PELLET BURNER

MPB 150/250/450 PRO

INSTALLATION AND USER MANUAL

VERSION: 1.3
UPDATE: 02.03.2022

Contents

1. Warnings, Cautions and Notes

Read the safety instructions carefully before installation. Always follow the safety instructions during installation and during maintenance

 **Electric switch must be used to the power supply cable as an emergency stop**

Always follow the instructions for operations and service.

Installation, operation, service, and other work must be carried out by qualified personnel in accordance with local codes and regulations.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid contact to skinand / or clothing.

Young children should be carefully supervised when they are in the same room with the burner.

There is a risk of burn from touching the equipment during operation.
The burner casing, burner body, flange, and flame trap pipe are hot surfaces during operation. Keep children away and do not touch the equipment during operation.

All electrical installation and service work shall be done by certified and qualified personnel inaccordance with local codes and regulations. Do not perform electrical work unless you have the required qualifications. Perform a complete burner shutdown and disconnect the power supply prior to performing any work on the burner. Observe all guidelines with respect to installation, service, or cleaning.

 Only wood pellets are to be used with this burner. No other fuel is to be used in the burner.

NEVER BURN ANY TYPE OF CORN, CHERRY PITS, STICKS OR OTHER TYPES OF FUEL IN THE BURNER.

Burning wood pellets according to recommendations and the specifications set forth will assure longer burner life and lessen potential maintenance issues.

 **DO NOT** install in a sleeping room.
DO NOT connect to any air distribution duct or system.
DO NOT terminate the vent in any enclosed or semi enclosed area, such as; carports, garage, attic, crawl space, under a sun deck or porch, narrow walkway or closed area, or any location that can build up a concentration of fumes such as a stairwell, covered breezeway etc.

1.1. Document information

This document is an integral and indispensable part of the product and must be retained in good condition by the user. Keep it in a safe place for future reference.

If the appliance is sold or transferred to another person, this manual has to always follow the appliance and handed to the new user or installer.

2. Function principle

The burner's operation is based on providing fuel via controlling the feeder appropriately and also the air fan which steers the burning process. After reaching a particular temperature of the heating water, the burner goes into the mode of maintaining the temperature or switches the burner completely off. The ignition of fuel starts automatically with the help of an igniter and the fire is detected by the fire sensor.

The burner has three modes of operation: Continuous/Single/Analogue (see paragraph **Error! R eference source not found.**).

The burner can also control Hot Usage Water (WUW or HUW) pump or buffers tank's pump. The WUW pump starts working when the regulator detects too low temperature of the WUW buffer. It is also possible to stipulate the working mode of the WUW pump – with a priority or without it. The burner can be also controlled (ON/Off) by the Room Thermostat or by any external thermostat. The burner is also equipped with the self-control systems (detecting the malfunction of the temperature's sensors) and mechanisms monitoring the furnace's work preventing from going beyond the range of safety for the installation of the central heating.

3. Technical specifications

Type	**MPB 150 PRO**	**MPB 250 PRO**	**MPB 450 PRO**
Heat output	70-150 kW	100-250 kW	200-450 kW
Maximum pellet	14-30 kg/h	20-50 kg/h	40-80 kg/h
Lenght (total)	815 mm	835 mm	1100 mm
Width	360 mm	425 mm	565 mm
Height with feeding pipe	540 mm	540 mm	610 mm
Height without feeding pipe	420 mm	420 mm	570 mm
Diameter	Ø204 mm	Ø254 mm	Ø570 mm
Power supply	230Volt / 50Hz	230Volt / 50Hz	230Volt / 50Hz
Average power consumption	60-70 Watt	70-80 Watt (approx.)	180-200 Watt
Fuel	Wood pellet Ø6-8mm, hymidity <10%		
Weight	45 kg	53 kg	120 kg
Feeder's length	2 m	2 m	2 m

4. Boiler

It is important to check that the combustion chamber in the boiler is big enough to ensure that the flame does not come in contact with the water-cooled walls. Verify that the boiler's capacity range complies with the burner. There must be enough space for the ash to accumulate. The exhaust gas channels should not be so narrow that they can easily be clogged with ash.

The distance between the front edge of the burner and the rear part of the combustion chamber should be at least 800mm for the MPB 150 Pro burner and 970mm for the MPB 250 Pro burner.

The minimum distance to the bottom of the fireplace depends on the boiler design.

There must be enough space for the quantity of ash build up that is created during at least one week's use in the winter heating season.

