

# MANUAL

FOR INSTALLATION, OPERATION AND MAINTENANCE OF  
AN AUTOMATED WOOD PELLET HOT WATER BOILER  
FROM SERIES PELLEATHERM V.2 M03



<http://www.ecotherm.bg>

<b>Manufacturer</b>	Ekoterm Proekt EAD
<b>Address</b>	Bulgaria, 6300 Haskovo, 67 Saedinenie blvd.
<b>Phone</b>	+359 800 15 145
<b>Fax</b>	+359 38 603 045
<b>E-mail</b>	<a href="mailto:office_haskovo@ecotherm.bg">office_haskovo@ecotherm.bg</a>
<b>Website</b>	<a href="http://www.ecotherm.bg">www.ecotherm.bg</a>

The company - manufacturer thanks you for the choice you made.

The manufacturer provides these instructions to help the team, who will install, set up, maintain and service the automated wood pellet hot-water boiler series "Pelletherm V.2 M03", and also to the customer who will operate it.

The manufacturer requires technicians who will carry out the above procedures have undergone training course on the activities carried out on this product.

Edition: 16/10/2019

## TABLE OF CONTENTS

Page

1. USER SAFETY INFORMATION.....	4
2. DESCRIPTION AND ADVANTAGES OF BOILER "PELLEATHERM V.2 M03".....	5
3. TECHNICAL DATA OF HOT-WATER BOILER "PELLEATHERM V.2 M03".....	8
4. DESCRIPTION OF THE CONSTRUCTION OF BOILER "PELLEATHERM V.2 M03".....	12
5. ASSEMBLY AND INSTALLATION OF THE BOILER.....	17
5.1. BASIC REQUIREMENTS FOR BOILER "PELLEATHERM V.2 M03" INSTALLATION.....	17
5.2. INSTALLATION OF HOT-WATER BOILER "PELLEATHERM V.2 M03".....	17
5.2.1. TRANSPORTATION OF BOILER "PELLEATHERM V.2 M03".....	17
5.2.2. SETTING UP BOILER "PELLEATHERM V.2 M03".....	18
5.2.3. SETTING UP THE BOILER IN COMPLIANCE WITH THE REQUIREMENTS FOR CONNECTION TO THE ELECTRIC NET.....	18
5.2.4. CONNECTING TO THE CHIMNEY.....	19
5.2.5. CONNECTING TO THE HEATING SYSTEM.....	19
5.2.6. INSTALLATION OF ASH DRAW-OFF SYSTEM.....	21
5.2.7. EXEMPLARY PRINCIPAL HYDRAULIC SCHEME.....	23
6. COMMISSIONING OF THE EQUIPMENT.....	24
6.1. MAIN REQUIREMENTS FOR THE FUEL USED.....	24
6.2. COMMISSIONING OF BOILER "PELLEATHERM V.2 M03".....	24
6.3. DESCRIPTION OF DISPLAY MAIN WINDOW.....	24
6.3.1. SWITCHING TO A RESERVE BOILER.....	26
6.4. MAIN MENU STRUCTURE.....	27
6.5. BOILER OPERATIONAL SETTINGS.....	28
6.5.1. SWITCHING ON AND OFF THE BOILER.....	28
6.5.2. SETTING PRESET BOILER TEMPERATURE.....	28
6.5.3. FIRING-UP MODE.....	28
6.5.4. OPERATION MODE.....	29
6.5.5. SUPERVISION MODE.....	29
6.5.6. BURNING OFF.....	30
6.5.7. STANDSTILL MODE.....	30
6.5.8. DOMESTIC HOT WATER SETTINGS (HUW).....	30
6.5.9. SETTING HUW PRESET TEMPERATURE.....	30
6.5.10. HUW TANK HYSTERESIS.....	31
6.5.11. ENABLING THE SUMMER FUNCTION.....	31
6.5.12. MIXER CIRCUITS SETTINGS.....	31
6.5.13. WEATHER CONTROLLED OPERATION.....	32
6.5.14. DESCRIPTION OF NIGHT TIME DECREASE SETTINGS.....	33
6.5.15. CIRCULATING PUMP CONTROL.....	35
6.5.16. FUEL LEVEL SETUP.....	35
6.5.17. OPERATION WITH ADDITIONAL FEEDER.....	36
6.5.18. INFORMATION MENU.....	37
6.5.19. MANUAL CONTROL.....	37
6.5.20. FAVOURITE MENU.....	37
6.5.21. ecoSTER TOUCH.....	37
6.5.22. ecoNET INTERNET MODULE.....	38
6.6. DESCRIPTION OF ALARMS.....	38
6.6.1. EXCEEDING MAXIMAL BOILER TEMPERATURE.....	38
6.6.2. MALFUNCTION OF BOILER TEMPERATURE SENSOR.....	38
6.6.3. UNSUCCESSFUL FIRING ATTEMPT.....	39
6.6.4. BOILER OVERHEATING STB OPEN CONTACT.....	39
6.6.5. LACK OF COMMUNICATION.....	39
6.6.6. UNSUCCESSFUL ATTEMPT OF BUFFER LOADING.....	39
6.7. PANEL WITH CONNECTORS FOR CONNECTING AND CONTROL OF THE BOILER.....	39
6.8. FAMILIARIZING USER WITH THE MAINTENANCE PROCEDURES AND SETTING OF THE EQUIPMENT.....	41
6.9. SAFETY AND ADDITIONAL RISKS.....	42
6.9.1. RISKS RELATED WITH USAGE OF A PELLET BOILER.....	42
6.9.2. ADDITIONAL RISKS.....	42
6.10. COMPLETION OF EQUIPMENT WARRANTY CARD.....	43
6.11. ACTIONS AFTER COMPLETION OF THE SERVICE LIFE OF THE EQUIPMENT.....	43
7. TROUBLESHOOTING.....	44
8. WIRING DIAGRAM OF BOILER "PELLEATHERM V.2 M03".....	46
WARRANTY TERMS AND CONDITIONS.....	48

## 1. USER SAFETY INFORMATION.

The operating instructions of the automated pellet hot-water boiler series "Pelletherm V.2 M03" is designed for users and authorized service specialists.

User needs to know the following:

- All activities on the installation of the boiler may only be carried out by authorized installers received rights for that from the competent authorities;
- All work on the electrical installation should only be performed by electricians in accordance with the regulations in force;
- Initial technical commissioning, including a view of the performing the installation, setup and commissioning of boiler operation must be performed by an authorized representative of the manufacturer.

During installation, startup, setup and commissioning of pellet hot-water boiler series "Pelletherm V.2 M03" the following must be observed:

- All legal regulations for safety;
- Provisions for environmental protection;
- Provisions for installation, commissioning and setting;
- Harmonised European Union provisions applicable in the country.

Please follow strictly the described safety instructions to prevent accidents and injury to people and damage to property as well as damage and environmental pollution.

Please note the following symbols in this instruction:



**Danger**  
This symbol warns the user of danger to man's health.



**Caution**  
This symbol alerts the user to the risk of damage to property and the environment.



**Information**  
This symbol gives the user additional information.



In the interest of your safety is to familiarize in detail and carefully with this instruction before taking action on the installation and operation of this equipment. Failure to follow these instructions may result in damage and fatal consequences for which the company will not be held responsible.



In this manual is used the designation "Pelletherm V.2 M03" which provides information about hot-water boilers "Pelletherm 30 V.2 M03", Pelletherm 45 V.2 M03", "Pelletherm 60 V.2 M03", Pelletherm 80 V.2 M03" and "Pelletherm 100 V.2 M03".

## 2. DESCRIPTION AND ADVANTAGES OF BOILER "PELLETHERM V.2 M03".

Type designation of boiler series: "Pelletherm V.2 M03"

Example	Pelletherm	30	V.2	M03
Boiler trade name				
Nominal heating output*, kW				
Boiler version				
Boiler control model				

\* Similar to other models of hot water boilers "Pelletherm 45 V.2 M03", "Pelletherm 60 V.2 M03", "Pelletherm 80 V.2 M03" and "Pelletherm 100 V.2 M03".

The automated pellet hot-water boiler "Pelletherm V.2 M03" is intended for heating of household and corporate sites, as well as domestic hot water (DHW) during the summer. Heat source is characterized by high reliability and efficiency.

Boiler "Pelletherm V.2 M03" is designed as a steel structure utilizing wood pellets. The generated heat energy is absorbed by the heat exchange surface of the boiler body and transmitted to the heat-transfer medium (usually circulation water) in the heating system or DHW system.

The equipment could utilize following types of fuel:

- Wood pellets according to standard EN ISO 17225-2:2014, class A1, A2 and B or with category: A, AB, B, BC and C according to the methodology, developed and applied by the manufacturer.

The set of pellet hot-water boiler "Pelletherm V.2 M03" includes:

- Pellet hot-water boiler - 1pc;
- Ash-tray - 1pc;
- Feet for installation and leveling – 8 pcs;
- Cleaning tool;
- Installation and operation instruction of the boiler - 1 pc.

The equipment is equipped with:

- Steel heat exchanger for heating the coolant;
- Smoke suction fan;
- Fan for supplying of combustion air;
- Mechanism providing mechanical cleaning of the burner zone from ash remains;
- bunker for fuel with capacity of about 100 kg;
- microprocessor controller that controls the operation of the modules of the boiler;
- Display with keyboard showing the mode of operation of the equipment and by which is making adjustment of its operating parameters;
- Factory integrated ash draw-off system system (device for automatic removal of ash remains from the combustion chamber and ash bunker) in boilers "Pelletherm 80 V.2 M03" and "Pelletherm 100 V.2 M03";

- Ash container with a capacity of 20 l in boilers "Pelletherm 80 V.2 M03" and "Pelletherm 100 V.2 M03";
- Mechanism for manually cleaning the tube bundle from the accumulated ash.



The automatic ash removal system for hot water boilers of type "Pelletherm 30 V.2 M03, "Pelletherm 45 V.2 M03 and "Pelletherm 60 V.2 M03" is an option.

The equipment is equipped with:

- Automatic fuel ignition system;
- System for modulating the flow of air in the process of fuel ignition;
- System for modulation of mode of operation that provides optimal operating conditions and low fuel consumption;
- System for automatic cleaning of the ash from the burner;
- Screw system for automatic fuel dosing.

Advantages of the boiler:

- Not pretentious to the quality of the utilized fuel - all classes of wood pellets according to standard EN ISO 17225-2:2014 (A1; A2; EN B);
- Intuitive and simple operation;
- Unique design (attractive display with a touch panel, presenting information in the form of meaningful icons);
- Automatic ignition;
- Fuzzy Logic of the combustion process which reduces the number of stops and starts as well as the fuel consumption and the used electricity;
- Weather-sensitive control;
- Ability to monitor temperature of the flue gases;
- Adjustment of the thermal capacity in wide range;
- Automated fuel feeding system. Own patented utility model of the fuel dosing module, which eliminates the "back fire" possibility;
- Automated operation of the boiler - possibility to operate with room remote control devices or universal room thermostat, which allows maximum thermal comfort and economic fuel consumption rate;
- Possibility to control all basic functionalities of central heating, mixer pump and the mixer itself;
- Additional (optional) modules control mixing systems;
- Remote control;
- Full access to all controller's functions by using internet module. Service functions are available remotely via mobile devices. Users can take advantage of clear visualization of boiler operation history in a form of graphs;
- Possibility to control flue gas fan, which eliminates the problem with the draught of the chimney and guarantees the safety work of the unit;
- Summer/Winter function;
- Microprocessor module for controlling of boiler parameters and control board with interface display;
- Automated cleaning (scrapping) of the ash residue from the burner's grate without interrupting of the combustion process;
- Daily fuel hopper with capacity 100 kg with option to charge with fuel, delivered by external transport auger;
- Mechanical cleaning system of the heat exchanging surfaces;
- Steel sheet three pass welded heat exchanger, which allows dynamic operation of the boiler;
- Elements produced from reliable European producers;
- Password protected control module, which allows restricted access to limited operating parameters by the service technician;
- Easy maintenance, high efficiency, reliability and safety operation;

- Meet all requirements of LVD, EMC and to standard EN 303-5:2012;
- Ecologic operation - the pollutant emissions meet the most stringent European requirements.

### 3. TECHNICAL DATA OF HOT-WATER BOILER "PELLEATHERM V.2 M03".

Thermal - technical parameters of boiler series "Pelletherm V.2 M03", utilizing wood pellets are given in Table 3.1.

Table 3.1. Thermal - technical parameters of the boiler series "Pelletherm V.2 M03".

PARAMETER	DIMENSION	PELLEATHERM V.2 M03				
Hot-water boiler model	-	30 V.2	45 V.2	60 V.2	80 V.2	100 V.2
Rating	kW	30	45	60	80	100
Setting range of thermal power	kW	9-30	13-45	18-60	30-80	35-100
Fuel used	-	Wood pellets				
Class of pellets according to standard EN ISO 17225-2:2014	-	A1, A2, B				
Categories of pellets used (according to the classification of the equipment manufacturer)		A, AB, B, BC, C				
Necessary amount of air required for effective combustion process*	kg/h	50-60	75-90	100-120	140-150	170-190
	m <sup>3</sup> /h	42-50	63-75	84-100	84-100	84-100
Mass flow of flue gases*	g/s	18.6	27.9	41.9	41.9	41.9
Efficiency at nominal power mode	%	over 93	over 93	over 93	over 93	over 93
CO emissions in the flue gases (0°C, 1013 mbar) at 10% O <sub>2</sub>	mg/m <sup>3</sup>	182.6	33.0	238.0	264.2	264.2
Dust emissions in the flue gases (0°C, 1013 mbar) at 10% O <sub>2</sub>	mg/m <sup>3</sup>	11.4	11.4	11.4	11.4	11.4
OGC emissions in the flue gases (0°C, 1013 mbar) at 10% O <sub>2</sub>	mg/m <sup>3</sup>	5.3	5.3	5.3	5.3	5.3
Boiler class according to standard EN 303-5:2012	-	5				
Coefficient of excess air (λ)	-	1.4-1.6	1.4-1.6	1.6-1.8	1.5-1.8	1.4-1.6
Temperature of flue gases at nominal power mode	°C	150-170	190-210	193-213	224-244	190-200
Waste during fuel burning	ash	The amount depends on the ash content in fuel				

\* The data specified are calculating.

