N&W
GLOBAL VENDING

TECHNICAL AND AFTER-SALES SERVICE

SERVICE MANUAL

"KORINTO"

(Espresso Version)

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1 - PLANNED MODELS

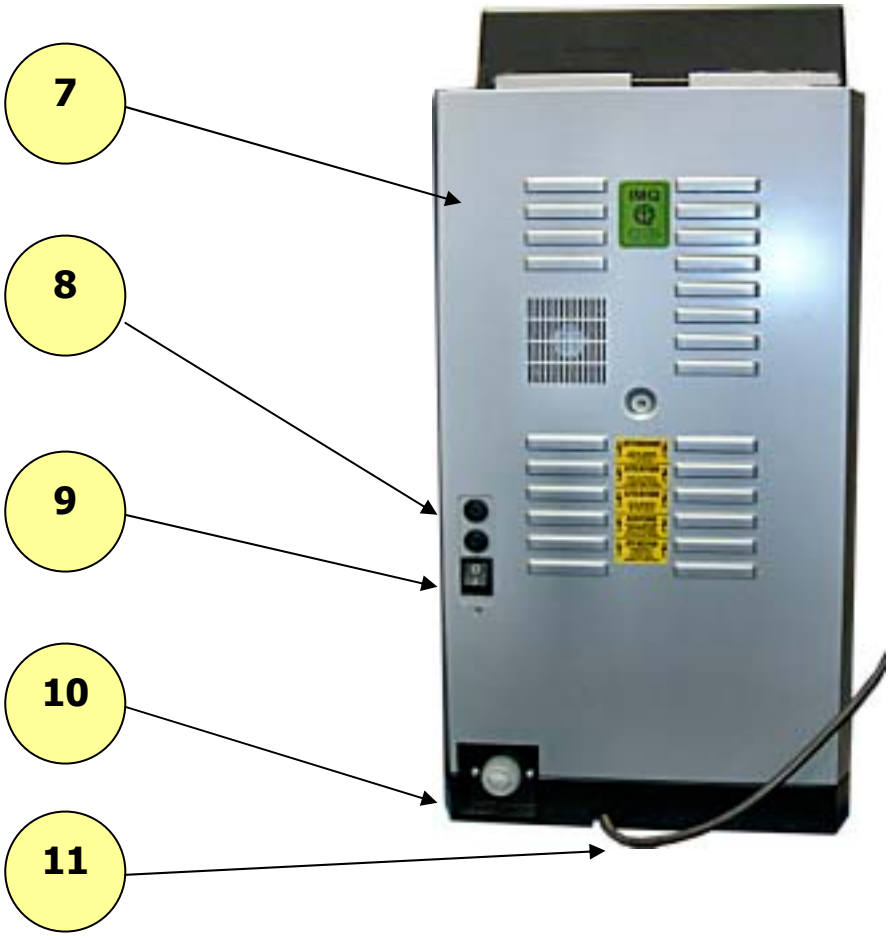
INSTANT VERSION

ESPRESSO VERSION
DOUBLE CUP & SINGLE CUP

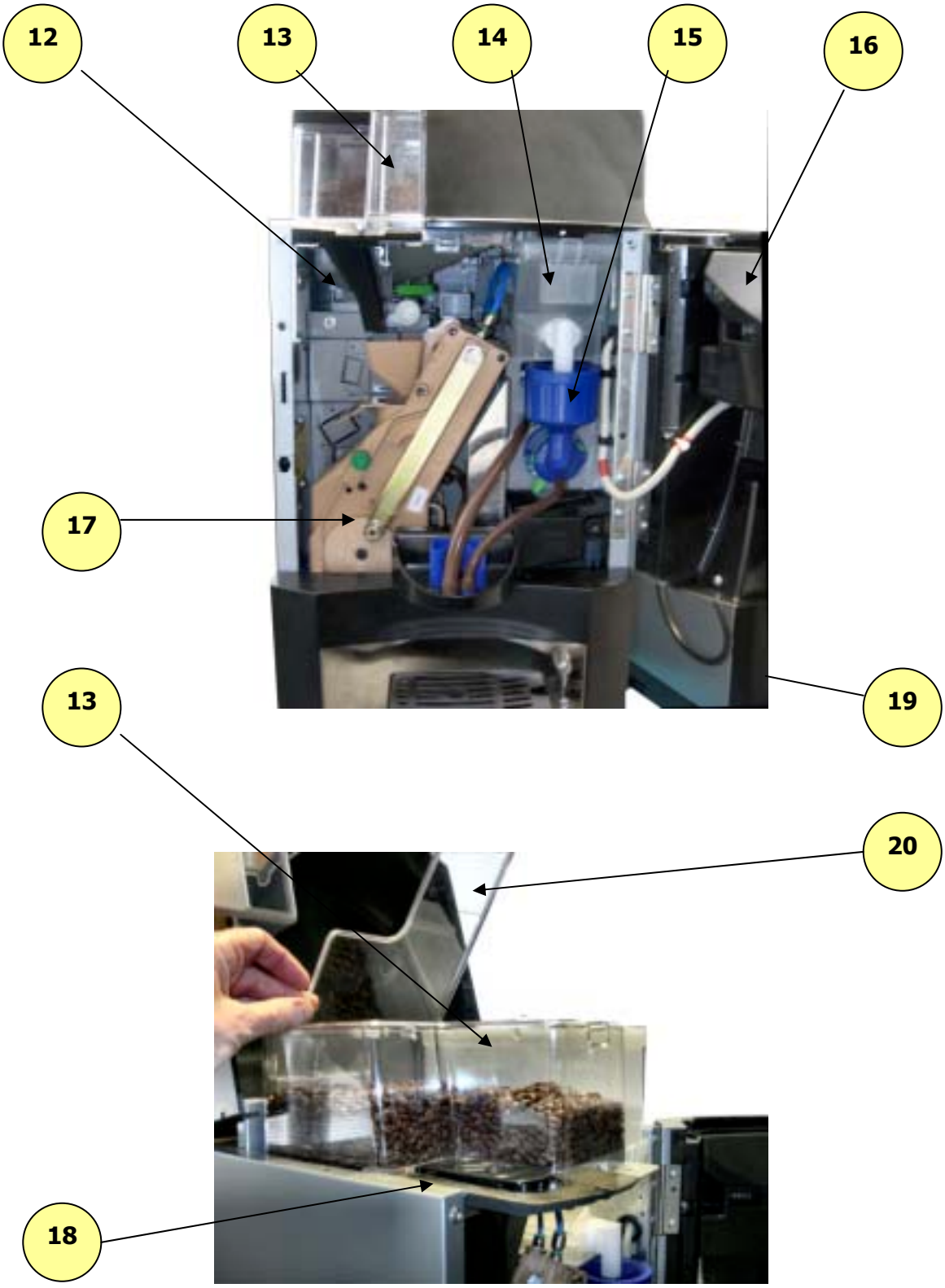
ESPRESSO VERSION WITH FROTHER AND CUP-WARMER

