

SY250 IDRO 4/8 BUTTONS MANUAL

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1 INTRODUCTION

The Controller SY250 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:



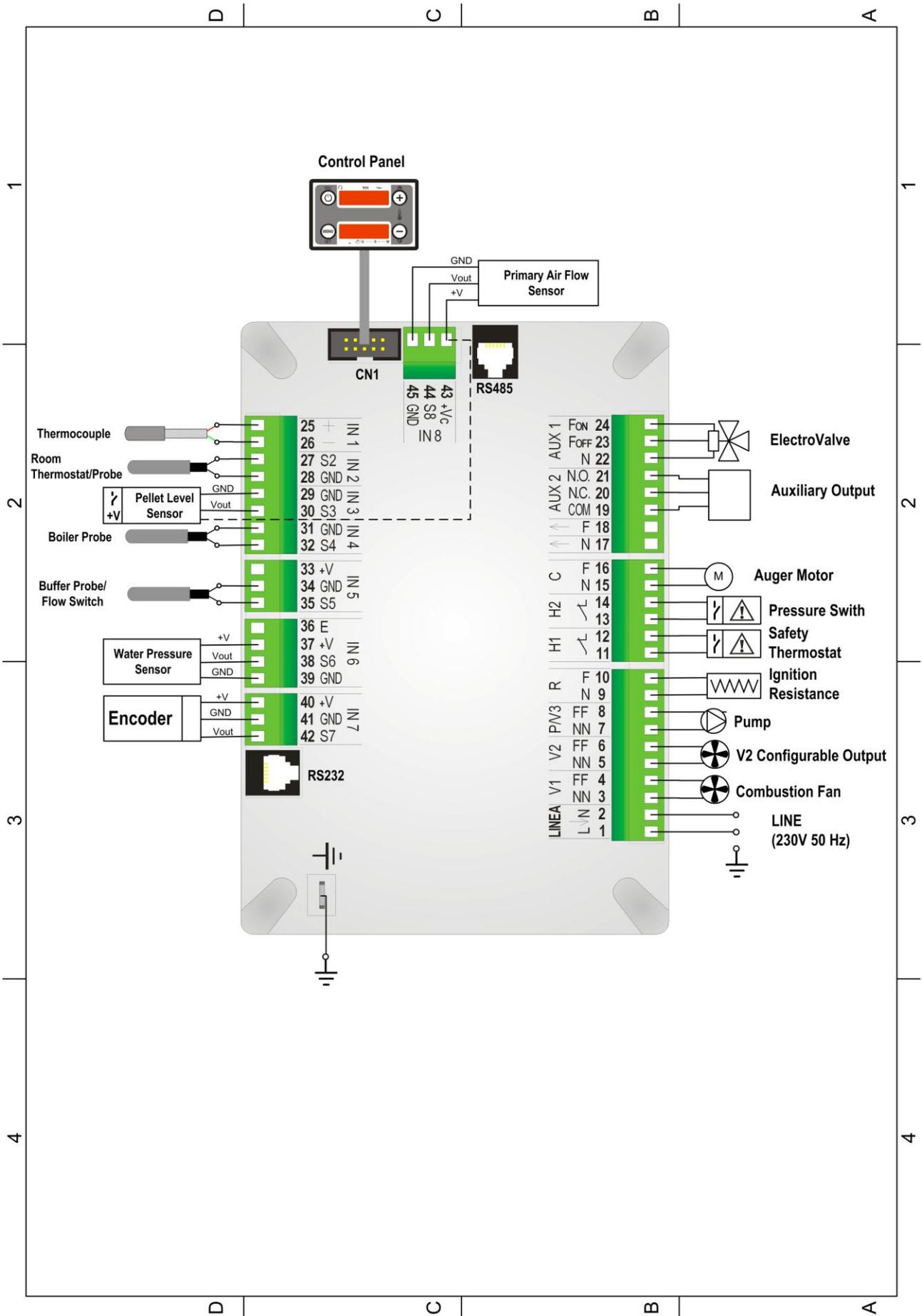
For a correct and secure functioning connect always heart connection.



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.



Pin	Function
1-2	Line 230Vac \pm 10%
3-4	Combustion Fan
5-6	Configurable Output V2: Heating Fan, Safety Pellet Valve or Auger 2, External Loading Pellet Engine, Combustion Fan 2, Cleaning Engine, Output Under Thermostat
7-8	Pump
9-10	Ignition Resistance
11-12	High Voltage 1 Input: Safety Thermostat Short-circuit if not used
13-14	High Voltage 2 Input: Pressure Switch Short-circuit if not used
15-16	Auger Motor
17-21	Configurable Auxiliary Output: Safety Pellet Valve or Auger 2, External Loading Pellet Engine, Cleaning Engine, Output Under Thermostat
22-23-24	Valve
25-26	Thermocouple 25: Red (+) 26: Green (-)
27-28	Room Probe or Thermostat
29-30-43	Pellet Sensor 29: GND 30: signal 43: +12V
31-32	Boiler Probe
33-34-35	Buffer Probe / Flow Switch
36	Non used
37-38-39	Pressure Sensor
40-41-42	Encoder Combustion Fan (if available) 40: +5V 41: GND 42: signal
43-44-45	Primary Air Flow Sensor 43: +12V 44: signal 45: GND
CN1	Connection to the Control Panel
RS232	Serial Connection
RS485*	Serial Connection
	Connect to the Earth CONNECT ALWAYS

* if present

2.2 DIGITAL INPUTS

2.2.1 SAFETY HIGH VOLTAGE 1

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 visualises error High Voltage 1 Safety (**Er01**). If you don't use a rearmed thermostat short-circuit Pins 11-12 of the connector.

2.2.2 SAFETY HIGH VOLTAGE 2

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. On Control Panel displays you can visualises 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.

2.2.3 ENCODER

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 combustion fan. Connect as showed in the table.

2.2.4 PELLET LEVEL INPUT

Setting the parameters **P44** and **P48** in the System Menu it is possible to:

- **P44**=1, 3, 4, 5, 6 and **P48**=1, 3, 4
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**=2 or **P48**=2
If the level falls below the predetermined threshold, the output that controls the Load Pellet Engine is switched on.

If the input is not used, if **P09** =0 short circuit pins 29-30, otherwise leave pins unconnected.

2.3 ROOM PROBE OR THERMOSTAT

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

2.3.1 ROOM PROBE

If a probe is used, set **A19**=1. This probe can read the room temperature; it is a 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:

- **A01** = 0
Room Thermostat not reached: the system goes in Ignition State
Room Thermostat reached: the system goes in Extinguishing State
Button ON/OFF on Control Panel has priority on this input
- **A01** = 1
Room Thermostat not reached: the system goes in Run Mode State
Room Thermostat reached: the system goes in Modulation State
- **A01** = 2
Room Thermostat not reached: the system goes in Run Mode State
Room Thermostat reached: the system goes in Standby State
- **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 until the temperature reaches the **Th21** Thermostat.

This feature is available only if it is selected a plumbing plant different from 4.

If it is set the plant 0 or 2, if there is a sanitary water demand the Pump is not blocked by the Room Thermostat and, if it was previously been blocked by the Thermostat, it is reactivated.

If **A01** = 1, 2, 3 and the input is not used short circuit the relative pins.

2.3.2 ROOM THERMOSTAT

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

- se **A01** = 0
contact open: the system goes in Extinguishing State
contact closed: the system goes in Ignition State
Button ON/OFF on Control Panel has priority on this input
- se **A01** = 1
contact closed: the system goes in Run Mode State
contact open: the system goes in Modulation State
- se **A01** = 2
contact closed: the system goes in Run Mode State
contact open: the system goes in Standby State
- se **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 until the temperature reaches the **Th21** Thermostat. This feature is available only if it is selected a plumbing plant different from 4. If it is set the plant 0 or 2, if there is a sanitary water demand the Pump is not blocked by the Room Thermostat and, if it was previously been blocked by the Thermostat, it is reactivated.

If **A01** = 1, 2, 3 and the input is not used short circuit the relative pins.

2.4 BUFFER PROBE OR FLOW SWITCH

To the connections 34-35 is available a Buffer Probe or a Flow Switch input.

2.4.1 BUFFER PROBE

To use this input as a Probe set the parameter **P26**=2, 3, 4.

This probe is a NTC 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.

2.4.2 FLOW SWITCH

To use a Flow Switch input set the parameter **P26**=0, 1, 5, 6. Leave unconnected the pins if not used.

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 BOILER PROBE

To the connections 31-32 is available the Boiler Probe. With this probe it is possible to read the water temperature of the boiler. This probe is an NTC 10K sensor and its range is 0 ÷ 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 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).

2.5.4 PRIMARY AIR FLOW SENSOR

It allows to detect the speed of the air flow in the air extraction pipe of the stove.

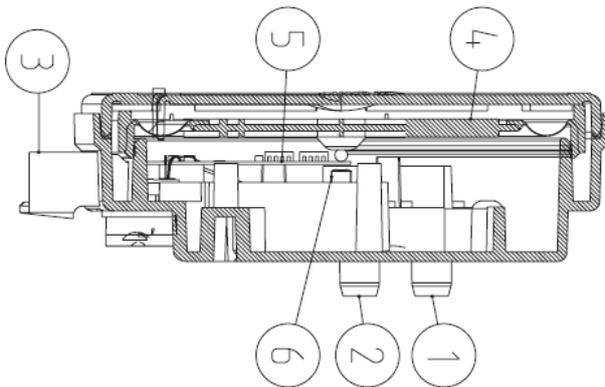
The range is 0 to 2000. In the case of disconnected probe will read a speed value of 0.

In the case of failed adjustment the message **Er17** appears; in case of sensor failure or not properly connected appears the message **Er39**.

You can use an Air Flow Sensor or a Differential Pressure Sensor.

If you use a Differential Pressure Sensor:

- Install it horizontally through the mounting bracket supplied
- The connections for the pressure reading (see the picture details 1 and 2) should be lowered. To read connect to the **P2** connector (see picture detail 2). Leave unconnected the **P1** connector.
- The connections with the control board are: **43**=+12V (red wire), **44**=SEG (yellow wire) **45**=GND (black wire)



Legend:

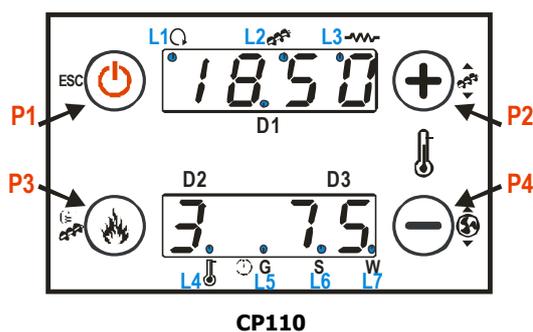
1 Pressure Connection **P1** (high pressure)

2 pressure Connect **P2** (low pressure)

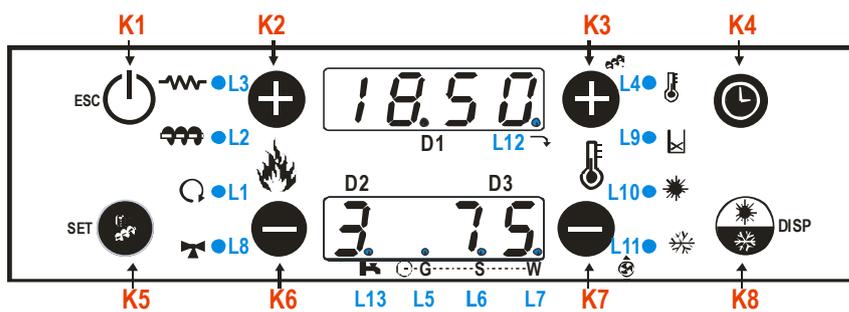
3 Electrical Connections

3 CONTROL PANEL

Setting the parameter **P50** it is possible to select the keyboard connected to the control board. If **P50=0** is selected the keyboard **CP110** (4 keys), if **P50=1** is selected the keyboard **CP120** (8 keys).



