COMBISTAR BX

TECHNICAL MANUAL

2020

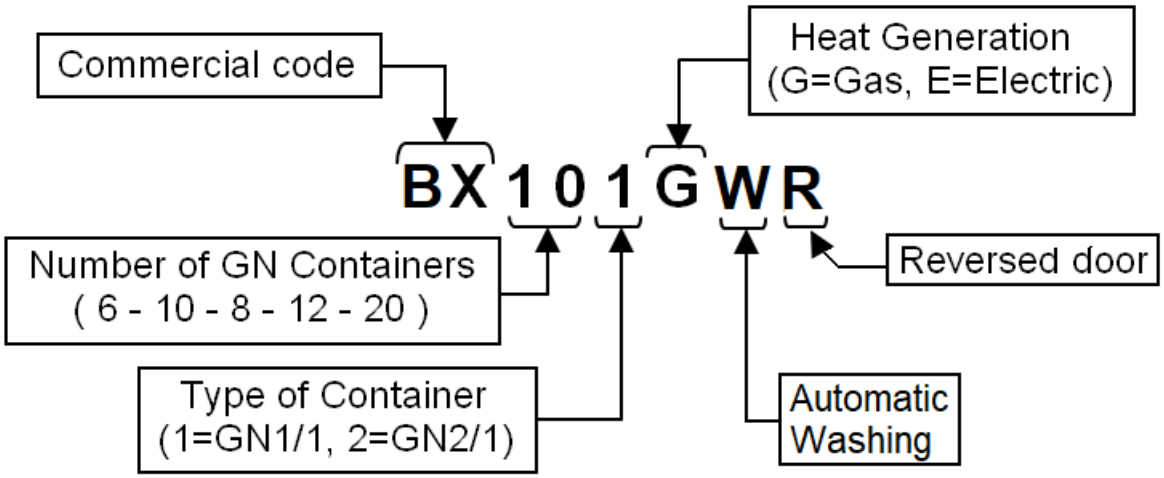
Rev. 0

ANGELO PO
A Marmon / Berkshire Hathaway Company

CONTENTS

1. COMMERCIAL MODEL NUMBER

1.1. Product range identification



1.2. BX Models table

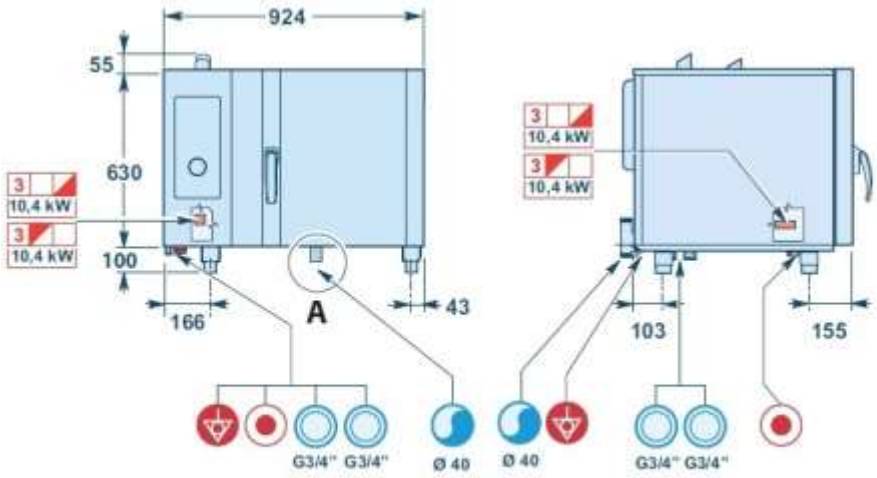
6 1/1GN	10 1/1GN	8 2/1GN	12 2/1GN
BX61E	BX101E	BX82E	BX122E
BX61ER	BX101ER	-	-
BX61EW	BX101EW	BX82EW	BX122EW
BX61EWR	BX101EWR	-	-
BX61G	BX101G	BX82G	BX122G
BX61GR	BX101GR	-	-
BX61GW	BX101GW	BX82GW	BX122GW
BX61GWR	BX101GWR	-	-

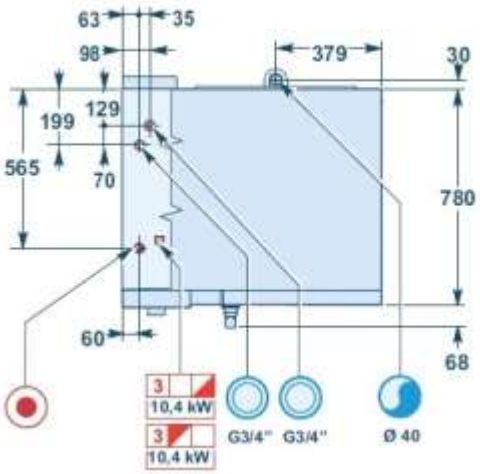
1.3. BX Power (FX-BX 2018)

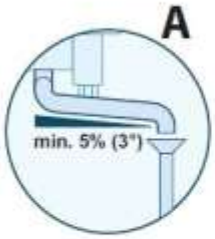
POTENZA - kW	6 1/1GN	10 1/1GN	8 2/1GN	12 2/1GN
GAS	14	19.5 (20)	27	32.5 (32)
ELETTRICA	10.1	17.3	19.8	27.5

1.4. Connection diagram electric and gas

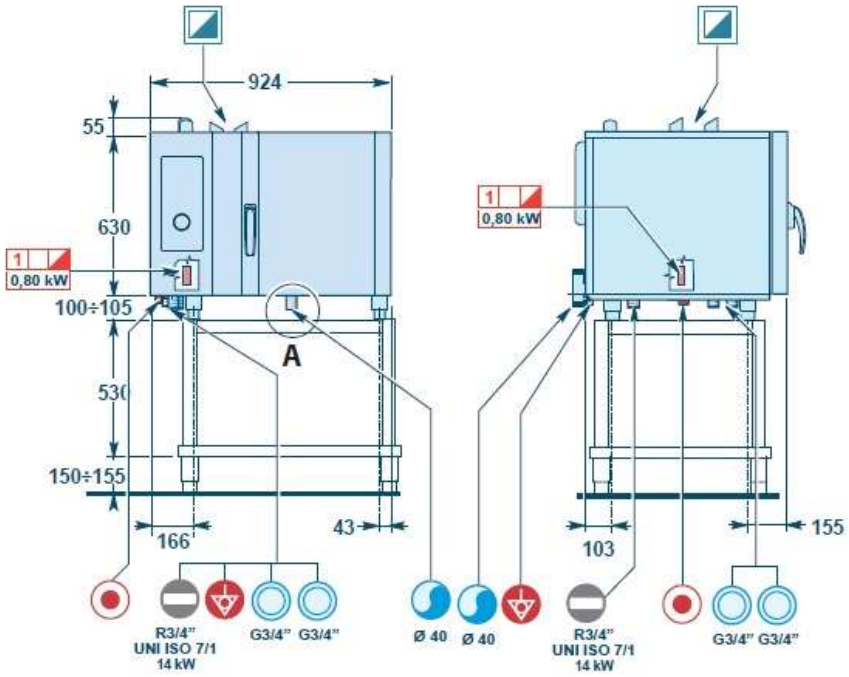
OVEN CONNECTION DIAGRAM (eg: BX 61 E)

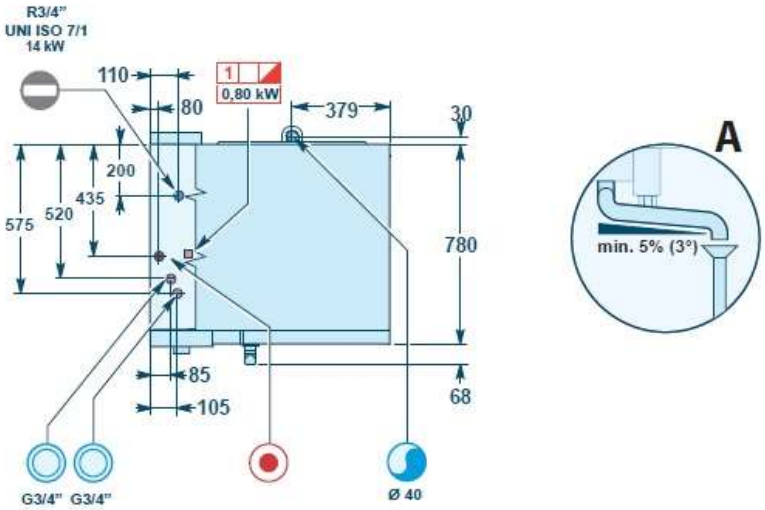






OVEN CONNECTION DIAGRAM (eg: BX 61 G)





Scarico fumi
Flue gas drain
Degagement gas brules
Gaseinzug
Evacuación humos

Allacciamento Gas
Gas input
Entrée Gas
Gaseinzung
Conexiòn Gas

Allacciamento acqua fredda
Cold water input
Entrée eau froide
Kaltwassereinzug
Conexiòn agua fria

Scarico acqua
Water drain
Vidage eau
Wasserabfluss
Evacuacion agua

Allacciamento elettrico
Electric connection
Branchement electrique
Elektroanschluss
Conexiòn elètrica

Morsetto equipotenziale
Equipotential terminal
Borne équipotentiel
Potetentialausgleichklemme
Borne equipotencial

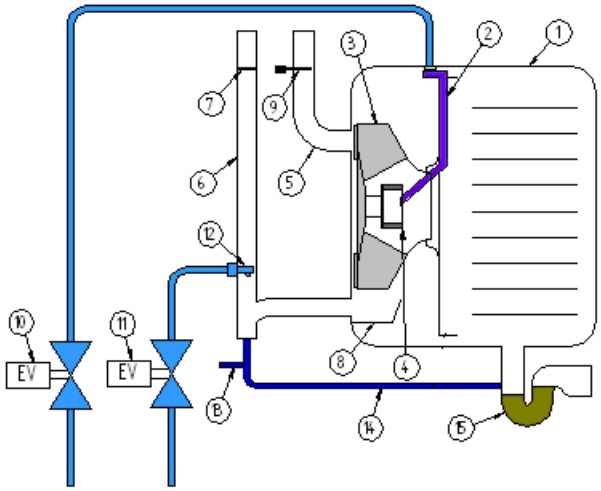
1
1~ N ⏚
230 V
Morsettiera
Terminal board
Plaque à bornes
Klembrett
Tablero de bornes

1.5. Water characteristics

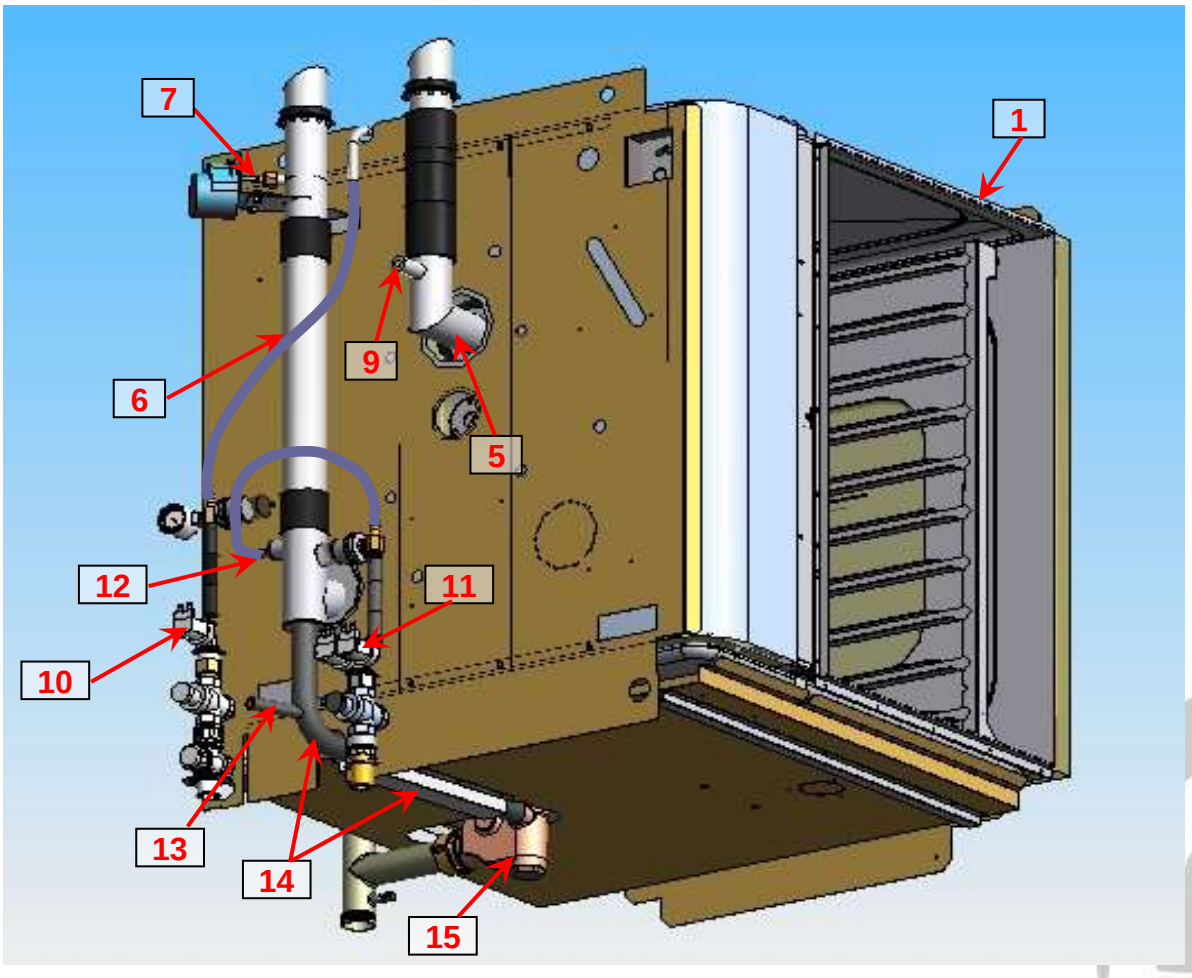
The appliance must be supplied with drinking water having the characteristics shown in the table. If these characteristics are not complied with, the appliance might suffer damage; a water treatment device should therefore be installed.

Parameters to be checked		*Value*
Pressure		200÷400 kPa (2÷ 4 bar)
Water flow rate (l/h)		9 l/h (FX 61) (*) 12 l/h (FX 101) (*) 17,5 l/h (FX 82) (*) 17,5 l/h (FX 122) (*) 24 l/h (FX 201) (*) 32 l/h (FX 202) (*)
pH		7÷8.5
TDS		40÷150 ppm
Hardness		3÷ 9°f (1,5÷5°d, 2.1÷6.3°e, 30÷90 ppm)
Langelier index (Recommended) (**)		>0.5
Salt and metallic ion content		
Requested	Chlorine Chlorides Sulphates	<0,1 mg/l <10 mg/l <30 mg/l
Recommended (**)	Iron Copper Manganese	< 0,1 mg/l < 0,05 mg/l < 0,05 mg/l

2. FUNCTIONAL DIAGRAM COMBI OVEN



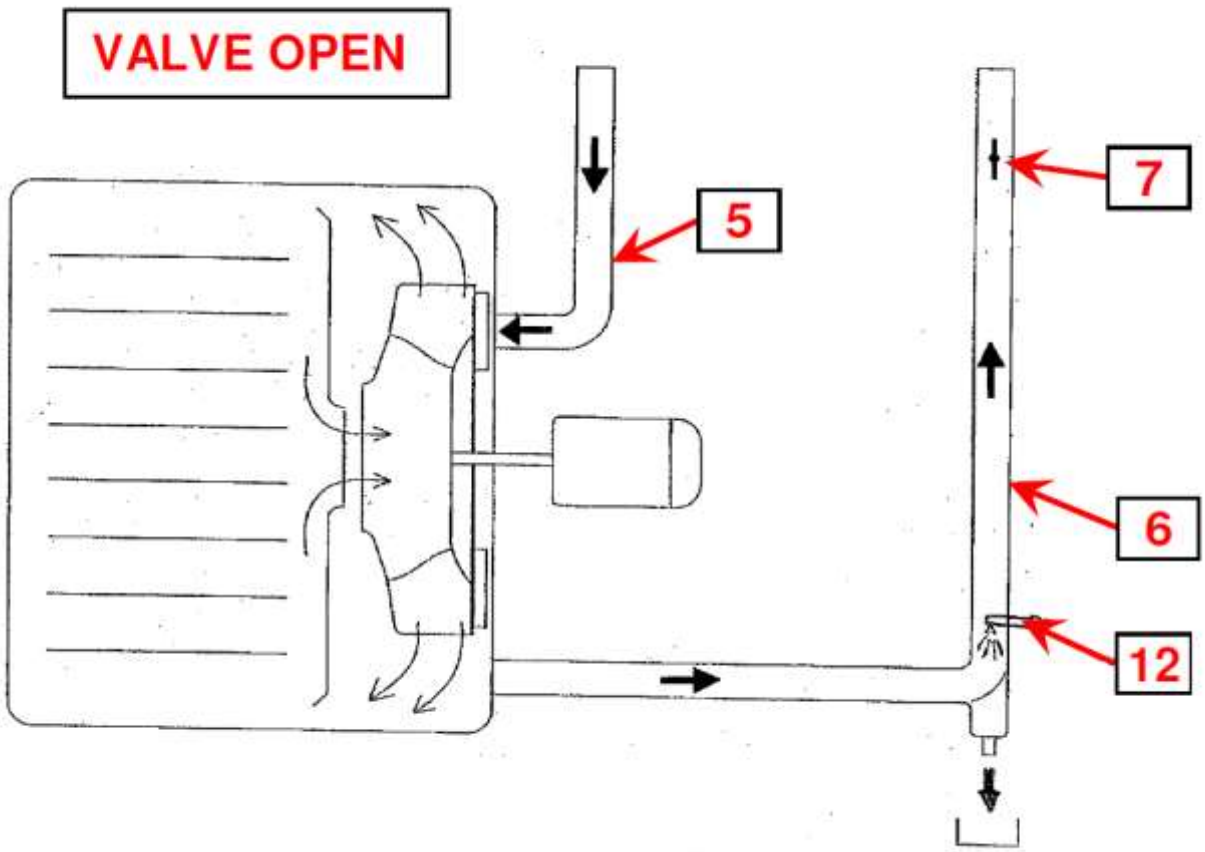
1. Cooking chamber
2. Water inlet pipe
3. Fan
4. Atomizer
5. Air pipe
6. Air outlet pipe
7. Motorised valve
8. Air flow diverter
9. Drain probe
10. Solenoid valve for steam production
11. Solenoid valve for steam condensing / drain cooldown
12. Injector for steam condensing / drain cooldown
13. Washing circuit drain pipe - **only BXW**
14. Condensate drain pipe
15. Siphon



The system works in two distinct ways depending on whether the motorised valve is opened or closed.

2.1. Open valve operation

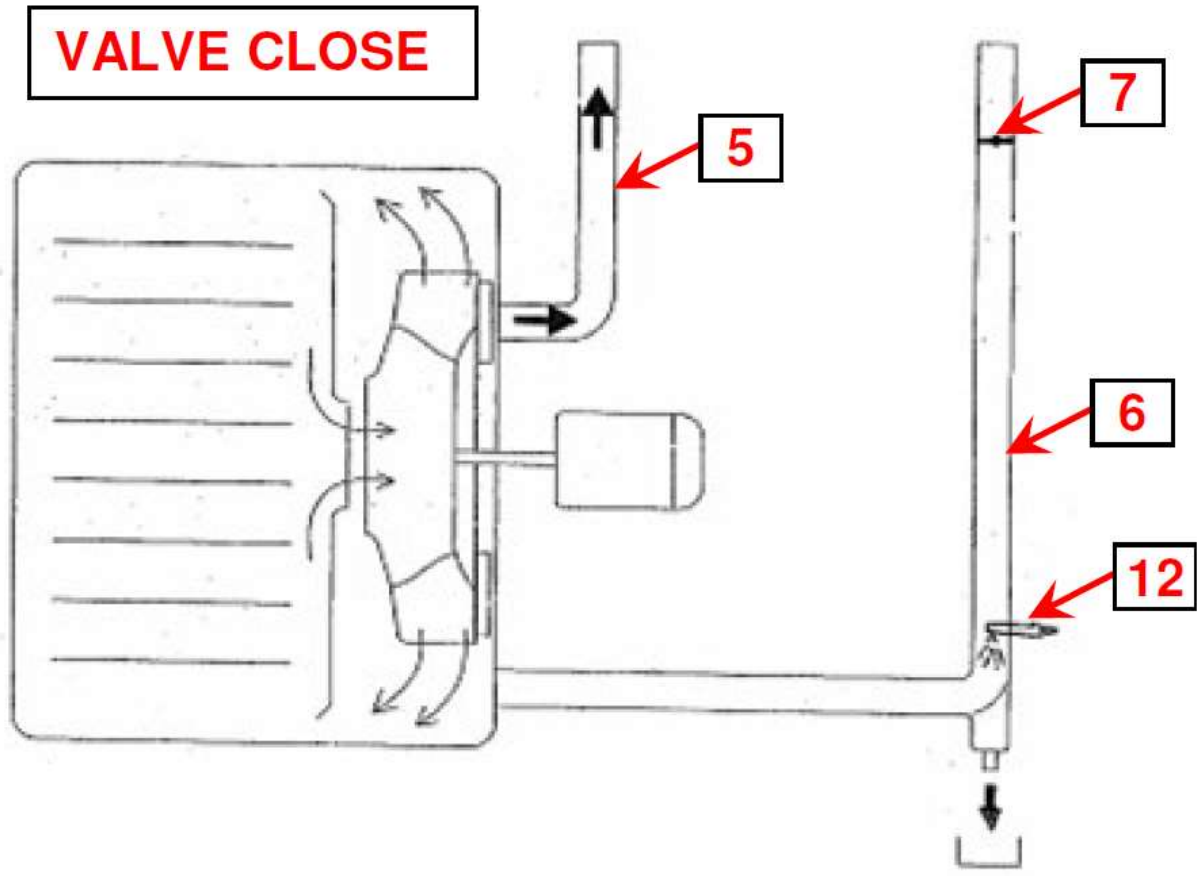
The rotation of the fan creates a vacuum effect in the local area behind his disk back where it faces the suction pipe/exhaust 5. When the butterfly valve 7 is open to this effect a vacuum sucking air flow entering through the pipe 5. Simultaneously the moist air inside the cooking chamber is induced to leave through the vent tube 6, aided by a flow diverter (not shown) placed inside the chamber at the exit hole. Through the injector 12 is sprayed water into the vent pipe - especially at high temperatures - in order to cool and condense the flow of moist air coming out. The condensate is collected on the bottom of the pipe to siphon 6 and conveyed through the rubber hose 14.



2.2. Closed valve operation

With the valve closed, the steam can't escape from the vent pipe 6, or from the tube 5 at least until the pressure inside the cooking chamber is not sufficient to overcome the effect of decompression generated by the rotation of the fan (usually 1,5-2,0mBar). But when the pressure chamber exceeds the decompression generated by the fan, the steam excess is expelled through the tube 5. The system operates as a closed system, where the overpressure valve (overpressure valve in the FM ovens) is dynamically replaced by the effect of decompression generated by the fan. Even in this mode, water is sprayed by the injector 12 in order to maintain the siphon full.

Note that, unlike than the FM, the condensate tube 14 is connected upstream of the swing of the siphon, as with the motorised valve closed the vent pipe 6 and the drain tube 14 are at the same pressure of the cooking chamber.



The two modes of operation described above are used in different modes of cooking in the following way:

Convection cooking: means the user can determine the % the vent valve is open according to the diagram below.

0%: vent completely open (bar on the display all red)

from **10** to **90%**: the valve opens and closes in timed mode, the value shown on the display is the % of time that remains closed.

--.--: vent completely closed (bar on the display all grey)

Combi cooking mode: the user can set the desired % of steam - the opening and closing of the vent valve is controlled automatically by the oven, based on values detected from the opposite humidity probe.

Steam cooking: valve remains closed.

2.3. Drain cooldown / steam condensing operation

The inlet water assembly 11 feeds the cooling water injector 12. The opening of the water solenoid valve is timed based on the mode of operation (convection, combi or steam), chamber temperature and the temperature detected by temperature sensor 9.

The inlet water assembly 11 is different depending on the levels:

BX W (with Automatic Washing)

It consists of:

- Non return valve EN1717 (for washing)
- Pressure reducer (for washing)
- Double water solenoid valve (one is for washing)
- Pressure switch on the drain cooldown line
- Pressure switch and manometer on the washing water line

Note: the water pressure adjustment should be done during a washing cycle.