FRESH BREWER VERSION

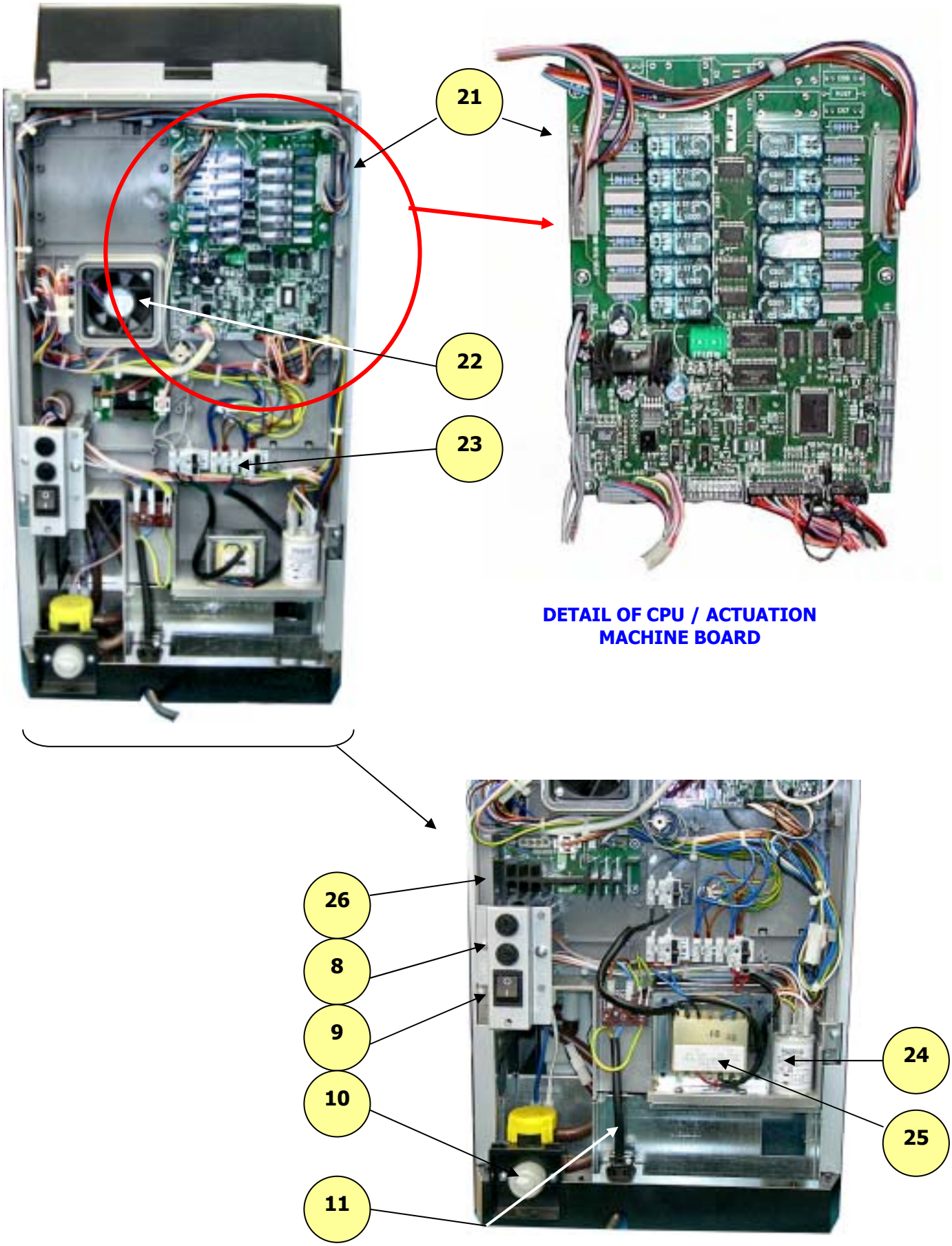
1.1 MAIN EXTERNAL COMPONENTS



1.2 MAIN INTERNAL COMPONENTS

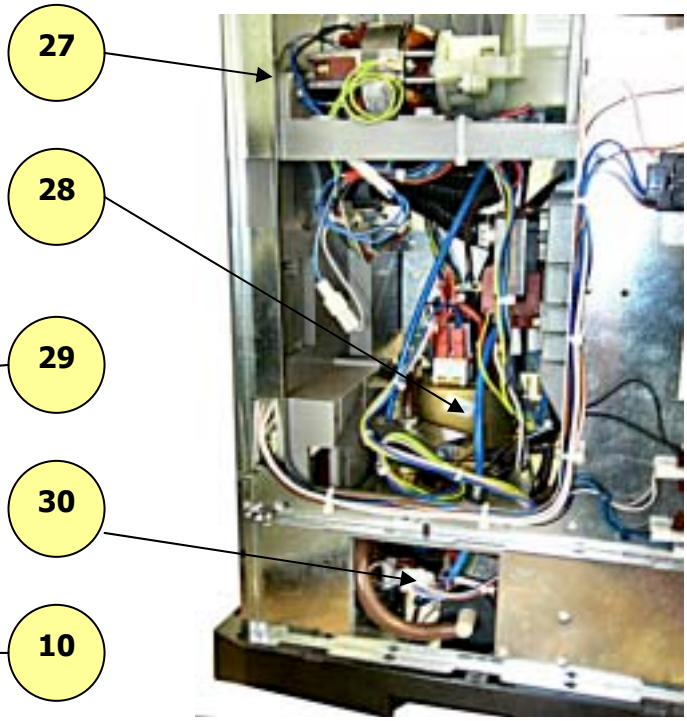


REAR COMPARTMENT WITHOUT PROTECTIVE CASING

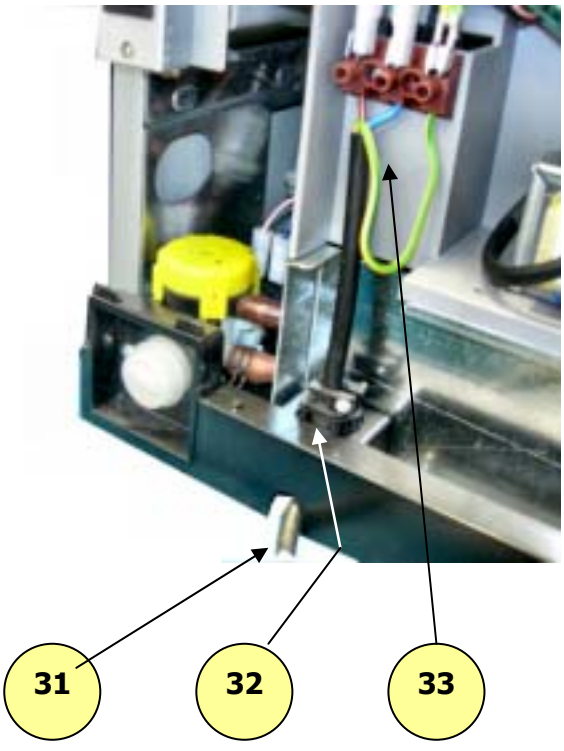


DETAIL OF CPU / ACTUATION MACHINE BOARD

PERSPECTIVE VIEW WITHOUT PROTECTIVE CASING - AIR-BREAK SIDE

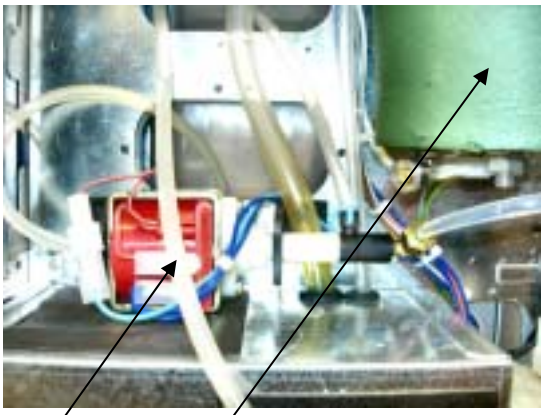


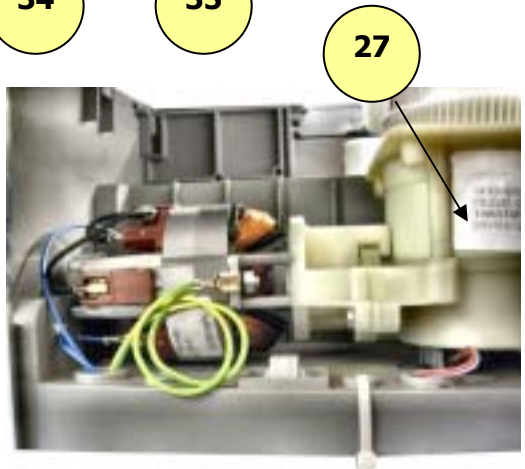
SIDE VIEW WITHOUT PROTECTIVE CASING - ESPRESSO BOILER SIDE



DETAIL OF POWER SUPPLY CABLE CLAMPING

DETAIL OF PUMP AND BOILER FOR FROTHER UNIT

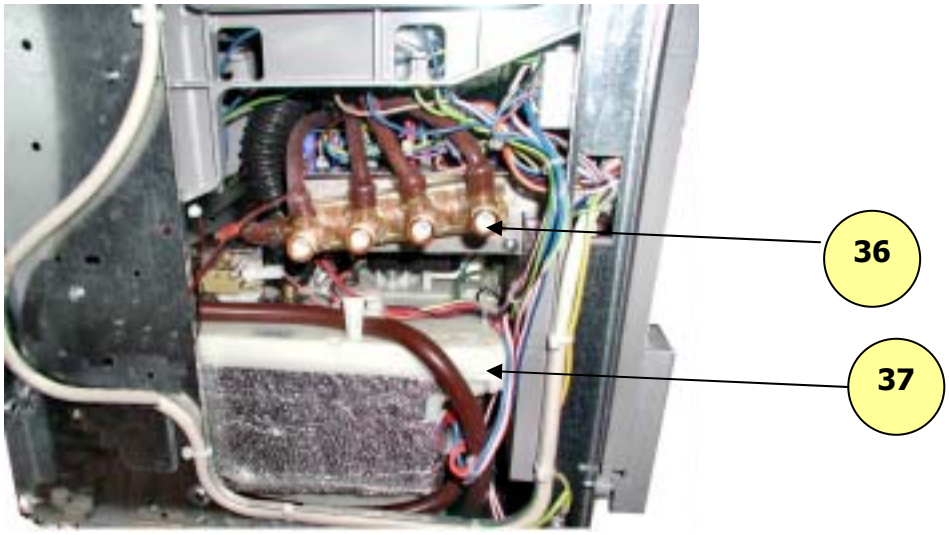




DOSER GRINDER UNIT DETAIL

SIDE VIEW WITHOUT PROTECTIVE CASING - INSTANT BOILER SIDE
(Only for INSTANT VERSION or FRESH BREWER)

