Date: 30/07/2015

TECHNICAL MANUAL MB250 HYDRO LCD STD5_01

Revision Date	Description
30/07/2015	• Modified "Block Auger" function
30/06/2015	• Added parameter T69 • Added parameter A61 • Added parameter P86 • Modified parameter T07 range: minimum value from 15 to 5 • Modified functioning of Room Thermostat for plumbing plants with buffer • Modified "Internal Chrono" management • Added function "Fast Extinguishing"

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1 Introduction

The Controller MB250 is an instrument to control Stoves and Boilers with automatic ignition and pellet load.
Thanks to exhaust temperature acquisition and parameters settings the system's functioning is defined.
It is possible to set Parameters' configuration inside the menu.
Modifying parameters settings it is possible to:

- adapt the operation of the system
- adapt the operation of the controller

This manual indicates the installation's steps, setup, functioning and technical characteristics

2 Installation

2.1 Connections

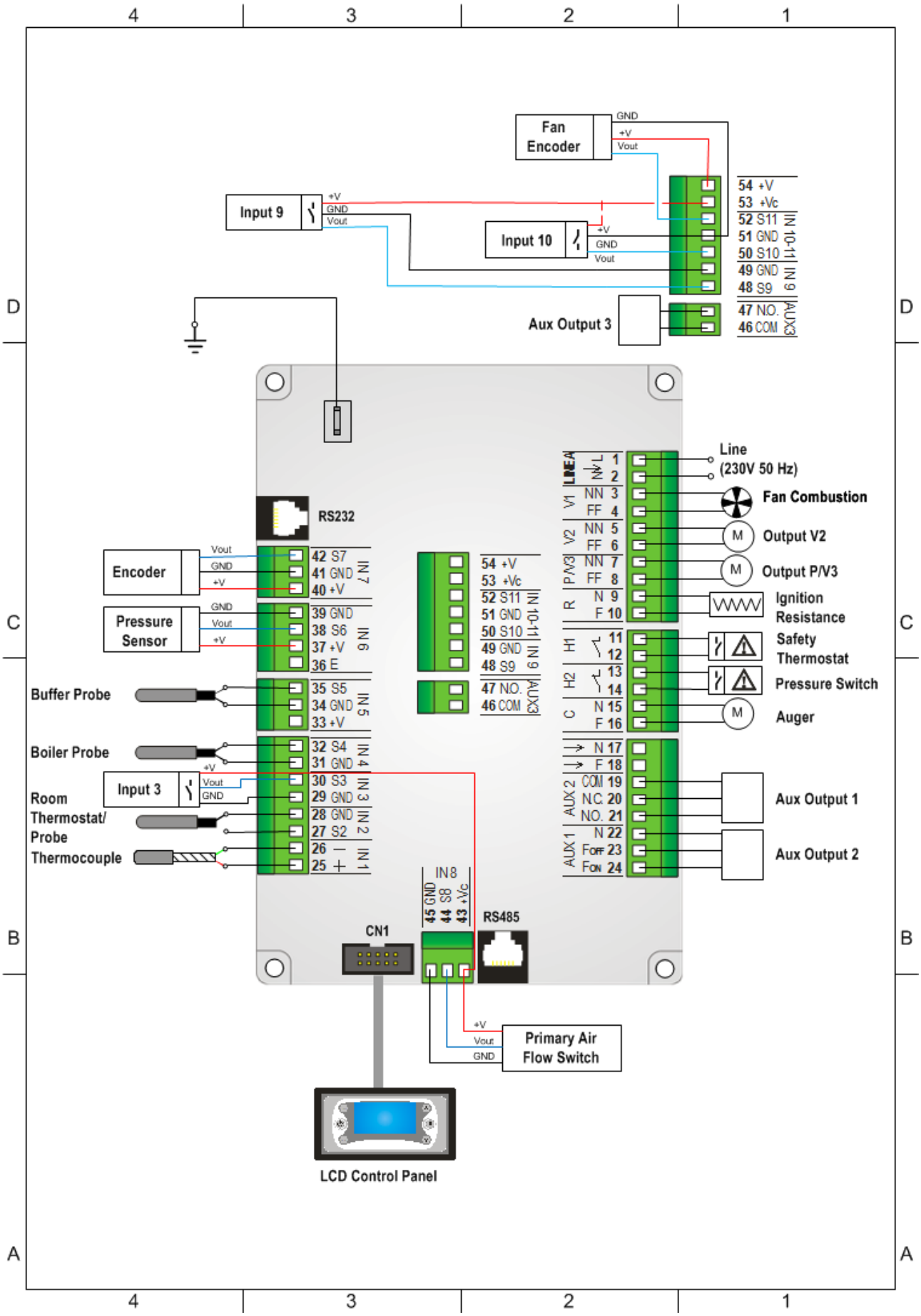
In the below picture is showed the connections of the main board and its outputs and inputs.
Follow the indications of the connection modalities for a correct installation.

ADVICES:

⚠ **For a correct and secure functioning connect always heart connection.**

⚠ **For a correct operation follow carefully the modalities of connection indicated to avoid damage to electronics.**

⚠ **Make connection in a tidy way; keep separated cables of low voltage (probes, contacts, control panel flat) and cables of high voltage (power source, loads) to reduce interference problems.**


Fan Encoder
GND
+V
Vout
Input 9
Input 10
54 +V
53 +Vc
52 S11
51 GND
50 S10
49 GND
48 S9
IN 10-11
IN 9
47 N.O.
46 COM
AUX3
Aux Output 3
Line (230V 50 Hz)
Fan Combustion
Output V2
Output P/V3
Ignition Resistance
Safety Thermostat
Pressure Switch
Auger
Aux Output 1
Aux Output 2
RS232
Encoder
Pressure Sensor
Buffer Probe
Boiler Probe
Input 3
Room Thermostat/ Probe
Thermocouple
IN 7
IN 6
IN 5
IN 4
IN 3
IN 2
IN 1
IN 8
CN1
RS485
Primary Air Flow Switch
LCD Control Panel

Pin	Function	Technical Data
1-2	**Line**	Version 230Vac ± 10% 50/60 Hz T Fuse 5 A Version 110Vac ± 10% 50/60 Hz T Fuse 5 A
3-4	**Combustion Fan**	Triac, feed line (Max 0.8 A)
5-6	**Configurable V2 Output** (configuration parameter: **P44**)	Triac, feed line (Max 0.8 A)
7-8	**Configurable P/V3 Output** (configuration parameter: **P50**)	Triac, feed line (Max 0.8 A)
9-10	**Ignition** Resistance	Relay, feed line (Max 2 A)
11-12	**High Voltage 1 Input** (Safety Thermostat): short-circuit if not used	High Voltage Input, open/close contact
13-14	**High Voltage 2 Input** (Pressure Switch): short-circuit if not used	High Voltage Input, open/close contact
15-16	**Auger**	Triac, feed line (Max 0.8 A)
17	-	Neutral
18	-	Phase
19-20-21	**Configurable Aux2 Output** (configuration parameter: **P48**)	Relay, free contact (Max 2 A) 19: COM 20: N.C. 21: N.O.
22-23-24	**Configurable Aux1 Output** (configuration parameter: **P51**)	Relay, feed line (Max 2 A) 22: N 23: F_{OFF} 24: F_{ON}
25-26	**Exhaust Probe**	Thermocouple K 25: Red (+) 26: Green (-)
27-28	**Room Probe or Thermostat**	Analogue Input
29-30-43	**Configurable Input 3** (configuration parameter: **P75**	29: GND 30: signal 43: +12V
31-32	**Boiler Probe**	NTC 100K Analogue Input
34-35	**Buffer Probe**	NTC 100K Analogue Input
36	Not used	-
37-38-39	**Pressure Sensor**	37: +5V 38: Signal 39: GND
40-41-42	**Encoder** (configuration parameter: **A57**)	40: +5V 41: GND 42: Signal
43-44-45	**Primary Air Flow Sensor**	43: +12V 44: Signal 45: GND
46-47	**Configurable Aux3 Output** (configuration parameter: **P36**)	Relay, free contact (Max 2 A) 46: N.O. 47: COM
48-49-53	**Configurable Input 9** (configuration parameter: **P70**)	48: Signal 49: GND 53: +12V
50-51-53	**Configurable Input 10** (configuration parameter: **P73**)	50: Signal 51: GND 53: +12V
51-52-54	**Combustion Fan Encoder** (configuration parameter: **P25**)	51: GND 52: Signal 54: +5V
CN1	Connection to local keyboard	-
RS232	Serial connection	RS232 Serial Port
RS485	Serial connection	RS485 Serial Port
⏚	Connect to the Earth **CONNECT ALWAYS**	-

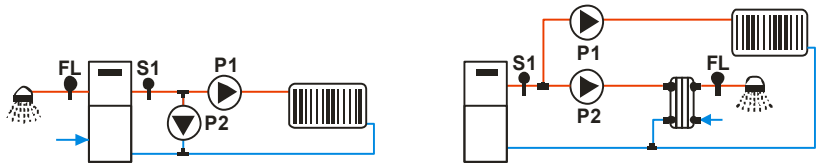
2.2 START UP

First of all set the parameter **A57** to configure the hardware used (set it to 0-1 for the board without the module and 2 for the one with it). To program the control board, first of all select the plumbing plant by **P26** parameter (present in the Default Settings sub-menu of the System Menu) and then, proceed with the configuration of the various inputs and *configurable outputs* via parameters **P36, P44, P48, P50, P51, P70, P73, P75** always present in the menu "Default Settings"

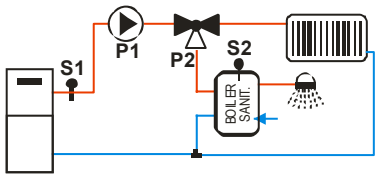
Choosing plants (for further details see sec. 6.14):

Configuration 0 (**P26**=0)

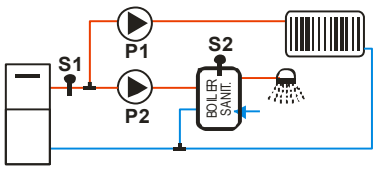
Configuration 1 (**P26**=1)



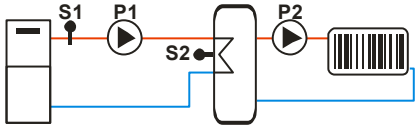
Configuration 2 (**P26**=2)



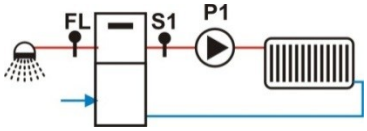
Configuration 3 (**P26**=3)



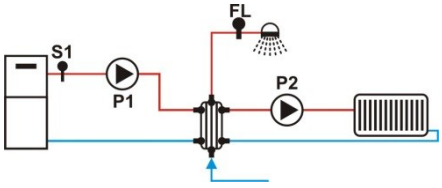
Configuration 4 (**P26**=4)



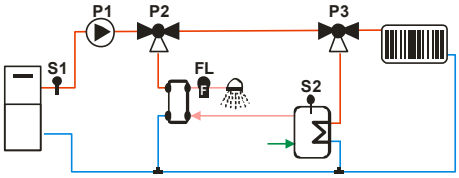
Configuration 5 (**P26**=5)



Configuration 6 (**P26**=6)



Configuration 7 (**P26**=7)

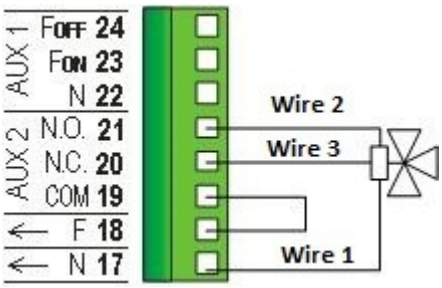


Configurable Outputs (for further details see sec. 6.13):

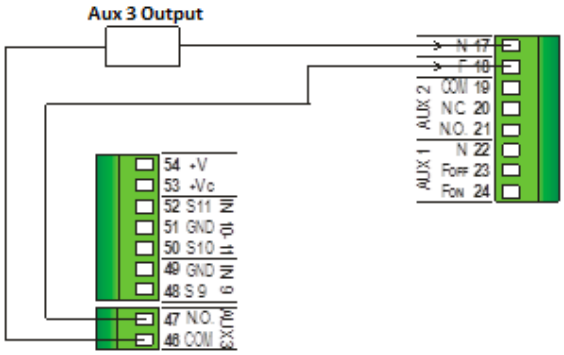
Device	*Parameter Value*	*Outputs*				
		*V2 (**P44**)*	*P/V3 (**P50**)*	*Aux 1 (**P51**)*	*Aux 2 (**P48**)*	*Aux 3 (**P36**)*
Output disabled	0	√	√	√	√	√
Safety Valve / Auger2 (see sec. 6.13.1)	1	√	√	√	√	√
Pellet Load Engine (see sec. 6.13.2)	2	√	√	√	√	√
Output under Thermostat (see sec. 6.13.3)	3	√	√	√	√	√
Cleaning Engine (see sec. 6.13.4)	4	√	√	√	√	√
Combustion Fan 2 (see sec. 6.13.5)	5	√	√	–	–	–
Heating Fan (see sec. 6.13.6)	6	√	√	–	–	–
Air Valve (see sec. 6.13.7)	7	√	√	√	√	√
Function not available	8-9-10	–	–	–	–	–

Error Signaller (see sec. 6.13.8)	11	√	√	√	√	√
Winter-Summer Valve (see sec. 6.13.9)	12	√	√	√	√	√
Cleaning Engine 2 (see sec. 6.13.10)	13	√	√	√	√	√
P1 Pump (see sec. 6.13)	14	√	√	√	√	√
P2 Pump or Valve (see sec. 6.13)	15	√	√	√	√	√
Function not available	16-17-18-19-20-21-22-23-24	–	–	–	–	–
Cleaning Engine Brazier (see sec.6.13.13)	25	√	√	√	√	√
Block Auger (see sec.6.13.14)	26	–	–	–	√	√
Output under thermostat 2	27	√	√	√	√	√

The Aux2 Output is a free contacts output; if it isn't used to control an external system (e.g. a boiler)or like a block auger, it is necessary to supply it. In this case there is voltage between pins 19-21 if the output is off, otherwise there is voltage between pins 19-20.
Even the Aux3 Output is a free contacts output; if it isn't used to control an external system (e.g. a boiler)or like a block auger, it is necessary to supply it.



Aux2 Output



Aux3 Output

Configurable Inputs (for further details see sec. 6.13):

Dispositivi collegabili	*Parameter Value*	*Contacts Type*	*Input*		
			In 3 (P75)	*In 9 (P70)*	*In 10 (P73)*
Output Disabled	0	-	√	√	√
Chrono (see sec. 2.3.9)	1	NC/NO	√	√	√
Pellet Thermostat (see sec. 2.3.8)	2	NC	√	√	√
Limit Engine Cleaning Brazier (see sec. 2.3.7)	3	NC	√	√	√
Sensor Pellet (see sec.2.3.6)	4	NC/NO	√	√	√
Flow Switch (see sec. 2.3.5)	5	NO	√	√	√

NC: Normally closed contacts
NO: Normally open contacts

2.3 Digital Inputs

2.3.1 High Voltage 1 (Safety Thermostat)

When the contact is opened in every functioning state (Manually Rearmed Thermostat), after a delay equal to timer **T09**, the system goes in to Extinguishing and then in Block. Control Panel display visualizes error High Voltage 1 Safety (**Er01**).
If you don't use a rearmed thermostat short-circuit Pins **11-12** of the connector.

2.3.2 High Voltage 2 (Pressure Switch)

When the contact is opened and the system is in a On State, after a delay equal to timer T10, the system goes in to Extinguishing and then in Block. Control Panel display visualizes error High Voltage 2 Safety (**Er02**). **The state of this input is not detected if the Combustion Fan is off**.

If you don't use a rearmed thermostat short-circuit Pins **13-14** of the connector.

2.3.3 Encoder Auger

To the connections **40-41-42** you can connect an input for the read of the encoder signal in order to adjust rounds number of Auger. The input is enabled if the parameter **P81** = 1 or 2.
Connect as showed in the table.

2.3.4 Fan Encoder Combustion

To the connections **51-52-54** you can connect an input for the read of the encoder signal in order to adjust rounds number of the fan encoder combustion. The input is enabled if the parameter **P25** = 1 or 2.
Connect as showed in the table.

2.3.5 Flow Switch

Enable in one of the *configurable inputs* if you have configured a Hydraulic System that provides the functioning Flow switch (P26 = 0, 1, 5, 6, 7).
Connect in this way: **Input 3** pins 29-30, **Input 9** pins 48-49, **Input 10** pins 50-53.
If selected and not used, leave open the Pins of the connector.

