out.
- Risk of injury/damage to equipment due to lack of combustion air can lead to tar and noxious gas formation.
- Ensure sufficient fresh air supply through holes out.
- Notify the user of the installation that these holes must remain open.

NOTES:
When using the circulation pump for the transmission of heat energy from the hot water boiler to the heating system,d it is not recommended that the return („cold ") water's temperature is lower than 60oC. A local (in the heat exchanger of the boiler) over-cooling of flue gases and condensing water vapour is possible, which is one of the end products of fuel combustion.
Continued operation of the burner is not recommended when the heat rating is less than 50%, since such operating modes are not efficient and not cost effective, unless the combustion process is not set up exactly in such operating mode.

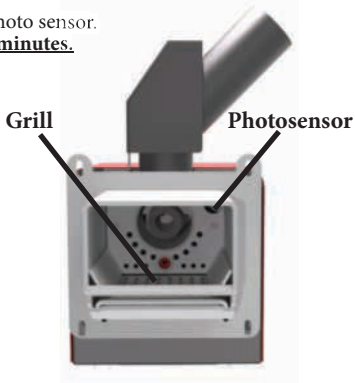
EXPLANATION: If the boiler has to operate in a heat power mode which is lower than 50%, it is recommended that a heat accumulator is installed to the heating system which to ensure a reliable, economical, and efficient operation of the boiler-burner system in the installation.

Why is regular maintenance important?
Heating systems should be maintained on a regular basis for the following reasons:
- To maintain high efficiency and to operate the heating system economically (with low fuel consumption);
- Achieving high safety of operation;
- Achieving high environment-friendly combustion;

5. Pellet burner cleaning

The appliance must be cleaned regularly for long and good operation of the pellet burner. Cleaning is done when the burner is stopped and switched off from the mains. The more qualitative the pellets used are, the longer the intervals between cleaning will be.
The main elements in the burner to be cleaned are the grate and the photo sensor.
It is mandatory daily cleaning of the basin. Cleaning takes about 5 minutes.

Cleaning sequence:
1. Turn off the burner.
2. Wait for the fan to blow out and cool down the burner. The display will show OFF.
3. Switch to OFF the power supply button.
4. Open the boiler door.
5. Using gloves or pliers (temperature is still high), remove the grate and clean it.
6. Place the grate back into the burner.
7. Make sure the basin stops are in position. Improper installation will result in auto-shut off of the burner thereafter.
8. Switch to ON the power supply button.
9. Start the burner.



Clean the photo sensor once per every 2 months or more often if necessary. Simply open the top cover of the burner by unscrewing the fixing screws. The photo sensor is located in the upper left corner. Remove the fixing screw and clean with a dry soft cloth. Check the fan, and clean it if necessary.
Do not use any cleaning agents.!

Boiler: Clean the ashes from the boiler with a brush and remove the soot.
Pellet hopper: Clean the pellet hopper periodically. When using lower quality pellets, they generate ash, which accumulates on the hopper base and impedes the passage of the pellets.

MANUAL MODE FOR THE CLEANING MECHANISM - when the switch on the burner is activated in this mode, the cleaning mechanism is managed by the user. This is done through the **FORWARD** and **BACK** buttons on the bottom right of the product. This allows the user to activate the cleaning mechanism of the unit when it is in **OFF MODE**. This feature is especially useful in the case when additional cleaning of the device is necessary.



BACK - in manual mode activating this button makes the cleaning mechanism go back.

FORWARD - in manual mode activating this button makes the cleaning mechanism go forward.

AUTOMATIC MODE FOR THE CLEANING MECHANISM - when the switch on the burner is activated in this mode, the cleaning mechanism is managed by the electronic control board of the unit. This is done automatically during the use of the device.

IMPORTANT !!!
Manual mode for the cleaning mechanism can only be used when the unit is in **OFF MODE**. When the product is functioning or is in **RUN MODE** the switch for the cleaning mechanism must be placed in Automatic mode in order to insure the correct operation of the product.

Additional instructions:
1. Remove the ash and slag from the boiler once a week or according to the volume of ashtray.
2. Check boiler flues periodically and clean them if there is congestion.
3. Check the burner adjustment once a year using a gas analyser.
4. Clean ash at the pellet hopper bottom once a year.
5. Clean boiler chimney once every two years.
6. If there is law draught in the chimney, install additional chimney suction fan. Its control is planned and integrated in the control unit of the burner.