FRONT VIEW WITHOUT PROTECTIVE CASING - INSTANT BOILER SIDE
(Only for INSTANT VERSION)



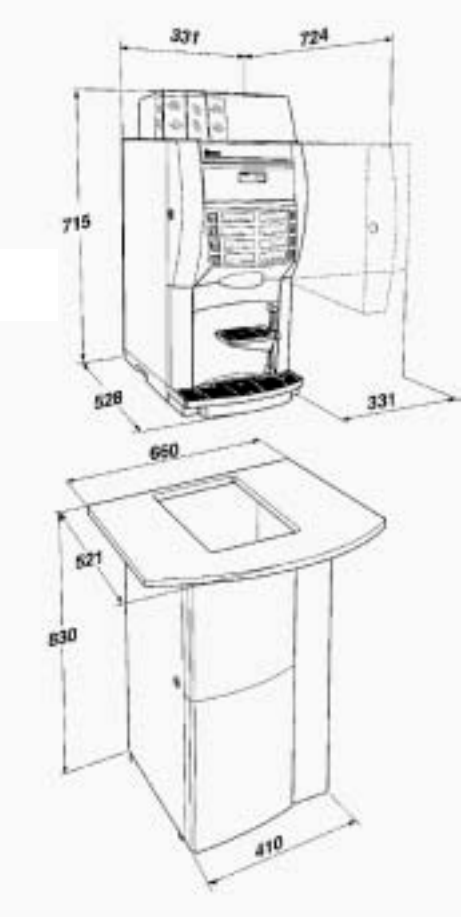
DETAIL OF SOLENOID VALVES FOR INSTANT BOILER
(Only for INSTANT VERSION)

2 - LIST OF MAIN COMPONENTS

N° Ref.	DESCRIPTION
1	Lock
2	Cabinet
3	User interface
4	Selection keypad
5	Dispensing unit
6	Cup tip-up support
7	Rear protective casing
8	Power supply fuses
9	Main switch
10	Water inlet solenoid valve
11	Power supply cable
12	Grinder and doser device
13	Coffee beans hopper
14	Instant product canister
15	Mixer assembly
16	Door
17	Espresso coffee brewer unit
18	Decaf. coffee door (pre-measured sachets of ground coffee)
19	Coffee hopper lid
20	Spouts assembly
21	Actuation and control board
22	Exhaust fan
23	Fuse box
24	Power supply interference suppressor
25	Transformer
26	Boiler power supply board
27	Grinder and doser device
28	Espresso boiler
29	Air break
30	Vibration pump
31	Power supply cable
32	Cable clamp
33	Power supply cable connector
34	Frother pump
35	Frother unit boiler
36	Instant boiler solenoid valve
37	Instant boiler

3 – TECHNICAL DATA AND FEATURES

Height	28.14"
Width	13.03"
Depth	20.78"
Overall depth with door open	28.89"
Weight	**70.54lb**
Power supply	120V AC 60 Hz
Installed power	1300W(Espresso)



Overall size of vending machine and of base cabinet (optional)

Payment systems used:

The machine is pre-set to use (by means of special kits) payment systems, coin mechanisms and 24 V DC validators with EXECUTIVE, BDV and MDB protocols.
The payment systems must be housed in the special side module supplied as optional accessory together with the payment system kits.

Water supply:

From the mains, 7-123PSI 0.05-0.85 Mpa 0.5-8.5

Available adjustments:

Grade of grinding for espresso coffee
Espresso coffee dose through number of rotations of grinding wheels +
Water doses for coffee by volume
Water doses for instant products by timing
Powder doses for instant products by timing
Boiler temperature adjusted via software

Base versions:

Espresso – Instant – Fresh brever

Installed boilers and temperature:

Una caldaia in pressione per la versione espresso
One open-top boiler for Instant and Fresh-brew versions - Temperature setting via SW

Safety devices:

Main switch (at the back) – Main safety switch for opening the door
Water inlet solenoid valve with passive overflow device
Manual-reset boiler safety thermostat
Manual-reset instant boiler anti-boiling thermostat
Air-break float jamming and instant boiler
Presence of liquid waste tray – Presence of coffee grounds tray
Boiler sensor control (short-circuit or failure)
Double heating and timing protection for:
Pump – Doser devices – Coffee unit ratiomotor – Coffee grinder – Mixer motors
Fuse protection for: Transformers, electronic boards and main wiring
Protection for 100% impedance: Instant product solenoid valves, water inlet solenoid valve

Controls:

Presence of water - Presence of coffee - Operating temperature reached

4 – ELECTRICAL SAFETY AND RELEVANT STANDARDS

The vending machine **KORINTO** was designed and made in conformity with the provisions of the following directives and related European standards:

MACHINE SAFETY DIRECTIVE 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

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With regard to **Low Voltage** and **Electromagnetic Compatibility** this vending machine KORINTO was tested and certified by **IMQ**, a certifying body authorised by ministerial decree at European level**.**
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.

5 – REQUIREMENT FOR THE USERS

For safety purposes, three different operators with different qualifications have been 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.

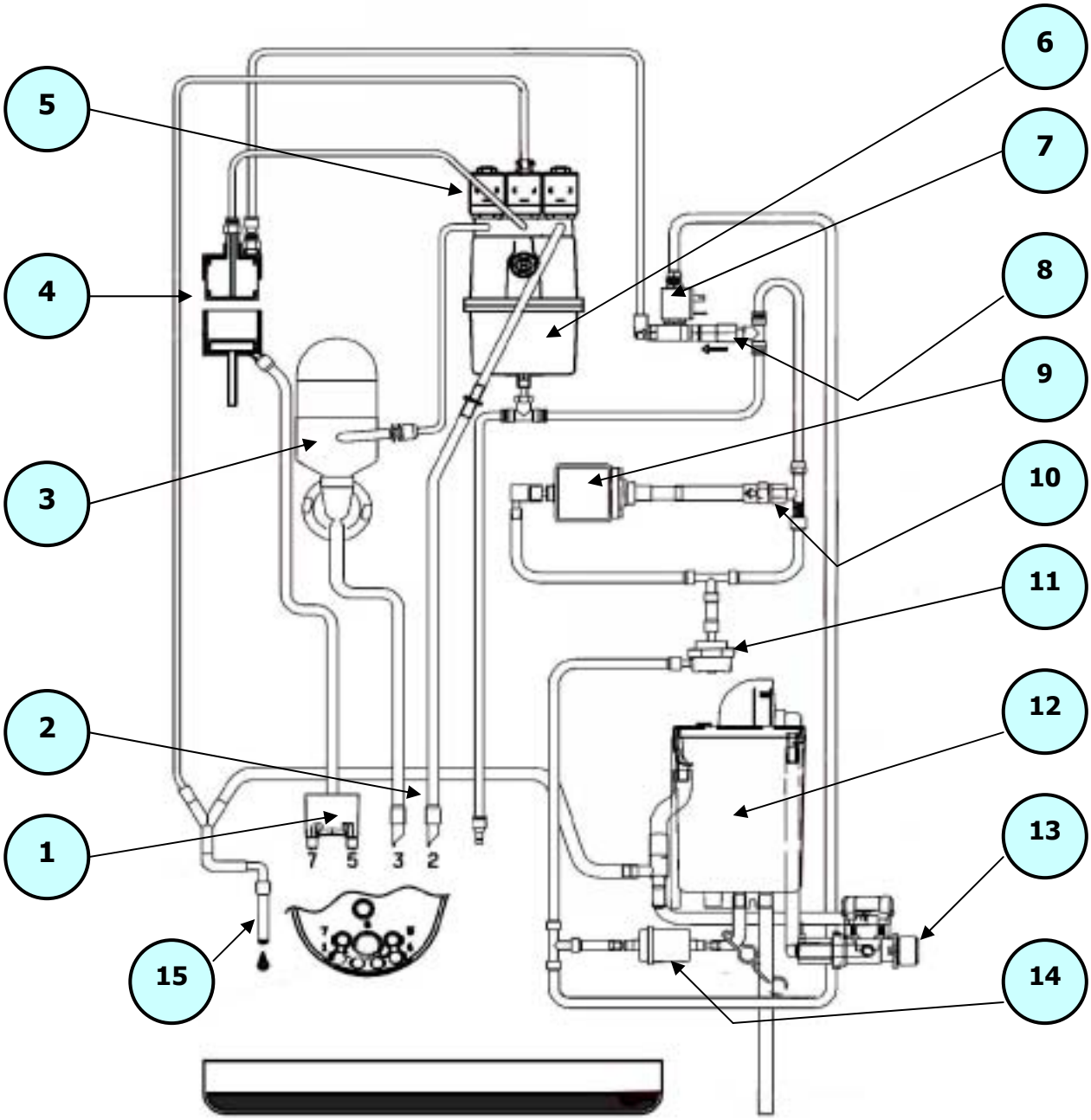
PERSON RESPONSIBLE FOR REFILLING AND ROUTINE CLEANING

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.

