Service
Service
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ServiceManual

Rev. 00 OCT. 2018

TYPE	12NC	DESCRIPTION
EP5330/10	882867810010	PHI5000 LatteGo BLACK WE
EP5330/10	882867810300	PHI5000 LatteGo BLACK CEE
EP5330/10	882867810220	PHI5000 LatteGo BLACK DACH
EP5930/10	882868110010	PHI5000 LatteGo BLACK WE (QVC)
EP5930/10	882868110300	PHI5000 LatteGo BLACK CEE
EP5331/10	882867410010	PHI5000 LatteGo WHITE WE
EP5331/10	882867410300	PHI5000 LatteGo WHITE CEE
EP5333/10	882868210010	PHI5000 LatteGo SILVER WE
EP5333/10	882868210300	PHI5000 LatteGo SILVER CEE
EP5334/10	882868010010	PHI5000 LatteGo ANTRACITE WE
EP5334/10	882868010300	PHI5000 LatteGo ANTRACITE CEE
EP5934/10	882869610010	PHI5000 LatteGo ANTRACITE WE (QVC)
EP5335/10	882867910010	PHI5000 LatteGo SS WE
EP5335/10	882867910300	PHI 5000 LatteGo SS CEE
EP5335/10	882867910220	PHI 5000 LatteGo SS DACH
EP5340/10	882868310010	PHI5000 LatteGo+ BLACK WE
EP5340/10	882868310300	PHI5000 LatteGo+ BLACK CEE
EP5345/10	882868410010	PHI5000 LatteGo+ SS WE

TYPE	12NC	DESCRIPTION
EP5345/10	882868410300	PHI5000 LatteGo+ SS CEE
EP5346/10	882869510010	PHI5000 LatteGo+ SS Titan WE
EP5346/10	882869510300	PHI5000 LatteGo+ SS Titan CEE
EP5030/10	882869410870	PHI5000 LatteGo BLACK RU
EP5034/10	882867410870	PHI5000 LatteGo ANTRACITE RU
EP5331/10	882867410870	PHI5000 LatteGo WHITE RU
EP5035/10	882869210870	PHI5000 LatteGo SS RU
EP5040/10	882869110870	PHI5000 LatteGo+ BLACK RU
EP5045/10	882869010870	PHI5000 LatteGo+ SS RU

HISTORY OF CHANGES TO THE SERVICE MANUAL				
From Rev.	To Rev.	Chapter	Inserted	Modified

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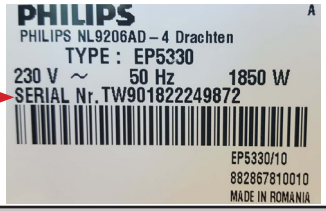
PHILIPS

PHI 5000 LATTE GO / GO+

General Information	
Description	**Value**
Housing material	Thermoplastic material
Size (w x h x d)	221 x 340 x 430 mm (data may vary depending on the model)
Weight	7,6 kg (data may vary depending on the model)
Power Cord length	1200 mm
Cup size	Up to 145 mm
Water tank	1.8 litres - Removable type
Water fileter	Acquaclean filter 12NC-421944082321 (CA6903/00)
Coffee bean hopper capacity	250 g
Coffee grounds drawer capacity	15
Milk carafe capacity	265 ml
Energy Efficiency Label	A
Energy saving mode consumption	< 1 Wh
Pump pressure	15 bar
Boiler	Stainless steel type
Safety devices	Thermal fuse
Nominal voltage - Power rating – Power supply	Data stored on the below label placed inside the service door
Serial Number TW90xxyy249872	TW90= product + production location - xxyy = year & Production week - 249872 = unique following number



Technical specification	
Description	**Value**
Power supply and output:	230 V~ 50/60 Hz 1850 W
Power consumption:	During heating phase- approx. 5.6 A
Coffee heat exchanger output: Stainless steel	(230 V~) 1900 W for coffee, hot water and steam dispensing
Safety system:	2 thermostats at 190°C one shot
Temperature monitoring:	(NTC) variable resistor sensor - transmits the value to the electronic card
Automatic dosage:	Dose adjustment controlled by the electronic system
Gear motor:	2 rotation directions; power supply 24VC
Coffee grinder:	Direct current motor with flat ceramic grinder blades
Pump:	Ulka Type EP5/S GW approx. 13-15 bar with reciprocating piston and thermal switch 100°C 48 W, 230V, 50 Hz,
Overpressure valve:	Opening at approx. 16-18 bar
Water circuit filling time:	Approx. 15 sec Max. on first filling cycle
Approx. 15 sec Max. on first filling cycle	Approx. 45 sec.
Grinding time:	Approx. 8-10 sec.

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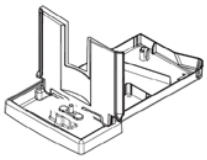
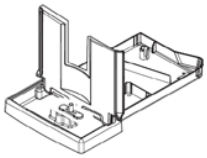
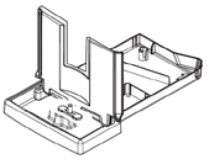
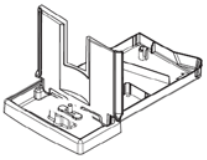
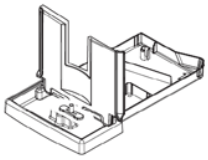
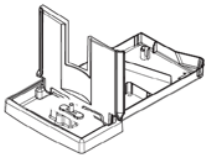
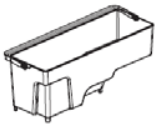
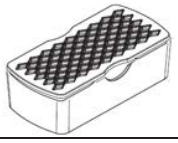
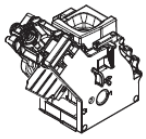
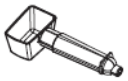
CHAPTER 1

INTRODUCTION

1.1. Consumer Replaceable Parts (CRP) List

Consumer Replaceable Parts are parts which we encourage consumers to replace themselves (as required); these parts can be removed without help of a screwdriver

CRP CTN	12NC	Description	Compatible for (models):	Picture (assembled)
CP0727/01	421941312281	Drip tray (DEEP/BLK)	EP5330/10 -EP5930/10-EP5340/10-EP5030/10-EP5040/10	
CP0728/01	421941312291	Drip tray (WHIS)	EP5331/10	
CP0729/01	421941312301	Drip tray (M/SIL)	EP5333/10	
CP0730/01	421941312311	Drip tray (G/ANM)	EP5334/10-EP5934/10-EP5034/10	
CP0731/01	421941312321	Drip tray (TIT)	EP5335/10-EP5345/10	
CP0732/01	421941312331	Drip tray (Stainless Steel)	EP5346/10-EP5035/10-EP5045/10	
CP0228/01	421944052271	Water tank	ALL MODELS	
CP0392/01	421941309971	Coffee grounds container	ALL MODELS	
CP0652/01	421944078961	Espresso Stand	ALL MODELS	
CP0653/01	421944078161	Espresso Stand cover	ALL MODELS	
CP0733/01	421944089571	Drip tray cover	ALL MODELS	

CP0657/01	421944083391	Complete milk container (GO)	EP5330/10- EP5331/10-EP5333/10-EP5334/10-EP5335/10-EP5930/01-EP5934/10-EP5030/10-EP5034/10-EP5331/10-EP5035/10	
CP0734/01	421944083621	Complete milk container (GO+)	EP5340/10-EP5345/01-EP5346/10-EP5040/10-EP5045/10	
CP0739/01	421944092331	Brew group	ALL MODELS	
CP0504/01	421944070662	Lid of coffee bean container	ALL MODELS	
CP0164/01	421944033301	Coffee measuring scoop	ALL MODELS	
HD5087/01	996530025808	Power cord	ALL MODELS	

1.2. Specific tools and equipment

As well as the standard equipment, the following is required:

12NC	Description	Notes
-	Flathead screwdriver	# 0, # 2
-	Torx screwdriver	(T10) - (T20)
-	Cutter	
-	Cable tie tightening tool	
-	Pliers for Oetiker clamps	
-	Digital Thermometer	Type K (accuracy for temperature of 0,05 % or ± 0,3°C)
-	Temperature probe	80PK-22 (80AK-A Thermocouple adapter required)
-	Scale	KERN EMB 500-1 or comparable device with a base accuracy of 0,05 % or ± 0,5 g
-	Power meter	Voltcraft EnergyCheck 3000 or comparable device with a base accuracy of 1 % or ± 5W
-	Stopwatch	Basic model
996530009845	Serkit	Tool needed for programming with our service tool
-	EPSC (Espresso Philips Service Center)	Tool used to flash the SW on the machines (for SW upgrade and diagnostics mode). Refer to SDA_114585.

1.3. Maintenance Products

12NC Code	Material	Description
-	Thermal paste	Heat resistance > 200°C
996530067222	Descaler	“ACC SAE DECALCIFIER 5 L 1 UNIT”
132253695601	Jar of Grease	“PARALIQ GB 363”
996530045784	Silicone grease	“ACC TUBE FIN FOOD GREASE 2 400 ML”

1.4. Safety warnings

Please, read the Service manual of the machine before starting any maintenance.
Operation, maintenance and/or repair of this device may be carried out only by qualified persons, trained for work at or with electric devices.

