EasyTech.One

Temperature Controller for Pellet Burner

Burner

- Installing and use simplicity
- Simple and direct user's functions
- Reliable and flexible functioning software with well-established TiEmme elettronica technology
- Advanced functions available for the builder to adapt to different Burners and installations

Product composition:

- Control Board with 4 fixing points, solid and sure.
- Extractable connectors
- Photoresistance or Exhausting Temperature Probe
- Boiler Probe
- Connection cable Main Board-Control Panel
- Control Panel with antistatic cover
- Connector RS232 for the Modem/Computer connection

Safety rules

Before working on the system make follow:

- The accident prevention and Room prevention rules
- The National Institute rules against the work accidents
- The legal safety rules
- These instructions are only for technical personnel only

CE

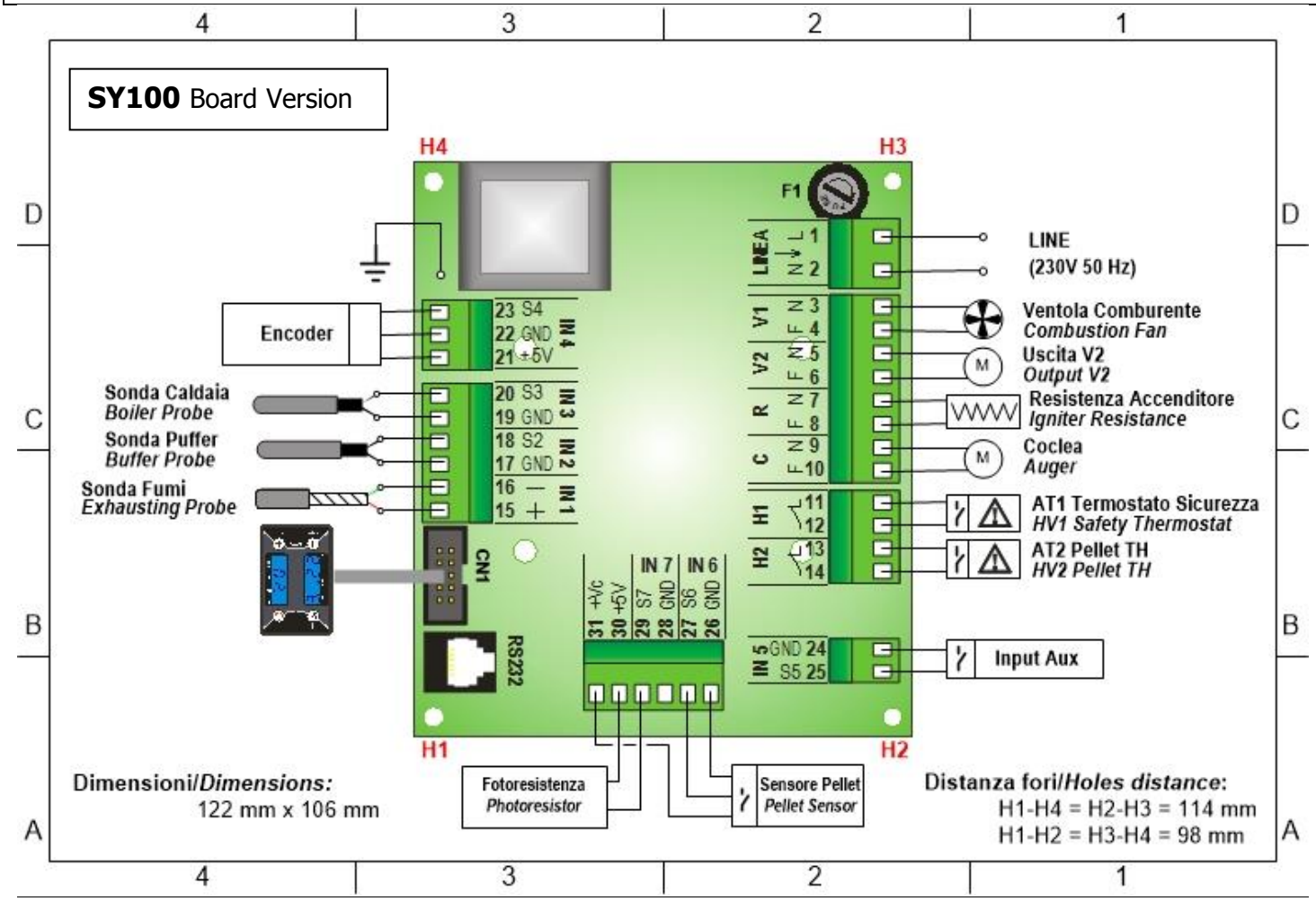
Conformity declaration

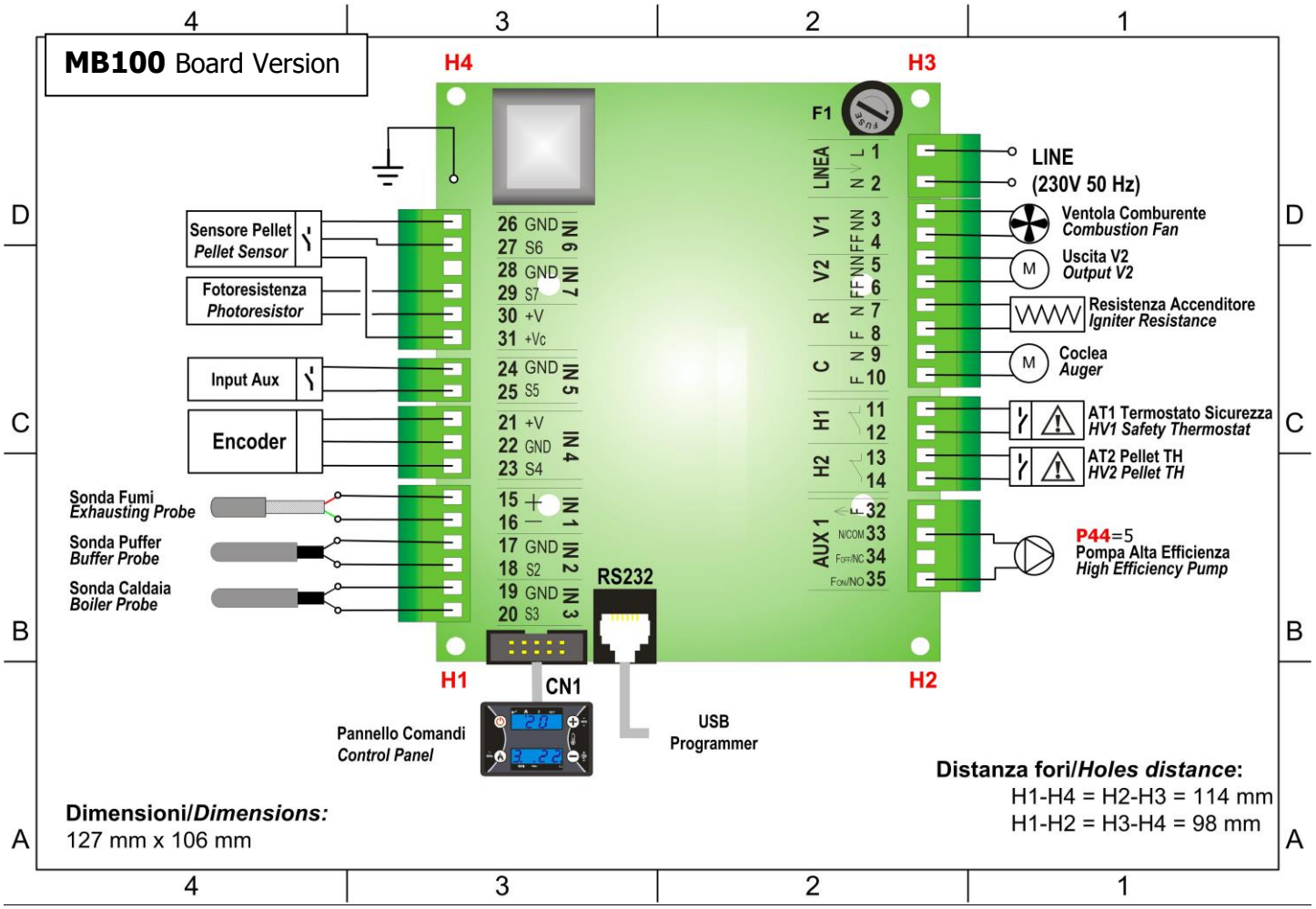
Applied rules: EN 60730-1 50081-1 EN 60730-1 A1 50081-2

For compliance with the CEI EN 55014 you must install upstream a filter EMI properly sized.

This manual is done with care and attention, but the information could be incomplete, not comprehensive or could have mistakes. For this reason the design, the information could be modified without advance notice according to the model.

1 Connections





PIN		Function	Characteristics
1	N	Voltage Power Supply	230 Vac ± 10% 50/60 Hz **F1**= Fuse T5,0 A
2	L		
3	N	Combustion Fan	Triac Regulation 1A max
4	L		
5	N	Configurable Output V2: Pump, Pellet Load Engine, Auger 2, Pellet Safety Valve, Cleaning Engine, Output Under Thermostat	Triac Regulation 1A max
6	L		
7	N	Igniter Resistance	Relè 3 A max
8	L		
9	N	Pellet Auger	Triac Regulation 1A max
10	L		
11		Safety Thermostat Input HV1	Contact ON/OFF Normally closed To Bypass if not used
12			
13		Safety Thermostat Input HV2	Contact ON/OFF Normally closed To Bypass if not used
14			
15	Red +	Exhaust Temperature Probe	Thermocouple K: 500 °C Max
