N&W
GLOBAL VENDING

AFTER-SALES SERVICE

SERVICE MANUAL

brio3

(FRESH BREWER Version with open-top boiler)

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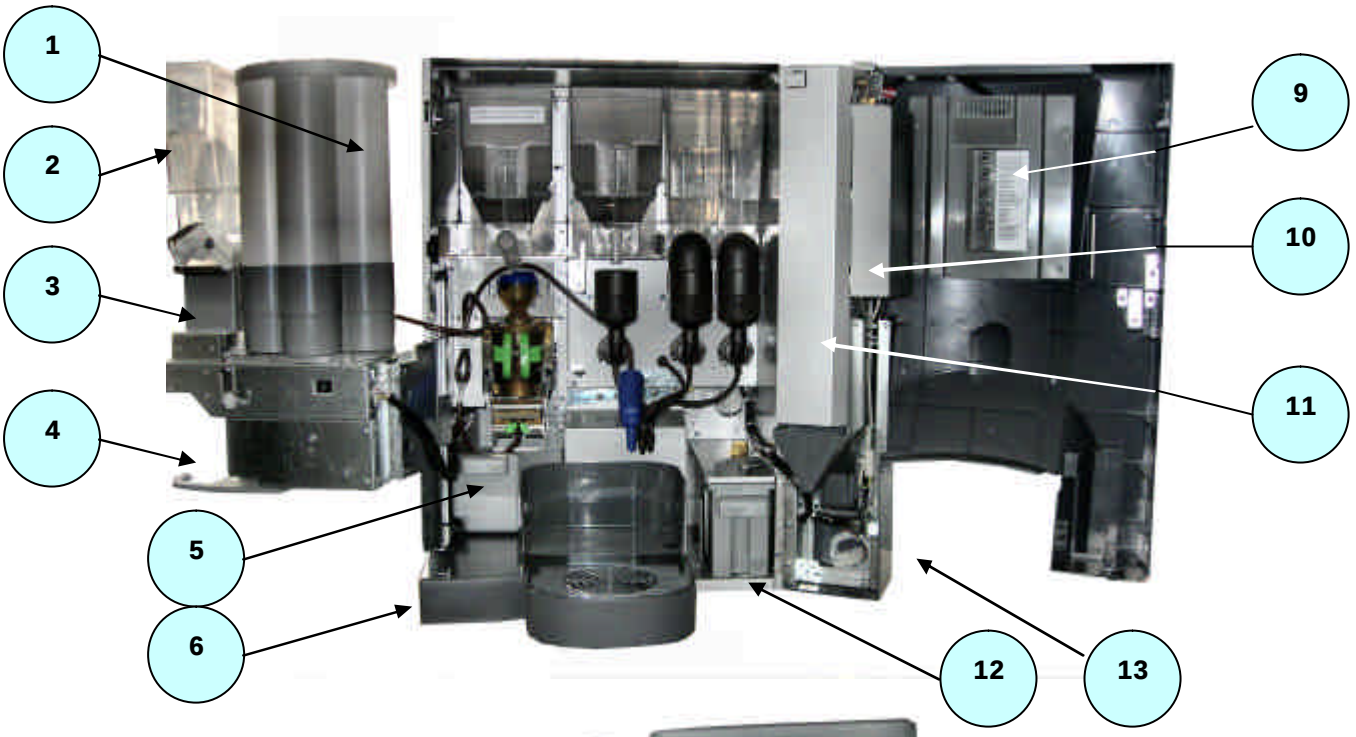

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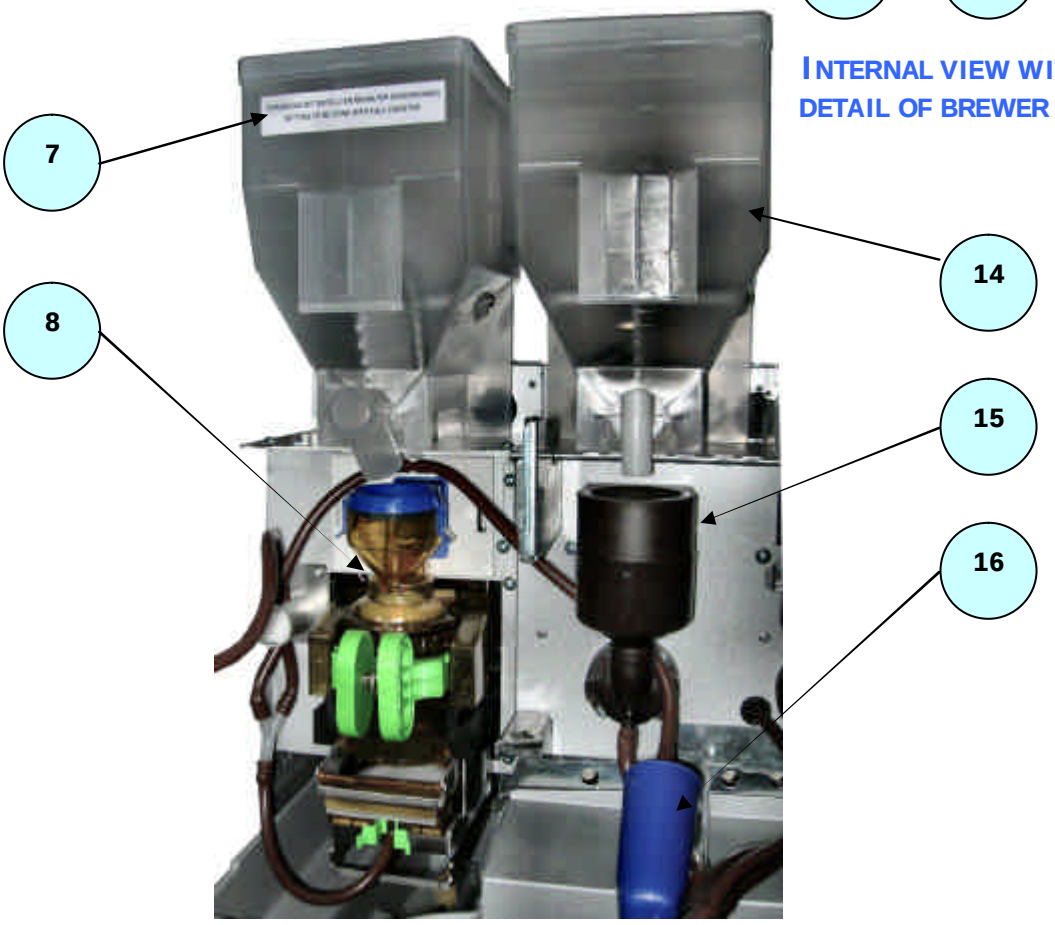
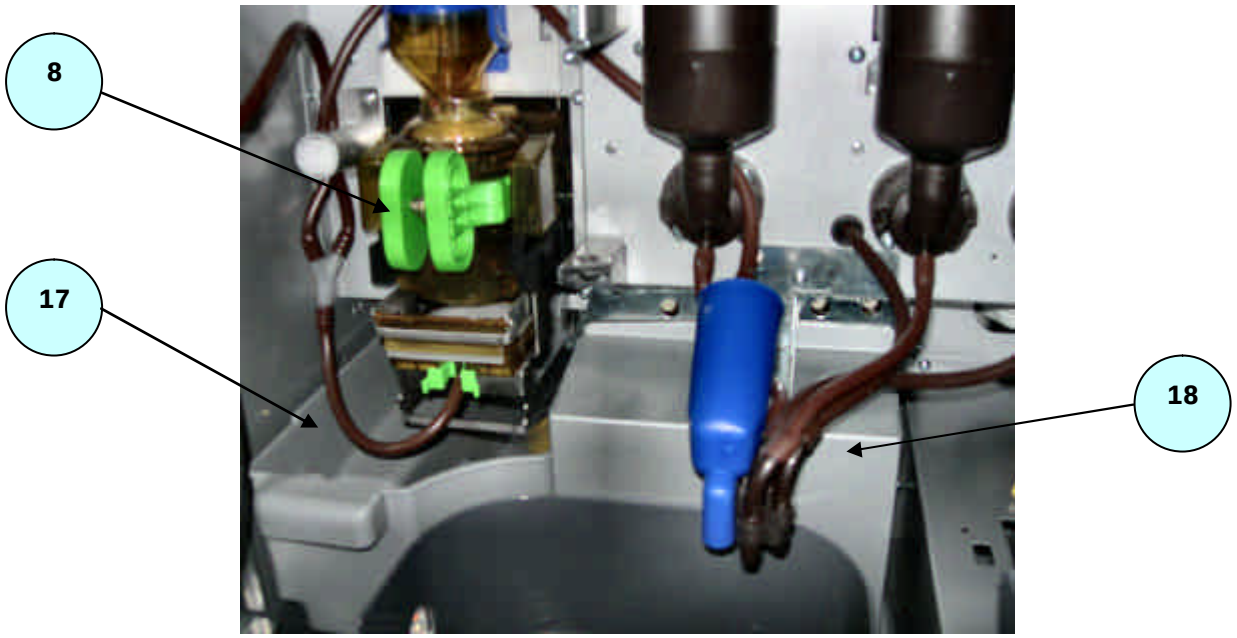


1 INTERNAL MAIN COMPONENTS



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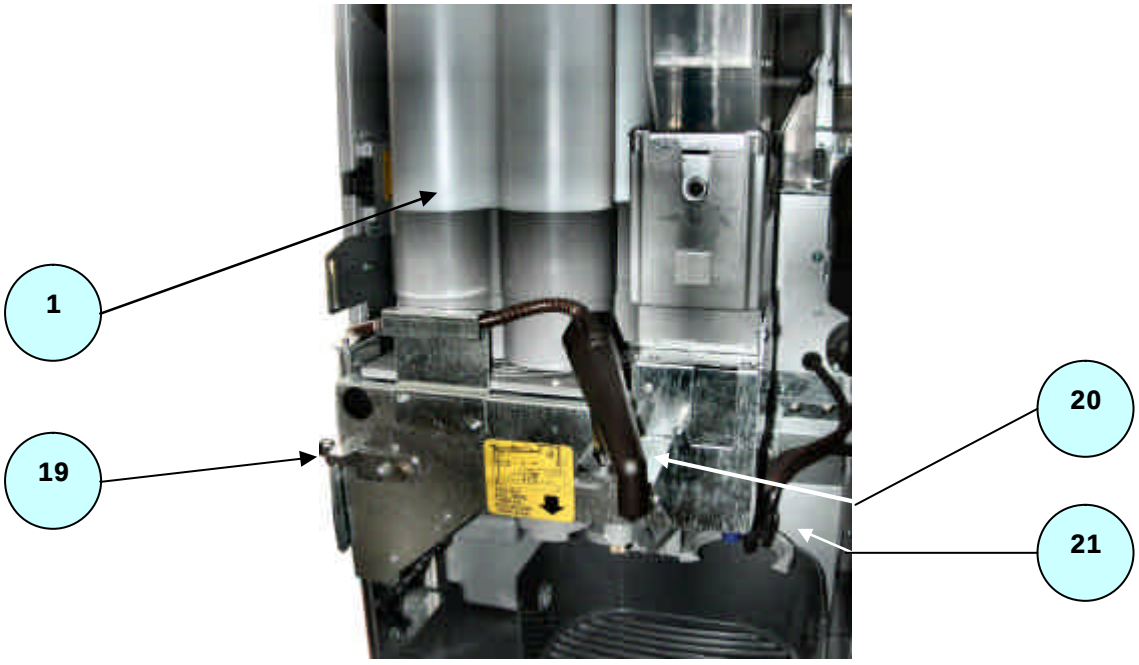
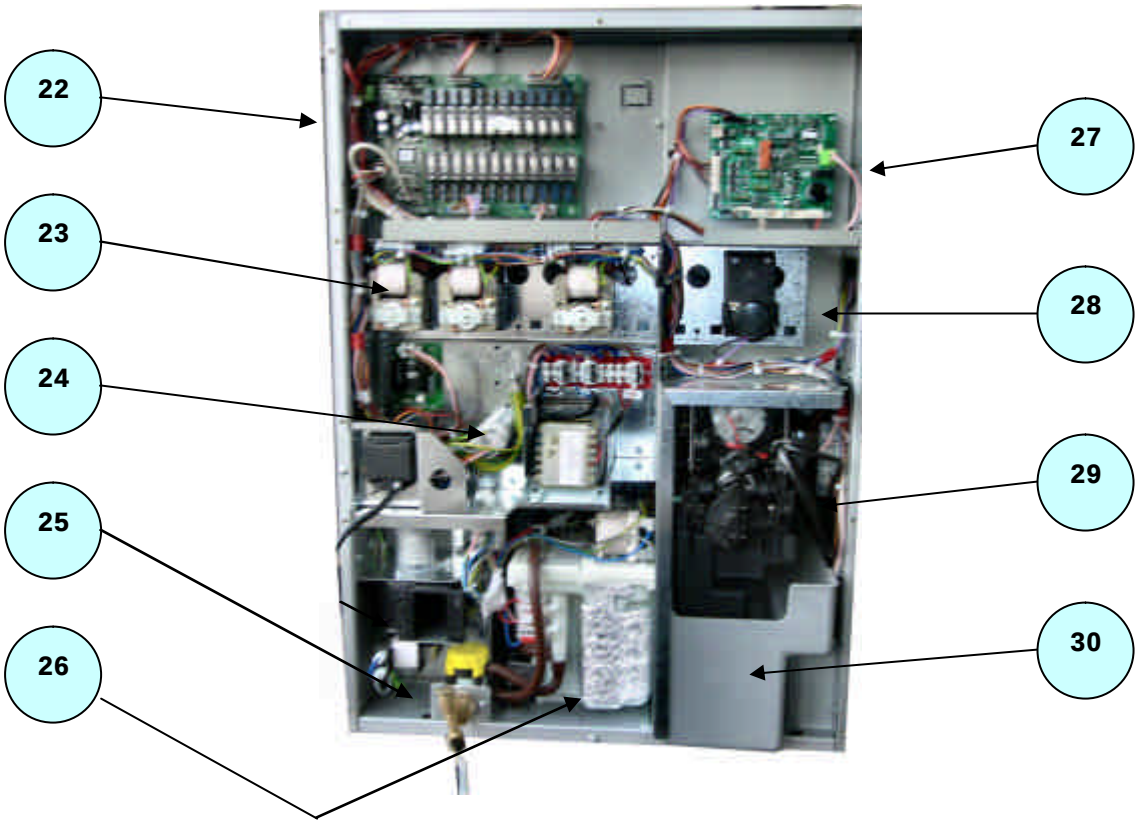
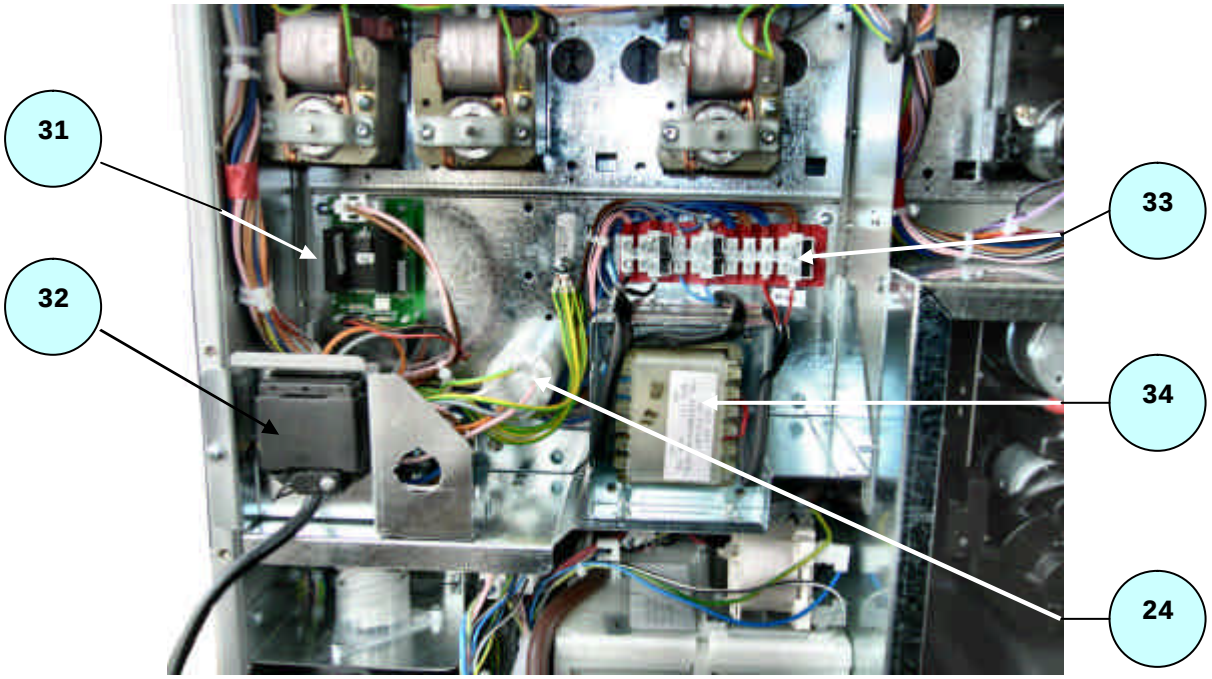


INTERNAL VIEW, WITH DETAIL OF JUG SPOUT (CUP DISPENSER UNIT)

