

Instruction manual
for installation and operation of
automatic pellet burner of series

“GP IV”



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Thank You for buying our product – automatic pellet burner of series „GP”. This manual will help You to use and maintain the unit properly.

NOTE : in this manual is used the symbol “GP” for the entire range of pellet burner, which includes the models “GP25 IV” and “GP32 IV”. The automatic pellet burners of series “GP IV” are modification of the well-known pellet burners of series “GP”. In the manual, however will be used a common symbol “GP”.

ATTENTION!

IN INTEREST OF YOUR PERSONAL SECURITY IT IS NECESSARY TO READ THOROUGHLY AND CAREFULLY THIS INSTRUCTION MANUAL BEFORE PROCEEDING WITH ANY ACTIONS WITH THE BURNER – INSTALLATING, CONNECTING, OPERATING, ETC. IN CASE THAT REQUIREMENTS, DEPICTED IN THIS MANUAL ARE NOT SATISFIED, FAILURE OF THE UNIT COULD BE EXPECTED, OR EVEN FATAL CONSEQUENCES, FOR WHICH THE PRODUCER COMPANY DOES NOT TAKE RESPONSIBILITY.

Instruction manual for installation and operation of automatic pellet burner of series “GP IV”

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1. Automatic pellet burner of series “GP” – description and advantages

“GP” is automatic pellet burner, which utilizes wood pellets. The burner is designed to be installed on already installed heating boilers or other equipment, thus allowing fuel switch procedure to a renewable energy sources - biomass. The installed burner operates on wood pellets and the thermal energy, resulting from the optimized combustion process is directed to the heat exchange surfaces of a boiler or another thermal consumer.

The kit of the pellet burner of series “GP” consists of:

- *Main module with detachable grate – 1 sp.;*
- *Fuel transport auger – 1 sp.;*
- *Flexible hose– 1sp. with fixing brackets – 2sp.;*
- *Pair of working gloves – 1sp.;*
- *User manual – 1sp.;*
- *Transport package of the main module – 1sp.;*
- *Transport package of the transport auger – 1sp.;*

The burner could utilize following types of fuel

- Wood pellets, class ENplus-A1;
- Wood pellets, having diameter 6 and 8 mm, categorized in the range of: A, AB, B (according to the methodology, developed for pellets properties estimation in pellet burner producer company);
- Pre-dried pits (from cherries for example);
- Fuel mixture – pellets and pits (for example mixture ratio could be 50% - 50%);
- Other solid biomass based pellets, but these fuels need testing and approval in pellet burner producer company laboratory;

The unit is equipped with

- microprocessor module, which controls the functions of the unit and is adjustable to the specific needs of a heating system;
- integrated display and keyboard, which indicates the operating mode of the burner, the keyboard is used to make changes of the values of the operating parameters;
- auger, which transports fuel from a bunker to the main unit;

- fresh air supplying fan, equipped with a Hall sensor, which returns information to the control unit;
- electric heater, which ignites the fuel;
- combustion chamber, which gives environment for efficient combustion process;
- removable grate of the combustion chamber, allowing easy access and ash cleaning;
- photosensor, which gives information for the status of the combustion process to the control unit and allows dynamic operation of the burner;
- reversible thermo sticker, indicating the operating mode of the system and the requirement of ash deposition cleaning of the appliance and/or the flue stack;
- irreversible thermosticker, indicating alarm overheating of the burner, which could precondition act of no-warranty service of the unit;

The burner is equipped with

- automatic fuel ignition system;
- automatic fuel transport system – from bunker to the combustion chamber of the main unit;
- safety system, which blocks its operation in case that at any circumstances the fuel delivery pipe is preheated above certain temperature safety level;
- photosensor, which allows dynamic monitoring of the combustion process status;
- transition system, which modulated the air supply fan operation at ignition process;
- thermal capacity modulating system, which controls both the air supply fan operation as well as the fuel dozing in order to obtain optimal operation and low fuel consumption;
- the control module could periodically perform procedure of final combustion and air driven grate de-ashing of the burner and will continue operation with new fuel ignition;

Advantages of the burner

- the burner automatically utilizes renewable energy source – biomass, which makes it environmental friendly and does not contribute to the global warming and pollution;
- the burner is installed in order to apply the so called “fuel switch process” for appliances, utilizing fossil fuels – diesel, natural gas, LPG, coal;
- the burner’s design allows easy installation on manual fed boilers – such as those, designed for coal, wood logs. The heating system and the

boiler/equipment however need minor redesign and reconstruction in order to allow such fuel switch process;

- the resulting heat energy, based on organized combustion process of renewable energy source - biomass, is less influenced by the global trend of the energy sources and as result the price is competitive, compared to price of the popular energy sources;
- the burner operates automatically and achieves operation comfort, delivered by operating of fossil fuel burners – working with liquid and gaseous fuel, which permits remote control by programmable room thermostat;
- the burner's control module performs automatic fuel ignition procedure;
- automatic operation of the burner, which allow variable thermal capacity operation, operation with standard room thermostat (or weekly programmable thermostat), which allows maximal thermal comfort and optimized fuel consumption;
- modulation of the operating process, which allows optimal working conditions and sustaining high combustion efficiency;
- the modulation of the controlled combustion process allows intensified technical work at installation and simplified adjustment;
- simplified installation procedure and initial adjustment, which guarantees faster assembly and unified approach;
- opportunity to utilize biomass, pellet shaped as well as other dried nuts, according the appropriate fuel table;
- high efficiency;
- low pollutant emissions;
- automatic fuel transport from a bunker, built according to the local units arrangement and need of the client (the bunker is not part of the burner equipment delivery);
- simplified maintenance and service;
- minimal operating costs;

2. Automatic pellet burner of series “GP” technical data

2.1. Thermal and technical data of automatic pellet burner of series “GP”, utilizing wood pellets are given in **Table 2.1**;

2.2. Dimensions and technical data of automatic pellet burner of series “GP” are given in **Table 2.2**;

2.3. Recommended solid biomass fuel properties – wood pellets, are given in **Table 2.3**;

2.4. Pellets classification, considering their physical properties (based on fuel proximate analysis) are shown in **Table 2.4**;

2.5. The European standard for wood pellets ENplus is shown on **Table 2.5**;

Parameter	Dimension	Value	
<i>Model</i>	-	GP 25 IV	GP 32 IV
<i>Nominal thermal capacity</i>	<i>kW</i>	25	32
<i>Thermal capacity operation range</i>	<i>kW</i>	7 – 25	10 – 32
<i>Utilized solid fuel</i>	<ul style="list-style-type: none"> • Wood pellets; • Pre-dried cherry nuts; • Other dried nuts; 		
<i>Utilized wood pellets, complying ENplus</i>	ENplus-A1*		
<i>Utilized pellets, complying pellet burner producer classification methodology</i>	A, AB, B*		
<i>Wood pellets fuel consumption rate at nominal thermal capacity</i>	<i>kg/h</i>	5.3	6.8
<i>Fresh air flow rate, required for effective combustion process and boiler operation</i>	<i>kg/h</i>	45 – 50	57 – 64
	<i>m³/h</i>	39 – 44	50 – 56
<i>Averaged wood pellets consumption rate (the unit is operating in a popular heating system)</i>	<i>kg/h</i>	3.6	4.7
<i>Air excess ratio</i>	λ	1.5 – 1.6	
<i>Solid fuel residue</i>	<i>ash</i>	The quantity depends on the ash contents in the raw fuel, as well as operating conditions	

Table 2.1 Thermal and technical data of automatic pellet burner “GP”, utilizing wood pellets;

* EXPLANATION : the automatic pellet burner of series “GP” is designed to utilize wood pellets, which have properties, defined in the referred ENplus norm. As an temporal exception (for several hours) it is allowed to utilize pellets, which are not covering the required class of the fuel, practically in such cases the fuel has low quality and high ash content, which leads to more frequent ash residue cleaning of the burner’s grate, as well as the heat exchanger’s walls;

Parameter		Dimension	Value	
Type		-	GP 25 IV	GP 32 IV
Weight	main module	kg	17	17
	fuel transport auger	kg	8.5	8.5
Overall dimension of the unit (WxDxH)	main module	mm	250 x 627x 485	
	fuel transport auger	mm	184x1520x107	184x1520x107
Power supply		-	1PEN ; 50Hz; 230V;	
Power consumption rate	at nominal load	A	0.2	0.2
	at ignition	A	4.5	4.5
Electrical capacity		VA	<100 + 1100 (at ignition process)	
Electric protection		-	IP20	

Table 2.2 Dimensions and technical data of automatic pellet burner “GP IV”

Parameter	Dimension	Value
Pellet’s characteristic size	mm	6 – 8
Recommended fuel net calorific value	MJ/kg	>17.2
	kWh/kg	>4.7
Class of wood pellets (ENplus)	ENplus-A1	
Wood pellets category	A, AB, B*	
Ash content	%	See Table 2.4.
Moisture content	%	Max. 8 – 10%

Table 2.3 Recommended solid biomass fuel properties – wood pellets

* See the notes above;

Classification of wood pellets, considering their physical properties (based on fuel proximate analysis) – according to fuel evaluation method, developed and applied in pellet burner producer company is show on the following table.

Pellet's category	A^d	DU
A	$A^d \leq 0.6\%$	$DU \geq 97.0\%$
AB	$A^d \leq 0.6\%$	$DU < 97.0\%$
B	$0.6 < A^d \leq 1.0\%$	$DU \geq 97.0\%$
BC	$0.6 < A^d \leq 1.0\%$	$DU < 97.0\%$
C	$1.0\% < A^d \leq 2.0\%$	$DU \geq 97.0\%$
CD	$1.0\% < A^d \leq 2.0\%$	$DU < 97.0\%$
D	$2.0\% < A^d \leq 3.0\%$	$DU \geq 97.0\%$
DE	$2.0\% < A^d \leq 3.0\%$	$DU < 97.0\%$
E	$A^d > 3.0\%$	$DU \geq 97.0\%$
EF	$A^d > 3.0\%$	$DU < 97.0\%$

Table 2.4. Pellets classification, considering their physical properties

where :

A^d – ash contents, dry basis, [%];

DU – mechanical durability, [%];



The approval of the new EU standard for wood pellets (EN 14961-2) was at mid 2010 and introduces new certificates ENplus for pellets, utilized in domestic heating appliances, the certificate EN-B is applied for industrial boilers. The standard ENplus defines classes of the wood pellets, which could be considered as qualifications: A1 and A2. The class A1 introduces the most stringent limits for the ash content in the wood pellets. The class A2 defines ash content up to 1.5%. For industrial applications the wood pellets should cover the requirements of the certificate EN-B, which is less stringent, that the previous and the generally the quality of the pellets is lower.

Parameter	Dimension	ENplus-A1	ENplus-A2
Diameter	mm	6 (± 1)	6 (± 1)
Length	mm	$3,15 \leq L \leq 40$ ¹⁾	$3,15 \leq L \leq 40$ ¹⁾
Bulk density	kg/m ³	≥ 600	≥ 600
Calorific value	MJ/kg	≥ 16.5	≥ 16.5
Moisture	%	≤ 10	≤ 10
Dust	%	≤ 1 ³⁾	≤ 1 ³⁾
Mechanical durability	%	≥ 97.5 ⁴⁾	≥ 97.5 ⁴⁾
Ash	% ²⁾	$\leq 0,7$	≤ 1.5
Ash melting temperature	°C	≥ 1200	≥ 1100
Chlorine	% ²⁾	≤ 0.02	≤ 0.03
Sulphur	% ²⁾	≤ 0.05	≤ 0.05
Nitrogen	% ²⁾	≤ 0.3	≤ 0.5
Copper	mg/kg ²⁾	≤ 10	≤ 10
Chromium	mg/kg ²⁾	≤ 10	≤ 10
Arsenic	mg/kg ²⁾	≤ 1	≤ 1
Cadmium	mg/kg ²⁾	≤ 0.5	≤ 0.5
Mercury	mg/kg ²⁾	≤ 0.1	≤ 0.1
Lead	mg/kg ²⁾	≤ 10	≤ 10
Nickel	mg/kg ²⁾	≤ 10	≤ 10
Zink	mg/kg ²⁾	≤ 100	≤ 100

1) no more that 1% of the wood pellets could be longer that 40 mm, the max. length is 45mm;

2) determined on dry basis;

3) particles <3.15 mm, fine dust particles, before fuel delivery;

4) for measurements, performed with Lignotester the limit value ≥ 97.7 weight based %;

Table 2.5 European standard for wood pellets ENplus;

3. Description of the construction of pellet burner of series “GP”

3.1. Main properties

The pellet burner of series “GP” consists of the following elements/modules:

- The basis part of the pellet burner is the **main unit**, which consists of:
 - **Combustion chamber**, which forms combustion domain and optimal environment for solid biomass combustion, is designed of high quality stainless steel;
 - **Grate of the combustion chamber**, which could be easily detached and reveals access for ash removal;
 - **Air duct**, which uniformly distributes the airflow and ensures safe cooling of the elements of the burner;
 - **Electric heater**, which heats and ignites the fuel. The heater is positioned beneath the inclined plate of the grate in the combustion chamber;
 - **Air supply fan**, equipped with Hall sensor for rotation speed monitoring;
 - **Photosensor**, which monitors the intensity/presence of the combustion process, installed aside of the combustion chamber for easy access and cleaning;
 - **Alarm thermo-probe**, which stops and blocks burner operation in case of “back fire” process in the fuel delivery pipe;
 - **Control board**, which monitors and controls the operation of the burner and indicates its status;
 - **LCD display and integrated keyboard**, used to change the values of the operating parameters as well as adjustment of the thermal capacity of the burner;
 - **Transport auger connector**, which realizes power supply to the electric motor of the auger;
 - **Reversible liquid crystal thermo sticker**, which indicates the operating temperature of the burner’s main body at the spot of the sticker. This thermometer should be used to estimate the real condition of the appliance as well as the flue stack draught and the requirement for ash deposition cleaning;
 - **Irreversible thermosticker**, which indicates any overheating of the fuel delivery pipe, preconditioning no-warranty servicing of the burner’s main module and any damages of the fuel supply hose;
- Electrically driven (external for the main unit) **fuel transport auger**, which extracts the solid fuel from the bunker and delivers pellets to the main unit, according to the operating mode of the burner. The transport

auger consists of electric gear-motor, a transport pipe with one end in the fuel hopper and the other end is side opened and delivers fuel to the main unit through a aperture;

- **Flexible hose**, which is made of specific semitransparent thermal resistant material (in case of combustion it does not emit toxic substances and does not sustain combustion process), which connects the transport auger and the main module;

The main modules of the pellet burner and their arrangement are shown of the following figure.

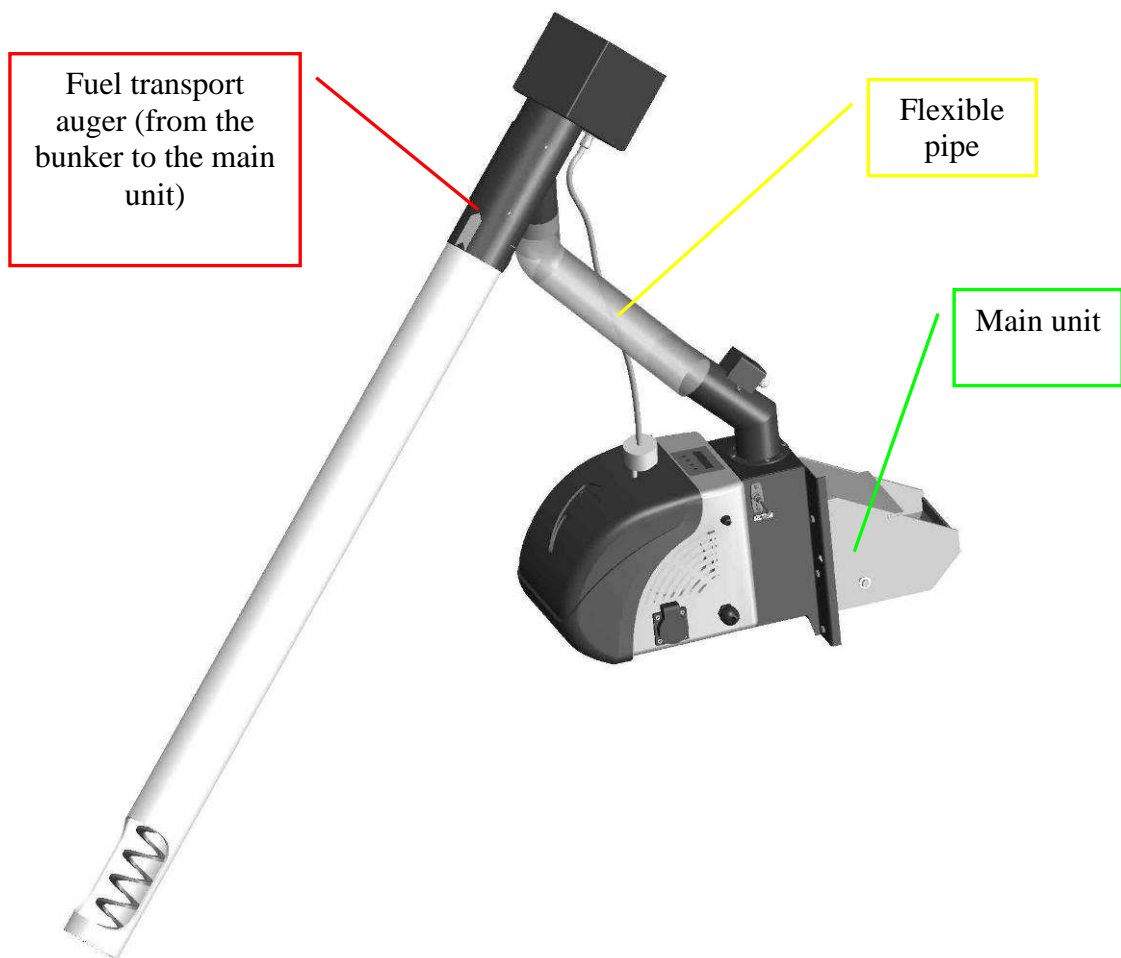


Figure 3.1 Arrangement of the modules of the pellet burner of series “GP IV”
(*side view*);

Elements and modules of the main unit of the pellet burner of series “GP IV” are shown on figure 3.2 and figure 3.3.

