



AZKOYEN
GROUP

Technical Information



ZENSIA



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GROUP

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1. INTRODUCTION

The automatic vending machines in the **Zensia** range are designed to elaborate and vend *espresso coffee* and instant drink powder mixed with hot water. The final product is served to the customer in a plastic cup.



In the rest of this document, the names of the following components indicated below will be abbreviated as shown below:

The *machines* in the **Zensia** range, as "*machine or machines*".

The *coffee infusion group*, as "*group*". The electro-valves, as "*EV*".

1.1. DEFINITIONS

Espresso coffee: infusion of coffee elaborated according to the following conditions:

- 7 g of ground coffee.
- The temperature of the water the infusion is between 92° C and 96° C.
- The pressure of the infusion water is at 9 kg/cm².
- The time of *infusion* of the coffee is between 15 and 20 seconds.
- The volume of water in the *infusion* is 40 ml.

Volume dosage: this dosage system measures the volume of water that is used in the *infusion*.

Water pump: an electro-mechanical system used to pump the *infusion* water and to apply the necessary water pressure.

Infusion: In coffee terms it means to pass hot water through the ground coffee to extract its oils and essences.

Volumetric infusion: during the *infusion* process the volume of water used is always constant.

Tablet: in coffee terms it means the pressed coffee residue that remains in the group after the *infusion*.

Programming status: when the *machine* is ready to be programmed.

Working mode: when the *machine* is in ready for the user to request any of services that the machine offers.

MODELS

The **Zensia** series is comprised of the models **LE** and **LI**.

- The **LE** model elaborates *espresso* coffee and instant products.
- The **LI** only elaborates instant products.

1.2. PRINCIPLE TECHNICAL CHARACTERISTICS

- ✎ On automatic: the press of the finger is enough to elaborate any service; *espresso* or *instant*.
- ✎ It grinds the coffee in the time of the *infusion*.
- ✎ Products available in each model of machine:

Model	Coffee beans	Sugar	Instant Coffee	Instant Decaf.	Milk	Chocolate	Tea	Soup
Zensia ESP+4	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Zensia ESP+5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Zensia INST 5	No	Yes	Yes	Yes	Yes	Yes	No	No
Zensia INST 6	No	Yes	Yes	Yes	Yes	Yes	Yes	No

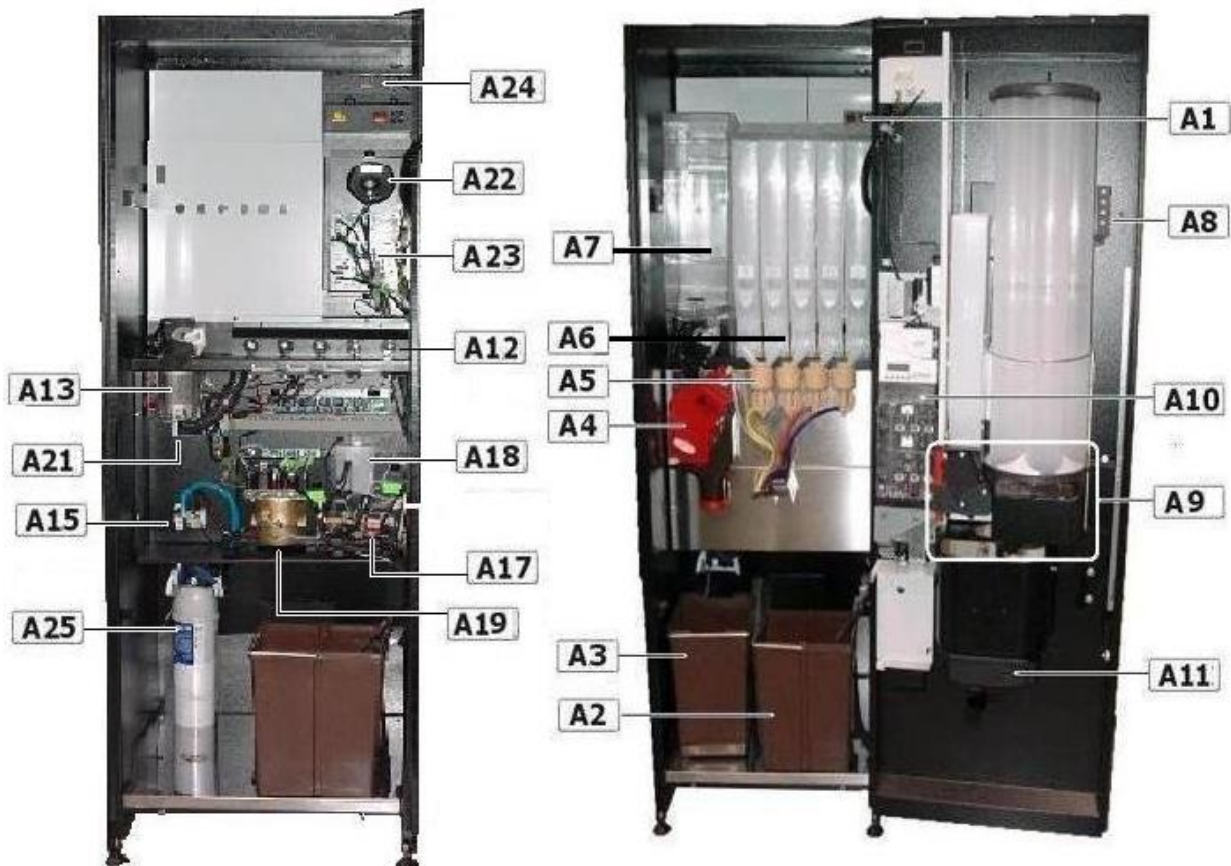
- ✎ The temperature of the water is programmable.
- ✎ Dosage of ground coffee is programmable up to a maximum of 8g.
- ✎ Electrical connection and disconnection of the *machine* is automatic and programmable.
- ✎ *Water pump* for the water pressure incorporated in the *machine*.
- ✎ Volume of water dosage is programmable in the different services of *espresso coffee*.
- ✎ Painted in black - RAL 9005 "textured"
- ✎ Electrical characteristics:

ZENSIA instant	Voltage	Power	Length
Mains voltage of red	230 Vac / 50 Hz		
Heating element	230 Vac / 50 Hz	2000 W	
Mains cable			3,400 mm

ZENSIA espresso	Voltage	Power	Length
Mains voltage of red	230 Vac / 50 Hz		
Heating element	230 Vac / 50 Hz	1100 W	
Mains cable			3,400 mm

2. DESCRIPTION OF COMPONENTS

PRINCIPLE COMPONENTS



A1. Mains switch.

Allows the mains power to be disconnected from all the components in the machine

A2. Waste liquids bucket.

It collects all the waste liquids that the machine generates. It has a capacity of 8 litres. When it reaches a determined level, a device is activated that puts the machine in "out of order" status.

A3. Coffee residue bucket.

It collects all the waste coffee grinds that are generated in the machine. It has a capacity for 7500 grams of ground coffee.

A4. Group and piston. These are made of plastic resins and are the elements where the machine makes the *infusion* with the dosage of ground coffee.

The *group* has moving parts activated by 24 Vdc motor that rotates the flywheel that moves the *coffee holder* from the dosage device to the piston. It also moves a lever that acts on a *micro switch*, which indicates the position that the *group* is located to the electronic board.

At rest position, the *group* cannot be removed. Before removing, and with the machine switched on, activate the black button on the device. On pressing button, the *group* situates itself in the load coffee position. Now the levers that hold it in place can be turned to free it from the support and it can be removed.



Pull on the clip



Remove the piston

- B1. Lower Group
- B2. Loading funnel
- B3. Piston

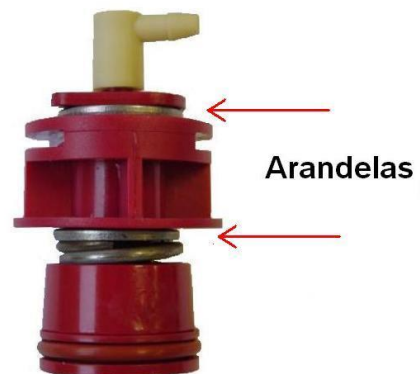


To replace the *group* in the machine, it can be in any position and it does not matter if it has been turned while it was out of the machine. It is only necessary to fit it and fasten the holding levers; the motor of the *group* will automatically position it correctly.

- C1. Piston
- C2. Group
- C3. Filter
- C4. Holding lever
- C5. Extraction button
- C6. Position Microswitch
- C7. Lever for moving the group
- C8. Group motor



The piston has a spring and two spacers that, depending on where they are placed, adjust the pressure of the piston for the quantity of ground coffee in the dosage.