1 INTERNAL MAIN COMPONENTS

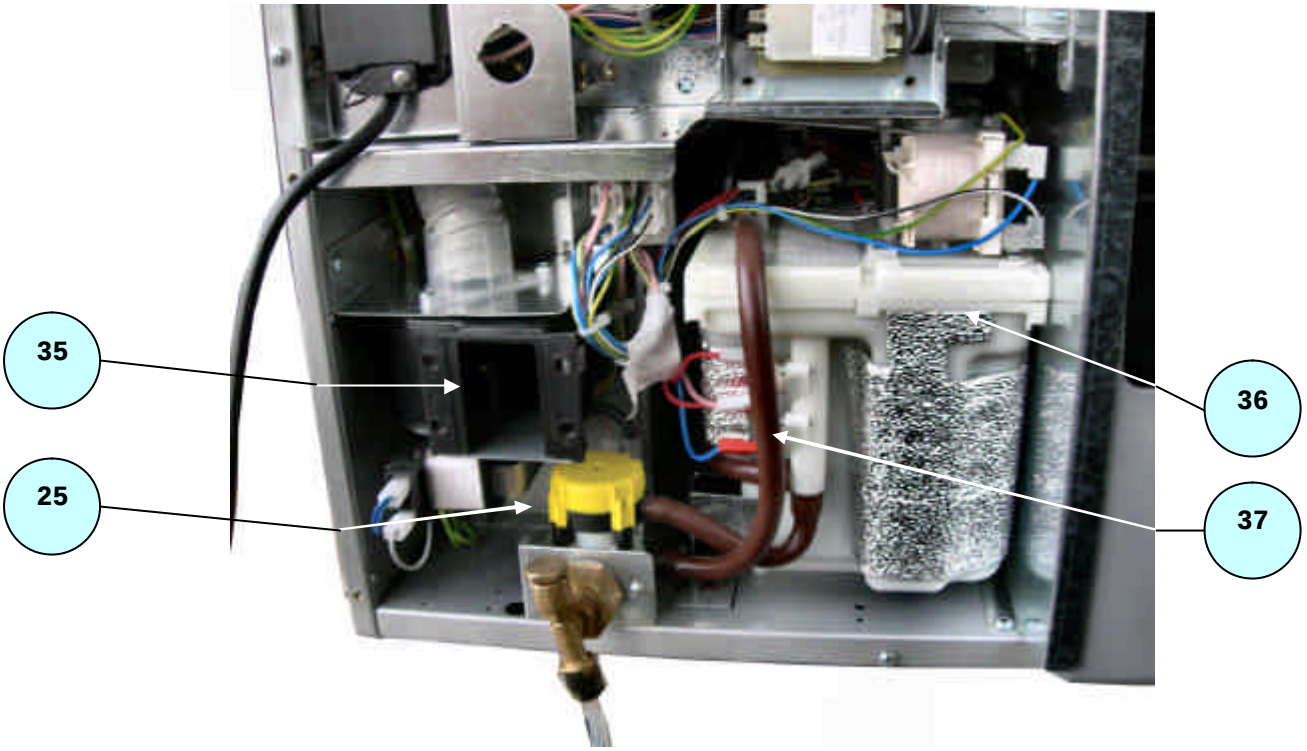


REAR VIEW WITHOUT PROTECTIVE CASING

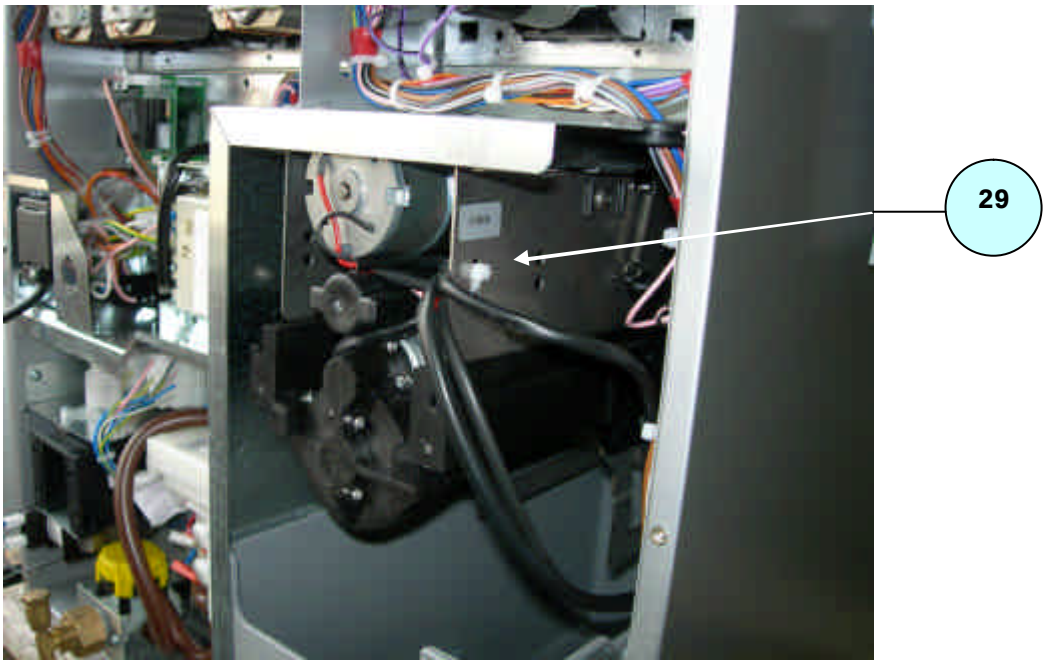


DETAIL OF POWER SUPPLY UNIT

1 INTERNAL MAIN COMPONENTS

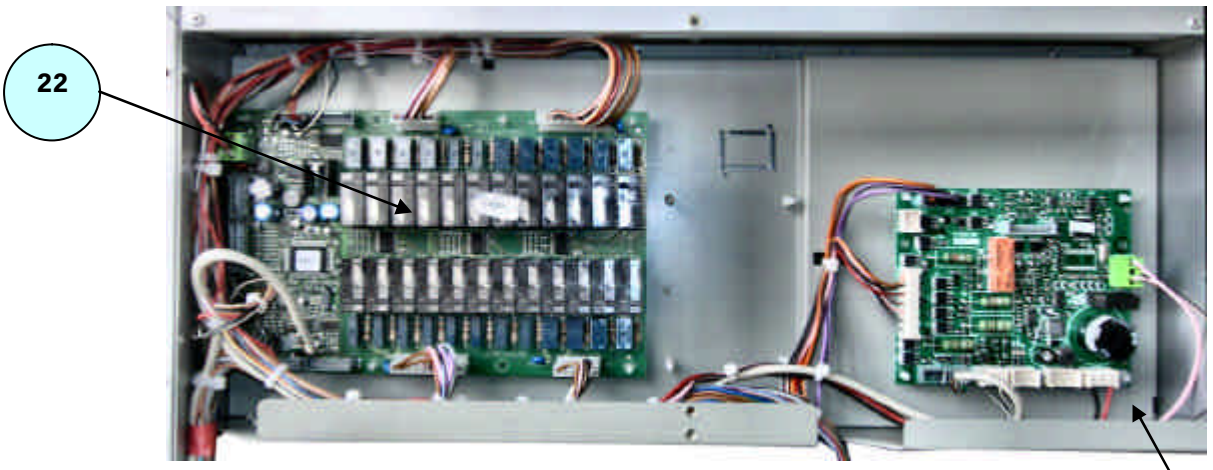


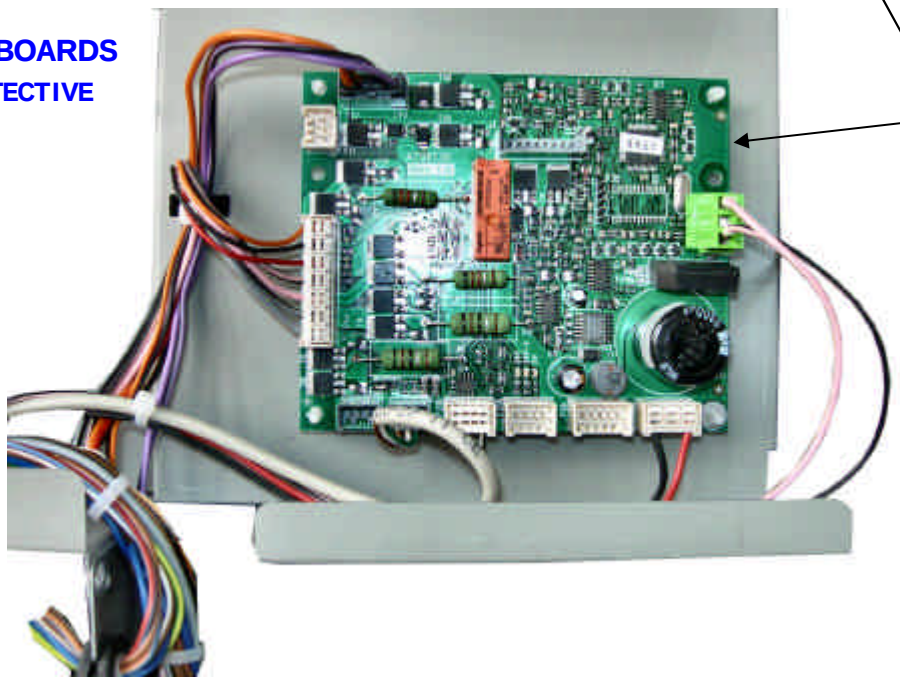
DETAIL OF WATER INLET SOLENOID VALVE AND REAR SIDE OF BOILER



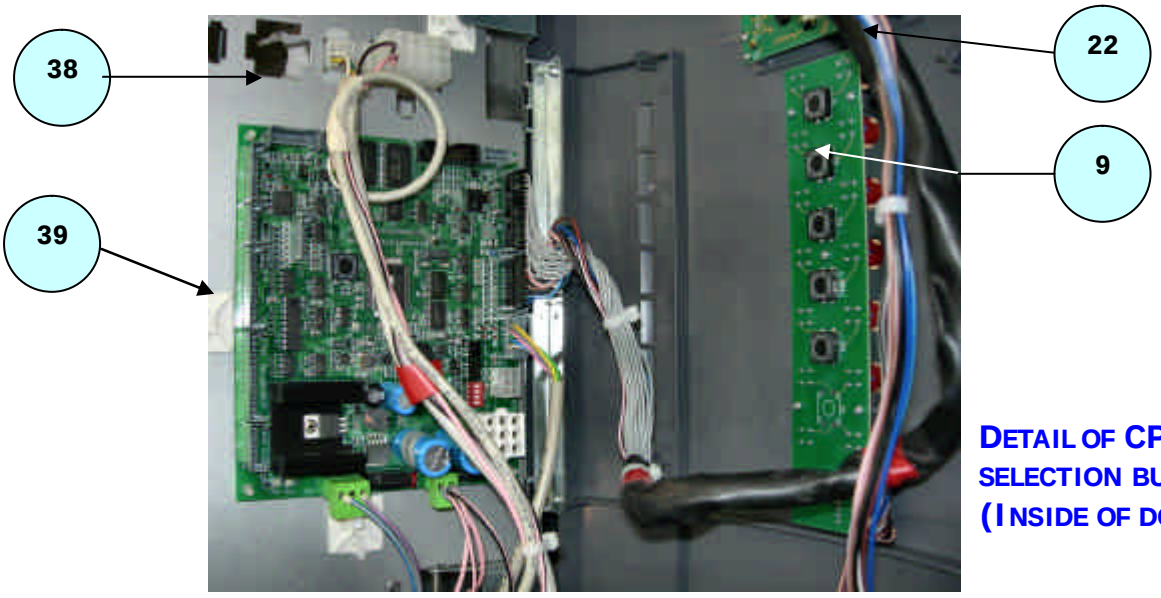
DETAIL OF FB UNIT – REAR SIDE

1 INTERNAL MAIN COMPONENTS





DETAIL OF ACTUATION BOARDS (REAR SIDE WITHOUT PROTECTIVE CASING)



DETAIL OF CPU AND SELECTION BUTTON BOARDS (INSIDE OF DOOR)

1.2 - LIST OF MAIN COMPONENTS

N° REF.	DESCRIPTION
1	CUP STACKER
2	SUGAR CANISTER
3	SUGAR DOSER DEVICE
4	CUP POSITIONING FORK
5	SOLID WASTE CONTAINER
6	LIQUID WASTE PAN
7	COFFEE CONTAINER
8	FB BREWER UNIT
9	MAINTENANCE BUTTONS
10	CPU BOARD COMPARTMENT
11	COIN MECHANISM COMPARTMENT
12	COIN BOX
13	CUP SENSOR (OPTIONAL)
14	INSTANT PRODUCT CONTAINERS
15	MIXER
16	COFFEE SPOUT
17	COFFEE WASTE PAN
18	ASSEMBLY
19	CUP DISPENSER RELEASE LEVER
20	JUG SPOUT
21	SPOUTS FOR INSTANT PRODUCTS
22	ACTUATION BOARD
23	POWDER DOSER DEVICES
24	POWER SUPPLY INTERFERENCE SUPPRESSOR
25	WATER INLET SOLENOID VALVE
26	INSTANT BOILER
27	ACTUATION BOARD OF FB BREWER UNIT
28	RATIOMOTOR FOR FB COFFEE
29	BREWER UNIT
30	WASTE CONTAINER
31	BOILER ACTUATION BOARD
32	POWER SUPPLY CABLE
33	TERMINAL STRIP AND TRANSFORMER FUSES
34	TRANSFORMER
35	STEAM EXHAUSTER
36	BOILER
37	ANTI-BOILING THERMOSTATS
38	RS232 SOCKET
39	CPU BOARD

2 – TECHNICAL DATA AND FEATURES

Height (without base cabinet)	760 mm
Width	540 mm
Depth	585 mm
Overall depth with door open	1000 mm
Weight	75 Kg
Power supply voltage	230 V AC - 50 Hz
Installed power	2400 W
Capacity of cup dispenser	Approx. 300 (70-71 dia.)
Capacity of stirrer dispenser	Approx. 255

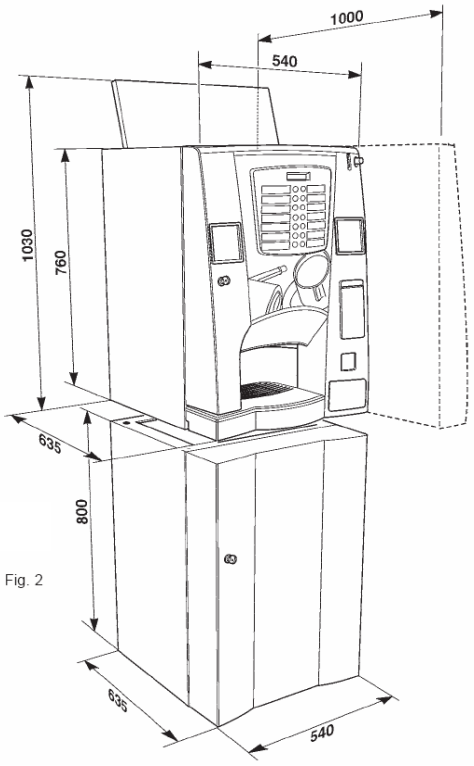


Fig. 2

Payment systems used:

Coin mechanisms and 24 V DC validators with EXECUTIVE, BDV and MDB protocols

Accessories:

Water supply kit with 20 litre tank
Equipped base cabinet and plain base cabinet
Height extension for base cabinet (installation in a bank of machines)
Master/slave kit (bank with Snakky) Irda kit, RS 232 jack kit
Cup detection sensor
External dispensing of jug

Water supply:

From the mains, with a water pressure of 5 to 85 N/cm^2.
Pre-set to control the water supply from an internal tank (optional kit)

Power consumption

To reach standby temperature 272 W/ h
For each hour of stand-by 99.9 W/ h

Base versions:

Espresso – Instant – Fresh brewer

Boiler temperature

Adjustable via software setting

Safety devices

Main door-switch
Presence of waste tray
Water inlet solenoid valve with overflow device
Manual-reset boiler safety thermostat
Manual-reset instant boiler anti-boiling thermostat
Air-break float jamming (incorporated into the boiler)
Liquid waste pan float
Boiler sensor control (short-circuit or failure)
Double heating and timing protection for:
Pump – Doser devices – Coffee unit ratiomotor – Coffee grinder – Mixer motors
Cup column shift ratiomotor – Cup release ratiomotor
Solenoid valves protected by own impedance (ED 100%)
Fuse protection for: Transformers and electronic boards

Controls

Empty cup dispenser – Water failure –Brewer unit position – Full liquid waste pan – Boiler temperature – Position of mobile dispensing spouts.

3 – ELECTRICAL SAFETY AND RELEVANT STANDARDS

The vending machine "brio3" was designed and made in compliance with the provisions of the following directives and related European standards:

MACHINE SAFETY EEC 98/37

EN 60529 UNI EN 292 –1-2 IEC 695-2-2

LOW-VOLTAGE DIRECTIVE EEC 73/23 ; EEC 89/392 ; EEC 89/336

(the low voltage directive covers all equipment powered with voltage below 400 V AC)

The following European standards are applied**:**

EN 60335-2-14 EN 60335-2-15 EN 60335-2-24 EN 60335-2-75

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

EN 61000-3-3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-11

With regard to **Low Voltage** and **Electromagnetic Compatibility** this vending machine brio3 was tested and certified by **IMQ** (the most important certifying body authorised by ministerial decree).
It is therefore prohibited (on pain of voiding the warranty and the responsibility of the certification) to replace any electrical component with non-original parts during the routine and extraordinary maintenance operations.

Therefore it is also prohibited to:

Tamper with or deactivate the safety systems installed in the vending machine.
Install the vending machine outdoor or in any case in a place that is not protected from the weather.
Use the vending machine for purposes other than those indicated in the sales contract.
Connect the vending machine by means of extension cords or multiple sockets and/or adapters.
Use water jets for cleaning.

Then, it is also compulsory to:

Verify the conformity and suitability of power supply line and of the power outlet

4 – REQUIREMENT FOR THE USERS

For safety purposes concerning the above directives, **three** different operators with different and specific qualifications must be defined.

USER

The user is practically the final user who buys the products from the machine.
The user must not have any access whatsoever to the inside of the machine.

