# Service Service Service

## Syntia cappuccino



# Service Manual

Rev.01 December 2012

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10.

Electrical diagram

INTRODUCTION

### 1.1. Documentation required

The following documentation is required for repairs:

- Instruction booklet of the specific model
- Technical documentation of the specific model (diagrams, exploded view, sympton cure and service manual).

### 1.2. Tools and equipment required

Besides standard equipment, the following tools are required:

Qty.	Description	Notes
1	Screwdriver	Torx T 8 - T 10 - T 20
1	Pliers for Oetiker clamps	
1	AC - DC - Vdc tester	
1	Digital thermometer	Full scale > 150°C
1	SSC (Saeco Service Center)	Programmer (for programming and diagnosis mode)

### 1.3. Material

Description	Notes
Thermal grease	Thermal resistance > 200°C
Descaler	Saeco descaler
Degreaser	Personal choice
Silicone grease	Safe to use with food

### 1.4. Safety warnings

It is recommended to consult this Service Manual of the appliance before implementing any operation.

Comply with all applicable standards relating to the repair of household appliances.

Always disconnect the power plug from the mains before beginning repairs on the appliance. Simply turning off the main switch is not sufficiently safe to prevent electrical discharges.

This household appliance is rated as insulation class I.

On completion of the repairs, insulation and dielectric rigidity tests must be performed.

### 1.5 Service POLICY grid as used for coffee machine

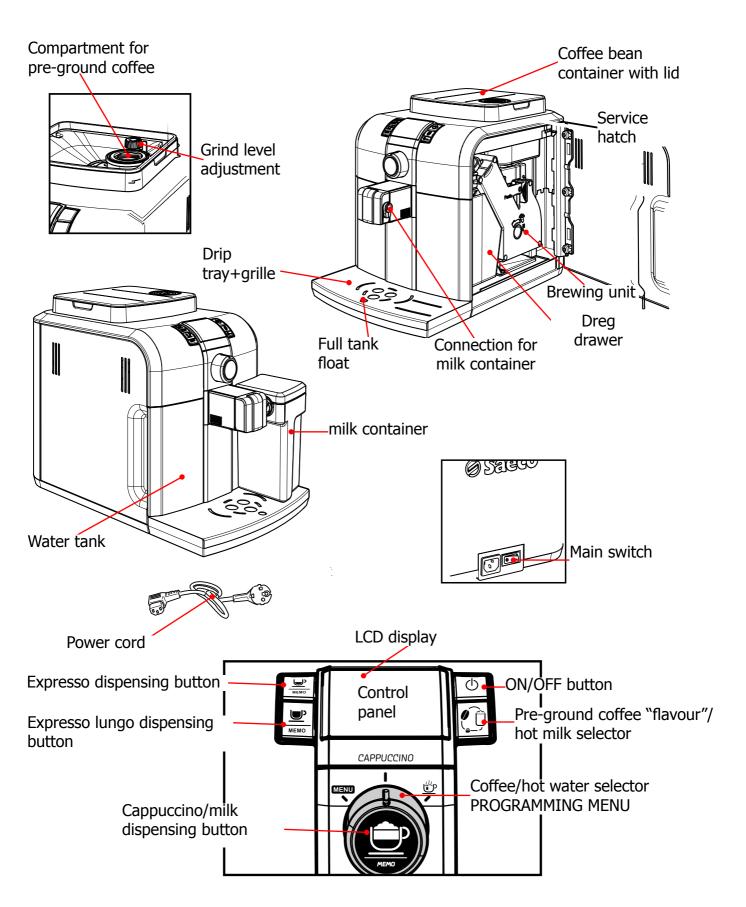
**For IN WARRANTY** repairs is mandatory to use the single components (not the assembly) available in the exploded views of the coffee machines or of the specific components. If you find the information "SEE THE EXPLODED VIEW E......." in the assembly description field, it means that the single components of the assembly are available in the other pages of the exploded view. It's possible to use the assembly only if there is a specific Symptom Cure that include this possibility or when the single components are not available for the order.

### List of principal assembly present in all our coffee machines

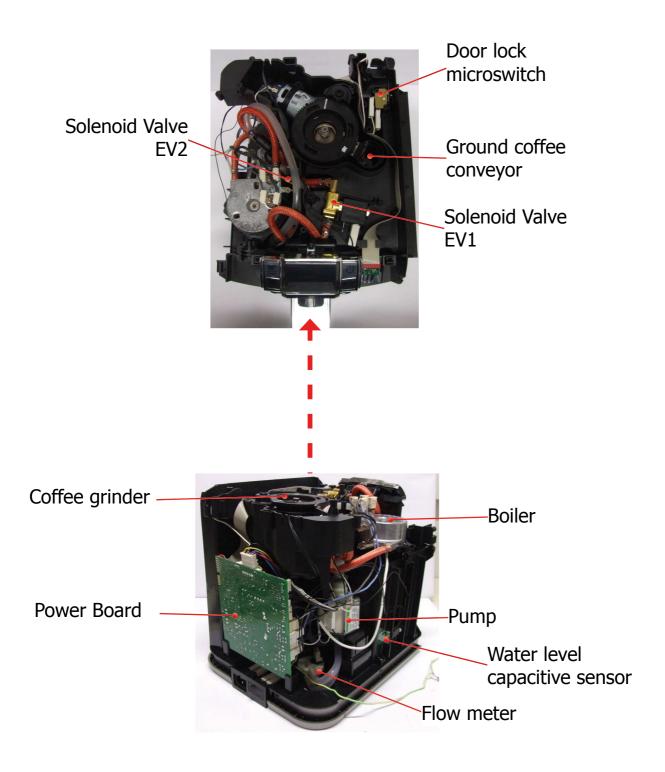
Components	Assembly use	Single components available
COFFEE GRINDER	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine or of the Coffee Grinder on website
BREWING UNIT	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine or of the Brewing unit on website
BOILER	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine on website
GEAR MOTOR	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine on website
FILTER HOLDER	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine on website
MILK CARAFE	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the machine on website
THERMAL CARAFE	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the Thermal Carafe on website
MILK ISLAND	Only for OOW repairs	<b>YES</b> , to consult the specific exploded-view of the Milk Island on website

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### 1.6.1. External appliance parts



### 1.6.2. Internal appliance parts



TECHNICAL SPECIFICATIONS

### 2.1. Technical specifications

Power supply and output:	240 V~ 50 Hz 1400 W - 230 V~ 50/60 Hz 1400 W - 120 V~ 60 Hz 1500 W - 100 V~ 50/60 Hz 1300 W
Temperature control:	Variable resistor sensor (NTC)
'	transmits the value to the control board
Safety system:	2 manual reset or one-shot thermostats (175°C)
Coffee heat exchanger output:	(230/120 V~) 1300 W – (100 V~) 1100 W
Stainless steel	to dispense coffee, hot water and steam
Gearmotor:	33VC 2 rotation directions; 24VC power supply
Pump:	Ulka with reciprocating piston and 120°C cutout 48 W, 230V, 50 Hz, Type EP5 approx. 13-15 bar 120V, 60Hz 100V, 50/60 Hz
Overpressure valve:	Opening at approx. 16-18 bar
Water filter:	In tank
Coffee grinder:	Direct current motor with flat ceramic grinder blades
Automatic dosage	Dose adjustment controlled by the electronic system
Consumption:	During the heating phase - approx. 5.6 A
Consumption in Stand-by	< 1 W
Dimensions: W x H x D in mm:	256x315x415
Weight:	9 kg
Water tank capacity:	1.2 l.
Coffee container capacity	260 g coffee beans
Dreg drawer capacity	8
Heat exchanger capacity:	Approx. 10 cc
Water circuit filling time:	Approx. 15 sec Max. on first filling cycle
Heating time:	Approx. 45 sec.
Grinding time:	approx. 8-10 sec.