Dimensions and technical parameters of the boiler series "Pelletherm V.2 M03" are presented on Figure 3.1 and Table 3.2.



Figure 3.1. Dimensions of the boiler series "Pelletherm V.2 M03".

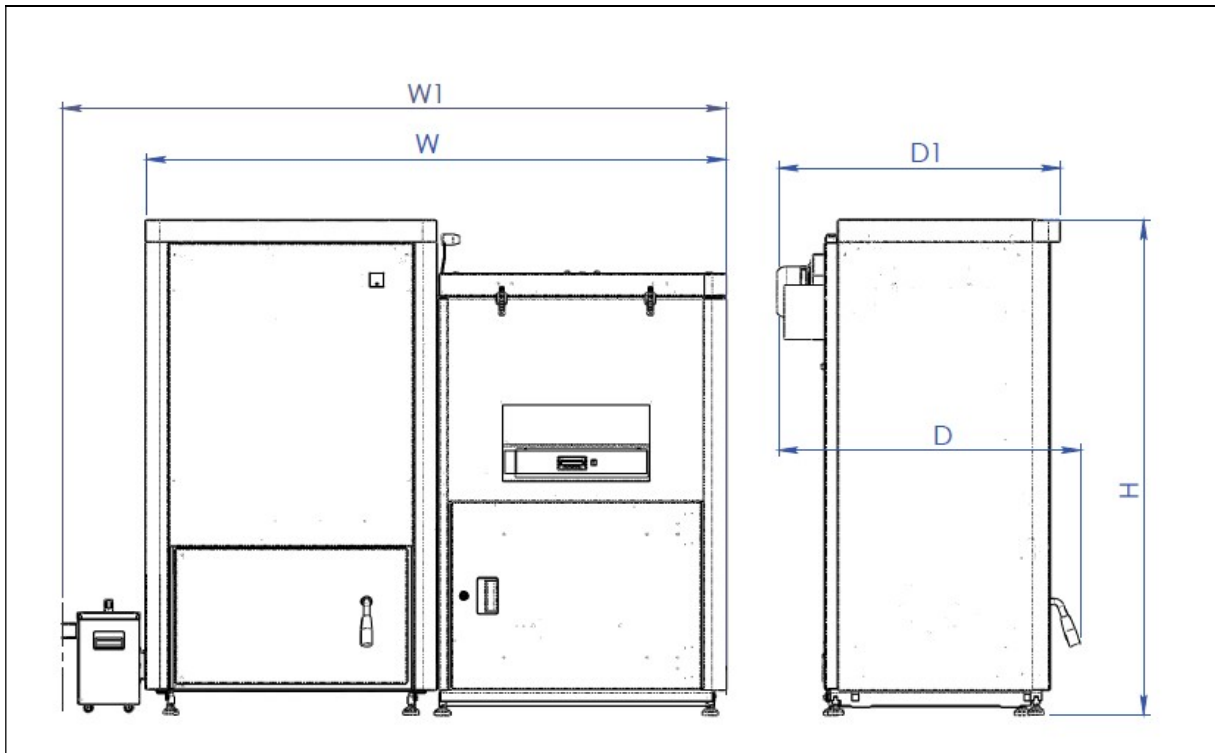


Table 3.2. Dimensions and technical parameters of the boiler series "Pelletherm V.2 M03".

PARAMETER	DIMENSION	PELLETHERM V.2 M03				
		30 V.2	45 V.2	60 V.2	80 V.2	100 V.2
Hot-water boiler model	-	30 V.2	45 V.2	60 V.2	80 V.2	100 V.2
Weight	kg	460	575	711	730	770
Water volume	l	95	120	184	184	220
Volume of the pellet bunker	kg	100				
Overall dimensions of the boiler:						
D	mm	850	850	970	970	-
D1		-	-	-	-	900
H		1380	1380	1620	1620	1830
W		1520	1620	1620	-	-
W1		-	-	-	1880	1880
Operating overpressure of the boiler water	bar	2.5				
Test overpressure	bar	4				
Recommended water operating temperature	°C	80				
Minimum temperature of the incoming water	°C	60				
Chimney draught	Pa	10-20	10-20	15-25	25-35	25-40
Connections: supply/return water	G	1½"				
Drain hole	G	½"				
Diameter of the flue	mm	150				
Supply voltage	-	L1, N, PE, 50Hz; 230VAC				
Electric power	VA	120 (+250 at ignition)			200 (+300 at ignition)	
Electric protection	-	IP20				

Classification of wood pellets depending on the physical properties developed by the manufacturer is given in Table 3.3.

Table 3.3. Wood pellets classification depending on the physical properties according to a methodology developed and applied by the manufacturer.

PELLETS 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	$A^d > 3.0\%$	$DU < 97.0\%$

where:

A<sup>d</sup> - ash content of dry mass, %;

DU - mechanical resistance, %.

With the adoption of the new standard for wood pellets (EN ISO 17225-2) in 2014 there are introduced a new classes for wood pellets used in domestic heating boilers (Table 3.4.).

Table 3.4. Standard for wood pellets EN ISO 17225-2:2014.

PARAMETER	MEASURE	Class A1	Class A2	Class B
Length (L)	mm	$3,15 \leq L \leq 40$	$3,15 \leq L \leq 40$	$3,15 \leq L \leq 40$
Diameter (D)	mm	6±1 8±1	6±1 8±1	6±1 8±1
Moisture (M)	%	< 10	< 10	< 10
Ash (A), dry	%	< 0,7	< 1,2	< 2,0
Buck density (BD)	kg/m <sup>3</sup>	> 600	> 600	> 600
Mechanical durability (DU)	%	> 97.5	> 97.5	> 96.5
Net caloricity (Q)	MJ/kg kWh/kg	> 16,5 > 4.6	> 16,5 > 4.6	> 16,5 > 4.6
Chlorine Cl	%	< 0,02	< 0,02	< 0,03
Nitrogen (N)	%	< 0,3	< 0,5	< 1,0
Sulphur (S)	%	< 0,04	< 0,05	< 0,05
Arsenic (As)	mg/kg	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.5	< 0.5	< 0.5
Chromium (Cr)	mg/kg	< 10	< 10	< 10
Copper (Cu)	mg/kg	< 10	< 10	< 10
Lead (Pb)	mg/kg	< 10	< 10	< 10
Mercury (Hg)	mg/kg	< 0.1	< 0.1	< 0.1
Nickel (Ni)	mg/kg	< 10	< 10	< 10
Zinc (Zn)	mg/kg	< 100	< 100	< 100

#### 4. DESCRIPTION OF THE CONSTRUCTION OF BOILER "PELLETHERM V.2 M03".

Steel hot-water pellet boiler series "Pelletherm V.2 M03" serves to heat the local consumers, which can be considered as systems with natural circulation of water or through its forced movement by circulating pump. The heat exchanger is a module of the structure designed for heating circulating water through the automatic use of pellets. Organization of the combustion process and heat exchange with the walls of the boiler body ensures high efficiency of the equipment. The work of the hot-water boiler series "Pelletherm V.2 M03" depends also on the chimney draught. The chimney draught depends on its condition, and the temperature of the flue gases which directly influence it.

The construction of the water section (hot-water heat exchanger) of the boiler meets the requirements of sustainability under the current standard for this type of equipment: EN 303-5:2012 - "Heating boilers. Part 5: Heating boilers for solid fuels, manually and automatically stoked nominal heat output of up to 500 kW. Terminology, requirements, testing and marking".

The boiler consists of the following elements/modules:

- The main part of the equipment is boiler body (heat exchanger) with mounted burner, which is designed on the principle of combustion grate and horizontal fuel feeding;
- The heat exchanger is welded construction from steel plates and seamless pipes. At the bottom of the heat exchanger is formed the combustion chamber in which is installed the burner;
- Specialized burner is mounted horizontally and is made of high quality stainless steel;
- Ash draw-off system – device for automatic removal of ash remains from the combustion chamber and external bunker for ash in boilers "Pelletherm 80 V.2 M03" and "Pelletherm 100 V.2 M03";
- The fuel bunker is located next to the boiler, which is mounted above the screw feed (conveying) appliance. Over the conveying appliance is mounted a prison (cutter), which divides the volume of the horizontal feeder than that of the pellet bunker and prevents it from ignition;
- The fan for supply of combustion air is mounted on the burner. The throttle valve which is mounted on the fan serves to adjust the flow of combustion air.
- There are additionally fitted flaps through which can be adjusted the distribution of so called "primary" and "secondary" air
- The input and outlet orifices of the supply and return water are at the rear of the heat exchanger of the boiler, and are two terminal with internal threads G1½", through which the equipment is connected to the heating system;
- Drainage opening is terminal with thread (internal) G½", on which must be installed drain cock;
- The flue (with external diameter 150 mm) is located at the top rear of the boiler and is located after the smoke suction fan, which serves for removal of flue gases;
- The steel heat exchanger, its lid and door of the furnace chamber are insulated with mineral insulation that limits heat loss to the environment;
- External decorative step stringers are made of steel sheet metal and treated with quality color cover.

The external appearance of the pellet hot-water boilers series "Pelletherm V.2 M03" is presented in Figure 4.1 and Figure 4.2.

Figure 4.1. External appearance of the pellet boiler "Pelletherm 30 V.2 M03".



Figure 4.2. External appearance of the pellet boiler "Pelletherm 60 V.2 M03".



The boiler construction is made on a modular principle (left part consists of a heat exchanger, combustion chamber and ash draw-off system and the right part consists of fuel bunker, burner with conveying screw and control module), which enables easy transportation and installation of the equipment.



The manufacturer reserves the right to make changes in the construction of the boiler "Pelletherm V.2 M03" without obligation to inform the end customers about that.

Figure 4.3. Sectional view of pellet boiler "Pelletherm 45 V.2 M03" - front view.

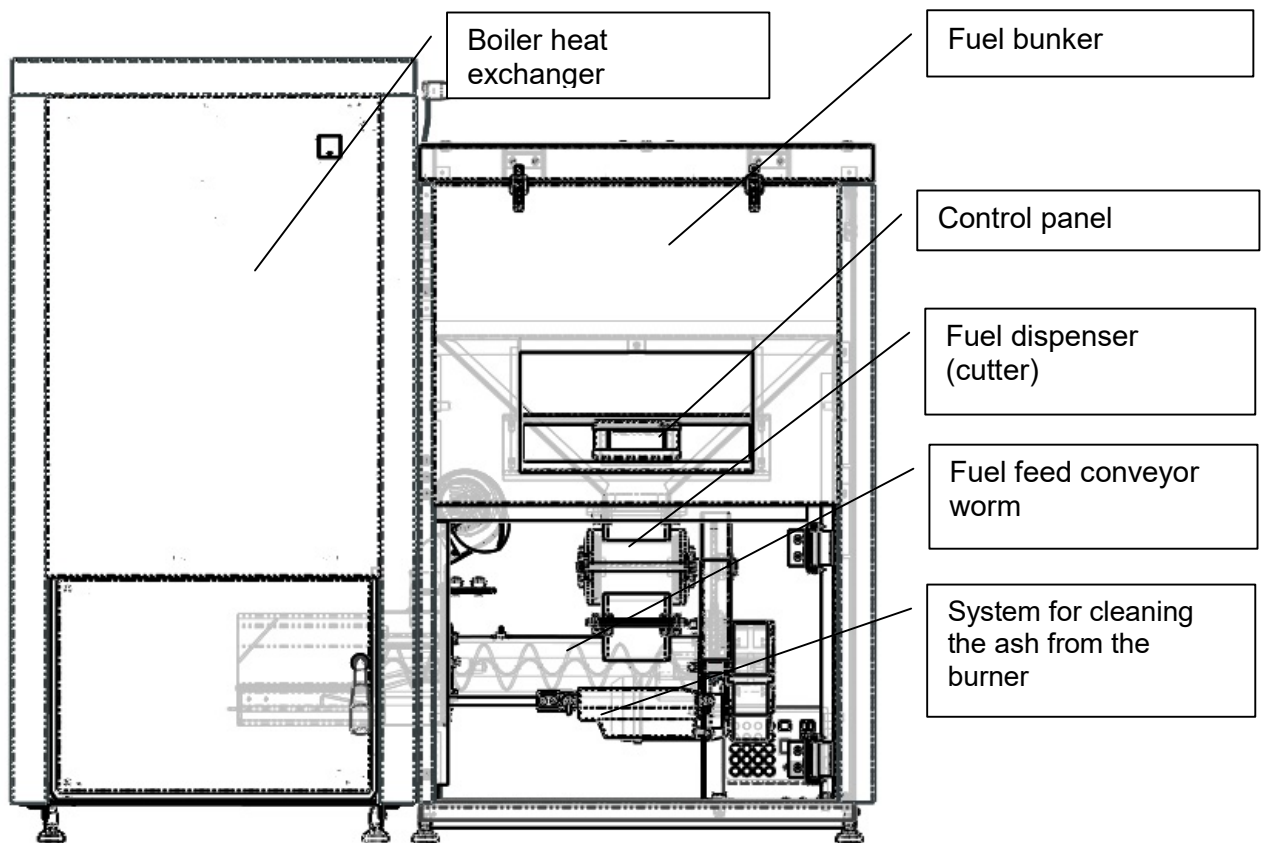


Figure 4.4. Sectional view of pellet boiler "Pelletherm 100 V.2 M03" - front view.