16	Green –		
17		Water Tank Buffer Temperature Probe	NTC 10K @25 °C: 120 °C Max
18			
19		Boiler Temperature Probe	NTC 10K @25 °C: 120 °C Max
20			
21	+5V	Encoder Signal	Signal TTL 0 / 5 V
22	GND		
23	S4		
24		AUX Input: Chrono/Room Thermostat	Contact ON/OFF
25			
26	GND	Level Pellet Sensor	Signal 0 / 5 V
27	SEG		
31	+V		

29	**S7**	Photoresistor	
30	**+5V**		
CN1		Connector to Keyboard	Flat Cable
RS23		Connector RS232	Connection to Modem/Computer
33	**COM/N**	High Efficiency Pump	Relé 3 A max
35	**NO/FON**		
34	**NC/FOFF**		
CN1		Connector for keyboard connection	Flat cable
RS232		Connector RS232	Connection to Programmer, Modem, Computer

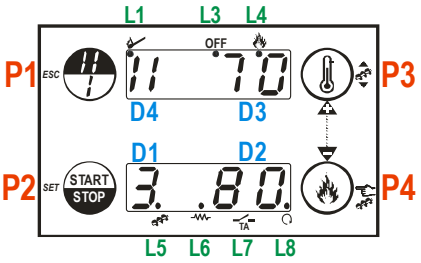
NOTE:

- With the MB100 version, it is possible to control a High Efficiency Pump (pin 33-35) if **P44**=5, the management modality is the same as the Pump (pin 5-6).

2 Control Panel: Use and Functions

2.1 Led

Led	Fix	Blinking
L1	Stabilization phase	Ignition Start phase
L3	Burner OFF	Extinguishing phase
L4	Work phase	Modulation/Standby phase
L5	Auger ON	-
L6	Igniter Resistance ON	-
L7	-	External Thermostat open
L8	Output V2 ON	-



2.2 Display

Display	Fix	Blinking
D1	Work Combustion Power Set	
D2	Boiler Thermostat Set	Combustion Power Change
D3	Boiler Temperature	Boiler Thermostat Change
D4	Selected fuel if **A31**=0 or recipe if **A31**=1. If **A31**=0 the symbol **I** indicates the Pellet Modality **II** indicates the Wood Modality If **A31**=1 the symbol **I** indicates the Pellet recipe 1 **II** indicates the Pellet recipe 2 If **A31**=2 the combustible is only wood. In that case display is always off.	-

2.3 Buttons

Button	Click [P click]	Long Pressure [P long]
P1	Display other data / Esc	Fuel selection if **A31**=0 or Pellet recipe selection if **A31**=1
P2	Set in to the Menu function	Burner Start / Stop
P3	Thermostat Setting/ Increasing Value / Scroll Menu	Pellet Loading Correction
P4	Combustion Power Setting/Decreasing Value/Scroll Menu	Manual Pellet Loading