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### 2.2. Specification for the measurement of the coffee products temperature.

The temperature is influenced by the flow from the dispenser and stratification of temperatures in the glass. In order to consider these phenomena and to introduce measures that allow comparisons in controlled conditions, below guidelines must be followed:

### **Conditions:**

- a) Water temperature in tank: 23°C (+/-2°C).
- b) It must be used a plastic cup (see picture N°1).
- c) It must be used a thermocouple thermometer (e.g. type K see picture N°2).
- d) The coffee machine is tested without any change of parameters or calibrations, which may affect the temperature of products, so the measurement of temperature must be done with machine in default factory setting.

### **Procedure:**

- 1. The temperature must be measured in the cup, immediately after dispensing. Cup has to be placed on a non-metal surface using a thermocouple thermometer.
- 2. The temperature in the cup is measured by immersing the probe of the thermometer up to touch the bottom. The probe then must be moved in a circular motion for 5/6 rotations. At the of the rotations, stop in the center of the cup.
- 3. The highest temperature measured during the rotations is the value we are searching for, and that must be reported;
- 4. Test measurement: from end of dispensing to the end of rotations must be completed within 12 seconds.

### Limits of acceptability

The acceptance limits are divided by features and products and are the following:

### Espresso Coffee Italy Q.ty 25/40 gr.

Temperature of 1st product  $69^{\circ}C \le 85^{\circ}C$ Temperature of 2nd product  $72^{\circ}C \le 85^{\circ}C$ 

### Coffee Q.ty 70/120 gr.

Temperature of 1st product  $69^{\circ}\text{C} \leq 85^{\circ}\text{C}$ Temperature of 2nd product  $72^{\circ}\text{C} \leq 85^{\circ}\text{C}$ 





### 2.3. Appliance parameters and performance

PRODUCT QUANTITY	Minimum quantity (Puls.)	Default quantity (Puls.)	Maximum quantity (Puls.)	Set by the user	Set by the Production/Service Dept
Expresso	70	165	600	Yes	No
Average coffee	No	No	No	No	No
Expresso lungo	70	440	600	Yes	No
Pre-ground	Yes				
Hot water	Continues until the water is used up (capacitive sensor)				
Steam	Continues until the water is used up (capacitive sensor)				

RINSE	Initial rinse	Final rinse
When performed	When the appliance is switched on and the boiler temperature is ≤ 50°C	When the machine is switched off electronically, manually or automatically after 60', if at least one coffee has been dispensed before being switched off
No. of Pulses	180	80
Stop option	Yes, by pressing any button	Yes, by pressing any button
Can be disabled by the user	No	No
Can be disabled by the Production/Service Dept	No	No
No. of pulses adjustable by the user	No	No
No. of pulses adjustable by the Production/Service Dept	No	No
Pulse range (Min - Max)	No	No

WATER HARDNESS	ADJUSTABLE

Descaling frequency					
Hardness Water hardness Without anti-scale filter With anti-scale		With anti-scale filter			
1	Soft (up to 7°dH)	240 litres (480,000 pulses)	480 litres (960,000 pulses)		
2	Medium (7° - 14°dH)	120 litres (240,000 pulses)	240 litres (480,000 pulses)		
3	Hard (15° - 21°dH)	60 litres (120,000 pulses)	120 litres (240,000 pulses)		
4	Very hard (over 21°dH)	30 litres (60,000 pulses)	60 litres (120,000 pulses)		

The default water hardness level is 3. Each litre of water corresponds to approximately 2,000 pulses.

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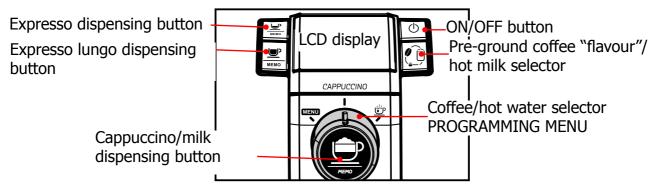
DREG DRAWER	Description and values
Time-out for dreg drawer	5 sec.
Alarm to empty dreg drawer block after	8 lots of dregs
(double expresso as the last dispensed product)	(9 lots of dregs)
Warning to empty dreg drawer	No
Reset dreg counter	Each time the dreg drawer is removed for at least 5 seconds, even if the "empty dreg drawer" alarm is not triggered

STAND-BY	Description and values	
Input time (min - max)	15 minutes - 180 minutes	
Input time (default)	60 minutes	
Input time set by user	Yes	
Input time set by	Yes	
the Production/Service Dept		
Boiler temperature during Stand-by	Boiler OFF	

WATER TANK	Description
Level sensor	Yes
Water reserve (pulses)	200
Water reserve modifiable by the Production/Service Dept	No
"Fill tank" alarm	Yes
"No tray" alarm	No
Water mains	No

# USER INSTRUCTIONS

### 3.1. Customer and programming menu



### Appliance ready mode indications (GREEN)

Indications	Causes	Solutions
	The appliance has reached the temperature - to dispense coffee beans - to dispense hot water	Dispense the product
<u> </u>	The appliance has reached the temperature - to dispense ground coffee (pre-ground)	Dispense the product
	The appliance is ready to dispense hot milk	Dispense the product
<u> </u>	The appliance is dispensing hot water	Dispense hot water
	The appliance is dispensing a coffee	Wait for the dispensing process to end (press the button again to stop dispensing)
	The appliance is dispensing two coffees	Wait for the dispensing process to end (press the button again to stop dispensing)
	The appliance is dispensing a cappuccino with coffee beans.	Stop the dispensing process as desired
	The appliance is dispensing a cappuccino with ground coffee.	Stop the dispensing process as desired
M E M O	The appliance is programming the amount of coffee to be dispensed.	Stop the dispensing process as desired
M E M O	The appliance is programming the amount of hot milk to be dispensed.	Stop the dispensing process as desired
	The appliance is programming the amount of cappuccino to be dispensed.	Stop the dispensing process as desired

### Warning indications (ORANGE)

Indications	Causes	Solutions	
	Appliance is in heating mode to dispense coffee, hot water or steam	Wait for the heating process to end (see the progress bar)	
	The appliance is in rinsing mode wait for the appliance to complete the operation	Wait for the operation to be completed	
MENU WWW	The machine requires a descaling cycle	Perform a descaling cycle  Press the aroma/pre-ground coffee button for 5 seconds to access the descaling cycle	
	The brewing unit is in restart mode for the appliance to be reset	Wait for the restart to be complete	
	Fill the coffee bean container and restart the dispensing cycle	Fill the coffee bean container	
	The appliance requires the Intenza filter to be replaced	Replace the filter. This message is displayed if the function is activated via the programme	
ON OFF OK		The alarm is only disabled if "RESET" is performed via the programme	
CLEAN	The appliance requires the milk system to be cleaned	After having washed the milk unit, press the button to cancel the message	

