BURNiT by SUNSYSTEM

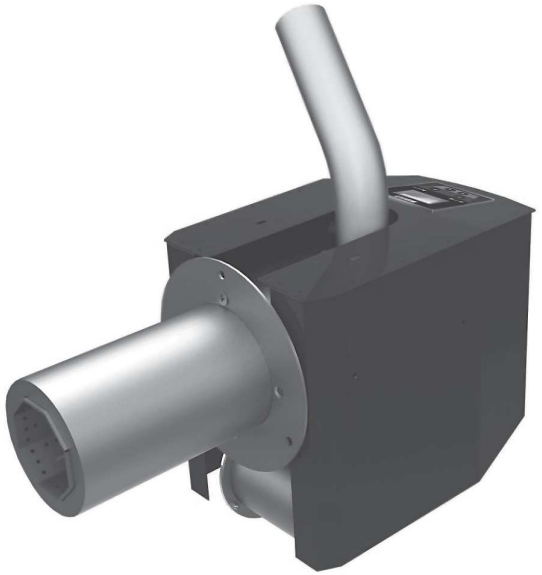
PELLET BURNER
Pell series

TECHNICAL PASSPORT
INSTALLATION and OPERATION MANUAL

TÜVRheinland®
Precisely Right.

ISO 9001:2008
BUREAU VERITAS
Certification
BG14958Q

CE



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v.0.2

model:	
serial number:	

NOTES:

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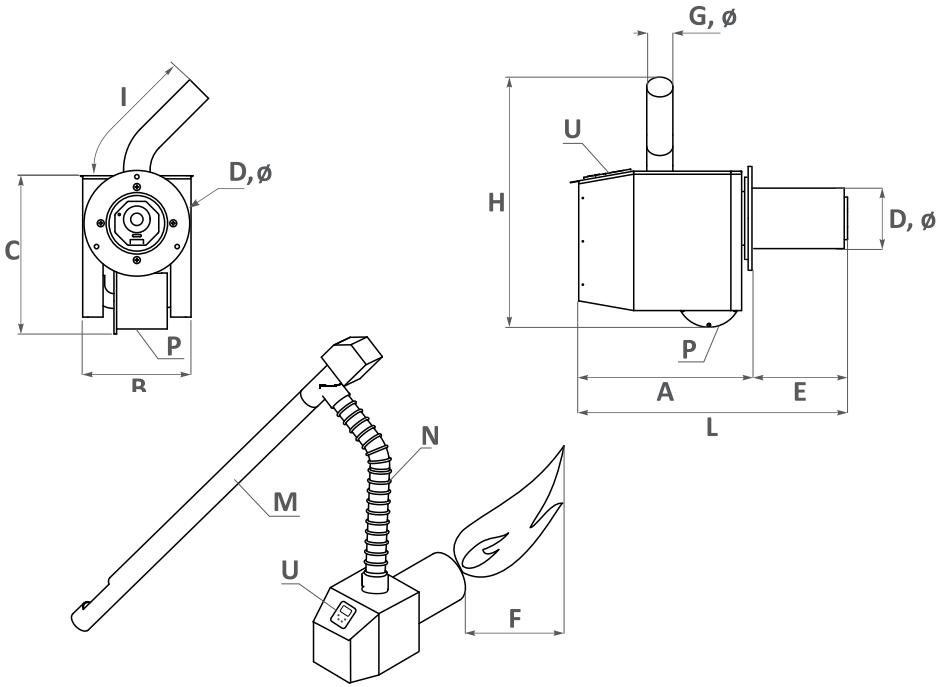


13. RECYCLING AND WASTE DISPOSAL

13.1. Recycling of boiler packaging

Parts of the packaging made of wood or paper can be used as combustible for the burner. Submit the rest of the packaging material for recycling according to the local regulations and requirements. Replaced heating installation components must be submitted for processing to an authorized factory which complies with the environmental protection regulation.

3.2. Recycling and waste disposal

At the end of life cycle of each product its components are due to be disposed of in conformity with regulatory prescriptions.

According to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE) they are to be disposed of outside the normal flow of solid domestic waste.

Obsolete equipment shall be collected separately from other recyclable waste containing materials with adverse effect on health and environment.

Metal details, as well as non-metal ones shall be sold to licensed recyclable metal or non-metal waste collection organizations. Those should not be treated as domestic waste.

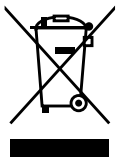


TABLE OF CONTENTS

1. EXPLANATION OF SYMBOLS AND SAFETY INSTRUCTIONS

1.1. Explanation of symbols

CAUTION! - *Important recommendation or warning concerning safety conditions during installation and operation of the pellet burner*

DANGER! - *fault or improper use may cause injury or be hazardous to life of humans or animals.*

FIRE HAZARD! - *fault or improper installation and operation may cause fire.*

INFORMATION - *Important information on the proper operation of the product.*

1.2. Requirements to pellet burner installation room

This manual contains important information for the safe and correct installation, start-up and trouble-free operation and maintenance of the pellet burner.

The pellet burner can be used for heating rooms only in the manner described in this manual.

The application and any other was the area of operation is not recommended by the manufacturer and is not responsible for the occurrence of defects or failures.

Note the pellet burner type data indicated on the factory rating label and the technical data provided in chapter 11 in order to ensure proper operation of the product.

1.2.1. Instructions to boiler installer

During installation and operation, the country-specific requirements and regulations must be observed:

- local construction regulations on installation, air supply and exhaust gas extraction as well as chimney connection.
- regulations and norms concerning the fitting of the heating installation with safety devices.

Use only original BURNiT parts

WARNING! Installation and setting the pellet burner should be done by an authorized specialist / service shop and must follow the safety instructions and rules of operation.

DANGER of intoxication, suffocation.

Inadequate inflow of fresh air to the boiler room may result in dangerous leak of exhaust gases during burner operation.

- *Make sure the air inlets and exhaust gas outlets are not clogged or closed.*
- *If faults are not remedied immediately, the burner must not be operated*
- *The user must be provided with written instructions on the fault and the hazard it entails.*

It is mandatory to assure a backup power generator of corresponding rated power! (see 12.1)

DANGER of fire when burning flammable materials or liquids.

- *Flammable materials/liquids must not be left in close proximity of the burner and heating boiler.*
- *Instruct system user of the allowed minimum clearances from surrounding objects.*

12.3. Technical parameters

			PEll 25	PEll 40	PEll 70
Heat output		kW	5÷25	10÷40	5÷25
Average power consumption	Firing-Up mode	W	~ 400	~ 400	~ 400
	Operate mode	W	~ 60÷70	~ 60÷70	~ 70÷110
	Self-cleaning mode	W	~ 1300	~ 1300	~ 1300
Electric power supply		V/Hz	~230 / 50	~230 / 50	~230 / 50
Overall dimensions	Height H	mm	575	575	575
	Width L / Depth D		615/245	700/300	750/350
Minimal recommended size of boiler combustion chamber	Height	mm	250	300	300
	Width		250	300	300
	Depth		390	500	500
Loudness of operation	Burner	dB	40-45	40-45	40-45
	Auger		10	10	10
	Self-cleaning mode		65-67	65-67	65-67
Required chimney draught		Pa	25	27	30
Boiler mounting kit			✓	✓	✓
Heat-output adjustment			✓	✓	✓
Control of central heating pump			✓	✓	✓
Combustion Efficiency/Emitted heat		%	99/96	99/96	99/96
Weight of burner		kg	17	18	20
Burner body	Length	A, mm	390	390	390
	Width	B, mm	245	245	245
	Height	C, mm	360	360	360
Combustion chamber housing	Diameter	D, mm	140	170	170
	Length	E, mm	220	300	340
Feeder chute	Diameter	G, mm	60	60	60
	Length	I, mm	250	250	250
Automatic cleaning system		P	✓	✓	✓
Built-in CPU control unit		U	✓	✓	✓
Burner flame, length*		F, mm	750	1000	1500
Pellet auger	Diameter	M, mm	75	75	75
	Length		1500	1500	1500
Flexible connection	Diameter	N, mm	60	60	60
	Length		700	700	700
Weight of auger		kg	6	6	6

