NECTA

WITTENBORG

AFTER-SALES SERVICE HO.RE.CA

This image represents the version
" Gran Mattino espresso PLUS "

SERVICE MANUAL

"Gran Mattino"

BASIC TECHNICAL MANUAL

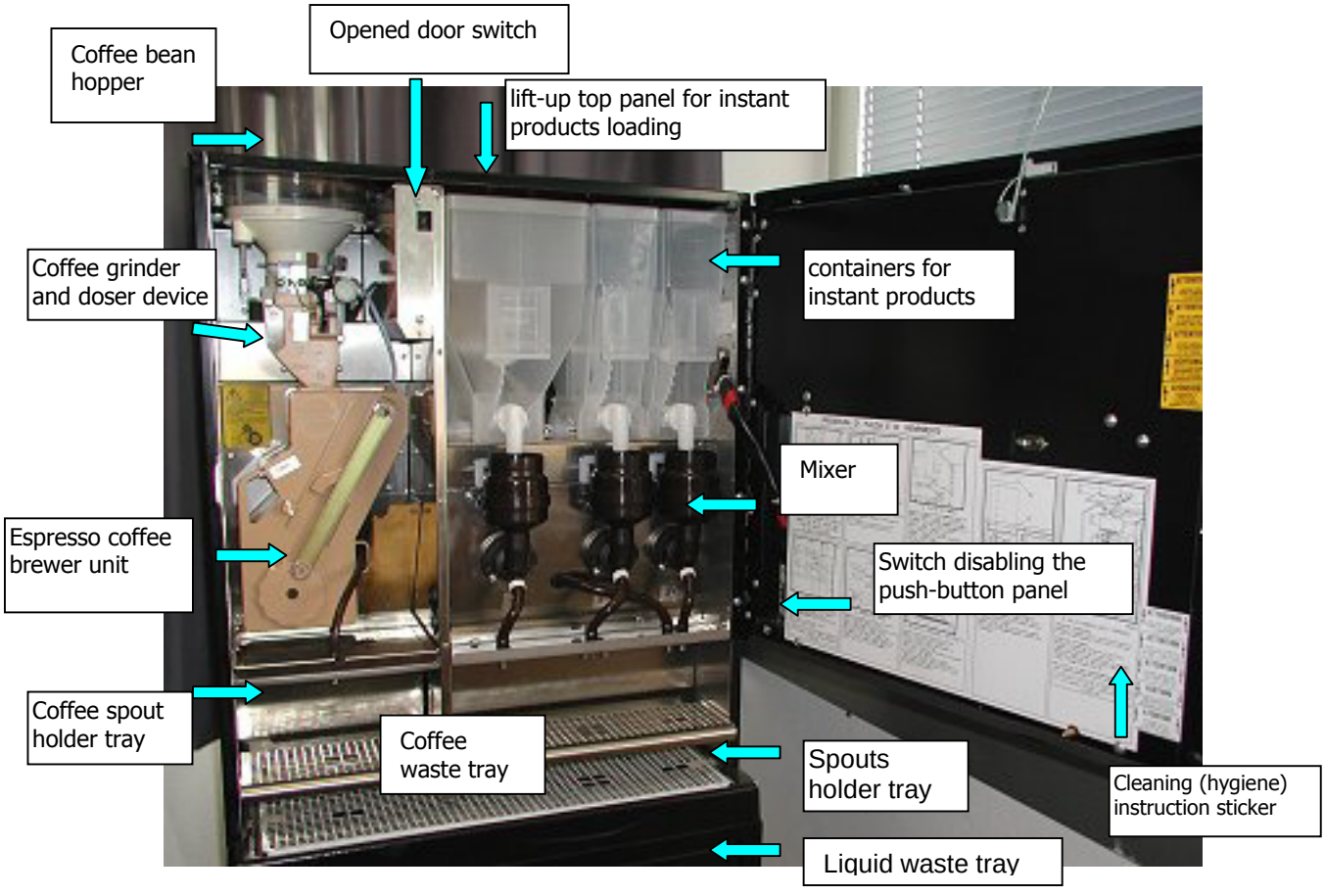
THE CONTENTS OF THIS DOCUMENT ARE INTENDED FOR NECTA'S AFTER SALES PERSONNEL.

TABLE OF CONTENTS

1	Layout	Pages 3-4-5-6
2	Electrical systems, connections and configuration	Pages 7-8-9-10
3	Air-break / Espresso boilers / Instant boilers	Pages 11-12-13
4	Pumps and by-pass	Page 14
5	Espresso coffee brewer unit	Page 15
5.1	FB coffee brewer unit	Page 15
5.2	Module diagram for Instant / FB / Espresso version	Page 16
6	Doser devices and powder product containers	Page 17
7	Doser devices	Page 18
8	Mixer and steam suction assembly	Page 19
9	Powder and water dose tables	Page 20
10	Trouble-shooting	Pages 21-22-23
11	Wiring diagrams	Page 24
12	HACCP directive (Use instructions)	Page 25
13	Daily cleaning and hygiene	Page 26
14	Weekly cleaning and hygiene	Page 27
15	Monthly cleaning and hygiene	Page 28

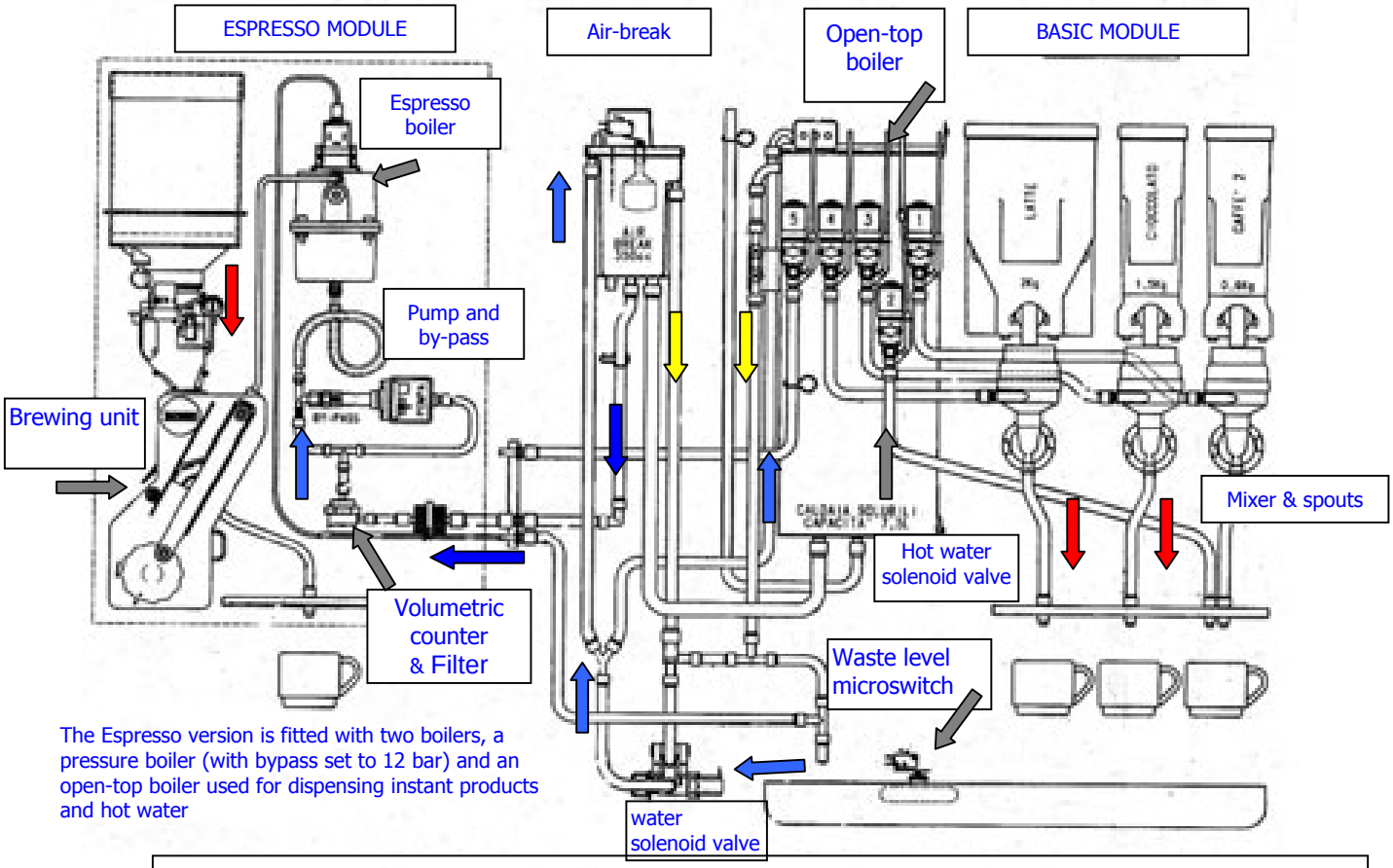
NOTE

The above systems and functional units are specific to this machine..
All functional units installed but not listed in this document, are also used in other machines in the same range; therefore they will be described in a separate manual for machines belonging to the same range, where all base functional units will be described more in detail..



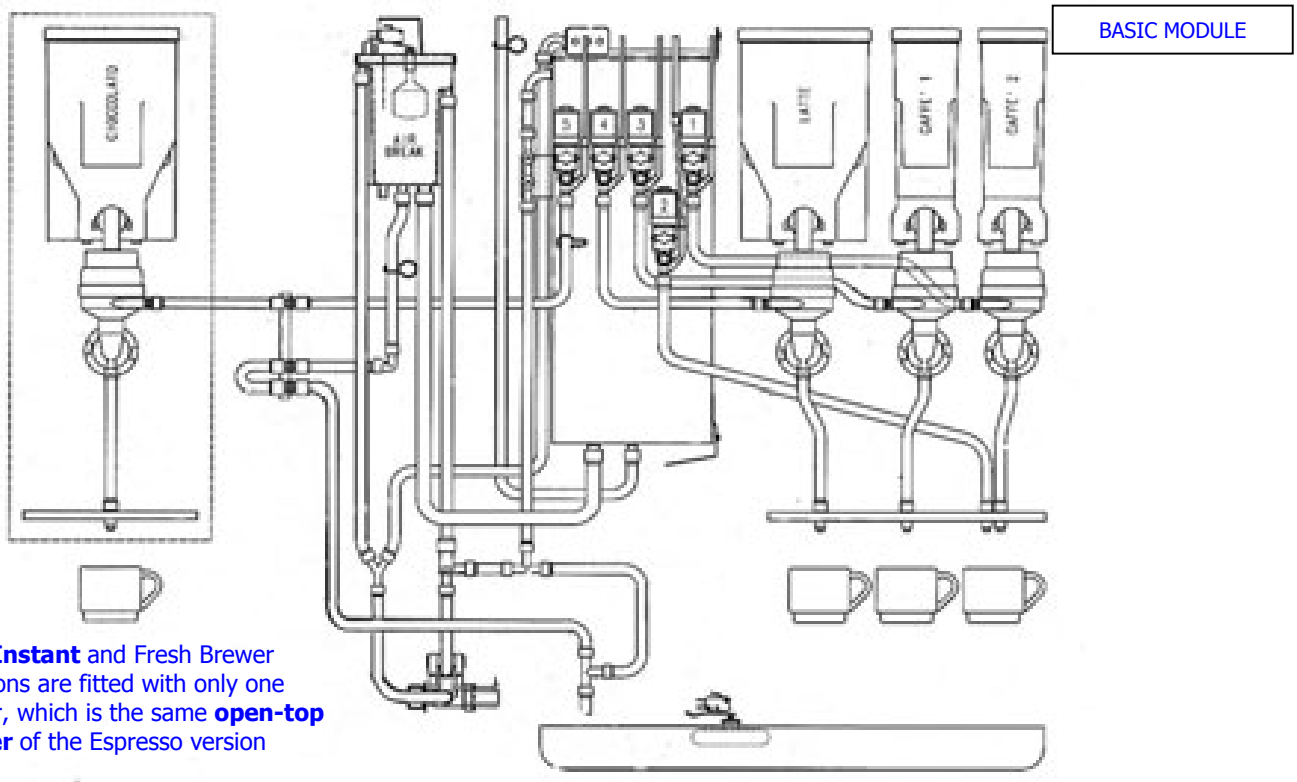
Gran mattino (Espresso coffee version): View with door open

1 – HYDRAULIC LAYOUT "ESPRESSO" VERSION



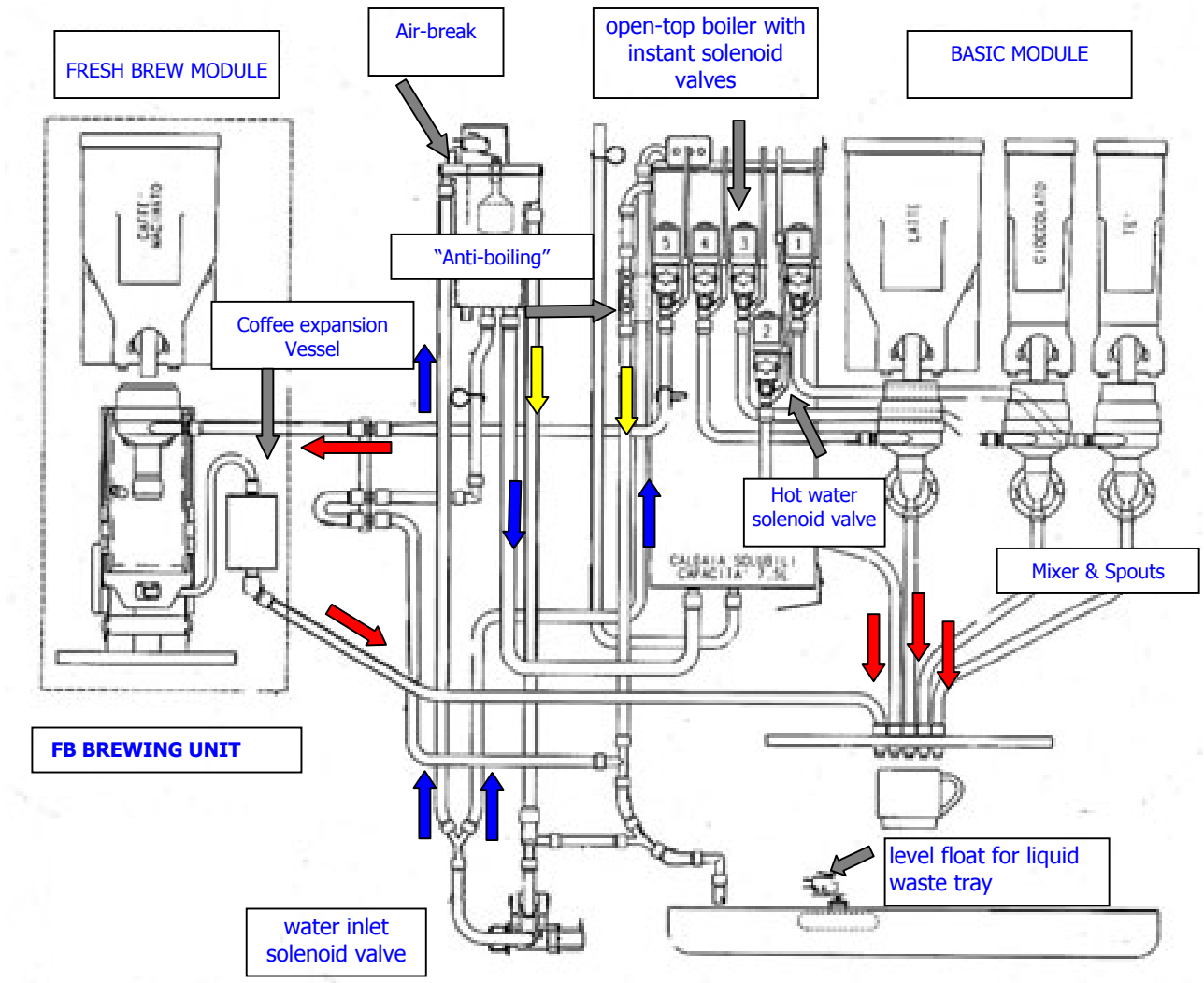
The Espresso version is fitted with two boilers, a pressure boiler (with bypass set to 12 bar) and an open-top boiler used for dispensing instant products and hot water