BX (2nd generation and MY2016)

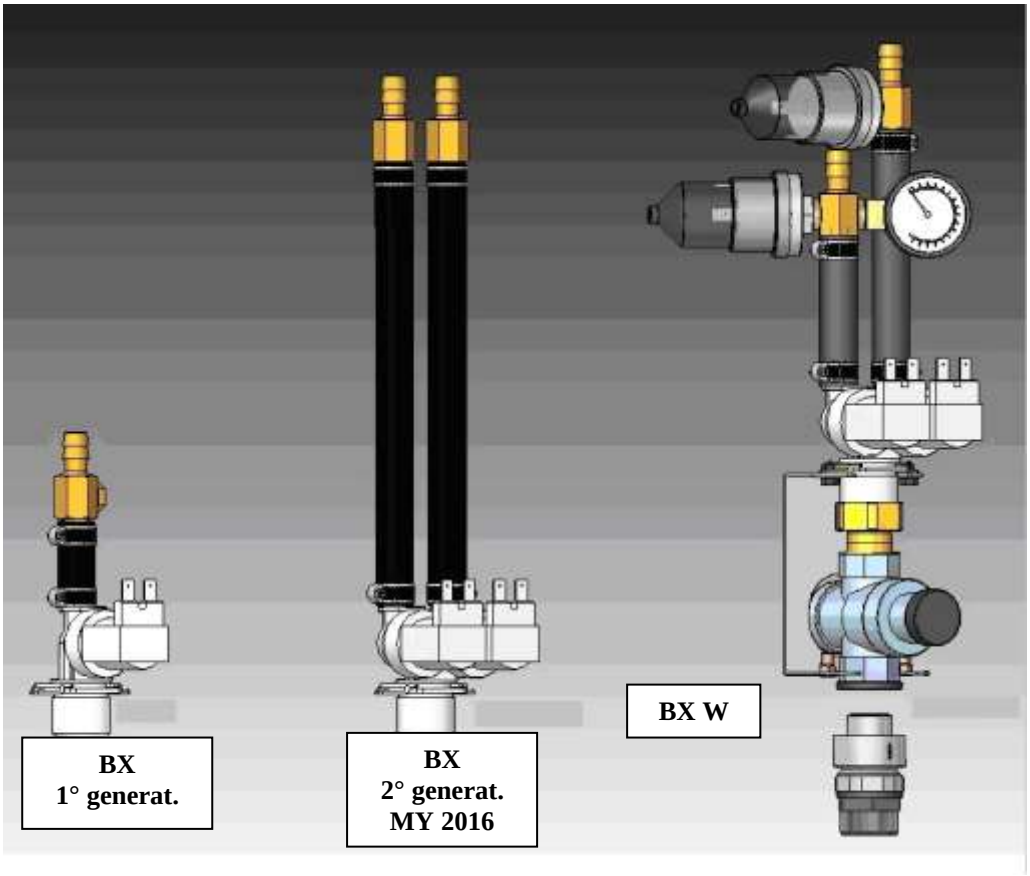
It consists of:

- Double water solenoid valve (one is for washing)

BX (1st generation)

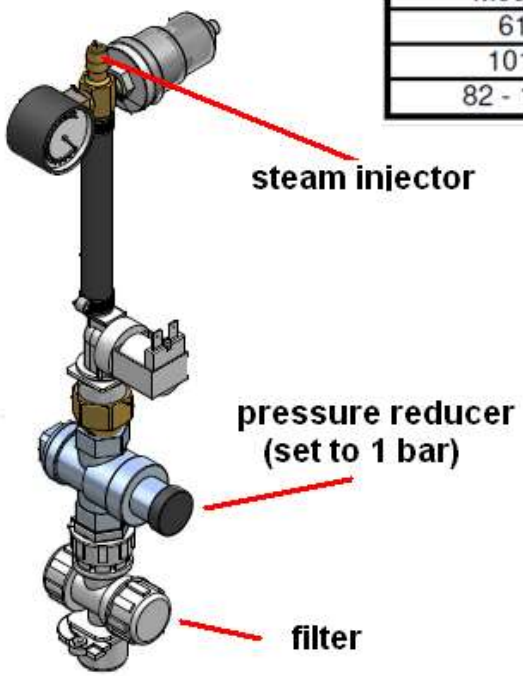
It consists of:

- Single water solenoid valve (only for steam condensing/drain cooldown)



2.4. Steam producing operation (injectors code)

Modell	Diameter Injector	Code
61	§ 0,50 mm	3032930
101	§ 0,60 mm	3032940
82 - 122	§ 0,70 mm	3032950



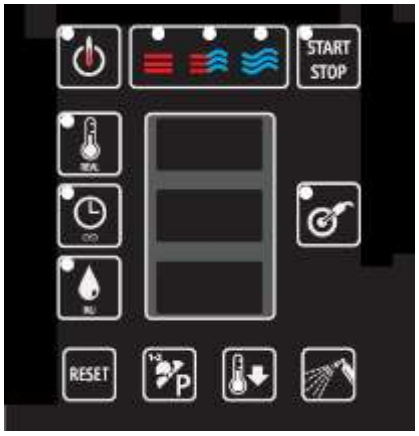
3. ELECTRONIC BOARDS, FUSES, OVERLOAD RELAYS

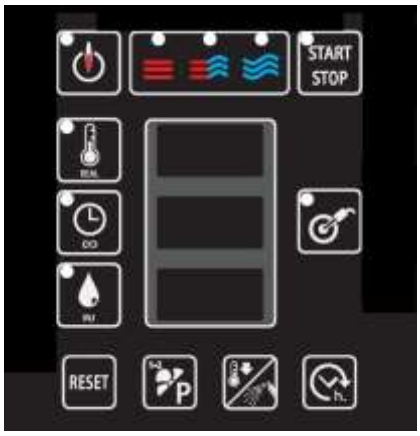
3.1. Electronic boards BX

The electronic boards system comprises:

1. CPU board (with Keyboard)
2. Power PCB
3. Combustion Control PCB (only gas model)
4. ON/OFF switch – 230V AC
5. Transformer (in 230Vac – out 12Vac) – **only for BXW**

1st generation





2nd generation MY2016 BXW

BX ovens – 1st e 2nd generation and MY2016

The CPU board (1) is made up of segment displays, key illumination LEDs and keys. It is connected to the power board (2) with 4 cables connected to PHOENIX connectors. The CPU power supply is measured between terminals 1 and 4 (approx. **12V DC**). Communication between the boards takes place between terminals 2 and 3.

The CPU board (1) receives the signals from the oven probes (temperature probes PT1000, etc.) and communicates with the power board through the cable connected to the PHOENIX connectors.

The power board (2) receives the micro-door signal and controls all the components of the oven through the appropriate relays. It communicates with the CPU board (1) as mentioned above and with the combustion control board (3) (only for gas ovens) via an RJ45 network cable.

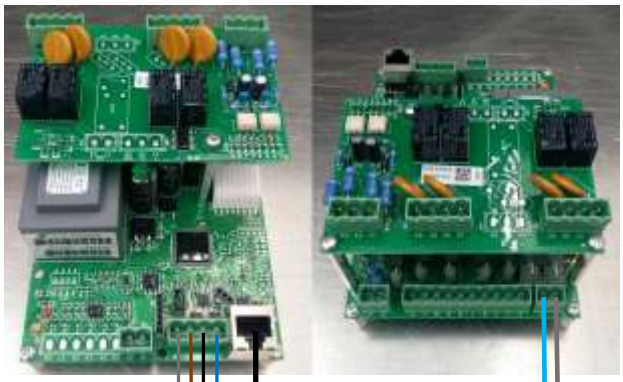
If the communication between the power board and the CPU board or the comb. control board fails, alarm E13 appears (communication error).

The management programme of the oven consists of two parts:

Firmware (FW) – it controls the operation of the oven (inputs and outputs) – it is in the power board

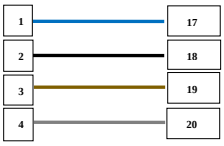
Software (SW) - Contains all the functions of the user interface, programs, probe inputs, etc... – it is in the CPU

2 – Power board



1 – CPU board

1-4: 12Vdc



RJ45

220Vac

4 – ON/OFF switch

3 – Comb. Control board

BXW ovens

The CPU board (1) is made up of segment displays, key illumination LEDs and keys. It is connected to the power board (2) with 2 cables connected to PHOENIX connectors. The CPU power supply is measured between terminals 1 and 4 (approx **12V AC**).
Communication between the boards is via an RJ45 type network cable.

The power board (2) receives the signals from the oven probes (temperature probes PT1000, etc.), the micro-door signal and controls all the oven components via the appropriate relays. It communicates with the CPU board (1) and with the Combustion Control board (3) (only for gas ovens) via an RJ45 network cable.

If the communication between the power board and the CPU board or the comb. control board fails, alarm E13 appears (communication error).

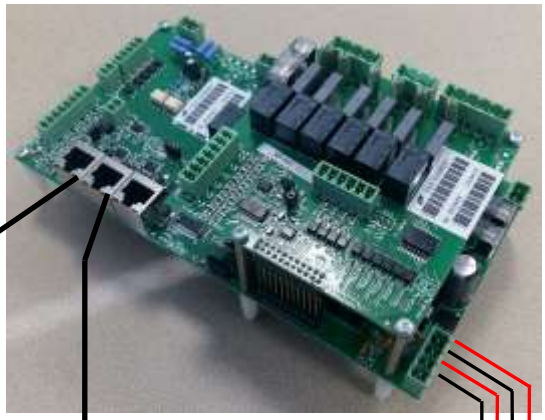
The management programme of the oven consists of two parts:

Firmware (FW) – it controls the operation of the oven (inputs and outputs), probe inputs and the washing system – it is in the power board

Software (SW) - Contains all the functions of the user interface and programs – it is in the CPU

1 – CPU board

2 – Power board



RJ45

12Vac

5 - Transformer

RJ45

3 – Comb. Control Board

220Vac

4 – ON/OFF switch

Oven menu management

The following procedure allows: **a)** to set the temperature measurement unit (°C or °F), **b)** to enable / disable the automatic preheating, **c)** to display the SW and FW versions

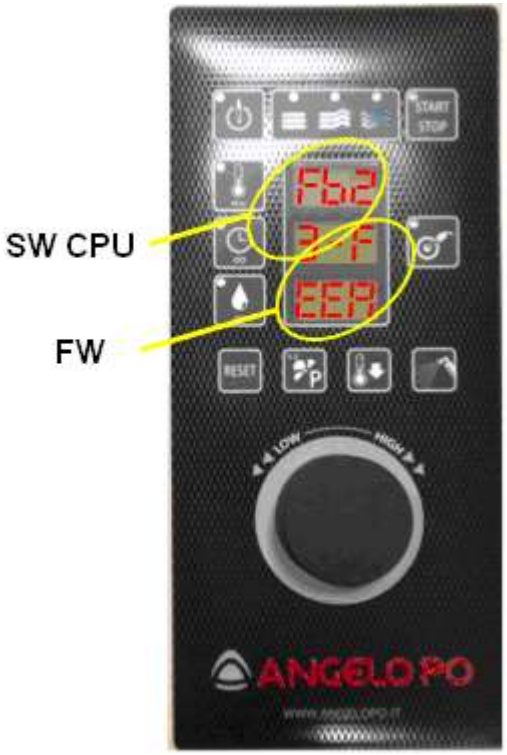
With the oven on in standby mode (**green** power supply LED on):

a) Press the "**TEMPERATURE**" button for 2 seconds and turn the knob to change the temperature unit setting (**°C** o **°F**).

b) Press the "**TIME**" button for 2 seconds and turn the knob to set the automatic preheating (**PrH**)

c) **1st generation version**: keep the "**WASHING**" button pressed for 2 seconds to display the **SW** and **FW** versions.

MY2016 and BXW versions: keep the "**DELAYED COOKING**" button pressed for 2 seconds to display the **SW** and **FW** versions.



d) **1st generation version**: press the "**COOLDOWN**" key and use the knob to enable/disable the cooldown during cooking with water.

MY2016 and BXW versions: press the "**COOLDOWN / WASHING**" button and use the knob to enable/disable the cooldown during cooking with water.

e) Press the "**HALF SPEED / REGENERATION**" button (**P**) for 5 seconds to restore the original regeneration programs.

Wait without pressing any key for the automatic restart of the display

How to configure the type of oven

The setup process of the oven must be done after replacing one of the following components: **CPU board, power board, combustion control board.**

It is required, in order to make all the boards communicate and to select the correct operating parameters of the oven. Operate as follows:

1. With the oven ON and in STOP mode press and hold (simultaneously) the keys "**CONVECTION**" and "**RESET**" for 4 seconds to enter the configuration screen.

2. Select using the knob the model of the oven in the display and confirm pushing the knob.

3. Wait for the end of the configuration process and compare what appears on the display with the table below.

4. If the configuration is incorrect check the connections between the boards and press the knob to repeat the configuration.

5. If the configuration is correct press the "START / STOP" button to exit.

Oven configuration table

MODEL	DISPLAY
61E, 101E, 82E, 122E	0 – 0
61G, 101G, 82G, 122G	0 – 1

3.2. Alarm recording MY2016 and BXW models

With the oven on in standby mode (green power supply LED on), press "**start/stop**" for 3 seconds to see the last 10 error codes. The first displayed is the last error. By turning the knob anticlockwise you can see the older alarms. If you press "**time**" you will see the time starting from the first use of the oven until the alarm happened. The first 2 lines are the hours and the last line Minutes. The displayed time is the time that the oven was ON (regardless in Start or in Stop).

3.3. Explanation table

When a component is replaced you must perform the procedures indicated below - attention: these procedures should be performed after replacement of the component and in the order listed below.

ITEM REPLACED	PROCEDURES TO FOLLOW
CPU board (1)	Oven configuration procedure Gas setup procedure
Power board (2)	Oven configuration procedure
Comb. Control board (3)	Oven configuration procedure

Note: after replacing one of the items listed above, at the first ignition of the oven you may see alarms E13 and / or E20. After following the procedures listed in the table the alarms should no longer appear.

3.4. Reset parameters BX board

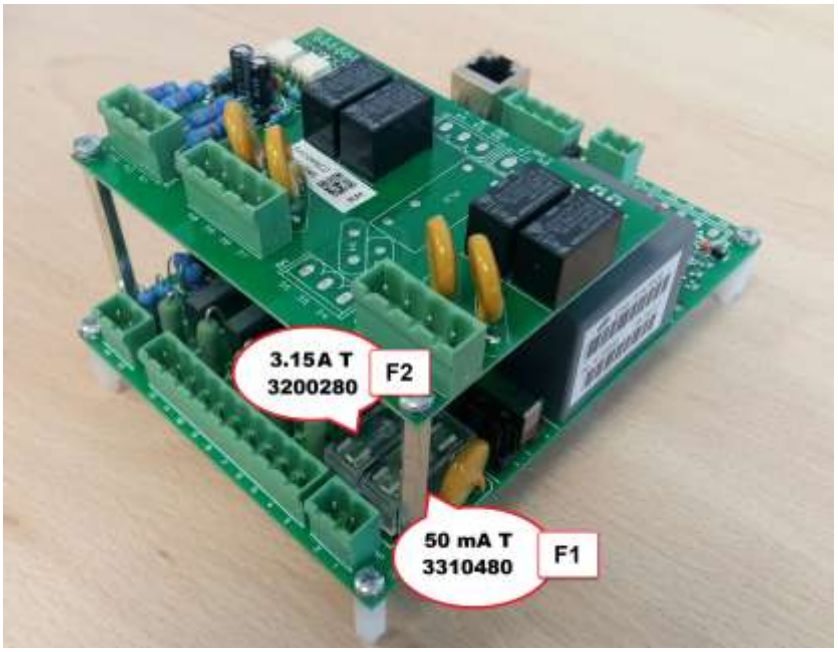
To reload in the board the default parameters need operate as follow: In Standby Mode (**green** LED of the on/off button is on), press the on/off button [1] together with the delayed start (older model cleaning) [3] for 5 Seconds. The display will show the SW version. Now press the temperature button [2] together with the delayed start (older model cleaning) [3] for 5 Seconds. The display will show “PRK OK”. Press the on/off button [1] to turn the oven on.

3.5. BX fuses description (non BX-W)

3.5.1. Power board:

F1: board fuse (**50mA T**)

F2: fuse contactors (Motor & Heating Element), rinse solenoid valve (**3,15A T**)



3.5.2. Wiring:

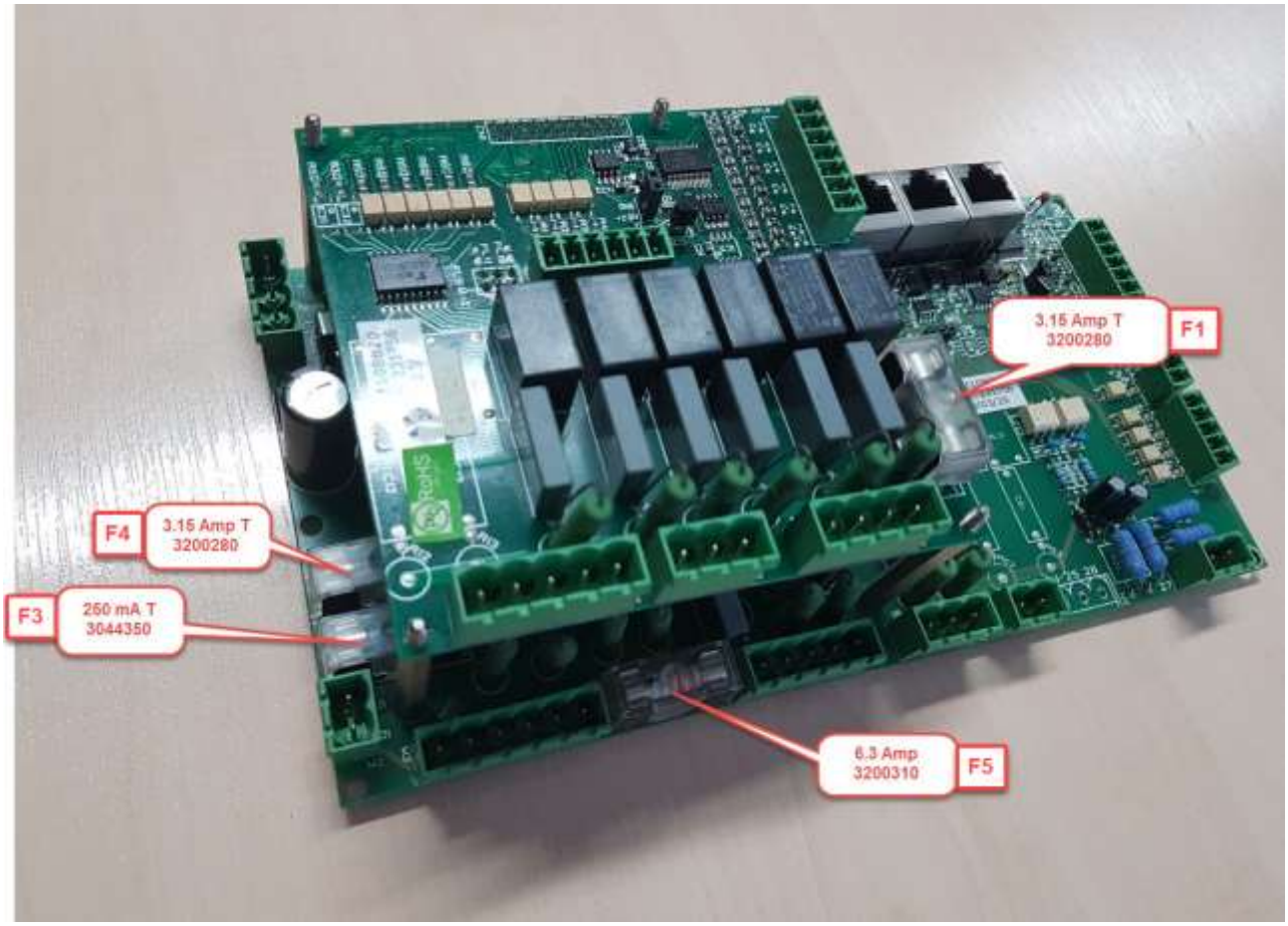
F1, **F2**, **F3**: motor protection fuses (**10 A**) (only electric models)

F4: fuse illumination (**1A T**)

F5: fuse steam & drain solenoid valves, motorized valve (**1A T**)

3.6. BX W fuses description

3.6.1. Power board



F3: fuse illumination (**250mA T**)

F4: fuse solenoid valves drain & steam, motorized valve (**3,15A T**)

F5: fuse contactors, combustion controller, solenoid valve rinse & washing (**6,3A F**)

F1: Washing circuit fuse (detergent & rinse aid dispensers, solenoid mixing-tank draining) (**3,15A T**)

3.6.2. Wiring

F1, **F2**, **F3**: motor protection fuses (10 A) (only electric models)

F1 Transformer: Power supply electronic boards (**630mA T**)

3.7. Electric ovens motor overload relays table

MOTOR OVERLOAD RELAY SETTING (50/60 Hz)				
Model	MOTOR part number	Power supply	Overload relay part number	Setting
BX61E BX101E BX82E	3103750	400V 3N 50 Hz 380V 3N 60 Hz	3156680 (3 ÷ 5 A)	3
BX122E	3103760	400V 3N 50 Hz 380V 3N 60 Hz		
BX61E BX101E BX82E	3103750	230V 3 50 Hz 220V 3 60 Hz	3156680 (3 ÷ 5 A)	4
BX122E	3103760	230V 3 50 Hz 220V 3 60 Hz	3108370 (4 ÷ 6,5 A)	4,8

3.8. Gas ovens motor overload relays table

MOTOR OVERLOAD SETTING 50Hz					
Model	Capacitor	MOTOR part number	Power supply	Overload part number	Setting
BX61G	31,5 µF	3184020	230V 1N	3108370 (4 ÷ 6,5 A)	4
BX101G BX82G	40 µF				
BX122G	50 µF	3103760	230V 1N	3108370 (4 ÷ 6,5 A)	5,2

MOTOR OVERLOAD SETTING 60Hz						
Model	Capacitor	Fan Wheel	MOTOR part number	Power supply	Overload part number	Setting
BX61G BX101G	25 µF	FX 6	3184020	230 V 1 N	3108370 (4 ÷ 6,5 A)	4
BX82G	40 µF	FX 8	3013760			5 , 5
BX122G	50 µF	FX 8	3103760			

3.9. Service Communication 2017_03 of 17/07/2017

Reference: FX-BX electronic components serial number

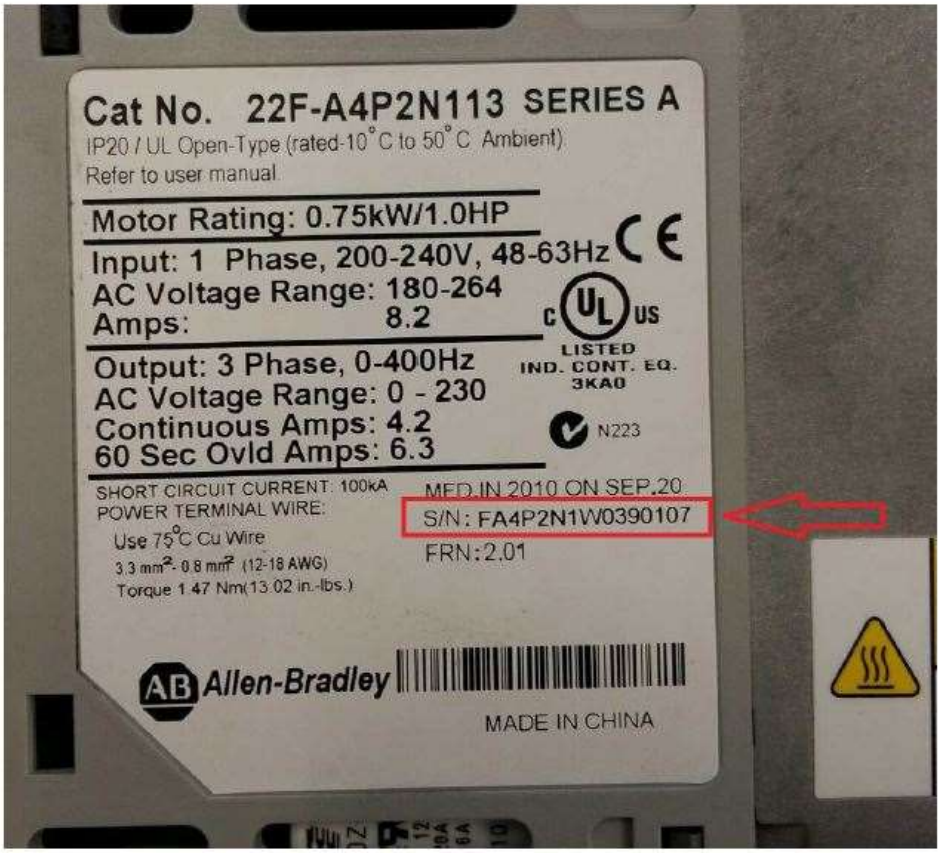
I hereby inform you that from today, whenever any of the following spare parts are required under warranty, you will need to provide, in addition to the serial number of the oven, the serial number of the component as well:

- Power board *(pic1)*
- CPU *(pic1)*
- LCD Display *(pic1)*
- Led board *(pic1)*
- Key board *(pic1)*
- Inverter *(pic2)* – *NOT PRESENT ON BX*
- Combustion Control Board *(pic3)*

Below are some sample photos how to identify the serial number:

pic1

pic2


Cat No. 22F-A4P2N113 SERIES A
IP20 / UL Open-Type (rated-10°C to 50°C Ambient)
Refer to user manual
Motor Rating: 0.75kW/1.0HP
Input: 1 Phase, 200-240V, 48-63Hz
AC Voltage Range: 180-264
Amps: 8.2
Output: 3 Phase, 0-400Hz
AC Voltage Range: 0 - 230
Continuous Amps: 4.2
60 Sec Ovld Amps: 6.3
LISTED
IND. CONT. EQ.
3KA0
N223
SHORT CIRCUIT CURRENT: 100kA
POWER TERMINAL WIRE:
Use 75°C Cu Wire
3.3 mm² - 0.8 mm² (12-18 AWG)
Torque 1.47 Nm(13.02 in.-lbs.)
MFD IN 2010 ON SEP.20
S/N: FA4P2N1W0390107
FRN:2.01
Allen-Bradley
MADE IN CHINA

pic3


Technosystem srl
Cd. FMB09912:1FW09912ST rev.B
1FW09912RE:010302s1v3 build 33
CE PIN:0694CP1824
S/N 003197 0317
Sol.E. snc
0050002-02
licence key:
cod. 3260000
70°C/B
250mA
250mA

4. GAS SYSTEM - OPERATE TEST ADJUST INSTALL REPORT

4.1. System operation

4.1.1. Premixed system general principles

FX oven gas system is a "total premix", this means that the gas is completely mixed with the necessary air to have "good" combustion and then the air-gas mixture is ignited at the burner.