The technicians to operate under safety conditions, must:
1. Use personal safety devices;
2. Turn off the machine by the power switch is not an adequate safety precaution;
3. Disconnect the appliance from the power mains before repairing;
4. Before and after repair, it is recommended to perform dielectric strength tests (This domestic appliance is rated as insulation class 1).

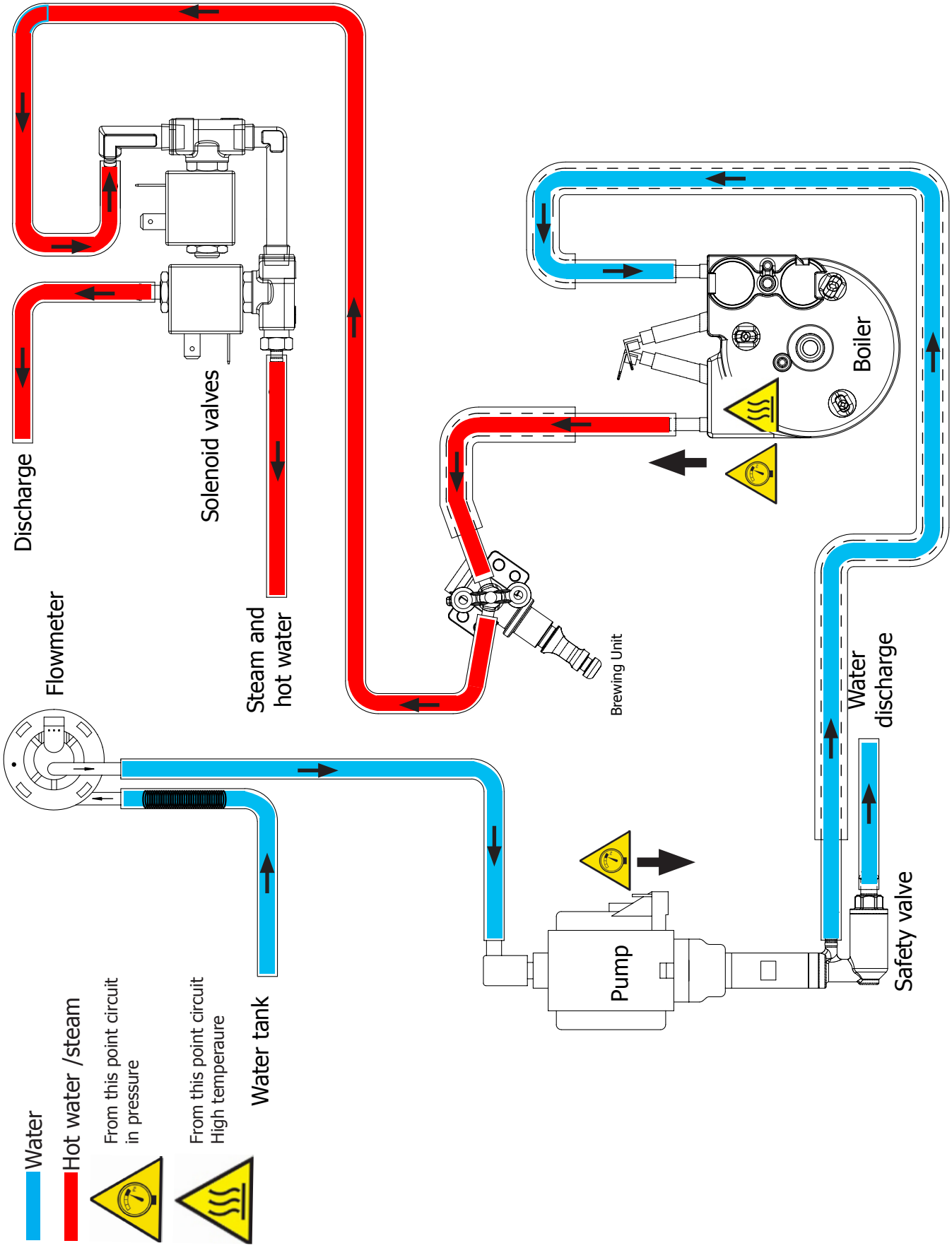
During the machine disassembly the operator has to pay attention to hot and under pressure parts.
All parts involved can be find in the hydraulic circuit below schema (Image 1-par.1.7.).
The machine hydraulic circuit can reach maximum pressure of 16/18 bar.

To operate under safety condition is recommended to perform the Steam Out procedure in order to remove the pressure and hot water inside the hydraulic circuit.

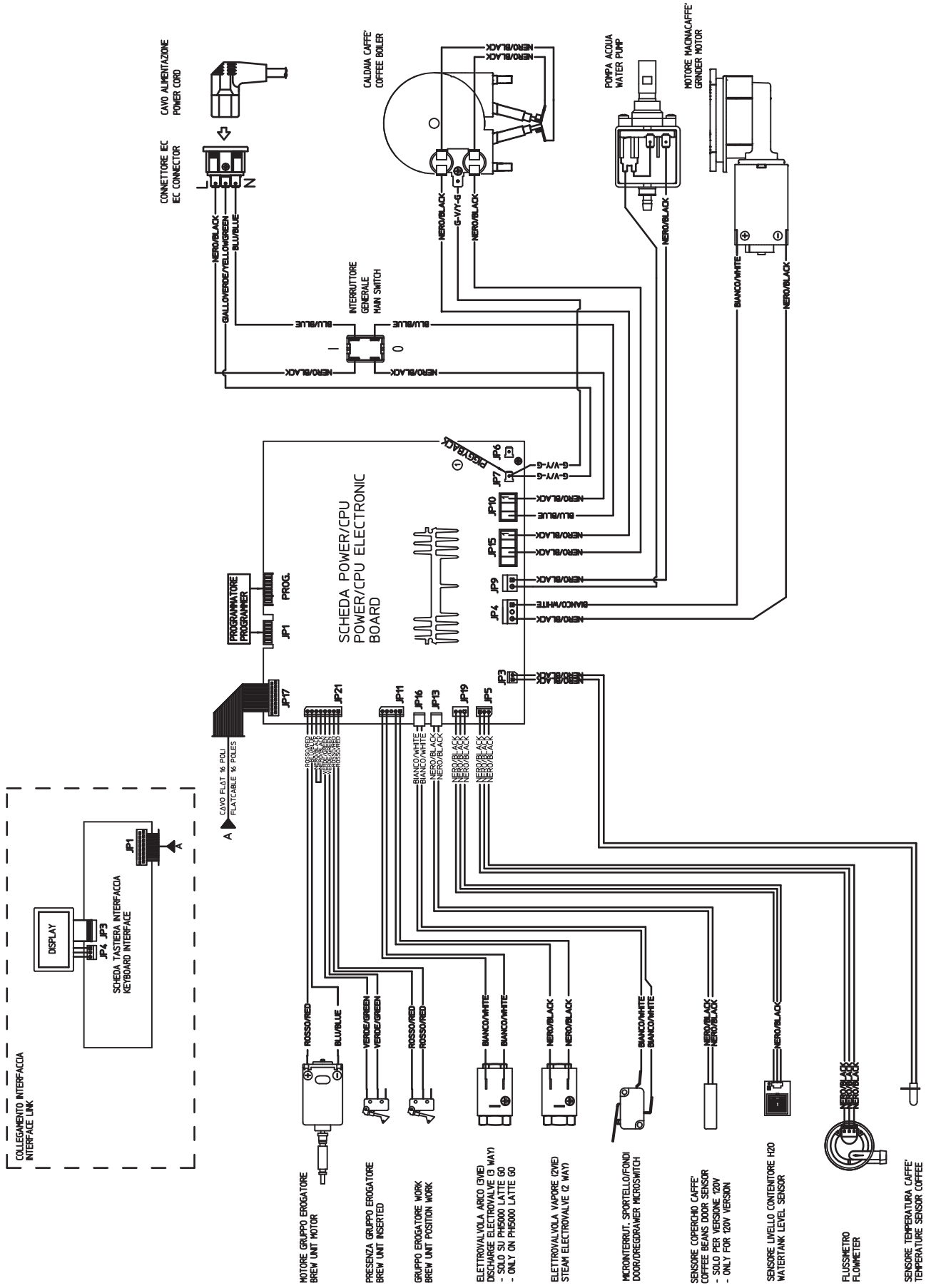
When the machine arrives at the Service Center in descaling mode interrupted, or making Descaling , take EXTREME CARE to avoid any unintentional contacts with the descaler.
After the product has been repaired, it should function properly and has to meet the safety requirements and legal regulations as officially laid down at this moment.