5. Chimney

We recommend that you have a local chimney sweeper or other corresponding authority make an inspection and provide advice and instructions on the chimney measurements in accordance with local codes and regulations.

The chimney should be of a length and diameter that gives a draught of **15 - 35 Pa**. Measures have to be taken if the chimney is smaller or much larger in diameter in order to give the proper draught and flow.

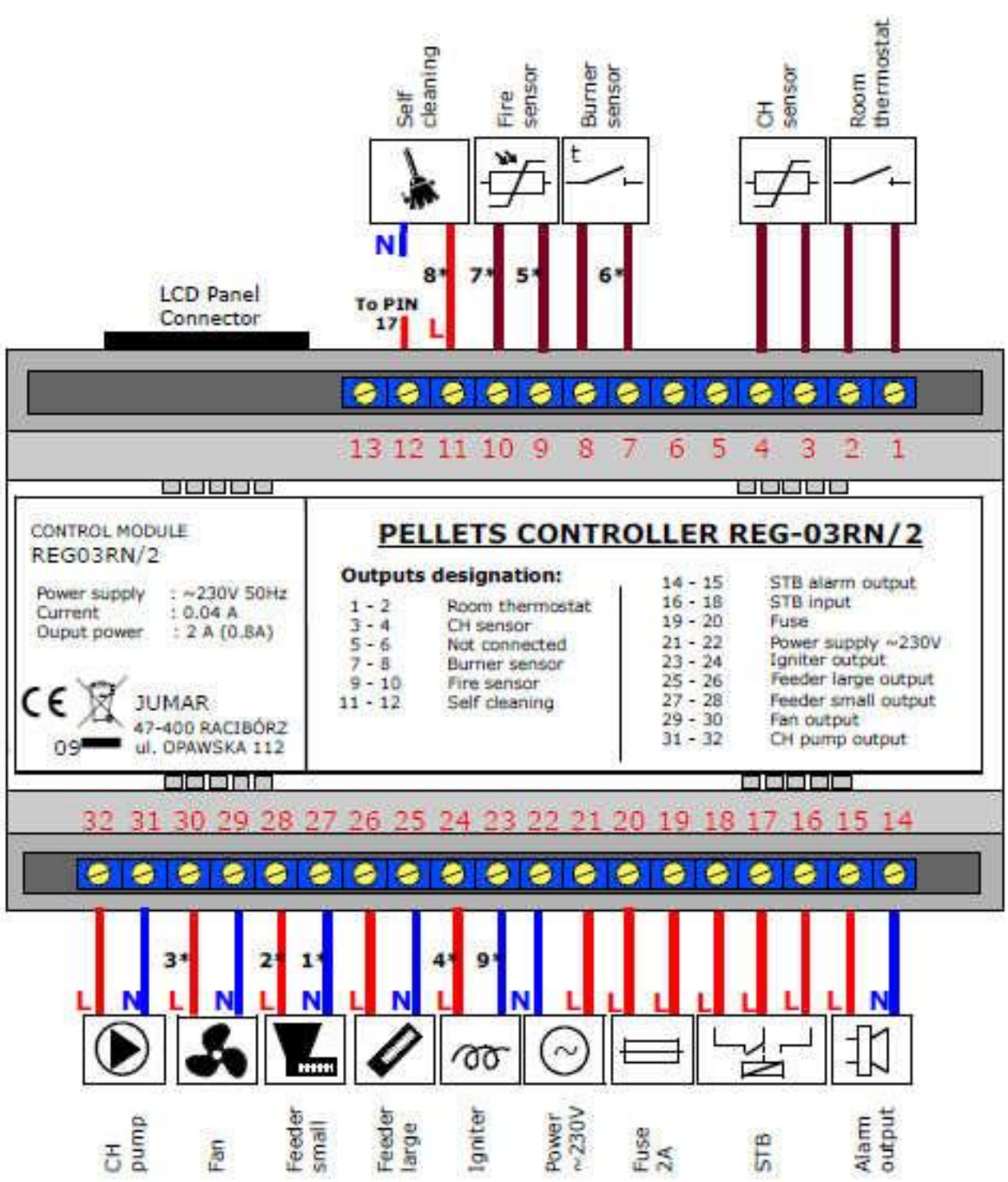
If there is not enough draught in the chimney, exhaust gases stack in boiler's combustion chamber or in the chimney with the risk of explosion. Also, gas flow into the boiler's room can happened.

