Z E N

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== I N D E X ==

1. INTRODUCTION

The automatic vending machines in the **ZEN** range are destined to the elaboration and sale of *espresso coffee* and instant beverages that consist of the mixture of hot water and soluble powder or granules. The product is served in a plastic or paper cup.

In the rest of this document the following elements will be called:

The machines in the **ZEN** range, *machine* or *machines.* The espresso coffee infusion brewer, *infusion brewer*. The electro valve, *EV* or *EVs*

1.1. DEFINITIONS

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

- 7 g of ground coffee.
- The temperature of the infusion water between 92º C and 96º C.
- The water pressure at 8 kg/cm².
- The infusion time of the coffee between 20 and 28 seconds.
- The volume of water in the infusion 40 ml.

Volume dosage: this dosage system measures the volume of water that is used for the espresso infusion.

Water pump: an electro magnetic system for pumping the infusion water and giving it the correct pressure.

Infusion: this is the name given to the process of passing hot water through the ground coffee to extract its oils and essences.

Volumetric infusion: when the process of infusion uses a constant volume of water.

Coffee tablet: the residual compressed coffee grounds after the infusion process.

Programming mode: when the *machine* is ready for any of its functions or parameters to be programmed.

Working mode: when the *machine* is in the working state and ready to prepare any of the services it offers.

1.2. RANGE

The **ZEN** range is composed of the models that elaborate *espresso coffee* and instant products.

- The models with **espresso coffee** elaborate instant products as well.
- The models with **instant** products only elaborate **instant** products
- The L range has a Fresh brew model destined to the elaboration of tea infusions

1.3. PRINCIPLE TECHNICAL CHARACTERISTICS

➘ Super automatic function: the press of a button is sufficient to elaborate a magnificent *espresso coffee*.

➘ It grinds the coffee at the moment it is ordered.

➘ Products that each machine can elaborate:

Zen	Coffee beans	Sugar	Instant coffee	Decaffeinated	Milk	Chocolate	Tea
MI		Yes	Yes		Yes	Yes	
ME	Yes	Yes			Yes	Yes	
MzI							
MzE							
LI		Yes	Yes	Yes	Yes	Yes	Yes
LE							
LzI							
LzE	Yes	Yes		Yes	Yes	Yes	

➘ The water temperature is programmable.

➘ The ground coffee dose is programmable between 5 g and 8 g.

➘ The switching on and off of the *machine* is automatic and programmable.

➘ *Water pump* for water pressure incorporated in the *machine*.

➘ Volume dosage of water in the different *espresso coffee* services is programmable.

➘ The *infusion element* is thermo compensated.

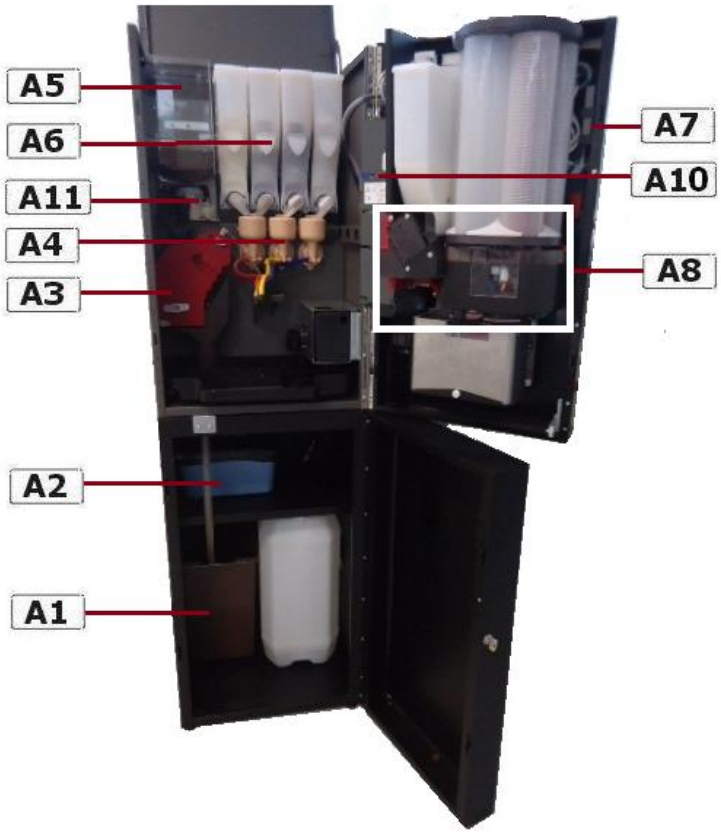
➘ Power supply:

ZEN instant	Voltage	Power	Length
Mains voltage	230 Vac / 50 Hz		
Heating element	230 Vac / 50 Hz	1100 W	
Average daily consumption		3000 W	
Mains flex			3.400 mm

ZEN espresso	Voltage	Power	Length
Mains voltage	230 Vac / 50 Hz		
Heating element	230 Vac / 50 Hz	1100 W	
Average daily consumption		3000 W	
Mains flex			3.400 mm

2. DESCRIPTION OF COMPONENTS

2.2. PRINCIPLE COMPONENTS



A1. Residue liquid bucket

It collects all the residue liquids that the machine generates. It has a capacity of 8 litres. When it reaches a determined level an electronic device is activated to put the machine out of order until it is emptied.

A2. Coffee residue bucket

It collects the solid residue that the machine generates. It has a capacity for the residue of 7500 grams of ground and elaborated coffee beans.

A3. Infusion brewer + Piston

The two elements are made of resin, it is the element that the *machine* uses to make the espresso coffee.

The *infusion brewer* has moving parts that are activated by a 220 Vac motor, that moves a crank which moves the *coffee* from the grinder to the piston. At the same time it also moves a lever that activates a *micro switch*; this indicates the position of the *infusion brewer* to the control board.

To remove the group from its anchoring position should rotate the two levers that attach to its support, as shown in the photograph. In case that the group was in dispensing position, to remove it is necessary to remove the piston, as follows.

Pull out the clip

Remove the piston

To replace the *infusion brewer* into the machine it may be in any position and it does not matter if it moves while out of the machine. It only needs to be replaced and the two holding levers fixed. The *infusion element* motor will position it correctly.

B1. Pistón

B2. Brewer

B3. Filter

B4. Lever

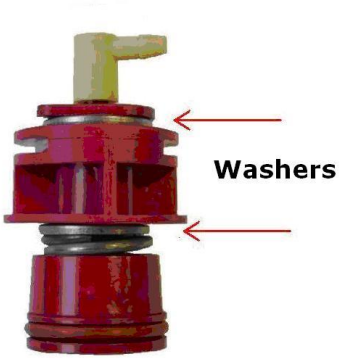
B5. Brewer Motor

B6. Position micro switch

B7. Infusion brewer movement handle

The piston has a spring and two washers which, depending where they are positioned, adjust the pressure of the piston on the ground coffee according to the quantity dosed.

The position of the washers according to the quantity of coffee set in the doser is indicated in the following table:



Coffee Dose	Numbers of washers in bottom position	Numbers of washers in top position
5 g	2	0
5,5 g	2	0
6 g	1	1
6,5 g	1	1
7 g	1	1
7,5 g	0	2
8 g	0	2

A4. Beaters

The product is mixed with the hot water from the boiler in the blenders.