Burner flame length is approximate. Depends on the settings of the power, fan speed and chimney draft

Table 4

№	Part Number	Model PEll 25	Model PEll 40	Model PEll 70
1	82801300000002	x		
1	82801300000003		x	
1	82801300000005			x
2	82801300000001	x		
2	82801300000004		x	
2	82801300000006			x
3	89801300000006	x		
3	89801300000024		x	x
4	89800000000005	x	x	x
5	89801381000001	x		
5	89801381000002		x	x
6	78801100000001	x	x	x
7	83801200000001	x	x	x
8	32800032000001	x		
8	32800032000007		x	x
9	89080000000006	x	x	x
10	89801200000006	x	x	x
11	89800000000004	x	x	x
12	32590000000092	x	x	x
13	89080000000007	x	x	x
14	32640000000002	x		
14	32640000000003		x	
14	32640032000017			x
15	32800000000006	x(C130)	x(C130)	x(C130)

- Do not install the burner in sleeping premises.
- Do not connect the burner to any other air-intake systems .
- The burner must be connected to the boiler as a heating device
- Improper installation may cause fire or injury. Contact your local construction supervisory body in case you need prior approval for installation of this product.
- Mandatory is the installation of smoke detectors in the room where the burner is installed.
- Pellet burner is NOT designed for installation in motorhomes, caravans etc.

1.2.2. Instructions to installation user

DANGER of intoxication or explosion

Toxic gases may be discharged when burning waste, plastics, liquids.

- *Use only the fuels indicated in this manual.*
- *In case of danger of explosion, ignition or discharge of exhaust gases in the room, stop the pellet burner from operation.*

CAUTION! Danger of injury / damage of system due to incompetent operation.

- *The pellet burner must be serviced only by persons familiar with the operation manual.*
- *As a user, you are only allowed to start the pellet burner up, adjust the temperature of the burner, shut the burner down and clean it.*
- *Unattended children must not be allowed access to premises with running pellet burner inside..*

It is mandatory to assure a backup power generator of corresponding rated power! (see 12.1)

Safety rules for user operation:

- Operate the pellet burner on recommended fuel only, and to that end you must regularly inspect the boiler room.
- Do not use flammable liquids for ignition or increase of burner output.
- Collect ash in lid-covered fireproof containers.
- Clean the burner surface using non-flammable agents only.
- Do not place flammable objects onto the burner housing and heating boiler cabinet or in their proximity. (see diagram 1 for the minimum clearances)
- Do not store flammable materials in the boiler room.
- Boilers, chimneys and other connections of mounted burner must meet standards for fire and emergency safety of the country.
- It is mandatory to strictly observe instructions for connecting the burner to power network as well as to all peripherals.
- Structural changes to burner by user can cause damage to equipment or injury.
- Do not allow contact transmission of electrical wire or touch any part of the boiler, where the surface temperature can exceed 70 °C.
- Dismount the burner when the boiler

are heating alternative (mainly) of fuel - wood, wood briquettes, coal or other fuel.

- This manual should be kept throughout the lifetime of the burner.

	CAUTION! Hot surface! *Risk of burns if you touch the running system. Burner housing, body and flange are hot surfaces during burner operation.* *It is strictly prohibited to open boiler inspection doors with the burner running.* *Also, exercise caution when touching the observation port for monitoring the burning process. It may be hot.*

1.2.3. Minimum clearances for installation and combustibility of construction materials

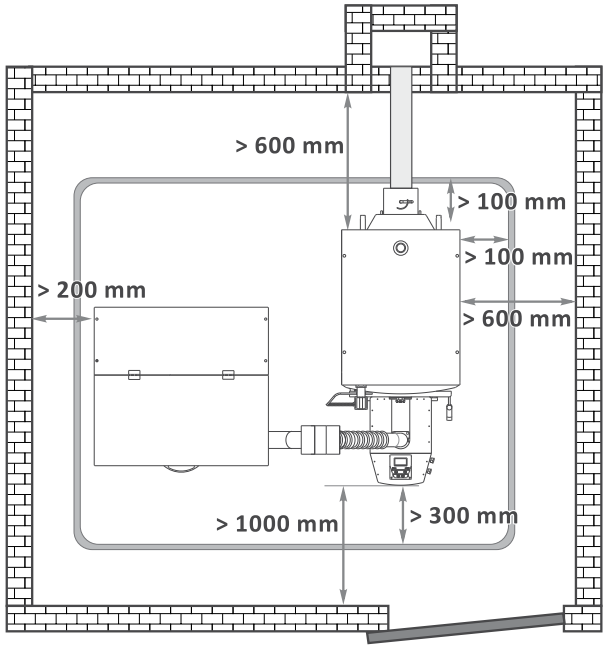


Diagram 1
Recommended clearances between the boiler with mounted burner and walls.

TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL

12. TECHNICAL FEATURES OF PELLET BURNER PELL

12.1. Elemets of pellet burner PELL

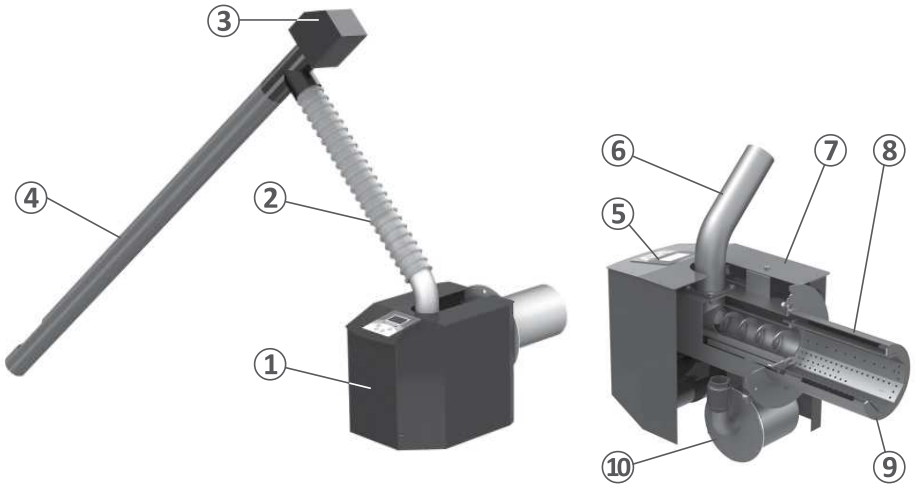


Diagram 8. Elemets of pellet burner PeLL

1. ***Pellet burner Pell***
2. ***Auger flexible pipe connection***
3. ***Auger`motor***
4. ***Automatic pellet auger***
5. ***Control unit***
6. ***Feeder chute***
7. ***Burner housing***
8. ***Combustion chamber corps***
9. ***Combustion chamber***
10. ***Automatic cleaning system***

