

SY325

For Pellet Burner Boiler
for single / double burner management
(Version 1.1 to 2.2)



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INTRODUCTION

The SY325 regulates Multi-Fuel Wood Boilers, and features automatic ignition and feed.

The SY325 checks the flame, temperature of the combustion fumes, water and user parameters to ensure that the heating system is functioning.

The settings of the Control Unit are entered via a dedicated menu.

By changing the above settings you may:

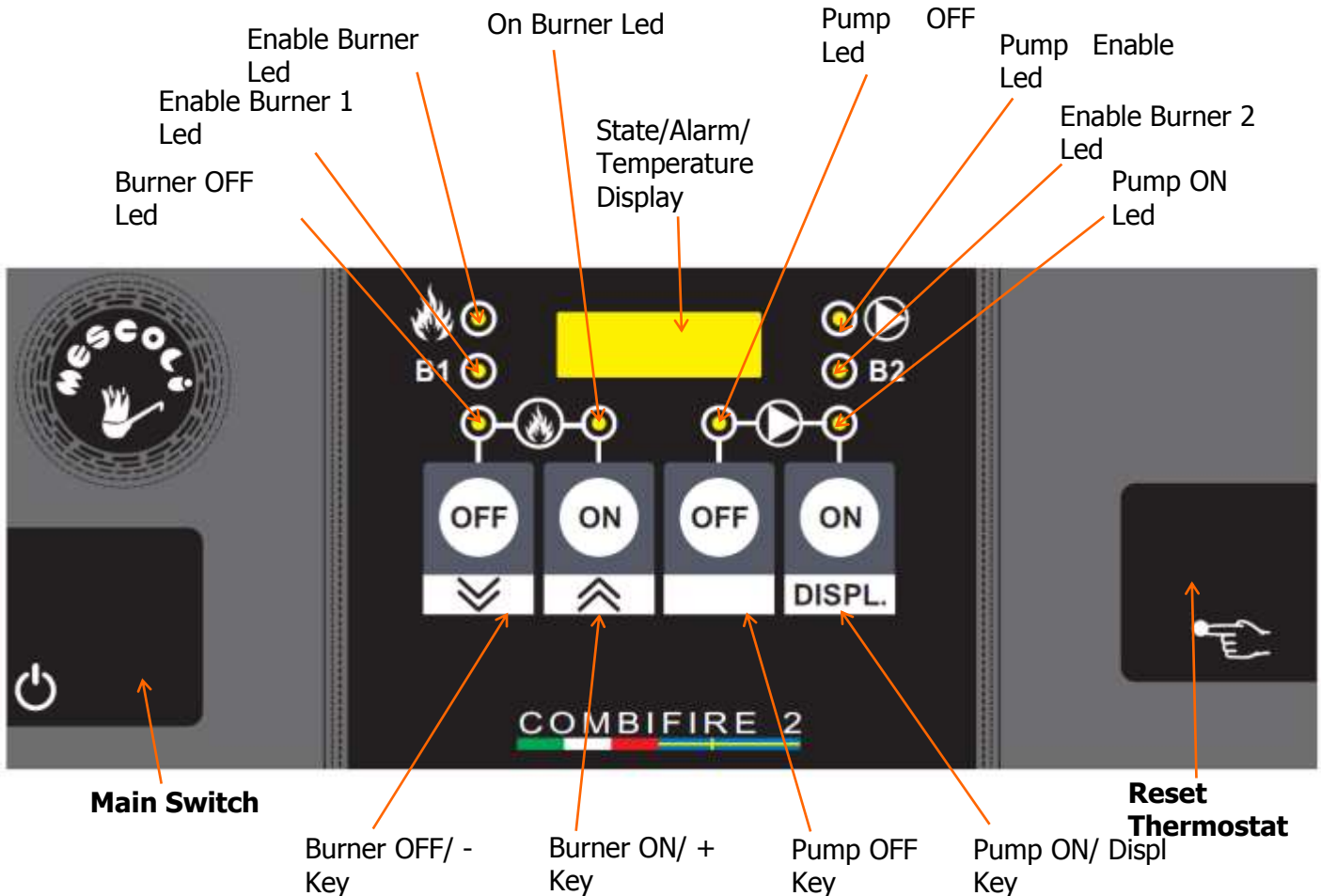
- ⇒ Adjust the heating system to your personal requirements
- ⇒ Adjust the heat regulator to different Boiler models

The next chapter gives a detailed description of the heat regulator, settings, installation and functioning principles.



1 THE CONTROL PANEL

The figure below shows the control panel of the Control Unit with key legend of functions:



2 THE KEYS

- **Burner ON/ + :** Hold down key for 5 seconds to Ignite/Shutdown the System. In **Menu**, use this key to increase the settings.
- **Burner OFF/ - :** Hold down key for 5 seconds to shutdown system. In **Menu**, use this key to decrease the settings.
- **Pump ON/ Displ :** Hold down key for 5 seconds to enable the Pump. In **Secret Menu**, use this key to exit without saving the settings.
- **Pump OFF :** Hold down this key for 5 seconds to deactivate the Pump. In **Secret Menu**, use this key to display the code/value of the parameters.

3 THE LEDS

1. **Enable Burner Led :** **ON** for at least one active *Burner Enable* outlet
2. **Enable Burner 1 Led:** **ON** for active *Burner Enable1* outlet
Flashes during Burner1 shutdown
3. **Enable Burner 2 Led:** **ON** for active *Burner Enable2* outlet,
Flashes during Burner2 shutdown
4. **Burner OFF Led:** **ON** for *System OFF*
5. **Burner ON Led :** **ON** for *System ON*



- 6. **Pump OFF Led:** **ON** for *Pump* disabled by Key
- 7. **Pump ON Led:** **ON** for *Pump* enabled by Key
- 8. **Pump Enable Led:** **ON** for active *Pump* outlet
Flashes when *Pump* outlet is disabled by Key, but is enabled by the System for Anti-frost Safety or Excess Temperature

4 THE DISPLAYS

- **Display\Temperature\Alarms:** the 4-digit Display shows the Water Temperature in the boiler and Alarms which have gone off.