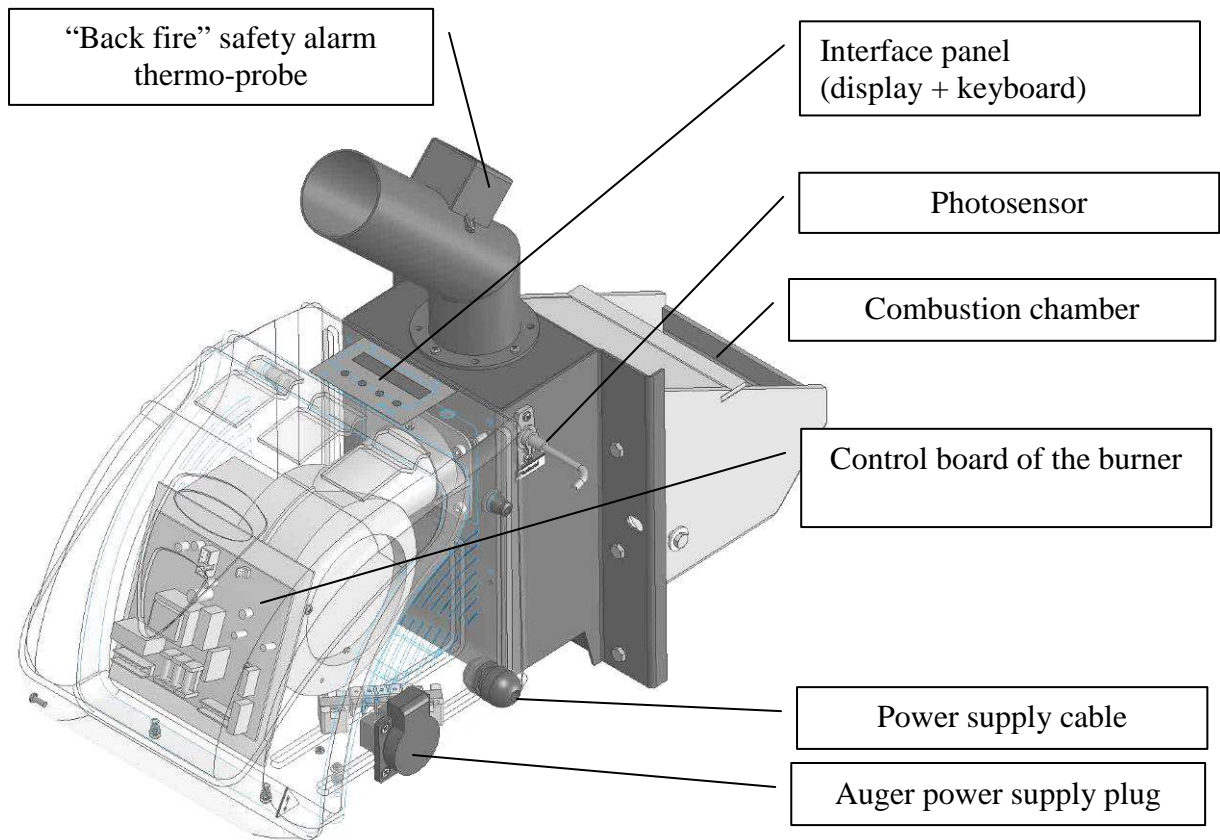


Figure 3.2 Section view of the elements of the main unit of the burner of series "GP IV";

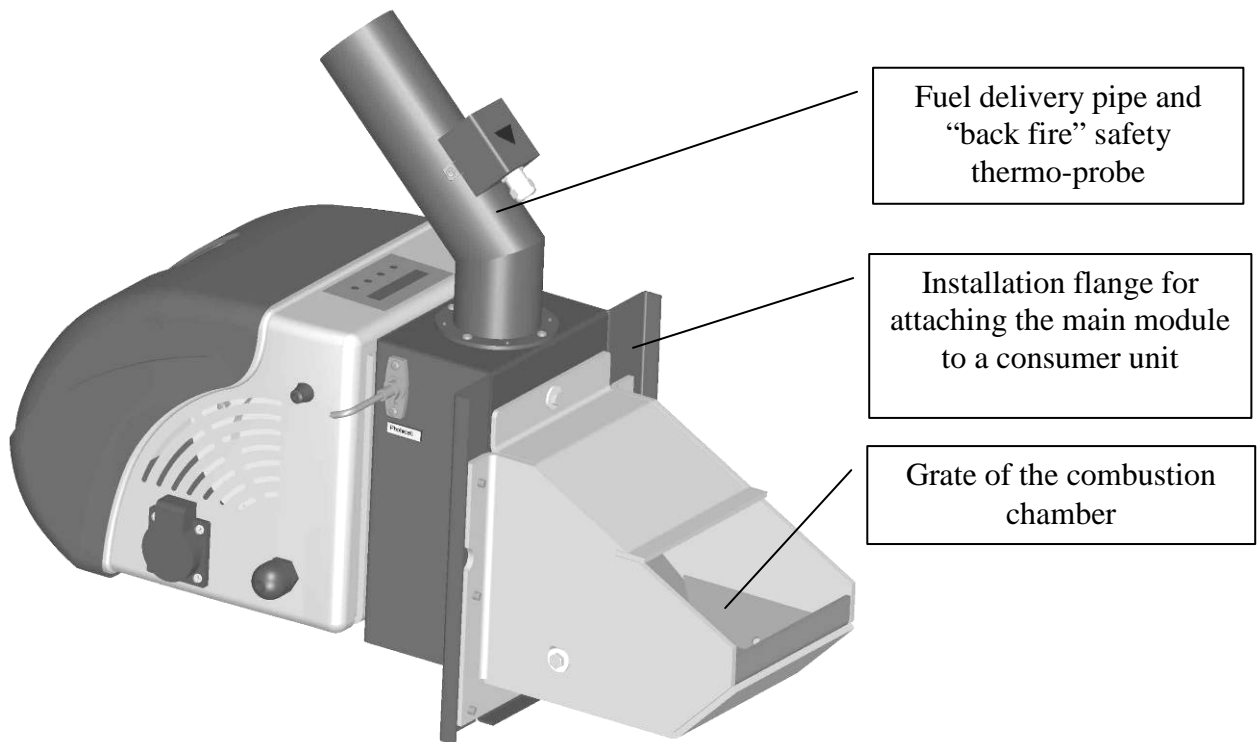


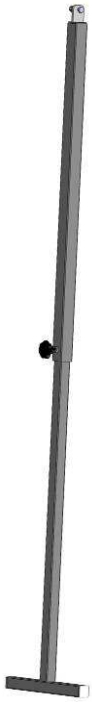
Figure 3.3 Side view of the main unit of the pellet burner of series "GP IV";



Figure 3.4. View of the side of the burner with attached liquid crystal thermo sticker;

COMMENTS :

- **Reversible liquid crystal thermo sticker** indicates the operating temperature of the spot around the sticker. This temperature is indicative for the operating mode of the pellet burner and the hydraulic losses of the flue gases, passing through the heating appliance to the flue stack. The initial condition of the thermo-sticker is indicated with black color of all thermo active segments. In case of temperature rise, the segments are sequentially getting light colored, according to the temperature range of any individual thermo-active segments. However, the increased temperature in this zone of the burner is indicator for the requirement for planning of ash cleaning procedure of the heating appliance and/or the chimney. At cooling down the main body of the burner, the reversible sticker gets into its initial condition (all segments are dark);
- **Irreversible liquid crystal thermo sticker** is indicator for at least one event of overheating the pellet supply pipe of the main body of the burner. This sticker changes its color irreversibly. Initially the color of this sticker is **white**, at activation the sensing segment gets dark irreversibly;



In case the fuel transport auger should be supported, then an option should be utilized – a telescopic support, which could support the weight of the auger and the length could be adjusted in order to achieve the required installation angle and the overall stability of the auger.

Figure 3.5. Side view of the auger support telescopic element – option of the kit of the pellet burner of series “GP”;

3.2. Specific design measures in order to increase the safety operation of the burner

- The ignition and the combustion process is monitored by microprocessor control board;
- The ignition process is monitored and in case that the fuel is not ignited for some reason, after certain number of ignition trials, the operation of the burner is stopped and alarm mode is indicated;
- In case that fuel is consumed from the hopper, than after the defined number of ignition trials the burner will go out in **stop** mode and alarm is indicated as well;
- The flexible hose, which connects the fuel transport auger with the main unit, is transparent and is made of specific heat resistant material;
- Information stickers are applied, indicating certain precautions measures and correct operation of the unit;
- The burner is equipped with safety elements, which are involved in „back fire” protection system:
 - Free falling duct, which practically interrupts the fuel flow between the transport auger and the main module. This duct is approximately 250mm long. Beside that, the fuel auger is connected to the main unit by a flexible hose, which does not contain fuel. The grate of the burner is however charged with

controlled amount of fuel, which is utilized at the combustion process and possibility of back fire is strongly reduced;

- Sensor of “back fire” alarm thermo-probe, which is positioned on the fuel delivery pipe of the main unit, activates at surface temperature levels above 90 – 95°C. In case of alarm thermo-probe activation, the main unit and the fuel transport auger are stopped and switched to alarm mode. This mode is indicated by appropriate message, shown on the display - „STOCKER FAULT”. The alarm mode is not automatically deactivated and needs manual restarting. The cause of the alarm situation should be clarified and precaution measures should be taken before restarting the burner (performed by switching OFF and back ON the main power supply of the burner);
- Reversible liquid crystal thermo sticker, which shows the operating temperature in the zone around the sticker, considered as characteristic for the condition of the burner and the heating system in total. It indirectly indicates the need for ash deposition cleaning of the heating appliance as well as the chimney;

4. Installation of automatic pellet burner

Requirements and recommendations.

4.1. Some basic requirements for correct installation of automatic pellet burner of series “GP” :

- The burner should be positioned in order to guarantee comfort maintenance and easy access for cleaning procedures;
- The main unit of the burner should be installed on a unit (a boiler, heat consumer, etc.), which has the appropriate thermal capacity, at least equal that of the burner and should provide easy access for burner’s grate cleaning and ash removal;
- It is strongly forbidden to install the burner in dwellings, including corridors;
- The installation process of the burner, its attachment and connection of the power supply and control should be performed by authorized personal only;
- Installation and maintenance of the burner is performed by specialized trained personal of authorized companies;
- Connection of the burner to the power supply and the control board should be performed by authorized technician only;
- Before starting the burner, the heat consumer unit (at which the burner is attached) should be thoroughly checked in order to guarantee safe operation of the system;
- The maintenance of the burner should be performed by adult person, who is familiar with the safety procedures and the user manual of the appliance;

ATTENTION : *the mounting of the main module of the pellet burner of series “GP” to a heating appliance (in most of the cases – hot water boiler) is made by screws and corresponding nuts. It is necessary to tighten the main module of the burner to the appliance by a tool (wrench). It is not permissible to attach the burner to an appliance by handles, which could allow detachment of the main module by hand. The installation process of the burner should be performed by authorized trained technician only, using a tool;*

4.2. Installation of the burner

The installation process of the burner should be based on authorized project, which governs the requirements of acting norms and recommendations.

- In case that the heat consumer unit is solid fuel hot water boiler, that the requirements are depicted in norm EN 303-5/2000 - „*Heating boilers. Part 5 : Heating boilers for solid fuels, hand and automatically fired, nominal heat output of up to 300 kW. Terminology, requirements, testing and marking*”;
- In case that the heat consumer is not hot water boiler, than appropriate norm and requirements should be governed at preparing the installation project;
- Fire safety requirements;
- To the power supply - EN 60335-1/1997 - “*Household and similar electrical appliances – safety. Part 1. General requirements*”;

4.3. Overall and attachment dimensions of the burner’s main unit

The installation process of the burner should consider the requirements, described above, as well the dimensions of the unit, shown on the following figures.

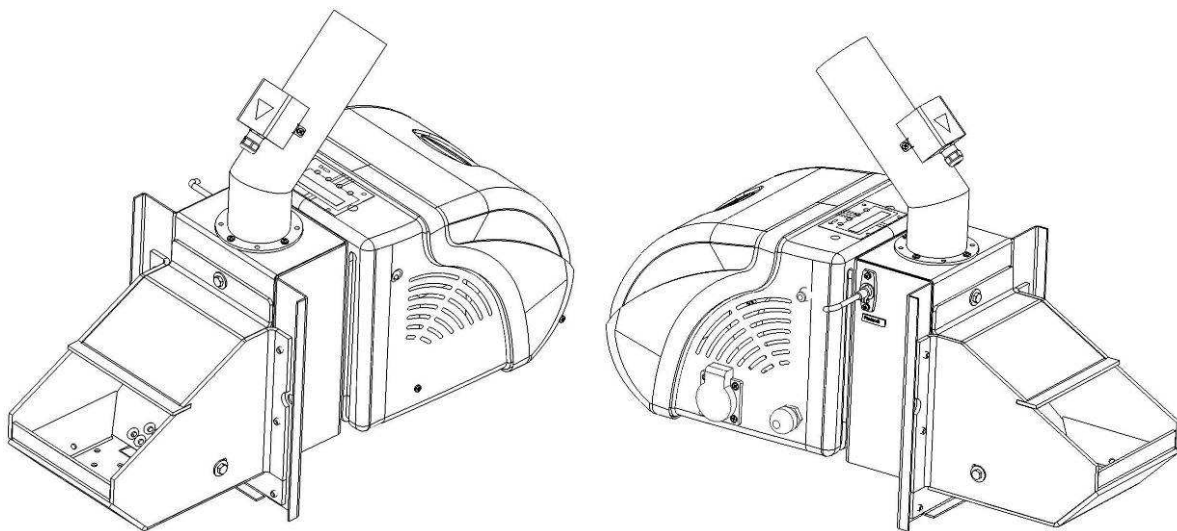


Figure 4.1. Isometric view of the main unit of the pellet burner of series “GP IV” – side views;

Figures 4.2, 4.3. and 4.4. show the overall and detailed dimensions of the main unit of the burner, which should be considered at preparing a project and installation of the appliance.