12.2. Spare parts for Pell pellet burner

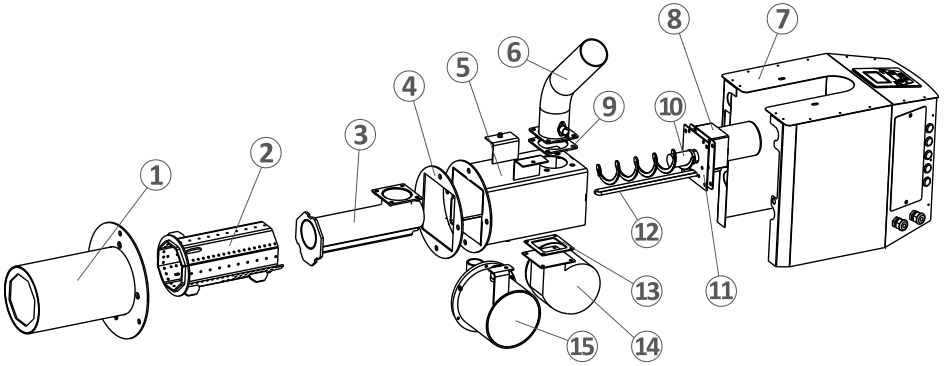


Diagram 9. Spare parts for pellet burner Pell

which would change the value for the feed and the burner output.
Using the above procedure, you can set any of the three output modes of the burner.

Mode 🔥🔥🔥: Maximum output mode – It is indicated by three flames.
Pellet auger running time (Feed) – 7.3 sec. (25kW)
Main combustion cycle (Cycle) – 20 sec. (recommended)
Fan output (Fan) - adjust using gas analyzer

Mode 🔥🔥: Medium output mode – It is indicated by two flames.
We recommend to set value at 50% of the main mode.
Pellet auger running time (Feed) – 3,7 sec. (12,5kW; 7,3 x 50% = 3,7)
Main combustion cycle (Cycle) – 20 sec. (recommended)
Fan output (Fan) - adjust using gas analyzer

Mode 🔥: Low output mode – It is indicated by one flame.
We recommend to set value at 20% of the main mode.
Pellet auger running time (Feed) – 2,2 sec. (7,5 kW; 7,3 x 30% = 2,2)
Main combustion cycle (Cycle) – 20 sec. (recommended)
Fan output (Fan) – adjust using gas analyzer

⚠	**Important: For each of the output modes the optimal fan setting is tweaked by using gas analyzer to control the oxygen amount registered by the device (within the range 8÷10%, and for the lower modes up to 16%). The specific setting depends also on the internal resistance of the boiler combustion chamber on which the burner has been installed as well as on the chimney draught. Therefore it is not possible to provide here the exact value for the fan output and it must be entered by a competent installer or service technician using gas analyzer**

ⓘ	**Important: You use a burner whose carbon footprint values are approximately (CO=100 ppm), which is 2.5 times lower than the maximum allowed limits for harmful emissions in the EU Member States. Thus you can reduce the amount of harmful emission and contribute to environment protection.**

11. WARRANTY TERMS

The warranty terms are described in the Service booklet included in the supply.

The applicable minimum clearances in your country may differ from the ones specified below. Please, consult your installer.
The minimum distance from the burner, heating boiler or exhaust gas pipe to objects or walls must be at least 200 mm.

Table 1. Combustibility of construction materials

Class A – non-combustible	Stone, bricks, ceramic tiles, baked clay, solutions, plaster free of organic additives.
Class B – hard combustible	Gypsum board panels, basalt fiber needled felt, fiberglass board, AKUMIN, Izomin, Rajolit, Lignos, Velox, Heraklit.
Class C1/C2 Medium combustible	Wood beech, oak Wood softwood, layered wood
Class C3 – easy combustible	Asphalt, cardboard, cellulose, tar, fiberboard, cork, polyurethane, polyethylene.

For general safety considerations, we recommend that the boiler be placed on a foundation with height of 100 mm made of class A material, see table 1.

2. PRODUCT DESCRIPTION

The BURNiT Pell pellet burner for hot water boilers is designed to burn only and exclusively wood pellets and it is intended to heat up heating boilers. The built-in control unit, automatic cleaning system and internal pellet auger ensure the automated operation of the burner and optimal burning of the fuel.

2.1. Design.

The burner is made of high-quality stainless steel able to withstand temperatures of up to 1150°C. The burner must be installed on a heating boiler.

The burner consists of two parts: combustion chamber tube and external tube with sheet metal mantle. Longitudinally, under the housing, there are blow chamber, fuel ignition heater, fan and power supply. On the upper part of the burner there is a feeder chute to which the pellet auger is attached. The housing of the burner has been designed to meet all regulatory safety requirements (no sharp or protruding elements) with operating temperature not exceeding 50 °C.

The combustion chamber consists of two tubes:

Ember resistant steel tube inside the burner with holes for air intake along its entire length, opening for the hot air from the fuel ignition heater, opening for photosensor.

Outer stainless steel tube. Between the two tubes there is a gap which provides for free circulation of the air necessary both for cooling and oxygen supply into the combustion chamber.

The feeder chute allows 360° rotation for its best convenient positioning when connecting the pellet auger to the hopper.

TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL

Diagram 2.
Pellet burner Pell design

- **Built-in controller.**
  The main control unit, located in the burner, manages the entire heating process. Controler functions:

Controler functions:

1) fully automated ignition and pellet feed;
2) self-cleaning function (adjustable 1-4 times over 24 hours at equal intervals), programmable start time;
3) controls the operation of the circulation pump of the central heating;
4) controls the operation of the pump of the domestic hot water;
5) option for control by room thermostat;
6) timer;

- **Photo-sensor** - monitors the power of the burner flame
- **Internal auger**
- Dry contactless resistance heater assuring ignition of fuel
- **Innovative cleaning system** of the combustion chamber
- **Air feed fan**, step-regulated (0% to 100 %).

2.2. Burner safety devices

- **Elbow-shape feeder chute.** The geometrical shape of burner feeder chute prevents backfire entry from burner into pellet hopper.
- **Thermostatic protection** (80°C). The thermostatic protection is fitted on the feeder chute. When the surface of the feeder chute reaches 80°C, the control stops the feeding of pellets into the burner and signals for fault.
- **Fuse**. In case of electrical fault in the system of the burner (short circuit, high current, etc.), the overload is borne by the electrical fuse fitted on the main control panel of the burner (3,15 A).
- **Power interruption**. In case of power interruption, all parameter settings are stored in the memory of the controller. Upon the subsequent restart of the burner, the controller resumes the execution of the program from the point when the power interruption occurred.