1.5. Water circuit diagram

Image 1



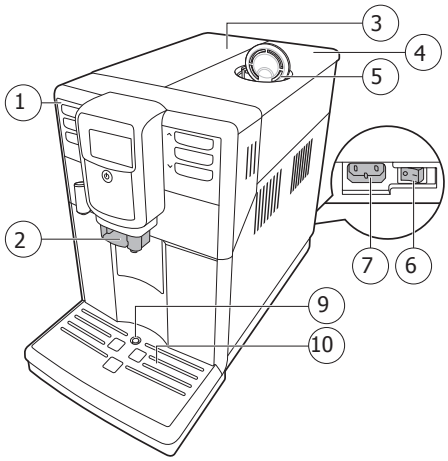
1.6. Electrical diagram

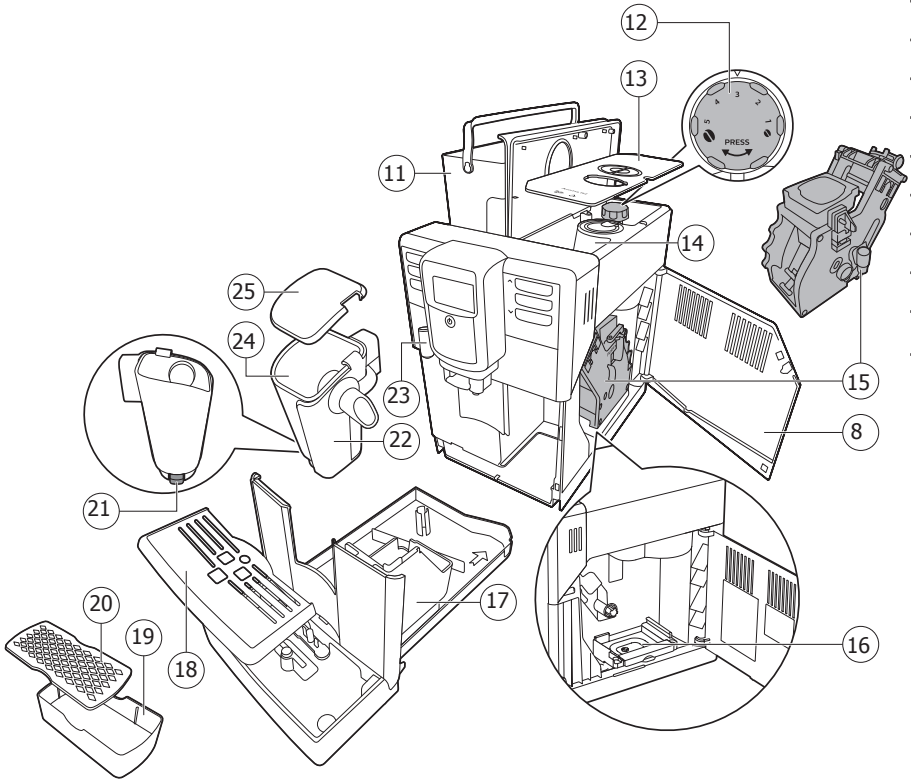


1.7. Service POLICY grid as used for coffee machine

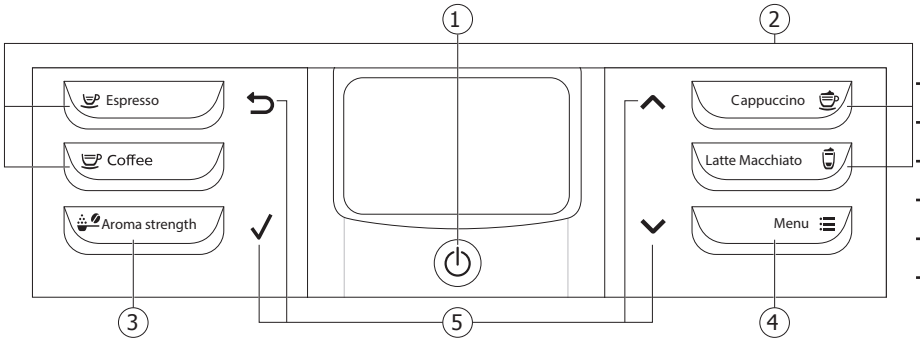
During the repair is always recommended to use, if possible, single parts rather than the correspondent assembly.

1.8. External machine parts





1	Control panel
2	Adjustable coffee and milk dispensing spout
3	Lid of water tank
4	Lid of bean hopper
5	Lid of pre-ground coffee compartment
6	Main switch
7	Socket for cord
8	Service door
9	Drip tray full indicator
10	Drip tray
11	Water tank
12	Grind setting knob
13	Cover of bean hopper
14	Bean hopper
15	Brew group
16	Coffee residues drawer
17	Coffee grounds container
18	Drip tray cover
19	Espresso stand tray
20	Espresso stand cover
21	LatteGo milk container release button
22	LatteGo frame
23	Hot water dispensing spout
24	LatteGo milk container
25	LatteGo storage lid



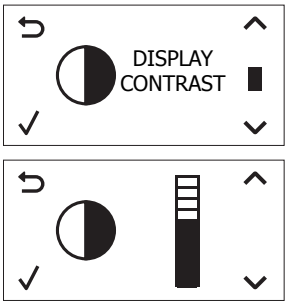
1	On/off button
2	One-touch drink buttons
3	AROMA STRENGTH button
4	MENU button
5	Navigation icons (up, down, back, ok)

1.9. Customer menu in the PHI 5000 Latte Go / Go+

List of default settings

Display	Setting	Setting	Value	Description
COFFEE TEMP	MAX MED MIN	Coffee temperature	average	Coffee brewing temperature setting.
STANDBY	180° 60° 30° 15°	Stand-by time	15 minutes	Stand-by time setting.
DISPLAY CONTRAST		Contrast	average	Display contrast setting.
WATER HARDNESS	4 3 2 1	Water hardness	4 (very hard water)	Water hardness setting.
FILTER ACQUA CLEAN FILTER 0/8	FILTER ON 0/8	AquaClean water filter	to be installed	AquaClean settings.

Changing the default settings



It is possible to customise the machine functions through the programming menu. The machine must be turned on and ready to work.
If necessary, refer to the "8.1 List of default settings" chapter.

> Press the MENU button and scroll through functions list to select the function whose settings are to be modified:
Note: the images at the side refer to a sample function.

> Press the OK button to select the desired function

Once selected:

> Press the UP button to increase the value.

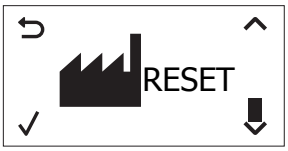
> Press the DOWN button to decrease the value.

> Press the OK button to confirm the change.
When the change has been implemented, the OK message will be displayed.

⚠ The modified but unconfirmed values will not be stored.

> Press the ESC button to exit the programming function.
The machine automatically exits the programming mode if no button is pressed for 3 minutes.

Reset to the default settings



It is possible to restore the default settings through the programming menu. The machine must be turned on and ready to work.

> Press the MENU button and scroll through functions list to select the RESET function.

> Press the OK button to select the function.
When the change has been implemented, the OK message will be displayed.

> Press the ESC button to exit the programming function.
The machine automatically exits the programming mode if no button is pressed for 3 minutes.

Alarm signals summary: red display

Display	Description	Display	Description
	Put back the drip tray and coffee grounds drawer; close the service door.		Coffee grounds drawer full.
	Coffee bean hopper empty.		Water tank empty.
	Brew group not inserted.	XX	The machine is out of service.

Warnings signals summary

Display	Description	Display	Description
	The machine is ready to brew products: coffee bean hopper empty	START CALC CLEAN / FILTER START CALC CLEAN	The machine must be descaled.
FILTER	If the filter signal starts blinking, the AquaClean filter must be replaced.		The machine is heating up.
	The machine is waiting to start the water circuit priming process.		The machine is rinsing.
START QUICK CLEAN	The milk carafe ducts should be cleaned.		Brew group rebooting.

The machine is out of service

Red Display xx	If the machine error alarm signal is triggered, the error code is displayed in the bottom right corner of the display.