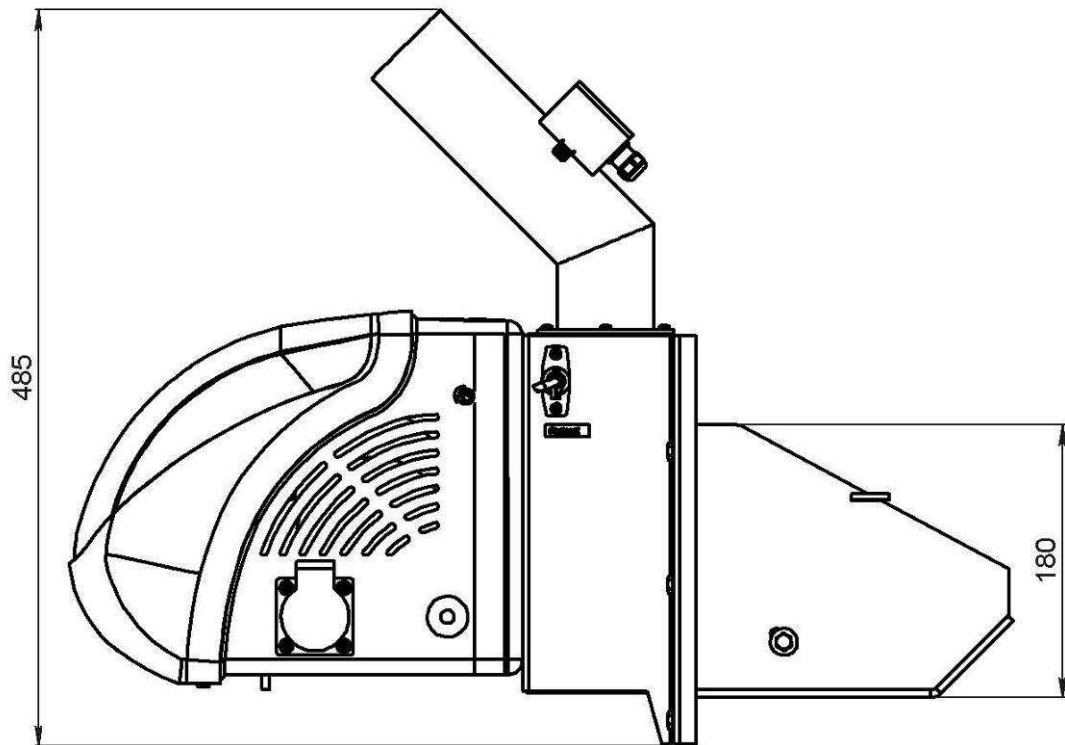


Figure 4.2. Overall and characteristic dimensions of the main unit – *side view*;

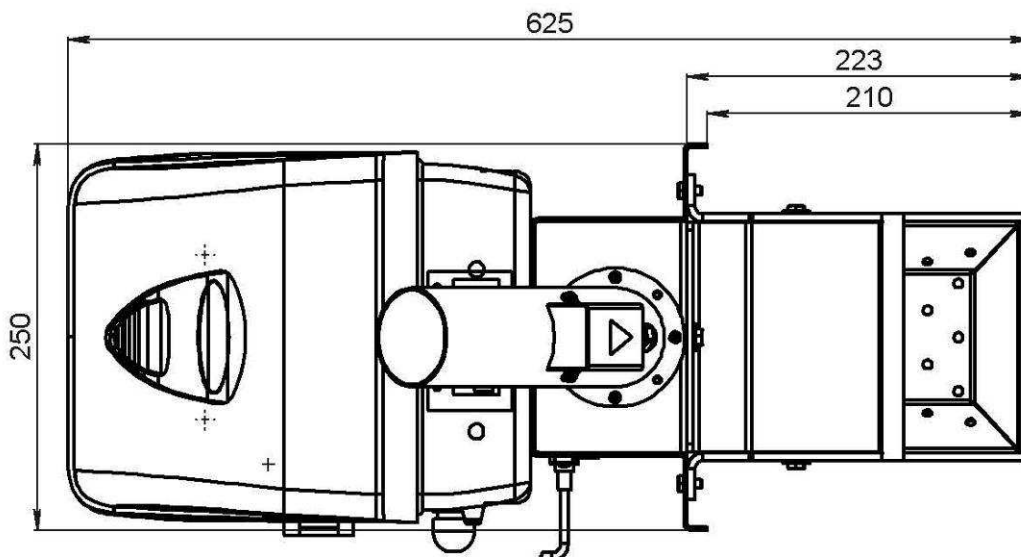


Figure 4.3. Overall and characteristic dimensions of the main unit of the pellet burner of series „GP IV” – *top view*;

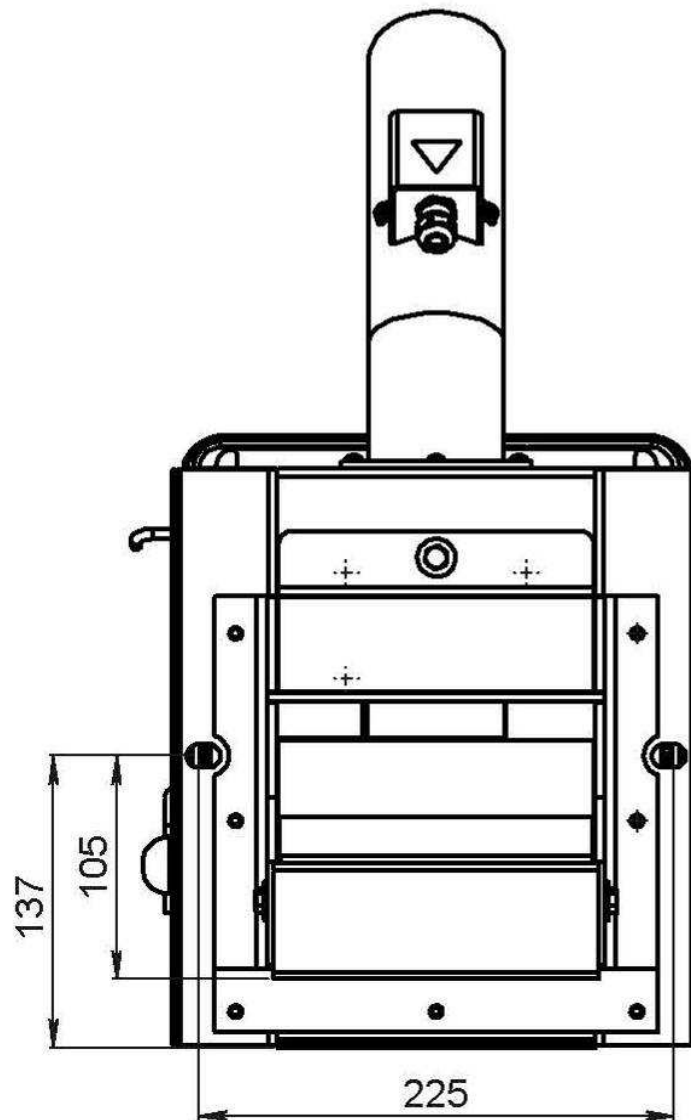


Figure 4.4. Overall and characteristic dimensions of the main unit of pellet burner of series „GP IV” – *front view*;

4.4. Arrangement and installation of the pellet burner’s modules

- **The main unit** of the burner should be installed in horizontal position on a heat energy consumer appliance. According to the type of the appliance, an expert should prepare technical evaluation of the project for installation of the burner, as well as local arrangement of the units in order to ensure efficient and reliable system operation and easy access for cleaning and maintenance purposes. The main unit of the burner should be attached to the heat energy consumer appliance. The insulation gasket should be placed between the main unit and the heat energy consumer;
- **Fuel transport auger** is positioned in a close region of the burner of series “GP”, in order to allow its easy connection with fuel delivery pipe of the main unit by the applied transparent flexible hose. The auger should

be positioned at 45° – the angle between the axis of the auger and the horizontal plane, in order to provide optimal operating conditions for the electric motor and efficient combustion process in the combustion chamber of the main unit. The lower section of the auger should be positioned in the fuel bunker and appropriate measures should be taken in order to prevent fuel discharge through gaps between the auger's pipe and the wall of the bunker. Additionally the lower section of the transport auger should be positioned in the lowest part of the hopper in order to ensure reliable fuel charging of the auger's pipe entrance. The final position of the transport auger should be fixed. The fuel transport auger and the hopper should properly be arranged in order to ensure safe operation of the units and easy access and maintenance. The installation of the flexible hose should be considered as well – it could be bended and eventually its length could be decreased if necessary;

*In order to achieve optimal operation of the fuel transport auger, it is **recommended** to install a pellet hopper of series “BP” – produced by pellet burner producer company as well.*

ATTENTION: any change of the position (i.e. angle between the auger's axis and the horizontal plane) practically influences/changes the fuel flow rate and the thermal capacity of the burner as follows:

- *decrease of the angle between the axis of the transport auger and horizontal plane leads to **increased** fuel flow rate and respectively higher thermal capacity of the burner;*
- *increase of the angle between the axis of the transport auger and horizontal plane leads to **decreased** fuel flow rate and respectively lower thermal capacity of the burner;*
- **Flexible hose** should be installed – it connects the exit pipe of the fuel transport auger and the fuel delivery pipe of the main unit. The flexible hose should be straight (no visible hose slacking is allowed as such regions could accumulate dust and small fuel particles) and finally its ends should be tightened to the pipes by applied adjustable braces;

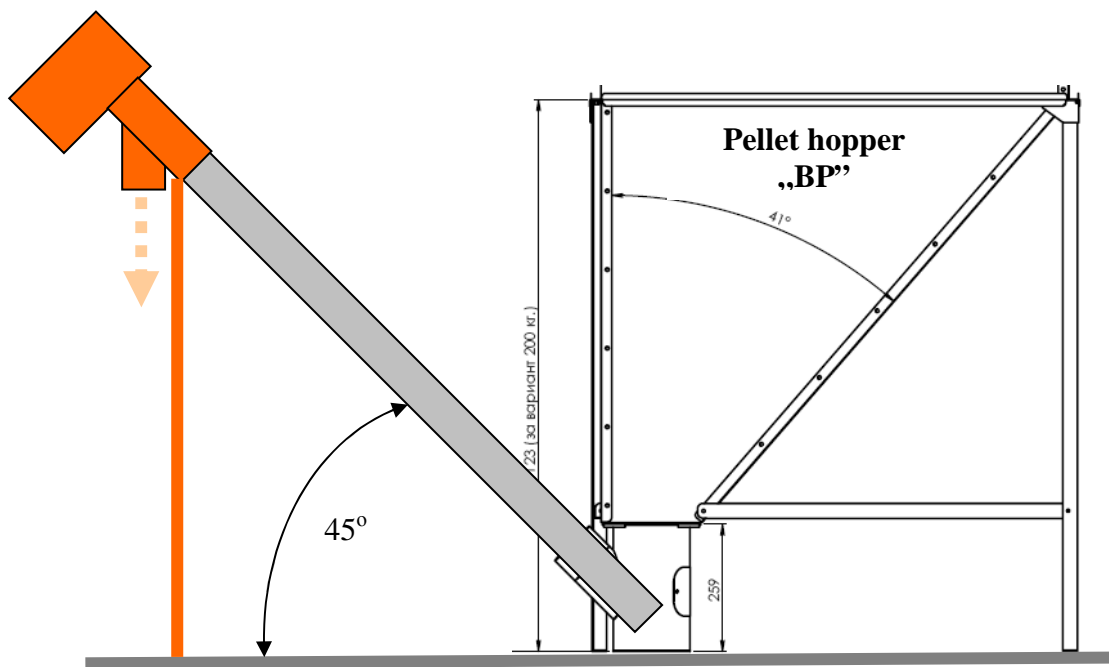


Figure 4.5. A principal scheme for installation of fuel transport auger (*the axis of the auger should be inclined at 45° by the horizontal plane*);

EXPLANATION : *the auger is installed with additional supporting telescopic element, which is an option for the kit of the pellet burner of series “GP”;*

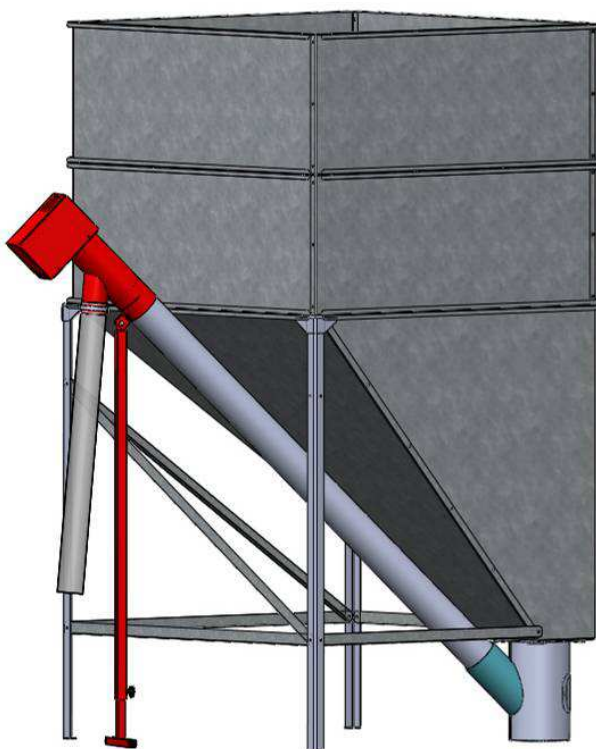


Figure 4.6. Isometric view of the fuel transport auger, installed on pellet hopper with attached additional elements, which increase its capacity up to 650kg of wood pellets;

4.5. Information, considering the installation of the automatic pellet burner of series “GP” and its operation with hot water boilers.

The automatic pellet burner of series “GP” is a separate module (which requires electrical power supply and a signal for operation), which could be installed on an appliance – a heat energy consumer. The practice shows, that the consumer in most of the cases is a hot water boiler, which is installed in local heating systems. The producer has made thorough tests for compatibility, reliability and efficiency of the pellet burner of series “GP” with most of the popular hot water boilers, known on the market. However, considering the design of the boiler, the system could require additional elements (like flanges, transition kits, etc), which allow efficient operation of the burner and the system in general, thus increasing the reliability as well.

In ANNEX I of this user manual is shown information for the operating parameters of a system, consisting of : automatic pellet burner of series “GP” and a hot water boiler, at their nominal operation as complete system. The producer strongly advices to check the applied information prior to perform any installation procedures as well as adjustment of the burner, in order to achieve high efficiency and reliability of the system : pellet burner – hot water boiler;

5. Initial steps and starting of pellet burner of series “GP”

ATTENYION : *The burner should be installed, adjusted and verified **ONLY** by trained staff of an authorized company.*

5.1. Basic fuel requirements

- The fuel should be dry. The unit producer recommends that the fuel should be stored in dry and well ventilated rooms;
- It is strongly forbidden to store the fuel in close region of the unit, on which the pellet burner is installed, the minimal safety distance between the fuel and the appliance is 400 mm;
- The burner producer recommends an optimal distance between the unit, on which the pellet burner is installed, and the fuel bunker to be at least 1000mm. It is recommended to store the fuel in room, next to that, where the system is installed;
- At the installation procedure of the burner, as well as the fuel storage one, fire prevention recommendation should be considered. It is also recommended to install a fire-extinguisher in a safe and easy accessible place;

5.2. Staring automatic pellet burner of series “GP”

Basic requirements :

- Any maintenance procedures should be performed in accordance with the described in this manual;
- The operating mode of a system : *automatic pellet burner of series “GP” and a heat-consumer*, should also cover the following requirement : the operating pressure in the combustion chamber **should be below the atmosphere pressure** within the following range: 5 - 20 Pa. The incompleteness of this requirement could lead to alarm modes of the burner and/or ineffective operation regime of the burner. The operating pressure in the combustion chamber of the heat-consumer strongly depends on the draught of the flue stack as well as the hydraulic loses in the gas duct of the system (as well as the operation of induced draught flue gas fan module installed). Any operating modes, not complying with the requirements for the above defined combustion chamber pressure range could be detected indirectly by the status of the reversible thermosticker;
- Any intervention in the working process of the unit, which could lead to unit’s failure and/or dangerous and health threatening situations, are strongly prohibited;



- The unit should be checked by the maintenance staff or any trained personal/end user regularly;
- The end-user should not perform any interventions, repairs, etc. of the unit. In case that warning and failures arise, check the failures table (applied at the end of this manual) and call the service support if the case is not described there;
- Any adjustments of thermal capacity higher than the nominal thermal load of the unit is not allowed;
- The ash residue should be collected in fireproof containers and cooled down to ambient temperature. The cooled ash should be disposed in appropriate waste containers. Please take into account that the mineral ash, result of wood biomass pellets could be considered/utilized as soil fertilizer and dispersed for agricultural purposes for example;

5.2.1. Interface control board of pellet burner of series “GP IV”

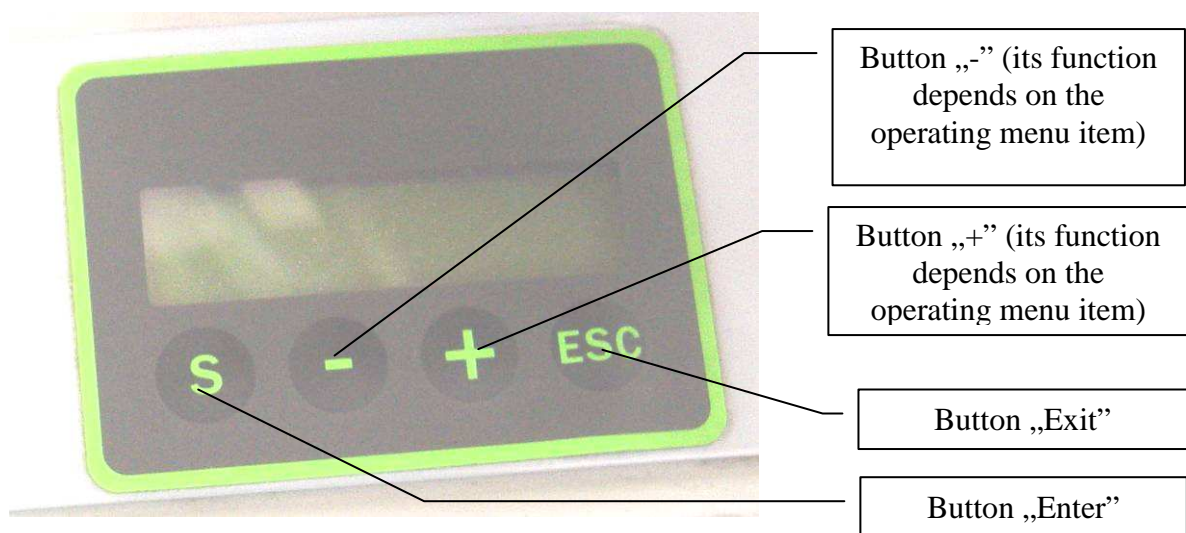


Figure 5.1. Interface board, LCD display and keyboard for control and monitoring of the of automatic pellet burner of series “GP IV”.