### Alarm indications (RED)

Indications	Causes	Solutions
<b>&gt;</b> ──c ₁	Switch the appliance off and back on after 30 seconds. Repeat this twice or three times	If the appliance does not go on, contact the Service Centre.
START	Problems with the water circuit. Press the button to start the manual loading cycle of the water circuit	Wait for the circuit to fill up
M	No coffee beans inside the container.	Restart the cycle after having filled the coffee container
8	No water	Fill the water tank

Indications	Causes	Solutions	
<b>\</b>	Service hatch open: Close it If the service hatch is opened while a product is being dispensed, the appliance stops dispensing and starts a 30 sec countdown before cancelling the dispensing process. The countdown can be interrupted by closing the service hatch and the dispensing process continues where it stopped from.		
<b>७</b> ₃0	Bring the hot water/steam stopcock knob to the correct position.  If the knob is turned (opened) while a product is being dispensed, the appliance stops dispensing and starts a 30 sec countdown before cancelling the dispensing process. The countdown can be interrupted by closing the knob and the dispensing process continues where it stopped from.		
30	No brewing unit  If the brewing unit is removed while a product is being dispensed, the appliance stops dispensing and starts a 30 sec countdown before cancelling the dispensing process. The countdown can be interrupted by reinserting the brewing unit and closing the door - the dispensing process continues where it stopped from.		
<b>└</b> ;;;;	Empty the dreg drawer and the drip tray	To reset the dreg counter, wait for the dreg value inside the icon on the display to disappear (5 seconds)	
-	Insert the dreg drawer	When the dreg counter is reset, the icon is displayed with no dreg value	

Indications	Causes			Solutions
	Descaling			
	(press the Aroma/pre-ground of	coffee	button	for 5 seconds)
OK Saeco	<b>1</b> ) Initial screen to enter the descaling cycle. Press "esc" to exit	START		<b>5</b> ) Rinse cycle of the descaling cycle during the pause mode
STOP	2) Descaling cycle being performed	E	ND →	<b>6</b> ) Descaling cycle ended. Press the Dutton to exit the cycle
START	3) Descaling cycle in Pause mode	8		<b>7</b> ) Fill the tank with fresh water
STOP	<b>4</b> ) Rinse cycle of the descaling cycle being performed			

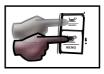
# MENU (controls and programmes)



Turn the selector anti-clockwise until "MENU" is reached in order to access the programming menu in appliance ready mode



Press to scroll the MENU



Press edit



### **Coffee temperature:**

This function adjusts the dispensing temperature of the coffee.



### Timer (Stand-by):

This function adjusts the interval to switch to Stand-by after the last product is dispensed.



### **Contrast:**

This function adjusts the contrast of the display for the messages to be read better.



### Water hardness:

This function adjusts the water hardness for better management of appliance maintenance.

= very soft water AA = soft AAA = hard AAAA = very hard



### "INTENZA" water filter

This function lets the user manage the "INTENZA" water filter.



### **Descaling cycle**

This function lets the user manage the appliance descaling cycle.



### **Default settings**

This function restores the default settings.

### 3.2. Operation, cleaning and maintenance

	Operating the machine		
1	Fill the water tank		
2	2 Fill the coffee bean container		
3	Switch on the appliance		
4	Fill the circuit	Insert a container beneath the dispenser, turn the selector to the "  symbol and wait for the appliance to return to the coffee ready mode.	
5	Press the coffee button	Press once for one coffee and twice for two coffees	

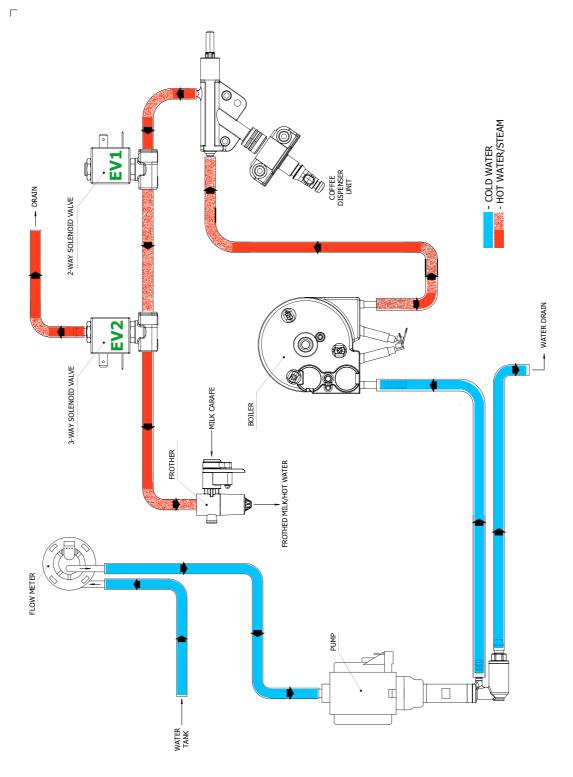
	CLEANING AND TECHNICAL ASSISTANCE			
A Empty the dreg drawer If indicated		If indicated		
В	Empty the drip tray	As necessary		
С	Clean the water tank	Weekly		
D	Clean the coffee bean container	As necessary		
Е	Clean the casing	As necessary		
_	Clean the coffee unit	Every time the coffee bean container is filled or once a week		
F	Lubricate the coffee unit	Monthly or after 500 dispensing cycles		
	Clean the unit housing	Weekly		
Н	Descaling cycle	If indicated		
G	Clean the milk frother	After it is used		

Descaling frequency			
Hardness Water hardness Without anti-scale filter With anti-scale fil			With anti-scale filter
1	Soft water (up to 7°dH)	Approx. 3 months or 120 litres	Approx. 6 months or 240 litres
2	Medium Water (7°-14°dH)	Approx. 2 months or 90 litres	Approx. 4 months or 180 litres
3	Hard Water (15°-21°dH)	Approx. 6 weeks or 60 litres	Approx. 3 months or 120 litres
4	Very hard water (over 21°dH)	Approx. 4 weeks or 30 litres	Approx. 6 weeks or 60 litres

OPERATING LOGIC

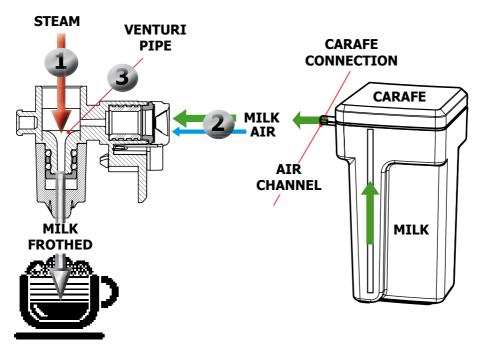
SYNTIA CAPPUCCINO 04 OPERATING LOGIC

### 4.1. Water circuit



STATUS OF SOLENOID VALVES EV1 AND EV2 DURING THE VARIOUS FUNCTIONS			
FUNCTION EV1 EV2			
COFFEE	OFF	OFF	
FROTH/CAPPUCCINO	ON	ON (it opens after 5 seconds to drain any water residue inside the circuit)	
HOT WATER	ON	ON	

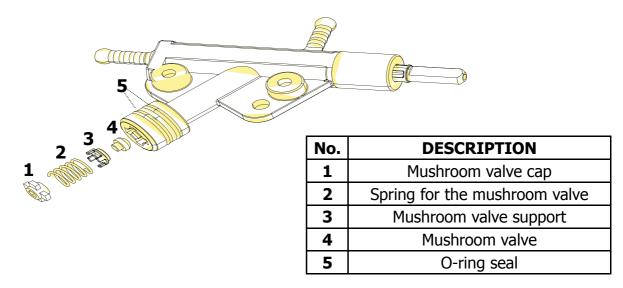
### 4.2. Frother valve assembly



### The milk is frothed as follows:

- **1)** The steam goes through the frothing valve, thereby creating a depression that draws the milk and a percentage of air
- **2)** The milk is drawn from the carafe and is mixed with the air that is drawn through the slot on the carafe connection.
- 3) STEAM AIR MILK are mixed inside the Venturi Pipe, thereby forming froth.