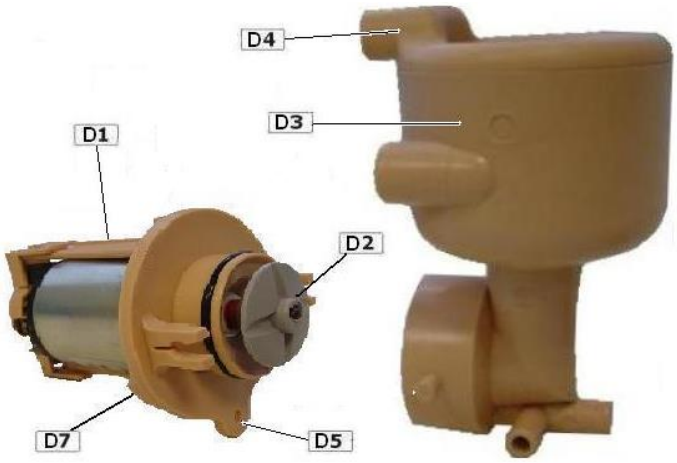
D1. Beater motor assembly

D2. Short blade mixer

D3. Beater assembly

D4. Shake funnel

D5. Screw



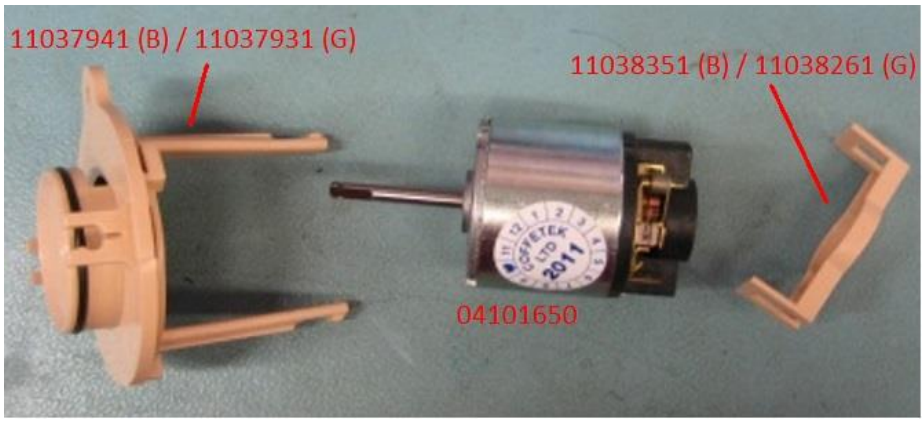
A motor with the following characteristics moves the blender blade:

Make of motor	Mabuchi
Voltage	24 Vdc
Power	20 w
Speed	16 rpm

The blender assembly can be removed from the machine by pulling on it until the pins that fasten it are released and then revolving the motor to the right until the tabs that fasten it are released

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.



The EVs of the instant beverages are an important part of the beating process. They control the hot water from the boiler to the beaters for the elaboration of the instant beverages.

They are fitted to a thermo compensated brass support that provides a constant temperature, which is screwed into the hot water boiler. This way, during the elaboration of the instant beverages, the hot water that goes to the beaters do not suffer excessive temperature losses

A5. Coffee bean hopper

Only the *espresso* coffee models have a container for coffee beans. It's located above de grinder coffee and he has a capacity of 1,9 kg

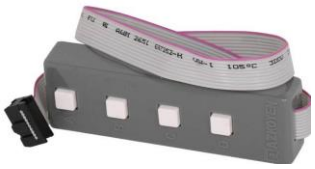
A6. Instant product hoppers

The capacity of the soluble product hoppers is 6 litres and the approximate product weight is:

Product	Sugar	Instant coffee	Descaf. coffee	Milk	Chocolate	Tea	Soup
Capacity in grams	2600	525	525	1300	1500	2000	3000

A7. Programming box

This element is used for programming the machine.



A8. Extractor systems for cups, sugar and spoons

The three systems are mounted in the one support.

> The instant models, standard, do not have a container for *spoons*

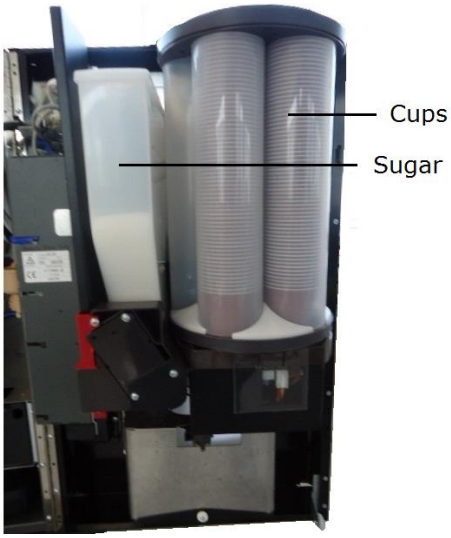
To remove the extractors from the machine, follow these steps:

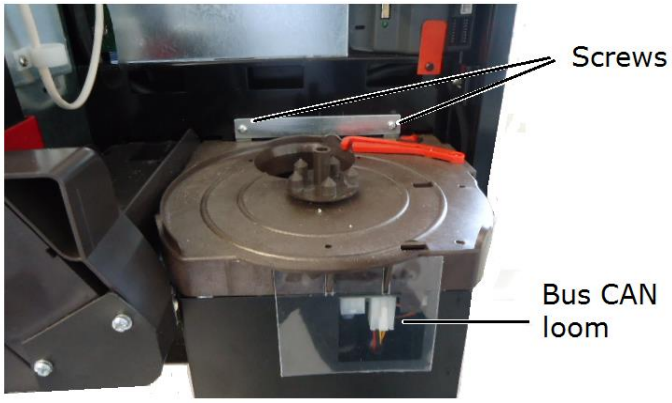
1st Remove the sugar and cup container.

2nd Unscrew the screws indicated in the photo.

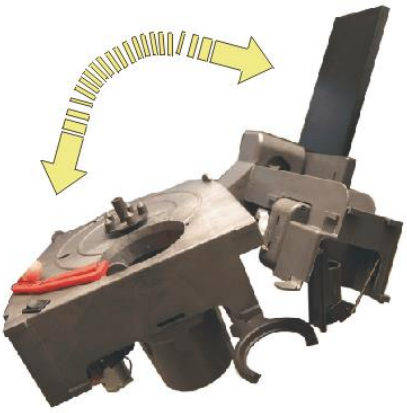
3rd Pull the extractors upwards until freeing them from the clips in the support.

4th Disconnect the CAN bus loom from the cup extractor board

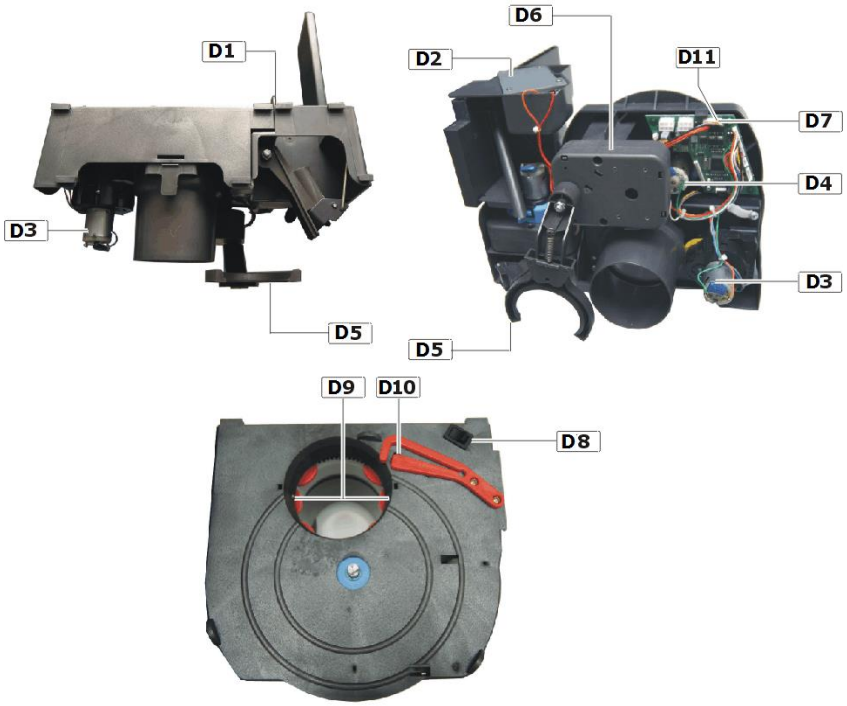




First the wiring loom should be disconnected by removing the cover that protects the cup extractor. The sugar and *spoon* extractor can be separated from the cup extractor by freeing the clip indicated in the photo and pulling upwards



