SPITFIRE

# *TECHNICAL ISTRUCTIONS*


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# NATURAL GAS

Electronic SPITFIRE Burner is setted depending on the order.
If you were to change the type of gas you'll need the following electronic configuration.


**REG GAS = screw gas**

The position of the screw gas ( RegGas )
Controls the gas flow inside the ventuti.


The position of the air regulator (the gray PVC disc)
Controls the air flow inside the venturi.

| Group | Type | p (mbar) | | |
|---|---|---|---|---|
| H; E | G20 | 20, 25 | | AT, BE, CH, CZ, DE, DK, EE, ES, FI, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UA. |
| E | G20/G25 | 20/25 | | FR, BE. |
| L | G25 | 25 | | DE. |
| LL | G25 | 20 | | NL. |
| S | G25.1 | 25 | | HU. |

## *Tabella di regolazione impianti bruciatore*
## *INJECTORS LIST :*

### *SPITFIRE SILVER (25 kW) - SPITFIRE GOLD 29 (29 kW) - SPITFIRE GOLD 34 (34 kW)*

| GAS | G25.1 | G25.1 | G25.1 | G25 | G25 | G25 | G20 | G20 | G20 |
|---|---|---|---|---|---|---|---|---|---|
| MIX (mm) | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 |
| P out | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar |
| Air | See Drawing DIS. 519-035 | | | See Drawing DIS. 519-035 | | | See Drawing DIS. 519-035 | | |
| Ignition (Hz) | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Reduced rate (Hz) | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Nominal rate (Hz) | 150 | 180 | 200 | 150 | 180 | 200 | 140 | 150 | 180 |
| Nominal Thermal input | 24 kW | 29 kW | 32 kW | 25 kW | 29 kW | 34 kW | 25 kW | 29 kW | 34 kW |
| Reduced Thermal input | 8,0 kW | 8,0 kW | 8,0 kW | 8,2 kW | 8,2 kW | 8,2 kW | 9,5 kW | 9,5 kW | 9,5 kW |
| Burner Model | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 |

[redacted]

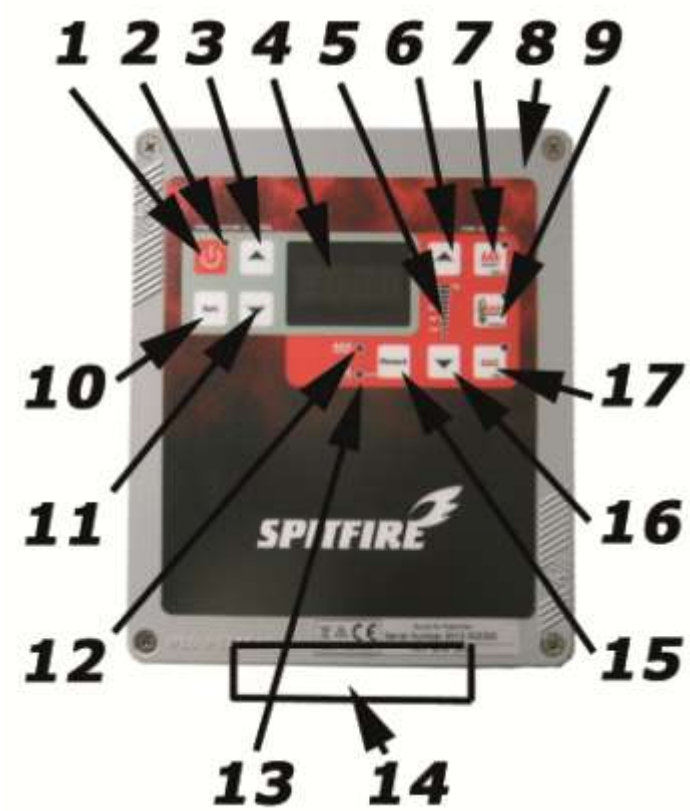
| | |
|---|---|
| Co: | MILLBERG - Italy |
| System : | Spitfire New Generation Setting |
| Title : | Injectors List — code : |
| Material : | |
| Autor : | RP.DG L — Dis. : 519 - 038 — Rev : D 1 |
| Date : | 23-05-2011 — Shett 1 of 1 |

# TO KNOW THE FUNCTIONS OF THE CONTROL BOARD'S BUTTON

**THE MILLBERG - SPITFIRE ELECTRONIC BOARD**

The electronic board MILLBERG – SPITFIRE which has been made exclusively for this burner is purposely inserted inside the electronic board and function as a PWM control and flame management mechanism. In addition to the burner base command buttons such as Power ON – OFF, RESET, and Leds, there is also a digital thermo modulator for the automatic temperature control ( °F - °C ), flame selection buttons (MIN – MAX – AUTOMATIC) which allow choosing the flame that best suits a particular baking job.