6 – HYDRAULIC LAYOUT "ESPRESSO"

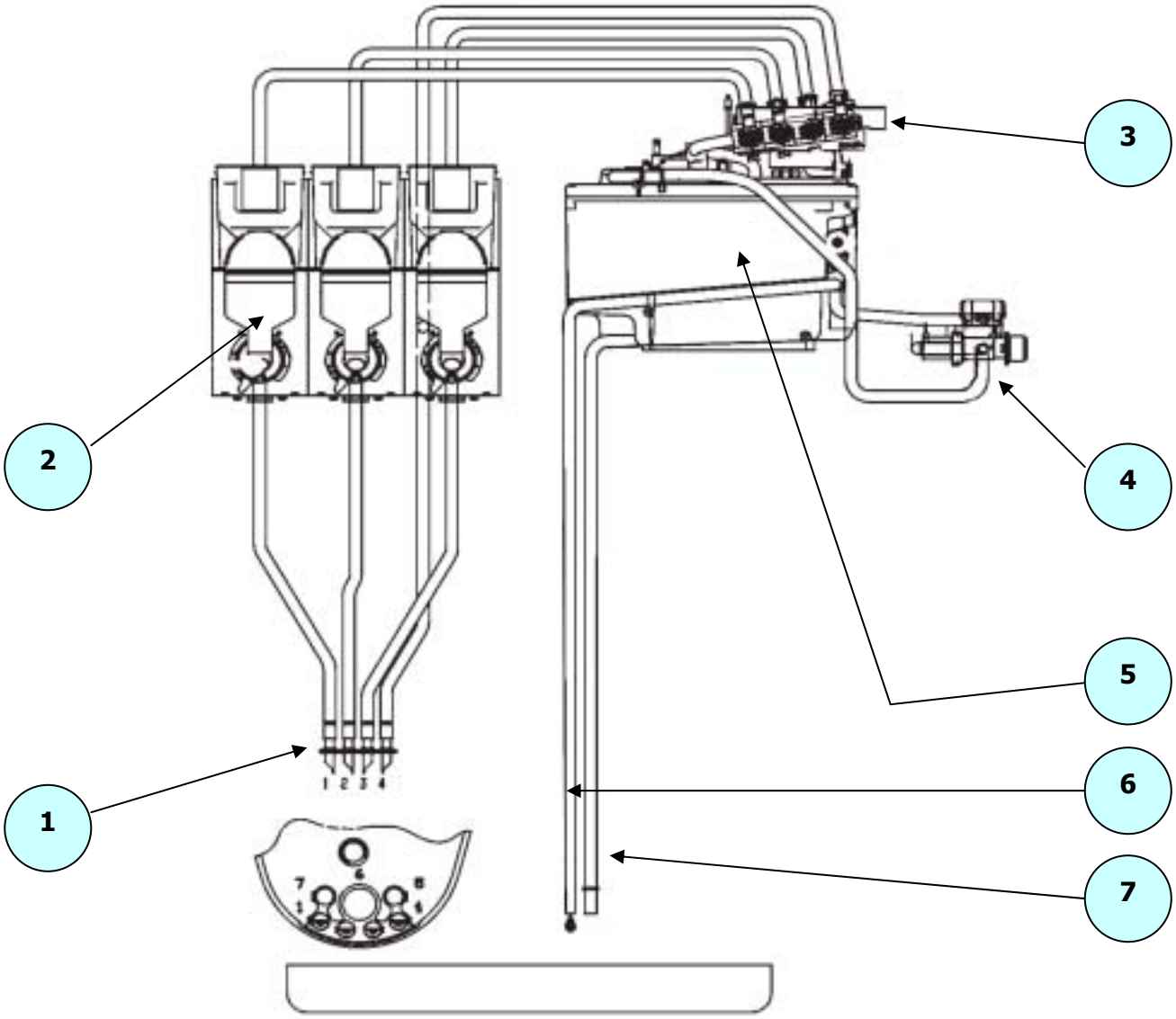


ESPRESSO VERSION COMPONENTS (with variable brewing chamber)

RIF	DESCRIPTION	RIF	DESCRIPTION	RIF	DESCRIPTION
1	Spouts assembly for double coffee	**2**	Instant drinks spouts assembly	**3**	Mixer
4	Brewing chamber	**5**	Solenoid valve assembly	**6**	Espresso boiler
7	Piston solenoid valve	**8**	By-pass	**9**	Vibration pump
10	By-pass pump	**11**	Volumetric counter	**12**	Air-break
13	Water solenoid valve	**14**	Water filter	**15**	Vent tube

N.B. The diagram shown is given only as a reference as it may differ for each version.

7 – HYDRAULIC LAYOUT "INSTANT"

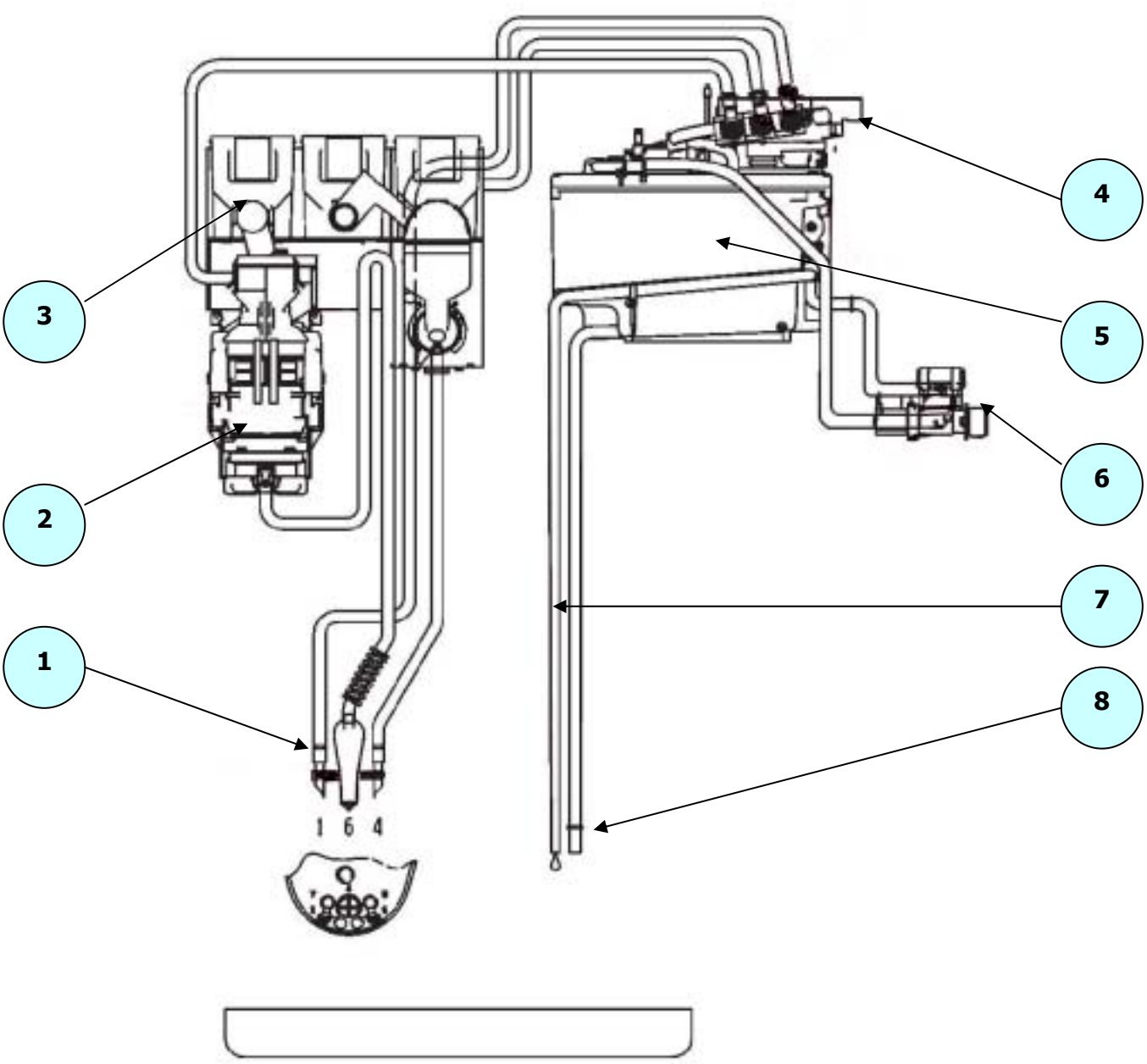


INSTANT VERSION COMPONENTS

RIF	DESCRIPTION	RIF	DESCRIPTION	RIF	DESCRIPTION
1	SPOUTS ASSEMBLY	**2**	Mixer	**3**	Solenoid valves
4	Water solenoid valve	**5**	Boiler assembly	**6**	Boiler vent tube
7	Drain tube				

N.B. The diagram shown is given only as a reference as it may differ for each version.