F1. Clip
F2. Sugar and spoon extractor motor
F3. Cup extractor motor
F4. Cup container movement motor
F5. Cup support arm
F6. Cup arm motor
F7. Control board
F8. Cup extraction button
F9. Cup presence photocells
F10. Hopper position micro
F11. Sugar and spoon extractor connector

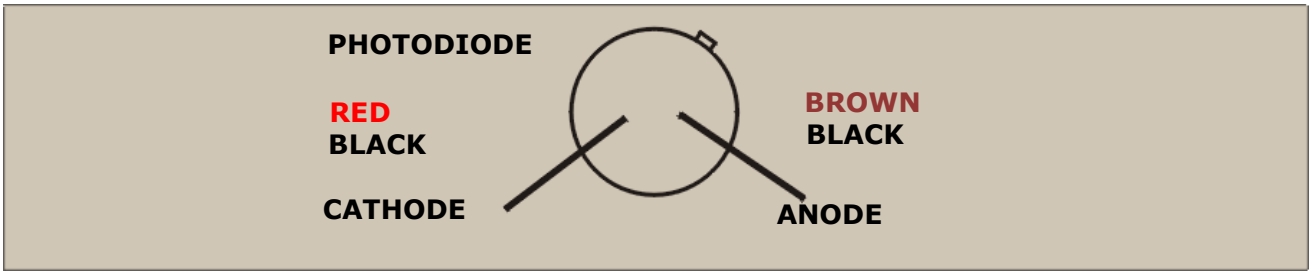


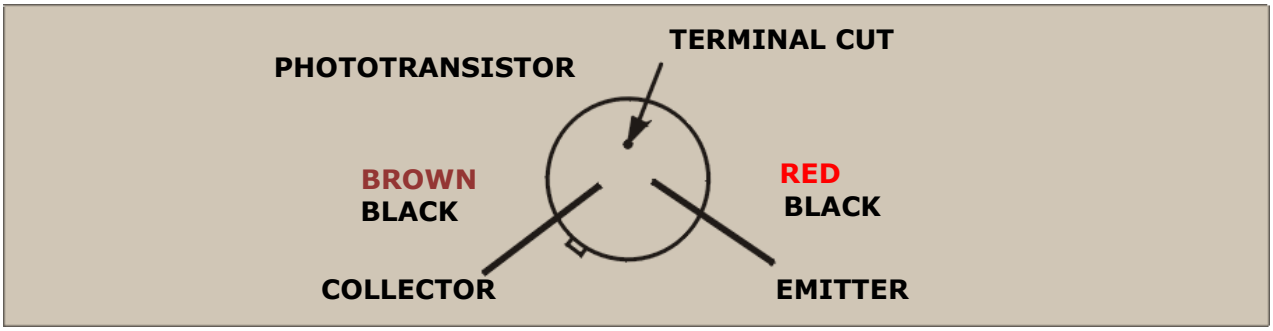
Each Zen range models, may incorporate a cups extractor 70 mm, or 73 mm. The characteristics of this cups extractors are:

	Espresso and instant models	
Quantity	320	320
Ø of cups	70 mm	73 mm
Voltage to motor	24 Vdc	24 Vdc

The cups should be opaque so the infrared detectors can detect them

- The cup container is divided into 5 separate columns. When one of them runs out of cups, the motor turns the container until the next column is situated over the extractor. After the motor turns for 6.5 seconds and the photocells do not detect a new column of cups, the machine will go out of order and the display will show "Out of cups".
- The cup container holder has a button to extract a cup when it is pressed.
- The electrical connections for the infrared photocell terminals that are used to detect the cups are:





Depending on its intended market the machine, can incorporate spoon stractors 90 mm, or 105 mm.

	Espresso and instant models	
Quantity	350	350
Standard spoon measurement	90 x 9 x 1.5 mm	90 x 9 x 1.5 mm
Motor voltage	24 Vdc	24 Vdc

There is a Spoon extractor designed for spoons of 110 x 9 x 1.5 mm

Sugar extractor characteristics:

	Espresso and instant models
Capacity	2600
Motor voltage	24 Vdc

A10. Product extractors

Its function is to extract the soluble product of the corresponding bin and send it to the beaters of product. It consist of a motor Mabuchi and a reduction gear developed by Azkoyen.

Manufacturer: Mabuchi
Voltage supplier: 24 V cc
Speed: 40 rpm

A11. Coin system

All the models in the **ZEN** range use coin changers with **Executive** or **MDB** communication protocol.

The models in the **ZEN M** range use a **coin validator**. It is always "exact amount"; no change given.

On the left of the door there is a space for the coin changer which is held with three screws. The connectors are situated on the upper part. When the machine is connected, it will automatically detect if it has a coin changer with **MDB** or **Executive** communication protocol.

Executive coin changer

MDB coin changer

A12. Coffee grinder

The grinder incorporated in Zen machines is Eldom brand, manufactured in Switzerland. Their teeth are conical and operates at low speed, allowing the time-dosed amount of ground coffee, without using a volumetric. Also favor a ground more "soft and gentle" with the coffee, the flat teeth

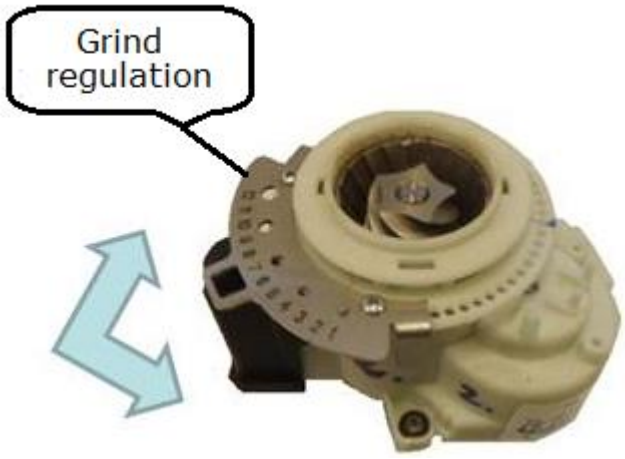
It is supported to a metal support, tied to the frame of the cabinet with 3 screws. To remove, simply remove these 3 bolts and electrical connector

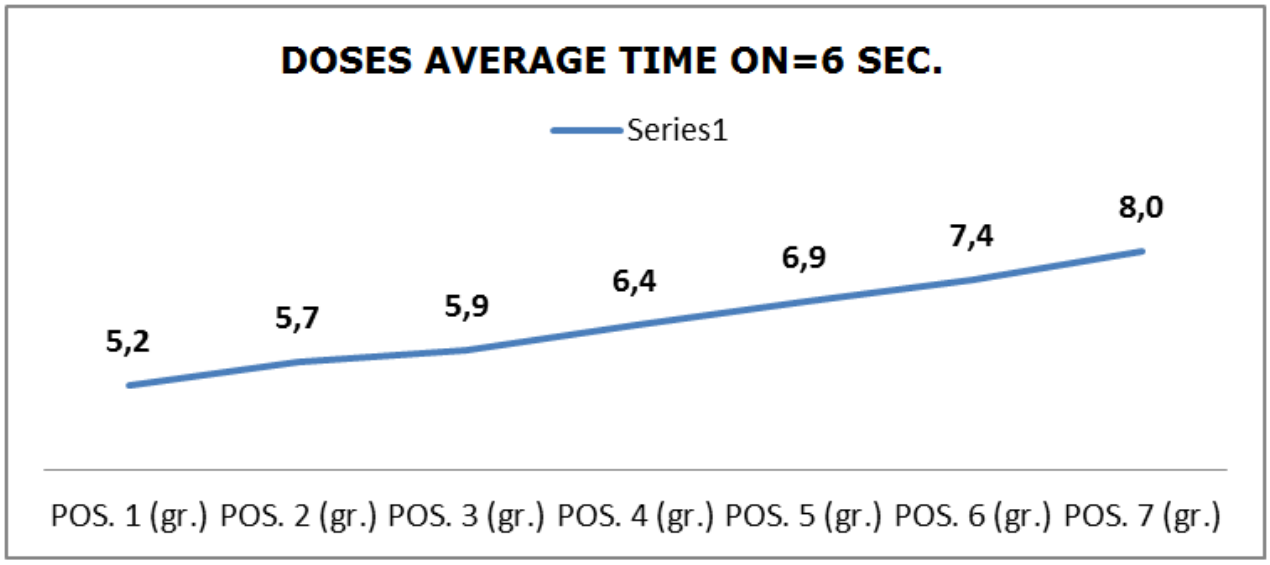
The amount of coffee to be ground at each service time is adjustable from 315 function, see the "Programming Manual".