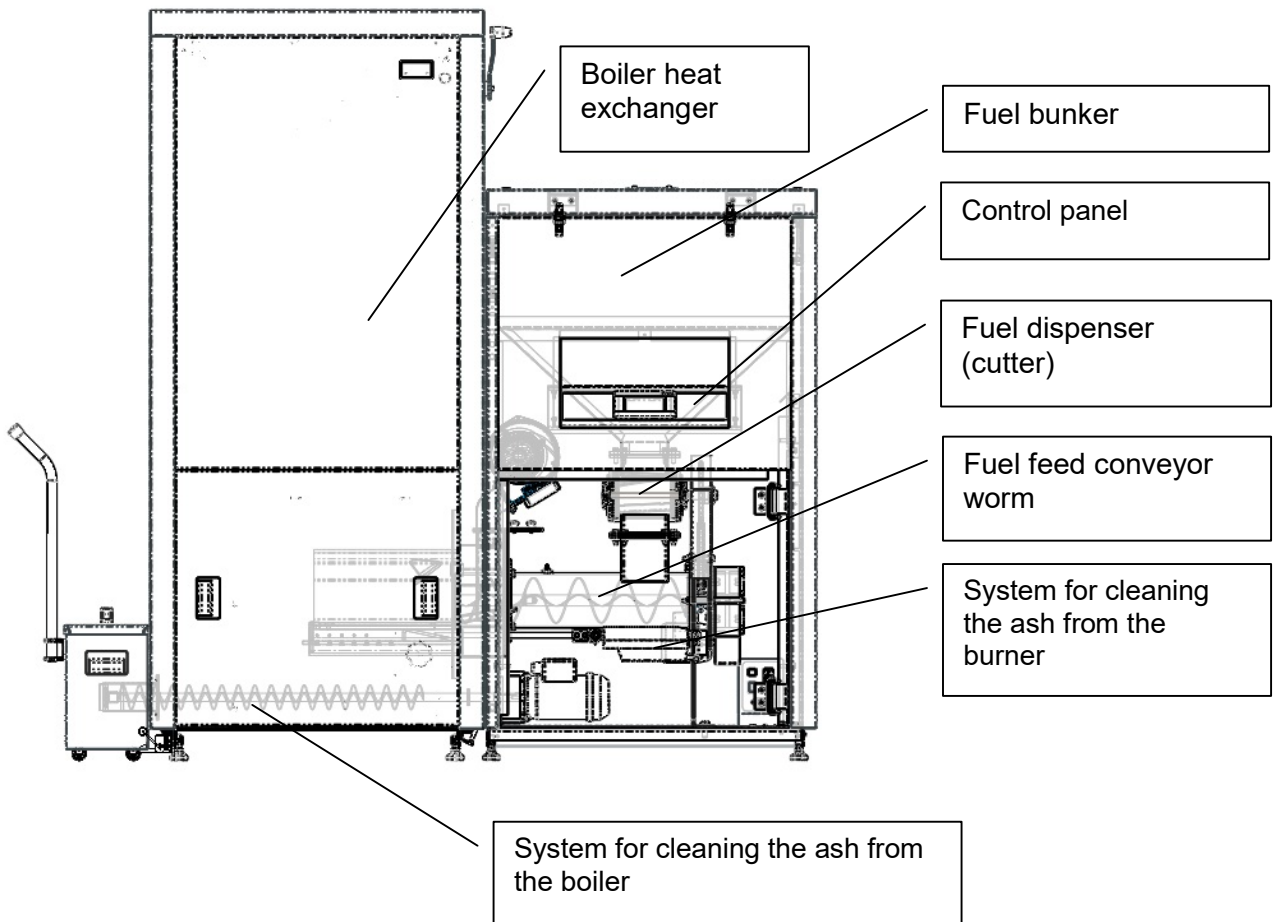


Figure 4.5. View of pellet hot-water boiler "Pelletherm V.2 M03" - top view.

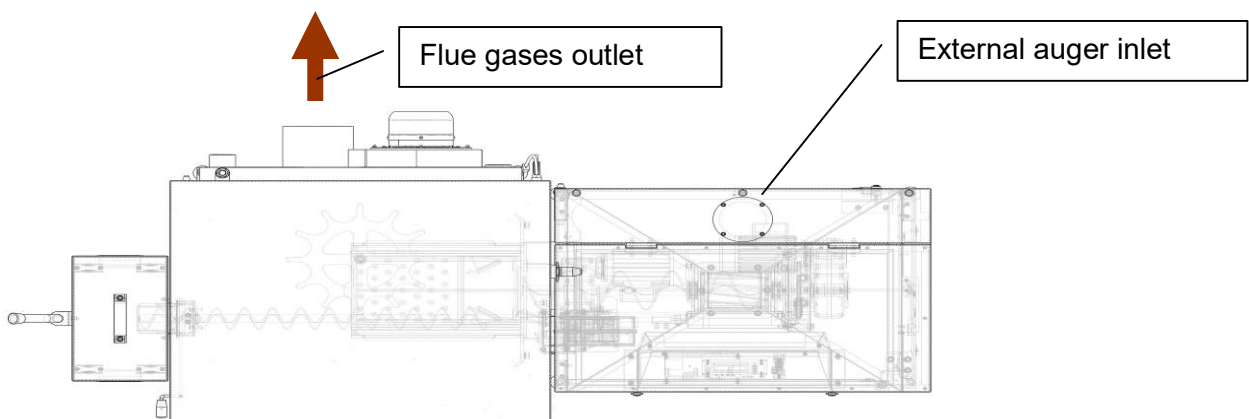
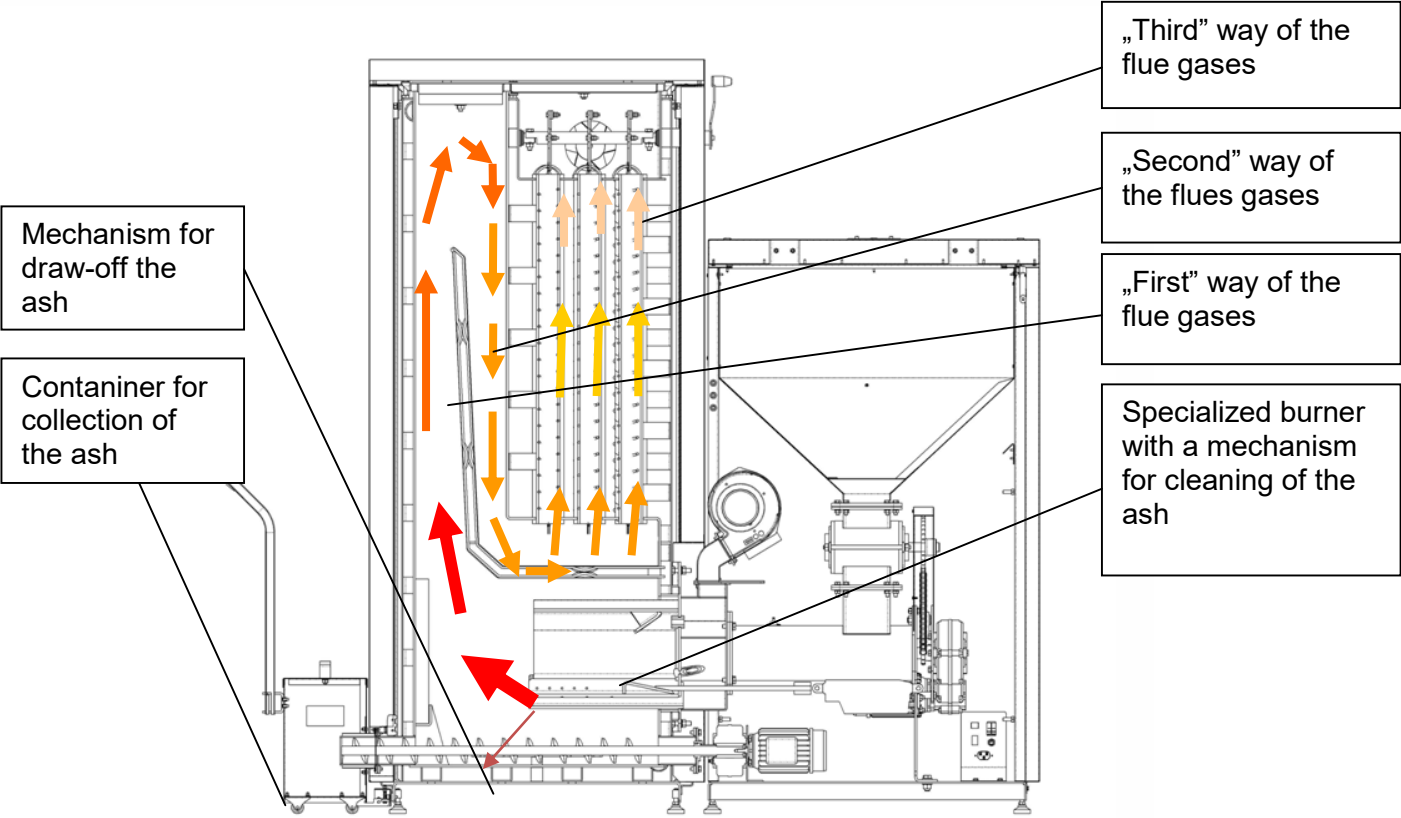


Figure 4.6. Cross-section of pellet boiler "Pelletherm V2\_M03" with shown way of flue gases and ash.





## 5. ASSEMBLY AND INSTALLATION OF THE BOILER.

### 5.1. BASIC REQUIREMENTS FOR BOILER "PELLEATHERM V.2 M03" INSTALLATION.

When assembling and installing hot-water pellet boiler series "Pelletherm V.2 M03", the service technician must observe with the following basic requirements:

- The room anticipated for the installation of the boiler must provide a constant flow of fresh air needed for the combustion process and good ventilation;
- It is not allowing installation of the boiler in dwellings, including corridors;
- Joining the boiler to the heating installation must be performed only by a qualified technician;
- Installation and maintenance of solid fuel boilers is carried out by specialized companies with right to perform this activity;
- The hot-water pellet boiler "Pelletherm V.2 M03" is connected to the heating system with **CLOSED** expansion vessel. In the event that the system is with closed expansion vessel, in it must be installed pressure-relief valve that opens when exceeding the operating pressure of the boiler (2.5 bar) and this valve must be certified in accordance with PED 97/23;
- Before entering the boiler into operation must there must be ensured complete filling and venting the heating system.



Maintenance of the boiler should be performed only by adult persons who are familiar with the operating instructions of the equipment.

### 5.2. INSTALLATION OF HOT-WATER BOILER "PELLEATHERM V.2 M03".

The installation of the boiler requires preparation of and initial project in accordance with applicable standards and regulations:

- For the heating system - EN 303-5:2012 - "Heating boilers. Part 5: Heating boilers for solid fuels, manually and automatically stoked nominal heat output of up to 500 kW. Terminology, requirements, testing and marking;
- For the chimney;
- Fire safety requirements;
- For the power supply - EN 60335-1/2006/A12012 - "Protection of domestic electrical appliances".



When installing hot-water boiler series "Pelletherm V.2 M03" observe the requirements for the necessary chimney draught referred to in the table with the technical parameters of the boiler.

#### 5.2.1. TRANSPORTATION OF BOILER "PELLEATHERM V.2 M03".

Hot-water pellet boiler "Pelletherm V.2 M03" is available in packaged form (polyethylene and stretch film), equipped and factory tested. Upon delivery, the boiler is situated vertically on two wooden pallets.

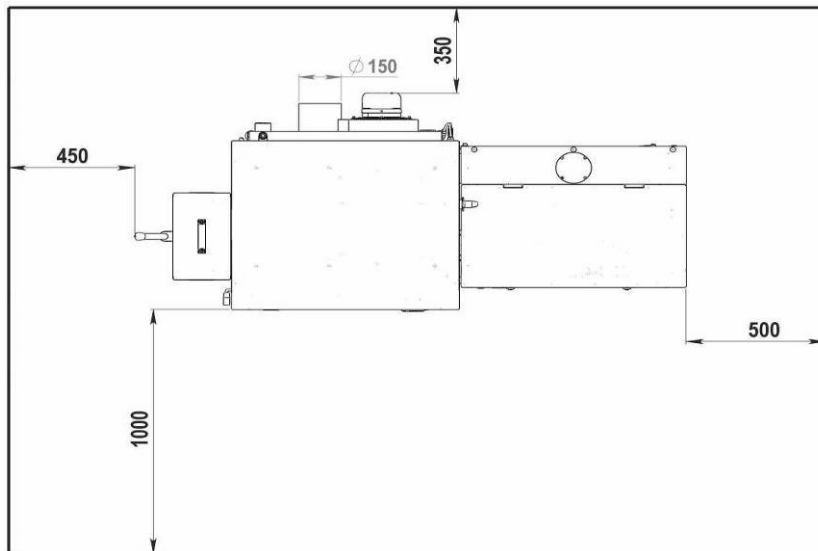
On one pallet is situated and locked the main part of the equipment – boiler body (heat exchanger) with mounted burner. On the other pallet is situated and locked fuel bunker and screw feed (conveying) appliance.

## 5.2.2. SETTING UP BOILER "PELLETHERM V.2 M03".

When installing the boiler for easy manipulation it is necessary to pay attention to the following (Figure 5.1):

- Minimum space for manipulation in front of the boiler must be 1000 mm;
- Minimum permissible distance between the rear of the boiler and wall should not be less than 350 mm;
- Minimum distance on the right side of the equipment (on the side of fuel bunker) and wall should be 500 mm, in order to ensure free access to the feed screw and the other modules of the equipment located in this compartment;
- Minimum distance on the left side of the boiler shall be 450 mm, to provide lateral access to the boiler in cleaning its ash and servicing the smoke suction fan;
- Minimum distance of the free space above the boiler must be at least 1000 mm, in order to provide easy access to the bunker for charging with fuel, and also cleaning the heat exchanger from the accumulated ash.

Figure 5.1. Location of boiler "Pelletherm V.2 M03" in a boiler room.



Setting up of the boiler is done according to the requirements for connection to the electric net - the equipment is set up so as to ensure free access to the plug box (230VAC/50Hz).



Completion of the installation and implementation of hot tests of the boiler are recorded in the report for commissioning and adjustment where mandatory the fields are filled in with the necessary information.

## 5.2.3. SETTING UP THE BOILER IN COMPLIANCE WITH THE REQUIREMENTS FOR CONNECTION TO THE ELECTRIC NET.

The system is set up so as to ensure free access to the plug box (230VAC/50Hz). Connecting the hot-water boiler of series "Pelletherm V.2 M03" is made through the power cord supplied.



The manufacturer reserves the right to change the construction of the modules of the boiler without the need to give prior notice to the client for this.

#### 5.2.4. CONNECTING TO THE CHIMNEY.

After installation and leveling of the boiler (by leveling screws available at the base of the heat exchanger and fuel bunker), it must be connected to the chimney by observing the requirements for effective and reliable operation of the system.

#### 5.2.5. CONNECTING TO THE HEATING SYSTEM.

The following figures present the connection of the hot-water pellet boiler "Pelletherm V.2 M03" to the heating system by appropriate fittings and fixture – made according to the prepared thermal-technical project.

Figure 5.2. View to the input/output orifices of hot-water boiler "Pelletherm 30 V.2 M03".

