



SERVICE MANUAL

" Astro "

BASIC TECHNICAL MANUAL

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

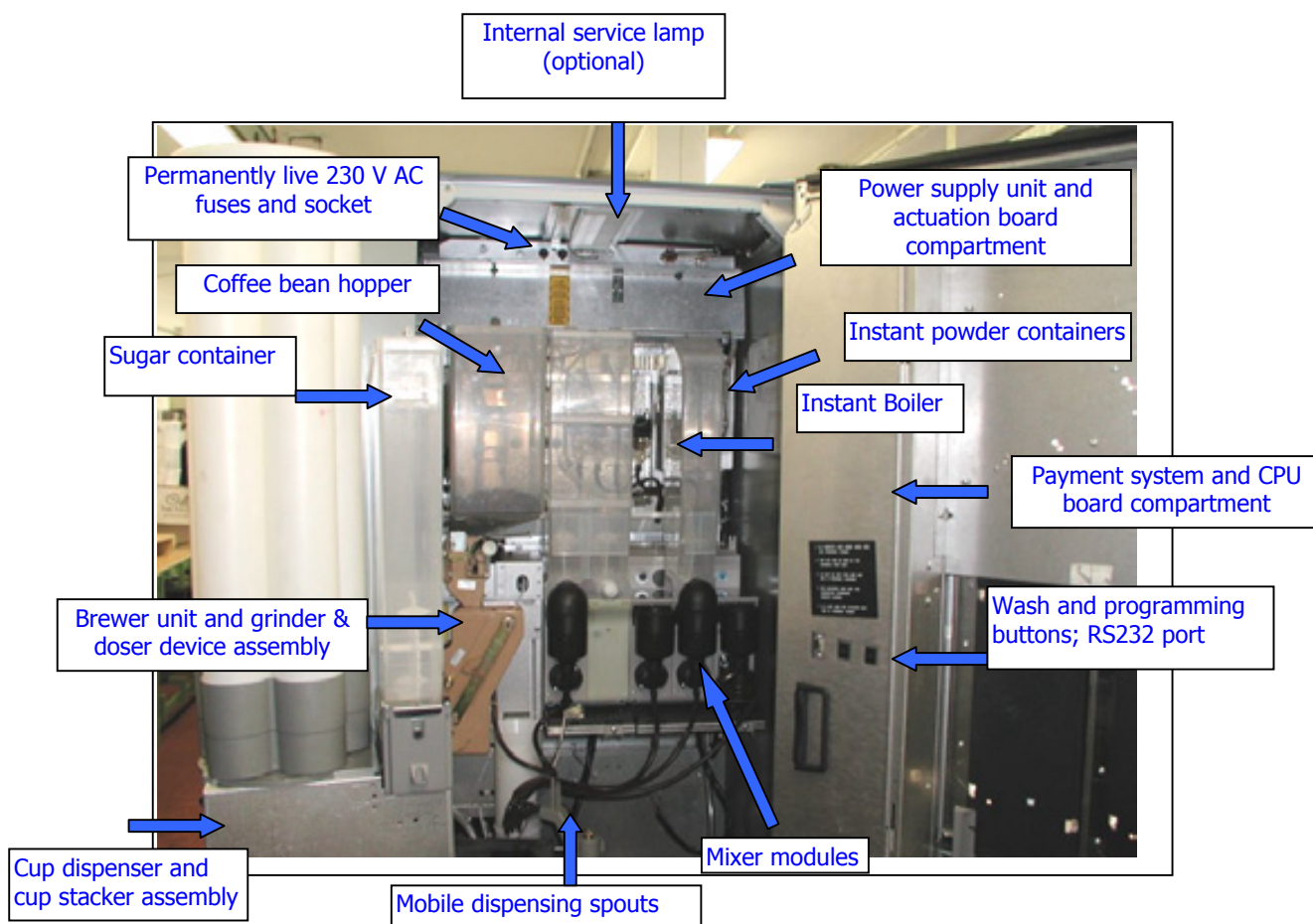
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NOTE

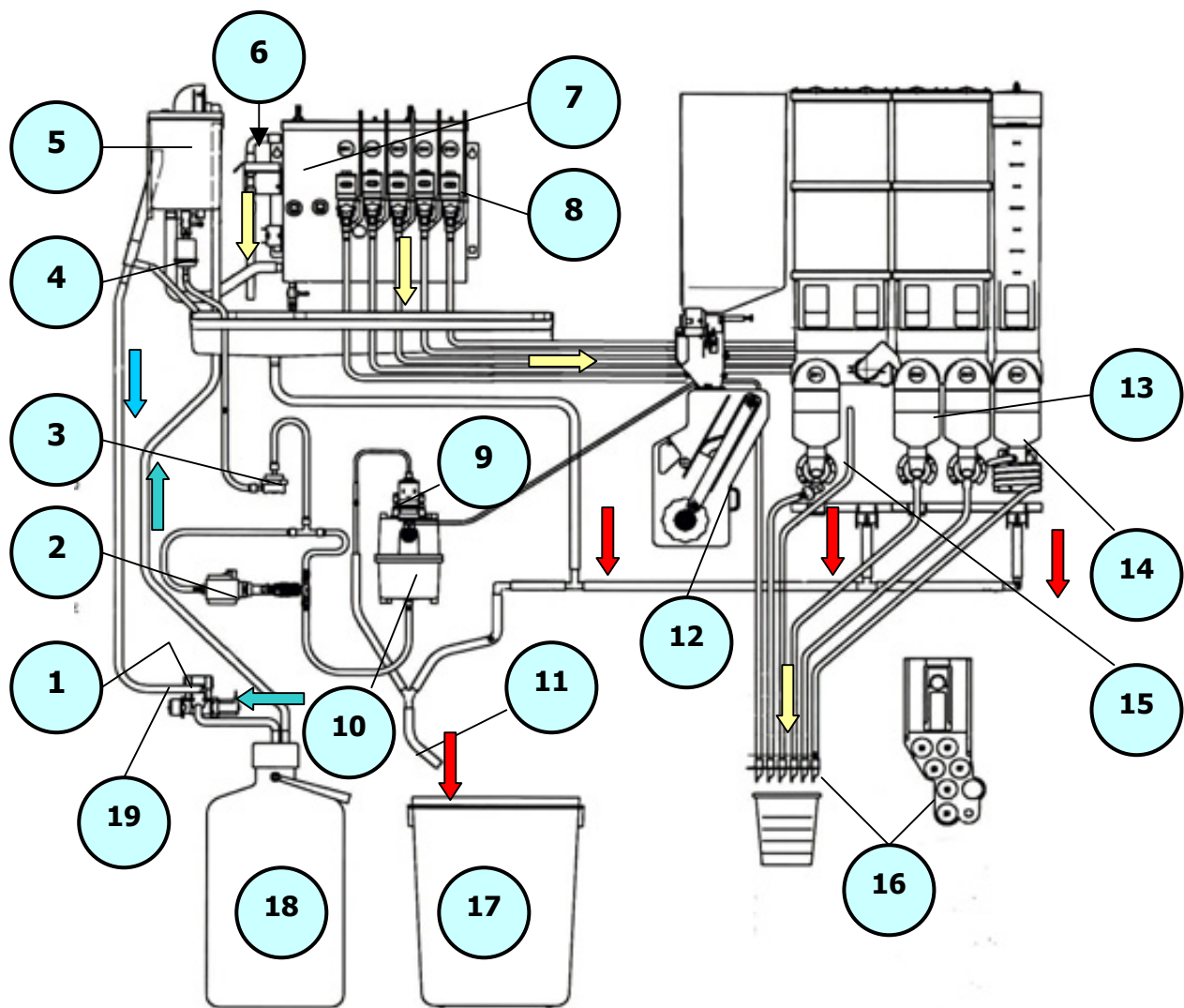
The above systems and functional units are specific to this machine.

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.



VIEW WITH DOOR OPEN AND WITHOUT CASING ON THE INSTANT BOILER

1 – HYDRAULIC LAYOUT



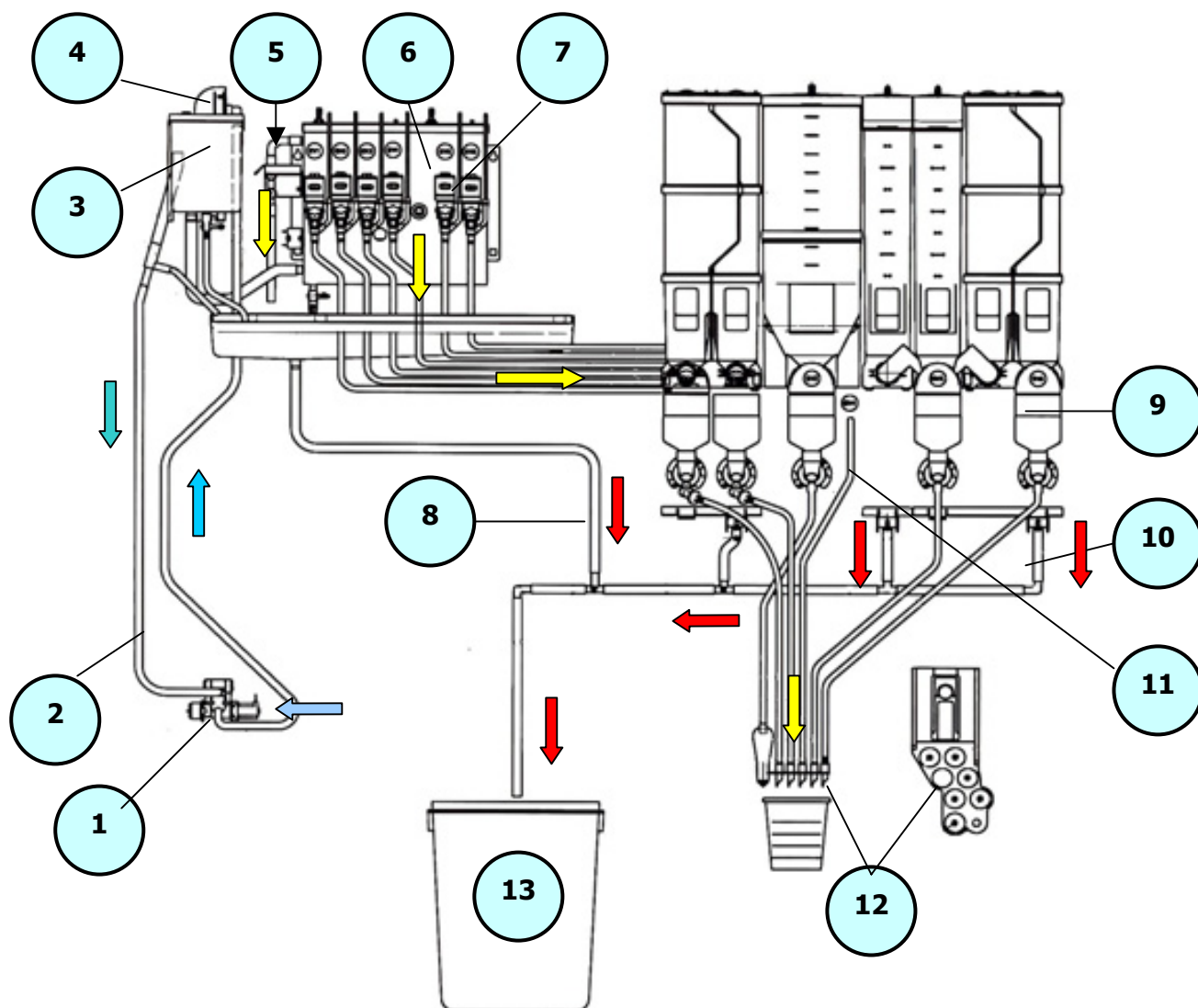
Hydraulic layout "ESPRESSO" version

ESPRESSO VERSION COMPONENTS (DOUBLE BOILER)

REF	DESCRIPTION	REF	DESCRIPTION	REF	DESCRIPTION
1	Water inlet solenoid	7	Open-top boiler	13	Mixer with motor
2	Pompa & By pass	8	Instant solenoid assembly	14	Tea mixer
3	Volumetric counter	9	Espresso solenoid assembly	15	Hot water solenoid outlet
4	Water filter	10	Pressure boiler	16	Spouts assembly
5	Air-break	11	Drain	17	Liquid waste container
6	Anti-boiling thermostat	12	Coffee unit	18	Softener filter
19	Overflow tube				

The **Espresso model** is fitted with **two** boilers: one pressure boiler (with bypass set to 12 bar) for espresso coffee based selections and one open-top boiler, at atmospheric pressure, for instant product selections.

Hydraulic layout "INSTANT" version



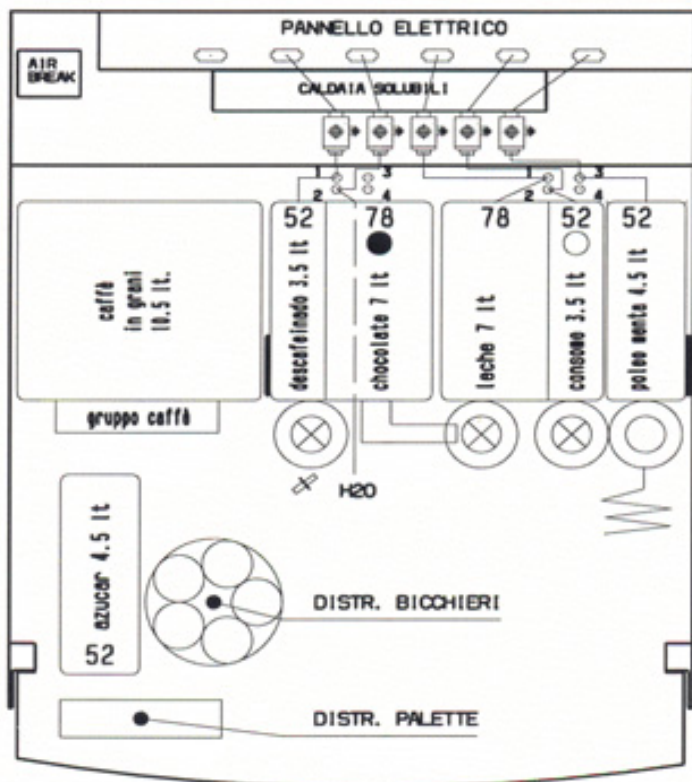
INSTANT VERSION COMPONENTS

REF	DESCRIPTION	REF	DESCRIPTION	REF	DESCRIPTION
1	Water inlet solenoid	7	Instant solenoid valves	13	Liquid waste container
2	Overflow tube	8	Drain pipe		
3	Air-break	9	Mixer		
4	Level microswitch	10	tray drain pipe		
5	Anti-boiling thermostat	11	Hot water spout		
6	Open-top boiler	12	Spouts assembly		

The Instant version is fitted only with an open-top boiler, having the operating pressure equal to the atmospheric pressure

EXAMPLES OF THE INTERNAL LAYOUT

NOTE : THE FOLLOWING ITALY LAYOUTS ARE ONLY GIVEN AS AN EXAMPLE FOR THE PURPOSE OF INDICATING THE CONFIGURATION POSSIBILITIES



ESPRESSO LAYOUT - ITALY ASTRO ES7D /IQ

According to the market, two product selection modes are provided:

Keypad with direct selection

Keypad with numeric selection.

(see examples below)

EXAMPLE OF INTERPRETING CODES

ES7D/IQ Meaning:

ES = Espresso

7 = Number of containers

D = Double boiler

I = Italy

Q = IMQ certification

THE FIRST TWO LETTERS INDICATE:

IN = INSTANT

ES = ESPRESSO

FB = FRESH BREWER

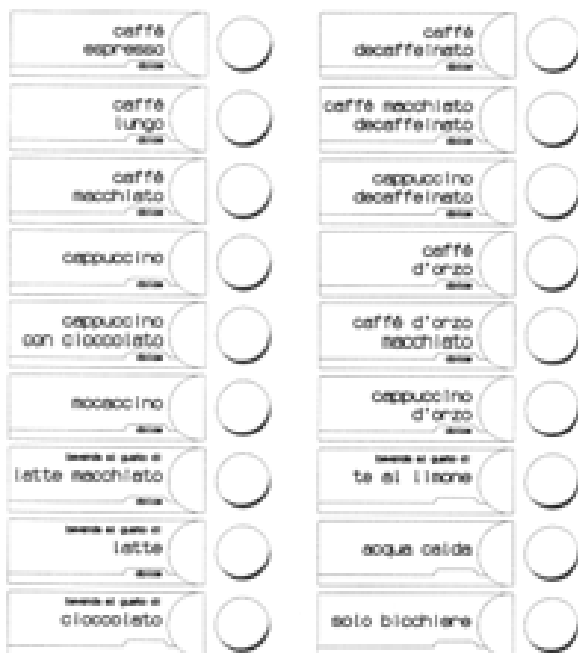
THE NUMBER INDICATES THE NUMBER OF CONTAINERS INSTALLED..

THE LAST LETTER DEFINES WHETHER SINGLE (M) OR DOUBLE (D) BOILER.