3. FUEL

All pellets are biomass manufactured from common low-growing plants and trees. The most common household type pellets are made of sawdust and milled wood chippings which are waste material

		Parameter value:		
	Actuator	Pell 25	Pell 40	Pell 70
Cleaning Setup	Fan	180 sec		
	Cleaner	20 sec		
General Setup	Retries	3		
	Feed	45 sec		
Cycle Setup	Heater	3 min		
	Fan 15	1 min		
	25	3 min		
Burn Level	🔥🔥🔥	dt>8	dt>8	dt>8
	🔥🔥	dt>4	dt>4	dt>4
	🔥	dt>0	dt>0	dt>0
Setup 🔥🔥🔥	Feed	8 sec	10 sec	12 sec
	Cycle	20 sec	20 sec	20 sec
	Fan	37	26	26
Setup 🔥🔥	Feed	4 sec	5 sec	6 sec
	Cycle	20 sec	20 sec	20 sec
	Fan	30	20	20
Setup 🔥	Feed	3 sec	3 sec	3 sec
	Cycle	25 sec	20 sec	20 sec
	Fan	25	17	17
Suspend	Feed	5 sec		
	Cycle	60 sec		
	Fan	17		
Suspend Time	-	5 min		
Auto Clean Setup	Start	12:00		
	Clear Count	4		
Hardware Setup		v Cleaning Motor		
		v Tstat NO		
Vacuum Feeder		v NO		
		NC		
Burner Feeder	Duty	160%		
Addons Activacion		v CH Pump		
		DHW Pump		
		v Termostat		
IR Level Setup	Ign >	100/020 s		
	Ext <	040/060 s		
Set Temperature	Max	85°C		
	Test Fan Speed	00		
	Test Outputs	FF	BF	
		CH	DHW	
		Ign	CM	

10. SETTING OUTPUT MODES OF OPERATION OF THE PELL PELLET BURNER.

⚠	**CAUTION! You must use gas analyzer when setting the burner.**

The Pell pellet burner is equipped with three-step output adjustment and their setting depends on the boiler and heat requirements of the heating installation.

10.1. Calibration of auger fuel feed rate.
The auger fuel feed rate changes depending on the density and size of the fuel used. Therefore it is necessary to calibrate the main auger every time you change the type of the fuel used.

⚠	**CAUTION! It is recommended to use the same fuel throughout the heating season.**

Once you have installed the pellet auger according to the instructions in the manual, fill the hopper with fuel (pellets). Connect the power supply of the pellet auger directly to the power mains. The auger is now in operation. Wait about 15-20 minutes for the pellet auger to fill with pellets. The auger is filled with pellets when pellets begin to fall from the T-branch of the auger at the point where the flexible pipe is attached.

Filling of the pellet auger is necessary when the fuel in the hopper has been depleted or when fuel has been changed. Once you have ensured that the pellet auger has been filled, take an empty plastic bag and fixed it securely on the pellet auger, at the place of the flexible pipe. Reconnect the auger to the power socket and measure the amount of pellets collected in the bag over a period of 15 minutes using scales/weighing scale. (In our example, the amount of pellets collected in the bag over a 15-minute period is 3560 grams . (900 sec). We then divide 3560 by 900 and get 3.95 grams of pellets per 1 second. Repeat the measurement in order to obtain conclusive results .

10.2. Burner output adjustment.
In the burner output settings menu you can adjust the running time of the main auger (**Feed**); main running interval (**Cycle**) and fan output (**Fan**).
Example for Pell 25 model: we select mode **Cycle** = 20 sec. The heating value of your fuel is **4.8kWh/kg**. (manufacturers indicate the heating value of the fuel on the packing – take it from there). We then employ the following formula to calculate the number of seconds for setting the operation of the main auger for these 20 seconds:
t_{FEED}= 25 000 : 4,8 : 180 : 3,95
hence **t_{FEED}= 7,32 сек.,**
where **25,000** is the desired output of the burner in Watts (W),
4.8 is the heating value of the fuel in kWh/kg,
180 is the number of burning cycles per 1 hour,
3.95 is the amount of pellets in grams fed by the auger per 1 second. This way the output mode can be changed and instead the number **25,000 – 25kW**, we input the desired kilowatts (40 kW=4000 W, 70 kW=7000 W etc.).
Take also note of the fuel heating value

from wood used in the production of logs, furniture and other products. Wood is the richest raw material which does not have any impact on the production costs of food products or ethyl alcohol (ethanol). The raw material is processed under high-pressure and temperature and is pressed to produce small-size cylindrical pellets. The production process may utilize soft wood material (such as softwood, pine), hardwood (oak) as well as recycled waste wood. Wood pellets are produced in hammer mills or wood pellet plants.

Advantages of wood pellets:

Convenient storage. Pellet bags can be stored on a small area in a dry garage, basement, service room or shed.

Easy loading. In most cases the boiler hopper needs loading only once a week – this depends on the hopper capacity.

Better control of fuel quantity. The small size of the pellets allows for precise fuel feeding. On the other hand, the supply of air for reaching optimal combustion efficiency is easier to adjust since the fuel quantity in the combustion chamber remains constant and predictable.

Fuel efficiency. High combustion efficiency is also determined by consistently low moister content of pellets (consistently under 10% as opposed to 20% to 60% moisture content of the logs). Low moisture content, controlled fuel portions and precise air setting means high combustion efficiency and very low carbon oxides in the flue gases.

ⓘ	**When purchasing pellets, ask for conformity declaration and certificate issued by an accredited laboratory and make sure the fuel meets the requirements indicated in the manual. If you purchase large amount of pellets (bulk supply for the entire heating season for example), ask your supplier to provde accurate and true information about the storage conditions.**

We recommend to use pellet with size of 6 - 8mm. Density 600 - 750kg/m^3 heating value 4.7 - 5.5 kWh/kg. Ash content – less than 1% and moisture content up to 8%, EN 14961-2:2011.

The optimal density of the pellets which guarantees their quality is 605-700 kg per cubic meter.

Pellet moisture content must not exceed 10%. Make sure you store your fuel in a dry and well-ventilated place.

The optimal pellet ash content is ≤ 1%. This also provides for less frequent cleaning intervals for the burner.

The table below contains the parameters which we recommend that you take into consideration when choosing fuel for your „Pell" burner

Table2

European Certification of Wood Pellets for Heating Purposes

Parameters	Units	ENplus-A1	ENplus-A2	EN-B
Diameter	mm	6 (± 1) 8 (± 1)	6 (± 1) 8 (± 1)	6 (± 1) 8 (± 1)
Lenght	mm	15 ≤ L ≤ 40 [1)]	15 ≤ L ≤ 40 [1)]	15 ≤ L ≤ 40 [1)]
Bulk dentsity	kg / m^2	≥ 600	≥ 600	≥ 600
Calorific/heating value	MJ / kg	≥ 16,5-19	≥ 16,3-19	≥ 16,0-19
Humidity /moisture	Ma .-%	≤ 10	≤ 10	≤ 10
Dust	Ma .-%	≤ 1 [3)]	≤ 1 [3)]	≤ 1 [3)]
Mechanical durability	Ma .-%	≥ 97,5 [4)]	≥ 97,5 [4)]	≥ 96,5 [4)]
Ash	Ma .-% [2)]	≤ 0,7	≤ 1,5	≤ 3,5
Melting point of ash	°C	≥ 1200	≥ 1100	-
Chlorine content	Ma .-% [2)]	≤ 0,02	≤ 0,02	≤ 0,03
Sulfur content	Ma .-% [2)]	≤ 0,03	≤ 0,03	≤ 0,04
Nitrogen content	Ma .-% [2)]	≤ 0,3	≤ 0,3	≤ 1,0
Copper content	mg / kg [2)]	≤ 10	≤ 10	≤ 10
Chromium content	mg / kg [2)]	≤ 10	≤ 10	≤ 10
Arsenic content	mg / kg [2)]	≤ 1,0	≤ 1,0	≤ 1,0
Cadmium content	mg / kg [2)]	≤ 0,5	≤ 0,5	≤ 0,5
Mercury content	mg / kg [2)]	≤ 0,1	≤ 0,1	≤ 0,1
Plumbum content	mg / kg [2)]	≤ 10	≤ 10	≤ 10
Nickel content	mg / kg [2)]	≤ 10	≤ 10	≤ 10
Zinc content	mg / kg [2)]	≤ 100	≤ 100	≤ 100

1) not more than 1% of the pellets may be longer than 40 mm, max. length 45 mm;

2) dry weight;

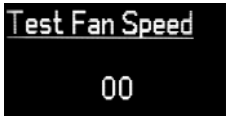
3) particles <3.15 mm, particulate matter, before handing over the goods;

4) measurements with Lignotester limit value ≥ 97,7% by weight.

TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL

in the burner is under 40 units over a period of more than 60 sec, the burner will detect that there is no stable burning process going on and will extinguish the burner and attempt to reignite.
Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

Use this menu to conduct **fan operation test**.

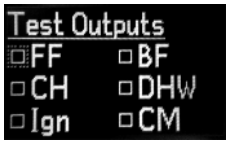


You can control the fan in real time, without confirming anything, using only the navigation arrows.

Important. This menu is for installers only and it is active and visible only if the controller is in „Standby" mode.

Use the „**F**" button to open the next page of the menu.

This menu allows you to check the operation of the various pellet burner components. Using the navigation arrows, you can turn on and off the various components and each time the respective components is being activated a checkmark will appear in front of its name. Use the „**Enter**" button to select the individual components.



Description of components:
1) **FF** – Fuel Feeder – main auger
2) **BF** – Burner Feeder – internal burner auger / feeder
3) **CH** – Central Heating pump
4) **DHW** – Domestic Hot Water pump
5) **Ign** – Ignition
6) **CM** –Cleaning Motor

Important. This menu is for installers only. It is active and visible only if the controller is in "Standby".

This menu allows you to select maximum boiler temperature. In other words, the maximum temperature to heat the boiler on which the burner has been installed.
The maximum value for this setting is **85°C**.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

9.3.10. Factory setting - Alarms

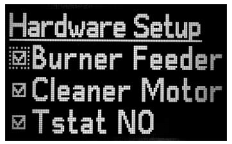
BB ALARM	Reverse fire Alarm (when the thermostat contact RB input is open)
SENSOR E1	Boiler Temperature Sensor is missing (input B)
SENSOR E2	Boiler Temperature Sensor Short circuit (input B)
IGNITION FAIL	Failure ingnition
DHW E1	Water Heater Temperature Sensor is missing (input WH)
DHW E2	Water Heater Temperature Sensor Short circuit (input WH)

When restarting the controller alarm is deactivated.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

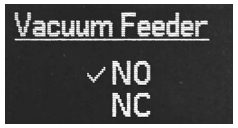
9.3.9. Hardware Setup

Use this submenu to activate or deactivate some external burner devices The checkmark in the box indicates that the device is active.



Burner Feeder - internal burner auger/feeder/
Cleaner Motor
Tstat NO - Thermostat, normally open.

There must be a checkmark on the internal pellet auger of the burner (Burner Feeder)
Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

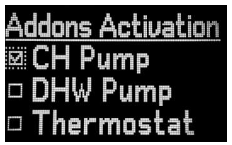


Set the sensor switch and control an external device (vacuum or screw auger for loading the main hopper with pellets).
NO - normally open; NC- normally closed.
Burner feeder – Use this submenu to adjust the internal auger of the burner as a percentage value of the operation of the external pellet auger.

Example: If the external pellet auger runs for 10 seconds and feeds fuel in the burner, the internal auger will run for 20 seconds, if the setting is (**Duty 200%** - see picture).

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

Use this submenu to activate or deactivate the **additional peripheral components.**



CH PUMP - central heating pump
DHW PUMP - domestic hot water pump

Thermostat

The checkmark in the box indicates that the device is active.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

This submenu allows you to adjust the conditions under which the **photosensor** detects the presence of stable or unstable flame and signals the burner to shift to operating mode or be extinguished.
Example: (see picture) If the light intensity in the burner is above 100 units over a period of more than 20 sec, the burner will detect that there is a stable burning process going on and will shift from ignition to burning. If the light intensity

4. TRANSPORTATION OF THE PELLET BURNER

When loading, transporting and unloading of the device appropriate safety equipment must be used in accordance with Directive 2006/42/SE. Product must be in original packaging following the instructions on the label - to be protected from adverse weather conditions (snow, rain and dust) from the shocks, and other activities likely to cause damage. In case of malfunction of the fan or the motor drive (noise, friction) or failure of high-tech elements such as broken LCD screen, contact your nearest authorized service center for repairs and maintenance.
- Dimensions of the packaging of the burner: 450x350x750 mm
- Dimensions of the packaging of the auger: 260x120x1700 mm

5. DELIVERY OF THE PELLET BURNER

- Inspect the integrity of the packaging upon delivery.
- Check whether all components have been delivered to you. Burner consignment package includes (diagram 3):

1) Pellet Burner Pell with built-up Control unit
2) Feeding chute
3) Fire irons
4) Auger
5) Technical passport. Installation and operation manual
6) Service booklet and Warranty card

If any of the above items are missing, contact your supplier.

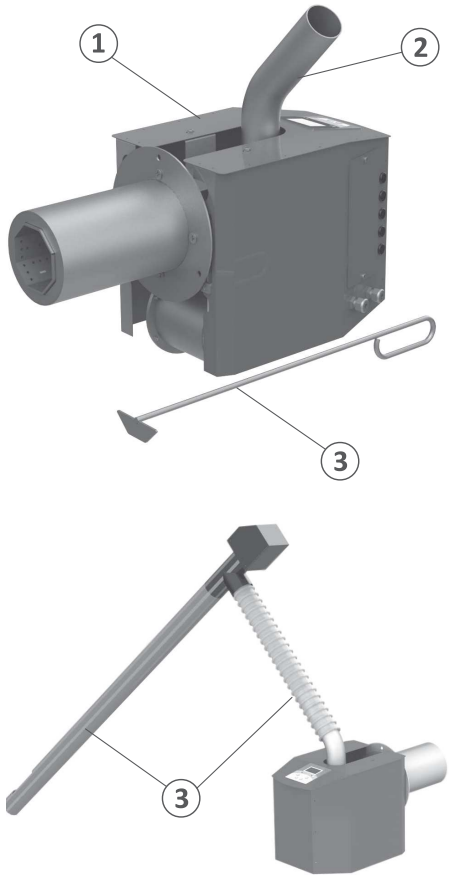


Diagram 3.
Pellet burner consignment elements

6. STORAGE OF PELLET BURNER

Pellet burners shall be stored in dry and well ventillated spaces, free from any gases, liquids, acids and oil vapours that may damage the burner. Storing burner and auger in spaces with fertilizers, chlorinated lime, acids, chemicals, ect. is not allowed. Recommended storage temperature shall be from +5°C to +40°C.

Recommended relative humidity -below 70%. When stored, the devices shall not have direct contact with the ground, placed on pallets, maximum two tiers and in their original packaging. The storage period is not more than 2 years from date of manufacture. It is recommended that every burner is tested before installation. Quality and safety of the burner must be confirmed by a test mentioned in the warranty card.