CP110



CP120

-Buttons

CP110	Click	Long Pressure
P1	Visualisations / Exit Menu	Ignition / Extinguishing / Block reset
P2	Thermostat modify (+) / Increase data	Pellet loading correction
P3	Combustion Power modify / Save data	Manual pellet loading
P4	Thermostat modify (-) / Decrease data	Combustion Fan speed correction
CP120	Click	Long Pressure
K1	Exit Menu	Ignition / Extinguishing / Block reset
K2	Combustion Power modify (+)	-
K3	Thermostat modify (+) / Increase data	Pellet loading correction
K4	-	Enable Chrono time slot
K5	Input User Menu 2 / Save data	Manual pellet loading
K6	Combustion Power modify (-)	-
K7	Thermostat modify (-) / Decrease data	Combustion Fan speed correction
K8	Visualisations	Summer / Winter choice

-Leds

L1		Led On: Pump On
L2		Led On: Auger On
L3		Led On: Ignition Resistance On
L4		Led On: thermostat temperature reached
L5		G Led On: Daily program selected
L6		S Led On: Weekly program selected
L7		W Led On: Week End program selected
L8		Led On: Valve On
L9		Led On: lack of pellet in the tank
L10		Led On: Summer functioning selected
L11		Led On: Winter functioning selected
L12		Led On: Safety Pellet Valve or Auger 2, or External Loading Pellet Engine, or Cleaning Engine On (only for Output V2)
L13		Led On: there is a sanitary water demand (contact closed). Only for hydraulic systems with flow switch

-Control Panel Configuration:

Pushing at the same time the buttons **P1/P3** or **K1/K5** it is possible to choose the keyboard connected to the control board without enter in System Menu.

-Values shown on the main frame:

Display **D1**: Time, Functioning States, Errors, Menu, Submenu, Parameter value;
Display **D2**: Power, Parameter code; Display **D3**: Main Temperature, Parameter code

-Functioning States:

Check Up (**CHEc**), Ignition (**On 1, On 2, On 3, On 4**), Stabilisation (**On 5**), Modulation (**Mod**), Standby (**StBY**), Run Mode, Safety (**SAF/Erxx**), Extinguishing (**OFF**), Recover Ignition (**rEc**), Block (**Alt/Erxx**).

-Errors:

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
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
Er17	Air Flow Regulator Error
Er18	Run out of pellet
Er39	Air Flow Regulator Sensor broken
Er41	Minimum air flow in Check Up not reached
Er42	Maximum air flow Up reached (F40)

-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).
Hi	Boiler water temperature greater than 99 °C.
SErU	This message notifies that the planned hours of functioning (parameter T66) is reached. It is necessary to call for service.
PULi	This message notifies that the planned hours of functioning (parameter T67) is reached. It is necessary to clean the stove or boiler.
FLu	The message appears in Run Model and indicates that there is a sanitary water demand. (It appears only for plumbing systems with a flow switch).
Ignition Block	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.

3.1 USER MENU 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.

-Visualisations:

tA	Control board room temperature (visible only if A19 =1)
tP	Buffer temperature (visible only if P26 =2, 3, 4)
tF	Exhaust temperature
UF	Combustion Fan speed [RPM/Volt]
FUnC	Funzionamento Modalità Summer (Est)/Winter (InU)
FC	Firmware code and revision: FYSD01000114.00.00 (product without 2Ways) FYSD01000102.00.00 (product with 2Ways)
395	Product Code: 0Y.OX

-Combustion Power Setting:

Click on **P3** or **K2/K6** button: the **D2** display blinks. With other click of the same button the power is changed. Ex.: 1-2-3-4-5-A (A=Automatic combustion). After 5 seconds the new value is saved and the display shows as normal.

-Manual Pellet Loading:

The long pressure of button **P3** or **K5** activates the Pellet Manual Loading with activation of Auger engine in continuous way. The bottom display shows the word **LoAd**, the up display shows the passed loading time. To stop the loading push any button. The loading stops automatically after 300 seconds.

-Pellet Loading Correction:

The long pressure of **P2** or **K3** button activates this function. The bottom display shows **PELL**, the upper display the value. With buttons **P2/P4** or **K3/K7** the value is increased or decreased. Values are

between the range $-7\div7$; the default set is '0'. After 5 seconds the new value is saved and the display shows as normal.

-Combustion Fan Correction:

The long pressure of **P4** or **K7** button activates this function. The bottom display shows **UEnt**, the upper display the value. With buttons **P2/P4** or **K3/K7** the value is increased or decreased. Values are between the range $-7\div7$; the default set is '0'. After 5 seconds the new value is saved and the display shows as normal.

-Enable Chrono (only for CP120 control panel):

With the long pressure of **K4** button it is possible to choose the Chrono Modality.

Daily Program	<input checked="" type="radio"/> G <input type="radio"/> S <input type="radio"/> W	Week-End Program	<input type="radio"/> G <input type="radio"/> S <input checked="" type="radio"/> W
Weekly Program	<input type="radio"/> G <input checked="" type="radio"/> S <input type="radio"/> W	Chrono disabled	<input type="radio"/> G <input type="radio"/> S <input type="radio"/> W

-Summer – Winter Modality (only for CP120 control panel):

With the long pressure of **K8** button it is possible to modify the season.

3.2 USER MENU 2

To enter in Menu:

CP110 control panel (4 buttons keyboard) → push at the same time **P3** and **P4** buttons for 3 seconds

CP120 control panel (8 buttons keyboard) → push the button **K5**

DISPLAY	DESCRIPTION
Air	Menu to modify the heating power. It is visible only if P06 =3 and P44 =6.
TErM	Menu to modify the Buffer Thermostat's (Th58) and Room Thermostat's value.
Cron	Mode Menu to select the Chrono's program modality: Daily, Weekly, Week-End or disabled. Only for CP110 control panel.
	Prog Menu to program the time slots to switch on/off the system for each program modality.
ricE	Menu to select the Combustion Recipes. It is visible only if P04 is different to 1.
rEM	Menu to enable the Remote Keyboard's Room Thermostat. It is visible only if A52 >0.
oroL	Menu to set time and date.
FUnC	Menu to select the Winter or Summer modality. Only for CP110 control panel.
TELE	Menu to enable the Remote Control SYTX. Only for product without 2Ways.
LEAr	Menu to change the transmission code. Only for product with 2Ways.

3.2.1 HEATING POWER MENU

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 **P06**=3 and **P44**=6.

Heating	Description
OFF	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

3.2.2 THERMOSTATS MENU

This Menu allow to modify the most important Thermostats used by the system.

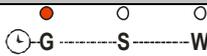
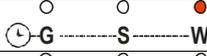
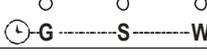
Display	Thermostat	Description
AMb	Room	Menu to modify the Room Thermostat's value. This Menu appears only if A19 =1.
PuFF	Buffer	Menu to modify the Buffer Thermostat's value. This Menu is visible only setting a plumbing system with a Buffer probe (parameter P26 =2, 3, 4).

3.2.3 CHRONO MENU

It allows to program the automatic ignition and extinguishing timer; it has 2 Submenu.

3.2.3.1. ENABLE CHRONO MENU

This Menu is present only for product with the CP120 control panel and allows to select the chrono modality. On display appears the label **ModE**.

MODALITY	LED
Gior : Daily Program	
SEtt : Weekly Program	
FiSE : Week-End Program	
OFF : Programs Disabled	

3.2.3.2. PROGRAMMING MENU

On display appears the label **ProG**. It has 3 sugmenu, one for each program modality:

Daily: it allows to set 3 programs for each day of the week

Weekly: it allows to set 3 programs for all days of the week

Week-End: it allows to set 3 programs for Monday-Friday and 3 programs for Saturday-Sunday

VISUALISATIONS	DISPLAY
Daily Modality: the day	M o
Weekly Modality: Monday-Sunday	M S
Week-End Modality: Monday-Friday	M F
Saturday-Sunday	S S
For On Timer is on the bottom segment on display D2	--- 1 M o
For Off Timer is on the above segment on display D2	--- 1 M o

- Instructions**

For each program it is necessary to set the time on and the time off.

DESCRIPTION	DISPLAY
1) Scroll with the buttons P2/P4 or K3/K7 until the wished Submenu and push the button P3 or K5	G i o r n
2) Push the buttons P2/P4 or K3/K7 to select one of the 3 available programs	--- 1 M o
3) Push the button P1 or K4 for 3 seconds	00.00
4) Select the ignition time	1 M o
5) Push the button P3 or K5 to enter in modify mode: the selected value (hours or minutes) blinks. Push the button P3 or K5 to switch between hours and minutes, P2/P4 o K3/K7 to modify the value.	01.00 1 M o
6) Push the button P3 or K5 to save	21.30 1 M o
7) Select with the button P2 or K3 the Off Timer and repeat the procedure from point 5	00.00 1 M o

For each time is possible to modify minutes with intervals of 15 minutes (e.g.: 20:00, 20:15, 20:30, 20:45).

Only for 11 p.m. is possible to increase minutes from 45 to 59, in order to get an ignition around midnight.

- Program Chrono across Midnight:**

Set for a programming time of a day of the week the time OFF at 23:59. Set the programming time of the following day at the time of ON at 00:00.

Example:

Monday Program Chrono			
ON	22.00 1 M o	23.59 1 M o	OFF
Tuesday Program Chrono			
ON	00.00 1 T u	07.00 1 T u	OFF

3.2.4 COMBUSTION RECIPE MENU

Menu to select the Combustion Recipe. The maximum value is the number of recipes visible to the user. This value can be set in Default Settings Menu (parameter **P04**). If the parameter **P04**=1 the Menu isn't visible.

3.2.5 REMOTE KEYBOARD THERMOSTAT ENABLE MENU

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

3.2.6 TIME AND DATE MENU

This Menu allows to set time and date. The above display shows hour and minutes, the under display shows the day of the week.