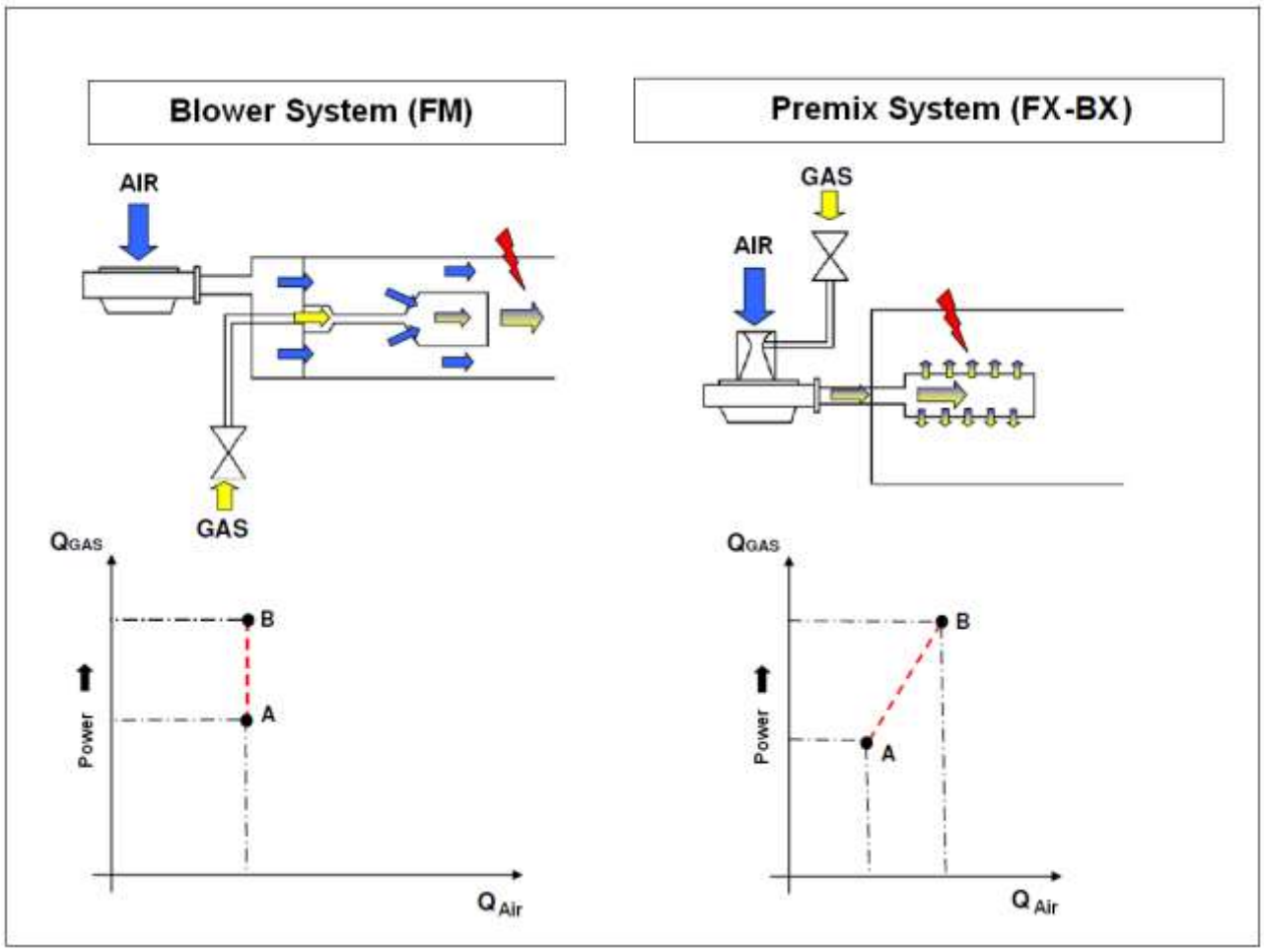
Therefore, the relationship between the quantity of air and the amount of mixed gas is constant and must be properly adjusted to avoid being too rich (risk of production of CO) or too poor (unstable flames).

In the diagram below we highlight the major differences between the blown system (FM) and premixed system (FX-BX): In the blown system, the gas and air inlet circuit to the burner are separated, while in the premixed system both flow into the mixer before going into the burner.

Consequently, in the blown system to adjust the gas flow and the combustion quality it is enough to adjust the gas valve output pressure or replace the nozzle.

In the premixed system, however, the gas valve output pressure is zero because of the vacuum created by the fan and therefore, only at low speeds (when the influence of the blower decreases), the combustion is controlled by the gas valve offset. To make this adjustment it is necessary to use a gas flue analyzer.

Furthermore, an electronic variable-speed blower, controlled by the power board, allows you to change the quantity of the air-gas mixture.



4.1.2. Power schemes

As it is evident from the diagram above, in the pre-mixed system air and gas are sucked in and mixed together by a fan. It is possible control the quantity of the air-gas mix because the fan rotation speed is electronically controlled, to obtain a variation of gas flow and thus the power of the burner.

There are 3 different power levels:

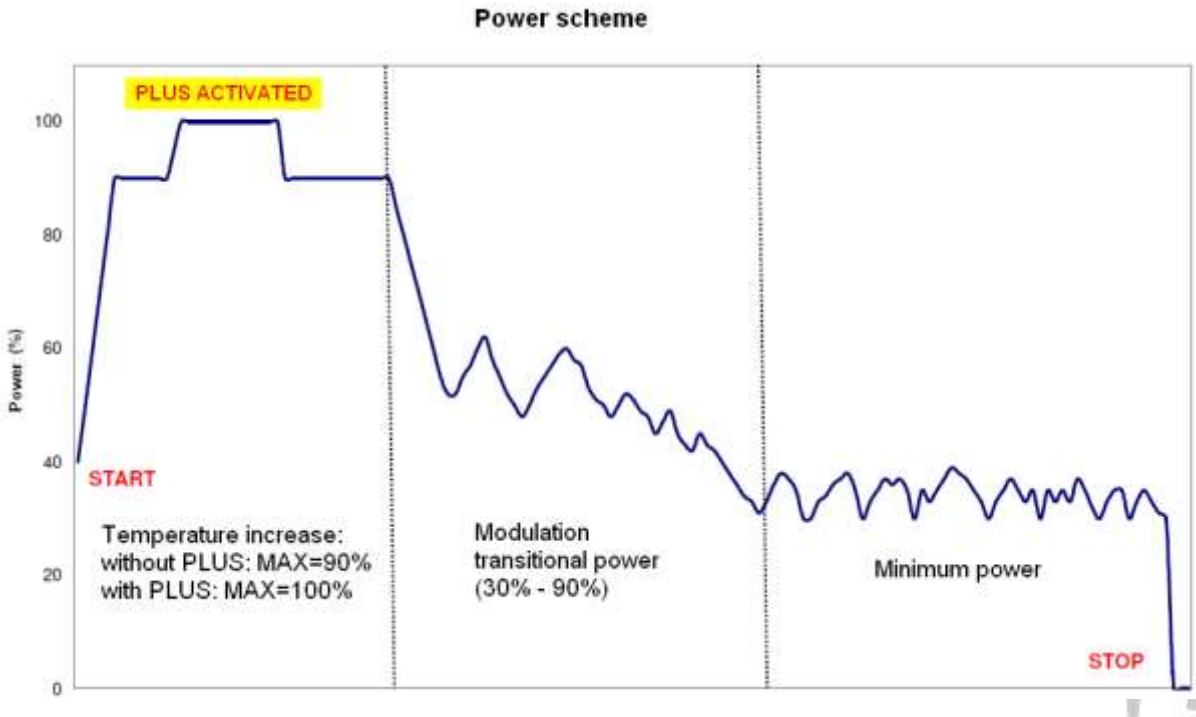
- Full power*: operating at maximum capacity and blower engines at full speed, the inlet gas circuit is in total decompression and the gas valve adjustment of the valve does not cause significant differences. The combustion is totally dependent on the nozzle installed.

- Modulation Transitional power: the system is able to control all the range of power from minimum to maximum with the control of the rotation speed of the blower fan by the power board. In this way, the combustion is "good" at any range of power.

- Minimum power: The minimum power is set at 30-40% of maximum. In this case, the vacuum created by the blower decreases and the effect of the valve offset adjusting becomes more important. The proper adjustment of the valve is essential. For details concerning the valve adjustment, see the section 4.4.3. Valve offset adjusting.

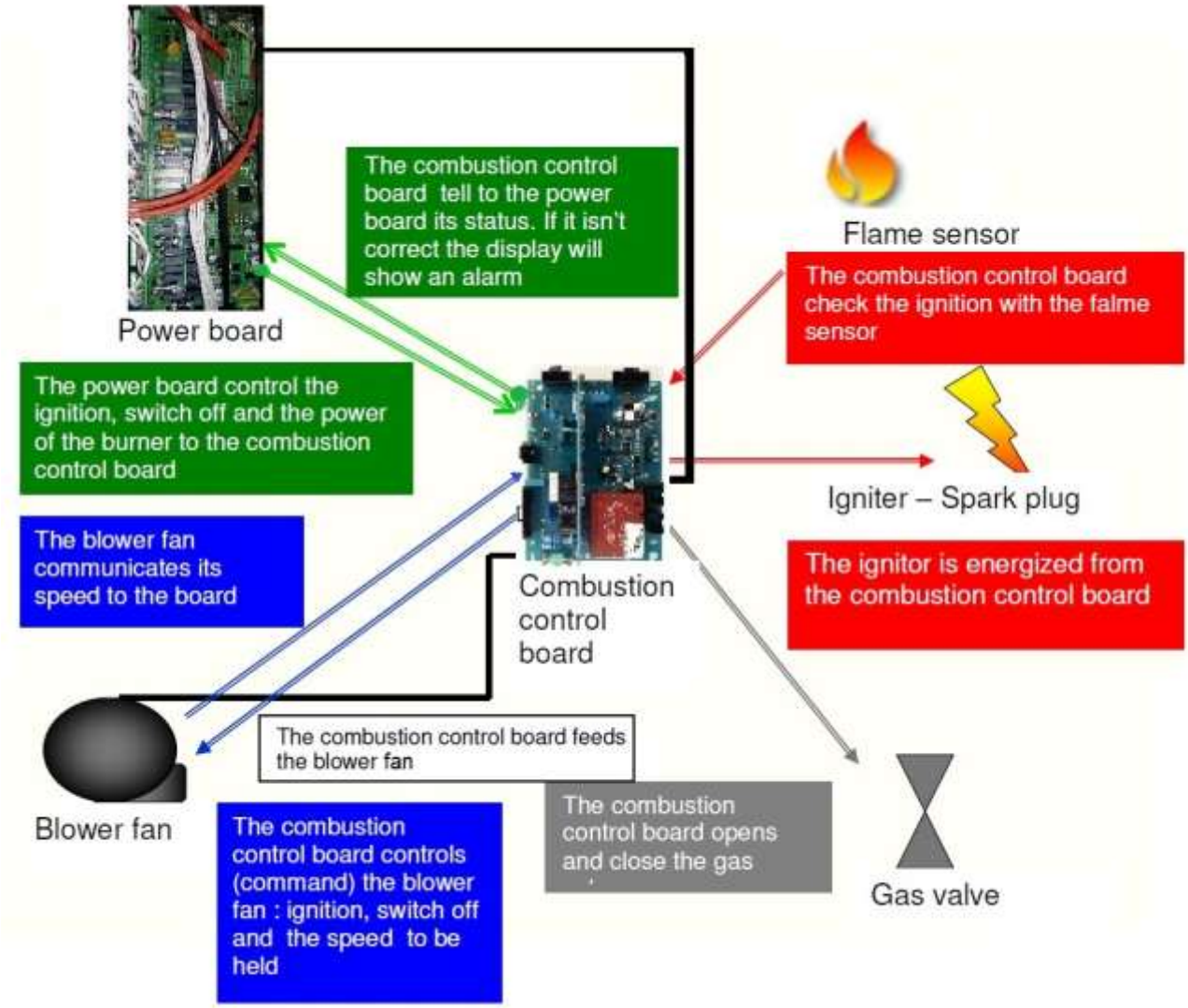
* With the PLUS function turned off the oven works with maximum set at 90% of maximum power, to use 100% of the power it is necessary to enable the PLUS function.

NOTE: the burner ignition occurs at a power of about 10% higher than the minimum (40-50%).



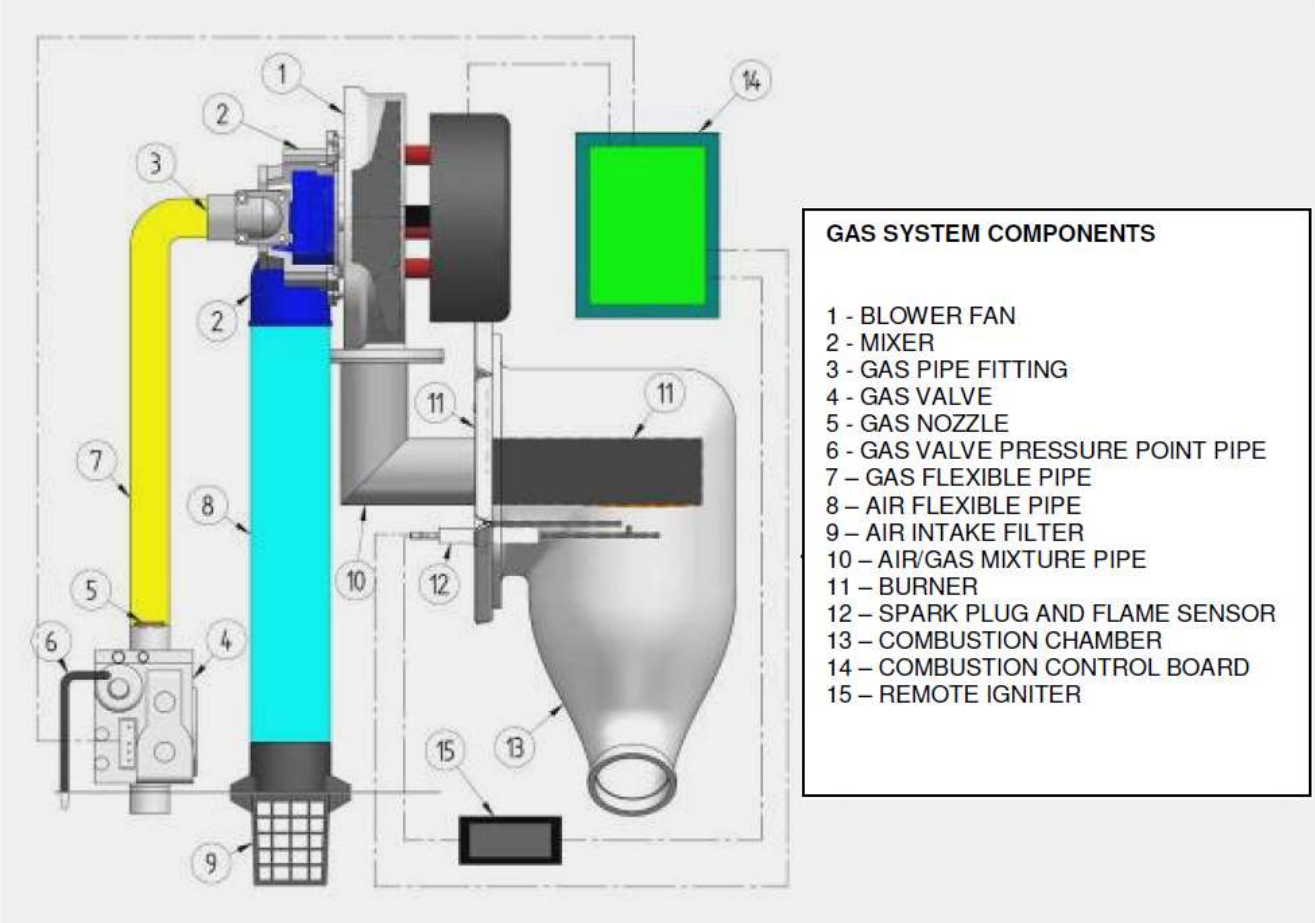
4.1.3. General functional diagram

The diagram shows how the major components interface each other. The power board feeds and drives the combustion control board, which during the ignition controls the blower, the gas valve and the igniter, until it receives the signal from the flame detector. Likewise, at the stop, the power board commands simultaneously the valve and turns off the blower. Power board and combustion control board continuously communicate by exchanging commands and communication status (for details see section 3. Combustion Control board logic operation).



4.2. System components

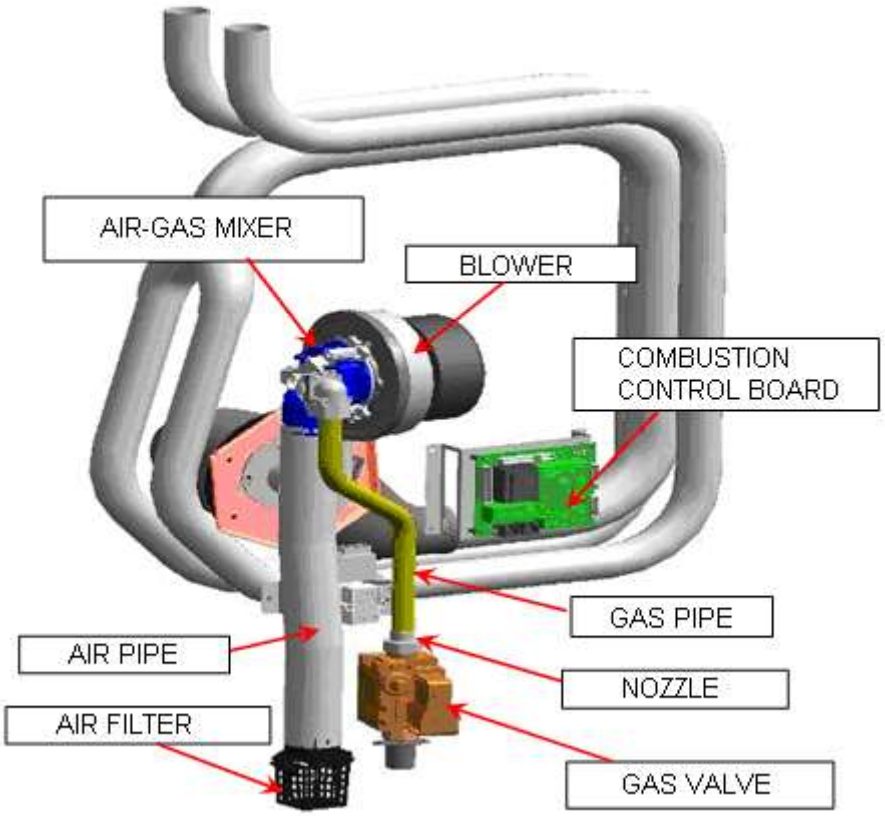
The picture shows all the components of the gas system.

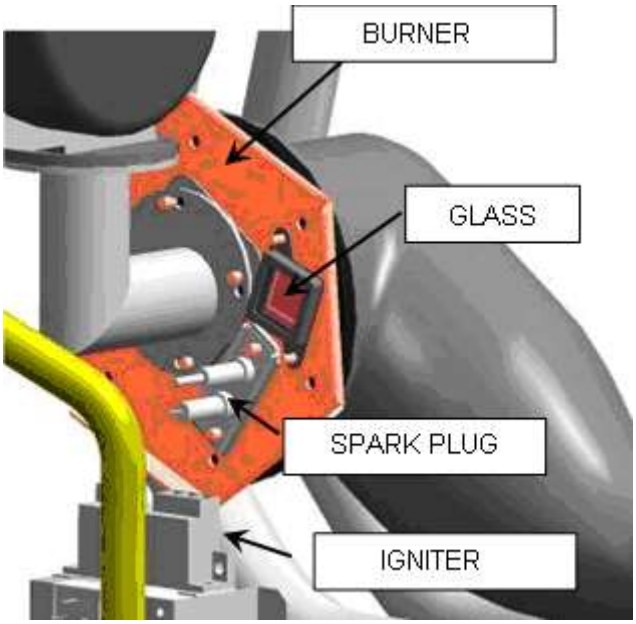


Attention:

- Always check before every intervention that all components are securely attached (electrical connectors, screws, clamps, fittings, insulation materials).
- Be sure the air inlet filter (9) and the exit of the gas valve pressure test point pipe (6) are totally clean (if necessary clean them properly).
- As the gas inside the tube (7) and the fitting (3) is at negative pressure, in case of leak to find it don't use flame because it could be sucked in the mixer and cause a fire / explosion.

Functional diagram gas system





4.2.1. Gas valve

All other test points are not used

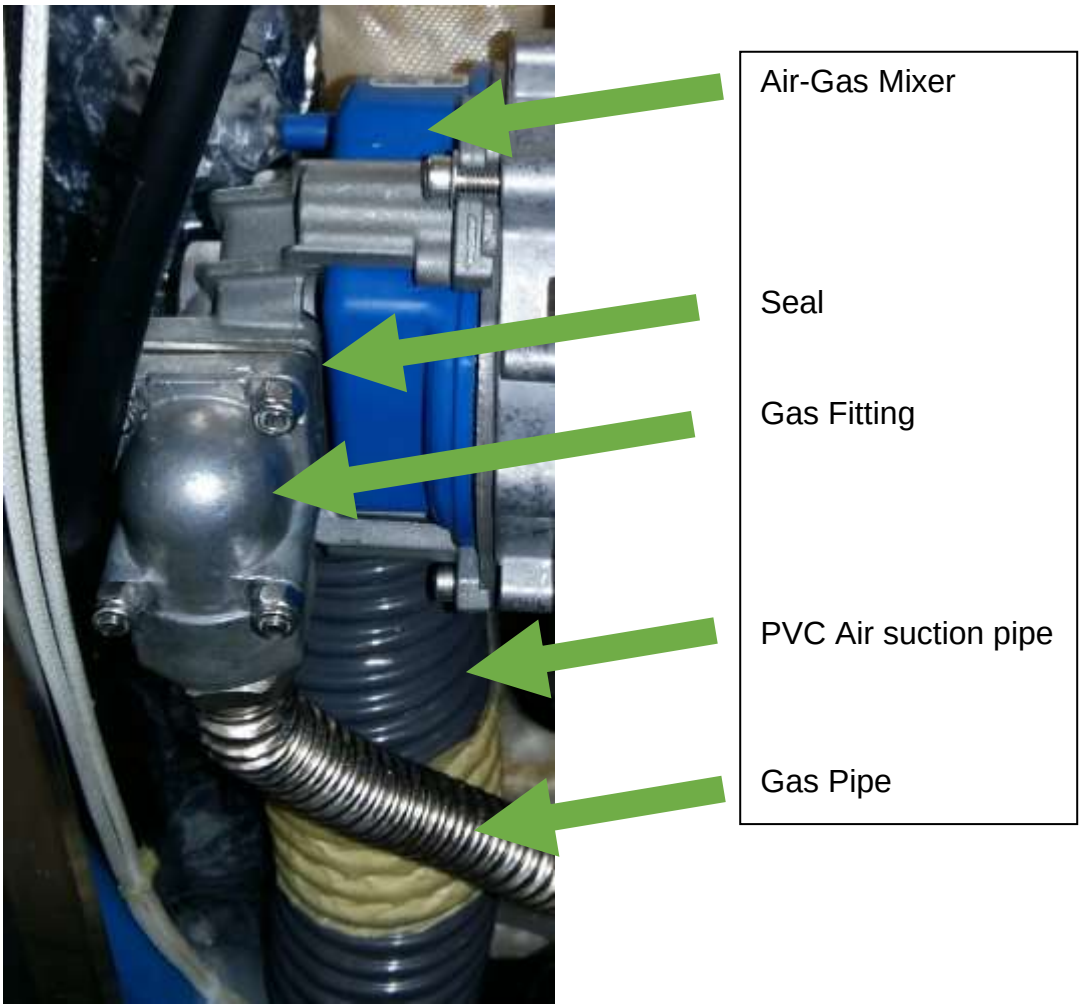
NOTE:

- For any details concerning the valve adjustment, see the section Valve offset adjusting.

- Be sure the air inlet filter (9) and the exit of the gas valve pressure test point pipe (6) are totally clean (if necessary clean them properly).

ATTENTION!: Each replacing of the gas valve is necessary to make the wizard test, check the combustion and even the gas valve offset adjusting.