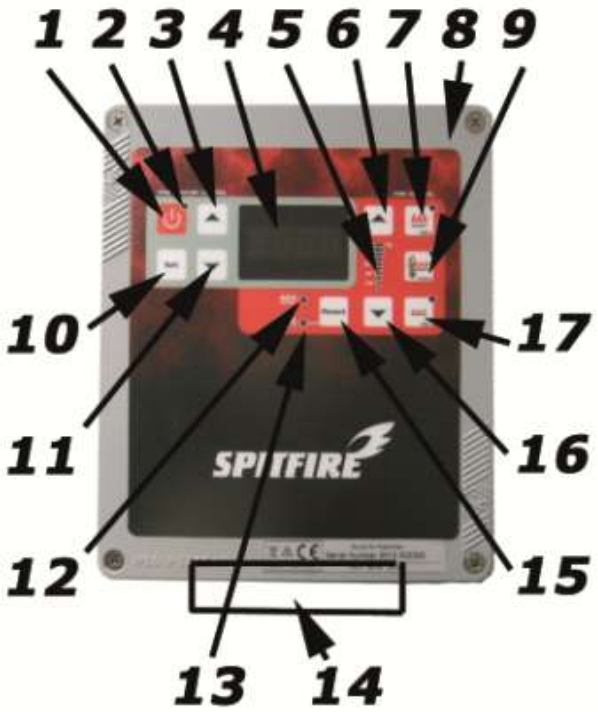
Entering configuration parameters that you can change the frequency engine fan and then change the setting of minimum and maximum flames.