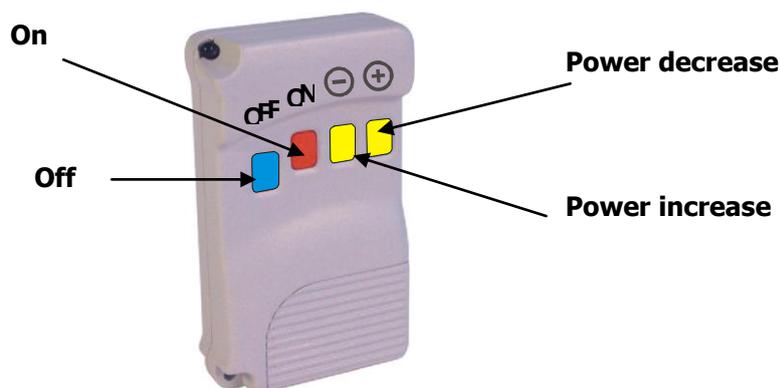
INSTRUCTIONS	DISPLAY
Push the button P3 or K5 to enter editing. The selected value (hours, minutes, days) blinks. To change the value use the P2/P4 or K3/K7 button. Push the button P3 or K5 to switch to modify the other parameters. Push again P3 or K5 to save the set value.	07.33 M

3.2.7 SUMMER - WINTER MENU

Menu to modify the plumbing system functioning according to the season. **Only for CP120 control panel.**

3.2.8 REMOTE CONTROL MENU

This Menu allows to enable and disable the Remote Control SYTX. The system can manage a remote controller that can communicate with the thermoregulator until 10 meters. Using the remote controller's 4 buttons it is possible to switch on/off the thermoregulator and modify the functioning power.



The keys *Decrease/Increase Power* aren't able to work if the combustion power is automatic. It is possible to change the combustion power from Power 1 to Number of users power (parameter **P03**).

3.2.8.1. CHANGE CODE

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

On the Remote Controller:

- Open the battery box and move right the cover, modify the dip-switch's configuration, close the remote controller

On the Control Board

- Switch off the power supply (230V)
- Switch on the power supply pushing the same time one remote controller's button
- Wait (approximately 5 seconds) a controller board 's acoustic signal that confirms the new code.

3.2.9 LEARN MENU

This Menu allows to the control board learning the 2Ways remote controller code. The default code is 1000; if it is necessary to change code because problems of interference with other remote control, set the new code into the Terminal Radio 2Ways Menu. When the remote controller 2Ways is ready to send the new code, enter in the control board's Learn Menu.

In the bottom display 4 lines blink. Wait for the message of the learning done 'YES'. If the controller doesn't receive correctly the new code, the display shows the message "NO". In this case repeat the operation.

3.3 SYSTEM MENU

This menu allows to enter in the Technical Menu. On display appears the label **tPAr**. The access is protected by password; the **default password is "0000"**. **The menu of the product with radio control 2Ways consists only of the Reset Counters Menu (tP11).**

DISPLAY	DESCRIPTION
TP.01	Auger Menu
TP.02	Combustion Fan Menu
TP.03	Heating Fan Menu
TP.04	Thermostats Menu
TP.05	Timer Menu
TP.06	Default Settings Menu
TP.07	Pressure Sensor Menu
TP.08	Enables Menu
TP.09	Temperature Delta Menu
TP.11	Counters Menu
TP.12	Outputs' Test Menu
TP.13	Extinguishing Thermostats Menu
TP16	Air Flow Regulator Menu
TP25	Combustion Fan 2 Menu
TP26	Restore Default Values Menu

3.3.1 AUGER MENU (TPO1)

Menu that allows to set the Auger work time. 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.

Code	Description	Min	Max	Unit
C01	Ignition Power	0	60	[s]
C02	Stabilisation Power	0	60	[s]
C03	Power 1	P27	60	[s]
C04	Power 2	P27	60	[s]
C05	Power 3	P27	60	[s]
C06	Power 4	P27	60	[s]
C07	Power 5	P27	60	[s]
C08	Power 6	P27	60	[s]
C09	Periodic Cleaning Power	0	60	[s]
C10	Second Ignition Power	0	60	[s]
C11	Modulation Power	P27	60	[s]
P05	Auger Period	4	60	[s]
P15	Calibration step of Auger work time	1	20	[%]
P27	Minimum work time	0	60	[s]

3.3.2 COMBUSTION FAN MENU (TPO2)

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, 2) 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.

Code	Description	Min	Max	Unit
U01	Ignition Power	0	230	[Volt]
		300	2800	[RPM]
U02	Stabilisation Power	0	230	[Volt]
		300	2800	[RPM]

U03	Power 1	0	230	[Volt]
		300	2800	[RPM]
U04	Power 2	0	230	[Volt]
		300	2800	[RPM]
U05	Power 3	0	230	[Volt]
		300	2800	[RPM]
U06	Power 4	0	230	[Volt]
		300	2800	[RPM]
U07	Power 5	0	230	[Volt]
		300	2800	[RPM]
U08	Power 6	0	230	[Volt]
		300	2800	[RPM]
U09	Periodic Cleaning Power	0	230	[Volt]
		300	2800	[RPM]
U10	Second Ignition Power	0	230	[Volt]
		300	2800	[RPM]
U11	Modulation Power	0	230	[Volt]
		300	2800	[RPM]
P23	Extinguishing Power	0	230	[Volt]
		300	2800	[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	[%]
P25	0 =Combustion Fan without Encoder; 1 =Combustion Fan with Encoder; 2 =Combustion Fan with Encoder and automatic switch to P25 =0 if there is not encoder signal (alarm Er07)	0	2	[nr]

3.3.3 HEATINGN FAN MENU (TPO3)

Menu to set the Heating Fan parameters. Set these parameters if **P44**=6.

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]

3.3.4 THERMOSTATS MENU (TPO4)

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 Pump Thermostat	30	85	[°C]
Ih19	Activation Pump Thermostat Histeresys	1	20	[°C]
Th20	Sanitary 1 Thermostat	30	85	[°C]
Th21	Sanitary 2 Thermostat	30	85	[°C]

Ih24	Water Boiler Thermostat Histeresys	1	20	[°C]
Th25	Boiler Safety Thermostat	80	99	[°C]
Th26	Boiler Thermostat minimum range	30	60	[°C]
Th27	Boiler Thermostat maximum range	60	95	[°C]
Th28	Exhaust Temperature control in Standby	5	900	[°C]
Ih33	Room Thermostat Histeresys	0	10	[°C]
Th56	Auxiliary Output Thermostat (if P48=3 or P44=3)	30	85	[°C]
Th57	Differential Thermostat Boiler Probe – Buffer Probe	1	30	[°C]
Ih57	Differential Thermostat Histeresys	1	5	[°C]
Ih58	Buffer Thermostat Histeresys	1	20	[°C]

3.3.5 TIMERS MENU (TP05)

Code	Description	Min	Max	Unit
T01	Check up cleaning time	0	900	[s]
T02	Preheating phase	0	900	[s]
T03	Auger Preload	0	900	[s]
T04	Fixed Ignition	1	3600	[s]
T05	Variable Ignition	1	3600	[s]
T06	Stabilisation	0	900	[s]
T07	Periodic cleaning cycle	15	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]
T12	Delay to increase the Pump Thermostat (Th19) in Step mode functioning	0	10	[min]
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 to enter in Standby	0	900	[s]
T23	Pellet tank charging time over minimum level (used if P44 or P48=2)	0	9900	[s]
T24	Length signalling of fuel lack (if P44 and P48=1, 3, 4) or Pellet tank charging time over minimum level (if P44 or P48=2)	0	3600	[s]
T27	Delay to disable Auger 2 (used if P44 or P48=1)	1	900	[s]
T30	Work time of Cleaning Engine (used if P44 or P48=4)	0	9600	[s]
T31	Wait time of Cleaning Engine (used if P44 or P48=4)	1	600	[min]
T40	Delay to enable Auger (used if P44 or P48=1)	0	900	[s]
T41	Work time of Pump	0	3600	[s]
T42	Maximum idle time of Pump	1	900	[ore]
T43	Delay to go in Standby from Modulation if boiler temperature > (Boiler Thermostat+ D23) and A13=1	0	3600	[s]
T46	Work time of Valve	0	3600	[s]
T66	Working time of the system before it goes in Block	0	9999	[ore]
T67	System's working time before appears the message Cleaning	0	9999	[ore]
T68	Delay to restore the Boiler Thermostat's value if there isn't sanitary request	0	900	[s]

3.3.6 DEFAULT SETTINGS MENU (TP06)

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.; 2 =Sensor not used	0	2	[nr]
P20	Configuration of Pressure Boiler Water Sensor	0	2	[nr]

P26	Plumbing system management	0	6	[nr]
P44	Output V2 management (pin 5-6): 0 =Not used; 1 =Safety Pellet Valve or Auger 2; 2 =Load Pellet Engine; 3 =Output controlled by Thermostat; 4 =Cleaning Engine; 5 =Combustion Fan 2; 6 =Heating Fan	0	6	[nr]
P48	Auxiliary Output management (pin 19-20-21): 0 =Not used; 1 =Safety Pellet Valve or Auger 2; 2 =Load Pellet Engine; 3 =Output controlled by Thermostat; 4 =Cleaning Engine	0	4	[nr]
P50	Local Panel Control selection (0 =4 buttons keyboard; 1 =8 buttons keyboard)	0	1	[nr]
P66	Enable RS485	0	1	[nr]

3.3.7 PRESSURE SENSOR THRESHOLD MENU (TPO7)

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

3.3.8 ENABLE MENU (TPO8)

Code	Val.	Description
A01 (see sec. 2.3)	0	Reached the Room Thermostat the system goes in Extinguishing
	1	Reached the Room Thermostat the system goes in Modulation
	2	Reached the Room Thermostat the system goes in Standby
	3	Pump blocked (until water temperature < Th21 Thermostat)
A03	0	In Standby for Room Thermostat the Heating Fan is Off
	1	In In Standby for Room Thermostat the Heating Fan goes at Power 1
A06	0	In Modulation the system uses Power 1: C03, U03
	1	In Modulation the system uses Modulation Power: C11, U11
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 goes at Power 1
A13	0	Reached the Boiler Thermostat the system goes in Modulation
	1	Reached the Boiler Thermostat the system goes in Modulation, then if water temperature > (Boiler Thermostat + D23), at the end of T43 , the system goes in Standby
A14	0	Error Sensor Pressure disabled
	1	Error Sensor Pressure enabled
A15	0	Pump works normally
	1	Enable Step Pump management
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
A23	0	At end of Step Pump cycle, the Thermostat Th19 is at last calculate value
	1	At end of Step Pump cycle, the Thermostat Th19 returns at default value
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
A28	0	Auger brake not activated
	1	Auger brake activated
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

A50	0	Modem management disabled
	1	Modem management enabled
A52	0	Room Thermostat Menu of Remote Keyboard disabled
	1	Reached the Room Thermostat the system goes in Modulation
	2	Reached the Room Thermostat the system goes in Standby
	3	Reached the Room Thermostat the system blocks the Pump until water temperature < Th21 Thermostat

3.3.9 TEMPERATURE DELTA MENU (TP09)

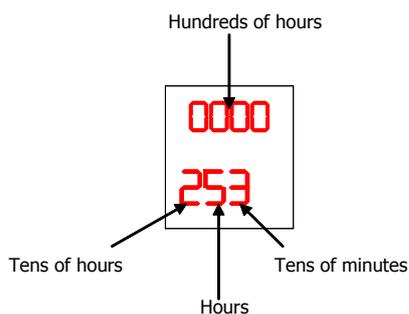
Code	Description	Min	Max	Unit
D01	Stabilisation Delta	0	100	[°C]
D04	Exhausting temperature delta for automatic management of Heating Fan	10	120	[°C]
D05	Room temperature delta for automatic management of Heating Fan	3	30	[°C]
D06	Increase of Th19 Thermostat if the Step mode functioning of Pump is set	1	10	[°C]
D07	Water delta for final value of Thermostat if the Step mode functioning of Pump is set	0	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]

3.3.10 COUNTERS MENU (TP11)

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

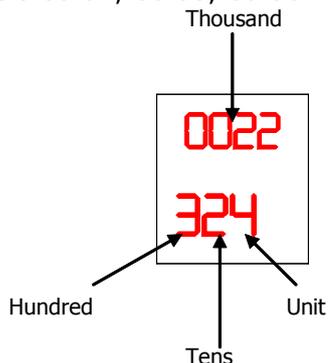
Submenu	Description
Co.01	Total time system feeding
Co.02	Activity time system: time at least one Fan works
Co.03	System real heating time: time in which heating is effectively produced (Run and Modulation)
Co.04	Number of done ignition attempts
Co.05	Number of failed ignition attempts
Co.06	Number of errors occurred.
rES	Reset all counters: turn to zero all counters

The Counters **Co.01**, **Co.02**, **Co.03** have the format:



The image shows a counter that indicates 25 hours and 30 minutes.