1.1 – Hydraulic layout "INSTANT" version



The **Instant** and Fresh Brewer versions are fitted with only one boiler, which is the same **open-top boiler** of the Espresso version

1.2 – Hydraulic layout " FRESH BREW "version



The Fresh Brewer version is fitted with **only one** open-top boiler with a **separate** air break, which is the same as the Espresso and instant versions

COLORED ARROWS LEGEND

Cold water flow from the solenoid valve to the boiler inlet

Hot water flow from the overflow hole (or steam exhaust)

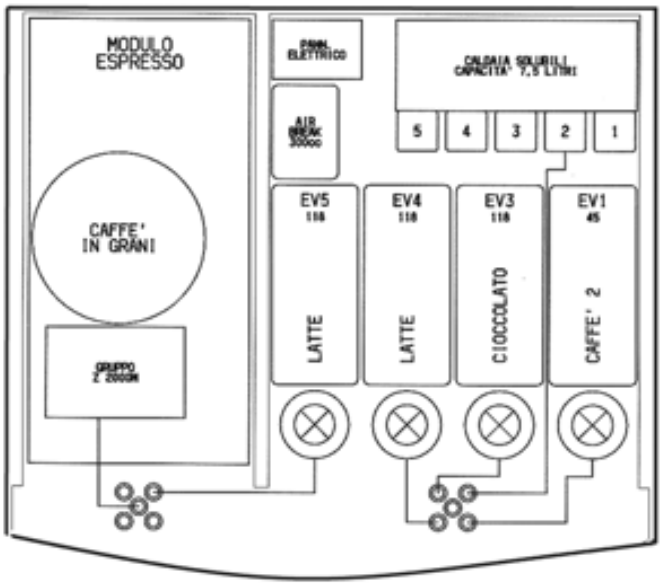
Hot water flow from the solenoid valves for dispensing

(Cold or hot) water flow for draining the boiler

Nota :
THE FOLLOWING LAYOUTS ARE ONLY GIVEN AS AN EXAMPLE, THEY COULD CHANGE ACCORDING TO SPECIFIC MARKET NEEDS; IF NECESSARY, REFER TO THE OFFICIAL LAYOUT SUPPLIED WITH THE MACHINE. THE MACHINE IS CONFIGURED IN THE HOTELLERIE LAYOUT BY DEFAULT

Gran Mattino Plus LAYOUT
Italy Espresso Version
SELF SERVICE
(2 dispensing points)

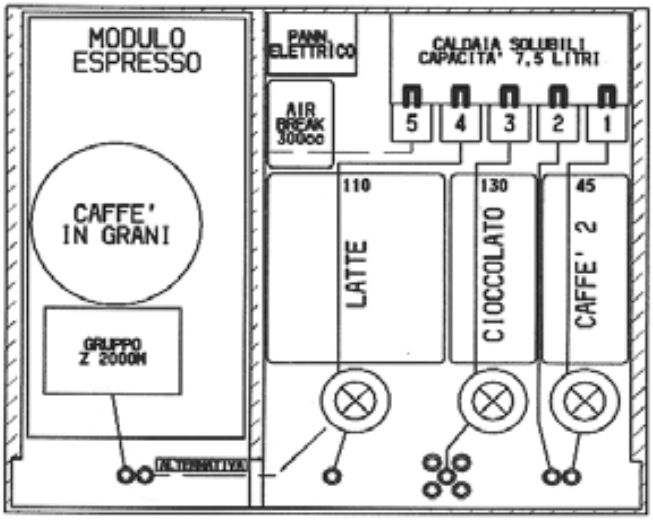
It corresponds to the **LX C5/IQ** model.

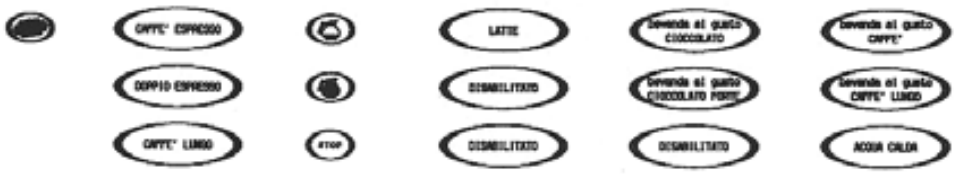


01- ESPRESSO
02- COFFEE WITH MILK
03- INSTANT COFFEE
04- CHOCOLATE
05- LONG ESPRESSO COFFEE
06- CAPPUCCINO
07- LONG INSTANT COFFEE
08- CHOCOLATE WITH MILK
09- MILK
10- MILK WITH COFFEE ADDED
11- MILK COFFEE
12- HOT WATER
P - PROGRAMMING
FULL JUG = FILL JUG
CROSSED OUT JUG = STOP JUG

Gran Mattino RY LAYOUT
Italy Espresso Version
HOTELLERIE
(4 dispensing points)

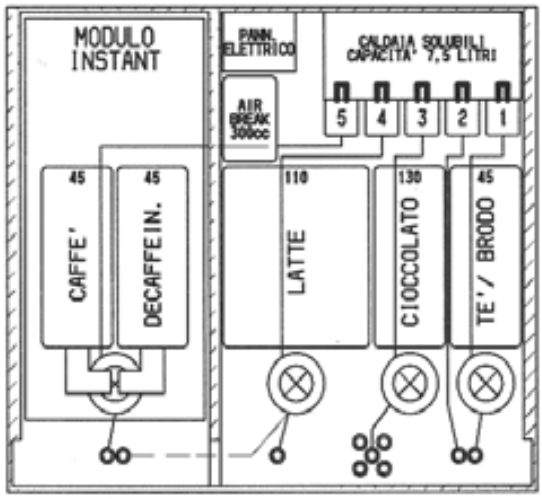
It corresponds to the **C4/IQ** model.

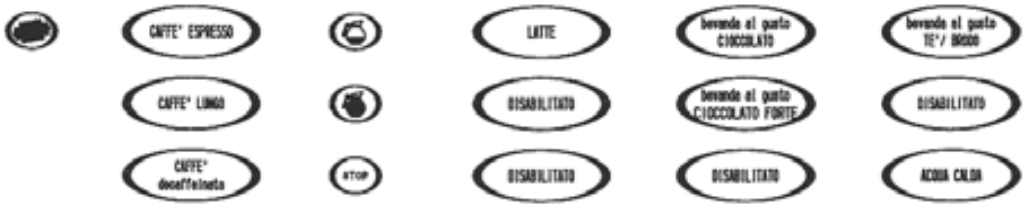




Gran Mattino RY LAYOUT
Italy Instant Version
HOTELLERIE
(4 dispensing points)

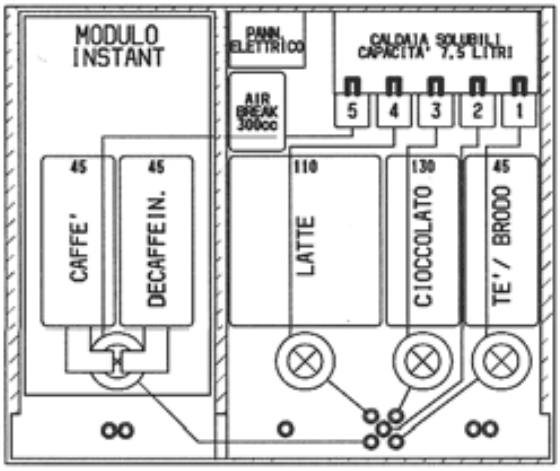
It corresponds to the **I5/IQ** model.

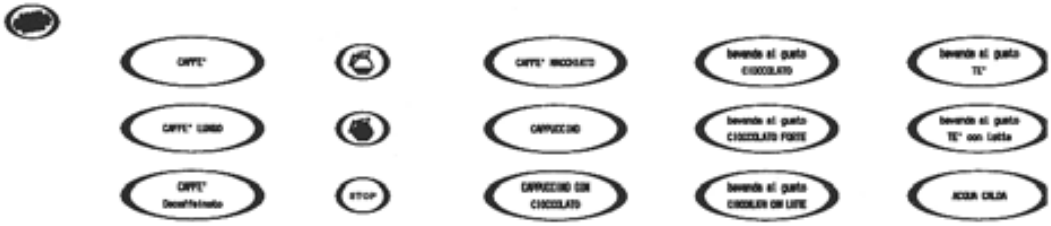




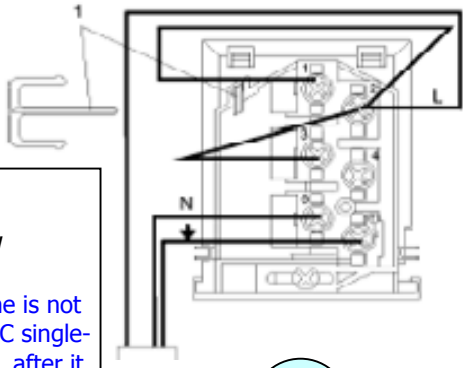
Gran Mattino RY LAYOUT
Italy Instant Versione
SELF SERVICE
(1 dispensing point)

It corresponds to the **I5/IQ** model.



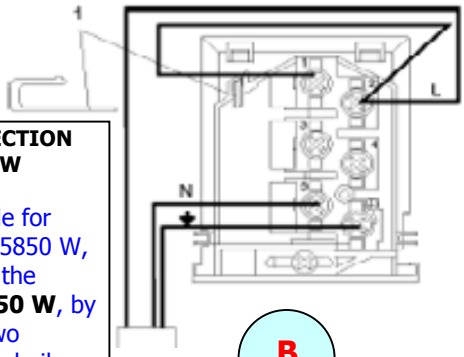


2 - ELECTRICAL SYSTEMS - CONNECTIONS - CONFIGURATIONS



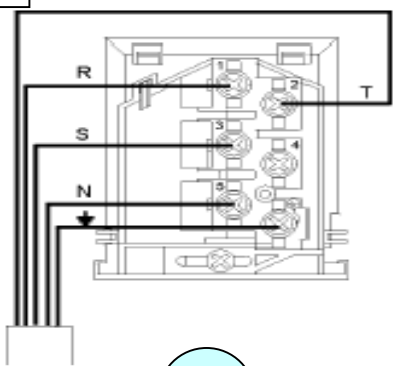
SINGLE-PHASE CONNECTION
230 V AC 32 A 7400 W
3 x 4 mm² CABLE
When a three-phase line is not be available, a 230 V AC single-phase line can be used, after it is checked to ensure that it is adequately sized for withstanding the required load of **7400 W**
Use the special blade **1**, supplied with the terminal box, as a jumper.

C



SINGLE-PHASE CONNECTION
230 V AC 13 A 3150 W
3 x 1.5 mm² CABLE
If the line is not suitable for withstanding a load of 5850 W, it is possible to reduce the absorbed power to **3150 W**, by excluding one of the two heating elements in the boiler when making the electrical connection.
In this case the performance of the machine regarding hot water output will be halved.
Use the special blade **1**, supplied with the terminal box, as a jumper.

B



THREE-PHASE + neutral CONNECTION
400 V 3 N AC 11.8 A 7400 W
5 x 1.5 mm² CABLE

This connection is advisable for a **7400 W** power supply to the machine.

A

NOTE : The indicated power values are referred to the Espresso version with two boilers. See the following table for the other versions

THE POWER SUPPLY CONNECTION

The machine is designed to operate under single-phase **230 V~** voltage and is protected by 15 A fuses on the heating elements circuits and by 4 A on the electronic control circuits.
A line having the following characteristics can be used for the power supply connection:
- three-phase + neutral 400 V AC / 50 Hz (recommended solution)
- single-phase 230 VAC / 50 Hz

The machine is supplied without power line cable; for connection to the power grid use only cables type H05 VV-F or H05 VV H2-F with adequate section (see indications on the connection diagrams).
Before making the connection ensure that the ratings correspond to those of the power grid, and more specifically that the supply voltage rating is within the range recommended for the connection points.
According to the safety standards in force (EN) a safety main switch must be installed and located within easy reach, suitable for withstanding the required peak load and at the same time ensuring proper omnipolar disconnection from the power grid with the opening gap in the contacts of at least 3 mm.
The machine electrical connection must be permanent. Therefore, adapters, multiple sockets and/or extensions must not be used.
The electrical safety of the machine is ensured only when it is correctly earthed according to the safety standards in force.
This fundamental safety requirement must be duly verified, and if in doubt the system must be carefully tested by qualified technicians.
The power cable must be connected to the specific terminal box located on the back panel of the machine, ensuring correct position of the phases as indicated in the diagrams, according to the type of connection.
A different connection, as well as not permitting correct operation, could also cause damage to the machine.
To get the maximum heating power, it is advisable to use (if possible) the following connection:
"A" three-phase + NEUTRAL 400 V 3N 11.8 A 5850 W with a 5 wire cable having a section of 1.5 mm².
Should this not be possible, solutions "B" and "C" can be adopted but with the indicated limitations.