2.4 Alarms

Safety Thermostat HV1: always signalled	**Block** ALt	**Er01**
Safety Thermostat HV2: always signalled	**Block** ALt	**Er02**
Extinguishing for Lack of Flame	**Block** ALt	**Er03**
Extinguishing for Water over Temperature	**Block** ALt	**Er04**
Extinguishing for Exhaust gas over Temperature	**Block** ALt	**Er05**
Encoder Error: No Encoder Signal (in case of **P25=1** or **2**)	**Block** ALt	**Er07**
Encoder Error: Combustion Fan regulation failed (in case of **P25=1** or **2**)	**Block** ALt	**Er08**
Day, time and data not correct due to prolonged absence of power supply	**Block** ALt	**Er11**
Failed Ignition	**Block** ALt	**Er12**
Lack of fuel	**Block** ALt	**Er18**
Anomaly in probe control during Check Up phase		**Sond**

The reset of the BLOCK Condition is done by the Long Pressure of the button P2

3 User Menu (1)

3.1 Fuel or Recipe Selection

Through a long pushing of the button **P1** is changed the type of fuel if **A31**=0 or the recipe number if **A31**=1.

If **A31**=0:

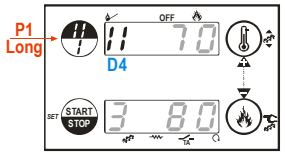
the function is available only in case of **OFF** state

the display **D4** shows the type of fuel (**I**=Pellet fuel managed by Auger Motor and Combustion Fan; **II=**Wood fuel managed only by the Combustion fan)

If **A31**=1:

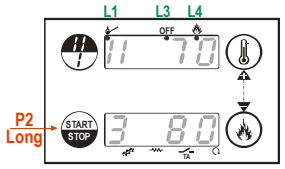
the display **D4** shows the selected recipe (**I**=Recipe 1; **II=** Recipe 2)

If **A31**=0 and the system is working in Wood modality, if **A31** is changed to 1 the system goes in Off State and it works in Pellet modality.



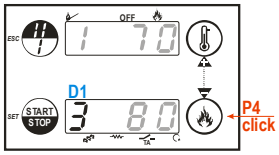
3.2 Ignition/Exstinguishing

The Ignition and Extinguishing are activated with a long pushing of the button **P2**
The Ignition is signalled by the first blinking than fix led **L1**
The Work state is signalled by the fix led **L4**
The Modulation state is signalled by the blinking **L4**
The Extinguishing is signalled by the blinking led **L3**
The Extinguishing finished = OFF state is signalled by the fix led **L3**



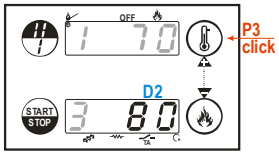
3.3 Combustion Power Setting

Click button **P4:** the display **D1** blinks
Trough the click of the buttons **P4 (**increasing) or **P3** (decreasing) the power is changed according to the values available
Ex.**: 1 – 2 – 3 – 4 – 5 – A** (**A**= Automatic Combustion)
After 5 seconds the new value is memorised and the display shows as normal



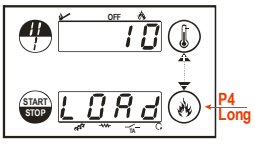
3.4 Work Thermostat Setting

Click button **P3:** the display **D2** blinks
Trough the click of the buttons **P4** (increasing) or **P3** (decreasing) the value of the thermostat is changed.
After 5 seconds the new value is memorised and the display shows as normal



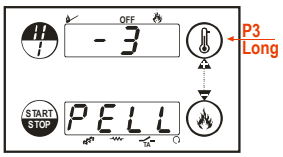
3.5 Manual Pellet Loading

The long pressure of button **P4** activates the Pellet Manual Loading with activation of Auger in continuous way.
The bottom display shows **LoAd** and the upper display shows the elapsed loading time. To stop the loading push any button. The loading stops automatically after 300 seconds



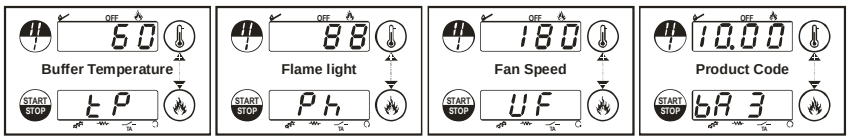
3.6 Pellet Loading Correction

The activation is with a long pushing of the button **P3**
The bottom display shows **PELL,** the upper display shows the blinking value
With buttons **P3 / P4** the blinking value increases or decreases
The values are between the range **– 7 ÷ 7**. The default value is '**0**'
After 5 seconds the new value is memorised and the display shows as normal



3.7 Display

With a click sequence of **P1**
tP= Buffer Probe Temperature (if present)
Ph= Light Value (visible only if **P37**=1 or 2)
UF= Combustion Fan Speed [RPM/Volt]
tF= Exhaust temperature [°C] (if **P37**=0)
bA3
00.00 + Product Code



4 User Menu (2)

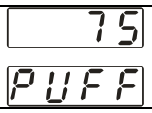
- Push contemporary the buttons **P2** and **P4** for three seconds to enter into User Menu (2)
- To scroll the Menu push the buttons **P3** or **P4**
- To enter in a submenu push the button **P2**
- To modify the blinking value push the button **P3** (to increase) or **P4** (to decrease)
- To exit push the button **P1**

4.1 Thermostats

TErM

4.1.1 Water Buffer Tank Thermostat

it allows to set the Water Buffer Tank Thermostat **Th48**. It is showed in case of **P26**= 1 and **P44**=5



5 INSTALLER MENU

TPAR

Push contemporary the buttons **P2** and **P4** and choose the item **tPAr** to enter in the installer menu protected by password.

5.1 AUGER MENU

TP01

Setting of the **Auger TimeON** defined for each phase/power in the **Auger Period P05**

If a TimeON value is set = 0 the Auger is disabled for the corresponding Power/Phase; if a TimeON value is set ≥ **P05** the Auger works continuously for the corresponding Power/Phase. The TimeON regulation is settable as steps of 0.1 seconds. The set or calculated values are automatically limited in the threshold **P05** and **P27**.