Always check the exhaust gas temperature. Directly after the boiler it should be between 160°C and 250°C.

Too high a temperature can damage the chimney and is not economical.

Too low a temperature, a very high chimney, or a large chimney diameter creates a risk for condensation that can cause corrosion and damage due to freezing.

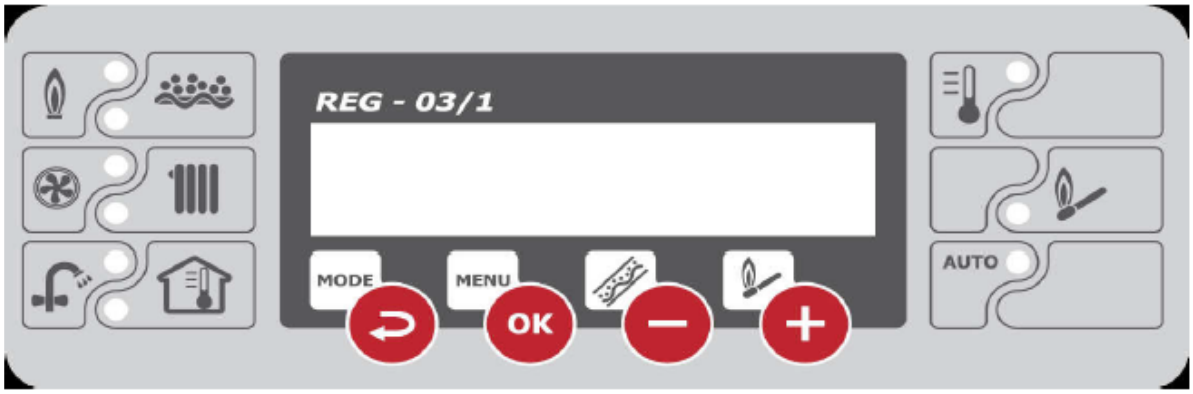
6. Electrical connections



* number on cable

7. Controller

7.1. General description



Description:

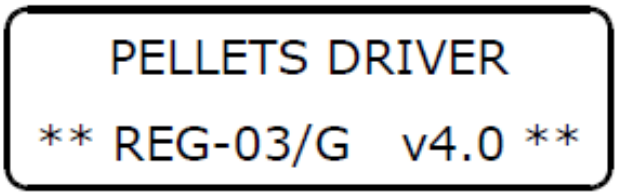
- Diodes signalizing the status of outputs and the working mode of the driver,
- LCD screen used for communication between the device and the user,
- Buttons steering the driver's work.

7.2. Description of buttons

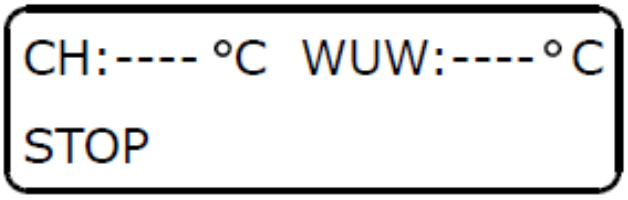
Button		Function
	1	Changes the burner's working mode – **"STOP", "IGNITION", "AUTOMATIC WORK".**
	2	Return to the previous menu
	1	Entry on the Menu's parameters
	2	Saves the change of a parameter
	1	In the **Ignition MODE** activates the feeder for the time specified on the parameter "Filling Feeder Time"
	2	Go to the previous menu or parameter Decreases the value of a parameter
	1	In the **Ignition MODE** activates the ignition procedure
	2	Go to the menu or parameter Increases the value of a parameter του καυστήρα.

8. Operation functions

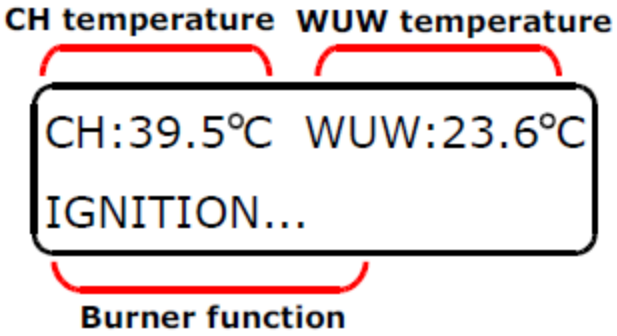
After switching the burner on, it is appeared on the LCD screen the program's logo defining the type of the driver and the version of the current software.