8 – HYDRAULIC LAYOUT "FRESH BREWER"



COMPONENTS OF FRESH BREWER VERSION

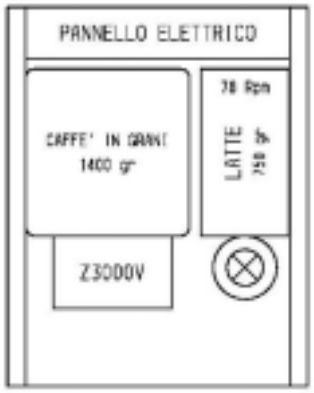
RIF	DESCRIPTION	RIF	DESCRIPTION	RIF	DESCRIPTION
1	Spouts assembly	**2**	Sigma Brewer unit	**3**	Mixer
4	Solenoid valves	**5**	Instant boiler	**6**	Water solenoid valve
7	Vent tube	**8**	Drain tube	**9**	

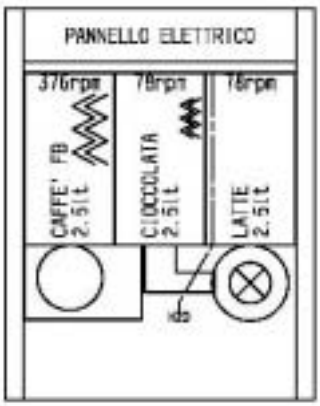
N.B. The diagram shown is given only as a reference as it may differ for each version.

9 - INTERNAL LAYOUTS

EXAMPLES OF INTERNAL LAYOUT

NOTE: THE FOLLOWING I LAYOUTS ARE ONLY GIVEN AS AN EXAMPLE FOR THE PURPOSE OF INDICATING THE CONFIGURATION POSSIBILITIES. REFER TO THE TABLES SUPPLIED WITH THE MACHINE FOR THE ACTUAL LAYOUT.





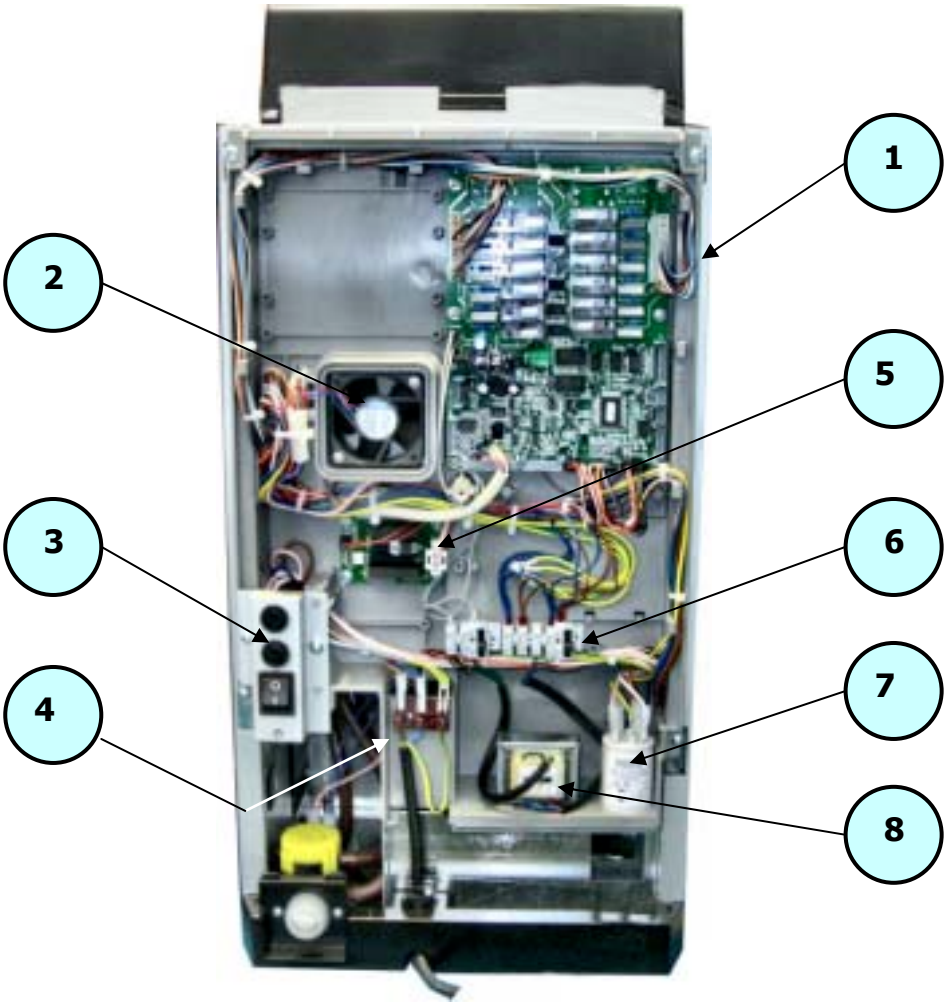
LAYOUT OF KORINTO INSTANT AND SELECTION PANEL

LAYOUT OF KORINTO FRESH BREWER AND SELECTION PANEL

9.1 - ELECTRICAL SYSTEMS – CONNECTIONS

The machine is designed to operate under a single-phase voltage of 120 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
It 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 mm^2 section
2) HO5 V V – F ,, ,, ,, ,,
3) 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 "**KORINTO**" 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.

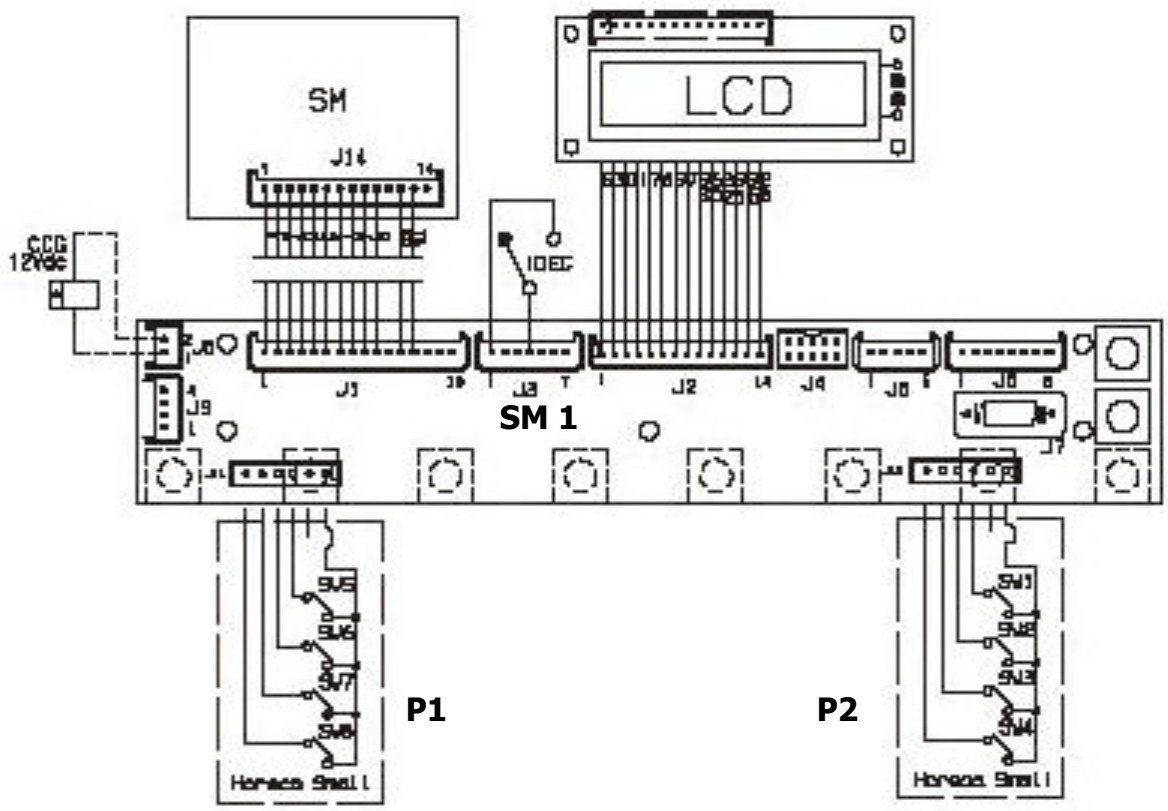
9.2 – CONNECTION OF ELECTRONIC BOARDS



1	Actuation board
2	Steam exhauster
3	Switch and fuses
4	Terminal strip
5	Boiler control board
6	Secondary winding fuses
7	Interference suppressor filter
8	Transformer