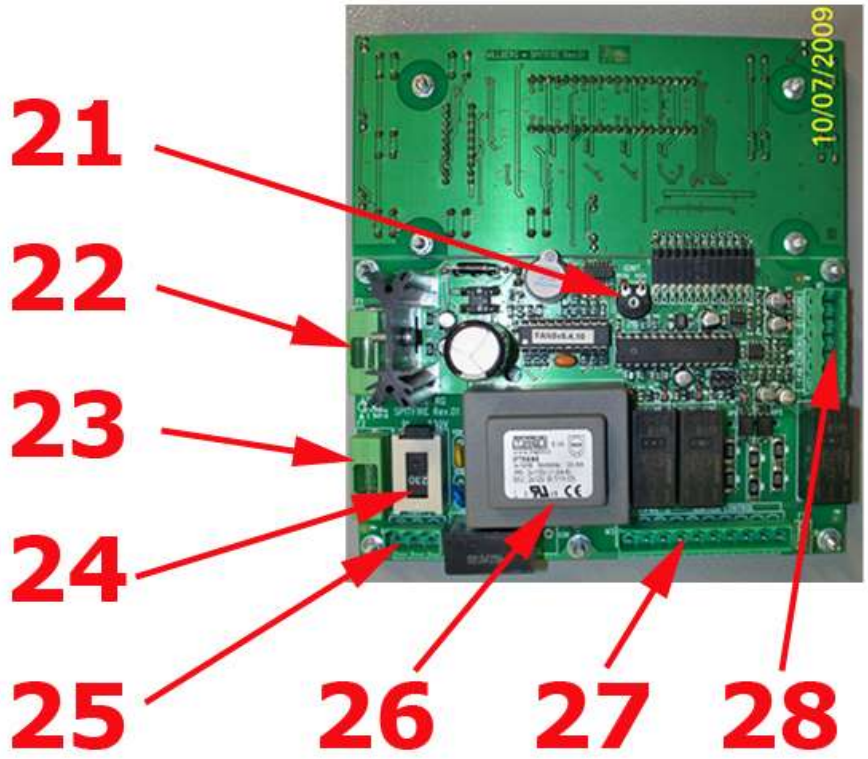

| | |
|---|---|
| 1 | ON – OFF Button |
| 2 | Tension light // indicated the burner is lit |
| 3 | UP temperature Button |
| 4 | Thermo Modulator Display |
| 5 | LEDs ramp // indicates flame power |
| 6 | UP flame Button |
| 7 | Maximum flame Button |
| 8 | Electronic board // Protective Case |
| 9 | Automatic temperature selector button |
| 10 | Thermo Modulator SET button |
| 11 | Temperature DOWN button |
| 12 | Light indicator that burner is lit |
| 13 | Burner ALARM indicator light |
| 14 | Electric connections |
| 15 | RESET button |
| 16 | DOWN flame button |
| 17 | Minimum flame level button |

# TO KNOW THE FUNCTIONS OF THE CONTROL BOARD'S BUTTON

| | | |
|---|---|---|
| 1 | ON – OFF Button | Turns the burner ON and OFF |
| 2 | Tension light | When the light is ON = the burner is lit // when light is out = the burner is OFF |
| | // Burner ON light | A blinking light warns that the tension is engaged |
| 3 | UP Temperature Button | Increases the set-point value |
| 4 | Thermo modulator Display | Shows the oven temperature |
| 5 | LEDs ramp | Shows the percentage of power at which flame is set |
| | // Flame Power | // 20% minimum flame // from 40% to 100% maximum flame |
| 6 | UP Flame Button | Increases the flame power to the maximum |
| 7 | Maximum Flame Button | Allows permanent selection of MAXIMUM flame |
| 8 | Electronic board // Protective Case | |
| 9 | Automatic temperature control selection button | Allows automatic control of temperature selection |
| 10 | Thermo modulator SET Button | Press once to ENTER or EXIT this menu |
| 11 | DOWN Temperature Button | Lowers the set-point value |
| 12 | ON Burner Light Indicator | A lit indicator = flame is ON // No light indicator = flame is OFF |
| 13 | Burner ALARM Light | Light ON = ALARM |
| 14 | Electric Connections | |
| 15 | RESET Button | Press this button to RESET the ALARMED Burner |
| 16 | DOWN Flame Button | Lowers the maximum flame power |
| 17 | Minimum Flame Button | Allows permanent selection of MINIMUM flame |



# TO KNOW FEW COMPONENTS OF THE ELECTRONIC BOARD MILLBERG




21 SWITCH TO SET IGNITION FLAME

22 SECONDARY FUSE 250 mA

23 MAIN FUSE 4 A

24 CHANGER OF TENSION 230 V - 115 V
selected in factory and locked with seal
**NOT MODIFIABLE**

25 CONNECTOR POWER ELECTRONIC BOARD
230 V. 50 Hz. - 115 V. 60 Hz.

26 TRANSFORMER LOW TENSION 2x12 V.

27 CONNECTOR POWER FAN / CONTROL BOX

28 CONNECTOR SIGNALS FAN

# HOW TO MODIFY THE SPEED PARAMETER OF THE BURNER

To modify or to set the flames of the burner, needs to enter the inside parameters.

- start the burner spitfire (green spy 12 illuminated)
- select MIN flame (push 17)
- contemporarily " press the keys 3 and 11 up to the appearance on the display of the letter P 1
- P 1 to set °C or °F (press 3 or 11 to change)
- Press SET for P 2
- P 2 is the hysteresis value. -5°C or -9°F (press 3 or 11 to change) this value is the difference of temperature under the set-point to restart again in maximum flame and to perform the automatic control of temperature of the oven.
- Press SET for P 3
- P 3 first door for the parameters press 3 until number 19
- Press SET for P 4
- P 4 second door for the parameters press 3 until number 19
- **Press SET and the burner turn off. The burner pass in pre-Ventilation and after few seconds it turn on with the ignition flame….**

**IGNITION FLAME - FLAME OF LIGHTING**

- the burner turns off and starts again in flame of lighting. The led of the button 9 turns on.
- On Display 4 you read 75 – 78. This values are the Hz. The frequency of the fan's motor.
- This parameter is exclusively modified only inside on the electronic board **to the point 21.**
- the minimal set is 50 and the maximum set is 90 – **Factory setting 75 Hz. For natural gas ; 50 Hz.**