2.3.6 Pellet Level Input

If you have a sensor of Pellet Level, enable it in one of the *configurable inputs.*
Setting the parameters **P36**, **P44**, **P48**, **P50** and **P51** in the Technical Menu, there are the following features:

- **P44**, **P36**, **P48**, **P50** and **P51** different from two
  If the level falls below the threshold, the system signals the lack of fuel for a time equal to the **T24**, then it goes in Extinguishing with error (**Er18**). If the tank is filled the system stops every signalling and it is possible to restart it.
- **P44**, **P36**, **P48**, **P50** or **P51** are two
  If the level falls below the predetermined threshold, the output that controls the Load Pellet Engine is switched on (see sec. 6.13.2).

If the sensor is of the type *Free contacts*, connect as follows: **Input 3** pins 29-30, **Input 9** pin 48-49, **Input 10** pins 50-53.
If the sensor is of the type with an output in DC Voltage,connect as follows: : **Input 3** pins 29-30-43, **Input 9** pin 48-49-53, **Input 10** pins 50-51-53 (see the electrical diagram and the table of connections to see the Pins of: GND, signal and power supply 12V).

WARNING: If you connect a Pellet Level Sensor with output in DC Voltage, and the value of output signal is over 5V, connect it in **input 10** only. This input support voltages up to 12V. Sensors with output up to 5V can be connected to any input. The temperature controller only supports Level Sensors pellets **PNP.**

If selected and not in use, leave the pins free of the connector indicated for the type free contact if **P09 =** 1, or short circuit it if **P09** = 0.

2.3.7 Input Limit Engine Brazier

Enable in one of the *configurable inputs* if you have configured a *configurable output* like a Cleaning Engine Brazier.
Connect as follows: **Input 3** pins 29-30, **Input 9** pins 48-49, **Inputs 10** pins 50-53.
If not used, disable the input with the corresponding configuration parameter.

2.3.8 Pellet Thermostat Input

If you have a Thermostat pellet you can enable it by one of the *configurable inputs.* The opening of the thermostat contact Pellet, in any state of operation, does perform the following operation:

- Enable the operation of the auger and fan Combustion (if it was off) for the time **T34**
- Turn on all the time until the closing of the contact Auger 2, if selected (**P36**=1, **P44**=1, **P48**=1, **P50**=1, **P51**=1).
- Send the system in the state of **Shutdown.**
- On the display appears the error **Er06**.

Connect in this way: **Input 3** pins 29-30, **Input 9** pins 48-49, **Input 10** pins 50-53.
If selected and not in use, short-circuit the pins of the connectors.

2.3.9 Chrono Input

If you have a chronothermostat you can enable it by one of the *configurable inputs.*
Setting **A07** by System Menu, you have the following features:

- If **A07 = 0**
  Open Contact: The system goes into the state of shutdown
  Closed Contact: The system goes into the state of Checkup
  Button ON/OFF on Control Panel has priority on this input
- If **A07** = **1**
  Open Contact: The system goes into the state of Normal
  Closed Contact: The system goes into the state of Modulation
- If **A07** = **2**
  Open Contact: The system goes into the state of Normal
  Closed Contact: The system goes into the state of Standby
- If **A07** = **3**
  Open Contact: The system reactivates the Pump Plant
  Closed Contact: If the temperature of water into the boiler exceeds the value of the thermostat **Th19** the system blocks the pump plant until the attainment of thermostat **Th21**.
- If **A07** = **4**
  Open Contact: The system reactivates the Pump Plant and goes in Normal Mode
  Closed Contact: The system goes into the state of Standby and stops the Pump Plant like in the case n°3

If there is a request of sanitary water and the Pump is also used for sanitary, it isn't blocked from the Chrono input.
If selected and not in use, short-circuit the pins of the connectors if **A07** = **1**, **2, 3, 4** and leave them free in other cases.

2.4 Room Probe or Thermostat

To the connections **27-28** is available a Room Probe or a Room Thermostat.

2.4.1 Room Probe

If a probe is used, set **A19**=1.
It is a 10 K NTC sensor and it can read from 0 to 50°C with a precision of 1 °C. If you don't connect the probe to the system you'll read 0 °C. In case of short-circuit you'll read 50°C.
Setting the parameter Enables **A01** it is possible to:

- if **A01**=**0**
  Room Thermostat not reached: the system goes in Check-up State
  Room Thermostat reached: the system goes in Extinguishing State
  Button ON/OFF on Control Panel has priority on this input
- if **A01**=**1**
  Room Thermostat not reached: the system goes in Run Mode State
  Room Thermostat reached: the system goes in Modulation State
- if **A01**=**2**
  Room Thermostat not reached: the system goes in Run Mode State
  Room Thermostat reached: the system goes in Standby State
- if **A01**=**3**
  Room Thermostat not reached: the system reactivates the Pump
  Room Thermostat reached: if the temperature of the boiler's water exceeds the value of the **Th19** Thermostat the system blocks the Pump of the plant until the temperature reaches the **Th21** Thermostat.
- if **A01** = **4**
  Room Thermostat not reached: the system reactivates the Pump and goes in Run Mode
  Room Thermostat reached: the system goes in Standby and blocks the Pump as in case 3
- if **A01** = **5**
  Room Thermostat not reached: Heating fan running regularly
  Room Thermostat reached: if **A11 = 0** the heating fan will turn off, if **A11 = 1** goes to Power 1

If there is a sanitary water demand and the Pump it's also used for the sanitary, isn't blocked from the Room Probe.
If **A01**=**1**, **2, 3, 4, 5** and the input is not used short circuit the relative pins and leave them free in other cases.

2.4.2 Room Thermostat

If a contact is used, set **A19**=0. Setting the parameter Enables **A01** it is possible to:

- if **A01** = **0**
  contact open: the system goes in Extinguishing State
  contact closed: the system goes in Checkup State
  Button ON/OFF on Control Panel has priority on this input
- if **A01** = **1**
  contact closed: the system goes in Run Mode State
  contact open: the system goes in Modulation State
- if **A01** = **2**
  contact closed: the system goes in Run Mode State
  contact open: the system goes in Standby State
- if **A01** = 3
  contact closed: the system reactivates the Pump
  contact open: if the temperature of the boiler's water exceeds the value of the **Th19** Thermostat the system blocks the Pump of the plant until the temperature reaches the **Th21** Thermostat.
- if **A01** = **4**
  contact closed: the system reactivates the Pump and goes in Run Mode
  contact open: the system goes in Standby and blocks the Pump as in case 3.
- if **A01** = **5**
  contact closed: Heating fan running regularly
  contact open: if **A11 = 0** the heating fan will turn off, if **A11 = 1** goes to Power 1

If there is a sanitary water demand and the Pump it's also used for the sanitary, isn't blocked from the Thermostat.
If **A01**=**1**, **2, 3, 4, 5** and the input is not used short circuit the relative pins and leave them free in other cases.

2.5 Analogue Inputs

2.5.1 Thermocouple (Exhaust Probe)

To the connections **25-26** is available the Exhaust Probe. With this probe it is possible to read the exhaust temperature.
This probe is a Thermocouple K sensor. The sensor can read from 0 to 500°C with a precision of 1 °C. If you don't connect the probe to the system you'll read 900 °C.
NOTE: even if the sensor can read temperatures in the range 0 ÷ 500 °C the entire sensor wiring can work only in the range 0 ÷ 500 °C.
TiEmme elettronica is not responsible of any damage or bad functioning of the probe due to a wrong use of it (i.e. thermic and mechanical stresses to the probe).

2.5.2 Buffer Probe

To the connections **34-35** is available the Buffer Probe.
To use this input as a Probe set the parameter **P26**=2, 3, 4, 7.
This probe is a NTC 10K sensor; it can read from 0 to 110°C with a precision of 1 °C. If you don't connect the probe to the system you'll read 0 °C. In case of short-circuit you'll read 110°C.

2.5.3 Boiler Probe

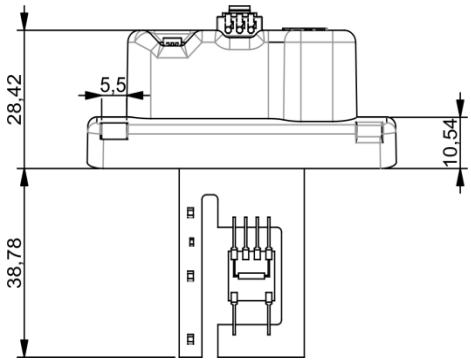
To the connections **31-32** is available the input to read the temperature of Boiler.
This probe is a NTC 10K sensor; it can read from 0 to 110°C with a precision of 1 °C. If you don't connect the probe to the system you'll read 0 °C. In case of short-circuit you'll read 110°C.

2.5.4 Pressure Sensor

To the connections **37-38-39** is available the Pressure Sensor to read the boiler's pressure.
It can read from 0 to 3000 mbar.
If you don't connect the probe to the system you'll read 0 mbar.
To activate the alarms due over/under pressure of the boiler, set the parameter **A14**=1. In this case, set the minimum and maximum pressure levels (**SP01** and **SP08** parameters)

2.5.5 Primary Air Regulator

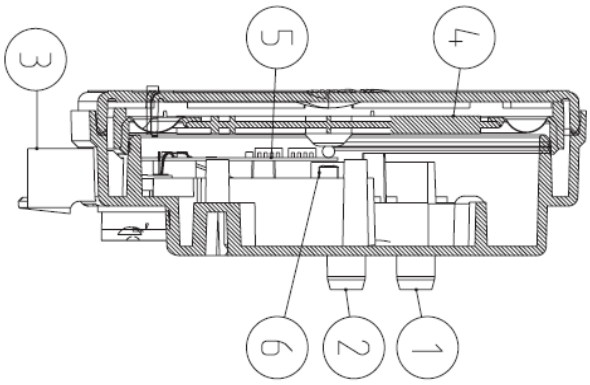
To the connections **43-44-45** is available an Air Primary sensor or a Vacuum sensor; the sensor works on the combustion parameters (Auger and Combustion Fan). The range is 0÷2000.
In the case of disconnected probe the system will read a speed value of 0.
In case of failure adjustment it shows the message **Er17**, in case of broken sensor or not connected properly, will appear the message **Er39**.
If an Air Primary sensor is used:



Connections:
43=+12V (brown wire)
44=SEG (green wire)
45=GND (white wire)

If a Vacuum sensor is used:

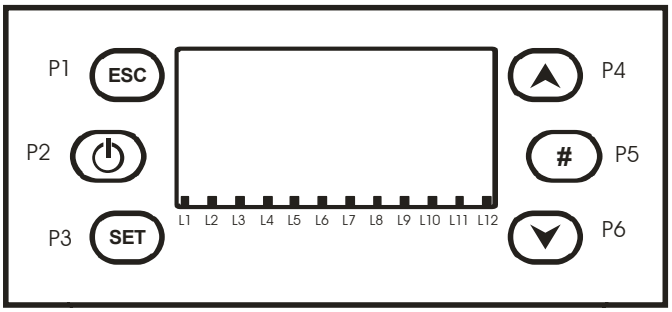
- has to be placed horizontally through the bracket supplied
- the connections for the pressure reading (see Figure 1 and 2) should be directed downward. To read the depression connect to **P2** connector (see Figure 2 especially). Free up the **P1** connector.



Connections:
43=+12V (red wire)
44=SEG (yellow wire)
45=GND (black wire)

Caption:
1 Connection pressure P1 (high pressure)
2 Connection pressure P2 (low pressure)
3. Electrical connections

3 Control Panel



- **Buttons**

Key	*Function*	*Description*
P2	On/Off	Function Ignition, Extinguishing pushing the button for 3 seconds until the acoustic signal
	Unblock	Function unblocked when the system is in Block pushing the button for 3 seconds until the acoustic signal
P4	Modify Values	In modify mode change Menus and Submenus values
P6	Run on Menu and Submenu	In Menu run on Submenu and Menu
	Visualizations	Enter and run in Visualization Menu
P1	Esc	Function Exit managed pushing the button
P3	Menu	Function Enter in Menu or in a Submenu
	Modify	Enter in modify mode into a Menu
	Set	Save data in a Menu
P5	Reset System Maintenance 2 Function	Reset **T67** timer
	Manual Standby	Pressing the button for 3 seconds, the system goes in Standby state

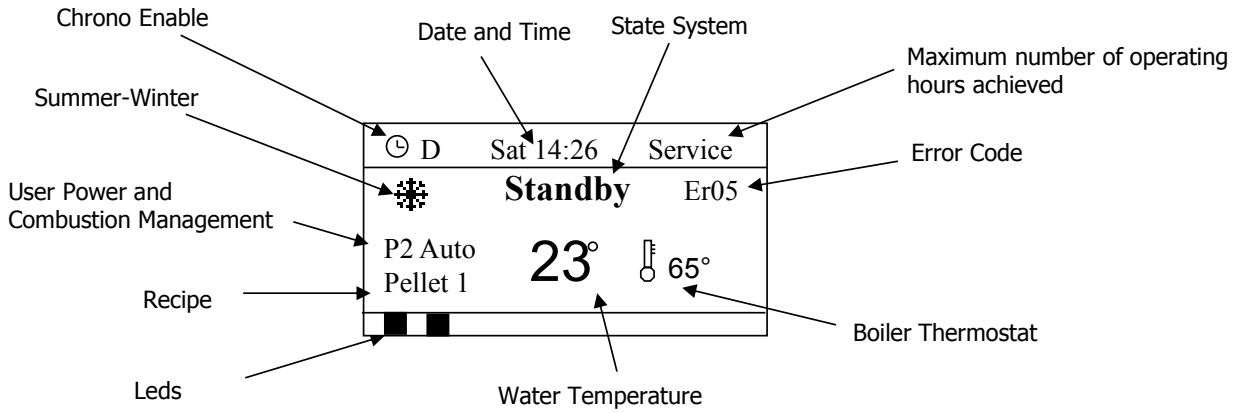
- **Leds**

Function	*Description*	*Led*
Ignition Resistance	Led On: output on	**L1**
Auger	Led On: Auger in the time on interval	**L2**
P/V3 Output	Led On: output on	**L3**
Aux1 Output	Led On: output on	**L4**
V2 Output	Led On: output on	**L5**
Aux2 Output	Led On: output on	**L6**
Aux3 Output	Led On: output on	**L7**
Pellet Level	Led On: lack of pellet	**L10**
External Thermostat	Led On: contact open	**L11**
Flow Switch *	Led On: sanitary water demand	**L12**

* Only for plumbing plants with Flow Switch

- **Display**

-Main Frame:



-Visualizations:

Date and Time, Chrono activation modality (D-Daily, W-Weekly, We-Week-End), system power, recipe,

state system, error code, Boiler Thermostat value, water temperature

-State System:

Check Up, Ignition, Stabilization, Run Mode, Modulation, Standby, Safety, Extinguishing, Recover Ignition, Block, Off

-Errors:

Errors get the system in Block state.

Er01	Error Safety High Voltage 1. Also with the system Off
Er02	Error Safety High Voltage 2. Only if the Combustion Fan is On.
Er03	Extinguishing for exhaust under temperature
Er04	Extinguishing for water over temperature
Er05	Extinguishing for exhaust over temperature
Er06	Extinguishing for intervention of thermostat pellets (Alarm return of Flame)
Er07	Encoder Error. This error can occurs for lack of Encoder signal
Er08	Encoder Error. This error can occurs in case of adjustment problems of rounds number
Er09	Water pressure low
Er10	Water pressure high
Er11	Real time clock error
Er12	Extinguishing for Ignition failed
Er15	Lack of voltage for 50 minutes or more
Er16	Error communications RS485
Er17	Air Flow Regulator error
Er18	Run out of pellet
Er25	Error Cleaning Engine Brazier
Er39	Air Flow Regulator sensor broken
Er41	Minimum air flow in Check Up not reached(**FL20**)
Er42	Maximum air flow Up reached (**F40**)
Er47	Error Auger Encoder. The error may occur due to lack signal encoder
Er48	Error Auger Encoder. The error can occur due to problems of adjustment of the number of revolutions
Er52	Error Module I/O I2C

-Other Messages:

Sond	Visualisation of the state of temperature probes. The message displayed in Check-Up indicates that the red temperature on one or more probes is equal to the minimum value (0°C) or maximum (it depend on probe considered). Check that the probes aren't open (0°C) or in short-circuit (maximum value of the temperature scale).
Service	This message notifies that the planned hours of functioning (parameter **T66**) is reached. It is necessary to call for service.
Clean	This message notifies that the planned hours of functioning (parameter **T67**) is reached. It is necessary to clean the stove or boiler.
Block Ignition	The message appears if the system is turned off during Ignition (after Preload) by an external device: the system will stop only when it goes in Run Mode.
Link Error	No communication between LCD panel and control board
Standby Man	It appears if the system is in Standby state for **P5** key pressing

-Visualizations:

Menu to visualize the value of some system's parameters.