While activating, the burner carries out a test of the connected sensors. In case of one lacking, on the screen appears an appropriate message (---). The work of the burner without a heating water temperature sensor (CH) is blocked and an emergency mode is activated (CH pump is still on).



Correct connection of sensors causes displaying of actual CH furnace's temperature and the temperature of useful warm water of the WUW buffer (if the function is active). On the screen appears which function is currently used by the driver.



The burner may work in three working modes ("STOP", "IGNITION", "AUTOMATIC WORK"). The mode changes when the "**MODE/⊃**" button is pressed. Activating the "STOP" mode is possible in all modes after pressing the "MODE/⊃" button for 3 seconds. When Stop is activated, the burner goes at "Burning off" process (if there is fire) and the at "Cleaning" process.

When the burner is activated for first time, it is on "STOP" mode. Every next time, its status is saved in the regulator's non-volatile memory. Activating the driver again, automatically causes switching on of the lately used working mode.

In the table beneath a short description of particular functions of the burner, activated depending on the working mode of the driver, is shown.

FUNCTION'S NAME	DESCRIPTION OF FUNCTIONS
STOP	Burner stopped.
FEEDER FILLING	Filling the feeder. Filling stops automatically after about 10 minutes.
IGNITION	The burner is on Ignition process, which mean that has fed with ignition dose of pellet, the heating element (igniter) and the air fan are working. The mode would be automatically changed after detecting a flame by the sensor.
CLEANING	The cleaning of the burner is activated. The cleaning function also works as a blow down before ignition.
WORK	Heating the boiler up to the set temperature. Showing the actual power of the burner.
MAINTAIN	Sustaining the set temperature (if the burner's working mode is in the mode of continuous work)
BURNING OFF	Putting off the burner. Active in the "STOP" mode or in the temporal working mode of the burner.
STANDBY	Standby of the burner for the decline of the temperature of a hysteresis (if the burner's working mode is in the temporal mode).

9. Parameters

To move round the menu and to set particular parameters there are four buttons placed on the driver's panel: **"MODE/↩"**, **"MENU/OK"**, **"+"**, **"-"**. The parameters chosen by the user are divided into four groups: (A) **"CH FURNACE SETTINGS"**, (B) **"BURNER SETTINGS"**, (C) **"DEVICE SETTINGS"**. The division of particular parameters in groups is shown in the **"Settings table".**

CH FURNACE SETTINGS (A)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	HEATING WATER TEMPERATURE	ºC	35 - 85	65*
2	CH PUMP ACTIVATION TEMPERATURE	ºC	20 - 60	35*
3	CH FURNACE HYSTERESIS	ºC	1 - 20	5*
4	THERMOSTAT 2 TEMPERATURE	ºC	10 – 90	Off*
5	FURNACE MODE	---	Winter/Summer	Winter*

BURNER SETTINGS (B)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	BURNER POWER (WORK)	kW	10 – 250	30*
2	BURNER POWER (MAINTAIN)	kW	10 – 19	10*
3	BURNER MODE*	---	Continuous/ Single/Analogue	Continuous*
4	MAXIMUM MAINTAIN TIME**	hours	Off – 8	2
5	SELF CLEANING FREQUENCY TIME	min	10-480	240
6	SELF CLEANING TIME**	sec	Off-60	Off
7	BURNER FLAME MEASUREMENT	%	0-100	-------

*** Burner has 3 modes: continuous mode, single mode and analogue mode.**

Single mode: The burner reaches the desired "HEATING WATER TEMPERATURE" and burns off. Then, it starts its operation again when the temperature of the boiler goes down to the temperature "HEATING WATER TEMPERATURE - CH FURNACE HYSTERESIS". The CH FURNACE HYSTERESIS must be more than 10°C.

Continuous mode: The burner reaches the desired "HEATING WATER TEMPERATURE" and goes down at 3kW (maintain). When the boiler's temperature goes down to the temperature "HEATING WATER TEMPERATURE - CH FURNACE HYSTERESIS", the burner increases its power from 3kW (maintain) to the maximum burner power (i.e30kW). The CH FURNACE HYSTERESIS must be no more than 5°C.

Analogue mode: The burner reduces its power 1/3 (for example: from 30kW to 21kW) 10°C before the furnace reaches the "HEATING WATER TEMPERATURE". When the temperature of the furnace is 5°C before "HEATING WATER TEMPERATURE", the burner reduces its power again 1/3 (for example: from 21kW to 12kW).