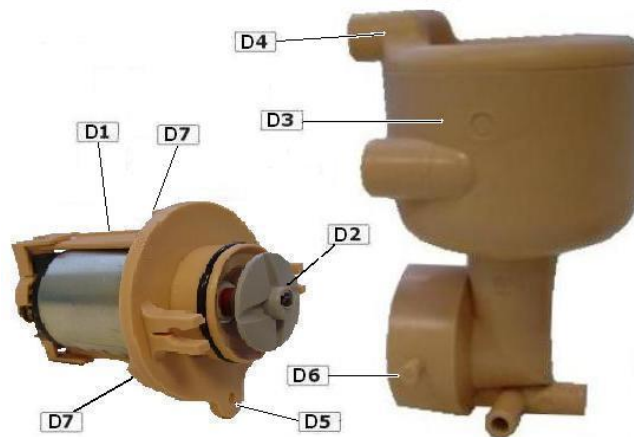
The position of the spacers will depend on the quantity of coffee configured in the dosage mechanism; the positions are indicated in the following table:

Dosage	Position of spacers		Position of dosage
5 g	Inferior	Inferior	1
5.5 g	Inferior	Inferior	2
6 g	Inferior	Superior	3
6.5 g	Inferior	Superior	4
7 g	Inferior	Superior	5
7.5 g	Superior	Superior	6
8 g	Superior	Superior	7

A5. Beaters

This mechanism mixes the product with the hot water from the boiler.

- D1. Beater motor
- D2. Beater fins
- D3. Beater assembly
- D4. Vapour extractor
- D5. Holding screw
- D6. Beater holding pivots
- D7. Motor holding tabs



The movement of the beater is carried out by a motor of the following technical characteristics:

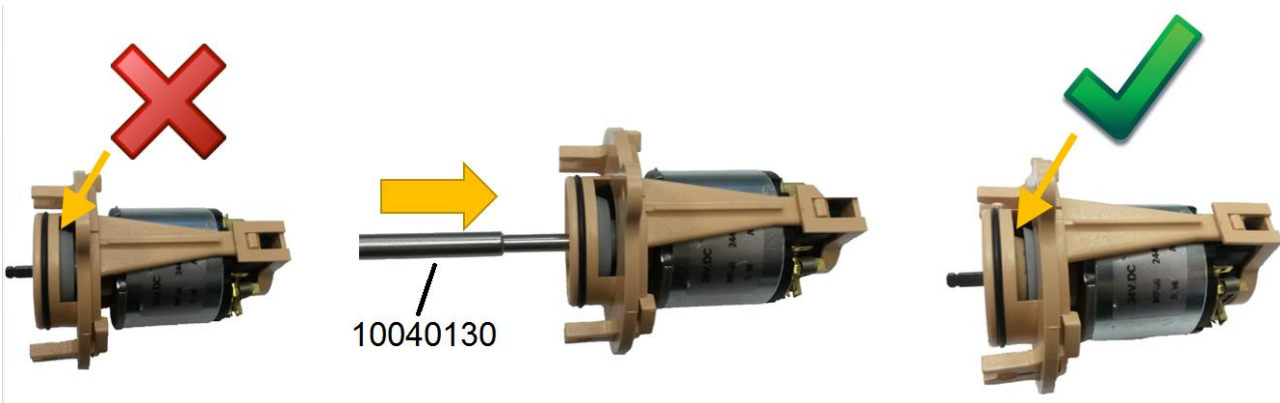
Supply voltage	34 Vdc.
Speed	15,000 rpm

The beater assembly can be removed from the machine by turning it to free it from the holding pivots. To remove the motor, remove the holding screw and twist the motor to the right to free it from the holding tabs.



WARNING! When mounting the wiper motor (04101650) and wiper base assembly (11037941 Beige / Grey 11037931 / Green 41221621) the grey part which is inside the base must be pushed toward the beater motor.

The contact between this grey part and the wiper base assembly must be avoided. If these two bodies remain in contact or very close to each other, when the motor runs, friction between the two parts causes them to fuse together, leaving the beater unusable. For this task, Azkoyen has available in its catalogue, the appropriate tool which is part number 10040130.



During the beating process, the EVs of the instant products is very important; they allow the hot water from the boiler into the beaters to elaborate the instant products. These are housed on a brass support that is at a constant temperature, because it is fixed to the hot water boiler. This way the water for elaborating the instant products does not suffer temperature losses and reaches the beaters at an adequate temperature.

A6. Soluble product hoppers

The capacity in volume of the hoppers of instant product is of 6 litres.

The approximate weight of the product is:

Product	Capacity in grams	
	Zensia ESP	Zensia INS
Instant coffee	1,500	1,500
Decaffeinated	1,500	1,500
Milk	2,200	2,200
Chocolate	3,100	3,100
Tea	3,900	3,900
Soup	6,000	6,000
Sugar	5,300	5,300

A7. Coffee bean hopper

The coffee bean hopper is only fitted to the *espresso* machines, its capacity is 4.2 Kg.

A8. Programming handset

This device is used to programme the machine.

A9. Cup, sugar and stirrer extraction systems

The three systems are together in the one module which is located in the door.



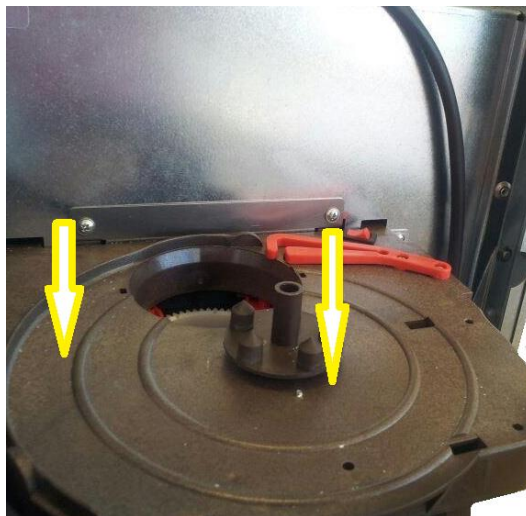
The standard *instant* models do not have a holder for the stirrers

To remove there extractors from the machine, follow the instructions below:

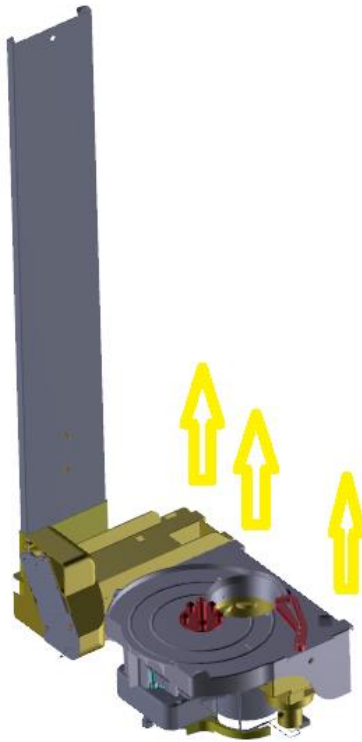
- 1^o Disconnect the power from the board of the cup extractor.



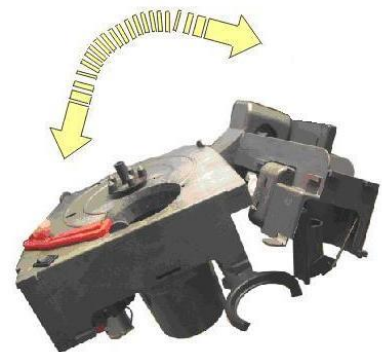
2° Remove the screws and the holding plate as indicated in the photograph.



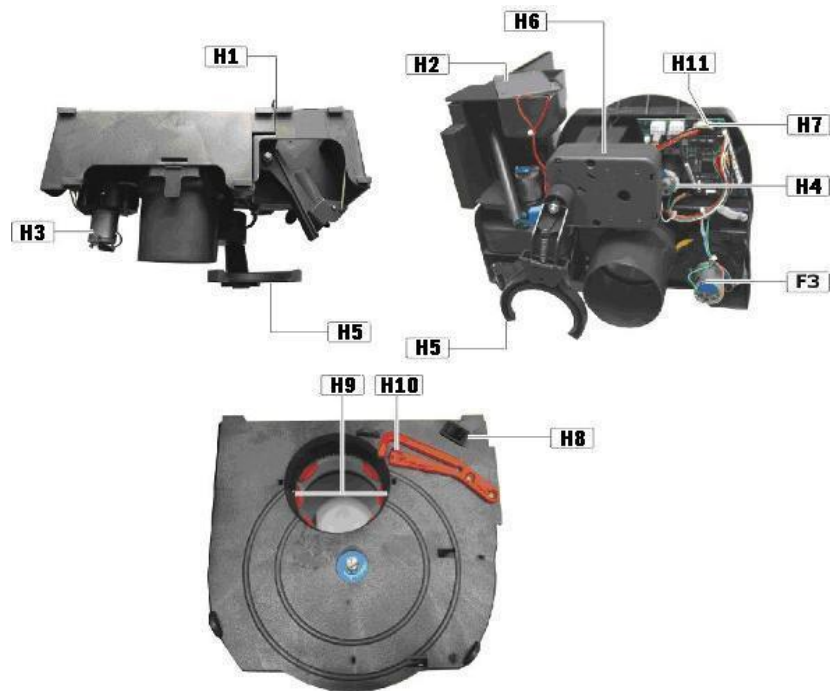
3° Pull upwards on the extractor to free the holding tabs from the support.