L3 On P1 Pump	Led number and output P/V3 condition
L4 Off Safety Valve	Led number and output Aux1 condition
L5 Off Out not used	Led number and output V2 condition
L6 On Load Engine	Led number and output Aux2 condition
L7 Off Out not used	Led number and output Aux3 condition
Exhaust T.: 103	Exhaust temperature [°C]
Water T.: 55	Water temperature [°C]
Buffer T.: 52	Buffer temperature [°C] (visible only if **P26**=2, 3, 4, 7)
Room T.: 21	Room temperature [°C] (visible only if **A19**=1)
Pressure: 1548	Pressure [mbar]
Air Flux: 680	Air Flux [cm/s] (visible only if **A24** different from 5)
Speed Fan: 1000	Speed/Voltage Fan Combustion [rpm/V]

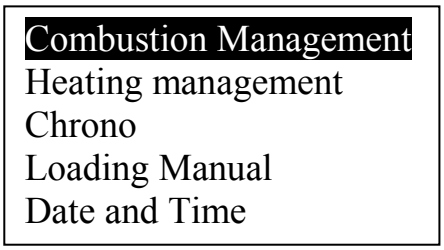
Auger ON: 800	Speed/Voltage Auger ON [rpm/s]
Product Code 512 – 1111	Product Code
FSYSD01000149.0.2	Control Board Firmware Version
PSYSF01000240.0.2	Keyboard Firmware Version

4 The Menu

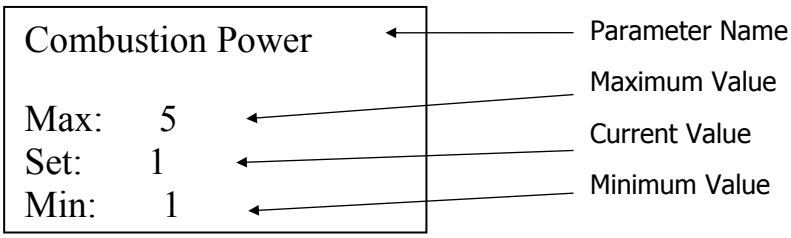
The Menu of the control panel consists of a User Menu and a Technical Menu in which the manufacturer can modify the operating parameters, test the outputs, check the history of the system.

4.1 Menu Browsing

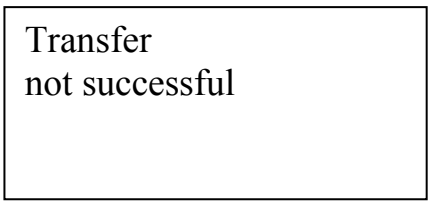
Push **P3** button to enter in the User Menu.



Using **P4** and **P6** buttons it is possible to select the desired Menu or Submenu. Push **P3** button to enter in the desired Menu or Submenu.



To decrease or increase value push the buttons **P4** or **P6**; to save the new value push the button **P3**; to cancel the modifies and restore the old parameter's value push the button **P1**.
If a parameter value is changed, the new value is sent to the control board; if the transmission failures appears the message:



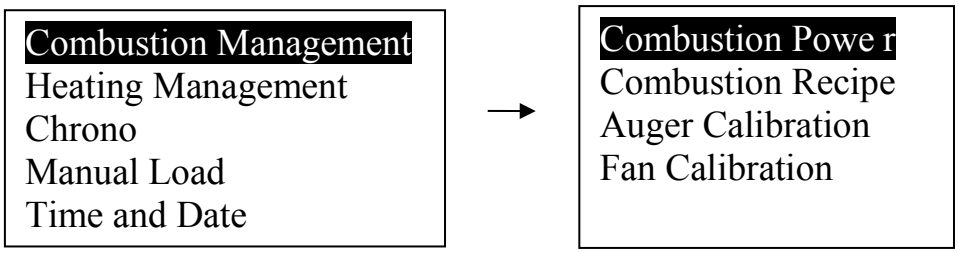
in this case modify again the parameter's value.

4.2 User Menu

MENU		DESCRIPTION
Combustion Management	Combustion Power	Menu to modify the combustion power
	Combustion Recipe	Menu to set the combustion recipe. Visible only if **P04**>1
	Auger Calibration	Menu to modify the Auger's work time
	Fan Calibration	Menu to modify the Combustion Fan speed
Heating Management	Boiler Thermostat	Menu to modify the Boiler Thermostat value
	Buffer Thermostat	Menu to modify the Buffer Thermostat. Visible only if **P26**=2, 3, 4, 7.
	Room Thermostat	Menu to modify the Room Thermostat value (if a probe is used). It appears only if **A19**=1.
	Summer-Winter	Menu to select the Winter or Summer modality
	Heating Power	Menu to modify the heating power. It is visible only if **P44** or **P50**=6
	Remote Keyboard	Menu to enable the Room Thermostat of the Remote Keyboard. It appears only if **A52**>0.
Chrono		Menu to select the Chrono's program modality and the timers of Ignition/Extinguishing of the boiler/stove
Manual Load		Menu to load the Auger manually. Only with the system Off.
Time and Date		Menu to set time and date
Remote Control		Menu to enable remote control SYTX
Language		Menu to change the language of the panel
Keyboard Menu		Menu to set the contrast and the light of LCD panel
System Menu		Menu to enter in the Technical Menu

4.2.1 Combustion Management Menu

Menu to change the combustion parameters. It has some Submenu.



4.2.1.1. Combustion Power

Menu to set the system's combustion in automatic or manual mode. If the manual mode is set, the user can choose the combustion power.

Combustion	*Description*
1–Number of user power	Power manually set from 1 to Number of User Power (parameter **P03**)
Auto	Combustion Power set automatic by the system

4.2.1.2. Combustion Recipe

Menu to select the combustion recipe in Pellet modality. The maximum value is the number of recipes visible to the user (parameter **P04**). If **P04**=1 the Menu isn't visible.

4.2.1.3. Auger Calibration

Menu to change the Auger's work time or speed. The system has 10 calibration's steps (0 value is set by the factory). **The calibration's effect is valid only in Run Mode and Modulation for the current recipe**. For each step the value is increased or decreased of a per cent value **P15** set in the Default Settings Menu.

Example: **P15**=10%, Step=-1

Default Values	**C03**=2,0	**C04**=3,0	**C05**=4,0	**C06**=5,0	**C07**=6,0	**C11**=1,0
Calibrated Values	**C03**=1,8	**C04**=2,7	**C05**=3,6	**C06**=4,5	**C07**=5,4	**C11**=0,9

The calibrated values fall within the range defined by **P27** and **P05** parameters.

4.2.1.4. Combustion Fan Calibration

Menu to change the Combustion Fan speed. The system has 10 calibration's steps (the 0 value is set by the factory). **The calibration's effect is valid only in Run Mode and Modulation for the current recipe**. For each step the value is increased or decreased of a per cent value **P16** set in the Combustion Fan Menu.

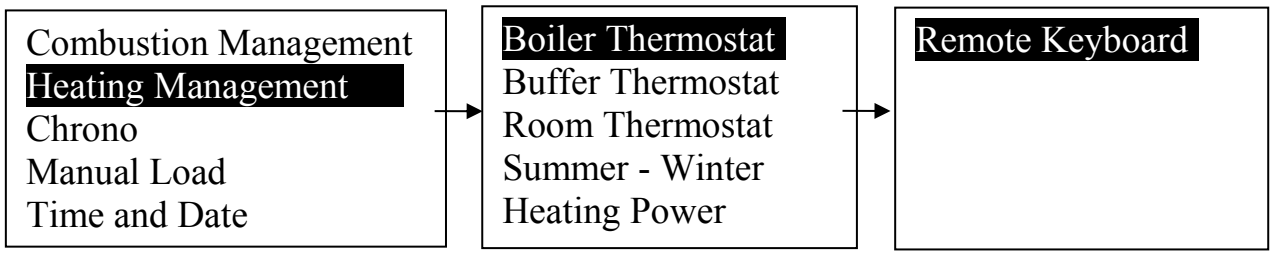
Example: **P16**=5%, Step=+3

Default Values	**U03**=1000	**U04**=1200	**U05**=1400	**U06**=1600	**U07**=1800	**U11**=900
Calibrated Values	**U03**=1150	**U04**=1380	**U05**=1610	**U06**=1840	**U07**=2070	**U11**=1030

The calibrated values fall within the range defined by **P14** and **P30** parameters.

4.2.2 Heating Management Menu

Menu to change the system's heating parameters. It has some Submenu.



4.2.2.1. Boiler Thermostat

Menu which allows to modify the Boiler Thermostat's value. It is possible to program the minimum and the maximum value of the Boiler Thermostat setting the **Th26** and **Th27** Thermostats.

4.2.2.2. Buffer Thermostat

Menu which allows to modify the Buffer Thermostat's value. This Menu is visible only setting a plumbing plant with a Buffer probe (parameter **P26**=2, 3, 4, 7).

4.2.2.3. Room Thermostat

Menu modify the Room Thermostat's value. This Menu appears only if the parameter **A19**=1.

4.2.2.4. Summer - Winter

Menu to modify the plumbing plant functioning according to the season. On display appears one of these symbols: ❄ or ☀ .

4.2.2.5. Heating Power

This Menu allows to manage the system's heating in automatic or manual mode (in this case it is possible to set the heating power). This Menu is visible only if **P44** or **P50**=6.

Heating	*Description*
0	Heating Fan Off
1 – Number of user power	Power manually set from 1 to Number of User Power (parameter **P03**)
Auto	Heating Power set automatic by the system

If the user chooses the automatic mode, the heating is proportional to the exhaust temperature or to the room temperature or equal to the combustion power (according to the parameter **P06** value).

4.2.2.6. Remote Keyboard

Menu which allows to enable the Room Thermostat of the Remote Keyboard. It appears only if **A52**>0.

4.2.3 Chrono Menu

Menu to set the time to turn on/off the system. It has 2 Submenu: **Modality and Programming**

4.2.3.1. MODALITY

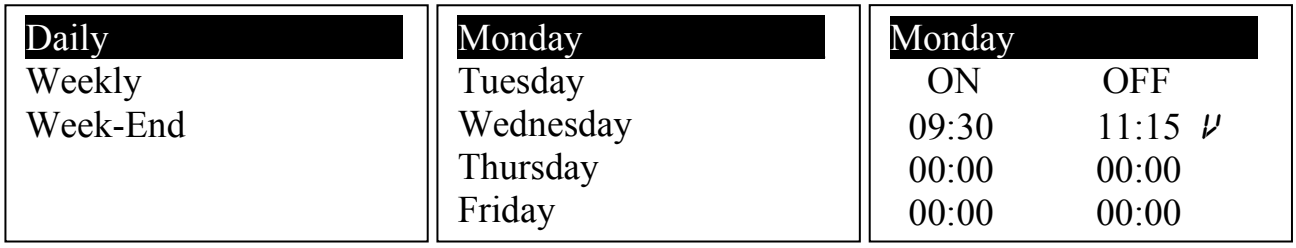
Description	*Buttons*	*Display*
The current modality blinks		Disable Daily Weekly **Week-End**
Enter in modify mode	**P3**	
Select the favourite modality	**P4** and **P6**	
Cancel the modifies and restore the old modality	**P1**	
Save the new setting	**P3**	
Exit from Menu	**P1**	

4.2.3.2. PROGRAMMING

Choice Program	*Buttons*	*Display*
The current modality blinks		**Daily** Weekly Week-End
Enter in the Submenu	**P3**	
Select the favourite program	**P4** and **P6**	
Exit from Menu	**P1**	

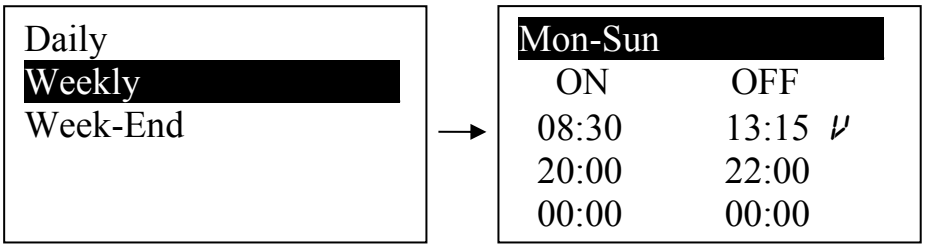
The three types of programming are stored separately: if for example the Daily modality is set, the other modalities aren't changed. **After making the programming it is necessary to select the desired mode from the Modality Menu to turn on/off the system by Chrono**.
Choose the type of programming to set:

- **Daily**: select the day of week and program the times to switch on and off the system; for each day there are 3 time slots.

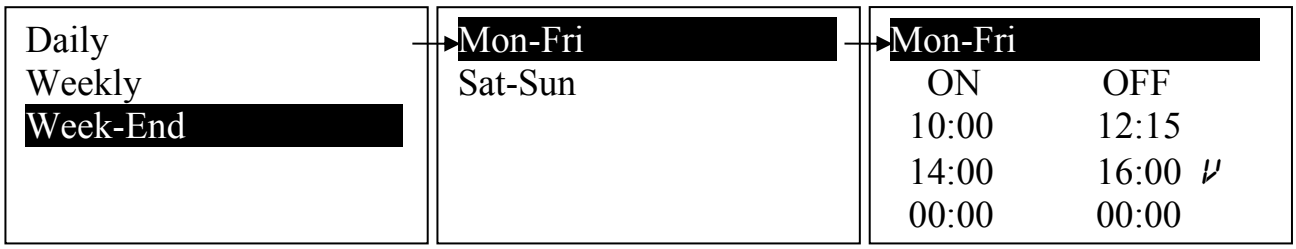


Program across midnight: set the hour of extinguishing of a day at 23:59 and set the hour of ignition for the next day at 00:00

- **Weekly**: program the times to switch on and off the system (there are 3 time slots).



- **Week-End**: choose between 'Monday-Friday' and 'Saturday-Sunday'. There are 3 time slots for each period.



PROGRAM CHRONO	*Buttons*
After choosing the favourite program, select the programming time	**P4** or **P6**
Enter in modify mode (the selected time blinks)	**P3**
Modify the timers	**P4** or **P6**
Save program	**P3**
Enable a program (a "*V*" appears) or disable a program (a "*V*" disappears)	**P5**
Exit	**P1**

4.2.4 Load Menu

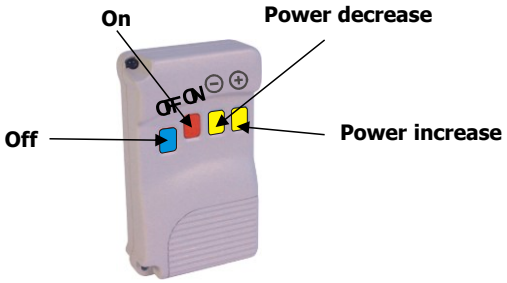
This menu allows load manually the Auger or the brazier. **The system has to be in Off state to do the loading**. When the Auger is manually started the Exhaust Fan switches on in order to close pins **13-14** (HV2) for the power supply of the Auger.

4.2.5 Time and Date Menu

This Menu allows to set time and date. Push the button **P4** and **P6** to select hours, minutes, year, month and day. Push **P3** to enter editing, **P4** and **P6** button to change the value. Push **P3** to save and **P1** to exit.

4.2.6 Remote Control Menu

This Menu allows to enable or disable the Remote Control SYTX. The system can manage a remote controller that can communicate with the thermoregulator until 10 meters. With the remote control it is possible to switch on/off the system and modify the combustion power. The keys *Decrease/Increase Power* doesn't work if the combustion power is automatic. It is possible to change the combustion power from Power 1 to Number of user power (parameter **P03**).



Learning Code

The remote controller's signal is recognized from controller board through a code; it is possible to change the code using the learn procedure. For a correct transmission it is necessary that the remote control and the control board have the same transmission code. Default code is 0, but if it is necessary to change it, follow the procedure:

On the Remote Controller:

Open the battery box, modify the dip-switch's configuration, then close the battery box

On the Control Board

Turn off the power supply (230V)

Turn on the power supply pushing the same time one remote control's button

Wait (approximately 5 seconds) a control board 's acoustic signal that confirms the new code

4.2.7 Language Selection Menu

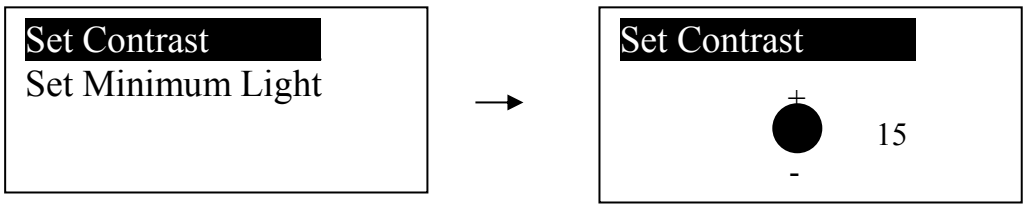
This Menu allows to change the language of LCD panel. The highlighted language is currently set.