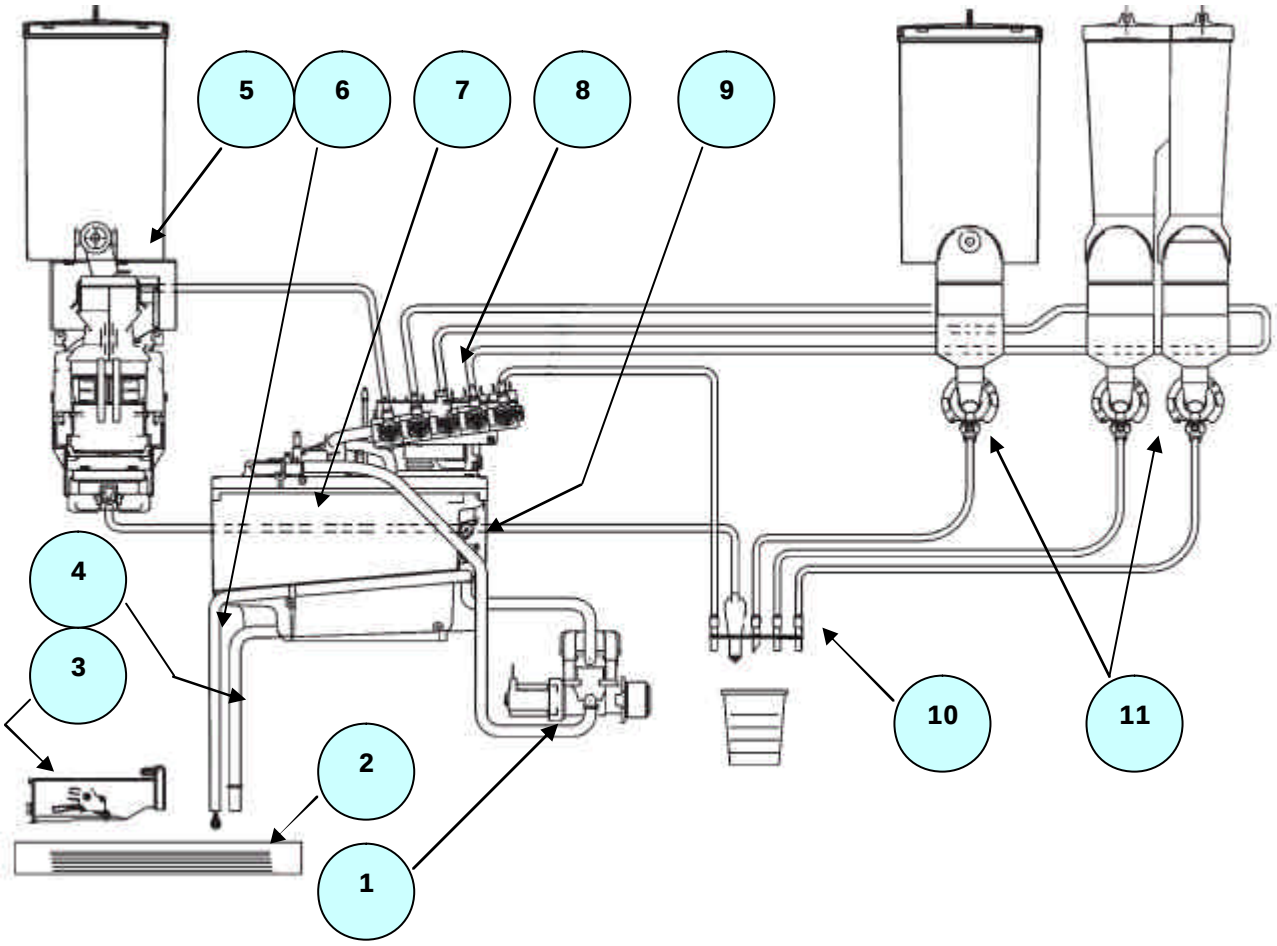
PERSON IN CHARGE OF REFILLING AND ROUTINE CLEANING

The person responsible for refilling has the key for opening the machine and is in charge of the refilling, cleaning and internal hygiene of the machine.
He must not have any access to energised parts or moving parts.

MAINTENANCE TECHNICIAN

The maintenance technician must be a highly skilled person and must be aware of the electrical hazards in the event of complex technical operations and can operate with the machine switched on and the door open, using the safety key supplied

5 – HYDRAULIC LAYOUT “FRESH BREWER”
OPEN-TOP BOILER

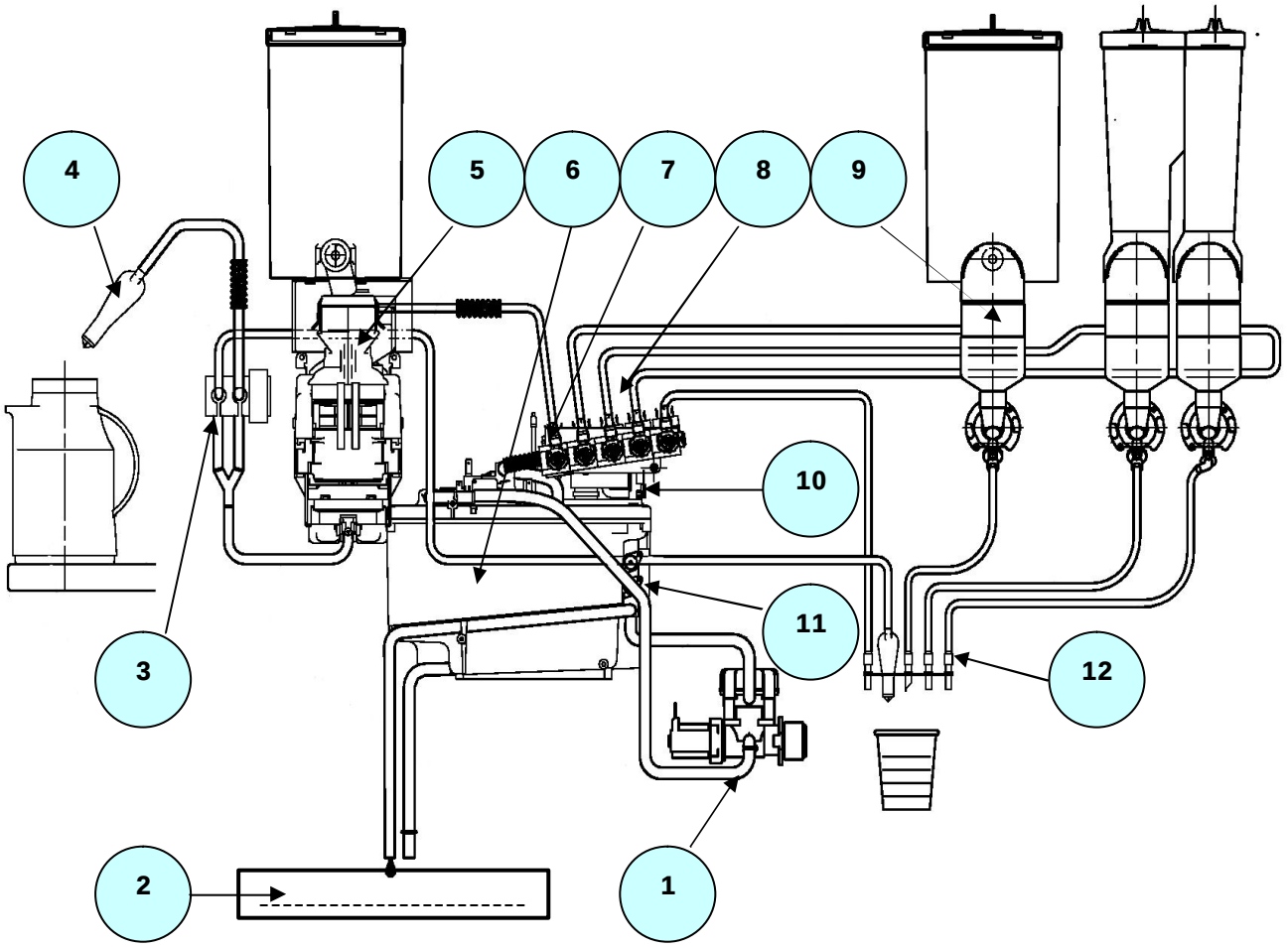


COMPONENTS OF FRESH BREWER VERSION

REF.	DESCRIPTION	REF.	DESCRIPTION
1	Water inlet solenoid	7	Open-top boiler
2	Liquid waste tray	8	Instant solenoid valves
3	Pan level microswitch	9	Anti-boiling thermostat
4	Drain pipe	10	Spouts assembly
5	FB Brewer unit	11	Mixer
6	Overflow tube		

The Fresh brewer version is fitted only with an open-top boiler, having the operating pressure equal to the atmospheric pressure (EN 60335-2-75 standard)

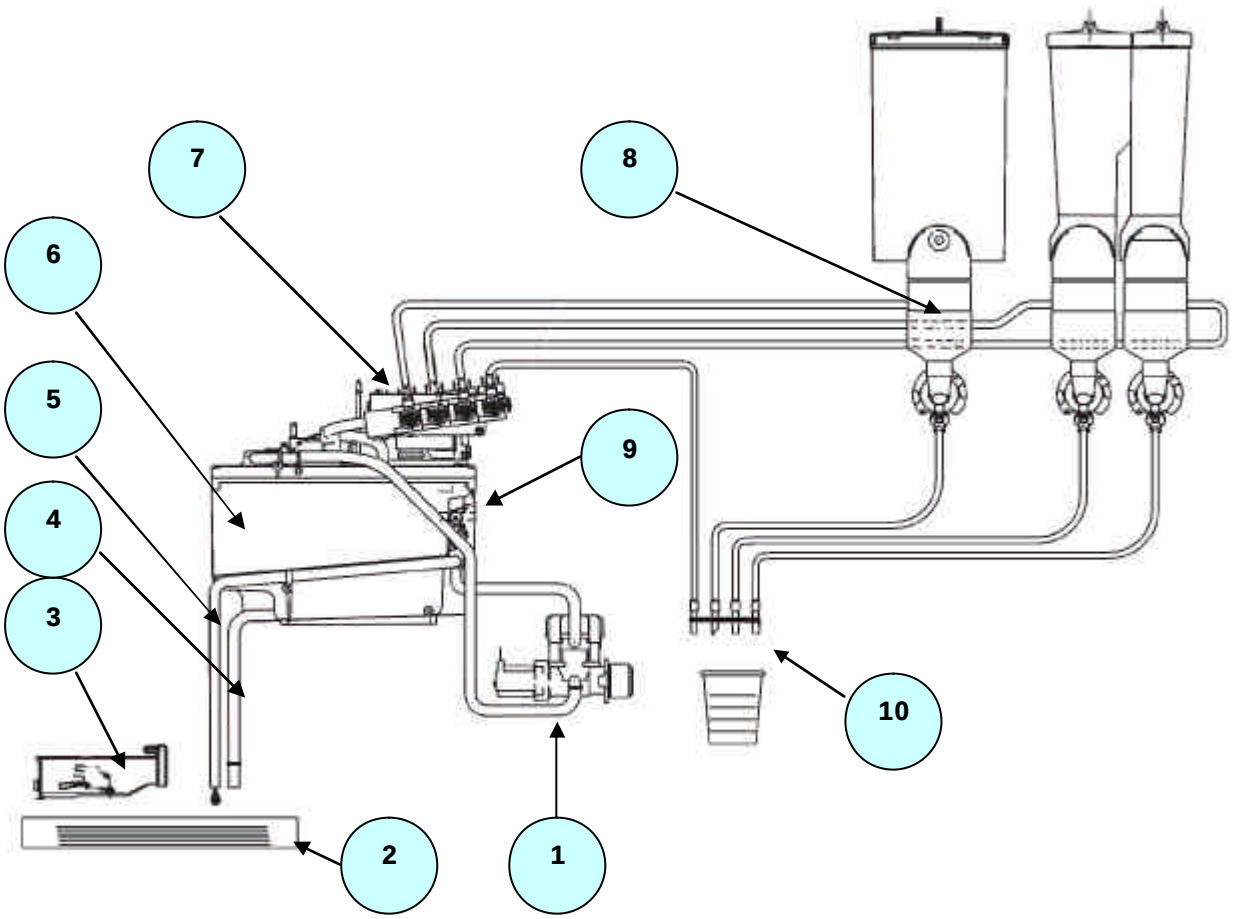
6 – HYDRAULIC LAYOUT " FRESH BREWER"
Version with jug (BIG JUG) for FB coffee



COMPONENTS OF FRESH BREWER VERSION (BIG JUG)

REF.	DESCRIPTION	REF.	DESCRIPTION
1	Water inlet solenoid	7	FB solenoid valve
2	Liquid waste tray	8	Instant solenoid valves
3	Flow diverter valve	9	Mixer
4	Coffee spout for jug	10	Pump
5	FB brewer unit	11	Anti-boiling thermostat
6	Open-top boiler	12	Spouts assembly

7 – HYDRAULIC LAYOUT " INSTANT "



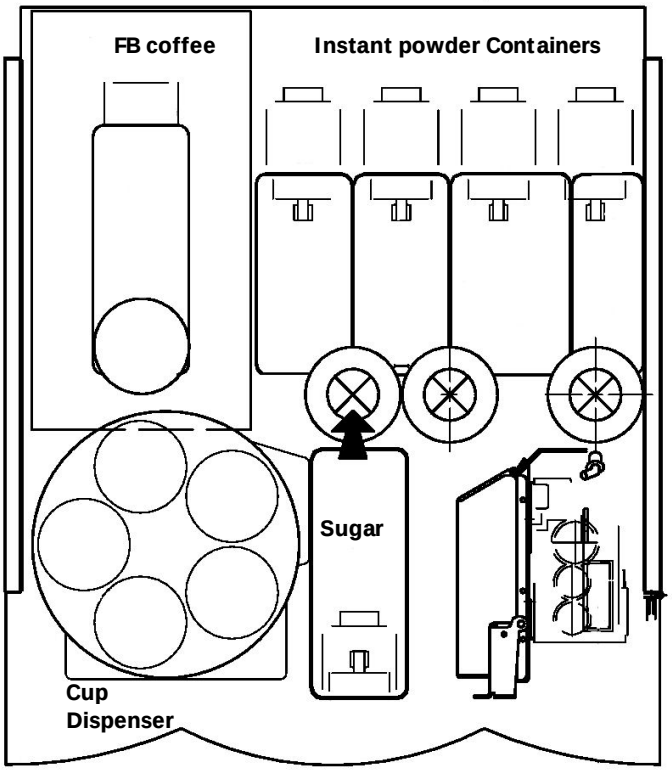
COMPONENTS OF INSTANT VERSION

REF.	DESCRIPTION	REF.	DESCRIPTION
1	Water inlet solenoid	7	Instant solenoid valves
2	Liquid waste tray	8	Mixer
3	Pan level microswitch	9	Anti-boiling thermostat
4	Drain pipe	10	Spouts assembly
5	Overflow tube		
6	Open-top boiler		

8- INTERNAL LAYOUTS AND MACHINE CODES

EXAMPLES OF THE INTERNAL LAYOUTS

Note: The following layouts are only given as a guideline for the purpose of indicating the configuration options. Refer to the tables supplied with the machine for the actual layout.



ESPRESSO LAYOUT - GERMANY

Brio 3 FB 6 /D Q

According to the market, two product selection modes are provided:
Keypad with direct selection
Keypad with numeric selection
(see examples below)

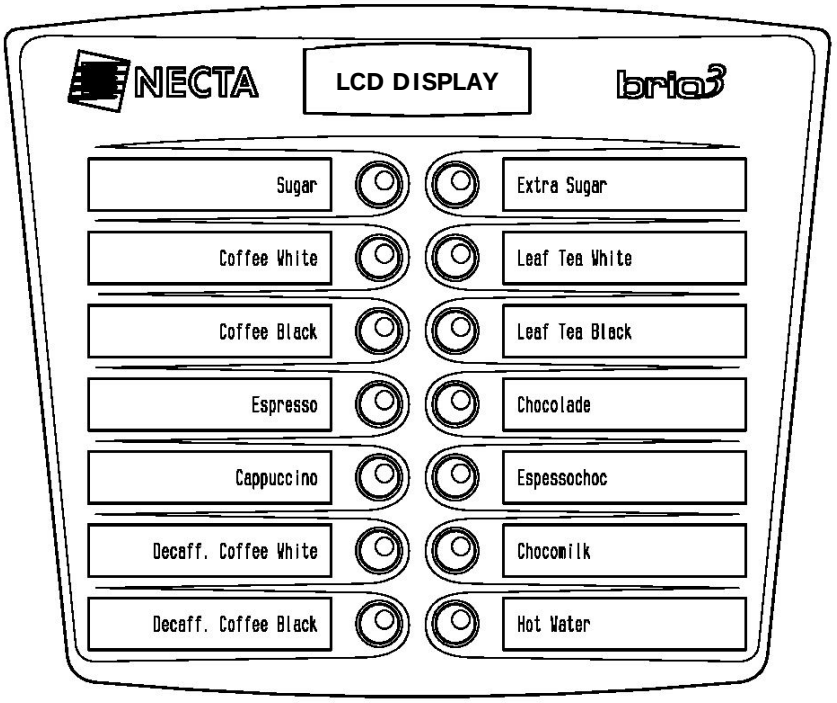
EXAMPLE OF INTERPRETING CODES

FB 6/DQ Meaning:
FB = FRESH BREWER
6 = Number of containers
D = Germany
Q = IMQ certification

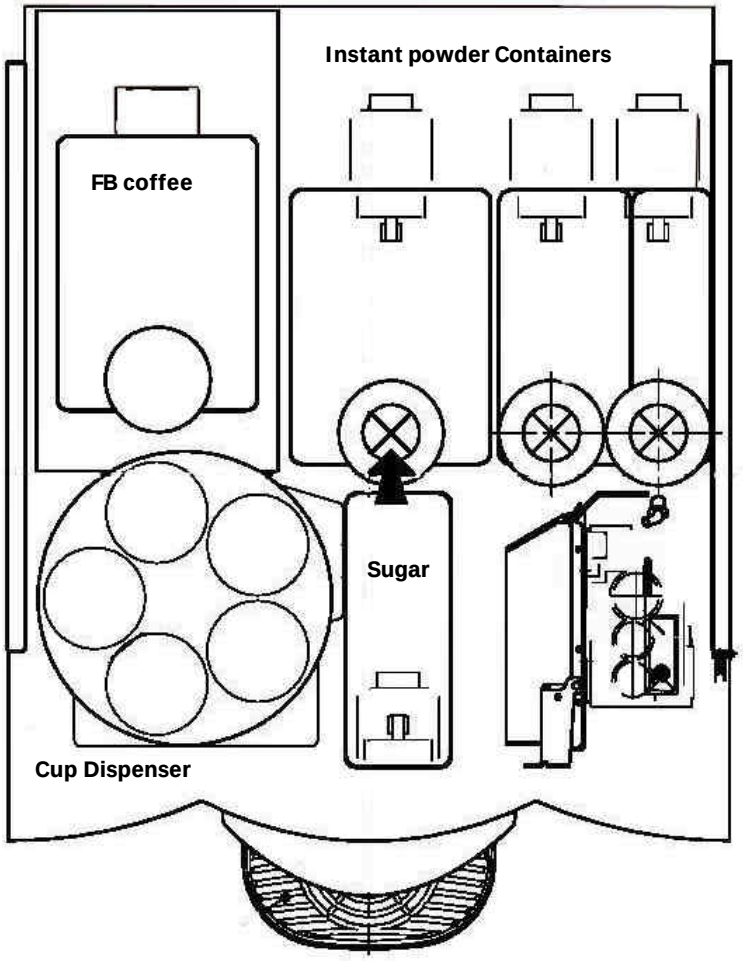
The first two letters indicate:

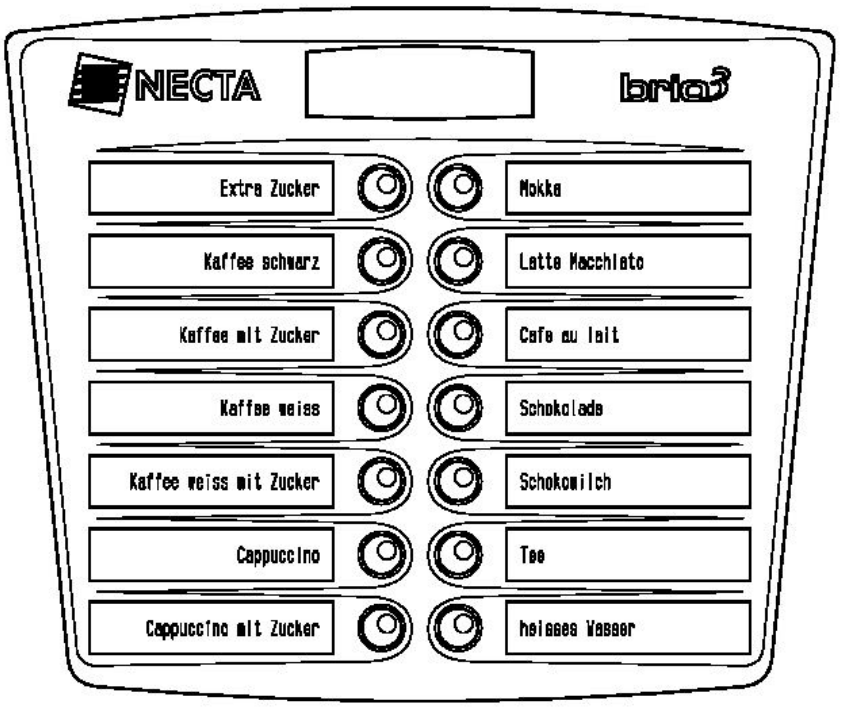
IN = INSTANT
ES = ESPRESSO
FB = FRESH BREWER

The number indicates the number of containers installed.
The last letter, if present, 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 if fitted with two brewer units (ESPRESSO and FRESH BREW).