When necessary	Weekly	Once per every two weeks	Monthly	Every 6 months	Annually	
X	X	X				Clean the combustion chamber, if solid ash precipitated
		X	X			Clean the dust and ash under the grate of the burning chamber
X				X		Clean the photo sensor
				X		Clean the fan from dust – if necessary
X		X	X			Clean the burner and the boiler
					X	Check the sealing rope and replace it when worn out
X						Adjust the burner set up

The maintenance timetable is recommended, cleaning must be made whenever necessary.

The need of cleaning varies individually, since the choice of pellets, the system itself, and the settings of the burner affect the frequency of cleaning. Unforeseen risks upon cleaning and maintenance.
Hand burn hazard: Possible reason – high temperature in the burning chamber. This risk exists in case of unburned fuel pellet, as well as not cooled burner when cleaning by the user!
It may occur upon cleaning and maintenance of the burner. The use of special protective equipment (gloves) is recommended!
Electrical shock hazard: The maintenance of the burner during operation as well as under voltage is prohibited! If a short circuit or possible damage occurs, an authorised technician should be called. Touching the conducting parts is prohibited!
Dust in eye hazard: May occur during work both upon cleaning and maintenance. The use of special protective equipment (safety goggles, tightly fitted) is recommended!

CAUTION: Periodic cleaning, as well as supervision of the burner will prevent any incidents caused by faulty pellet fuel, incorrect slopes of burner and of screw conveyor, as well as incorrect combustion settings. Read this manual before installing and working with the burner. The manufacturer bears no responsibility!

A burner with properly adjusted settings operates well and cost-efficiently. If there are problems, please, contact the supplier for the removal of any defects or for setting up the burner.

POSSIBLE FAULTS AND TROUBLESHOOTING:
The verification shall be carried out only by a qualified electrical technician or an authorized by Mareli Systems service centre.

The unit does not work:
- Check the hopper for sufficient quantity of pellets.
- Check operation of the heater.
- Check operation of the screw conveyor (whether it feeds pellets). Check the flexible connection. The facility does not start: (display is not illuminated).
- Check fuses on the circuit board.
- Check the power source for loose connections.

ATTENTION! CUT OFF THE POWER SUPPLY.
Ignition failure:
- The initial dose of pellets is insufficient (increase parameter 02)

Faulty heater - check it with a multimeter
- High fan speed (decrease parameter 04)

Fuel feeding is OK, but the ignition fails:
- Check the igniting heater with a multimeter;
- Check the voltage supplied to the igniting heater with a multimeter;
- Upon interruption of the facility's operation (poor combustion, etc.) check the condition of the flue and clean any debris and soot caused by the condensation.

It is important that faulty parts to be replaced immediately !!!

Always keep in stock additional photo sensor and heater for replacement.

At the end of the period, upon decommissioning the burner, clean the fuel surfaces from any deposits. Clean the screw conveyor and the hopper from residual sawdust. Cut off the burner power supply.

Additional information:

1. Cables of the thermal sensors can be extended up to 10 m.
2. Installation of the thermal sensors should be done with immersion sleeves or applied under insulation pipes.
3. Sensors are part of the controller. Do not replace them with others.
4. Indoor thermostats with relay output must be used.
5. Bedroom thermostat cable section - 2x0.75mm2
6. The required chimney draught is at least 20 Pa. Install additional chimney fan (controlled by the control unit of the burner) if the values are lower.
7. When wiring pumps or a chimney fan, the wiring inputs in the housing of the burner must be used. If there is a shortage of inputs, additional inputs must be installed.
8. The burner ignites more easily at low fan speed. Carefully adjust parameter 04. Recommended values are 15-18%.
9. The time for pellet loading before ignition - parameter 02 (first dose), must be sufficient so that the fallen pellets.
   Cover the holes in the combustion basin.
10. The initial ignition of pellets produces large volume of smoke. If there is no additional chimney fan, smoke leakage is possible through the seals on the boiler doors. The smoke usually disappears during normal operation.
11. To achieve the desired output of the burner, do the following:
    - Start the burner and wait it to go to the 5-th degree of power.
    - Remove the photoelectric cell from the connector and keep light conditions of the photo-electric cell over 100 units.
    - Disconnect the flexible connection from the burner and collect the pellets passed from the conveyor into a bag for 10 min.
    - Weigh the pellets passed and multiply by the factor 0.03.
    - The calculated value is the power in KW/h.
    - Example: If the screw conveyor passes 1,300 g pellets for 10 min. 1,300x0.03 = 39 Kw/h - heating power.
12. It is recommended that the time for pellet feeding is half of the time for rest.
13. Indoor thermostat is connected to a filter for about 3 minutes. This means that the START signal from the thermostat shall be read as such 3 min. after it has been reported to the control unit. It is similarly for the STOP signal. If there is a signal of overheating from the back combustion sensor, the fan of the burner continues to operate for about 5 minutes in order to purge and cool.
14. If during the winter period the facility will not use, the installation must be drained or filled with non-freezing fluid (polypropylene glycol).