The *sugar* and *stirrer* extractor can be separated from the cup extractor. First disconnect the power loom by removing the cover that protects the cup extractor, then free the clip and pull upwards as indicated the figure.



- H1. Clip
- H2. Sugar and stirrer motor extractor
- H3. Cup motor extractor
- H4. Cup holder motor
- H5. Cup support arm
- H6. Cup support motor
- H7. Electronic circuit board
- H8. Cup extractor switch
- H9. Cup detection photo-cells
- H10. Hopper position microswitch
- H11. Connector for the sugar and stirrer cable



Characteristics of the cup extractor:

	Range - ESP and INS
Units	700
Ø of the cups	From 70 to 71 mm.
Motor voltage	24 Vdc.



There is an extractor available for cups with a diameter of 73 mm.

- The cup hopper is divided into 5 separate columns. When one of the columns is empty, the motor spins the hopper so that another column of cups is situated over the extractor. If, after 65 seconds of the motor running, the photo cells do not detect a new column with cups, the machine goes to "out of order" status and the *display* shows the message of "Out of order, no cups".
- The cup hopper has a switch that can be pressed to manually extract a cup.
- The electrical connexions of the terminals of the infrared photocells that are used to detect the presence of the cups are:

Characteristics of the stirrer extractor:

	Range ESP and INS
Units	500
Standard measurements of the <i>Stirrer</i>	90x9x1.3 mm.
Voltage of the motor	24 Vdc.



There is an extractor available for stirrers of 105 x 9 x 1.5 mm

Characteristics of the sugar extractor of:

	Range ESP and INS
Capacity of the sugar hopper	6,100
Voltage of the motor	24 Vdc.

A10. Coin System

The models of the **Zensia** range can work with coin changers that have **executive** or **MDB** protocol.

On the left of door there is a space with 3 screws to hang the coin changer. The connectors for the coin changer are on the top of the changer. On connecting it to the machine, the **MDB or Executive** protocol is automatically recognised.



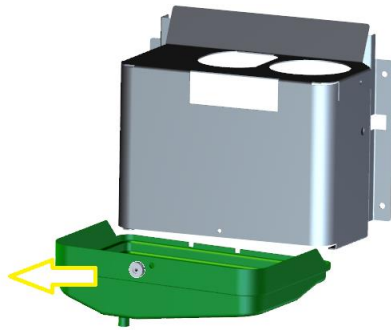
I1. Connexions of the Executive protocol

I2. Connexions of the MDB protocol

A11. Waste liquid tray

It collects the possible drops of water or any other liquid after making a vend. It channels them to the waste liquid bucket.

To remove it, unscrew the white screw and pull on the tray to release it from its mounting.

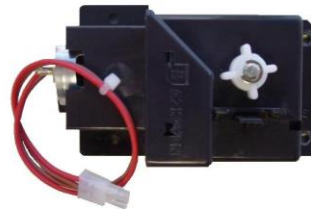
**A12. Product extractors**

Their function is to extract the instant products from the corresponding hoppers and take them to the beaters.

Manufacturer: Mabuchi

Voltage: 24 Vdc.

Speed: 40 rpm

**A13. Coffee grinder**

Model ELDOM L60

Voltage:	200-230 Vac.
Current:	0.8A



Moving the lever in an anticlockwise direction will obtain a coarser grind and a higher quantity of coffee, and moving the lever in a clockwise direction will obtain a finer grind and therefore less quantity of ground coffee.

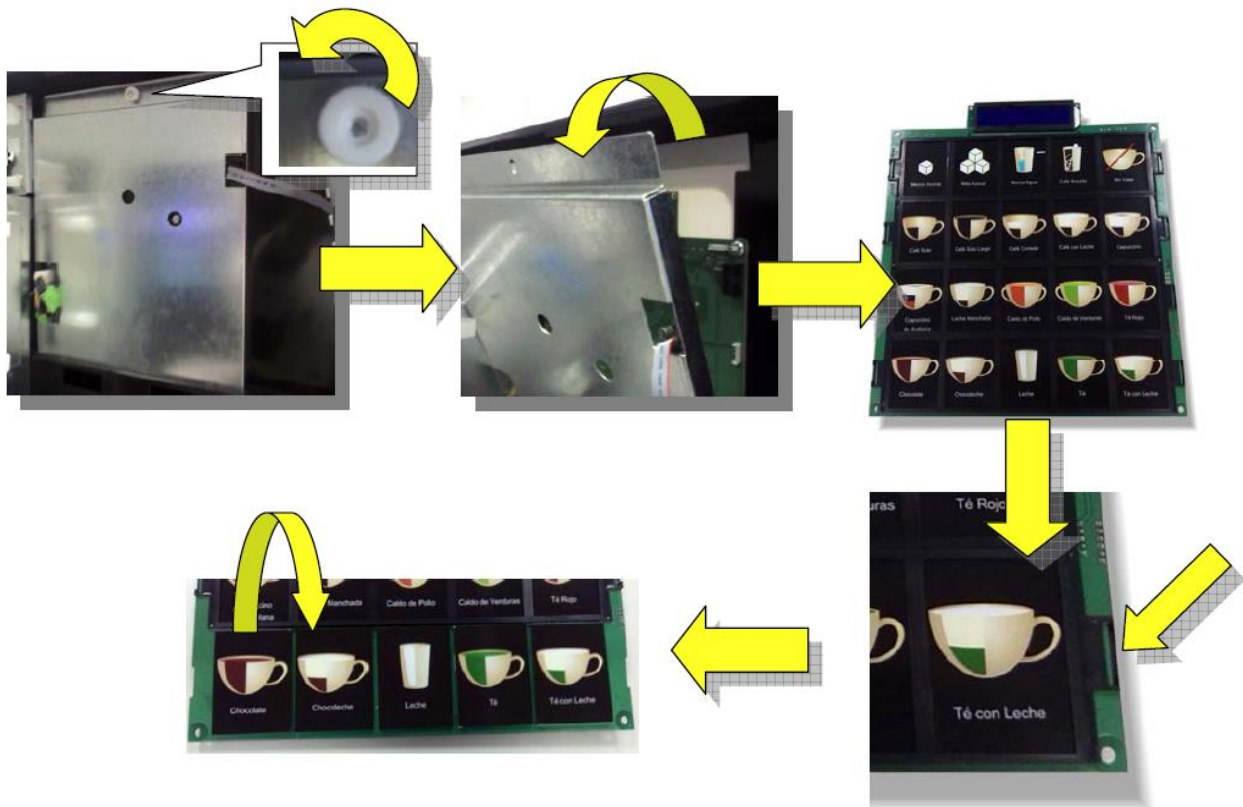
This grinding system has a level detector that indicates when the coffee bean hopper is empty. It also has a detection system to stop it working when there is a jam in the grinder.

A14. Selection panel

In the Zensia models, the product selection buttons are touch sensitive; to select a product it is not necessary to press a button, just put one's finger near the product required and the machine detects its presence, which activates the service of the product requested.

Behind the glass of the machine, there is an electronic board with detectors for 20 products or pre-selections. Each one of the product selections is lit with a LED; when a selection is requested from the machine, all the rest of the selections are switched off, only leaving the requested product lit up.

Access to the product and pre-selection pictures and the electronic board with the detectors:



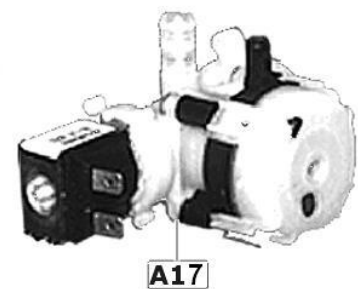
A15. Water inlet Electro-valve

This allows water from the mains to enter the cold water deposit. It works on **230 Vac**.

It has a security mechanism for cases where solids, such as scale or any other solids, or the EV does not close properly and does not cut the entry of water into the machine. This mechanism is activated when the level of water in the waste water bucket reaches its maximum.

To reset the EV, just reduce the mains water pressure. If this is not possible, a light tap with a rounded object, like an Allen key, inside the hole (as shown in the figure) in the upper part of the EV will suffice.

It is also possible to reset it by giving the EV a sharp knock with the handle of a screw driver.



A16. Volume meter

This meter measures the quantity of water that the pump sends for the elaboration of coffee *espresso*.

Inside there is a flow meter with two small electro-magnets that spin with the flow of water. As it spins, 5 Vdc electrical pulses are sent to the infusion board. With these pulses, the board is capable of calculating the quantity of water that has entered for the elaboration of the different products.

It has three electrical connections: positive, negative and the terminal that sends the electrical pulses.