Spinning the grind regulator, you can change both the degree, as the flow of ground coffee, turning clockwise, you get a finer grind and flow is reduced. Turning to the contrary, the ground is thicker and increases the flow. In the following chart, you can see the amount of ground coffee on 6 scs, according to throttle position.

Technical characteristics

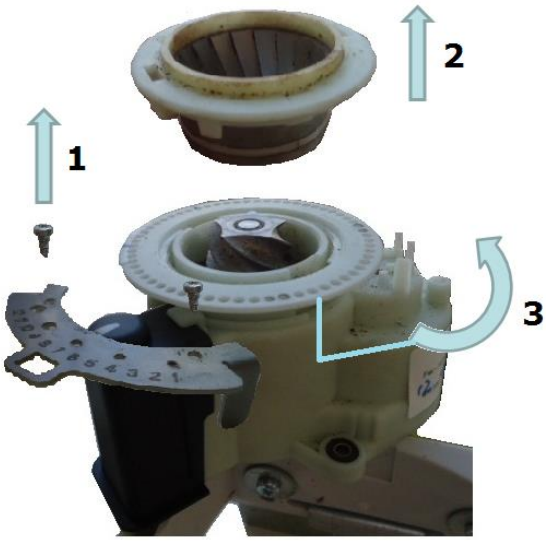
Voltage	230 Vca
Consumption	0,8 A
Spedd	1.250 rpm





Removal of the teeth:

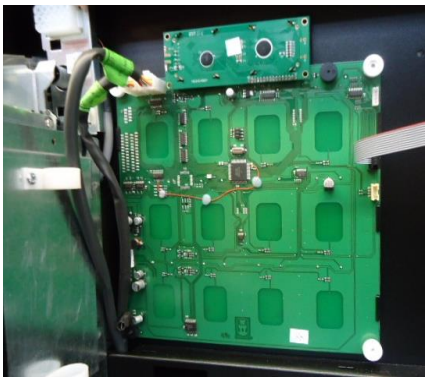
Loosening the two screws that secure the control handle can be removed the upper tooth rotating clockwise. To replace the tooth in place, turn it clockwise until it locks with the lower wheel, then 3 point turn counterclockwise and screw the adjustment knob.



A13. Button panel and display

Zen models, have 8 direct product selections and 4 pre-selections. Activation of these pre-selections and selections are made using capacitive sensors, To order a product you do not need to press any button, just bring your finger to the desired product and the machine providing the service.

Behind the methacrylate of the door, is the card buttons and each button is placed its corresponding product label, the fixing of these labels, is done by a label holder.



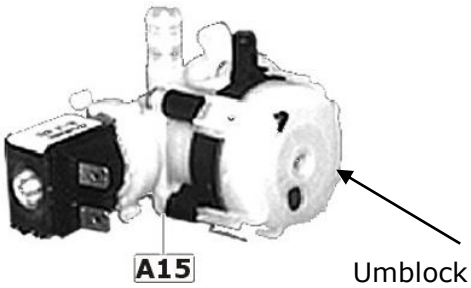
Each product label and pre-selection, is backlit by an LED, when requesting a product of the machine, the remaining labels off, remaining lit only requested. When you press a pre-selection, the signs are illuminated only product affected by the pre-selection, the rest goes off.

On the push buttons electronic board, the display is connected, which is alphanumeric with two lines of 16 characters each.Push buttons board is tied with four plastic nuts and protected by a metal panel. The label holders are tied to the board by pressure. To access the board, you must remove the cups container.

A14. Water inlet EV

It allows the entry of water from the mains to the cold water deposit. It works at 230 Vac. This EV is only fitted to machines that are connected to the mains water supply.

It has a security block system for cases where, for lime scale or any solids from the main water supply, the EV does not close properly. This system activates when the level in the residue bucket is excessively high.

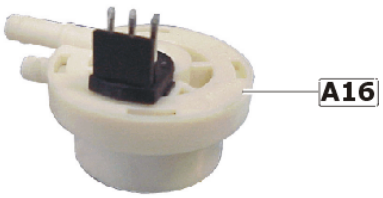


To unblock the EV, switch off the water pressure from the mains. If this is not possible, tap the EV with a blunt object, for example an Allen key, on the inside of the hole on the top part of the EV as shown in the photograph.
It you may also unblock the EV by tapping it with something like the handle of a screw driver.

A15. Volumetric counter

Its function is to measure the quantity of water that is pumped for the elaboration of the espresso coffee.
Inside, there is a blade with two small electromagnets, which rotates thanks to the force of the water. As it rotates, the electromagnets affect a circuit located on the counter cover, making it send 5 VDC impulses to the distribution board. Thanks to these impulses, the board is able to measure the amount of water entering the machine in order to make the different products.
It has three electrical terminals: positive, negative and the terminal that sends the electrical impulses.

If measured between the negative terminal _Π_ when breweing pump is working, one can see the change in the voltage to the passage of each magnet, the voltage oscillates between 0 and 5 volts, indicating correct operation of the counter

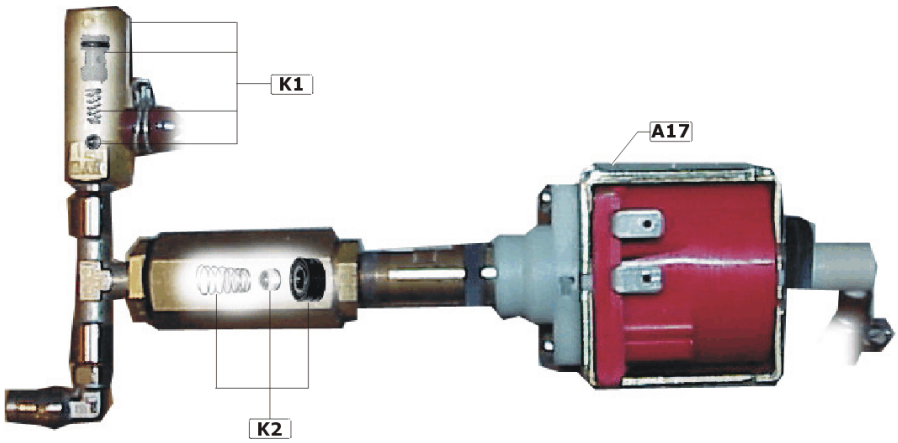


A16. Water pump

This element has the job of pumping water from the cold water deposit to the hot water boiler; the cold water pushes the hot water towards the EVs for the instant products or towards the *infusion element* for making espresso coffee.

K1. By-pass

K2. Anti return valve



When an espresso coffee is elaborated, the water pressure needed is quite high to be able to pass through the compressed ground coffee in the *infusion element*. This resistance the coffee offers makes the water pressure in the boiler increase up to a pressure of 9 Kg/cm². At this pressure the by-pass (2) opens allowing a small amount of water to return; sufficient to prevent the water pressure from going over the 9 Kg/cm².

The by-pass is a small hole covered with a ball that is held in place by a spring. This spring will hold a pressure of 9 Kg/cm², but over this pressure it compresses and allows the water to pass.