THE FIRST LETTER AFTER THE BAR DEFINES THE COUNTRY

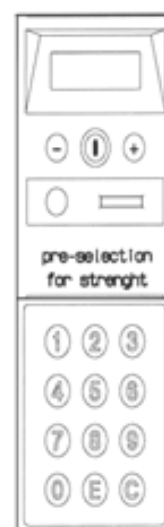
THE LAST LETTER - Q (IF PRESENT) INDICATES THAT THE MACHINE IS CERTIFIED BY IMQ

IF BOTH ES AND FB ARE PRESENT AT THE SAME TIME IT MEANS THAT THE MACHINE IS FITTED WITH TWO BREWER UNITS (ESPRESSO AND FRESH BREW)

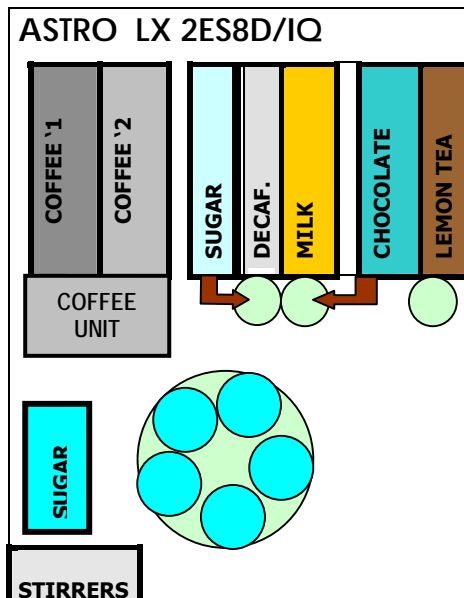


DIRECT SELECTION BUTTONS

coffee bean to cup black sugar extra sugar no sugar	chocolate
17 18 19	67
coffee bean to cup sugar extra sugar no sugar	chocolate
21 22 23	27
24 25 26	
coffee decaff. black sugar extra sugar no sugar	
37 38 39	
coffee decaff. sugar extra sugar no sugar	instant cappuccino sugar no sugar
41 42 43	71 72
44 45 46	instant espressochoc sugar no sugar
tea fresh brew black sugar extra sugar no sugar	73 74
57 58 59	
tea fresh brew sugar extra sugar no sugar	hot water
61 62 63	29
64 65 66	chilled water sugar carbonated
cappuccino sugar no sugar	81 84
61 62	orange sugar carbonated
63 64	82 85
espresso sugar no sugar	lemon sugar carbonated
65 66	83 86



NUMERIC SELECTION BUTTONS



ASTRO LX 2ES8D/IQ

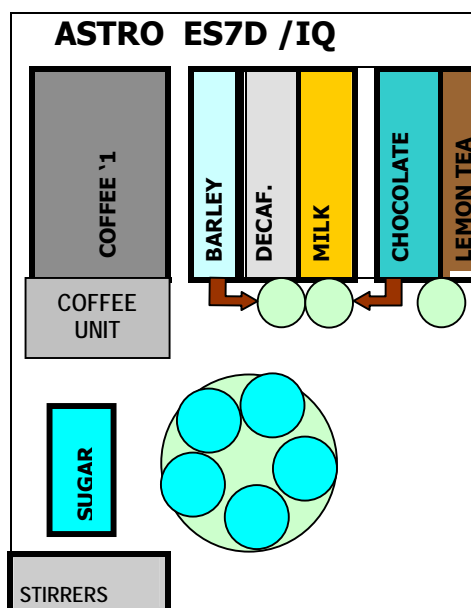
NUMERIC selection

SUGAR pre-selections

Selection menu:

- | | |
|---------------------------------------|----------------------------------|
| 12 - Espresso coffee 1 | 22 - Espresso coffee 2 |
| 13 - Long coffee | 23 - Long coffee 2 |
| 18 - Coffee with chocolate | 28 - Coffee with chocolate 2 |
| 14 - Coffee with milk | 24 - Coffee with milk 2 |
| 17 - Mocaccino | 27 - Mocaccino 2 |
| 15 - Cappuccino | 25 - Cappuccino 2 |
| 16 - Cappuccino with chocolate | 26 - Cappuccino with chocolate 2 |
| 41 - Milk | 42 - Chocolate |
| 19 - Milk with coffee added | 43 - Strong chocolate |
| 61 - Decaffeinated coffee | 44 - Chocolate with milk |
| 62 - Decaffeinated coffee with milk | 45 - Lemon tea |
| 63 - Decaffeinated cappuccino | 48 - Cup only |
| 64 - Decaf. cappuccino with Chocolate | |
| 49 - Hot water | |

ASTRO Mod. LX - Double espresso unit, 8 containers, Double boiler
Country = **ITALY** - IMQ certification



ASTRO ES 7D /I Q

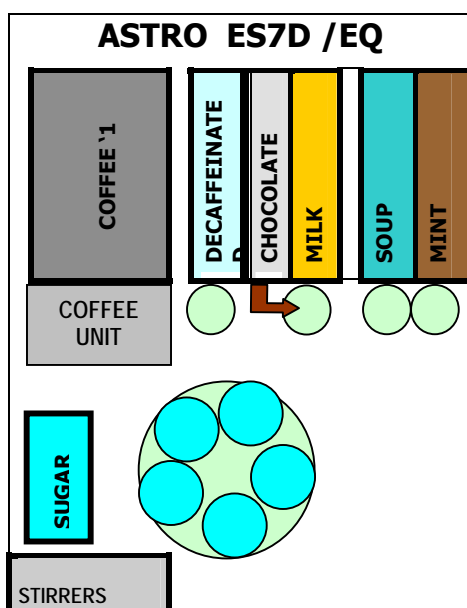
DIRECT selection

SUGAR pre-selections

Selection menu:

- | | |
|-----------------------------|----------------------------------|
| - Espresso coffee | - Decaffeinated coffee |
| - Long coffee | - Decaffeinated coffee with milk |
| - Coffee with milk | - Decaffeinated cappuccino |
| - Cappuccino | - Barley drink |
| - Cappuccino with chocolate | - Barley drink with milk |
| - Mocaccino | - Cappuccino d'orzo |
| - Milk with coffee added | - Lemon tea |
| - Milk | - Hot water |
| - Chocolate | - Cup only |

Standard ASTRO - Espresso unit, 7 containers, Double boiler
Country = **ITALY** - IMQ certification



ASTRO ES 7D /E Q

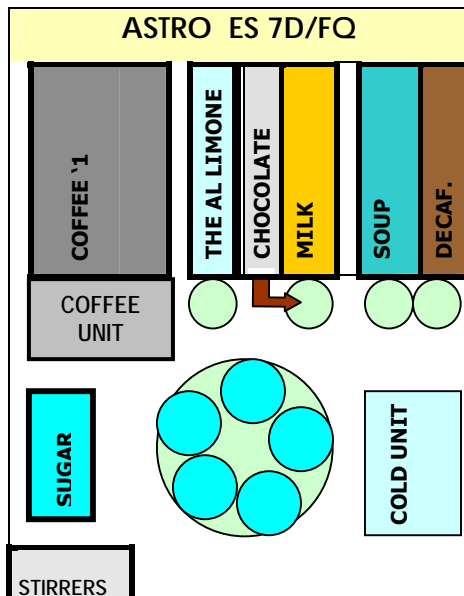
DIRECT selection

SUGAR pre-selections

Selection menu:

- | | |
|----------------------|-------------------------------|
| - Cafè express | - Cafè expres descafeinado |
| - Cafè Largo | - Cafè Largo descafeinado |
| - Caffè Cortado | - Cafè cortado descafeinado |
| - Cafè con Leche | - Cafè con Leche descafeinado |
| - Cappuccino | - Cappuccino descafeinado |
| - Leche Menchada | - Leche manchada descafeinado |
| - Leche | - Consome |
| - Chocolata | - Poleo Menta |
| - Seleccion sin vaso | - Vaso con agua |

Standard ASTRO - Espresso unit, 7 containers, Double boiler
Country = **SPAIN** - IMQ certification



ASTRO ES 7D/FQ

DIRECT selection

SUGAR pre-selections

Selection menu:

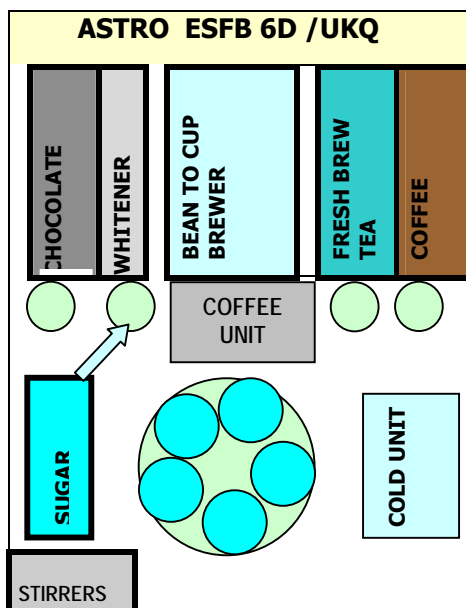
- Café expresso
- Café Long
- Café macchiato
- Café au lait
- Cappuccino
- Café + chocolat
- Boisson cacao
- Boisson arôme cacao fort
- Boisson arôme cacao + lait

- Café court d'acafeiné
- Café Long
- Café macchiato
- Café macchiato
- Café ou lait
- Cappuccino
- Boisson potage
- Thé citron
- Lait
- Globelet seul

Standard ASTRO - - Espresso unit, 7 containers, Double boiler

Country = **FRANCE** - IMQ certification

COLD unit - Optional as a kit



ASTRO ES FB 6D /UKQ

NUMERIC selection

SUGAR pre-selections

Selection menu:

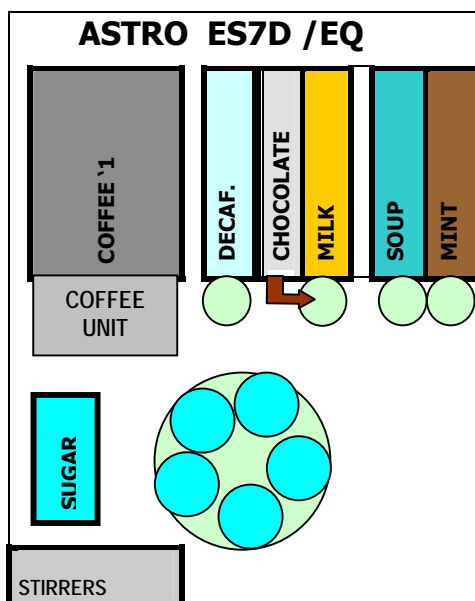
- 17-18-19 - Coffee bean to cup
- 21-22-23 - Long coffee
- 24-25-26 - Coffee with milk
- 37-38-39 - Cappuccino
- 41-42-43 - Cappuccino with chocolate
- 44-45-26 - Moccacino
- 57-58-59 - Milk with coffee added
- 51-52-53 - Milk
- 54-55-66 - Extra Milk
- 61 - 62 - Chocolate
- 63 - 64 -
- 65 - 66 -

- Decaffeinated coffee
- Decaffeinated coffee with milk
- Decaffeinated cappuccino
- Barley drink
- Barley drink with milk
- Barley drink based cappuccino
- Lemon tea
- Hot water
- Cup only

Standard ASTRO - Espresso unit + , Fresh-Brew unit

Country = **England** - IMQ certification

COLD unit - Optional as a kit



ASTRO ES 7D /E Q

DIRECT selection

SUGAR pre-selections

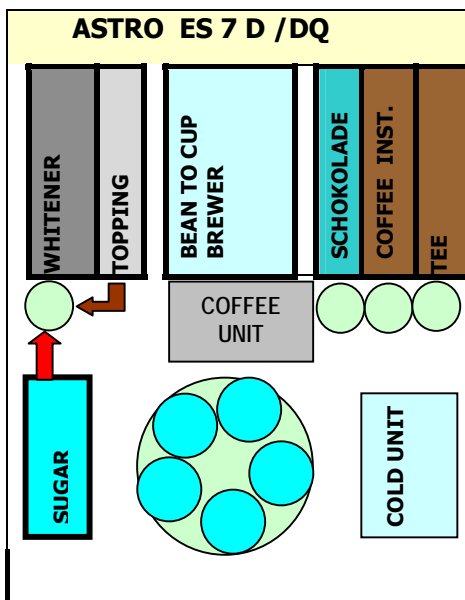
Selection menu:

- Cafè express
- Cafè Largo
- Cafè Cortado
- Cafè con Leche
- Cappuccino
- Leche Manchada
- Lache
- Chocolata
- Seleccion sin vaso

- Cafè expres descafeinado
- Cafè Largo descafeinado
- Cafè cortado descafeinado
- Cafè con Leche descafeinado
- Cappuccino descafeinado
- Leche manchada descafeinado
- Consome
- Poleo Menta
- Vaso con agua

Standard ASTRO - Espresso unit, 7 containers, Double boiler

Country = **SPAIN** - IMQ certification



ASTRO ES 7D /DQ

DIRECT selection

KURZ Pre-selections

PRE-MIXED SUGAR DELIVERED TO THE MIXER

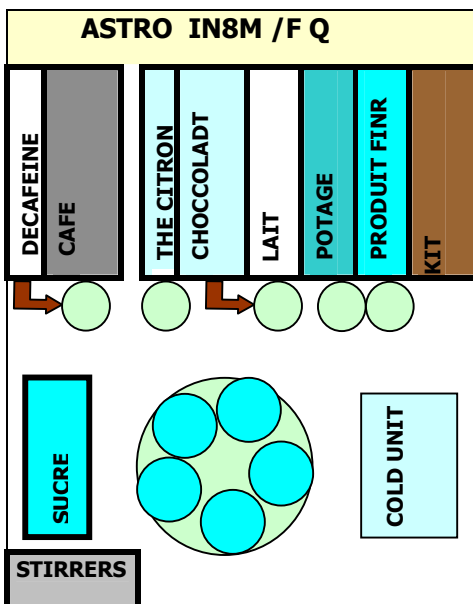
Selection menu:

- Extra zucker
- Kaffee schwarz
- Kaffee schwarz mit zucker
- Instant Kaffee weiß
- Instant Kaffee weiß mit zucker
- Cappuccino
- Cappuccino mit zucker
- Choccoccino
- Choccoccino mit zucker
- Kaffee 2
- Café au lait
- Café au lait mit zucker
- Wiener melange
- Wiener melange mit zucker
- Schokolade
- Schokomilch
- Tee
- nur Becher

Standard ASTRO - Espresso unit, 7 containers, Double boiler

Country = **GERMANY** , IMQ certification

COLD unit - Optional as a kit



ASTRO IN8M /FQ

DIRECT selection

SUGAR pre-selections

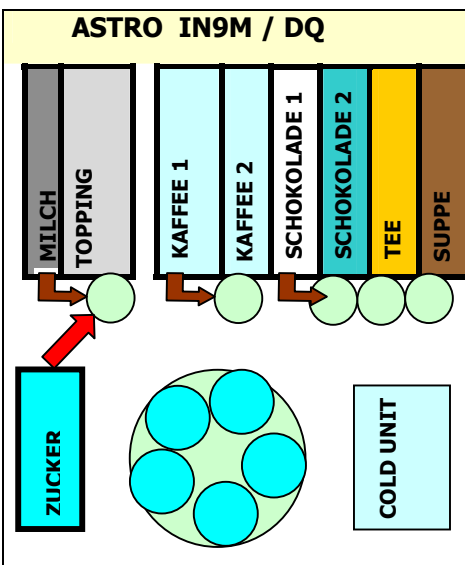
Selection menu:

- Café court
- Café long
- Café macchiato
- Café au lait
- Cappuccino
- Café + chocoalat
- Cacao
- Cacao + fort
- Cacao + lait
- Café court decafeiné
- Café long decafeiné
- Café macchiato decafeiné
- Café au lait decafeiné
- Capuccino Decafeiné
- Produit fini
- Té citron
- Potage
- Lait

Standard ASTRO - Instant, 8 containers, single boiler

Country = **FRANCE** - IMQ certification

COLD unit - Optional as a kit



ASTRO IN9M / DQ

DIRECT selection

STRENGTH pre-selection

PRE-MIXED SUGAR DELIVERED TO THE MIXER

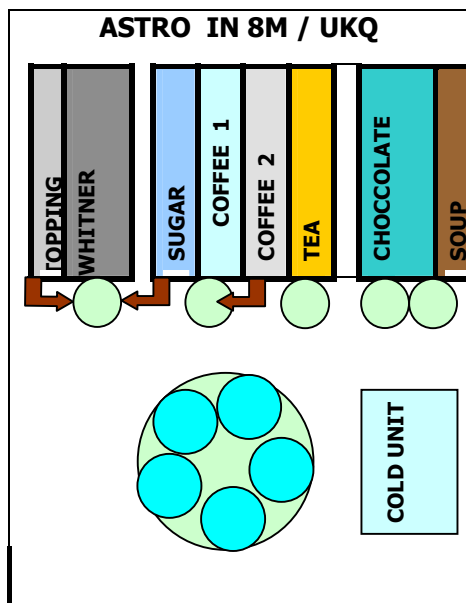
Selection menu:

- Extra zucker
- Kaffee schwarz
- Kaffee schwarz mit zucker
- Instant Kaffee weiß
- Instant Kaffee weiß mit zucker
- Cappuccino
- Cappuccino mit zucker
- Choccoccino
- Choccoccino mit zucker
- Kaffee 2
- Café au lait
- Café au lait mit Zucker
- Wiener malange
- Wiener malange mit zucker
- Schokolade
- Schokomilch
- Tee
- Suppe

Standard ASTRO - Instant, 9 containers, single boiler

Country = **GERMANY** , IMQ certification

COLD unit - Optional as a kit



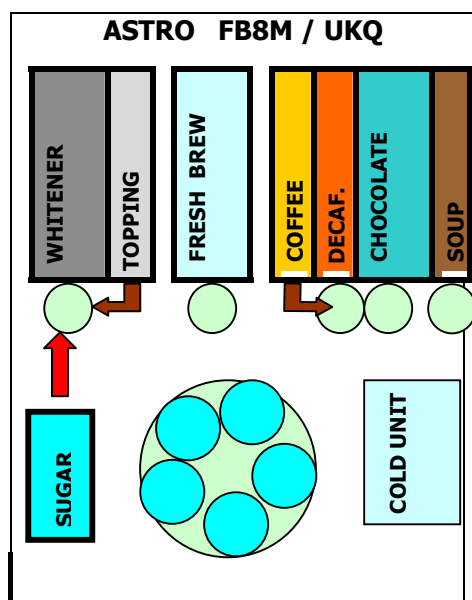
ASTRO IN8M / UK Q

NUMERIC selection - **STRENGTH** pre-selection

PRE-MIXED SUGAR DELIVERED TO THE MIXER

Selection menu:

- 17/18/19 Coffee instant Black sugar / extra sugar/no sugar
- 21/22/23 Coffee instant White sugar/ extra sugar/no sugar
- 24/26/26 Coffee instant extra White sugar/ extra sugar/ no sugar
- 27 – Chocolate
- 28 - Soup
- 29 – Hot Water
- 37/38/39 Coffee instant Black Decaf. sugar/ extra sugar/ no sugar
- 41/42/43 Coffee instant White Decaf. sugar/ extra sugar/ no sugar
- 44/45/46 Coffee instant extra White Decaf. sugar/ extra sugar/ no sugar
- 51/52/53 Tea Instant white sugar/ extra sugar/ no sugar
- 54/55/56 Tea Instant Extra white sugar/ extra sugar/ no sugar
- 57/58/59 Tea Instant Black sugar/ extra sugar/ no sugar
- 61/62 Cappuccino instant sugar / no sugar
- 63/64 Espresso Instant sugar / no sugar
- 65/66 Espresso Choc Instant sugar / no sugar
- 67 Choc. Milk
- 75/76 Cappuccino instant decaf. sugar / no sugar
- 77/78 Espresso Choc Instant decaf. sugar / no sugar
- 81/84 Chilled Water STILL / CARBONATED
- 82/85 Orange Syrup 1 STILL / CARBONATED
- 83/86 Lemon Syrup 2 STILL / CARBONATED



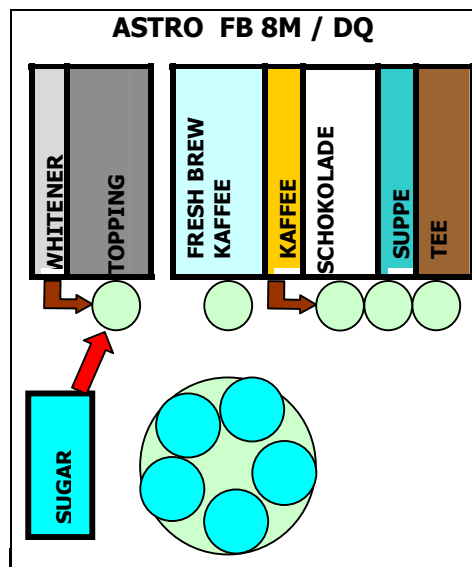
ASTRO FB 8M / UK Q

NUMERIC selection - **STRENGTH** pre-selection

PRE-MIXED SUGAR DELIVERED TO THE MIXER

Selection menu::

- 17/18/19 Coffee instant Black sugar / extra sugar/no sugar
- 21/22/23 Coffee instant White sugar/ extra sugar/no sugar
- 24/26/26 Coffee instant extra White sugar/ extra sugar/ no sugar
- 27 Chocolate
- 28 Soup
- 29 Hot Water
- 37/38/39 Coffee instant Black Decaf. sugar/ extra sugar/ no sugar
- 41/42/43 Coffee instant White Decaf. sugar/ extra sugar/ no sugar
- 44/45/46 Coffee instant extra White Decaf. sugar/ extra sugar/ no sugar
- 51/52/53 Coffee Fresh brew white sugar/ extra sugar/ no sugar
- 54/55/56 Coffee Fresh brew Extra white sugar/ extra sugar/ no sugar
- 57/58/59 Coffee Fresh brew Black sugar/ extra sugar/ no sugar
- 61/62 Cappuccino instant sugar / no sugar
- 63/64 Espresso Instant sugar / no sugar
- 65/66 Espresso Choc Instant sugar / no sugar
- 67 Choco Milk
- 75/76 Cappuccino instant decaff. sugar / no sugar
- 77/78 Espresso Choc Instant decaf. sugar / no sugar
- 81/84 Chilled Water STILL / CARBONATED
- 82/85 Orange Syrup 1 STILL / CARBONATED



ASTRO FB8M / DQ

DIRECT selection

STRENGTH pre-selection

PRE-MIXED SUGAR DELIVERED TO THE MIXER

Selection menu:

- | | |
|----------------------------------|-----------------------------|
| - Extra zucker | - Kaffee 2 |
| - Kaffee schwarz | - Café au lait |
| - Kaffee schwarz mit zucker | - Café au lait mit Zucker |
| - Instant Kaffee weiß | - Wiener malange |
| - Instant Kaffee weiß mit zucker | - Wiener malange mit zucker |
| - Cappuccino | - Schokolade |
| - Cappuccino mit zucker | - Schokomilch |
| - Choccoccino | - Tee |
| - Choccoccino mit zucker | - Suppe |

2 - Electrical systems - Connections - Configurations

The machine is designed to operate under a single-phase voltage of 230 V AC (+5-10V)

It is protected with a main 15 A fuse on both phases.

With regard to the transformer:

The primary winding is protected with a 125 mA fuse

The secondary winding is protected with a 1.25 mA fuse

The machine is fitted with a door opening safety switch.

The power cable can be supplied as standard feature and chosen among the following types:

- 1) HO5 RN – F copper with a 3 x 1.5 mm² section
- 2) HO5 V V – F " " " "
- 3) HO7 RN – F " " " "

Fitted with a fixed SCHUKO ** plug.

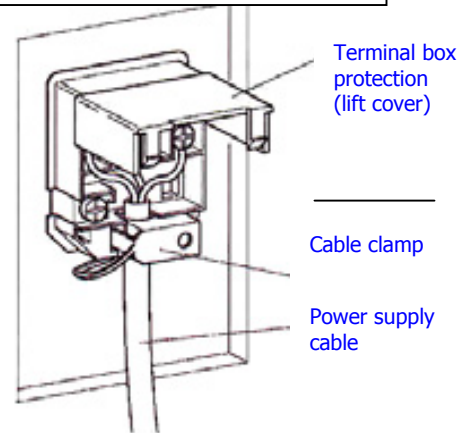
NB **: it is possible for **some markets** to obtain the original cable with a specific plug fitted in accordance with the regulations and standards in force for that country.

In the event of replacement, cables of exactly the same characteristics must be used.

Since the "ASTRO" vending machine is approved by an electrical safety certification institute (**IMQ**), replacements with non-original components are not permitted.

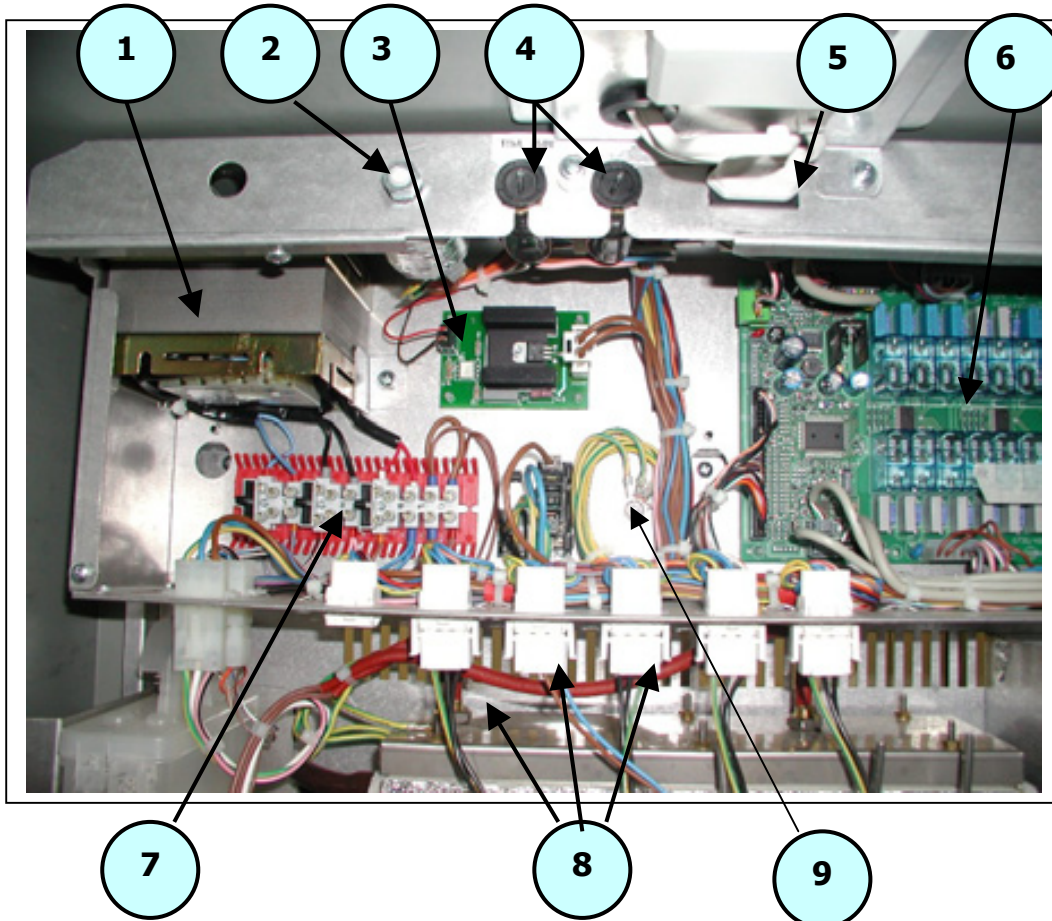
Otherwise the electrical safety certificate and the warranty will be void.

Power supply cable securing diagram



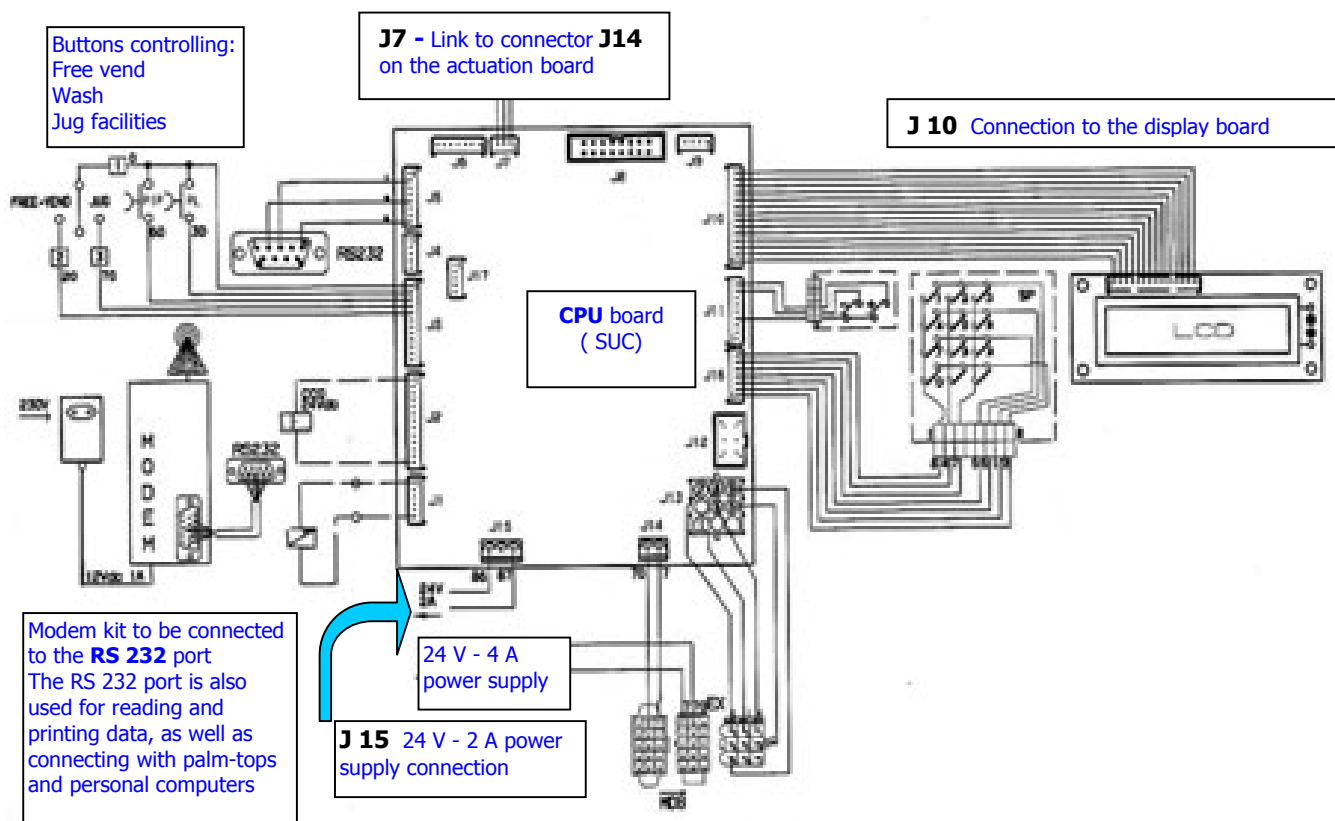
2.1 - Electronic boards connections

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



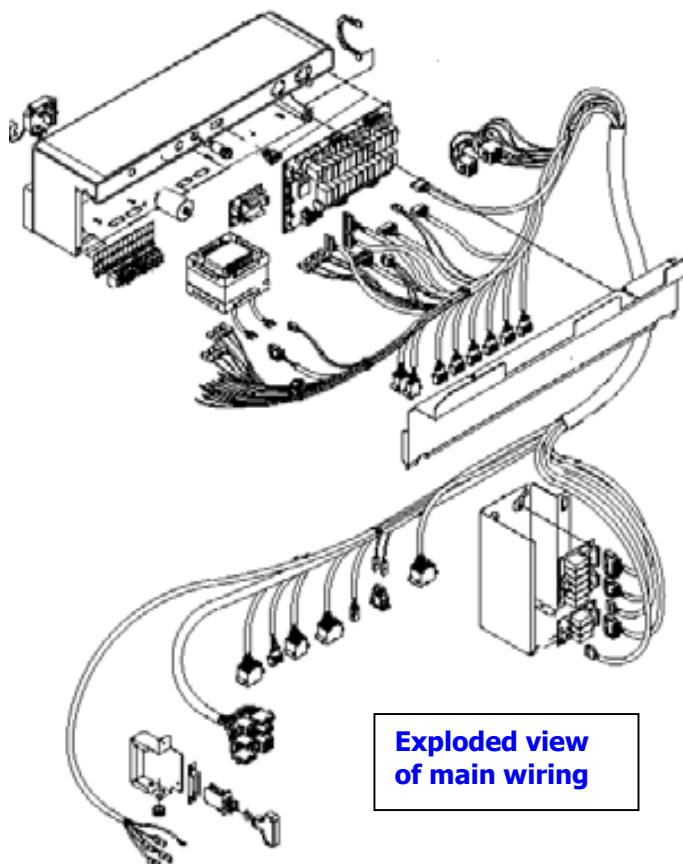
- | |
|---------------------------------------|
| 1. Transformer |
| 2. Radio interference suppressor |
| 3. Instant boiler control board |
| 4. Fuses |
| 5. 230 V socket |
| 6. Actuation board |
| 7. Transformer fuses |
| 8. Actuation connectors |
| 9. Power supply unit earth connectors |