Instructions for installer and service technician:

Screw conveyor installation:

Install the screw conveyor at an angle of 45 0 into the pellet hopper.
Fill the hopper and plug the screw conveyor to 230V/ 50Hz. Wait for the screw conveyor pipe to be filled with pellets and switch the plug to the burner. In order to ensure the normal free-fall of the pellets from the screw conveyor to the burner, the flexible connection must be well tensioned and the difference in levels between the screw conveyor outlet and the burner input shall be at least 40 cm.

Parameter adjustment:

The fuel process of the burner depends on several parameters. Fan speed (in percentages), time for feeding pellets from the screw conveyor (s), time for the rest of the screw conveyor (s). These parameters are adjusted separately for the five degrees of power. The degrees are upstream. It is not recommended that the power of the first or second degree is greater than the power of third, fourth, and fifth. For the recommended settings, please refer to the manual for programming the controller of the pellet combustion system.

If the facility does not operate satisfactorily:

- Check the quality of pellets (must be free from dust). Upon normal operation of the burner, the quantity of the pellets on the grate (combustion basin) must be such so that its holes are covered.
- Check the exhaust temperature (175- 240°C).
- If the temperature is very high, decrease the pellets fed. If the temperature is very low, increase the amount of input air.

It is important to replace faulty parts immediately!!!
Always keep in stock additional photo sensor and heater for replacement.

The criterion for good operation of the burner is the colour of the flame - IT MUST BE YELLOW. When it is dark red, mixed with smoke it is most likely that the volume of input air is less than required for good combustion and must be increased.
Adjustment of the air affects essentially the combustion mode, the aim must be a calm, stable combustion, without residue.
Sometimes, if the initial loading dose for ignition is large (Parameter 02), "choking" of the burner may occur, i.e. it may not ignite and upon re-activation of the ignition (second attempt) the basin may clog up with pellets. The volume of the first dose must be decreased so as to avoid choking.

NOTE: It is desirable when adjusting the burner settings to use exhaust gas analyser.

IMPORTANT:
Default values of the parameters should not be taken for granted. The settings must be adjusted individually according to REQUIRED POWER, TILT OF THE SCREW CONVEYOR, QUALITY OF PELLETS, CHIMNEY DRAUGHT, CUSTOMER REQUIREMENTS!

Switching off the burner and the boiler
Switching off the automated pellet burner should be done according to the guidelines in its manual. After cooling of the boiler, the burner also should be switched off. It is also recommended that the facility is cleaned from the accumulated ash.

An emergency stop of burner and boiler
During operation of the automated pellet burner an emergency situation may arise. Some situations of this kind are recorded by the burner controller and a procedure for their prevention is automatically performed. The monitoring controller also indicates the burner status. In the event of an accident check the reason for its occurrence and take appropriate measures for its removal.

ATTENTION: In the event of emergency situation - overheating the boiler, the additionally mounted mandatory emergency thermostat is activated. Determine the cause of this accident and take appropriate measures for its removal. This thermostat must be manually switched by unscrewing and removing the protective cap and pressing its button until it switches, then replace back the protective cap. Also, the burner needs to be restarted by switching it off and on.

Faults and Troubleshooting

In the presence of a fault in the operation of the burner-boiler system, one should be familiar with the problems and how to solve them as described in the user manual for operation of steel hot water boiler, as well as in such for automated pellet burner. In the following table this information is supplemented by data that will be of assistance to the service technician.