### 4.3. Stopcock



When dispensing coffee - cappuccino, the mushroom valve opens at 4bar  $\pm$  0.5.

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SYNTIA CAPPUCCINO 04 OPERATING LOGIC

### 4.4. Coffee cycle

Main switch ON		START	STOP	
Time				
Coffee grinder			Pulses (Dosage)	
Heating	approx.45 sec.			
Pump			Pump action (flow meter pulses) depending on the set quantity of the product	
Gearmotor Brewing unit	<b>↓</b> ↑		<u> </u>	
Mode	Heating	Ready	Coffee cycle	

**Notes: \* Only with Pre-brewing** 



Single microswitch gearmotor

### **Switch-on**

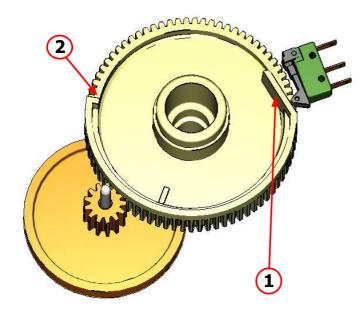
When the appliance is switched on, the gearmotor repositions itself as follows:

- It stresses microswitch 1 (see the following chapter)
- The gearmotor changes the rotation direction and moves upwards again by approx. 1-2 mm
- The boiler begins to heat the water for approx. 45 sec. at full power in order to reach the optimal temperature. The temperature will then remain constant.

### **Coffee cycle**

- 1. The coffee grinder starts the grinding process (controlled by pulses generated by a sensor)
- 2. The gearmotor (coffee unit) moves to the dispensing position
- 3. Preliminary dispensing phase (short pump activity, short pause)
- 4. The product is dispensed (the pump operation time depends on the amount of product dispensed)
- 5. The gearmotor moves to the idle position (the dregs are expelled automatically)

### 4.5. Single microswitch



The gearmotor is activated by a direct current motor that acts on the smaller double toothed wheel via a worm screw. The unit is mounted on the axle of the large toothed wheel and when a coffee is requested, it moves from the idle position to the dispensing position to then return to the idle position.

- Idle position: 1

- Dispensing position: 2

### 4.6. Temperature sensor (adjustment)

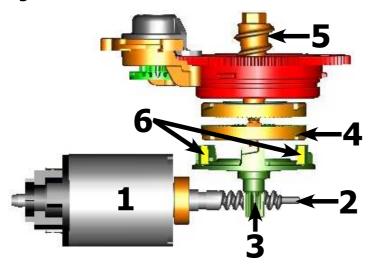
Temp. (° C)	R nom (kΩ)	ΔR (+/- %)
20	61.465	8.6
50	17.599	5.9
75	7.214	4.1
80	6.121	3.7
85	5.213	3.4
90	4.459	3.1
100	3.3	2.5
125	1.653	3.9
150	0.893	5.1

An NTC is used as a temperature sensor, which reduces the resistors consumption, in the event of overheating.

The electronic system detects the actual boiler temperature from the drop in voltage and adjusts it accordingly.

**Resistor values and corresponding temperatures:** see table

### 4.7. Coffee grinder

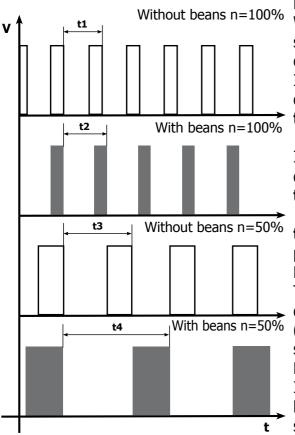


The coffee grinder is activated by a direct current motor (1) via helicoidal wheel transmission and a worm screw (2).

The worm screw (2) activates a plastic toothed wheel (3), which turns the lower grinder blade (4) and the increment pin (5)

There are two magnets (6) in the toothed wheel and with every rotation they transmit two pulses to a Hall sensor, which in turn transmits them to the electronic system.

# 4.8. Detection of coffee bean absence, dose adjustment, blocked coffee grinder



### No coffee

When no coffee beans are present, this is detected by the Hall sensor due to variations in the pulse frequency (with or without coffee).

If there are no coffee beans (operation while empty), the number of rotations and therefore the number of pulses, will be greater.

### t1 = no coffee indication

If there are coffee beans, the number of rotations will be lower due to the force created during the grinding process.

### t2 = no indication

**t3 and t4 =** this reading is taken at the end of each grinding process

### Dose quantity adjustment

The dose quantity is adjusted in accordance with the pulses detected.

(number of rotations proportional to the weak, medium and strong flavour selection).

### **Blocked grinder blades**

If the coffee grinder is blocked for any reason, pulses will no longer be transmitted to the electronic system and the grinder stops.

### 4.9 Auto-learning dose (SAS)

The aim of this function is to automatically adjust the average dose of ground coffee (AUTO-LEARNING); this occurs by means of an algorithm based on three pieces of information detected by the appliance board:

- 1. Number of coffee grinder pulses during the grinding cycle
- 2. Max average value of the power consumed by the gearmotor during the coffee brewing cycle
- 3. Flavour selected by the user

The algorithm compares the maximum average value of the power consumed by the gearmotor with the value shown in the table, depending on the selected flavour, in order to calculate the new grinding pulse value for the next coffee product.

If the consumption value is less than the minimum current value, the grinding pulses will be increased by 2.

If the consumption value is greater than the maximum current value, the grinding pulses will be decreased by 4.

If the consumption value falls within the "excessive stress" range, the product is dispensed and the grinding pulses will be decreased by 10.

If the consumption value falls within the "expel" range, the pad will be expelled and the grinding pulses decreased by 10.

If the "pre-ground" flavour is selected by the user, no modification is made.

# This guarantees that regardless of the coffee type used, the grinding adjustment and any wear on the grinder blades always remains constant.

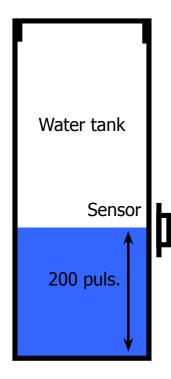
Cotting / Status		Power consumption	The pulse is corrected in the next grinding process		
	Setting / Status	in mA	Exceeded in excess	Exceeded in default	
Α	Mild flavour	200 - 300 mA	- 4	+2	
В	Medium Flavour	301 - 450 mA	- 4	+2	
С	Strong Flavour	451 - 600 mA	- 4	+2	
D	Stress	601 - 800 mA	- 4		
Е	Excessive stress	801 - 1,000 mA	- 10		
F	Pad expulsion	> 1000 mA	- 10		

### **Important:**

For perfect operation, the adjustment is carried out in the area of the fields highlighted in green (A, B and C). When the type or brand of coffee is changed, there may be variations in the size of the beans and their stickiness or roasting level. This leads to variations in power consumption (mA), resulting in excessive or insufficient doses (until the adjustment compensates this change).