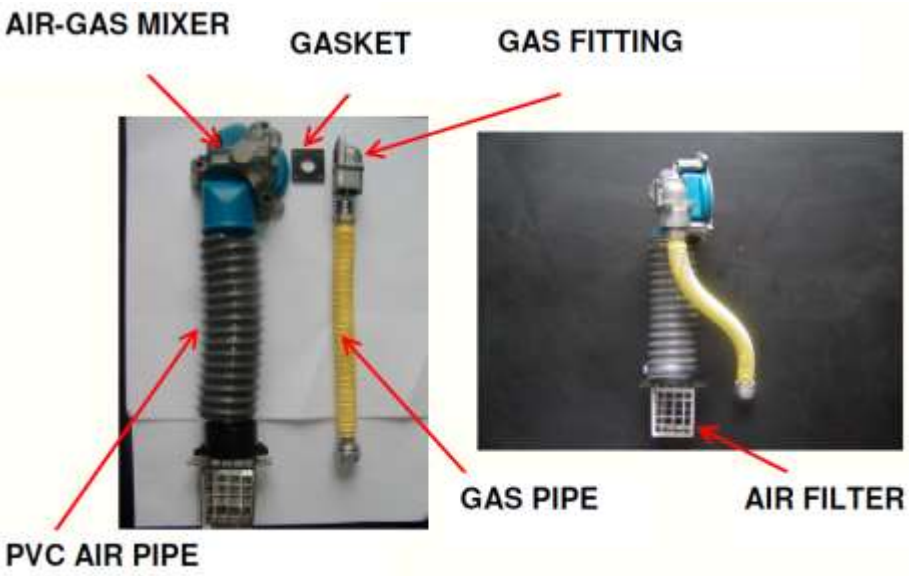
4.2.2. Mixer



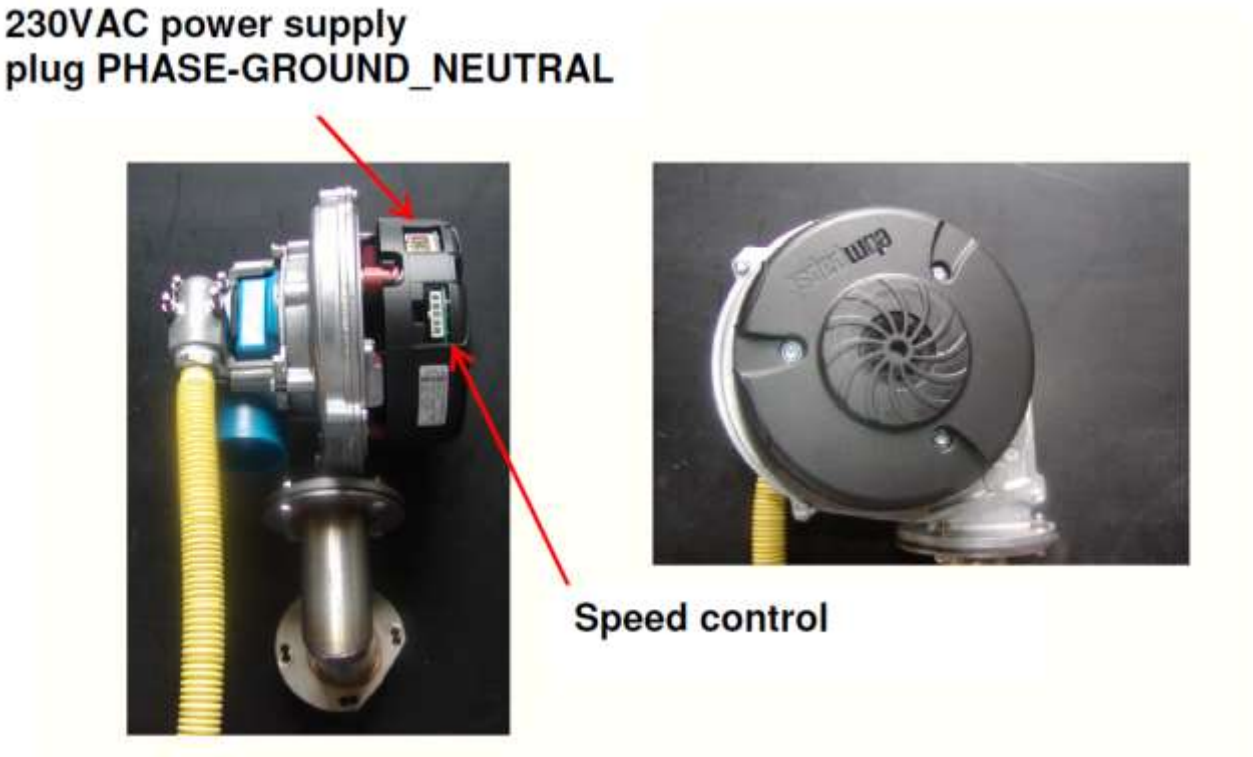
Exploded view of the Mixer + Seal + Fitting

Notes:

- Check that the combustion air filter is always clean and not clogged.
- Check that the draft air tube is free of cuts or tears and that the clamps are tight
- Check the connections tightness; do not use flames on gas burner because they could be sucked into the mixing circuit and cause fire / explosion.



4.2.3. Blower



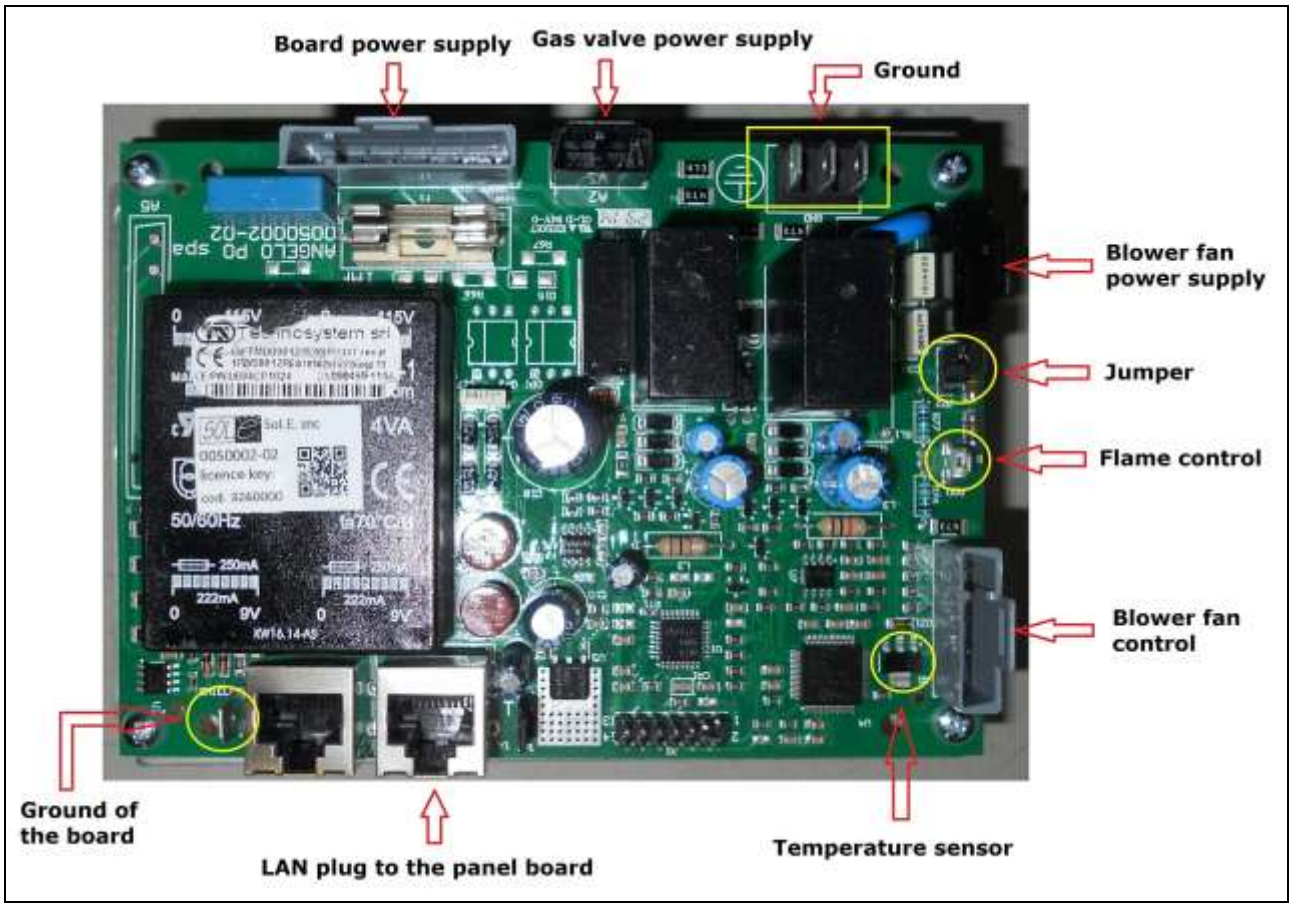
NOTES:

- Do not force the connector of the modulation control, it is one way inserting.
- The power supply of the fan is not polarized, remember that the ground connection is inserted in the middle.
- The blower speed is controlled by the combustion control board
- Brand's fan is **EBM**.

4.2.4. Blower (FX/BX 2018)

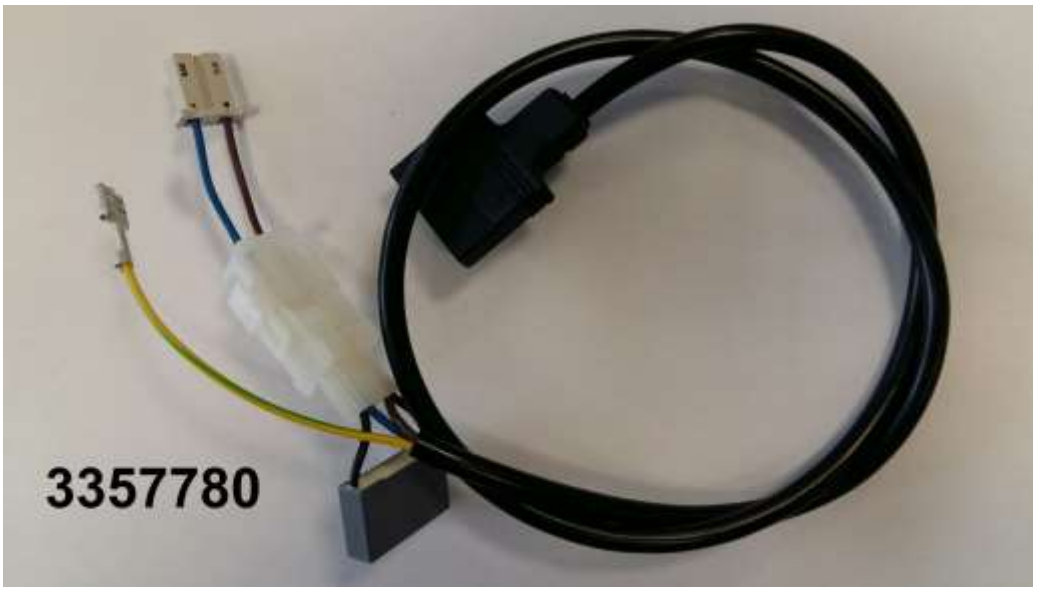
- Do not force the connector of the modulation control, it is one way inserting.
- The power supply of the fan is not polarized, remember that the ground connection is inserted in the middle.
- The blower speed is controlled by the combustion control board
- Brand's fan is **SIT**
- This fan must be used with the new combustion control and new burner (B200)

4.2.5. Combustion control board

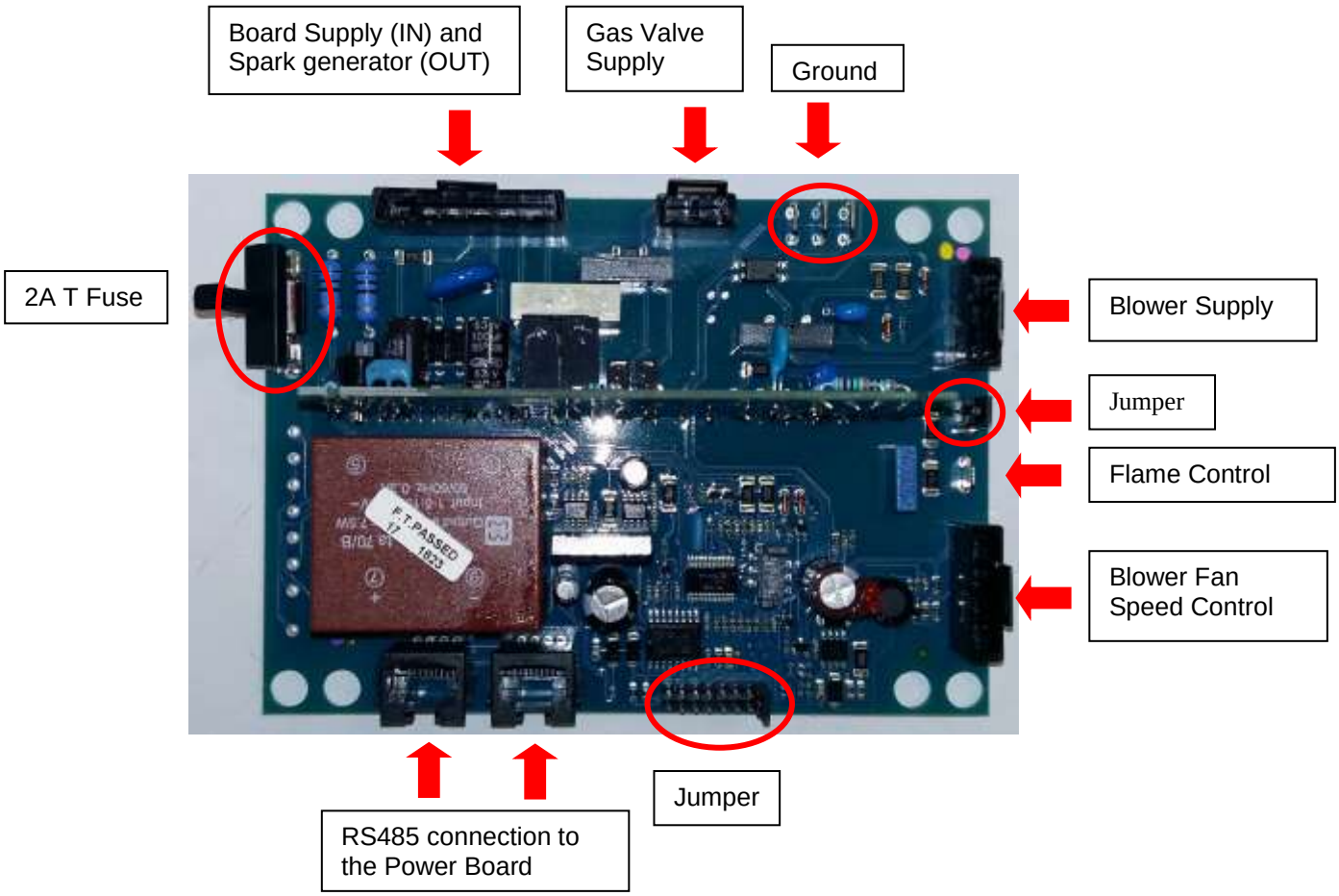


NOTE: during the installation, it's necessary to respect the correct connection of phase and neutral (not inverted). If the connection is inverted the microAmpere reading of the flame detector will be lower as it should be. To check, remember that the voltage measured between **NEUTRAL** and **EARTH** is **0±10 Vac**

The connection cable from combustion control to the valve is equipped with an LC filter.
This cable must be used only with the “old” card (the green one).



4.2.6. Combustion Control Board (FX/BX2018)



Connections are the same as the older combustion control.

NOTE: during the installation, it's necessary to respect the correct connection of phase and neutral (not inverted). If the connection is inverted the microAmpere reading of the flame detector will be lower as it should be. To check, remember that the voltage measured between **NEUTRAL** and **EARTH** is **0±10Vac**

With this card must be used the cable without LC Filter

NOTE: the BOARDS are perfectly interchangeable, only the cable for the connection changes

JUMPER position

- Jumper PRESENT for the CE market
- Jumper NOT present for the USA

FLAME READING POLARISATION jumper (Polarized System)
Put the Jumper on the left if the system is NOT Polarized

4.2.7. Spark generator

GROUND

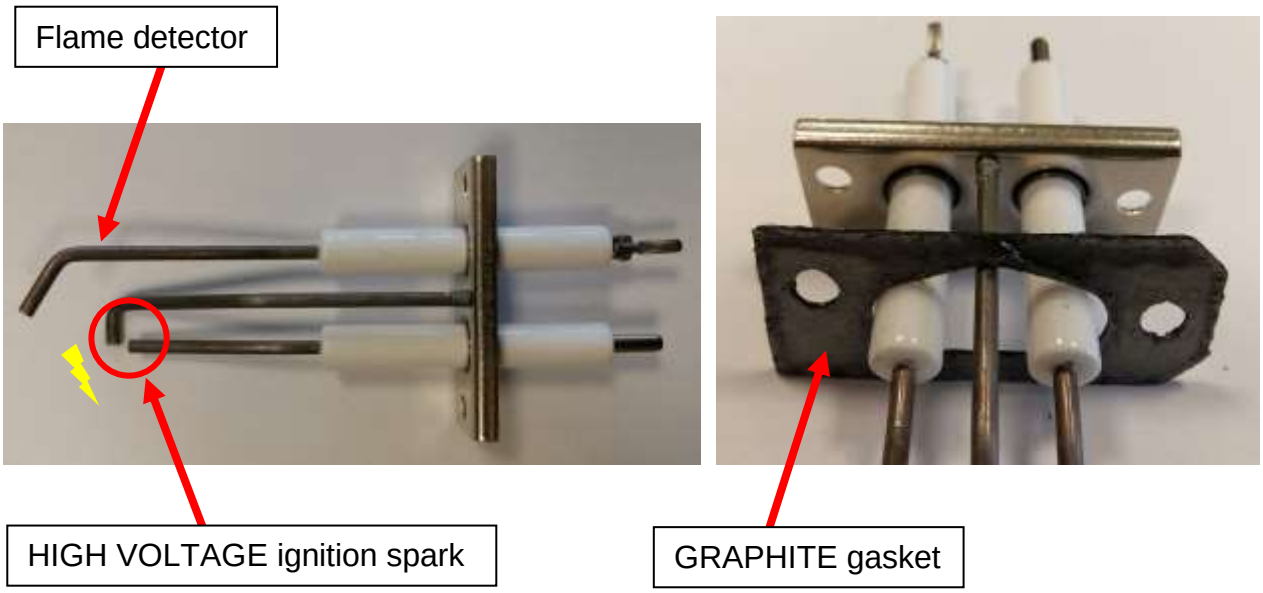
HIGH VOLTAGE ignition cable (shielded) towards the spark plug

POWER SUPPLY: 230Vac from Comb. Contr. board
POLARIZED: **L** – **N** – **G**round

NOTES:

- Check that the connectors are correctly fitted and that during the ignition the sparks are from the electrode and the ground and not in other different points.
- To replace connect the wires as shown on the wiring diagram on the igniter body.

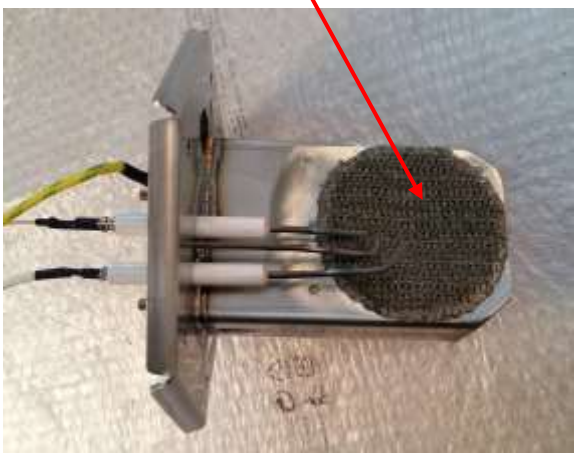
4.2.8. Spark plug and Flame detector

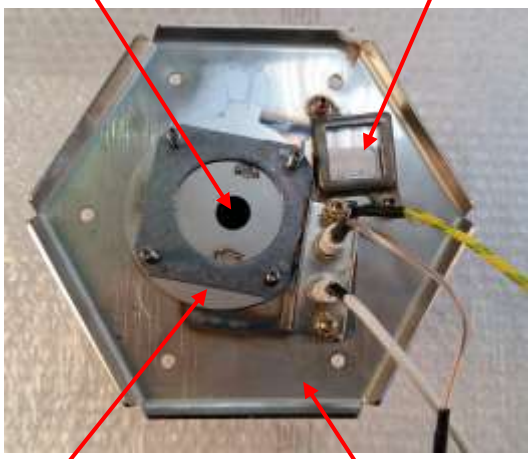


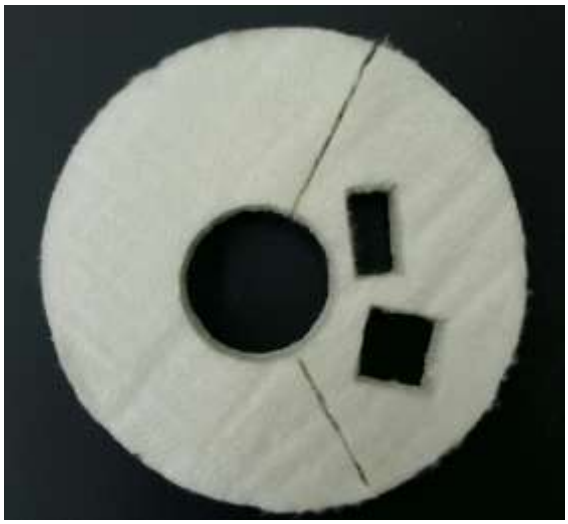
NOTES:

- During gas system maintenance check the spark plug conditions, dismantle the part and if necessary, replace it (e.g.: if the distance between electrodes is too high or if the flame detector is deformed).
  - The spark plug needs scheduled maintenance.
  - We recommend the replacement of the gasket each spark plug replacement.
  - The spark plug kit is one way fixing (see picture).

4.2.9. Burner: standard and FX/BX2018





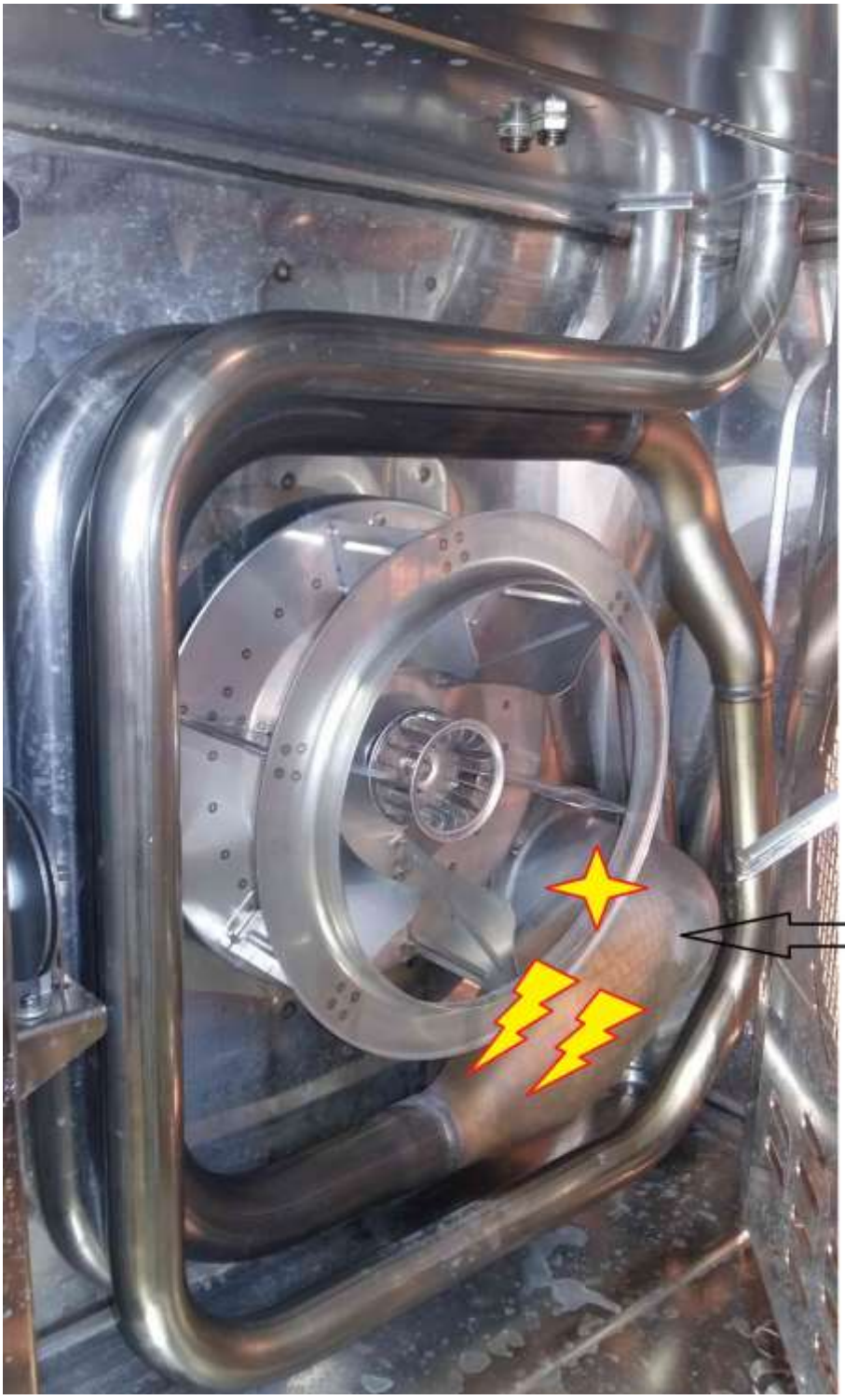


INSULATION

NOTES:

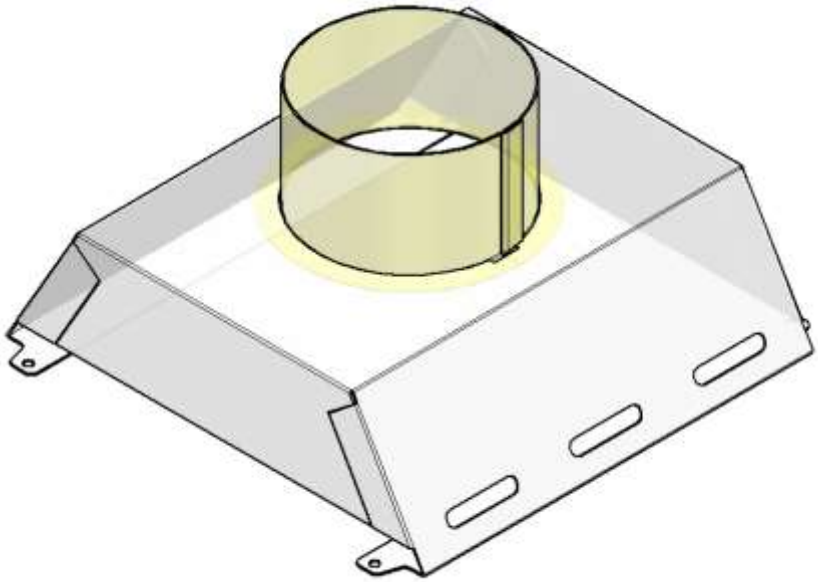
- Replace the insulation panel at any replacement of the spark plug kit, if necessary.
- New burner (B200) used in FX/BX2018 is different only in the mesh size: **3357120** (1/1G) et **3357130** (2/1G).