4.2.8 Keyboard Menu

MENU	DESCRIPTION
Set Contrast	Menu to set the contrast of LCD panel
Set Minimum Light	Menu to set the light of LCD panel

4.2.8.1. Set Contrast

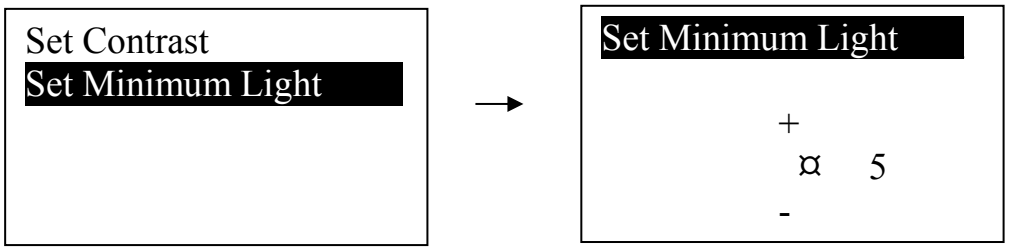
This Menu allows to set the display contrast.



Push the buttons **P4** and **P6** to increase or decrease the contrast; **P3** to save and exit, **P1** to exit without save.

4.2.8.2. Set Minimum Light

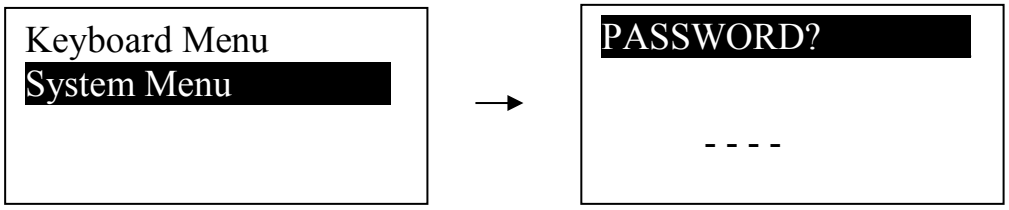
This Menu allows to set the display light when any button is pushed.



Push the buttons **P4** and **P6** to increase or decrease the light (minimum 0, maximum 20); Push **P3** to save and exit, **P1** to exit without save.

4.2.9 System Menu

This menu allows to enter into Technical Menu. The access is protected by password and **the default Password is 0000**.



Push **P3** to enter in editing mode, **P4** and **P6** to increase or decrease the selected digit. Push **P3** to save the digit and pass to the next. Push **P1** to cancel the digit or exit from Menu.
If the password is right, the first menu screen appears.

MENU	DESCRIPTION
Auger	Auger Menu
Exhaust Fan	Exhaust Fan Menu
Exhaust Fan 2	Exhaust Fan 2 Menu
Heating Fan	Heating Fan Menu
Thermostats	Thermostats Menu
Extinguishing Thermostats	Extinguishing Thermostats Menu
Timers	Timers Menu
Default Settings	Default Settings Menu
Enables	Enables Menu
Air Flow Sensor	Air Flow Sensor Menu
Delta	Temperature Delta Menu
Pressure Sensor	Pressure Sensor Menu
Modulating Pump Menu	Pump in Modulating mode Menu
Step Pump Menu	Pump in Step mode Menu
Counters	Counters Menu
Outputs' Test	Outputs' Test Menu
Restore Default Values	Restore Default Values Menu

For more information see section 7.

5 Functioning States

The functioning of the controller is managed with functioning states, each one is characterised by the control of the system's main functioning parameters. The system guarantees the security and alarms in each states. The system's states are: Off, Check Up, Ignition, Stabilization, Recover Ignition, Run Mode, Modulation, Standby, Safety, Extinguishing, Block.

5.1 Off

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
		exhaust temp.>**Th01** Thermostat	→ goes in Extinguishing	**OFF**	**OFF**	**OFF**
		water temp.>Thermostat **Th25**	→ goes in Block			

5.2 Check Up

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
	T01	exhaust temp.>**Th09** Thermostat	→ goes in Run Mode	**Max speed**	**OFF**	**OFF**
Control at the end of **T01** timer: goes in **Ignition**						

5.3 Ignition

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
Preheating	**T02**	exhaust temp.>**Th09** Thermostat	→ goes in Run Mode	**U01**	**OFF**	**ON**
Preload	**T03**	exhaust temp.>**Th09** Thermostat	→ goes in Run Mode		Always **ON**	
	T29				**OFF**	
Fixed	**T04**	exhaust temp.>**Th09** Thermostat During the phase the exhaust temperature minimum value is saved by system	→ goes in Run Mode		**C01**	
Variable	**T05**	exhaust temp.>**Th09** Thermostat	→ goes in Run Mode	I Ignition: U01 II Ignition: U10	I Ignition: C01 II Ignition: C10	**OFF** if exhaust temp.>**Th02** otherwise **ON**
		exhaust temp.>**Th06** Thermostat exhaust temp.>minimum value saved during the phase + **D41**	→ goes in Stabilization			
Control at the end of **T05** timer: if exhaust temp.>**Th06** **and** exhaust temp > minimum value saved during the phase + **D41** the system goes in Stabilization. if exhaust temp.<**Th06** **or** exhaust temp < minimum value saved during the phase + **D41** the system tries again Ignition from Variable Phase In case of finished number of attempts it goes in Extinguishing.						

5.4 Stabilization

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
	T06	exhaust temp.>**Th09** Thermostat	→ goes in Run Mode	**U02**	**C02**	**OFF** if exhaust temp.>**Th02** otherwise **ON**
		exhaust temp.<**Th06** Thermostat	→ tries again Ignition from Variable Phase			

Control at the end of **T06** timer: if exhaust temp.>(**Th06**+**D01**) the system goes in Run Mode, if exhaust temp.<(**Th06**+**D01**) the system tries again Ignition from Variable Phase; in case of finished number of attempts it goes in Extinguishing.

5.5 Recover Ignition

The system goes in Recover Ignition:

- After a Power failure into the range of time **T88** and **T89** if the system was in a On State
- Pushing the button ON/OFF when the system is in Extinguishing and **A10**=0

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
Wait	**T13**	exhaust temp.>**Th01** Thermostat	→ starts **T13**	**P23**	**OFF**	**OFF**
Final Cleaning	**T16**	exhaust temp.<**Th01** Thermostat and **T13** timer finished	→ starts **T16** timer	**Max speed**		
Control at the end of **T16** timer: the system goes in **Check Up**						

5.6 Run Mode

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
	T14	When combustion has reached final power, if: exhaust temp.<**Th03** thermostat **or** exhaust temp.< **Extinguishing Thermostat** for the used power	→ starts **T14** timer of pre-extinguishing	**User Power**	**User Power**	**OFF**
		water temp.>**Boiler Thermostat** **or** exhaust temp.>**Th07** Thermostat **or** **A32**=1 and the system is a time off of internal chrono **or** **A07**=1 and external chrono contact open * **or** room temp.>**Room Thermostat** and **A01**=1 * **or** room temp.>**Remote Room Thermostat** and **A52**=1 *	→ goes in Modulation			
		exhaust temp.>**Th08** thermostat **or** water temp.>**Th25** thermostat	→ goes in **Safety**			
	T22	room temp.>**Room Thermostat** and **A01**=2, 4 ** **or** room temp.>**Remote Room Thermostat** and **A52**=2, 4 ** **or** **A32**=2, 4 and the system is a time off of internal chrono **or** **A07**=2, 4 e and external chrono contact open **or** buffer temp.>**Buffer Thermostat Th58** and **P26**=4 **or** buffer temp.>**Buffer Thermostat Th58** and **P26**=2, 3, 7 and Summer modality	→ goes in **Standby** at the end of **T22** timer			
Control at the end of **T14** timer: the system goes in **Extinguishing** with error **Er03**						
* This condition is true if there isn't a sanitary water demand (if it is selected a plumbing plant with Flow Switch), or if buffer temperature>**Buffer Thermostat Th58** (if **P26**=2, 3, 7) or if it is selected a plumbing plant with buffer ** This condition is true if there isn't a sanitary water demand or if it is selected a plumbing plant with buffer						

5.7 MODULATION

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
	T14	When combustion has reached final power, if: exhaust temp.<**Th03** thermostat **or** exhaust temp.< **Extinguishing Thermostat** for the used power	→ starts **T14** timer of pre-extinguishing	**U11** if **A06**=1 otherwise **U03**	**C11** if **A06**=1 otherwise **C03**	**OFF**
		exhaust temp.>**Th08** thermostat **or** water temp.>**Th25** thermostat	→ goes in Safety			
	T22	room temp.>**Room Thermostat** and **A01**=2, 4 * **or** **A32**=2, 4 and the system is a time off of internal chrono **or** **A07**=2, 4 and external chrono contact open **or** water temp.>(**Boiler Thermostat**+**D23**) and **A13**=1 and **T43**=0 **or** buffer temp.>**Buffer Thermostat Th58** and **P26**=4 **or** room temp.>**Remote Room Thermostat** and **A52**=2, 4 * **or** buffer temp.>**Buffer Thermostat Th58** and **P26**=2, 3, 7 and Summer modality	→ goes in Standby at the end of **T22** timer			
		exhaust temp.<**Th07** Thermostat **and** **A32**=1 and the system is a time on of internal chrono **and** **A07**=1 and external chrono contact closed **or** water temp.<**Boiler Thermostat and** room temp.<**Room Thermostat** and **A01**=1 **and** room temp.<**Remote Room Thermostat** and **A52**=1	→ goes in Run Mode			
Control at the end of **T14** timer: the system goes in **Extinguishing** with error **Er03**						
* This condition is true if there isn't a sanitary water demand or if it is selected a plumbing plant with buffer						

5.8 STANDBY

Setting the **A27** parameter it is to get the brazier in Maintenance or in Extinguishing.

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
• **Extinguishing** (**A27**=**0**)						
Extinguishing	**T57**	Extinguishing of combustion	→ starts **T57** timer	**U12**	**OFF**	**OFF**
Cleaning	**T58**	At the end of timer **T57** if exhaust temp.<**Th28** thermostat	→ starts **T58** timer	**Max speed**		
Wait			→ wait	**OFF**		
When the conditions that led to the system in Standby aren't valid, the **T11** timer starts (if **A26**=1 from Wait phase, if **A26**=0 from any phase). At the end the system goes in Check-Up.						
• **Maintenance** (**A27**=**1**)						
Pause	**T32**	Extinguishing of the combustion for the **T32** time. At the end start the Work phase		**OFF**	**OFF**	**OFF**
Work	**T33**	Combustion on for the **T33** time. At the end start the Pause phase		**U12**	**C12**	

When the conditions that led to the system in Standby aren't valid, the **T11** timer starts. At the end the system goes in Check-Up. In all phases if the flue gas temperature>**Th08** Thermostat or water temperature>**Th25** Thermostat the system is in Safety.
To reduce oscillations between states Standby→Ignition→Run Mode→Standby, adjust Room Thermostat Hysteresis and Boiler Thermostat Hysteresis.

5.9 Safety

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
Safety from Standby	**T15**	exhaust temp.>**Th08** thermostat **or** water temp.>**Th25** thermostat	→ starts **T15** timer	**P23**	**OFF**	**OFF**
		exhaust temp.<**Th08** thermostat **and** water temp.<**Th25** thermostat	→ goes in Standby			
Safety from other States	**T15**	exhaust temp.>**Th08** thermostat **or** water temp.>**Th25** thermostat	→ starts **T15** timer	**U11** if **A06**=1 otherwise **U03**	**C11** if **A06**=1 otherwise **C03**	
		exhaust temp.<**Th08** thermostat **and** water temp.<**Th25** thermostat	→ goes in Modulation			
Control at the end of **T15** timer: the system goes in Extinguishing with error						

5.10 Extinguishing

Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
Wait	**T13**	exhaust temp.>**Th01** thermostat	→ starts **T13** timer	**P23**	**OFF**	**OFF**
Final Cleaning	**T16**	exhaust temp.<**Th01** thermostat and **T13** finished	→ starts **T16** timer	**Max speed**		
Control at the end of **T16** timer: the system goes in Off if there isn't any functioning error, otherwise it goes in Block.						

5.11 Block

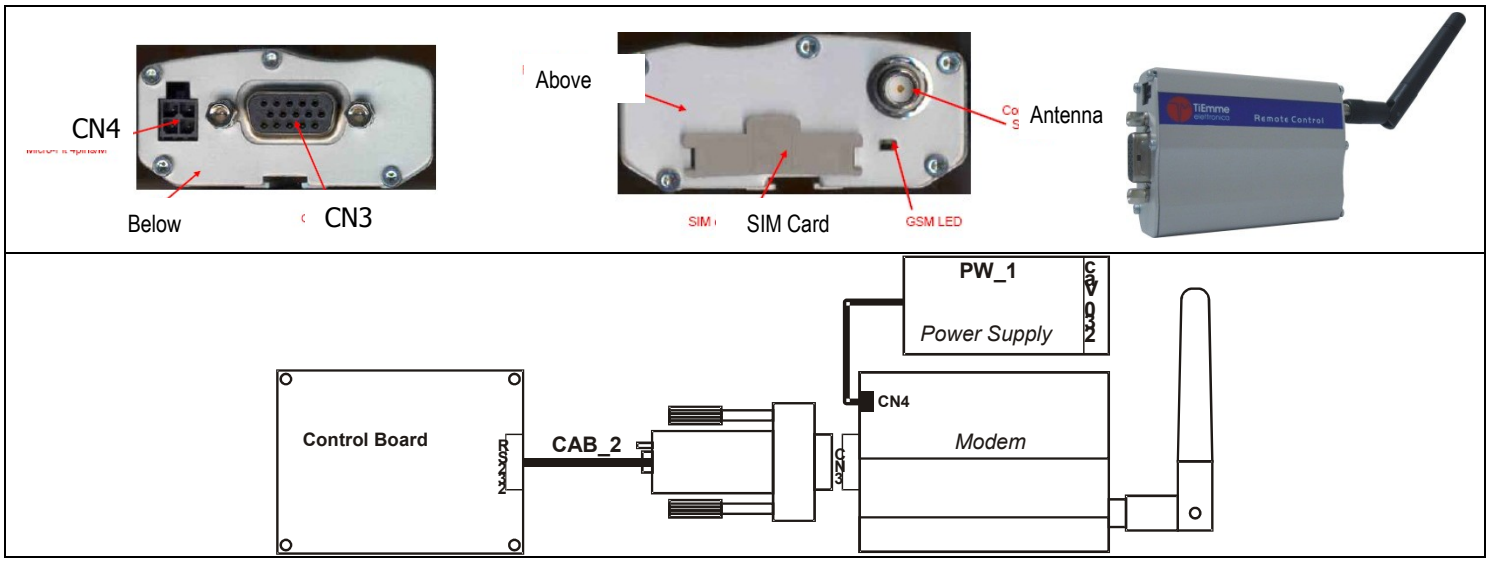
Phase	Timer	Control Thermostats		Combustion		Heating Resistance
				Fan	Auger	
		exhaust temp.>**Th01** thermostat		**U11** if **A06**=1 otherwise **U03**	**OFF**	**OFF**
		exhaust temp.<**Th01** thermostat		**OFF**		

6 Other Functions

6.1 Basic Modem Module

The system manages a modem module (given on demand) for the dialogue with the stove through SMS to operate the Ignition, Extinguishing, State's request and have information about the Block/Alarms conditions. The Modem is connected to the Control Board's port RS232 with cables and connectors given; it is supplied with a AC/DC Power Supply unit.

- Use a SIM card in the Modem enabled to the traffic GSM data
- Disable the PIN request from the SIM
- The Modem management is activated with the parameter **A50**=1
- The insertion and removal of the SIM card must be done with the Modem NOT supplied



Modem Management

The user can send an SMS to the Modem's SIM with a command word written both capital and small.

Start: to start Ignition from system Off; the Modem sends back a message to the number from which it received the command with the system status. This feature is available only in Pellet modality

Stop: to start Extinguishing from system in an On state; the Modem sends back a message to the number from which it received the command with the system status

Status: to ask the system's state; the Modem sends back a message to the number from which it received the command with the status

Learn: to learn the number to send an SMS in case of Block; if there is a Block condition, the Modem automatically sends a message to the learnt number with the system's state and the alarm error code.

6.2 Combustion Standby

The Standby is a temporary shutdown of the flame due to the attainment of the target temperature of the medium to be heated. The conditions to go in Standby are managed by parameters **A01**, **A32**, **A52**, **A13**:

- **A01**, **A52**=1→if room temperature>Rom Thermostat, the system goes in Modulation
- **A32**=1→ if the time is in a range of internal Chrono Off the system goes in Modulation
- **A07**=1 → if contact Chrono Open the system goes in Modulation
- **A01**, **A52**=2, 4→if room temperature>Room Thermostat, the system goes in Standby
- **A32**=2, 4→ if the time is in a range of Off Chrono inside the system goes into Standby
- **A07**=2, 4→ if contact Chrono Open, the system goes into Standby
- **A13**=0→if boiler water temperature>Thermostat Boiler, the system goes in Modulation
- **A13**=1→if boiler water temperature>(Boiler Thermostat+**D23**)→when the timer **T43** is finished, the system goes in Standby

Manual Standby

Pressing the **P5** key for 3 seconds, the system enters in Standby, the display shows the message "*Standby Man*" and it remains there until there are the conditions to stay, or pushing **P5** key again. In the latest case the system goes in Off state; if the key is pressed for the second time with the system in the Check Up, Ignition or Stabilization states, the function is disabled.