**MIN FLAME – LOW FLAME**

- Press the **button 17** to pass on Min Flame or Low Flame
- On Display 4 you read 48 – 52. This values are the Hz. The frequency of the fan's motor.
- This parameter is modified with the button 3 or 11. To increase the flame press 3, to decrease press 11.
- the minimal set is 35 and the maximum set is 65 – **Factory setting 50 Hz. For natural gas ; 55 Hz.**

*** ATTENTION: in big ovens it is opportune to increase the frequency to 55 Hz.

- The **Leds Ramp 5** will be always **to 20%** when the burner is on Low Flame

**MAXIMUM FLAME – MAX FLAME**

- Press the **button 7** to pass in MAX FLAME
- On Display 4 you read 145 – 150. This values are the Hz. The frequency of the fan's motor.
- This parameter is modified with the button 3 or 11. To increase the flame press 3, to decrease press 11.
- the minimal set is 85 and the maximum set is 210 – **Factory setting : see next table NOMINAL RATE.**

*** ATTENTION: in big oven it is opportune to increase the frequency to 190 Hz. to 100% of the power.

*** Every time that the parameter of maximum flame is modified the burner will go to 100%.

*** The power can be lowered up to 40% with **the button 6 and 16** visualizing the power on the ramp 5, so you can verify the correctness of the flame.

- The **Leds Ramp 5** various **from 40% to 100%** when the burner is on Max Flame.

- press Set to Memorize and to go out of the configuration.

## *Tabella di regolazione impianti bruciatore*
## *INJECTORS LIST :*

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| GAS | G25.1 | G25.1 | G25.1 | G25 | G25 | G25 | G20 | G20 | G20 |
|---|---|---|---|---|---|---|---|---|---|
| MIX (mm) | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 |
| P out | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar | 0 mbar |
| Air | See Drawing DIS. 519-035 | | | See Drawing DIS. 519-035 | | | See Drawing DIS. 519-035 | | |
| Ignition (Hz) | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Reduced rate (Hz) | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Nominal rate (Hz) | 150 | 180 | 200 | 150 | 180 | 200 | 140 | 150 | 180 |
| Nominal Thermal input | 24 kW | 29 kW | 32 kW | 25 kW | 29 kW | 34 kW | 25 kW | 29 kW | 34 kW |
| Reduced Thermal input | 8,0 kW | 8,0 kW | 8,0 kW | 8,2 kW | 8,2 kW | 8,2 kW | 9,5 kW | 9,5 kW | 9,5 kW |
| Burner Model | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 | SPITFIRE SILVER | SPITFIRE GOLD 29 | SPITFIRE GOLD 34 |

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| Autor : | RP.DG L. — Dis. : 519 - 038 — Rev : D 1 |
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This table shows the adjustment of the burners
SPITFIRE SILVER
SPITFIRE GOLD 29
SPITFIRE GOLD 34
Relative to gas type
G25.1
G25
G20
G30

LEGEND:

MIX : depth of the screw gas RegGas

Air : air regulator position
Respect to the type of gas used

Ignition : fan speed with ignition flame

Reduced rate : fan speed with minimum flame

Nominal rate : fan speed with maximum flame at 100%

Nominal Thermal input :
Thermal power to 100%

Reduced Thermal input :
Thermal power to 20%

# PROGRAMMED MAINTENANCE

The programmed maintenance is a configuration that allows the customer to ensure the continued efficiency of the system burner SPITFIRE purchased.
Thanks to an internal timer will count the working hours of a plant.
Since the maintenance and / or extraordinary should not be considered by the customer at a cost, but a guarantee of the efficiency of the system and then of his work.
The restoration works on time split between operators and diversified, so it is not possible to establish a fixed term equal for all.
The program allows supervision SPITFIRE electronic control of the burner. There are security parameters to ensure the proper functioning of the burner and ensure maximum efficiency at work and prevent damage to the equipment used, before they will fail beyond repair.