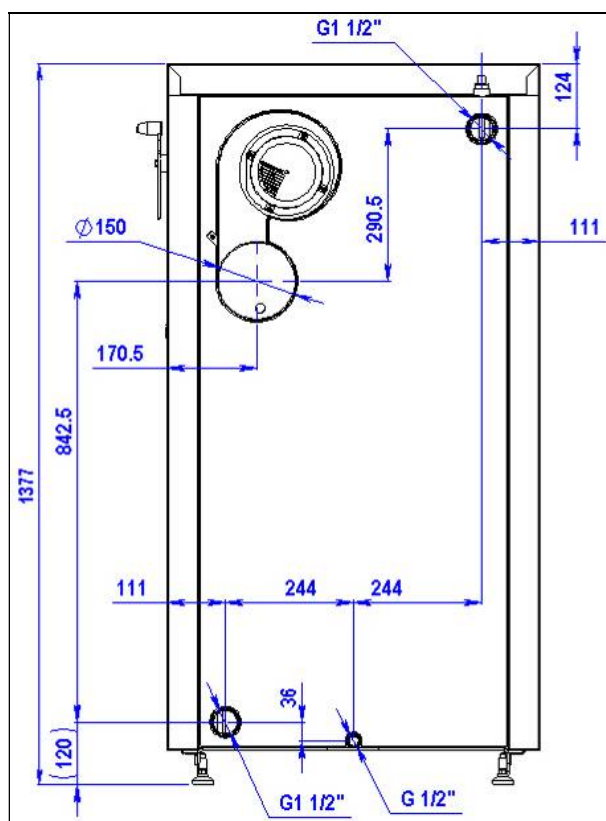


Figure 5.3. View to the input/output orifices of hot-water boiler "Pelletherm 45 V.2 M03".

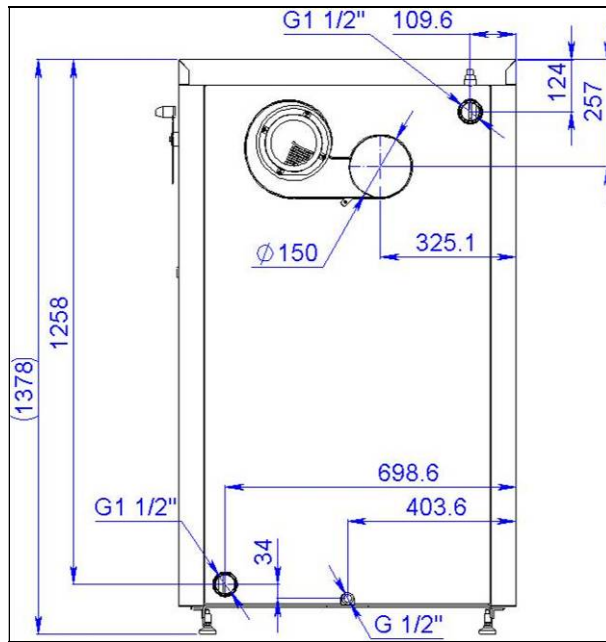


Figure 5.4. View to the input/output orifices of hot-water pellet boiler "Pelletherm 60 V.2 M03 and boiler Pelletherm 80 V.2 M03".

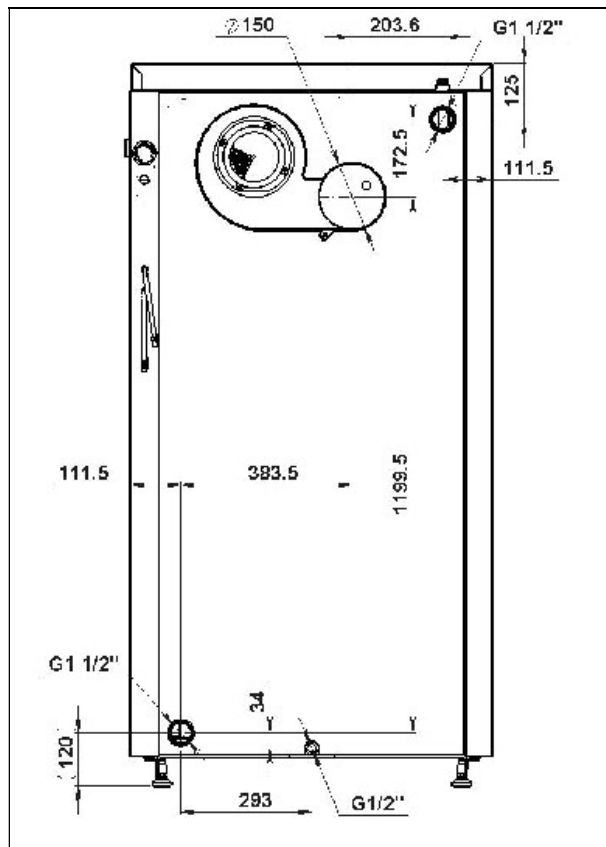
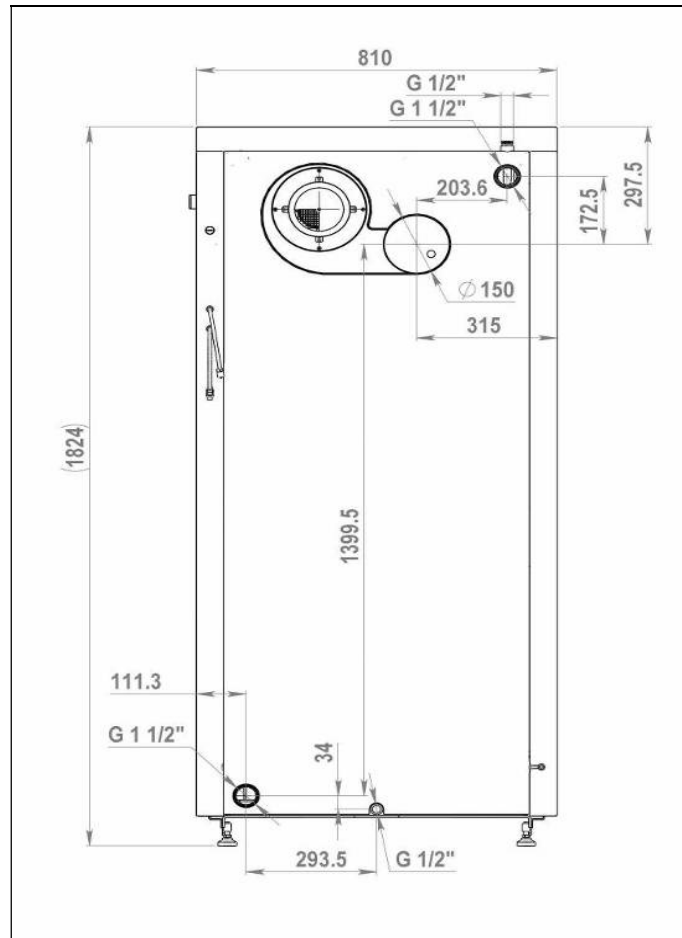


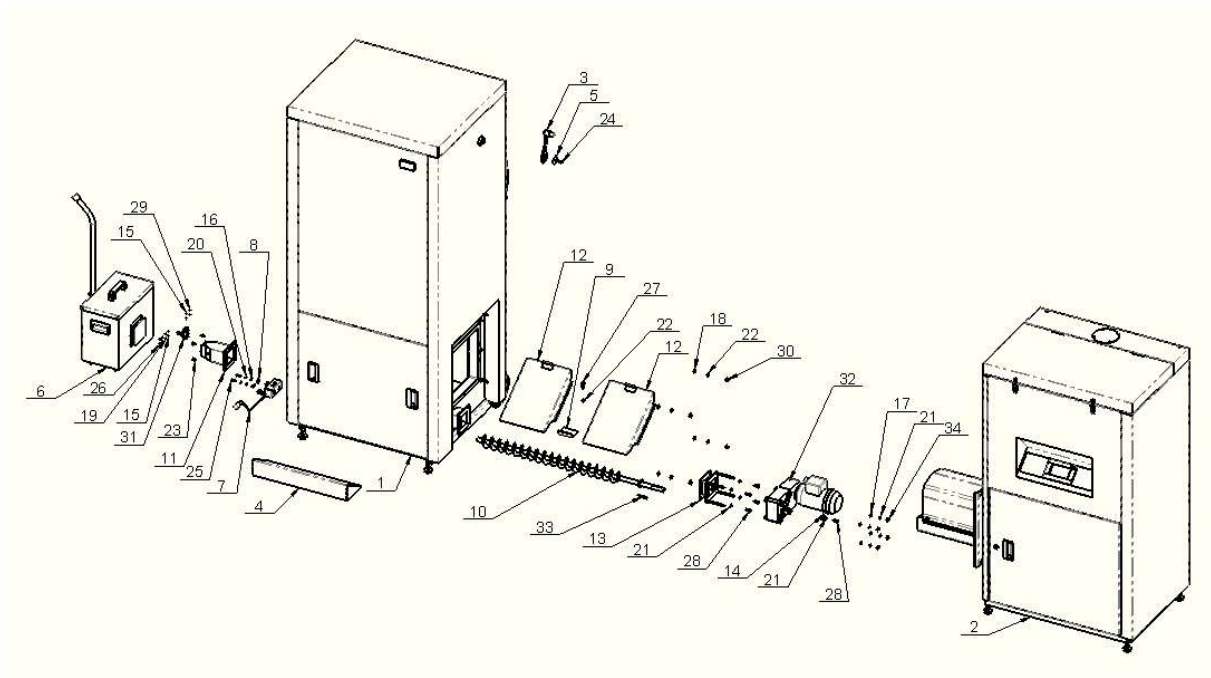
Figure 5.5. View to the input/output orifices of hot-water boiler "Pelletherm 100 V.2 M03".



### 5.2.6. INSTALLATION OF ASH DRAW-OFF SYSTEM.

Figure 5.6 presents the mounting scheme of ash draw-off system of hot-water boiler "Pelletherm 60 V.2 M03", boiler "Pelletherm 80 V.2 M03" and boiler "Pelletherm 100 V.2 M03".

Figure 5.6. Installation scheme of ash draw-off system of the boiler.



- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. Boiler body - 1 pc.</li> <li>2. Supply module with burner - 1 pc.</li> <li>3. Handle - 1 pc.</li> <li>4. Additional plate - 1 pc.</li> <li>5. Washer - 1 pc.</li> <li>6. Ash hopper - 1 pc.</li> <li>7. Fixing mechanism - 1 pc.</li> <li>8. Bushing - 2 pc.</li> <li>9. Foothold - 1 pc.</li> <li>10. Auger for cleaning - 1 pc.</li> <li>11. Transition - 1 pc.</li> <li>12. Slope for ash - 2 pcs.</li> <li>13. Cover bearing - 1 pc.</li> <li>14. Washer - 1 pc.</li> <li>15. Subjected washer A4 - 4 pcs.</li> <li>16. Subjected washer A6 - 2 pcs.</li> <li>17. Subjected washer A8 - 4 pcs.</li> <li>18. Subjected washer A10 - 4 pcs.</li> <li>19. Spring washer H4 - 2 pcs.</li> <li>20. Spring washer H6 - 2 pcs.</li> <li>21. Spring washer H8 - 9 pcs.</li> </ul> | <ul style="list-style-type: none"> <li>22. Spring washer H10 - 5 pcs.</li> <li>23. Countersunk allen head screw M8x16-4 pcs.</li> <li>24. Screw with a cylindrical head and hexagon socket M6x16 - 1 pc.</li> <li>25. Screw with a cylindrical head and hexagon socket M6x20 - 2 pcs.</li> <li>26. Bolt with hexagon head full thread M4x30 - 2 pcs.</li> <li>27. Bolt with hexagon head full thread M10x25 - 1 pc.</li> <li>28. Bolt with hexagon head full thread M8x20 - 5 pcs.</li> <li>29. Hexagonal nut M4 - 2 pcs.</li> <li>30. Hexagonal nut M10 - 4 pcs.</li> <li>31. Stop switch - 1 pc.</li> <li>32. Motor gear FT146_3.3 - 1 pc.</li> <li>33. Spline 6x6x50 - 1 pc.</li> <li>34. Hexagonal nut M6 - 4 pcs.</li> </ul> |
|---|---|

### 5.2.7. EXEMPLARY PRINCIPAL HYDRAULIC SCHEME.

Exemplary principal hydraulic scheme for connecting the hot-water boiler series "Pelletherm V.2 M03" to the heating system with OPENED expansion vessel is shown in Figure 5.7.

Figure 5.7. Exemplary principal hydraulic scheme for connecting boiler "Pelletherm V.2 M03" to heating system.

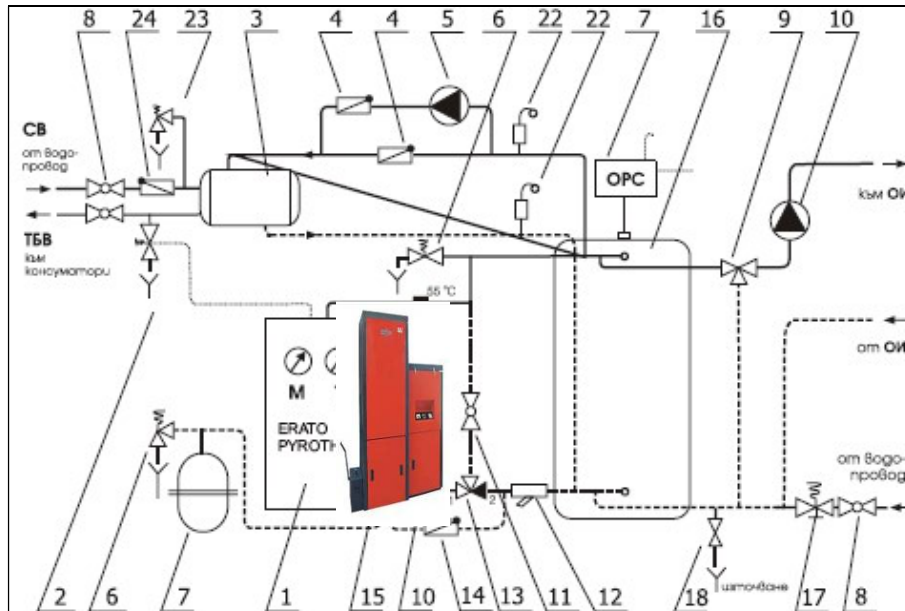


Table 5.1. Name of the elements indicated in Figure 5.7.