Caution: In case of an excessive dose, ground coffee can fall into the dreg drawer. This is not a fault, but can occur when the machine is switched on or following a service.

### 4.10. Water level detection (water tank)



### **Water absence indication (water reserve)**

### **Function:**

The water level is monitored by a capacitive sensor, located one third up the water tank wall.

If the electronic system detects that the water is below the relative level by means of the sensor, a water reserve of 200 pulses of the flow meter remains available for the dispensing process.

The product dispensing process is then completed.

If a dispensing process ends after the sensor has intervened (in the reserve), the "water absence" indication continues to be displayed as from the next dispensing process

### 4.11. Water level detection (drip tray)

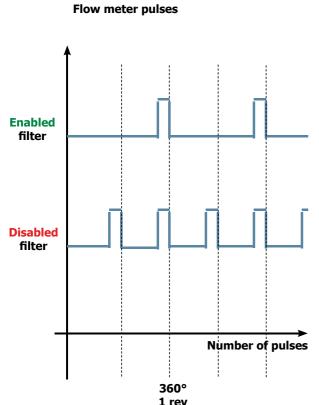
# Residual water tank Sensor Total capacity Level of sensor intervention

### **Empty residual water tank indication**

### **Function:**

The residual water level is monitored by a capacitive sensor. The sensor is located approximately half way up the upper edge of the residual drip tray. To make the best of the tray capacity, the sensor is positioned near a dam device. In this way, the residual water tray fills up to the upper edge and overflows inside and when it reaches the sensor, it triggers the "empty residual water tank" indication.

### 4.12. Descaling request



### Descaling indication with anti-scale filter

(only in appliances equipped with a display)

The water hardness is set on the basis of the regional water hardness analysis (1, 2, 3, 4).

### **Disabled filter:**

If the function is **disabled**, the electronic system counts the flow meter pulses, recording **one pulse for every revolution.** 

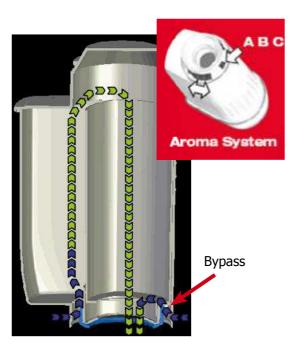
### **Enabled filter:**

If the function is **enabled**, the electronic system counts the flow meter pulses, recording **one pulse for every two revolutions**.

### "Change anti-scale filter" indication

The electronic system uses the flow meter pulses to keep track of the amount of water that flows and once the defined litres are exceeded (based on the water hardness setting), the "Replace filter" indication is triggered.

### 4.14 Anti-scale filter



### **Anti-scale filter**

### **Function:**

- Reduced limescale deposits that take longer to form.
- Improved water quality.
- Better taste due to ideal water hardness.

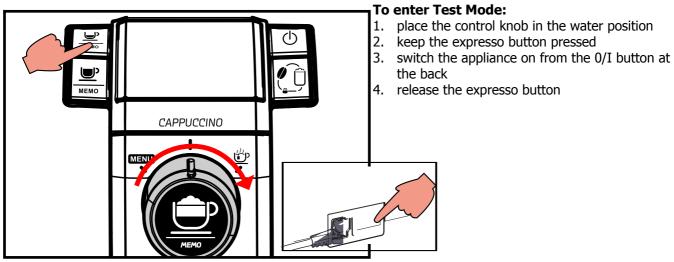
### **Descaling duration / efficiency:**

- 10° dH
- 60 litres
- 2 months

To obtain a linear characteristic of its effectiveness, throughout the duration of the descaling process, the water is split according to the degree of hardness in a three-phase by-pass (A,B and C). See small picture.

# TROUBLESHOOTING

### 5.1. Test mode



		MEMO		an m			
lev.	knob pos.	display	button	function	notes		
Software C version	<u></u>	FIRMWARE 00.02.00		The software version is displayed	The software version must be the same as that on the label of the Microprocessor.		
		PRESS THE	ON/OFF	BUTTON TO ACCESS	THE UPPER LEVEL		
Functional verification of the buttons		KEYBOARD  1N N5 2N N N4 3		Initial status, buttons not pressed			
		KEYBOARD  1Y N5 2N N N4 3	MEMO	the no. 1 from "N to Y" and the display changes from green to red	If the display does not change with respect to the initial status, replace the interface board and/or the JP21 flat cable. If the colour of the		
		KEYBOARD  1N N5 2Y N N4 3	MEMO	the no. 2 from "N to Y" and the display changes from green to orange	display remains green, check the JP4 wiring from the interface board to the display.		
al verifica		KEYBOARD  1N N5 2N Y N4 3	REMO	the no. 3 from "N to Y" and the display remains green	If the display does not change with respect to the initial status, replace the interface board and/or the JP21 flat cable.		
Function	Function		KEYBOARD  1N N5 2Y N Y4 3		the no. 4 from "N to Y" and the display remains green	If the display does not change with respect to the initial status, replace the interface board and/or the JP21 flat cable. If the colour of the	
		KEYBOARD  1Y Y5 2N N N4 3	Φ	the no. 5 from "N to Y" and the display remains green	display remains green, check the JP4 wiring from the interface board to the display.		
	PRESS THE ON/OFF BUTTON TO ACCESS THE UPPER LEVEL						

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lev.	knob pos.	display	button	function	notes
L2		INPUTS TAPMENU=N DOOR=Y TAPCAP= Y BU-P=Y TAPWATER=N DREG=Y TANK-H2O=Y TRAY=Y		Initial status: Unit connected, dreg drawer inserted, water tank full, water drip tray inserted, side door closed and control knob in the coffee position.	
		INPUTS TAPMENU=N DOOR=Y TAPCAP= Y BU-P=Y TAPWATER=N DREG=Y TANK-H2O=N TRAY=Y	Remove the water tank	TANK-H2O signal changes from "Y" to "N"	If the TANK-H2O signal does not change, check the capacitive sensor and the JP23 wiring.
ation sensors		INPUTS TAPMENU=N DOOR=N TAPCAP= Y BU-P=Y TAPWATER=N DREG=N TANK-H2O=Y TRAY=Y	Remove the dreg drawer	The DREG signal changes from "Y" to "N"	If the signal does not change, check the dreg drawer microswitch and the JP16 wiring.
erific and	INPUTS TAPMENU=N DOOR=N TAPCAP= Y BU-P= Y TAPWATER=N DREG=Y TANK-H2O=Y TRAY=Y	Open the side door	The DOOR signal changes from "Y" to "N"	If the DOOR signal does not change, check the microswitch of the door and the JP16.	
Functional volumes		INPUTS TAPMENU=N DOOR=Y TAPCAP= Y BU-P=N TAPWATER=N DREG=Y TANK-H2O=N TRAY=Y	Remove the brewing unit	The BU-P signal changes from "Y" to "N"	If the BU-P signal does not change, check the unit presence microswitch and the JP14.
ш		INPUTS TAPMENU=N DOOR=Y TAPCAP= Y BU-P=Y TAPWATER=N DREG=Y TANK-H2O=Y TRAY=N	Remove the drip tray	The TRAY signal changes from "Y" to "N"	If the BU-P signal does not change, check the unit presence microswitch and the JP14.
	<b>≈</b>	INPUTS TAPMENU=N DOOR=Y TAPCAP= N BU-P=Y TAPWATER=Y DREG=Y TANK-H2O=Y TRAY=Y	Knob in water pos.	TAP-WATER signal from "N" to "Y"	If the
		INPUTS TAPMENU=N DOOR=Y TAPCAP= Y BU-P=Y TAPWATER=N DREG=Y TANK-H2O=Y TRAY=Y	Knob in coffee pos.	TAP-COFFE signal from "N" to "Y"	TAPWATER, TAPCOFFE, TAPMENU indication does not change, check the knob board and/or the connection wiring with interface board JP2.
	MENU	INPUTS TAPMENU=Y DOOR=Y TAPCAP= N BU-P=Y TAPWATER=N DREG=Y TANK-H2O=Y TRAY=Y	Knob in MENU pos.	TAP-MENU signal from "N" to "Y"	g
		PRESS THE	ON/OFF BI	JTTON TO ACCE	SS THE UPPER LEVEL