The computer program is protected by sending some warnings lights and horns on the display:

| ALARM | EVIDENCED BY | HOW DOES THE BURNER | THE PROBLEM IS | RESOLUTION |
|---|---|---|---|---|
| | | | | |
| ERR 1 | inscription on the display | BURNER STOPPED | The thermocouple temperature is disconnected or interrupted.<br>If the thermocouple is disconnected when the burner runs, the system goes in alarm and obligatory stop for 3 minutes. | Change the thermocouple. |
| | | | | |
| ERR 2 | inscription on the display | BURNER STOPPED | Fan stop. The electronic switchboard has a protection from abnormal spikes, above the internal protection standard electronic. | Cut power to the control panel for 120 sec. and reboot. |
| | | | | |
| ERR 2 | inscription on the display | BURNER STOPPED | Fan stop. The electronic switchboard stops the burner because the fan isn't run in a right time, when it pass from MIN to MAX flame. The fan shall be dirty or in overheating. | Cut power to the control panel for 120 sec. and reboot. |
| | | | | |
| ALL 1 e BIP | inscription on the display | BURNER OPERATING | Fan is dirty, and is hard to run. | Do the routine services.<br>Clean the fan and the internal passages of the venturi.<br>Please call Technician. |
| | | | | |
| ERR 05 | inscription on the display | BURNER STOPPED | 300 hours after ALL 1 | Please call Technician for routine maintenance and reset system. |
| | | | | |
| ALL 3 e BIP | inscription on the display | BURNER OPERATING | Critical situation. Some electronic device is damaged. | Please call Technician for service maintenance and reset system. |
| | | | | |
| ERR 07 | inscription on the display | BURNER STOPPED | Critical situation. Some electronic device is damaged. | Please call Technician for service maintenance and reset system. |

## HOW TO SET THE TIMER OF PROGRAMMED MAINTENANCE

Power up the control panel

- Press 1
- Press at the same time 3 : 11 until the display shows the letter P 1
- P 1 - press SET to pass in P 2
- P 2 - press SET to pass in P 3
- P 3 - first step to entry in the configuration; set 30 with button **3**
- press SET to pass in P 4
- P 4 - second step to entry in the configuration; set 30 with button **3**
- **PRESS RED BUTTON 1 to see the hours worked for 3 sec.**

- Setting time **T** desired , the hours worked will return at the start.
- Press buttons **3 e 11** at the same time until the beep sound warn the time is reset.

| | TIMER SELECTION | HOURS OF WORK | FUNCTION |
|---|---|---|---|
| | T 0 | 0 | OFF TIMER |
| | T 1 | 600 | 600 hours of work before the next programmed maintenance |
| | T 2 | 1200 | 1200 hours of work before the next programmed maintenance |
| | T 3 | 1800 | 1800 hours of work before the next programmed maintenance |
| | T 4 | 2400 | 2400 hours of work before the next programmed maintenance |
| | T 5 | 3600 | 3600 hours of work before the next programmed maintenance |
| | T 6 | 4800 | 4800 hours of work before the next programmed maintenance |
| | | | |

- press SET to return to operation mode.

# ROUTINE SERVICES

**THE MAINTENANCE OF THE BURNER IS TO CLEAN THE AIR GROUP ( VENTURI AND FAN ).**

- Remove the aluminium sleeve with the air regulator by unscrewing the hex screw affixed to the outside, without moving the PVC disc, and check the internal passages of the venturi.
- Use a blast of compressed air with burner off, to remove any dust and dirt inside.
- When finished, replace the aluminium sleeve with the air regulator.
- .
- Make cleaning the ignition and flame detection. See attachment below.
- .
- Check the working time of the system.

**THE MAINTENANCE AND THE ANOMALIES ARE ON THE MANUAL INSTRUCTION AT PAG. 15 AND 17.**
**That attached below.**

# ANOMALIES DURING THE STARTING OR WORKING

***Before considering anomalies during working makes sure that :***

- is not happened a black-out or a short circuit during the use of the plant
- there is no obvious damage to the electrodes or equipment burner
- display didn't show error or alarm
- *RTQ Make sure there is not high gas pressure inlet*
- make sure all gas valves are open

These procedures can be carried out by the personnel of the outfit except for those marked with the letters RTQ (Riservate per il tecnico qualificato = Reserved for the Qualified Technician)

- ***The system shows temperature on the display, the fan working, but there is not spark then doesn't go in ALARM.***

1. Check if the detection electrode is in its right position and clean.
2. Could be disconnect the silicon wires.
3. Could be damaged detection or ignition electrodes. Replace it.
4. Could be broken the HONEYWELL Control Box.