No.	NAME	No.	NAME
1	Hot-water boiler "Pelletherm V.2 M03"	11	Ball valve
2	Relief valve	12	Water filter
3	DHW boiler	13	Therموvalve TV
4	Check valve	14	Check valve
5	Circulation pump 1	15	Contact thermostat
6	Relief valve	16	Heat accumulator
7	Opened expansion vessel	17	Automatic machine for water refill
8	Ball valve	18	Tap for filling and draining
9	Three-way mixing valve	22	Automatic air eliminator with valve
10	Circulation pump 2	23	Relief valve
		24	Check valve



The exemplary hydraulic circuit is for information only, and can not be used as practically implemented hydraulic scheme.



Completion of the installation and implementation of hot tests of hot-water boiler "Pelletherm V.2 M03" shall be recorded in the report for commissioning and adjustment where mandatory the fields are filled in with the necessary information.

## 6. COMMISSIONING OF THE EQUIPMENT.

### 6.1. MAIN REQUIREMENTS FOR THE FUEL USED.

Upon commissioning of hot-water boiler "Pelletherm V.2 M03" there must be met the following requirements for the fuel:

- In order to achieve complete combustion it is necessary to be used only dry fuel meeting the requirements of standard EN ISO 17225-2:2014, class A1, A2 and B and developed by the manufacturer methodology for categorization of pellets;
- It is forbidden to store the fuel in close proximity to the boiler or at a distance less than 400 mm from it;
- The optimal distance which the manufacturer recommends between the boiler and the fuel is at least 1000 mm. It is advisable the fuel to be stored in an adjacent premise;
- Fire safety regulations must be complied with when installing hot-water pellet boiler series "Pelletherm V.2 M03" and storage of the fuel. It is recommended that at a convenient and safe place to be mounted a fire extinguisher.



Hot-water pellet boiler "Pelletherm V.2 M03" is commissioning only by specialized company authorized to this activity.

### 6.2. COMMISSIONING OF BOILER "PELLEATHERM V.2 M03".

Upon commissioning of hot-water boiler "Pelletherm V.2 M03" there must be met the following basic requirements:

- Servicing of the hot-water pellet boiler must be carried out in accordance with the instructions for maintenance and operation;
- Any interference in the work of the system, which could lead to a potential health hazard to staff or indirectly related parties is inadmissible;
- During operation of the system, it should be periodically be checked by the servicing staff/client;
- The user should not perform any repairs on the boiler modules. When a problem occurs during operation, it should be sought professional help from the company servicing it;
- The ash from the combustion process is collected in fireproof containers with covers and after is being cooled down to ambient temperature is disposed in the appropriate places.



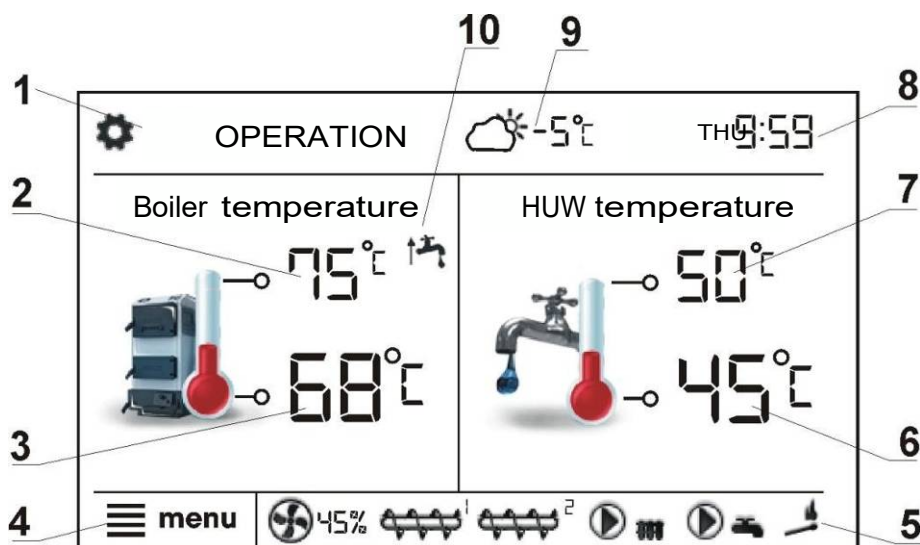
When installing pellet boiler "Pelletherm V.2 M03" and tank for feed the bunker with pellets boiler local fire requirements must be respected.

### 6.3. DESCRIPTION OF DISPLAY MAIN WINDOW.






The boiler's display main window is shown on Figure 6.1.



Figure 6.1. Main window of the boiler display.



1. Mode of regulator operation: FIRING-UP, OPERATION, SUPERVISION, BURNING OFF, STANDSTILL.
2. Preset boiler temperature.
3. Measured boiler temperature.
4. Key to enter "Menu" list.
5. Information fields:

	Fan
	Feeder 1
	Feeder 2
	Pump
	Lighter

6. Measured temperature of HUW container (for domestic hot water).
7. Preset temperature of HUW container (for domestic hot water).
8. Clock time and weekday.
9. Outside temperature (weather).
10. Field of functions, which modify preset boiler temperature -meaning of the symbols:



- Opening of room thermostat contacts;
- Preset room temperature has been reached;



- Off preset boiler temperature for active time intervals;



- Increase of preset boiler temperature for the time of HUW container filling;



- Increase of preset boiler temperature by mixer circuit;



- Increase of preset temperature for buffer loading.

Both, left and right windows may display different information. By touching the screen, you may navigate between displayed information: mixer circuits information window, HUW window, fuel level window.

To have the fuel level displayed, first enter the settings according to section 6.5.16.

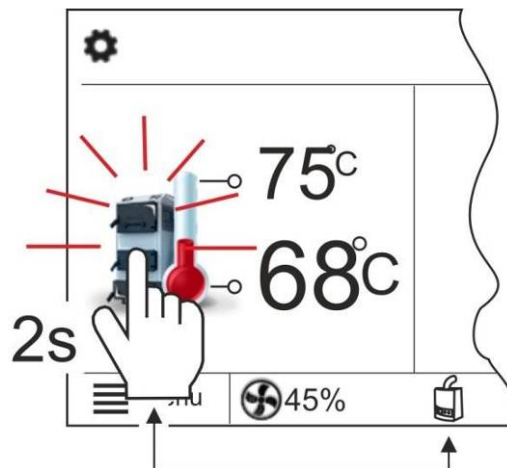


Fuel level may be displayed on ecoSTER TOUCH room control panel.

### 6.3.1. SWITCHING TO A RESERVE BOILER.

Figure 6.2. presents the possibility to switching to a reserve boiler.

Figure 6.2. Switching to the reserve boiler mode.



The boiler's controller can automatically switch between the pellet boiler and reserve boiler (gas or oil-fired). It is, however, possible to override the controller and switch to the reserve boiler manually. To do so, press and hold the boiler icon in the main window. A window is displayed allowing the user to select either the pellet or the reserve boiler. Select "Reserve boiler". The pellet boiler is then burned off. The reserve boiler is switched on after the pellet boiler is burned off.

## 6.4. MAIN MENU STRUCTURE.

Main menu
Information
Boiler settings
HUW settings
Summer/Winter
Mixer 1-4 settings*
General settings
Manual control
Alarms
Service settings

Boiler settings
Preset boiler temperature
Weather control the boiler*
Boiler heating curve*
Curve shift*
Room temp. factor*
Output modulation
<input type="checkbox"/> Airflow power correction 100%
<input type="checkbox"/> 100% feeder work correction
<input type="checkbox"/> Blow-in output 100%
<input type="checkbox"/> 50% H2 hysteresis
<input type="checkbox"/> 50% Airflow power correction
<input type="checkbox"/> 50% feeder work correction
<input type="checkbox"/> 30% H1 hysteresis
<input type="checkbox"/> Airflow power correction 30%
<input type="checkbox"/> 30% feeder work correction
<input type="checkbox"/> Boiler hysteresis
<input type="checkbox"/> Regulation mode: Standard, FuzzyLogic, Lambda FuzzyLogic
<input type="checkbox"/> Room thermostat
Fuel level
<input type="checkbox"/> Alarm level
<input type="checkbox"/> Fuel level calibration
Burner cleaning
Lambda calibration*
Night time decrease boiler

HUW settings
HUW preset temperature
HUW pump mode
<ul style="list-style-type: none"> <li>• Off</li> <li>• Priority</li> <li>• No priority</li> </ul>
HUW container hysteresis
HUW disinfection
Night time decrease HUW
Night time decrease circulation pump*

Mixer 1-4 settings
Preset mixer temperature
Mixer room thermostat
Mixer weather control*
Heating curve mixer*
Curve translation*
Room temperature factor*
Mixer night time decrease

General settings
Clock
Date
Screen brightness
Sound
Language
Software update*
WiFi settings*

Summer/Winter
SUMMER mode
<ul style="list-style-type: none"> <li>• Winter</li> <li>• Summer</li> <li>• Auto</li> </ul>

Manual control
Fan, Feeder, Boiler Pump, Lighter, HUW Pump, Serv.supply,
Servo, Alarm, Extending Feeder, Mixer Pump
Mixer Pump. Open/Close, Reserve boiler, Circulating Pump

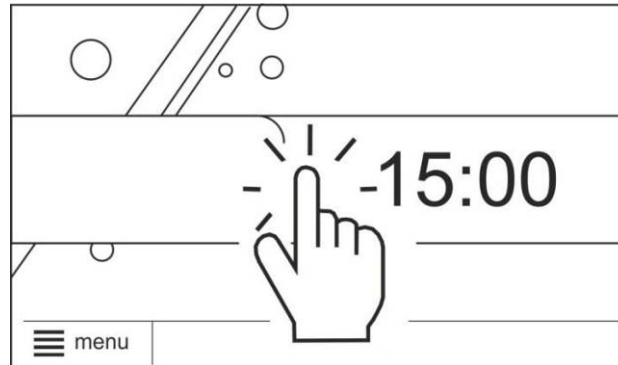
\* Unavailable if no adequate sensor or additional module is connected or the parameter is hidden.

## 6.5. BOILER OPERATIONAL SETTINGS.


### 6.5.1. SWITCHING ON AND OFF THE BOILER.

Make sure fuel is present in the tank and tank hatch is closed. Now boiler may be switched on. To start the boiler - press BURNER OFF? at any place on the screen. The message: ACTIVE REGULATOR? appears.

Figure 6.3. Boiler activation window.



Confirm the message. Boiler enters firing-up stage. There is also another method of boiler start-up. Press MENU button and find and press  button in pie menu.

To stop the boiler - press MENU button, and find and press button  in pie menu.



Regulator enters burning OFF phase. Upon completion of burning off stage, the Message BURNER OFF appears.

### 6.5.2. SETTING PRESET BOILER TEMPERATURE.

Preset boiler temperature, just like the preset mixer circuit temperature, can be set in the menu (possible settings of these temperatures are limited by the scope of their corresponding regulator service parameters).

**Menu → Boiler settings → Preset boiler temp.**

**Menu → Mixer 1,2,3,4 settings → Preset mixer temp.**


The value set as Preset boiler temp. is ignored by the regulator if the preset boiler temperature is controlled by weather sensor. Regardless of that, the preset boiler temperature is automatically increased in order to fill the hot utility water tank and feed heating mixer cycles.

### 6.5.3. FIRING-UP MODE.

The FIRING-UP mode is used for automatic firing-up of furnace in the boiler. Total duration of the firing-up process depends on regulator settings (feeder operation time, heater operation time, etc.) and on the boiler's status before firing-up. All parameters which influence the firing-up process can be found in menu:

**Menu → Service settings → Boiler settings → Firing-up**

If firing up the furnace fails, further attempts are carried out during which the fuel dose (feeding time) is reduced to 10% of the dose in the first attempt.

Consecutive attempts are visualised by numbers next to the lighter symbol . After three unsuccessful attempts, an alarm Failed firing-up attempt is reported. In such case, the boiler operation is halted. Boiler operation cannot be continued automatically - service crew must intervene. After removing causes of impossibility to fire-up, the boiler must be restarted.

#### 6.5.4. OPERATION MODE.

The fan operates continuously. Fuel feeder is activated cyclically. A cycle consists of feeder operation time and duration of feeding interval.

Parameters related with the Operation mode are: Feeder operation time and Fan output in:

**Menu → Boiler settings → Output modulation.**

#### 6.5.5. SUPERVISION MODE.

The regulator automatically enters the SUPERVISION mode without any user's intervention once actual temperature has exceeded the boiler preset temperature by 5°C.

In the SUPERVISION mode, the regulator supervises the fire in the furnace so that it does not burn off. To achieve that, the burner power is kept low which together with correctly adjusted parameters prevents any increase of the temperature. Burner power in the SUPERVISION mode and other SUPERVISION parameters can be found in:

**Menu → Service Settings → Burner Settings → Supervision**

SUPERVISION parameters should be set in accordance with the recommendations of the boiler or burner manufacturer. They should be such values so that the fire in the furnace does not burn off during boiler standstills (and it should not burn too intensely as the boiler temperature may increase). Feeder operation and standstill times in the SUPERVISION mode are set with the following parameters: Feeding Time SUPERVISION, Cycle time SUPERVISION and Blow-in SUPERVISION mode.



Parameters should be so selected that the boiler temperature in this mode gradually drops. Incorrect settings may lead to boiler overheating.

The maximum boiler operation time in the SUPERVISION mode is defined by Supervision time. If, after this time, the boiler does not have to operate again after it entered the SUPERVISION mode, the regulator initiates boiler burn-off.



For the setting Supervision time = 0, the regulator skips the SUPERVISION mode and enters the BURNING-OFF mode.

### 6.5.6. BURNING OFF.

In the BURNING OFF mode, remains of the pellet are burnt out and the boiler is prepared for standstill or deactivation. All parameters which influence the process of putting out can be found in menu:

**Service settings → Boiler settings → Burning off**

The regulator stops fuel feeding and performs periodical air flushes to burn fuel residues. When the flame brightness decreases or the maximum burning-off time elapses, the regulator enters the STANDSTILL mode.

### 6.5.7. STANDSTILL MODE.

In the STANDSTILL mode, the boiler is put out and awaits signal to resume heating. A signal to start heating can be:

- Decrease in preset boiler temperature below the preset temperature minus the value of boiler hysteresis (Boiler hysteresis);
- If the boiler is set to work with a buffer - decrease in upper buffer temperature below the preset value (Loading start temperature).