VIEW OF POWER SUPPLY UNIT COMPARTMENT AND ACTUATION BOARD (ESPRESSO VERSION WITHOUT REAR PROTECTIVE CASING)

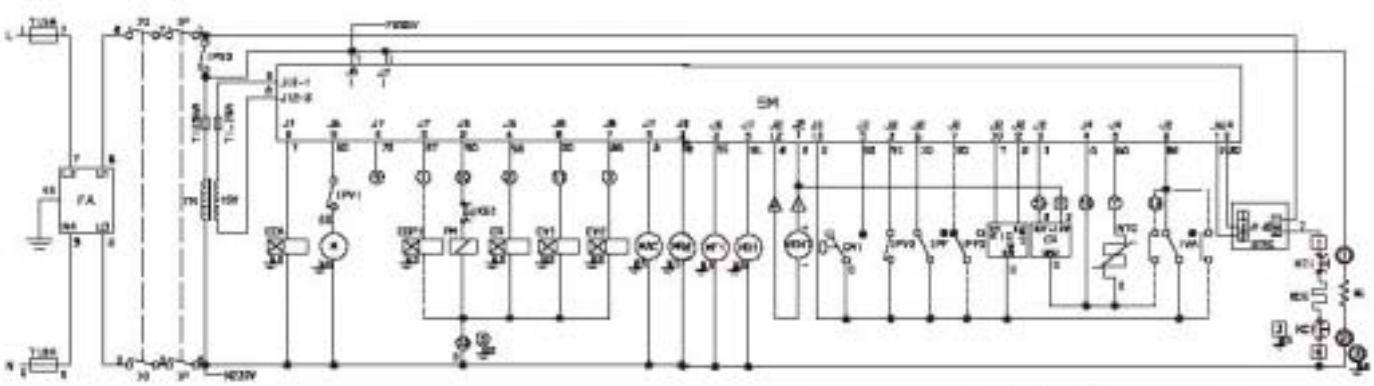
BOARD CONNECTION DIAGRAM

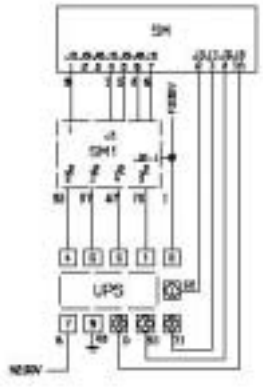


Signal	DESCRIPTION
SAL	Power supply card
SM FB	Sigma brewer control board (where provided)
SM	Actuation & control board
CCG	Mechanical general counter
SM 1	Push-button and display control card
LCD	Liquid Crystal Display
IDEC	Decaf. coffee door switch
P1- P2	Selection keypad

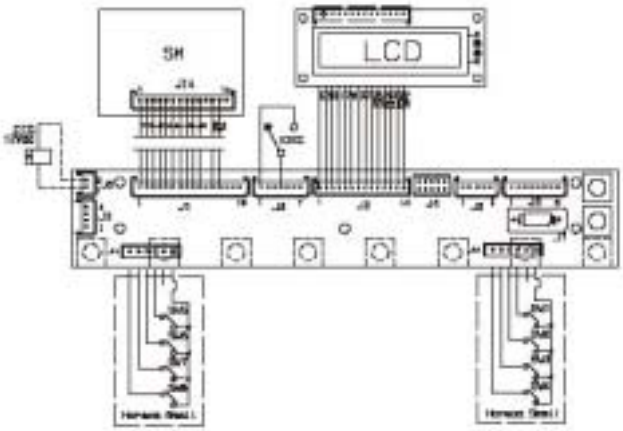
NB: The above codes are indicated in the wiring diagrams and in the tables supplied with the machine.

10 - WIRING DIAGRAMS





UPS CONNECTION DIAGRAM
(Cooler unit)



BLOCK CONNECTIONS DIAGRAM
(see detail in previous page)

11 - ACTUATION BOARD – CONFIGURATIONS

ACTUATION BOARD

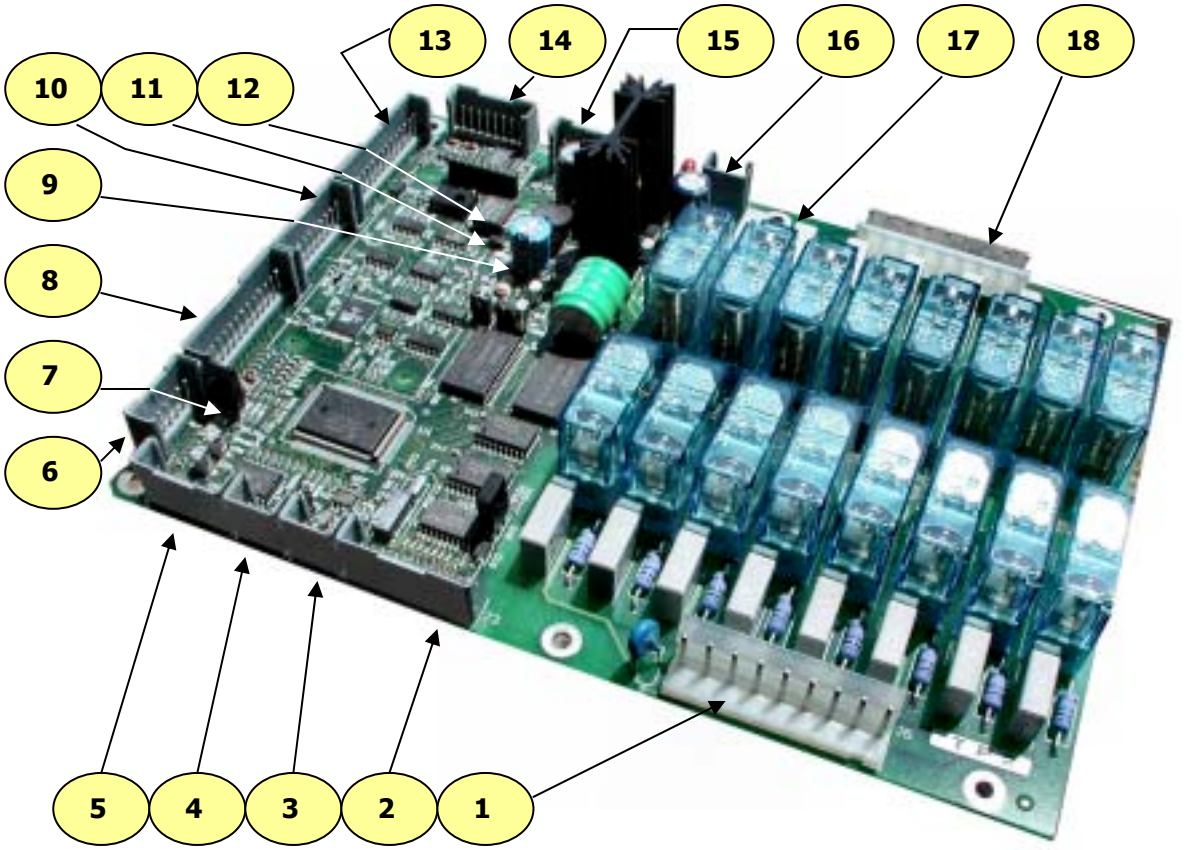
This board, placed at the back of the machine, processes the information from the push-button card and from the payment system (if fitted); it also controls the actuations, the input signals and the boiler board.

The 15 VAC voltage necessary for operating the board is supplied by the transformer, protected by a 125 mAT fuse on the primary winding and by a 1.25 AT fuse on the secondary winding; the voltage is rectified and stabilised directly by the board.