Interface board description:

- Button „**S**” – selects the menu item and for confirmation of any changes;
- Button „**-**” – decreases the value of operating parameter of the burner’s controller;
- button „**+**” – increases the value of operating parameter of the burner’s controller;
- Button „**Esc**” – rejects any change of operating parameter, also exits from operating item of the controller’s menu;

NOTE : *the described buttons could have other functionality, which is dynamically indicated on the display of the controller.*

5.2.2. Automatic pellet burner electrical power supply

ATTENTION : *all installation and servicing procedures, which are made on the electrical system of the pellet burner, by removing the cover and/or other protecting elements, should be performed by authorized technician only.*

- The burner should be connected to the power supply of the unit, at which it is attached and the appropriate safety rules should be satisfied. Use the attached to the main unit power supply cable and connect it to the control and power supply box of the heat consumer.
- The lower section of the fuel transport auger is positioned in the bunker, appropriately positioned and charged with fuel;
- The sensitive element of the sensor for temperature is installed in socket for measuring the temperature of the outlet of the boiler water or wrap it in a threaded hole (depending on the type of sensor);

5.2.3. Switching ON the burner of series “GP”

Switching the burner ON is performed by supply electrical power through the power supply box of the heat energy consumer, where the burner is installed. If the burner has been in operation mode (or in so called “hot state”), then if the power supply is restored, it starts/continues its operation automatically.

ATTENTION : *During the operation of burner and the heat consumer unit, when there are certain incompact sections, there could be smoke leakages, eventually through the flexible hose, which connects the fuel transport auger and the main unit of the burner. It is strongly recommended to make appropriate steps for stopping these leakages. Also the burner’s thermal capacity should be adjusted, according to the current heat demand. Same process could be observed at transition periods (autumn and spring) and especially in summer, when the ambient temperature is relative higher that the operating temperature of the unit, as well as the chimney’s draught is decreased.*

COMMENTS :

- *At the period of fuel ignition an electric heater, positioned below the inclined grate’s plate, is activated. Both the heater and the plate above are heated to high temperature levels and certain precautions should be taken*

in order avoid any contact with and get skin burned in case of combustion chamber manual manipulation. In case that manual operation is required (for example for ash cleaning or fuel management)- self protective measures and appropriate instruments should be used;

- *During the start-up operation of the burner, the fuel transport auger should be charged (filled) with fuel – this is long lasting, time consuming period. In such case it is recommended to plug the auger power supply cord into a common power supply wall-plug and do the auger charge until fuel starts to drop from its outlet. After this charge operation the auger's plug should be connected to the operating plug of the main unit;*

ATTENTION: *the control board of the burner monitors the presence and adequate operation of the transport auger and if the auger is not plugged in the main unit of the burner, then the control board goes in alarm mode and the burner will not function. In order to go in nominal operation mode it is necessary to plug the auger power supply in the contact point on the main module and restart the burner – switch off and back on the power supply;*

EXPLANATION : *if the auger's power supply cable has been disconnected from the main unit of the burner (this situation is considered as alarm mode of the control board of the burner)– i.e. the electric motor is malfunctioning or wiring problems) and the burner has been switched on, then the control board indicates this mode by appropriate message, shown on the display. The reset process should be performed : the auger should be correctly plugged in the operating connect point on the main unit, the power should be switched off and back on;*

- *The burner operates by predefined working algorithm, programmed in the inerasable memory chip on the control board. Optimal values of the parameters are defined by default at production and in principal no change is required in order to run the unit;*

5.2.4. Burner's operating algorithm

The burner starts its nominal operation if the following conditions are fulfilled:

- The main unit of the burner is installed at the heat energy consumer appliance;
- Available power supply;
- Activated “START” from display;
- Installed temperature sensor for measurement of the temperature of the circulating water – *in case the control module uses this type of thermal capacity control operation;*

- No alarm signals are available;
- The fuel transport auger is charged and filled with fuel and bunker is charged with fuel as well;

If the above described conditions are satisfied, then the control board performs algorithm as follows:

- The fuel transport auger is activated, the electric heater is activated and air fan are running simultaneously;
- After a factory set (predefined) period of time has ran out, (during this period the so called “initial fuel” mass has been charged to the combustion chamber), the electric motor of the fuel transport auger will be stopped (the ignition heater is active however);
- After certain period of time the photosensor of the burner should recognize stable combustion process by the emitted visible light and the electrical ignition element will be powered off. This is followed by graduate increment of the thermal capacity (i.e. the fuel flow rate) of the burner and after certain period of time the nominal thermal capacity will be reached. In case that the photosensor does not sense intensive light, i.e. there is no combustion process, or it is rather lean, than the control board of the burner will initiate new attempt to start the burner, the above described algorithm will be repeated. The total number of ignition attempts is however limited. In case that this limit has been passed, then burner will go into alarm mode and will not function until manual assistance is performed (for example bunker’s charge with fuel, solving a problem, etc.) and the burner is restarted;
- In case that the fuel has been ignited, the burner goes into nominal operation mode, which is performed by periodic fuel transport to the combustion chamber of the burner, followed by a certain interval, utilized for fuel combustion. The periods for fuel charge and combustion are predefined in the operating firmware of the control module, the thermal capacity of the burner is however changed by setting the operating stage of the burner;

ATTENTION: *The choice of the maximal thermal capacity stage – 5th is not recommended, this stage is available in order to utilize relatively low calorific value fuel or temporary demand of increased heat consumption rate. It is recommended to operate the pellet burner in the operating range of 1st to 4th thermal capacity stages, at 4th stage the burner achieves its nominal thermal capacity;*

- When in the burner’s control module is used NTC sensor for measurement of the operating temperature of the circulating water :
 - *At approaching the temperature of the circulating water set-point the control module decreases the burner’s operating thermal*

capacity (i.e. the control module operates the burner in modulating mode);

- *At decreasing the temperature of the circulating water, the burner's control module restores the set thermal capacity;*

- In case that the START signal goes off (for any reason – room thermostat for example, etc.) the burner will go into stand-by mode, following the algorithm, described above;
- In case that in stand-by mode the burner receives START signal, the control board will perform the above described algorithm in order to initiate ignition and continue into nominal thermal capacity mode; The same operating algorithm will be performed when the temperature of the circulating water is below the temperature set-point (in case the burner is equipped with NTC sensor);
- In case the first fuel dose is not ignited due to any reason, the control board of the unit will automatically start new ignition procedure. The total number of ignition attempts is limited to 2 (factory preset value). In case of two failures at ignition, there could be fuel particles on the burner's grate, which should be cleaned. **ATTENTION** : if the accumulated fuel is not cleaned after ignition failures, any new attempt to ignite the fuel particles will be accompanied with intensive smoke release and eventually blast ignition, which could eventually result even in mechanical damages of the burner and the heat consumer unit;
- In case that during nominal operation the photosensor does not recognize active combustion process, the initial fuel ignition procedure is started automatically;
- In case the total number of ignition attempts has been exceeded, for example when the fuel in the bunker has been consumed, the burner will go into alarm mode and the control module's display will indicate that manual assistance and restart of the unit is required as well. After the reason for alarm mode has been clarified and overcome, the burner should be restarted by switching it OFF and back ON from the main power supply. One can use the power supply of the main unit, which supplies electrical power to the burner, however.

ATTENTION : *before starting up the burner of series "GP" it is necessary to check if the grate of the burner contains unburned/raw fuel and ash, if available these residues should be cleared away, also clean any ash residue in order to achieve optimal combustion process;*

- In case that the power supply has been interrupted, at its renewal the burner will continue its operation automatically;
- **ATTENTION:** *at operation the burner periodically goes into final combustion mode and after combustion ash cleaning procedure is activated, if the option for such procedure has been activated –*

parameter „Makc.comb.time”. This parameter is in the „Advance menu” (restricted for authorized technicians only with a password);

5.2.5. Operating control parameters of the burner of series “GP”

The control board of the burner has factory preset operating parameters values, which in common case are satisfying the requirements of a system and does not require any intervention and variation. The optimal operating conditions, however are achieved by setting the thermal capacity stage of the burner. The practice however confirms, that the appropriate choice of the thermal capacity stage of the burner in order to achieve continuous operation of the burner, allows optimal operating conditions and optimal fuel consumption rate.

The control module’s display and the keyboard are used to indicate the current status of the burner, as well as adjustment of its operating parameters. The adjustment of the parameters however, should be performed by authorized trained technician only.

5.2.6. Description of the initial menu, the starting process and the adjustment of the control module of pellet burner of series “GP IV”

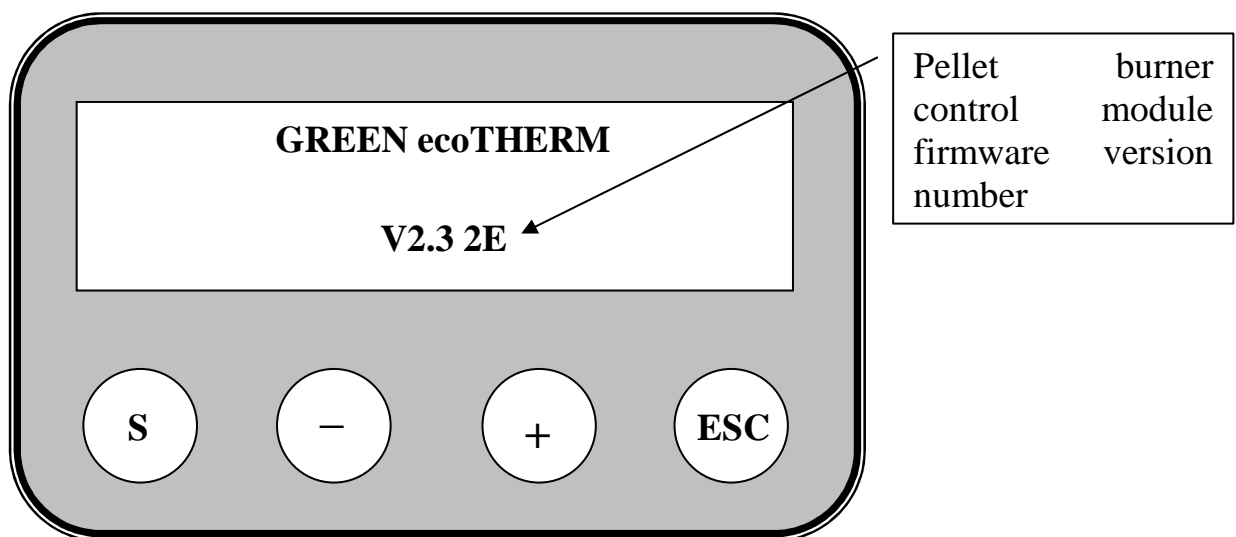


Figure 5.2. Initial menu, shown on the display at pellet burner of series “GP IV” start-up process.

After the burner’s software has been loaded into the control module (which actually takes several seconds), the display indicates a question: *should the burner be activated (Activate ?)* :

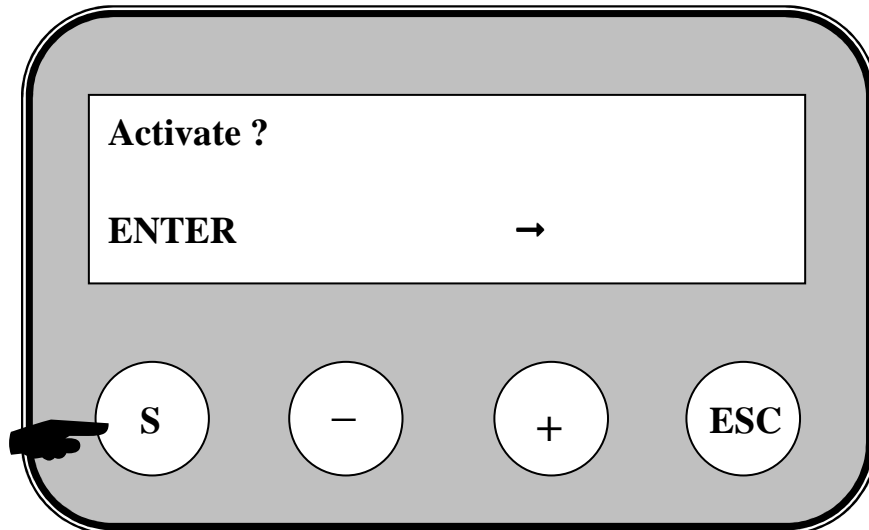


Figure 5.3. Menu item shown on the display at start-up procedure of the automatic pellet burner of series “GP IV”, indicating reminding question.

In order to start the burner, press the button “S”, as shown on the figure above.

After the burner has been activated, the display indicates the following message.

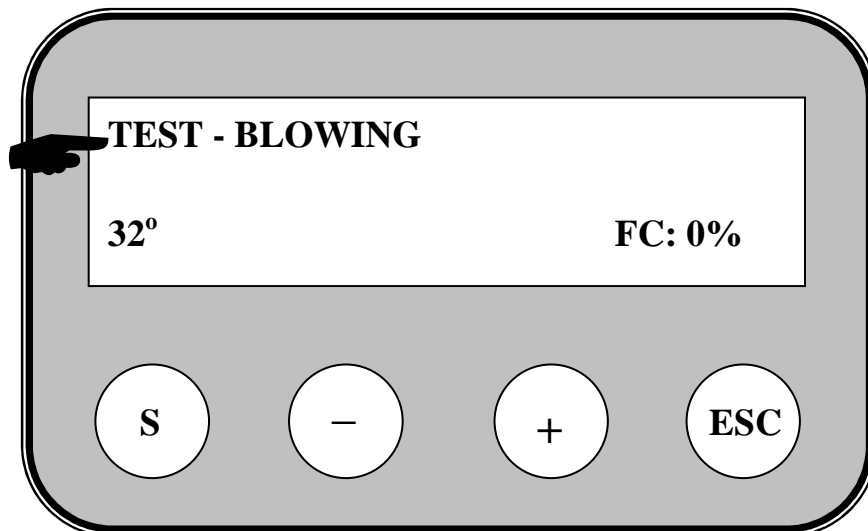


Figure 5.4. The display indicates information for the current operating mode of the control module – *in the case the control module performs functional check procedure of the air supply fan.*

COMMENTS :

- „**TEST – BLOWING** “ – indicates the operating mode – in the example the control module performs initial air fan blowing, which is dedicated to blow away any residues on the burner’s grate;
- „**32°**” – indicates (*shown on the display, in the lower right corner, above the “S” button*) the temperature of the circulating water in the heat exchanger of a hot water boiler, in degrees Celsius. The circulating water temperature is indicates in case the control module is equipped with

appropriate temperature sensor and the control module has been adjusted to operate with such sensor;

- „FC: 0% ” – indicates the intensity of the luminosity of the photosensor, in percents – *the current value is indicated in the lower right corner of the display, above the button „ESC”*;

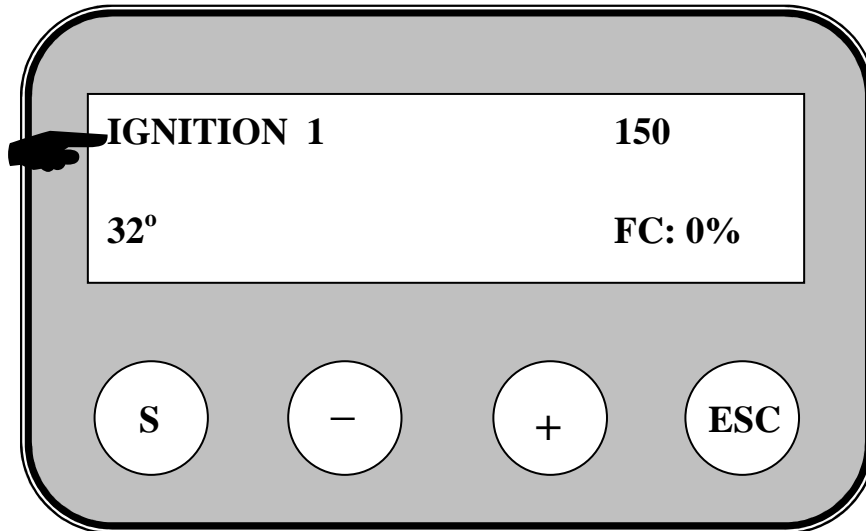


Figure 5.5. The display indicates information about the operating mode of the burner – in the example the control module is in fuel ignition process mode.