### 6.5.8. DOMESTIC HOT WATER SETTINGS (HUW).

The device controls temperature of the **domestic hot water** (HUW) – tank, provided that a HUW temperature sensor is connected. If the sensor is disconnected, an information about lack thereof is displayed in the main window. The parameter:

**Menu → HUW settings → HUW pump mode** allows the user to:

- Disable filling of the tank, parameter off, set HUW priority, using the priority parameter - in this case, the CH (central heating) pump is deactivated to speed up filling of the HUW tank;
- Set simultaneous operation of the CH (central heating) and HUW pump, using parameter no priority.

The regulator has a function of automatic, periodic heating of HUW container to 70°C to eliminate bacterial flora from the HUW container.



Keep the tenants informed of activating the disinfection functions as there is risk of being burning with hot usable water.

The regulator increases the HUW container temperature once a week, at 2:00 a.m. Monday. After 10 minutes of maintaining the temperature at 70°C, the HUW pump is switched off and the boiler returns to normal operation. Do not activate the disinfection function when the HUW support is off.

### 6.5.9. SETTING HUW PRESET TEMPERATURE.

Preset HUW temperature s defined by parameter:

**HUW settings → HUW preset temp.**

### 6.5.10. HUW TANK HYSTERESIS.

Below temperature HUW preset temp. reduced by HUW tank hysteresis, the HUW pump is activated in order to fill the HUW tank.



When value of hysteresis is set too low, the HUW pump will start faster after decrease in HUW temperature.

### 6.5.11. ENABLING THE SUMMER FUNCTION.

In order to activate the SUMMER function, which enables to load the HUW tank in the summer, without the need for activating the CH system and mixer cycles, set the parameter HUW pump operation mode to summer.



Do not enable the summer function if the HUW pump is disconnected or damaged.

The SUMMER function can be enabled automatically, on the basis of readouts from the weather sensor.

### 6.5.12. MIXER CIRCUITS SETTINGS.

Settings for the first mixer circuit can be found in the menu:

**Menu → Mixer 1 settings**

Settings for other mixers can be accessed in next menu items and they are identical for each circuit.

- Settings for mixer (without weather sensor).

It is necessary to manually set the required water temperature in the heating mixer circuit using parameter Preset mixer temp., e.g. at a value of 50°C. The value should allow to obtain the required room temperature.

After connecting room thermostat, it is necessary to set a value of decrease in preset mixer temperature by thermostat (parameters Mixer room therm.) e.g. at 5°C. This value should be selected by trial and error. The room thermostat can be a traditional thermostat (no/nc), or room panel ecoSTER TOUCH. Upon activation of the thermostat, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

- Settings for mixer with weather sensor (without room thermostat ecoSTER TOUCH).

Set parameter Weather contr.mixer to on. Select weather curve as per section 6.5.13. Using parameter Curve translation set preset room temperature following the formula:

Preset room temperature = 20°C + heating curve translation.

#### Example # 1.

In this setup, it is possible to connect a room thermostat which will equalize the inaccuracy of selecting heating curve, if the selected heating curve value is too high. In such case, it is necessary to set the value of preset mixer temperature decrease by thermostat, e.g. at 2°C. After opening of the thermostat contacts, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

Settings for mixer with weather sensor and with room thermostat ecoSTER TOUCH. Set parameter Weather contr.mixer to on. Select weather curve as per section 6.5.13.

The ecoSTER TOUCH regulator automatically translates the heating curve, depending on the preset room temperature. The regulator relates the setting to 20 °C, e.g. for preset room temperature = 22 °C, the regulator will translate the heating curve by 2°C, for preset room temperature = 18 °C, the regulator will translate the heating curve by -2 °C. In some cases described in section 6.5.13 it may be necessary to fine-tune the heating curve translation.

In this setup, the ecoSTER TOUCH room thermostat can:

- Decrease the heating cycle temperature by a constant value when the preset room temperature is reached. Analogously, as specified in the previous point (not recommended), or
- Automatically, continuously correct the heating cycle temperature. It is not recommended to use both options at the same time.

Automatic correction of room temperature is carried out in accordance with the following formula:

Correction = (Preset room temperature - measured room temperature) x room temperature coefficient /10.

#### Example # 2.

Preset temperature in the heated room (set at ecoSTER200) = 22°C. Temperature measured in the room (by ecoSTER200) = 20 °C. Room temp. coeff. = 15. Preset mixer temperature will be increased by  $(22^{\circ}\text{C} - 20^{\circ}\text{C}) \times 15/10 = 3^{\circ}\text{C}$ . It is necessary to find appropriate value of the Room temp. coeff. Range: 0...50. The higher the coefficient, the greater the correction of preset boiler temperature. If the setting is "0", the preset mixer temperature is not corrected. Note: setting a value of the room temperature coefficient too high may cause cyclical fluctuations of the room temperature!

### 6.5.13. WEATHER CONTROLLED OPERATION.

Depending on the temperature measured outside the building, both preset boiler temperature and temperatures of mixer circuits can be controlled automatically. If proper heating curve is selected, the temperature of the circuits is calculated automatically, depending on the outdoor temperature. Thus, if the selected heating curve is appropriate for the given building, the room temperature stays more or less the same, regardless of the temperature outside.



During trial and error selection of appropriate heating curve, it is necessary to exclude influence of the room thermostat on regulator operation (regardless of whether the room thermostat is connected or not), by setting the parameter:  
Mixer 1 settings > Mixer room therm. To "0".

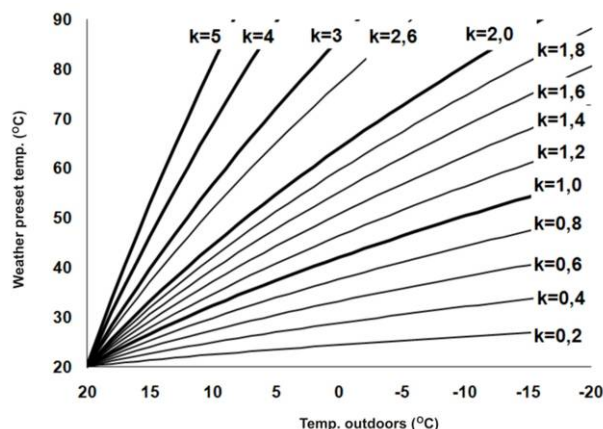


If a room panel ecoSTER200 is connected, it is also necessary to set the parameter Room temp. coeff. to "0".

Guidelines for proper setting of the heating curve:

- Floor heating: 0,2 -0,6;
- Radiator heating: 1,0 - 1,6;
- Boiler: 1,8 – 4,0.

Figure 6.4. Heating curves.



Guidelines for selection of appropriate heating curve:

- If the outdoor temperature drops, and the room temperature increases, the selected heating curve value is too high;
- If the outdoor temperature drops, and the room temperature drops as well, the selected heating curve value is too low;
- If during frosty weather the room temperature is proper, but when it gets warmer - it is too low, it is recommended to increase the Curve translation and to select a lower heating curve;
- If during frosty weather the room temperature is too low, and when it gets warmer - it is too high, it is recommended to decrease the Curve translation and to select a higher heating curve.

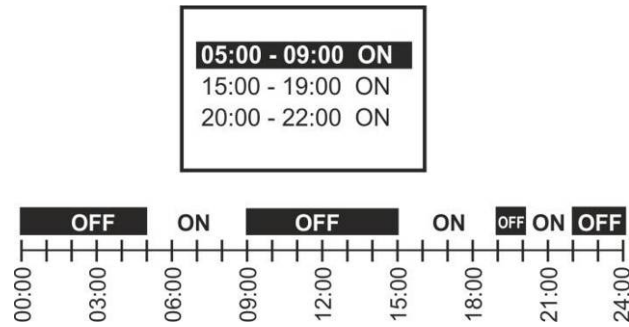
Buildings with poor thermal insulation require higher heating curves, whereas for buildings which have good thermal insulation, the heating curve can have lower value.

The regulator can increase or decrease the preset temperature, calculated in accordance with the heating curve, if it exceeds the temperature range for the given circuit.

#### 6.5.14. DESCRIPTION OF NIGHT TIME DECREASE SETTINGS.

Boiler night time decreases. The boiler operates in selected time intervals. Outside of the selected intervals, the boiler is burned off.

Figure 6.5. Boiler night time decreases.



Night time decreases for heating circuits, HUW container and circulation pump operation.

The intervals can be used to define time periods at which lower preset temperature may be set e.g. for a night time or when the user is not at home (e.g. he/she left for a work/school). This feature enables automatic reduction of preset temperature without compromising the heat comfort and reduces fuel consumption.

To activate time intervals, set the parameter: Night time decrease for the given heating circuit to ON. Night time decrease may be set for working days, Saturdays and Sundays.

The example of night time decrease of preset temperature from 22:00 to 06:00 next day and from 09:00 to 15:00 is given below.


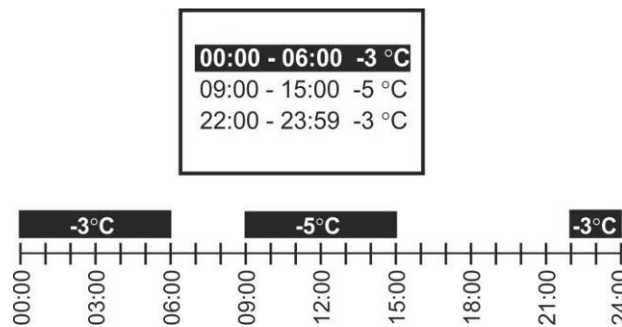

 Setting of time intervals for 24 hours (one day) should start from 00:00!


Figure 6.6. Night time decreases for heating circuits.



In the given example, the regulator will set the decrease of preset temperature by 3°C from 00:00 to 06:00, and will keep the preset value (without the decrease) from 06:00 to 09:00. Then, it will set the decrease by 5°C from 09:00 to 15:00, and will keep the preset value (without the decrease) again from 15:00 to 22:00; and again will set the decrease by 3°C from 22:00 to 23:59.

 Time interval is disregarded when its decrease is set to "0" even though "from.. to ..." values have been entered.



Decrease of preset boiler temperature in selected time intervals is indicated by the symbol:  on the main screen

### 6.5.15. CIRCULATING PUMP CONTROL.



The circulating pump functionality is available only if an additional extension mixer module.

The settings can be found in:

**MENU → HUW Settings → Circulation pumps night-time decrease**

and

**Menu → Service settings → CH/HUW settings**

Setting of circulating pump control is analogical to night decrease setting. Circulating pump switches on in selected time intervals. In disregarded time intervals circulating pump will start and remain in operation for the period of time set in Circulating Pump Operation Time, then will stop and remain out of operation for the period of time set in Circulating pump standstill time.

### 6.5.16. FUEL LEVEL SETUP

- Activating the fuel level gauge.

In order to enable display of the fuel level, set value of parameter:

**Fuel level → Alarm level**

to a value greater than zero, e.g. 10%

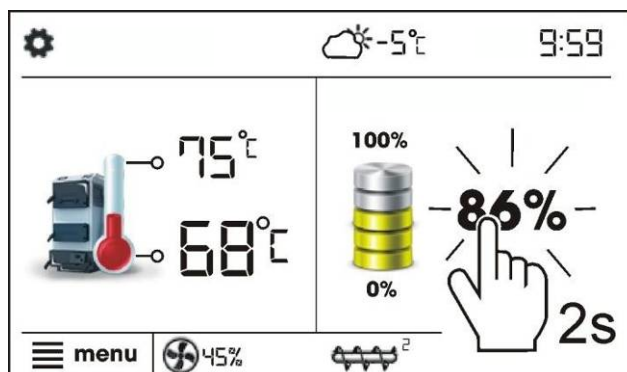
Rotate the TOUCH and PLAY knob in the main window to open the fuel level window.

Tip: The fuel level can be viewed in the room panel ecoSTER200. The room panel is not standard equipment of the regulator.

- Operation of fuel level indicator.

Touch version: Any time upon filling fuel tank, press and hold pressed current fuel level value. Following prompt appears:

Figure 6.7. Operation of fuel level indicator – Touch version.



"Set fuel level at 100% Once selected and confirmed YES, fuel level is set at 100%. Once selected and confirmed YES, fuel level is set to 100%.



Fuel may be replenished at any time without a need to wait for complete empty fuel tank. Replenish fuel always to the level corresponding to 100% level of the fuel tank and set 100% level as described above.

- Description of operation.

The regulator calculates the fuel level basing on the current fuel consumption. Default settings do not always correspond to the actual consumption of fuel by the given boiler, therefore, for proper operation this method requires the regulator user to perform level calibration. No additional fuel level sensors are required.

- Calibration.

To perform calibration - fill the fuel tank to the level corresponding to its full load and set the parameter:

**Menu → Boiler settings → Fuel Level → Fuel level calibration → Fuel Level 100%**

The indicator in the main window will be set to 100%. On-going calibration process is signalled by flashing fuel level gauge. The gauge will flash until the time of marking the point corresponding to minimal fuel level. One must systematically control the decreasing level of fuel in the bin. When the level reaches the requested minimum, set the value of the parameter:

**Menu → Boiler settings → Fuel Level → Fuel level calibration → Fuel Level 0%**

Calibration can be skipped if the Feeder Efficiency and Tank capacity, parameters are set correctly in:

**Menu → Service settings → Burner settings → Operation.**

### 6.5.17. OPERATION WITH ADDITIONAL FEEDER.

The regulator allows operation with additional feeder using low tank fuel level sensor (fuel feed from bunker). After the sensor is activated (contacts open), the regulator activates the additional tank for the Additional feeder - operation time to refill the main fuel tank. This parameter can be found in:

**Menu → Service settings → Burner settings**

### 6.5.18. INFORMATION MENU.

Information menu allows to preview temperatures being measured and to recognize which equipment is currently ON.



Upon connection of mixers' extension module, information windows of additional mixers are displayed.

### 6.5.19. MANUAL CONTROL.

Regulator offers possibility to manual start of working equipment such as pump, feeder motor or fan. This feature enables checking whether the given equipment is fault-free and properly connected.




Access to manual control menu is possible only in the STAND-BY mode, i.e. when the boiler is OFF.



Long-term operation of the fan, the feeder or other working equipment may lead to occurrence of hazardous conditions.

### 6.5.20. FAVOURITE MENU.

In Touch version in the menu bar at the bottom of the screen there is a button: .