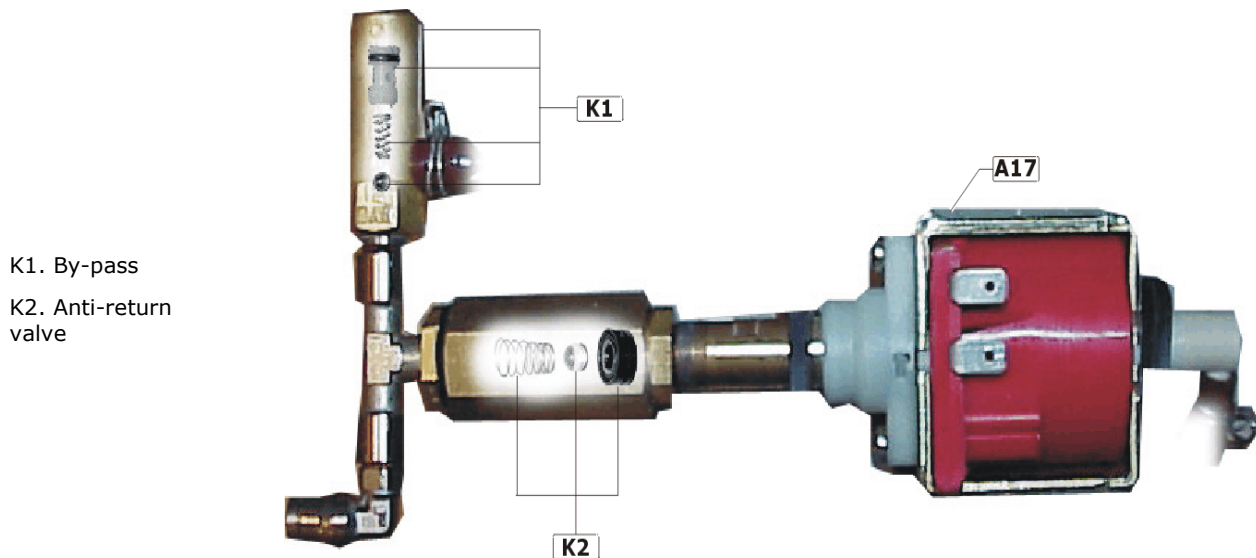


A17. Water pump

The water pump uses the cold water from the water deposit and pumps it into the boiler, which makes the hot water go out through the EV to the instant drinks or the *espresso* coffee drinks.

When the product to be elaborated is *espresso* coffee, the water pressure needed to force the water through the ground coffee that has been compressed by the piston in the infusion *group* is very high. This increases the pressure of the water going into in the boiler, and also the pressure of the water that leaves the boiler to elaborate the coffee, up to a pressure of 9 Kg/cm². At this pressure the by-pass (2) on the pump opens, allowing a little water to return back to the boiler; sufficient to avoid the pressure going above 9 Kg/cm².

The by-pass is a small opening that is closed with a small ball bearing, held in place with a spring. This spring will hold the ball bearing in place up to a pressure of 9 Kg/cm²; above this pressure the spring is compressed, which allows the water to go past the ball bearing through to the by-pass. A pressure of 9 Kg/cm² is considered to be the most adequate for the elaboration of *espresso* coffee.



K1. By-pass
K2. Anti-return valve

When the product to be elaborated is an instant product, there is no resistance for the water to go from the boiler to the beater, so that when instant products are elaborated, the pump operates at a lower pressure than when an *espresso* coffee is elaborated.

The pump has an anti-return valve that prevents the water returning to the boiler.

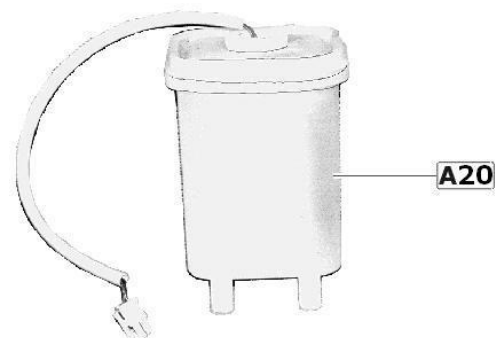
Technical characteristics:

Voltage	Pulsing at 110 V
Nominal power	70 w
Working pressure	9 Kg/cm ²

A18. Cold water deposit

Made with polypropylene, it has a capacity of 500 cc. It works at atmospheric temperature and pressure. The water for elaborating the instant and *espresso coffee* products is taken from this deposit.

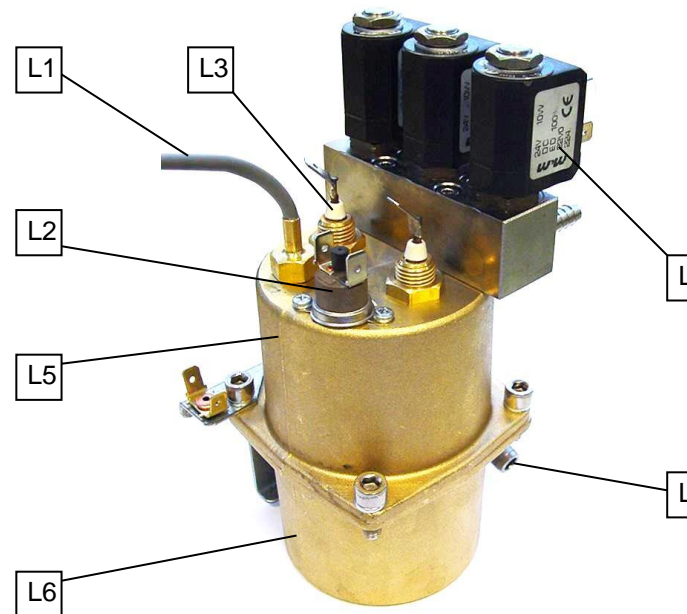
The water level is controlled with a magnetic switch activated by a float.



A19. Hot water boiler for *espresso* machines

The boiler works under pressure. Its capacity is 320cc of water. It heats the water for both products, *espresso* coffee and instant products.

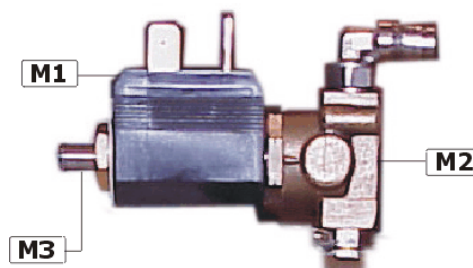
- L1. Temperature sensor (PTC)
- L2. Security thermostat: switches off at 120° C
- L3. Heating element 1100 W
- L4. Electro-valves
- L5. Upper part
- L6. Lower part
- L7. Water inlet



It is made from brass and does not need any device to control its w
 automatically filled when the machine is switched on. Whenever a s
 of water that is needed enters the boiler. Unless there are any problems, the boiler will always
 be full.

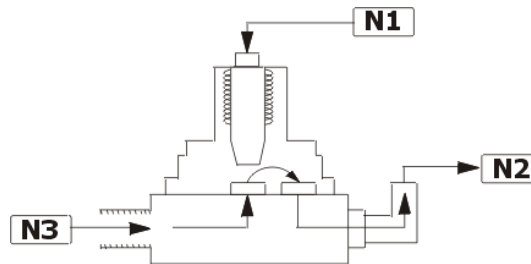
In the models that elaborate *espresso* coffee, the electro-valve has 3 ways. This *EV* has an outlet of water from the boiler, another to the *group*, and a third that, at rest position, allows the *group* to be at atmospheric pressure.

- M1. Coil
- M2. Valve
- M3. 3-way valve



When the machine making an *espresso* coffee the third way is closed while the outlet to the boiler and the entry to the *group* are interconnected.

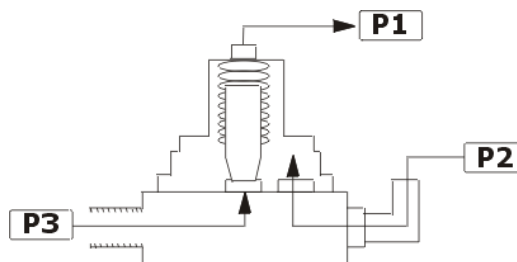
- N1. 3rd way closed
- N2. To infusion group
- N3. Entry of water from the boiler



When the machine finishes elaborating an *espresso* coffee, the 3-way *EV* goes to rest position, so that the water outlet from the boiler and the *group* are connected to the third outlet. This way, the water that didn't pass through the coffee, and that is retained in the *group*, is taken through the third channel to the residue bucket.

The water comes back from the infusion *group* to the third outlet of the *EV* due to the high pressure the pump produced during the infusion process.

- P1. 3rd way open
- P2. Connected to group at atmospheric pressure
- P3. Water closed



The other two outlets of the boiler connect to the support of the *EV* for instant products.