The Counters **Co.04**, **Co.05**, **Co.06** have the format:



The image shows a counter that indicates 22324 occur events.

3.3.1 1 OUTPUTS TEST MENU (TP1 2)

Menu that allows to test the Outputs (and the connected loading) with the system in **Off** state.

Submenu	Description
To.01	Auger Test
To.02	Output V2 Test
To.03	Combustion Fan Test
To.04	Heating Resistance Test
To.05	Pump Test
To.06	Valve Test
To.15	Auxiliary Output Test

The Outputs, if enabled, will stop after 30 seconds.

During the Combustion Fan Test, the display shows the set value [Volt] 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] / [Volt] to use for the passage from encoder mode **P25**=1 to not encoder mode **P25**=0 in case of encoder breakage.

3.3.1 2 EXTINGUISHING THERMOSTATS MENU (TP1 3)

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]

3.3.1 3 PRIMARY AIR FLOW SENSOR MENU (TP1 6)

Menu to set the Air Flow Regulator parameters; all parameters are referred to the current recipe: it has 4 Submenu:

1. FL01 - 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 =Air Flow Sensor not installed	0	5	[nr]
A25	0 =Nothing to do if a 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 disable	0	2	[nr]
A31	0 =The regulator comes back on the last output; 1 =The regulator always works on the last output	0	1	[nr]
T19	Waiting time for stabilisation 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]

2. FL02 - Air Flow Regulation Range

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

FL42	Maximum air flow for Power 1	0	2000	-
FL43	Maximum air flow for Power 2	0	2000	-
FL44	Maximum air flow for Power 3	0	2000	-
FL45	Maximum air flow for Power 4	0	2000	-
FL46	Maximum air flow for Power 5	0	2000	-
FL47	Maximum air flow for Power 6	0	2000	-
FL50	Maximum air flow for Modulation Power	0	2000	-

3. FL03 - Combustion Fan Regulation Range

Code	Description	Min	Max	Unit
U22	Minimum speed for Power 1	0	230	[Volt]
		300	2800	[RPM]
U23	Minimum speed for Power 2	0	230	[Volt]
		300	2800	[RPM]
U24	Minimum speed for Power 3	0	230	[Volt]
		300	2800	[RPM]
U25	Minimum speed for Power 4	0	230	[Volt]
		300	2800	[RPM]
U26	Minimum speed for Power 5	0	230	[Volt]
		300	2800	[RPM]
U27	Minimum speed for Power 6	0	230	[Volt]
		300	2800	[RPM]
U30	Minimum speed for Modulation Power	0	230	[Volt]
		300	2800	[RPM]
U42	Maximum speed for Power 1	0	230	[Volt]
		300	2800	[RPM]
U43	Maximum speed for Power 2	0	230	[Volt]
		300	2800	[RPM]
U44	Maximum speed for Power 3	0	230	[Volt]
		300	2800	[RPM]
U45	Maximum speed for Power 4	0	230	[Volt]
		300	2800	[RPM]
U46	Maximum speed for Power 5	0	230	[Volt]
		300	2800	[RPM]
U47	Maximum speed for Power 6	0	230	[Volt]
		300	2800	[RPM]
U50	Maximum speed for Modulation Power	0	230	[Volt]
		300	2800	[RPM]
U60	Regulation Step	5	100	[Volt]
		10	500	[RPM]

4. FL04 - Auger Regulation Range

Code	Description	Min	Max	Unit
C22	Minimum work time for Power 1	0	60	[s]
C23	Minimum work time for Power 2	0	60	[s]
C24	Minimum work time for Power 3	0	60	[s]
C25	Minimum work time for Power 4	0	60	[s]
C26	Minimum work time for Power 5	0	60	[s]
C27	Minimum work time for Power 6	0	60	[s]
C30	Minimum work time for Modulation Power	0	60	[s]
C42	Maximum work time for Power 1	0	60	[s]
C43	Maximum work time for Power 2	0	60	[s]
C44	Maximum work time for Power 3	0	60	[s]
C45	Maximum work time for Power 4	0	60	[s]
C46	Maximum work time for Power 5	0	60	[s]
C47	Maximum work time for Power 6	0	60	[s]
C50	Maximum work time for Modulation Power	0	60	[s]
C60	Regulation Step	0,1	20	[s]

3.3.14 COMBUSTION FAN 2 (TP25)

Menu to set the Combustion Fan 2 parameters. Set these parameters if **P44=5**.

Code	Description	Min	Max	Unit
F01	Ignition Power	0	230	[Volt]
F02	Stabilisation 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]
F23	Extinguishing Power	0	230	[Volt]

3.3.15 RESTORE DEFAULT PARAMETERS MENU (TP26)

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.

4 REMOTE KEYBOARD

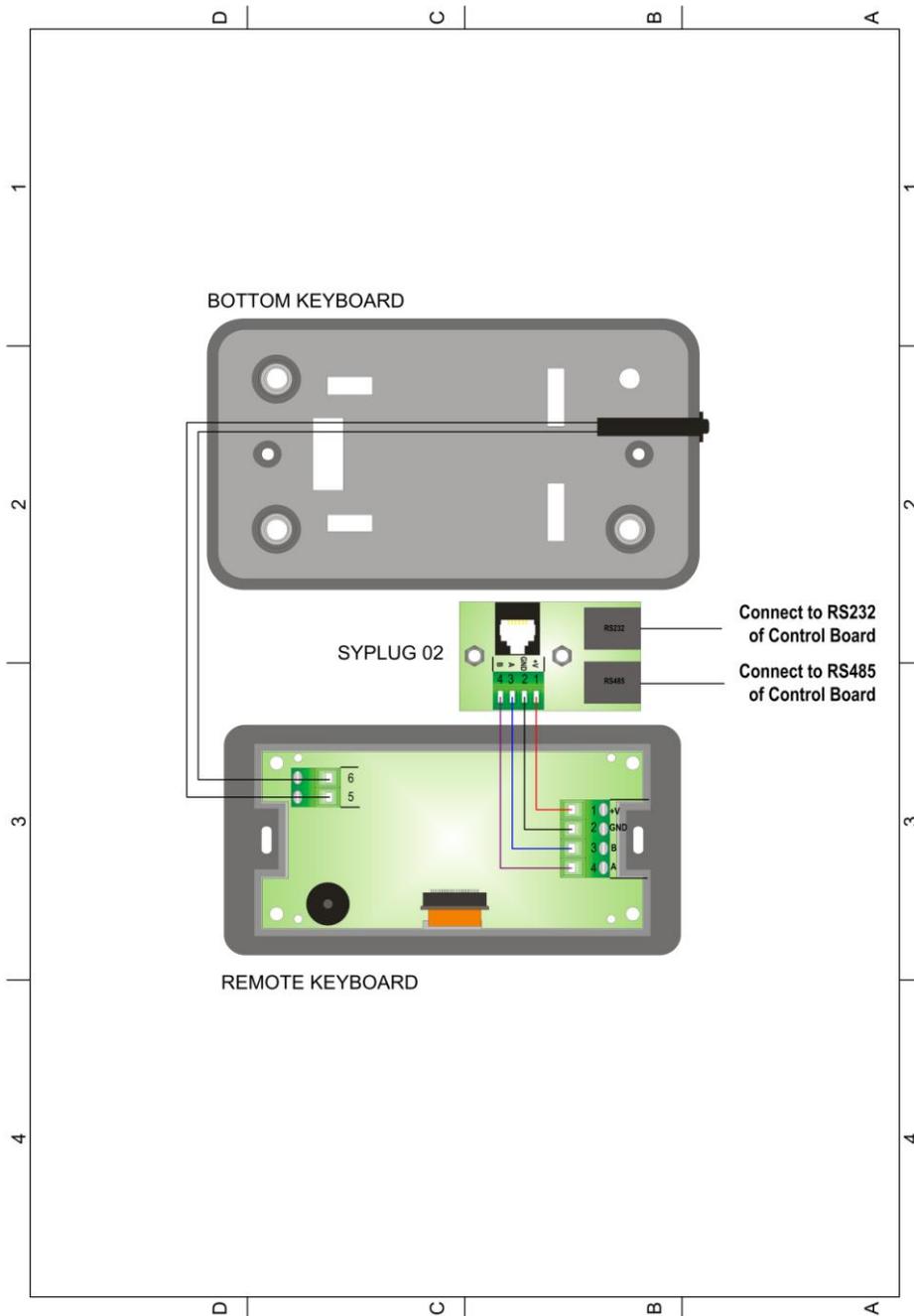
The Remote Keyboard allows the remote control of the system. Its features are similar to the Local Keyboard; on board is present a sensor to detect the room temperature (the temperature displayed on LCD panel is detected by the sensor).

4.1 CONNECTIONS

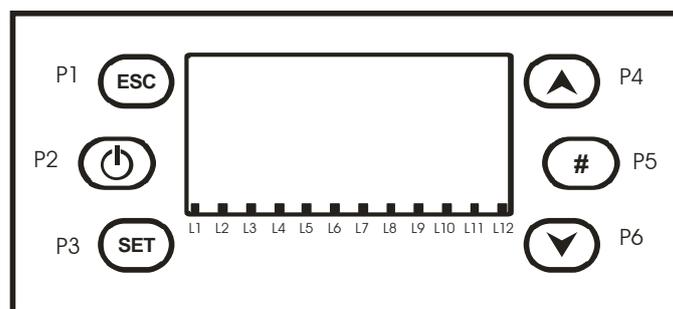
The Remote Keyboard uses the RS485 protocol for connecting the control board. This standard allows links to great distance, with high noise immunity if the protocol instructions are followed.

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.