COMMENTS:

- *After the initial ash residue air blowing by the fan, the control module of the burner starts to supply the initial amount of fuel and starts the process of fuel ignition. The display indicates the operating mode „IGNITION 1” – this is the first attempt (indicated by number 1) for fuel ignition, which is realized for a duration, defined in the operating software;*
- *The control module of the burner is preprogrammed in the producer’s factory with factory default values for the operating parameters, considered to be optimal for most of the common cases of burner’s operation. The control module operates at discreet thermal capacity stages, which are adjusted to predefined thermal capacities of the burner. The maximal thermal capacity stage, however, is adjusted to allow higher thermal capacity of the burner, than the nominal one – this stage is dedicated for cases of low quality fuel (i.e. with lower than required net calorific value of the fuel) or in case the heat demand exceeds the thermal capacity of the system: pellet burner – heat consumer (in most of the cases hot water boiler). It is recommended to operate at the highest thermal capacity stage no more than 10 hours for the entire heating season, in order to sustain high reliability of the pellet burner, as high thermal capacity operating modes result in increased thermal loads of the modules of the burner and decrease its life span;*

- *The practice shows, that the factory set values for the operating parameters does not require additional adjustment, even if the fuel has been changed during the exploitation period of the burner;*

The producer reserves the right to change the values of the operating parameters of the pellet burner control module without prior notice;

NOTES :

- The values of the operating parameters, which define the thermal capacity of the burner are determined by the following conditions:
 - The utilized fuel is : wood pellets with diameter $d=8$ mm , class ENplus-A1 (see the fuel properties table);
 - The inclination of the axis of the fuel transport auger measured on basis of the horizontal plane is 45° ;
- The content of ash (mineral incombustible matter) in the fuel does not change significantly the net calorific value, but requires special design of the pellet burner, in order to achieve reliable and efficient combustion process. That's why the applicability and the effective utilization of certain fuel should be verified and after approval should be utilized in the pellet burner;
- The producer reserves the right to change the values of the operating parameters, which are controlling the pellet burner, without prior notice;
- In Table 5.1. are described the factory default values of the thermal capacity stages of the burner, used to obtain optimal operating conditions for the pellet burner;
- The tabled stages for the thermal capacity of the burner define its thermal capacity as well as the operating modes of the unit;
- The initial adjustment of the burner is realized by authorized trained service technician, after that no additional adjustment by the end user is required;
- The following text describes the procedure for determining the fuel supply rate and determining the thermal capacity of the pellet burner:
 - Power on the burner;
 - Detach the fuel delivery flexible pipe from the fuel supply pipe of the pellet burner's main module and put the end orifice of the flexible pipe into a container (for example a PVC bag, a vessel or any appropriate container) in order to collect all the fuel particles, transported by the auger;
 - Performed by authorized technician only, select the „Advance menu” and activate the operating parameter „Stoker adj”. **NOTE:** *the access to this advanced menu is restricted by password and is accessible by authorized technician only;*

- Then the auger will operate continuously for a predefined period of 6 minutes. The collected in the container fuel quantity should be weighted and introduced in the operating parameter of the control module, following the onscreen information. After the initial fuel flow rate measurement, the nominal operation of the burner should be activated. In case the net calorific value of the utilized fuel is known, then it could be introduced in the operating parameters of the control module as well. The factory default value for the net calorific value of the wood pellets is 4,8 kWh/kg. After the fuel specification data has been introduced, these data changes should be saved, by appropriate choice of menu item, indicated on the control module's display – follow the onscreen instructions to proceed, utilizing the appropriate buttons indicated below the text. After these adjustments, the pellet burner have defined and controlled thermal capacity, complying the appliance producer specifications;

The producer reserves the right to make changes if the factory default values of the operating parameters without prior notice end users or service technicians.

5.2.7. Adjustment of the pellet burner, according to the heat consumption rate

It is highly recommended to adjust the operating thermal capacity of the pellet burner of series “GP” as well as the heat consumer unit, in order to achieve high efficiency and reliable operation of the system. The adjustment process consists of individual adjustment of the operating thermal capacity stage of the burner, as shown on Table 5.1.;

At the thermal capacity operating stage adjustment of the pellet burner of series “GP” the adjustment of the air flow rate, supplied by the air fan, is not required, as the operating mode of the fan is controlled by the burner's control module unit.

5.2.8. Nominal operating mode of the burner

After the process of initial operation of the pellet burner (the fuel in the burner's grate has been successfully ignited) and the heat consumer unit has been tempered and reached steady-state operating mode, it could be assumed that the heating units are in operating mode, appropriate for precise process adjustment. . At steady-state operation the precise adjustments of the pellet burner should be done and/or the burner's operation should be checked and verified. The thermal capacity stage of the pellet burner should be adjusted, complying with heat consumption rate of heating system/heat consumer unit. At

nominal thermal capacity mode is performed the so called “hot test” of the entire heating system, following the local legislation requirements and norms.

ATTENTION : *The air flow rate is substantial for the optimal operation of the pellet burner and the entire system : burner – heat consumer. The air flow rate also influences the efficiency and the reliability of the system – in case the air flow rate is below an optimal operating value (i.e. air deficiency) the fuel is not combusted efficiently and this results in decreased overall efficiency of the system. In case the air flow rate exceeds the optimal operating range, this causes combustion chamber cooling and overall system efficiency as well, The above shows, that free access of the ambient air to the pellet burner should be designed, also for air ventilation of the domain, where the pellet burner and the heat consumer unit are installed. This will allow efficient operation of the pellet burner and optimal operation of the entire heating system, resulting in low fuel consumption rate and low pollutant emissions, as well as increased overall reliability if the system’s components.*

5.2.8.1. Operating mode of the burner of series “GP IV”

After the fuel ignition process has been done successfully, the control module of the burner continues its operation, following factory preset algorithm, in order to stabilize the combustion process, as indicated on the display, show on the figure below:

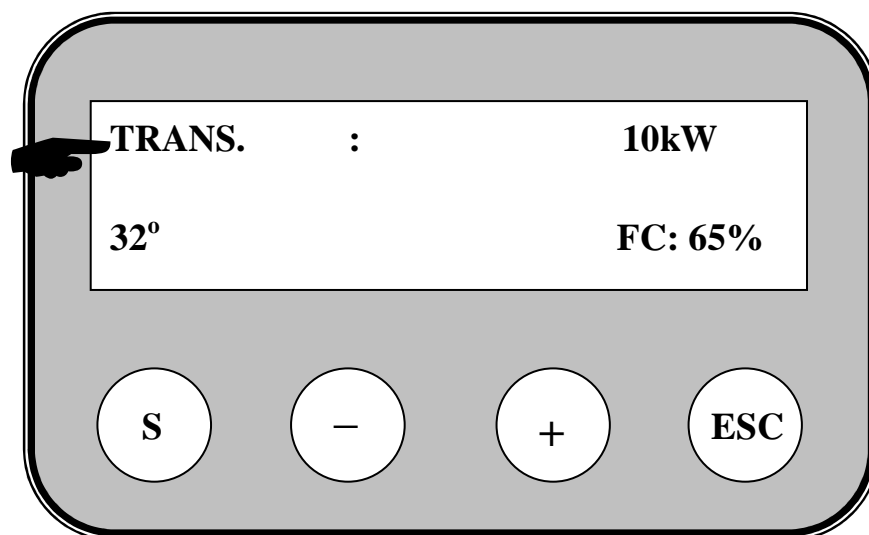


Figure 5.6. The control module display indicates the operating mode of the burner – **transition mode** – transition process from fuel ignition to stabilized combustion process at low thermal capacity stage.

NOTE - „TRANS.:10kW „ – indicates, that the burner is in intermediate operating mode, operating at thermal capacity of 10kW;

After the transition mode, the burner's algorithm continues to operate in the defined operating mode, as shown on the figure below:

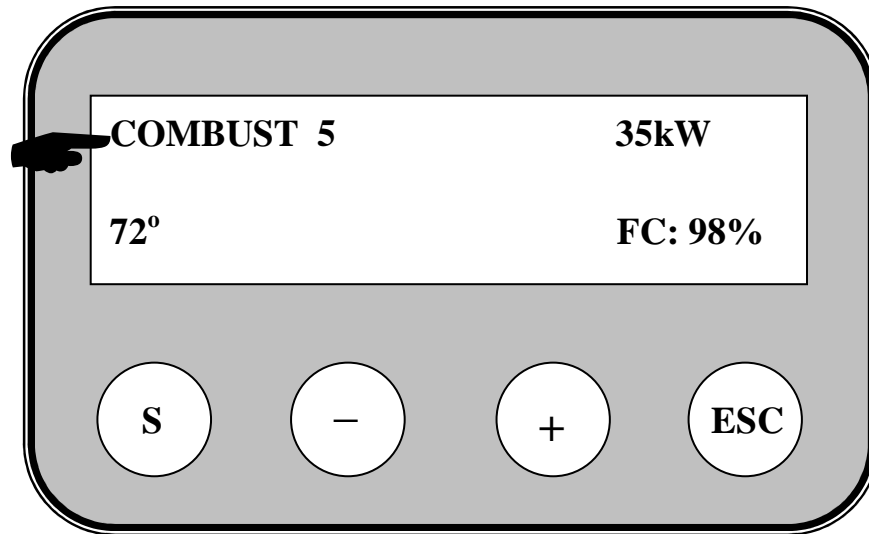


Figure 5.7. The control module's display indicates information for the current operating thermal capacity stage at maximal thermal capacity.

NOTES :

- „COMBUST 5 – 35kW ” – indicates the operating thermal capacity stage of the pellet burner (in the example the burner operates at 5th thermal capacity stage, its thermal capacity is 35 kW);
- „72° ”- indicates the temperature of the circulating water , [°C];
- “FC: 98%” – indicates the intensity of the flame, measured by the photosensor, [%];

5.2.8.2. User menu items of the control module of pellet burner of series “GP IV”

At pressing and holding the „S” button the control module enters in user defined menu items and their operating parameter adjustment.

Exit the current menu item by pressing the „Esc” button.

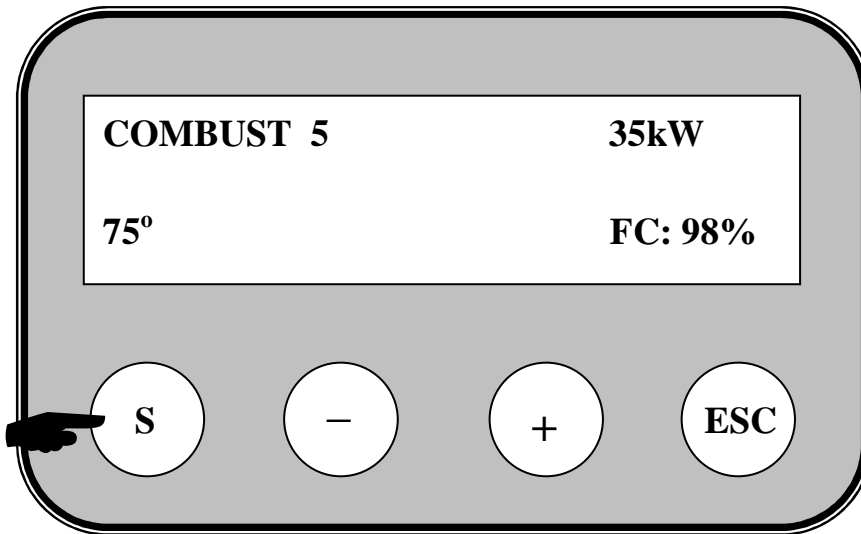


Figure 5.8. Pressing the “S” button allows to choose menu item of the pellet burner’s control module.

5.2.9. User menu items in control module of automatic pellet burner of series “GP IV”

5.2.9.1. Menu item „EFFECT LEVEL”

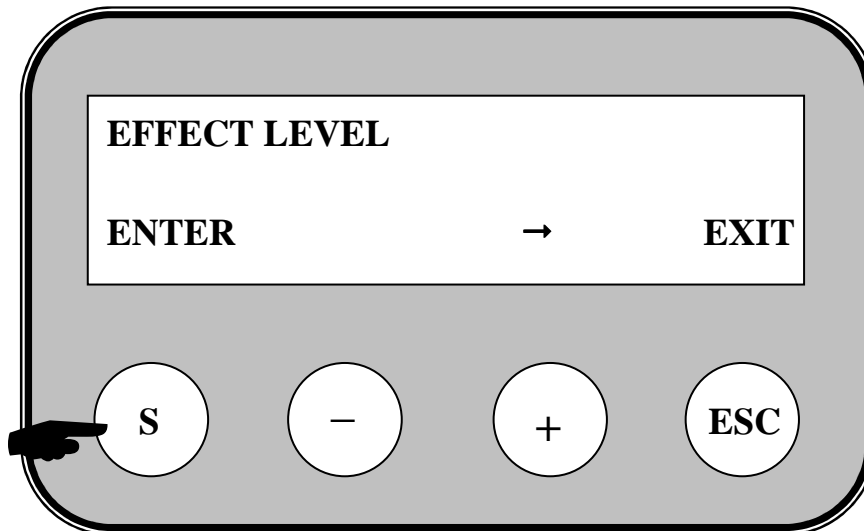


Figure 5.9. Menu item „EFFECT LEVEL” – choice of the operating thermal capacity stage of the pellet burner of series “GP IV”.

In this menu item the operating thermal capacity stage of the burner is chosen and the burner will operate at this stage until the set-point is reached, followed by thermal capacity modulation.

In the following table are presented the factory defined thermal capacity stages and their corresponding thermal capacity of the pellet burner of series “GP IV”.

Thermal capacity of the pellet burner , [kW]			
	Model	GP 25 IV	GP 32 IV
<i>Thermal capacity stage</i>		-	-
1		7.0	10.0
2		15.0	20.0
3		20.0	25.0
4		25.0	32.0
5		28.0	35.0

Table 5.1. Operating thermal capacity of the pellet burner of series „GP IV”, according to their specific model;

NOTE : *It is highly recommended to exploit the pellet burner of series “GP IV” at thermal capacity stage not exceeding the 4th including, the 5th thermal capacity stage is designed to operate only in high heat consumption rates for short periods of time;*

In order to chose the menu item „EFFECT LEVEL” one should press the button, below ENTER – button „S”. In order to go into another menu item, one should press the “+” button, found below the displayed arrow. Use the button „ESC ,, in order to return to upper menu level and going back to the main menu item.

At entering the menu item „EFFECT LEVEL” the end user could choose one of the five operating thermal capacity stages available at set as thermal capacity set-point of the automatic pellet burner of series “GP IV”.

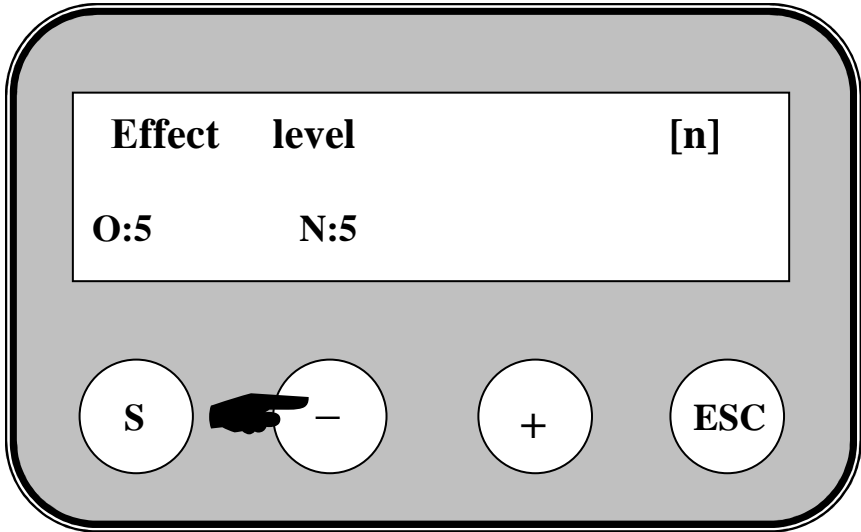


Figure 5.10. Choosing the operating thermal capacity stage of the pellet burner of series “GP IV” control module.

NOTE : use the buttons „ + ” and „ – ” in order to ce choose the desired operating thermal capacity stage of the pellet burner. Press the button „S” in order to confirm the choice, in order to exit from the operating menu item press the “ ESC ” button.