lev.	knob pos.	display	button	function	notes	
L3		BU PAGE WORK=Y HOME=N CUR= 0		Initia	Initial status, buttons not pressed	
		BU PAGE WORK=Y HOME=N CUR= 178		Bring the unit to the "WORK" position	CUR= corresponds to the motor consumption of the gearmotor and this value must be: WITH THE UNIT DISCONNECTED less than 200mA WITH THE UNIT CONNECTED less than 300 mA	
		BU PAGE WORK=N HOME=N CUR= 497	MEMO	changes from g in the gearmoto	ERROR: WORK signal remains "N" and the display colour changes from green to red. Check the gear microswitch in the gearmotor (broken or inserted wrongly) and the motor (blocked). Check the JP16 wiring.	
ification ınit		BU PAGE WORK=N HOME=N CUR= 203		ERROR:(WITH THE UNIT DISCONNECTED) The current consumption of the gearmotor is greater than 200mA, the display colour changes from green to red, check the unit and/or the gearmotor.		
Functional verification Brewing unit		BU PAGE WORK=N HOME=N CUR= 337		ERROR:(WITH THE UNIT CONNECTED) If the current consumption of the gearmotor is greater than 300mA, the display colour changes from green to red, check the unit and/or the gearmotor.		
Fun		BU PAGE WORK=N HOME=Y CUR= 193	МЕМО	Bring the unit to the "HOME" position		
		BU PAGE WORK=N HOME=N CUR= 497		ERROR: HOME signal remains "N" and the display colour changes from green to red. Check the microswitch of the gearmotor (broken or inserted wrongly) and the motor (blocked), the JP16 wiring.		
		BU PAGE WORK=N HOME=N CUR= 203		current consum 200mA, the dis check the unit	THE UNIT DISCONNECTED) The application of the gearmotor is greater than applications play colour changes from green to red, and/or the gearmotor.	
		BU PAGE WORK=N HOME=N CUR= 337		ERROR:(WITH THE UNIT CONNECTED) The current consumption of the gearmotor is greater than 300mA, the display colour changes from green to red, check the unit and/or the gearmotor.		
	PRESS THE ON/OFF BUTTON TO ACCESS THE UPPER LEVEL					

lev.	knob pos.	display	button	function	notes	
L4		EV PUMP EV1 OFF IMP=0 EV2 OFF L/H=0			status, buttons not pressed stopcock in water position.	
Functional verification Pump / Solenoid Valves EV1 - EV2		EV PUMP  EV1 OFF IMP=142  EV2 OFF L/H=15		the boiler pin ar	or button for the water to pass through the pulse indicator (PULS) will eas the litre/hour (L/H) indicator should and 18.	
		EV PUMP EV1 OFF IMP=0 EV2 OFF L/H=0		ERROR: The display colour changes from green to red and the pulses remain at 0, check the pump, flow meter, its wiring and/or the connection on the POWER/CPU board (JP5), the wiring of the pump and/or the connection on the POWER/CPU board (JP24). If the water does not pass through the boiler pin but through the milk circuit or the safety/drain valve, verify the operation of solenoid valve EV1 or EV2.		
		EV PUMP EV1 ON IMP=238 EV2 OFF L/H=15	мемо	EV1 and activate water to come of	sso button to activate the solenoid valve e the pump (flavour button) for the but of the safety/drain valve. The litre/ cator should be between 14 and 18.	
		EV PUMP EV1 ON IMP=0 EV2 OFF L/H=0		red and the pul- meter, its wiring CPU board (JP5 connection on t water does not but through the	splay colour changes from green to ses remain at 0, check the pump, flow g and/or the connection on the POWER/), the wiring of the pump and/or the he POWER/CPU board (JP24). If the pass through the safety/drain valve milk circuit or the boiler pin, verify the enoid valve EV1 or EV2.	
_		EV PUMP  EV1 ON IMP=238  EV2 ON L/H=15		valve EV1 and a	sso button to activate the solenoid activate the pump (flavour button) for me out of the milk circuit. The litre/cator should be between 14 and 18.	
		EV PUMP EV1 ON IMP=0 EV2 OFF L/H=0	MEMO	red and the pul- flow meter, its v POWER/CPU bo or the connection If the water does through the safe the operation of	splay colour changes from green to ses remain at 0, check the pump, wiring and/or the connection on the pard (JP5), the wiring of the pump and/on on the POWER/CPU board (JP24). Les not pass through the milk circuit but ety/drain valve or the boiler pin, verify of solenoid valve EV1 or EV2.	
		PRESS THE	ON/OFF BU	JTTON TO ACCE	SS THE UPPER LEVEL	

lev.	knob pos.	display	button	function	notes	
L5		HEATER GRINDER  OFF 0 30 0 15		Initia	Initial status, buttons not pressed.	
		HEATER GRINDER OFF 40 30 15 14		GRINDER MOTOR	that indicates the rotation of the COFFEE increases up to 40. The other two numbers isplay are not important for the test mode.	
		HEATER GRINDER OFF 0 30 0 15		ERROR: The number remains 0 and the motor of the coffee grinder does not rotate, the display colour changes from green to red, check the sensor and/or the coffee grinder motor, the wiring of the sensor and/or the connection on the POWER/CPU board (JP2), the wiring of the coffee grinder motor and/or the connection on the POWER/CPU board (JP8).		
ication boiler	***	HEATER GRINDER ON 40 15 14		The current consumption is OK, the HEATER signal changes from "OFF" to "ON" and the temperature value increases.		
Functional verification coffee grinder - boiler	<b>₽</b>	HEATER GRINDER OFF 40 159 15 SHORT 14		the temperate the colour of t check the w	IORT" appears in the HEATER signal, ure sensor of the boiler is interrupted, the display changes from green to red, viring of the boiler sensor and/or the the POWER/CPU board (JP13 could be disconnected).	
ĒO		HEATER GRINDER  OFF 40 71 15 OPEN 14	MEMO	temperature s of the display wiring of the b	EN" appears in the HEATER signal, the sensor of the boiler is open, the colour changes from green to red, check the poiler sensor and/or the connection on PU board (JP13 could be disconnected).	
				ERROR: The current consumption is NOT OK and the temperature value does not increase, check the wiring of the power supply and/or the connection on the POWER/CPU board (JP17-3).		