The system uses these values only in Pellet Modality

Code	Description	Min	Max	U	Def.
C01	Auger TimeON Ignition	0	60	[s]	
C02	Auger TimeON Stabilization	0	60	[s]	
C03	Auger TimeON Power 1	**P27**	60	[s]	
C04	Auger TimeON Power 2	**P27**	60	[s]	
C05	Auger TimeON Power 3	**P27**	60	[s]	
C06	Auger TimeON Power 4	**P27**	60	[s]	
C07	Auger TimeON Power 5	**P27**	60	[s]	
C08	Auger TimeON during Periodic Cleaning	0	60	[s]	
C10	Auger TimeON Second Ignition	0	60	[s]	
C11	Auger TimeON Modulation	**P27**	60	[s]	
P05	Total Time Auger Period	4	60	[s]	
P15	Correction Step value of the value Auger TimeON	1	20	[%]	
P27	Minimum Auger TimeON	0	60	[s]	

5.2 COMBUSTION FAN MENU

TP02

Setting of the Combustion fan speed for each power/phase of functioning; the value are referred to the current combustion recipe or combustible. The set or calculated values are automatically delimited between in the thresholds **P14** and **P30**. If **P25**=1: Encoder version (values are in RPM); if **P25**=0: No Encoder version (values are in VOLT).

Code	Pellet Modality	Wood Modality	Min	Max	U	Pellet	Wood
U01	Ignition Speed	- - -	0	230	Volt		- -
			300	2800	RPM		- -
U02	Stabilization Speed	- - -	0	230	Volt		- -
			300	2800	RPM		- -
U03	Power 1 Speed	Power 1 Speed	0	230	Volt		
			300	2800	RPM		
U04	Power 2 Speed	Power 2 Speed	0	230	Volt		
			300	2800	RPM		
U05	Power 3 Speed	Power 3 Speed	0	230	Volt		
			300	2800	RPM		
U06	Power 4 Speed	Power 4 Speed	0	230	Volt		
			300	2800	RPM		
U07	Power 5 Speed	Power 5 Speed	0	230	Volt		
			300	2800	RPM		
U08	Speed during the Periodic Cleaning	- - -	0	230	Volt		- -
			300	2800	RPM		- -
U09	Speed during the Extinguishing	- - -	0	230	Volt		
			300	2800	RPM		
U10	Second ignition Speed	- - -	0	230	Volt		- -
			300	2800	RPM		- -
U11	Modulation Speed	Modulation Speed	0	230	Volt		
			300	2800	RPM		
P14	Combustion Fan Minimum Speed	Combustion Fan Minimum Speed	0	230	Volt		
			300	2800	RPM		
P30	Combustion Fan Maximum Speed	Combustion Fan Maximum Speed	0	230	Volt		
			300	2800	RPM		
P25	**0**=Combustion Fan without Encoder; **1**= Combustion Fan with Encoder; **2**= Combustion Fan with Encoder whit automatic passage to **P25**=0 in case of no signal Encoder: alarm **Er07**		0	2	[nr]		

5.3 THERMOSTATS' MENU

TP04

Code	Description	Probe	Min	Max	U	Def.
L00	Burner OFF Light Value	Photo	0	100	[nr]	

L01	Light Value to Bypass Ignition	Photo	0	100	[nr]	
Th01	System OFF Thermostat	Exhausting	5	900	[°C]	
Th02	Deactivation Igniter Resistance Thermostat	Exhausting	5	900	[°C]	
Th03	Pre-Extinguishing Thermostat for no flame	Exhausting	5	900	[°C]	
Th06	Thermostat to go in Stabilization from Variable phase	Exhausting	5	900	[°C]	
Th07	Modulation Thermostat for Exhausting Over Temperature	Exhausting	5	900	[°C]	
Th08	Safety Thermostat for Exhausting Over Temperature	Exhausting	5	900	[°C]	
Th09	Ignition Bypass Thermostat	Exhausting	5	900	[°C]	
Th18	Antifreeze Thermostat	Boiler	5	10	[°C]	
Th19	Enable Pump Thermostat	Boiler	30	85	[°C]	
Ih19	Enable Pump Thermostat Hysteresis	Boiler	1	20	[°C]	
Th21	Discharge Thermostat (Unblock Pump). Used if **A07** = 3	Boiler	30	85	[°C]	
Ih24	Boiler Thermostat Hysteresis	Boiler	1	20	[°C]	
Th25	Boiler Safety Thermostat	Boiler	80	99	[°C]	
Th26	Minimum Range of Boiler Thermostat	Boiler	30	60	[°C]	
Th27	Maximum Range of Boiler Thermostat	Boiler	60	95	[°C]	
Th28	System OFF Thermostat in Standby	Exhausting	5	900	[°C]	
Th29	Water Boiler Minimum Temperature, in case Wood Modality, goes in the OFF after **T21**	Boiler	30	85	[°C]	
Ih29	Water Boiler Minimum Temperature, in case Wood Modality, goes in the OFF after **T21** Hysteresis	Boiler	1	20	[°C]	
Th47	Boiler Probe – Buffer Probe Differential Thermostat	Buffer	1	30	[°C]	
Ih47	Differential Thermostat Hysteresis	Buffer	1	5	[°C]	
Ih48	Buffer Thermostat Hysteresis	Buffer	1	20	[°C]	
Th56	Output V2 Enable Thermostat (if **P44**=3)	Boiler	30	85	[°C]	
d01	Increasing Delta Temperature in Stabilization	Exhausting	0	100	[°C]	
d08	Delta Water Temperature in the boiler for combustion power in automatic regulation [**A**]	Boiler	1	30	[°C]	
d23	Delta Water Temperature over Boiler Thermostat to go from Modulation to Standby at the end of **T43** if **A13**=2	Boiler	0	50	[°C]	