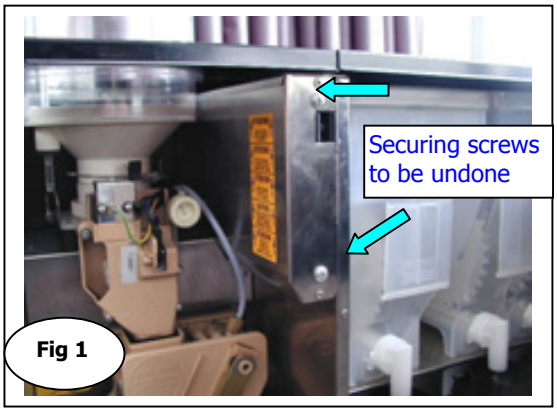
SETTING THE VOLTAGE MINIDIP

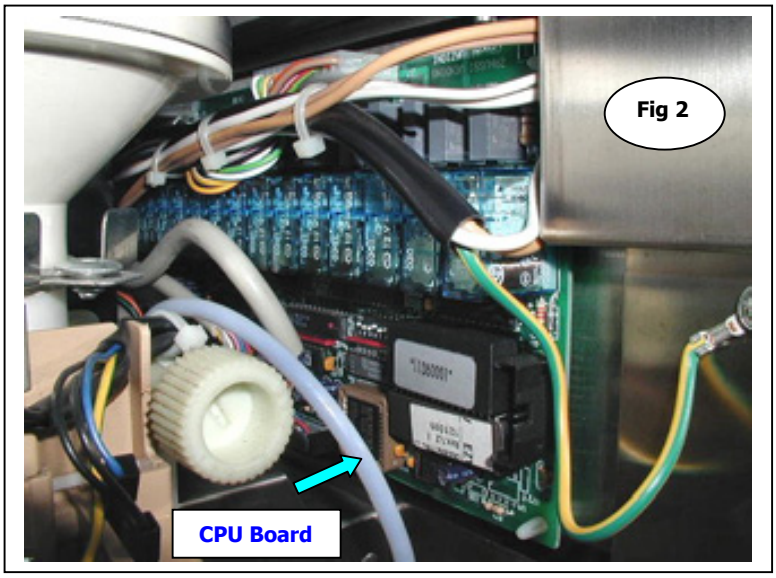
In the Espresso version with **TWO** boilers it is necessary to set minidip 2 on the control board (see relevant chapter), defining the control settings for the boiler heating elements according to the available power and therefore to the type of connection used.
If the connection type is the one shown in Fig. **A and C** it must be set to **OFF** and therefore both boilers will operate simultaneously, thus achieving maximum output.
If the connection type is the one shown in Fig. **B** it must be set to **ON** and therefore the boilers will alternate, thus achieving a smaller hourly output

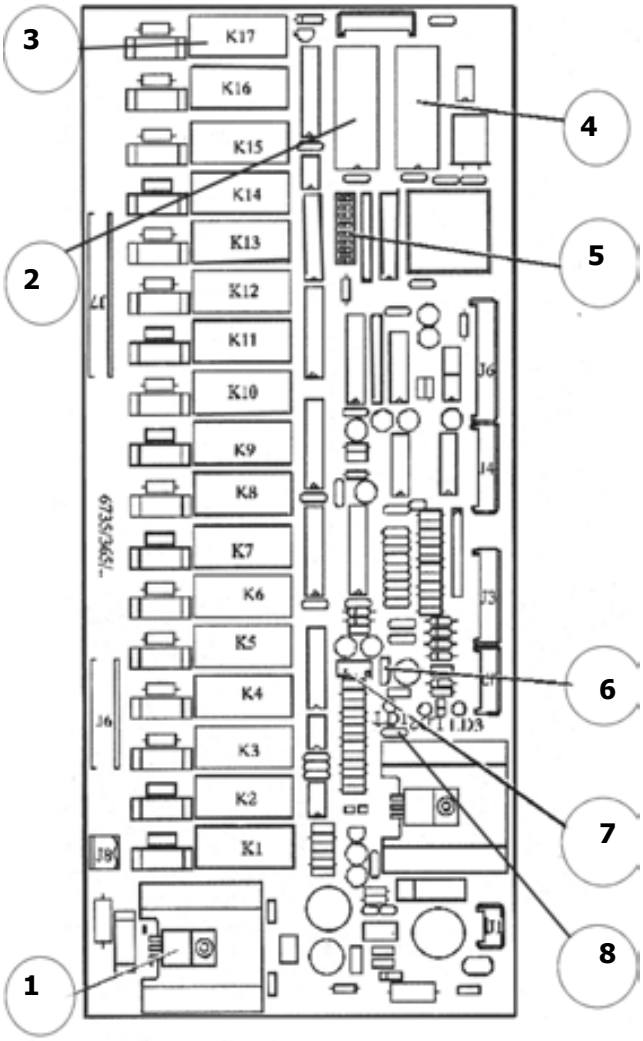
2.1 - BOARD CONNECTIONS

View of power supply unit and actuation board compartment (without casing)

MOTHERBOARD COMPARTMENT
1 VIEW WITH PROTECTIVE CASING
2) VIEW WITHOUT CASING







REF.	DESCRIPTION
1	ESPRESSO COFFEE BOILER TRIAC
2	RAM
3	ACTUATION RELAYS K1 - K17
4	EPROM
5	Configuration Minidip
6	Multi-turn TRIMMER (ESPRESSO BOILER TEMPERATURE)
7	JUMPER
8	LED indicators*

- **LED INDICATORS**

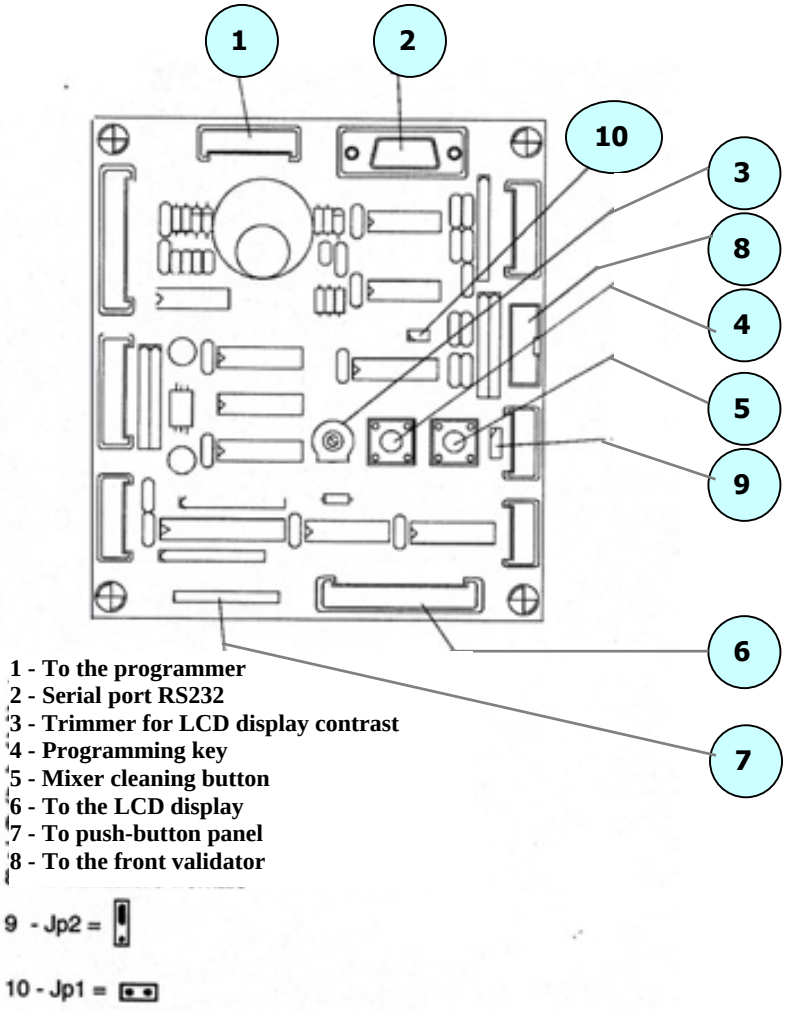
RED LED = Indicating heating of the espresso coffee boiler
GREEN LED = Blinking to indicate correct processor's function
YELLOW LED = Indicating the presence of 12 V for board control

MODEL			
MINIDIP	ESPRESSO	INSTANT	FRESH BREW
3	ON	OFF	OFF
4	OFF	OFF	ON

With minidip **1** set to OFF more selections are dispensed simultaneously
Minidip **2** defines the control settings for the boiler heating elements according to the available power (see power connection at Pag. 7)

PAYMENT SYSTEM CONFIGURATION				
TYPE	MINIDIP	MINIDIP	MINIDIP	MINIDIP
None	OFF	OFF	OFF	OFF
VALIDATORs	OFF	ON	OFF	OFF
VALIDATORs WITH CREDIT	OFF	OFF	ON	OFF

Descriptions of relay functions			
Relay	**ESPRESSO VERSION**	**INSTANT VERSION**	**FRESH BREW VERSION**
K 1	COFFEE DISPENSING SOLENOID VALVE	SOLENOID VALVE EV 5	SOLENOID VALVE EV 5
K 2	COFFEE RELEASE MAGNET	ACTIVATING DOSER DEVICE 5	ACTIVATING DOSER DEVICE 5
K 3	ACTIVATING COFFEE GRINDER	ACTIVATING MIXER 4	ACTIVATING MIXER 4
K 4	STARTING PUMP	FREE	FREE
K 5	STARTING COFFEE UNIT MOTOR	ACTIVATING DOSER DEVICE 4	STARTING FRESH BREW UNIT MOTOR
K 6	ACTIVATING MIXER 1	ACTIVATING MIXER 1	ACTIVATING MIXER 1
K 7	ACTIVATING MIXER 2	ACTIVATING MIXER 2	ACTIVATING MIXER 2
K 8	SOLENOID VALVE EV 4	SOLENOID VALVE EV 4	SOLENOID VALVE EV 4
K 9	SOLENOID VALVE EV 2	SOLENOID VALVE EV 2	SOLENOID VALVE EV 2
K 10	ACTIVATING DOSER DEVICE 3	ACTIVATING DOSER DEVICE 3	ACTIVATING DOSER DEVICE 3
K 11	ACTIVATING DOSER DEVICE 2	ACTIVATING DOSER DEVICE 2	ACTIVATING DOSER DEVICE 2
K 12	ACTIVATING DOSER DEVICE 1	ACTIVATING DOSER DEVICE 1	ACTIVATING DOSER DEVICE 1
K 13	SOLENOID VALVE EV 1	SOLENOID VALVE EV 1	SOLENOID VALVE EV 1
K 14	SOLENOID VALVE EV 3	SOLENOID VALVE EV 3	SOLENOID VALVE EV 3
K 15	ACTIVATING CONTACTOR	ACTIVATING CONTACTOR	ACTIVATING CONTACTOR
K 16	ACTIVATING WATER INLET SOLENOID	ACTIVATING WATER INLET SOLENOID	ACTIVATING WATER INLET SOLENOID
K 17	ACTIVATING MIXER 3	ACTIVATING MIXER 3	ACTIVATING MIXER 3



1 - To the programmer
2 - Serial port RS232
3 - Trimmer for LCD display contrast
4 - Programming key
5 - Mixer cleaning button
6 - To the LCD display
7 - To push-button panel
8 - To the front validator

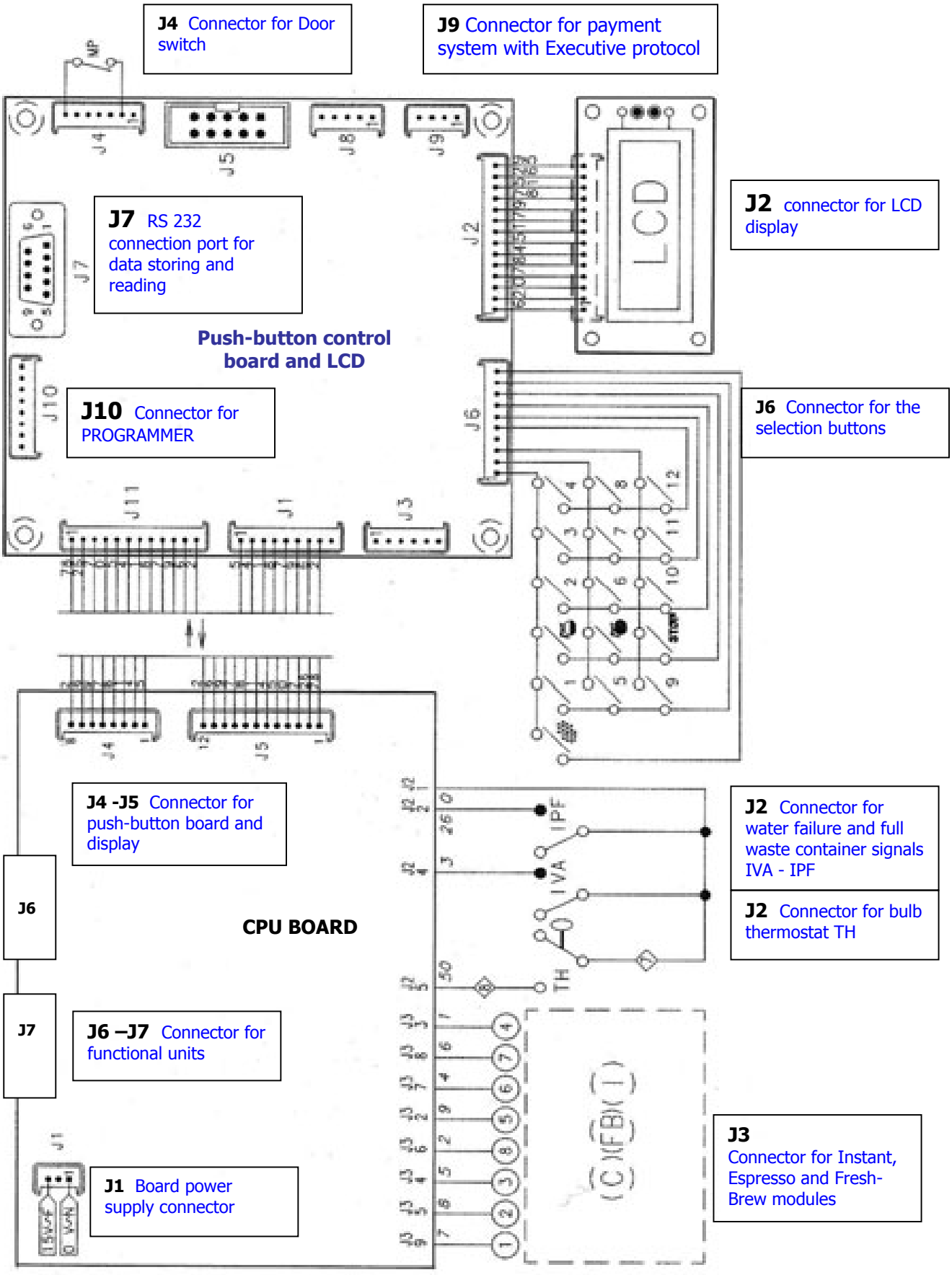
9 - Jp2 =

10 - Jp1 =

PUSH-BUTTON BOARD LAYOUT

This board controls the alphanumeric display, the selection keys and the service keys.
It supports the payment system connectors as well as the printer port or other serial systems