- ***The system shows temperature on the display, the fan working, but there is not spark then goes in ALARM.***

1 Check if the ignition electrode is in its right position and clean.
2 Could be disconnect the silicon wires.
3 Could be damaged detection or ignition electrodes. Replace it.
4 Could be broken the HONEYWELL Control Box.

- ***The system make the spark , light the flame then goes in ALARM.***

1. Check if the detection electrode is in its right position and clean.
2. Could be disconnect the silicon wires.
3. Could be damaged detection electrode. Replace it.
4. Could be broken the HONEYWELL Control Box.

- ***The system make the spark, doesn't light the flame then goes in ALARM.***

*1* *RTQ* Check the gas pressure. Increase gas pressure or decrease air / gas ratio.
*2* *RTQ* Check gas filter are clean, fan and venturi aren't dirty.
*3* *RTQ* Could be broken the gas valves.

- ***The MIN flame is on but doesn't change in MAX flame.***

1. Check if is set MAX FLAME BUTTON or AUTO.
2. Check if the thermos-regulator have the set-point over the real oven's temperature.
3. *RTQ* Check gas filter are clean, fan and venturi aren't dirty.
4.

- ***The MIN flame is on but when the MAX flame starts, the burner shuts down.***

1 *RTQ* Make sure the gas pipe is enough for maximum thermal power.
2 *RTQ* Check is not changed the builder's gas setting.
3 *RTQ* Check gas filter are clean, fan and venturi aren't dirty.

- ***The max flame is blue, tight and noisy.***

1 *RTQ* Check the gas pressure. Increase the gas pressure or decrease the air / gas ratio.
2 *RTQ* Check gas filter are clean, fan and venturi aren't dirty.

*Maximum Flame very tight*

*Correct Minimum Flame*

- ***The max flame is all yellow and dirties the dome of the oven.***

1 *RTQ* Check the gas pressure. Decrease the gas pressure or increase the air / gas ratio.
2 *RTQ* Check gas filter are clean, fan and venturi aren't dirty.

*Maximum Flame much yellow*

*Correct Maximum Flame*

## ***DISPLAY MESSAGES***

- ***Display shows "ER01"***

1 The thermocouple temperature is disconnected or broken. Replace it.
2 Reconnect the wire with burner off, or is possible have 3 minutes in stand-by.
3 Disconnect the power supply and try again.

- ***Display shows "ER02"***

1 The fan is off. Disconnect power supply for 2 minutes and reboot.
2 The fan is broken. Please call technical assistance.

- ***Display shows "ER05" and the buzzer sounds periodically.***

1. Electronic failure. Please call technical assistance.

- ***Display shows "ER07" and the buzzer sounds periodically.***

1. System failure. Please call technical assistance.

- ***Display shows warning "ALL1" and the buzzer sounds periodically.***

1 The fan is dirty. Do ordinary maintenance, please call technical assistance.
2 The fan is in over temperature. Please call technical assistance.

- ***Display shows warning "ALL3" and the buzzer sounds periodically.***

1. System damaged. Please call technical assistance.

- ***Display shows "LO" (LOW Temperature).***

1 The temperature probe is cold : less 60°C or less 140°F
2 If the burner is in operation and the oven is hot, to reverse the polarity of the thermocouple.

- ***Display shows "HI" (HIGH Temperature)***

1 The temperature probe is too hot over 705°C or over 1300°F
2 The burner reached the limit temperature set by the manufacturer.

## 18.0 ROUTINE SERVICING

18.1 The ordinary maintenance of the burner is very easy, therefore it can be carried out by service personnel. Maintenance involves cleaning the most important components of the system, that means the electrodes and the fan; they should be cleaned at least once a month by the service personnel and once a year by a skilled Technician.

## 19.0 IGNITION ELECTRODE AND DETECTION ELECTRODE

19.1 They're very delicate components, even if made of ceramic or steel; these materials can withstand high temperatures, but not mechanical stress.
The system efficiency depends on their right functioning, so it's very important not to damage them during cleaning.

19.2 When the system is cool, check that the tip of the electrode is centered and inside the head of the burner and that the tip doesn't touch any ferrous parts.