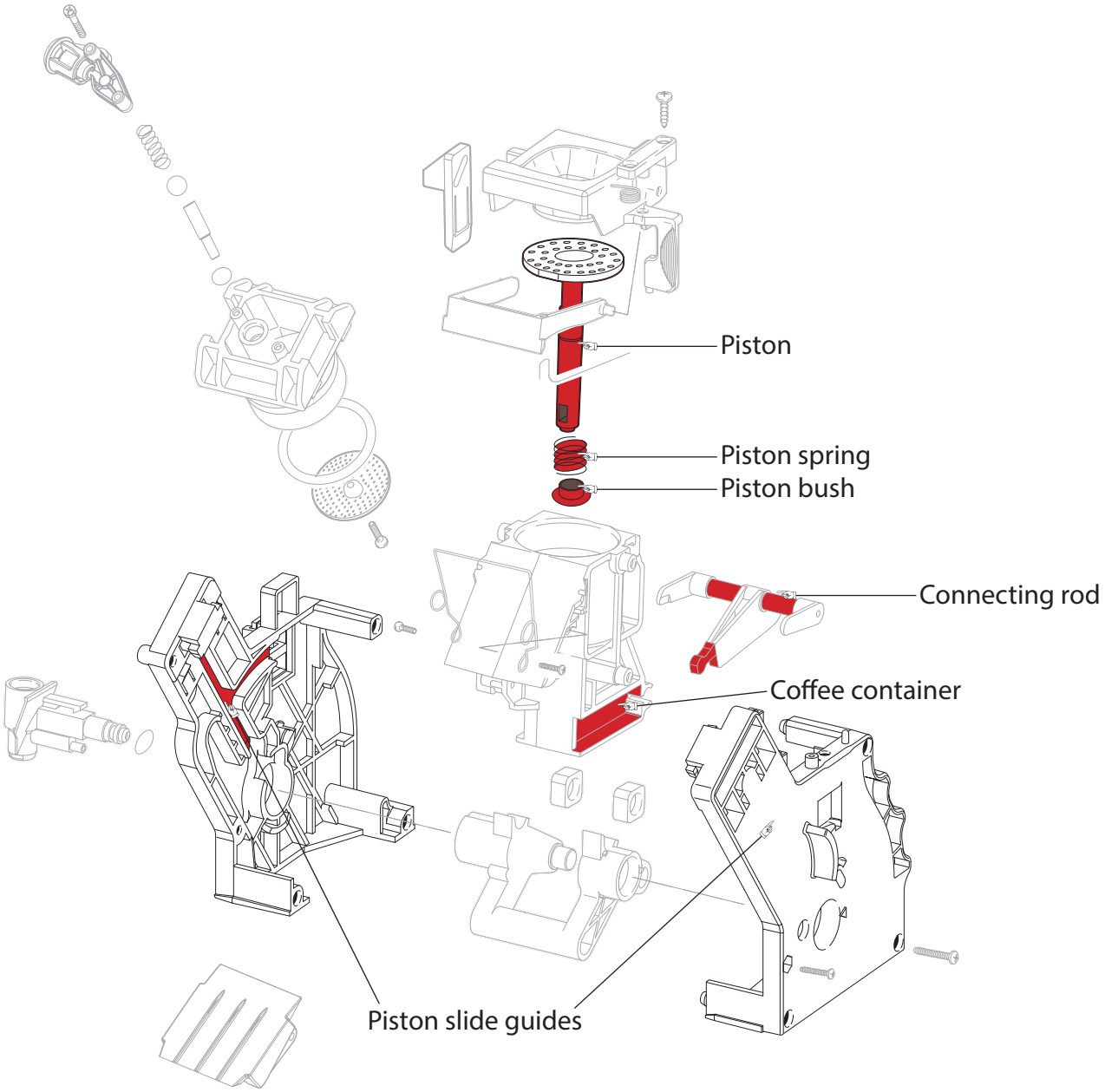
Error code	Behaviour	Cause	Action
1	Coffee grinder blocked	Coffee outlet duct clogged	Clean the coffee outlet duct thoroughly.
3 - 4	Brew group locked, cannot be taken out	The brew group is incorrectly positio-ned.	Close the service door. Turn the machine off and back on again. Wait for the 'Ready for brewing' signal and then remove the brew group.
5	Water circuit error	Air in the water circuit	Remove and restore the water tank a couple of times, making sure to position it correctly. Check that the water tank seat is clean.

1.10. Operation, cleaning and maintenance

Operating the machine		
1	Fill water tank	
2	Fill the coffee bean hop-per	
3	Switch on the appliance	
4	Press the button to start the appliance	⏻
5	Heating	When the heating phase begins, wait for it to finish
6	Rinse	Carry out a rinse cycle for the internal circuits
7	Machine ready	The machine is ready to dispense beverages

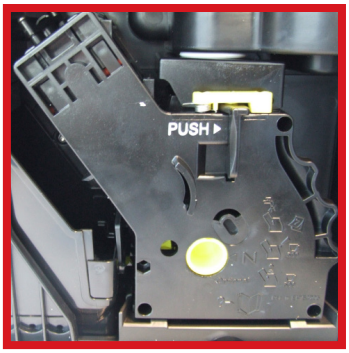
CLEANING AND TECHNICAL SERVICING		
A	Empty the dregs drawer	When indicated
B	Empty the drip tray	As necessary
C	Clean the water tank	Weekly
D	Clean the coffee bean hopper	As necessary
E	Clean the casing	As necessary
F	Clean the brewing unit	Every time the coffee bean hopper is filled or weekly
	Lubricate the brewing unit	After 500 dispensing cycles or when the grease is no longer present on the brewing unit
	Clean the unit housing	Weekly
H	Descaling	When indicated