The pressure of 9 Kg/cm² is considered the ideal for elaborating espresso coffee.

When the instant beverages are elaborated, there is no resistance offered and so during there elaboration the water pump works at lower pressures than when elaborating espresso coffees.

Technical characteristics

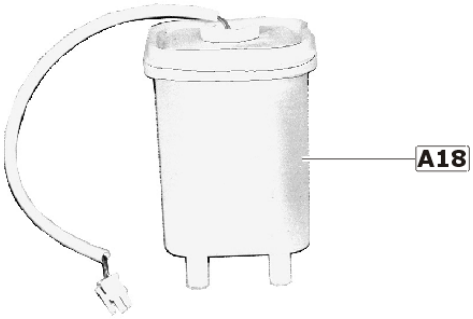
Voltage	Pulsing 110 V
Power	70 w
Working pressure	8 Kg/cm²
Maximum pressure	12 Kg/cm²

The pump has an anti return valve that prevents the return of water from the boiler.

A17. Cold water deposit

Made of polypropylene, It has the capacity of 500 cc. It is at atmospheric pressure and temperature. From this deposit is taken the water to elaborate the *espresso coffee* and instant beverages.

The water level in the deposit is controlled by a float that activates a magnetic switch.

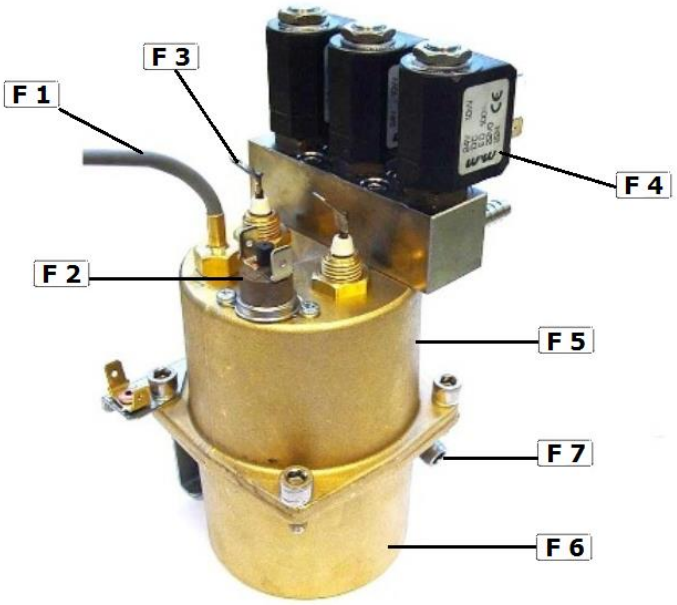


A18. Hot water boiler

The boiler works under pressure and has a capacity of 0.5 litres of water. The water for elaborating espresso coffee and instant beverages is heated in this deposit.

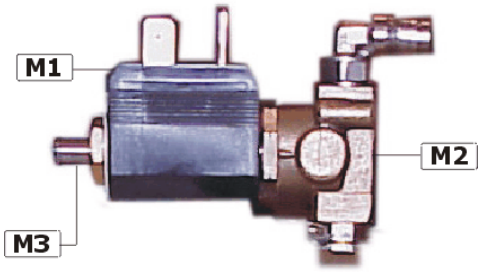
The boiler is made of brass and does not need any device to control the level of water as the boiler fills automatically from the moment the machine is switched on. After this the water that is used is replaced with water from the cold deposit so the boiler is always full.

L1. 1500 W heating element
L2. Security thermostat 120º C
L3. Temperature sensor (PTC)
L4. Triac
L5. Electrovalves



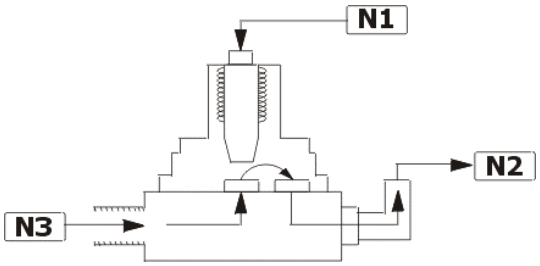
The electrovalves for instant products and espresso services are located on a brass support screwed on the boiler. The espresso EV has three ways: one is for water output coming from the boiler, other one is directly going to the espresso brewer and the 3rd one, in rest status allows the group to reach ambient pressure.

M1. Solenoid
M2. Valve
M3. 3rd outlet



When the machine is in the espresso coffee making process, the third is closed while the outlet from the boiler and the inlet to the *infusion element* are open to each other.

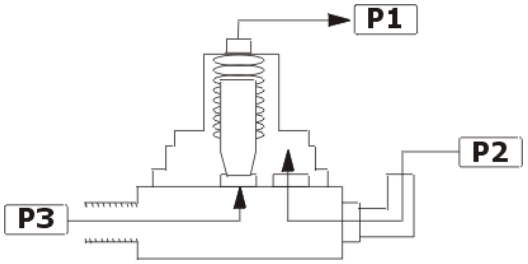
N1. 3rd closed
N2. To the infusion element
N3. From the boiler



When the machine finishes elaborating an espresso coffee, the *EV* goes to rest state and closes the outlet from the boiler leaving the *infusion element* open to the third outlet. In this way the water that did not pass through the coffee and was retained in the *infusion element* goes out through the third outlet to the residue bucket.

The water recedes back from the *infusion element* towards the third outlet because of the pressure it was submitted to by the pump in the infusion process.

P1. 3rd open
P2. Infusion element joined to atmospheric pressure
P3. Boiler water closed

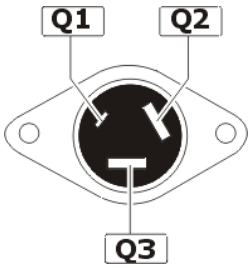


Technical characteristics:

Heating element voltage	230 Vac
Power	1.500 w
Temperature programming	40 a 99º C
Safety protection with manual reset	120º C
Voltage of EVs	24 Vac
Power of instant and espresso EV	10 w
Maximum pressure of EVs	15 Kg./cm²
Working temperature of EVs	-10º C a 140º C

Control of the *heating element* is done with a *triac* that is situated on the boiler support. Always respect the position of the connection cables.

Q1. White
Q2. Black
Q3. Brown



Temperature control of the water in the boiler is done with a PTC100. The following table shows the resistance values that the PT100 gives according to the temperature that it is submitted.

ºC	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									

A19. Extractor

The steam and vapour that is generated by the beaters can reach the product containers and if they become damp they form lumps in the powder. This consequently results in the irregular extraction of the product. To avoid this, the extractor is used to remove the steam and vapour from the interior of the machine. It works on 230 Vac

A20. Transformer

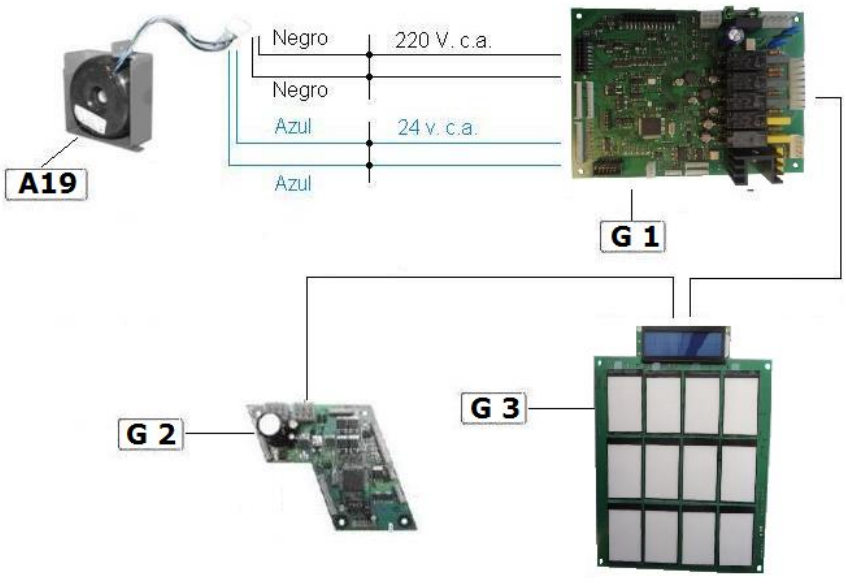
The transformer is connected to the main board and it is this that supplies the voltage of 220 V ac. The transformer secondary reverts to the main board a voltage of 24 V AC.