Board connection diagram

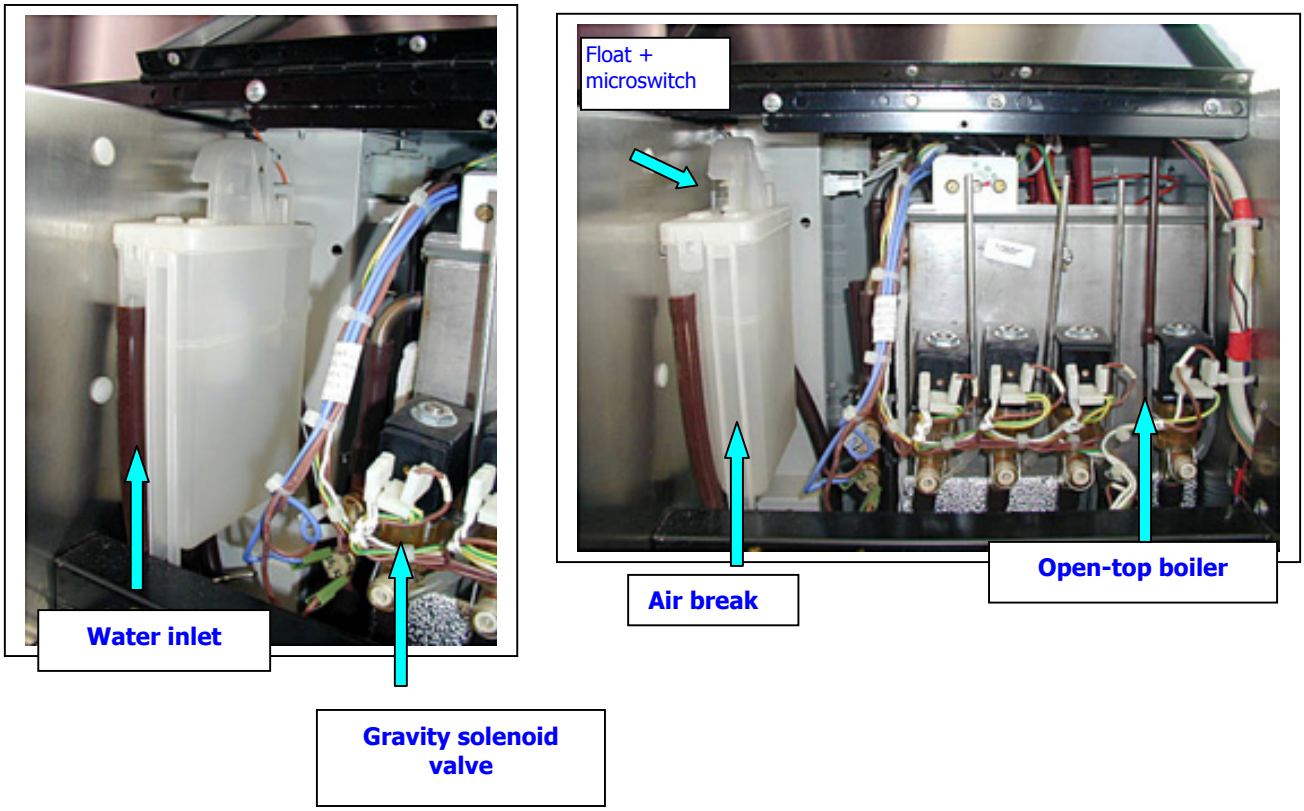


NB : The CPU and push-button boards are used also in other vending machine models; therefore some connectors are not used in this model

3 – Air-break & Boilers

The main function of the **air-break** is to keep the water level constant and to signal a water flow interruption from the mains; in the event of such water failure the current selection can be completed.
In addition, it serves the purpose of holding a reservoir of water at normal atmospheric pressure, so that the pump can draw the correct water dose for the selection and deliver it to the Espresso boiler without changes in pressure that may affect the volumetric counter reading.
The **GRAN MATTINO vending machine** is equipped with an air-break separate from the boiler, because of the need to have cold water for the Espresso pressure boiler.
The air-break is the same type used for the Zenith and other models, therefore it's a highly reliable and accurate functional unit.
In order to standardise construction it was installed in all three versions: Instant, Espresso, Fresh-Brew.
The water dose used for the selections is measured by means of the volumetric counter for the Espresso coffee selections, while it is measured by timing the solenoid valve opening (in tenths of a second).
The water level is ensured by a float that triggers a microswitch, keeping the level between a factory set minimum and maximum (it very important not to replace the microswitch with any one of different mechanical characteristics, as a variety of malfunctions may occur).
Furthermore, in the event of failure to the maximum level microswitch, an overflow hole allows the water to be conveyed through a tube and to the safety device fitted on the water inlet solenoid valve, thus causing its mechanical lock (such safety device is triggered also in the event of a power failure).
The air-break also causes a signal to be sent the machine control board necessary for the initial installation and for filling with water, that anyway need to be done manually.
If upon switching the machine on the float does not trigger the maximum level microswitch within a set time (e.g. 60 sec) the vending machine locks due to a water failure.

View of compartment showing the air-break without protective casing

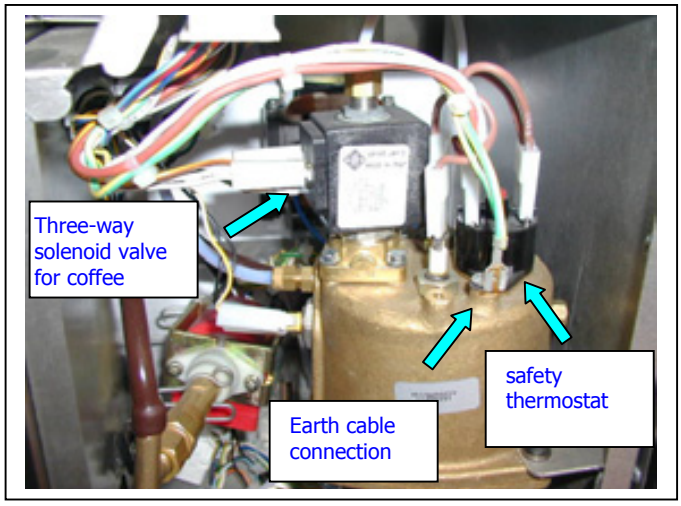


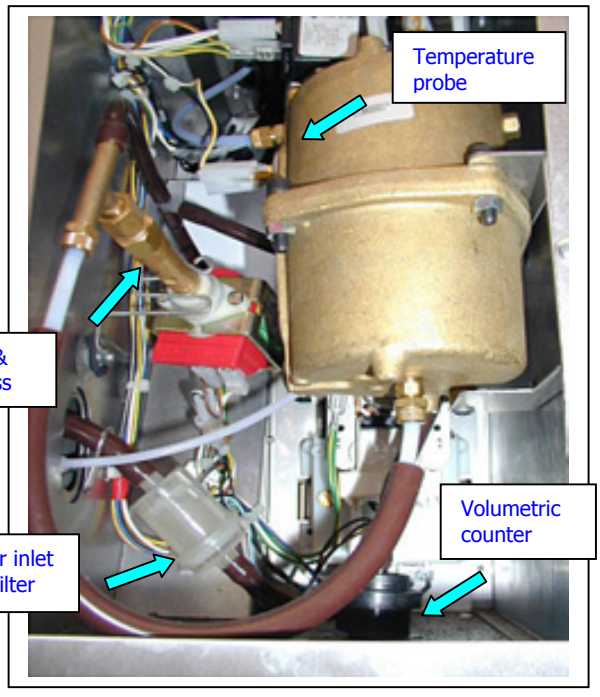
3.1 - PRESSURE BOILERS

The **GRAN MATTINO Model has THREE versions with two different configurations; an Espresso version fitted with the Espresso pressure boiler for Espresso products and an open-top boiler for Instant products, an Instant version fitted with only one open-top boiler and separate air-break**. And a FRESH BREW version also fitted with the **open-top instant** boiler.

The espresso boiler is the same used for other models with higher capacity, therefore with the same well-known and established characteristics and reliability, but with specific application for such vending machine.

The **open-top** boiler for the **Instant and FB version is a new design and specific for such model**.





REAR COMPARTMENT WITHOUT PROTECTIVE CASING

See relevant functional unit manual for details, photos and complete description

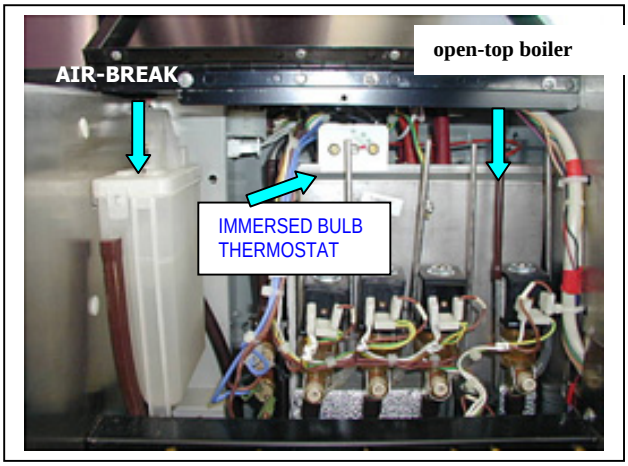
The internal temperature control in the espresso boiler is by means of an NTC type electronic probe fitted with an internal 12 kohm (± ohm) resistance at a temperature of 25° C.

As the temperature increases the resistance is reduced progressively as indicated in the following table.

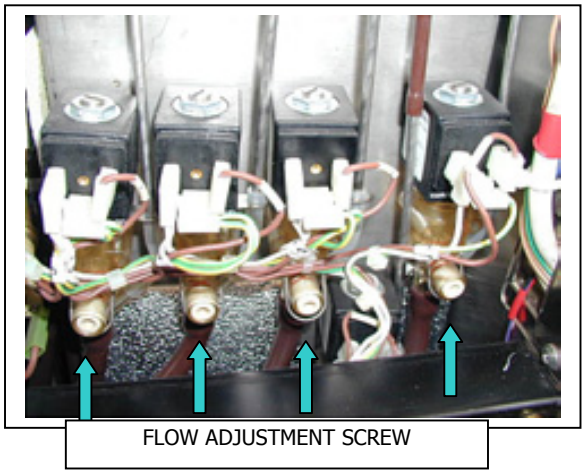
Boiler temperature °C	Value in ohm	Allowed tolerance
0	35875	**± 7 ohm**
25	12000	**± 4 ohm**
50	2900	,,
85	1475	,,
90	1260	,,
100	963	,,

3.2 – OPEN-TOP BOILER

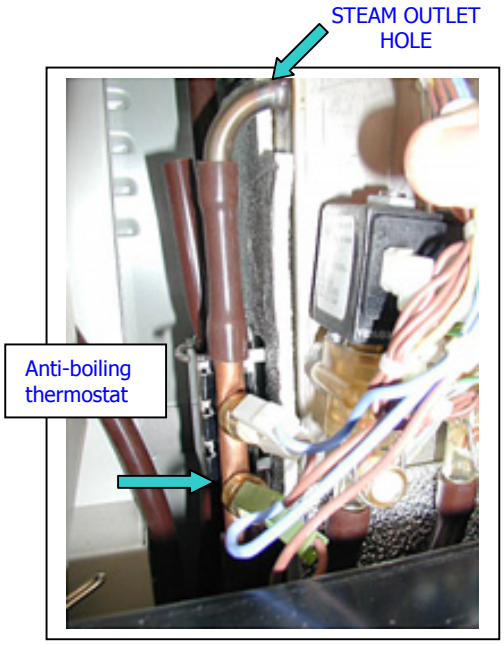
View of internal compartment without containers but with protective casing



View of internal compartment without protective



GRAVITY SOLENOID VALVE DETAIL

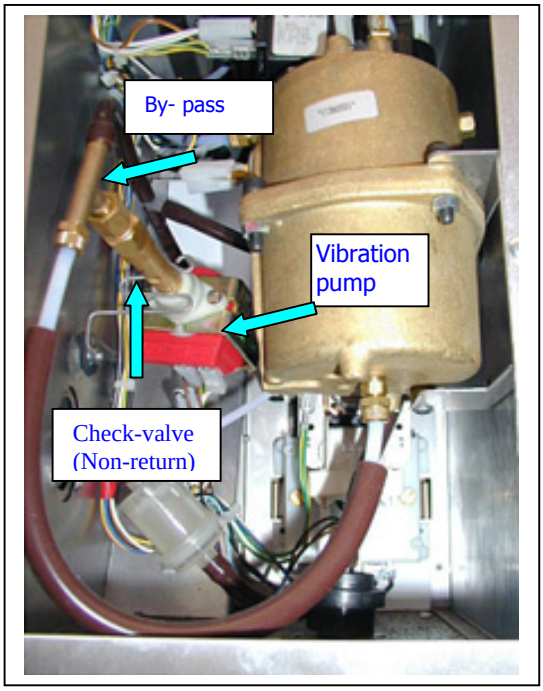


DETAIL of Anti-boiling thermostat position

SAFETY DEVICES
The boiler is fitted with electric safety protections against dry operation overheating and boiling caused by a failure to the temperature control system.
In the event of dry operation overheating the bulb thermostat acts as a hardware safety system and disconnects the power supply from the heating elements.
In the event of overheating with the boiler full of water, the steam is forced to exit from the overflow hole and, flowing through the copper pipe, trips the thermostats (one for each phase) that then disable the power supply to the heating elements.
Set must be manual after checking and fixing the problem.