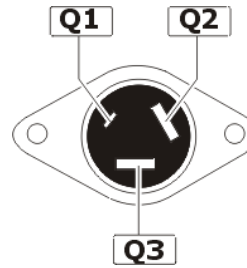
Technical characteristics:

Voltage of heating element	230 Vac
Power of heating element	1.100 w
Programming of temperature range	81°C - 99°C
Thermal protector: manual reset	120° C
3-Way EV voltage	24 Vdc
Power of 3-way EV	10 w
Maximum pressure of the EV	15 Kg/cm ²
Working temperature range of the EV	-10° C a 140° C

The *heating element* is controlled by a *triad* that is situated in the control board.

Make sure the position of the cables is correct.

- Q1. White
- Q2. Black
- Q3. Brown



The control of the temperature of the water in the boiler is with a PTC100. The following table shows the values that the PT100 shows for the temperature it detects.

The boiler works under pressure and has capacity of 350cc of water. The water for the elaboration of the products is heated here, for *espresso* coffee and for instant products.

°C	0	1	2	3	4	5	6	7	8	9
0	100,00	100,39	100,78	101,17	101,56	101,95	102,34	102,73	103,12	103,51
10	103,90	104,29	104,68	105,07	105,46	105,85	106,24	106,63	107,02	107,40
20	107,79	108,18	108,57	108,96	109,35	109,73	110,12	110,51	110,90	111,28
30	111,67	112,06	112,45	112,83	113,22	113,61	113,99	114,38	114,77	115,15
40	115,54	115,93	116,31	116,70	117,08	117,47	117,85	118,24	118,62	119,01
50	119,40	119,78	120,16	120,55	120,93	121,32	121,70	122,09	122,47	122,86
60	123,24	123,62	124,01	124,39	124,77	125,16	125,54	125,92	126,31	126,69
70	127,07	127,45	127,84	128,22	128,60	128,98	129,37	129,75	130,13	130,51
80	130,89	131,27	131,66	132,04	132,42	132,80	133,18	133,56	133,94	134,32
90	134,70	135,08	135,46	135,84	136,22	136,60	136,98	137,36	137,74	138,12
100	138,50	138,88	139,26	139,64	140,02	140,39	140,77	141,15	141,53	141,91
110	142,29	142,66	143,04	143,42	143,80	144,17	144,55	144,93	145,31	145,68
120	146,06	146,44	146,81	147,19	147,57	147,94	148,32	148,70	149,07	149,45
130	149,82	150,20	150,57	150,95	151,33	151,70	152,08	152,45	152,83	153,20
140	153,58	153,95	154,32	154,70	155,07	155,45	155,82	156,19	156,57	156,94
150	157,31	157,69	158,06	158,43	158,81	159,18	159,55	159,93	160,30	160,67
160	161,04	161,42	161,79	162,16	162,53	162,90	163,27	163,65	164,02	164,39
170	164,76	165,13	165,50	165,87	166,24	166,61	166,98	167,35	167,72	168,09
180	168,46	168,83	169,20	169,57	169,94	170,31	170,68	171,05	171,42	171,79
190	172,16	172,53	172,90	173,26	173,63	174,00	174,37	174,74	175,10	175,47
200	175,84	176,21	176,57	176,94	177,31	177,68	178,04	178,41	178,78	179,14
210	179,51	179,88	180,24	180,61	180,97	181,34	181,71	182,07	182,44	182,80
220	183,17	183,53	183,90	184,26	184,63	184,99	185,36	185,72	186,09	186,45
230	186,82	187,18	187,54	187,91	188,27	188,63	189,00	189,36	189,72	190,09
240	190,45	190,81	191,18	191,54	191,90	192,26	192,63	192,99	193,35	193,70
250	194,07	194,44	194,80	195,16	195,52	195,88	196,24	196,60	196,96	197,33
260	197,69	198,05	198,41	198,77	199,13	199,49	199,85	200,21	200,57	200,93
270	201,29	201,65	202,01	202,36	202,72	203,08	203,44	203,80	204,16	204,52
280	204,88	205,23	205,59	205,95	206,31	206,67	207,02	207,38	207,74	208,10
290	208,45	208,81	209,17	209,52	209,88	210,24	210,59	210,95	211,31	211,66
300	212,02	212,37	212,73	213,09	213,44	213,80	214,15	214,51	214,86	215,22
310	215,57	215,93	216,28	216,64	216,99	217,35	217,70	218,05	218,41	218,76
320	219,12	219,47	219,82	220,18	220,53	220,88	221,24	221,59	221,94	222,29
330	222,65	223,00	223,35	223,70	224,06	224,41	224,74	225,11	225,46	225,81
340	226,17	226,52	226,87	227,22	227,57	227,92	228,27	228,62	228,97	229,32
350	229,67	230,02	230,37	230,72	231,07	231,42	231,77	232,12	232,47	232,82
360	233,17	233,52	233,87	234,22	234,56	234,91	235,26	235,60	235,96	236,31
370	236,65	237,00	237,35	237,70	238,04	238,39	238,74	239,09	239,43	239,78
380	240,13	240,47	240,82	241,17	241,51	241,86	242,20	242,55	242,90	243,24
390	243,59	243,93	244,28	244,62	244,97	246,69	245,31	245,66	246,00	246,35
400	247,04									

A20. Hot water boiler for *instant* machines

The hot water boiler for machines that only have instant products works at atmospheric pressure. The hot water goes to the beaters due to gravity. It is therefore not necessary to have a pump or a deposit for the cold water, unlike the machines for *espresso coffee*.

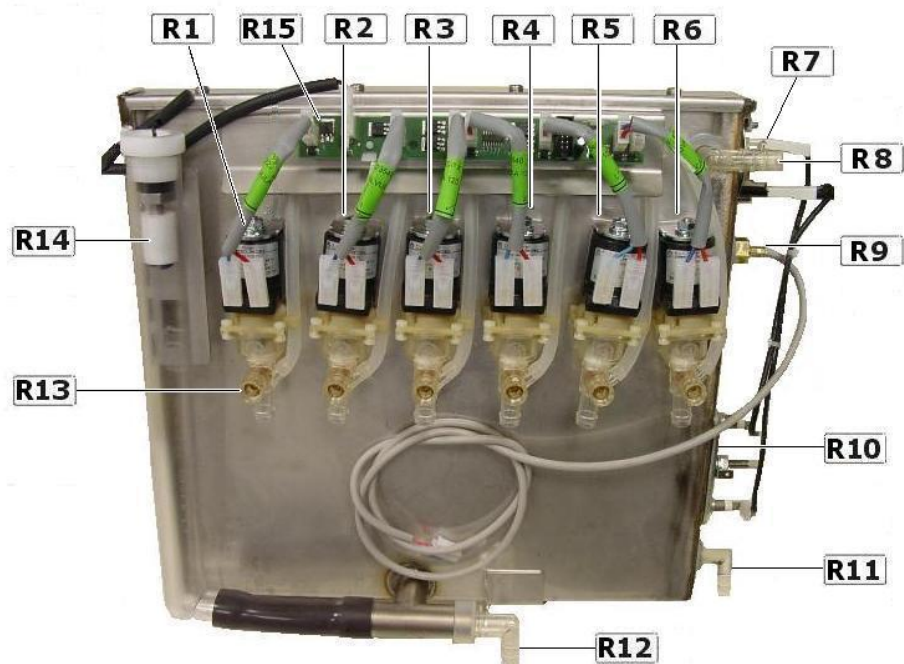
This machine measures the quantity of water necessary for elaborating the products by the time the EV is open, so it does not have a water meter either.

Technical characteristics:

Capacity of the boiler	2 litres
Full level control	Float that activates a switch
Voltage of heating element	230 Vac
Power of heating element	2,000 w

The control of the water temperature is carried out by the same PT100 sensor that the *espresso coffee* models have.

- R1. EV Sugar and coffee
- R2. EV Decaffeinate
- R3. EV Milk
- R4. EV Chocolate
- R5. EV Tea
- R6. EV Soup
- R7. Security thermostat
- R8. Overflow
- R9. Sensor of temperature
- R10. Heating element
- R11. Water inlet
- R12. Emptying tube
- R13. Flow regulation screw
- R14. Level control
- R15. Electro-valve board



There are as many EVs as there are beaters on the machine. All the EVs are 24 Vdc

A21. Vapour extractor

The vapour that is generated in the beaters may enter into the product hoppers. If this happens the product may get damp and go solid. This makes the product extraction irregular. To avoid this, the extractor removes the vapours that are generated by the hot water and beaters from the machine through a tube. It works at 230 Vac continuously from when the machine is switched on.