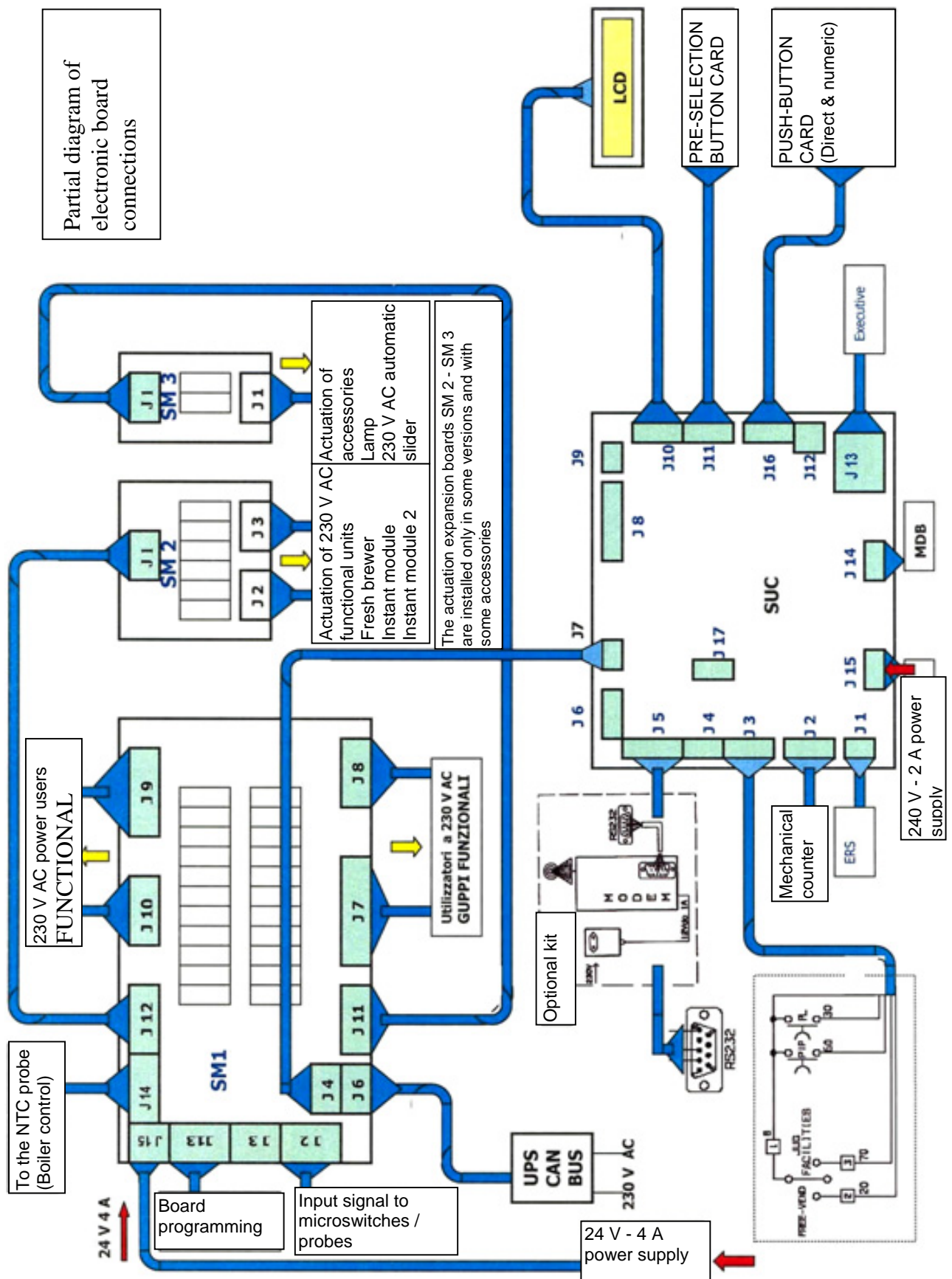
BOARD CONNECTION GENERAL DIAGRAM



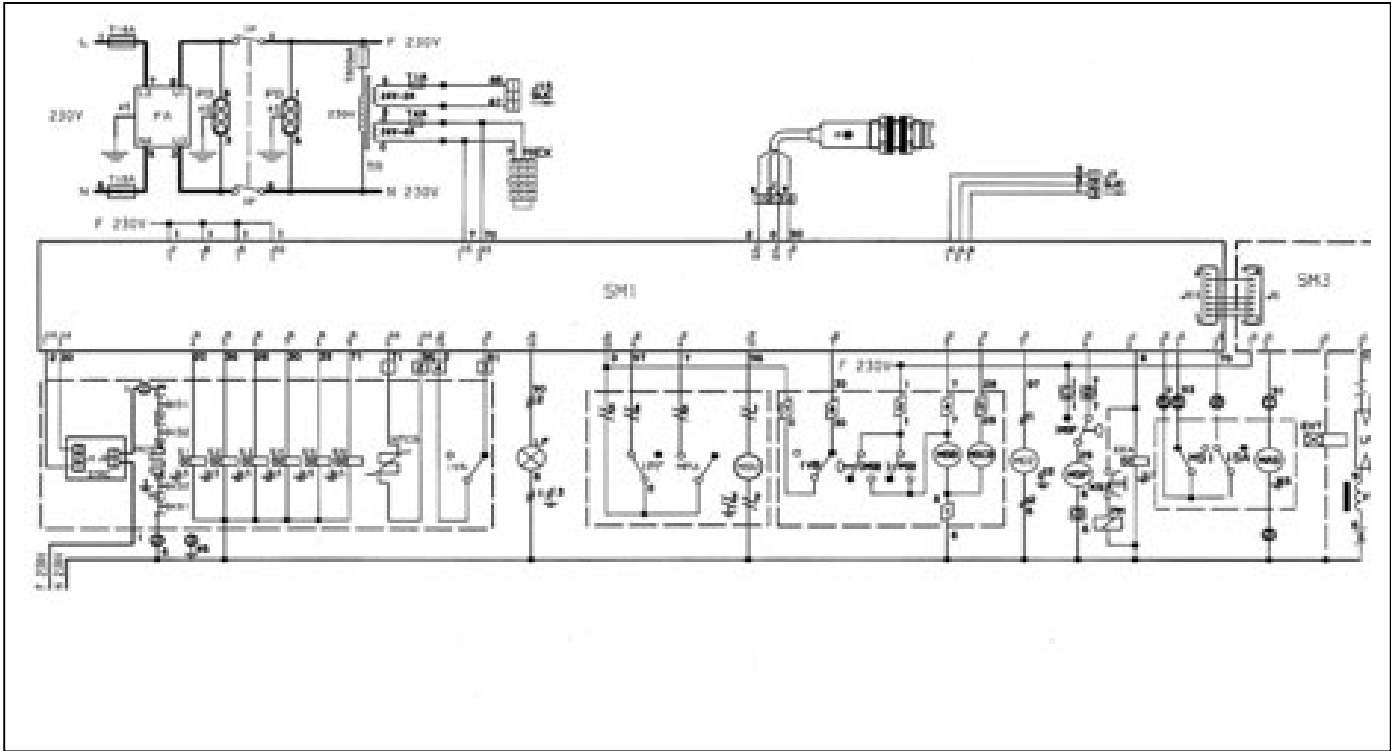
Code	Description
SM	Actuation and control board
LCD	LCD display card
NTC	Espresso temperature control probe
NTCS	Instant temperature control probe
CV	Volumetric counter
RS 232	Printer or data reading device port (only if the relevant optional board is installed)
SP	Push-button card
IVB	Cup sensor switch
IVA	Water sensor (level) switch
IPF	Liquid waste overflow switch
CMSB	Cup release motor cam
MSU	Spout movement motor
MPU	Spout positioning switch
SUC	CPU board

NB: The above codes are indicated in the wiring diagrams and in the tables supplied with the machine

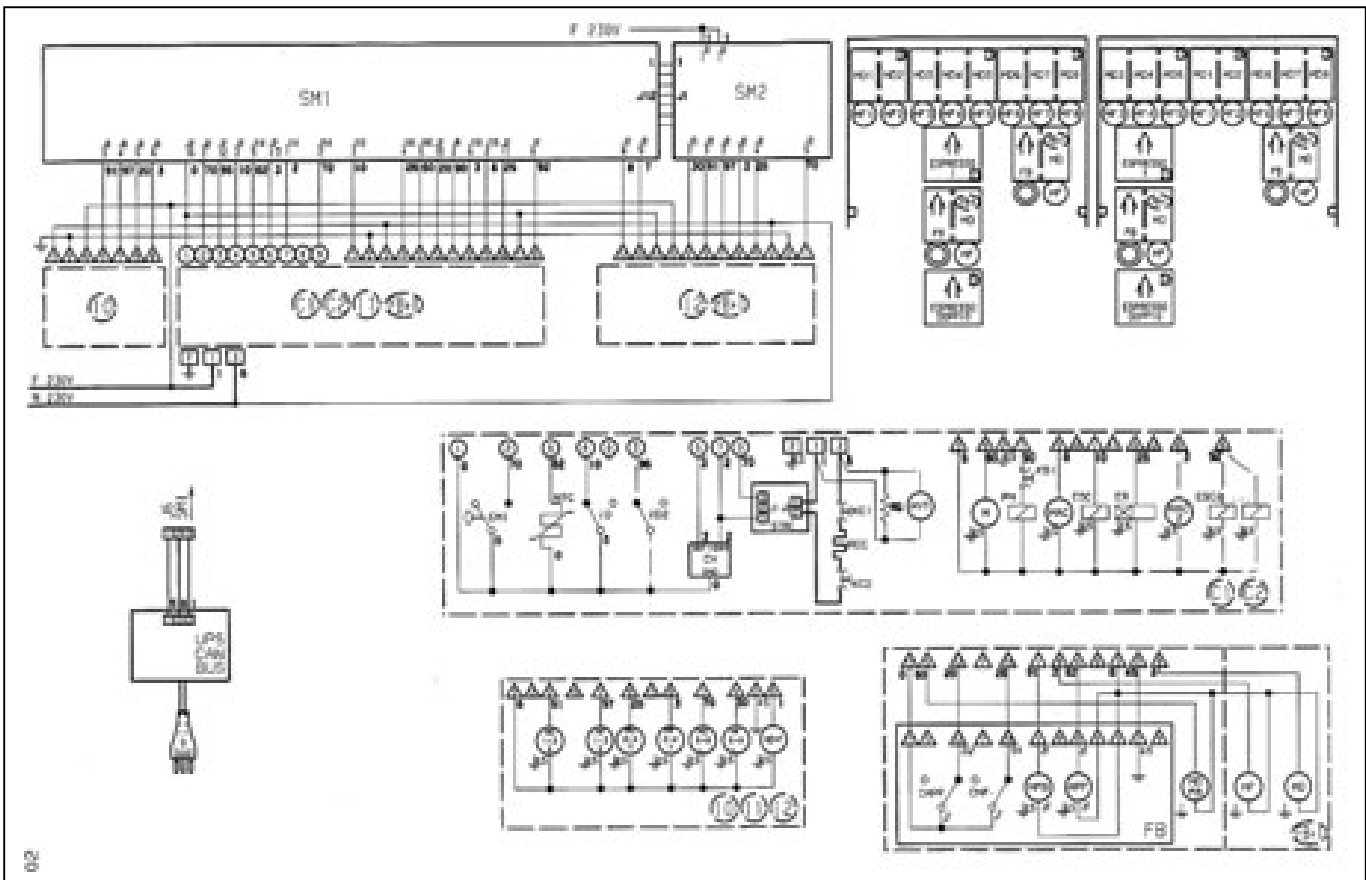




GENERAL WIRING DIAGRAM



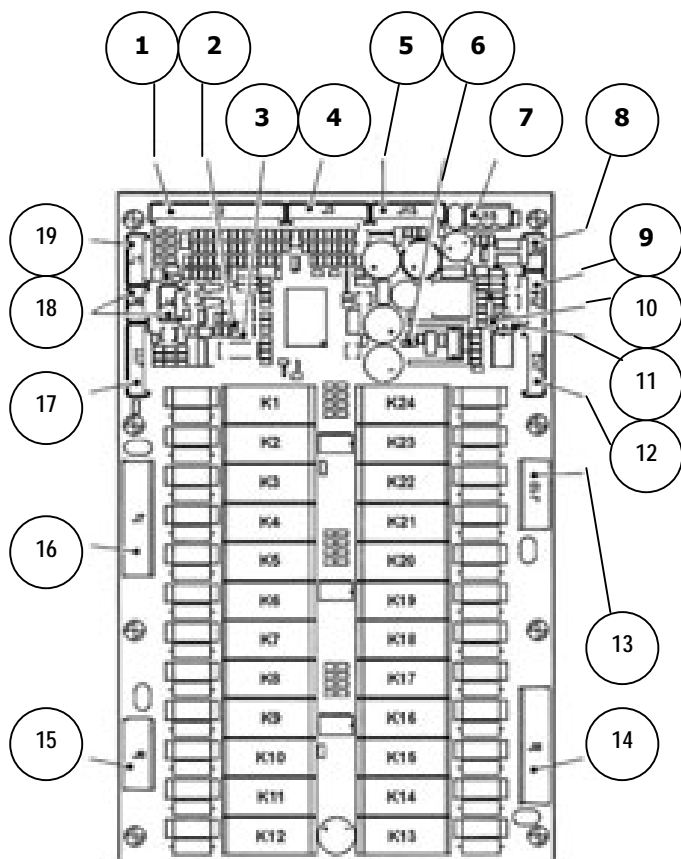
PARTIAL WIRING DIAGRAM



ACTUATION BOARDS

(Positioning, logics and actuation diagrams)

SM1 ACTUATION BOARD



The actuation board activates all 230 V AC power users by means of relays. It also controls the signals from the cams and microswitches located on the various power users and controls the boiler board. The board is powered with 24 V AC through the power supply unit, which is incorporated into the electrical board. The control software is installed directly in the microprocessor. The **GREEN LED** (2) blinks during the normal operation of the board.

The **YELLOW LED** (6) indicates the presence of 5 V DC.

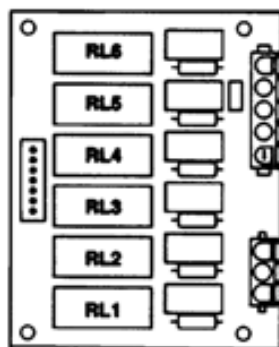
The **RED LED** (10) glows when the espresso boiler is activated.

The **RED LED** (11) glows when the instant boiler is activated.

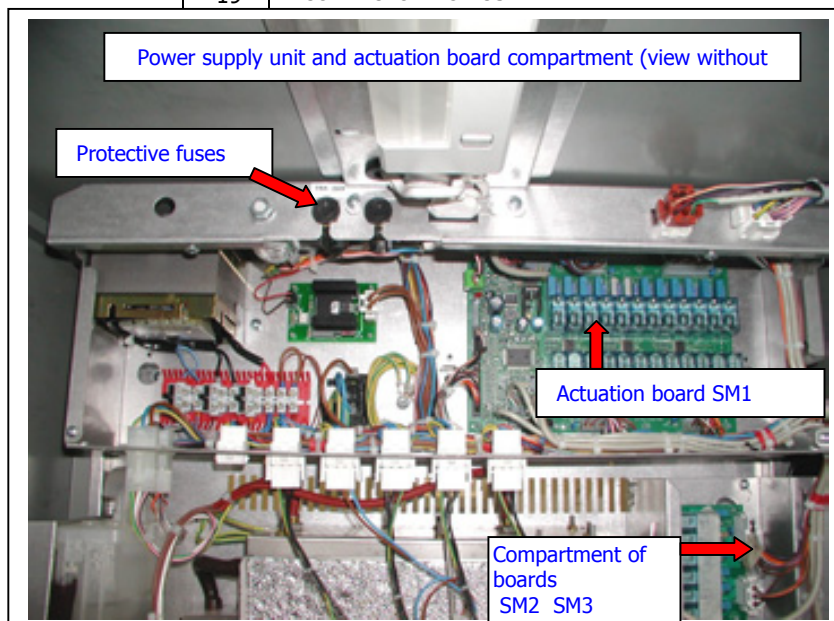
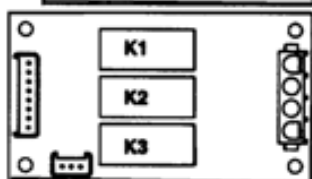
The two boilers are never activated simultaneously, but the espresso boiler will have priority. When the pre-set temperature is reached, the instant boiler will start.

REF.	DESCRIPTION
1	CONNECTOR FOR SIGNAL INPUT
2	GREEN LED
3	RED LED
4	CONNECTOR FOR INPUT SIGNALS
5	CONNECTOR FOR BOARD PROGRAMMING
6	YELLOW LED
7	CONNECTOR FOR BOARD POWER SUPPLY
8	CONNECTOR NOT USED
9	CONNECTOR FOR PROBE AND BOILER CONTROL
10	RED LED - ACTIVATION OF ESPRESSO BOILER
11	RED LED - ACTIVATION OF INSTANT BOILER
12	CONNECTOR TO EXPANSION BOARD - 6 RELAYS
13	230 V AC USERS
14	230 V AC USERS
15	230 V AC USERS
16	230 V AC USERS
17	CONNECTOR TO EXPANSION BOARD - 3 RELAYS
18	CAN-BUS CONNECTOR ** (Connector for the control of banked machines with GSM protocol)
19	CONNECTOR NOT USED

SM 2 Expansion board - Actuation of 6 relays



SM 3 Expansion board - Actuation of 3 relays



Reference to relay code and actuations - Espresso / Instant version **SM1**

Espresso Configuration			Instant		Fresh Brewer	
(See references in previous page)						
K 1	EEA	WATER INLET SOLENOID VALVE				
K 2	MSB	CUP RELEASE RATIOMOTOR				
K 3	MSCB	CUP STACKER SHIFT RATIOMOTOR				
K 4	MDZ	SUGAR DOSER DEVICE				
K 5	MSP	STIRRER RELEASE RATIOMOTOR				
K 6	ESC2	COFFEE RELEASE MAGNET 2	FAN			
K 7	MSU	SPOUT MOVEMENT RATIOMOTOR				
K 8	PM	PUMP	MF3 - WHIPPER 3			
K 9	MD1	DOSER DEVICE 1				
K 10	MF 1	WHIPPER 1				
K 11	MD 2	DOSER DEVICE 2				
K 12	MF 2	WHIPPER 2				
K 13	E1	SOLENOID VALVE 1				
K 14	E2	SOLENOID VALVE 2				
K 15	E3	SOLENOID VALVE 3				
K 16	E4	SOLENOID VALVE 4				
K 17	E5	SOLENOID VALVE 5				
K 18	E6	SOLENOID VALVE 6				
K 19	LF	FLUORESCENT LAMP				
K 20	MAC	COFFEE GRINDER MOTOR	MD4	DOSER DEVICE 4	MDFB	FB DOSER DEVICE
K 21	ESC	RELEASE MAGNET	MD5	DOSER DEVICE 5	MFB	FB RATIOMOTOR
K 22	ERS	SLIDER MAGNET	MF5	WHIPPER 5	MPF	2 FB RATIOMOTOR
K 23	M	UNIT RATIOMOTOR	MD3	DOSER DEVICE 3	MDFB	FB DOSER DEVICE
K 24	MAC2	COFFEE GRINDER MOTOR 2	MF4	WHIPPER 4	MFFB	FB WHIPPER

SM2 - 6-relay board

Espresso Configuration			Instant		Fresh Brewer	
RL 1	MPF	FB PISTON MOTOR			MFB	FB RATIOMOTOR
RL 2	---		MD6	DOSER DEVICE 6	MDFB	FB DOSER DEVICE
RL 3	---		MF6	WHIPPER 6	----	
RL 4	---		MF4	WHIPPER 4	MFFB	FB WHIPPER
RL 5	---		MD7	DOSER DEVICE 7	MDFB	FB DOSER DEVICE
RL 6	---		MD8	DOSER DEVICE 8	MFB	FB WHIPPER

SM3 - 3-relay board

Expansion actuation board for optional accessories			
K 1	LF	DOOR FLUORESCENT LAMP	
K 2	MAS	SLIDER OPENING MOTOR	
K 3	EVT		

CPU BOARD (Central Processing Unit)