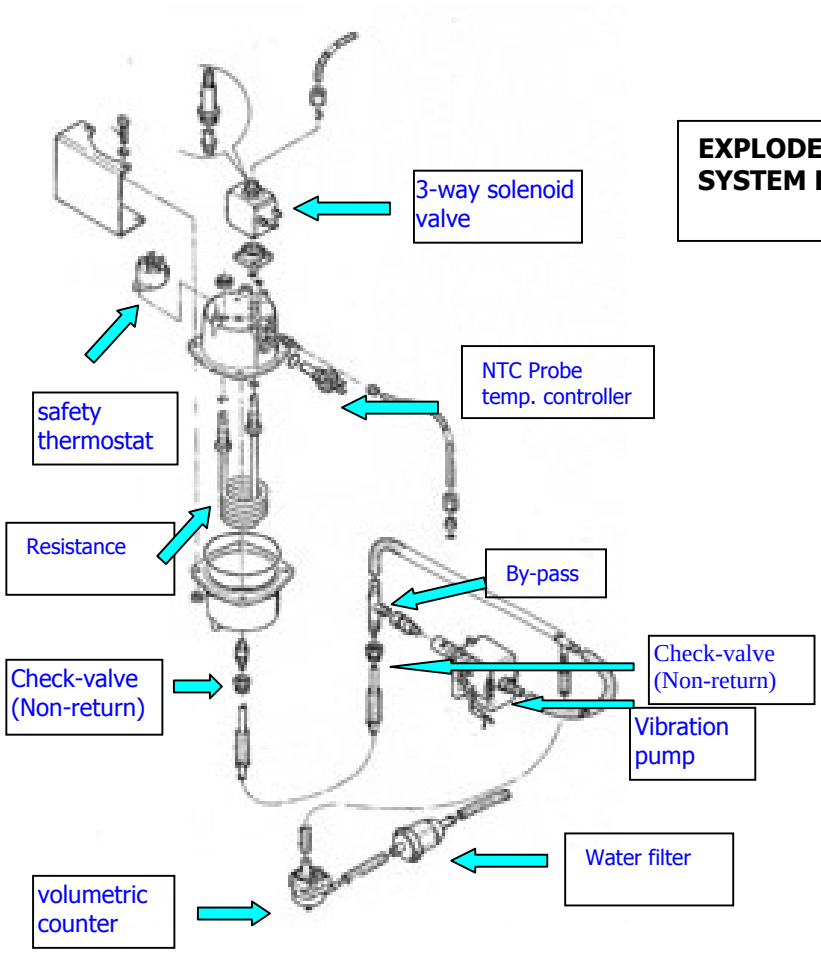
The boiler used in the Gran Mattino model is of the open-top type (i.e. with an external opening that will ensure that the internal pressure does not exceed the atmospheric pressure). It is fitted with two 230 V AC heating elements, 2700 W each.
In the situation of maximum output, a total power of 5400 W is absorbed (when two heating elements are operating).
The water level is ensured by the separate air-break through a communicating vessels connection.
Contrary to the Piccolo Mattino model (where the level control is by means of probes) in the Gran Mattino the Air-break solution has been adopted because of the need to have cold water for the espresso module; such solution has been adopted also in the other Instant and Fresh-brew versions to standardise the models and circuits.
The overflow level is ensured by both the air-break and an overflow hole that also serves the purpose of controlling the anti-boiling system.
Should there be any hot water or steam flow out of such hole because of a malfunction the two klixons (manually resettable) are triggered, stopping the function and locking the machine.
SEE FUNCTIONAL UNIT MANUAL REGARDING BOILERS FOR DETAILS, FUNCTIONS AND SAFETY DEVICES

4 - PUMP AND BY-PASS



In order to supply water to the espresso boiler, only for the ESPRESSO version, the same vibration pump used in the entire range of espresso machines is used.
Of course the application is different, as pump, boiler and connections are positioned inside a compartment accessed from the rear after removing the back panel.
This solution ensures total full access for maintenance and hygiene (see picture).
The pump has overheating protection in case of continuous or dry operation by means of a 90° C self-resetting klixon, fitted to the power supply unit as standard feature.
To be pointed out the klixon was sized not to be triggered at all in normal vending conditions; however, in the case of continuous power supply caused by any malfunction, or operation without water, the klixon will be triggered at the pre-set temperature to prevent overheating that is dangerous to the pump coil.
The by-pass is factory pre-set at **12 bar**.
The pump is activated by **relay K 4**

VIEW OF PUMP - BOILER (without back casing **)**

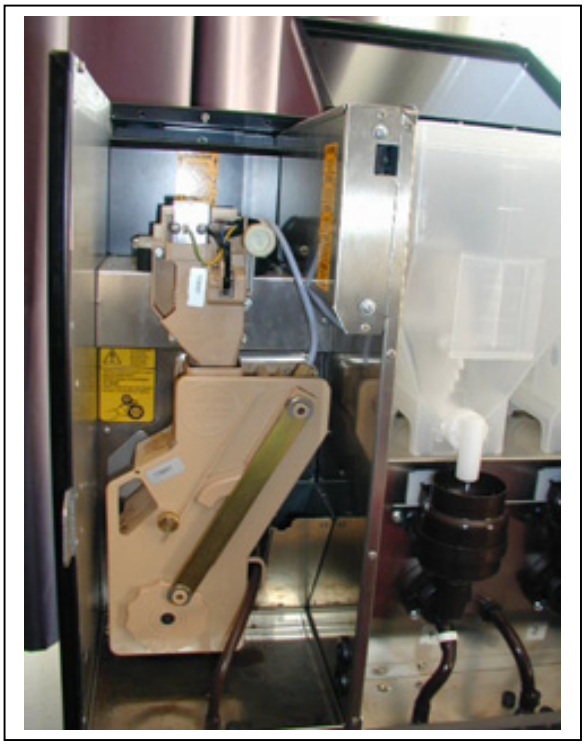


EXPLODED VIEW HYDRAULIC SYSTEM FOR ESPRESSO BOILER

5 – ESPRESSO COFFEE BREWER UNIT

The well-known and reliable **Z 2000** M unit is used, but with some changes to make it more suitable and with simpler operation, to take into account the high range characteristics of the GRAN MATTINO vending machines.

Espresso coffee brewer detail
Positioned at the upper dead centre
Ready for loading ground coffee



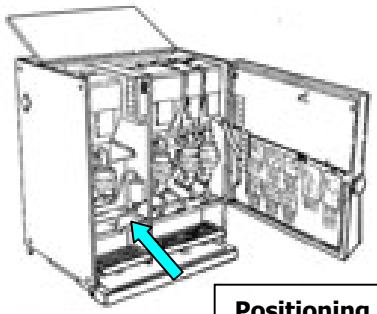
BREWER UNIT IN OPERATING POSITION

The unit is factory fitted for the installation of a first coffee heater kit

5.1 – FRESH-BREW COFFEE UNIT

FRESH BREW COFFEE UNIT
REMOVED FROM THE MACHINE

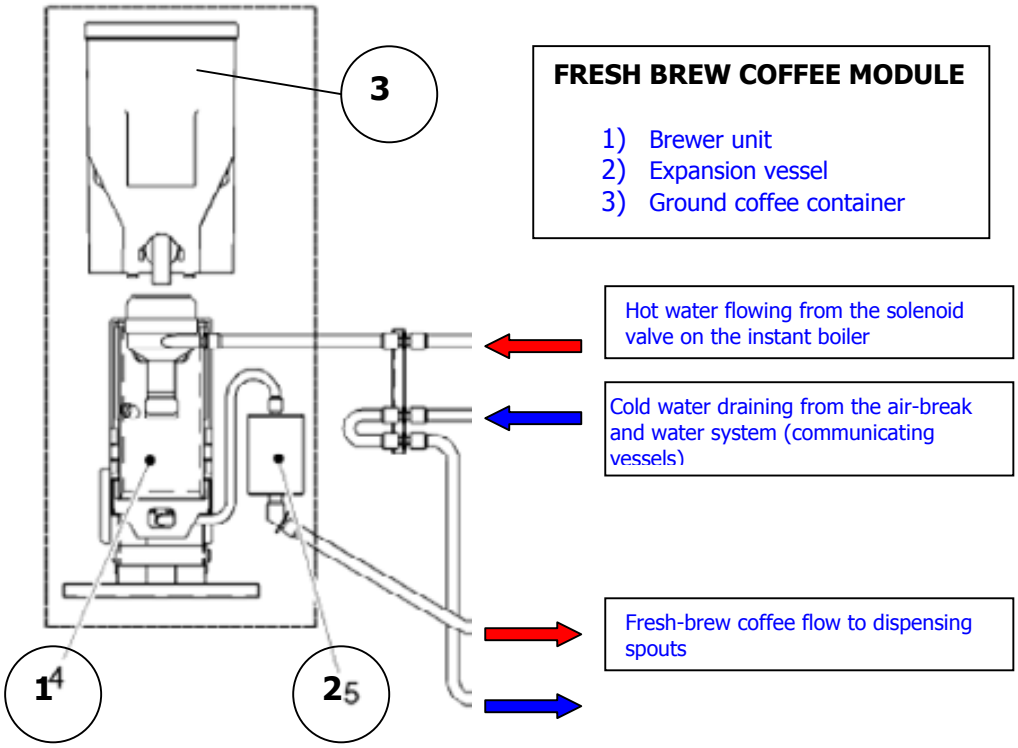
This is a specific version fitted with the Fresh-brew coffee unit.
Such unit for the moment makes filtered coffee using special coffee for FB, already ground to a coarser grade compared to espresso coffee. Such coffee is consumed especial in northern European countries.
This is a modern, very compact unit. For further details see the functional unit manual.



Positioning FB unit

5.2 – DIAGRAMS OF INSTANT/ESPRESSO /FRESH BREW MODULES

The Gran Mattino machine has three different versions using the same hydraulic system, with the difference concerning the water connection of the three modules used. The different connections are illustrated below.



FRESH BREW COFFEE MODULE

1) Brewer unit
2) Expansion vessel
3) Ground coffee container

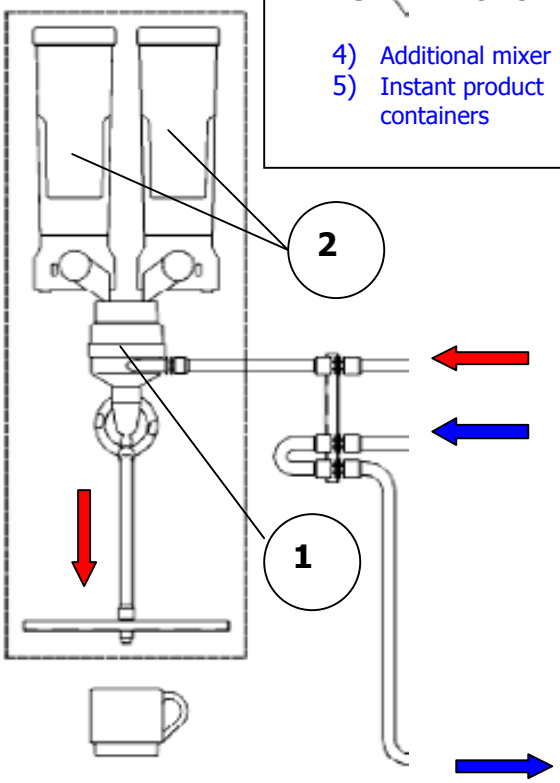
Hot water flowing from the solenoid valve on the instant boiler

Cold water draining from the air-break and water system (communicating vessels)

Fresh-brew coffee flow to dispensing spouts

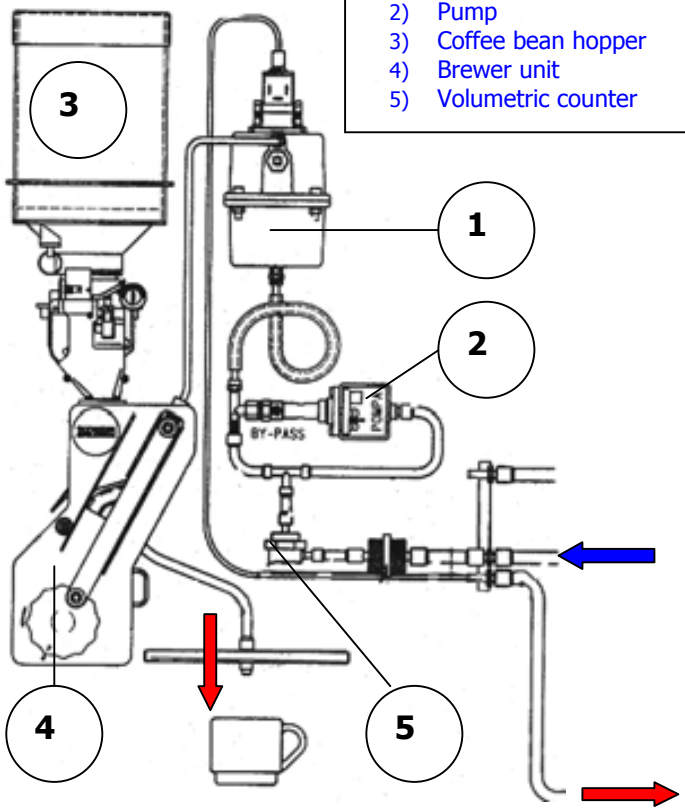
INSTANT MODULE

4) Additional mixer
5) Instant product containers



ESPRESSO MODULE

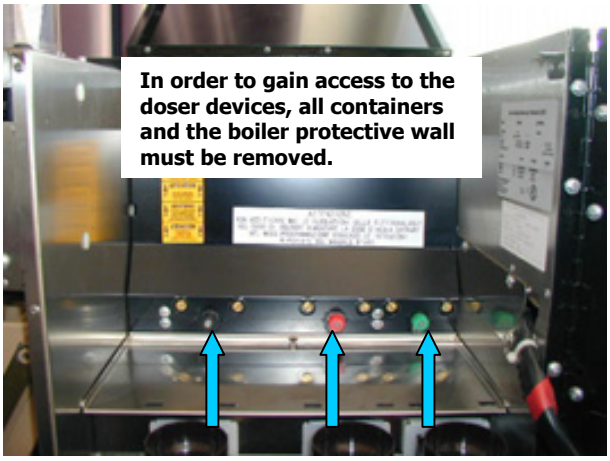
1) Espresso boiler
2) Pump
3) Coffee bean hopper
4) Brewer unit
5) Volumetric counter