5.3. Adjustment of the thermal capacity of the burner

The adjustment of the thermal capacity of the pellet burner is made by choosing the operating thermal capacity stage, which actually defines burner’s thermal capacity.

Information for the thermal capacity of the burner at different stages of the thermal capacities is given in Table 5.1.

ATTENTION: *In case the fuel has been changed (for example the class of the pellets is changed) this could cause additional adjustment of the pellet burner operating parameters, as well as the operating thermal capacity of the burner.*

5.3.1. Decreasing the thermal capacity of the pellet burner

The thermal capacity of the pellet burner is decreased by decreasing the thermal capacity operating set-stage, which results in reduced thermal capacity of the burner as well as lowered fuel consumption rate;

5.3.2. Increasing the thermal capacity of the pellet burner

The thermal capacity of the pellet burner is increased by increasing the thermal capacity operating set-stage, which results in increased thermal capacity of the burner as well as increased fuel consumption rate;

NOTES:

- At any change of the thermal capacity set-point of the pellet burner, the operating algorithm of the burner automatically makes changes of the operating values for the air flow rate, supplied by the air fan, as well as the fuel flow rate, which allows optimal operation in wide thermal capacity range of the pellet burner;
- The default values of the operating parameters of the pellet burner of series “GP” are derived at the following conditions:
 - The fuel is wood pellets, with diameter $d=8$ mm, A category (see table of wood pellets categories);
 - The axial inclination of the fuel transport auger (the angle between the auger axis and horizontal plane) is 45° ;

- The ash content (mineral, incombustible content in the fuel) does not influence significantly the gross calorific value of the fuel, but requires specialized design of the burner in order to achieve optimal and efficient combustion process. Following this, one should test the applicability of a fuel for combustion process in the current design of the burner and if positive result is achieved to be massively utilized as fuel material. However, many aspects of the unit operation should be considered;
- The producer preserves its right to change any factory preset value of the operating parameters of the burner, without a without prior notice;

5.4. Stopping the operating mode of the burner of series “GP IV”

The stopping process of the pellet burner could be done by setting off the heat consumer control module, which gives operating signal to the pellet burner. The restoration of the nominal operation of the pellet burner is performed by changing the signal status of the heat consumer control module, which governs the operation of the burner. In case the operation of the pellet burner is not required for a relatively longer period of time, then it is highly advisable to clean thoroughly the combustion chamber of the heat consuming unit, as well as the burner’s grate, then power off the heat consumer unit, which is connected with the pellet burner.

5.4.1. Stopping the operating mode of the pellet burner of series “GP IV” by switching OFF the “START” switch

Use the “START” switch (installed by the authorized technician at the installation process of the burner, following the applied electrical schemes) to switch ON and run the operation of the burner and respectively to switch the unit OFF and stop its process. At switching OFF the burner’s operation, its control module’s display indicates “**FINAL COMBUSTION**”.

ATTENTION: *At switching OFF the burner, use the “START” switch, DO NOT switch off the power supply of the burner.* The reason for the requirement is, that the “START” switch activates controlled switching off procedure of the burner’s control module, which also cools down the unit and results in total combustion of the char residues, thus preserving the burner’s reliability and efficiency.

5.4.2. Stopping the operating mode of the pellet burner of series “GP IV” by setting the menu item of its control module.

In order to stop the operation process of the burner, it is necessary to perform the following procedure:

- Press and hold the “ESC” button (for more than 5 seconds);
- Choose “YES” at the question „Make final combustion?“, indicated on the control module’s display;

If the choice is “YES”, then the display indicates „Final combustion” and the control module performs process stopping of the burner.

There is another way to stop the burner’s operation, described below :

In order to stop the operation of an operating pellet burner, it is necessary to enter the menu item „MAKE FINAL COMB.” of the burner’s control module.

NOTE : *use the above describe option for stopping the operation of the pellet burner in order to follow the implemented control algorithm and to perform the final combustion of the fuel residue and oxidizing char, found on the burner’s grate.*

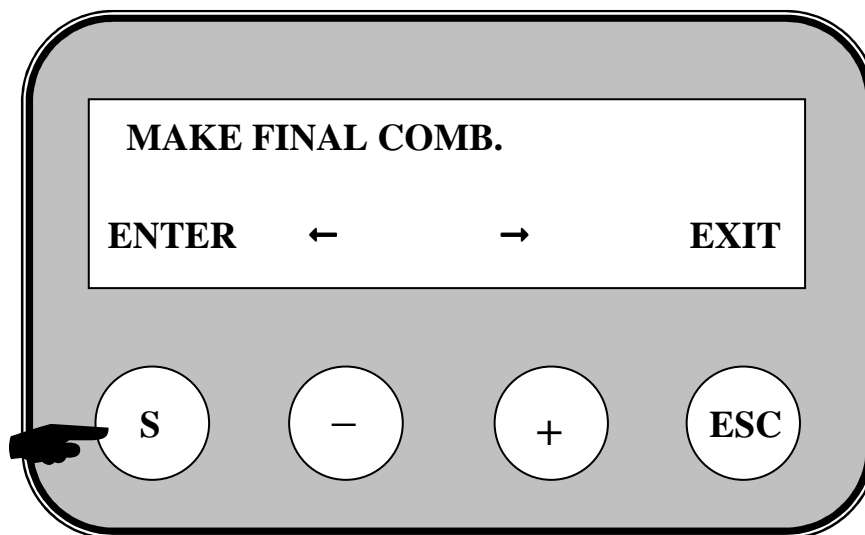


Figure 5.11. Choose the menu item „MAKE FINAL COMB.”, which is used for stopping the operating mode of the pellet burner of series “GP IV”.

NOTE : in order to enter the menu item „MAKE FINAL COMB.” One should press the button “S”, in case of rejection, press the “ESC” button, use the “+” and “-” in order to navigate to other menu items

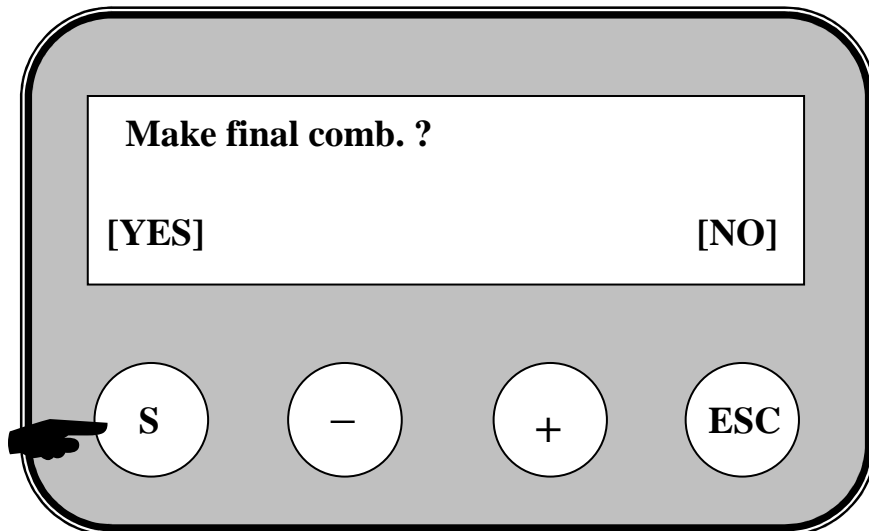


Figure 5.12. The control module’s display indicates operating question for choosing the options for activating the stopping process of the pellet burner of series “GP IV”.

In order to activate the final combustion process, one should press the „S” button, found below the “[YES]” label, indicated on the control module’s display. In case of rejection, then one should press the “ESC” button, found below the “[NO]” label, found below.

In case that the burner will not operate for a relatively long period of time, it is recommended to shut down the central power supply of the unit and clean the ash deposited in the combustion chamber, beneath it, as well as other surfaces of the combustion chamber, the photosensor should be checked/cleaned as well.

ATTENTION:

- *In case that the burner will not operate for a long period of time, then thorough ash deposit cleaning procedure should be performed. The ash layer acts corrosively on the carbon steel surfaces, which will lead to a decrease of the lifetime of the burner’s main module. It is obligatory to perform service procedures and preventive observations of the unit by trained service personal only as well as thorough cleaning at the end of the heating season. Completing these requirements will ensure long exploitation duration of the burner and its high efficiency and reliability;*
- *In case there is signal to stop the operation of the burner, the fuel delivery stops, but its air fan continues to run. That’s why at stop signal the burner continues to operate and the combustion process will continue to release heat energy, which makes the system quite inert. This particular feature should be concerned, especially when a local heating system is equipped with radiators with thermostatic control valves (or any other control elements), which stop the flow of the circulating fluid and thus the*

released in the combustion process heat energy could not be transferred (dissipated) and thus the hot water boiler could be overheated. That's why in case the pellet burner of series "GP" operates in a local heating system, which have heating elements with thermostatic valves, these valves should not should be cutting the heating fluid flow rate, but should allow a minimal flow rate in order to allow heat dissipation in any way. It is recommended to install a heat accumulating tank parallel to the circuits of the heating system in order to achieve a buffer effect and to decrease any variations of the consumption of heat energy by the heating system;

5.5. Turning OFF the automatic pellet burner of series "GP IV" by external for the burner control module

The pellet burner is turned off by changing the "START" signal status into OFF, supplied by the control module. During the working process in OFF state, the control module of the burner performs so called "controlled turning off procedure" in which the air fan is working (and the burner is cooled down) and operating parameters are simultaneously monitored, in case of emergency appropriate actions will be taken. After the burner has been cooled down (to ambient temperature), it should be switched off by turning off the main power supply of the heat consumer unit. It is recommended to clean the deposited ash thoroughly both of the burner as well as heat energy consumer surfaces.

- **Emergency burner stop**

In operating process of the burner emergency situations could arise and the unit will go into alarm/failure mode. Such situations are detected by the process control board and it will go into automatic protective mode in order to be protected as well as the heat consumer unit. These modes are operated by appropriate preventive measures, automatically taken by the control board of the main module and the alarm mode is indicated by appropriate message, shown on the control module's display. Detailed description of the error codes could be found in Table 5.3. Please check the error messages and refer this manual before taking any actions. After the cause of the alarm situation is clarified, take adequate actions for bringing back the burner into normal operating conditions and restart it by switching off the power supply OFF the main module and back into ON. Prior to powering ON the burner, clean the ash and char residue in order to allow reliable ignition and operation of the burner.

ATTENTION:

- *in case of emergency situation – heat consumer overheating, the emergency thermostat (which is not part of the burner's equipment and is **obligatory** – it should be installed on the control module of the unit) is*

activated. In this case the system (burner-heat consumer) should be cooled down and the reason for such emergency situation should be investigated and preventive measures should be performed. The emergency thermostat should be manually reset by unscrewing its preventive cap and its stem should be pressed until the thermostat switches back on (a “click” sound is heard in this process), then screw back its cap. After the system (burner-heat consumer) boiler is checked and the cause for overheating is determined and repaired, restart the burner by turning off its power supply and then back on in order to run the burner in normal mode;

- *in case of alarm mode – fuel delivery pipe overheating, the alarm thermo-probe of the burner’s main module is activated and the control board switches into alarm mode. This thermo-probe senses the temperature on the surface of fuel pipe and prevents so called “back fire” process. After the unit is cooled down and the reason for such kind of emergency situation are clarified and special preventive measures have been taken, then the burner should be restarted into nominal operating mode. This is done by manual switch OFF and back ON of the power supply of the burner. In some situations this thermo-probe could be thermally damaged and will need renewal, in such situation please refer to service assistance. In some cases it is possible to achieve high temperature levels in the region of the pellet supply pipe, which will result in sensor failure and it should be replaced by authorized technician;*

5.6. Menu item, indicating list of the latest 10 errors, arose from the operation of the pellet burner of series „GP IV”

In order to check the last logged errors got at the operation of the pellet burner; one should enter the “LOG” menu item.

NOTE : *in the “LOG” menu item are shown only the latest ten (10) errors logged, as result of the operation of the pellet burner. In case of abnormal operation of the pellet burner arise, the logged error codes are stored in FIFO (first- in-first-out) mode and the error, which exceed the capacity of the log list will be replaces with the next error log message, thus the newest error code will be stored successfully;*

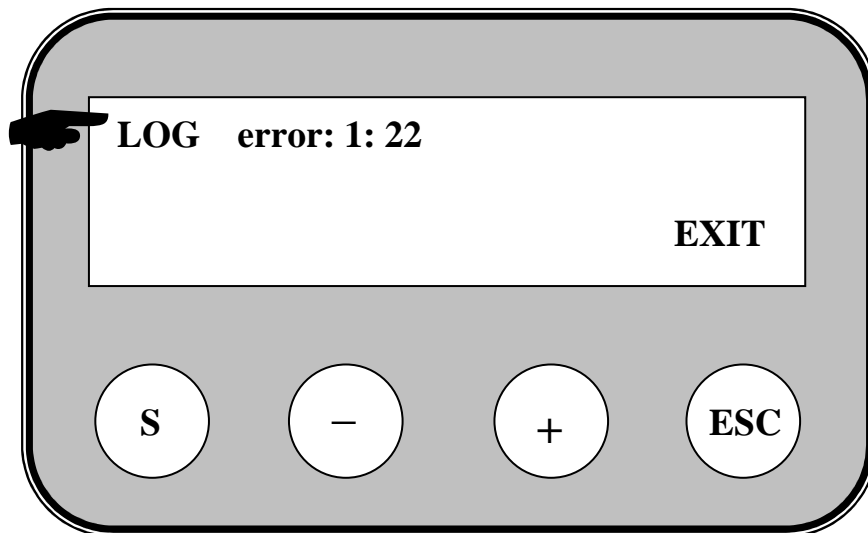


Figure 5.13. The burner’s control module display indicates the chosen “LOG” menu item, also the number of the error in the log list and its code number.

In order to exit the operating menu item, press the “ESC” button.

In **Table 5.3** one could find information for the error code number and detailed description in order to resolve a problem.

5.7. Restarting the operation of a pellet burner of series “GP”

The restarting of the burner is required in case of failure modes, for example the burner has a start signal, but the control module of the burner is operating in safe mode, which is not allowing nominal operation of the burner. The pellet burner control module’s display indicates the error code number. It is necessary to take precaution measures in order to solve the problem and to remove the cause for the failure. After that the burner should be restarted – this is performed by switching off and back on the electrical power supply of the main module of the pellet burner (*performed for example by switching off the power supply by an automatic circuit breaker*). It is recommended to check and eventually clean the grate of the burner before starting the burner again.

5.8. Description of the active thermo stickers, showing the condition of the system

The thermosticker is used to measure the operating temperature of the burner’s body in a characteristic zone of the burner. The temperature measurement could indirectly determine the condition of the heating system and the need for preventive and service actions of the burner and the entire system, as well as the flue gases duct.



Figure 5.14. View of the reversible thermosticker, used to measure the spot temperature – *initial condition, at normal room temperature;*



Figure 5.15. View of the reversible thermosticker, used to measure the spot temperature – *condition at increased burner's body temperature – in the range of 60 – 65°C;*



Figure 5.16. View of the reversible thermosticker, used to measure the spot temperature – *condition at increased burner's body temperature – in the range of 70 – 75°C.*



Figure 5.17. View of the reversible thermosticker, used to measure the spot temperature – *condition at increased burner's body temperature – in the range of 80 – 85°C.*

EXPLANATION – the reversible thermosticker should be checked on regular basis, recommended at any maintenance procedure of the heating appliance and/or the pellet burner. *It indicates the current temperature at operation of the burner and gives indirect information for the ash deposition and the need of cleaning of the residue, also the ash deposits on the internal surfaces of the chimney.*



Figure 5.18. View of the irreversible thermosticker, used to mark an alarm overheating of the pellet's delivery pipe – *initial condition, the active segment is white, the temperature has not reached activation level of 104°C;*



Figure 5.19. View of the irreversible thermosticker, used to mark an alarm overheating of the pellet's delivery pipe – *activated condition, the active segment is dark, the temperature has exceeded activation level of 104°C;*

EXPLANATION – *the activation of the **irreversible thermosticker** is indicator for an overheating event of the pellet delivery pipe. The condition of this sticker is not reversed to its initial condition at cooling down of the burner's body. It is necessary to check and make the appropriate maintenance/service actions prior to start the burner again. This thermosticker should be changed after the successful operation of the burner has been achieved – the check and service of the burner is performed by authorized technician only. The activation of this thermosticker could happen in cases like flowing hot flue gases though the pellet's pipe, due to increased resistance of the flue gases duct and/or decreased draught of the chimney. In such situations the flexible hose, connecting the pellet transport auger and the main body of the burner could be damaged as well and could also need replacement. Such situations are abnormal and are not covered by the warranty for the burner.*

5.9. Removal and attachment of the burner's grate at maintenance and cleaning procedure of the pellet burner of series "GP"

At the cleaning process, the removable grate should be taken out of the burner's head, as shown on the following figure.