USER INTERFACE:
EXAMPLE OF SELECTIONS AVAILABLE IN THE FB VERSION.





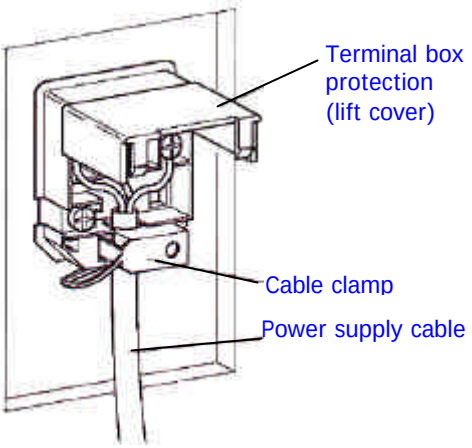
USER INTERFACE:
EXAMPLE OF SELECTIONS AVAILABLE IN THE FB- D VERSION

9 - ELECTRICAL SYSTEMS – CONNECTIONS

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 A** fuse
It is fitted with a door opening safety switch.

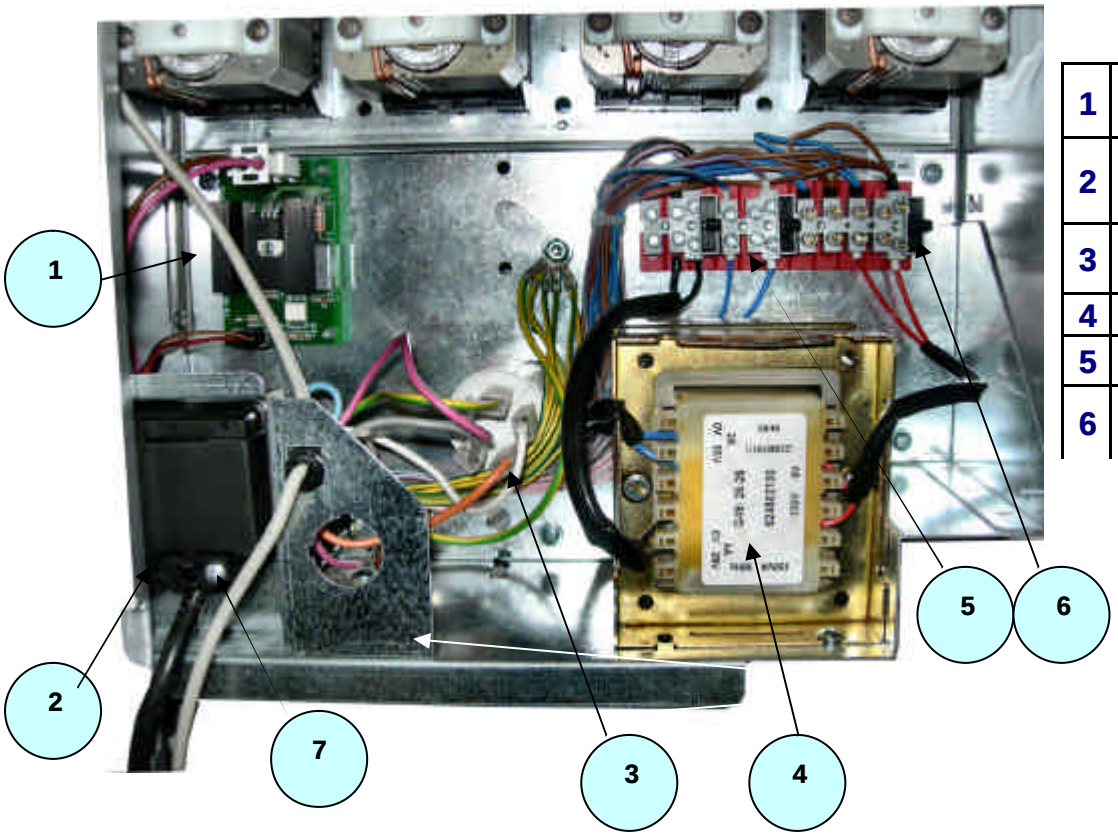
The power cable can be supplied as standard feature and chosen among the following types:
HO5 RN – F copper with a 3 x 1.5 mm^2 section
HO5 V V – F ,, ,, ,,
HO5 V V – F ,, ,, ,,
Fitted with a fixed **SCHUKO **** plug.
NB **: it is possible that for some specific markets a cable with specific plug be fitted in accordance with the regulations in force in that country.
In the event of replacement cables of exactly the same characteristics must be used.
Since the "**Brio 3**" 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



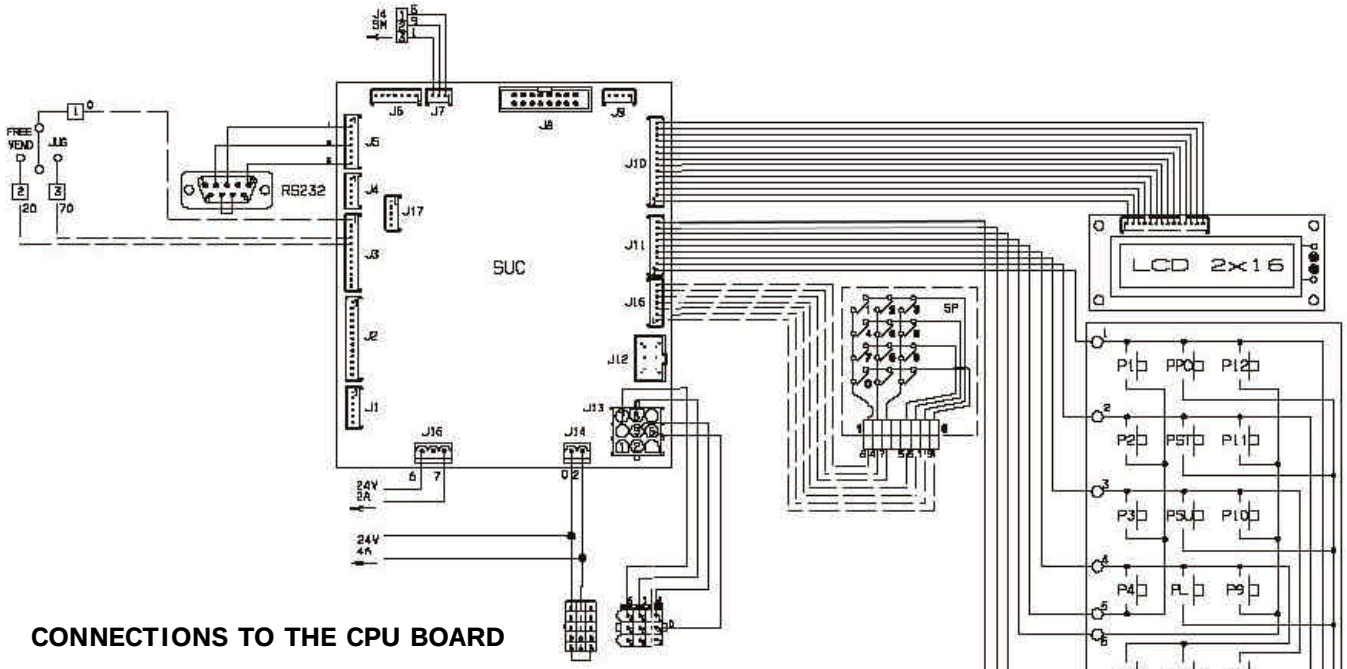
9.1 – CONNECTION OF ELECTRONIC BOARDS

View of power supply compartment (detail without protective casing)



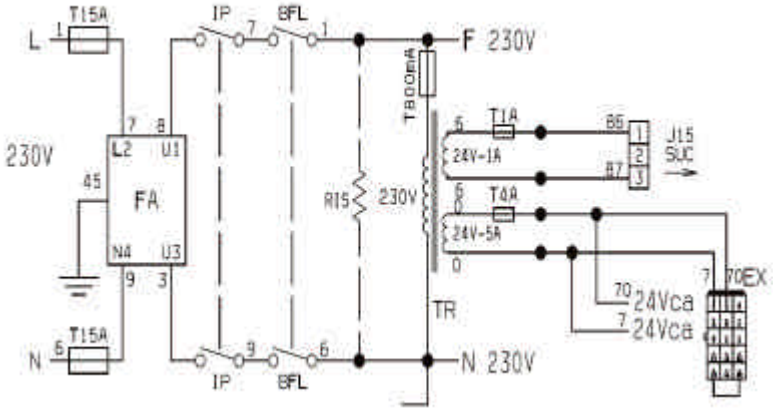
1	Coffee boiler control board
2	Line cable connection clamp
3	interference suppressor
4	Transformer
5	Terminal strip
6	Transformer fuses

BOARD CONNECTION DIAGRAM



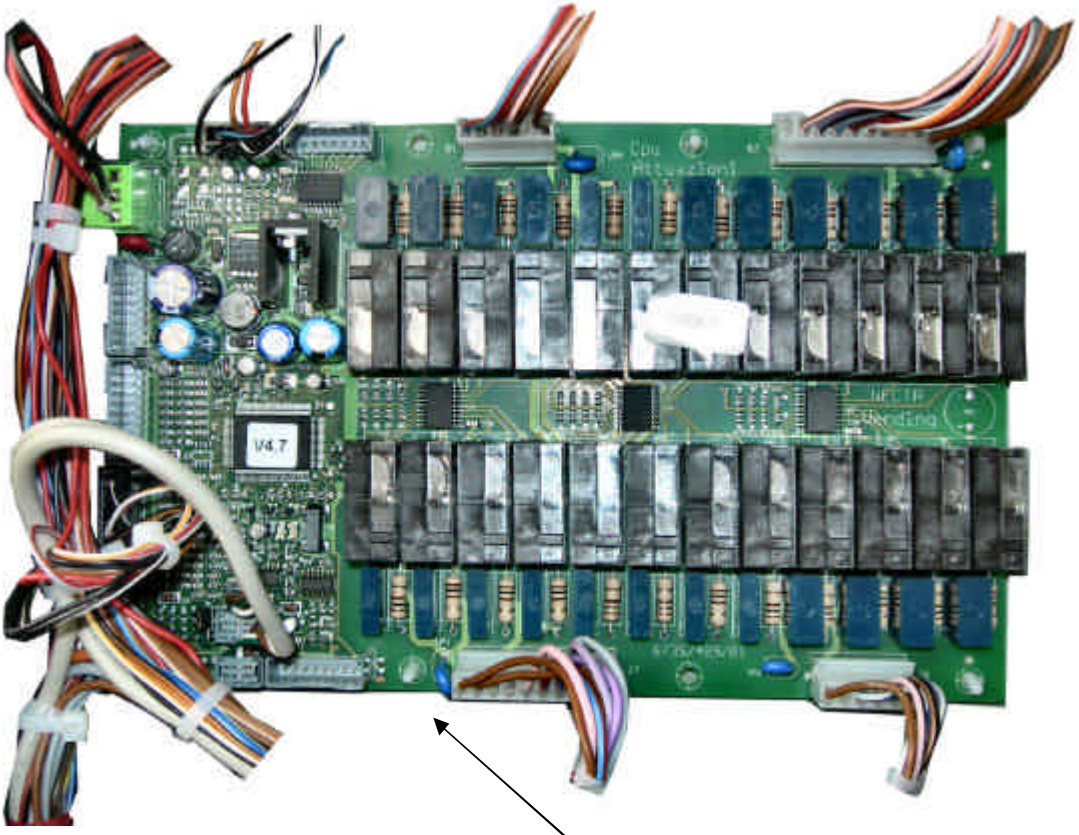
CONNECTIONS TO THE CPU BOARD

Signal	DESCRIPTION
SM	Actuation and control board
LCD	LCD display card
NTC	Espresso temperature control probe
NTCS	Instant temperature control probe
RS 232	Printer or data reading device port (only if the relevant optional board is installed)
SP	Push-button board
IVB	Cup sensor switch
IVA	Water sensor (level) switch
IPF	Liquid waste overflow switch
CMSB	Cup release motor cam
FA	Interference suppressor filter
IP	Door switch
SUC	CPU board