5.4 TIMER MENU — TP05

Code	Description	Min	Max	U	Def.
T01	Ignition: Cleaning Time	0	900	[s]	
T02	Ignition: Igniter Resistance Pre-heating Time	0	900	[s]	
T03	Ignition: Pre-Load Time	0	900	[s]	
T04	Ignition: Fixed Time	0	3600	[s]	
T05	Ignition: Variable Time	1	3600	[s]	
T06	Ignition: Stabilization Time	0	900	[s]	
T07	Interval Periodic Cleaning Repetition	15	600	[min]	
T08	Periodic Cleaning Time	0	900	[s]	
T09	Delay time HV1 Safety intervention	1	900	[s]	
T10	Delay time HV2 Safety intervention	1	900	[s]	
T11	Delay time for Standby Exit	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]	
T21	Time after which the Burner in case of Wood Modality goes in OFF if the Water Temperature < **Th29**	0	600	[min]	
T22	Delay time for Standby Input	0	900	[s]	
T23	Timer tank filling (if **P44**=2)	0	3600	[s]	
T24	Length signalling of fuel lack if **P44** is different from 2, or length of filling control fuel if **P44**=2	0	3600	[s]	
T27	Delay to disable Auger 2 (used if **P44**=6)	1	900	[s]	
T30	Work time of Cleaning Engine (used if **P44**=4)	0	9600	[s]	
T31	Wait time of Cleaning Engine (used if **P44**=4)	1	600	[min}	
T40	Delay to enable Auger (used if **P44**=1)	0	900	[s]	
T41	Work time of Pump in De-Block function	0	3600	[s]	

T42	Maximum time of inactivity of Pump in De-Block Function	1	900	[h]	
T43	Time, after which the Burner goes from Modulation to Standby if Water Temperature>[Boiler Thermostat+**d23**] and **A13**=1	0	9600	[s]	

5.5 Enable's Menu — TP08

Code		Description	Min	Max	U	Def.
A05	**0**	Manual power change (power level is modifiable by user)	0	2	[nr]	
	1	Automatic power change (power level is modifiable by user)				
	2	Only Auto power change (user is not allowed to select power level)				
A06	**0**	In Modulation the system uses Power 1: **C03**, **U03**	0	1	[nr]	
	1	In Modulation the system uses Modulation Power: **C11**, **U11**				
A07	**0**	The input Aux is used for ON/OFF functioning	0	3	[nr]	Only in Pellet
	1	The input Aux is used for Modulation/Normal functioning				
	2	The input Aux is used for Standby/Normal functioning				
	3	The input Aux is used to block the Pump until water temperature <**Th21** (**P26**=0)				
A13	**0**	Reached the Boiler Thermostat the Burner goes in Modulation	0	1	[nr]	
	1	Reached the Boiler Thermostat the Burner goes in Modulation, then if **d23** is satisfied and **T43** is finished it goes in Standby				
A26	**0**	The immediate Exit from Standby is allowed	0	1	[nr]	Only in Pellet
	1	Exit from Standby is allowed only in the phase Standby OFF				
A28	**0**	Auger brake not activated	0	1	[nr]	
	1	Auger brake activated				
A31	**0**	Product Pellet/Wood	0	2	[nr]	
	1	Product only Pellet				
	2	Product only Wood				
P02	Maximum number ignition attempts		1	5	[nr]	
P03	Work Combustion Powers' number		1	5	[nr]	
P09	Pellet Sensor configuration: 0=N.C., 1=N.O., 2=Not Available		0	2	[nr]	
P26	Plumbing system management (see section 8.8.5)		0	1	[nr]	
P37	Thermocouple (**P37**=0); Photoresistor (**P37**=1);Photo+Thermocouple (**P37**=2) choice		0	2	[nr]	
P44	Output V2 Configuration (pin 5-6): **0**=Not used; **1**=Pellet Safety Valve; **2**=Pellet Load Engine; **3**=Output controlled by Thermostat; **4**=Cleaning Engine; **5**=Pump; **6**=Auger 2		0	6	[nr]	

5.6 Outputs Menu Test — TP12

It allows the test of the single management outputs with the connected devices. The function is available in **OFF** state.

Code	Description	Min	Max	U	
To01	Auger Test	Off	On	-	
To03	Combustion Fan Test	0	230	[Volt]	
		300	2800	[RPM]	
During the Combustion Fan Test, the upper display shows the set value [Volt] o [RPM], the under display shows the RPM of the fan detected by the encoder if it 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					
To04	Igniter Test	Off	On	-	
To05	Output V2 Test	Off	On	-	
To06	High Efficiency Pump Test	Off	On		

5.7 Extinguishing Thermostats Menu — TP13

Settings for each Combustion Phase/Power of the Exhausting Temperature under which, after the Pre-Extinguishing time **T14**, the stove goes in Extinguishing for no flame. **These values occur with the Th03 Thermostat**.

Code	Description	Probe	Min	Max	U	Def.
Th35	Power 1	Exhausting	5	900	[°C]	
Th36	Power 2	Exhausting	5	900	[°C]	
Th37	Power 3	Exhausting	5	900	[°C]	
Th38	Power 4	Exhausting	5	900	[°C]	
Th39	Power 5	Exhausting	5	900	[°C]	
Th43	Modulation Power	Exhausting	5	900	[°C]	

6 Functioning States in Pellet Modality

6.1 Off

Timer	Controls			Combustion Fan	Auger	Igniter
		If Water Temperature> **Th25**	→ goes in **Block**	**OFF**	**OFF**	**OFF**
	Photoresistor **P37**=1 or 2	If Flame Light > **L00**	→ goes in **Extinguishing**			
	Thermocouple **P37**=0	If Exhaust Temperature>**Th01** Thermostat and the last functioning modality was pellet	→ goes in **Extinguishing**			

6.2 Check Up

Timer	Controls			Combustion Fan	Auger	Igniter
T01	**Photoresistor** **P37**=1 or 2	If Flame Light > **L01**	→ goes in **Normal**	**Max Speed**	**OFF**	**OFF**
	Thermocouple **P37**=0	If Exhaust Temperature>**Th01** Thermostat and the last functioning modality was wood	→ goes in **Recover Ignition**			
		If Exhaust Temperature>**Th09** Thermostat and the last functioning modality was pellet	→ goes in **Normal**			

6.3 Pre-Heating

Timer	Controls			Combustion Fan	Auger	Igniter
T02	**Photoresistor** **P37**=1 or 2	If Flame Light > **L01**	→ goes in **Normal**	**U01**	**OFF**	**ON**
	Thermocouple **P37**=0	If Exhaust Temperature>**Th09** Thermostat				

6.4 Pre-Loading

Timer	Controls			Combustion Fan	Auger	Igniter
T03	**Photoresistor** **P37**=1 or 2	If Flame Light > **L01**	→ goes in **Normal**	**U01**	**ON**	**ON**
	Thermocouple **P37**=0	If Exhaust Temperature>**Th09** Thermostat				

This phase doesn't start if P44=1 and T40 isn't finished

6.5 Fixed Phase

Timer	Controls			Combustion Fan	Auger	Igniter
T04	**Thermocouple** **P37**=0	If Exhaust Temperature>**Th09** Thermostat	→ goes in **Normal**	**U01**	**C01**	**ON**

This phase is present only if the system works with the Thermocouple.