### 5.2. Error messages

code	brief description	description
01	blocked coffee grinder	the coffee grinder is blocked (jammed grinder blades or sensor is not reading properly)
03	brewing unit blocked in 'work'	descent time-out exceeded
04	brewing unit blocked in 'home'	ascent time-out exceeded
05	blocked water circuit	water does not flow in the flow meter
06	frother unit solenoid valve	short-circuit in a solenoid valve of the frother unit
10	coffee boiler short-circuit	coffee boiler temperature sensor short-circuit
11	coffee boiler in open circuit	coffee boiler temperature sensor in open circuit
12	steam boiler short-circuit	steam boiler temperature sensor short-circuit
13	steam boiler in open circuit	steam boiler temperature sensor in open circuit
14	various temperature errors (in the coffee boiler)	coffee boiler temperatures out of control
15	various temperature errors (in the steam boiler)	steam boiler temperatures out of control
16	coffee unit short-circuit	brewing unit microswitch short-circuit
17	not used	
18	clock error	memory fault or impossible to set
19	no zero crossing	no zero crossing on board, could also be caused by the power board
20	not used	

STANDARD CHECKS

### 6.1. Repair schedule

	Action					
1	Visual inspection (damage during transport)					
2	Appliance data check (plate)					
3	Functional check / problem analysis					
4	Opening the appliance					
5	Visual inspection					
6	Functional tests					
7	Repairing the faults encountered					
8	Checking any modifications (view info, new sw, etc.)					
9	Service activities in accordance with the operating schedule					
10	Internal cleaning					
11	Functional test with the appliance open					
12	Assembly					
13	Final inspection test					
14	Draining the circuit (in winter)					
15	External cleaning					
16	Lubricating the brewing unit with suitable grease					
17	Insulation test HG 701 (dielectric)					
18	Documentation					

### 6.2. Service schedule

S	Replacement	P	Cleaning
ES	Visual inspection	TR	Noise test
D	Descaling cycle	R	Adjustment
CF	Functional check		

Component	Action	Support/tool
Water filter	P/S/CF	
Water tank lip seal	S/CF	
Boiler pin O-ring	S/CF	
Brewing unit	ES/P/CF	Degreaser / Grease
Pipes, fittings and Oetiker clamps	ES/CF	
Coffee circuit pump	ES/TR/CF	
Hot water/steam circuit pump	ES/TR/CF	
Gearmotor	ES/TR/CF	
Coffee grinder	P/R/CF	Vacuum cleaner / brush
Water circuit	D/CF	Saeco descaler
Frothing valve assembly	ES/S/CF	
2-way solenoid valve	ES/S/CF	
3-way solenoid valve	ES/S/CF	

## **6.3.** Final inspection

Test	Procedure	Support/ tool	Standard	Tolerance
Expresso	2-3 Expressos for adjustment purposes	Measuring beaker	Same amount	15%
Coffee	2-3 Coffees for adjustment purposes	Measuring beaker	Same amount	15%
Noise			Standard	
Amount of cream	Blow into the cup until the cream separates		The cream should come together again completely	
Cream colour			Hazel brown	
Temperature	Reading taken while dispensing	Thermometer	84 °C	± 4 °C
Grinding level	Check the grain size of the ground coffee			
Hot water	Dispense water			
Steam	Dispense steam			
Dreg drawer absence indication	Remove the dreg drawer		Dreg drawer absence indication	
No signal coffee beans	Start brewing a coffee with the coffee bean container empty		No signal coffee beans	

DISASSEMBLY

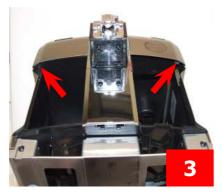
#### 7.1. Outer elements





#### Disassembly of the upper cover

- 1) Remove the dreg drawer, water tank, coffee container cover, water drip tray, brewing unit, control knob cover and the cappuccino button (use a screwdriver as a lever).
- **2)** Loosen the screws shown and remove the finger protection mushroom and the coffee container.





- **3**) Loosen the screws shown from inside the compartments that contain the water tank and dreg drawer.
- **4**) Move the upper cover outwards to facilitate the removal of the front panel.



**5)** Lift the upper cover and disconnect the earth wire shown.

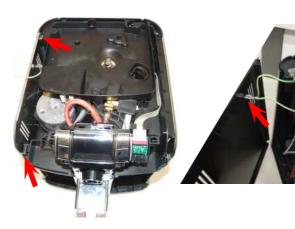


When assembling the appliance cover, be careful not to scratch the keyboard cover.

It is recommended to place a sheet of paper on the keyboard cover (see picture) before repositioning the appliance cover and remove it when assembly is complete.

#### **Side cover**

Loosen the screws shown and disconnect the earth wire.



### **Side door**

Lift the door and remove it from the support hinge.







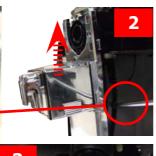
Rear cover

Loosen the screws shown.

## 7.2. Coffee dispenser







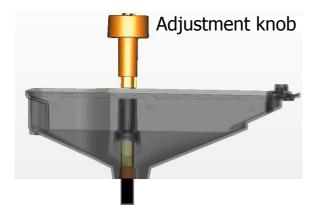




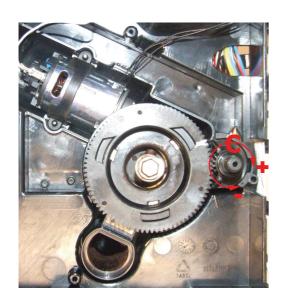
- 1) Loosen the screws shown.
- **2)** Use a screwdriver as a lever to release the front panel support, which facilitates the removal of the dispenser.
- **3)** Remove the fork and the clamp.
- **4/5)** Loosen the screws shown.
- 6) Dispenser assembly.

#### 7.3. Coffee grinder adjustment

The grinding machine can be adjusted by the user (only with the grinding machine on) by pressing and turning the knob inside the coffee bean container one notch at a time.

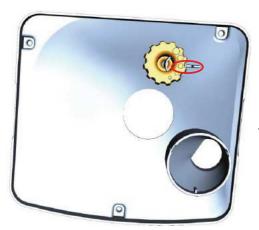


#### **Adjustment implemented by the service centres**



To further adjust the grinding machine, the technician can operate directly on the machine by pressing and turning the highlighted ring nut (C). (clockwise + to increase the grain size and anti-clockwise - to decrease it).

If coffee residue is found between the two grinder blades, it is recommended to adjust this by tightening a max of two notches at a time.

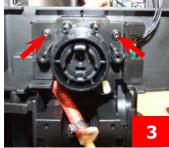


Lastly, bring the middle dot of the adjustment knob back to the centre.

## 7.4. Keyboard Card and Control Knob



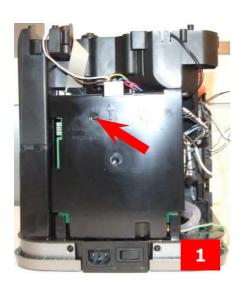




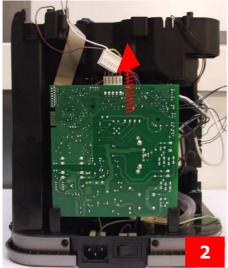


- 1) Loosen the screw shown and remove the cover, glass panel, frame, keyboard and seal.
- **2**) Release the display support and the display.
- **3**) Loosen the screws shown and remove the control knob.
- 4) Parts.