4.2.10. Heat exchanger

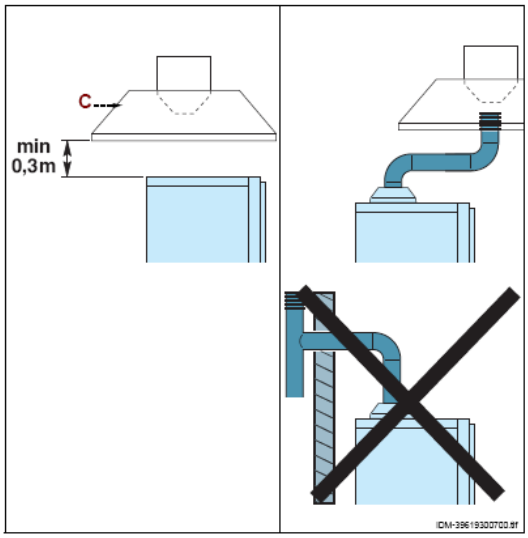


4.2.11. Exhaust extraction KIT

If the oven is not positioned under a fume hood, you can use the Exhaust extraction kit to make a connection to an exhaust system. It is absolutely prohibited the direct connection to the outside.



ATTENTION: Connection to the outside is strictly forbidden.



4.3. Combustion control board: logic operation

The logic of the Combustion control board with several steps or state: there are 10 states as reported in the table and each one of these corresponds to a check / audit and controls to the blower and to the gas.

STEP	Blower fan	Blower fan speed	Gas valve	Description
0	OFF	0	OFF	STANDBY: ignition not required
1	OFF	0	OFF	CONTROL: : ignition required, no flame checking and blower fan speed lower than 500 rpm. As soon as the check is finished it pass to step 2, otherwise after 20" appears the alarm GAS:F11 or GAS:F24.
2	ON	Ignition speed	OFF	START: blower fan start and the ignition speed has been checked. As soon as the check is finished it pass to step 3, otherwise after 30" appears the alarm GAS:F24.
3	ON	Ignition speed	OFF	PURGING: the blower fan run at the ignition speed for few seconds (7 sec) to purge the circuit from exhaust fumes.
4	ON	Ignition speed	ON	IGNITION: gas valve opens and the igniter makes the spark until the flame sensor recognize the flame or until the safety time (3 sec) is passed.
5	ON	Target speed	ON	WORKING: ignition done successfully. Power board control the power.
6	OFF	0	OFF	STOP: burner turn off.
7	OFF	0	OFF	BLOCKAGE
8	OFF	0	OFF	BLOCKAGE: ignition lock until RESET.
9	OFF	0	OFF	RESET: RESET activated and pass to phase STANDBY

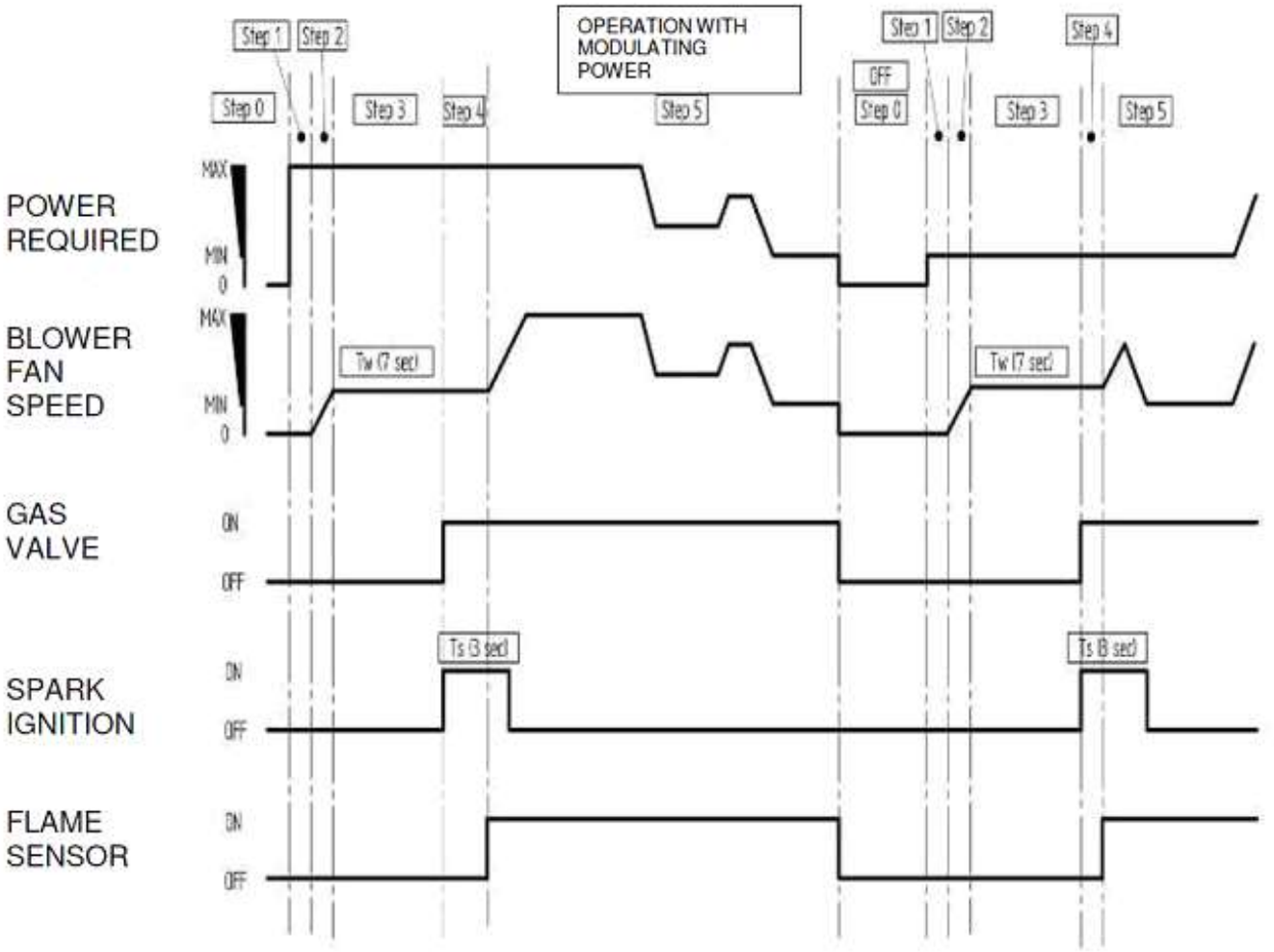
The combustion control board is controlled by the power board with the following commands:

- Burner ignition
- Burner off
- Speed modulation

The combustion control board start with the state "0" STANDBY, and when the power board requires turning on the burner, go to the state "5" OPERATIVE, once detected the presence of the flame. All intermediate states are done. When in state "5", depending on the need for power / temperature, the power board drive the combustion control board which controls the blower speed. When the oven reaches the temperature, the burner turns off and the combustion control board goes in state "6" and then returns available in the state "0".

If there are problems the board turn on state "8" BLOCK, showing alarm E12: F4 can be reset from the panel.

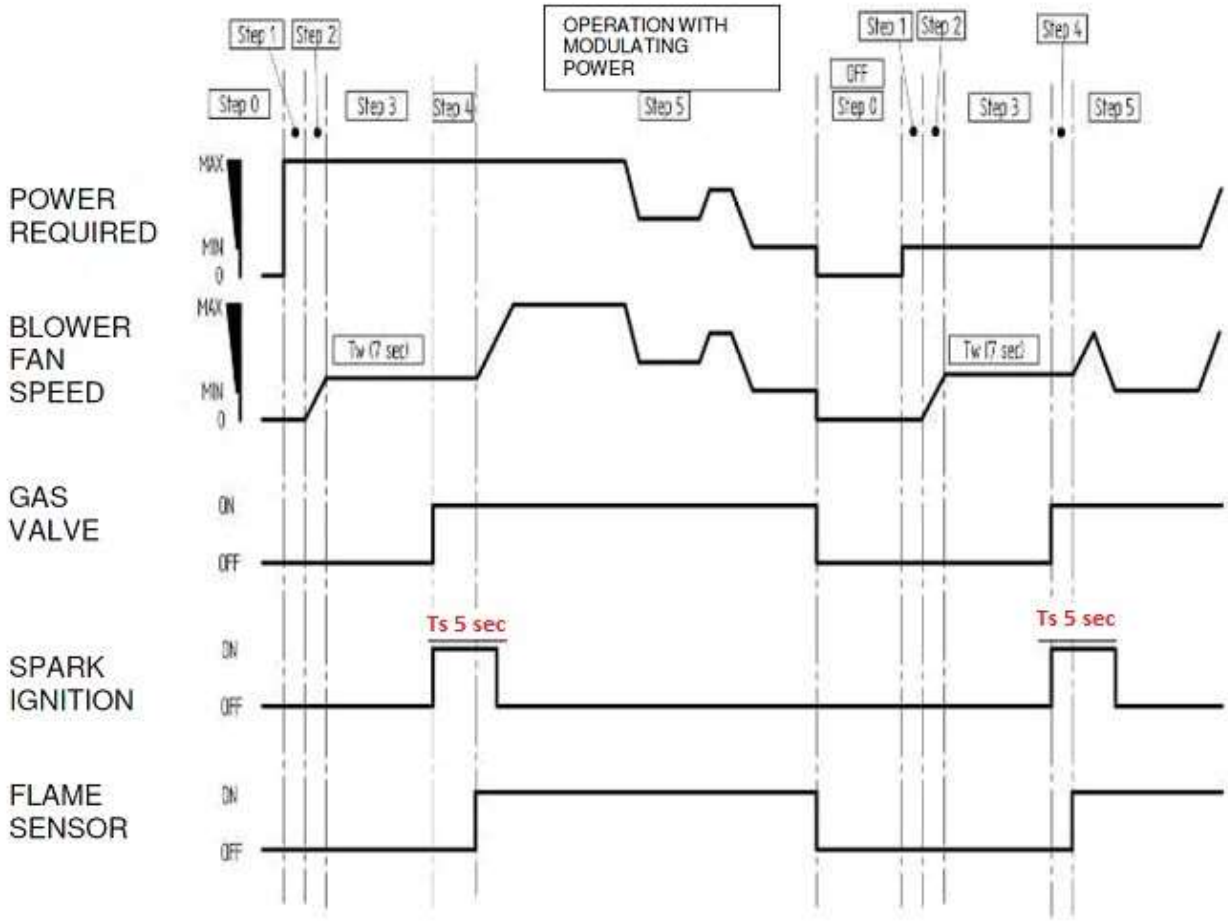
4.3.1. Ignition standard cycle



The diagram shows 2 ignition cycles (step 1-5): the first operational phase (step 5) has a modulating working, the second, the minimum power range working.

The difference between the two cycles is the speed of the blower, which varies with the required power.

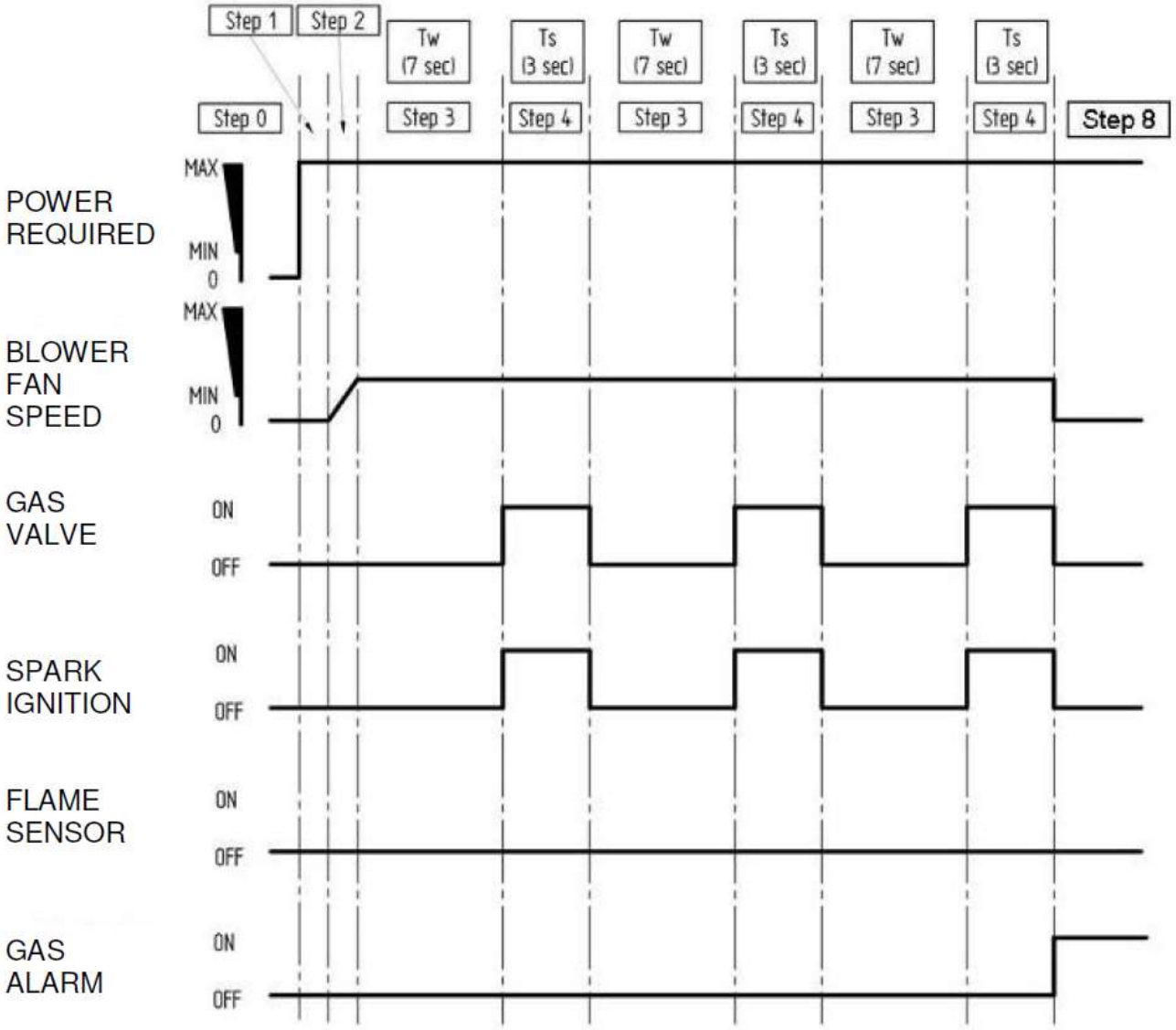
4.3.2. Standard ignition cycle (FX2018)



Notes are the same of above but with **Ts = 5** seconds

The time mentioned above are 4+1 i.e. the gas valve is open for 5 seconds, sparks are produced only for 4 seconds

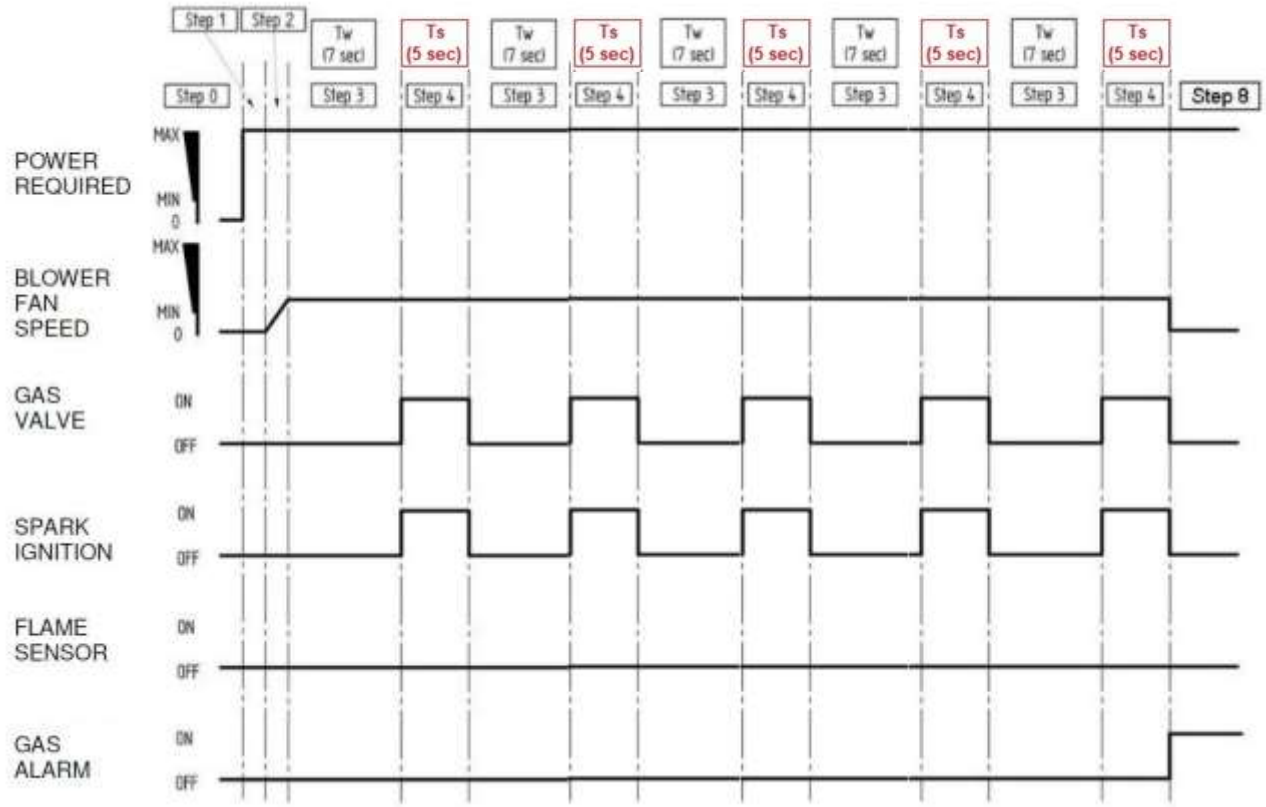
4.3.3. GAS alarm: E12:F4: flame missing



The diagram shows an ignition cycle where there is no detection of flame. During the cycle you have 3 ignition attempts (spark) 3 seconds long, each one preceded by purging of the combustion chamber (necessary for removing from the combustion chamber the gas released previously).

After these 3 attempts the combustion control board goes into state "8" the combustion is blocked and the display shows the alarm E12:F4. The alarm can be reset by the user. The causes may be different, for details please refer to section Gas Alarms.

4.3.4. Gas alarm E12:F4: flame missing (FX/BX2018)



The diagram shows an ignition cycle where there is no detection of flame. During the cycle you have 5 ignition attempts (spark) 5 seconds long, each one preceded by purging of the combustion chamber (necessary for removing from the combustion chamber the gas released previously).

After these 5 attempts the combustion control board goes into state "8" the combustion is blocked and the display shows the alarm E12:F4. The alarm can be reset by the user.

The causes may be different, for details please refer to section 4.8 Gas Alarms.

4.4. Gas Test

4.4.1. Polarity check

During the installation, it's necessary to respect the correct connection of PHASE and NEUTRAL (not inverted). If the connection is inverted the microAmpere reading of the flame detector will be lower as it should be. To check, remember that the voltage measured between **NEUTRAL** and **EARTH** is **0±10Vac**

4.4.2. Gas conversion

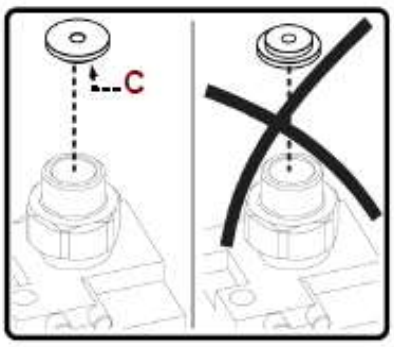
All equipment is tested and adjusted to work with Natural gas (G20), where it is required to use a different type of gas follow the instruction below:

1. **Gas nozzle replacement**: Unscrew the gas pipe (Pic 1), remove the Natural gas (G20) nozzle and put in place the replacement nozzle (Pic 2), then tighten the pipe. The nozzle works also as seal.

The nozzle must be mounted as shown in pic 3.

PICTURE 1

PICTURE 2



PICTURE 3

Standard nozzles table

Nozzles	FX-BX 61G	FX-BX 101G	FX-BX 82G	FX-BX 122G
G20	Ø635 - 3147120	Ø605 - 3141800	Ø635 - 3147120	Ø640 - 3147130
G25	Ø760 - 3153040	Ø730 - 3167710	Ø760 - 3153040	Ø760 - 3153040
G30	Ø435 - 3141570	Ø455 - 3141610	Ø445 - 3141590	Ø465 - 3141630
G31	Ø465 - 3141630	Ø485 - 3153010	Ø485 - 3153010	Ø500 - 3167720

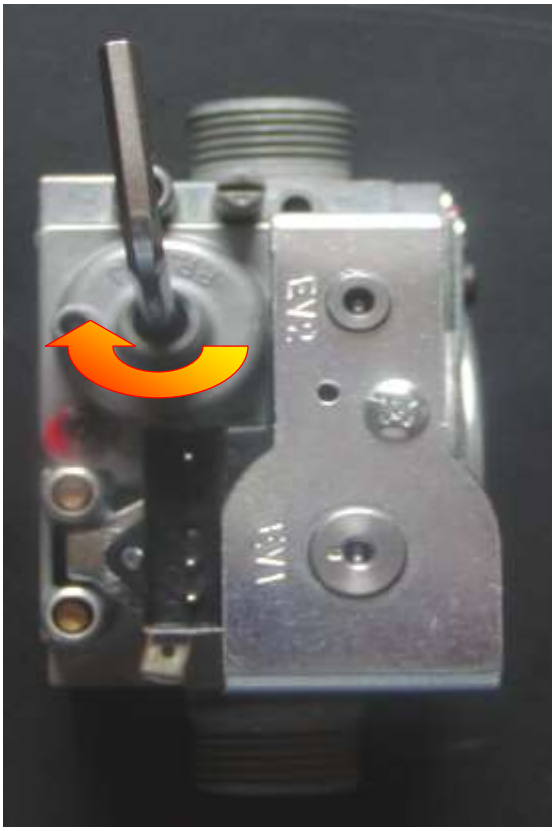
FX-BX 2018 nozzles table

Nozzles 2018	FX-BX 61G	FX-BX 101G	FX-BX 82G	FX-BX 122G
G20	Ø575 - 3147140	Ø575 - 3147140	Ø615 - 3141820	Ø615 - 3141820
G25	Ø630 - 3147110	Ø680 - 3141880	Ø730 - 3167710	Ø730 - 3167710
G30	Ø410 - 3141520	Ø435 - 3141570	Ø455 - 3141610	Ø445 - 3141590
G31	Ø445 - 3141590	Ø455 - 3141610	Ø485 - 3153010	Ø480 - 3153000

4.4.3. Gas valve adjustment

Loosen the protective brass cap and prepare a 4mm Allen wrench to set the gas values.

If the combustion values at minimum power do not correspond to the recommended offset adjusting of the valve is needed.



At this point, if the CO2 is lower than the recommended value, screw clockwise (see figure at right), to enrich the mixture.

If the CO2 is higher unscrew slowly to lessen the mixture.

The adjustment is very sensitive and you should make small movements (a quarter turn rotation involves a variation of about 1% CO2) and wait for the gas analyzer to detect the change and stabilize.