7. MOUNTING OF THE BURNER

⚠	**Mounting, installation and setup of burner should be carried out by authorized technician.** **Installer shall advise the user of the installation minimum clearances to combustible materials and liquids.**

Recommended boiler chamber sizes for mounting of Pell pellet burner:

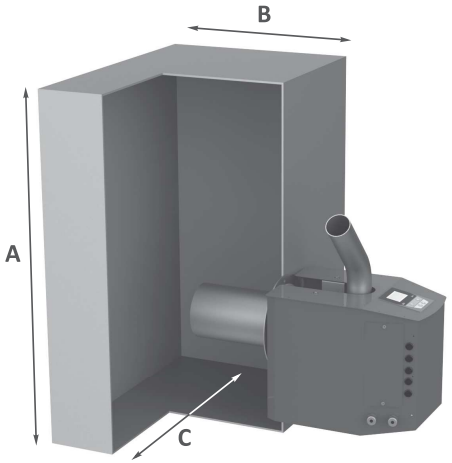


Diagram 4.
Mounting of Pell pellet burner to boiler combustion chamber

	Pell 25	Pell 40	Pell 70
A	250	250	350
B	390	450	550
C	250	250	350

7.1. Pellet burner connection to the fuel hopper and pellet auger

Take the feeder chute flexible hose (from the auger set). Using a bracket, clamp one end of the hose onto the motor-end outlet of the pellet auger.

- Remember – pellet auger must be installed at 45° angle to the ground horizontal surface.
- Fill the hopper with fuel (see table 2 for parameters of the fuel types used)
- Plug the power cord of the pellet auger into the indicated Schuko-type burner socket on the left side of the burner housing.

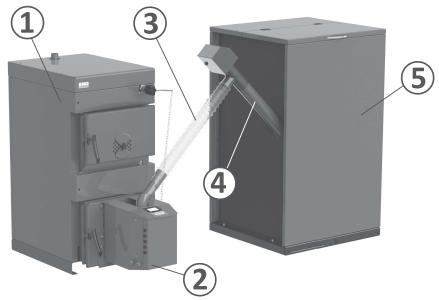
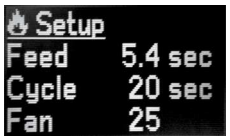


Diagram 5.
Mounting the pellet burner Pell to WBS boiler

1. WBS boiler;
2. Pellet burner Pell;
3. Auger flexible pipe;
4. Auger;
5. Fuel hopper.



In this submenu you can adjust the parameters of the **lowest output** mode of operation of the burner. It is indicated by one flame .

We recommend to set at 10÷35% of the main mode.

You can modify the pellet quantity (Feed), time interval at which these pellets are fed (Cycle) and fan output as a percentage value (FAN).

Example: with the period set at 20 seconds, the pellet auger runs for 5,4 seconds feeding pellets in the burner, and is off for 14,6 seconds.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

Complete description of the output modes is provided in section 10 of this manual.

9.3.6. Suspend

This submenu allows you to adjust the parameters of the suspended mode of operation of the burner. You can modify the pellet quantity (**Feed**), time interval at which these pellets are fed (**Cycle**) and fan output as a percentage value (**FAN**).

Example: with the period set at 20 seconds, the pellet auger runs for 5 seconds feeding pellets in the burner, and is off for 115 seconds.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

9.3.7. Suspend Time

In this menu you can adjust the time period for which the burner will remain in suspended mode and the time can be set in minutes with a maximum duration of 180 minutes.

If within a set time (20 minutes) the temperature in the boiler does not decrease, the burner enters into **Extinguish mode** – crossed-out flame .

9.3.8. Auto Clean Setup

Use this menu to adjust the automatic cleaning of the burner by means of the cleaning motor.

You can set the time of the first cleaning (Start) and the number of cleanings over a 24-hour period (Clean Count).

Example: The automatic cleaning system will starts at 14:00 h (Start), and will be turned on again at 2:00 h because it has been set to two cleanings over a period of 24 hours (Clean Count 02). Before each automatic cleaning cycle the burner is automatically extinguished and then ignited back on.

stable flame is present, the burner feeds in pellets again and repeats the process.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

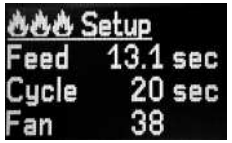
9.3.4. Burn Level

The burner has three main levels of burning (three main output modes of operation). Use this menu to set the temperature differences at which the burner will shift from higher output mode to lower (step modulation).

Example: We have set maximum temperature of **85°C**. Upon reaching **77°C**, the burner will shift down to lower mode of operation (**two flames**). Upon reaching **82°C**, the burner enters into still lower mode of operation (**one flame**). Upon reaching **85°C**, the burner enters into suspend mode (**Suspend**).

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

9.3.5. Setup of burning Level

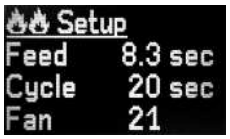


This submenu allows you to adjust the parameters of the **main** mode of operation **Maximum output** of the burner. It is indicated by three flames .

You can modify the pellet quantity (Feed), time interval at which these pellets are fed (Cycle) and fan output as a percentage value (FAN).

Example: with the period set at 20 seconds, the pellet auger runs for 13.1 seconds feeding pellets in the burner, and is off for 6.9 seconds.

Select the desired option using the navigation arrows. Use the "**Enter**" button to open the next parameter. Use the "**F**" button to open the next page of the menu.



In this submenu you can adjust the parameters of the medium output mode of operation of the burner.

It is indicated by two flames .

We recommend to set at 50% of the main mode.

You can modify the pellet quantity (**Feed**), time interval at which these pellets are fed (**Cycle**) and fan output as a percentage value (**FAN**).

Example: with the period set at 20 seconds, the pellet auger runs for 8,3 seconds feeding pellets in the burner, and is off for 11,7 seconds.

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL

7.2. Connecting the pellet burner to the mains power supply

⚠	**Caution! ELECTRIC SHOCK HAZARD!** *- Before opening the unit: switch off the voltage and secure the unit against accidental restart.* *- Observe installation instructions.*
⚠	**Such connection must be performed by a technician / service shop authorized for such operations.**

⚠	**It is mandatory to assure a backup power generator of corresponding rated power! (see 12.1)**

The boiler must be connected to a 220V/50Hz mains using power plug (3 meters long, bound to the burner).

Create tight connection with the electrical mains which complies with the local regulations.