1.11. Brew Unit mainteinance: Where to grease.

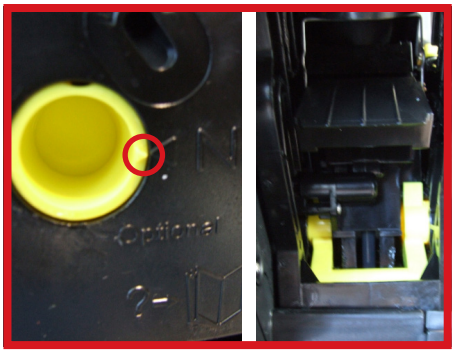


1.12. Position of the Brew Unit

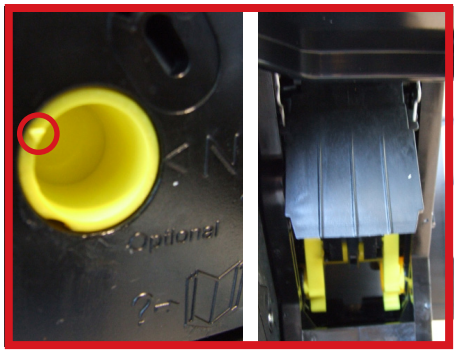
Brew Unit



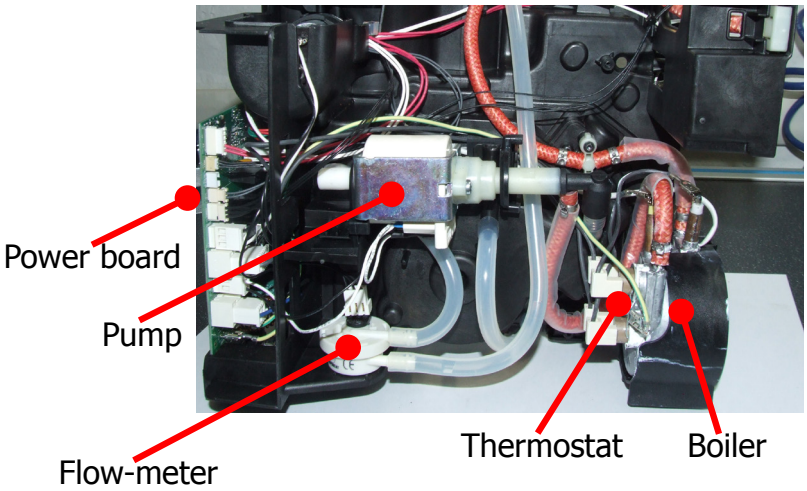
Home Position

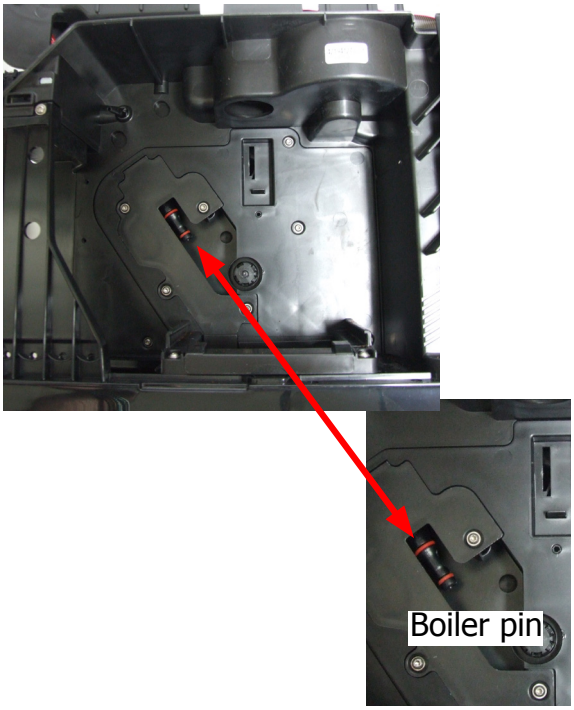


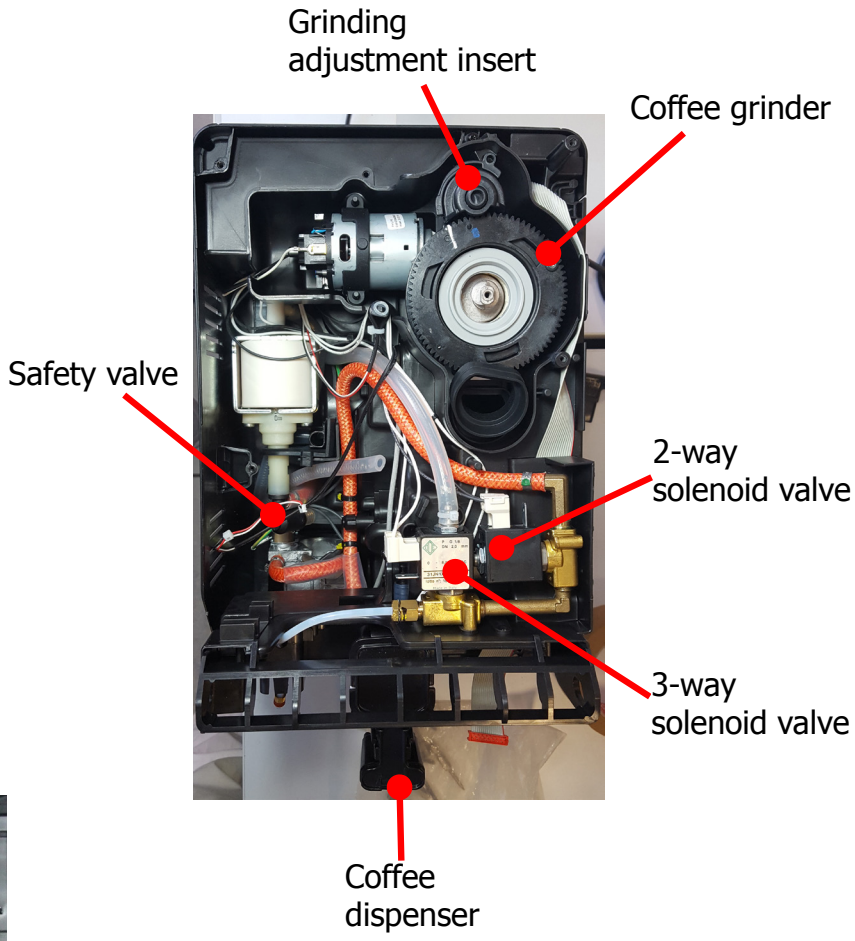
Work Position



1.13. Internal machine parts







CHAPTER 2

TECHNICAL SPECIFICATIONS

2.1. Specification for the measurement of the coffee products temperature.

The below procedure is also contained in the Symptom Cure 97832.

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 (Picture 1).

2. The temperature in the cup is measured by immersing the probe of the thermometer up to touch the bot tom.The probe then must be moved in a circular motion for 5/6 rotations. At the of the rota- tions, stop in the center of the cup (Picture 2).

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.

5. The distance of the probe from the bottom of the glass is a function of the quantity of coffee dis- pensed: 10mm for 35gr - 17mm for 60gr - 35mm for 120gr and superior (Picture 3).

Limits of acceptability

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

Espresso Coffee Italy Q.ty 25/40 gr.

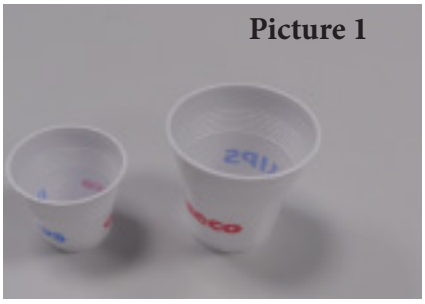
Temperature of 1st product 69°C ≤ 85°C

Temperature of 2nd product 72°C ≤ 85°C

Coffee Q.ty 70/120 gr.

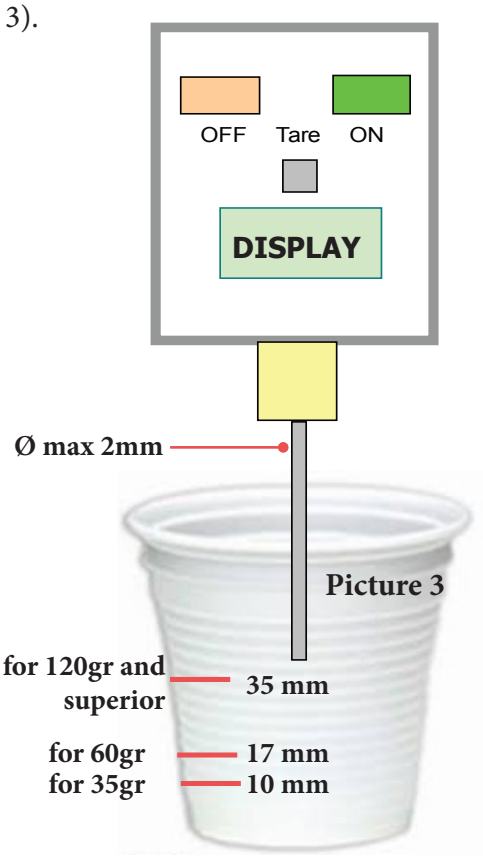
Temperature of 1st product 69°C ≤ 85°C

Temperature of 2nd product 72°C ≤ 85°C



Picture 1

Picture 2



Picture 3

2.2. Specification for the measurement of the Milk products temperature.

Milk evaluation

To carry out the test, a partially skimmed UHT milk with a percentage of grease between 1.5-1.8% at a refrigerator temperature Trefr. between 4 to 10°C (4 to 8° for LatteGo) must be used.
The milk product must be checked on a beaker of 250 ml of capability and with an inner diameter of 70mm, brewing 100gr of product.

Parameters to be respected:

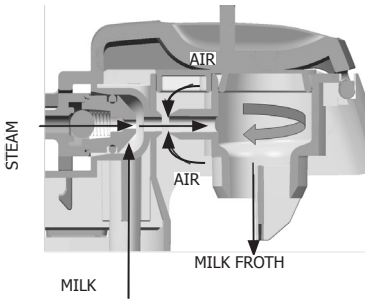
The parameters to be respected are: milk temperature and height of the cream. Each of these parameters, however, must be evaluated depending on the type of system used for the production of hot milk. Actually three types of devices are present on the appliances:

- Manual system (CMF)
- Semi-Automatic system (AMF)
- Automatic system (Carafe,LatteGo,etc.)

Milk temperature in the beaker:

System with Pinless Wonder: With milk at Trefr. (about 4-10 °C): → Δ ≥ 45
System with LatteGo: With milk at Trefr. (about 4-8 °C): → Δ ≥ 60
how does it work:

1. The milk is heated in the first chamber of the carafe thanks to the steam.
2. Then, it is mixed with air and frothed in the middle chamber.
3. Finally, in the outlet chamber, the 'typhoon effect' perfects the milk texture by removing the large bubbles



Height of the milk cream in the beaker:

Manual system (pannarello) ≥ 15mm on 100gr. of brewed product

Semi-automatic system (cappuccinatore) ≥ 20mm on 100gr. of brewed product

Automatic system: carafe, cappuccinatore, Pinless wonder e.g. (New Royal, Energica Pure, Intelia EVO latte) ≥ 20mm on 100gr. of brewed product.
LatteGo: Requirement should be ≥15mm on 120gr.

How to measure the temperature of the milk.

1. The measurement is carried out in the beaker, immediately after the end of milk brew, positioned on a non-metallic surface, using a thermocouple thermometer (eg. Type K). Stop the preparation of mixed product: at the end of milk brewing, where "One Touch product" function is present.
2. The temperature is measured by immersing the probe of the thermometer, positioning the probe inside the beaker at about 10mm from the bottom of the container, then the probe moves in a circular motion for 3-5 turns, stopping at the end, at the center of the beaker. It detects the maximum temperature reached in a time of relief between 3 to 5 seconds. It is important the mixing of milk before the measurement at 10mm from the bottom of the beaker. If the mixing is correct, temperature, for a few fractions of a second, during the measurement should not oscillate.

How to measure the milk cream.
The temperature (Trefr or Tamb) of the milk doesn't affect as much the test result on measuring the milk cream; by convection is assumed to always use milk at refrigerator temperature **T**refr..

Manual systems (CMF)
Pour 100cc. of milk at Trefr. in a beaker of 250 ml of capacity and with a inner diameter of 70 mm; with machine in steam mode:

1. Place the beaker with the frother dipped in milk, dispensing steam and start the chronometer.
2. After about 30 to 60 seconds, stop the steam and check the result on milk.

Semi-automatic systems (AMF)
Pours milk at Trefr. in a container ; with the machine in steam mode:

1. Insert the silicone tube in the milk container, placing a beaker of 250 ml capacity and with an inner diameter of 70 mm under the cappuccino maker and dispensing steam.
2. After having provided 100gr. of product, stop the steam and check the result obtained on milk.

Automatic: Carafe, Cappuccino Pinless wonder, LatteGo
After setting the machine to delivery of 100gr. of product (120gr for LatteGo):

1. Launch the "hot milk" function.
2. Collect the product in a beaker with a 250ml of capacity and with an inner diameter of 70 mm, and verify the result obtained on milk. Carry out the test using milk at a **T**refr..

In case the machine allows modify of the emulsion through the menu, use the machine with the emulsion set to the default value.

Related to the above testing procedure derives the following table of acceptability:

Manual, Semi-Automatic and Automatic's Milk System	
Grams of Product	Minimun Height of the milk cream
≥ 130	≥ 30mm
120	≥ 25mm ≥15mm (LatteGo only)
110	≥ 22mm
100	≥ 20mm
90	≥ 16mm
80	≥ 13mm
70	≥ 11mm

NB: To verify better the height of the cream, a practical example is to add
to dispensed product a small amount of coffee. The addition of coffee immediately highlights the
the surface of separation between liquid and cream.