Upon activation of this key, a quick selection menu appears. To add new item to this menu - hold respective icon pressed in pie menu for a while. To remove selected item from favourite menu - hold corresponding icon pressed and confirm REMOVE.

### 6.5.21. ecoSTER TOUCH.

The controller can work together with ecoSTER TOUCH remote control device, which have a built-in room thermostat. This room panel shows useful information such as: fuel level, alarm indication etc.

Figure 6.8. Room panel of ecoSTER TOUCH device.



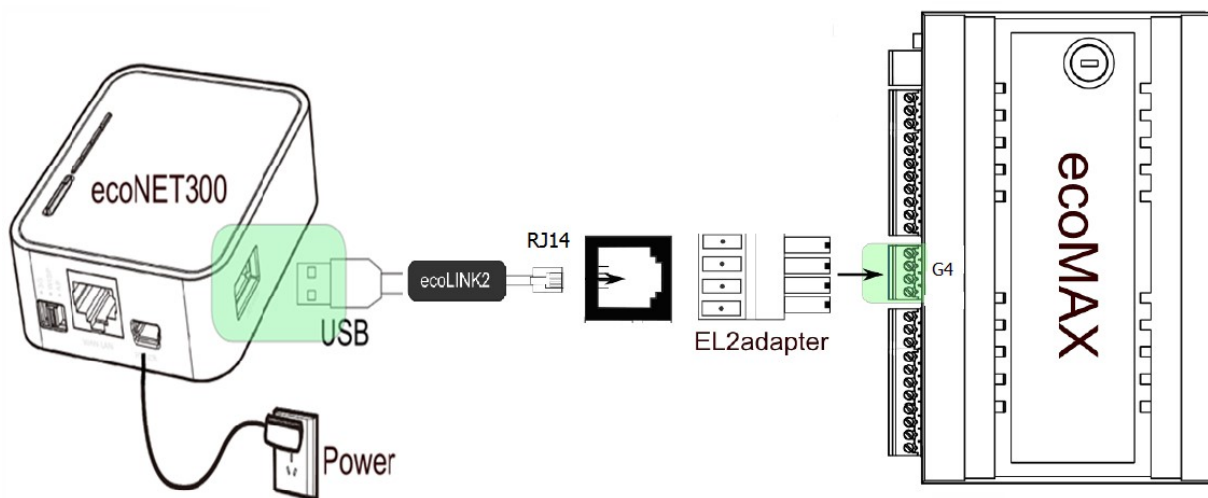
## 6.5.22. ecoNET INTERNET MODULE.

The controller can work together with ecoNET 300 internet module. This module is necessary to be connected to a router using a WiFi connection, or a network cable. If opting connection can be made in WiFi signal is necessary in the "General Settings"/WiFi be set SSID, connection protocol and password.

Connecting the module to the control ecoNET 300 (controller) is performed after making the following actions:

- Connect the adapter to the terminal G4 controller;
- Connect EkoLink cable to the adapter via RJ14 connector;
- Connect the other end of the cable to the USB port of the module ecoNET 300.

Figure 6.9 Connection of internet module ecoNET 300.



## 6.6. DESCRIPTION OF ALARMS.

### 6.6.1. EXCEEDING MAXIMAL BOILER TEMPERATURE.

There is a two-stage safety precaution for boiler overheating. First of all, i.e. after exceeding Boiler cooling temperature the controller is trying to lower the temperature by directing overheated water to the HUW tank and also by opening mixer actuators (only when Mixer Support = CH On). When the temperature, measured by HUW sensor, will exceed the value of Maximum HUW temperature than the HUW pump will be shut down in order to protect the users against scalding. If the boiler temperature drops down, so the controller will return to its normal operation. However if the temperature will continue to increase (and it will reach 95 °C) so the constant alarm of boiler overheating and corresponding signaling sound will be activated.



Installation of temperature sensor outside boiler water mantle, e.g. on the exhaust pipe is potentially dangerous, because it can lead to a delay in boiler overheating detection.

### 6.6.2. MALFUNCTION OF BOILER TEMPERATURE SENSOR.

An alarm occurs with the malfunction of boiler temperature sensor as well with exceeding measurement range of this sensor. It is necessary to check the sensor and eventually replace it with a new one.

### 6.6.3. UNSUCCESSFUL FIRING ATTEMPT.

An alarm occurs after the third unsuccessful automatic firing attempt. The reason behind this alarm occurrence can be among other things: malfunctioning igniter or ventilator, malfunction of fuel feeder system, incorrect parameter setting, insufficient fuel quality or lack of fuel in the container.



Before work continuation it is required to check, if in the combustion chamber there was a large accumulation of unburned fuel. If it is the case than it is required to remove this excessive fuel. Firing the boiler with an fuel overdose can lead to an explosion of combustible gases.

### 6.6.4. BOILER OVERHEATING STB OPEN CONTACT.

The alarm message **STB activated** (enabled open contact STB) occurs if a sensor for back fire mounted to the auger is activated. After its activation, stopping the feeding of pellets and appears sound alarm signal.

To restore the burner's operation of a boiler is required the necessary user intervention (to switch off the boiler and solve the problem).

In activation of the emergency thermostat of water, the electricity supply of the boiler is interrupted. In this case, is necessary the intervention of a service technician to troubleshoot problem reason.

After decreasing of the water temperature in a boiler is necessary to uncover a cap of the safety thermostat on the water and then push **Reset** buton.

### 6.6.5. LACK OF COMMUNICATION.

The control panel is being linked with the rest of the electronics with RS485 digital communication link. In case a cable of this link will be damaged, an alarm will occur on the screen with the information "**Attention! No communication**".

The controller doesn't stop to operate and works normally with before preset parameters. It is required to check the connection cable between control panel and the module and replaced it with a new one or repair it.

### 6.6.6. IUNSUCCESSFUL ATTEMPT OF BUFFER LOADING.

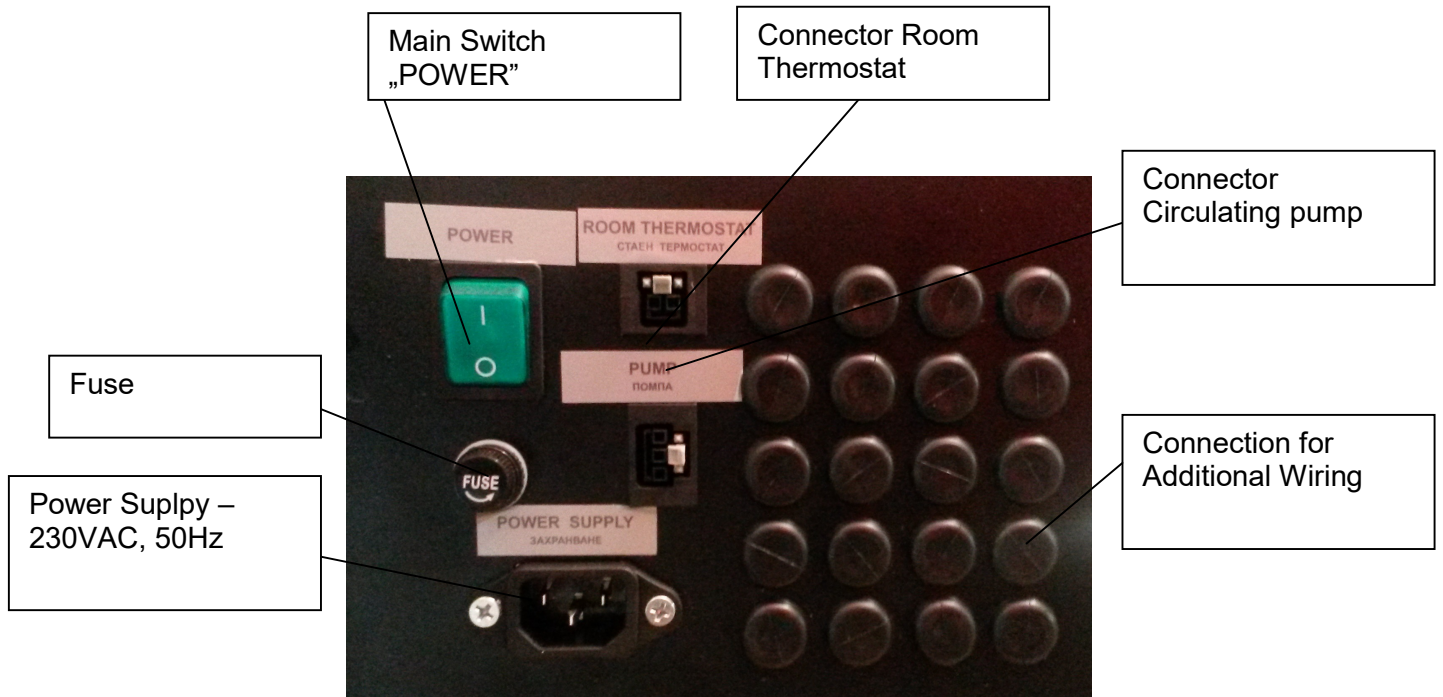
This feature has an application only after module B connection. It is a silent alarm, which informs about unsuccessful attempt of adding fuel from additional fuel container (bunker) to boiler container. In case, when during preset time of container loading, a sensor in this container will not detect the increase of fuel level, this alarm will occur.

This signalisation does not shut down boiler automatic operation.

## 6.7. PANEL WITH CONNECTORS FOR CONNECTING AND CONTROL OF THE BOILER.

Figure 6.10 presents panel with connectors for connection and control of hot-water boiler "Pelletherm V.2 M03".

Figure 6.10. Panel with connectors for connection and control of the boiler.



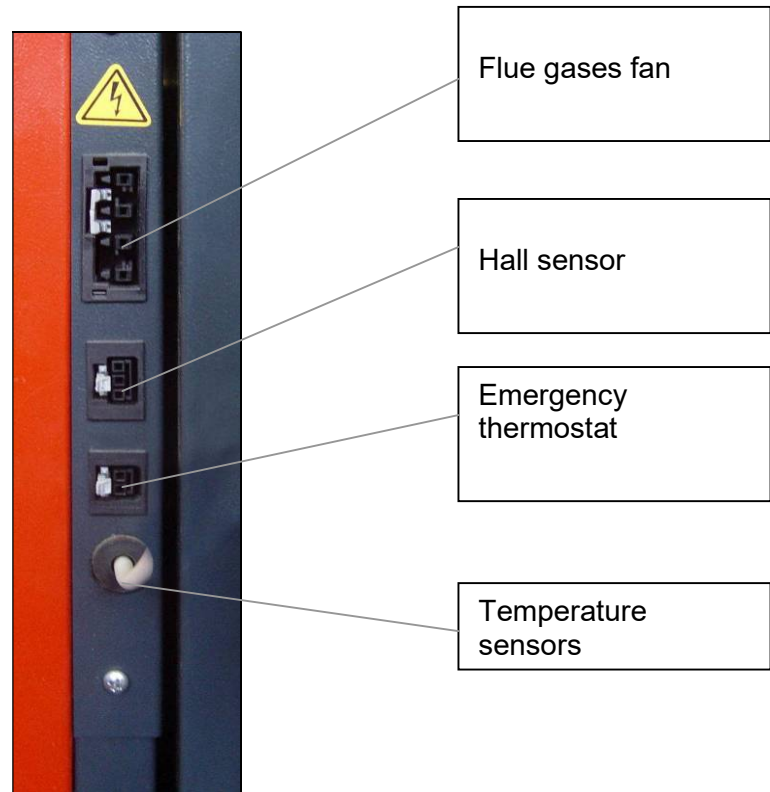
The electrical panel with connectors is mounted in the rear part of the boiler. Elements of the panel and their function are as follows:

- Power switch "POWER" - serves as a central switching on and off the hot-water boiler "Pelletherm V.2 M03";
- Connector - Room thermostat – serves for connecting of a room programmable thermosta, by which operation of the boiler can be managed. This thermostat is an option, and is not available in the standard equipment of the boiler;
- Electrical fuse - Central fuse on the control panel of the boiler;
- Connector - circulation pump;
- Connector – Power supply - 230VAC, 50Hz;
- Connection for additional wiring - used when necessary wiring of additional components.

The designation of the electrical connectors mounted on the interface panel of the boiler (on its rear side) are shown on Figure 6.11.



Figure 6.11. Designation of the electrical connectors mounted on the interface panel of the boiler.



The elements of the interface panel are as follows:

- Connector - Flue gases fan;
- Connector – Hall sensor;
- Connector - Emergency thermostat 95<sup>0</sup>C;
- Connector - Temperature sensors.



All work on the electrical installation of the boiler, making of settings where are removed covers and other elements that protect against contact with live parts, should only be performed by a qualified person.

## 6.8. FAMILIARIZING USER WITH THE MAINTENANCE PROCEDURES AND SETTING OF THE EQUIPMENT.

User is necessary to get familiarized in details with the equipment's operating instruction provided, and also with the way of operation of the equipment, with the method of setting up and adjustment, and with the methodology for servicing the boiler:

- Method of loading the bunker with pellets – pellets are poured into the boiler bunker and after that bunker's lid must be closed to limit entering of uncontrolled air from the boiler through this module;
- Method of cleaning the heat exchanger - periodically (at least once per day) client should set in motion by moving at the extreme positions of the lever for manual cleaning of boiler tubes bundle. This provides conditions for effective and reliable operation of the equipment;
- We recommend cleaning the ash to be carried out periodically, depending on the quality of the pellets, power with which the boiler works, the duration of operation. Typical time for cleaning the ash is within a few weeks.



Before taking any actions on cleaning, servicing and repair, the equipment should be turned off from the supplying voltage.

In servicing, the user should wait enough time to (it is recommended to wait about 30 minutes) until the boiler cool down to save temperature values of its surfaces and after cleaning the internal heat exchanger surfaces from the ash accumulated, to take the ash out of the boiler, gathered in the container for ash, and then in reverse order to put the ash container and container lids, to clean the burner, and then to turn it on in the described manner.



Cleaning othe ash from the burner and boiler, as well as taking out of the container for ash should be done with personal protective equipment (gloves and sleeves).



We recommend cleaning the ash to be carried out periodically, depending on the quality of the pellets, power with which the boiler works and the duration of the operation. Typical time for cleaning the ash is within a few weeks.



Regular cleaning of heating surfaces of the boiler ensures its reliable and economical operation and conditions for a long service time of the equipment.