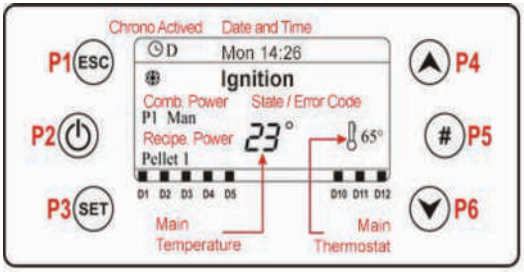
No.	Fault	Reason	Method of remedy
1	There is no pellet ignition	Faulty heater for fuel ignition	Check the status of the electric heater
2	There is no feeding of pellets in the area of combustion in the burner	Failure of the screw conveyor	Check the proper functioning of the drive gear motor. Check the connection of the engine to power control of the burner.
3	Smoke leakage of flue gases from the boiler	Leaks in the boiler	Check connection to the chimney. Check seals of the boiler doors.
4	Deformation of the burner in the area of the combustion process	Overheating of the burner structure	Replace the burner and change the combustion process settings.
5	Other problems	Must be specified by the service technician	Consult the service team.

In case of a failure, try to repair it or inform a heating specialist. As an installation user you may only make repairs, which involve just a simple replacement of the grate.

In case of „first "commissioning of the boiler condensation of water vapour on the heating surfaces of the heat exchanger may occur. This one-time process does not cause problems in the operation of the facility;

Operation of the automated pellet burner in modes, which exceed its heating power according to its technical parameters, is not allowed. In the case of exceeded rated thermal power of the automated pellet burner irrevocable deformations may occur in the area of the combustion chamber of the burner, which lead to its failure – in such cases the factory warranty of the burner is not recognized by the manufacturer.

CONTROL PANEL: USE AND FUNCTIONS



The main frame shows:
time and date, chrono activation, combustion power and recipe, functioning state, error code, main temperature, main thermostat, summer/winter mode.

Button	Function
P1	Exit Menu/Submenu;
P2	Ignition and extinguishing (push for 3 seconds), Reset errors (push for 3 seconds), Enable/disable chrono;
P3	Enter in User Menu 1/submenu, Enter in User Menu 2 (push for 3 seconds), Save data;
P4	Enter in Visualizations Menu, Increase
P5	Activation chrono time band
P6	Enter in Visualizations Menu, Decrease

LED

D1 - Heating Resistance;
D2 - Auger 1;
D3 - Pump 1;
D4 - Valve or Pump 2;
D5 - Auger 2;
D6 - Motor for cleaning engine;
D7 - Relay for cleaning engine;
D9 - External Chrono reached;
D10 - Lack of pellet;
D11 - Local Room Thermostat reached;
D12 - Sanitary water demand;

ALARMS

Er01 - Security Error High Voltage 1. It may also intervene with the system off;
Er02 - Security Error High Voltage 2. It can only intervene if the Combustion fan is active;
Er03 - Extinguishing for low exhaust temperature or missing light in the brazier;
Er04 - Extinguishing for water over temperature;
Er05 - Extinguishing due to high exhaust temperature;
Er06 - Pellet Thermostat open (flame return from the brazier);
Er07 - Encoder Error. The error may occur due to lack signal from Encoder;
Er08 - Encoder Error. The error can occur due to problems of adjustment of the number of revolutions;
Er09 - Water pressure low;
Er10 - Water pressure high;
Er11 - Clock Error. The error occurs due to problems with the internal clock;
Er12 - Extinguishing for ignition failure;
Er15 - Extinguishing due to power failure for more than 50 minutes;
Er16 - RS485 communication error (Display);
Er17 - Adjusting the Air Flow Failed;
Er18 - No more Pellet in the bunker;
Er23 - Boiler probe or Back boiler probe or probe Buffer open;
Er25 - Engine cleaning brazier broken;
Er26 - Engine cleaning broken;
Er27 - Engine cleaning 2 broken;
Er34 - Depression below the minimum threshold;
Er35 - Depression above the maximum threshold;
Er39 - Sensor Flowmeter broken;
Er41 - Minimum air flow in Check Up is not reached;
Er42 - Maximum air flow exceeded;
Er44 - Open door error;
Er47 - Error Encoder Auger: missing signal Encoder;
Er48 - Error Encoder Auger: Auger regulation speed not achieved;
Er52 - Error Module I/O I2C;
Er57 - Test 'Forced Draught High' in Check Up fail ;
Service - Service error. It notifies that the planned hours of functioning is reached. It is necessary to call for service.