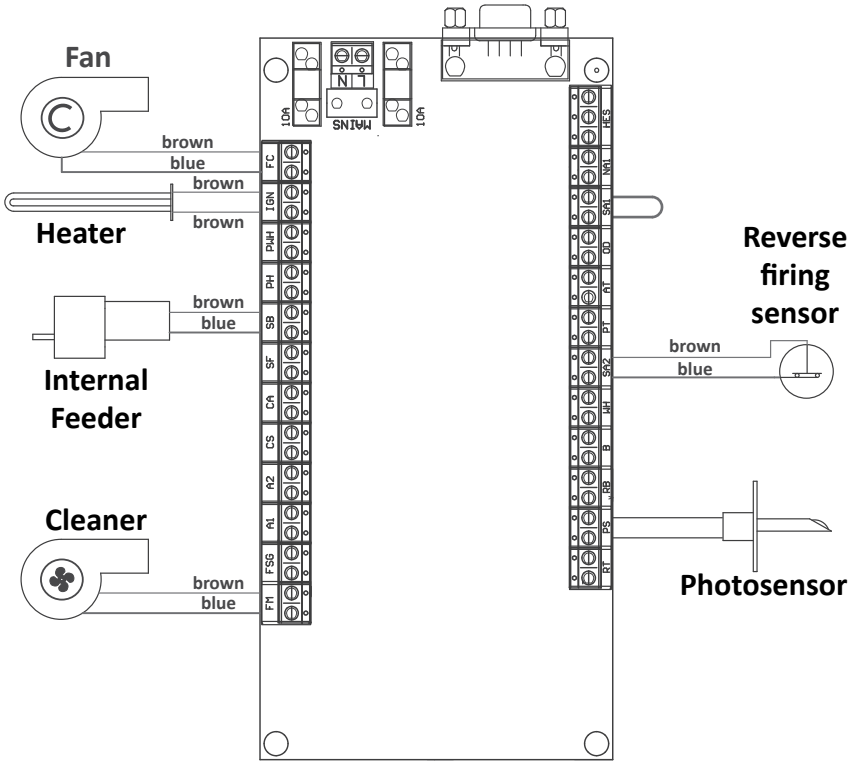


Diagram 6.
Wiring diagram of connection of internal devices / sensors to the burner

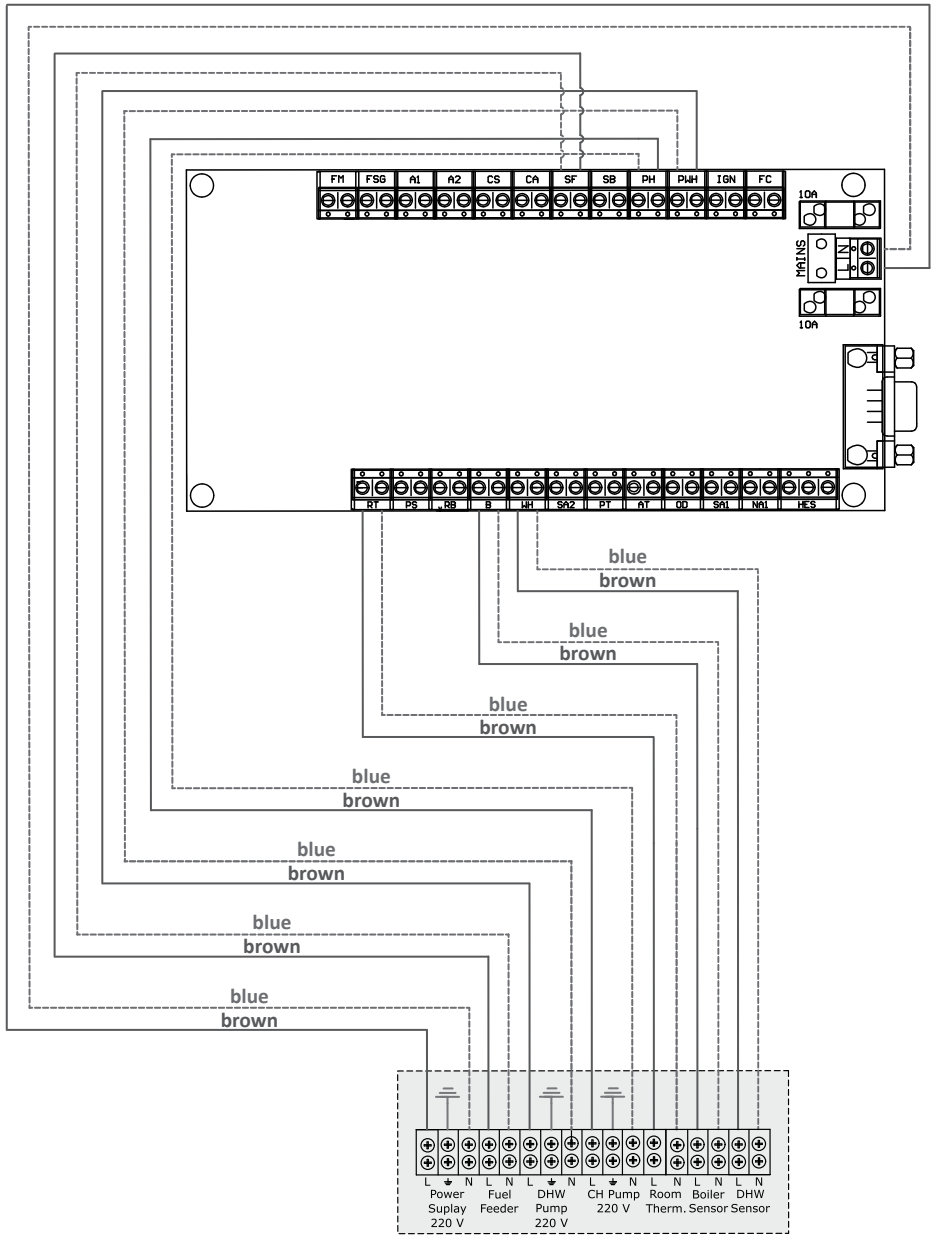
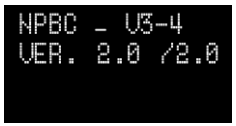


Diagram 7.
Wiring diagram of connection of external devices / sensors to the burner

After all settings have been confirmed, the burner will initiate ignition sequence according to the input parameters.

9.3. Installer's menu (setting the combustion parameters in the burner controller)

⚠	**CAUTION! We recommend that this menu be used only by an authorized installer/ service shop in order to ensure efficient and safe operation of the equipment**



To access the settings adjustment mode, simultaneously press the "**Enter**"and „**F**" buttons and hold them pressed for 4 /four/ seconds. This will display the controller hardware and software version on the screen. Press again button "**F**" and this will open the initial page for the burner settings.

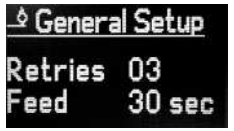
9.3.1. Cleaning setup

The burner performs automatic cleaning before each ignition and shut-down.
You can use this menu to adjust the running time of the main fan (FAN) and of the cleaning motor (Cleaner).

⚠	**Important: Once you have browsed to the next page you cannot return to the previous one.**

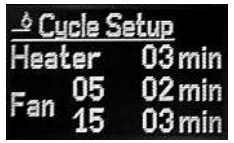
Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

9.3.2. General setup



In this submenu you can set the number of attempts (**Retries**) to ignite the burner and the time of the initial feed portion of pellets (**Feed**).
Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next parameter. Use the „**F**" button to open the next page of the menu.

9.3.3. Cycle setup



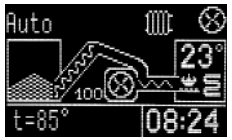
Use this submenu to adjust the running time of the heater (**Heater**) and the running time and output of the main fan during the ignition of the initial portion of pellets.

Principle of operation:
After feeding the initial portion of pellets, the heater operates for 3 minutes , and the main fan is turned on at **5%** of its capacity and operates for 2 minutes (the heater continues to work). After the two minutes have expired, the fan starts to work at **15%** of its capacity and continues at that level for 3 minutes. If upon the expiration of that period the photosensor detects the presence of stable flame, the burner enters into operating mode. If no

Select the desired option using the navigation arrows. Use the „**Enter**" button to open the next page of the menu.

Important – The use of "External room thermostat for the burner" option (Thermostat) is active only if option is selected (CH Priority – priority of central heating installation pump).