POWER SUPPLY UNIT WIRING DIAGRAM

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

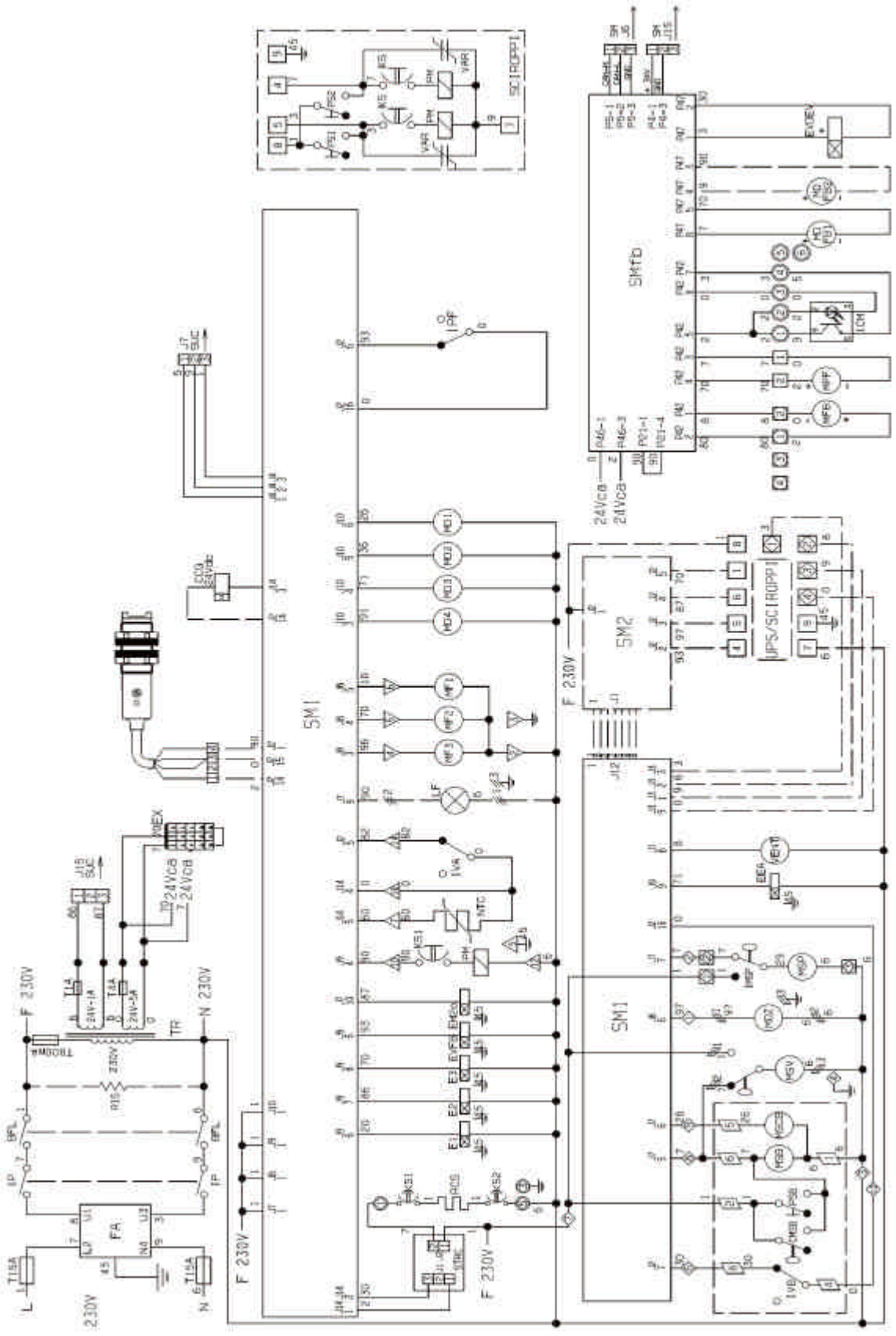


MAIN ACTUATION BOARD SM1

FRESH BREWER UNIT CONTROL BOARD

REAR SIDE WITHOUT CASING – LOCATION OF ACTUATION BOARD AND FRESH BREWER UNIT CONTROL BOARD

10 GENERAL WIRING DIAGRAMS

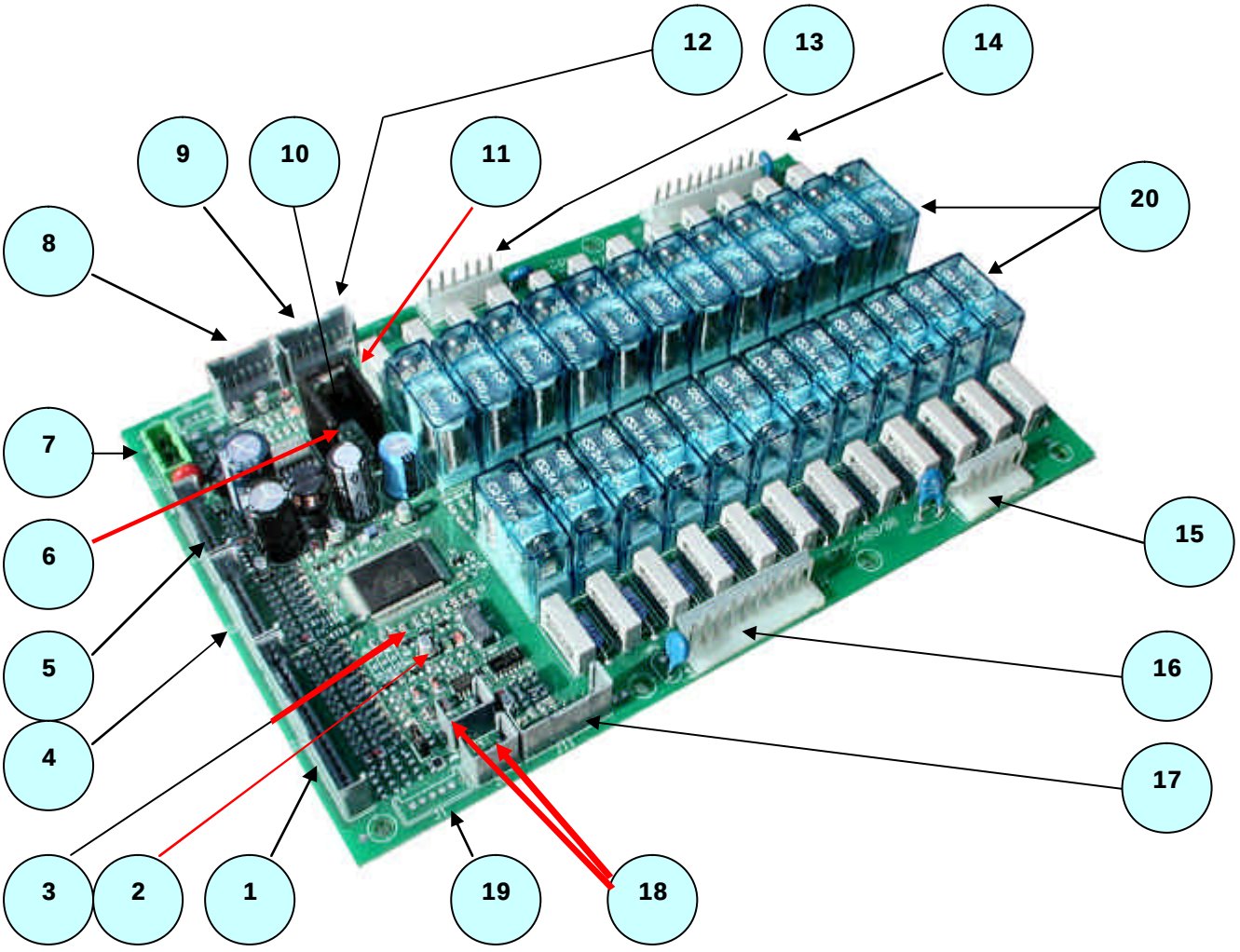


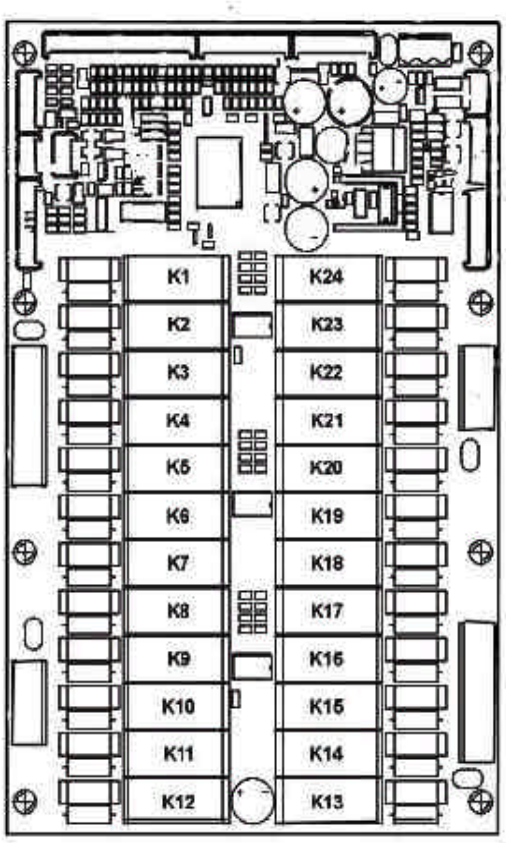
11 - ACTUATION BOARD – CONFIGURATIONS

(POSITIONING, LOGICS AND ACTUATION DIAGRAMS)

The actuation board activates all 230 V AC power users by means of relays. It also controls the signals from the cams and micro-switches 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 (3) glows during the boards reset.
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.

SM1 ACTUATION BOARD





REF.	DESCRIPTION
1	CONNECTOR FOR SIGNAL INPUT
2	GREEN LED
3	RED LED
4	CONNECTOR NOT USED
5	CONNECTOR FOR BOARD PROGRAMMING
6	YELLOW LED
7	CONNECTOR FOR BOARD POWER SUPPLY – 24 V
8	CONNECTOR NOT USED
9	CONNECTOR FOR PROBE AND BOILER CONTROL
10	RED LED - ACTIVATION OF ESPRESSO BOILER
11	RED LED – NOT USED
12	CONNECTOR TO EXPANSION BOARD - 6 RELAYS
13	230 V AC POWER USERS
14	230 V AC POWER USERS
15	230 V AC POWER USERS
16	230 V AC POWER USERS
17	CONNECTOR NOT USED
18	CAN-BUS CONNECTOR ** (Connector for the control of banked machines with GSM protocol)
19	CONNECTOR NOT USED

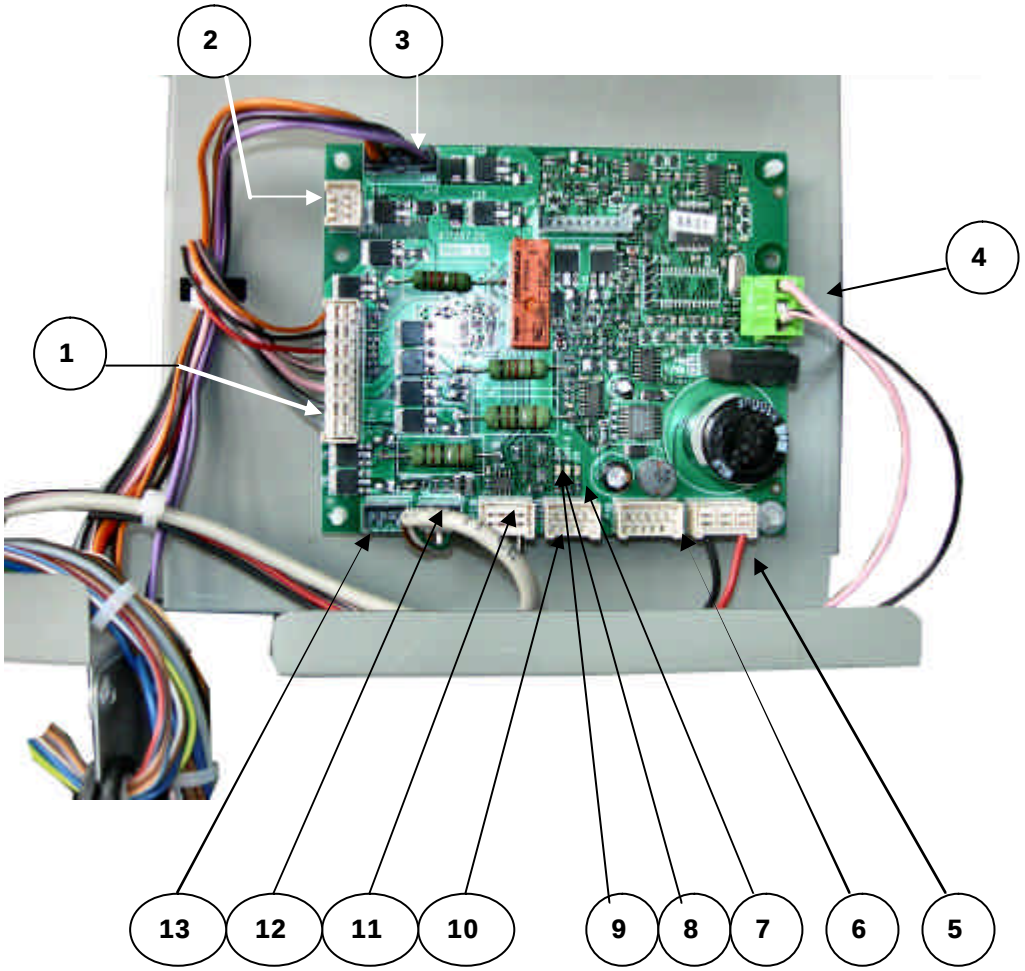
Reference to relay code (20) and actuations - Espresso / Instant version SM1

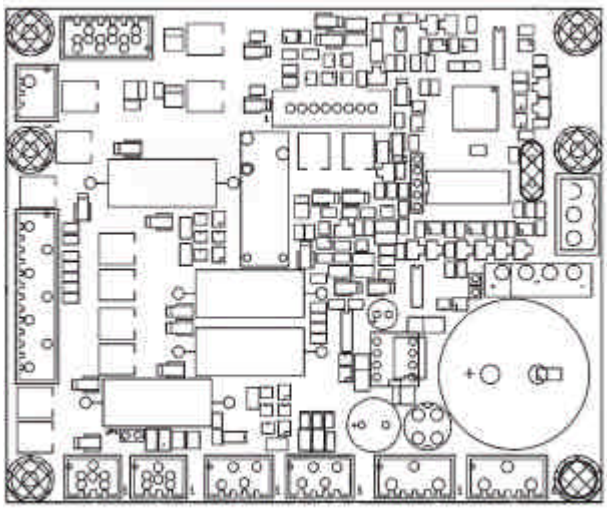
	Configuration FRESH BREWER (see references in previous page)	
K 1	----	NOT USED
K 2	MSB	CUP RELEASE MOTOR
K 3	MSCB	CUP STACKER SHIFT MOTOR
K 4	MSP	STIRRER RELEASE MOTOR
K 5	VENT	FAN
K 6	LF	LAMP
K 7	EV H2O	HOT WATER DISPENSING SOLENOID VALVE
K 8	M	NOT USED
K 9	MF3	WHIPPER 3
K 10	MF2	WHIPPER 2
K 11	MF1	WHIPPER 1
K 12	MD Z	SUGAR DOSER DEVICE
K 13	PM	PUMP
K 14	----	EV FB
K 15	E1	INSTANT PROD. SOLENOID VALVE 1
K 16	E2	INSTANT PROD. SOLENOID VALVE 2
K 17	E3	INSTANT PROD. SOLENOID VALVE 3
K 18	EEA	WATER INLET SOLENOID VALVE
K 19	-- -	NOT USED
K 20	----	NOT USED
K 21	MD4	DOSER DEVICE 4
K 22	MD3	DOSER DEVICE 3
K 23	MD2	DOSER DEVICE 2
K 24	MD1	DOSER DEVICE 1

SIGMA BREWER CONTROL BOARD

This board, placed at the back of the machine, processes the information from the Sigma brewer unit and controls its operation.
The board also controls the dispensing of fresh product and the flow diverter solenoid valve.
The 24 V AC voltage required for board operation is supplied by a transformer which is protected by a 800 mAT fuse on the primary and by a 3.5 AT fuse on the secondary winding. The voltage supply is rectified and stabilised directly by the board.

- The green LED (7) indicates the presence of +5 V;
- The green LED (8) indicates the presence of 34 V DC variable;
- The green LED (9) indicates the presence of 34 V DC.





REF.	DESCRIPTION
1	CONNECTOR FOR SIGMA UNIT
2	CONNECTOR NOT USED
3	CONNECTOR MDFB & EVDEV
4	CONNECTOR FOR 24 V AC POWER SUPPLY
5	CONNECTOR NOT USED
6	CONNECTOR NOT USED
7	GREEN LED + 5 VOLT
8	GREEN LED 34 VOLT DC VARIABLE
9	GREEN LED 34 VOLT DC
10	CONNECTOR FOR PRESENCE OF TRAY MICRO
11	CONNECTOR FOR PRESENCE OF TRAY MICRO
12	CONNECTOR FOR CAN-BUS WITH ACTUATION BOARD (1)
13	CONNETTORE FOR CAN-BUS WITH ACTUATION BOARD (2)

12 - CPU BOARD & PUSH-BUTTON CARD

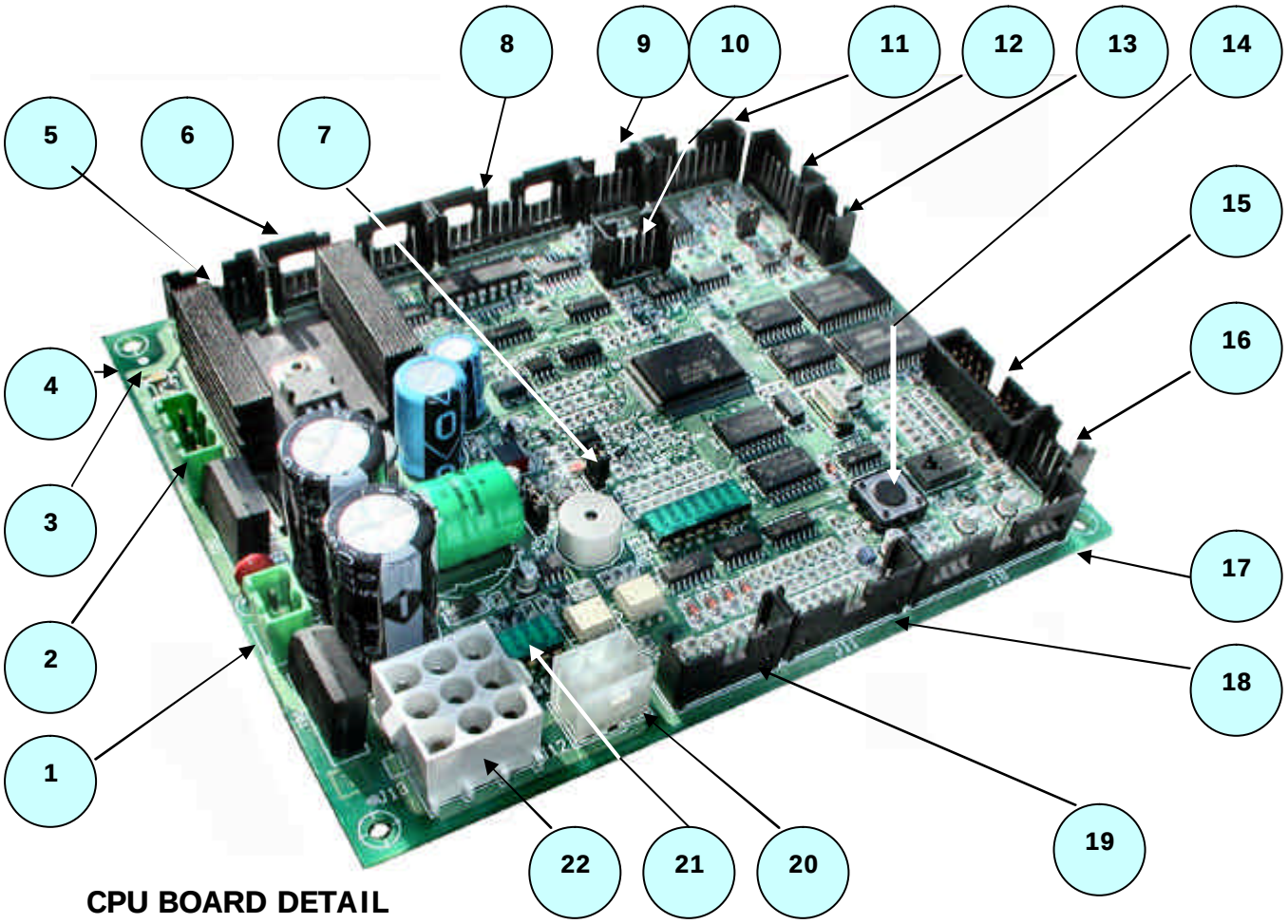
(Central process unit)

LA 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 actuations and the push-button board. It is built on SMT technology.
The LEDs furnish the following indications during the vending machine operation:

The **GREEN** LED (3) blinks during normal operation
The **YELLOW** LED (4) glows when 5 V DC is detected
The **RED** LED (16) - Glows during the software reset phase

Two other boards are also installed:

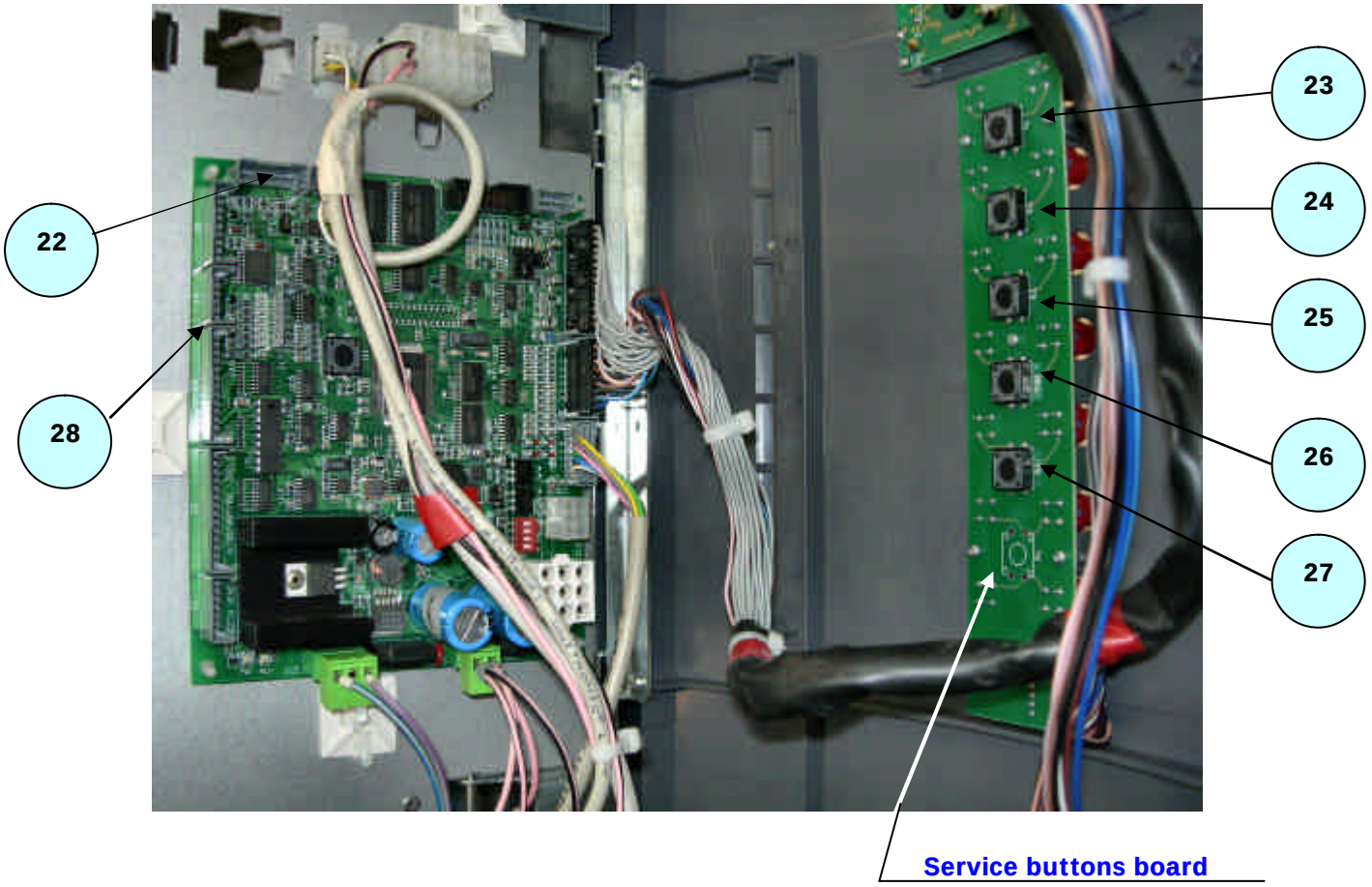
PUSH-BUTTON CARD located on the inside of the door, controls the alphanumeric display and it processes the push-button commands; it also supports the coin mechanism connectors and the RS232 printer port.
The 5 service buttons are located in the internal side.
DISPLAY CARD
It processes the information and converts it into readable signals.