The Control Unit visualises the following System State Code :

OFF

= Burner/boiler OFF

Chc

= Check UP

rEc

= Recovery startup

Stby

= Standby from boiler temperature

PuFF

= Standby from ext signal

Err

= Boiler shutdown due to alarm

LoHi

= Safety is activated on the Reset Thermostat inlet

Hot

= Error due to excessively high temperature of water

door

= Open boiler door contact

N.B.:

- When the control unit is powered by means of the Main Switch, the Product Code and Programme Version are displayed for 2 seconds:

L703

Pellet Burner Boiler Code

Ur 1.1

Programme Version

5 THE MENUS

The settings of the Heat Regulator may be set on the Menu which has three levels:

- **User Menu**
- **Protected Menu**
- **Probe Menu**

5.1 THE USER MENU:

To access this Menu, press the **Burner OFF or Burner ON Key**. Once you have accessed the Menu, the **Enable Burner Led** starts to flash and the value of the Boiler Thermostat is displayed.

To EDIT the Thermostat value, follow these steps:

- Press the **Burner ON or Burner OFF Key** to enter Edit
- Increase the value with the **Burner ON Key** (hold down to change settings quickly)
- Decrease the value with the **Burner OFF Key** (hold down to change settings quickly)



- To escape from the Menu and save the new setting manually, press the **Pump ON Key**
- To escape automatically and save the setting, wait 20 seconds without pressing any key

User Menu Settings:

LED	Code	Description	Default Value	Minimum Value	Maximum Value
Burner Enable	BOILER-TH	Boiler Thermostat for self-maintained function	80° C	A 12	A 13

N.B.:

- The parameters **A12** and **A13**, are the lower and upper thresholds of the BOILER-TH thermostat. These values of the Protected Menu, may be programmed.

5.2 THE RESTRICTED ACCESS MENU:

To enter, hold down the **Burner OFF and Pump OFF** keys together on the front panel for 5 seconds. Use the **Burner OFF and Burner ON** Keys to scroll through the parameters which are indicated by a Code on the Display. To display the value corresponding to the parameter selected, press and hold down the **Pump OFF Key**.

To EDIT the settings, follow these steps:

- Go to the parameter you wish to edit by pressing the keys **Burner OFF or Burner ON** (the parameter appears on the Display)
- Press the **Pump OFF Key** to enter EDIT (the setting appears on the Display)
- Set the required value with the **Burner OFF and Burner ON keys** (hold keys down for 2 seconds to fast forward the figures)
- To store the new setting, press the **Pump OFF Key**
- To escape without saving, press the **Pump ON Key**
- To escape from Menu manually, press the **Pump ON Key**
- The System automatically escapes Menu 40 seconds, if no other key is pressed.

Protected Menu Parameters:

NAME	Code	Description	Default Value	Minimum Value	Maximum Value
Uc05	Burner 2 speed	Fan speed with two burners on	80 %	Uc20	99 %
Uc09	Burner 1 speed	Fan speed with one burner on	30 %	Uc20	99 %
Uc10	Velocità-STBY-Bruciatori	Fan speed in standby and safety state	20 %	Uc20	99 %
Uc20	Minimum speed	Minimum fan speed	15 %	0 %	99 %
A 01	PUMP-TH	Boiler Thermostat for Pump start up	30° C	20° C	80° C
A 04	BOILER-TH-SAFETY	Boiler Thermostat for Pump Safety	95° C	80° C	95° C
A 05	Modulation Delta	Temperature difference from BOILER-TH for Modulation	5° C	0° C	20° C
A 07	BOILER-TH-ALLARM	Boiler Thermostat for System Safety	95° C	80° C	100° C
A 11	TH-CALDAIA-BLOCCO	Boiler thermostat for block signal	50° C	30° C	80° C
A 12	BOILER-TH-Min	Minimum setting for Boiler Thermostat	5° C	5° C	60° C



A 13	BOILER-TH-Max	Maximum setting for Boiler Thermostat	90° C	60° C	90° C
F 10	TH-FUMI-BLOCCO	Smoke thermostat for block signal	100° C	10° C	250° C
IA01	PUMP-TH Hysteresis	Boiler Thermostat Hysteresis to start up Pump	2° C	1° C	15° C
IA06	BOILER-TH Hysteresis	Boiler Thermostat Hysteresis for Self-Maintained Function	3° C	1° C	15° C
IA09	Isteresi TH-CALDAIA-BLOCCO	Histeresis boiler thermostat for block signal	2° C	1° C	15° C
IA16	Hysteresis 2 Delta	Difference from BOILER-TH Hysteresis IA06 for second burner start up	1° C	0° C	15° C
t 14	SHUTDOWN DELAY TIME	Burner shutdown delay time for change in fan speed	240 sec.	0 sec.	900 sec.
t 24	PIPE OFF MOTOR TIME	Pipe OFF Cleaning MOTOR Time	1 hour	1 hour	16 hours
t 25	PIPE ON MOTOR TIME	Pipe ON Cleaning MOTOR Time	40 sec.	0 sec.	900 sec.

t 26	ENABLE PIPE MOTOR TIME OFF	Pipe Cleaning MOTOR Time OFF during ON period	0 sec.	0 sec.	900 sec.
t 27	ENABLE PIPE MOTOR TIME ON	Pipe Cleaning MOTOR Time ON during ON period	40 sec.	1 sec.	900 sec.
t 32	ASH MOTOR TIME OFF	Ash Cleaning MOTOR Time OFF	60 sec.	1 sec.	900 sec.
t 33	ASH MOTOR TIME ON	Ash Cleaning MOTOR Time ON	3 sec.	0 sec.	900 sec.
t 55	BURNER2 START UP DELAY	Start up delay for burner 2 when cold	3 min.	0 min.	300 min.
t 56	BURNER2 RESTART TIME	Minimum restart time for burner 2 r (for restart from hysteresis IA16)	60 sec.	0 sec.	900 sec.
t 57	TIME-SEGNALAZIONE-BLOCCO	Waiting time for block start from system	20 min.	0 min.	600 min.
P 10	Maximum Thermostat Enable	Alarm enabled due to Maximum Thermostat	1	0	1
P 30	Fan Enable	Enabled for suction fan outlet	1	0	1
P 48	PUMP-TH Enable	Thermostat enabled due to Pump Activation	1	0	1
P 49	Double Burner Enable	Outlet enabled and control burner two	0	0	1
P 50	Enable TH-FUMI-BLOCCO	Enable block signal from smoke thermostat	1	0	1