4.2 CONTROL PANEL



-Buttons

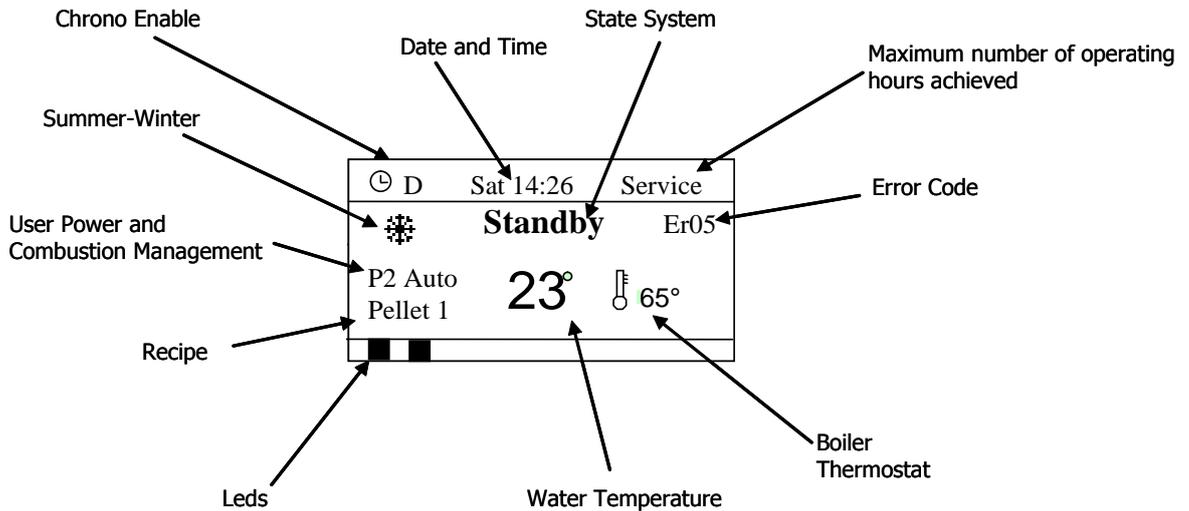
Function	Description	Button
On/Off	Function Ignition, Extinguishing pushing the button for 3 seconds until the acoustic signal	P2
Unblock	Function unblocked when the system is in Block pushing the button for 3 seconds until the acoustic signal	
Modify Menu and Submenu Values	In modify mode change Menus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

-Leds

Function	Description	Led
Heating Resistance	Led On: Resistance ON	L1
Auger	Led On: Auger in the On interval	L2
Pump	Led On: Pump ON	L3
Valve	Led On: Valve ON	L4
Output V2 configured as Pellet Safety Valve or Load Pellet Engine or Cleaning Pipe Engine	Led On: Output V2 ON	L5
Heating Fan	Led On: Heating Fan ON	L6
Output Aux2 configured as Pellet Safety Valve or Load Pellet Engine or Cleaning Pipe Engine	Led On: Output Aux2 ON	L10
Pellet Level	Led On: lack of pellet	L11
External Thermostat	Led On: contact open	L12

* Only for plumbing systems with Flow Switch

-Main Frame:



-Visualizations in the Main Frame: Date and Time, Chrono attivation Modality (D-Daily, W-Weekly, We-Week-End), System Power, Recipe, State System, Error code, Boiler Thermostat value, Water temperature

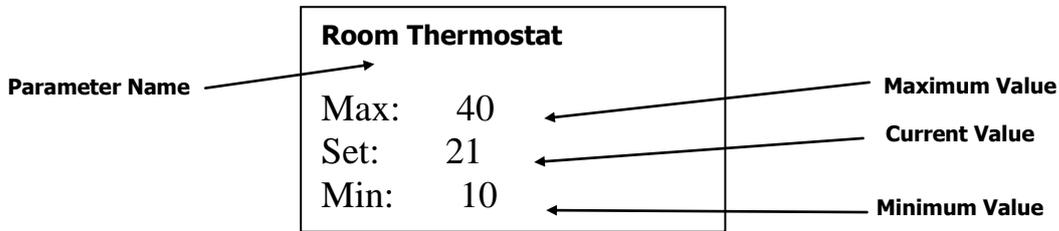
-Visualisations: Menu to visualize some parameter's system value.

Exhaust Temp	103	Exhaust Temperature [°C]
Boiler Temp	55	Boiler Temperature [°C]
Buffer Temp	55	Buffer Temperature [°C] (visible only if P26 =2, 3, 4)
Room Temp	35	Pressure [mbar]
Pressure	1548	Air Flow [cm/s] (visible only if A24 is different from 5)
Air Flow	680	Auger work time [s]
Auger	2.5	Product Code
Product Code 395 – 0000		Controlboard firmware code and version without 2Ways
FSYSD01000114.0.0		Keyboard firmware code and version without 2Ways
FSYSF01000158.0.0		Control Board firmware code and version with 2Ways
FSYSD01000102.0.0		Keyboard firmware code and version with 2Ways
FSYSF01000134.0.0		

4.3 REMOTE KEYBOARD MENU

Display		Description
Room Thermostat	Room Thermostat	Menu which allows to modify the Room Thermostat value.
	Enable	Menu which allows to enable and disable the functioning of Room Thermostat of the Remote Keyboard.
Chrono	Modality	Menu to select the Chrono's program modality: Daily, Weekly, Week-End or disabled.
	Program	Menu which allows to program 3 period of time to switch on and switch off the system for each program modality.
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 light of LCD panel.

Each parameter in Menu consists of the name, the minimum and maximum set, the current value ("Set").



Push **P3** button to enter in edit mode (the field "Set" is blinking), use **P4** and **P6** to increase or decrease the value. 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 "Transfer not successful": in this case modify again the parameter's value.

4.3.1 ROOM THERMOSTAT MENU

Menu to change the value of the Room Thermostat of Remote Keyboard. The menu has two submenus:

- Room Thermostat: it allows to set the thermostat's value
- Enable: it allows to enable/disable the functioning of Thermostat of Remote Keyboard and to combine some functioning at reaching of set room temperature (see section 3.3.8, parameter **A52** explanation)

4.3.2 CHRONO MENU

Menu to set the time to switch on and off the stove or the boiler. It has 2 Submenu: Modality and Program.

4.3.2.1. MODALITY

This Menu allows to:

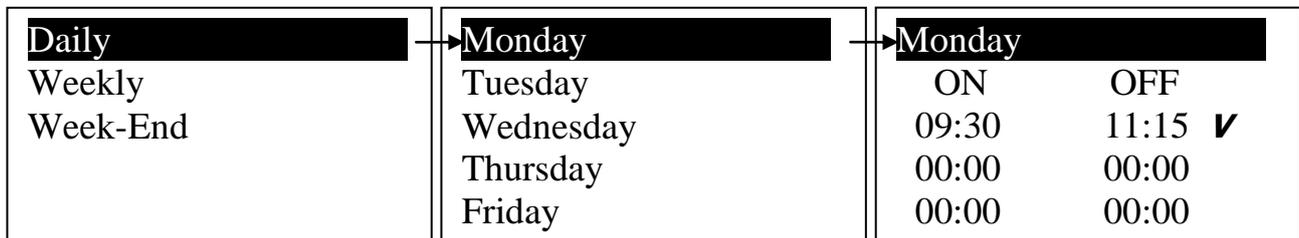
- disable the ignition/extinguishing of the system by chrono
- choice the modality (Daily, Weekly or Week-End) to switch on and off the stove or boiler. If a chrono modality is set, on main frame appears the relating symbol (D=Daily, W=Weekly, We= Week-End)

Procedure Description	Buttons	Display
Modify current modality (the selected modality blinks)	P3	Disable Daily Weekly Week-End
Select the favourite mode	P4 e P6	
Cancel the modifies and restore the old modality	P1	
Save the new setting	P3	
Exit from Menu	P1	

4.3.2.2. PROGRAMMING

This Menu allow to set the time slot the favourite modality (Daily, Weekly, Week-End). If it is selected the modality:

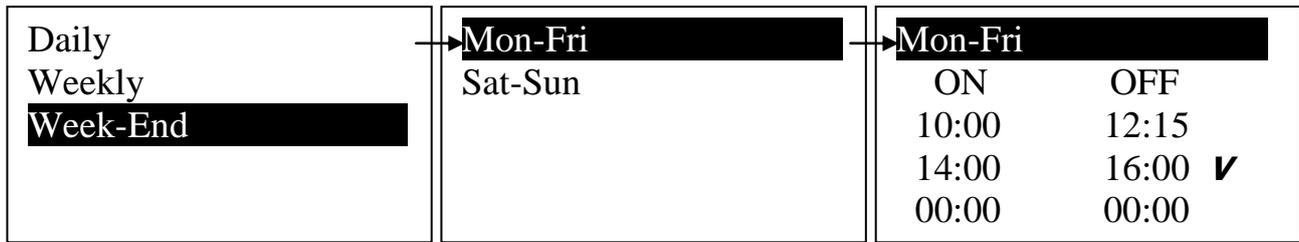
- **Daily:** Select the day of week and program the times to switch on and off the system; for each day there are 3 time slots.



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



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



Program Chrono	Button
After choosing the favourite program:	
Select the programming time	P4 o P6
Enter in modify mode (the selected time blinks)	P3
Modify the timers	P4 o P6
Save program	P3
Enable a program (a "✓" appears) or disable a program (a "✓" disappears)	P5
Exit	P1

Program Chrono across Midnight
Set the hour of On for the previous day to the wanted value: Example 20.30
Set the hour of OFF for the previous day at: 23:59
Set the hour of On for the next day at 00:00
Set the hour of OFF for the next day to the wanted value: Example 6:30
The system will turn on Tuesday, at 20.30, and will turn off on Wednesday, at 6.30.

The 3 programs modality are saved separately: for example, if it is set the daily mode, the others mode aren't modified.

IMPORTANT: after the Chrono programming to switch on the system by Chrono it is necessary to enable the desired mode (Daily, Weekly or Week-End) from Modality Menu.

4.3.3 TIME AND DATE MENU

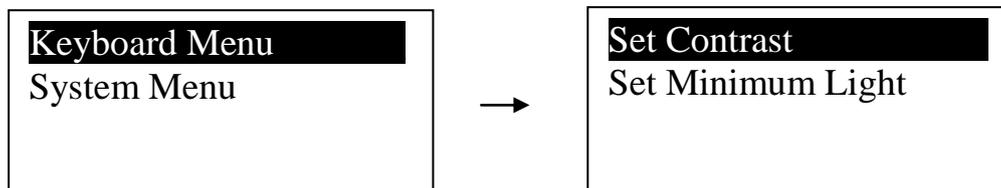
This Menu allows to set time and date. Push the button **P4** and **P6** to select hours, minutes, year, month and day. Push **P3** to enter editing, **P4** and **P6** button to change the value. Push **P3** to save and **P1** to exit.

4.3.4 LANGUAGE MENU

This Menu allows to change the language of LCD panel.

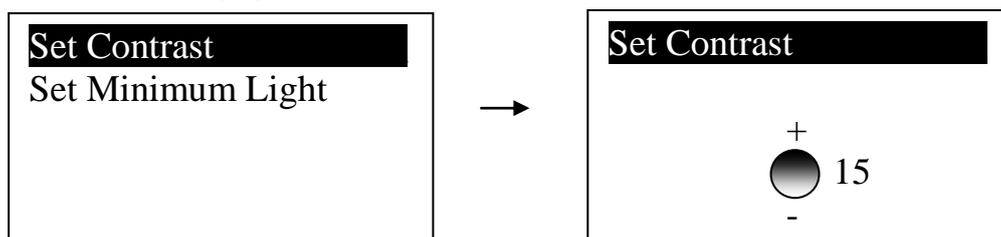
4.4 KEYBOARD MENU

Menu to set the contrast and light of LCD panel.