6.6 Variable Phase

Timer	Controls			Combustion Fan	Auger	Igniter
T05	**Photoresistor** **P37**=1 or 2	If Flame Light > **L01**	→ goes in **Stabilization**	I Ignition: **U01** II Ignition: **U10**	I Ignition:**C01** II Ignition:**C10**	**ON**
		At the end of **T05** if Flame Light < **L01**	→ tries again Ignition from **Variable phase**			
			→ goes in **Extinguishing** with error **Er12** in case of finished number of attempts			
	Thermocouple **P37**=0	If Exhaust Temperature>**Th09** Thermostat	→ goes in **Normal**			**ON** if exhaust temp.<**Th02**
		If Exhaust Temperature>**Th06** Thermostat	→ goes in **Stabilization**			
		If Exhaust Temperature<**Th06** Thermostat at the end of **T05**	→ tries again Ignition from **Variable phase**			
			→ goes in **Extinguishing** with error **Er12** in case of finished number of attempts			

6.7 Stabilisation

Timer	Controls			Combustion Fan	Auger	Igniter
T06	**Photoresistor** **P37**=1 or 2	If Flame Light < **L01**	→ Tries again Ignition from **Variable phase**	**U02**	**C02**	**OFF**
			→ Goes in **Extinguishing** phase with error **Er12** in case of finished number of attempts			
		At the end of **T06** if Flame Light > **L01**	→ goes in **Normal**			
	Thermocouple **P37**=0	If Exhaust Temperature>**Th09** Thermostat	→ goes in **Normal**	**U02**	**C02**	**ON** if exhaust temp.<**Th02**
		If Exhaust Temperature <**Th06** Thermostat	→ tries again Ignition from **Variable phase**			
			→ goes in **Extinguishing** phase with error **Er12** in case of finished number of attempts			
		At the end of **T06** if Exhaust Temp. > **Th06**+**d01**	→ goes in **Normal**			

6.8 Recover Ignition

The system goes in **Recover Ignition**: after a Power failure while the Burner were in **ON** State as Ignition, Normal, Modulation or if the system is in Extinguishing and you want restart the Burner pushing the button START/STOP.

Timer	Controls			Combustion Fan	Auger	Igniter
T16	**Photoresistor** **P37**=1 or 2	If Flame Light > **L01**	→ goes in **Ignition**		**OFF**	**OFF**
		If Flame Light > **L00**	→ waits	**U09**		
		If Flame Light < **L00**	→ starts Timer **T16**	**Max Speed**		
		At the end of **T16** if Flame Light < **L00**	→ goes in **Check Up**			
	Thermocouple **P37**=0	If Exhaust Temperature>**Th01**	→ waits	**U09**		
		If Exhaust Temperature<**Th01**	→ starts Timer **T16**	**Max Speed**		
		At the end of **T16** if Exhaust Temperature<**Th01**	→ goes in **Check Up**			

6.9 NORMAL

Param.	Controls			Combustion Fan	Auger	Igniter
		If Water Temperature > **Boiler Thermostat**	→ goes in **Modulation**	**User's Power**	**User's Power**	**OFF**
A07=1		If Input Aux open				
	P37=0 or 2	If Exhausting Temperature> **Th07** Thermostat				
		Buffer Temp.>**Buffer Thermostat** and **P26**=1 and **P44**=5	→ goes in **Standby**			
A07=2		If Input Aux open				
T15		If Water Temperature > **Th25** Thermostat	→ starts Timer **T15**			
		At the end of **T15** if Water Temperature>**Th25**	→ goes in **Extinguishing** with error **Er04**			
	P37=0 or 2	If Exhaust Temperature > **Th08** Thermostat	→ starts Timer **T15**			
		At the end of **T15** if Exhaust Temperature>**Th08**	→ goes in **Extinguishing** with error **Er05**			
T14	**Photoresistor** **P37**=1 or 2	If Flame Light < **L00**	→ starts Timer **T14**			
		At the end of **T14** if Flame Light **<L00**	→ goes in **Extinguishing** with error **Er03**			
	Thermocouple **P37**=0	If Exhaust Temp.<**Th03** Thermostat or If Exhaust Temp.<**Extinguishing Thermostat** for the used power	→ starts Timer **T14**			
		At the end of **T14** if exhaust temperature is low	→ goes in **Extinguishing** with error **Er03**			

6.10 MODULATION

Param.	Controls			Combustion Fan	Auger	Igniter
A13=1		If for the time **T43** Water Temperature>**Boiler Thermostat+d23**	→ goes in **Standby**	If **A06**=1 → Power **U11** If **A06**=0 → Power **U03**	If **A06**=1 → Power **C11** If **A06**=0 → Power **C03**	**OFF**
		Buffer temp>**Buffer Thermostat** and **P26**=1 and **P44**=5				
A07=2		If Input Aux open				
T15		If Water Temperature > **Th25** Thermostat	→ starts Timer **T15**			
		At the end of **T15** if Water Temperature>**Th25**	→ goes in **Extinguishing** with error **Er04**			
	P37=0 or 2	If Exhaust Temperature > **Th08** Thermostat	→ starts Timer **T15**			
		At the end of **T15** if Exhaust Temperature>**Th08**	→ goes in **Extinguishing** with error **Er05**			
T14	**Photoresistor** **P37**=1 or 2	If Flame Light < **L00**	→ starts Timer **T14**			
		At the end of **T14** if Flame Light **<L00**	→ goes in **Extinguishing** with error **Er03**			
	Thermocouple **P37**=0	If Exhaust Temp.<**Th03** Thermostat or If Exhaust Temp.<**Extinguishing Thermostat** for the used power	→ starts Timer **T14**			
		At the end of **T14** if exhaust temperature is low	→ goes in **Extinguishing** with error **Er03**			