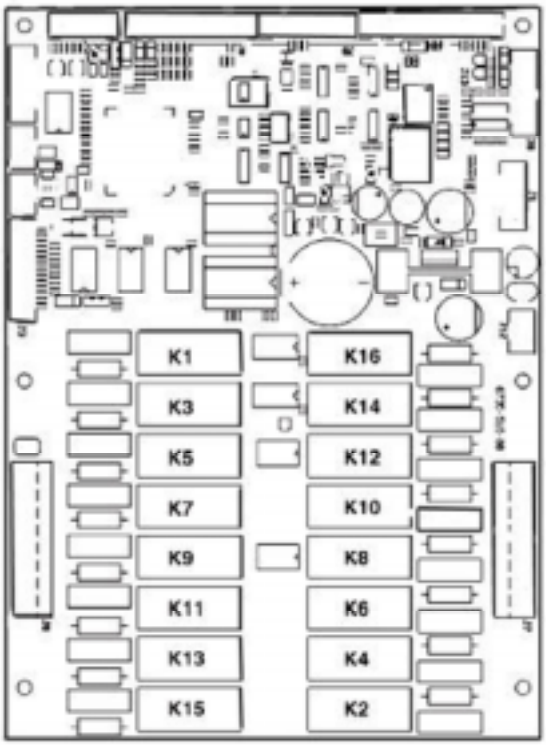
This board houses the Flash EPROM. The control software of the board is installed directly (via RS232) in the microprocessor.

The program can be updated or some of its functions can be changed through a PC or palmtop with special Software.

- The red LED (7) indicates the operating status of the boiler heating element;
- The red LED (9) for resetting the CPU glows during the board reset;
- The green LED (11) blinking indicates that the microprocessor is working correctly;
- The yellow LED (12) indicates the presence of 12 V DC.



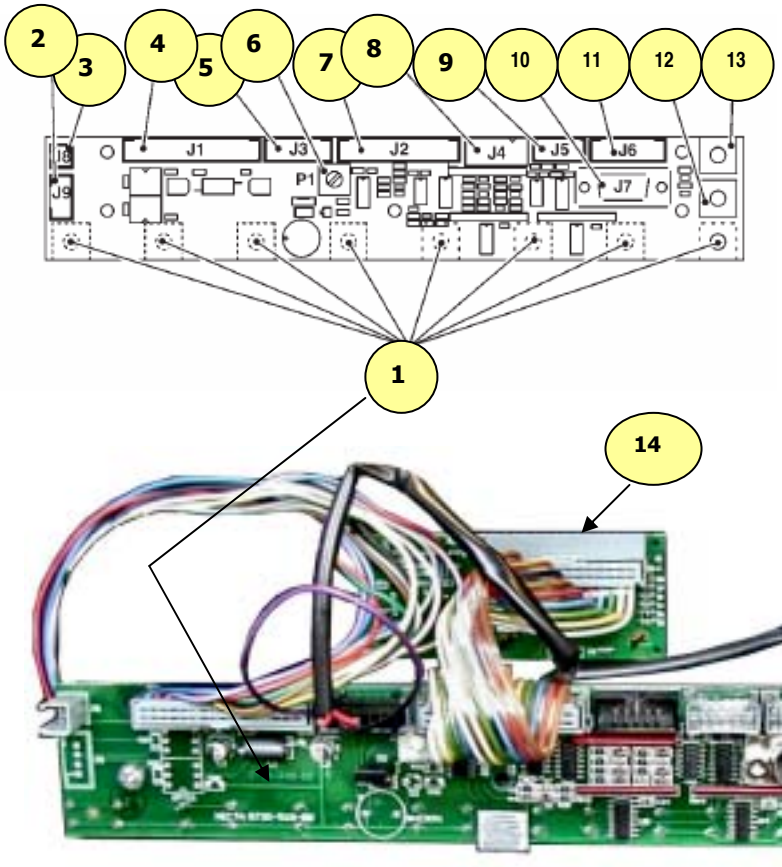
1 - 120 V~ power users
2 - Input signal
3 - Can-Bus connection
4 - Can-Bus connection
5 - Relay expansion connection
6 - Boiler control probes
7 - Red LED - boiler heating element
8 - Input signal
9 - Red LED
10 - Not used
11 - Green LED
12 - Yellow LED
13 - To the push-button board
14 - Connector for board programming (RS232)
15 – Up-Key connector
16 - Board power supply (15Vac)
17 - Relays K1 to K16
18 - Connector for 120 V AC power users



SM: REFERENCE TO RELAY CODE AND ACTUATIONS – ESPRESSO VERSION

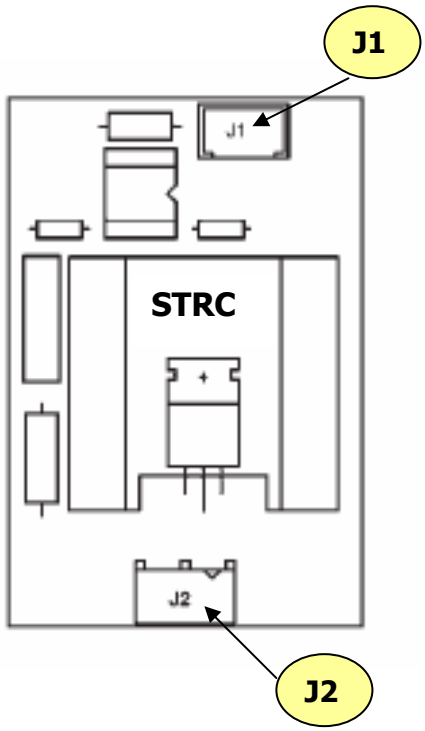
ESPRESSO CONFIGURATION	
K 1	**Starting pump**
K 2	**Not used**
K 3	**Whipper motor 1**
K 4	**Not used**
K 5	**Coffee dispensing solenoid valve**
K 6	**Discharge solenoid valve 1**
K 7	**Coffee brewer motor**
K 8	**Discharge solenoid valve 2**
K 9	**Instant prod. solenoid valve 1**
K 10	**Doser device motor 1**
K 11	**Instant prod. solenoid valve 2**
K 12	**Not used**
K 13	**Not used**
K 14	**Mains water inlet solenoid valve**
K 15	**Not used**
K 16	**Coffee grinder ratiomotor**

12 - PUSH-BUTTON BOARD



1 - Selection buttons (not used)
2 - Not used
3 - To mechanical counter (optional)
4 - To actuation/CPU board
5 - Input
6 - Display adjustment trimmer
7 - To display
8 - 12 Vdc validators
9 - Not used
10 - RS232 serial port
11 - Not used
12 - Programming access button
13 - Wash button
14 - Display card

13 - ESPRESSO BOILER CONTROL BOARD



Triac board

This board is controlled by the machine board and is powered under 120 V AC.
It is used for controlling and starting the boiler heating element.

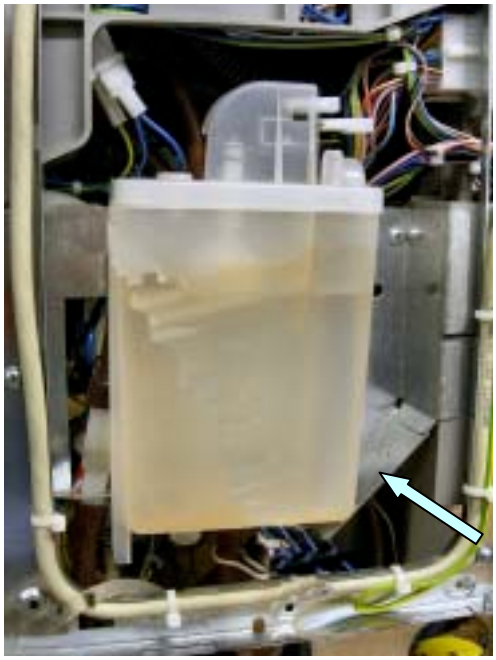
Connector **J2** is connected to a 120 V AC phase
Connector **J1** receives the information from the **SM** board that sends a consent signal to activate the triac for the power supply to the heating element.

14 – AIR-BREAK AND 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 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 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).
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).
In the Instant version the level is controlled directly through a float located in the boiler itself (see page 24).