### 7.5. Power/CPU Board



**1**) Loosen the screw shown and remove the board cover.

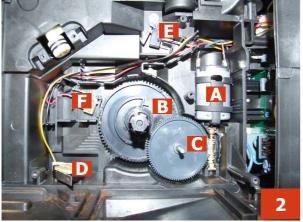


**2**) Remove the board by removing all the connections.

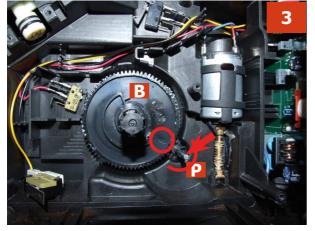
#### 7.6 Gearmotor



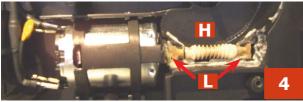
**1**) Loosen the screws of the boiler pin, remove it and loosen the others shown.



- **2**) The following are located inside the compartment protected by the casing:
- The electric motor (A) with gears (B) and (C) for transmission and timing of the dispensing unit.
- The dreg drawer presence sensor (D).
- The dispensing unit presence microswitch (E).
- The microswitch (F) that detects the idle phase of the dispensing unit as well as that of the dispensing process.
- Remove the gear (C) that engages with the motor transmission shaft.
- Remove the large gear (B).
- Remove the motor (A) complete with the transmission shaft.



**3**) Reconnect the gear (B), making sure that the arrow is aligned with the opening that contains the pin (P).

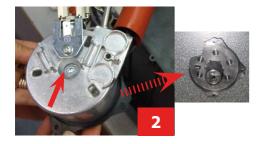


**4**) When re-mounting the motor and the transmission shaft, make sure the guides (L) are inserted in the correct housing. Grease the shaft thoroughly and evenly.

#### 7.7. Boiler



1) Loosen the screws shown.



**4**) Loosen the screw and remove the plastic support. Disconnect the pipes and the connections.

## 7.8. Stopcock



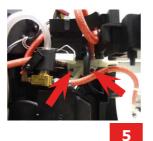
**1**) Remove the boiler pin by loosening the screws shown.





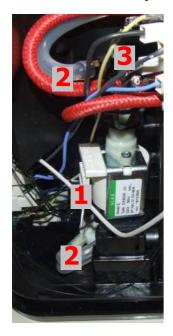
2/3) Loosen the screws shown.





- **4**) Loosen the screws shown and remove the structure base insert.
- **5**) Loosen the screws shown and remove the water connections and the stopcock.

### 7.9. Pump and flow meter



#### **PUMP**

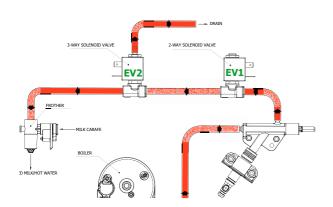
Remove the connection **1** and the silicone pipes **2**. Loosen the safety valve **3** and remove the pump from the two supports.



#### **FLOW METER**

Remove the connection and the silicone pipes and release the flow meter.

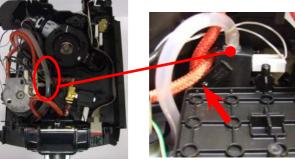
#### 7.10. Solenoid valves





## 2-way solenoid valve

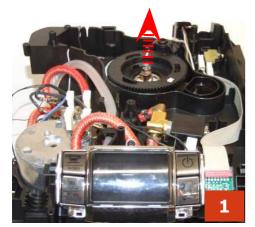
Remove all electrical and water connections.



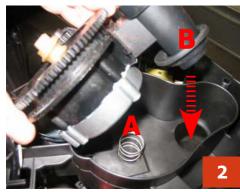
3-way solenoid valve

Loosen the screw shown and remove the electrical and water connections.

### 7.11 Coffee grinder



**1)** To remove the coffee grinder, simply slide it out and remove the connections.



**2)** When reassembling it, make sure the spring (A) and the coffee duct (B) are repositioned correctly.

## 7.12. Adjusting/removing and installing the grinder blades



1) To remove the upper grinder blade support, use an Allen wrench and turn it clockwise to release it from the bayonet coupling.



**2)** To remove the grinder blade from the upper support, turn it anti-clockwise until it is released from the bayonet coupling.

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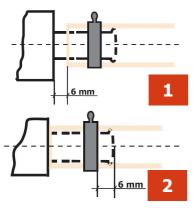


**3)** To remove the lower grinder blade, block the increment pin (A) in place and turn the grinder blade anti-clockwise until it is released from the bayonet coupling.



**4)** When refitting the upper grinder blade support, make sure it is placed as shown in the picture, with the highlighted mark in the same position.

### 7.13. Un/installing Oetiker clamps



1) Boiler connection





Use a suitable pair of pliers to remove the clamp (as shown).

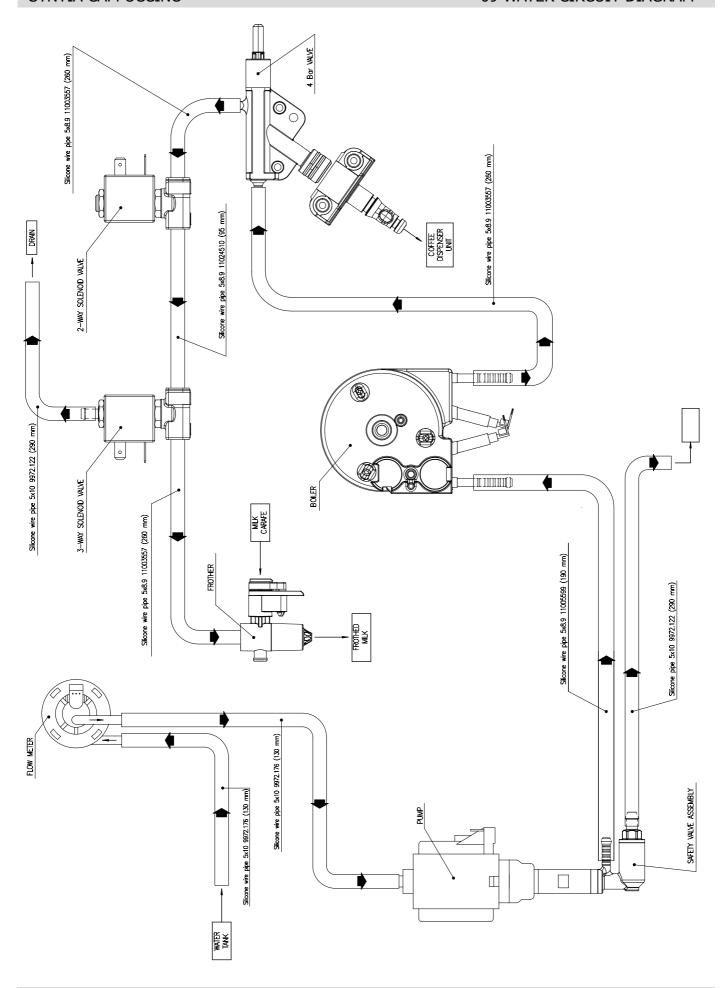


Tighten the clamp as shown in the pictures.

NOTES

SYNTIA CAPPUCCINO 08 NOTES

# WATER CIRCUIT DIAGRAM



# ELECTRICAL DIAGRAM