The **CPU control board**, located inside the payment system compartment, processes the information from the push-buttons, the payment system and from the sensors installed throughout the machine; it also controls the actuators and the push-button board. It is built on SMT technology. The LEDs furnish the following indications during the vending machine operation:

GREEN LED (3): Blinks during normal operation

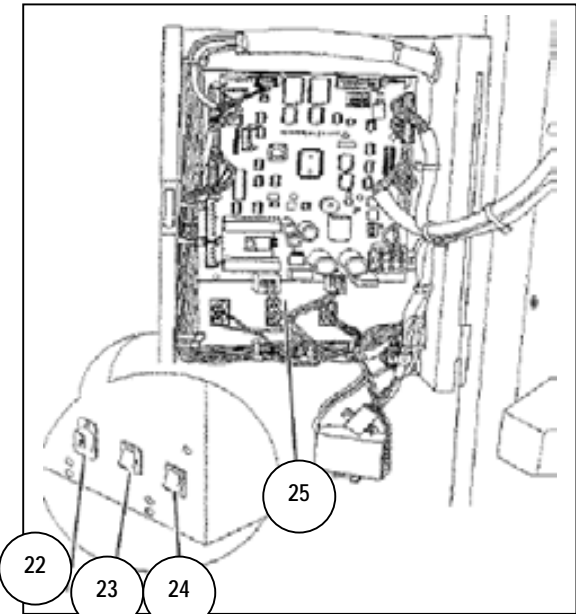
YELLOW LED (4): Glows when 5 V DC is detected

RED LED (16) - Glows **during the software reset phase**
Two other boards are also installed:

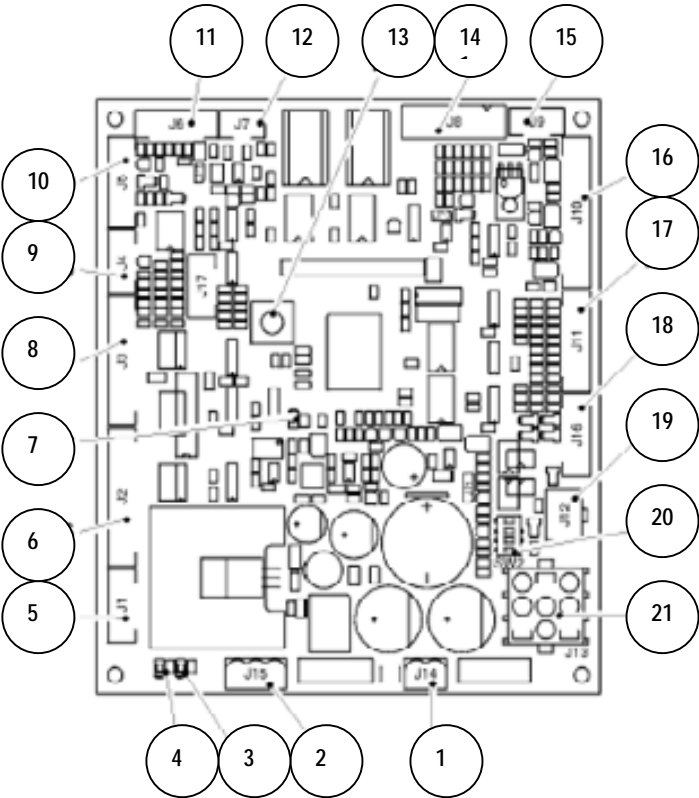
PUSH-BUTTON CARD located on the inside of the door, controls the alphanumeric display and it processes the push-button commands; it also supports the coin mechanism connectors and the RS232 printer port.

DISPLAY CARD

Processes the information and converts it into readable signals.



Payment system compartment - detail of CPU board



List of CPU board components

1	J14 Coin mechanism	12	J7 Can-Bus
2	J15 Board power supply	13	Button not used
3	Green LED: run - DL2	14	J8 Validators
4	Yellow LED: 5 V Dc DL1	15	J9 Not used
5	J1 24 V output	16	J10 Liquid crystal display
6	J2 24 V outputs	17	J11 Push-button panel
7	Red LED: - CPU reset DL3	18	J16 Push-button panel
8	J3 Input/output	19	J12 MDB coin mechanism
9	J4 Not used	20	Coin mechanism Minidips
10	J5 Programmer (RS232)	21	J13 Expansion for BDV /
11	J6 Not used	22	RS232 serial port
23	Wash button	24	Failure reset button
25	CPU board		



CPU BOARD DETAIL

The CPU board is fitted with FLASH EPROM; such component is used for re-writing the software that is modified for updating or for changing configuration. Therefore, using a Personal Computer and specific control software, the machine software can be re-written without replacing the EPROM. The system permit software update simply and quickly for the entire operating life of the vending machine. Using the "PROGRAMMER" (supplied as a kit) it is also possible to transfer the settings from one vending machine to another. The board is the same used in the Kikko and the only difference is the different software and the positioning of the machine.

3 - AIR-BREAK & BOILERS

The **air-break** is a functional unit with the function of keeping the water level in the instant boiler constant (connected using the principle of communicating vessels) and of signalling a water flow interruption from the mains; in the event of such water failure the current selection can be completed. In the espresso version, 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 Astro is fitted with an air-break, in both the espresso version with double boiler and the instant version with only one open-top boiler (i.e. with the internal pressure equal to the atmospheric pressure). It is the same base used in the Kikko.

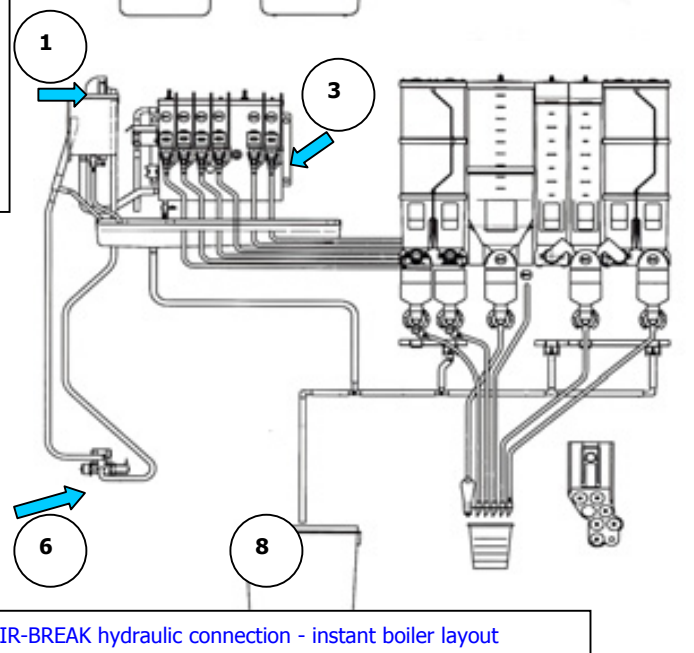
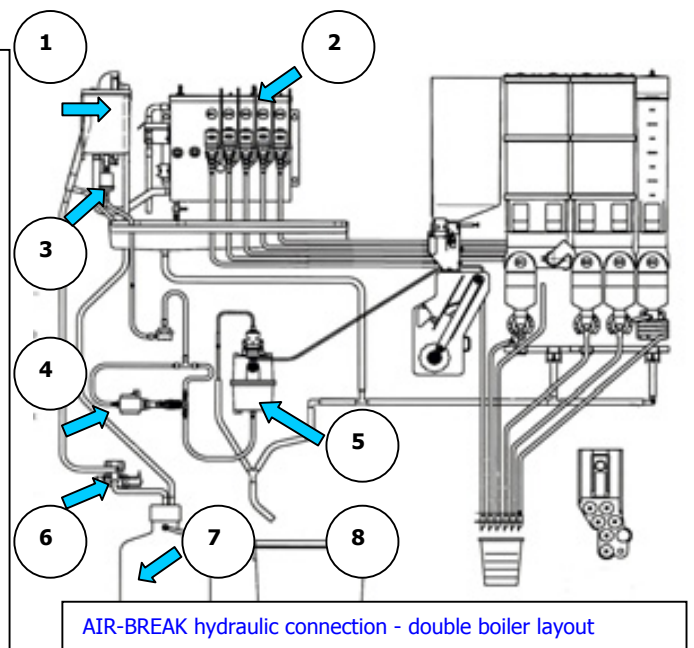
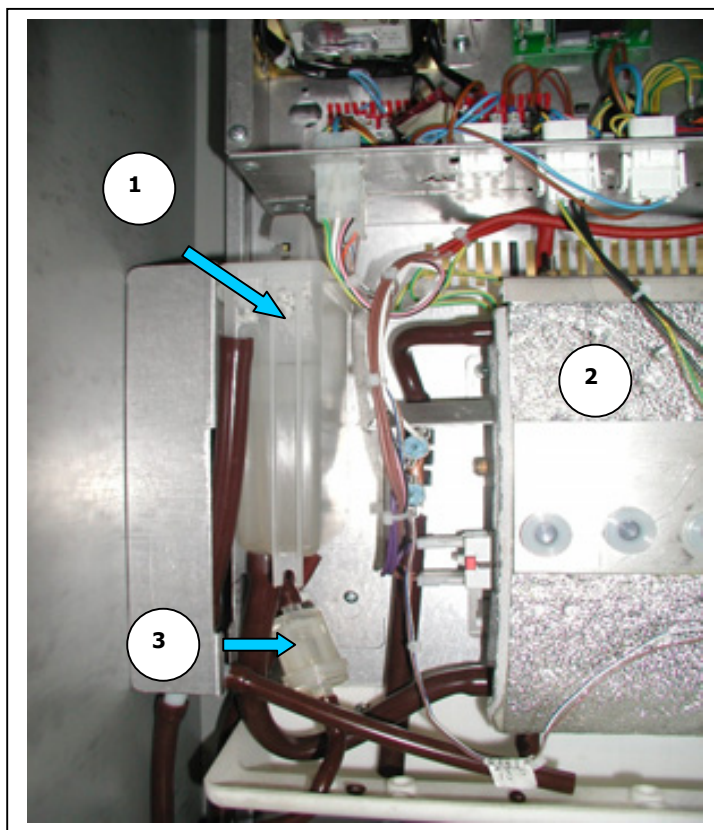
For the espresso selections, the required dose is measured by means of the volumetric counter, while for the instant selections it is measured by timing the gravity solenoid valve opening (in tenths of a second).

The water level is ensured by a float that triggers a microswitch, keeping the level between a factory set minimum and maximum (it is 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, therefore there is total overflow protection).

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.

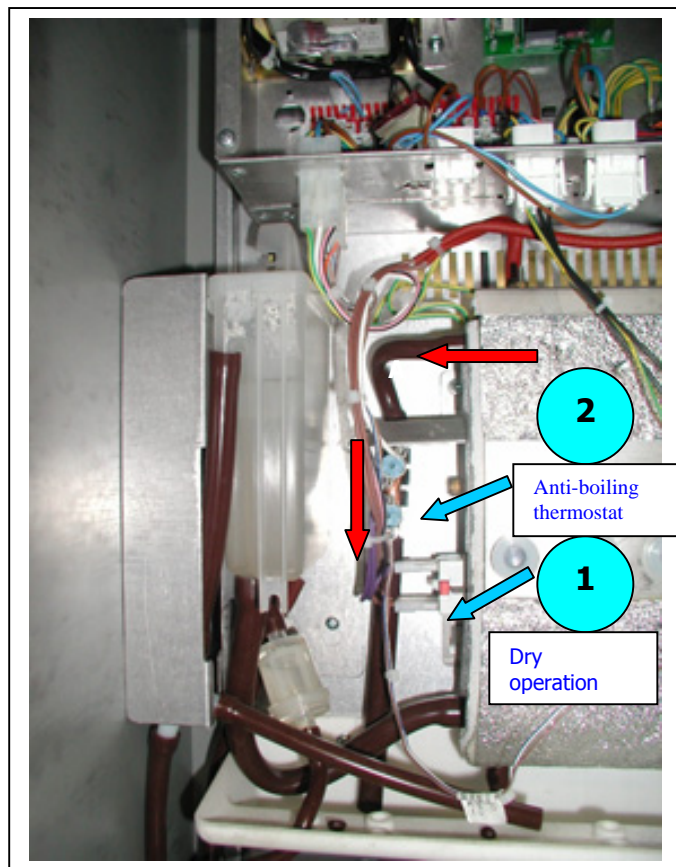


REF.	DESCRIPTION
1	Air-break
2	Instant Boiler
3	Water filter
4	Vibration pump
5	Espresso boiler
6	Water inlet solenoid valve
7	Softener filter
8	Liquid waste container

3.1 - BOILERS

For the **ASTRO** model there are three base versions: 1) Espresso version, fitted with two boilers; one pressure boiler and one **open-top boiler**, both controlled by the air break. 2) **Instant** version, fitted with only the Instant **open-top boiler**, also controlled by the air break. 3) **Fresh-brew** version, fitted with only the **open-top instant** boiler, also controlled by the air break.

The **espresso boiler** is the same used for **KIKKO** models, therefore with the same well-known and established characteristics and reliability. The **open-top** boiler for the **Instant** version is developed from the model used in the **SPAZIO**, but with slightly different size and position of probes and thermostats, due to the specific design of such vending machine.



NOTE: The open-top boiler is fitted with **two** safety overheating devices

1) Dry operation protection.

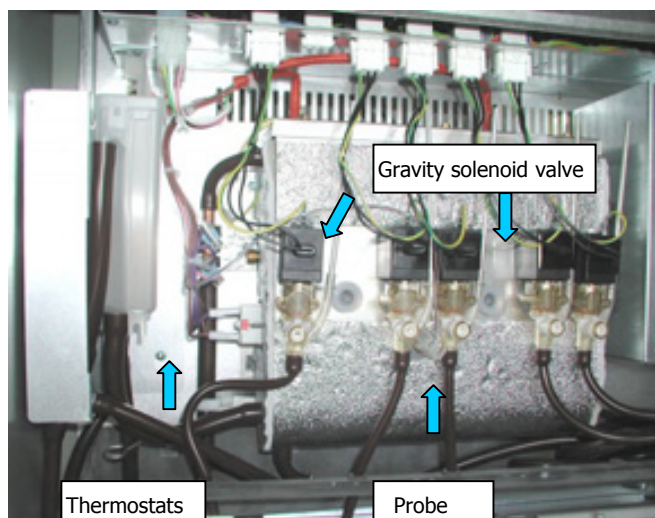
In the event of failure to the control system and the boiler without water, thermostat **1** is triggered at approximately **150°C** and disconnects the power supply; in order to reactivate everything, the malfunction must be identified and the thermostat must be reset by pressing the central red button.

2) Anti-boiling protection.

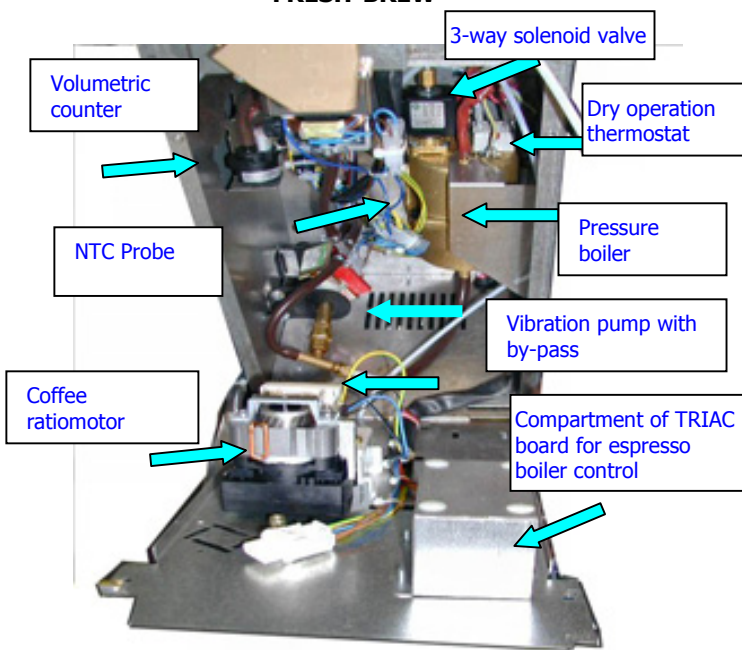
In the event of failure to the control system and the boiler full, upon reaching boiling temperature, as the steam exits from tube **A** it touches and triggers the two thermostats **2**

Proceed as above to reset them; see specific chapter to identify the type of malfunction. See relevant section in the functional unit manual for details, photos and complete description: **BOILERS**

The internal temperature control (in both boilers) is by means of an NTC type electronic probe fitted with an internal 12K ohm (± 4 ohm) resistance at a temperature of 25°C.



OPEN-TOP BOILER FOR INSTANT AND FRESH-BREW



ESPRESSO MODULE COMPLETE WITH BOILER, PUMP AND RATIOMOTOR

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

4 - PUMPS AND BY-PASS

In order to supply water to the espresso boiler a vibration pump used, which is the same used in the entire **H&C** range of Necta. The application is specific, as pump, boiler, TRIAC circuit and connections are positioned inside the espresso module and easily accessible after opening the compartment wall, closed by only two screws and a quick snap fastener (see Page 16) This solution ensures maximum access for maintenance and hygiene, it also allows the option of using configurations with two espresso modules as an alternative to other two modules, and even mixed modules espresso/instant/fresh-brew.

The pump has overheating protection in case of continuous or dry operation by means of a 90°C self-reset klaxon. It is fitted with a by-pass at the outlet to ensure correct and consistent dispensing pressure.

The by-pass is factory pre-set at **12 bar**.

The pump is activated by **relay K 8** (see previous page for the pictures).

5 - ESPRESSO COFFEE & FB BREWER UNIT

For the espresso version the well-known and reliable **Z 2000 M** unit is used.

In the **FB** version a specific brewer unit for filtered coffee is used; there is also the option of having a version with both brewer units fitted together (see picture).