**N.B.:**

- Parameter **Uc20**, is the minimum setting for the Fan and should be set according to the Fan used. If the value of this setting is higher than any of the Fan parameters, the system automatically returns the latter to **Uc20** (only "0" is not modified to allow the Fan to turn off in some cases).
- Parameter **A12** is the minimum setting for **BOILER-TH** thermostat.
- Parameter **A13** is the maximum setting for **BOILER-TH** thermostat.
- Parameter **P10** enables the Maximum Thermostat Reset function:
 - When set on 0 the thermostat alarm is deactivated and the System continues to function.
 - When set on 1 the thermostat alarm is activated and the System switches OFF.
- Parameter **P30** set on 0 deactivates the Fan and its parameters disappear from the Menu.
- Parameter **P48** activates the Pump Thermostat:
 - When set on 0 the thermostat is deactivated and the Pump may be shutdown only on the Keyboard.
 - When set on 1 the thermostat is enabled and the Pump is started up by the System, when the temperature of the water in the Boiler is higher than that of this Thermostat.
- Parameter **P49** enables/deactivates Burner2 outlet and the double burner control.
- Il parametro **P50** abilita/disabilita il Termostato Fumi **F10** per la Segnalazione di Sistema in blocco. Se settato a 0, la segnalazione di blocco puù avvenire solo per il Termostato Caldaia **A11**.

5.3 THE PROBE MENU:

Simply hit the **Pump ON Key** on the front panel. After entering this Menu, the value detected by the Fume probe is displayed.

Steps to follow:

- Enter the Menu by pressing the **Pump ON Key**
- To escape from the Menu manually, press the **Pump ON Key** again
- The System escapes automatically from the Menu after 10 seconds if no key is pressed

Probes Displayed:

Code	Description	Value Detected
	Fume Temperature reading	0°C – 300°C

5.4 Non Programmable Parameters:

This Table gives all the parameters that may be not programmed on the Control Panel.

Table of Non Programmable Parameters

Thermostat Code	Description	Value
BOILER-TH-ICE[A00]	Anti-Frost Boiler Thermostat	5° C

Table of Thermostat Hysteresis

Thermostat Code	Description	Hysteresis Value
BOILER-TH-ICE[A00]	Anti-frost Boiler Thermostat	0° C



BOILER-TH-SAFETY[A04]	Boiler Thermostat for Pump Safety	2° C
BOILER-TH-ALARM[A07]	Boiler Thermostat for System Safety	2° C
TH-FUMI-BLOCCO[F10]	Termostato Fumi per Segnalazione di Blocco	2° C

N.B.:




- The heat operating modes of the System are taken into account by the Heat Regulator as follows:
 - During the **Increasing Temperature Stage** takes into account the **Thermostat Value** (E.g.: **BOILER-TH[A03] = 80° C**)
 - During the **Decreasing Temperature Stage** takes into account the **Thermostat Value – relevant Hysteresis** (E.g.: **BOILER-TH[A03] = 80° - 3° = 77° C**)

6 INSTALLATION

Terminal Board and Connections

The following figure shows the connection layout between the terminal boards of the mother card and the relevant inputs and outputs; the necessary input and output connections of the control unit to ensure proper installation are indicated.

IMPORTANT INFORMATION:

-  **To ensure correct and safe functioning, always earth the terminal of the product.**
-  **Keep CAREFULLY to the connection layout indicated by the diagram below to prevent damage to the electronic system.**
-  **Make the connections in an orderly manner keeping the low voltage signals (Probes, Digital Inputs, etc.) well separated from the high voltage signals (power supply, outputs of the Heat Regulator, etc.) to keep interference to a minimum.**

Connection NOTES:

7-8: to the normally closed High Tension contact of the Main Manual Reset.
short-circuit if not used

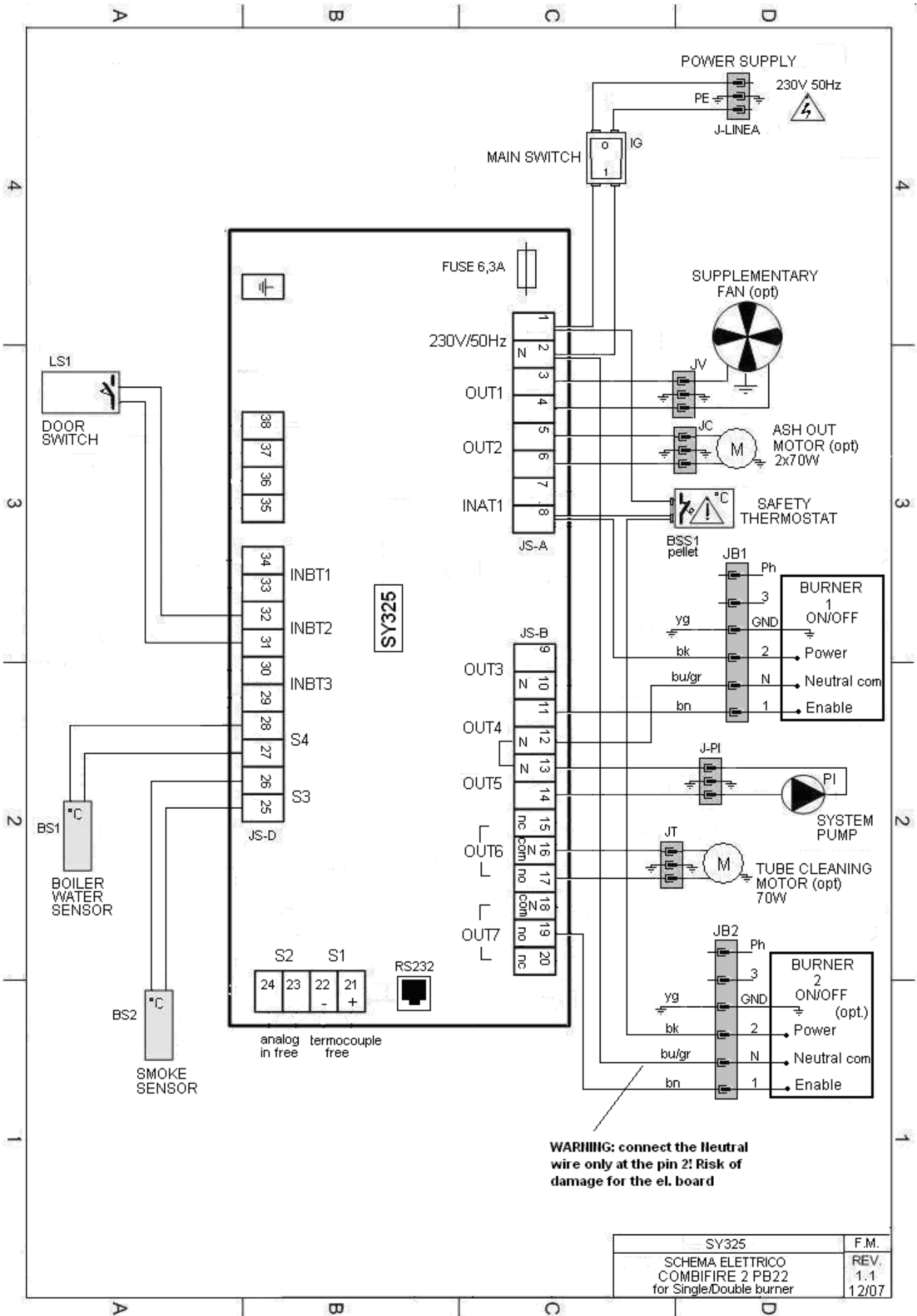
29-30: the normally closed contact of the device to spin down of the burners.
To short circuit if not used