Extractor

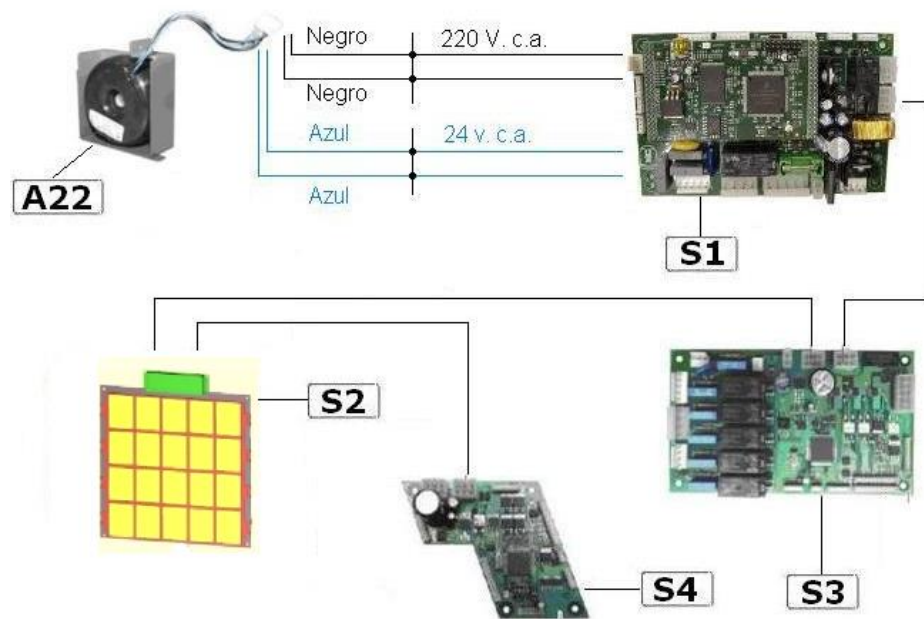
A22. Transformer

Technical characteristics:

Primary	230 Vac
Secondary (blue-blue)	24 Vac
Secondary (black-black)	230 Vac
Power Zensia LE	96 w
Power Zensia LI	145 w

A23. Electronic boards

All the models in the **Zensia** range have 4 *electronic boards*. The *PMC module* (Payment methods Communication), provides the power supply voltage to the other boards and makes the decisions for the machine to work correctly. The other three control independently a number of other devices in the machine.



- S1. PMC Module
- S2. IDU Module
- S3. Infusion Module
- S4. Cup Module

The four boards are linked by one unique 6-way cable called a CAN bus. Two of these lines are used to provide a voltage of 34 volts, another two are for the 8 volt supply and the remaining two are used for communication between the boards. The colour and the function of each pin are shown below:

PIN 1. Orange	Positive 34 volts
PIN 2. Grey	Negative 34 volts
PIN 3. Red	Positive 8 volts
PIN 4. Yellow	Communication
PIN 5. Green	Communication
PIN 6. Black	Negative 8 volts

A24. USB Port

It is situated above the main switch and allows the loading of application programmes onto machine, upload and download load product data files (functions 81 and 82), as well as downloading accounting files.

When the machine is connected to the mains with the USB pen drive in the USB port, it automatically saves the accounting file to the USB pen drive.

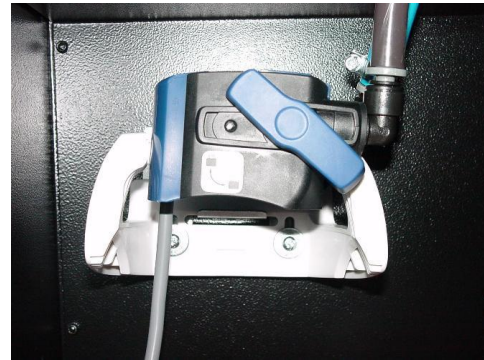
A25. Scale filter

The espresso models have a scale filter fitted, Purity C150 Quell ST from Brita. The head piece is fixed the cabinet, in the lower part of the machine, whereas the filter is supplied in a box; it is easy to fit, just follow the instructions on the filter.

The photographs below show the position of the lever when the filter is fitted to the head. The machine will work without the filter; make sure the lever is in the correct position.



Position with filter



Position without filter

It works correctly when the mains water pressure is between 2 and 8.6 bar.

The quantity of water that it is capable of filtering depends on the quality of the water where the machine is installed; with a hardness of 12° KH, equivalent to 22° F, it can filter 2000 litres. If you consider 100 cc as the average volume of each service, it is necessary to substitute the filter every 20,000 services of the machine.

3. INSTALLATION AND START UP

3.1. UNPACKING

Only unpack the machine at the moment of installation in the site where it will be used. Dispose of the packaging following the current legal norms for these materials.

Safety Norms:

- Do not touch any mechanisms when you have wet hands or feet.
- Do not plug in the *machine* with bare feet.
- Do not pull on the flex to unplug the machine from the mains.
- Do not leave the *machine* exposed to the elements: sun, rain, snow, etc.

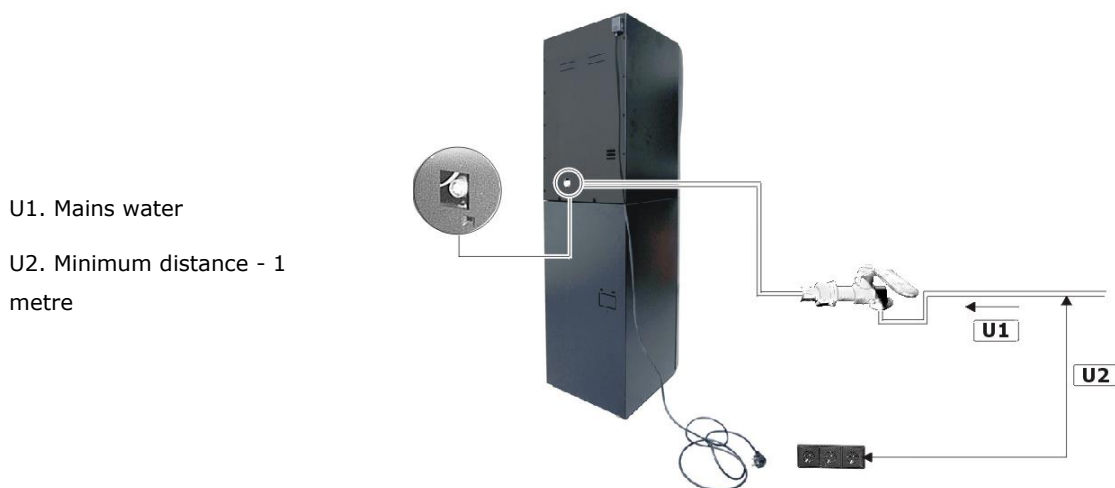
3.2. START UP

Place the *machine* in its final location, level it using the adjustable feet.

3.2.1 Mains water connexion

The machine can be used by connecting to the mains water supply or an autonomous water supply. To connect to the mains, use a **3/4" male connection**. Connect it to a drinking water supply that has a minimum flow of 5 litres/minute and a pressure between 1 and 10 kg/cm².

The hose pipe to the mains is not supplied with the machine.



Current legislation dictates that the minimum distance between the water supply and mains power supply is **1 metre**.

The espresso model has a scale filter fitted, whereas the instant model does not. When the machine has a filter system fitted, the minimum pressure of the mains water supply is **1 Kg/cm²**.

3.2.2 Electrical Connexion

The *machine* requires a voltage of 230 Vac (50 Hz). The installation point must have:

- A "Euro" approved socket with an earth connection.
- A minimum power rating of 2,500 w.
- The electrical installation where the machine is sited will be protected with a cut off fuse and have an earth connection.

3.2.3 Installation of the coin changer

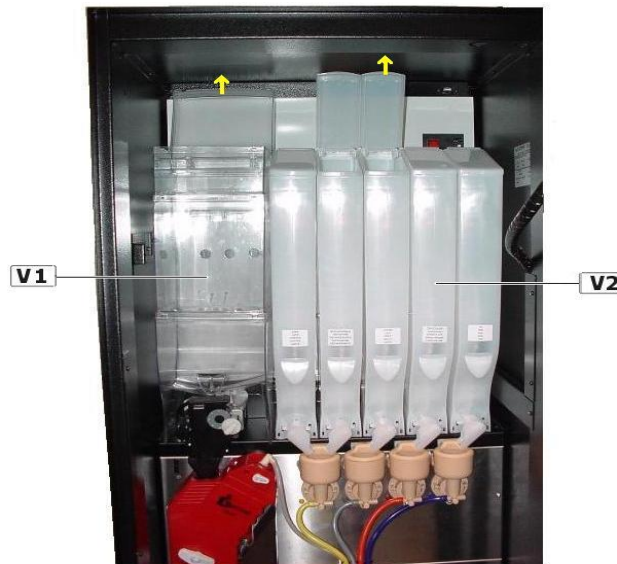
The machine will accept a coin changer with MDB or Executive protocol. The support is the same for the two models. It is fitted into the support with three screws. See point A11 Coin system.

On connecting the machine to the mains, the machine automatically recognises which type of coin changer is fitted.

3.2.4. Filling of the product hoppers

To put the product in the hoppers, either for the instant products or the coffee beans, just lift the cover of each one of the hoppers and pour in the corresponding product.

W1. Hopper for coffee beans
W2. Hoppers for instant products



Whenever a hopper is empty, and after filling it, it is recommended to elaborate a service so that the spiral moves the powder to fill the empty spaces so that it can deliver the correct quantity programmed.