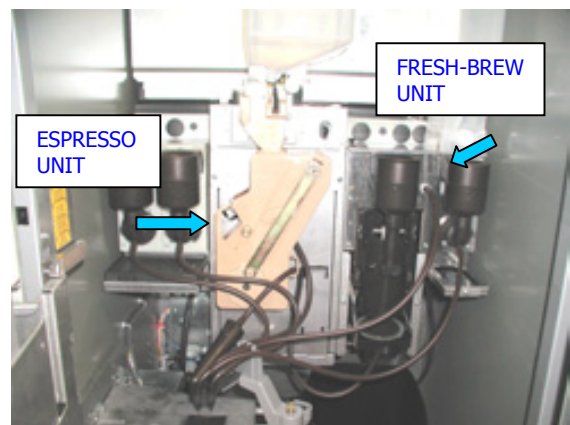
See specific H&C functional unit manual for details

The espresso brewer unit uses coffee that is ground during the selection with the grinder/doser unit already used in the entire range gamma (Venezia – Spazio – Kikko). See specific manuals for details. The FB unit uses specific already ground coffee.

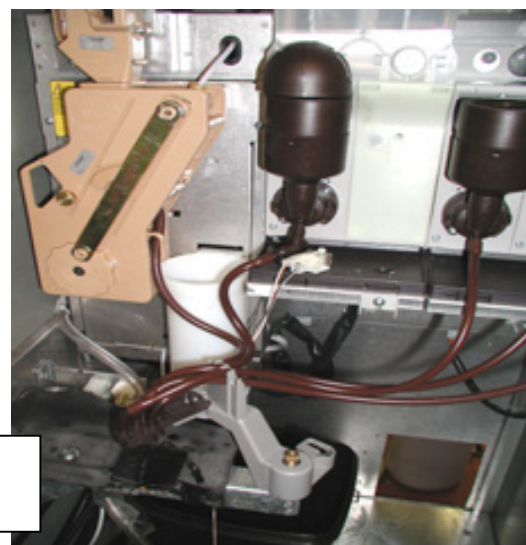
There are various configuration and layout options; some of them are indicated at Page. 5-6.



Z 2000 brewer unit positioned at the upper dead centre, ready for ground coffee loading.
The unit is pre-set for the installation of a first coffee kit
For further technical information see the specific functional unit manual: BREWER UNITS



VERSION WITH BOTH BREWER UNITS INSTALLED



DETAIL OF BREWER UNIT
WITH VIEW OF DISPENSING
SPOUTS

6 - CUP DISPENSER ASSEMBLY (complete with sugar and stirrer release mechanism)

It is a new design functional unit specially conceived and optimised for the ASTRO vending machine; it is integrated in the sugar and stirrer dispenser.

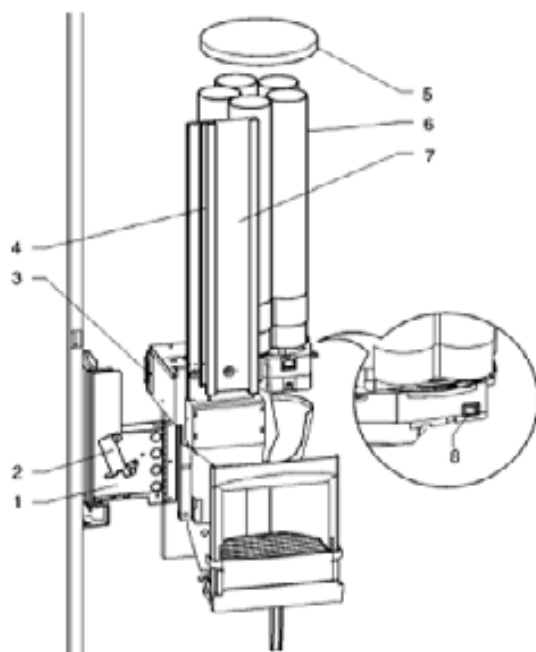
The new feature consists in the option of using three different size stirrers:

95 mm - 105 mm - and 115 mm stirrers

With a total capacity of approximately 600 stirrers.

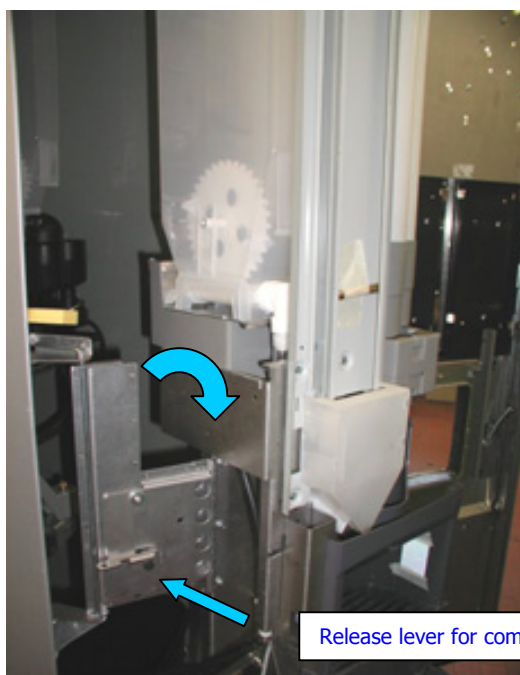
To adjust to the desired length it is sufficient to move the adapter profile inside the guide and place it in the preset position for the new size.

Operation: The release ratiomotor is triggered by relay **K2** and the sugar release spout is rotated at the same time as the stirrer release system is activated.

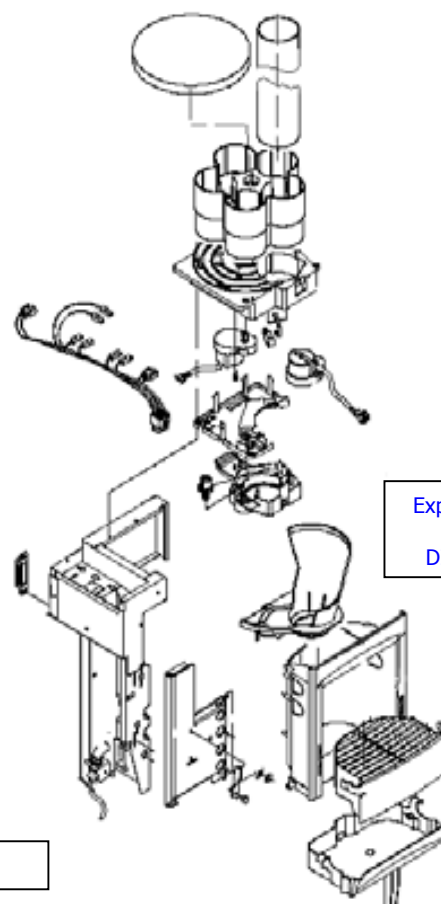


- 1 - Swivel shelf
- 2 - Swivel release lever
- 3 - Shelf positioning magnet
- 4 - Adjustable stirrer guide
- 5 - Cover
- 6 - Cup stacker
- 7 - Stirrer stacker
- 8 - Cup release button

Plastic or waxed paper cups of 70-71 or 72-73 diameter can be dispensed, for a total of approximately 650 pcs.
For correct operation, the snail gears and the cup release ring (supplied on request and of different colour) must be replaced.

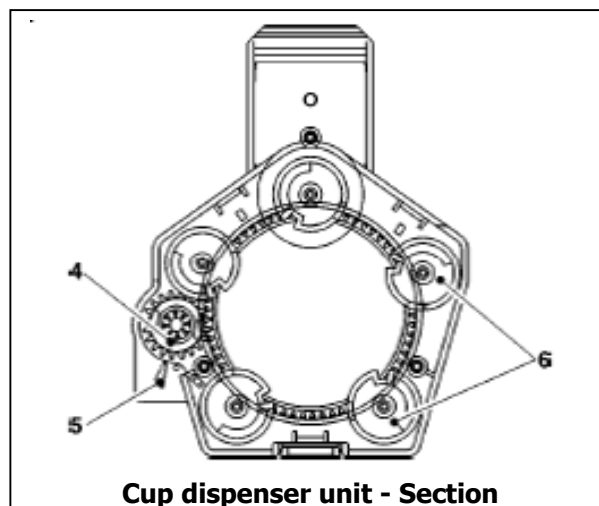
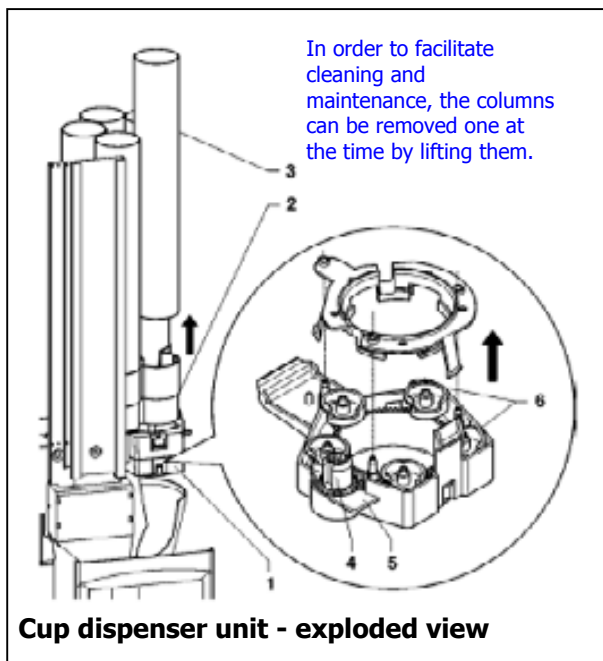


Release lever for complete opening

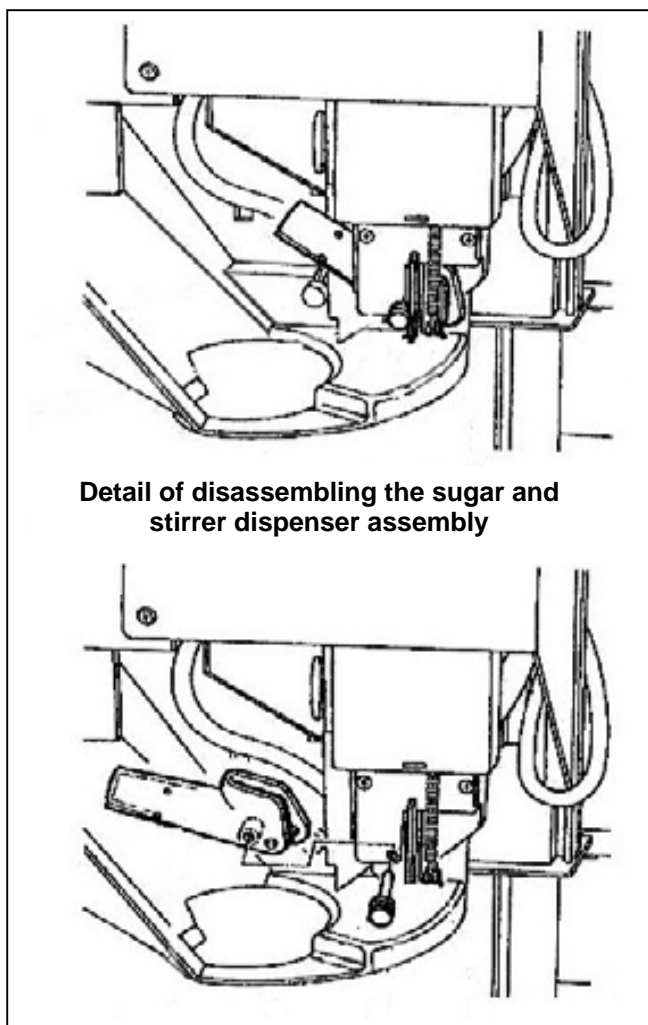


Exploded view
of CUP
DISPENSER

A special feature is the option of swinging completely open the cup dispenser, to allow full access to the parts located at the back.



- 1 - Cup release ring
- 2 - Cup stacker
- 3 - Removable column
- 4 - Microswitch actuation gear
- 5 - Snail gear support
- 6 - Cup release snail gears



The cup, stirrer and sugar dispenser was designed to be disassembled easily for normal cleaning and maintenance operations.

Each single column of the cup stacker and the dispenser unit can be disassembled without using tools.

The cup release ring must not be opened for normal cleaning.

Should any adjustments be necessary during re-assembly, special attention must be paid to:

- Line up the notch on the microswitch actuation gear with the arrow on the snail gear support.
- Respect the orientation of the snail gears, as indicated in the figure.

It is possible to use different diameter cups and different length stirrers for a total of 600-650 cups (according to the type used).

For the stirrers it's sufficient to widen the left-hand guide, undoing the two screws A and reposition the guide into the special slots.

8 - MOBILE SPOUTS ASSEMBLY



In order to ensure better hygiene and optimum appearance of the dispensed products, a new **"Mobile spout"** unit was specially designed.

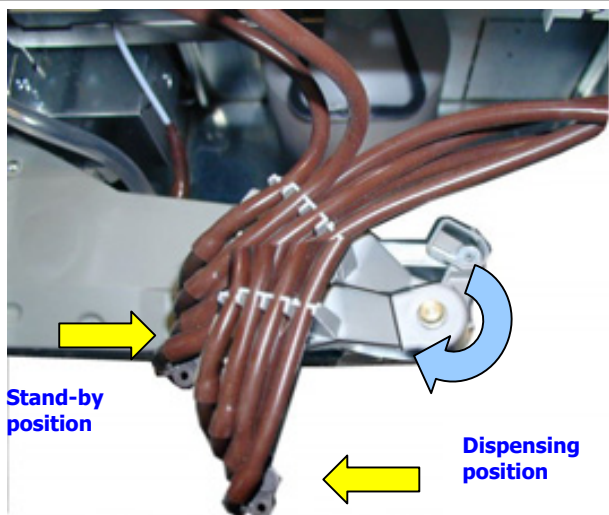
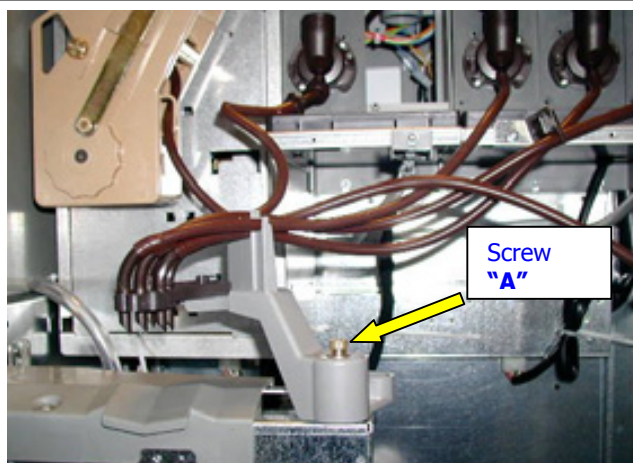
The system moves the spouts out of the way during stand-by and moves them as close as possible to the rim of cup during drink dispensing. This operation will also prevent someone from touching the spouts from outside the machine during stand-by.

For normal maintenance and hygiene operations, the unit is designed so that only one person can easily remove it by undoing screw **A**.

After selecting a product, a cup is dropped immediately, the mechanism's ratiomotor is activated and the spouts are moved into dispensing position.

The positioning during dispensing is ensured by a microswitch that is activated by a special cam, while the positioning during stand-by is determined by the software, with a set operating time.

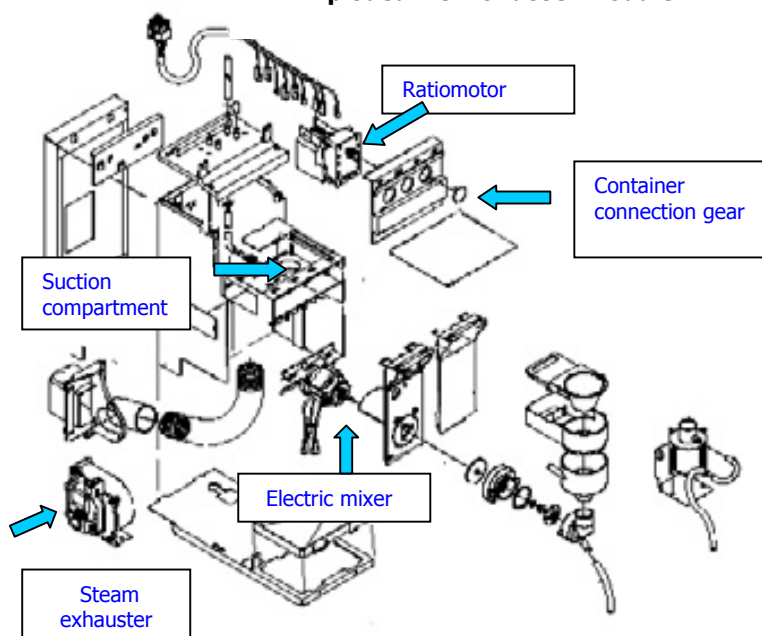
The motor is activated by **relay K7**.



8 - DOSER DEVICES AND POWDER PRODUCT CONTAINERS

According to new market requirements, it was necessary to design new solutions using quick fastening without any screws, to allow easy access for maintenance, as well as quick changes to the layout by means of preassembled modules.

Exploded view of doser module



In order to rationalise the internal spaces and allow 7 powder containers (according to model) double and modular containers were designed.

Modular because designed as three vertical parts that can be removed or inserted according to need or to the type of vending machine.

Double because each container, although made as a single piece, is divided into two sections of different capacity to ensure maximum rationalisation of the instant products.

For example, greater capacity for milk and chocolate, less capacity for instant coffee and tea or other products according to location requirements.

In the instant versions there can be up to 7 containers.

The ratiomotors are clicked into place without any screws; they are powered with 230 V AC, of the induction type, and fitted with overheating protection by means of a klixon wound on the coil. They are used at different speed according to the product to be dispensed, and are identified by the drive gears with different colours.