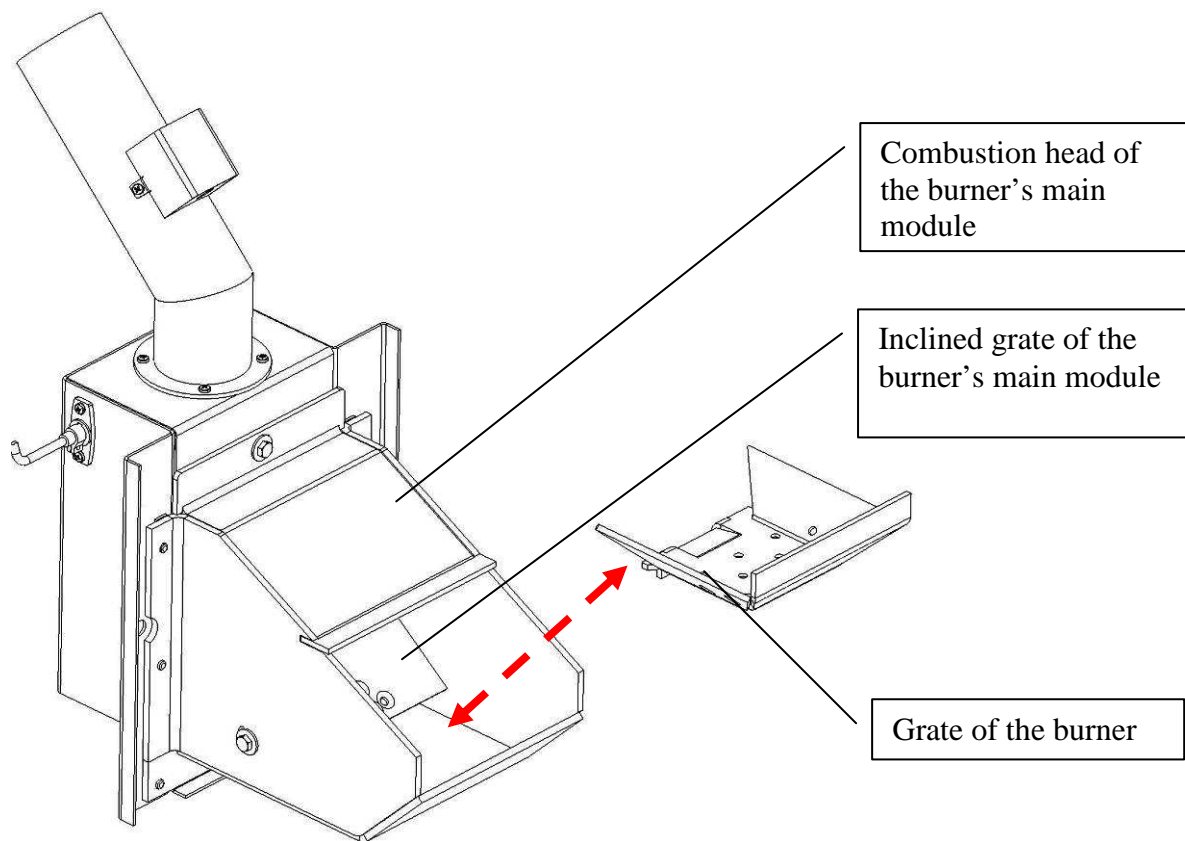


Figure 5.20. Side view of the burner's main module with detached grate;

NOTE : the grate of the burner should be taken out of the burner's head after the burner has been cooled down to safe temperature levels, in order to be cleaned thoroughly. It is highly recommended to use self protecting means and to use tool (for example pincers or any appropriate tool) in order to handle the grate safely.

At the grate cleaning process, it is necessary to pay attention to clean thoroughly the holes, which conduct the air through the grate, which will allow efficient combustion process and optimal air cooling of the grate.

After thorough cleaning of the ash residue out of the burner's grate, as well as other unburned fuel particles and/or slagging material, the grate should be carefully installed back on its initial position. The grate's installation is made in two steps: first: *incline the grate in order to direct its extension below the inclined grate of the burner's main module*, second: *slide the grate until the gap between the grate and the inclined detail is diminished*;

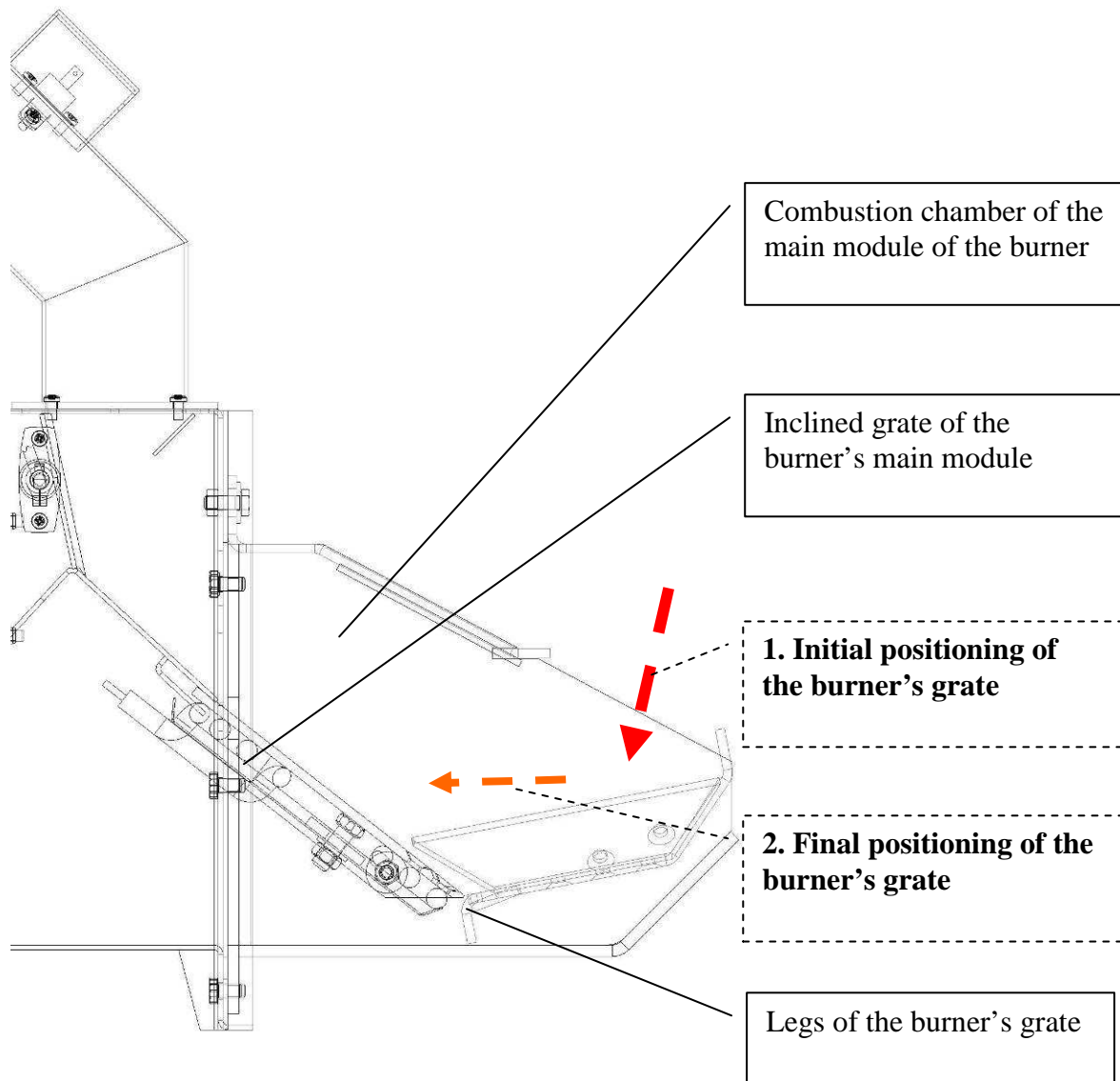


Figure 5.21. Cross-section of the burner, showing the position of the grate at the attachment process;

NOTE : The burner's grate positioning is made in two steps:

1. position the burner's grate, so that its legs touch the bottom of the burner's combustion chamber;
2. slide the grate until it fits below the inclined grate of the burner and there is no gap between the grate and the inclined detail of the burner;

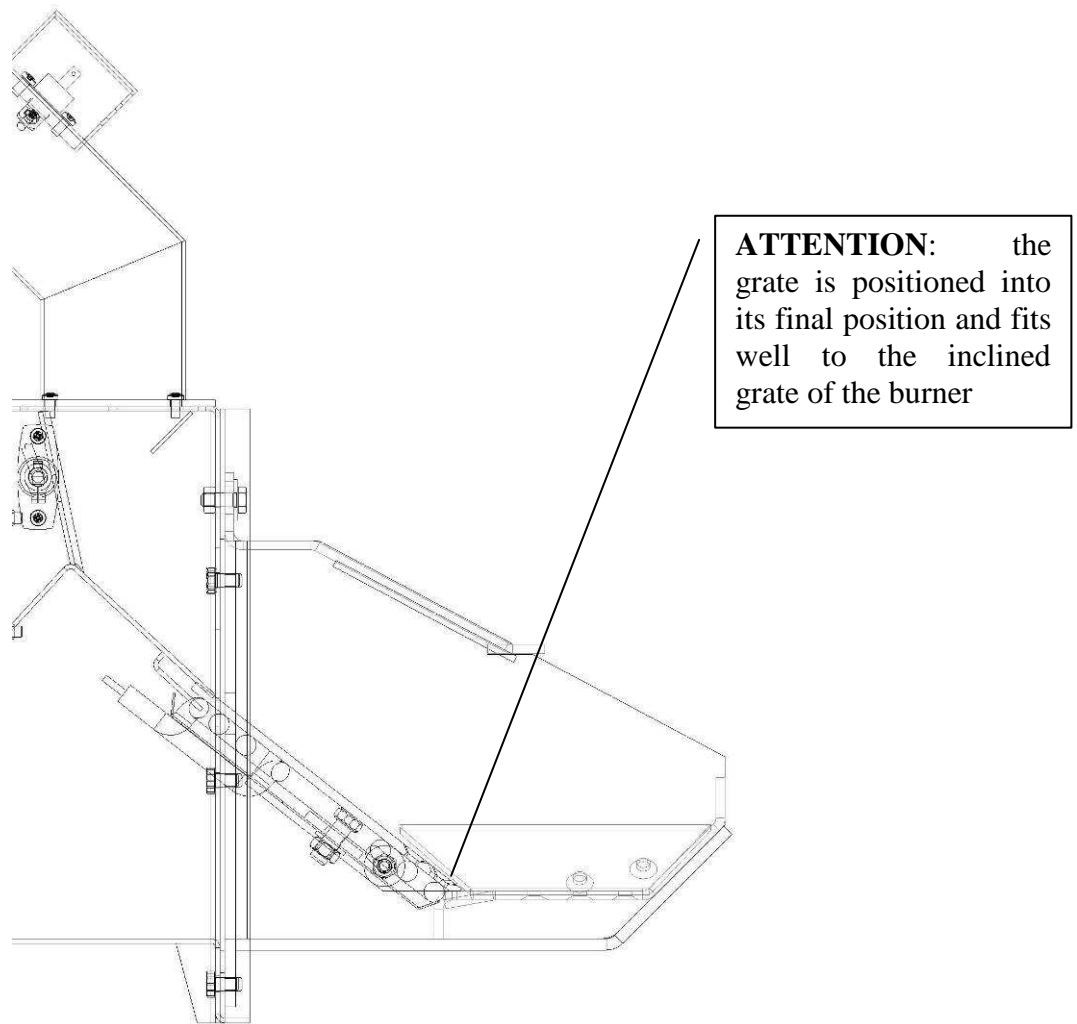


Figure 5.22. Final position of the grate, positioned in the burner’s main module (*shown as cross-section*);

5.10. Showing and teaching the end user about the maintenance and adjustment procedures of the burner

It is necessary to show and teach the end user the maintenance procedures for operating the burner efficiently and keep its reliability in high degree order. Also the installer should demonstrate and teach the end user how to adjust the thermal capacity of the burner, according to the estimated heat consumption and initial fuel transport auger charging:

- **combustion chamber and grate cleaning** – it is recommended (at least once per day or a longer period is appropriate) to stop the burner (turn off the “START” signal of the burner), wait until the char has been incinerated and the burner cooled down. After the combustion chamber has been cooled down, remove the grate and clean the ash residue thoroughly. Use protective gloves and appropriate instruments if necessary;



Figure 5.23. Pair of working gloves, supplied for safe and easy cleaning the ash and char residues of the burner’s main module;

- **cleaning procedure of the flexible hose, connecting the fuel transport auger and the main unit of the burner**– it is recommended to clean periodically this hose, as during the fuel transport fine particles are deposited on the internal surface of the hose, which eventually could impede the fuel transport through it. Furthermore, the deposited layer of fine fuel particles could be ignited in case that hot flue gases are exhausted through this hose in case of emergency;
- **the way to restart the burner** – after the cause for malfunctioning/failure of the burner has been determined and the problem has been solved, the starting of the burner should be performed by restarting the power supply of the main module of the pellet burner;

ATTENTION : *regular cleaning of burner will ensure long-life reliable exploitation period, economic and efficient performance of the unit;*

5.11. Safety and unexpected risks

Risks could arise at the exploitation of the burner of series “GP”:

The automatic pellet burner “GP” is designed according to the safety requirements of the operating European standards and norms. However safety and unexpected risks could arise in situations like following:

- *The pellet burner of series “GP” is operating incorrectly/abnormally;*
- *The unit is installed by unauthorized/unqualified personal;*
- *The safety instructions, described in this manual are not followed and fulfilled;*

Unexpected risks:

The pellet burner of series „GP” is designed and produced according to the requirements of the operating EU safety norms. However, in spite of that possible risks are considered as a result of the operating process of the pellet burner, it is possible to arise risks as follows:

- ***Cauterization risks***, caused by high temperatures, as a result of the combustion process in the combustion chamber, at manual cleaning processes of the surfaces of the burner (i.e. its combustion chamber), or ash residue cleaning, or any unburned fuel material, smoldering on the grate of the combustion chamber;
- ***Electrical shock risks at indirect contact***. The burner is connected to the power supply and its operating modules are separated in a section of its main module, equipped with required protective and short-circuit preventive elements. It is obligatory to perform by authorized personal/technician the burner ground connection. It is forbidden to remove the cover of the main unit of the burner, as well as the protective cover of the electric motor of the fuel transport auger, by unauthorized person;
- ***Fingers injuring risks*** at operating mode or at maintenance and cleaning process of the burner. It is recommended to use appropriate individual resources for self-protection;
- ***Suffocation risks*** due to flue gas uncontrolled emissions, in case when the chimney draught is insufficient, in case that the flue gas duct (of the heat consumer unit) is clogged, or in case that the flue gas duct is not fully tightened and gas leaks are possible;

5.12. Operation faults and repairing procedures

No	Operation fault	Cause	Method of repairing
1.	In case that the burner is installed on a hot water boiler and there is low temperatures in the heat energy supplied rooms	Insufficient heat capacity of the burner	The pellet burner thermal capacity operating stage should be increased
		Low set-point temperature	It is necessary to check and adjust the circulating water temperature set-point, defined in the burner's control module;
		Low set-point temperature of the remote room thermostat (if connected)	It is necessary to increase the set-point of the room thermostat
2.	In case that the burner is installed on a hot water boiler and there is high temperatures in the heat energy supplied rooms	Thermal capacity of the burner exceeds the heat energy consumption	It is necessary to decrease the pellet burner's thermal capacity operating stage
		High set-point temperature of the remote room thermostat (if connected)	It is necessary to decrease the set-point of the room thermostat
3.	The burner is active, but no combustion process	signal for operation is not available	It is necessary to check the status of the control module of the heat consumer unit, which controls the operation of the burner
4.	Difficult fuel ignition	Low quality fuel	It is necessary to replace the fuel, most probably due to its high moisture content, which could be above the required value for nominal operation of the burner
5.	The ignition process is accompanied with improper noise	Insufficient draught of the chimney	It is required to check the condition of the flue stack, as well as the heating appliance – it is recommended to stop the burner and clean the ash deposits thoroughly. In some situation adjustment of the operating parameters is requires as well –

			<i>this should be performed by authorized technician;</i>
6.	Heat consumer unit emergency overheating	Absence of heat consumption or incorrect adjustment of the parameters of the burner or imbalanced operation of the system : burner-heat consumer	It is necessary to check the correct operation process of the system: burner-heat consumer unit and eventually appropriate adjustment of the operating parameters of the burner– <i>this should be performed by authorized technician only.</i> After the system is cooled down to ambient temperature and the reason for overheating is serviced out/resolved, the protective cap of the emergency overheating thermostat (if activated) should be unscrewed, its rod should be pressed until the thermostat is reset and its cap should be screwed back. Then restart the burner (switch off the power supply and back on)
7.	No fuel ignition	Absence of fuel in the hopper	The fuel hopper should be charged. Then manually charge the fuel transport auger until new fuel comes out of the exit side of the auger and back plug its cable onto the burner’s main unit.
		Absence of fuel in the burner’s combustion chamber	It is possible by manually restarting to achieve nominal operation process of the burner;
		Fuel is present in the burner’s grate, but it’s not ignited or it is fully incinerated and the combustion process has extinguished, i.e. not present;	Clean the fuel particles, laying on the burner’s grate; In case that the electric heater is out of order or not operating, then it should be replaced (or checked for proper functioning).