Once done repeat the wizard test.

When the adjustment is finished refit the protective cap of the screw.

Attention: the pressure adjustment screw PR.ADJ. has no effect on increasing the power of the oven.

4.4.4. Analysis of the Combustion values

During the installation the technician is required to analyze the combusted gas. To do this a portable analyzer fitted with a probe and printer is needed. It is advisable to prepare an extension pipe in order to avoid damages to the probe, a cause of the high temperature of the gas (about 400°C).

During the setup procedure wizard (described in section 4.1), it is recommended to keep the engine speed (minimum or maximum) for 2-3 minutes and only then insert the probe for the acquisition of CO2 and CO values. Wait until the measure has stabilized (about 1 minute).

- The gas analyzer should be calibrated and checked periodically to make precise measures.
- Recommended analyzer: Testo 310 (**NOT** showed in the pictures)

4.4.5. Setup Gas – Wizard

The gas system has the same characteristics and the same components as the FX ovens. The interface changes during the testing procedure, but the combustion checks and measurements described must be performed in the same way as the FX ovens.

1. **Start Procedure**: when in STOP, enter the menu "**GAS TEST**" pushing together and holding for 3 seconds the buttons **STEAM** and **REGENERATION**.

2. **Choice of the Blower**: in recent SW versions, at the beginning of the procedure you must select the type of blower (by rotating the encoder), which can be **SIT** or **EBM**. The choice is made with the enter function of the encoder. The combustion and nozzle values vary according to the choice of the blower.

3. **Type of gas**: the first display shows the kind of gas: turning the knob is possible to choose the type of gas G20, G25, G30, G31 and Out; the selection is confirmed with enter with the knob.

4. **Burner selection**: after the type of gas, on the first display it is possible to choose the burner to test: CC1 and Out; the selection is confirmed with enter with the knob.

5. **Display parameters**: after the burner selection it is possible to see the parameters: first display shows the fan blower maximum speed, Vmax; the value is divided for 10 i.e. in the picture the speed is 6.400 rpm. The second display shows the fan blower minimum speed Vmin and the third display shows the fan blower ignition speed Vignition, both the values expressed in percentage.

6. **Start testing**: the START/STOP button is on, press it to start the testing phases.

STEP 1: burner at minimum power (cold)

- check correct ignition
- check stability of the minimum
- check combustion (CO, CO2) of the minimum when cold
- **ONLY in this phase can you adjust the valve**
- enter values on the installation report
- go to the next step by pressing the core probe button.

STEP 2: burner at maximum power.

- **in this step it is forbidden to act on the valve adjustment**
- check stability of the maximum
- check combustion (CO, CO2) of the maximum
- enter values on the installation report
- go to the next step by pressing the core probe button.

STEP 3: shutdown, ignition and burner at minimum (hot).

- **in this step it is forbidden to act on the valve adjustment**
- check correct re-ignition
- check stability of the minimum when hot
- check combustion (CO, CO2) of the minimum when hot
- enter values on the installation report

7. **End of procedure**: the test is ended by pressing the **START/STOP** key.

Change the parameters of the gas board: This adjustment must be done only in according with Service Angelo Po. In all the screens, the gas parameters can be changed: press the TEMPERATURE (red) button to change the maximum speed, TIME (yellow) for the minimum speed, HUMIDITY (green) for the ignition speed.

If any anomalous functioning occurs, please refer to the paragraph "Problems during the testing procedure" and to the previous ones.

4.4.6. Recommended combustion values

Here below there are listed the values of combustion (CO2, CO) recommended by "Angelo Po", values taken should be as closely as possible to these values. It is recommended to take the measure after 2-3 minutes that the flame has stabilized, in fact at the ignition it could measure higher values of CO which could affect the measurements. The system, if well adjusted, should take values of CO below 100 ppm, if they are higher act as described in the following paragraph. Similarly, if the values of CO2 have a difference greater than ± 0.5% (± 0.8%) compared to the recommended action following the directions described in the next section.

FX-BX 61G		CO2%	Range CO2%	CO ppm
G20	minimum	9,3%	± 0,5	0÷100
	Maximum	10,7%	± 0,8	0÷100
G25	minimum	9,2%	± 0,5	0÷100
	Maximum	9,9%	± 0,8	0÷100
G25.1	minimum	10,2%	± 0,5	0÷100
	Maximum	10,8%	± 0,8	0÷100
G30	minimum	13,1%	± 0,5	0÷100
	Maximum	12,8%	± 0,8	0÷100
G30 50mbar	minimum	13,8%	± 0,5	0÷100
	Maximum	12,8%	± 0,8	0÷100
G31	minimum	11,2%	± 0,5	0÷100
	Maximum	12,0%	± 0,8	0÷100

FX-BX 101G		CO2%	Range CO2%	CO ppm
G20	minimum	10,1%	± 0,5	0÷100
	Maximum	10,3%	± 0,8	0÷100
G25	minimum	10,4%	± 0,5	0÷100
	Maximum	10,0%	± 0,8	0÷100
G25.1	minimum	11,1%	± 0,5	0÷100
	Maximum	10,9%	± 0,8	0÷100
G30	minimum	13,1%	± 0,5	0÷100
	Maximum	12,8%	± 0,8	0÷100
G30 50mbar	minimum	14,3%	± 0,5	0÷100
	Maximum	13,3%	± 0,8	0÷100
G31	minimum	13,0%	± 0,5	0÷100
	Maximum	12,7%	± 0,8	0÷100
FX-BX 82G		**CO2%**	**Range CO2%**	**CO ppm**
G20	minimum	8,9%	± 0,5	0÷100
	Maximum	10,0%	± 0,8	0÷100
G25	minimum	9,3%	± 0,5	0÷100
	Maximum	10,3%	± 0,8	0÷100
G25.1	minimum	10,0%	± 0,5	0÷100
	Maximum	11,1%	± 0,8	0÷100
G30	minimum	12,7%	± 0,5	0÷100
	Maximum	12,3%	± 0,8	0÷100
G30 50mbar	minimum	13,4%	± 0,5	0÷100
	Maximum	12,2%	± 0,8	0÷100
G31	minimum	11,2%	± 0,5	0÷100
	Maximum	11,6%	± 0,8	0÷100
FX-BX 122G		**CO2%**	**Range CO2%**	**CO ppm**
G20	minimum	9,5%	± 0,5	0÷100
	Maximum	10,5%	± 0,8	0÷100
G25	minimum	9,3%	± 0,5	0÷100
	Maximum	10,0%	± 0,8	0÷100
G25.1	minimum	9,9%	± 0,5	0÷100
	Maximum	10,7%	± 0,8	0÷100
G30	minimum	13,0%	± 0,5	0÷100
	Maximum	12,6%	± 0,8	0÷100
G30 50mbar	minimum	13,1%	± 0,5	0÷100
	Maximum	13,6%	± 0,8	0÷100
G31	minimum	11,6%	± 0,5	0÷100
	Maximum	11,7%	± 0,8	0÷100

4.4.7. Recommended combustion values (FX/BX 2018)

Following values must be followed when unit has new elements**: combustion control board+blower+B200 burner**

FX-BX 61G		CO2%	Range CO2%	CO ppm
G20 (CH_4)	Min	8,8%	± 0,5	0÷100
	Max	10,4%	± 0,8	0÷100
G25	Min	9,0%	± 0,5	0÷100
	Max	9,4%	± 0,8	0÷100
G25.1	Min	10,0%	± 0,5	0÷100
	Max	10,4%	± 0,8	0÷100
G25.3	Min	9,7%	± 0,5	0÷100
	Max	9,9%	± 0,8	0÷100
G30	Min	12,4%	± 0,5	0÷100
	Max	11,6%	± 0,8	0÷100
G30 50mbar	Min	12,6%	± 0,5	0÷100
	Max	11,8%	± 0,8	0÷100
G31 (LPG)	Min	11,2%	± 0,5	0÷100
	Max	11,5%	± 0,8	0÷100

FX-BX 101G		CO2%	Range CO2%	CO ppm
G20 (CH_4)	Min	8,5%	± 0,5	0÷100
	Max	8,9%	± 0,8	0÷100
G25	Min	8,5%	± 0,5	0÷100
	Max	9,1%	± 0,8	0÷100
G25,1	Min	9,0%	± 0,5	0÷100
	Max	8,9%	± 0,8	0÷100
G25,3	Min	8,5%	± 0,5	0÷100
	Max	9,3%	± 0,8	0÷100
G30	Min	12,5%	± 0,5	0÷100
	Max	12,1%	± 0,8	0÷100
G30 50mbar	Min	12,6%	± 0,5	0÷100
	Max	12,1%	± 0,8	0÷100
G31 (LPG)	Min	10,9%	± 0,5	0÷100
	Max	11,0%	± 0,8	0÷100

FX-BX 82G		CO2%	Range CO2%	CO ppm
G20 (CH_4)	Min	9,2%	± 0,5	0÷100
	Max	9,1%	± 0,8	0÷100
G25	Min	8,7%	± 0,5	0÷100
	Max	9,7%	± 0,8	0÷100
G25,1	Min	9,3%	± 0,5	0÷100
	Max	10,8%	± 0,8	0÷100
G25,3	Min	9,3%	± 0,5	0÷100
	Max	10,8%	± 0,8	0÷100
G30	Min	11,9%	± 0,5	0÷100
	Max	11,7%	± 0,8	0÷100
G30 50mbar	Min	12,0%	± 0,5	0÷100
	Max	12,1%	± 0,8	0÷100
G31 (LPG)	Min	11,1%	± 0,5	0÷100
	Max	10,9%	± 0,8	0÷100

FX-BX 122G		CO2%	Range CO2%	CO ppm
G20 (CH_4)	Min	8,7%	± 0,5	0÷100
	Max	9,9%	± 0,8	0÷100
G25	Min	8,7%	± 0,5	0÷100
	Max	9,7%	± 0,8	0÷100
G25,1	Min	9,3%	± 0,5	0÷100
	Max	10,8%	± 0,8	0÷100
G25,3	Min	8,7%	± 0,5	0÷100
	Max	10,2%	± 0,8	0÷100
G30	Min	11,2%	± 0,5	0÷100
	Max	11,8%	± 0,8	0÷100
G30 50mbar	Min	11,5%	± 0,5	0÷100
	Max	11,8%	± 0,8	0÷100
G31 (LPG)	Min	10,7%	± 0,5	0÷100
	Max	11,8%	± 0,8	0÷100

4.4.8. Gas board parameters

This adjustment must be carried out only and exclusively after contacting Service Angelo Po.

Attention: never increase the maximum blower speed over the value set by the factory.

In case of tampering, the warranty is void

Board Parameters FX-BX Gas							
Speed (rpm)	FX61G3	FX101G3	FX82G3	FX122G3	FX201G3	FX202G3	Range
VMin G20 - G31	40%	40%	30%	30%	40%	30%	30% - 65%
VMin G25 - G25.1	40%	40%	30%	30%	60%	30%	
VMin G30	60%	60%	30%	30%	60%	30%	
VMax G20 - G25 - G25.1	6500	7000	6500	6500	7000	6700	5500rpm - 7000rpm
VMax G30	6000	6000	6000	6000	6200	6000	
VMax G31	6000	6000	6000	6000	6500	6000	
VAcc G20 - G31	50%	50%	40%	40%	50%	40%	35 - 60%
VAcc G25 - G25.1	50%	50%	40%	40%	60%	40%	
VAcc G30	60%	60%	40%	40%	60%	40%	
Ramp	30000						10000-30000

Board Parameters FX-BX GAS 2018															
V max (rpm - %)															
GAS	**FX61G**		**FX101G FX201G**		**FX82G**		**FX122G**		**FX202G**		**Range**				
G20	6400	100 %	6600	100 %	6400	100 %	6000	100 %	6500	100 %	**5500 ÷ 7000**				
G25 - G25.1 - G25.3	7000	100 %	6600	100 %	6400	100 %	5800	100 %	6600	100 %					
G30	6600	100 %	5700	100 %	5800	100 %	5500	100 %	5900	100 %					
G31	6500	100 %	6200	100 %	6100	100 %	5500	100 %	5900	100 %					
V min (rpm - %)															
GAS	**FX61G**		**FX101G FX201G**		**FX82G**		**FX122G**		**FX202G**		**Range**				
G20	3200	50 %	2640	40 %	3840	60 %	2100	35 %	3900	60 %	**30 ÷ 65%**				
G25 - G25.1 - G25.3	3500	50 %	2640	40 %	3840	60 %	2030	35 %	3960	60 %					
G30	3960	60 %	2850	50 %	3480	60 %	1925	35 %	3540	60 %					
G31	3250	50 %	2480	40 %	3660	60 %	1925	35 %	3540	60 %					
V acc (rpm - %)															
GAS	**FX61G**		**FX101G FX201G**		**FX82G**		**FX122G**		**FX202G**		**Range**				
G20	3840	60 %	3300	50 %	3840	60 %	2700	45 %	3900	60 %	**35 ÷ 60%**				
G25 - G25.1 - G25.3	4200	60 %	3300	50 %	3840	60 %	2610	45 %	3960	60 %					
G30	3960	60 %	3420	60 %	3480	60 %	2475	45 %	3540	60 %					
G31	3900	60 %	3100	50 %	3660	60 %	2475	45 %	3540	60 %					
Ramp	**30000**										**10000 ÷ 30000**				

4.5. Problems during the test setup wizard

The oven at minimum turns off	1. Increase the pressure adjustment (PR.ADJ.) until the oven stays on at the minimum 2. Check type of gas and inlet gas pressure. 3. Check gas nozzle. 4. Check the gas pipe fixing. 5. Check the flame detector wiring. 6. Check the pipe of benchmark pressure test point is clear. 7. Clean the blower fan air intake is clean. 8. Check electrical connections
At maximum power the flame blows out or “break away” from the burner.	1. Check gas nozzle. 2. Verify type of gas and inlet gas pressure. 3. Measure the CO and CO2 values and compare them with min/max value in the table.
ALARM E27: Gas test missed	Check that the chamber temperature has not exceeded 200°C in which case do a cool down, and then rerun the test. Check that the 10 minutes timeout is not expires.
In case of other alarms see “GAS ALARM TABLE”	
Important: At the end of each intervention on the gas system must perform the procedure for testing gas by measuring the CO and CO2, and verify that the data is within the fields declared by the manufacturer.	

4.6. Installation report

When first installed, the installer must fill in all parts of the following installation report and send it to "Angelo Po" within 7 days for the activation of the Warranty.

It presents data connection, and in particular must show the power supply, if possible, the mains water pressure (and other available data, e.g. Water hardness or presence of water treatment system) and the type of vent (if directly under a hood or connection).

The type of gas and the combustion gas analysis must be indicated.

INSTALLATION/WARRANTY REPORT

Date of Installation: ...\...\.....

Customer.....
Address:.....
Town/City..... Post Code ..... Country.....
Telephone:..... Fax: .....
Invoice n°: .....Model:..... Serial Number: .....

CONNECTION DATA

Electric power supply

Voltage: [ ] V

Frequency: ☐ 50Hz ☐ 60Hz

Water connection (as per manual and WRAS regulations)

Pressure: [ ] Bar

Type of flue (see chap.7 of manual)

☐ A3 direct discharge under extraction canopy.

☐ A3 direct discharge under extraction canopy with fumes evacuation fittings kit.

Type of Gas and Supply Pressure (see chap. 7 manual)

Note: the appliance is inspected in the factory and set-up for power supply with G20. If used with other gas, replace the nozzle.

X	TYPE OF GAS	INJECTOR REPLACED	TYPE OF GAS SET	PRESSURE MEASURED
	G20 (Natural gas) – P = 17-25 mbar			
	G25 (methane -nitrogen) – P = 20-30 mbar			
	G25.1 (methane - nitrogen) – P = 18-33 mbar			
	G30 (butane) – P = 25-35 mbar			
	G30 (butane) – P = 42.5-57.5mbar			
	G31 (propane) – P = 25-45 mbar			

INSPECTION

System Sealing Check (see chap. 7 of manual)

☐ Performed

Exhaust Analysis (see chap. 7 of manual)

Note: Activate the fumes control procedure from the control panel. The analysis of the combustion products must be carried out by an authorised technician. If the values of CO measured exceed the max limit indicated contact the after-sales centre.

PHASE	CO2 (%)	CO (ppm)	
Phase 1 – minimum warm-up phase, oven cold			***CO max: 100 ppm***
Phase 2 – maximum			***CO max:100 ppm***
Phase 3 – minimum oven hot			***CO max: 100 ppm***

Instrument Used (make and model):.....

This form is relative to the appliance indicated above. It must be filled-in completely and must be sent to Angelo Po SpA within 7 days from installation in order to activate the warranty.

Certification: the under-signed, is an engineer of an Angelo Po authorised dealer and certifies that all of the items on this form have been checked and verified and confirms that the unit is installed correctly.

Installer Technician:..... AAC:..... Signature.....

4.7. Gas alarms

GAS alarms table		
Code	**PROBLEM**	**SOLUTION**
E12:F4	The blower fan is working but there is no ignition spark	1. Check the spark generator and spark plug wirings/connection. 2. Check that the high-voltage cables do not discharge to ground. 3. Check the spark plug ground cable connection 4. Remove the spark plug and check the state of the electrodes. 5. Check that the spark generator is fed (the power supply). 6. Replace the spark generator.
	The blower fan is working and the spark is good but there is no flame ignition.	1. Check the inlet gas pressure. 2. Check gas nozzle 3. Increase the valve adjustment (PR.ADJ) until the oven turns on. 4. Check gas pipe fixing 5. Check gas valve power supply 6. Check the pipe of benchmark pressure test point is clear 7. Clean the blower fan air intake
	Detonation at the ignition	1. Remove the spark plug and check its status. 2. Check combustion and gas parameters.
	The flame is lighting but after some seconds the flame goes off.	1. Check the flame detector cable 2. Check the electrical connection 3. Replace the flame detector and/or the combustion control
E12:F5	Flame signal missing during the working	1. Check the flame sensor 2. verify the correct power connection
E12:F6	Overheating combustion control board	Check that the cooling fans in the components compartment are working properly. Check and cleaning air vents under the dashboard and below the components compartment.

GAS alarms table		
Code	**PROBLEM**	**SOLUTION**
E12:F10	Internal breakage of the combustion control board	Replace the combustion control board
E12:F11	Flame signal detected before start	Check the wirings to the flame sensor. If necessary replace the combustion control board.
E12:F20	Flame signal detected after the stop.	Check the wirings to the flame sensor. If necessary replace the combustion control board.
E12:F24	Blower fan speed out of control or blower fan blocked.	Check the power supply and control wirings to the air blowing fan. If necessary replace the blower fan.
E12:F26	Blower fan out of control: the blower fan doesn't stop after 30 seconds from its off.	Check the correct wirings to the blower fan. If necessary replace the combustion control board.
E12:F30	Operating parameters of the combustion control board corrupted.	Replace the combustion control board.

Note: the general gas alarm has been changed from the word **GAS** into **E12**

4.7.1. Combustion gas periodic inspection

For gas ovens only, a warning is provided for the analysis of fumes (CO2 and CO): at the end of 2500 working hours from the last execution of the "GAS setup" procedure, each time the oven is switched on, an "**Att**" "**Ctr**" "**GAS**" warning appears. This warning is eliminated only after the completion of the "gas setup" procedure made by the local Service.

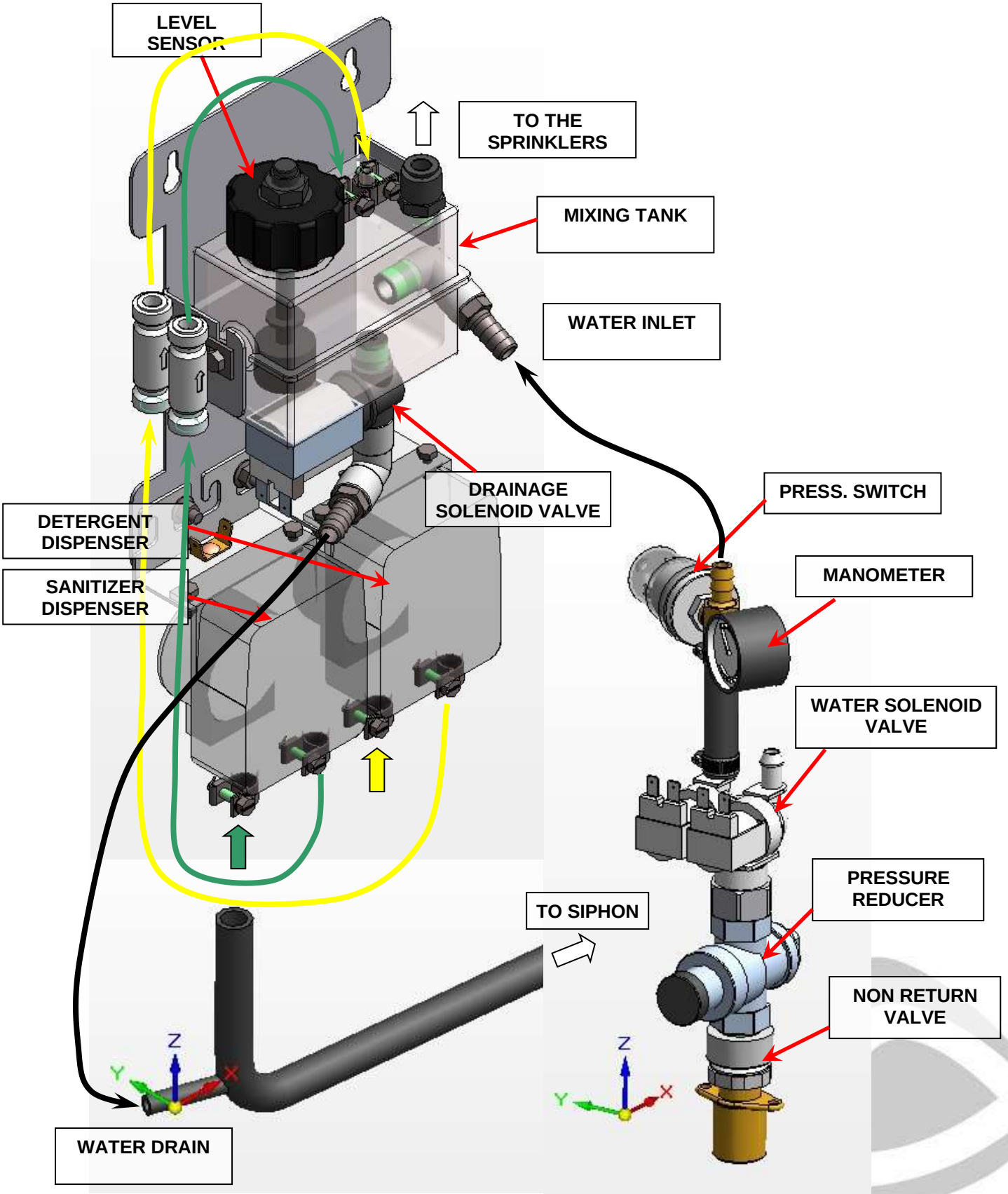
When this screen appears, the RESET button lights up flashing (the other buttons are off), pressing the RESET button returns to normal oven operation until the oven is turned on again, which returns the warning and so on until the "GAS setup" procedure is performed.