6.11 STANDBY

Param.	Controls			Combustion Fan	Auger	Igniter
T13 (Extinguishing phase)	**Photoresistor** **P37**=1 or 2	If Flame Light > **L00**	→ starts Timer **T13**	**U09**	**OFF**	**OFF**
		At the end of **T13** if Flame Light **>L00**	→ wait			
	Thermocouple **P37**=0	If exhaust temp.> **Th28** Thermostat	→ starts Timer **T13**			
		At the end of **T13** exhaust temp.>**Th28**	→ wait			
T16 (Final Cleaning phase)	**Photoresistor** **P37**=1 or 2	If Flame Light < **L00**	→ starts **T16**	**Max Speed**		
	Thermocouple **P37**=0	If Exhausting Temp. < **Th28** Thermostat				
(Standby OFF phase)		At the end of **T16**	→ goes in Standby OFF	**OFF**		

6.12 EXTINGUISHING

Param.	Controls			Combustion Fan	Auger	Igniter
T13 (Extinguishing phase)	**Photoresistor** **P37**=1 or 2		→ starts Timer **T13**	**U09**	**OFF**	**OFF**
		At the end of **T13** if Flame Light **>L00**	→ wait			
	Thermocouple **P37**=0	If exhaust temp.> **Th01** Thermostat	→ starts Timer **T13**			
		At the end of **T13** exhaust temp.>**Th01**	→ wait			
T16 (Final Cleaning phase)	**Photoresistor** **P37**=1 or 2	If Flame Light < **L00**	→ starts **T16**	**Max Speed**		
	Thermocouple **P37**=0	If Exhausting Temp. < **Th01** Thermostat				
		At the end of **T16**	→ goes in **Block** if there are errors, otherwise goes in **Off**	**OFF**		

This phase doesn't stop if P44=6 and T27 isn't finished

6.13 BLOCK

Controls	Combustion Fan	Auger	Igniter
To exit: Push for 3 seconds button **P2**. With no more block conditions the system goes in **Off**	**OFF**	**OFF**	**OFF**

7 Functioning States in Wood Modality

The system has the Wood modality only if **A31**=0.

7.1 Off

Timer	Controls	Combustion Fan	Auger	Igniter
		OFF	**OFF**	**OFF**

7.2 Normal

Param.	Controls		Combustion Fan	Auger	Igniter
T21	If Water Boiler Temperature < **Th29**	→ starts Timer **T21**	**User's Power**	**OFF**	**OFF**
	At the end of **T21** if Water Boiler Temperature<**Th29**	→ goes in **Block** with error **Er03**			
	If Water Temperature > **Boiler Thermostat**	→ goes in **Modulation**			
	Buffer Temp.>**Buffer Thermostat** and **P26**=1 and **P44**=5	→ goes in **Standby**			
	If Water Temperature > **Th25** Thermostat	→ goes in **Security**			

7.3 Modulation

Param.	Controls		Combustion Fan	Auger	Igniter
	If Water Temperature > **Th25** Thermostat	→ goes in **Security**	If **A06**=1 → Power **U11** If **A06**=0 → Power **U03**	**OFF**	**OFF**
A13=1	If for time **T43** the water temperature>**Boiler Thermostat**+**d23**	→ goes in **Standby**			

7.4 Standby/ Security

Param.	Controls	Combustion Fan	Auger	Igniter
		OFF	**OFF**	**OFF**

7.5 Block

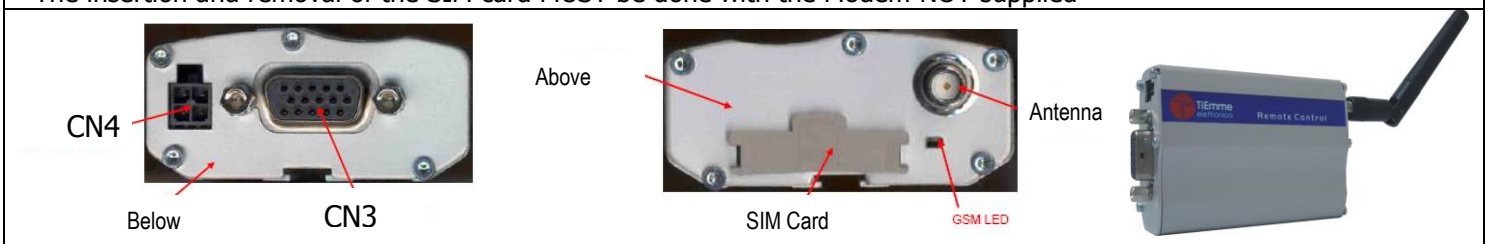
Param.	Controls	Combustion Fan	Auger	Igniter
To exit: Push for 3 seconds button **P2**. With no more block conditions the system goes in **Off**		**OFF**	**OFF**	**OFF**

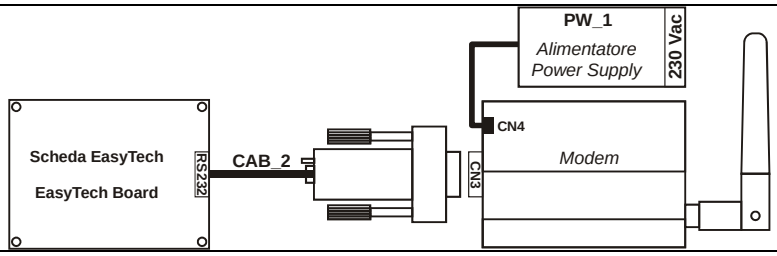
8 FUNCTIONS

8.1 MODEM MANAGEMENT

The system manages a modem module (given on demand) for the dialogue with the Burner 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 insertion and removal of the SIM card MUST be done with the Modem NOT supplied





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 Burner OFF in case of Pellet Modality. The Modem sends back a message to the number from which it received the command with the status, Boiler Temperature and a possible alarm error code.
Stop	To start Extinguishing from Burner ON in case of Pellet Modality. The Modem sends back a message to the number from which it received the command with the status, Boiler Temperature and the alarm error code.
Status	To ask the Burner's State. The Modem sends back a message to the number from which it received the command with the status, Boiler Temperature 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 Boiler status, Boiler Temperature and the alarm error code.
Reset	To unblock/cancel errors that don't need a manual reset.