		Abnormal operation or malfunctioning of the photosensor	The photosensor should be checked, cleared if necessary adjusted or replaced in case it is out of order – <i>this procedure is performed by authorized technician only;</i>
8.	The burner is not running or it stops	No power supply	<p>Check the operation of the control module's display, positioned on the interface panel of the burner. Check the connection and electricity parameters of the burner's main unit and the heat consumer power supply – the parameters should be as follows 220 V, 50 Hz – <i>it should be performed by authorized technician only;</i></p> <p>Check the correctness of the power supply connection, according to the applied electrical scheme – <i>it should be performed by authorized technician only;</i></p> <p>Check for tightness of electrical joints of the control board – <i>it should be performed by authorized technician only;</i></p>

		Absence of operating signal to the burner's main unit	<p>Check the availability of start signal of the burner. Check the wiring and connection of the burner's main unit and the power supply box of the heat consumer's power supply - <i>it should be performed by authorized technician only;</i></p> <p>Check for tightness of electrical joints of the control board - <i>it should be performed by authorized technician only;</i></p> <p>Check the operation and functioning of the control module, which gives operating signal to the burner - check the parameters of the power supply - it should be as follows : 220 V, 50 Hz - <i>it should be performed by authorized technician only;</i></p>
		The burner does not run and start signal is present	Check if the control board is in alarm mode - see following table with operating and alarm indication
		Safety fuses are broken due to emergency short circuit	<i>This check-up operation should be performed by authorized technician only : check each fuse status and replace if necessary with appropriate one (Attention: safety fuses F1, F2, F3 and F4 are fast reacting);</i>
9.	The flame looks "opaque" and smoke is observed at the exit of the chimney	Low quality fuel	Fuel replacement is recommended, most probably the moisture content is higher than required for nominal operation of the burner - see the requirements in the fuel properties table;
		Inappropriate operating parameters adjustment	It is necessary to perform operating parameters adjustment and achieve efficient combustion process - <i>this operation should be performed by trained authorized personal only;</i>

10.	The ignition process of the fuel is successful, but the unit could not reach stable operating mode	Incorrect photosensor positioning	Change (i.e. slightly rotate or even axially move) the position of the photosensor
		The external surface of the photosensor is dirty	Clean the transparent section of the photosensor by careful cleaning – do not use solvents
		The photosensor is gone – its working surface is damaged and overheating zones are observed	It is necessary to replace the photosensor – <i>it should be performed by authorized technician only</i>
11.	The operation of the burner is not stable	Photosensor malfunctioning	Check the condition and functionality of the photosensor
		The operating parameters of the control board have been changed	Check the position of the heat capacity potentiometer Check the operating thermal capacity stage of the burner's control board; Check the values of the operating parameters of the burner's control module – <i>this procedure should be performed by authorized technician only;</i>
12.	Heating-up of the pellet delivery pipe	Insufficient draught or ash deposition of the appliance	It is necessary to clean the ash deposition of the appliance, eventually clean the ash in the chimney. A possible solution is to install an additional flue gas fan and/or change of the chimney *
13.	Heating-up of the pellet delivery pipe and activation of the pipe's alarm thermostat	Low draught or high ash deposition of the appliance	It is necessary to make thorough cleanup of the ash, deposited on the appliance, eventually the chimney. It is necessary to restart the burner. A possible problem solution is to install an additional flue gas fan serially to the heating appliance and/or change of the chimney * - <i>performed by authorized technician;</i>
14.	Increased temperature, indicated by the reversible liquid	Increased resistance of the flue gases duct or insufficient draught of the	It is necessary to make thorough cleanup of the ash, eventually the chimney. It is necessary to restart the burner. A possible problem

	crystal thermosticker	chimney	solution is to install an additional flue gas fan serially to the heating appliance and/or change of the chimney * - <i>performed by authorized technician;</i>
15.	Activation of the irreversible thermosticker, attached to the fuel delivery pipe of the main module of the burner	Excessive operating temperature levels in the pellet delivery pipe, in most of the cases it is a result of the passage of hot flue gases	It is necessary to make thorough cleanup of the ash, deposited on the appliance, eventually the chimney. It is necessary to restart the burner. Check the pellet burner and clean if necessary * - <i>performed by authorized technician;</i>
16.	Blurred/melted photosensor	Incorrect stopping procedure of the burner	It is required to clean the external surface of the photosensor or eventually to replace it. It is obligatory to follow the stopping procedure, described in this manual;
17.	Presence of unburned fuel in the ash tray of the heat consumer unit	Ineffective fuel combustion process	It is necessary to perform adjustment of the operating parameters of the burner – <i>it should be performed by trained authorized technician;</i>
18.	Ash slagging and deposition is observed in the region of the combustion chamber of the burner (especially on the grate)	The fuels' ash content is higher than recommended	It is necessary to replace the fuel with appropriate one – see the table with properties of the recommended fuel
		The burner is operating at thermal capacity higher than the nominal one	Decrease the thermal capacity stage of the pellet burner
19.	The burner's control board display indicates an error code	Problem in the nominal operation of the pellet burner	Check the error code number and the explanation, given in the table below. In some situations the failure should be revised by authorized technician;
20.	The burner has stopped and after a manual restart it works properly	The photosensor is malfunctioning and the gives improper signal to the control board	Check the quantity of the fuel at nominal mode, delivered on the burner's grate. Ask for help the servicing company in order to solve the problem;

21.	High temperature of the flue gases (if flue gas thermometer is installed)	The heat exchanging surfaces of the heat consumer are deposited with ash, presenting heat resistive layer, thus decreasing the heat exchanging intensity	It is necessary to clean thoroughly the heat consumer surfaces in order to decrease ash layer heat resistance and to increase the efficiency of the system;
22.	Flue gases are emitted out of the heat consumer unit after certain period of exploitation	The flue gas duct is clogged or even blocked by fly ash deposits	It is necessary to clean thoroughly the heat consumer's flue gas duct as well as chimney;
23.	The burner stops as the circulating water temperature set-point has been reached or at regular char final combustion have been proceeded, but an error message is displayed "Error - final combustion failed"	The pellet's ash content is higher than required, raw fuel particles have been accumulated in the fuel delivery pipe	It is necessary to decrease the thermal capacity operating stage of the burner, also fuel replacement is recommended with pellets, covering the burner's requirements;
24.	Other failures, not described above		It is necessary to consult authorized technician and eventually service maintenance should be performed

Table 5.2. Automatic pellet burner of series "GP IV" faults and repair procedures.

EXPLANATION:

**: the overheating of the pellet delivery pipe is most commonly due to increased ash deposition layer on the heat exchanging surfaces on the appliance, on which the burner is installed;*

*** in case of deficiency of chimney's draught, it is recommended to ask for service assistance in order to solve the problem – it could be possible to make thorough cleaning of the chimney or even to make reconstruction of the chimney, also installation of additional flue gas fan could be an appropriate technical solution – any of these should be done by service technician as well;*

No	Error code	Description of the error	Method of repairing
1.	10	Unsuccessful fuel ignition	Clean the burner's grate; Check for fuel available in the hopper and the auger charged; <i>Ask for help an authorized technician;</i>
2.	11	Flame process loosed at operation of the burner	<i>Ask for help an authorized technician;</i>
3.	12	Error at operation of the photosensor	<i>Ask for help an authorized technician;</i>
4.	13	The control board ambient temperature is above defined limit	Switch off the burner and let the unit to get cooled; <i>Ask for help an authorized technician;</i>
5.	14	The circulating water temperature sensor has measured temperature levels below 5°C	The circulating water has low temperature, high danger of freezing and mechanical damages; <i>Ask for help an authorized technician to check the entire heating system;</i>
6.	15	The circulating water temperature sensor has measured temperature above 120°C	The circulating water has hazardous high temperature and there is high risk of overheating of the heating unit as well as the heating system; <i>Ask for help an authorized technician to check the entire heating system</i>
7.	16	Control board faulty operation	<i>Ask for help an authorized technician;</i>
8.	18	Air control relay failure	<i>Ask for help an authorized technician;</i>
9.	19	The air fan does not rotate	<i>Ask for help an authorized technician;</i>
10.	20	The air fan does not run at the designed rotation speed	<i>Ask for help an authorized technician;</i>
11.	21	The initial fuel ignition has failed	Check the presence of fuel and the proper operation of the auger; <i>Ask for help an authorized technician;</i>
12.	22	External auger failure	<i>Ask for help an authorized technician;</i>

13.	23	The photosensor does not get dark at the final combustion process	<i>Ask for help an authorized technician;</i>
14.	24	Loss of light of the photosensor at normal operation of the burner and unsuccessful fuel ignition after the initial ignition process	<i>Ask for help an authorized technician;</i>

Table 5.3. Description of the error codes, stored in the „LOG” list of the menu item of the control module of the pellet burner of series “GP IV”.

No	Text, shown on the control module’s display	Description	Method of repairing
1.	IGNITION FAILED	Failure at ignition	Check if fuel is available and check the auger’s operation; In case there is fuel – <i>ask for help an authorized technician</i>
2.	LOST FIRE IN COMBUSTION	Flame loss at normal burner’s operation	Check the connection of the auger power supply, restart the pellet burner;
3.	STOKER FAULT	Auger disconnection	Check the connection of the pellet transport auger, it is possible to have the high temperature pellet delivery pipe sensor activation due to overheating – check the status of the thermostickers;
4.	TEMP- SENSOR LOW	Temperature sensor disconnection	Check the connection of the NTC sensor
5.	PHOTOSENS	Problems at photosensor operation	Check the condition of the photosensor, replace if necessary – <i>this procedure should be done by authorized technician only;</i>
6.	TEMP SENSOR OVERHEAT	High temperature, estimated by the photosensor	Check the condition of the hot water boiler, cool down the unit;

Table 5.4. Error description, shown on the pellet burner’s of series “GP IV” control module display.

5.13. Automatic pellet burner of series “GP” warranty form completion.

The applied WARRANTY FORM should be completed, by filling the required information in the appropriate fields. The assigned field for signatures and stamp should be completed as well in order to VALIDATE the WARRANTY FORM of the automatic pellet burner of series “GP”.

5.14. Actions, after the burner is not in exploitation anymore (recycling).

When the lifetime period of the unit has been completed, then it should be treated properly in order to preserve environment contamination. The unit should be dismantled and disassembled by environmentally safe methods. This requirement is most commonly completed by appropriate components recycling, considering separate waste disposal and utilization methods.

6. Electrical scheme of automatic pellet burner of series “GP IV”

Figures 6.1 shows the principal electrical scheme of automatic pellet burner of series “GP IV”;

The factory default settings is : “NTC” sensor for measuring and control the burner’s operation by the circulating water temperature.

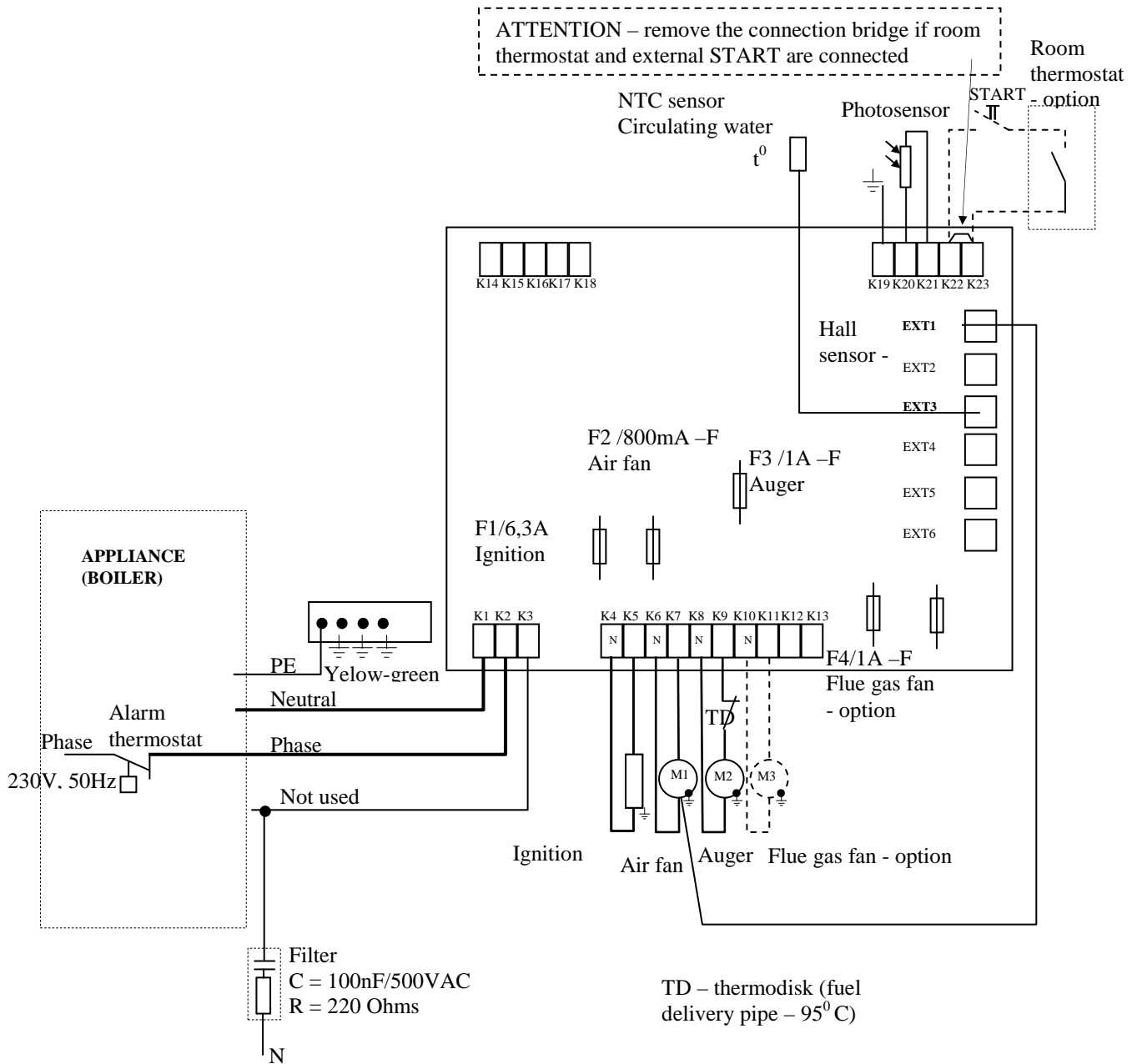


Figure 6.1. Principal electrical scheme of automatic pellet burner of series “GP IV”;

WARRANTY CONDITIONS

The producer guarantees correct and reliable operation of the pellet burner of series “GP” ONLY when installation and maintenance requirements are completed.

The warranty period of the pellet burner starts from date, when the warranty form is filled and stamped by the authorized organization.

The warranty period of the pellet burner starts from date when it is started for very first time, but no longer than 18 months of the day of delivery.

The warranty period of the automatic pellet burner “GP” is **24** (twenty four) months.

The warranty of the unit is valid when the original invoice document and the original warranty form are presented only.

THE WARRANTY OF THE AUTOMATIC PELLET BURNER IS NOT VALID in case one of the following is fulfilled:

- Unit damages, caused by incorrect handling, transport and/or loading/unloading, which are not organized by the producer;
- Failures, caused by natural disasters (Earth quakes, fires, floods, etc.);
- Unsatisfied installation, maintenance and service requirements, which are described in this manual;
- Repairing of any failure of the unit, performed by unauthorized technicians or the end user;
- Any changes in the design of the burner;
- Incorrect installation and/or improper functioning due to operator/client influence;
- Failures, caused by factors, for which the producer could not be blamed and/or has no control over them;
- Any malfunctions or damages, which are not caused by the operation of the pellet burner itself, but result in unit damages and its functionality;
- At color change of the irreversible thermosticker or in case this thermosticker is removed, torn , detached or destroyed;

Every warranty service operation should be noticed in its warranty service procedures list.

The warranty period of the unit is interrupted by the period, during which the unit is warranty serviced by authorized technicians (the period between failure notification and its repairing).