**** "MAXIMUM MAINTAIN TIME" parameter is activated only when the external thermostat is "Yes". It is suggested only in special industrial applications.**

***** When the parameter "SELF CLEANING TIME" is "Off", the self cleaning system does not work.**

DEVICE SETTINGS (C)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	LANGUAGE SETTINGS	---	Polish/ English/ German/Greek/ Serbian/...	English*
2	FACTORY SETTINGS	---	Yes/No	---
3	ENABLE SERVICE MODE	---	000 - 999	112

10. Room thermostat

The room thermostat (or a timer) can be connected on the connector which is at the back of the controller, by replacing the "bridge (or on the PINs 1&2 in the controller).

It is forbidden to give voltage to this connection. The connection with the room thermostat must be only a "Cold junction". When a room thermostat is connected in the controller, we have the two following options:

If external control No (Manufacturer's settings)**:**

1. When thermostat is ON, the burner works at the maximum power is set.
2. When thermostat is OFF, the burner burns off.

This is mostly suggested for low consumption houses (less than 3.000kg/year) or for connecting with timer.

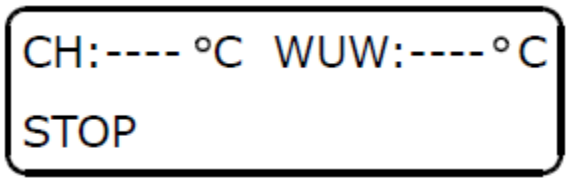
If external control Yes (Manufacturer's settings)**:**

1. When thermostat is ON, the burner works at the maximum power is set.
2. When thermostat is OFF, the burner goes at maintain mode and keeps a small fire.

11. Start of the burner

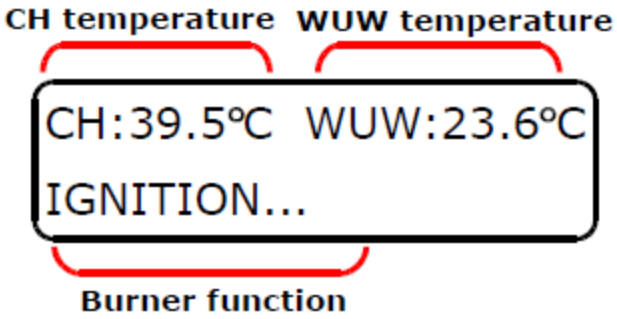
1. Activate the burner by connecting it with a power supply (230Volt, 50Hz) and pressing the ON/OFF button.

2. It is written on the LCD screen the following



3. By pressing the button "**MODE**/ ↻" once changes the operation from "**Stop**" to "**ignition**". By pressing the button "**MODE**/ ↻" changes the operation from "**Ignition**" to "**Automatic**".

4. In "Automatic mode", starts the operation of the burner.



5. When the photo sensors detects fire, then the burner starts its "Work" by increasing its power gradually to the power it has been set (i.e 30kW)
6. When the boiler's water temperature reaches the desired temperature "HEATING WATER TEMPERATURE ", the the power of the burner goes down ta 3kW (**Maintain mode**)
7. The burner works at "Maintain mode" till the boiler's water temperature goes down to the temperature:

"HEATING WATER TEMPERATURE - CH FURNACE HYSTERESIS"

12. Stop of the burner

1. The burner can be either at "**Work**" or "**Maintain**" or "**standby**"
2. Press the button "**MODE/**⮌"continuously till "**STOP MODE**" appears on the screen.
3. It is written "*Burning off*" till the photo sensor stops to detect fire (3-5 min)
4. When the photo sensor stops to detect fire, "cleaning procedure takes place for few seconds.

13. Cleaning burner's chamber

1. The burner can be either at "**Work**" or "**Maintain**" or "**standby**"
2. Press the button "**MODE/**⮌" continuously till "**STOP MODE**" appears on the screen.
3. It is written "**Burning off**" till the photo sensor stops to detect fire (3-5 min)
4. When the photo sensor stops to detect fire, "cleaning procedure takes place for few seconds.
5. When "**Stop**" appears on the LCD screen, waiting few minutes till the burner cools down.
6. Open the boilers door, clean the burners tube and close back the door.
7. By pressing the button "**MODE/**⮌ " once changes the operation from "**Stop**" to "**ignition**".

By pressing the button "**MODE/** ⮌ " changes the operation from "**Ignition**" to "**Automatic**".