MESSAGES

Description	Code
Anomaly of the probes checking, during Check Up phase.	**Sond**
Room temperature greater than 99 °C.	**Hi**
This message notifies that the planned hours of functioning are reached.	**Clean**
Door Open.	**Port**
The message appears if the system is turned off during Ignition (after Preload) not manually: the system will stop only when it goes in Run Mode.	**Ignition block**
Periodical Cleaning in progress.	**Cleaning on**
No communication between motherboard and keyboard	**Link Error**

VISUALIZATIONS

Exhaust T. [°C] - Exhaust temperature;
Room T. [°C] - Local room temperature; it is visible only if;
Buffer T. [°C] - Buffer Temperature;
Pressure [mbar] - Water pressure;
Air Flux - Air flow;
Fan Speed [rpm] - Exhaust fan speed;
Auger [s] - Auger work time;
Recipe [nr] - Combustion recipe set;
Product Code: 510 - Product code;

USER MENU 1

Combustion Management

Power - In this menu is possible to modify the combustion power of the system. It can be set in automatic or manual modality . In the first case the system chooses the combustion power. In the second case the user selects the desired power. On the left side of the display are signalled the combustion modality (A=automatic combustion, M=manual combustion) and the working power of the system.
Recipe - Menu to select the combustion recipe. The maximum value is the number of recipes visible to the user.
Auger Calibration - It allows to modify the value set in firm of Auger's speed or On times. The values are in the range – 7 ÷ 7. The firm's value is 0.
Fan Calibration - It allows to modify the value set in firm of Combustion Fan's speed. The values are in the range – 7 ÷ 7. The firm's value is 0.

Heating Management

Boiler thermostat - Menu to change the value of the boiler thermostat .
Buffer thermostat - Menu to change the value of the Buffer Thermostat.

Room Thermostat - This Menu allows to modify the Local Room Thermostat's value. It is visible only if the ambient probe is select.
Summer-Winter - Menu that allows the selection Summer-Winter.

Manual Load
The procedure activates the pellet manual loading with activation in continue modality of the Auger engine. The loading is stopped automatically after 600 seconds. The system must be OFF for the function can be activated.

Cleaning Reset
Menu to reset the 'System Maintenance 2' function.

CHRONO

This Manu allows selecting the programming modalities and and the Ignition/Extinguishing time slots.

Modality - It allows selecting the disired modality, or disable all set programming.

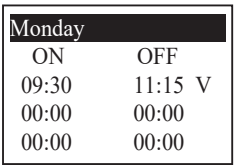
1. Enter modification mode through the key **P3**.
2. Select the chosen modality (Daily, Weekly or Week end).
3. Enable/disable chrono modality through the keys **P2**.
4. Save the settings through the keys **P3**.



Programming

The system includes three type of programming: Daily, Weekly, Week end.
After selecting the desired kind of programming:

1. Select the programming time through the keys **P4/P6**.
2. Enterthe adjustment modality (selected time will be flashing) through the keys **P3**.
3. Change the time via keys **P4/P6**.
4. Save the programmong with the keys **P3**.
5. Enable (a "V" is displayed) or disable the time slot (a "V" is not displayed") by pressing the keys **P5**.

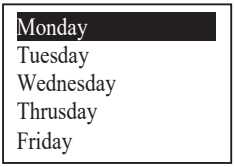


Daily

Select the day of the week to program and set the ignition and extinguishing times.

Programs around midnight

Set the clock On of the previous day at the desired time: Ex. 20.30
Set the clock of OFF of the previous day at: 23:59
Set the clock On of the following day at 00:00
Set the clock of OFF of the following day at the desired time: Ex. 6:30
The system turns on at 20.30 on Tuesday and turns off at 6.30 on Wednesday



Weekly

The programs are the same for all days of the week.

Week-end

Choose between 'Monday-Friday' and 'Saturday-Sunday' and then set the switching on and off times.



USER MENU 2

Menu is accessed by pressing the **P3** buttons for 3 seconds .

Keyboard Settings

Time and Date - Used to set the day, month, year and current time.
Language - Menu to modify the language of the LCD board.