This solution ensures total maximum accuracy and start speed.

The container can be fitted with a beater inside to optimise dispensing of products that may clog; dispensing is achieved through the rotation of food-safe plastic augers.

The powder dose is achieved by timing the auger's rotation with software setting in tenths of a second.

Available velocities: 52 RPM – 78 RMP

Activation is by means of relays:

k 21 – k22 – k23 – k24

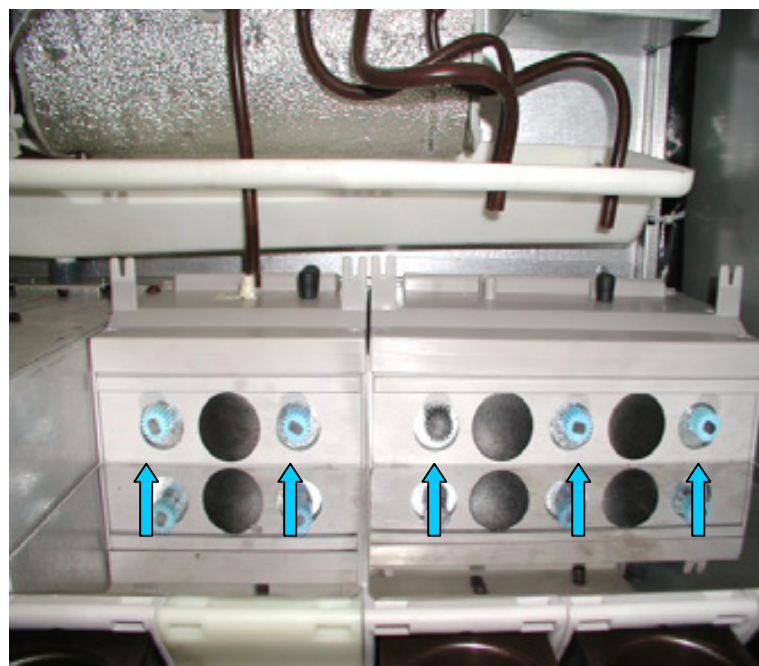
Connected to motors:

MD4 – MD3 – MD2 – MD5 for the espresso version.

k 20 - k 21 – k22 – k23 – k24

Connected to motors:

MD4 – MD3 – MD2 – MD5 for the instant version.



Doser device gears for coupling with powder product containers



Double powder container

9 - MIXER UNIT

Apart from their application, the mixers are the usual excellent and reliable ones used in the entire NECTA production.

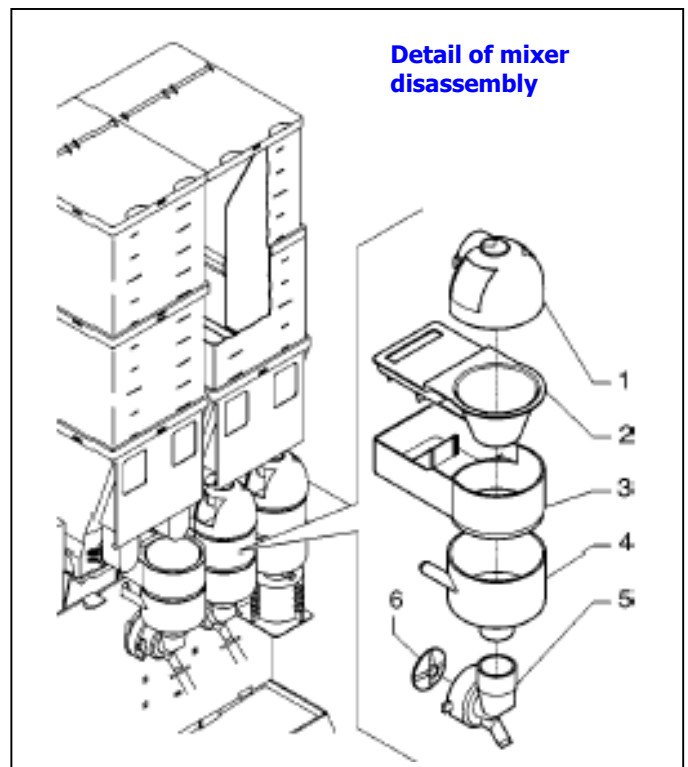
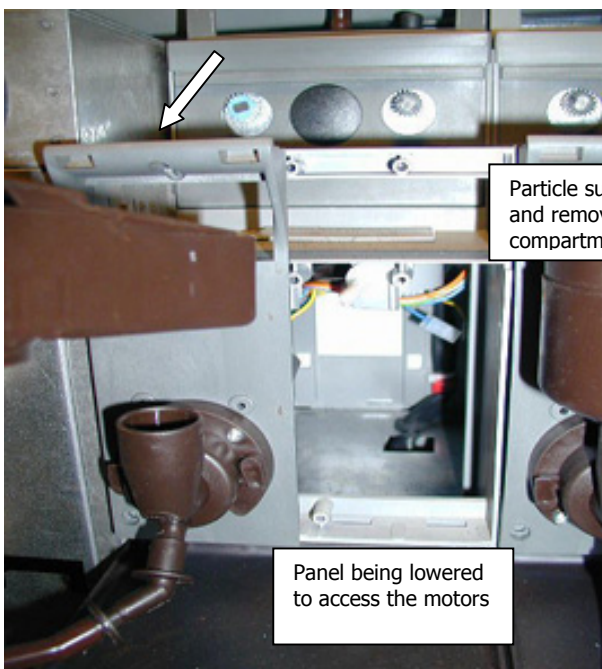
A mixer must have two main features:

- 1) Ease of disassembly and limited number of components to be able to meet the HACCP directive.
- 2) The quality of dispensed products that must have as much as possible be like the products served at the bar.
- 3) They must be able to optimise the product to be mixed

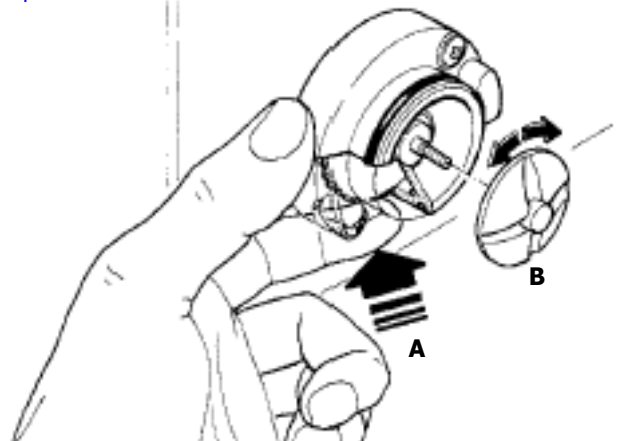
The particle removal tray is integrated into the conveyor (item 3)
This element permits emptying each time the mixer is removed for hygiene, thus ensuring that such operation is not neglected.

The motors are special high rotation speed commutator motors (20,000 rpm leadless) powered with 230 V AC and fitted with interference suppressors and self-resetting overheat protection (KLIXON).

The motors are activated by relay **K09 – K10 – K1** (Espresso version)
K08 – K09 – K10 – K11 – K12 (Instant version)



Detail of impeller removal: hold the internal knurled ring with a finger "A" and unscrew the impeller with the other hand "B"



The mixer motors are secured onto the inside of the compartment closing panel (mixer support shelf); in order to access them a screw need to be undone and the snap-on quick fastener released.

The closing panel can be lowered to access the motors.

All other operations are as for other vending machine models.

The panels are individual to ensure a single access without interfere with the other modules and are double for each module.

10 - POWDER AND LIQUID DOSE TABLES

The software is programmed by default with the most suitable settings for the relevant market.

The following table is an example, and are for the Italian market settings, and the correct and updated settings are indicated in the tables supplied with the machine.

Selection	Notes	Coffee beans	Coffee Instant	Water c.c.	Powder g	Sugar g	Notes
Short coffee Espresso	Time	2"	--	35 "	--	7 g	FMP = FLOW-METER PULSES
	Quantity	7 g		75 fmp 50			
Long coffee	Time	2"	--	38"	--	7 g	
	Quantity	7 g		90 fmp 60			
Coffee with milk	Time	2"	--	38"	--	7 g	
	Quantity	7 g		75 fmp 40+25 c.c.	2.0 g of milk		
Cappuccino	Time	2"	--	45"		7 g	
	Quantity	7 g		60 + 75 fmp 40+60	6.0 g of milk		
Cappuccino with chocolate	Time	2"		22 sec.		7 g	
	Quantity	7 g		50 +82+32 fmp 40+40+25	3.5 g of choc. 6.0 g of milk		
Instant coffee	Time	--	1.3 g	22 sec.	--	7 g	
	Quantity			50 fmp 40 c.c.			
Instant coffee with milk	Time	--	1.3 g	27 sec.		7 g	
	Quantity			55 + 35 fmp 40 + 25 c.c.	2.0 g of milk		
Cappuccino Instant	Time	--	1.3 g	31 sec.		7 g	
	Quantity			55 + 72 fmp 40 + 55 c.c.	6.0 g of milk		
Chocolate Strong chocolate	Time	--	--	32 sec.	23 g	--	
	Quantity			116 fmp 90 c.c.	27 g		
Instant tea (Optional)	Time	--	--	32 sec.		--	
	Quantity			116 fmp 90 c.c.	12.5 g		
Milk	Time	--	--	32 sec.			
	Quantity			116 fmp 90 c.c.	8 g	7.5 g	

NOTE 1

The water flow in the mixers is approximately 10 c.c. per second and it is given as an indication, as there are many variables that can affect the accuracy.

The liquid dose is determined by the flow-meter pulse counting (fmp).

Both versions (Instant and Espresso) use an electromechanical vibration pump (with the espresso boiler) for the water flow, therefore the liquid dose in both versions is measured in flow-meter pulses (**fmp**).

NOTE 2

To be noted that the number of pulses does not change in a linear manner (i.e. double the amount of water does not correspond to double the number of pulses), however the counter varies the accuracy according to the water flow velocity, and namely:

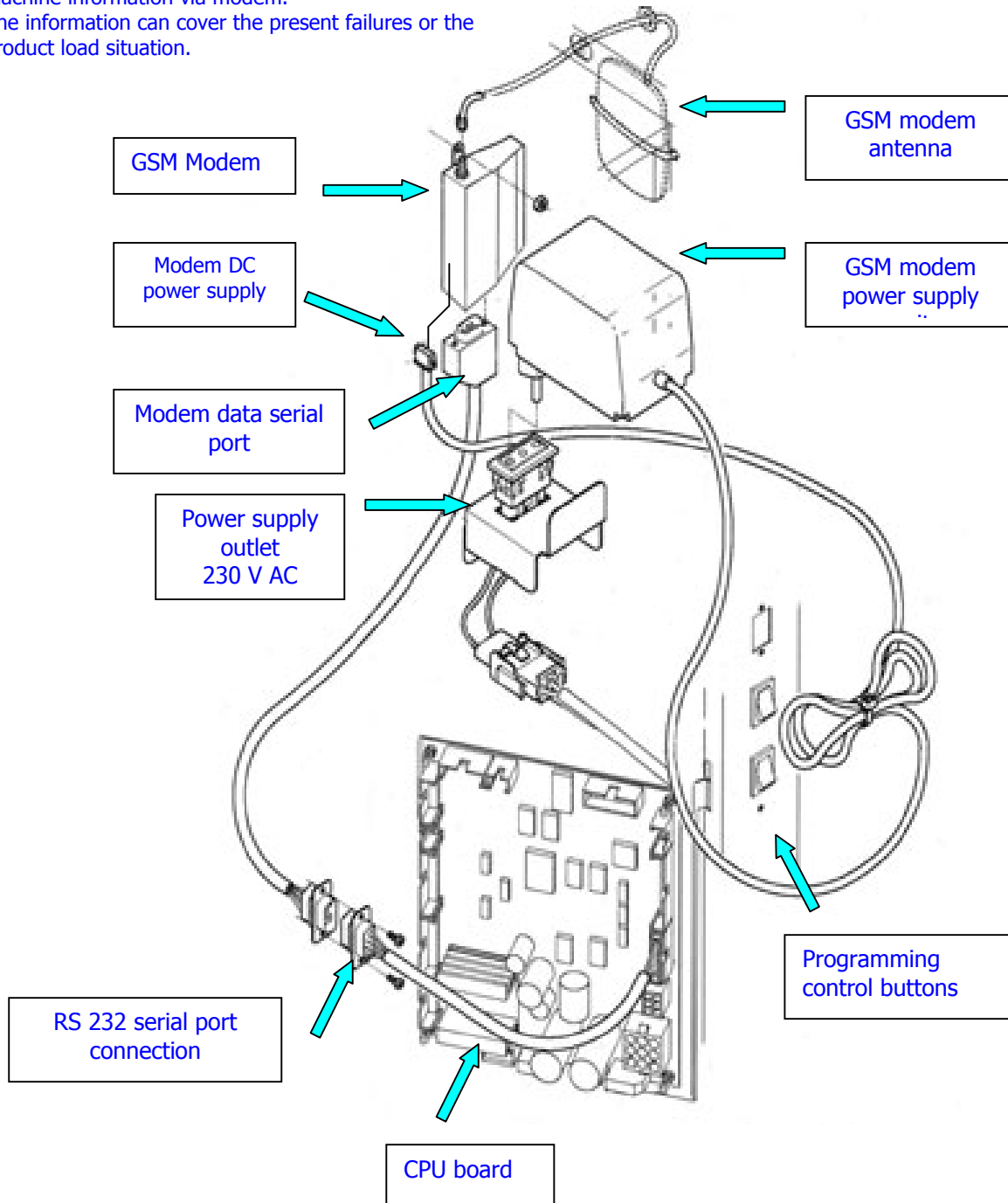
For espresso coffee it is reduced considerably because of the coffee compress reaction that slows down the water flow, while it is accelerated in the instant drinks selections, since there are no obstructions to the water flow. Therefore, in the event of changing the doses set at the factory, some measurements must be made using measuring containers.

11 – DIAGRAM OF KITS SUPPLIED ON REQUEST

Exploded view of GSM kit

The GSM Kit allows the machine software to communicate with a pre-set telephone number, sending real-time machine information via modem.

The information can cover the present failures or the product load situation.



The diagram is an example only and has the purpose of indicating the installation regarding connections. For all other information and connection diagrams follow the instructions included in the KIT documentation.

12 - TROUBLE-SHOOTING

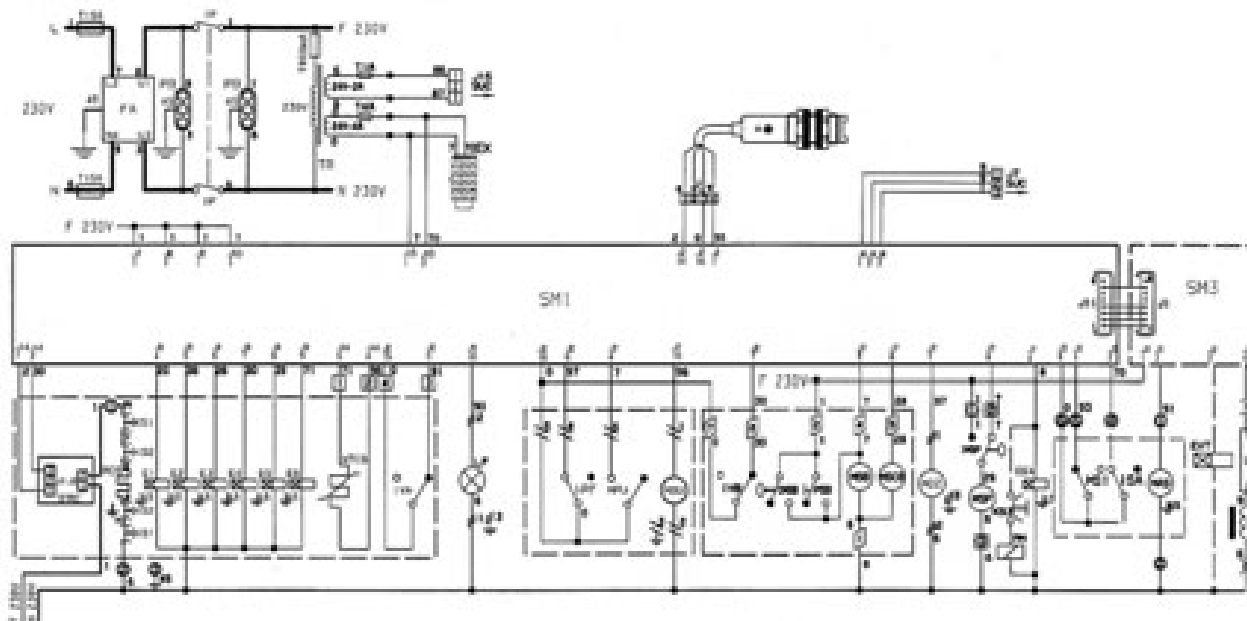
Problem (and/or indication on the display)	Possible cause	Solution
The machine does not go into the boiler heating phase, remaining in the "installation" phase	No water flow from the mains or insufficient pressure (5-85 N/cm ²) The air-break microswitch is faulty Water inlet solenoid valve locked by the overflow tube and activated by the relevant relay	Check the presence of one or more of situations indicated and once identified the cause do as follows: Short-circuit the microswitch to check it 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 K18
The display indicates the message "No coffee"	The grinder motor is locked because 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 identified the cause: Check the wear of the brushes Free the grinder wheels with the utmost care, as blocked wheels would have triggered the overheating protection, which is self-resetting. Open the shutter, add coffee
The display indicates the message "Coffee release failure"	Failure to the release magnet. Failure to the coffee dose microswitch. Failure to relay K01	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 KIKKO, in the event of using a microswitch with different characteristics considerable discrepancies in the ground coffee doses may occur.
The display indicates the message "Instant boiler failure"	The boiler does not heat Dry operation protection system triggered. Anti-boiling protection system triggered.	The machine is locked if the set temperature is not reached within 20 minutes after the machine start or after the last selection. Check the correct operation of the heating element, the dry-operation thermostat, the anti-boiling system, the probe and of the actuation TRIAC. In the event of replacing the probe, the correct temperature must be re-adjusted using the trimmer. In the event of triggered overheating control device, the cause must be identified and corrected before resetting the system.
The display indicates the message "Espresso boiler failure"	The boiler does not heat Dry operation protection system triggered.	The machine is locked if the set temperature is not reached within 20 minutes after the machine start or after the last selection. Check the correct operation of the heating element, the dry-operation thermostat, the probe and of the actuation Triac and control card. In the event of replacing the probe, the correct temperature must be re-adjusted using the trimmer. In the event of triggered overheating control device, the cause must be identified and corrected before resetting the system.