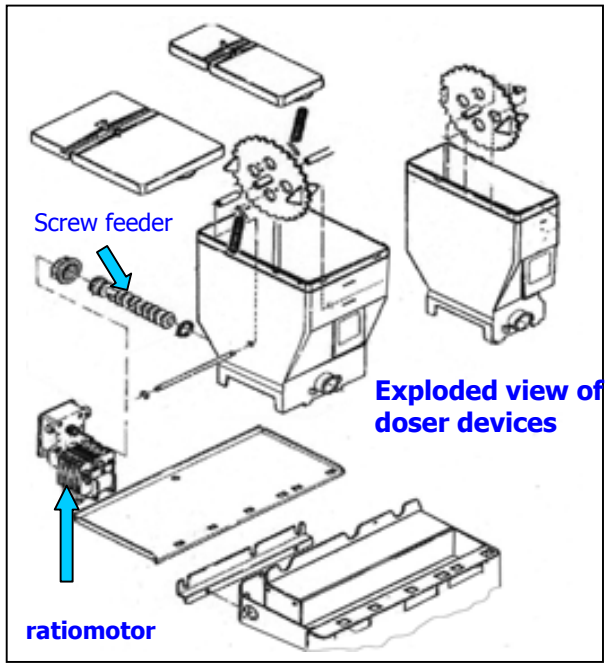
6 - DOSER DEVICES AND POWDER PRODUCT CONTAINERS

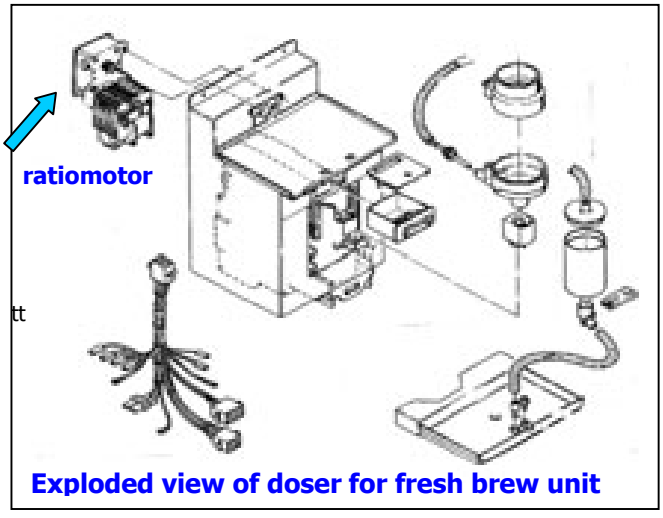
Due to the particular use of the Gran Mattino new solutions needed to be designed, with easier fastening to allow easy and full access for maintenance

The doser devices evolve from the ones used in other vending machines, but are optimised for the specific function.
They are secured to the back with two screws, they are of the induction type powered with 230 V AC and fitted with overheating protection by means of a klixon on the coil. They are used at different speed according to the product to be dispensed, and are identified by different colour drive gears.
The containers are the same ones used in the Brio and can be fitted with a whipper inside to optimise the dispensing of products that form clots; dispensing is through the rotation of food-safe plastic augers.
The powder dose is metered through the timed rotation of the auger, with software settings in tenths of a second.
According to the products to be dispensed, different dispensing timing and phases can be adopted, set by default in the software.
The motor start time can be increased or decreased through software setting, but any dispensing cycles set by default cannot be changed.
Activation is by means of relays:
K5 -K10 – K11 – K12 FOR DOSER DEVICES – MD3 – MD2 – MD1 - MD4



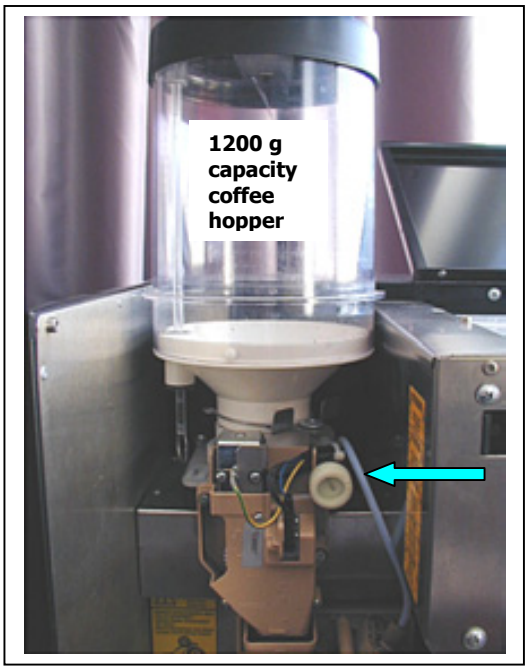
Auger clutch and drive gears (the different colour indicates a different rotation velocity)





tt

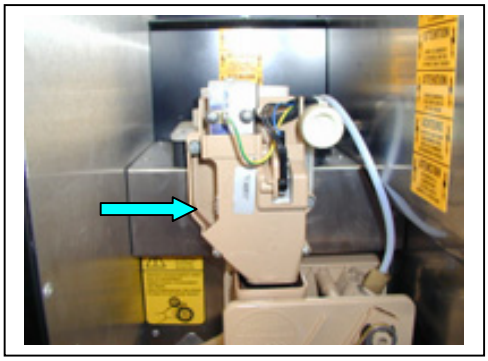
7 – COFFEE GRINDER AND DOSER DEVICE

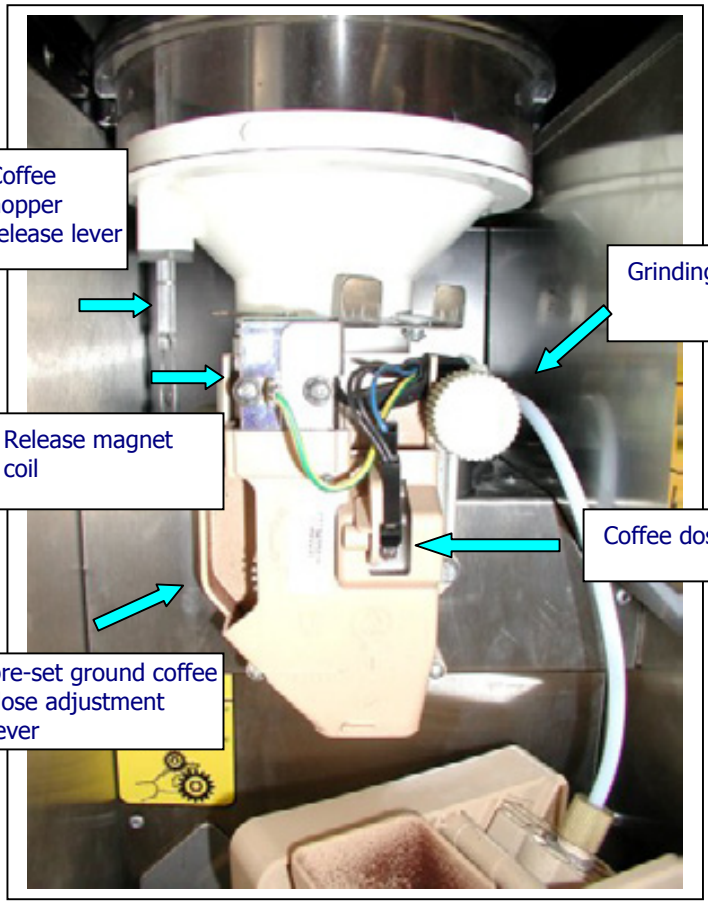


The espresso version is equipped with a coffee grinder and doser unit.
The same grinder and doser unit of the Spazio/ Brio / Venezia range is used.
The only change is the different coffee bean hopper, which has cylindrical shape and greater capacity.
Refer to the specific the functional unit manual for all maintenance, cleaning and adjustment operations.

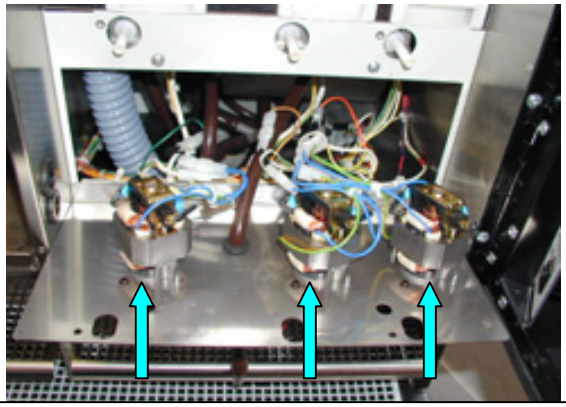
Grinding adjustment knob

Coffee dose adjustment lever





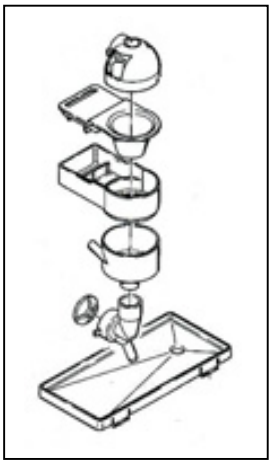
8 – MIXER AND STEAM SUCTION ASSEMBLY



Detail of motors viewed with wall lifted

Mixer being removed for cleaning

Mixer detail
(Version with integrated drawer)



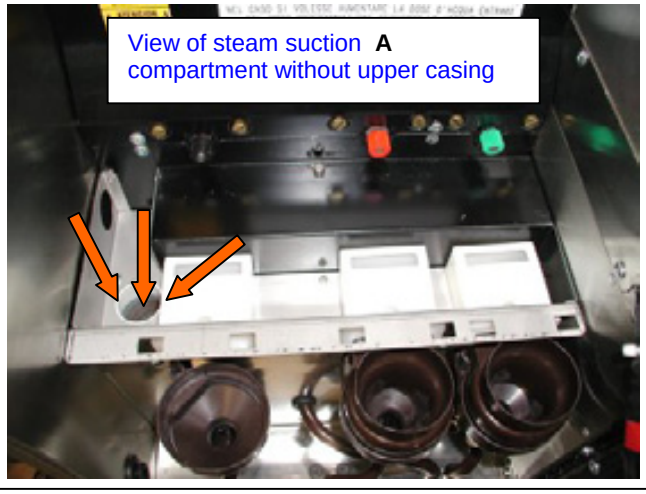
Apart from their application, the mixers are the usual excellent and reliable ones used in the entire Necta production. A mixer must have two important features:

1) Ease of disassembly and limited number of components
2) The aspect and blend quality of dispensed products must be as much as possible like the products served at a bar.

The motors are high rotation speed type fitted with radio interference suppressors and self-resetting overheat protections.
The motors are activated by relays k3 – k5 – k6 – k7- K17 for motors MF 5 – MF4 – MF1 – MF2 – MF3 (this applies to the instant version).
Relays K3 and K5 (which have other functions) are not used in the espresso version.

The steam exhaust and powder removal system reflects all the systems already used by Necta. A kind depression is created in compartment "A" by means of a cross-flow fan; such depression sucks the steam that forms during mixing, at the same time fine dust is inadvertently sucked and therefore must be removed before the hot air is expelled through the rear grille. The powder drawers fill up at each selection; therefore they must be emptied and sanitised (see specific manuals).

Powder removal drawer being extracted for emptying



View of steam suction **A** compartment without upper casing

9 – POWDER AND LIQUID DOSE TABLES

Factory "default" settings (doses for ITALY)

Selection code		Water dose		Powder dose	
		d/s.	cc	d/s.	gr.
CA1	Coffee	23	40	20	1,2
CA2	Not used	0	0	0	0
CA3	Long coffee	35	60	20	1,2
CA4	**Coffee** with milk	23	40	20	1,2
CA5	Cappuccino	23	40	20	1,2
LA1	Milk for **Coffee** with milk	16	25	10	2
LA2	Milk for cappuccino	35	55	19	4
LA3	Milk for cap choc.	25	40	19	4
LA4	Milk for Chocolate	19	30	15	3
KA1	Coffee for cap choc	23	40	20	1,2
KA2	Chocolate for cap choc.	14	25	6	3,5
KA3	Milk for tea	19	30	10	2
KK1	Chocolate	50	90	33	21
KK2	Strong Chocolate	50	90	42	24
KK3	Milk Chocolate	33	60	25	16
TE1	Thè nature	57	100	4	0,5
TE2	Thè nature + milk	37	70	4	0.5
DE1	decaffeinated coffee	23	40	20	1,2
DE2	Not used	0	0	0	0
BR1	Broth	0	0	0	0
AC1	Hot water	33	100	0	0
PC1	½ Jug of coffee	160	400	97	6
PL1	½ Jug of milk	250	400	185	40
PK1	½ Jug of Hot chocolate	160	400	145	80
PTI	½ Caraffe Tea	160	400	20	2,5
PA1	½ Caraffe Water	167	500	0	0
PD1	½ Caraffe decaffeinated coffee	160	400	97	6
PC2	Jug of coffee	325	800	193	12
PL2	Caraffe Milk	500	800	370	80
PK2	Caraffe Chocolate	325	800	290	160
PT2	Caraffe Tea	325	800	40	5
PA2	Caraffe Water	340	1000	0	0
PD2	Caraffe decaffeinated coffee	325	800	193	12

Water selection doses	
SEL.	**H_2O**
Coffee	40 cc
Long coffee	60 cc
Decaffeinated coffee	40 cc
Coffee with milk	65 cc
cappuccino	95 cc
cappuccino Chocolate	105 cc
Chocolate	90 cc
Strong Chocolate	90 cc
Chocolate with milk	90 cc
Tea	100 cc
Tea with milk	100 cc
Hot water	100 cc