Technical characteristics:

Primary (black-black)	230 Vac
Secondary (blue-blue)	24 Vac
Power	96 w

A22. Circuit boards

All the models in the **Zen** range, have 3 *circuit boards*. The *main module* is the one that provides the power supply to the other boards and takes the decisions for the correct working of the machine. The other two boards, control independently a determined number of elements in the machine.



G1. Main module
G2. Cup module
G3. Button module

The three boards are joined by one loom of 6 strands called a CAN bus. Two of these wires are used for the transmission of 34 volts, another two for 8 volts and the remaining two are used for the communication between boards. The colour and the function of each of the wires are the following:

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

3. INSTALLATION AND SWITCHING ON

3.1. UNPACKING

The power supply of the machine requires a socket, or another system, that allows its disconnection.

The method used must guarantee the complete disconnection of both poles.

Elemental safety requirements:

a) Never touch any mechanisms with wet hands or feet.
b) Never connect or use the machine barefoot.
c) Never pull on the flex to unplug the machine.
d) Never leave the machine exposed to the elements: sun, rain, snow, etc.

3.2. SWITCHING ON

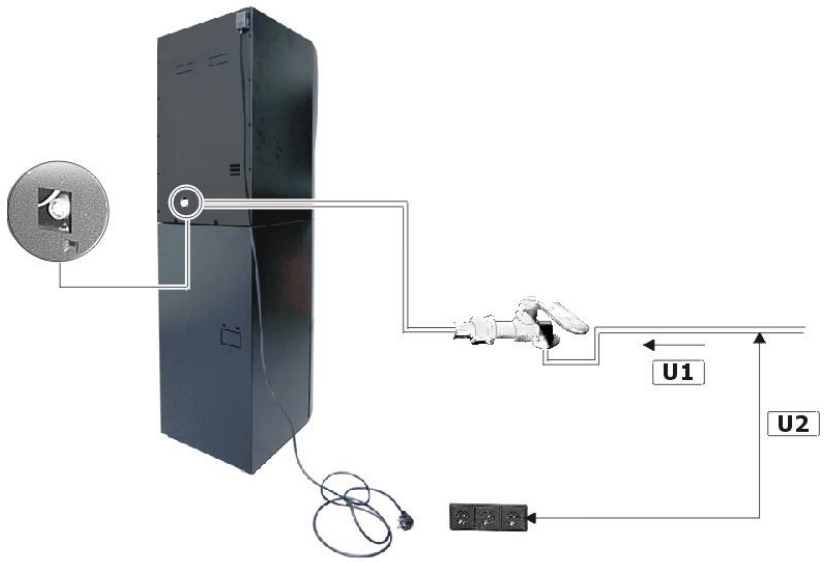
Site the *machine* in its place and level it using the regulating feet.

3.2.1. Water connection

The machine can be used connected to the mains or with an autonomous water deposit. To connect the machine to the mains use a **¾" male** connection. The mains supply must provide drinking water at a minimum of 5 litres/minute and a pressure of between 0.5 and 10 kg/cm². For the Fresh brew model, the minimum pressure is 2 kg/cm².
The connection hose for the mains is not supplied with the machine.

U1. Water

U2. Socket distance minimum 1 metre



Depending on the quality of the water, hardness, chlorine, bleach, etc, the connection should be complemented with a filter.

If the machine is fitted with a filter, the minimum water pressure should be **1 Kg/cm².**

3.2.2. Electrical connection

The *machine* works with 230 Vac (50 Hz). The installation must have:

- An earthed socket
- A minimum power rating of 2500 w
- The installation site must have a breaker switch and a good earth connection

3.2.3. Installing the coin changer with Executive or MDB protocol

Supports Executive or MDB protocol. The support is the same for the two types of coin mech, in this bracket are three screws which are fixed. The "executive" and "MDB" connectors are above the support.

When connecting the machine to the power supply, automatically recognizes the type of coin mechanism you have connected.

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3.2.4. Filling the product containers

To put products in the containers, you should lift the cover of the machine. Otherwise it is necessary to remove the container from the machine.

I1. Coffee bean hopper
I2. Instant powder hoppers
I3. Sugar hopper

After filling the containers for instant beverages, it is advised to request a service of each as the first time it is used, only a small quantity of product is served

Now the machine can be switched on.

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 process occur:

- The cold water deposit fills up, if it is empty.
- The volumetric counter is tested and the boiler is filled with the EVs closed. When the counter stops spinning, the boiler is full. Then the instant product EVs open to let out the air in the lines and boiler.

If the counter does not spin for 10 seconds while filling the boiler the machine will go out of order as there is no water. To reset this state, just switch the machine off and then back on

4. ERRORS

4.1. ERROR MESSAGES SHOWN ON THE DISPLAY

The description of the incident, the corresponding message that the display shows and the codes that in each case will be transmitted when using VTM or EVADTS communication protocols are:

Notes: ►: The machine is "out of order"
nn: number of the element that is faulty

	Description		Message on the Display	VTM	EVADTS
	Fault in a CHANGER, type of fault 1	nn	ERROR CHANGER	08	EAN1
	Fault in a CHANGER, type of fault 2	nn	ERROR CHANGER	09	EAN2
	Fault in a CHANGER, type of fault 3	nn	ERROR CHANGER	0A	EAN3
	Fault in a CHANGER, type of fault 4	nn	ERROR CHANGER	0B	EAN4
	Fault in a CHANGER, type of fault 5	nn	ERROR CHANGER	0C	EAN5
	Fault in the validator			0D	EAL
	MDB: Validator disconnected	00	ERROR VALIDATOR		
	MDB: Error of checksum ROM	01	ERROR VALIDATOR		
	MDB: Jam of coins	02	ERROR VALIDATOR		
	VALID: Error in signal of coins	03	ERROR VALIDATOR		
►	**Fault in the module of recuperation**		**ERROR RECUPERATION**	0E	EAB
	Fault communication with the changer			11	EAR
	MDB: Reply incorrect of the changer	02	ERROR CHANGER		
	MDB: Reply incorrect of the note reader	03	ERROR CHANGER		
	MDB: Reply incorrect of the card reader	04	ERROR CHANGER		
	MDB: Reply incorrect of the slave	05	ERROR CHANGER		
	MDB: Err. Product out of date (slave)	81	ERROR CHANGER		
	MDB: Err. Product sensor (slave)	82	ERROR CHANGER		