<p>The display indicates the message</p> <p>"No cups"</p>	<p>No cups in the dispenser Microswitch failure The cup column does not rotate</p>	<p>If no cups were loaded when starting the machine, the column rotation ratiomotor is activated to search for a full column and if no cups are found within a 60 sec "time-out", indicated by the specific microswitch, the machine is locked.</p> <p>Excluding the fact of a real lack of cups, the correct microswitch functioning must be checked and in the event of failure they must be replaced with identical characteristic microswitches.</p> <p>In the event of locked ratiomotor, check for the correct actuation of relays K2 and K3.</p>
<p>The display indicates the message</p> <p>"Cup release failure"</p>	<p>The signal is activated if the machine is fitted with the cup sensor photocell kit and no cups are detected.</p>	<p>After three failed attempts at releasing cups, the display indicates the "no cups" message; the software can be programmed to lock the machine or to consent dispensing with a cup placed manually: check the software setting.</p>
<p>The display indicates the message</p> <p>"Espresso unit"</p>	<p>The espresso unit failed to reposition. Failure to the lower dead centre positioning microswitch. Failure to relay K08</p>	<p>Check 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 card or reprogram the CPU.</p>
<p>The display indicates the message</p> <p>"Fresh-brew piston 1"</p>	<p>Due to wrong positioning of the FB unit.</p>	<p>The piston opening time must be less than 8 seconds; if this time is exceeded all FB coffee-based selections are disabled. Check the positioning microswitch, the ratiomotor operation and the correct travel inside the cylinder.</p>
<p>The display indicates the message</p> <p>"Fresh-brew scraper 1"</p>	<p>Due to wrong positioning of the coffee waste scraper.</p>	<p>The scraper positioning time must be less than 6 seconds; if this time is exceeded all FB coffee-based selections are disabled. Check the positioning microswitch, the ratiomotor operation and the correct sliding of the scraper.</p>
<p>The display indicates the message</p> <p>"Fresh-brew piston 2" Fresh-brew scraper 2</p>	<p>This message is displayed when two fresh-brew coffee units are present in the layout, and the cause is as above.</p>	<p>As above</p>
<p>The display indicates the message</p> <p>"Volumetric counter" (Impeller)</p>	<p>The set liquid is not reached within 60 sec. (The volumetric counter is installed only in the ASTRO espresso model and is used only to measure the water dose for coffee based selections. For instant selections the water dose is determined by the timed solenoid valve opening set via software.</p>	<p>The water amount for espresso coffee selections is ensured by a volumetric counter; the water flow causes an impeller to rotate and, by means of a sensors, sends a number of pulses corresponding to the water dose programmed in the SW.</p> <p>If such dose is not reached within 60 sec it means that there is a problem: Check the correct operation 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. Check that the impeller rotates freely and that there are no impurities to limit its rotation.</p>
<p>The display indicates the message</p> <p>"Air-break failure"</p>	<p>No water from the mains. Faulty air-break microswitch Failure to the microswitch float actuation system. In the Instant version the air-break is incorporated in the open-top boiler.</p>	<p>If in the period taken to make 7 selection 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.</p>
<p>The display indicates the message</p>	<p>Wrong RAM data that must be retrieved by initialising the Eprom. There can be many causes, among which also above standard electromagnetic interference.</p>	<p>Enter into the installation procedure and initialise the software; if the failure persists replace the CPU or reprogram the flash EPROM.</p>

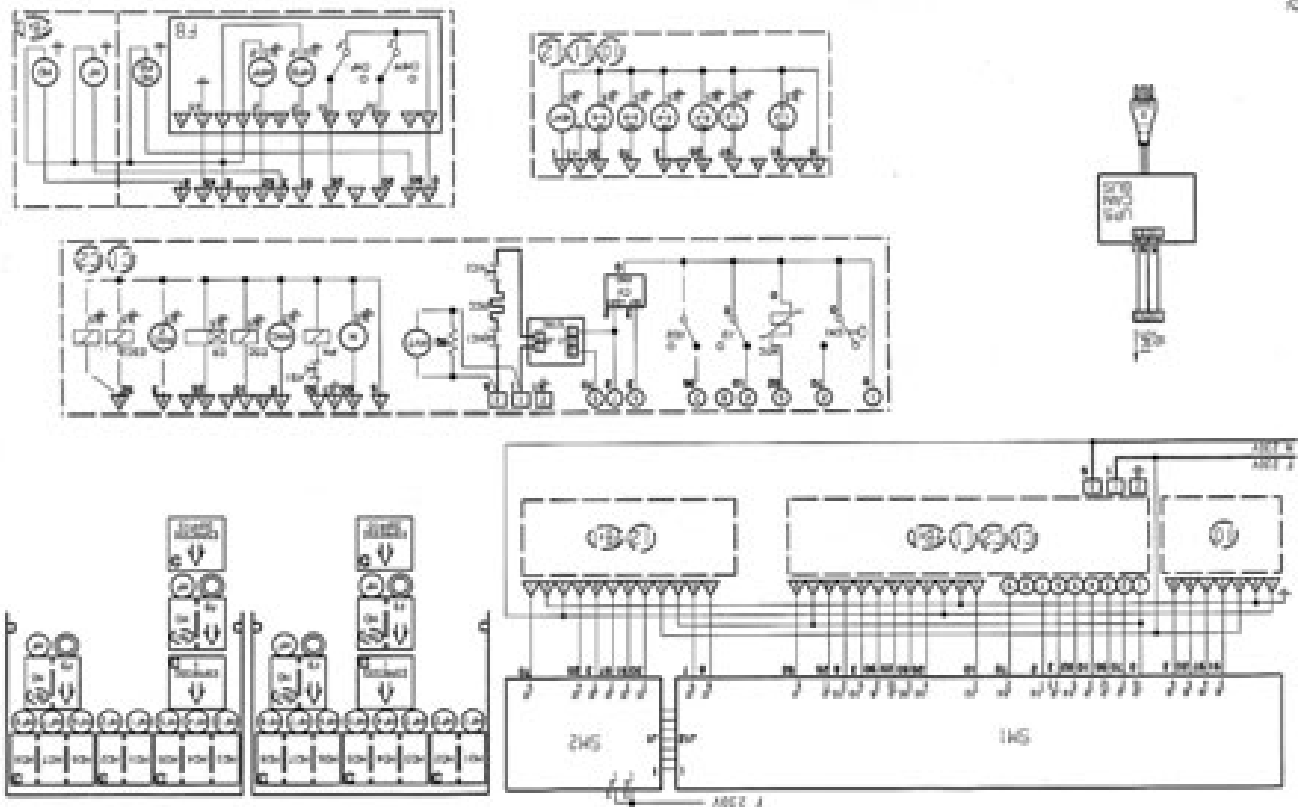
"RAM data"		
The display indicates the message "Water failure"	If the air-break microswitch is closed for more than a minute even with the solenoid valve activated.	Check the water inlet solenoid valve. Check the correct actuation of relay K 12. Check the air-break microswitch. Check the tank float microswitch. Check the presence of water from the mains.
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 they need replacing. Check the coffee dose, weighing it at least 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. Excessively fine grinding. Faulty pump by-pass, or stuck open due to calcium scaling. Clogged or scaled coffee filters. Scaled 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 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 and the solenoid valves.
The mixers "clog up"	The beater failed to rotate. Powder removal drawer full. Insufficient water to powder ratio. Incorrect variation of dispensing cycles 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.
The display indicates the message "Mobile spouts"	If the spouts do not reach the dispensing position, the machine is stopped and is disabled completely.	The dispensing position is controlled by a microswitch that is activated by a cam, while the return time for stand-by positioning is determined by a set operating time of the ratiomotor. Check that the microswitch works correctly and the position is correct.
The display indicates the message "Coin mech failure"	The machine locks if it receives a pulse longer than 2 seconds on a parallel line or if the serial communication does not take place for more than 30 seconds (Executive protocol) or 75 seconds (BDV protocol).	Check if the connection is correct, the protocol card is inserted correctly, and software setting is correct; if necessary replace the payment system.
The display indicates the message "Machine board"	There is no communication between the machine actuation card and the CPU board.	Initialise the software; if the failure persists replace the CPU board or reprogram the actuation card.
The display indicates the message "Waste container full"	The microswitch of the liquid waste container float was triggered.	The liquid waste container needs to be emptied, the microswitch is faulty, or the float is not positioned correctly.

13 - WIRING DIAGRAMS

Wiring diagram



Partial wiring diagram



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

Outline and instructions for use

Notes: What is indicated by the European Directive

Directives **EEC 93/43 and 96/3** regard 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 therefore a system that addresses the analysis of any potential risks in the manufacturing and distribution cycle of food product and the identification of 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 a correct use of the machine, the directives must be fully applied. **The operator is responsible for correct operations on a vending machine**

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.
- 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.
-

Cleaning the machine (Page 32, 33, 34)

- Carefully observe the following cleaning instructions!
- 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 checklist log for cleaning operations.
- 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 6 min 30 sec, excluding the time for test dispensing)



Fig. 1



Fig. 2



Fig. 3

Open the door and disconnect the machine from the power supply **(FIG 1)**
Remove the liquid collection container, empty it and rinse it thoroughly. Empty the grounds container and rinse it thoroughly.
Remove the powder dispensing spouts, open the suction compartment and clean everything thoroughly using specific hygiene products

(FIG 2-3)

Remove the coffee waste container and clean.

Remove the coffee unit, clean and rinse with hot water. Dry it thoroughly using an air jet **(FIG. 8)**.

Remove the sugar-dispensing spout and clean thoroughly **(FIG 7)**.

Clean the cup dispenser assembly **(FIG 4)**.

Remove and clean the cup chute **(FIG. 4)**

Remove and clean the mobile dispensing spout assembly **(FIG. 6)**

Remove and clean the dispensing compartment assembly **(FIG. 5)**

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.

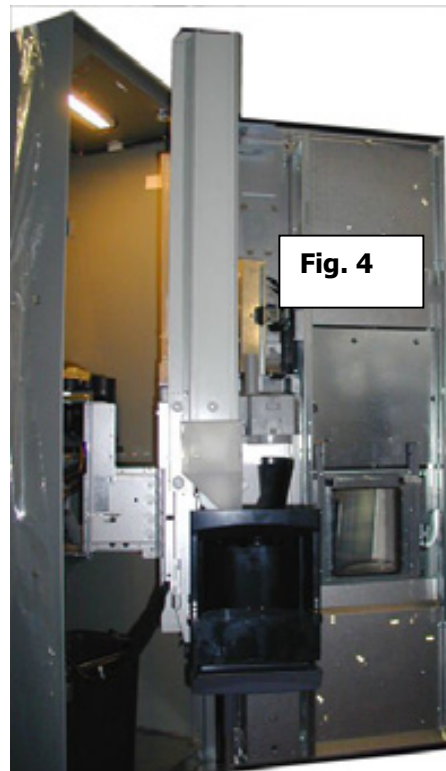


Fig. 4



Fig. 8

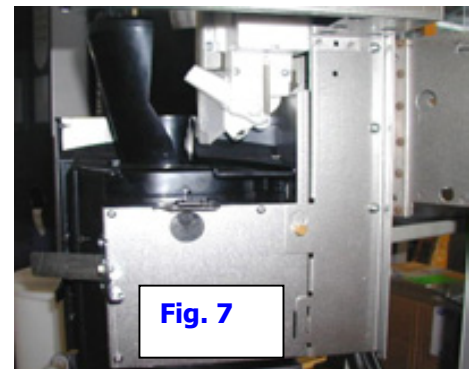


Fig. 7

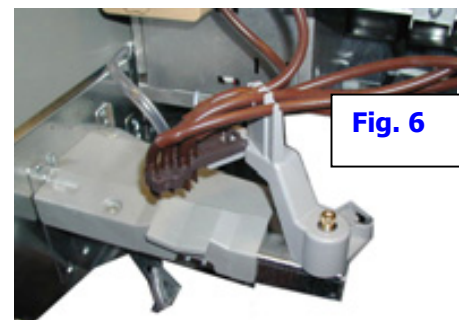


Fig. 6



Fig. 5

Weekly cleaning and hygiene

(Expected time 10 min, excluding the time for test dispensing)



Fig. 1



Fig. 2



Fig. 3

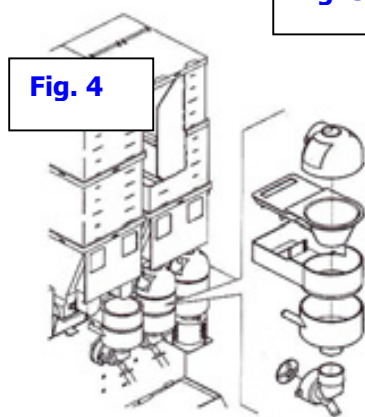


Fig. 4

Open the door and disconnect the machine from the power supply (**FIG. 1**)

Remove the powder dispensing spouts, open the mixer suction compartment and clean thoroughly using specific hygiene products (**FIG. 2-3**)

Remove the containers, empty them completely and clean thoroughly (**FIG. 5**)

Remove the liquid collection container and the grounds container, empty and clean them.

Empty any residue from the coffee dispenser assembly, clean thoroughly and rinse with hot water, paying special attention to the electrical parts.

Remove the sugar-dispensing spout and clean thoroughly (**FIG. 7**).

Remove and clean the mobile spouts assembly (**FIG. 8**)

Remove and clean the dispensing compartment assembly (**FIG. 9**)

Disassemble completely the mixers and clean thoroughly (**FIG. 2-3-4**)

Empty the powder collection containers, located within the steam suction system, and disinfect. (**FIG. 2-3-4**)

Clean the rotation base of the cup stacker

(**FIG. 6**) clean any encrustations from the cup chute

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 log.



Fig. 5



Fig. 9



Fig. 8

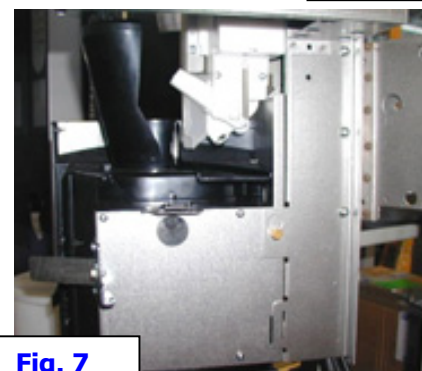


Fig. 7



Fig. 6

Note: it is advisable to replace the mixers with already sanitised ones and later carry out the hygiene operations at the workshop.

Monthly cleaning and hygiene (or every 5000 selections)

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



FIG 1

IN ADDITION TO THE **WEEKLY** OPERATIONS, ALSO THE FOLLOWING MUST BE CARRIED OUT:

Disconnect the machine from the power supply, and then open the door (**FIG. 1**).

Remove the brewer unit from the machine and disassemble, then clean all coffee residues and rinse thoroughly with hot water, check the filters for clogging and if necessary descale 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. 2-3**)

Disassemble the mixers completely, clean and wash using sanitising products, especially the powder removal areas, disassemble completely the wheel and check the state of the seal, when reassembling do not touch with the bare hands (**FIG. 6-7-8**)

NOTE: IT IS ADVISABLE TO CARRY OUT THIS OPERATION AT THE WORKSHOP AND USE ALREADY SANITISED MIXERS

Regenerate the water softener (if installed) using the special salt solution, even if the softener efficiency test is still positive (**FIG. 5**)

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

Note: it is advisable to carry out this operation at the workshop and use already regenerated filters

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

Thoroughly clean the cup, sugar and stirrer dispenser assembly, if necessary removing it from the machine.

Enter the operations carried out in the HACCP hygiene program log



FIG 2



FIG 3

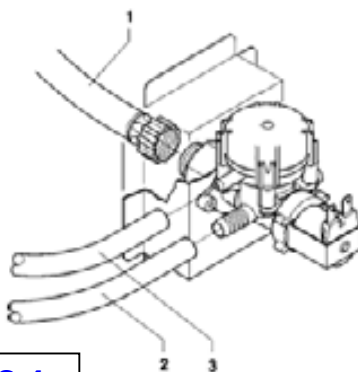


FIG 4



FIG 8

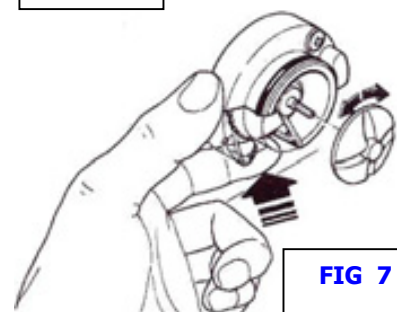


FIG 7

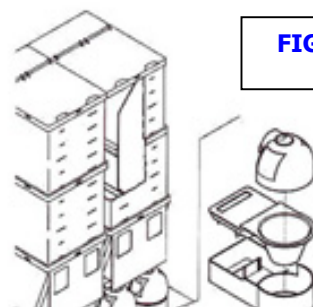


FIG 6



FIG 5