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 permits software update simply and quickly for the entire operating life of the vending machine.
Using the “Flash system” it is also possible to transfer the settings from one vending machine to another.
This is the same board used in the Kikko and the only difference is the software and the positioning.

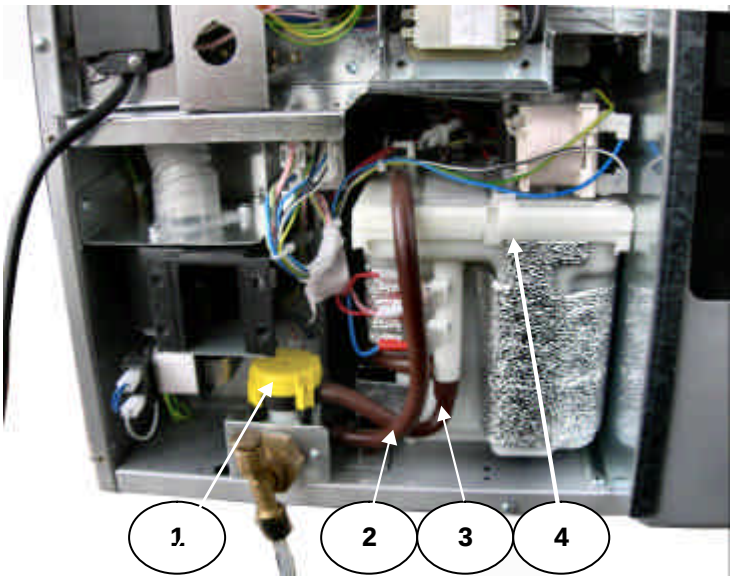
LIST OF CPU BOARD COMPONENTS			
1	J14 Coin mechanism power supply	15	J9 Not used
2	J15 Board power supply	16	J10 LCD display
3	GREEN LED RUN DL2	17	J11 Push-button panel
4	Yellow LED 5 VDC DL1	18	J16 Push-button panel
5	J1 24 V Output	19	J12 MDB coin mechanism
6	J2 24 V Output	20	Coin mechanism Minidips
7	RED LED reset CPU DL3	21	J13 Expansion for BDV / EXE
8	J3 Input / Output	22	RS232 serial port
9	J4 Not used	23	Cup release button
10	J5 Programmer (RS232)	24	Statistic reading button
11	J6 Not used	25	Failure reset button
12	J7 CAN - BUS	26	Mixer wash button
13	Button not used	27	Programming access button
14	J8 Validators	28	CPU board



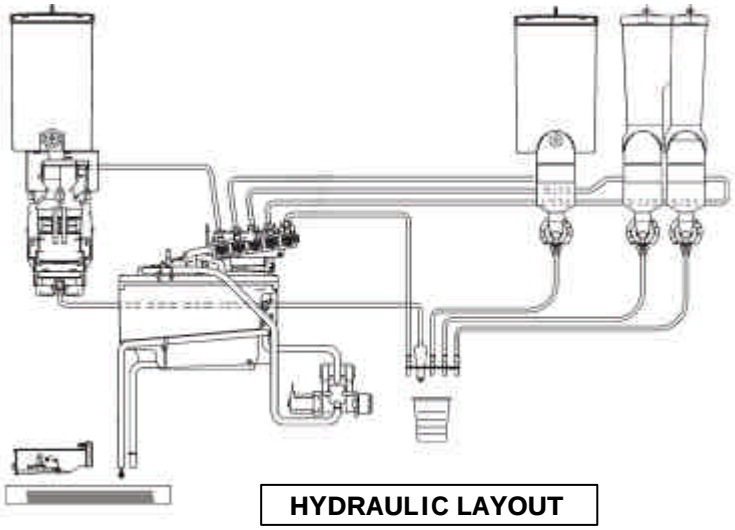
DETAIL OF CPU BOARD LOCATION AND INSIDE OF PUSH-BUTTON BOARD
(internal side of door without protective casing)

13 – AIR-BREAK & BOILERS

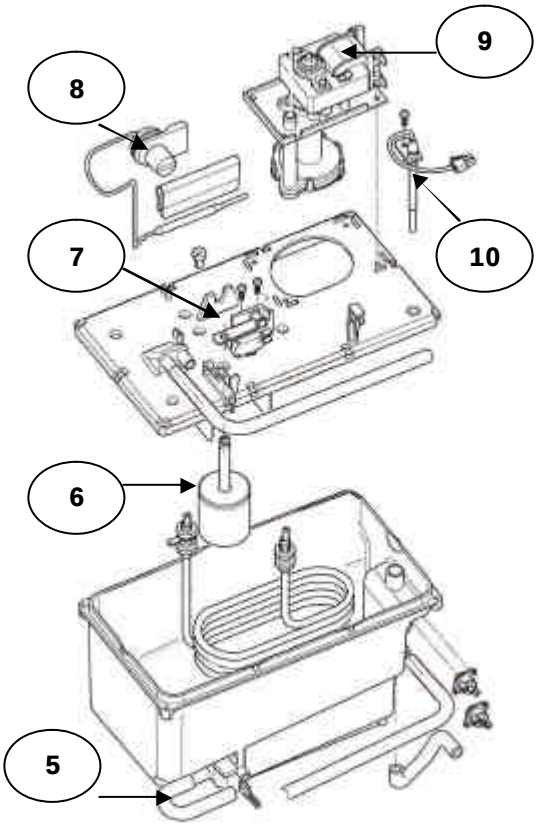
The **air-break** is a functional unit with the function of keeping the water level constant and of signalling a water flow interruption from the mains; in the event of such water failure it serves the purpose of completing the current selection; in addition it has the purpose of ensuring an “air break” in the water flow from the mains (preventing any contamination to the water mains).
In the FRESH BREWER version the air-break is incorporated in the open-top boiler.
The water level is ensured by a float that triggers a micro-switch, keeping the level between a factory set minimum and maximum (it very important not to replace the micro-switch with any one of different mechanical characteristics, as a variety of malfunctions may occur).
Furthermore, in the event of failure to the maximum level micro-switch, 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 micro-switch within a set time (different according to the model) the vending machine locks due to a water failure.
.



REF.	DESCRIPTION
1	Water inlet solenoid valve
2	Water inlet hose
3	Overflow and anti-boiling
4	Open-top boiler
5	Drain pipe
6	Float
7	Level micro-switch
8	Dry operation thermostat
9	Centrifuge pump
10	Temperature probe



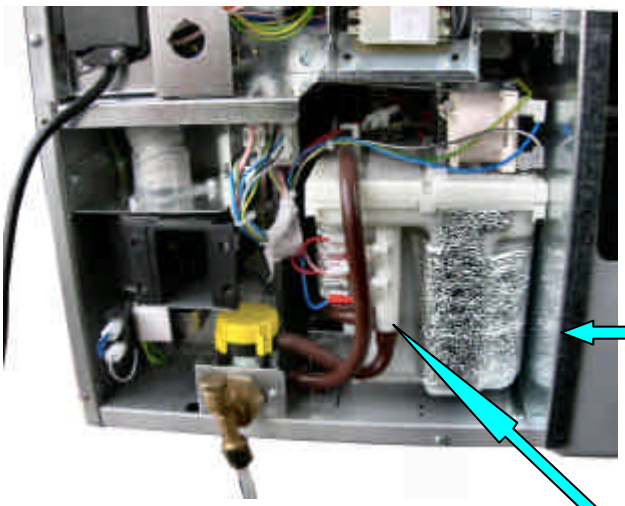
HYDRAULIC LAYOUT



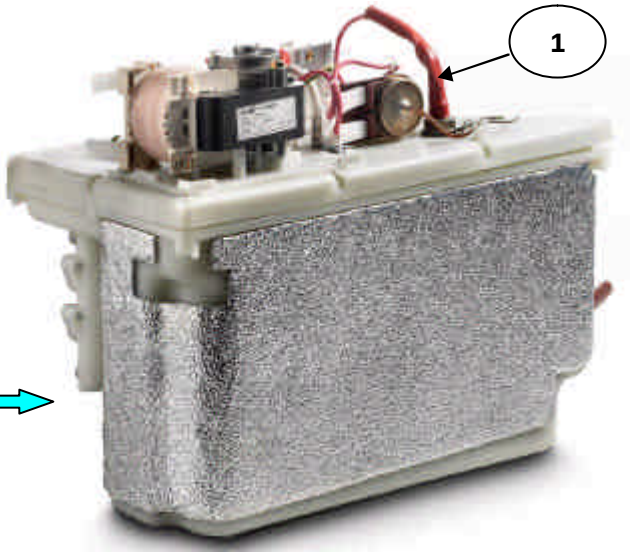
EXPLODED VIEW OF BOILER

13.1 – BOILERS

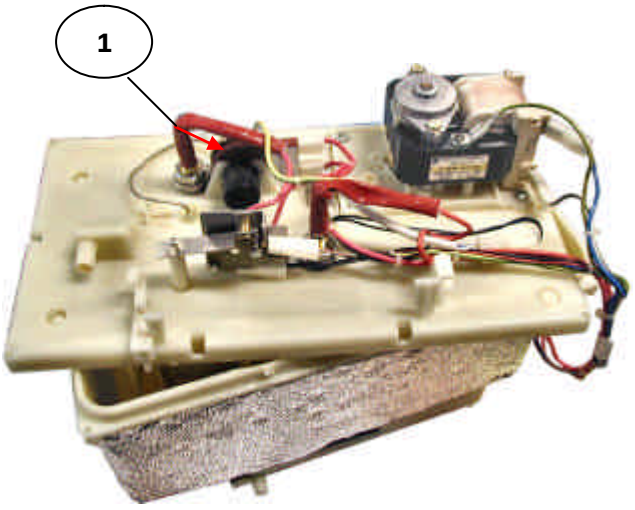
In the **BRIO 3** model, FB version, there is only one open-top boiler with incorporated air-break functions.
The special open-top **instant** boiler is developed from the boiler of the KORO.
The boiler is made of special thermoplastic food-safe material, constructed by means of injection molding into two parts.
Temperature control is by means of an NTC type submersed probe with changes in the internal resistance as control logic. A bulb thermostat **(1)**, with the function of dry-operation safety device, is located on the body of the heating element, and in the event of water failure it immediately detects the anomalous operation and disconnects the heating element.
In the event of failure to the temperature control system, the boiling water sends steam to the thermostats **(2)**, which cut off the heating element. Resetting is performed manually.
For further technical information see the **"Service manual"** of Boiler functional units



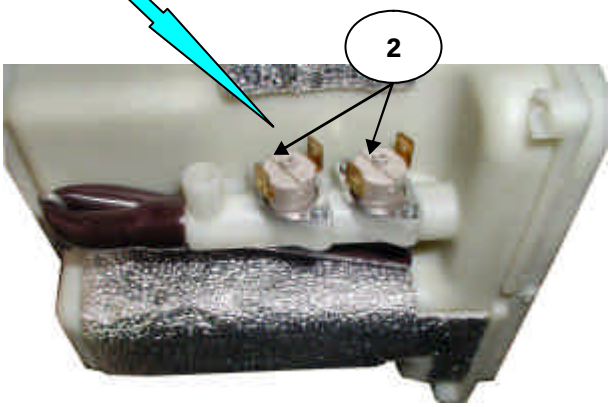
REAR VIEW WITHOUT PROTECTIVE CASING



BOILER REMOVED FROM ITS OPERATION LOCATION



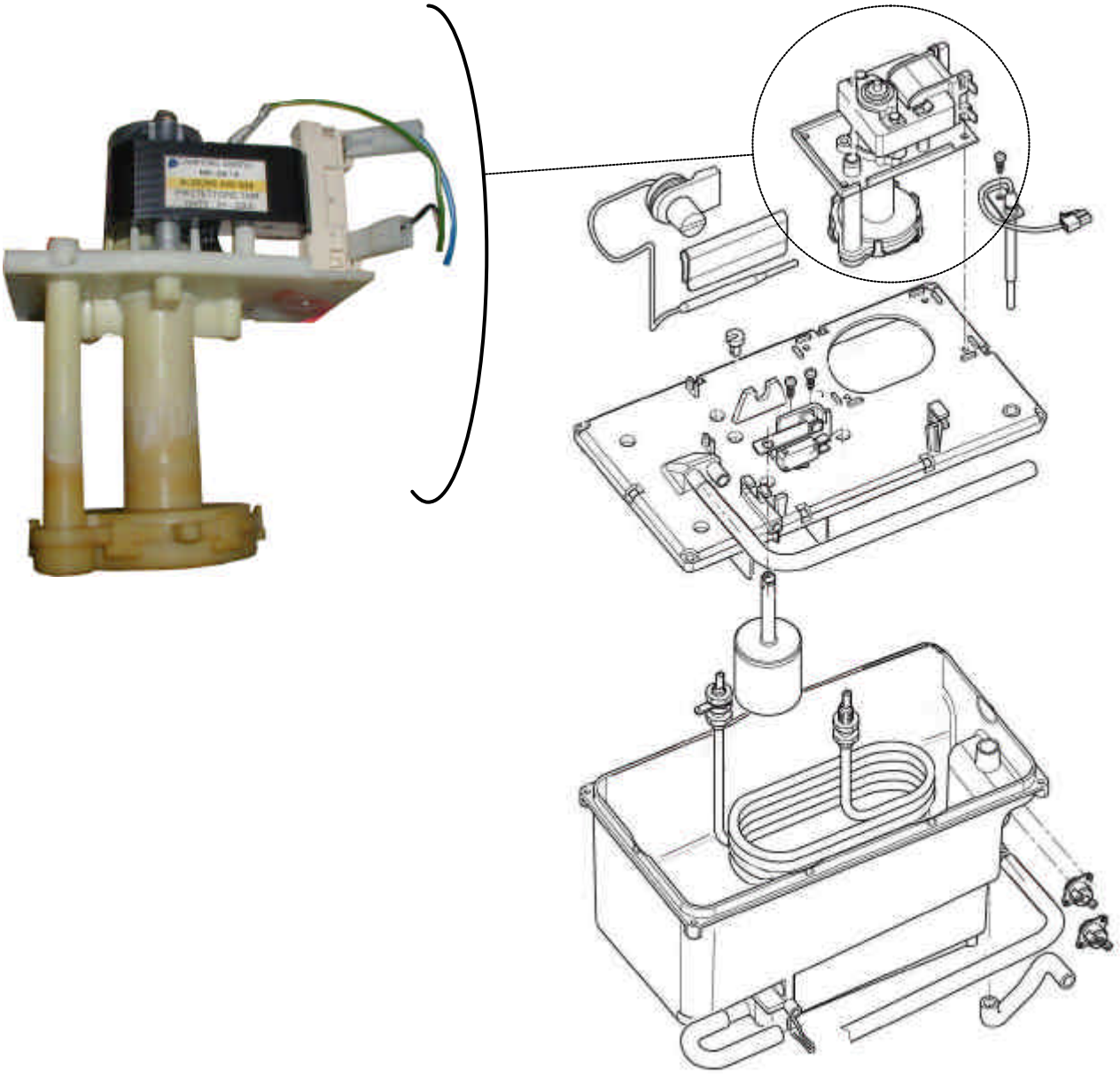
DRY OPERATION SAFETY THERMOSTAT (1)



ANTI-BOILING THERMOSTAT

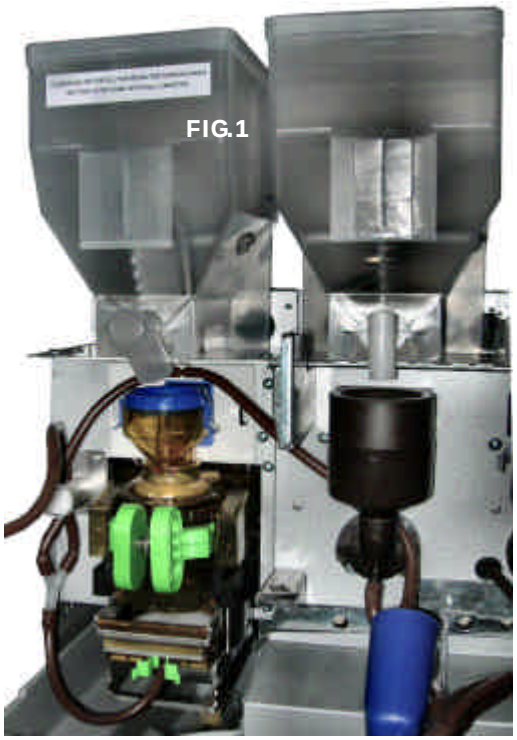
14 – PUMPS

Since the boiler is located lower than the mixers and the coffee unit, in order to draw the hot water necessary for the selections from the boiler, a centrifuge pump is used, drawing hot water from the boiler and sending it to the solenoid valves, which control the selection.
The pump is activated by **relay K13** (actuation board).
The application is specific and was developed from the Koro Fresh Brewer model; therefore the same components are used.
This solution permits a greater flow rate than the traditional system with gravity solenoid valves; in addition the flow rate is constant and not influenced by the water level inside the boiler.
The pump is driven by an induction motor with winding protected from overheating by means of a self-reset Klixon (set to 90°C.