31-32: to the normally closed contact of a End-of-stroke on the door of the Boiler
short-circuit if not used

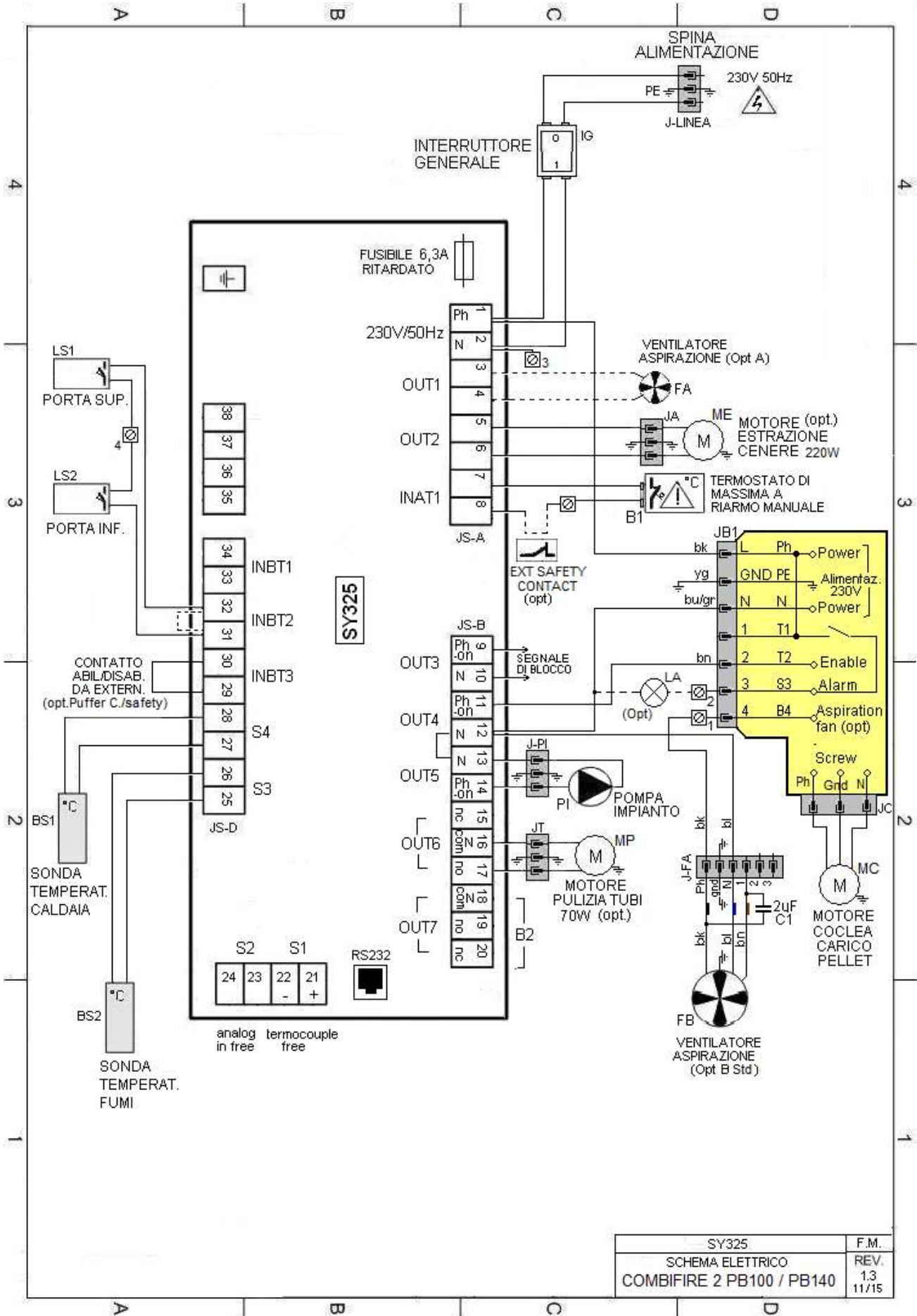


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SY325	F.M.
SCHEMA ELETTRICO COMBIFIRE 2 PB22 for Single/Double burner	REV. 1.1 12/07





7 OPERATING MODES

The Heat Regulator **SY325** consists of two sections:

- ◆ **The Mother Card** whose connectors must be connected as described in the Chapter **Installation**
- ◆ **Control Panel**

The SY325 P.C.B. operates in **Modes**, each of which depends on specific conditions of the main boiler operating parameters, such as the fume temperature in the combustion chamber, the water temperature in the boiler, the activation of the safety features and operating errors.