2.3. Machine parameters and performance

PRODUCT QUANTITY	Minimum amount (≃ ml)	Default amount (≃ ml)	Maximum amount (≃ ml)	**Programm. by the user**	**Machines**
Espresso	20	40	230	Yes	ALL MODELS
Coffee	20	120	230	Yes	ALL MODELS
Cappuccino	20 (90 ml milk)	40 (120 ml milk)	230 (200 ml milk)	Yes	ALL MODELS
Latte macchiato	20 (120 ml milk)	40 (200 ml milk)	230 (340 ml milk)	Yes	ALL MODELS
Milk Frother	40	180	340	Yes	ALL MODELS
Americano	20	150	230	Yes	ALL MODELS
Cafè au lait	20 (50 ml milk)	90 (90 ml milk)	230 (150 ml milk)	Yes	ALL MODELS
Hot water	No timeout				ALL MODELS
Steam for frother	Max 180 seconds				ALL MODELS

COFFEE GROUNDS DRAWER	Description and values
Time-out for coffee grounds drawer	5 sec.
Reset dreg counter	Dreg emptying alarm, if the coffee grounds drawer is removed for more than 5 seconds.

STANDBY	Description and values
Time (default)	15 minutes
Time programmed by Consumer/Service	Yes
Boiler temperature during Standby	Boiler OFF

WATER TANK	Description
Water reserve (pulses) with water filter	200
Water reserve (pulses) with no water filter	200
Water reserve modifiable by Production/Service departments	No
"Fill tank" alarm	Yes
Connect to water mains	No

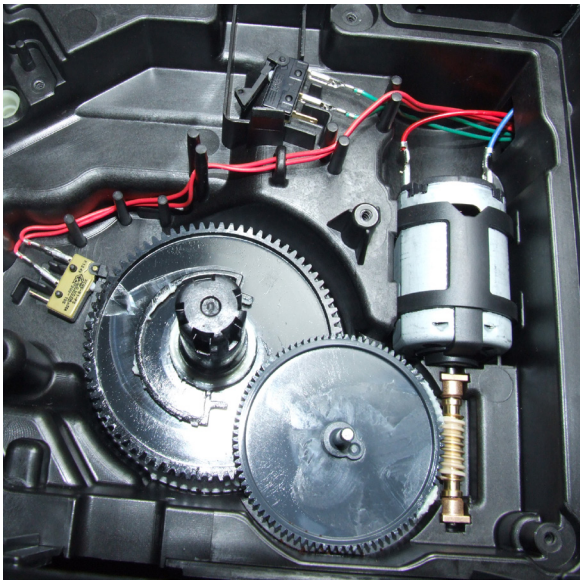
CHAPTER 3

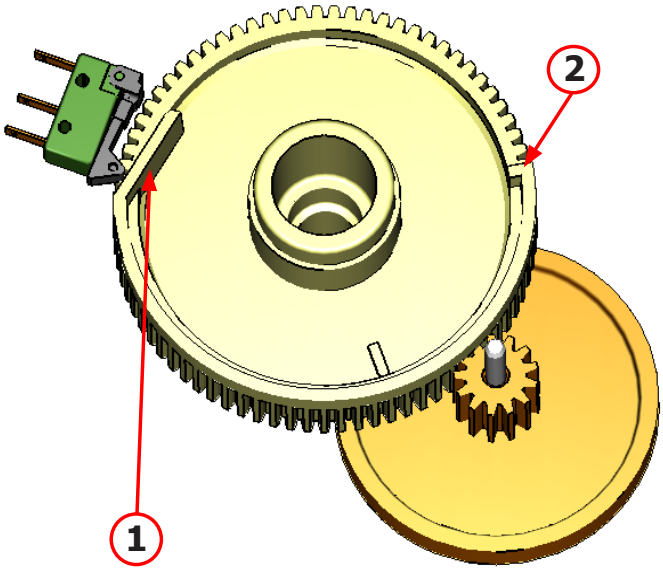
OPERATING LOGIC

3.1. Single microswitch gear motor

Switching on

When the machine is switched on, the gear motor repositions itself as follows:
- It acts on microswitch 1
- The gear motor changes its rotation direction and moves upwards again by approx. 1-2 mm.
- The boiler begins to heat the water for approx. 45 sec, in order to reach the optimal temperature (established by the software).





The gear motor is powered by a direct current motor that engages with the smaller double toothed wheel using a worm screw. The unit is mounted on the axle of the large gear wheel and when a coffee is requested, it moves from the standby position to the dispensing position, and then back to the standby position again. The microswitch indicates to the gear motor when the brew group is in the work position or home position.

- Standby position: 1

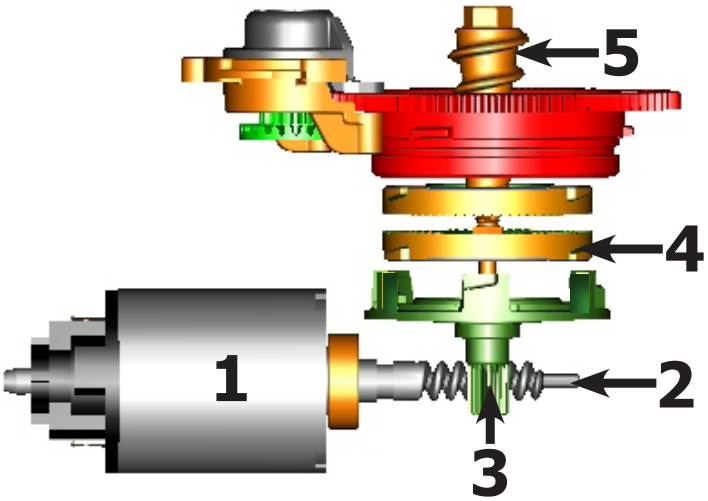
- Dispensing position: 2

3.2. 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

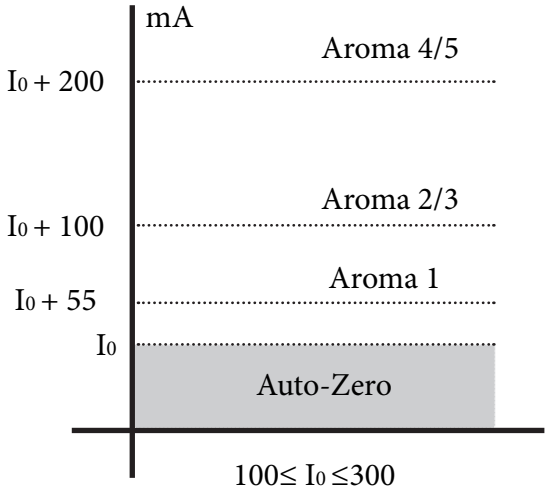
An NTC is used as a temperature sensor; in the event of overheating this reduces boiler element power consumption. The electronic system detects the current boiler temperature from the drop in voltage of the sensor and adjusts it accordingly. Heating element values and corresponding temperatures: see table.

3.3. Coffee grinder



The coffee grinder is driven by a direct current motor (1) using a worm screw helicoidal wheel transmission (2). The worm screw (2) drives a plastic gear wheel (3), which turns the lower grinder (4) and the increment pin (5)

3.4. Autodose system description



I_0 = current when the brew unit is moving without load, i.e. without coffee. It occurs, for example, during the rinsing phase of coffee spout.

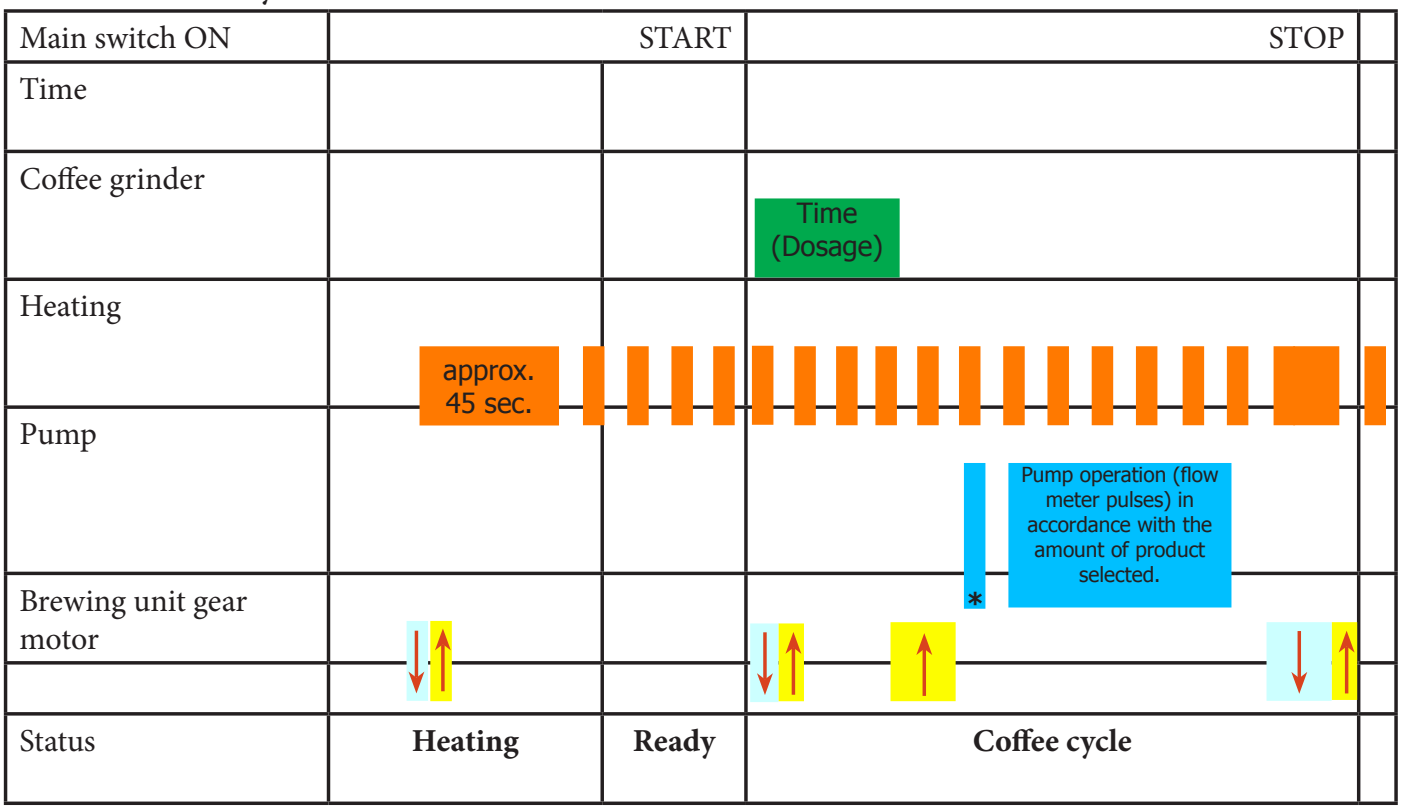
			DOSE ADJUSTMENT			
	5 levels		Grinder Time	Min Grinder Time	Max Grinder Time	Curret target
Aroma of the grinded product	Aroma1	Extra Mild	T_1	3s	8,1s	I_0 + 55mA
	Aroma2	Mild	T_2	3,5s	9s	I_0 + 100mA
	Aroma3	Medium				
	Aroma4	Strong	T_3	4s	10s	I_0 + 200mA
	Aroma5	Extra Strong				