4.4.1 SET CONTRAST

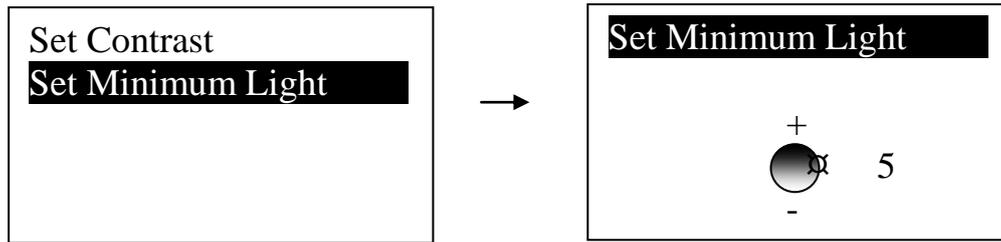
This Menu allows to set the display contrast.



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

4.4.2 SET MINIMUM LIGHT

This Menu allows to set the display light when you don't push any button.



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

5 FUNCTIONING STATES

The functioning of the controller SY250 is managed with functioning **States**, each one is characterised by the control of the system's main functioning parameters, such as the Exhaust temperature, the room temperature, the activation of safeties for functioning errors, etc.

OFF	The system guarantees the SECURITY and ALARMS reading in each functioning phase
CHECK UP	
IGNITION	
STABILISATION	
RECOVER IGNITION	
RUN MODE	
MODULATION	
STANDBY	
SAFETY	
EXTINGUISHING	
BLOCK	

5.1 OFF

PHASE	Timer	Control Thermostats		Combustion		Resistance
				Fan	Auger	
		Exhaust Temp > Th01 thermostat	→ goes in Extinguishing	OFF	OFF	OFF
		Water Temp > Th25 thermostat	→ goes in Block	OFF	OFF	OFF

5.2 CHECK UP

PHASE	Timer	Control Thermostats		Combustion		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		Resistance
				Ventola	Coclea	
<i>Preheating</i>	T02	Exhaust Temp > Th09 thermostat → goes in Run Mode		U01	OFF	ON
<i>Preload *</i>	T03				Always ON	
<i>Fixed *</i>	T04				C01	
<i>Variable *</i>	T05	Exhaust Temp > Th09 thermostat → goes in Run Mode	Exhaust Temp > Th06 thermostat → goes in Stabilisation	I Ignition: U01 II Ignition: U10	I Ignition: C01 II Ignition: C10	OFF Exhaust Temp > Th02 otherwise ON
Control at the end of T05 timer		If Exhaust Temp > Th06 thermostat the system goes in Stabilisation, if Exhaust Temp < Th06 thermostat the system tries again Ignition from Variable Phase; in case of finished number of attempts it goes in Extinguishing with error Er12				

* If the parameters **P44**=1 or **P48**=1 these phase will start at the end of timer **T40**.

5.4 STABILISATION

PHASE	Timer	Control Thermostats		Combustion		Resistance
				Fan	Auger	
	T06	Exhaust Temp > Th09 thermostat → goes in Run Mode	Exhaust Temp < Th06 thermostat → tries again Ignition from Variable Phase. In case of finished number of attempts it goes in Extinguishing with error Er12	U02	C02	OFF Exhaust Temp > Th02 otherwise ON
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 with error Er12				

5.5 RECOVER IGNITION

The system goes in **Recover Ignition**:

- After a Power failure of 1÷50 minutes when 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		Resistance
				Fan	Auger	
<i>Wait</i>	T13	Exhaust Temp > Th01 thermostat	→ starts Timer T13	P23	OFF	OFF
<i>Final Cleaning</i>	T16	Exhaust Temp < Th01 thermostat and T13 finished	→ starts Timer T16	Max Speed		
Control at the end of T16 timer		Goes in Check Up				

5.6 RUN MODE

PHASE	Timer	Control Thermostats		Combustion		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 Timer T14 of pre-extinguishing	User Power	User Power	OFF
		Water Temp. > Boiler Thermostat or Exhaust Temp > Th07 Thermostat or Room Temp. > Room Thermostat and A01=1 * or Room Temp. > Remote Room Thermostat and A52=1 * * This condition is true if there is a sanitary water demand (if it is selected a plumbing system with Flow Switch), or if buffer temperature > Buffer Thermostat Th58 (if P26=2, 3)	→ goes in Modulation			
		Exhaust Temp > Th08 thermostat or Water Temp > Th25 thermostat	→ goes in Safety			
	T22	Room Temp. > Room Thermostat and A01=2 or Buffer Temp. > Buffer Thermostat Th58 and P26=4 or Buffer Temp. > Buffer Thermostat Th58 and P26=2, 3 and Summer Modality or Room Temp. > Remote Room Thermostat and A52=2	→ goes in Standby at the end of T22 timer			
Control at the end of T14 timer		Goes in Extinguishing with error Er03				

5.7 MODULATION

PHASE	Timer	Control Thermostats		Combustion		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 Timer T14 of pre-extinguishing	U11 if A06 =1 otherwise U03	C11 if A06 =1 otherwise C03	OFF
	T22	Room Temp. > Room Thermostat and A01 =2 or Buffer Temp. > Buffer Thermostat Th58 and P26 =4 or Buffer Temp. > Buffer Thermostat Th58 and P26 =2, 3 and Summer Modality or Room Temp. > Remote Room Thermostat and A52 =2 or Water Temp. > (Boiler Thermostat+D23) and A13 =1 and T43 =0	→ goes in Standby at the end of T22 timer			
		Exhaust Temp > Th08 thermostat or Water Temp > Th25 thermostat	→ goes in Safety			
		Water Temp. < Boiler Thermostat and Exhaust Temp < Th07 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		Goes in Extinguishing with error Er03				

5.8 STANDBY

PHASE	Timer	Control Thermostat		Combustion		Resistance
				Fan	Auger	
<i>Extinguishing</i>	T13	Extinguishing of combustion	→ starts Timer T13	P23	OFF	OFF
<i>Final cleaning</i>	T16	At the end of timer T13 if Exhaust Temp < T28 thermostat	→ starts Timer T16	Max Speed		
<i>Wait</i>		At the end of timer T16 if the condition that brought the system in Standby are not longer satisfied	→ starts Timer T11	OFF		
<i>Every phase</i>		Exhaust Temp > Th08 thermostat or Water Temp > Th25 thermostat	→ goes in Safety			
If the condition that brought the system in Standby are not longer satisfied, it goes, at the end of T11 timer, in Check Up: <ul style="list-style-type: none"> • from Wait phase if A26 = 1 • from every phase if A26 = 0 						

To reduce oscillations between state Standby → Ignition → Run Mode → Standby, adjust Room Thermostat Hysteresis and Boiler Thermostat Hysteresis. Anyway Standby lasts at least 10 seconds.

5.9 SAFETY

PHASE	Timer	Control Thermostats		Combustion		Resistance
				Fan	Auger	
<i>Safety from Standby</i>	T15	Exhaust Temp > Th08 thermostat or Water Temp > Th25 thermostat	→ starts Timer T15	P23	OFF	OFF
		Exhaust Temp < Th08 thermostat and Water Temp < Th25 thermostat	→ goes in Standby			
<i>Safety from other States</i>	T15	Exhaust Temp > Th08 thermostat or Water Temp > Th25 thermostat	→ starts Timer T15	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		Goes in Extinguishing with error				

5.10 EXTINGUISHING

PHASE	Timer	Control Thermostats		Combustion		Resistance
				Fan	Auger	
<i>Wait</i>	T13	Exhaust Temp > Th01 Thermostat	→ starts Timer T13	P23	OFF	OFF
<i>Final Cleaning</i>	T16	Exhaust Temp < Th01 Thermostat and T13 finished	→ starts Timer T16	Max Speed		
Control at the end of T16 timer		Goes in Off if there isn't any functioning error, otherwise goes in Block				

5.11 BLOCK

PHASE	Timer	Control Thermostats		Combustion		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 AUTOMATIC COMBUSTION POWER

In the Combustion Power setting, the user can set the Automatic modality [A]. The work power is automatically selected according to the Water Temperature and the value of Boiler Thermostat:

- Water Temperature \leq **Boiler Thermostat-d08** the system goes to the maximum available Combustion Power
- **Boiler Thermostat-d08** < Water Temperature < **Boiler Thermostat** the Combustion Power decreases reaching the Boiler Thermostat
- Water Temperature \geq **Boiler Thermostat** the system goes to Combustion Power 1 if **A06=0** or to Modulation Power if **A06=1**

Example:

Boiler Thermostat=75 °C, **d08**=5 °C, **P03**=5, Modality=Automatic

Water Temperature (°C)	≤ 70	71	72	73	74	≥ 75
Combustion Power	Power 5	Power 4	Power 3	Power 2	Power 1	Power 1

6.2 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**.

6.3 SYSTEM MAINTENANCE 1 FUNCTION

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 goes in **Block**. To unblock it is necessary to reset the counters. To disable this feature set **T66=0**.

6.4 SYSTEM MAINTENANCE 2 FUNCTION

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**.

6.5 CALIBRATION STEP

The user can correct the Auger's times On and the Combustion Fan Speed with step $-5 \div 5$. The parameters and **P15** and **P16** are the percentage value of the single correction step and is applied on the Work default values.

Calibration Combustion Fan 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 calculated values are bounded by parameters **P14** and **P30**.

Calibration Auger 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 calculated values are bounded by parameters **P27** and **P05**.

6.6 OUTPUT V2 MANAGEMENT

It is possible to configure the Output V2 (pins 5-6) setting the parameter **P44**. If this output isn't used set **P44=0**.

6.6.1 PELLET SAFETY VALVE OR AUGER 2

If the parameter **P44**=1 the output is configured as a Pellet Safety Valve or Auger 2.

The output is on when the Auger is enabled to work: if it is used as Safety Valve, the Auger will be on only at the end of timer **T40**; if it is used as Auger 2, it will be Off, compared to the switch off of the first Auger, only at the end of timer **T27**.

State System	Pellet Safety Valve	Auger 2
Check Up	On	Off
Ignition, Stabilisation, Run Mode, Modulation	On	On
Safety	On	Off
Other States	Off	Off

6.6.2 LOAD PELLET ENGINE

If the parameter **P44**=2 the output is configured as a 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**.

6.6.3 OUTPUT UNDER THERMOSTAT

If the parameter **P44**=3 the output is managed by **Th56** Thermostat. If water temperature is greater than **Th56** the output is On, otherwise is Off.

6.6.4 CLEANING ENGINE

If the parameter **P44**=4 the output is configured as a 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**.

6.6.5 COMBUSTION FAN 2

If the parameter **P44**=5 the output is configured as a Combustion Fan 2. Its power is the same of Combustion Fan 1.

6.6.6 HEATING FAN

If the parameter **P44**=6 the output is configured as a Heating Fan.

It has the following functioning:

- If exhaust temperature is greater than Thermostat **T07** the Fan goes at maximum power (230V)
- 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 if **A11**=0 the fan is Off, if **A11**=1 the fan goes at Power 1
 - In Standby 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 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 **D05** (**D05** 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.