The System Operating Modes and management of the inputs, outputs and messages displayed are shown below:

1	OFF
2	CHECK UP
3	IGNITION RECOVERY
4	NORMAL
5	SELF-MAINTAINED
6	SAFETY

The System ensures that SAFETY and ALARM conditions are detected throughout functioning

7.1 OFF MODE

This is the System Stand-By mode. The appliance passes into this operating mode in all the following cases:

- when you press the **Burner OFF Key** on the Control Panel in any Mode
- if any **Alarm** intervenes

Display	OFF	Boiler Temperature alternate with OFF message Alarm messages if any
Fan	ON	If time has not run out TIME-DELAY-SHUTDOWN[t14]
	OFF	
Burner Supply	OFF	Not in V2.0
Burner Enable1	OFF	
Burner Enable2	OFF	
System Pump	ON	Active above the Thermostat PUMP-TH[A01] , if enabled
Ash Cleaning MOTOR	OFF	



Pipe Cleaning MOTOR	OFF	
Blocking signal	OFF	


7.2 CHECK UP MODE

This mode cleans the combustion chamber before passing to **NORMAL** Mode.

To enter this Mode:

- press the **Burner ON Key** on the Control Panel on **OFF** mode

CAUTION: The boiler will not ignite in Alarm Condition or if the Lid is open.


Display		Boiler Temperature alternate with Chc message
Fan	ON	If time has not run out TIME-DELAY-SHUTDOWN[t14]
	OFF	
Burner Supply	OFF	Not in V2.0
Burner Enable1	OFF	
Burner Enable2	OFF	
System Pump	ON	Active above the Thermostat PUMP-TH[A01] , if enabled
Ash Cleaning MOTOR	ON	According to <i>Brazier ash cleaning cycle</i>
Pipe Cleaning MOTOR	ON	According to <i>pipe cleaning cycle</i>
Blocking signal	OFF	

End of CHECK-UP Mode:

- When the Cleaning programme has been completed the System passes to **NORMAL**

7.3 IGNITION RECOVERY MODE

The boiler passes to this mode in the case of a **power supply failure**

Display		Boiler Temperature alternate with rEc message
----------------	---	--

In this stage the boiler is **reset** to the mode it was in at the time of the power failure in the following order:

- **CURRENT SYSTEM STATE TEST** (lasts about 5 seconds)
- **CHECK UP**



7.4 NORMAL MODE

The appliance passes to this mode in the following cases:

- at the end of **CHECK UP** mode
- after **SELF-MAINTAINED** mode

Display		Boiler Temperature
Fan	ON	According to Fan <i>control</i>
Burner Supply	ON	Not in V2.0
Burner Enable1	ON	Always ON if Double Boiler Enable[P49]=0 , otherwise as per <i>Double burner control</i>
Burner Enable2	ON	Always OFF if Double Boiler Enable[P49]=0 , otherwise as per <i>Double burner control</i>
System Pump	ON	Active above the Thermostat PUMP-TH[A01] , if enabled
Ash Cleaning MOTOR	ON	According to <i>Brazier ash cleaning cycle</i>
Pipe Cleaning MOTOR	ON	According to <i>pipe cleaning cycle</i>
Blocking signal	ON	According to the <i>Management Report Block</i>

End of NORMAL mode:



- If the Boiler Temperature is above **BOILER-TH[A03]** the System passes to **SELF-MAINTAINED mode**

7.5 SELF-MAINTAINED MODE (STANDBY)

The System passes to this mode in the following cases:

- If the Boiler Temperature is above **BOILER-TH[A03]**

SELF-MAINTAINED mode reduces combustion drastically to prevent the Boiler from going into **SAFETY** mode

Display	 	Boiler Temperature alternate with Mant message or alternate with PuFF message (standby from ext signal)
Fan	ON	If time has not run out TIME-DELAY-SHUTDOWN[t14]
	OFF	
Burner Supply	ON	Not in V2.0
Burner Enable1	OFF	
Burner Enable2	OFF	
System Pump	ON	Active above the Thermostat PUMP-TH[A01] , if enabled



Ash Cleaning MOTOR	ON	According to <i>Brazier ash cleaning cycle</i>
Pipe Cleaning MOTOR	ON	According to <i>pipe cleaning cycle</i>
Blocking signal	ON	According to the <i>Management Report Block</i>

End of SELF-MAINTAINED Mode:

- If the Boiler Temperature is under **BOILER-TH[A03]** the System returns to **NORMAL** mode
- If the Boiler Temperature is above **BOILER-TH-SAFETY[A04]** the system passes to **SAFETY** mode
- If the Boiler Temperature is above **BOILER-TH-ALLARM[A07]** the system passes to **SAFETY** mode

7.6 SAFETY MODE

The System passes to this mode in the following cases:

- If the Boiler Temperature is above **BOILER-TH-SICUR[A04]**
- If the Boiler Temperature is above **BOILER-TH-ALLARM[A07]**

In this mode, the safety of the System is monitored and signalled

Display	Hot	Boiler Temperature Alternates with the message Hot for boiler temperature higher than BOILER-TH-ALLARM[A07]
Fan	ON	If time has not run out TIME-DELAY-SHUTDOWN[t14]
	OFF	
Burner Supply	OFF	Not in V2.0 OFF when Boiler Temperature is higher than BOILER-TH-ALLARM[A07]
	ON	Not in V2.0 ON when Boiler Temperature is under BOILER-TH-ALLARM[A07]
Burner Enable1	OFF	
Burner Enable2	OFF	
System Pump	ON	Always ON when Boiler Temperature is higher than BOILER-TH-SICUR[A04]
		ON above PUMP-TH[A01] , if enabled, when Boiler Temperature is under BOILER-TH-SICUR[A04]
Ash Cleaning MOTOR	ON	According to <i>Brazier ash cleaning cycle</i>
Pipe Cleaning MOTOR	ON	According to <i>pipe cleaning cycle</i>
Blocking signal	ON	Always Active for boiler temperature greater than TH-CALDAIA-ALLARM[A07]
	ON	According to the <i>Management Report Block</i> for boiler temperature less than TH-CALDAIA-ALLARM[A07]

When Boiler Temperature is higher than the **BOILER-TH-ALARM[A07]** thermostat, an alarm will go off.
 End of SAFETY mode:



- When the Boiler Temperature is under the **BOILER-TH-SICUR[A04]** and **BOILER-TH-ALLARM[A07]** thermostats
the system returns to **SELF-MAINTAINED** mode

8 The Digital Inputs

8.1 Input for Reset Thermostat

Opening of the contact of the **Manual Reset Maximum Electric-Mechanical Thermostat** in any operating mode stops the Burner and takes the System to **OFF** mode.