## 6.9. SAFETY AND ADDITIONAL RISKS.

### 6.9.1. RISKS RELATED WITH USAGE OF A PELLETT BOILER.

The automated hot-water pellet boiler "Pelletherm V.2 M03" is designed and manufactured in compliance with the main safety requirements of the European standards and directives in force. Hazardous conditions can occur in the following cases:

- The hot-water pellet boiler "Pelletherm V.2 M03" is used incorrectly;
- The equipment is installed by unqualified personnel;
- The safety instructions described in this manual are not complied with.

### 6.9.2. ADDITIONAL RISKS.

The equipment is designed, constructed and produced in accordance with current safety standards. Although possible risks arising from improper use are considered, there may occur the following risks:

- Risks of burns caused by high temperatures as a result of the combustion process in the combustion chamber and/or access to the door of the combustion chamber, during cleaning the burner or not burnt out material in the ash container;
- Electrical shock risks at indirect contact. The boiler is connected to the electric net and controlling modules are separated in an electric panel equipped with the necessary devices for protection against overload and short circuit. It is mandatory to ground the boiler by an authorized technician;
- Risk of injury to fingers during operation when opening/closing, cleaning. It is recommended to use appropriate personal protective equipment;
- Risk of suffocation in case of insufficient chimney draught, blockage of the tubes bundle of the boiler or improper sealing of the flue.

## 6.10. COMPLETION OF EQUIPMENT WARRANTY CARD.



Attached WARRANTY CARD is completed by writing the necessary information into the indicated fields, as in places for signature and seal is necessary to put the corresponding signatures and seals, to ensure the VALIDITY of the WARRANTY CARD of the hot-water pellet boiler series "Pelletherm V.2 M03".

## 6.11. ACTIONS AFTER COMPLETION OF THE SERVICE LIFE OF THE EQUIPMENT.

After completing the service life of the boiler, its destruction is made in an environmentally friendly way. For this purpose, it is disassembled, and the modules are handed over to the secondary raw materials purchasing places, observing the separate collection principles.

## 7. TROUBLESHOOTING.

If a failure occurs in the system operation, the problems and ways of their remedy must be known. The following table gives additional information with data that would help to end user/service technician.

Table 7.1. Description of failures in the operation of hot-water pellet boiler series "Pelletherm V.2 M03" and ways to remedy them.

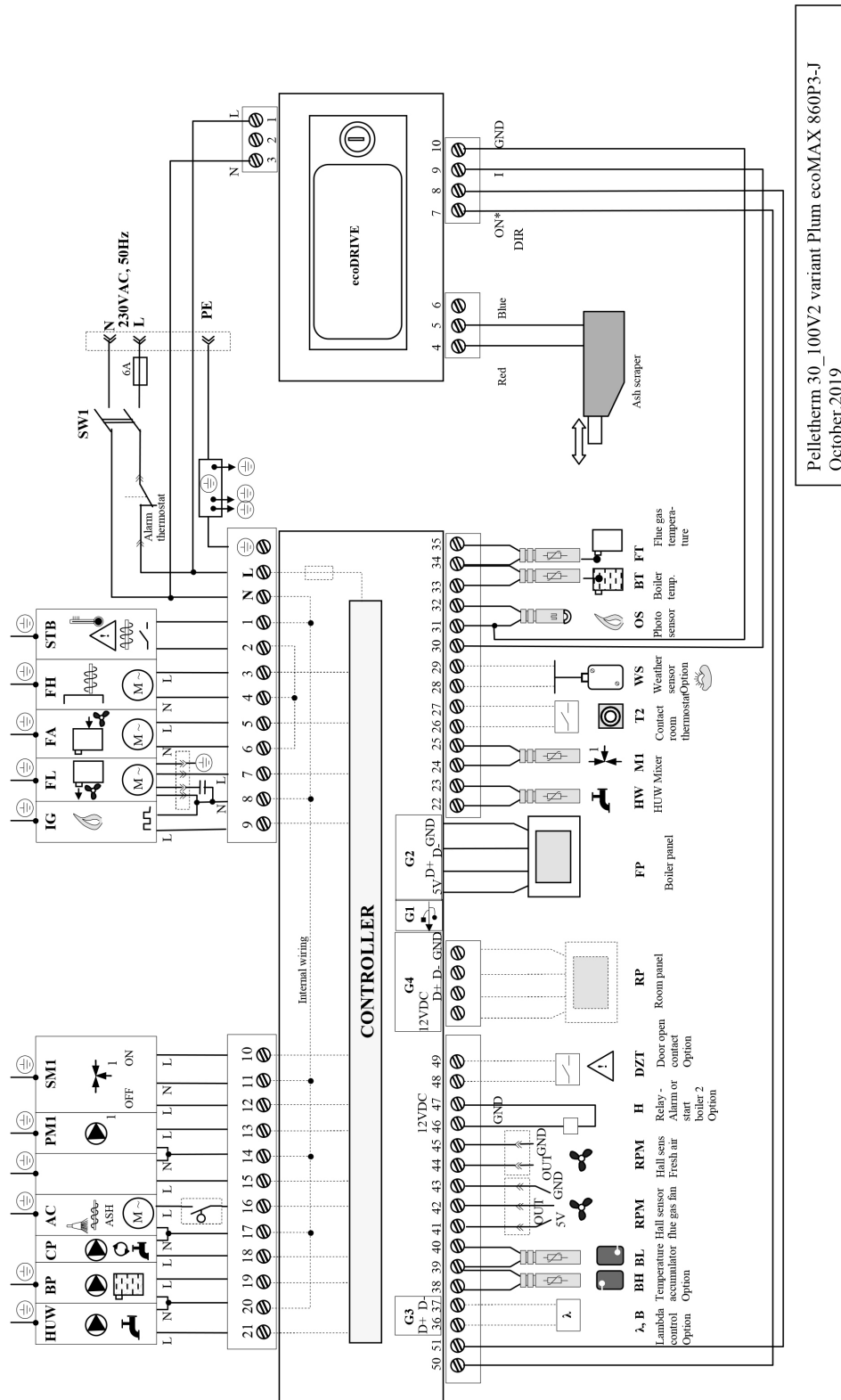
NO	FAILURE	CAUSE	TROUBLESHOOTING
1.	Low temperature in the heated rooms.	Insufficient thermal power.	It is needed to set the degree of thermal power of the equipment.
		Low temperature set of the circulating water.	It is necessary to increase the setpoint value of the circulating water (max. up to 85 °C).
		Low temperature set of the room thermostat (if such is connected).	It is necessary to increase the temperature set of the room thermostat.
2.	High temperature in the heated rooms.	High temperature set of the circulating water.	It is necessary to reduce the value of the temperature set of the circulating water (advisably minimum to 60 °C).
		High temperature set of the room thermostat (if such is connected).	It is necessary to decrease the temperature set of the room thermostat.
3.	The boiler is switched on, but there is no combustion process.	No operating task.	To check the operation task from the room thermostat.
4.	Difficult ignition of the pellets.	Pellets of low quality.	It is necessary to replace the pellets; probably their moisture is higher than required for normal operation of the equipment.
5.	Boiler overheating.	Lack of heat load or incorrect adjustment of the rate of thermal power of the boiler or operation of the heating installation.	It is necessary a check on the proper operation of the heating installation and possible adjustment of the degree of thermal power of the boiler - performed by a specialist. After cooling the equipment and elimination of the problem, the emergency thermostat is deactivating (unscrew the protective cap, press the button and screw again the cap), then reboot the boiler.
6.	No ignition of the fuel.	Lack of pellets in the bunker.	The fuel bunker must be loaded with pellets and the boiler to be restarted.
		Lack of pellets in the specialized burner.	the initial ignition of the fuel may be renewed by restarting the boiler.
		Availability of pellets into the burner, but they are not ignited or burnt out and again the combustion process is missing.	If the heater for ignition of the fuel is damaged or inactive, it must be checked, possibly replaced.

		Malfunction of the photosensor for monitoring the combustion process.	Photosensor for monitoring the combustion process should be checked (to be cleaned or replaced).
7.	The flame of the combustion process is "cloudy" and chimney is smoke.	Pellets of low quality.	It is necessary to replace the pellets; probably their moisture is higher than required for normal operation of the equipment.
		Inappropriate setting of the parameter of the equipment.	It is necessary to set up the parameters of the equipment - performed by a specialist.
8.	Presence of unburned fuel in the ash container.	Inefficient combustion of the fuel.	It is necessary to set up the parameters of the equipment - performed by a specialist.
			It is necessary to clean the grate of the specialized burner.
9.	High temperature of the flue gases (if there is installed thermometer).	The heat exchanger surfaces are dirty.	It is necessary cleaning the boiler heat exchanger surfaces.
10.	Appearing of condensation of water vapor in the heating surfaces of the combustion chamber.	Low temperature of the supply water.	It is necessary to set up the thermostat of the circulation pump (if such is installed in the system). It is recommended that temperature for operation of the circulating pump (or the temperature of the supply water) to be at least 65 °C.
11.	Appearing of smoke in the boiler room after a certain period of operation.	Dirty or clogged with ash smoke suction fan.	Cleaning or replacement of smoke suction fan - performed by a qualified technician
		Incomplete seal of the door of the combustion chamber and/or covers, sealing the flue.	It is necessary tightening/adjustment of the door and covers, replacement of the sealing ropes - performed by a qualified technician.
12.	The fuel feeder mechanism do not operate.	Opened door of the compartment with fuel bunker.	Switch at the door is actuated, that door should be closed.
		Door of the compartment with fuel bunker is closed, but there is no fuel supply.	Seek service help - possible mechanical damage.
13.	No signs of device operation on a display. Device is connected to mains supply.		Check: <ul style="list-style-type: none"> <li>▪ Whether mains fuse is not blown and replace it;</li> <li>▪ Whether cable connecting the control panel with output module is damaged or not.</li> </ul>
14.	"Initialization" command occurs on a display and screen resets.		Defect can be caused by a voltage drop resulting from too small cross section of the control panel supplying cable.
15.	Others not listed above troubles.		It is necessary consultation and/or intervention of a service technician.

## 8. WIRING DIAGRAM OF BOILER "PELLETHERM V.2 M03".

In Figure 8.1. is given the principal electrical scheme of the control board of hot-water pellet boiler "Pellettherm V.2 M03".

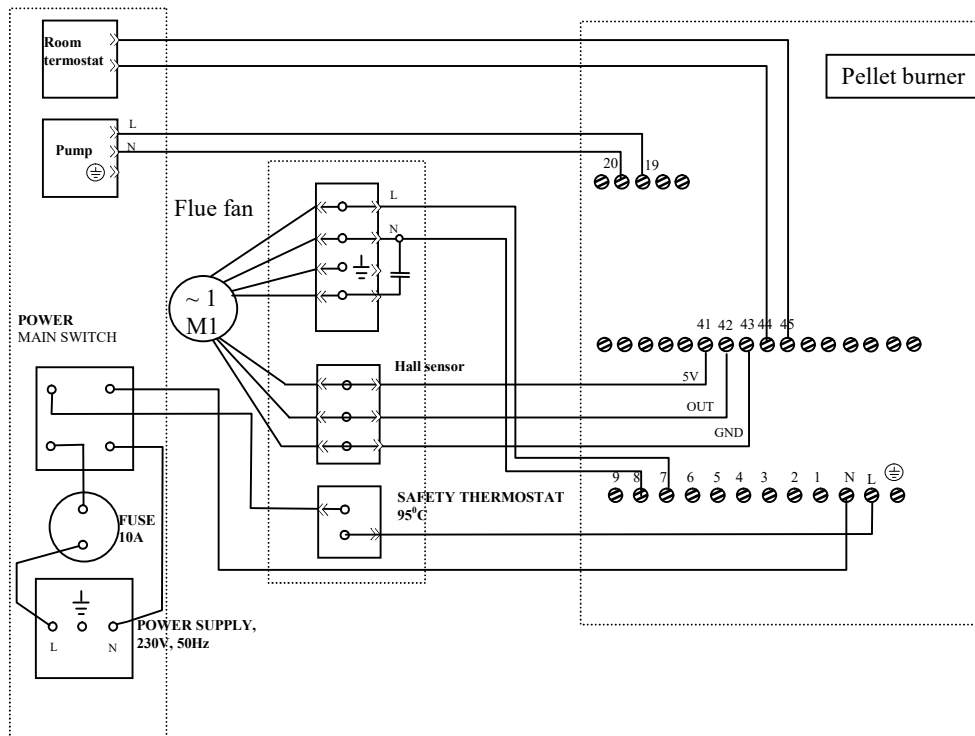
Figure 8.1. Principal electrical scheme of the control board of hot-water pellet boiler series "Pellettherm V.2 M03".



Pellettherm 30\_100V2 variant Plum ecoMAX 860P3-J  
October, 2019

Figure 8.2. presents the principal electrical scheme with panel's connectors for connection and control of boiler "Pelletherm V.2 M03".

Figure 8.2. Principal electrical scheme with panel's connectors for connection and control of boiler "Pelletherm V.2 M03".



## **WARRANTY TERMS AND CONDITIONS**

The manufacturer guarantees the correct and reliable operation of the devices from the system only when the requirements for installation and operation are met in commissioning and servicing.

The warranty of hot-water pellet boiler series "Pelletherm V.2 M03" starts from the date of completion and stamping of warranty cards for each of the products.

### **BOILER WARRANTY IS NOT VALID in the following cases:**

- Damage to the modules of the boiler caused by improper storage, transport and/or unloading, which are not organized by the manufacturer;
- Failures caused by natural disasters (earthquakes, fires, floods, etc.).
- Conditions for the installation, operation and periodic maintenance specified in this manual and service are not met;
- There is an attempt made to remove the defect by the buyer or by other unauthorized persons;
- Changes in the structure of the equipment;
- Incorrectly made thermal-technical calculations of the project, according to which system is implemented;
- Damage due to factors for which the manufacturer bears no fault/has no control over them;
- Interferences and damages that are not caused by the hot-water pellet boiler series "Pelletherm V.2 M03", but led to the occurrence of damage in its construction.

Any warranty repair must be recorded in the warranty card of the respective product.

The warranty period is interrupted for the time period from the claim until elimination of the damage of the respective item from the system.

The warranty period of the equipment is 24 (twenty four) months.

The warranty is valid only when an invoice and original warranty card are presented.