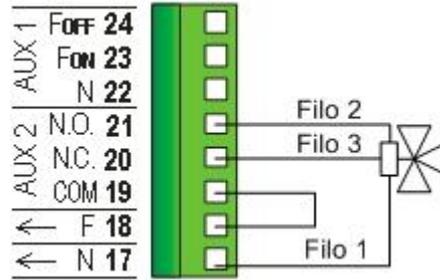
Example:

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

6.7 AUXILIARY OUTPUT MANAGEMENT

It is possible to configure the Auxiliary Output (pins 19-20-21) setting the parameter **P48**. If this output isn't used set **P48=0**. **It is a free contact output.**



6.7.1 PELLET SAFETY VALVE OR AUGER 2

If the parameter **P48=1** the output is configured as a Pellet Safety Valve or Auger 2. **It is necessary to supply the output.** See section 6.6.1 to see how it works.

6.7.2 LOAD PELLET ENGINE

If the parameter **P48=2** the output is configured as a Load Pellet Engine. **It is necessary to supply the output.** See section 6.6.2 to see how it works.

6.7.3 OUTPUT UNDER THERMOSTAT

If the parameter **P48=3** the output is managed by **Th56** Thermostat. It can be used to give consent to an external system (e.g a boiler) or, if it is supplied as shown upon, to control a valve or other device. If water temperature is greater than **Th56** it is guaranteed a voltage between pins 19-21, otherwise it is guaranteed a voltage between pins 19-20.

6.7.4 CLEANING ENGINE

If the parameter **P48=4** the output is configured as a Cleaning Engine. **It is necessary to supply the output.** See section 6.6.4 to see how it works.

6.8 PERIODIC CLEANING OF BRAZIER

Periodical Cleaning of brazier occurs in Run Mode for a time **T08** with a repetition time equal to **T07** timer. During the cleaning phase the, Exhaust Fan goes to at **U09** power and the Auger at **C09**.

6.9 PRIMARY AIR FLOW SENSOR

The Control Board is designed for reading a Combustion Air Flow Sensor. Estimating the air flow speed of the inlet it 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 minimum speed allowed for each power
 - **FL42, FL43, FL44, FL45, FL46, FL47, FL50** the Air flow maximum speed 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: **0**=Regulator Disabled; **1**=Combustion Fan regulation; **2**=Combustion Fan+Auger regulation; **3**=Auger regulation; **4**=Auger+Combustion Fan regulation; **5**=Regulator not present;

- Minimum e maximum range for each output:

Output	Min Regulation	Max Regulation
Combustion Fan	U22, U23, U24, U25, U26, U27, U30	U42, U43, U44, U45, U46, U47, U50
Auger	C22, C23, C24, C25, C26, C27, C30	C42, C43, C44, C45, C46, C47, C50

- 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 check if this value is in the range for the current System Power. 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**, the Auger's time work is decreased of **C60**
 - **Read value upper than Air flow maximum Speed**
The Combustion Fan speed is decreased of **U60**, the Auger's time work is increased of **C60**

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.

6.10 PLUMBING SYSTEMS CONFIGURATION

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

Block of Plant Pump for Room Thermostat/Probe:

- This feature is available if water temperature is greater than **Th19** Thermostat
- This feature is not available in plant 4; in plants 0 and 2 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=Pump P1 -> Pins 7 – 8;

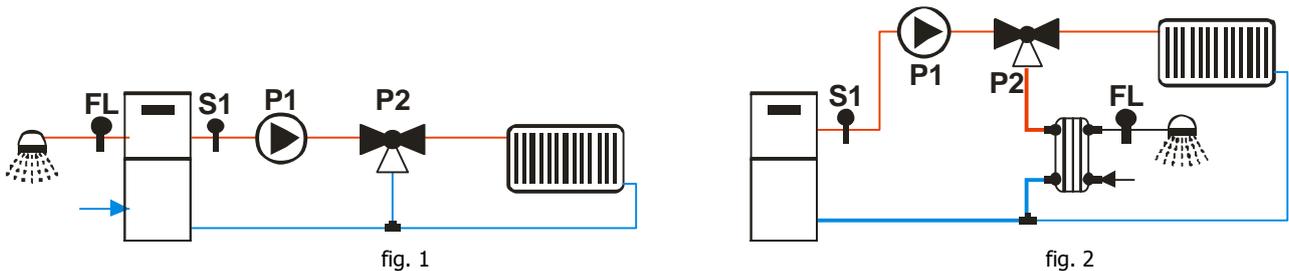
P2=Pump P2 or Valve -> Pins 22 – 23 – 24

For Output P2 Off is guaranteed a voltage between pins 22-23, for Output P2 On is guaranteed a voltage between pins 22-24

S1=Boiler Probe -> Pins 31 – 32; **S2**=Buffer Probe -> Pins 34-35, **FL**=Flow Switch -> Pins 34-35

CONFIGURATION 0

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



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 active.

Sanitary Water 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 active. If the water temperature exceeds the value of the **Th21** thermostat the valve switches to the system.

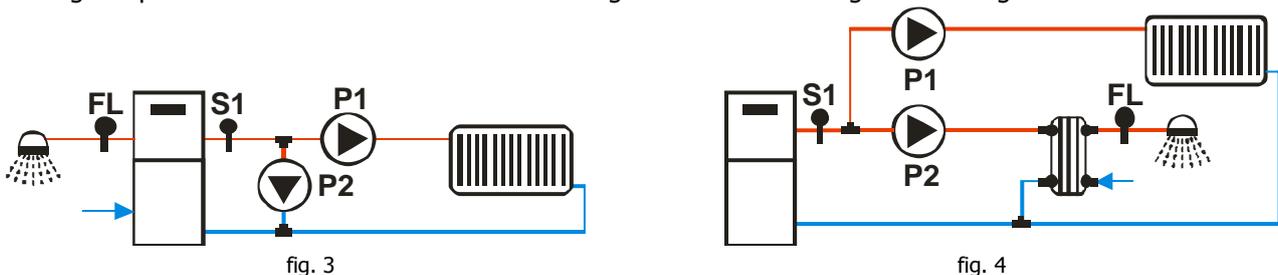
Example:

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

Water Temperature	Flow Switch	Modality	Valve P2	Pump P1
$T < 5^{\circ}\text{C}$			Plant (OFF)	ON
$5^{\circ}\text{C} \leq T < 30^{\circ}\text{C}$			Plant (OFF)	OFF
$30^{\circ}\text{C} \leq T < 40^{\circ}\text{C}$			Sanitary (ON)	ON
$40^{\circ}\text{C} \leq T < 70^{\circ}\text{C}$	Open	Winter	Plant (OFF)	ON
		Summer		OFF
	Close		Sanitary (ON)	ON
$T \geq 70^{\circ}\text{C}$			Plant (OFF)	ON

CONFIGURATION 1

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



Heating Plant

The Pump is On if the water temperature is greater than **Th19** Thermostat. When there is a demand of domestic water the Pump is blocked.

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 active.

Sanitary Water 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 **Th20** thermostat's value the Pump P2 is on. If 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	Pump P2	Pump P1
$T < 5^{\circ}\text{C}$			OFF	ON
$5^{\circ}\text{C} \leq T < 30^{\circ}\text{C}$			OFF	OFF
$30^{\circ}\text{C} \leq T < 40^{\circ}\text{C}$			ON	OFF
$40^{\circ}\text{C} \leq T < 70^{\circ}\text{C}$	Open	Winter	OFF	ON
		Summer	OFF	OFF
	Close		ON	OFF
$T \geq 70^{\circ}\text{C}$			OFF	ON

CONFIGURATION 2

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

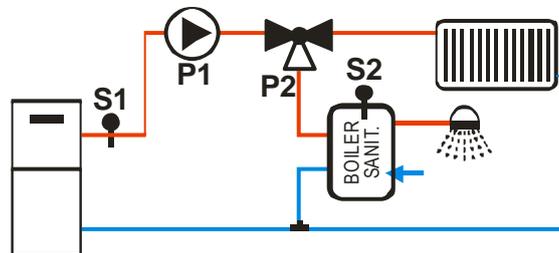


fig. 5

Heating Plant

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

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 active.

Sanitary Water Plant

If boiler water temperature is lower than **Th58** thermostat, is higher than **Th20** thermostat and the differential temperature between S1 probe and S2 probe is over than **Th57** thermostat the Valve P2 is active. If the water temperature exceeds the value of the **Th21** thermostat 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

Temp. Probe S1	Temp. Probe S2	Modality	Differential	Valve P2	Pump P1	
$T < 5^{\circ}\text{C}$				Plant (OFF)	ON	
$5^{\circ}\text{C} < T < 50^{\circ}\text{C}$				Plant (OFF)	OFF	
$50^{\circ}\text{C} < T < 65^{\circ}\text{C}$	$T < 55^{\circ}\text{C}$		$< 5^{\circ}\text{C}$	Plant (OFF)	OFF	
			$\geq 5^{\circ}\text{C}$	Sanitary (ON)	ON	
	$T > 55^{\circ}\text{C}$	Winter	$< 5^{\circ}\text{C}$	$\geq 5^{\circ}\text{C}$	Plant (OFF)	OFF
		Summer	$\geq 5^{\circ}\text{C}$	$\geq 5^{\circ}\text{C}$	Sanitary (ON)	ON
$65^{\circ}\text{C} < T < 70^{\circ}\text{C}$	$T < 55^{\circ}\text{C}$		$< 5^{\circ}\text{C}$	Plant (OFF)	OFF	
			$\geq 5^{\circ}\text{C}$	Sanitary (ON)	ON	
	$T > 55^{\circ}\text{C}$	Winter			Plant (OFF)	ON
		Summer	$< 5^{\circ}\text{C}$		Plant (OFF)	OFF
		Summer	$\geq 5^{\circ}\text{C}$	Sanitary (ON)	ON	
$T > 70^{\circ}\text{C}$				Plant (OFF)	ON	

CONFIGURATION 3

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

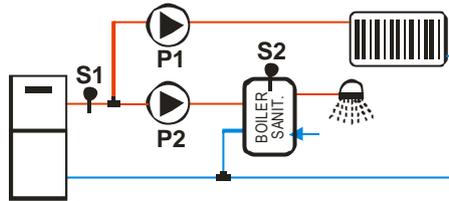


fig. 6

Heating Plant

The pump P1 is activated above the **Th19** thermostat if the difference between the temperature read by probes S1 and S2 is less than the **Th57** thermostat or water boiler has reached the desired temperature (thermostat Puffer **Th58**). To avoid freezing, the Pump is on if the water temperature is below the thermostat **Th18**. If water temperature exceeds the **Th21** thermostat's value, the Pump is always on.

Sanitary Water Plant

Pump P2 has to heat the water inside the sanitary boiler. It will be on 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 water temperature exceeds the value of the **Th21** thermostat for safety reasons the Pump P2 is always on.

Example:

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

Temp. Probe S1	Temp. Probe S2	Modality	Differential	Pump P2	Pump P1
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	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:

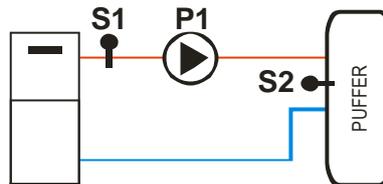


fig. 7

Loading Puffer

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

Example:

Th19 = 40 °C, **Th21** = 70 °C, **Th57** = 5 °C

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

CONFIGURATION 5

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

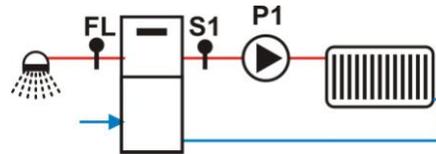


fig. 8

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 water temperature exceeds the **Th21** thermostat's value for safety reasons the Pump is always active.