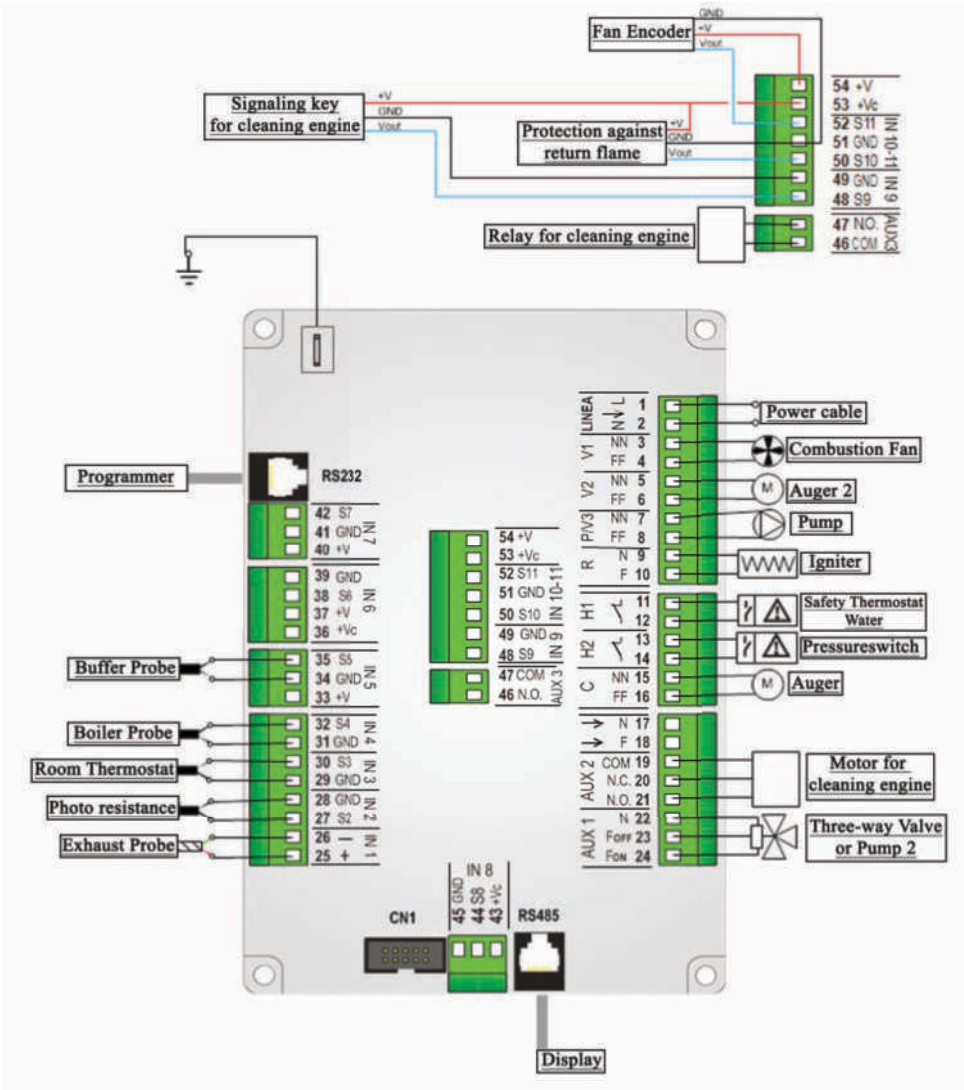
Keyboard Menu

Set Contrast - Menu used to regulate the display contrast.
Set Minimum Light - Menu used to regulate the lighting of the display when the command aren't used.
Keyboard Address - It allows to change the address of the RS485 node. In the RS485 bus it is not possible to have more nodes with the same address. It is possible to configure the keyboard as local or remote by changing the address (16 for local , 17 for remote).
Node List - This menu shows: communication address of the board, typology of the board, firmware code and firmware version. Data are not modifiable. The typologies of board that can appear are:

MSTR - Master;	INP - Input;	KEYB - Keyboard;	OUT - Output;
CMPS - Composite;	SENS - Sensor;	COM - Communication;	

Acoustic Alarm - It allows to enable or disable the acoustic alarm of the keyboard.

WIRING DIAGRAM



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