In the states Extinguishing, Recover Ignition, Safety and Block the function is not available, in Off State it is available only if **A27**=0.
In the states Check Up, Ignition and Stabilization the system completes the ignition and then it goes in Standby; in the states Run Mode and Modulation the system immediately goes in Standby.

6.3 Automatic Combustion Power

In the Combustion Power Menu, the user can set the Automatic modality [A]. The work power is automatically selected according to the water boiler temperature and the value of Boiler Thermostat **Th24**:

- boiler water temperature≤**Th24**–**d08**→the system goes to the maximum available power
- **Th24**–**d08**<boiler water temperature<**Th24**→the combustion power decreases reaching the Boiler Thermostat
- boiler water temperature≥**Th24**→the system goes to Power 1 or, if enabled, at Modulation Power

The parameter **d08** must be a multiple of the number of operating powers minus one.

Example: Thermostat Boiler **Th24**=60 °C, Delta **d08**=20 °C, Operating powers = 5

- Water Temp≤ **Th24** – **d08** = 40 °C the system goes to the maximum power, (5)
- Water Temp**≥ Th24 =**60 °C the system goes at Power 1 (or a modulation power if enabled)
- **Th24**–**d08**<Water Temp<**Th24** the system from 40 ° C, every 5 ° C, it decreases a power:

Water Temperature (°C)	< 40	40 ÷ 45	46 ÷ 50	51 ÷ 55	56 ÷ 60	≥ 60
Combustion Power	5	4	3	2	1	1 or Mod.

Step power= Delta **d08** / (Powers of operation-1) = 20/4 = 5 ° C:

6.4 Change Power Delay

When the system exits from the Ignition and goes in Run Mode, the Combustion Power, starting from the Power 1, reaches the target one increasing the value with the delay time as the timer **T18**. The other manual or automatic power changes are managed and actuated with the delay time as timer **T17**.

6.5 System Maintenance 1

When the system exceeds the working hours set by the parameter **T66** it is notify the user to contact the service to verify the proper functioning of the system. The display shows the message '**Service**' and the system, if **P86**=1, goes in Block. To unblock, or if **P86**=0 to make the message disappear, it is necessary to reset the counters. To disable this feature set **T66**=0.

6.6 System Maintenance 2

When the system exceeds the working hours set by the parameter **T67** it is notify the user to clean the boiler or the stove. The display shows the message '**Clean**' and the system gives out an acoustic signal periodically. To stop signalling push the button **P5**. To disable this feature set **T67**=0.
To enable it set **T67**>0

6.7 Extinguishing in Ignition Phase

When the system is turned off during the Ignition phase (after Preheating phase) by an external device or by internal chrono, it really goes in Extinguishing when it enters the Run Mode at the end of Ignition. On display appears the message "**Block Ignition**".
If it occurs an error the system goes immediately in Extinguishing; if the **P2** button is pressed it is possible to get immediately the system in Extinguishing or in Ignition.

6.8 Periodic Cleaning of Brazier

When the stove is Run Mode, or if **A61**=1 in Modulation too, the system automatically provides at the Periodical Cleaning Brazier.
At intervals of time equal to the Timer **T07** (minutes) and for the length of Timer **T08** (seconds), automatically start the periodic clean of brazier.
The values of Combustion Fan and Auger change respectively of the percentages **P92** and **P93** respect to set value. The minimum and maximum values are defined by parameters **P14** and **P30** for the fan and **P27** and **P05** for the auger; if it is set a value equal to -100% the relative output will be off.
While the periodic cleaning is in progress the display will show "Cleaning On".

6.9 Supply Voltage Lack Management

In case of supply voltage lack, the system saves the most important functioning data. With the return of the supply voltage, the system evaluates the saved and the value of parameter **A53**

- **A53** = **0**
  - o If there is a supply voltage lack for a time less than **T88** the system returns to the state it was in before
  - o If the system was in state of ON, and it comes a voltage lack for a time included between **T88** and **T89,** the system goes in Recover Ignition
  - o If there is a supply voltage lack for a time greater than **T89** the system goes in state of Block with error **Er15**
- **A53** = **1**
  - o If the supply voltage lack it were less than **T88** the system returns to the state it was in before
  - o If the system was in state of ON, and it comes a voltage lack for a time greater than **T88** the system goes in Recover Ignition

6.10 Internal Chrono Management

The control board is provided with a clock module for the management of programmed switching on and off (this feature is available only in Pellet modality). Setting the parameter **A32** it is possible to:

- **A32**=0→the chrono manages the system's Ignition/Extinguishing
- **A32**=1→the chrono sends the system in Modulation outside the programmed time on bracket
- **A32**=2→the chrono sends the system in Standby outside the programmed time on bracket
- **A32**=3→the chrono blocks the plant pump outside the programmed time on bracket if the water temperature in the boiler exceeds the **Th19** thermostat. If the temperature exceeds the **Th21** thermostat the pump turn on.
- **A32**=4→the chrono works as in the cases 2 and 3

If there is a sanitary water demand the pump isn't blocked by Chrono and, if it previously had been blocked, it is reactivated.

For **A32**=1, 2, 4 and time outside the programmed time on bracket, pressing the On/Off button for 3 seconds, the system goes in Off state. Pressing again the On/Off button for 3 seconds, the system goes in Run Mode ignoring the chrono settings (if **A32**=4 also the pump is disabled).

6.11 Primary Air Flow Sensor

Estimating the air flow speed of the inlet the sensor can adjust the scope of the system. **It works in Run Mode and Modulation states**. For the correct use of the system do the following:

1. Supply the System, switch on it and leave it works, with air flow sensor disabled (parameter **A24**=0). In Run Mode and Modulation states monitor the air flow velocity for each power of the system.
2. Once found the optimum air flow velocity values for each power of the System, start to configure the air flow regulator setting:
   - **FL22**, **FL23**, **FL24**, **FL25**, **FL26**, **FL27**, **FL30** the Air flow set value for each power
   - **FL52**, **FL53**, **FL54**, **FL55**, **FL56**, **FL57**, **FL60** the Air flow Delta variation allowed for each power
   - **T19** the time how often to regulate the combustion (short is this time, less readings will be done by the system).
   - **T20** waiting time with regulator fixed on the minimum or the maximum, before to go to regulate another output or before to go in regulation error.
   - **T80** Waiting Time before starts the first regulation (Stabilization of the System)
   - **A24** to set which kind of output has to be regulated
   - Regulation Step for each Output (**U60** for Combustion Fan, **C60** for Auger)
   - Regulation order on the selected output (this function will be active if **A24** is set to regulate two output):
     - If **A31=**0 the regulator starts to regulate the first output, goes on the next output if needed, then go back on the first output .
     - If **A31=**1 the regulator starts to regulate the first output, goes on the next output if needed and the remain on this output.
   - If attempt of regulation on the output(s) failed, the system behaviour will be:
     - if **A25=**0 selected output will works with last values calculated by air flow regulator.

- if **A25**=1 air flow regulator has been Reset and restarts for a new attempt.
- if **A25**=2 air flow regulator will be disabled, selected output will works with default settings and will be shown **Er17** on LCD keyboard.

3. At the end of the set-up procedure, it will be possible to restart the System with Air Flow Regulator turned on. The first intervention of regulation will be after **T80** seconds. Then, the Control board will read air flow speed for **T19** seconds and verify if is within range **FL2X ±** (**FL2X*****FL5X**). If so, the combustion power for the outputs remain the same, otherwise if the value is out of range, the System will regulate the output selected with **A24**. Regulation will be done in this way on the outputs:
   - Read value lower than Air flow minimum Speed: the Combustion Fan speed is increased of **U60** until **P30** value, the Auger's time work is decreased of **C60** until **P27** value.
   - Read value upper than Air flow maximum Speed: the Combustion Fan speed is decreased of **U60** until **P14** value, the Auger's time work is increased of **C60** until **P05** value.

   The regulator can be described into 2 modes:
   - *Single output regulation* (**A24**=1 or 3)
     In this case the controller regulate the power of one output and if the target is reached the System works normally. If output speed reach the minimum or the maximum value, without bring air flow speed into the limits, the system waits for a period equal to **T20** after which, if the parameter **A25** is equal to 0, continue with the current data, if equal to 1 resets and restarts from the beginning, if equal to 2 fails, disables and displays **Er17**.
   - *Two outputs regulation* (**A24**=2 or 4)
     In this case the controller regulate the power of first regulated output and if the target is reached the System works normally. If output speed reach the minimum or the maximum value, without bring air flow speed into the limits, the system waits for a period equal to **T20** after which, the regulation goes on the second output. If output speed reach the minimum or the maximum value again, without bring air flow speed into the limits, the system waits for a period equal to **T20** after which, if **A25**=0 continue with the current data, if **A25**=1 resets and restarts from the beginning, if **A25**=2 fails, disables itself and shows **Er17**.

4. If the Air Flow Regulator is interrupted by random events that force to change the combustion, such as Periodic Cleaning, then, when the system returns on the previous state, the regulator will wait for a period equal to **T80** before the first intervention.
5. If on display appears the message **Er39** the sensor is damaged, the regulation is disabled and the outputs will work with the factory settings
6. If on display appears the message **Er42** the maximum air flow is exceeded (**FL40**) and the system goes in Block
7. If the Air Flow Sensor is enabled to work and the time **T01** didn't set to zero, if the flow recorded at the end of Check Up is less than **FL20** the system goes in Extinguishing and on display appears the message **Er41**.

NOTE: If the user changes the Auger and Fan settings with the Calibration, the regulator will consider the new values obtained as starting values for the combustion management.
The values of each power obtained from regulation are stored by the system and used as starting values for the following settings. These stored values are reset (the system will start again from the value set by the manufacturer) if the combustion recipe or the **A24** value are modified, or in the case of lack of voltage.

6.12 Fast Extinguishing

This function allows to get the system in Off state jumping the Extinguishing phase. To enable it follow the procedure:

1. put the system in the Extinguishing state without errors
2. turn off the system
3. turn on the system pressing the On/Off button for 3 seconds

The errors' check is guaranteed.

6.13 Configurable Outputs Management

It is possible to configure the outputs V2 (pin 5-6), P/V3 (7-8), Aux1 (22-23-24) Aux2 (19-20-21) and Aux3 (46-47) setting the parameter **P36**, **P44**, **P48**, **P50**, **P51**.

6.13.1 Safety Valve or Auger 2

The output is on when the Auger is enabled to work. If a Safety Valve is used, the Auger will be on only at the end of timer **T40**. Preheating phase of the Ignition phase, the work phase of Standby-Maintenance and the Auger feeding in Wood modality will only start if the timer **T40** expires.
If an Auger 2 is used, the output will be off, compared to the switch off of the first Auger, only at the end of timer **T27**.

State System	*Safety Valve*	*Auger 2*
Check Up	On	Off
Ignition, Stabilization, Run Mode, Modulation, Standby-Maintenance (work phase)	On	On
Safety	On	Off
Other States	Off	Off

6.13.2 Load Pellet Engine

When the Pellet Level Sensor signals the absence of pellet, the output is activated to do the loading of the tank. If in a time **T24** is not reached the set pellet level, the system goes in Extinguishing and the display shows the message **Er18**. If the tank is filled manually, it is possible to reset the error and restart the system. If the set pellet level is reached, the loading of the material continues for a time equal to **T23**.

6.13.3 Output under Thermostat

The output is managed by **Th56** Thermostat. If boiler water temperature is greater than **Th56** the output is on, otherwise is off.

6.13.4 Cleaning Engine

The output is on for the time **T30** when the system reaches the number of minutes of operation in Run Mode and Modulation equal to time **T31**.
It is on also during the final cleaning of the Extinguishing and Recover Ignition for the time **T16** and during the final cleaning of Standby for the time **T58**.

6.13.5 Combustion Fan 2

If the parameter **P44** or **P50**=5 the outputs V2 or P/V3 are configured as a Combustion Fan 2. Its power is the same of Combustion Fan 1.

6.13.6 Heating Fan

If the parameter **P44** or **P50**=6 the V2 or P/V3 outputs are configured as a Heating Fan.
It has the following functioning:

- If exhaust temperature is greater than Thermostat **Th07** the Fan goes at maximum power (230V) after **T69** seconds
- If the user set a power different from 0:
  - it will be On only if exhaust temperature is greater than **Th05** Thermostat
  - In Modulation for Room Thermostat or Chrono if **A11**=0 the fan is Off, if **A11**=1 the fan goes at Power 1
  - In Standby for Room Thermostat or Chrono if **A03**=0 the fan is Off, if **A03**=1 the fan goes at Power 1
  - In Ignition if **A08**=0 the fan is Off, if **A08**=1 the fan goes at User Power.
  - In every state with **A01**=5, for Room Thermostat if **A11**=0 the fan is Off, ,if **A11**=1 the fan goes at Power 1

If the user chooses the automatic mode of heating, the system selects the power. By setting the parameter **P06** in the Default Settings, it is possible to manage the heating power:

- **P06=1 (Same as Combustion Power)**

The Heating power is the same as Combustion power.

- **P06=2 (Proportional to exhaust temperature)**

The system selects the heating power according to the value of exhaust temperature, of **Th05** Thermostat and of parameter **D04** (**D04** has to be a multiple of the powers' number less one).

Example:
Th05 Thermostat=75 °C, **D04**=100 °C, **P03**=5

Exhaust Temperature (°C)	≤ 60	60 ÷ 84	85 ÷ 109	110 ÷ 134	135 ÷ 159	≥ 160
Heating Power	Off	Power 1	Power 2	Power 3	Power 4	Power 5

- **P06=3 (Proportional to room temperature)**

The system selects the heating power according to the value of room temperature, of **Th05** Thermostat and of parameter **D05** (**D05** has to be a multiple of the powers' number less one).
If **A19**=0 and **P06**=3 and the set Heating Power is automatic, the Heating Power will be the same of Combustion Power.

Example:
Room Thermostat=30 °C, **D05**=12 °C, **P03**=5

Room Temperature (°C)	≤ 18	18 ÷ 20	21 ÷ 23	24 ÷ 26	27 ÷ 29
Heating Power	Power 5	Power 4	Power 3	Power 2	Power 1

6.13.7 Air Valve

The output is on if Combustion Fan is on.

6.13.8 Errors Signaller

The output is on if the system is in Block state.

6.13.9 Summer-Winter Valve

If **P48**=12 it is guaranteed voltage between the pins 19-21 in Summer modality and between the pins 20-21 in Winter modality.
If **P51**=12 it is guaranteed voltage between the pins 22-24 in Summer modality and between the pins 22-23 in Winter modality.
If **P44**, **P50** o **P36**=12 the output is power supplied only in Summer modality.

6.13.10 Cleaning Engine 2

The output is on for the time **T75** when the system reaches the number of minutes of operation in Run Mode and Modulation equal to time **T76**. It is on also during the final cleaning of Extinguishing and Recover Ignition for the time **T16** and during the final cleaning of Standby for the time **T58**.

6.13.11 Pump P1

The output controls the Pump P1 of the Plumbing system

6.13.12 Electro valve or Pump P2

The output controls the Electro valve or Pump P2 of the Plumbing system

6.13.13 Cleaning Engine Brazier

The cleaning engine brazier has the following function:

- Extinguishing, Recover Ignition, Standby, before the phase of cleaning. The fans and the augers are disabled; cleaning is repeated **P83** times. To disable the cleaning in this phase, set **P83**=0.
- Cyclically when the pause time in Normal mode and Modulation mode exceeds the value of the parameter **T87.** The parameters of combustion don't change; the cleaning is repeated **P49** times. To disable it set **P49**=0.

The management of engine Brazier can happen in two ways:

- **Management Limit Switch Engine P83=2 :**

Phase	Description
Phase 1	The system activate the engine and check the state of limit switch: when it is open moves to phase 2. If at the ending of the timer **T86** the limit switch it's still closed, the systems goes in block with error **Er25.**
Phase 2	The maximum duration of this phase is **T86** seconds: during this time the engine must have concluded its cycle and come back at the starting position. At the end of this the system goes at phase 3. If at the time limit of **T86** the switch limit it's still open the system goes in block state with error **Er25**.
Phase 3	If the number of cleaning cycles set is greater than one starts another cycle of cleaning, otherwise the motor is switched off.

If during normal operation the thermoregulator should read the switch limit open, the engine brazier is activated to attempt for closing the contact; If this fails over time **T86**, the system goes into **block** state with error message **Er25**.
In state of **OFF and Block for security reasons the engine it's always lock**.

- **Management without Limit Switch Engine P83=0 or 1 :**

Phase	Description
Phase 1	The system activate the engine for a time equal to **T86** seconds: during this time the engine must have concluded its cycle and come back at the starting position. At the end the system

	goes at phase 2
Phase 2	If the number of cleaning cycles set is greater than one starts another cycle of cleaning, otherwise the motor is switched off.