10 – TROUBLE-SHOOTING

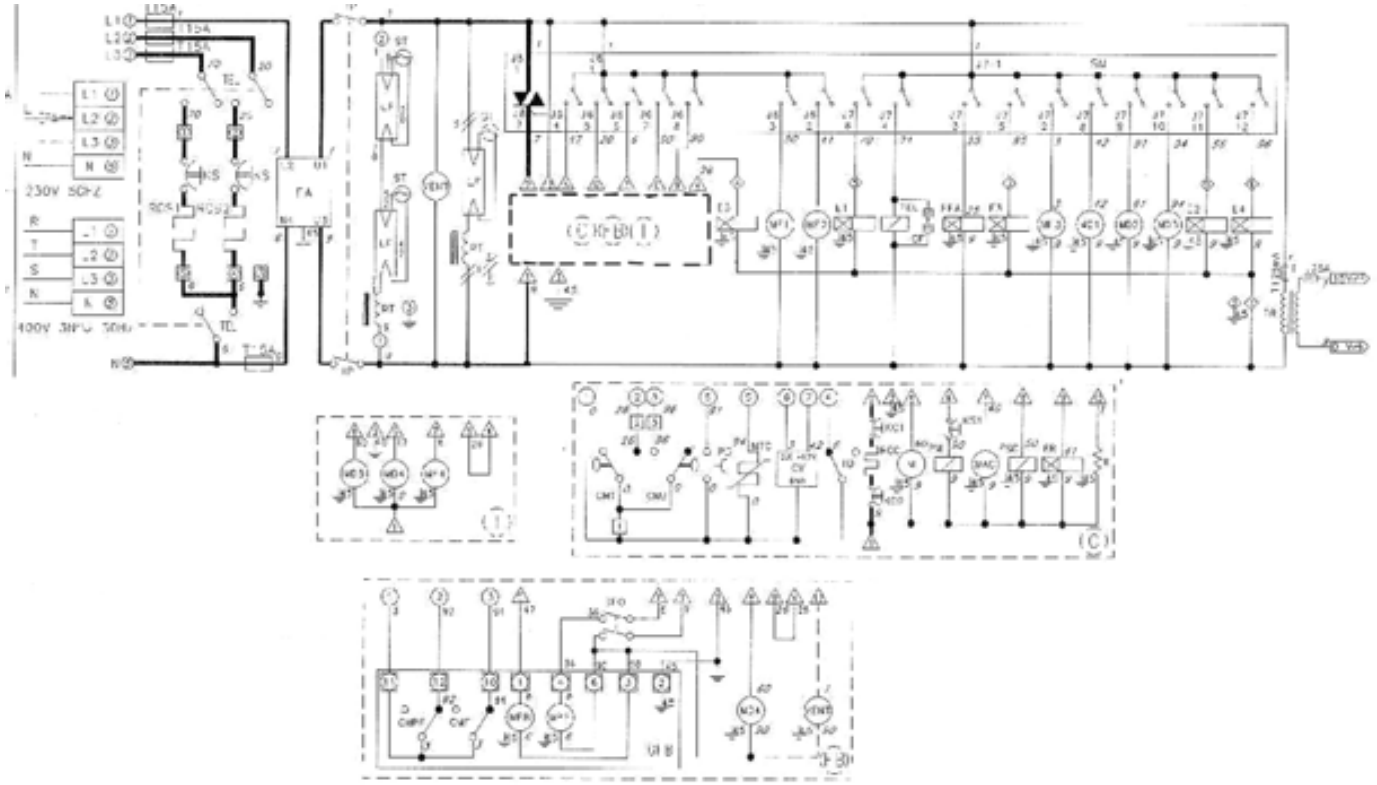
Problem (And/or indication on the display)	**Possible cause**	**Solution**
The machine does not go into the boiler heating phase, remaining in the "installation" phase	No water flow from the mains or insufficient pressure (5-85 N/cm^2) The air-break microswitch is faulty Water inlet solenoid valve locked by the overflow tube and activated by the relevant relay	Check for the presence of one or more of the situations indicated and once identifying the cause do as follows: Short-circuit the microswitch to check it's functioning Unlock the water inlet valve, undoing the threaded ring and emptying the overflow tube Check for 230 V AC voltage at the solenoid valve power supply ends Check the activation of relay K 16
The display indicates the message "No coffee" (ONLY for the espresso version.)	The grinder motor is locked because there is no coffee or because the relay was not tripped. There is no coffee The grinder wheels are locked because of foreign matter in the coffee Grinder motor overheating device triggered The coffee container shutter was not opened.	When an espresso coffee selection is made the grinder is activated conveying coffee to the doser device, the motor lock is determined by the microswitch, which is triggered when the set dose is reached. If such microswitch is not triggered, the system disables all espresso coffee selections, indicating the message "No coffee" on the display, once identifying the cause: Check the wear of the brushes Free the grinder wheels with the utmost care (Disconnect the power),as blocked wheels could have triggered the overheating protection, which is reset-able. Open the shutter, add coffee Check for the activation of relays K3 – K16
The display indicates the message "Coffee release failure"	Failure to the release magnet Failure to the coffee dose microswitch Failure to relay K 03	After grinding and during the attempt of releasing the ground coffee, the doser device plate triggers a microswitch that signals the coffee release If such microswitch is not triggered, there could have been two causes: Failure to the release magnet or overheating protection triggered (resetting is automatic, and after approximately 5 minutes it is reactivated, but the cause of such trigger must be identified). Failure to the microswitch: replace with an identical one designed for the GM, in the event of using a microswitch with different characteristics considerable discrepancies in the ground coffee doses may occur.
The display indicates the message "Boiler failure" or "Instant boiler failure"	The Espresso version is equipped with two boilers, a pressure boiler and an open-top boiler (Therefore both must be checked). The boiler does not heat Dry operation protection system triggered. Anti-boiling protection system triggered. (for instant boiler) The contactor does not activate the instant boiler heating elements	The machine is locked if after 10 minutes heating the set temperature is not reached (The time for the instant boiler is set to 120 minutes). Check for the correct operation of the heating element, the thermostat, the probe, the actuation TRIAC and contactor for activating the instant boiler In the event of replacing the probe(Espresso boiler) the correct temperature must be re-adjusted using the trimmer. In the instant version, check also the over-boiling thermostat and if triggered identify its cause
The display indicates the message "WATER FAILURE"	The water inlet solenoid valve remains energised for 30 sec (or 4 minutes after the machine is switched on); during this time the air-break float's microswitch must be activated; if this does not occur and if there are no problems in the water supply from the mains, check the points in the next column	Check that the water supply from the mains is operating. Check that the water inlet solenoid valve is working properly and relay K16 is activated Check that the air-break is functioning correctly. Check that the water inlet solenoid valve is not mechanically blocked by the overflow membrane

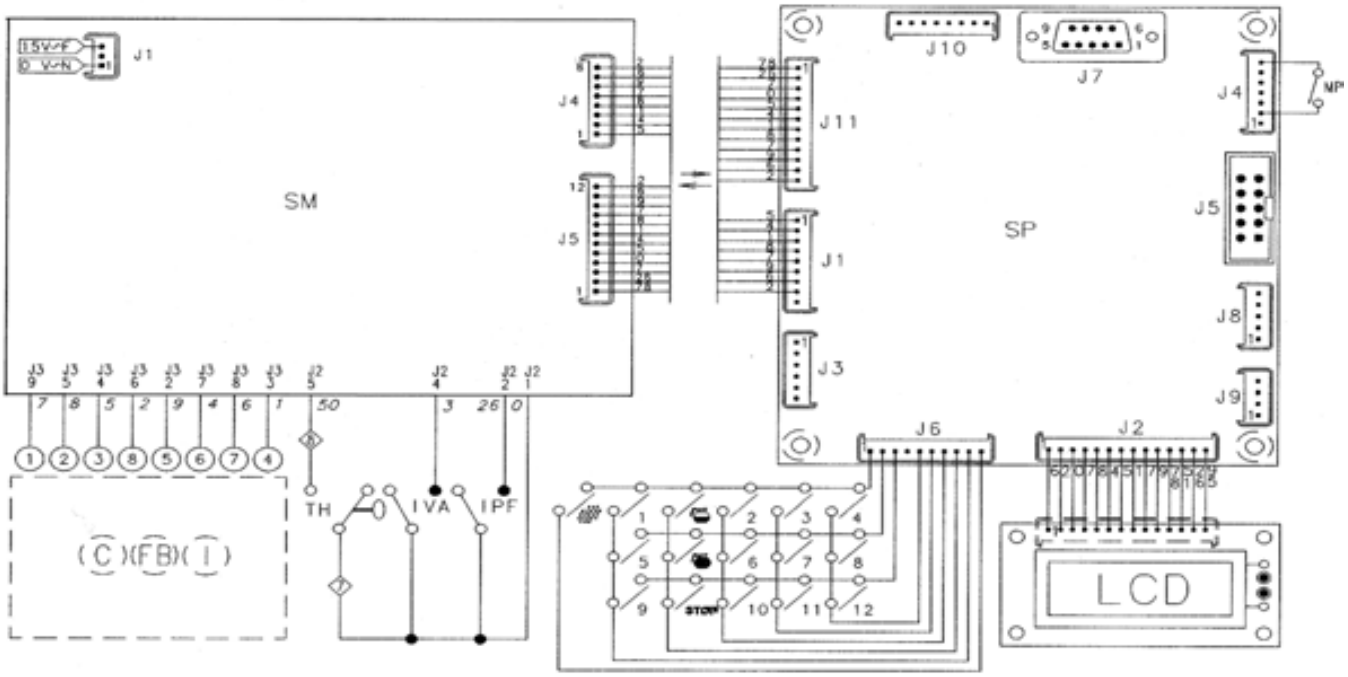
The display indicates the message "Espresso unit" FB coffee unit failure	The espresso unit failed to reposition. Failure to the lower dead centre positioning microswitch. Failure to relay K05 Overheating device triggered	Check for the correct operation of the lower dead centre positioning microswitch. Check that the unit stops correctly at the upper dead centre (monitored via SW). If not replace the board or reprogram the CPU Check for the overheating protection trigger and check the cause
The display indicates the message "Volumetric counter" (flow-meter) **ONLY for the espresso version**	The set liquid dose is not reached within 60 sec. (The volumetric counter in the GM espresso model) In the instant version the water dose is determined by timed solenoid valve opening via SW	The water amount for the espresso coffee selections is ensured by a volumetric counter; with the water flow a wheel rotates and through sensors sends a number of pulses corresponding to the water dose programmed in the SW. If such dose is not reached within 60 sec. it means that there is a problem: Check for the correct functioning of the volumetric counter; there must be 5 V AC on the terminals during the counter operation. Check that coffee is not ground too fine and the dose excessive. Check for clogging in the coffee filters
The display indicates the message "Air-break failure"	No water from the mains. Faulty air-break microswitch Failure to the float actuation Microswitch system. In the instant version the air-break is incorporated in the **open-top** boiler.	If in the period taken to make 6 selections with any dose the microswitch controlled by the air-break float is not triggered The vending machine is locked for air-break failure. The malfunction could occur for lack of water from the mains, or because of a failure to the float microswitch system. Replace the microswitch with one having the same characteristics, otherwise other malfunctions may occur.
The display indicates the message " RAM data"	Wrong RAM data, which must be retrieved by initialising the EPROM. There may be various causes, including possible electromagnetic interference above the norm.	Enter into the installation procedure and initialise the software; if the failure persists replace the CPU or reprogram the Flash EPROM.
The display indicates the message "COIN MECH FAILURE"	If the coin mechanism is fitted, it communicates with the CPU by means of signals that last less than two seconds (validators) or communication the is no communication for more than 30 sec (serial systems) If the coin mechanism is not fitted, check the software setting	Check the correct software setting of the payment system used. Connect a functioning coin mechanism to see if the failure is reset. Check that the connection is correct. Initialise the software Otherwise, replace the CPU
The coffee lacks body and cream and is dispensed too quickly	Excessively coarse grinding. Insufficient ground coffee dose.	Inspect the grade of grinding, keeping in mind that it takes between 15 and 20 seconds to dispense optimum espresso coffee. A shorter time means that the grade of grinding is too coarse. With wear the grinding wheels must be adjusted regularly. After 50,000 cycles, if necessary replace Check the coffee dose, weighing it at least for 5 consecutive doses; the average weight must be between 6.5 and 7 grams.
Coffee is dispensed too slowly and it tastes burnt	Excessive coffee dose. Grinding too fine. Faulty pump by-pass. Clogged coffee filters. Scale deposits in the solenoid valves	Inspect the grade of grinding, keeping in mind that it takes between 15 and 20 seconds to dispense optimum espresso coffee. A longer time means that the grade of grinding is too fine. Adjust the grinding wheels. Check the coffee dose, weighing it at least for 5 consecutive doses; the average weight must be between 6.5 and 7 grams. The by-pass is set from the factory to trigger at 12 bars. Lower settings will lengthen the dispensing time and make less cream. Replace the coffee filters, replace the solenoid valves.
The mixers "clog up"	The whipper failed to rotate. Powder removal drawer full. Insufficient water to powder ratio. Error in the dispensing cycles, set by default	Check for the motor overheating protection trigger, if necessary check the cause of such trigger. Empty the powder removal drawer. Check / adjust the water to powder ratio. Check the logic of the cycles.
The display indicates the message "Waste full"	Inside the tray there is a float that triggers a microswitch when the programmed level is reached.	Check that it is full and empty it; check that the microswitch works correctly Check that the tray is inserted correctly.