3.2.5 Filling the hot water boiler

On connecting the machine, the hot water boiler fills automatically.

In the *espresso* coffee machines the following processes take place:

- The cold water fills the boiler if it is empty.
- It checks the water meter is working and it fills the boiler with the EV closed, it detects it is full when the water meter stops spinning. Then it opens the EV for the instant products and the boiler to let the air that is trapped inside go out.



If flow meter does not spin for 10 consecutive seconds during the automatic filling of the boiler, the machine will go out of order because no water is detected. To reset the error, just enter and exit the programming or switch off and then switch on the machine.

3.2.6 Flow regulation of the electro-valves (instant machines)

If the flow out of the EV is low, it may provoke jams of product in the beaters because the quantity of the water that reaches the beater is not enough to completely dissolve the instant product.

On leaving the factory, the EV has the correct volume for the quantities of product that are programmed. However, if the programming of the product is modified or the EV is changed, the flow should be checked and regulated if needed. The flow is regulated with the screw on the EV. Turning the screw left increases the flow and to the right reduces it.



Although the regulation of volumes is correct, this may reduce over time due to the accumulation of scale in the EV and may need readjusting.

4. ERRORS

4.1. ERROR MESSAGES SHOWN ON THE DISPLAY

The following table describes the incidents and the corresponding messages that are shown on the display, as well as the codes that in each case are sent by the machine when using communications with protocols VTM or EVADTS.

Notes:

- ▶: *the machine will be out of order*
- nn: *number of the part that is faulty*

Description		Message on Display	VTM	EVADTS
Fault in a change giver, fault type 1 MDB: Sensor tube faulty	nn	ERR. CHANGE GIVER	08	EAN1
Fault in a change giver, fault type 2 MDB: Jam in tube	nn	ERR. CHANGE GIVER	09	EAN2
Fault in a change giver, fault type 3	nn	ERR. CHANGE GIVER	0A	EAN3
Fault in a change giver, fault type 4	nn	ERR. CHANGE GIVER	0B	EAN4
Fault in a change giver, fault type 5	nn	ERR. CHANGE GIVER	0C	EAN5
Fault in the validator			0D	EAL
MDB: Validator disconnected	00	ERR. VALIDATOR		
MDB: Error of checksum ROM	01	ERR. VALIDATOR		
MDB: Jam of coins	02	ERR. VALIDATOR		
VALID: Error in coin signal	03	ERR. VALIDATOR		
▶ Fault in the recuperation module		ERR. RECUPERATION	0E	EAB
Fault communication with the changer			11	EAR
MDB: Resp. incorrect coin changer	02	ERR. CHANGER		
MDB: Resp. incorrect bill reader	03	ERR. CHANGER		
MDB: Resp. incorrect card reader	04	ERR. CHANGER		
MDB: Resp. incorrect of the satellite (slave)	05	ERR. CHANGER		
MDB: Prod. outdated in satellite (slave)	81	ERR. CHANGER		
MDB: Err. Product out sensor (slave)	82	ERR. CHANGER		
MDB: Err. keyboard in the satellite (slave)	83	ERR. CHANGER		
Fault refund button		ERR. KEYBOARD	12	EGK
Fault selection keyboard			13	EGK
Button number	nn	ERR. KEYBOARD		
Fault button extractor cups	EB	ERR. CUP BUT.		
Fault button infusion/loading	EC	ERR. BUT. INF/LOAD		
Fault keyboard selection, no keyboard		ERR. KEYBOARD	14	EGK
Fault in the lector of board			15	
MDB: Error in the board	00	ERR. READ. BOARD.		
MDB: Invalid board	01	ERR. READ. BOARD.		
MDB: Tamper Error (Falsification?)	02	ERR. READ. BOARD.		
MDB: Error defined by manufacturer	03	ERR. READ. BOARD.		
MDB: Error of communications	04	ERR. READ. BOARD.		
MDB: Reader needs repairing	05	ERR. READ. BOARD.		



MDB: Not assigned	06	ERR. READ. BOARD.		
MDB: Error defined by manufacturer	07	ERR. READ. BOARD.		
Description		Message on Display	VTM	EVADTS
MDB: Error of the reader	08	ERR. READ. BOARD.		
MDB: Error of communications	09	ERR. READ. BOARD.		
MDB: Jam board	0A	ERR. READ. BOARD.		
MDB: Error defined by manufacturer	0B	ERR. READ. BOARD.		
MDB: Error refund credit	0C	ERR. READ. BOARD.		
Fault in the note reader				
MDB: Motor faulty	00	ERR. READ. BILL.		
MDB: Sensor faulty	01	ERR. READ. BILL.		
MDB: Error checksum ROM	02	ERR. READ. BILL.		
MDB: Jam	03	ERR. READ. BILL.		
MDB: Cash box / Stacker not present	04	ERR. READ. BILL.		
MDB: Reader deactivated	05	ERR. READ. BILL.		
▶ Out of order, prices not programmed		PREC. NOT PROGAM.	17	EAK
▶ Out of order, all coins inhibited		COINS INHIB.	18	EAC
Fault in rack, fault type 1			19	ELZ1
Fault in rack, fault type 2			1A	ELZ2
Fault in rack, fault type 3			1B	ELZ3
Fault product out detector (fault type1)		FAULT IDETECT	1C	
Fault sanitary temperature			1D	EJJ
Fault out-of-date product			1E	EJH
Fault detector product exit(fault type2)		FAULT IDETECT	1F	
Switch on the machine			20	OEZN
Switch off the machine			21	OEZF
Activation of receive infrared			22	OEZI
Communication protocol AZKOYEN			23	OEZA
Communication protocol EVADTS			25	OEZE
Communication VTM in SMS			26	OEZS
▶ Start configuration		MACH. NOT CFG[F401]	30	ECZC
Start progr. channels, prices, etc			31	ECZP
Start progr. Messages			32	ECZM
Start account			33	ECZO
▶ Error in EEPROM		ERROR EEPROM 'Module'	37	ECO
Mains low		Low mains voltage	38	ECA
Order total memory erase			39	ECN
Error clock in time real			EA	ECL
Error sensor temperature		ERR. SENSOR TEMPER	EB	EJK
Sensor of temperature open	01	ERR SENSOR TEMP.AB		
Sensor of temperature closed	02	ERR. SENSOR TEMP.CC		
Error in system of door lock		ERR DOOR FLAP	3D	EGC
Flap closed	01	DOOR FLAP C		
Flap open	02	DOOR FLAP O		
Flap in pos. undefined, ambos micros closed	03	P.FLAP P.D.,MC		
Flap in position undefined, ambos micros closed	04	P.FLAP P.D.,MO		
Detected manipulation of flap in the service	05	P.FLAP MANIP.		
Opening product flap			41	EGC



Received software module by EVADTS			50	
Description		Message on Display	VTM	EVADTS
Received software module by MDB			51	
▶ Fault in heating system		ERR. BOILER	60	EDK
▶ Error in the temperature sensor	01	ERR. SENSOR TEMP.		
▶ Error in heating element	02	ERR. RESISTENCIA		
▶ Fault in mains water supply		ERR. LEVEL WATER	61	EFL
▶ The water meter not counting	02	ERR: NO WATER		
▶ Error in the level of cup (no water)	03	NO MAINS WATER		
Fault arm: not in position			62	EBI1
▶ Fault arm: not reached its position		ERR. ARM	63	EBI2
▶ The arm not reached a pos. of cup	01	ERR. ARM P. CUP		
▶ The arm not reached a pos. of liquids	02	ERR. ARM P. LIQ.		
▶ The arm not reached a pos. of sugar	03	ERR. ARM P. SUG.		
▶ The arm not reached a pos. of STIRRER	04	ERR. ARM P. STIR.		
▶ Fault arm: 3 faults w/o reset			64	EBI3
Fault system extractor of cups		ERR. SYS. CUPS	65	EBM
▶ Error in the mfc of the cup hopper	01	ERR. CUP HOPPER		
▶ hopper of cups empty 5 turns	02	NO HAY CUPS		
▶ Error in the mfc of the cup extractor	04	ERR. CUP EXTRAC.		
▶ The arm of cups is spinning	05	ARM V. SPIN		
▶ The extractor of cups is spinning	06	EXTR. V. SPIN		
▶ The hopper of cups is spinning	07	HOPPER V. SPIN		
Fault stirrer extractor system		ERR. STIRRER	66	EDF
▶ The arm of STIRRER is spinning	01	ARM P. SPIN		
Fault in the group of infusion of <i>espresso</i>		ERR. GRP. <i>ESPRESSO</i>	67	EE
▶ Error in the mfc of the dosage	01	ERROR DOSE.		
▶ Error in the position of the group	02	ERR. POS. GROUP		
▶ No coffee in the grinder	03	SIN CAFÉ BEAN		
▶ No group of infusion	04	NO HAY GROUP		
▶ Time of infusion too long	05	EXC. TIME INF.		
▶ Retry of position of the group	06	RETRY POS. GROUP		
▶ RETRY. of prime pump in mach. with auton.	07	RETRY PRIME PUMP		
▶ Fault in deposits of residues / coffee		ERR. DE. RESIDUES	68	EDZ
▶ Waste Deposit full	00	DEP. RES. FULL		
▶ No Coffee deposit	01	NO DEP. RES COFFEE		

4.2. CONTROL POINTS

Heating element

Measured on the **infusion board** on connector [j12](#)

Between pins 1 and 2 (black and green) shows 0 Vac when the heating element is working. (Assuming the 10A fuse is OK)

Between pins 1 and 2 shows 220 Vac when the heating element is not working.