In state of **OFF and Block for security reasons the engine it's always lock**.

6.13.14 Block Auger

The output (which must be a free contact output) is used as a contact protection for the Auger. It has to be connected in series to the Auger and the contact is always closed when the Auger is enabled to work and it is open when it is not, furthermore it is open in case of encoder alarms (**Er47** or **Er48**) when **P81**=1, 2.

6.13.15 Output under Thermostat 2

The output is controlled by the thermostat **Th60**: above this value is supplied.

6.14 Unlock Auger

This function attempts to restart the engine Auger configured with Encoder (**P81** = 1 or 2), if it were to be blocked by some piece of fuel. If the Temperature Controller reads the speed of the auger to zero for a few seconds when it should run, the latter gives a series of pulses at full speed to try to unlock it. If this does not work, the system switches to **extinguishing** mode with error **Er47**. The pulses have a duration of 2 seconds and the pause time between one pulse and the other is given by the difference of the parameter **P05** to auger without encoders - 2 seconds. This function isn't enabled for engine auger configured without encoder (**P81** = 0).

6.14 Plumbing Configuration

Setting the parameter **P26** it is possible to select the wished Plumbing Plant.

Block of Plant Pump for Room Thermostat/Probe or internal chrono:

- this feature is available if water temperature in the boiler is greater than **Th19** Thermostat
- this feature is not available in plant 4; if there is a sanitary water demand the Pump isn't blocked and if it had previously been blocked, it is activated again

Electrical Wiring:

P1=P1 Pump->Pin 7–8; **P2=**P2 Pump or Sanitary Valve->Pin 22–23–24 ; **P3=**Summer-Winter Valve
S1=Boiler Probe -> Pin 31–32; **S2=**Buffer Probe -> Pin 34-35, **FL=**Flow Switch -> Pin 34-35

CONFIGURATION 0

Setting the parameter **P26** = 0 it is chosen the configuration shown in Fig.1 and in Fig.2.

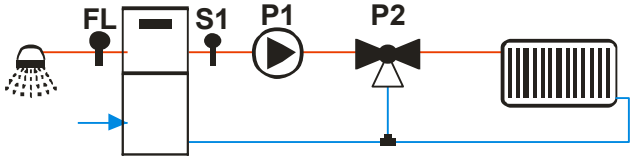


fig. 1

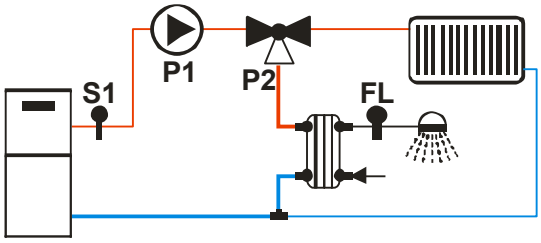


fig. 2

Heating Plant

The Pump is on if the water temperature is greater than **Th20** Thermostat. To avoid freezing, the Pump is on if the water temperature is below the thermostat **Th18**. If the water temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump is always on.

Sanitary Plant

When there is a water demand for domestic use and the water temperature in the boiler exceeds the value of **Th19** thermostat or the water temperature in the boiler exceeds the value of the **Th20** thermostat the valve is on. If the water temperature exceeds the value of the **Th21** thermostat the valve switches to the heating plant.

Example: **Th18** = 5 °C, **Th19** = 40 °C, **Th20** = 30 °C, **Th21** = 70 °C

Water Temperature	*Flow Switch*	*Modality*	*P2 Valve*	*P1 Pump*
T < 5°C			plant (OFF)	**ON**
5°C ≤ T< 30°C			plant (OFF)	OFF
30°C ≤ T< 40°C			sanitary (**ON**)	**ON**
40°C ≤ T< 70°C	open	Winter	plant (OFF)	**ON**
		Summer	sanitary (**ON**)	OFF
	closed		sanitary (**ON**)	**ON**
T≥70°C			plant (OFF)	**ON**

CONFIGURATION 1

Setting the parameter **P26**=1 it is chosen the configuration shown in Fig.3 and in Fig.4.

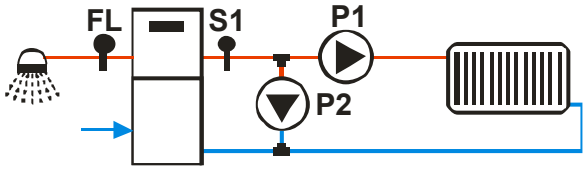


fig. 3

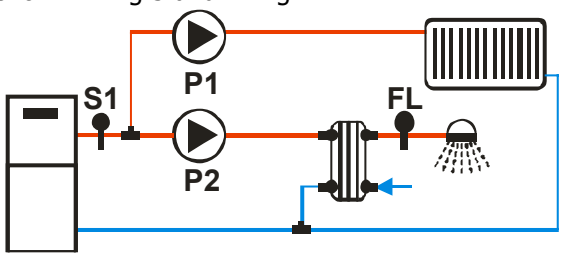


fig. 4

Heating Plant

The P1 Pump is on if the water temperature is greater than **Th19** Thermostat. When there is a demand of domestic water the Pump P1 is blocked. To avoid freezing, the Pump P1 is on if the water temperature is below the thermostat **Th18**. If the water temperature exceeds the value of the **Th21** thermostat for safety reasons the P1 Pump is always on.

Sanitary Plant

When there is a water demand for domestic use and the water temperature in the boiler exceeds the value of **Th19** thermostat or the water temperature in the boiler exceeds the value of the **Th20** thermostat the Pump P2 is on. If the water temperature exceeds the value of the **Th21** thermostat the Pump P2 is turned off.

Example: **Th18** = 5 °C, **Th19** = 40 °C, **Th20** = 30 °C, **Th21** = 70 °C

Water Temperature	*Flow Switch*	*Modality*	*P2 Pump*	*P1 Pump*
T < 5°C			OFF	**ON**
5°C ≤ T< 30°C			OFF	OFF
30°C ≤ T< 40°C			**ON**	OFF
40°C ≤ T< 70°C	open	Winter	OFF	**ON**
		Summer		OFF
	closed		**ON**	OFF
T≥70°C			OFF	**ON**

CONFIGURATION 2

Setting the parameter **P26**=2 it is chosen the configuration shown in Fig.5.

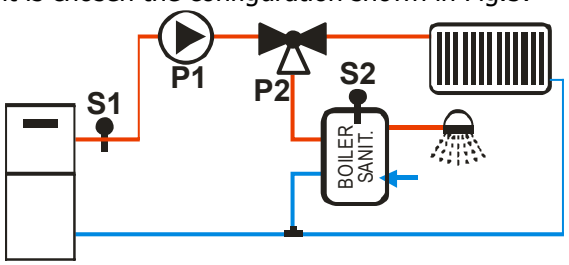


fig. 5

Sanitary Plant

The pump P1 is on if the water temperature in the boiler exceeds the value of **Th20** thermostat and the water temperature in the buffer doesn't exceed the value of Boiler Thermostat **Th58** and the difference between the read temperature by probe S1 and S2 probes is greater than the **Th57** thermostat.

The Pump is on if the water temperature in the boiler is greater than **Th19** Thermostat. To avoid freezing, the Pump is on if the water temperature in the boiler is below **Th18** thermostat. If the water temperature in the boiler exceeds the value of the **Th21** thermostat for safety reasons the Pump is always on.

Sanitary Plant

If buffer temperature is lower than **Th58** thermostat and the boiler temperature is higher than **Th20** thermostat and the differential temperature between S1 and S2 probes is over than **Th57** thermostat, the Valve P2 is on. If the boiler temperature exceeds the **Th21** thermostat's value the valve P2 is turned off.

Example: **Th18** = 5 °C, **Th19** = 65 °C, **Th20** = 50 °C, **Th21** = 70 °C, **Th57** = 5 °C, **Th58** = 55 °C

S1 Temp. Probe	*S2 Temp. Probe*	*Modality*	*Diff.*	*P2 Valve*	*P1 Pump*
T < 5°C				plant (OFF)	**ON**
5°C ≤ T< 50°C				plant (OFF)	OFF
50°C ≤ T< 65°C	T < 55°C		< 5°C	plant (OFF)	OFF
			≥ 5°C	sanitary (**ON**)	**ON**
	T > 55°C		< 5°C	plant (OFF)	OFF
		Winter	≥ 5°C	plant (OFF)	OFF
		Summer	≥ 5°C	sanitary (**ON**)	**ON**
65°C ≤ T< 70°C	T < 55°C		< 5°C	plant (OFF)	OFF
			≥ 5°C	sanitary (**ON**)	**ON**
	T > 55°C	Winter		plant (OFF)	**ON**
		Summer	< 5°C	sanitary (**ON**)	OFF
		Summer	≥ 5°C	sanitary (**ON**)	**ON**
T≥70°C				plant (OFF)	**ON**

CONFIGURATION 3

Setting the parameter **P26**=**3** it is chosen the configuration shown in fig.6.

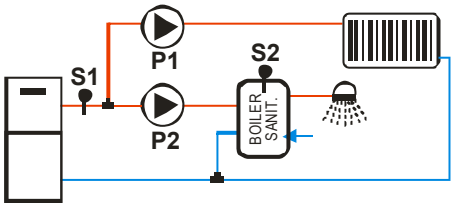


fig. 6

Heating Plant

The pump P1 is on above the **Th19** thermostat if the difference between the temperature read by probes S1 and S2 is less than the **Th57** thermostat. To avoid freezing, the Pump is on if the water boiler temperature is below the **Th18** thermostat or if exceed the value of thermostat **Th21**.

Sanitary Plant

The Pump P2 has to heat the water inside the sanitary tank. It will be activated only if the water temperature in the boiler exceeds the value of the thermostat **Th20** and the difference between the temperature read by probes S1 and S2 is greater than the **Th57** thermostat. If the boiler temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump P2 turns off.

Example: **Th18** = 5 °C, **Th19** = 65 °C, **Th20** = 50 °C, **Th21** = 70 °C, **Th57** = 5 °C, **Th58** = 55 °C

S1 Temp. Probe	*S2 Temp. Probe*	*Modality*	*Diff.*	*P2 Pump*	*P1 Pump*
T < 5°C				OFF	**ON**
5°C ≤ T< 50°C				OFF	OFF
50°C ≤ T< 65°C	T < 55°C		< 5°C	OFF	OFF
			≥ 5°C	**ON**	OFF
	T > 55°C		< 5°C	OFF	OFF
		Winter	≥ 5°C	OFF	OFF
		Summer	≥ 5°C	**ON**	OFF
65°C ≤ T< 70°C	T < 55°C		< 5°C	OFF	OFF
			≥ 5°C	**ON**	OFF
	T > 55°C	Winter		OFF	**ON**
		Summer	< 5°C	OFF	OFF
		Summer	≥ 5°C	**ON**	OFF
T≥70°C				OFF	**ON**

CONFIGURATION 4

Setting the parameter **P26**=4 it is chosen the configuration shown in fig.7.

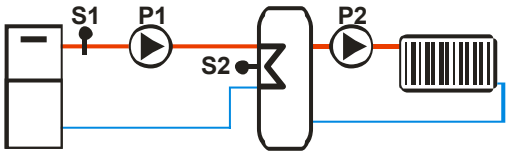


fig. 7

Loading Buffer

If the temperature in the boiler is greater than the **Th19** thermostat, the system heats the water in the Buffer if there is differential between the two probes (S1 temperature–S2 temperature > thermostat **Th57**). If the water temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump is always active. The Pump P2 turns on if the buffer temperature exceeds the thermostat **Th59** value.

Example: **Th19** = 40 °C, **Th21** = 70 °C, **Th57** = 5 °C, **Th59** = 40 °C

S1 Temperature Probe	*Differential*	*P1 Pump*	*P2 Pump*
T < 5°C		**ON**	OFF
T < 40°C		OFF	OFF
T ≥ 40°C	< 5°C	OFF	**ON**
	≥ 5°C	**ON**	**ON**
T ≥ 70°C		**ON**	**ON**

CONFIGURATION 5

Setting the parameter **P26**=**5** it is chosen the configuration shown in fig.8.

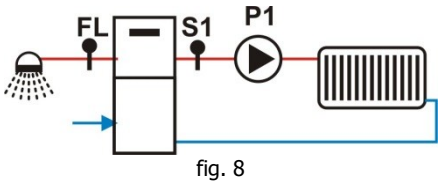


fig. 8

The Output Aux 1 switches on if the boiler temperature exceedes the thermostat **Th56** value.

Heating Plant

The pump P1 is activated if the water temperature in the boiler exceeds the value of **Th19** thermostat. To avoid freezing, the Pump is On if the water temperature is below the thermostat **Th18**. If the water temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump is always on.

Sanitary Plant

When there is a sanitary water demand the system stops the Pump.

Example: **Th18** = 5 °C, **Th19** = 40 °C, **Th21** = 70 °C

Water Temperature	*Modality*	*Flow Switch*	*P1 Pump*
T < 5°C			**ON**
5°C < T< 40°C			OFF
40°C < T< 70°C	Summer		OFF
	Winter	**closed**	OFF
	Winter	open	**ON**
T>70°C			**ON**

CONFIGURATION 6

Setting the parameter **P26**=6 it is chosen the configuration shown in fig.9.

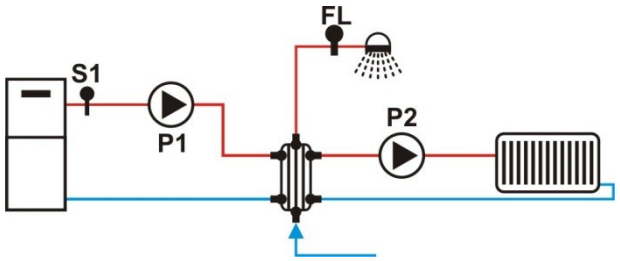


fig. 9

Heating Plant

The pump P2 is on above the **Th19** thermostat if there isn't a sanitary water demand. To avoid freezing the water pump P2 is on if the water temperature is under the thermostat **Th18** or if it is greater than **Th21** thermostat.

Sanitary Plant

The Pump P1 is on if the water temperature is greater than thermostat **Th20**. To avoid freezing, the Pump P2 is on if the water temperature is below the thermostat **Th18**.

Example: **Th18** = 5 °C, **Th19** = 40 °C, **Th20** = 30 °C, **Th21** = 70 °C

S1 Temp. Probe	*Flow Switch*	*Modality*	*P1 Pump*	*P2 Pump*
T < 5°C			**ON**	**ON**
5°C ≤ T< 30°C			OFF	OFF
30°C ≤ T< 40°C			**ON**	OFF
40°C ≤ T< 70°C	**closed**		**ON**	OFF
	open	Winter	**ON**	**ON**
		Summer	OFF	OFF
T ≥ 70°C			**ON**	**ON**

CONFIGURATION 7

Setting the parameter **P26**=7 it is chosen the configuration shown in fig.10.

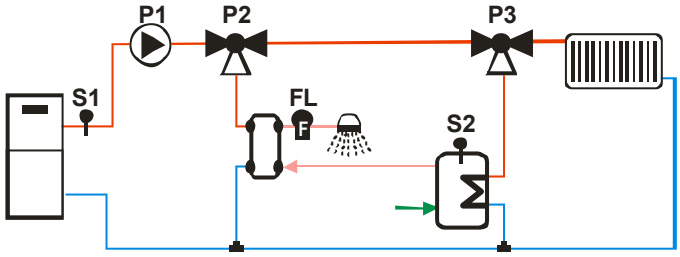


fig. 10

Summer Modality

The P2 and P3 valves are always turned towards the buffer except in cases of over temperature in which the P3 valve switches towards the plant.

The pump P1 is on if the water temperature in the boiler exceeds the value of **Th20** thermostat and the water temperature in the buffer doesn't exceed the value of Boiler Thermostat **Th58** and the difference between the read temperature by S1 and S2 probes is greater than **Th57** thermostat.

To avoid freezing, the Pump is on if the water temperature in the boiler is below **Th18** thermostat. If the water temperature in the boiler exceeds the value of the **Th21** thermostat for safety reasons the Pump is always on.

Example: **Th18**=5 °C, **Th19**=50 °C, **Th20**=30 °C, **Th21**=70 °C, **Th57**=3 °C, **Th58**=45 °C

S1 Temp. Probe	*S2 Temp. Probe*	*Diff.*	*P2 Valve*	*P1 Pump*	*P3 Valve*
T < 5°C			plant (OFF)	**ON**	plant (OFF)
5°C ≤ T< 30°C			plant (OFF)	OFF	sanitary (**ON**)
30°C ≤ T< 50°C	T < 45°C	< 3°C	plant (OFF)	OFF	sanitary (**ON**)
		≥ 3°C	plant (OFF)	**ON**	sanitary (**ON**)
	T > 45°C	< 3°C	plant (OFF)	OFF	sanitary (**ON**)
		≥ 3°C	plant (OFF)	**ON**	sanitary (**ON**)
50°C ≤ T< 70°C	T < 45°C	< 3°C	plant (OFF)	OFF	sanitary (**ON**)
		≥ 3°C	plant (OFF)	**ON**	sanitary (**ON**)
	T > 45°C	< 3°C	plant (OFF)	OFF	sanitary (**ON**)
		≥ 3°C	plant (OFF)	**ON**	sanitary (**ON**)
T≥70°C			plant (OFF)	**ON**	plant (OFF)

Winter Modality

The P3 Valve is always turned toward the plant.