SIDE VIEW - AIR-BREAK SIDE (WITHOUT PROTECTIVE CASING)

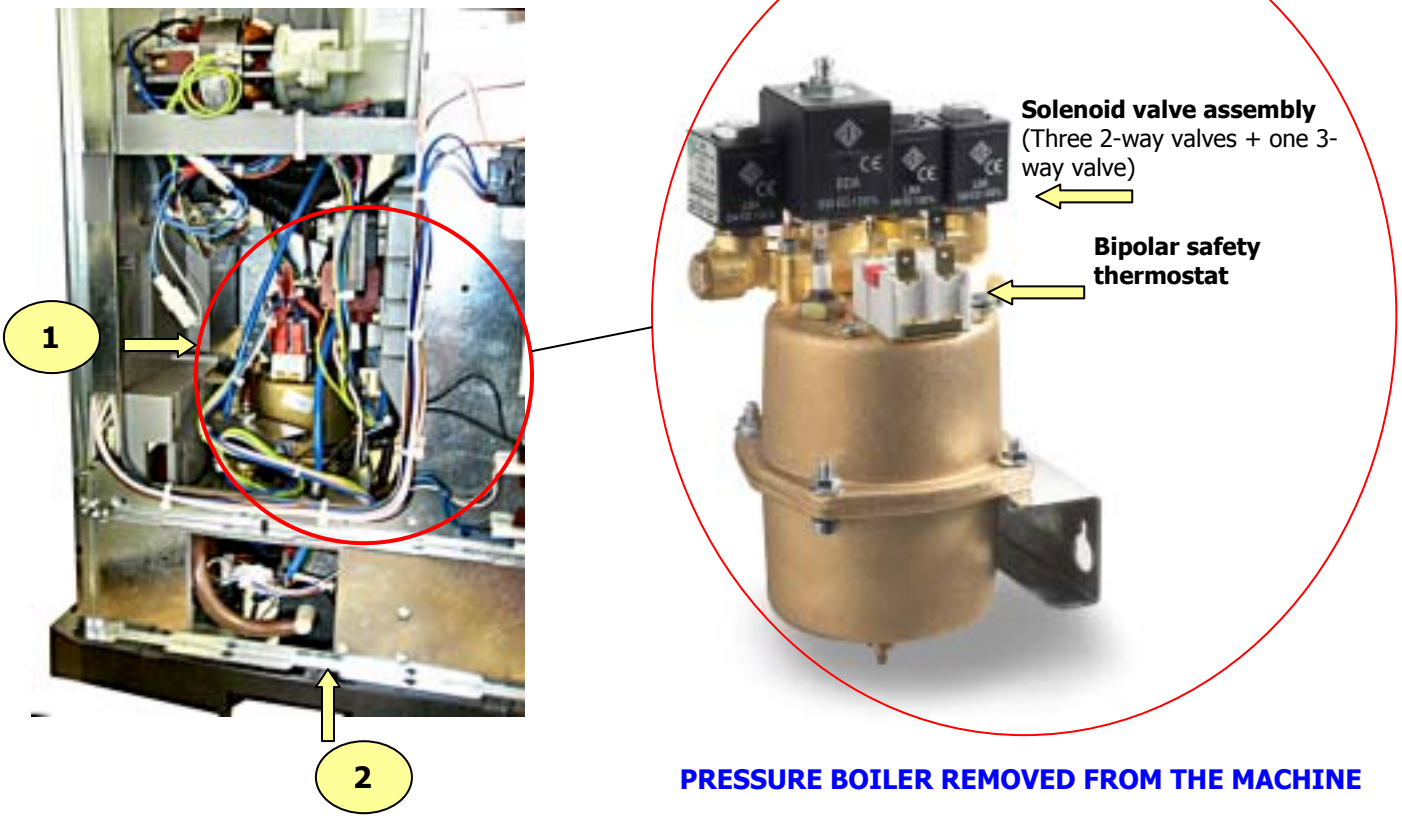
DETAIL OF WATER LEVEL MICRO-SWITCH



DETAIL OF AIR-BREAK IN WORKING POSITION

For the **KORINTO** model there are three base versions:
1) **Espresso** version, fitted with a pressure boiler, very similar to the one used in the entire range.
2) **Instant** version, fitted with only the open-top instant boiler, also fitted with a new design level control system.
3) **Fresh brewer** version, fitted with only the same open-top instant boiler used in the Instant version.
The **espresso** boiler is the same used for **KORO / BRIO** models, therefore with the same well known and established characteristics and reliability.
The open-top boiler for the Instant / FB version is a new and specific design with the feature of being molded from thermoplastic material with specific technical characteristics. (Already used in the KORO and Brio 3 models - instant and FB)
For further technical information see the functional unit manuals
To access the boiler and the pump see instructions at page. …

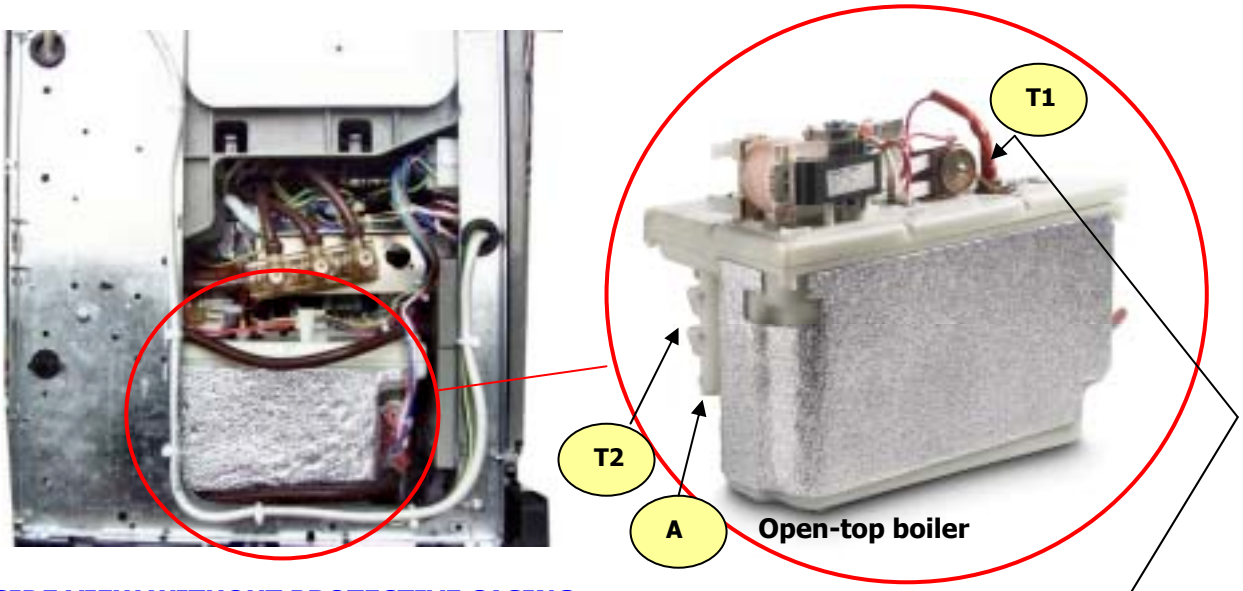
PRESSURE BOILERS (espresso version)



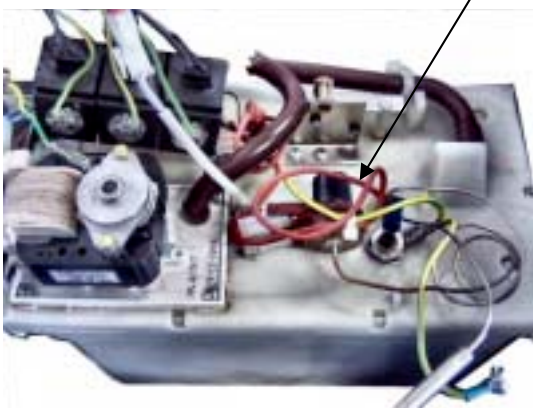
PRESSURE BOILER REMOVED FROM THE MACHINE

SIDE VIEW WITHOUT PROTECTIVE CASING – INSPECTION SIDE OF PRESSURE BOILER (1) AND VIBRATION PUMP (2)

OPEN-TOP BOILERS (Instant & Fresh Brewer models)



SIDE VIEW WITHOUT PROTECTIVE CASING – OPEN-TOP BOILER COMPARTMENT



OPEN-TOP BOILER – DETAIL OF SOLENOID VALVES AND OVERHEATING PROTECTIONS

NOTE: The open-top is made of special thermoplastic material and coated with insulating material for more efficient heat insulation; **two** overheating protections are fitted for safety.
(practically it is the same boiler used in the **KORO** instant model).
1) Dry operation protection.
2) Anti-boiling protection.

In the event of failure to the control system and of boiler without water, the thermostat **T** is triggered at approximately **125**°C, disconnecting the power supply. In order to reactivate everything, the fault must be identified and the thermostat must be reset by pressing the central red button.
In the event of failure to the control system and of a full boiler, upon reaching boiling temperature, as the steam exits from tube **A** it touches and triggers the two thermostats **T2** (each thermostat disconnects one phase of the power supply).
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 is by means of an **NTC** type electronic probe fitted with an internal 12K ohm (+/- 4 ohm) resistance at a temperature of **25°** C. The following table shows the changes in internal resistance as the temperature changes.
We can see that the resistance decreases as the **NTC** temperature increases
The SW, when reading such changes, causes the activation or deactivation of the heating element with a specific cycle to avoid temperature changes that are too high.

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