The **Thermostat** error is displayed on the Control Panel (**ALt toHi**).

The Reset Thermostat activation value is 100° C, but it is possible to change this by turning the ring nut at the front of the panel, from 90° C to 110° C.

The Maximum Thermostat function may be deactivated by setting the Parameter **Maximum Thermostat Enable [P10]** on the Protected Menu to **0**. In this case the Head Regulator cuts the power to the Burner, but continues to run without signalling an Alarm.

- if the system is not fitted with a Reset Thermostat, **short-circuit Pins 7-8** of the Terminal Board

8.2 Input for STANDBY BURNER signal

The card is provided with a contact in the terminal block to the pins 29-30, for the possible use of a device for the stop of the burners. The contact must be of the normally closed type.

Opening Contact for StandBy Burner:

- The sistem passes to the state of **STANDBY - AUTOMANTENIMENTO (PUFF)**

Closing Contact for StandBy Burner:

- The sistem passes to the state of **NORMAL**
- If the system does not provide for the use of a contact for the stop of burners short the Pin 29-30 of the terminal.

8.3 Input for Door Contact

The P.C.B. has a contact on the Terminal Board at **pin 31-32**, for the use of an end-of-stroke on the door of the Boiler. The contact must be a Normally Closed contact.

Opening of the Door Contact:

- The word **Door** is displayed

Output States:

- | | |
|-------------------|---------------------------|
| • Burner Supply | OFF (not for V2.0) |
| • Burner 1 Enable | OFF |
| • Burner 2 Enable | OFF |
| • Fan | OFF |

This function reduces combustion, if the door is opened when the Boiler is on.

- If the system does not have a Door Contact, **short-circuit Pins 31-32** of the Terminal Board.

9 Extra Functions

9.1 The ANTI-FROST Function

In this function the **Pump** is activated to prevent shutdowns due to low system water temperature.

- For Boiler Temperatures under **BOILER-TH-ICE[A00]**
 - **System Pump** **ON**



9.2 System Pump Activation

This function of the Heat Regulator allows you to Activate/Deactivate the Pump of the heating system by pressing the **Pump ON** and **Pump OFF** keys on the Control Panel.

Holding down the Pump ON Key for 5 seconds:

Pump Active above **PUMP-TH[A01]**, if enabled

Holding down the Pump OFF Key for 5 seconds:

Pump OFF

This function is deactivated in the case of an **Anti-Frost** or **Water Safety** alarm.

9.3 Pump Thermostat Activation

This function Enables/Deactivates the **PUMP-TH[A01] Pump**. It functions according to the setting of the parameter **Enable PUMP-TH[P48]** on the Protected Menu.

Parameter Enable PUMP-TH = 0

- **Pump** controlled by the **Pump ON** and **Pump OFF** keys

Parameter Enable PUMP-TH = 1

- **Pump** active above the thermostat **PUMP-TH** and may also be controlled by the **Pump ON** and **Pump OFF** keys

This function is deactivated in the case of an **Anti-Frost** or **Water Safety** alarm.

9.4 Ash Extractor Cleaning Cycle

This function allows you to clean the Boiler Brazier periodically, by means of a motor. It functions as follows:

- Cleaning is deactivated:
 - in **OFF** mode
 - every time the Burner is deactivated
- The Cleaning cycle starts at the End of **CHECK-UP** mode, as follows:
 - The motor is placed on hold for a time equal to the value of **ASH MOTOR TIME OFF[t53]**
 - After the hold stage, it is activated for a time equal to **ASH MOTOR TIME ON[t54]**
 - After the activation stage the cycles restarts from the hold stage.

N.B.:

When extraction is interrupted by the deactivation of the Burner, the cycle times are frozen. When the Burner restarts and extraction is resumed, the latter will restart from where they stopped.

9.5 Pipe Cleaning Cycle

This function allows you to clean the pipes of the Boiler periodically by means of a motor. It functions as follows:

- Cleaning is deactivated:
 - on **OFF** mode
- The first cleaning stage starts after **CHECK-UP** mode as follows:
 - The motor is activated in impulses at times equal to **ENABLE PIPE MOTOR TIME ON[t27]** and **ENABLE PIPE MOTOR TIME OFF[t26]**, for a total time equal to **TIME MOTOR TUBI ON[t25]**.
- At the end of the first cleaning stage, the cycle which is the same for all the other Modes, will start. The Cleaning cycle is regulated as follows:
 - The motor remains on hold for a time equal to the value of **TIME MOTOR TUBI OFF[t24]**



- At the end of the hold stage, it starts up in impulses at a time equal to **ENABLE PIPE MOTOR TIME ON[t27]** and **ENABLE PIPE MOTOR TIME OFF[t26]**, for a total time equal to **TIME MOTOR TUBI ON[t25]**.
- At the end of the activation stage, the cycle starts up from hold.

9.6 Double Burner Control

The Burner Enable1 and Burner Enable2 outlets are controlled alternatively as signals for a Main Burner and a Secondary Burner.

- Operating Cycle of the Main Burner:

- Active from the end of the **CHECK-UP** stage through to **BOILER-TH**.
- When **BOILER-TH** is reached, it remains off until the temperature drops under the value **BOILER-TH – Hysteresis BOILER-TH[IA06]**.

- Operating Cycle of the Secondary Burner:

- Active from the end of the **CHECK-UP** stage after a delay time equal to **DELAY-START-BURNER2[t55]**.
- For temperatures increasing to **BOILER-TH** it is deactivated if the temperature is higher than **BOILER-TH – Delta Modulation[A05]**.
- For decreasing temperatures once **BOILER-TH** is reached, it is activated for when the temperature is under **BOILER-TH – Hysteresis BOILER-TH[IA06] – Delta Hysteresis2[IA16]** provided at least a time **TIME-RESTART-BURNER2[t56]** has elapsed from the start up of the Main Burner. If the temperature increases against before it is dropped under **BOILER-TH – Delta Modulation[A05]** the Secondary Burner will be deactivated when the temperature exceeds **BOILER-TH – Hysteresis TH-CALDIA[IA06]**.