MDB: Err. Keyboard in the slave	83	ERROR CHANGER		
Fault button recuperation		**ERROR KEYBOARD**	12	EGK
Fault keyboard selection			13	EGK
Number of button	nn	ERROR KEYBOARD		
Fault cup extractor	EB	ERROR CUP		
Fault Infusion	EC	ERROR INFUSION		
Fault keyboard selection, no keyboard		**ERROR KEYBOARD**	14	EGK
Fault in the card reader			15	
MDB: Error in the circuit board	00	ERROR CARD READER.		
MDB: Circuit board not valid	01	ERROR CARD READER		
MDB: Tamper Error (Fraud?)	02	ERROR CARD READER		
MDB: error defined by the manufacturer	03	ERROR CARD READER		
MDB: Error in communications	04	ERROR CARD READER		
MDB: Repair reader	05	ERROR CARD READER		
Description		**Message on the Display**	**VTM**	**EVADTS**
MDB: Not assigned	06	ERROR CARD READER		
MDB: Error defined by the manufacturer	07	ERROR CARD READER		
MDB: Error of the lector	08	ERROR CARD READER		
MDB: Error in communications	09	ERROR CARD READER		
MDB: Jam circuit board	0A	ERROR CARD READER		
MDB: Error defined by the manufacturer	0B	ERROR CARD READER		
MDB: Error refunding credit	0C	ERROR CARD READER		
Fault in the note reader				
MDB: Motor defective	00	ERROR NOTE READER		
MDB: Sensor defective	01	ERROR NOTE READER		
MDB: Error checksum ROM	02	ERROR NOTE READER		
MDB: Jam	03	ERROR NOTE READER		
MDB: Store / Stacker not present	04	ERROR NOTE READER		
MDB: Lector deactivated	05	ERROR NOTE READER		
▶ **Out of order because prices deprogrammed**		**PRICE NOT PROGRAMMED**	17	EAK
▶ **Out of order for all coins inhibited**		**COINS INHIBIT.**	18	EAC
Fault in extraction grid, type of ERROR 1			19	ELZ1
Fault in extraction grid, type of ERROR 2			1A	ELZ2
Fault in extraction grid, type of ERROR 3			1B	ELZ3
Fault detector product (fault type 1)		**FAULT IDETECT**	1C	
Fault in temperature			1D	EJJ
Fault in product out of date			1E	EJH
Fault detector product (fault type 2)		**FAULT IDETECT**	1F	
Switch on of the machine			20	OEZN
Switch off of the machine			21	OEZF
Activation of infra red reception			22	OEZI
Communication AZKOYEN protocol			23	OEZA
Communication EVADTS protocol			25	OEZE

Communication VTM under SMS			26	OEZS
▶ **Reset configuration**		**Machine NOT CFG[F401]**	30	ECZC
Reset program. Channels ,prices, etc			31	ECZP
Reset program. Messages			32	ECZM
Reset of accounting			33	ECZO
▶ **Error in EEPROM**		**ERROR EEPROM 'Module'**	37	ECO
Power low		**VOLTAGE LOW**	38	ECA
Total memory erase order			39	ECN
Error clock			EA	ECL
Error temperature probe		**FAULT SENSOR TEMPER**	EB	EJK
Temperature probe open	01	OPEN SENSOR TEMP. AB		
Temperature probe short circuited	02	OPEN SENSOR TEMP. CC		
Error in system of door close		**DELIVERY DOOR OPEN**	3D	EGS
Gate closed	01	DELIVERY DOOR C		
Gate open	02	DELIVERY DOOR A		
Description		**Message on the Display**	**VTM**	**EVADTS**
Gate undefined position, both micros closed	03	DEL. DOOR P.D. MC		
Gate undefined position, both micros closed	04	DEL. DOOR P.D. MA		
Detected manipulation of collection hatch	05	DEL. DOOR MANIP.		
Product collection hatch open			41	EGC
Received module software by EVADTS			50	
Received module software by MDB			51	
▶ **Fault in system heater**		**ERROR CALDERA**	60	EDK
▶ Error in the temperature probe	01	ERROR PROBE TEMP.		
▶ Error in the heating element	02	ERROR HEATING ELEMENT		
▶ **Fault in water entry**		**ERR. WATER LEVEL**	61	EFL
▶ Volume meter faulty	02	ERR: NO WATER		
▶ Error in the water level (no water)	03	NO MAINS WATER		
Fault arm: not in out position			62	EBI1
▶ **Fault arm: not reached position**		**ERROR ARM**	63	EBI2
▶ Arm not reached cup position	01	ERROR ARM P. CUP		
▶ Arm not reached liquid position	02	ERROR ARM P. LIQ.		
▶ Arm not reached sugar position	03	ERROR ARM P. SUGAR		
▶ Arm not reached stirrer position	04	ERROR ARM P. STIR.		
▶ **Fault arm 3 faults without reset**			64	EBI3
Fault system extractor of cups		**ERROR SYS. COPS**	65	EBM
▶ Error in the mfc of the cup hopper	01	ERROR CUP HOPPER		
Cup hopper empty after 5 turns	02	NO CUPS		
▶ Error in the mfc of the extractor of cups	04	ERROR EXTRAC. CUPS		
▶ Cup arm turning	05	ARM HOP. TURNING		
▶ Cup extractor turning	06	CUP EXTR. H. TURNING		

▶	Cup hopper turning	07	HOPPER V. TURNING		
	Fault system extractor of stirrers		**ERROR STIRRERS**	66	EDF
	Stirrer arm turning	01	ARM STIR. TURNING		
	Fault in the espresso infusion group		**ERROR GRP. ESPRESSO**	67	EE
	Error in the mfc of the doser	01	ERROR DOS.		
	Error in the positioner of the group	02	ERR. POS. GROUP		
	No coffee in grinder	03	NO GROUND COFFEE		
	No infusion group	04	NO GROUP		
	Infusion time too long	05	LONG INF. TIME.		
	Retry of position of the group	06	RETRY. POS. GROUP		
	Retry of priming water pump in mach with deposit	07	RETRY PUMP PRIME		
▶	**Fault in waste drawer**		**ERROR IN WASTE**	68	EDZ
▶	Waste drawer full	00	WASTE DRAWER FULL		
▶	No waste drawer fitted	01	WASTE DRAWER NOT PRES.		

4.2. Control points

Heating element

It is measured on the **main board** on the connector J12

Between pins 1 and 2 (black and brown) it will show 0 Vac when the heating element is working. (Keeping in mind the 10 Amp fuse is correct)

Between pins 1 and 2 it will show 220 Vac when the heating element is not heating.

Infusion pump

It is measured on the **main board** on the connector J13

Between pins 1 and 6 it will show 200 Vac when the pump is working.

Water inlet electro-valve

It is measured on the **main board** on the connector J13

Between pins 2 and 6 it will show 200 Vac when the pump is working.

Motor of the infusion group

It is measured on the **main board** on the connector J13

Between pins 3 and 6 it will show 220 Vac when the group is working.

Grinder

It is measured on the **main board** on the connector J13

Between pins 5 and 6 it will show 220 Vac when the grinder is working.

Transformer

It is measured on the **main board** on the connector J11

Pins 1 and 2 = 220 Vac (black wires).

Pins 4 and 5 = 24 Vac (blue wires)

Electro-valve 1

It is measured on the **main board** on the connector J14

Between cables Or and Br-B, it will show 25 Vdc when the electro-valve is activated.

Electro-valve 2

It is measured on the **main board** on the connector J14

Between cables Or and Br-Y, it will show 25 Vdc when the electro-valve is activated.

Electro-valve 3

It is measured on the **main board** on the connector J14

Between cables Or and Br-Gr, it will show 25 Vdc when the electro-valve is activated.

Electro-valve 4

It is measured on the **main board** on the connector J14

Between cables Or and Br-R, it will show 25 Vdc when the electro-valve is activated.

Volume counter

It is measured on the **main board** on the connector J7.

The pin 10 (W-R) corresponds to +, the pin 11 to ground and the pin 8 (W-Bl) to signal.

When the counter spins, the reading will show 2.5 Vdc measuring between pins 8 and 11.

Water level buoy

It is measured on the **main board** on the connector J7.

Between pins 7 (Y) and 11 (B) it will show 0 Vdc when the deposit is contains water.

Between pins 7 and 11 iit will show 5 Vdc when the deposit is empty.

Micro-switch-switch for infusion group motor

It is measured on the **main board** on the connector J7.

Between pins 2 (Bl) and 11 (B) it will show 5 Vdc when the infusion group is in the coffee making position.

Between pins 2 (Bl) and 11 (B) it will show 0 Vdc when the infusion group is in the loading position.

Micro-switch for waste bucket

It is measured on the **main board** on the connector J7.

Between pins 6 (W) and 11 (B) it will show 5 Vdc when the waste bucket is full.

Between pins 6 (W) and 11 (B) it will show 0 Vdc when the waste bucket is not full.

Cup extractor motor

It is measured on the **Cup Board** on the connector J5.