5. WASHING CYCLES

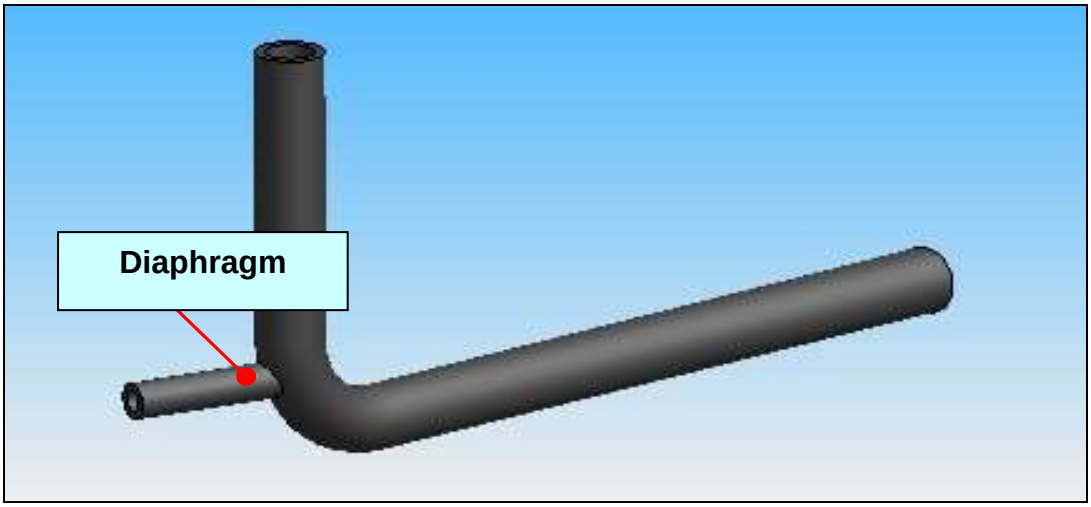
5.1. Washing circuit operating and components of BXW

The washing circuit consists of the following components:

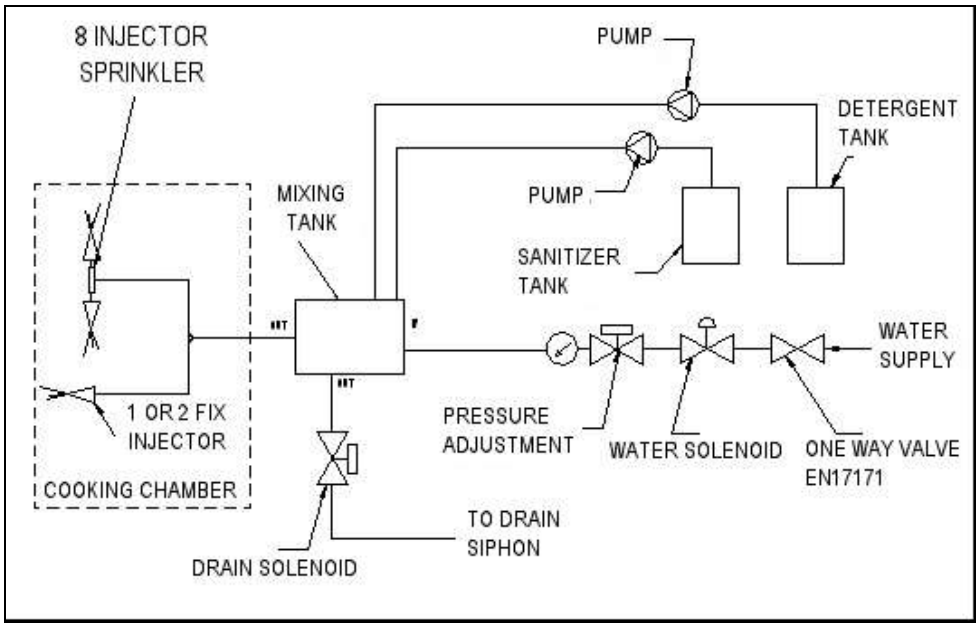
- Non-return valve (in the water inlet assembly) prevents the contamination of the water mains. If there is a decompression in the water supply network the valve drains the fluid outside of the circuit downstream of itself, preventing a possible flow back into the water network.
- Pressure adjustment (in the water inlet assembly).
- Water solenoid valve (in the water inlet assembly).
- Detergent dispenser (pump unit): peristaltic pump type.
- Sanitizer dispenser (pump unit): same as previous.
- Mixing tank.
- Drain solenoid valve (pump unit): normally close valve. It drains the contents of the tank into the pipe connected to the siphon.
- Fixed sprinkler into the cooking chamber: 8 nozzles sprinkler.
- Fixed sprinkler closed to the heat exchanger: it is near to the pipe for the steam production. Through this pipe the chemical reaches the nebulizer cleaning in the heat exchanger compartment.
- Additional water injector behind the fun which has appropriate holes.



NOTE: The rubber hose that leads to the condensation to the siphon is fitted with a diaphragm closing the branch connection to the drain circuit of the washing. In case of replacement, before proceeding to the assembly must drill the diaphragm with a bit of appropriate diameter (Ø 9-10 mm). On BX standard (w/o autocleaning) the diaphragm must not have to be drilled.



5.1.1. Functional Diagram of Washing circuit



In general, the washing cycle has the following stages:

1 – initial rinsing

2 – detergent sprinkling

3 – intermediate rinsing

4 – sanitizer sprinkling

5 - final rinsing

6 - drying

All these stages are separated by operating at low temperature with steam to soften the fat in the cooking chamber.

The washing cycle doesn't start if the temperature into the cooking chamber is more than 100°C.

In the more intensive cleaning programs, the dosing of the cleaning products is repeated several times depending on the program.

Available cleaning programs:

Programs	Total time	Description
P01	2:22′	Cleaning program recommended for dealing with very stubborn residues (e.g.: after convection cooking of meat with high fat content, such as chickens, roasts, etc.)
P02	1:35′	Cleaning program recommended for dealing with stubborn residues (e.g.: after convection cooking of meat and/or fish).
P03	1:10′	Cleaning program recommended for dealing with easily removed residues (e.g.: after mixed or convection cooking up to 150°C).
P04	0:30′	Cleaning program recommended for removing small amounts of residue (e.g.: after steam cooking)
dEC	0:34′	For removing limescale deposits from the cooking chamber.
SA	0:24′	Manual type wash.
tcl	0:12′	For rinsing the cooking chamber without using detergent.
SPl	0:03′	For rinsing the cooking chamber without using detergent.

The detergent and sanitizing distribution is made as follows:

- Product load. The pump sends the chemicals into the empty tank, this phase takes a few minutes. The total amount of chemicals is less than the tank capacity.
- Distribution. After stopping the pump, the water solenoid valve opens for a few seconds. The water pressure (1.5 bar nominal Max 2 bar) passes through the tank and mixed with the product, carries it into the chamber through the appropriate sprinklers.
- Emptying the tank. After finishing the distribution, the tank, still full of water and residual chemical, is flushed through the solenoid valve until the next stage.

Rinsing is accomplished by operating the solenoid water for several minutes. The water circulates through the tank and the dispensing circuit, and finally is distributed in the chamber through the sprinklers.

The circuit is also fitted the following safety:

- Water pressure switch: it is downstream of the solenoid water and detects the presence of pressure in all the phases in which the water valve is open (or supply rinsing detergent / sanitizer).
- Level sensor: it is a float sensor located inside the tank. It checks the chemicals loading and the emptying phases of the tank. During loading, if the level sensor doesn't switch, after a predetermined time, the display shows alarm (E21 or E22). During the emptying phase of the tank, after a fixed time the display, if the level sensor doesn't switch, shows an alarm (alarm E24).

NOTE: each time you switch on the oven, it runs for 5 seconds the dosing pumps, then it opens for 0.5 seconds the rinsing solenoid valve and then it empties the tank for 20 seconds.

5.1.2. Clean test

The Clean Test procedure is used to verify the functioning of the washing system. To enter, with the oven in STOP, press the **RESET + WASH** keys until the word "**CLT**" appears. To proceed and to move step by step, press the "**Humidity**" key.

It consists of 4 steps:

Step 1 – detergent pump working

During this stage it is possible to check that the detergent pump works and that after a few minutes the liquid level in the tank increases (if the suction pipe is empty, it takes about 2-3 minutes to fill it).

Step 2 – sanitizer pump working

During this stage it is possible to check that the sanitizer pump works and after a few minutes the liquid level in the tank increases (if the suction pipe is empty, it takes about 2-3 min to fill it).

Step 3 – rinsing

During this stage it is possible to check that there are no leaks in the connections of the pipes, no obstructions into the nozzles and that the water pressure is regulated. The level sensor have to switch in ON.

Step 4 – tank emptying

During this stage it is possible to check that the liquid level into the tank drops until the tank is empty. The level sensor have to switch in OFF.

During all stages the status of the float shows on the display: it must be open when the tank is empty (OFF), it must be closed when the liquid level in the tank exceeds half (ON).

5.1.3. Recommended procedure

1. Activate the Clean Test.
2. Proceed directly to the activation of STEP 3.
3. Check on the display the level sensor switches its status from OFF to ON.
4. Check the pressure of the rinse circuit (min 1.5 - max 2.0 bar).
5. Check for leaks along the entire circuit.
6. Proceed directly to the END of the test.
7. At this point the tank is under pressure, so check that the level remains at least for one minute.
8. If you see the level go down, check the tightness of the drain valve
9. If everything is fine, start to check the dispensers.
10. Reactivate the Clean Test by going directly to STEP 3
11. Go to STEP 4, checking the level indication on the display and go to END as soon as it changes from ON to OFF, in this way there will remain a minimum quantity of water in the tank.
12. Activate STEP 1 and wait for the indication on the display to return to ON, if it does not occur, check the detergent dispenser (rotation, suction, etc.).
13. Repeat steps 10 and 11
14. Activate STEP 2 and wait for the indication on the display to return to ON, if it does not occur, check the rinse aid dispenser (rotation, suction, etc.)
15. Go to STEP 4 and wait for the complete emptying of the system.

5.1.4. Washing interruption

If a washing is interrupted, appears "**int**" and the oven remains in the washing menu (it is impossible to access the cooking menus). To be able to exit the washing menu it is necessary to carry out one of these operations:

- Perform and let end a wash program
- Perform the "rinse" "**tcl**" or "**SPI**"

WASHING ALARM RESET

Below are the 2 procedures to exit the wash if the emergency rinse does not work or if it is interrupted (“int” appears):

- hold the **TEMPERATURE** key for **6 sec**. **ATTENTION**: Then rinse thoroughly to avoid leaving chemical residues.
- Switch the oven OFF and ON again. **ATTENTION**: Then rinse thoroughly to avoid leaving chemical residues.

5.1.5. Washing alarms table

Washing cycle control alarms table			
	Alarm code	**Problem**	**Solution**
1	**E21**	The washing cycle has been interrupted because the float didn't switch during the detergent load phase.	Check the pipe position and the level of cleaner in the tank; top up if necessary and restart the washing cycle. Carry out the PUMP TEST
2	**E22**	The washing cycle has been interrupted because the float didn't switch during the sanitizer load phase.	Check the pipe position and the level of cleaner in the tank; top up if necessary and restart the washing cycle. Carry out the PUMP TEST
3	**E24**	The washing cycle has been interrupted because the float didn't switch during the tank unload phase.	Possible obstruction in the oven drain. Carry out the PUMP TEST
4	**E26**	The washing cycle has been interrupted during the rinsing stage, caused by "missing water"	Carry out the PUMP TEST

Problems during the "CLEAN TEST"			
5	-	During phase 1 the detergent pump doesn't work. (the motor doesn't turn).	Check pump wiring. Check voltage on pole 68 on power board. Check fuse F1. Check power supply on pump cables. Chamber temperature must be under 100°C.
6	-	During phase 1 the detergent pump works but the tank is not filled on time.	Check the pipe position and the level of cleaner in the tank. Check if there is a leakage on the piping. If previous check are OK, replace the pump inner tube or the whole pump.
7		During phase 1 the detergent pump works but the float doesn't switch.	Wait until the tank is filled until at least half. Check the wiring of the float (inputs 81 and 82 on power board). Unplug the connector and check that the resistance of the float (with the tank above half) must be in short. Replace the float.
8	-	During phase 2 the sanitizer pump doesn't work. (the motor doesn't turn).	Check pump wiring. Check voltage on pole 66 on power board. Check fuse F1. Check power supply on pump cables. Chamber temperature must be under 100°C.
9	-	During phase 2 the sanitizer pump works but the tank is not filled on time.	Check the pipe position and the level of cleaner in the tank. Check if there is a leakage on the piping. If previous check are OK, replace the pump inner tube or the whole pump.
10	-	During phase 2 the sanitizer pump works but the float doesn't switch.	See point 9
11	-	During phase 3 the water doesn't fill the tank.	Check the pressure of water supply, control the power supply rinse solenoid (terminal 17 on the power board), check fuse F5, check the pressure regulator. Replace the solenoid.

Problems during the "CLEAN TEST"			
12	-	During Phase 3 the water reaches the tank regularly but it appears the alarm E26.	Check the pressure of water supply, check that the injectors are still present in the chamber, check the pressure regulator (it must be calibrated to 1.5 bar), check wiring and switching of pressure switch (must be wired to the C and NO to terminals 37 and 41 of the power board)
13	-	During Phase 4 the water level into the tank doesn't flow down.	Check wiring and power supply of the drain solenoid valve (terminal 63), check fuse F1, make sure the drain pipe is not crushed, check that the sprinklers in the chamber not all clogged, check the siphon of the oven is not obstructed, replace the coil of the drain solenoid valve (if not just replace the whole solenoid valve).
14	-	During Phase 4 the liquid level into the tank flow down but the float level sensor doesn't switch.	Replace the float level sensor.

5.1.6. Washing consumption table

WASHING CONSUMPTION BX W										
BX61-101	Consumption (Kg)		Consumption (L)			Duration	n° of Washes for 10L		n° of Washes for 2gal	
	Det	Rinse Aid	Det	Rinse Aid	H2O [L]	Minutes	Det	Rinse Aid	Det	Rinse Aid
Standard	0,72	0,51	0,56	0,50	73	142	18	20	13	15
Medium	0,50	0,27	0,39	0,26	63	95	26	39	19	29
Basic	0,25	0,26	0,19	0,25	63	70	52	40	40	30
Soft	0,25	0,28	0,19	0,27	52	46	52	37	40	28
Decalcificazione	0,00	0,28	0,00	0,27	23	34	---	37	---	28
Lav. Semiauto	man	0,00	man	0,00	28	24	---	---	---	---
Risc. Lungo TMP	0,00	0,00	0,00	0,00	16	12	---	---	---	---
Risc. Breve splash	0,00	0,00	0,00	0,00	11	3	---	---	---	---
BX82-122	Consumption (Kg)		Consumption (L)			Duration	n° of Washes for 10L		n° of Washes for 2gal	
	Det	Rinse Aid	Det	Rinse Aid	H2O [L]	Minutes	Det	Rinse Aid	Det	Rinse Aid
Standard	0,90	0,64	0,70	0,62	82	142	14	16	11	12
Medium	0,68	0,33	0,53	0,32	70	95	19	31	14	24
Basic	0,30	0,32	0,23	0,31	70	70	43	32	32	25
Soft	0,30	0,32	0,23	0,31	57	46	43	32	32	25
Decalcificazione	0,00	0,32	0,00	0,25	25	34	---	40	---	30
Lav. Semiauto	man	0,00	man	0,00	31	24	---	---	---	---
Risc. Lungo TMP	0,00	0,00	0,00	0,00	17	12	---	---	---	---
Risc. Breve splash	0,00	0,00	0,00	0,00	12	3	---	---	---	---

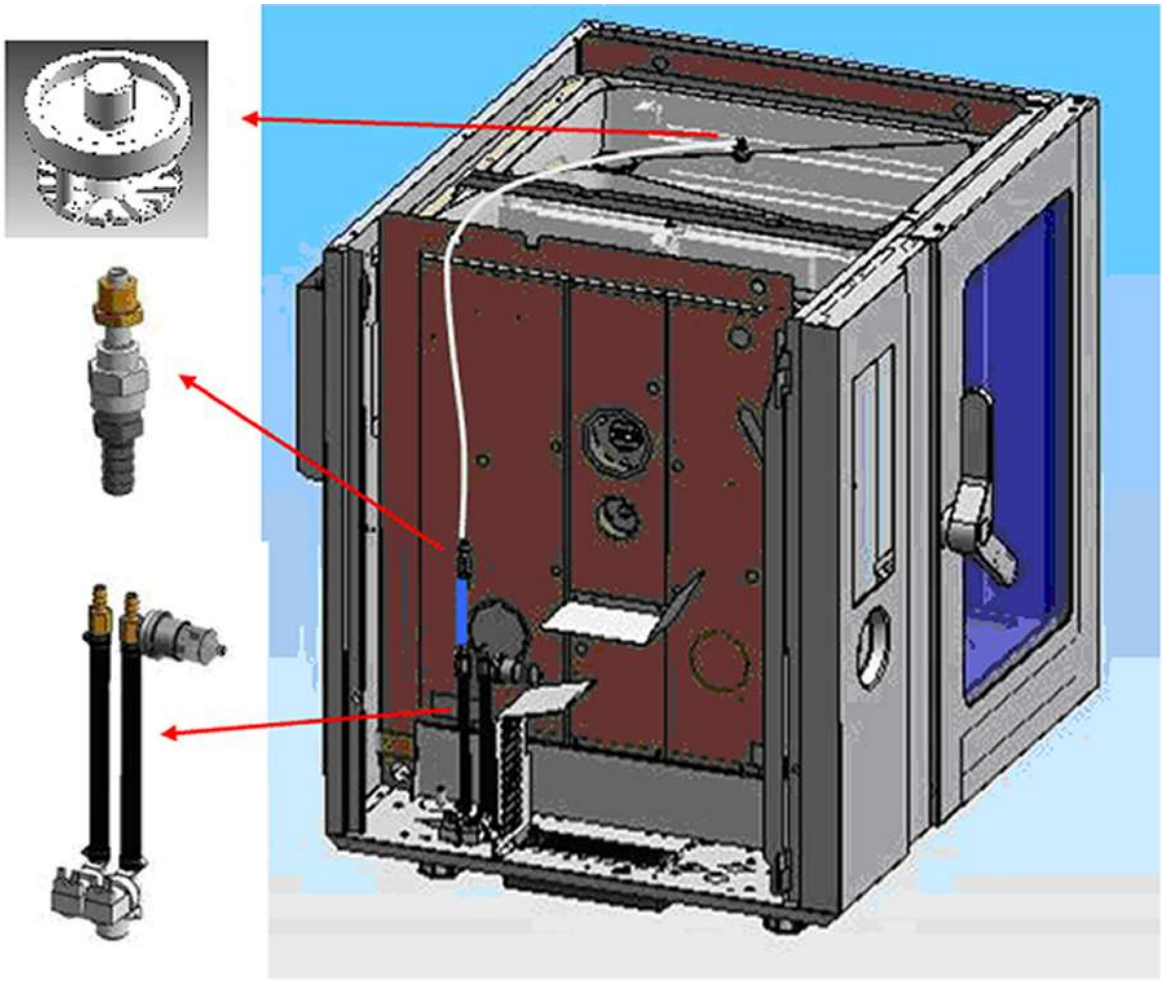
5.2. Components and functioning of BX washing system 1st and 2nd gen.

In the 1st and 2nd generation ovens, the operation of the system works in this way: the oven automatically heats and keeps at the most suitable temperature for the softening of the cooking residues, but the application of the washing product and rinsing must be done manually by the operator when **CLE** and **H2O** appears on the display.

5.3. Components and functioning of BX washing system MY2016

The washing system of the BX ovens consists of the following components:

- Rinse solenoid valve (in the water inlet unit).
- A hose connector (to connect the rubber pipe with the Teflon pipe)
- A "sprinkler" rinse dispenser



The operation of the circuit is similar to the FM: the oven is running automatically heated and holding the temperature most suitable for washing and rinsing, while the application of the chemicals must be done manually by the operator when the display shows the **CLE**.

The automatic rinsing is made simultaneously by opening the solenoid valves for rinsing and steam production.

CLEANING CONSUMPTION BX MY2016

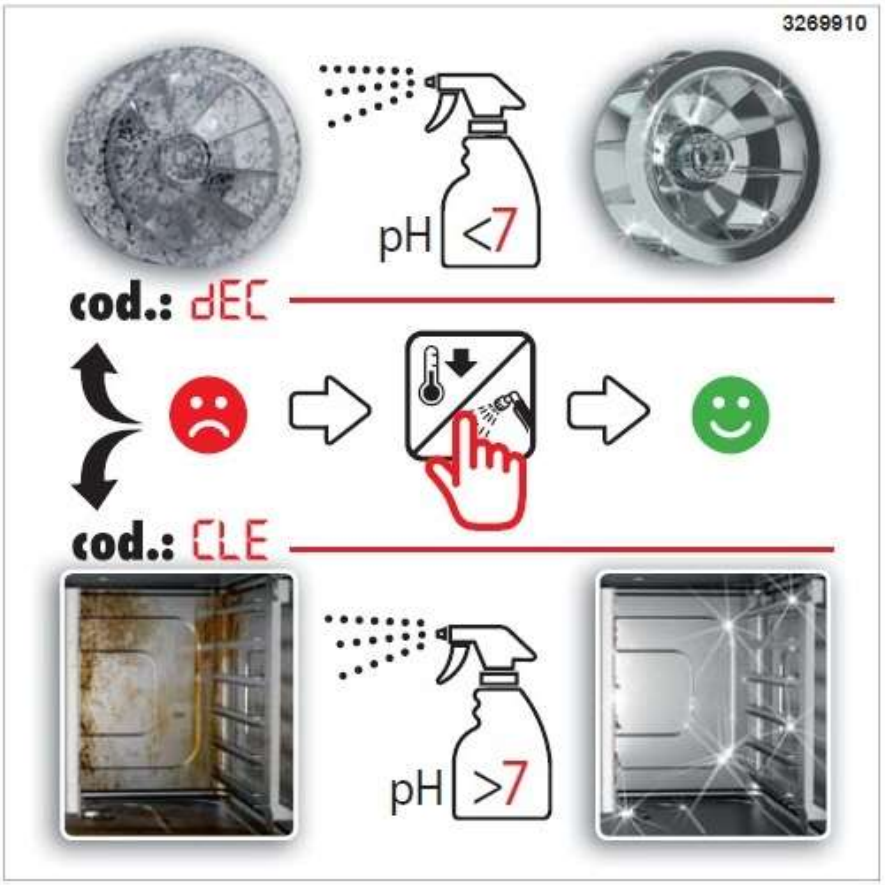
BX61-101	H2O [L]
CLE-STD-P01	28
BX82-122	**H2O [L]**
CLE-STD-P01	31

5.4. CLE and dEC Warning

Washing: after 12 hours of cooking and without having ever run a Semiautomatic washing program, the oven shows the following WARNING on the display: **CLE**
If the operator does not wash the oven within 12 hours, the warning reappears.

Descaling: after 15 hours of use of the steam mode and without having ever run a Semiautomatic washing program, the oven shows the following WARNING on the display: **dEC**
If the operator does not wash the oven within 15 hours, the warning reappears.

In support of the BX ovens there will be, respectively, the following plates which summarize what described above (PH <7 = descaler - PH> 7 = detergent):

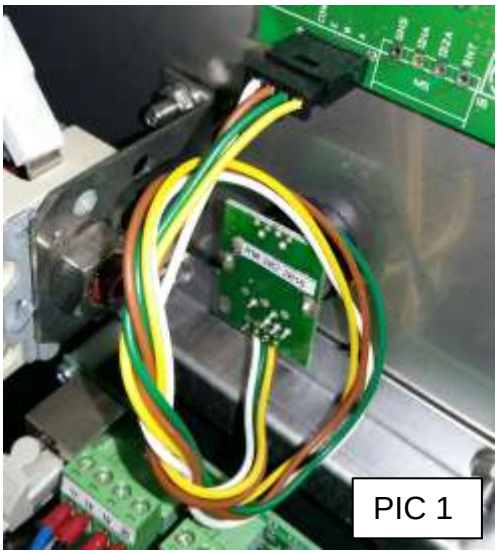


6. DISMANTLE AND REASSEMBLY COMPONENTS

6.1. Encoder

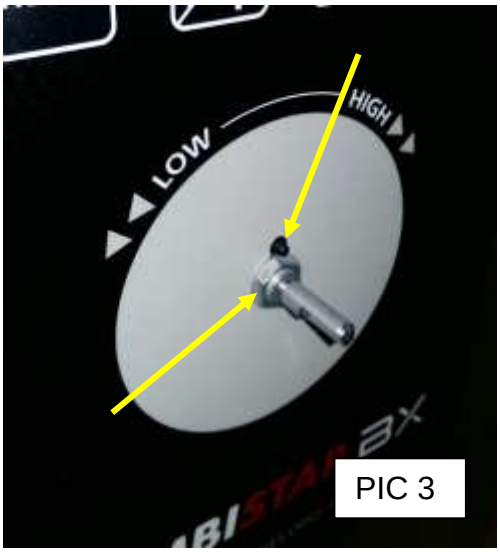
To replace the encoder, follow the instruction below:

1. Encoder from the back (PIC 1);
2. Encoder from the front; remove the knob and the silicon protection (PIC 2) and fixing nut (PIC 3);
3. All the assembly should be put in place with the pin into the hole on the dashboard (PIC 3).



PIC 1

PIC 2

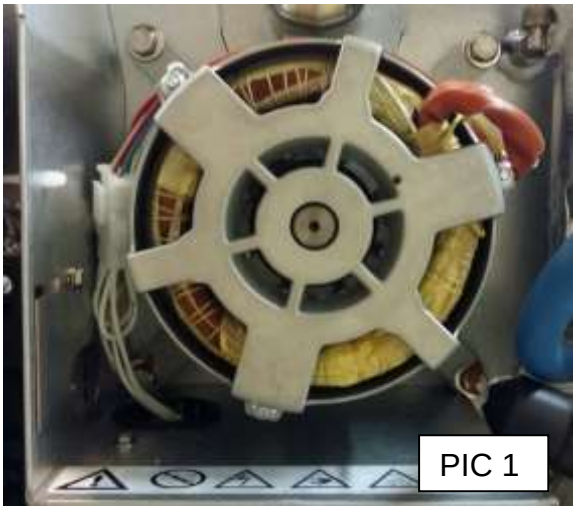


PIC 3

6.2. Motor

Proceed as follows to replace the motor:

1. front left side view of the motor from the component compartment (PIC 1);
2. to disassemble the motor, loosen the fixing screw (PIC 2), the only fixing between the motor shaft shaft and the fan (it may be necessary to heat the shaft and the hub).
3. fixing sequence of the clamping washer, change them if the motor is replaced (PIC 3);
4. assembly sequence of the motor shaft sealing system: brass bushing, sealing ring (CORTECO), VITON gasket in the component compartment (PIC 4). When replacing the sealing ring, it must be greased with MOLIKOTE 41.