19.3 To clean: take some sandpaper and rub the end of the electrode.

19.4 This operation must take place once a month at least, since inside the oven fats build up on the electrodes. The electrode is to be replaced if the ceramic or steel parts are broken.

## 20.0 CENTRIFUGE FAN

20.1 The fan efficiency is necessary if the burner is to function correctly.

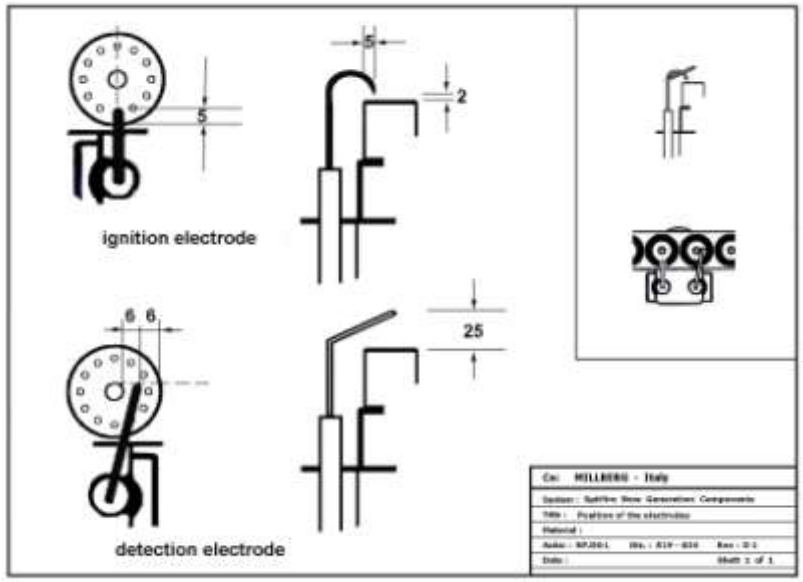
20.2 The inner wheel rotation is able to suck the surrounding air, that's why you must clean the area under the oven, where flour and dust could accumulate on the wheel causing the motor to burn out.

20.3 Use compressed air to clean the fan wheel.

20.4 The area under the oven must have enough aeration to allow for the cooling of the electric equipment and enough air to get a perfect combustion as the regulations in force require.

## 21.0 LINEAR MULTIHEADS BURNER

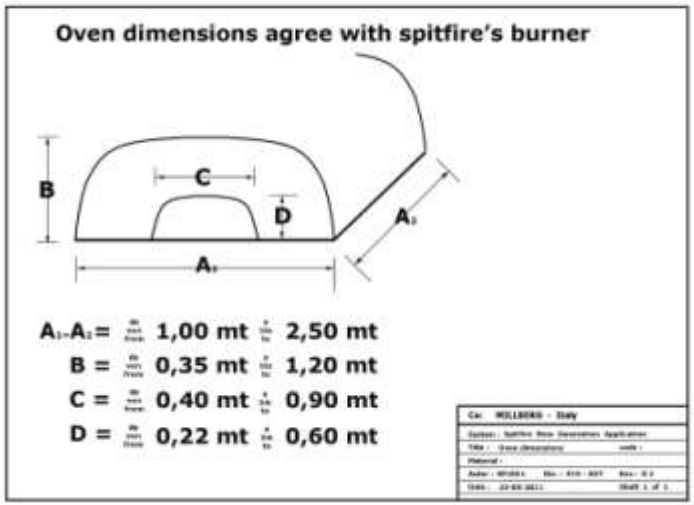
21.1 This doesn't wear down easily since it is made from stainless steel, however it must be kept running efficiently. The burner heads, in particular, need to be cleaned of any encrustation.
If dirt is allowed to build up on the head near the electrode, this will prevent the transmission of the electronic detection signal.




correct position of the ignition and detection electrodes compared burner heads

## SUITABLE OVENS : INTERNAL DIMENSIONS

size of the furnaces suitable
for the installation of a
new generation spitfire gas burner




## SUITABLE OVENS : EXTERNAL VISUAL INSPECTION

Check the consistency and temperature
of the oven prior to installation.
With temperature over 50°C after 3 hours
of work shall be obliged to apply
a thermal insulator at the base.