The level control device does not detect the presence of water and the boiler overflows, triggering the mechanical lock of the water inlet solenoid valve	The level control is managed directly in the boiler the following way: A probe made of special conductive material is immersed in the water, resulting in an extra-low voltage electrical conduction between the probe and the water in the boiler. If the water level drops the probe is no longer covered and there is no conduction. An electronic control unit separate from the CPU, processes this signal sending the information to the CPU that activates or deactivates the triggering relay of the water inlet solenoid valve.	Check the level control system, composed of a probe and control unit. Check the CPU functioning. Check the mains water hardness (if too low, therefore below the level indicated by the current regulations regarding natural spring water, proceed to correct the salt content). Check that the probe does not have scale deposits that could hinder the correct transmission of signals.
The display indicates the message "Suspended service"	The procedure disabling the buttons may have been activated. Or the maximum number of previously set dispensed selection may have been reached.	Access programming and disable suck lock, or reset the lock caused by the maximum number of selections reached, or disable it. If the problem persists, initialise the Eprom.
The coffee lacks body and cream. The products are perfectly mixed and contain large "un-dissolved" clots	The mixers do not rotate. The coffee dose is insufficient. The cycle timing is not correct. Note: some instant products are dispensed by the doser device in "step" mode, i.e. with ON and OFF phases, to ensure correct dissolving.	Check the correct operation of the mixers. Check that the relay is activating the motors. Check that the motor overheating protections were not triggered. In the preset layouts, precise positions were identified for some selections, with operating times and cycle timing appropriately studied. In the event such layout was changed, dispensing may not occur correctly. Restore the correct layout.
The dispensed products have inadequate temperature "Too Cold"	According to the product type an optimum temperature is set by default. In any case, it must not be lower than 70° C Should that occur, the thermostat may be adjusted incorrectly, or in the case of the espresso version check the probe.	Check the correct setting of the thermostat, factory set to 80° C (± 2° C). Check the dispensing temperature with a digital immersion thermometer in at least 10 consecutive selections. The average for the 10 selections must be between 70° and 80° C; different values indicate incorrect setting. Values too low may indicate that the thermostat is faulty or that the heating elements are not activated properly.
The dispensed products have excessive temperature and occasionally the "anti-boiling" control is triggered	The optimum temperatures are indicated in the previous paragraph. If the anti-boiling control is triggered, the problem is due to the thermostat set too high or to a short-circuit, or to a faulty probe; with no level control the water overflows, and being hot it triggers the anti-boiling control.	Check that the thermostat is triggered at a temperature of 80° C using a digital tester connected to its terminals. Too high temperatures, e.g. 90-95° C, considering the thermal differential of a thermostat, could create temporary steam conditions that would trigger a sensitive anti-boiling thermostat. If the thermostat works correctly, check level control probe that must trigger the solenoid valve lock when immersed in water.
The mixers "clog up" and the product overflow from the funnel	The whipper failed to rotate. Powder removal drawer full. Insufficient water to powder ratio. Error in the dispensing cycle timing, set by default.	Check for the motor overheat protection trigger, if necessary check the cause of such trigger. Empty the powder removal drawer. Check / adjust the water to powder ratio. Check the logic of the cycles, also checking that the layout is correct.
The powder is not dispensed and the drink is composed of only "hot water"	The powder is dispensed by the rotation of the doser devices for a certain time set in tenths of a second. The doser devices are protected from overheating by means of a Klixon.	The thermal protection Klixon in the doser devices was triggered. Approximately ten seconds are necessary for its reset. In the event of triggering, the cause must be identified anyway, as it is sized for normal operation and its triggering indicates that there is a malfunction to be corrected. Check that the instant products are not "clogged" by humidity.
In spite of having correct dose settings the liquid amount is "insufficient" or "excessive"	The liquid amount is determined by the timed opening of the solenoid valve, expressed in tenths of a second and set via software. The solenoid valves are factory set with an optimum flow rate.	The solenoid valves are factory set with an optimum flow rate; the dose is metered by their opening in tenths of a second, and this combined with the flow rate determines the correct liquid amount. After continuous use, scale deposits may form in the valves, resulting in a reduced flow rate. De-scale the solenoid valves; it is not advisable to change the dispensing time, the correct flow rate must be restored instead. On the contrary the solenoid valve ate too "open"; keeping unchanged the software dose settings close the valves as necessary to achieve the correct doses.

11 – WIRING DIAGRAM

Espresso version wiring diagram





HACCP DIRECTIVE (EEC 93/43 and 96/3)

Outline and instructions for use

Notes: What is indicated by the EEc Directive **93/43 96/3**

Directives **EEC 93/43 and 96/3** concern the hygiene of food products and are based on the **HACCP** (**H**azard **A**nalysis **C**ritical **C**ontrol **P**oint).
The purpose of this directive is to safeguard the consumer health, suggesting a series of actions to be taken by the vending company, aimed at checking, identifying and correcting any critical aspects in the foodstuff chain, from the purchase of products and machines to the dispensing of the product.
The **HACCP** is a system used to analyse any potential risks in the manufacturing and distribution cycle of food product and to identify critical points where such risks can occur; the system also highlights the actions to be undertaken and the decisions to be made with regard to such critical points, as well as the implementation of checking and monitoring procedures.

Therefore, each vending company must develop a Company Hygiene Self-control Manual according to the provisions of the directive - and if necessary use the information and recommendations formulated by some associations in the sector. The manual must contain a programming and checking schedule for the vending machine hygiene condition.

Important notes:

For correct use of the machine, the directives must be fully applied. The operator is responsible for correct operations on a vending machine, as indicated in the self-control manual.

HACCP Directives (EEC 93/43 and 96/3)

Guidelines for correct application

- Ensure hygiene control with a special manual for correct hygiene practices.
- After cleaning, do not touch the surface of any elements that may come into contact with food.
- Wash your hands thoroughly, preferably using disinfectant, before starting any hygiene operations
- Use disposable sterile gloves
- Always use a clean cloth to wipe dry.
- Keep the work area tidy.
- Check that the product packages are intact and not damaged.
- Keep coffee and powder products in a cool, dark and dry place.
- Use products within the recommended time period (see expiry date on the package).
- Always use products from the warehouse according to the principle of "first-in first-out".
- Tightly close and seal any product packages not completely used, then ensure that they are used as soon as possible.
- Coffee and consumables must be kept and transported separate from the cleaning products.
- The product containers must be cleaned regularly (see operation instructions).
- Only fill coffee or other product containers with sufficient amount for the expected use until the next cleaning.
- In the case of products classified as Food (therefore to be kept at a well defined temperature, normally under 4°C) such products must be conserved, transported and stored in special suitable equipment that are capable of maintaining the cold chain at the correct temperature.
- Do not replace original components that are in contact with foodstuff with other third party purchased non-original parts that are not certified as being food-safe (the food-safe certification is ensured by the special symbol stamped on the components and by a written certificate issued by the manufactured or other authorised body)

Cleaning the machine (Page 26,27,28)

- Carefully observe the cleaning instructions as described in the following pages! and carry out cleaning within the terms indicated
- Clean the machine, preferably at the end of the day or in the morning before the machine is used.
- After cleaning, dispense and check a drink (see last check).
- Fill in the check list log for cleaning operations , including the date and operator's signature
- When the display indicates an error message immediately check the trouble-shooting sheet.
- Use only recommended cleaning products approved for foodstuff, preferably liquid; avoid the use of powder and abrasive products.

DAILY CLEANING AND HYGIENE
(Expected time 8 min. 30 sec)

FIG. 1

FIG. 2

FIG. 3

FIG. 4

Open the door and disconnect the machine form the power supply. (FIG 1)
Empty the waste tray and rinse it thoroughly (FIG 2)
Remove the powder trap drawers, empty them and rinse them with hot water (FIG 3)
Clean all grinding residue from the coffee dispenser (using a brush and a small portable vacuum cleaner) (FIG 4)
Remove the powder dispensing spouts and clean thoroughly using specific hygiene products. (FIG 5)
Remove the coffee waste container and clean thoroughly (FIG. 6)
Disassemble and clean thoroughly the spout support tray (FIG. 7)
Remove the coffee unit, clean and rinse with hot water. (FIG 8)
In the version with a support cabinet (FIG. 9) open the door and remove the liquid collection container, empty and rinse thoroughly.
Reassemble all parts, taking care not to touch with your hands any parts that come into contact with food.
Carry out a mixer automatic wash cycle according to the pre-set procedures.
Close the door and make some test selections.
Enter the operations carried out in the daily maintenance log.

FIG. 7

FIG. 5

FIG. 9

FIG. 8

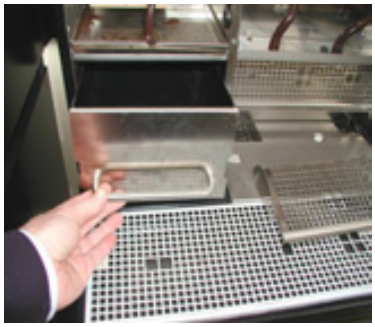


FIG. 6

WEEKLY CLEANING AND HYGIENE
(Expected time 12 min.)

FIG. 1

FIG .2

Open the door and disconnect the machine form the power supply. (FIG 1)
Remove the Instant powder containers and clean thoroughly using specific hygiene products eliminating any incrustations. (FIG.2 - 3)
Empty any residue from the coffee grinder and doser assembly, clean thoroughly eliminating any incrustations.(FIG. 4)
Remove the coffee unit, then clean it thoroughly and rinse with hot water (FIG. 5)
Disassemble completely the mixers and clean thoroughly (FIG. 6)
Remove the liquid collection container and the grounds container, empty and clean them. (FIG. 7–10) Empty the powder collection containers, located within the steam suction system, and disinfect (FIG.8).
Remove and clean spout assembly and the liquid collection tray (FIG 9).
Reassemble all parts, taking care not to touch with your hands any parts that come into contact with food.
Close the door and make some test selections.
Carry out a mixer automatic wash cycle according to the pre-set procedures.
Enter the operations carried out in the HACCP log.

FIG .3

FIG .6

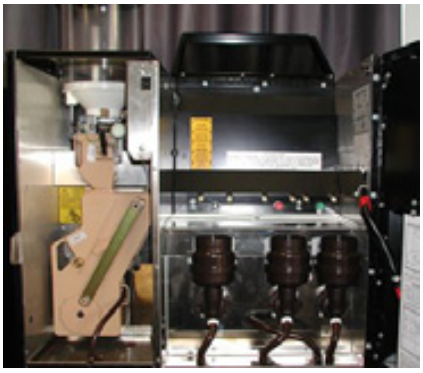


FIG .4

FIG .5

FIG .10

FIG .9

FIG .8

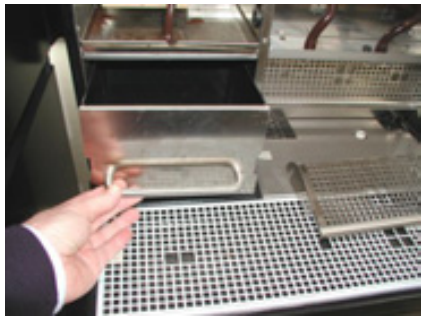


FIG .7

MONTHLY CLEANING AND HYGIENE (OR EVERY 5000 SELECTIONS)

Expected time 18 min. (in addition to the time taken for regenerating the filter)

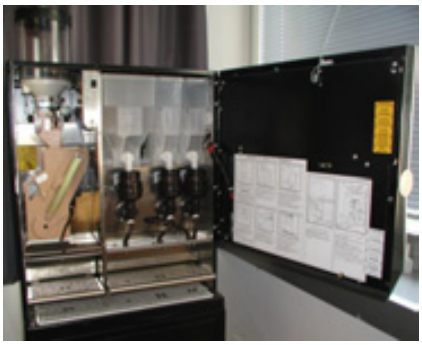


FIG .1

FIG .2

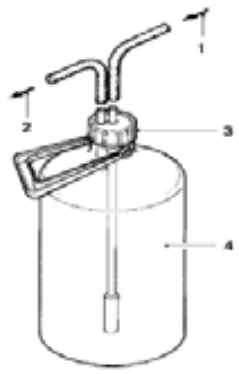


FIG .3

In addition to the **weekly** operations, also the following must be carried out:

Disconnect the machine form the power supply, open the door (FIG 1)

Remove the brewer unit from the machine and disassemble, then clean all residue and rinse thoroughly with hot water, check the filters for clogging and if necessary de-scale or replace them. Reassemble all parts and slightly lubricate the piston o-rings using food-safe grease or replace them if even slightly damaged (FIG. 1 - FIG. 2)

Disassemble the mixers completely, clean and wash using sanitising products, especially the powder removal area, disassemble completely the rotor and check the state of the seal (Fig. 7), when reassembling do not touch with the bare hands (FIG. 5-7-8)

Note : it is advisable to perform this operation at the workshop and use mixers that were already sanitised with the 'come-and-go' method

Regenerate the water softener (if installed) using the special salt solution, even if the softener efficiency test is still positive.(FIG. 3)

The softener filter can be contaminated easily and therefore regeneration ensures maximum hygiene.

Note: it is advisable to perform this operation at the workshop and use filters that were already regenerated with the 'come-and-go' method

During regeneration, it is advisable to completely sanitise the hydraulic system and the water inlet solenoid valves, including the air-break. (FIG. 4-5-6)

Enter the operations carried out in the HACCP hygiene program log

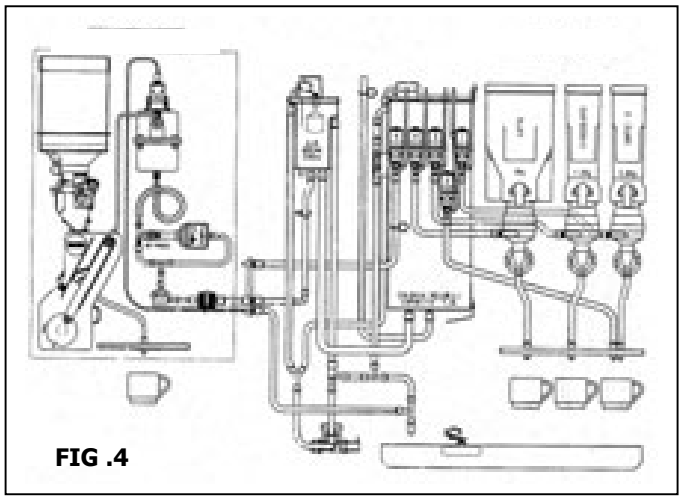


FIG .4

FIG .8

FIG .7

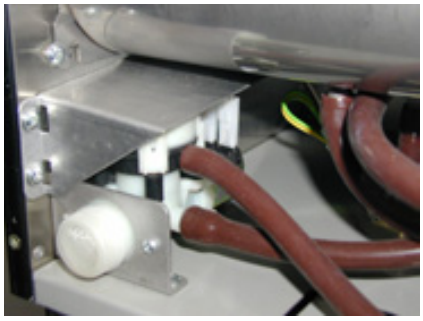


FIG .6

FIG .5