PIC 1

PIC 2

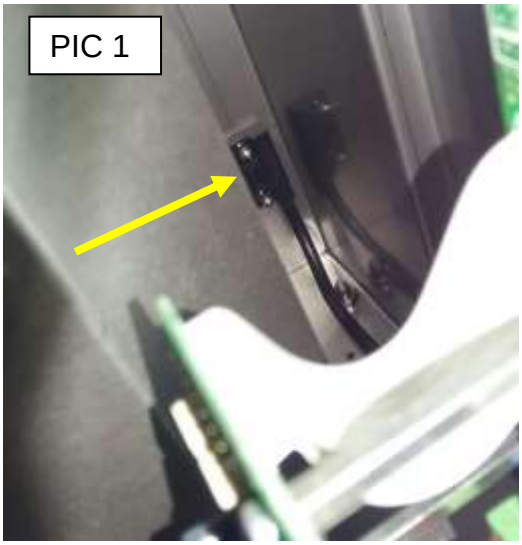
PIC 3

PIC 4

6.3. Door micro-switch

To replace the door micro-switch, follow the instruction below:

1. micro-switch position in the dashboard inner side (PIC 1);
2. to access and replace the micro, remove the air inlet plate located under the dashboard (PIC 2);


PIC 1


PIC 2

NOTE: the magnet for the micro switch is inside the door assembly.

6.4. Door glass frame disassembly

Once the door is open, release the glass and remove the screw and nut of the hinges (upper and lower) and then remove the glass frame

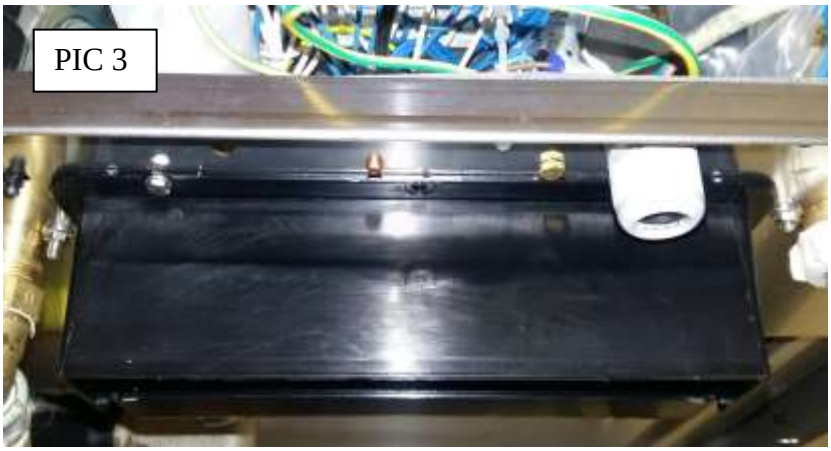
6.5. Component compartment cooling system

Explanation of the cooling system of the component compartment with relative cleaning of the air intake slots:

1. component compartment cooling fan (PIC 1) always ON even even with the oven in the STOP mode;
2. ventilation slots inside the component compartment (PIC 2);
3. air conveying box to the slots located inside the component compartment (PIC 3), cleaning is recommended;
4. ventilation slots located outside the lower side dashboard, cleaning is recommended (PIC 4);
5. gas air inlet filter and gas valve air inlet filter (PIC 5).

PIC 1

PIC 2



PIC 3

PIC 4

PIC 5

NOTE: If the cooling motor breaks the following alarm will appear: “components compartment over temperature E10” (see chapter Alarms).

6.6. Door adjustment

The correct adjustment of the door (models BX 61/101/82/122) is verified in three points:

1 - To check the adjustment on the right, measure the distance between the inner edge of the door and the panel with a gauge (calliper), as shown in the following two figures (PIC 1 and 2). **This distance must be between 15 and 16 mm both up and down**.
If one of the two distances measured is not within this range, proceed with the adjustment by loosening the top and/or bottom screws;

2 - To check the adjustment on the left, measure the depth between the external face of the door and the front of the oven with a gauge (PIC 3);
Warning: the gauge must be in a horizontal position. **The measure must be between 59 and 60 mm for all BX models**;

3 - If the measurement is not within these values, the door must be adjusted by screwing or unscrewing the pin located on the front of the oven, making sure that the pin is in a horizontal position (PIC 4).

Dopo la regolazione far funzionare il forno a vapore e verificare la tenuta della guarnizione.


PIC 1


PIC 2


PIC 3


PIC 4

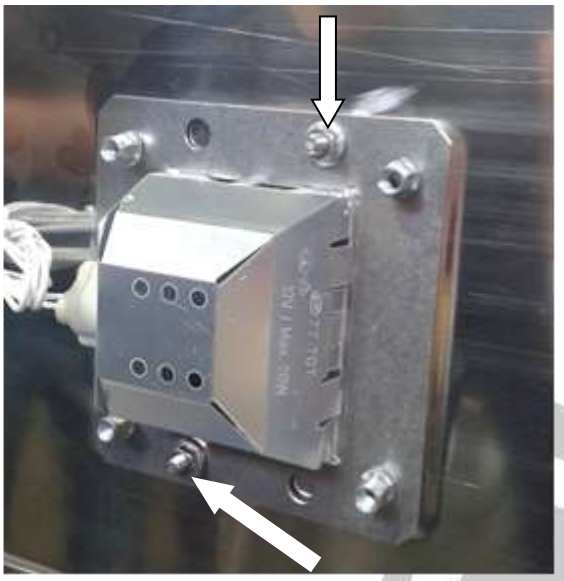
6.7. Halogen bulb replacement

6.7.1. New system of fixing bulb

The new system of fixing lamp differs from the current system in the following positions:

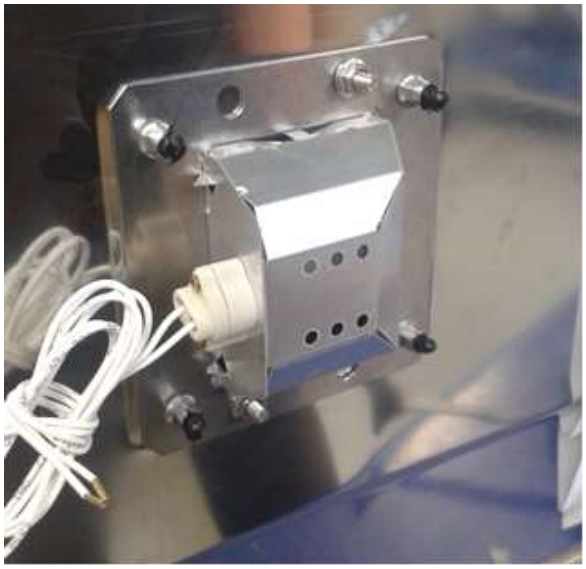
-Threaded inserts (nutser) will no longer be mounted on the camera but on a supporting frame

-The lamp holder is mounted on a supporting frame and this remains entirely outside the room (i.e. the whole socket + frame is mounted on the outside of the cooking room).



The room has two pins M5 (indicated by arrows in the picture above) which are used to hold the flange and the lamp holder while the other components are mounted inside the room.

The sealing system inside the room (frame/glass/seal) remains unchanged. The assembly needs the use of silicon as now.



6.7.2. Bulb replacement with the new system

Replacement lamp with the new system can be done in two different ways:

1) From the internal side

Removing frame, glass and gasket from the inside ... The lamp holder and its frame remain in place thanks to the two studs. The operation can be performed by one person.

2) From the external side

Loose the 4 screws (inside the room) that hold the frame until it detaches from the threaded inserts. On the outside, remove the two nuts onto the threaded pins and removing the group frame + lamp holder.

The sealing system inside the oven is not removed and stays in place thanks to the silicon that is applied on the seal. So, if there's no sign of leakage, this way is faster, easier and safer. Obviously, you must have free access to the right side of the oven.

6.8. Handle replacement

To replace the complete handle, remove the 3 screws inside the door. Remember to add Loctite medium thread locker 243 on each screw

6.9. Spark plug replacement

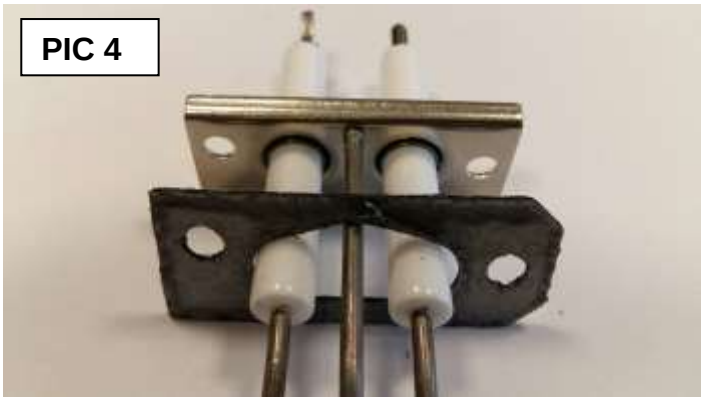
To replace the spark plug, follow the instruction below:

1. Disconnect the ignition and flame sensor wires from the spark plug (picture 1).
2. Disconnect the ground terminal (PIC 2).
3. Unscrew the nuts on the spark plug fixing pins (PIC 3).
4. Take off the spark plug and remove the gasket (PIC 4).


PIC 1


PIC 2


PIC 3


PIC 4

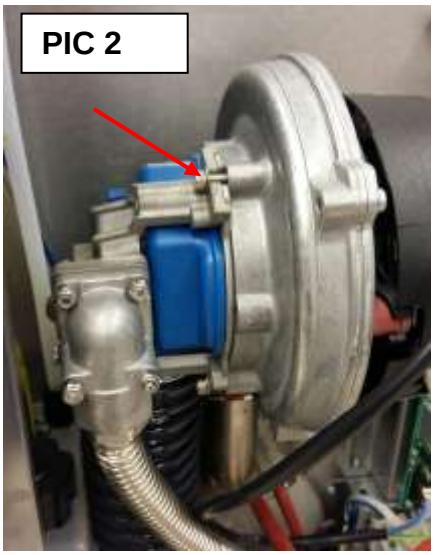
NOTE: with the spark plug always replace the gasket too.

6.10. Blower fan replacement

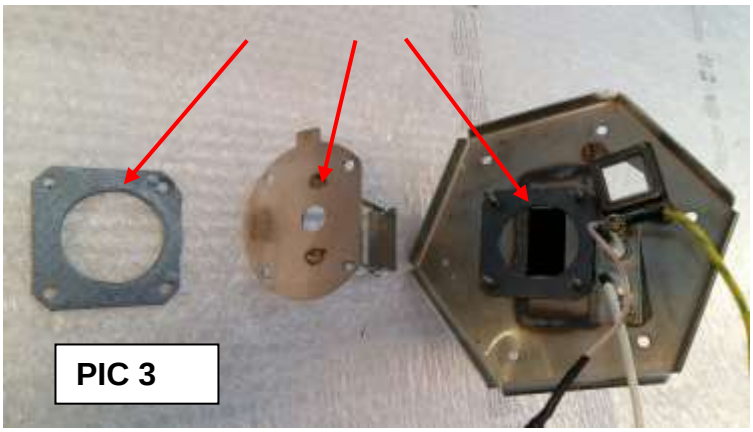
To replace the blower fan follow the instruction below:

1. Unscrew the 3 screws, then the 4 nuts on the bench (PIC 1)
2. Unscrew the 2 front screws and loosen the rear one (PIC 2)
3. Disconnect the wires and replace the blower fan


PIC 1


PIC 2

NOTE: when replacing check that the size of diaphragm installed is correct (see picture 3 and table)


PIC 3

Diaphragm	FX-BX 61G	FX-BX 101G	FX-BX 82G	FX-BX 122G
	Ø16 - 3138640	Ø20 - 3138660	Ø24 - 3138650	Ø30 - 3138670

Diaphragm 2018	FX-BX 61G	FX-BX 101G	FX-BX 82G	FX-BX 122G
	Ø14,5 - 3360000	Ø20 - 3320480	Ø23 - 3371590	Ø30 - 3320450

6.11. GASKETS: Service Circular 2016_02 of 03/10/2016

OBJECT: seals/gaskets codes oven models FX-BX

The spare parts codes of the following seals/gaskets were subject to change, so from 10/10/2016 you have to order the new code according to the oven model. The new seals will be in GRAPHITE and no longer in VITON.

Heating element gasket

Models:

FX/BX 61E

FX/BX 101E

FX 201E

FX/BX 82E

FX/BX 122E a 230V3

FX 122E 208V3 (USA/Canada) - 240V3 (USA/Canada) - 480V (USA/Canada)

FX 202E 230V3

FX 202E 208V3 (USA/Canada) - 240V3 (USA/Canada) - 480V (USA/Canada)

Old spare part code: 37Q3220

New spare part code: *3332550*

Models:

FX/BX 122E 400V3N

FX202E 400V3N

Old spare part code: 37Q3220

New spare part code: *3334690*

Note : the modification of heating element gaskets involves also the ovens out of production

(FCV… ed FM…)

Extraction pipe gasket

Models:

FX/BX61

FX/BX101

Old spare part code: 36E2990

New spare part code: *3332560*

Note : the modification of gasket p/n 36E2990 involves also the oven out of production model

FM…

Models:

FX/BX82

FX/BX122

FX202

FX201

Old spare part code: 3115280

New spare part code: *3332570*

Breather pipe gasket

Models:

FX/BX61

FX/BX101

Old spare part code: 3115260

New spare part code: *3332580*

Models:

FX/BX82

FX/BX122

FX202

FX201

Old spare part code: 3115270

New spare part code: *3332590*

N.B.: for the seals listed above, it is imperative to use silicone **Teroson SI 176** c/n **3282340**. The silicone itself must be also used for lamp gaskets.

6.12. Scheduled recommended maintenance

		Yearly	Every two years
All models	Cleaning air intakes	X	
	Check components compartment cooling fans working	X	
	Check motorized valve status and working	X	
	Check core probe status and working (where present)	X	
	Check door gasket and steam leakage during cooking.	X	
	Visual check of the cooking chamber	X	
	Check tightening of the fan fixing screw	X	
	Cleaning siphon and drain lines	X	
	Cleaning of water intake filter	X	
	Check door adjustment	X	
	Check lamp gasket	X	
Gas models only	Check incoming gas pressure and system tightness until gas valve	X	
	Check and tightening gas system fixing screws (blower fan, gas inlet, air-gas mixing inlet)	X	
	Cleaning combustion air intake (filter underneath the oven)	X	
	Check and cleaning gas valve air intake	X	
	Check CO and CO2 performing gas flue analyzes	X	
	Spark plug and gasket replacement and wires check	X (LPG)	X (Nat Gas)
	Visual check of heat exchanger gasket	X	
Electric only	Check resistance cables tightening	X	
	Check resistance gasket seal and screws tightening	X	
MY 2016	Check alarms list in the menu service	X	
BXW only	Replace the pipes in the peristaltic pumps		X
	Run pump test procedure – check the pumps working	X	
	Check possible leaks on the fittings of the pumps	X	
	Check and possible adjustment rinse water pressure	X	
	Disassemble multi-injector sprinkler and check possible obstructions	X	

7. ALARMS

7.1. Alarm Table BX standard

Display	Problem	Solution	Note	Note for Service
H2O	No water in the chamber, or water pressure too low	Check that mains water is present or adjust the pressure; if the problem persists inform the after-sales service.	Convection cooking cycles can still be carried out.	Check correct working conditions of chamber water solenoid valve and pressure switch. Check the fuse F5 (1 A). Pressure Switch connection: Common is connected to fuse F5 and normally open (NO) is connected to pin 42 of the power board. The Solenoid Valve is connected to Neutral and pin 6 of the power board. Verify the inlet water supply pressure and the adjustment of the water pressure reducer (about 1 bar)
E12 (ex Gas)	No mains gas, or gas pressure too low, or flame detection failure.	Press reset button (the button may have to e pressed several times); if the problem persists inform the after-sales service.	Stop cooking if this message is repeated more than once.	**See "GAS ALARMS table"**
OPE	Oven door opening or closure request.	Open or close the oven door. Inform the after-sales service if this message continues to be displayed.	The cooking cycle does not start until the door has been opened or closed as required.	Check with a tester the function of the door switch (remove the connector from the power board). The door switch is connected with a 2 pole connector pin 21 & 22. On older model with an 8 pole connector on pin 27 & 28. It could be interruption or short circuit.

CLE	Informs that cleaning is required	Perform cleaning	The oven functions are enabled and therefore it is possible to carry out cooking cycles	**See paragraph "CLE and dEC Warning"**
dEC	Informs that descaling is required	Perform descaling	The oven functions are enabled and therefore it is possible to carry out cooking cycles	**See paragraph "CLE and dEC Warning"**
E01	Chamber probe fault or not properly connected. **CCC**: Short circuit **---**: Open circuit	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	The temperature probe is out of range. Disconnect the 8 pole connector from the display board and check with a tester the Ohm reading. It should be 1100 Ohm at 25°C. The probe is connected to the terminals 5 & 6.
E02	Core probe fault. **CCC**: Short circuit **---**: Open circuit	Check the position of the product core probe or inform the after-sales service if it is faulty.	Cooking cycles with product core probe cannot be carried out.	The temperature probe is out of range. Disconnect the 8 pole connector from the display board and check with a tester the Ohm reading. It should be 1100 Ohm at 25°C. The probe is connected to the terminals 7 & 8 (optional).
E03	Drain probe fault. **CCC**: Short circuit **---**: Open circuit	Inform the after-sales service.	Convection and steam cooking cycles can still be carried out.	The temperature probe is out of range. Disconnect the 8 pole connector from the display board and check with a tester the Ohm reading. It should be 1100 Ohm at 25°C. The probe is connected to the terminals 9 & 10.

E04	The motor-operated valve is not positioned correctly.	Switch on the oven again and if the problem persists inform the after-sales service.	Convection and steam cooking cycles can still be carried out.	Check that the motor-operated valve is not blocked. Check the fuse F5 (1 A). Positioning micro-switch connection: Common is connected to fuse F5 and normally closed (NC) is connected to pin 41 of the power board. The Motor is connected to Neutral and pin 10 of the power board.
E05	Safety thermostat failure.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Reset the safety thermostat. Check that the thermostat capillary is not bent, squeezed or broken. Test the oven at the maximum temperature for some minutes.
E06	Motor overload tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Reset the motor overload protection relay or reset the alarm from the keyboard. Check the motor to rotate free and the 3 phases in case of 3 phases power supply.
E08	The vacuum probe has failed.	Press reset button. Check if the vacuum probe is correctly connected to the plug on the control board.	Connect and disconnect the vacuum probe only when the oven is not working. If the problem persists, call the after-sales service.	The temperature probe is out of range. Disconnect the 8 pole connector from the display board and check with a tester the Ohm reading. It should be 1100 Ohm at 25°C. The probe is connected to the terminals 31 & 32 (optional). Verify the connector terminals are clean and be sure to follow the user instructions.
E09	Exceeded maximum temperature allowed in room (Probe is set to 315°)	Inform the after-sales service.	The oven's functions are enabled so cooking cycles can be carried out.	Check the chamber probe, and check the contactors are not blocked

E10	Electrical component compartment has overheated.	The oven solves the problem on its own.	The oven's functions are enabled so cooking cycles can be carried out.	The chamber heating will be temporarily disabled. Check the panel board cooling fan. Remove and clean the air gratings located on the front of the oven. This alarm will be automatically reset when the temperature drops down.
E11	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	This alarm will appear in the case the alarm E10 has not been removed and the temperature on PCB has rised up to 69°C. Follow the above instructions.
E13	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Communication failure between the boards or peripheral devices. Verify electrical connections. E13 = Power Board - CPU E13b= Combustion control board 1
E14	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	PCB temperature probe failure. Replace the power board or the CPU board. E14V = CPU E14Q = power board
E20	Configuration error	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Found inconsistencies between the type of oven and installed boards. Verify the installed boards (display, power board) and devices (inverter and combustion control), verify their proper connection on net cables and repeat the configuration of the oven.
E27	Gas test failure	- - -	- - -	**See paragraph "Problems during the test setup wizard"**

7.2. Alarm Table BX-W

Display	Problem	Solution	Note	Note for Service
H2O	No water in the chamber, or water pressure too low	Check that mains water is present or adjust the pressure; if the problem persists inform the after-sales service.	Convection cooking cycles can still be carried out.	Check correct working conditions of chamber water solenoid valve and pressure switch. The terminals Common and Normally Open of pressure switch must be connected with wires 37 and 40 to the power PCB. Verify the inlet water supply pressure and the adjustment of the water pressure reducer (about 1 bar). Check voltage on the terminal 9 of the power PCB; check the fuse 3,15 A on the power PCB.
H2O.	No water in the drain, or water pressure too low	Check that mains water is present or adjust the pressure; if the problem persists inform the after-sales service.	The oven's functions are enabled so cooking cycles can be carried out.	Check correct working conditions of chamber water solenoid valve and pressure switch. The terminals Common and Normally Open of pressure switch must be connected with wires 37 and 39 to the power PCB. Verify the inlet water supply pressure and the adjustment of the water pressure reducer (about 1 bar). Check voltage on the terminal 10 of the power PCB; check the fuse 3,15 A on the power PCB.
E12 (ex Gas)	No mains gas, or gas pressure too low, or flame detection failure.	Press reset button (the button may have to e pressed several times); if the problem persists inform the after-sales service.	Stop cooking if this message is repeated more than once.	**See "GAS ALARMS table"**

OPE	Oven door opening or closure request.	Open or close the oven door. Inform the after-sales service if this message continues to be displayed.	The cooking cycle does not start until the door has been opened or closed as required.	Check the door magnetic micro switch, to be correctly connected to the power PCB by wires 42 and 43. It could be interruption or short circuit.
CLE	Informs that cleaning is required	Perform cleaning	The oven functions are enabled and therefore it is possible to carry out cooking cycles	**See paragraph "CLE and dEC Warning"**
dEC	Informs that descaling is required	Perform descaling	The oven functions are enabled and therefore it is possible to carry out cooking cycles	**See paragraph "CLE and dEC Warning"**
E01	Chamber probe fault or not properly connected. **CCC**: Short circuit **---**: Open circuit	Alert the after-sales service	The oven functions are disabled and therefore cooking cycles cannot be performed.	Check the cooking chamber probe. It must have a resistance of about 1100 Ohm at 25°C. It is connected to poles 44 and 45 of the power board.
E02	Core probe fault **CCC**: Short circuit **---**: Open circuit	Check the position of the core probe or alert the assistance service in case of failure.	It is not possible to carry out cooking cycles with a core probe.	Check the core temperature probe. It must have a resistance of about 1100 Ohm at 25°C. It is connected to poles 46 and 47 of the power board.

E03	Drain probe fault **CCC**: Short circuit **---**: Open circuit	Alert the after-sales service.	Convection and steam cooking cycles are possible.	Check the discharge temperature probe. It must have a resistance of about 1100 Ohm at 25°C. It is connected to poles 48 and 49 of the power board.
E04	The motorized valve is not positioned correctly.	Repeat turning on the oven and if the problem persists, contact the after-sales service.	Convection and steam cooking cycles are possible.	Check that the motorized valve is not blocked. Check the 3.15A fuse (delayed) on the power board. Check that there is voltage in pole 11 when operating the valve. Check that the C and NC terminals of the valve (external terminals) are connected to poles 37 and 38 of the power board.
E05	Safety thermostat failure.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Reset the safety thermostat. Check that the thermostat capillary is not bent, squeezed or broken. Test the oven at the maximum temperature for some minutes.
E06	Motor overload tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Reset the motor overload protection relay or reset the alarm from the keyboard. Check the motor to rotate free and the 3 phases in case of 3 phases power supply.
E07	Power board error.	Alert the after-sales service.	The oven functions are disabled and therefore cooking cycles cannot be performed.	Check that switches 1-2-3-4 of DP1 on the power board are all in the OFF position.

E08	The vacuum probe has failed.	Press reset button. Check if the vacuum probe is correctly connected to the plug on the control board.	Connect and disconnect the vacuum probe only when the oven is not working. If the problem persists, call the after-sales service.	Check the vacuum probe. The resistance value must be about 1100 Ohm at 25°C. The probe is connected to the terminals 50 and 51 of the panel PCB. Verify the connector terminals are clean and be sure to follow the user instructions.
E09	Exceeded maximum temperature allowed in room (Probe is set to 315°)	Inform the after-sales service.	The oven's functions are enabled so cooking cycles can be carried out.	Check the chamber probe, and check the contactors are not blocked
E10	Electrical component compartment has overheated.	The oven solves the problem on its own.	The oven's functions are enabled so cooking cycles can be carried out.	The chamber heating will be temporarily disabled. Check the panel board cooling fan. Remove and clean the air gratings located on the front of the oven. This alarm will be automatically reset when the temperature drops down.
E11	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	This alarm will appear in the case the alarm E10 has not been removed and the temperature on PCB has rised up to 69°C. Follow the above instructions.
E13	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Communication failure between the boards or peripheral devices. Verify electrical connections. E13 = Power Board - CPU E13b= Combustion control board

E14	Electronic circuit board diagnostics tripped.	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	PCB temperature probe failure. Replace the power board or the CPU board. E14V = CPU E14Q = power board
E20	Configuration error	Inform the after-sales service.	The oven's functions are disabled so no cooking cycles can be carried out.	Found inconsistencies between the type of oven and installed boards. Verify the installed boards (CPU, power board) and devices (inverter and combustion control), verify their proper connection on net cables and repeat the configuration of the oven.
E21-E26	Washing cycle alarms			**See paragraph "Washing alarm table"**
E27	Gas test failure	- - -	- - -	**See paragraph "Problems during the test setup wizard"**
E30-E38	Electronic circuit board diagnostics tripped.	Press reset button	If the problem persists inform the after-sales service.	Protections against electromagnetic interferences. Check all the ground wiring of the equipment. In case of gas version, please check ignition electrode and cover protections to be properly fitted. Check all the wirings relative to the ignition system. Check the correct insulation of the cable.
E80-E85	---	---	Inform the after-sales service.	See above