8.2 SUPPLY VOLTAGE LACK MANAGEMENT

In case of power failure, the system saves the most important functioning data.
When the control board is supplied again, the system evaluates the saved data and if the Burner were ON in the phases Ignition, Normal, Modulation, Standby, the system goes in Recover Ignition.
In case of functioning state of OFF or Block or Wood modality, the system goes back to the previous state.

8.3 COMBUSTION POWER CHANGE DELAY MANAGEMENT

When the system exits from the Ignition and goes in **Normal**, the Combustion Power, starting from the Combustion 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**.

8.4 BRAZIER PERIODIC CLEANING

When the Burner is activated in Pellet Modality, the system automatically starts the brazier's periodic cleaning.
With intervals as Timer **T07** (minutes) the Combustion is taken to Periodic Cleaning Power according to parameters **C08** and **U08** for the Timer **T08** (seconds).

8.5 AUTOMATIC COMBUSTION POWER MANAGEMENT

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 the selected Boiler Thermostat:

- Water Temperature ≤ **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≥**Boiler Thermostat**→The system goes to Combustion Power 1 if **A06=0** or to Modulation Power if **A06=1**

Example: **A06** = 1, Modality = [**A**], **Boiler Thermostat** =75 °C, **d08** = 5 °C, **P03** = 5

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

8.6 PELLET LOAD CORRECTION MANAGEMENT

The user could correct the Auger's times ON of Pellet Loading in Step **– 7 ÷ 7**

P15 is the percentage value of the single correction Step and is applied on the Work default values.							
Example:	**P15**=10%	**C03**=2,0	**C04**=3,0	**C05**=4,0	**C06**=5,0	**C07**=6,0	**C11**=1,0
	Step=-1	**C03**=1,8	**C04**=2,7	**C05**=3,6	**C06**=4,5	**C07**=5,4	**C11**=0,9
The defined values are within the defined range P27 ÷ P05							

8.7 Speed Combustion Fan Management

The parameter **P25** sets the regulation modality of the Exhausting Fan Speed

P25=0	Exhausting Fan without Encoder: the speed is defined by the set voltage value [Volt].
P25=1	Exhausting Fan with Encoder: the speed is defined by the set number of turns [RPM]. In case of signal presence but regulation failed, the system goes in BLOCK with **Er08** alarm. In case of sensor break with absence of the signal, the system goes in BLOCK with **Er07** alarm.
P25=2	Exhausting Fan with Encoder: the speed is defined by the set number of turns [RPM]. In case of signal presence but regulation failed, the system goes in BLOCK with **Er08** alarm. In case of sensor break with absence of the signal, the system goes in BLOCK with **Er07** alarm. After the reset of the **BLOCK** done by the button **P2**, the system goes **Automatically** to **P25=0**

8.8 Output V2 Management

The parameter **P44** allows to manage the functioning of the Output V2: if **P44**=0 the output V2 is not used.

8.8.1 Pellet Safety Valve

If the parameter **P44**=1 the output is configured as a Pellet Safety Valve.
It works in Check Up, Ignition, Stabilisation, Run Mode, Modulation and Safety. When the output is activated, the Auger will be on only when the timer **T40** is finished.

8.8.2 Pellet Load Engine

If the parameter **P44**=2 the output V2 is configured as a Pellet Engine.
When the Pellet Level Sensor signals a lack of fuel, the output is switched on. If in the time **T24** is not reached the set level pellets, the system goes in Extinguishing and the display shows the error message **Er18**. If you fill the tank manually, you can reset the error and restart the system. However if the level is reached, the loading of the material continues for the time **T23**.

8.8.3 Output Under Thermostat

If the parameter **P44**=3 the output V2 is managed by **Th56** Thermostat. If water temperature is greater than **Th56** the output is On, otherwise is Off.

8.8.4 Cleaning Engine

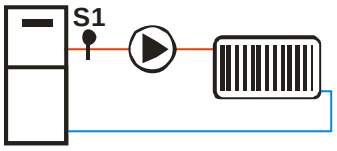
If the parameter **P44**=4 the output V2 is configured as a Cleaning Engine.
The output is On for the time **T30** when the system reaches the operation time **T31** in Run Mode and Modulation. In Wood modality it works only if water temperature is greater than **Th29** Thermostat.

8.8.5 Pump

If the parameter **P44**=5 the output V2 is configured as Pump. It is possible to choose 2 plumbing plants:

P26=0

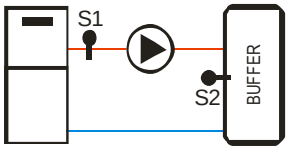
Ex. Th18= 5 °C
Th19= 50°C
Th21= 80°C



System pump is used to supply heating plant.
Pump is enabled if S1 temperature is greater then **Th19** Thermostat.
Pump is always ON if S1 temperature is greater then **Th21** Thermostat and lower than **Th18** Thermostat.

P26=1

Ex. Th18= 5 °C
Th19= 40 °C
Th48= 80 °C
Th47= 8 °C



Pump is used as Buffer charge.
It is ON if differential temperature S1-S2 is greater than **Th47** and S1 temperature is greater than **Th19**.
If Buffer Thermostat **Th48** is satisfied, system goes in Standby. Pump is always ON if S1 temperature is lower than **Th18** Thermostat.

Unblock Pump
If Pump is OFF for a time greater than **T42**, it is activated for **T41** seconds, to avoid Pump block for inactivity.

8.8.6 Auger 2

If the parameter **P44**=6 the output V2 is configured as a second Auger.
The Auger 2 carries the fuel into the brazier; if the Auger is enabled, the Auger 2 is always on, when the Auger is turned off, the Auger 2 remains on until the timer **T27**.

8.9 Pellet Sensor Management

If the Output V2 isn't set as Pellet Engine (**P44**=2) the Pellet Level Sensor has the following functioning: when pellet is under the fixed level, after a signalling for a time **T24**, the system goes in Extinguishing with error **Er18**. If the pellet is put in the tank, the system stops every signal and it is possible to restart it. If don't use the sensor set **P09**=2.