- Exchanged functions of the outlets:

- The two outlets Burner Enable1 and Burner Enable2 exchange roles when the temperature, after having reached the value **BOILER-TH**, drops again under the value **BOILER-TH – Hysteresis BOILER-TH[IA06] – Delta Hysteresis2[IA16]**.

9.7 Fan Control

The Fan outlet:

- is active at **Speed-2-Brucciatori[U05]** if both the Burner Enable outlets are active;
- is active at **Speed-1-Burner[U09]** if only one of the two Burner Enable outlets, is active;
- Is active at **Velocità-STBY-Brucciatore[U10]** in State of **Standby** or **PuFF** or **Safety**
- is off if both the Burner Enable outlets are off;

A delay time **TIME-DELAY-SHUTDOWN[t14]** may also be set to delay both the Speed change of the Fan and its shutdown.

9.8 Gestione Segnalazione Blocco

Il Termoregolatore è predisposto per segnalare tramite una sua uscita, se i Bruciatori connessi al Sistema sono andati un Blocco. Il suo funzionamento è il seguente:

- L'uscita è attiva solo se la Caldaia è in funzione (Stato Sistema diverso da **SPENTO**)
- Attivando il Sistema con la pressione del **Tasto Bruciatore ON**, parte il conteggio di un tempo pari a **TIME-SEGNALAZIONE-BLOCCO[t57]**, entro il quale, la temperatura dei Fumi deve superare il Termostato **TH-FUMI-BLOCCO[F10]** e quella dell'acqua il Termostato **TH-CALDAIA-BLOCCO[A11]**.
- Allo scadere del tempo se entrambe le temperature risulteranno al disotto dei due termostati sopra indicati ed almeno uno dei due Bruciatori sarà attivo, l'uscita **Segnalazione Blocco** si attiverà alimentando il dispositivo di allarme ad essa connesso.
- Se allo scadere del tempo invece almeno una delle due temperature sarà al disopra del proprio termostato, l'uscita **Segnalazione Blocco** rimarrà spenta.



- Il tempo **TIME-SEGNALAZIONE-BLOCCO[t57]** viene automaticamente azzerato, se durante il suo conteggio entrambe le temperature raggiungono i propri termostati.
- A tempo scaduto, l'uscita **Segnalazione Blocco** si attiverà solo se entrambe le temperature saranno al disotto del proprio termostato ed almeno uno dei due Bruciatori sarà attivo. Si disattiverà, se almeno una delle due temperature sarà al disopra del proprio termostato.
- Se si vuole disabilitare il conteggio del tempo iniziale, impostare il parametro **TIME-SEGNALAZIONE-BLOCCO[t57] = 0**. In questo caso, l'uscita di segnalazione si attiverà solo se entrambe le temperature saranno al disotto del proprio termostato, dopo almeno una volta che quest'ultimi sono stati raggiunti.
- Se si vuole che l'uscita di segnalazione sia controllata solo dalla temperatura dell'acqua, impostare il parametro **Enable TH-FUMI-BLOCCO[P50] = 0**.
- L'uscita Segnalazione Blocco resta sempre accesa, anche se la temperatura dell'acqua risulta maggiore del termostato **TH-CALDAIA-ALLARM[A07]**.

9.9 Communications Via Computer (RS232)

The Heat Regulator has a connector for communication of the **RS232** with a Computer. Connect the Control Unit to a Serial Port of the PC with the cable supplied, and by launching the programme **SYSTEM EVOLUTION**, it is possible to monitor the efficiency of the P.C.B. and programme all the parameters. Please read the SYSTEM EVOLUTION manual for full operating details of the software.

9.10 Heat Regulator Firmware Programming

The Firmware in the Heat Regulators of the SY325 may be updated by means of the Software **Evo Firmware Loader** and a the **hardware key SYKEY-03**, supplied with the programme. Programming may be carried out in two different ways:

- **From Computer to Heat Regulator by means of the key SYKEY-03**
- **Directly from the key SYKEY-03 to the Heat Regulator**

9.10.1 Computer to Heat Regulator Programming

In this situation, the **SYKEY-03** Key converts the communication between the Computer and the Control Unit.

Steps to follow:

1. Connect the **SYKEY-03 Key** by means of the serial cable supplied to a computer, plugging it to the 9-pin connector on the same.
2. Connect the phone plug of the Key by means of the cable supplied to the communications connector **RS232** of a Heat Regulator **which is not powered**.
3. Connect the power supply to the **SYKEY-03 Key** and power it up (**at voltages between 6V and 9V, with central positive pole and external negative pole**).
4. The **Power Leds** will light up on the key and after several seconds the **Error Led** lights up.
5. Launch the software **Evo Firmware Loader** and use the key "**Settings**" to select the serial port of the Computer to which the Key is connected.
6. Launch the creation wizard "**Load Product Firmware**" and follow the instructions given by the programme (**the Heat Regulator must not be powered until indicated by the software**).
7. At the end of the procedure turn off the Control Unit and disconnect the connection with the Key.
8. Power up the Control Unit again and check that it is operating correctly.

9.10.2 Key to Heat Regulator Programming

In this case, the **SYKEY-03 Key** acts as a stand alone programmer of the Firmware.

Steps to follow:

❖ **Stage 1: SYKEY-03 Key Programming**

1. Connect the **SYKEY-03 Key** by means of the serial cable supplied, to a computer, plugging into the 9-pin connector of the same.



2. Connect the power supply to the **SYKEY-03 Key** and power it up (**at a voltage between 6V and 9V, with central positive pole and external negative pole**).
3. The **Power Leds** will light up on the key and after several seconds the **Error Led** lights up.
4. Launch the software **Evo Firmware Loader** and use the key "**Settings**" to select the serial port of the Computer to which the Key is connected.
5. Launch the software **Evo Firmware Loader** and use the key "**Settings**" to select the serial port of the Computer to which the Key is connected.
6. At the end of the procedure, the Firmware is loaded on an internal memory of the Key.
7. Disconnect the Key from the Computer and the power supply.