Between pins 9 and 11 it will show 0 Vdc when the motor is at rest.

Between pins 9 and 11 it will show 25 Vdc when the motor is working.

Motor for turning the cup container

It is measured on the **Cup Board** on the connector J5.

Between pins 7 and 10 it will show 30 Vdc when the motor is at rest.

Between pins 7 and 10 it will show 0 Vdc when the motor is working.

Motor for the sugar extractor

It is measured on the **Cup Board** on the connector J7.

Between pins 3 and 6 it will show 30 Vdc the motor is at rest.

Between pins 3 and 6 it will show 0 Vdc when the motor is working.

Motor for the stirrer extractor

It is measured on the **Cup Board** on the connector J7.

Between pins 3 and 5 it will show 30 Vdc the motor is at rest.

Between pins 3 and 5 it will show 0 Vdc when the motor is working.

Photocell for detecting cup presence

It is measured on the **Cup Board** on the connector J5.

Between pins 6 and 7 it will show 5 Vdc when there are cups between the photocells.

Between pins 6 and 7 it will show 0 Vdc when there are no cups.

Micro-switch of the cup container lever

It is measured on the **Cup Board** on the connector J5.

Between pins 3 and 7 it will show 5 Vdc when the lever is at rest.

Between pins 3 and 7 it will show 0 Vdc when the lever closes the micro-switch.

Micro-switch for the cup extractor motor

It is measured on the **Cup Board** on the connector J5.

Between pins 4 and 7 it will show 0 Vdc when the motor is at rest.

Between pins 4 and 7 it will show 5 Vdc when the motor turns to extract a cup.

Micro-switch sugar arm

It is measured on the **Cup Board** on the connector J7.

Between pins 2 and 3 it will show 5 Vdc when the arm is at rest.

Between pins 2 and 3 it will show 0 Vdc when the arm moves to deposit sugar in the cup, it returns to 5 Vdc when it returns to its original position.

Temperature probe

It is measured on the **main board** on the connector J2. It measures the resistance values (see the table for the PTC values).

5. CLEANING AND MAINTENANCE

❒ In every product recharge. Maximun weekly.

- ➘ *Liquid residue bucket*. Empty the waste water and rinse with clean water.
- ➘ *Solid waste bucket*. Empty the coffee residues and rinse with clean water.
- ➘ *Liquid collector tray*. Clean with a water and dish washing liquid solution.
- ➘ *Beaters*. Carry out various auto-cleaning operations by pressing button "B" on the programming handset.
- ➘ *Product ouptut elbows from the hoppers. Check and clean in case of product retained.*
- ➘ *Product collection front*. Wipe it with a solution of water and detergent.

❒ Monthly

- ➘ *Infusion group*. Remove it from the machine and rinse it under a tap to remove coffee particles. Before replacing the group, dry it with a cloth.
- ➘ *Beaters*. Remove the beaters, the outlet tubes and the chamber from the machine, and clean everything with a water and dish washing liquid solution. If necessary, only use a soft cloth to clean so as not to scratch their surfaces.
- ➘ *Cup support arm.* Remove and clean it with a water and dish washing liquid solution.

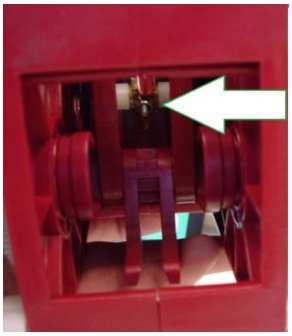
❒ Six monthly

- *Product hoppers*. Remove them from the machine and empty them. Clean them with a water and dish washing liquid solution. Dry them before replacing into the machine. Clean the supports where the hoppers are fitted.
- *Coffee bean hopper*. Carry out the same as with the product hoppers.

❒ Depending on the use of the machine

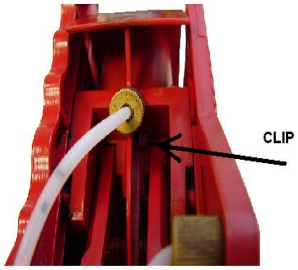
- *Piston filter*. Every 20,000 services, it is recommended to remove and clean it. If necessary, it can be cleaned with a non metallic brush. If the holes are blocked, do not introduce sharp objects into the holes to clean them. It is recommended to replace the filter with a new one when is becomes blocked.
- *Infusion group filter*. Clean the infusion group filter at the same time as you clean the piston filter. See how to release the filter in the pictures. On replacing the screw it is recommended to use Loctite 243 or a similar product to keep it tight.
- *Piston seal*. Replace every 30,000 services
- *Group seals*. Replace every 60,000 services. To get to these it is necessary to remove the group filter. They are reachable by following the explanation below.

1. Remove the nut that holds the spindle shaft at the bottom of the group, it is recommended to support with a screwdriver the shower filter at the same time.



2. Push the shaft from the bottom and remove the filter holder.
3. Press on the clips (one on each side) shown in the picture below to release the part where the o-ring gaskets.
4. Once replaced the gaskets, replace lids in the group.

Spindle



Clips

Gaskets

5. WORKING CONDITIONS AND NORMS

The optimum working conditions of this equipment is achieved by fulfilling the following requirements:

- Temperatures:
  - Storage: -25 to + 70ºC.
  - Working: 0 to 50º C.
  - Maximum relative humidity without condensation 85%
- Norms that are met:
  - The coffee machines meet the following EU directives: Directive 73/23/CEE electrical safety and Directive 89/336/CEE electromagnetic compatibility.
  - The mains connection cable has an earth wire as established in the electrical safety norm.
  - The boiler has a temperature sensor that controls the connection and disconnection of the heating element automatically.
  - The boiler has a temperature clixon that disconnects the heating element when it reaches 120º 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**

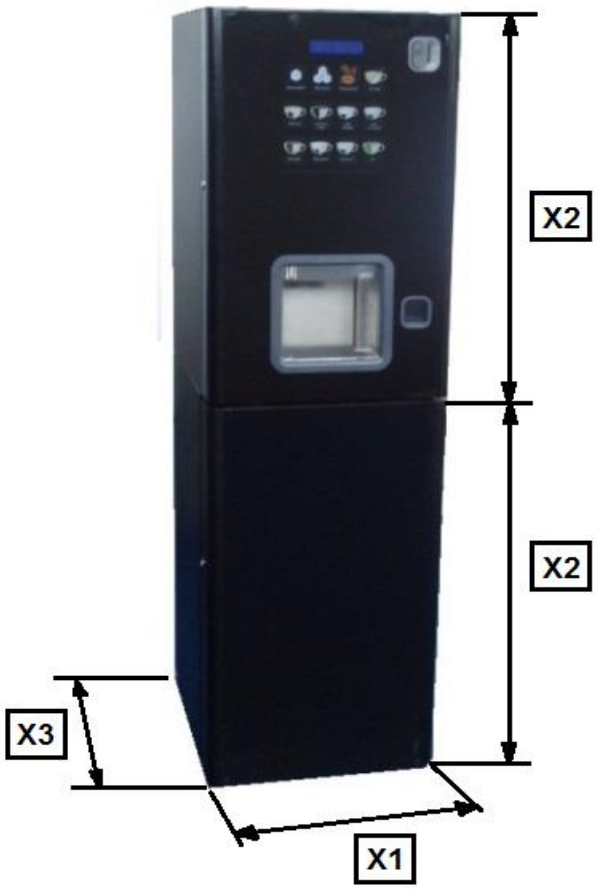
❒ For the correct working of all the elements, the maximum inclination the machine should have on any of its axis should be ± **5º.**

6. DIMENSIONS

The measurements are in mm and the weights in Kg.

MACHINE				
Zen	Width X1	Height X2	Depth X3	Weight
Instant	480	775	900	55
Espresso	480	775	900	55
Fresh brew	480	775	900	55
Espresso + FB	480	775	900	55

CABINET				
	Width X1	Height X2	Depth X3	Weight
ME/MI	480	885	590	19




GRUPO
AZKOYEN