9.2.3. Automatic mode of operation "Auto"



The burner goes into automatic mode of operation "**Auto**". In this operation mode the ignition and the combustion process are automatic as well as the pump control. The burner operates in this mode until the maximum preset temperature has been reached. It then enters into "**Suspend**" mode.

9.2.4. Burner shut-down "Standby"

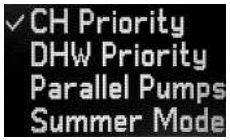
Pressing the "**F**" button will take you to the main menu and by using the navigation arrows you can select the "**Standby**" menu and confirm the selection by pressing "**F**". The burner goes into extinguishing mode.

9.2.5. Setting up delayed start

From the start-up screen, press „**F**" to enter into the burner status "**Switch Mode**". Use the navigation arrows to select the "**Programme**" menu and confirm your selection by pressing the "**F**" button.
This will open a menu where within a 24-hour period you can set up to 3 /three/ delayed start-ups and shut-downs of the burner.

Example: The picture shows the first checkmark being set and next to it is the start-up time at 06:00 and burner shut-down time at 22:00.
Programming desired time:
- Activate the checkmark in the box
Select the desired option using the navigation arrows. Use the „ Enter" button to open the next page of the menu.

Heating priority selection - Menu.



From this menu you can select the priority of one of the two pumps:

(**CH Priority**) or (**DHW Priority**).

Parallel Pumps – parallel operation of both pumps.

Summer Mode.

Important – The use of "External thermostat for the burner" option is active only if option is selected (CH Priority – priority of central heating installation pump).

Use the navigation arrows to select the desired priority and press the "**F**" button to open the next page.

7.3. Trouble - shooting
Table 3.

Fault	Cause	Solution
1. Low temperature in the boiler on which the burner is installed. Unable to reach normal temperature mode of 65°-85° C	1.1. Inadequate sizing and/or combination of heating appliances	1.1. Immediately consult your installer about the problem. Mount the supplied filling and drainage cock on the drainage outlet Y.
2. Ejection of unburned pellets into the combustion chamber of the boiler	2.1. Poor adjustment of the fuel-to-air ratio from the burner controller	2.1. Contact your installer. It is necessary to set the burner properly using gas analyzer
	2.2. Utilization of low-quality pellets (shorter than the specified length)	2.2. Use only fuel which meets the requirements specified in the manual.
3. Formation of clinkers and noncombustible inclusions inside burner body.	3.1. Utilization of low-quality pellets (with higher ash content)	3.1. Use only fuel which meets the requirements specified in the manual.
	3.2. Low performance of the automatic cleaning system	3.2. Increase turn-on frequency of the automatic cleaning system.
	3.3. Improper setting of fuel-air mixture	3.3. Adjust using gas analyzer
4. Smoke in the pellet hopper	4.1. Poor chimney draught or high internal resistance of the boiler combustion chamber	4.1. Immediately consult your installer about the problem.
	4.2. Blockage of burner combustion chamber due to build-up of noncombustible materials	4.2. It is necessary to clean the burner combustion chamber using brush
	4.3. Improper setting of fuel-air mixture	4.3. Adjust using gas analyzer
5. Unstable flame (photosensor detects > 180 units at maximum output)	5.1. Blockage of burner combustion chamber due to build-up of noncombustible materials	5.1. It is necessary to clean the burner combustion chamber using brush
	5.2. Dust on the photosensor	5.2. It is necessary to clean the photosensor. Refer to the manual for the cleaning procedure.
	5.3. Improper setting of fuel-air mixture	5.3. Adjust using gas analyzer
6. Boiler temperature too high. Controller failure	6.1. Grid power fluctuations 6.2. Power failure	It is mandatory to assure a backup power generator of corresponding rated power! (see 12.1)

TECHNICAL PASSPORT. INSTALLATION and OPERATION MANUAL | BURNiT by SUNSYSTEM

8. BURNER OPERATING

8.1. Ignition.
After the start up of the burner from the control panel, the main pellet auger conveys certain amount of fuel from the pellet hopper to the burner. This specific amount of pellets is set by the installer and depends on the fuel characteristics. The fed-in quantity of pellets is conveyed from the auger conveyor built in the burner to the combustion chamber where it is being ignited using hot air.

8.2. Burning.
The burning process takes place in the combustion chamber and, after it has been fed into the combustion chamber, the fuel is then transported from the internal auger conveyor to the combustion chamber in portions. This allows for constant and optimal burning rate of the fuel . Flame intensity is monitored by a photosensor which monitors the burning and feeds data into the control unit which enables the starting or stopping of the combustion process, if necessary. The output of the burner is determined by the intervals preset on the control panel taking into account the heating value, size and density of the pellets.

8.3. Automatic cleaning system.
The “Pell” pellet burner is equipped with innovative automatic cleaning system for the combustion chamber. Thanks to a powerful cleaning motor built in the burner body, air is being blown in at high speed and rate thus removing all residues – ash, noncombustible inclusions, etc. built up into the combustion chamber of the boiler. These automatic cleaning cycles last several seconds and can be additionally adjusted as well as their repeat rate depending on the load of the burner.

8.4. Important recommendations for long-lasting and correct operation of the boiler

- For assembly and installation of the burner follow the requirements in this manual.
- Use only recommended in this manual fuel.
- Disassemble the burner from the boiler body before clean it. Depending on fuel and burner settings, clean the pellet burner once a month.
- User`s training for operation and maintenance of burner is performed by an authorized installer or service shop.

⚠	**Failure to observe the installation and operating requirements described in the manual and the service booklet voids the warranty.**

9. CONTROL UNIT

9.1. Controller view. Explanation of buttons and indicators.

LCD screen:

The controller screen displays the information for the operation of the facility.
Explanation of buttons:

Button F (F) function key (button). Used to move from one page to the next menu, and passing the burner from one stage to another (Manual -Auto – Programe).

Button „Enter” – Used to move from one line to another menu of the controller. Confirm the entered value.

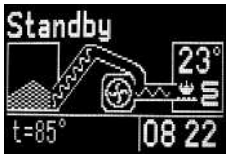
Buttons „Navigation arrow Up” and **„Navigation arrow Down”** – Used to change the value of a parameter in the menu. After entering the correct value press button “Enter", to move to next parameter.

Lights for operating „Pump heating system”

and **„Pump Domestic hot water”**.

9.2. User`s menu

9.2.1. Initial (start-up screen) "Standby"



The burner is in standby mode.

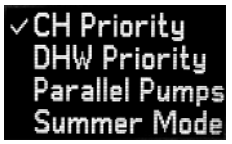
The display shows:

- **Temperature in the boiler (**23 degrees), time, and by pressing the Enter button you can browse the quick menu (bottom left) where the following read-only data is displayed:
- **Maximum set temperature t-85**, temperature of domestic hot water (where such heating circuit is connected)
- **Light intensity in the burner**
- **Burner status** (detected errors, if any)
- **Date**.

9.2.2. Burner star- up "Switch mode"

Burner start-up. After pressing the “F” button and using the „navigation arrows”, the “Auto” menu is selected. Pressing the **F** button will open the next page of the menu.

Set the priority mode of the burner through "navigation arrows."



- **CH Priority** – Priority pump heating system
- **DHW Priority** – Priority pump for domestic hot water
- **Parallel Pumps** – parallel operation of both pumps.
- **Summer Mode** – Summer mode. Burner works for heating of domestic hot water only.