14. Restart the burner after an error

1. Turn off the burner by using the electric switch ON/OFF.
2. Open the boiler's door and check the burner tube.
3. Remove any ashes and impurities from burner fire chamber.
4. Close the door and switch on the controller by using the electric switch the burner is connected
5. By pressing the button "MODE/ ⊃ " once changes the operation from "Stop" to "ignition".
   By pressing the button "MODE/ ⊃ " changes the operation from "Ignition" to "Automatic"

15. Feeder filling procedure

1. Remove the plastic tube connection the burner with the feeder
2. Reset the controller by pressing the ON/OFF button.
3. "Stop" appears on the LCD scree
4. By pressing the button "MODE/⊃ " once changes the operation from "**Stop**" to "**ignition**".
5. **"CHOICE FUNCTION-/+"** appears on the LCD screen
6. Press the button  to start the feeder
7. Feeders operation lasts 11min (Manufacturer's setting / Feeder's filling time"
8. When the wood-pellet starts to come out of the feeder, switch off the controller.
9. Connect the feeder with the burner, by using the plastic pipe.

16. Self cleaning system

Self cleaning can be activated only when the burner is equipped with an electrovalve and it is connected with an air-compressor (not provided with the burner). Minimum requirements for air-compressor: 50 lit at 7bar, or 25 lit at 8 bar.

SELF CLEANING FREQUENCY TIME: It is the maximum time the burner can work without interrupted by Self Cleaning procedure.

SELF CLEANING TIME: It is the time the electro-valve is activated to remove the ashes form the burner.

Activation of self cleaning: It is activated by changing the parameter "SELF CLEANING TIME" from "Off" to "xsec" (for example 3sec).

17. Burner safety systems

For total, fail-safe security, the burner is equipped with four safety systems:

1. The plastic pipe connecting the feeder with the burner. This tube will melt away from the burner in event of a too high temperature, thereby breaking contact between pellets fuel replenishment and the burner.

2. The burner's fall-tube is equipped with a back-burn protection system which is triggered at 65°C. The back-fire protection system is placed on the fall-tube. In the event of the alarm being triggered always investigate the cause and rectify.

3. The Overheating Boiler sensor (STB sensor), which is activated when the boiler's temperature is higher than 95°C. When this protection is activated, the light next to the STB sensor is ON and the feeder is turned off. The, you must reset the STB sensor, the feeder to work again.

4. The photo sensor senses that ignition has taken place and is running normally.

18. Errors

Indication	Description	Solution /
CH:!!!! **WUW:!!!!!!** **STOP**	Malfunction of the water temperature sensors	1. The driver starts up relevant emergency procedures for every sensor in order to prevent the boiler from working beyond the safe range for the installation of the central heating 2. When the boiler cools down, then restart the controller and set the burner on automatic mode.
"Furnace protect"	The temperature in the boiler is higher than 92°C. If the temperature is above 95°C, the STB sensor is activated and the feeder is turned off automatically (the light next to the STB sensor is ON). At any case the pumps are activated to avoid higher temperatures	1. Wait till the boilers water temperature goes down to 60°C 2. Reset the STB sensor, so the light next to it to be OFF. 3. Restart the controller and set the burner at automatic mode.
"Burner alarm"	The temperatures on burner's feeder pipe is higher than 70°C. (Back fire protection) This is happened either the chimney's draught is no the appropriate or the burner hasn't been cleaned.	If the temperature goes down to 60 °C and the photo sensor scans light, then the burner's operation continuous normally. If the temperature goes down to 60 °C and the photo sensor doesn't scan any light, then the signal "Burner alarm" is still on the LCD and you must restart the controller.
"NO pellet"	No pellet on the silo	1. Fill up the silo with pellet 2. Fill the feeder with pellet (Filling feeder procedure) 3. Set the burner at automatic mode
	The feeder doesn't work	If the light next to STB sensor is ON, it means that overheat of the boiler has occurred and STB has turned the feeder OFF. 1. Reset the STB sensor, so the light next to it to be OFF. 2. Restart the controller and set the burner at automatic mode.
		Check the cable from feeder to the controller
	3. Problem during ignition procedure	Burner's tube hasn't been cleaned properly 1. Clean the burner 2. Restart the controller and set the burner at automatic mode.
		Igniter doesn't work 1. Change the igniter inside the burner.

THERMOSTAHL ROMANIA

HEATING SYSTEMS S.R.L.

DRUMUL OSIEI 57-59, sector 6

Bucharest 062395, Romania

www.thermostahl.ro