Sanitary Water Plant

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

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

Example:

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

Water Temperature	Modality	Flow Switch	Pump
$T < 5^{\circ}\text{C}$			ON
$5^{\circ}\text{C} < T < 40^{\circ}\text{C}$			OFF
$40^{\circ}\text{C} < T < 70^{\circ}\text{C}$	Summer		OFF
	Winter	Close	OFF
	Winter	Open	ON
$T > 70^{\circ}\text{C}$			ON

CONFIGURATION 6

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

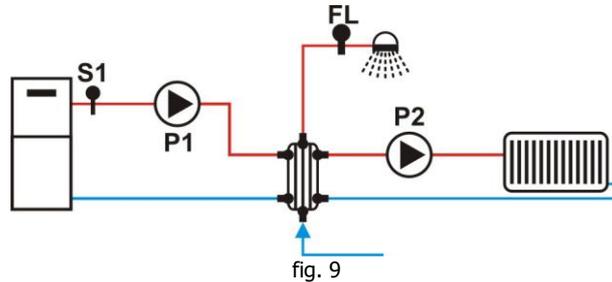


fig. 9

Heating Plant

Pump P2 is on above the **Th19** thermostat if there isn't a sanitary water demand. To avoid the water freezing, pump P2 is on if water temperature is under **Th18** thermostat or over **Th21** thermostat.

Sanitary Water 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

Temp. Probe S1	Flow Switch	Modality	Pump P1	Pump P2
$T < 5^{\circ}\text{C}$			ON	ON
$5^{\circ}\text{C} \leq T < 30^{\circ}\text{C}$			OFF	OFF
$30^{\circ}\text{C} \leq T < 40^{\circ}\text{C}$			ON	OFF
$40^{\circ}\text{C} \leq T < 70^{\circ}\text{C}$	Close		ON	OFF
	Open	Winter	ON	ON
		Summer	ON	OFF
$T \geq 70^{\circ}\text{C}$			ON	ON

6.10.1 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 **Tt19** 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 water temperature exceeds this value the Step mode 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.

6.10.2 PUMP AND VALVE ANTI-LOCK FUNCTION

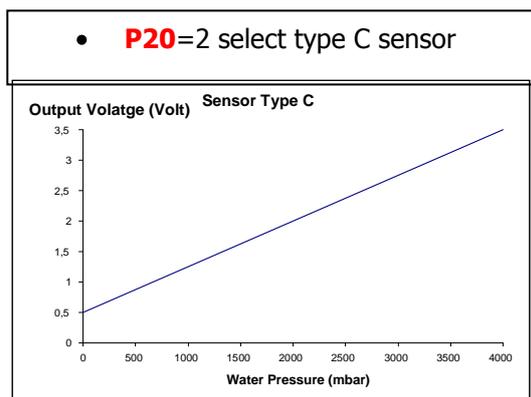
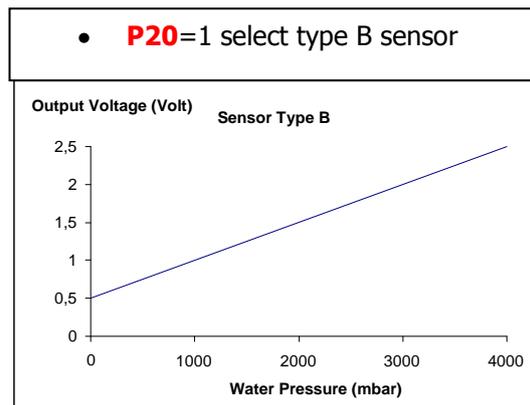
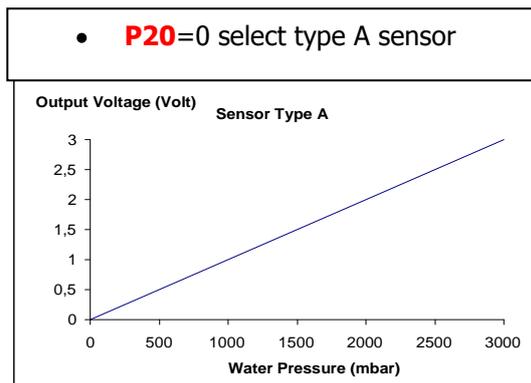
If Pump is off for the time **T42** it will switch on for the time **T41**. If Valve is off for the time **T42** it will switch on for the time **T46**.

6.10.3 SANITARY FUNCTION

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

6.11 SENSOR PRESSURE SELECTION

Setting the parameter **P20** it is possible to select the Water Pressure sensor to use. If:



6.12 SUPPLY VOLTAGE LACK MANAGEMENT

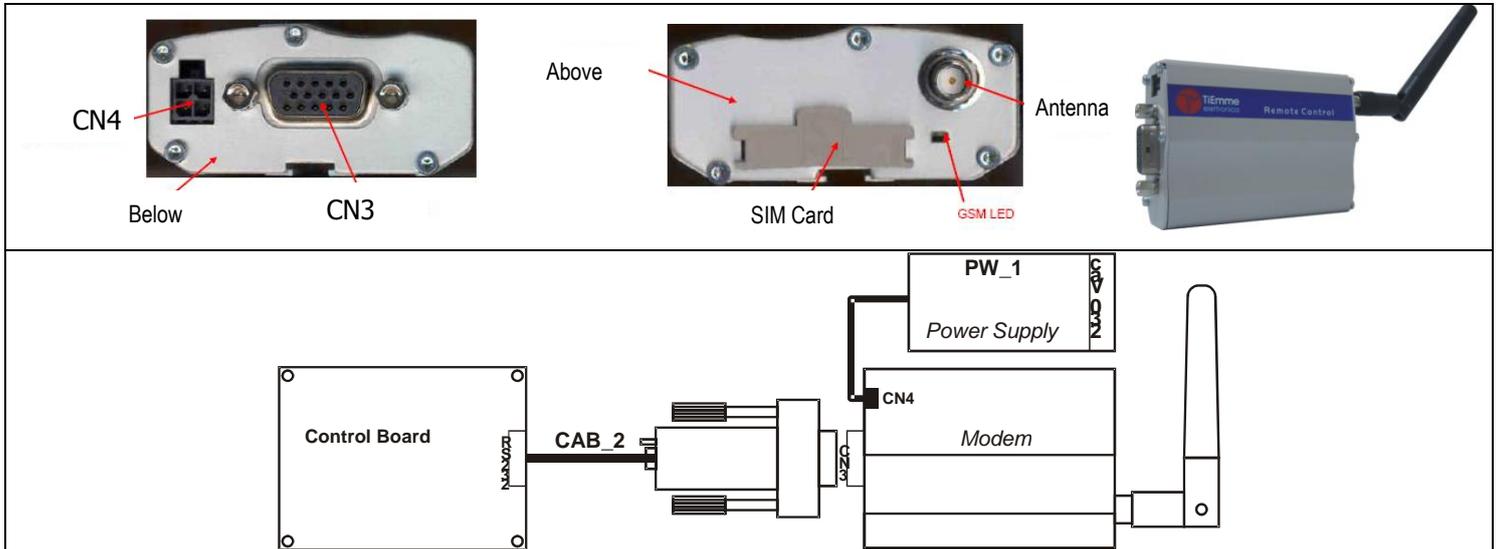
In case of supply voltage lack, the system saves the most important functioning data. With the return of the supply voltage, the system evaluates the saved data and:

- If the lack is less than 60 s the system returns to the state in which it was previously
- If the system was in a On state and lack of voltage is less than 50 min and greater than 60 s, the system goes in Recover Ignition
- In case of prolonged absence of Supply Voltage the systems goes in Block with error message **Er15**

6.13 MODEM BASIC

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



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 a status and a possible alarm error code..

Stop: to start Extinguishing from system On.

The Modem sends back a message to the number from which it received the command with a status and a possible alarm error code.

Status: to ask the system's State.

The Modem sends back a message to the number from which it received the command with a status and a possible alarm error code.

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.

6.14 EXTINGUISHING IN IGNITION PHASE

When the system is switched off during the Ignition phase (after Preheating phase) by an external device or internal chrono, it really goes in Extinguishing when it enters the Run Mode at the end of Ignition.

On display appears the message "**OFF-dEL**".

If it occurs an error the system goes immediately in Extinguishing; if the **P1** or **K1** button are pressed it is possible to get immediately the system in Extinguishing or in Ignition.

7 TECHNICAL DATA

Temperature Controller Code: SY250

Revision: 0.1

Date: 13/04/2012

- ◆ Power supply 230Vac 50/60Hz with protection fuse 5A delayed
- ◆ Control Panel with 8 digit display
- ◆ Management Ignition and Extinguishing system
- ◆ Regulation Exhaust Thermostat
- ◆ Activation Auger
- ◆ Activation Ignition Resistance
- ◆ Activation Output V2
- ◆ Activation Auxiliary Output
- ◆ Activation Pump
- ◆ Activation Valve
- ◆ Regulation Combustion Fan
- ◆ Regulation Modulation and Standby function
- ◆ Safety and alarms functions
- ◆ Signal functions and system state
- ◆ Exhaust Probe
- ◆ Boiler Probe
- ◆ Buffer Probe
- ◆ Room Probe
- ◆ Pellet Sensor
- ◆ Air Flow sensor
- ◆ External Thermostat
- ◆ Flow Switch input
- ◆ Safety Thermostat
- ◆ External Rearmed Thermostat

INPUTS			
Thermocouple	K	T = 0 – 500 °C	2 Conn.
Room Probe	Analogue NTC	T = 0 – 50 °C	2 Conn.
Boiler Probe	Analogue NTC	T = 0 – 110 °C	2 Conn.
Buffer Probe	Analogue NTC	T = 0 – 110 °C	2 Conn.
Pressure switch (HV)		N. C.	2 Conn.
Safety Thermostat (HV)		N. C.	2 Conn.
Flow Switch	ON/OFF	N. A.	2 Conn.
Air Flow sensor	Analogue	F = 0 – 20 m/s	3 Conn.
Pressure Sensor	Analogue	P = 0 – 3 bar	3 Conn.
Encoder*	Digital		3 Conn.
Pellet Sensor	ON/OFF	N.C.	3 Conn.

OUTPUTS (maximum load 5 A)			
Combustion Fan	Regulation with Triac	Feed Line (Max 0.8 A)	2 Conn.
Auger	ON/OFF with Triac	Feed Line (Max 0.8 A)	2 Conn.
Igniter	ON/OFF with Relay	Feed Line (Max 2 A)	2 Conn.
Output V2	ON/OFF or Regulation with Triac	Feed Line (Max 0.8 A)	2 Conn.
Pump	ON/OFF with Triac	Feed Line (Max 0.8 A)	2 Conn.
Valve	ON/OFF with Relay	Feed Line (Max 2 A)	2 Conn.
Auxiliary Output	ON/OFF with Relay	Free Contact (Max 2 A)	2 Conn.

* if present