This table shows, depending Aroma set, the grinding time and the current consumption of the coffee grinder with medium grinding (500±60µm) and using coffee of test.

3.5 Coffee lack detection and coffee grinder blocked

When the coffee grinder is working, the software monitors the current consumption. If the current value is very low, the machine concludes that coffee is missing; if the current value is very high, the machine concludes that the coffee grinder is blocked; instead, if the current value is in the middle, the machine concludes that all is ok and it goes on to do the product.
Because the current consumption of grinder changes depending on the situations (motor new or old, cold or hot, coffee blends, etc.), these current targets are not static, but dynamic.

3.6. Coffee cycle



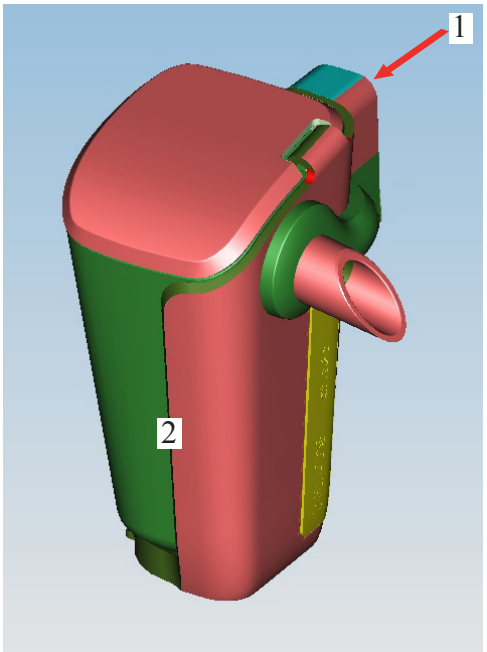
Notes: * Only with Pre-brewing

Coffee cycle

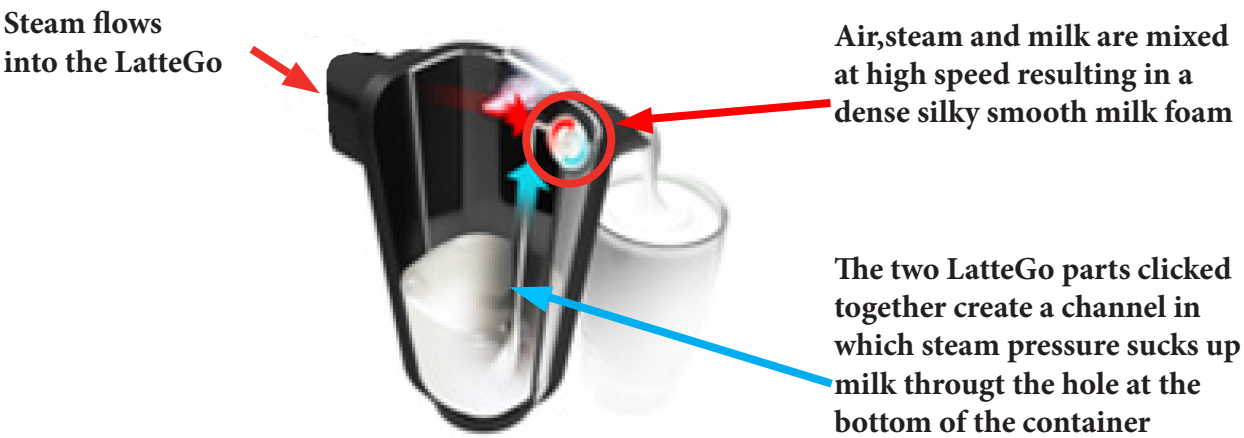
1. The coffee grinder starts the grinding process (controlled by Time);
2. The gear motor (brewing unit) moves to the brewing position;
3. Preliminary dispensing phase (short pump activity, short pause);
3.1. Solenoid valve opening (For products: Cappuccino and Frothed Milk);
3.2. Dispensing Milk (For products: Cappuccino and Frothed Milk);
3.3. Solenoid valve closing (For products: Cappuccino and Frothed Milk);
4. Coffee dispensing (the pump operation period is defined by the amount of product dispensed);
5. The gear motor moves to its home position (the dregs are expelled automatically);

Note: For the product cafè au lait, the dispensing of the milk takes place after that of coffee.

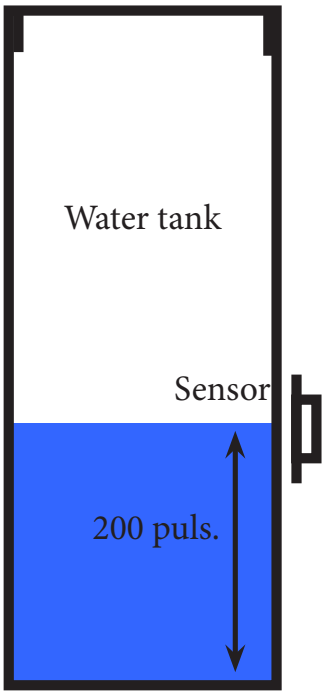
3.7. Milk container



1) Steam inlet
2) Complete LatteGo milk container assy



3.8. Water level detection (water tank)



"Water low" message (water reserve)

Function:
The water level is monitored by a capacitative sensor, located one third of the way up the water tank wall.
If the electronics assembly detects, by means of the sensor, that the amount of water in the tank has dropped below the above mentioned level, a water reserve remains available for the dispensing process underway (this will cover 200 flow meter pulses).
The product dispensing process will then come to an end.
If a dispensing cycle ends after the sensor has been triggered (in the reserve) then the display "Water low" continues to be displayed during the following dispensing cycle.

3.9. AquaClean water filter

The AquaClean filter is designed to reduce limescale deposits in the coffee machine and provide filtered water to preserve the aroma and flavor of each cup of coffee. By using a series of 8 AquaClean filters, there is no need to descale the machine for 5000 cups (It depends both on the type of coffee used, rinsing and cleaning programs). We recommend installing the water filter AquaClean the first use of the machine to the maximum before using 5 L of water. The machine display will indicate when the filter needs to be replaced. The maximum limit is equivalent to 110 L of water. The conditions related to the filter work environment (water, therefore, an active environment for bacteria and microorganisms), require the replacement with a minimum frequency (we suggest 3 months from the activation to ensure the best performance). The filter starts' working from the time is filled with water and continues working even with the machine off. It cannot be deactivated manually, as it must end its life cycle. At the filter activation the display shows the icon with the percentage of use:

- Initially 100% then decreasing.

When the autonomy of the current filter becomes less than 8 L of water the display shows:

- The icon flashing slowly. It means 10%.

When the autonomy of the current filter becomes less than 2 L of water the display shows

- The icon flashing quickly. It means 0%.

After a maximum of 110 L of water supplied the flashing light turn off and the machine needs to be descaled.

The water tank of all PHI5000 models is designed to fit only with the AquaClean filter.

3.10. Descaling request

Descaling frequency in AQUACLEAN					
The first activation must make before you've paid up to 5000ml products because mind thinks as if he had the filter					
Hardness	**Filter number**	**Percentual on display 10% the icon flashes slowly. (encourage the consumer to buy the filter)**	**Percentual on display 0% the icon flashes quickly. (tell the consumer to change the filter)**	**MAX Quantity water, the icon turns off. (replace filter)**	
Indifferent	From 1/8 to 7/8	8050ml	2000ml	62500ml 75000ml only OTC	Replace filter (you can not turn off)
	8/8				Descaling

If after descaling or after the use of a filter this is not reactivated , the machine recognizes the water hardness setting and calculates as in the table below			
Descaling cycle frequency			
Hardness	**WATER HARDNESS**	**Without water filter**	**Not reactivating the filter**
1	Soft (up to 7°dH)	240 litres (480,000 pulses)	210 litres (420,000 pulses)
2	Medium (7° - 14°dH)	120 litres (240,000 pulses)	105 litres (210,000 pulses)
3	Hard (15° - 21°dH)	60 litres (120,000 pulses)	52.5 litres (105,000 pulses)
4	Very hard (over 21°dH)	30 litres (60,000 pulses)	26.25 litres (52,500 pulses)
The default water hardness level is 4. Each litre of water corresponds to approximately 2,000 pulses.			