15 – SIGMA BREWER UNITS

For the **FB** version A specific brewer unit for filtered coffee is used in the **SIGMA BREWER**
(SEE THE FUNCTIONAL UNITS MANUAL)
For further details on the functional units refer to the specific H&C functional unit manuals **"BREWER UNITS".**
The FB unit uses specific coffee, already ground to an optimum grade for quick and adequate brewing.
Coffee is dispensed directly into the brewing chamber of the unit, with timed rotation system of the auger (FIG. 1).



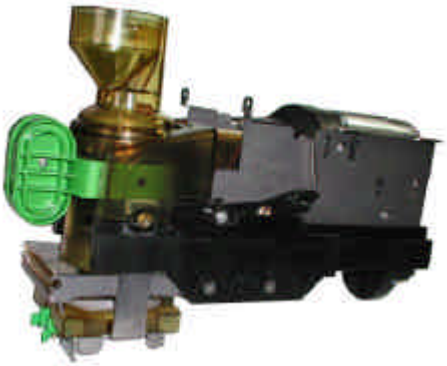


FIG. 2
UNIT REMOVED FROM THE MACHINE

FIG. 4
BREWING CYLINDER BEING REMOVED

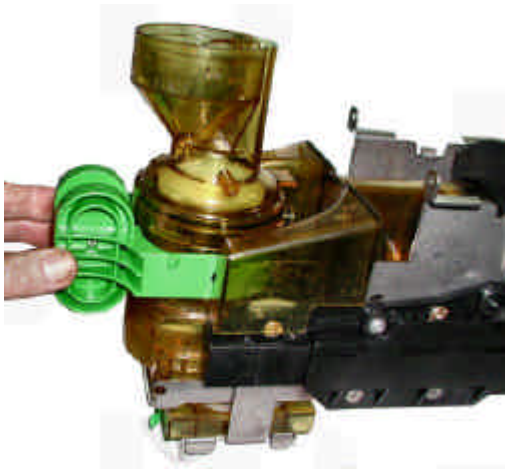


FIG. 3
FEEDER AND COFFEE VALVE BEING REMOVED

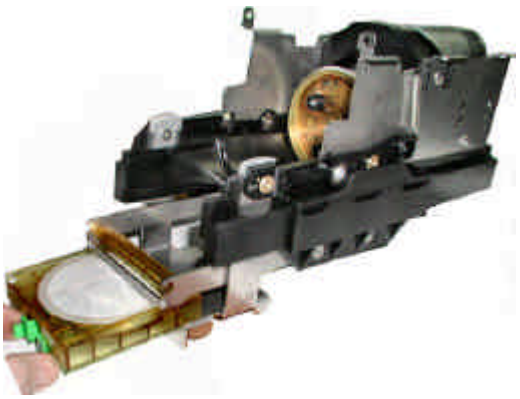
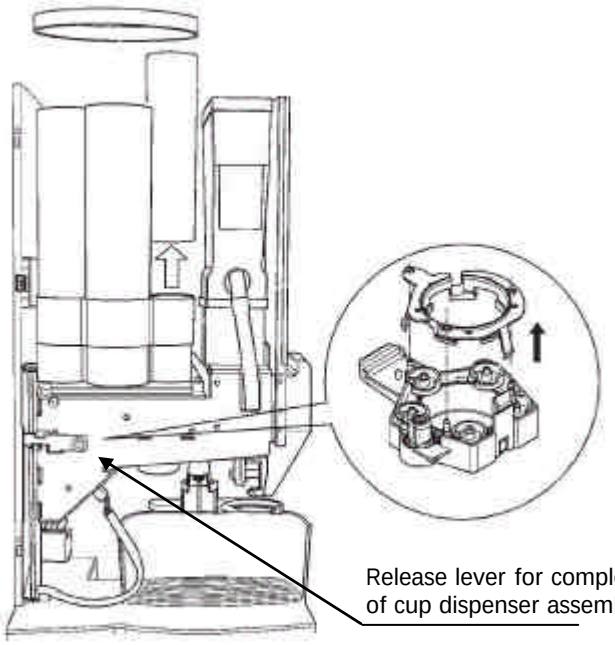


FIG. 5
LOWER FILTER BEING REMOVED

16 - CUP DISPENSER ASSEMBLY

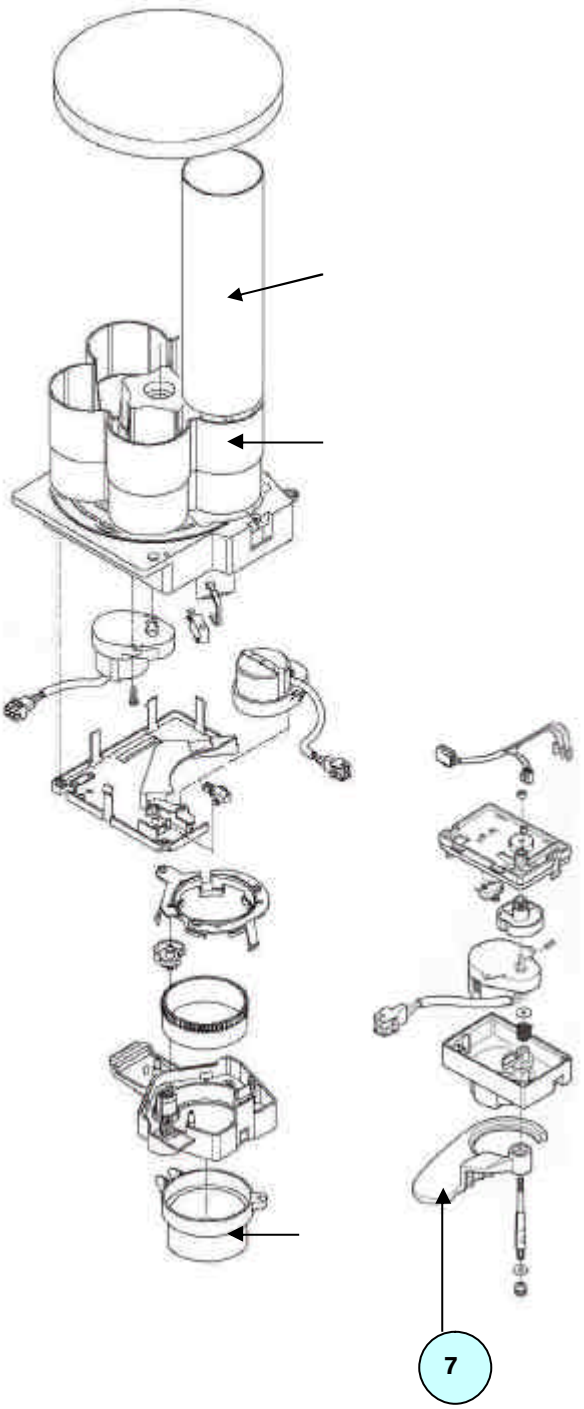
It is a new design functional unit specially conceived and optimised for the **BRIO 3** vending machine; it is integrated in the sugar and stirrer dispenser (developed from the ASTRO model).
The new feature consists in the option of using three different size stirrers:
95 mm - 105 mm - and 115 mm stirrers
With a total capacity of approximately 255 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.



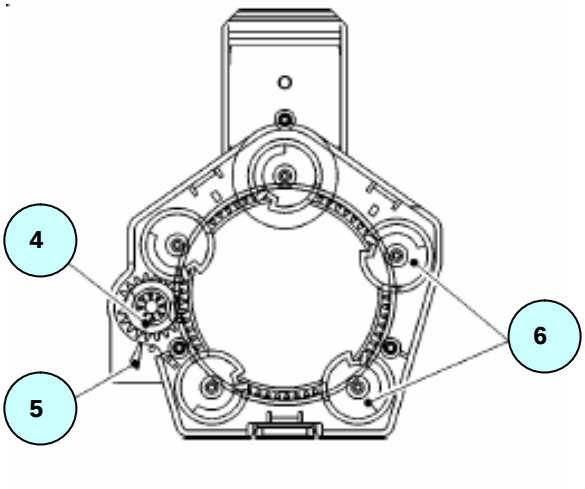
A special feature is the option of swinging completely open the cup dispenser, to allow full access to the parts located at the back.

It is possible to remove completely the cup dispenser and remove the cup stackers individually for better cleaning and hygiene.

The cup dispenser can be released completely with a few simple operations.



In order to facilitate cleaning and maintenance, the columns can be removed one at the time by lifting them.

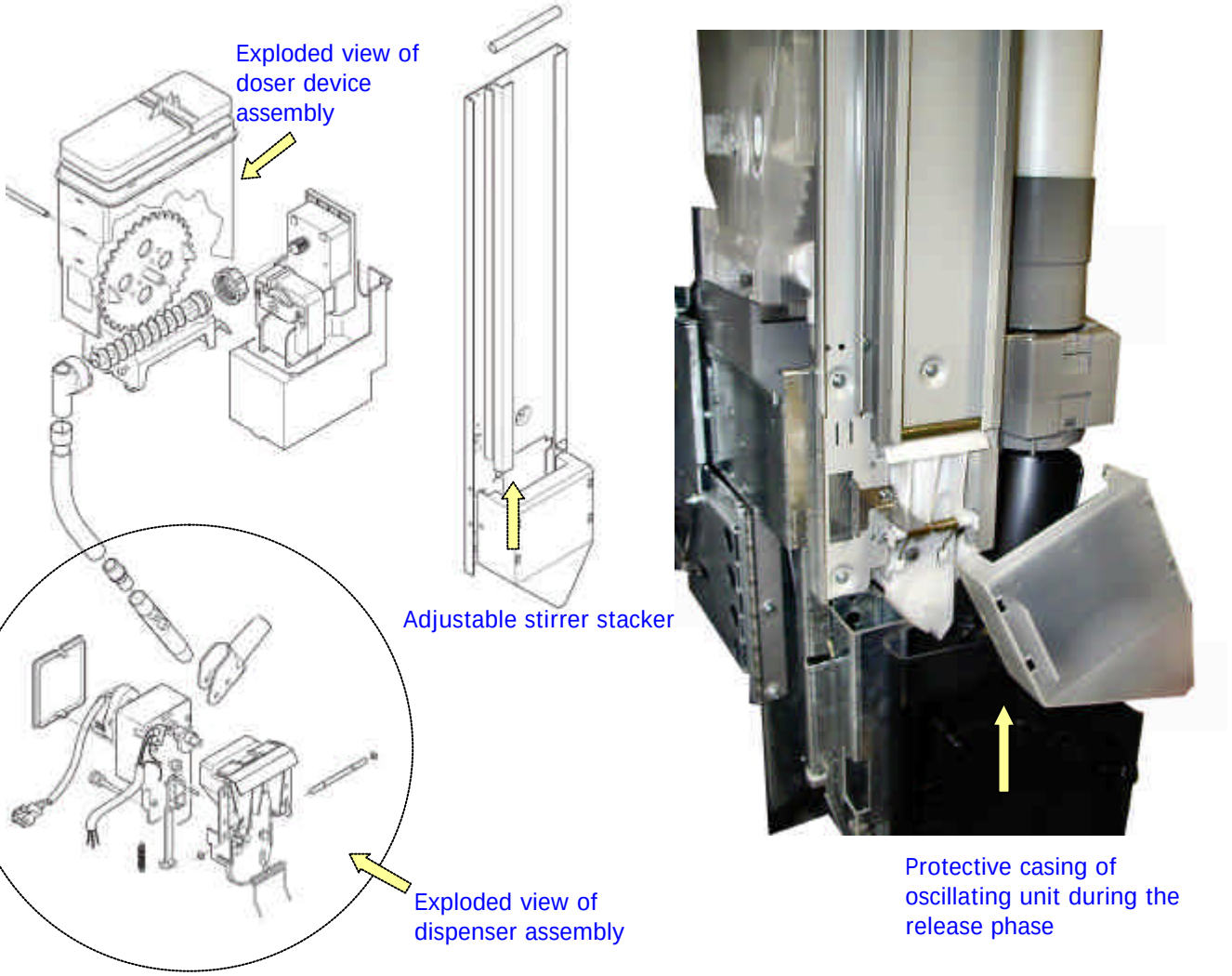


1 - Cup release ring
2 - Cup stacker
3 - Removable column
4 - Micro-switch actuation gear
5 - Snail gear support
6 - Cup release snail gears
7 - Cup shift oscillating arm

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, the dispenser unit and the cup shift oscillating arm can be disassembled without using any 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 micro-switch actuation gear with the arrow on the snail gear support.
- respect the orientation of the snail gears, as indicated in the figure.

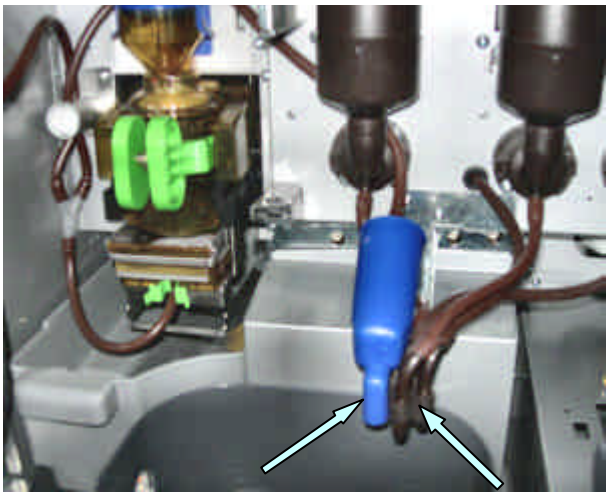
It is possible to use different diameter cups and different length stirrers for a total of 300 cups (according to the type used).
For the stirrers it's sufficient to widen the left-hand guide, undoing the two screws A and reposition the guide into the special slots.
3 stirrer sizes can be used:
95 mm – 105 mm – 115 mm for a total of 255 pieces.
For larger diameter cups, the snail gears must be replaced with other suitable ones and of different colour.
See specific service manual "CUP DISPENSER"

16.1 - SUGAR AND STIRRER DISPENSER ASSEMBLY



The sugar and stirrer dispenser is integrated in the cup dispenser assembly and uses the usual components already used in the entire range of machines.
The powder ratiomotor is fitted with Klixon overheating protection. The sugar and stirrer release ratiomotor is of the synchronous type, and considering the type of motor there is no need of overheating protection.
The main feature is the quick release and slow return that avoids the spilling of sugar in the dispensing compartment.
The side retaining guide can be moved sidewise into preset positions for using three different stirrer types.
In some versions sugar is pre-mixed in the mixer when the drink is dispensed; therefore such functional unit is not present.

17 – SPOUTS ASSEMBLY



COFFEE DISPENSING SPOUT

INSTANT DRINKS DISPENSING SPOUTS

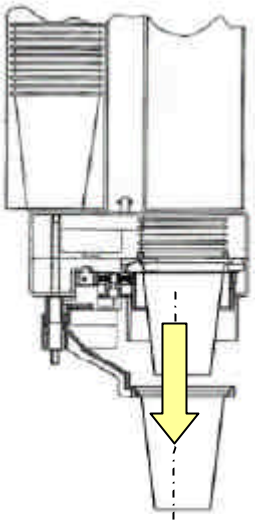
For the new Brio 3 model it was decided to keep the spouts fixed, and move the cups instead.
The spouts are fixed and their location and shape are conceived for optimising each drink.
The assembly can be removed without using any tools, for easy and quick cleaning.
In the Brio 3FB ***BIG JUG*** version there is an external nozzle dedicated to FB coffee for dispensing into a one litre jug placed onto a special base (see figure below).

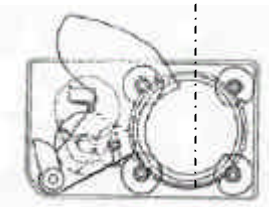
VERSION WITH EXTERNAL JUG

18 – CUP POSITIONING UNIT

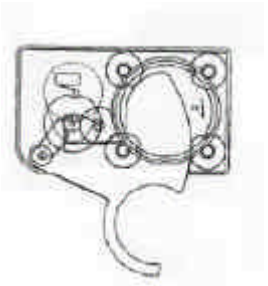
In the Brio 3 the cups are moved as close as possible to the spouts during dispensing. (The dispensing spouts are fixed)
The system operates as follows:
When a selection is made, relay K2 activates the cup release ratiomotor which rotates the cam clockwise, also driving the pinion that connects the cogged wheel of the ring by means of a free wheel.
When rotating, the ring also rotates the four worm gears which due to their special profile (snail) cause a cup to be released and hold the other cups above.
The cup falls into the holding and shifting.
When the cam rotates driven by the motor, it controls the lever, as a consequence the fork moves away from the idle (starting) position until it reaches the cup release position.
It stays in such position long enough to receive the cup.
Then, completing the ratiomotor rotation, the fork brings the cup into drink dispensing position (horizontal section in dispensing position).
It remains in this position until a new selection is made.
Such position is determined by the micro-switch that also gives the dispensing consent.
The fork is retained against the cam by a torsion spring, that also allows manual movement of the fork to place a jug in the dispensing compartment and automatic return after the jug is removed.