Infusion pump

Measured on the **infusion board** on connector [j14](#)

Between pins 1 and 4 shows 200 Vac when the pump is working.

Mains water Electro-valve

Measured on the **infusion board** on connector [j14](#)

Between pins 2 and 4 shows 220 Vac when the electro-valve is activated.

Infusion group motor

Measured on the **infusion board** on connector [j15](#)

Between pins 1 and 3 shows 220 Vac when the group is working.

Grinder

Measured on the **infusion board** on connector [j15](#)

Between pins 1 and 5 shows 220 Vac when it is working.

Transformer

Measured on the **PMC board** on connector [J11](#)

Pines 1 and 2 = 220 Vac (black)

Pines 4 and 5 = 24 Vac (blue)

Infusion electro-valve

Measured on the **infusion board** on connector [J9](#)

Between pins 7 and 8 shows 25 Vdc when the electro-valve is activated.

Flow meter

Measured on the **infusion board** on connector [J10](#).

Pin 3 corresponds to +, pin 4 to earth and pin 2 to signal.

When the it spins, the multi-meter shows 2.5 Vdc measured between the pines 2 and 4.

Float level

Measured on the **infusion board** on connector [J10](#).

Between pins 1 and 4 shows 0 Vdc when the cold water deposit is full.

Between pins 1 and 4 shows 5 Vdc when the cold water deposit is empty.

Dosage micro-switch

Measured on the **infusion board** on connector [J9](#).

Between pins 1 and 6 shows 5 Vdc when the dosage is full of coffee.

Between pins 1 and 6 shows 0 Vdc when the dosage empty.

Group motor microswitch

Measured on the **infusion board** on connector [J9](#).

Between pins 2 and 6 shows 5 Vdc when the group is in infusion position.

Between pins 2 and 6 shows 0 Vdc when the dosage is in loading position.

Group presence microswitch

Measured on the **infusion board** on connector [J9](#).

Between pins 3 and 6 shows 0 Vdc when the group is fitted in the machine.

Between pins 3 and 6 shows 5 Vdc when the group is removed.

Cup extractor motor

Measured on the **board of cups** on connector [J5](#).

Between pins 9 and 11 shows 0 Vdc at rest position of the motor.

Between pins 9 and 11 shows 25 Vdc when the motor is extracting a cup.

Motor for turning cup holder

Measured on the **cup holder board** on connector [J5](#).

Between pins 7 and 10 shows 30 Vdc at rest position of the motor.

Between pins 7 and 10 shows 0 Vdc when the motor is spinning.

Sugar extractor motor

Measured on the **cup holder board** on connector [J7](#).

Between pins 3 and 6 shows 30 Vdc at rest position of the motor.

Between pins 3 and 6 shows 0 Vdc when the motor is extracting.

Stirrer extractor motor

Measured on the **cup holder board** on connector [J7](#).

Between pins 3 and 5 shows 30 Vdc at rest position of the motor.

Between pins 3 and 5 shows 0 Vdc when the motor is extracting.

Cup presence photocell

Measured on the **cup holder board** on connector [J5](#).

Between pins 6 and 7 shows 5 Vdc when there are cups between the photocells.

Between pins 6 and 7 shows 0 Vdc when there are no cups between the photocells.

Microswitch of the cup lever

Measured on the **cup holder board** on connector [J5](#).

Between pins 3 and 7 shows 5 Vdc when the lever is at rest.

Between pins 3 and 7 shows 0 Vdc when the lever closes the micro.

End of run microswitch cup extractor

Measured on the **cup holder board** on connector [J5](#).

Between pins 4 and 7 shows 0 Vdc at rest position of the motor.

Between pins 4 and 7 shows 5 Vdc when the motor is extracting a cup.

Sugar arm microswitch

Measured on the **cup holder board** on connector [J7](#).

Between pins 2 and 3 shows 5 Vdc at rest position.

Between pins 2 and 3 shows 0 Vdc when the arm moves.

Temperature sensor

Measured on the **infusion board** on connector [j2](#). Measure resistance values (see the table of values of the PTC).

5. CLEANING AND MAINTENANCE

☐ For each reloading of product, maximum weekly

- *Waste liquid bucket.* Empty and rinse with clean water.
- *Waste coffee.* Empty and rinse with clean water.
- *Waste liquid tray.* Clean with water and dish washing liquid.
- *Beaters.* Carry out various automatic rinses using the "B" button on the programming handset.
- *Outlets of the product hoppers.* Check and clean any retained product.
- *Front product tray.* Clean with water and dish washing liquid.

☐ Monthly

- *Group.* Remove from the machine and clean deposits of coffee under running water. Before replacing, dry with a cloth.
- *Beaters.* Remove from the machine with rubber tubes and clean with water and dish washing liquid. If necessary, wipe with a clean cloth that does not scratch the material of the beaters.
- *Cup support arms.* Remove from the machine and clean with water and dish washing liquid.



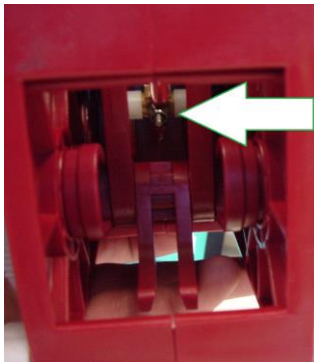
☐ Half yearly

- *Soluble hoppers.* Remove from the machine and clean with water and dish washing liquid. Dry with a clean cloth before fitting back in the machine. Also clean the supports of the hoppers.
- *Coffee hopper.* Remove from the machine and clean with water and dish washing liquid. Dry with a clean cloth before fitting back in the machine. Also clean the support of the hopper.

☐ Depending on machine use

- ✎ *Piston filter*. Every 20,000 services remove and clean. If necessary, clean with a non-metallic brush. If necessary, clean holes with a tooth pick. If necessary totally blocked, replace with a new filter.
- ✎ *Infusion filter*. Every 20.000 services remove and clean. If necessary, clean with a non-metallic brush. If necessary, clean holes with a tooth pick. If necessary totally blocked, replace with a new filter. On replacing the filter, fix screw with Loctite® 243 or similar. Another way to clean filter is to do a cycle with a detergent cube. (See programming manual)
- ✎ *Piston seal*. Substitute every 30,000 services
- ✎ *Group seals*. Substitute every 60,000 services. To get to these seals, remove the group filter. See below for instructions.

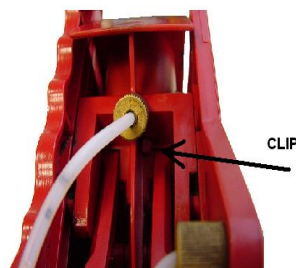
1. Remove the nut that holds the axle the bottom the group, it is recommended to hold the filter still with a screwdriver at the same time.



2. Push the axle from below and remove it with the filter holder.
3. Press on the clips (one each side) indicated in the following photograph, to free the part with the seals.
4. After substituting the seals, Replace the cover and the seals in the group



Piston



Clips



Seals

6. WORKING CONDITIONS AND NORMS

Optimum results will be obtained from the machine by following the requirements below:

- Temperatures:
 - ↘ Storage: from -25°C to +70°C.
 - ↘ Working: from 0 to +50° C.
 - ↘ Maximum relative humidity without condensation 85%

- Norms that it complies with:
 - ↘ The machine complies with that established in the CE Directives: Directive 73/23/CEE for electrical safety and Directive 89/336/CEE for electro-magnetic compatibility.
 - ↘ The mains cable is earthed as established by the electrical safety norms.
 - ↘ The boiler has a temperature sensor that controls the connection and disconnection of the heating element electronically.
 - ↘ The boiler has a overload for temperature that disconnects the heating element when it reaches 120° C.
 - ↘ EN 60335-2-63:96
 - ↘ EN 60 335-1(88) + A2(88) + A5(89) + A6(89) + A51(91) + A52(92) + A53(92) + A54(92) + A55(93)
 - ↘ EN 55014-1
 - ↘ EN 61000-3-2
 - ↘ EN 61000-3-3
 - ↘ EN 55014-2:98 (EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8 and 4-11)
 - ↘ **CE**

- For all the elements to work correctly, the maximum inclination that the machine should have on any of its axis is of **± 5°**.

7. DIMENSIONS

The measurements are in mm and the weights in Kg.

Width X1	Height X2	Depth X3	Weight
600	1830	625	180