Heating Plant

The Pump is on if the water temperature is greater than **Th19** Thermostat. To avoid freezing, the Pump is on if the water temperature is below the thermostat **Th18**. If the water temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump is always on.

Sanitary Plant

When there is demand of sanitary water and the water temperature in the boiler exceeds the value of the **Th19** thermostat or the water temperature in the boiler exceeds the value of the **Th20** thermostat, the P2 valve is on. If the water temperature exceeds the value of the **Th21** thermostat, the P2 valve switches to the plant.

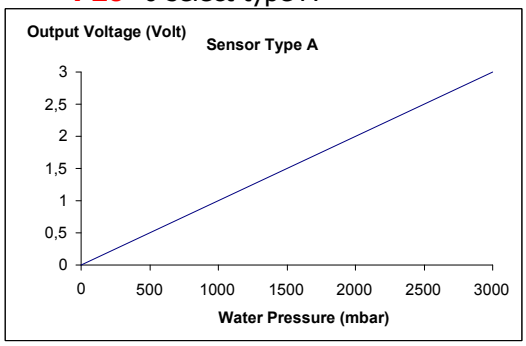
Example: **Th18**=5 °C, **Th19**=50 °C, **Th20**=30 °C, **Th21**=70 °C, **Th57**=3 °C, **Th58**=45 °C

Water Temperature	*Flow Switch*	*P2 Valve*	*P1 Pump*	*P3 Valve*
T < 5°C		plant (OFF)	**ON**	plant (OFF)
5°C ≤ T< 30°C		plant (OFF)	OFF	plant (OFF)
30°C ≤ T< 50°C		sanitary (**ON**)	**ON**	plant (OFF)
50°C ≤ T< 70°C	open	plant (OFF)	**ON**	plant (OFF)
	closed	sanitary (**ON**)	**ON**	plant (OFF)
T≥70°C		plant (OFF)	**ON**	plant (OFF)

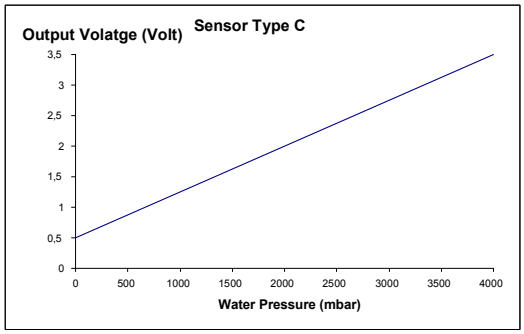
6.14.1 Pressure Sensor Selection

Setting the parameter **P20** it is possible to select the water pressure sensor to use. If

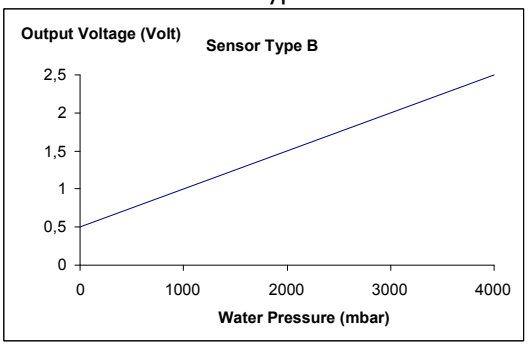
- **P20**=0 select type A



- **P20**=2 select type C



- **P20**=1 select type B



6.14.2 Sanitary Function

In the plumbing plants in which the Flow Switch is present, if there is a domestic water demand the Sanitary Function starts: the Boiler Thermostat becomes equal to the value of **Th21 - Ih21** and the combustion is controlled by this value. When there is not required the Sanitary Function will stop at the end of **T68** timer.

6.14.3 Pump and Valve Ant-Lock Function

If the Pump is off for the time **T42** it will switch on for the time **T41**. If the Valve is off for the time **T42** it will switch on for the time **T46**.

6.14.4 Pump in Modulating Functioning

Setting **A38**=1 the Modulating Pump function that allows to adjust the speed of P1 pump to the thermal conditions in the boiler and/or any other devices such as boilers or buffer. The function is not carried out in safety conditions, that is, if the water temperature in the boiler exceeds the value of **Th21** or **Th25** thermostats, or in a plant with a Flow switch in case of sanitary request. In all these cases, the pump speed is maximum (230 V).
The table below shows the parameters used in the plumbing plants to manage the pump in modulating functioning.

Plant	*Configuration*	*Parameters used*	*Modulanting function*
0	Heating	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
1	Heating	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
2	Heating	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
	Sanitary	**T70**,**T72**,**Th57**,**Ih57**,**VP01**,**VP02**,**VP03**	T_{diff} > **Th57**
3	Heating	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
4	Loading Buffer	**T70**,**T72**,**Th57**,**Ih57**,**VP01**,**VP02**,**VP03**	T_{diff} > **Th57**
5	Heating	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
6	All configurations	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
7	All configurations in Winter modality	**T70**,**T71**,**Th19**,**Ih19**,**VP01**,**VP02**,**VP03**	T_{Boiler} > **Th19**
	Sanitary in Summer modality	**T70**,**T72**,**Th57**,**Ih57**,**VP01**,**VP02**,**VP03**	T_{diff} > **Th57**

The pump is on at maximum speed (230 V) for the time **T70**. Finished **T70**, it goes to the **VP01** speed for the time **T71** or **T72**. At the end, according to the set plumbing plant, the system controls the water temperature in the boiler related to the **Th19** thermostat, or the differential temperature between the boiler

water and the buffer water related to the **Th57** thermostat. If the temperature is greater than the reference thermostat, the pump goes to the speed **VP02**. The control time is restarted and, at the end, the system does a new verify: if the temperature is greater than the reference thermostat, the pump goes to the speed **VP03**.
If at the end of the control time the temperature is between the value of the reference thermostat and the thermostat value less its hysteresis, the pump decreases its speed of a unit and, if this condition persists, it decreases the speed until to **VP01**.

6.14.5 Pump in Step Functioning

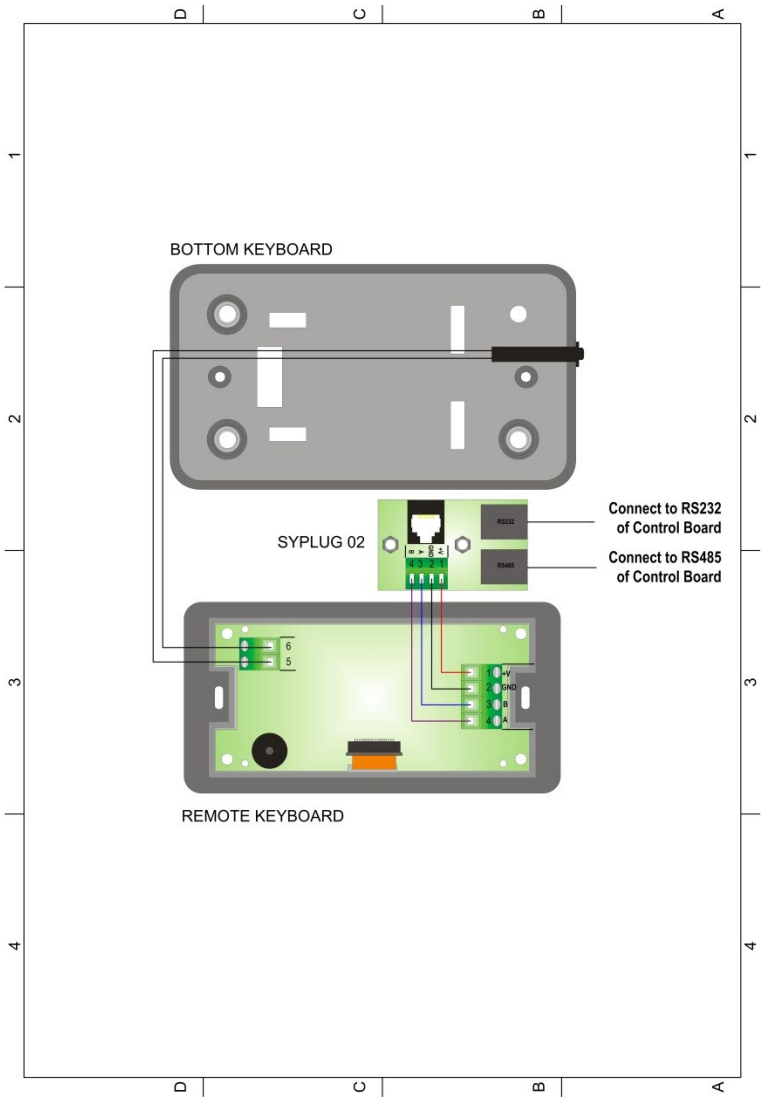
If parameter **A15**=1, the Step mode functioning of Pump (Output P/V3, pin 7-8). is set.
If the water temperature exceeds the Pump Thermostat **Th19** the Pump is switched On for a time **T12**. At the end of this timer the Pump Thermostat is increased of parameter **d06** value; so the new Pump Thermostat becomes **Th19*=Th19+d06**.
If water temperature is under **Th19***, the Pump is switched Off until the water temperature reaches the **Th19*** thermostat's value. Now the Pump is switched on for a time **T12**.
At the end of timer **T12** the Pump Thermostat **Th19*** is newly increased of parameter **d06** value. So the new Pump Thermostat is **Th19**=Th19*+d06**.
The Pump thermostat increase continues until the (**Boiler Thermostat–d07**) value is reached.
When the water temperature exceeds this value the Step modality ends and the Pump's work can be set by parameter **A23**:

- **A23**=**0** → Pump thermostat **Th19** value remains the last one
- **A23**=**1** → Pump thermostat **Th19** value returns to the set value. If water temperature goes under **Th19**, Step cycle starts again

6.15 Remote Keyboard

The Remote Keyboard allows the remote control of the system. Its features are similar to the Local Keyboard; on board is present a sensor to detect the room temperature (the temperature displayed on LCD panel is detected by the sensor).

Connections
The Remote Keyboard uses the RS485 protocol for connecting the control board. This standard allows links to great distance, with high noise immunity if the protocol instructions are followed.
It is recommend using twisted and shielded wire to connect the Remote Keyboard to the Control Board.
Below is shown how connect the Remote Keyboard to the SYPlug02 board that leads out of the stove or boiler the control board's RS232 and RS485 connectors.



Menu

DISPLAY	DESCRIPTION
Room Thermostat	Menu to modify the remote keyboard's Room Thermostat; it is visible only if **52**>0 and it has two Submenu: *Room Thermostat*: allows to set the thermostat's value *Enable*: allows to enable and disable the function associated with the thermostat according to the **A52** parameter (see section 7.9)
Chrono	Menu to select the Chrono's program modality and the timers of Ignition/Extinguishing of the boiler/stove
Time and Date	Menu to set time and date
Language	Menu to change the languages of the LCD panel
Keyboard Menu	Menu to set the contrast and the light of LCD panel

The Menu Chrono, Date and Time, Language and Keyboard Menu are handled as explained in the section 4.2.

7 System Menu Parameters

7.1 Auger Menu

The values are referred to the current combustion recipe (selected in the User's Menu); each value is a functioning power. If a value is set to 0 seconds the Auger is disabled for the corresponding power. The Auger regulation can be set with a step of 0.1 seconds, while the speed can be set with a step of 10RPM.

Code	*Description*	*Min*	*Max*	*Unit*
C01	Ignition Power	0	**P05**	[s]
		0/**P27**		[RPM]
C02	Stabilization Power	0	**P05**	[s]
		0/**P27**		[RPM]
C03	Power 1	**P27**	**P05**	[s]
				[RPM]
C04	Power 2	**P27**	**P05**	[s]
				[RPM]
C05	Power 3	**P27**	**P05**	[s]
				[RPM]
C06	Power 4	**P27**	**P05**	[s]
				[RPM]
C07	Power 5	**P27**	**P05**	[s]
				[RPM]
C08	Power 6	**P27**	**P05**	[s]
				[RPM]
C09	Periodic Cleaning Power	0	**P05**	[s]
		0/**P27**		[RPM]
C10	Second Ignition Power	0	**P05**	[s]
		0/**P27**		[RPM]
C11	Modulation Power	**P27**	**P05**	[s]
				[RPM]
C12	Standby Power	0	**P05**	[s]
		0/**P27**		[RPM]
P05	Total Auger Period	4	60	[s]
	Maximum Speed of Auger	300	3000	[RPM]
P15	Calibration step of Auger work time	1	20	[%]
P27	Minimum work time Auger ON	0	**P05**	[s]
	Low speed Auger	300		[RPM]
P35	Pulses for Revolution	1	4	[nr]

NOTE:
If the auger is run in RPM, the minimum allowed speed is 300rpm. The powers where you can bring the speed value to 0 to disable it, it will be accepted only the value of 0, another value of **P27** will be listed below the value of the latter.

7.2 Combustion Fan Menu

Menu to set the Combustion Fan's values**.** They are referred to the current combustion recipe and each value is a functioning power. In the encoder version (**P25**=1) values are in revolutions per minute, in the version without encoder (**P25**=0) they are in Volts. The set or calculated values are automatically define between the limits **P14** and **P30**. **If a value is set to zero, it isn't modified by P14 parameter**.

Code	*Description*	*Min*	*Max*	*Unit*
U01	Ignition Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U02	Stabilization Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U03	Power 1	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]

U04	Power 2	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U05	Power 3	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U06	Power 4	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U07	Power 5	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U08	Power 6	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U09	Periodic Cleaning Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U10	Second Ignition Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U11	Modulation Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
U12	Standby Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
P23	Extinguishing Power	**P14**	**P30**	[Volt]
		P14	**P30**	[RPM]
P14	Minimum Speed of Combustion Fan	0	230	[Volt]
		300	2800	[RPM]
P30	Maximum Speed of Combustion Fan	0	230	[Volt]
		300	2800	[RPM]
P16	Calibration step of Combustion Fan	1	20	[%]

7.3 Combustion Fan 2 Menu

Code	*Description*	*Min*	*Max*	*Unit*
F01	Ignition Power	0	230	[Volt]
F02	Stabilization Power	0	230	[Volt]
F03	Power 1	0	230	[Volt]
F04	Power 2	0	230	[Volt]
F05	Power 3	0	230	[Volt]
F06	Power 4	0	230	[Volt]
F07	Power 5	0	230	[Volt]
F08	Power 6	0	230	[Volt]
F09	Periodic Cleaning Power	0	230	[Volt]
F10	Second Ignition Power	0	230	[Volt]
F11	Modulation Power	0	230	[Volt]
F12	Standby Power	0	230	[Volt]
F23	Extinguishing Power	0	230	[Volt]

7.4 Heating Fan Menu

Code	*Description*	*Min*	*Max*	*Unit*
F01	Power 1	0	230	[Volt]
F02	Power 2	0	230	[Volt]
F03	Power 3	0	230	[Volt]
F04	Power 4	0	230	[Volt]
F05	Power 5	0	230	[Volt]
F06	Power 6	0	230	[Volt]
P06	Heating management: **1**=heating power is the same of combustion power; **2**=heating power is proportional to the exhaust temperature; **3**=heating power is proportional to the room temperature	1	3	[nr]

7.5 Thermostats Menu

Code	*Description*	*Min*	*Max*	*Unit*
Th01	Stove off	5	900	[°C]
Th02	Resistance switch off	5	900	[°C]
Th03	Pre-Extinguishing thermostat for low flue gas temperature	5	900	[°C]
Th05	Switch on Heating Fan Thermostat	5	900	[°C]
Th06	Thermostat to go in Stabilisation from Variable Ignition	5	900	[°C]
Th07	Exhaust Modulation	5	900	[°C]
Th08	Exhaust Safety	5	900	[°C]
Th09	Bypass Ignition	5	900	[°C]
Th18	Ice Thermostat	5	10	[°C]
Th19	Activation P1 Pump Thermostat	30	85	[°C]
Ih19	Activation P1 Pump Thermostat Hysteresis	1	20	[°C]
Th20	Sanitary 1 Thermostat	30	85	[°C]
Th21	Sanitary 2 Thermostat	30	95	[°C]
Ih21	Sanitary 2 Thermostat Hysteresis	1	20	[°C]
Ih24	Water Boiler Thermostat Hysteresis	1	20	[°C]
Th25	Boiler Safety Thermostat	80	99	[°C]
Th26	Boiler Thermostat minimum range	30	**Th27**	[°C]
Th27	Boiler Thermostat maximum range	**Th26**	95	[°C]
Th28	Exhaust temperature control in Standby (*it changes with combustion recipe*)	5	900	[°C]
Ih33	Room Thermostat Hysteresis	0	10	[°C]
Th56	Thermostat to contrl the Output under Thermostat	30	85	[°C]
Ih56	Thermostat to contrl the Output under Thermostat Hysteresis	1	20	[°C]
Th57	Differential Thermostat Boiler Probe – Buffer Probe	1	30	[°C]
Ih57	Differential Thermostat Hysteresis	1	5	[°C]
Ih58	Buffer Thermostat Hysteresis	1	20	[°C]
Th59	Activation P2 Pump Thermostat (only if **P26**=4)	30	85	[°C]
Ih59	Activation P2 Pump Thermostat Hysteresis (only if **P26**=4)	1	20	[°C]
Th60	Thermostat to control the Output under Thermostat 2	30	95	[°C]
Ih60	Thermostat to control the Output under Thermostat 2 Hysteresis	1	20	[°C]

7.6 Extinguishing Thermostats Menu

This Menu is the list of settings for each Combustion Power of the Exhausting Temperature under which, after the Pre-Extinguishing time **T14**, the system goes in Extinguishing for no flame (**Er03**). These values occur with the **Th03** Thermostat.