VERTICAL SECTION
Release position





HORIZONTAL SECTION
Release position



HORIZONTAL SECTION
Dispensing and stand-by position

REAR VIEW

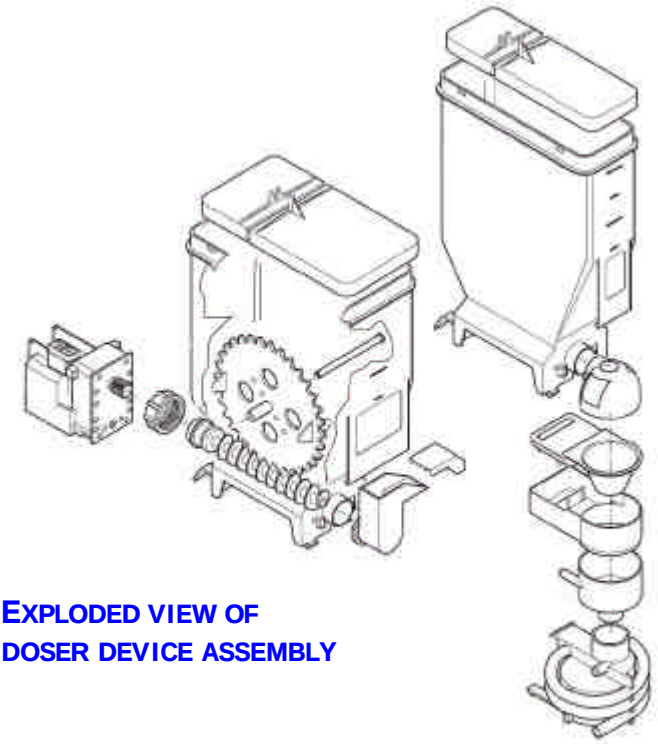
19 – POWDER PRODUCT CONTAINER AND DOSER DEVICES ASSEMBLY

DOOR OPEN AND VIEW OF POWDER AND COFFEE CONTAINER

SUGAR CONTAINER BEING REMOVED

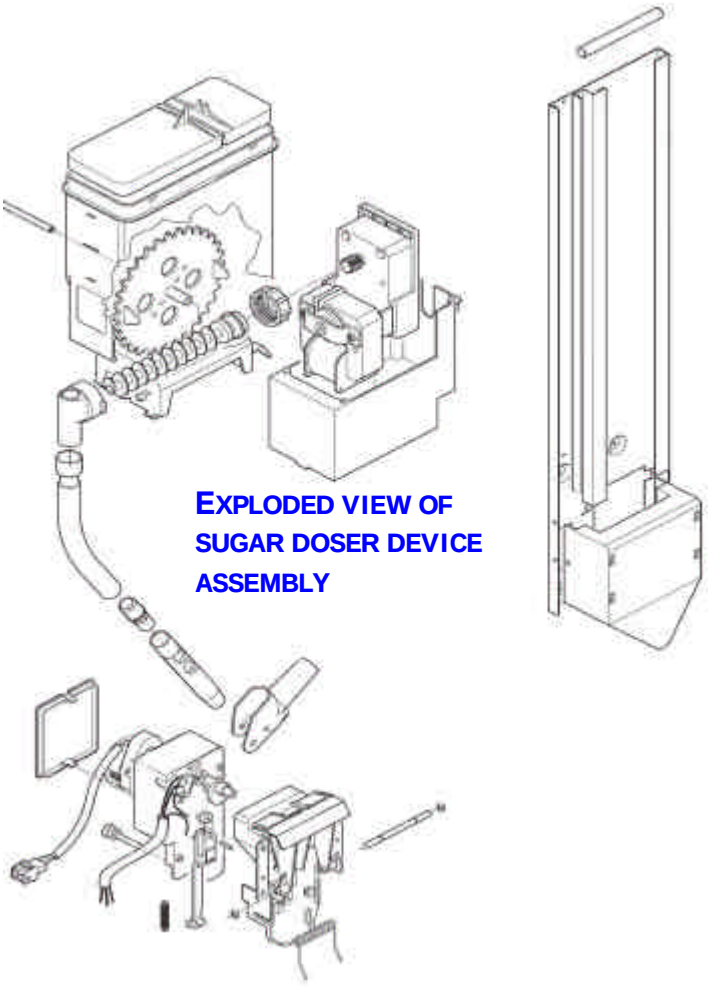
In order to optimise the number of containers and use the space to its maximum, a solution was conceived to permit a greater number of containers and to vary their volume.
For example, greater capacity for milk and chocolate, less capacity for instant coffee and tea or other products according to location requirements.
In the instant versions there can be up to 6 containers plus the sugar canister.
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

In the FB & Instant versions, activation is by means of relays:
k 12 - k 21 – k22 – k23 – k24
Connected to ratiomotors:
MDZ – MD4 – MD3 – MD2- MD1



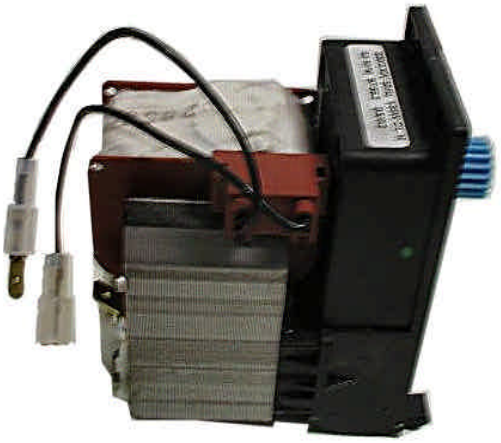
EXPLODED VIEW OF DOSER DEVICE ASSEMBLY

The doser device unit is designed with a modular shape for the purpose of increasing the options of using more powder containers, single or double versions or with two powders.
The photo shows the doser device unit installed in two different versions; a double version on the right and a triple version on the left.
The high modularity allows the configuration of a compartment with 5 instant product selections + the espresso coffee unit, or a compartment with seven / eight / nine instant selections without espresso unit, or 5 instant selections and fresh-brew coffee unit. All this is possible using each time single containers, double containers and double containers with two selections.
(See enclosed layouts)



EXPLODED VIEW OF SUGAR DOSER DEVICE ASSEMBLY

The ratiomotor is very compact and can be secured by means of snap-on fasteners. It is powered with 230 V AC and it is of the induction type (without sliding brush).
The ratiomotor is protected from overheating by means of an auto-reset Klixon, therefore in the event of overheating the Klixon is triggered and disconnects the power supply, avoiding any electrical and thermal risk.
When the temperature in the winding falls to a preset level the Klixon is reset, allowing the motor to start. It is obvious that the cause for triggering the klixon must be verified before switching the machine back on.



POWDER DOSER DEVICE RATIOMOTOR

20 – MIXER ASSEMBLY

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

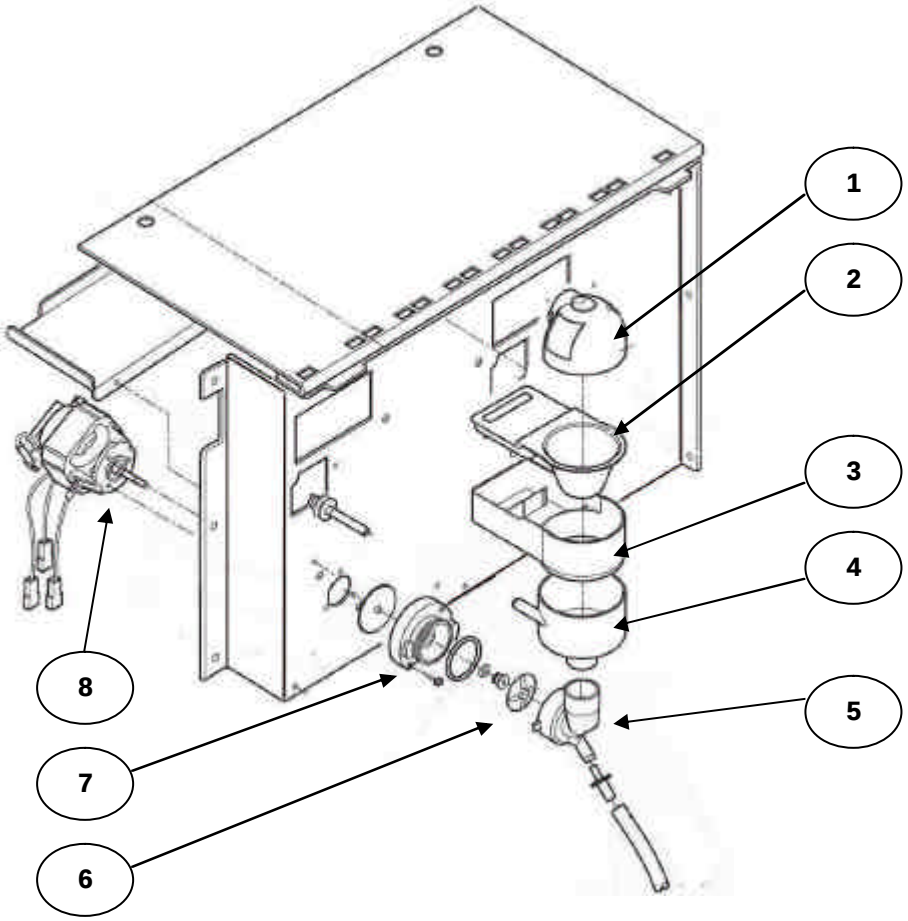
Mixers must have three main features:

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

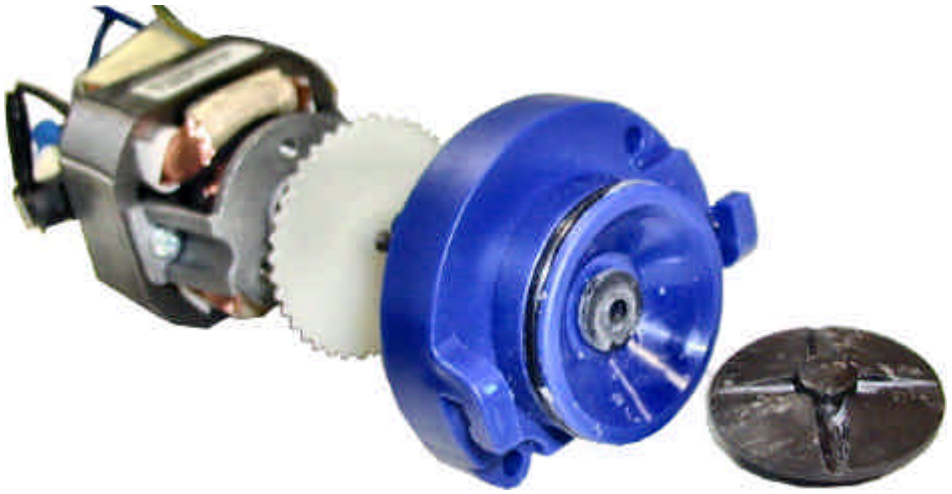
The dust removal tray is integrated into the conveyor (item 3). This element permits emptying each time the mixer is removed for hygiene, thus ensuring that such operation is not neglected. The motors are special high rotation speed commutator motors (**20,000 rpm leadless**) powered with 230 V AC and fitted with interference suppressors and self-resetting overheating protection (KLIXON).

The motors are activated by relay:
K09 - K10 – K11 (FB version)

Parts that can be disassembled for daily hygiene



EXPLODED VIEW OF MIXER ASSEMBLY



EXPLODED VIEW OF MOTOR, SUPPORT WITH BUSH AND IMPELLER

1	UPPER COVER
2	POWDER FEEDER
3	POWDER COLLECTION BOX
4	MIXER CHAMBER
5	FEEDER
6	MIXING IMPELLER
7	MIXER SUPPORT WITH BUSH
8	MOTOR

21 – ROUTINE AND EXTRAORDINARY MAINTENANCE SCHEDULE

The vending machine BRIO 3 was designed to operate for a long time without malfunctions; however in order to ensure excellent reliability periodic maintenance is necessary.
Such maintenance must be performed according to the number of selections made and the time lapsed.
Periodic and correct maintenance ensures reliability, constant quality and also guarantees safety standards over time.
The following table indicates the functional units that must be subjected to periodic maintenance and the frequency of maintenance. For the operations to be carried out, refer to the specific **Functional unit manuals.**

NAME OF UNIT	DESCRIPTION OF OPERATION	N. of selections	Max frequency
SIGMA Brewer Unit	**1)** Check state of filters and wear of silicone O-ring seal. **2)** Replace upper and lower filters and related seals. **3)** De-scale the internal vent hole and lubricate with specific food-safe grease.	4000 8000 30.000	1 month 6 months annual
Mixer Assembly	**1)** Check the water tightness in the axial bush and the correct assembly, if necessary replace. **2)** Check the wear of the motor brushes and clean off the excess of carbon powder	 50.000	 annual
Sugar And Stirrer Dispensers	There is not need of any particular maintenance. To have perfect functioning, it must always be clean and free from sugar deposits.		Every week
Cup Dispenser & Positioning Assembly	There is not need of any particular maintenance. To have perfect functioning, it must always be clean and free from sugar deposits.		Every week
Boiler And Solenoid Valve Assembly	If the boilers and the solenoid valves operate with soft water or are fitted with specific softener filters, the should be no need of periodic maintenance; otherwise periodically check the grade of scaling and if necessary proceed to complete de-scaling.	According to the water hardness	Max. every 6 months
Steam Exhauster Unit	There is not need of any particular maintenance. For perfect functioning, it is necessary that the powder removal boxes be emptied periodically.		Every week
Powder doser device	There is not need of any particular maintenance. To have perfect functioning, it must always be clean and free from sugar deposits.		Every year

Extraordinary maintenance is carried out in the event of possible malfunctions.
For the most typical problems the vending machine is fitted with sensors that inform the software about any malfunction. The following tables list the possible malfunctions and possible remedies.

22– 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 microswicth 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 **"Water failure"**	If for a certain time the micro-switch of the boiler float remains closed, the water inlet solenoid valve stays energised until the level is restored and the boiler is deactivated.	Check that there is actually no water from the mains; check the functioning of the micro-switch; check that the water inlet solenoid valve is not mechanically blocked.
The display indicates the message **"Instant boiler failure"** (only for versions fitted with an open-top boiler).	The boiler does not heat. Dry operation protection system triggered. Anti-boiling protection system triggered. The Triac on the boiler board is faulty.	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 **"No cups"**	No cups in the dispenser. Microswitch failure. The cup column does not rotate.	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. 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. In the event of locked ratiomotor, check for the correct actuation of relays K2 and K3.
The display indicates the message **"Cup release failure"**	The signal is activated if the machine is fitted with the cup sensor photocell kit and no cups are detected.	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.
The display indicates the message **"Sigma Unit"**	The unit failed to reposition. Failure to the lower dead centre positioning microswitch. Failure to the actuation relay.	Check the correct operation of the lower dead centre positioning microswitch. Check that that the unit stops correctly at the upper dead centre (monitored via SW). If not replace the card or reprogram the CPU.

The display indicates the message "Air-break failure"	No water from the mains. Faulty air-break microswitch. Failure to the microswitch float actuation system.	If in the period taken to make 7 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 float microswitch system. Replace the microswitch with one having the same characteristics, otherwise other malfunctions may occur.
The display indicates the message "Piston FB "	The signal is due to a positioning error. The machine is not locked, but all FB coffee-based selections are disabled. Failure to actuation relay	Check the correct actuation of relevant relay. Check and if necessary replace the linear position sensor.
The display indicates the message "Scraper FB "	The signal is due to positioning error of the waste scraper. The machine is not locked, but all FB coffee-based selections are disabled. Failure to actuation relay.	Check and if necessary replace the linear position sensor. Check the correct actuation of relevant relay.
The display indicates the message "RAM data"	Wrong RAM data which must be retrieved by initialising the Eprom. There can be many causes, among which also above standard electromagnetic interference.	Enter into the installation procedure and initialise the software; if the failure persists replace the CPU or reprogram the flash EPROM.
The mixers "clog up"	The whipper 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 "Insert waste tray"	The power supply is disconnected if there in no liquid waste tray. The detection micro-switch is faulty.	Insert waste tray, Check the efficiency of the micro-switch.
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 need to be emptied, the microswitch is faulty, or the float is not positioned correctly.
Coffee comes out slowly and from the edge of the filter	The filter is clogged, the gasket is no longer efficient.	Replace the filter, replace the gasket.
The unit does not position correctly, or it keeps on going back and forth	The positioning system is inefficient. Check the position sensor efficiency.	Replace the position sensor.
In spite of apparent good functioning, the liquid does not get ejected completely from the brewing chamber.	Check the efficiency of the brewing chamber closing valve.	Clean or replace the valve or the complete piston.

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

Outline and instructions for use

Notes: What is it, and 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 critica 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 42, 43, 44)

- 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 check list 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

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. **(FIG. 2)**
Open the upper lid and block with the special lever. **(FIG. 3)**
Remove the powder canisters, clean the dispensing spouts and clean thoroughly using specific hygiene products. **(FIG. 4)**
Remove the coffee unit, clean and rinse with hot water. Dry it thoroughly using an air jet. **(FIG. 5)**
(see specific Service manual)
Remove the sugar dispensing spout and clean thoroughly. (if present)
Clean the cup dispenser assembly. **(FIG. 6)**
Remove and clean the cup chute.
Remove and clean the dispensing spout assembly**.**
(FIG. 7- 7B)
Remove the mixer feeder and the powder collection box, empty and clean thoroughly **(FIG. 8)**

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.

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 8

FIG. 6

FIG. 7

FIG. 7B (VERSION WITH EXTERNAL JUG)

WEEKLY CLEANING AND HYGIENE

(EXPECTED TIME 10 MIN 10 SEC., excluding the time for test dispensing)

FIG. 1

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. **(FIG. 2)**
Open the upper lid and block with the special lever. **(FIG. 3)**
Remove the powder canisters, clean the dispensing spouts and clean thoroughly using specific hygiene products. **(FIG. 4 - 5)**
Clean the internal base of the machine (waste tray support) and remove all residue. **(FIG. 7)**
Remove the mixers, clean thoroughly using specific hygiene products. **(FIG. 7)**
Disassemble the coffee brewer unit and clean thoroughly **(FIG. 8)**
Remove the sugar dispensing spout and clean thoroughly (if present in the version being tested) **(FIG. 9)**
Remove the dispensing spout and clean thoroughly **(FIG. 10)**
Remove and clean the dispensing compartment assembly. **(FIG. 10)**
Clean the rotation base of the cup stacker.
Clean any encrustations from the cup chute **(FIG. 11)**

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. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10

FIG. 11

26 – MONTHLY CLEANING AND HYGIENE SCHEDULE

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 (see functional unit service manual), 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 - 4)**
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 don not touch with the bare hands. **(FIG. 5 - 6)**

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
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 systems, the water inlet solenoid valves, instant boiler and the pump. (**FIG. 7 – 8 - 9)**

Enter the operations carried out in the HACCP hygiene program log.

FIG. 2

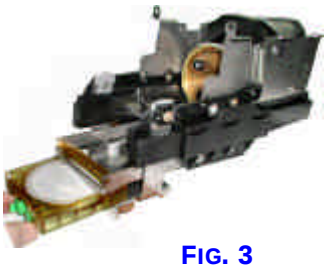


FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

FIG. 9