❖ **Stage 2: Programming the Heat Regulator from the SYKEY-03 Key**

1. Connect the **SYKEY-03 Key** to connector **RS232** of a Heat Regulator **which is not powered**, by means of the phone cable supplied (**the key must not be connected to its power supply**).
2. Power up the Heat Regulator.
3. If the Control Unit and Key do not recognise each other, the first will light up launching the Firmware loaded previously, while the **Power** and **Error** Leds will light up on the second.
4. In this case, turn off the Heat Regulator and start again from **step 2**.
5. If the Control Unit and Key recognise each other, the first will be apparently off (**Led and Display OFF**), while the **Power** and **Ready** Leds will light up on the second.
6. Press the **Start Key** of the Key to start programming the Firmware.
7. The **Com Led** will flash on the key while the **Power** and **Program** Leds light up.
8. At the end of the procedure, the **Com** and **Program** Leds will be switched off and the **Done Led** lights up.
9. Turn off the Heat Regulator and disconnect the connection with the Key.
10. Power up the Control Unit again and ensure that it is operating correctly.
11. If the procedure is not successful, turn off the Heat Regulator and start again from **step 2**

9.11 Self-Test Function

The Heat Regulator also has a Self-Test Function, which tests the efficiency of the Inputs and Outputs. This function may be activated only when the appliance is **OFF** by holding down the **Menu** and **+** keys at the same time for 5 seconds. After being displayed, the outputs and inputs of the Control Unit do not function as described previously but the function of this Test Mode.

Follow these steps to check the Heat Regulator correctly:

1. With the Control Unit on **OFF**, check that all the probes connected to the same give a correct reading as follows:
 - **Boiler Probe** always visible on the Display
 - **Fume Probe** enter the Probes Menu
2. Enter in the Self-Test Function following the above procedure.
3. When you enter, the Display shows the message **tEST** and all the L.E.D.s light up
4. You are now ready to **Test the Inputs**:
 - The Control Unit is programmed to read normally closed/normally open contacts; when they open/close, an input event is displayed. Connect a circuit-breaker on each input of the Heat Regulator and then open or close them one at a time.
 - The Heat Regulator alternatively displays the name of the input which has been tripped and the word **tEST**. The following codes may also be displayed:

Num.	Name	Type	Description
1	In03	Normally Closed	Door
2	In04	Normally Closed	StandBy Burner
2	In09	Normally Closed	Reset Max Thermostat

N.B.: only one input at a time may be displayed so that if two are activated at the same time, only the high priority input will be displayed. The priority is given in the **Num** column.



5. After checking the inputs, you may now **Test** the **Outputs**:

- To enter this mode, press the **SET Key**.
- The Heat Regulator will test Output one displaying its name. The codes that may be displayed are as follows:

Num.	Name	Type	Description
1	Ou01	Speed Regulation	Fan
2	Ou02	ON/OFF powered	Ash out motors
3	Ou03	ON/OFF powered	Burner Supply
4	Ou04	ON/OFF powered	Burner Enable 1
5	Ou05	ON/OFF powered	System Pump
6	Ou06	ON/OFF powered	Tube Clean motor
7	Ou07	ON/OFF powered	Burner Enable 2

- Hit **SET Key** to scroll through the Outputs.
- When you test the Outputs with **Speed Regulation**, the name of the output being tested is alternated with the Speed of the same, which initially will be **0% Off**.
- Using the + and - keys, you may increase or decrease this speed in steps of 1% (hold down the keys for 2 seconds to scroll the numbers automatically).
- When you test the **ON/OFF** Outputs, the name of the Output tests and its current state (which initially is **OFF**, are alternated on the display.
- Press the **+ Key** to **turn on** the output and the word **OFF** on the display is replaced by **ON**..
- Press the **- Key** to turn off the output.
- To pass from one output to another, you do not need to turn off the outputs. After scrolling them with **SET Key**, the Control Unit turns them all off automatically and the word **test** is again displayed.

N.B.:

- if, when you test the **Burner Supply** output, the same remains OFF, even if the word **ON** appears on the display, check that the input of the **Main Rest Maximum Thermostat** is closed. This in fact physically disconnects the output from the mains.

6. To escape from **Self Test** you may:

- Hit **ESC** on the Control Panel.
- At the end of the Maximum Time of **60 seconds**, of no key is pressed or input tested.
- If the water temperature is higher than **BOILER-TH [A03]** thermostat.

7. Once you have escaped, the appliance returns to **OFF**.



Technical data

Heat Regulator Code: SY325**Revision: 1.1****Date: 07/12/2007**

- ◆ Power supply 220Vac 50Hz protected by delayed 6,3A fuse
- ◆ Multifunction Control Panel with 4-Digit Display
- ◆ Boiler Shutdown and Ignition Management r
- ◆ BOILER Thermostat Regulation
- ◆ Fume Temperature Reading
- ◆ Fan Speed Regulation
- ◆ Activation of Supply Burner
- ◆ Activation of Burner Enable 1 and Burner Enable 2
- ◆ Activation of System Pump power supply
- ◆ Activation of Pipe Cleaning motor supply
- ◆ Activation of Ash Cleaning motor power supply
- ◆ Safety and Alarm Functions
- ◆ Signalling of the Functions and System Mode
- ◆ Fume Probe in Teflon cable to read the Fume Temperature
- ◆ Boiler Probe in silicon cable to read the Water Temperature
- ◆ Contact for reset thermostat input, door

INPUTS

Fume Probe	Analogic NTC 100K	Temp. = 0° – 300 °C	2 Terminals
Boiler Water Probe	Analogic NTC 100K	Temp. = 0° – 300 °C	2 Terminals
Door Contact	ON/OFF	Normally Closed	2 Terminals
Hand Reset Safety Thermostat		Normally Closed	2 Terminals

OUTPUTS

FAN	TRIAC Regulation	LINE Powered Max 1.3A	Outputs under 6.3 A fuses	2 Terminals
ASH OUT MOTORS	TRIAC ON/OFF	LINE Powered Max 1.3A		2 Terminals
BLOCK SIGNAL	RELAY ON/OFF	LINE powered		2 Morsetti
BURNER SUPPLY (not used-see wire connections plan)	RELAY ON/OFF	LINE powered NOT FROM V2.0		2 Terminals
BURNER ENABLE 1 (phase)	RELAY ON/OFF	LINE powered		2 Terminals
SYSTEM PUMP	RELAY ON/OFF	LINE powered		2 Terminals
PIPE CLEANING MOTOR	RELAY ON/OFF	LINE powered		3 Terminals
BURNER ENABLE 2 (phase)	RELAY ON/OFF	LINE powered		3 Terminals



Diagramma di funzionamento di massima