Code	*Description*	*Min*	*Max*	*Unit*
Th35	Power 1	5	900	[°C]
Th36	Power 2	5	900	[°C]
Th37	Power 3	5	900	[°C]
Th38	Power 4	5	900	[°C]
Th39	Power 5	5	900	[°C]
Th40	Power 6	5	900	[°C]
Th43	Modulation Power	5	900	[°C]

7.7 Timers Menu

Code	*Description*	*Min*	*Max*	*Unit*
T01	Check Up cleaning time (*it changes with combustion recipe*)	0	900	[s]
T02	Preheating phase (*it changes with combustion recipe*)	0	900	[s]
T03	Auger Preload (*it changes with combustion recipe*)	0	900	[s]
T04	Fixed Ignition (*it changes with combustion recipe*)	0	3600	[s]
T05	Variable Ignition (*it changes with combustion recipe*)	0	3600	[s]
T06	Stabilization (*it changes with combustion recipe*)	0	900	[s]
T07	Periodic cleaning cycle	5	600	[min]
T08	Periodic cleaning duration	0	900	[s]
T09	High Voltage 1 (Safety Thermostat) delay	1	900	[s]
T10	High Voltage 2 (Pressure switch) delay	1	900	[s]

T11	Exit from Standby delay	0	900	[s]
T13	Minimum period time of extinguishing	0	900	[s]
T14	Waiting time pre-extinguishing for no flame	0	900	[s]
T15	Waiting time pre-extinguishing in Safety	0	900	[s]
T16	Final cleaning time	0	900	[s]
T17	Delay time combustion power change	0	900	[s]
T18	Delay time combustion power change in exit from Ignition	0	900	[s]
T22	Delay time for Standby input	0	900	[s]
T23	Pellet tank charging time over minimum level	0	3600	[s]
T24	Length signalling of fuel lack if **P44**, **P48**, **P50**, **P51** or **P36** are different from two, or Pellet tank charging time over minimum level if **P44**, **P48**, **P50**, **P51** or **P36** are two	0	3600	[s]
T27	Delay to disable the Pellet Safety Valve (if set)	0	900	[s]
T29	Auger Off in Preload	0	900	[s]
T30	Work time of Cleaning Engine (if set)	0	9600	[s]
T31	Wait time of Cleaning Engine (if set)	1	600	[min}
T32	Wait time to maintain the brazier in Standby (*it changes with combustion recipe*)	1	500	[min]
T33	Work time to maintain the brazier in Standby (*it changes with combustion recipe*)	0	900	[s]
T34	Activation Time Auger in case of backfire	0	3600	[s]
T40	Delay to enable Auger (if set)	0	900	[s]
T41	Work time of P1 Pump if **T42** is finished	0	3600	[s]
T42	Maximum idle time of P1 Pump or Valve or P2 Pump.	1	1500	[hour]
T43	Timer delay to go in Standby from Modulation if boiler temperature>(Boiler Thermostat+**D23**) and **A13**=1	0	3600	[s]
T46	Work time of Valve or P2 Pump if **T42** is finished	0	3600	[s]
T57	Minimum period time of extinguishing in Standby (*it changes with combustion recipe*)	0	900	[s]
T58	Final cleaning time in Standby (*it changes with combustion recipe*)	0	900	[s]
T66	Working time of the system before it goes in Block	0	20000	[hour]
T67	Working time of the system before appears the message "Cleaning"	0	20000	[hour]
T68	Delay restore the value of Boiler Thermostat if there isn't sanitary request	0	900	[s]
T69	Delay time for heating fan to go to maximum speed when Exhaust T. > **Th07**	0	900	[s]
T75	Work time of Cleaning Engine 2 (if set)	0	9600	[s]
T76	Wait time of Cleaning Engine 2 (if set)	1	600	[min}
T85	Maximum time to open Limit Switch	1	60	[s]
T86	Wok Time of Cleaning Engine Brazier	0	9600	[s]
T87	Pause Time of Cleaning Engine Brazier	1	900	[min]
T88	Maximum time without power supply so that the system return to the state it was before.	10	900	[s]
T89	Maximum time without power supply so that the system return to the state of recover ignition	1	1400	[min]

7.8 Default Settings Menu

Code	*Description*	*Min*	*Max*	*Unit*
P02	Maximum number ignition attempts	1	5	[nr]
P03	Work Combustion Powers' number	1	6	[nr]
P04	Recipe number	1	4	[nr]
P09	Pellet Sensor configuration: **0**=input N.C.; **1=**input N.O.	0	1	[nr]
P20	Pressure Boiler Water sensor configuration (see sec. 6.14.1)	0	2	[nr]
P25	**0=** Fan without encoder; **1:** Fan with encoder; **2=** Fan with encoder with automatic changeover in **P25** = 0 in case of encoder signal lack (alarm **Er07**)	0	2	[nr]

P26	Plumbing system management (see sec. 6.13)	0	7	[nr]
P36	Output Aux 3 management (pin 46-47: see sec. 6.13)	0	27	[nr]
P44	Output V2 management (pin 5-6: see sec. 6.13)	0	27	[nr]
P48	Output Aux 2 management (pin 19-20-21: see sec. 6.13)	0	27	[nr]
P49	Cycles Cleaning Engine Brazier at full speed.	0	100	[nr]
P50	Output P/V3 management (pin 7-8: see sec. 6.13)	0	27	[nr]
P51	Output Aux 1 management (pin 22-23-24: see sec. 6.13)	0	27	[nr]
P66	Enable RS485	0	1	[nr]
P70	Input 9 Management	0	5	[nr]
P73	Input 10 Management	0	5	[nr]
P75	Input 3 Management	0	5	[nr]
P81	**0=** Auger without encoder; **1=** Auger with encoder; **2=** Auger with encoder with automatic changeover in **P81**=0 0 in case of encoder signal lack (alarm **Er47**)	0	2	[nr]
P83	Cycles Cleaning Engine Brazier at the Extinguishing brazier phase	0	100	[nr]
P86	System Maintenance Management: 0 = the system does not go in Block when **T66** is reached; 1 = the system goes in Block when **T66** is reached	0	1	[nr]
P92	Combustion Fan's speed percentage change during Periodic Cleaning	-100	101	%
P93	Auger's speed/time on percentage change during Periodic Cleaning	-100	100	%

7.9 Enable Menu

Code	*Val.*	*Description*
A01	0	Room Thermostat set to do Ignition/Extinguishing
	1	Room Thermostat set to do Run Mode/Modulation
	2	Room Thermostat set to do Run Mode/Standby
	3	Room Thermostat set to block the plant pump until water temperature<**Th21** Thermostat
	4	Room Thermostat set to do Run Mode/Standby and block the plant pump until water temperature<**Th21** Thermostat
	5	Room Thermostat stops the fan heater or set it at Power 1.
A03	0	Heating Fan is disabled in Standby
	1	Heating Fan at Power 1 in Standby
A06	0	In Modulation the system uses Power 1
	1	In Modulation the system uses Modulation Power
A07	0	External Chrono set to do Ignition/Extinguishing
	1	External Chrono set to do Run Mode/Modulation
	2	External Chrono set to do Run Mode/Standby
	3	External Chrono set to block the plant pump until water temperature**<Th21** Thermostat
	4	External Chrono set to do Run Mode/Standby and block the plant pump until water temperature**<Th21** Thermostat
A08	0	During Ignition the Heating Fan is Off
	1	During Ignition the Heating Fan is On
A10	0	From Extinguishing state it's not possible to go directly to Ignition (first the system goes into Recover Ignition and then goes into Ignition)
	1	From Extinguishing state it's possible to go directly to Check Up
A11	0	If room temperature is under Room Thermostat the Heating Fan is Off
	1	If room temperature is over Room Thermostat the Heating Fan is On
A13	0	Reached the Boiler Thermostat the system goes in Modulation
	1	Reached the Boiler Thermostat the system goes in Modulation, then, if the temperature boiler > (thermostat boiler + **D23**) **,** the system goes in Standby**-** Extinguishing Mode
A14	0	Error Sensor Pressure disabled
	1	Error Sensor Pressure enabled
A16	0	Disable delay time on power changing
	1	Enable delay time on power changing

A19	0	Room Thermostat On/Off selected
	1	Room Probe selected
A26	0	The immediate exit from Standby is allowed
	1	Exit from Standby is allowed after the timer **T13** and if the Exhausting Temperature<**Th28** Thermostat
A27	0	Auger brake not activated
	1	Auger brake activated
A28	0	Break Auger not allowed
	1	Break Auger allowed
A29	0	If the system is in Standby for Room Thermostat or External Thermostat it doesn't exit if a sanitary water demand occurs
	1	If the system is in Standby for Room Thermostat or External Thermostat it exits if a sanitary water demand occurs
A32	0	Internal chrono set to do Ignition/Extinguishing
	1	Internal chrono set to do Run Mode/Modulation
	2	Internal chrono set to do Run Mode/Standby
	3	Internal chrono set to block the plant pump until water temperature<**Th21** Thermostat
	4	Internal chrono set to do Run Mode/Standby and block the plant pump until water temperature<**Th21** Thermostat
A52	0	Room Thermostat Menu of Remote Keyboard disabled
	1	Remote Room Thermostat set to do Run Mode/Modulation
	2	Remote Room Thermostat set to do Run Mode/Standby
	3	Remote Room Thermostat set to block the plant pump until water temperature<**Th21** Thermostat
	4	Remote Room Thermostat set to do Run Mode/Standby and block the plant pump until water temperature<**Th21** Thermostat
A53	0	System Block with error **Er15,** if supply voltage is more than **T89** minutes
	1	System in Recover Ignition if supply voltage is more than **T89** minutes
A57	0	Additional module not present and input IN7 (pin 40-41-42) used for fan encoder
	1	Additional module not present and input IN7 (pin 40-41-42) used for auger encoder
	2	Additional module present
A61	0	Periodic Cleaning enabled only in Run Mode
	1	Periodic Cleaning enabled also in Modulation

7.10 Primary Air Flow Sensor Menu

Menu that allows to set Air Flow Regulator parameters; all parameters are referred to the current recipe: It has four submenu:

1. **Enables**

Code	*Description*	*Min*	*Max*	*Unit*
A24	**0**=Regulator disabled; **1**=Combustion Fan speed regulation; **2**=Combustion fan speed regulation+Auger; **3**=Auger On time regulation; **4**=Auger+Combustion fan speed regulation; **5**=Sensor not present	0	5	[nr]
A25	**0**=nothing to do if regulation error occurs; **1**=in case of regulation error, the regulator has been reset and restart regulation; **2**=in case of regulation error the regulator is disabled	0	2	[nr]
A31	**0**=the regulator comes back on the first output; **1**=the regulator works on the last output always	0	1	[nr]
T19	Waiting time for stabilization of Regulation	5	900	[s]
T20	Waiting time for Out of Range Regulator	10	900	[s]
T80	Waiting time for First Regulation	0	900	[s]
U60	Fan Regulation Step	5	100	[Volt]
		10	500	[RPM]
C60	Auger Regulation Step	0,1	20	[s]
		10	500	[RPM]

2. Range for Air Flow Regulation

Code	*Description*	*Min*	*Max*	*Unit*
FL20	Minimum air flow in Check Up	0	2000	-
FL22	Set air flow for Power 1	0	2000	-
FL23	Set air flow for Power 2	0	2000	-
FL24	Set air flow for Power 3	0	2000	-
FL25	Set air flow for Power 4	0	2000	-
FL26	Set air flow for Power 5	0	2000	-
FL27	Set air flow for Power 6	0	2000	-
FL30	Set air flow for Modulation Power	0	2000	-
FL40	Maximum air flow	0	2000	-

3. Delta Air Flow

Code	*Description*	*Min*	*Max*	*Unit*
FL52	Delta Air Flow for Power 1	0	100	%
FL53	Delta Air Flow for Power 2	0	100	%
FL54	Delta Air Flow for Power 3	0	100	%
FL55	Delta Air Flow for Power 4	0	100	%
FL56	Delta Air Flow for Power 5	0	100	%
FL57	Delta Air Flow for Power 6	0	100	%
FL60	Delta Air Flow for Modulation	0	100	%

7.11 Temperature Delta Menu

Code	*Description*	*Min*	*Max*	*Unit*
D01	Stabilization Delta	0	100	[°C]
D04	Exhausting temperature delta for automatic management of Heating Fan	10	120	[°C]
D05	Room temperature delta for automatic management of Heating Fan	3	30	[°C]
D08	Water delta for power modulation in automatic combustion management	1	30	[°C]
D23	Water Delta to add to the Boiler Thermostat to go in Standby from Modulation at the end of **T43** if **A13**=1	0	50	[°C]
D41	Ignition Delta	0	100	[°C]

7.12 Pressure Sensor Threshold Menu

Code	*Description*	*Min*	*Max*	*Unit*
SP01	Minimum Pressure Sensor threshold	50	3000	[mbar]
SP08	Maximum Pressure Sensor threshold	50	3000	[mbar]

7.13 Modulating Pump Menu

This menu allows to manage the function of the Pump P1 in state of modulation.
Enable this only if the output configured like Pump P1 is V2 or P/V3

Code	*Description*	*Min*	*Max*	*Unit*
A38	Enable Modulating Pump functioning	0	1	[nr]
T70	Timer for Pump at maximum speed (230 V)	1	900	[s]
T71	Control timer for plumbing plant with flow switch	1	900	[s]
T72	Control timer for plumbing plant with buffer	1	900	[s]
VP01	Minimum speed	0	230	[V]
VP02	Middle speed	0	230	[V]
VP03	Maximum speed	0	230	[V]

7.14 Step Pump Menu

Menu to manage the Pump 1 functioning in Step mode

Code	*Description*	*Min*	*Max*	*Unit*
A15	Enable Step Pump management	0	1	[nr]
A23	Pump Thermostat management at the end of step cycle: 0=thermostat at last calculate value; 1=thermostat at the default value	0	1	[nr]
T12	Delay to increase the Pump Thermostat	0	10	[min]
D06	Increase of **Th19** Thermostat	1	10	[°C]
D07	Water delta for final value of Thermostat	0	30	[°C]

7.15 Counters Menu

Menu that allows the control of the counters useful for the diagnosis of the system's life.

Submenu	*Counters Description*
Total time	Total time system feeding
Functioning time	Activity time system: time at least one Fan works
Operating work time	System real heating time: time in which heating is effectively produced (Run Mode and Modulation)
Ignitions' Numbers	Number of done ignition attempts
Failed Ignitions' Numbers	Number of failed ignition attempts
Errors' Numbers	Number of errors occurred.
Counters Reset	Reset all counters: turn to zero all counters

7.16 Output Test Menu

Menu that allows to test the Outputs (and the connected loading) with the system in **Off** state. The Outputs, if enabled, will stop after 30 seconds.

Submenu	*Description*
Combustion Fan	Combustion Fan test
Output V2	Output V2 test
Auger	Auger test
Heating Resistance	Heating Resistance test
Output P/V3	Output P/V3 test
Output Aux1	Output Aux1 test
Output Aux2	Output Aux2 test
Output Aux3	Output Aux3 test

During the Combustion Fan test, the display shows the set value [V] or [RPM] and the RPM of the fan detected by the encoder (if is present): so it is possible to create a conversion table [RPM] / [V] to use for the passage from encoder mode **P25**=**1** to not encoder mode **P25**=**0** in case of encoder breakage.
During the Auger with encoder test, the display shows the set value [V] and the RPM, detected by the encoder. If the auger is without encoder, is only ON/OFF test.

7.17 Restore Default Value Menu

This feature allows to save the parameters set by the manufacturer as the default parameters, to be restored in case the local welfare or installers have made changes that lead to abnormal functioning of the boiler or stove.
To set the default parameters, use System Evolution Software and set the parameter "*Default parameters Restore"* to 1.