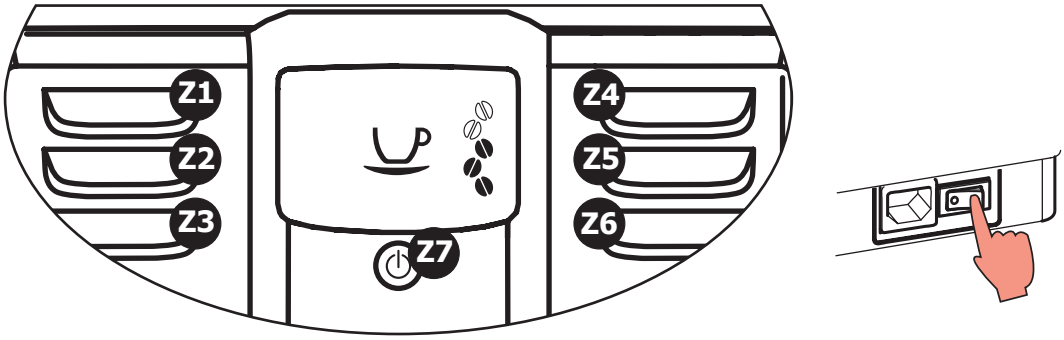
CHAPTER 4

DIAGNOSTIC MODE

4.1. Test Mode PHI 5000

Introduction
This document describes the Test Mode of the PHI 5000 Coffee Machine. This application is used in order to test the machine in its mechanics and electronic components.

To enter Test Mode
The machine enters in Test mode by holding pressed together **Z1** and **Z6** buttons while switching on the machine by the main switch on the backside of the CA.
Once entered in Test Mode, the display shows the firmware version (Level 0).



The Test Mode is organized into **6 different** pages, each level the coffee machine can execute different commands:

Page 0: The display shows:
a) Firmware version.
b) Version of machine
c) Voltage of PCB.
d) Main supply frequency (50 or 60 Hz).

Page 1: Keyboard and display's colour test:
a) Z1 button
b) Z2 button
c) Z3 button
d) Z4 button
e) Z5 button
f) Z6 button
g) Z7 button
h) Backlight colors

Page 2: Input signals test:
a) Water level sensor
b) Micro-switch door closed/opened
c) Microswitch presence of the Brew Unit

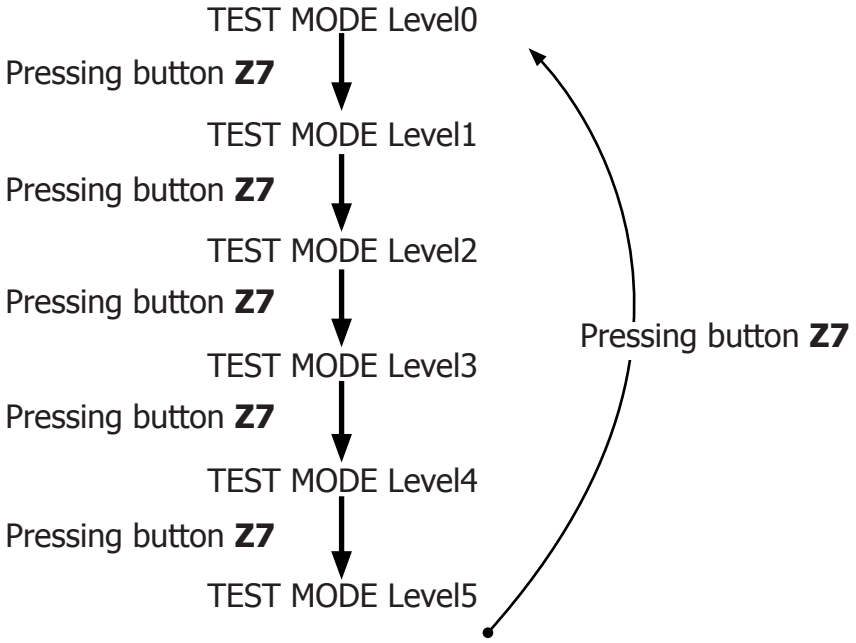
Page 3: Low voltage loads test:
a) Brew Unit movement upward and downward (24V DC)

Page 4: High/Low voltage loads test (Pump, E.Valve) :
a) Pump (230V AC)
b) DC Solenoid valve (24V) (The door must be closed !!)
c) Flow-meter

Page 5: **High voltage loads test (Heater , Grinder):**

a) Heater (230V AC and 120V AC)
b) Grinder (320V DC and 170V DC)

The user can change the page by pressing the **Z7** button.
Page 0 is accessible only entering Test Mode from power-off mode; at the start up all loads are turned off.



Page 0 (FIRMWARE)

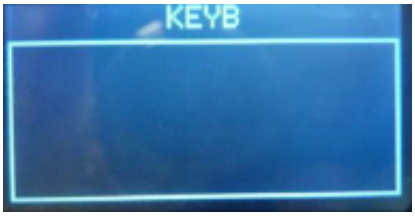
Verify the firmware version

Firmware version on the display.
The machine model is shown
The voltage of the main supply "230V"
The frequency of the main supply is shown (50 or 60 Hz)

ERROR: If in machine model field is written "Unknow" and backlight of display is Red, check the jumper in interface.

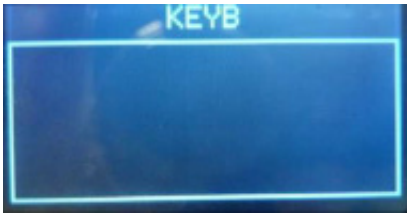
The firmware version is the same as the label on MicroController
ERROR: The firmware version is different from the label on MicroController; change the CPU_POWER Boards !

Press **Z7** " ⏻ " to move to the next screen



The machine passes to the Page 1 (KEYBOARD)
ERROR: The page does not change; Check the interface board and the flat cable (JP21)

Page 1 (KEYBOARD)



Start condition

Press buttons from 1 to 7
Only when a button is pressed a O appears on the relative position of button pressed.
In the middle of display appears the name of the button pressed and the backlight color changes from WHITE to RED.
When a button is pressed, also the Stand-By led (RED) turn ON.

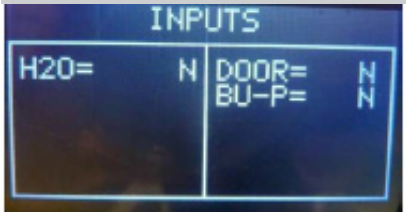
Note: Press button Z7 as the last once, since it makes change the test page.
Note: If 2 or more buttons are pressed the name that appears on display could be wrong.

ERROR: If nothing appears on display; check the interface board and the flat cable (JP21).

ERROR: If during the movement the backlight remain WHITE check the wiring (JP1) from the interface board and the display.

ERROR: The name displayed is wrong; check the position of jumper in interface in JP5. It must be the same of machine model.

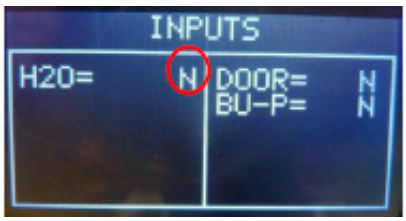
Press **Z7** " ⏻ " to move to the next screen



The machine passes to the level 2 (INPUTS)

Page 2 (INPUTS)

Start condition



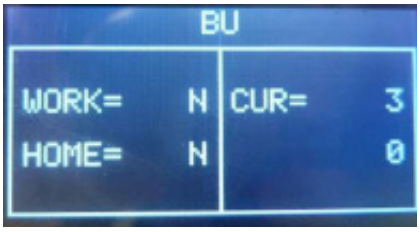
Insert a full Water Tank.
The indication H20 changes from "N" to "Y".
NOTE: the switching from "N" to "Y" requires about 1-2 seconds.

ERROR: The indication TANK-H2O doesn't change; check the capacitive sensor (fixing) and the wiring (JP23)

Insert the BrewUnit
The indications **BU-P** changes from "N" to "Y".
Note: removing the BrewUnit the indication from "Y" to "N" requires about 2-3 seconds to switch.
ERROR: Check the BU presence Microswitch and the wiring (JP16).

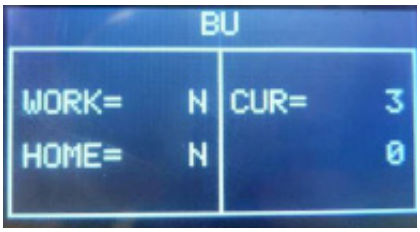
Close the Door and Dreg Drawer
The indication **DOOR** change from "N" to "Y"
ERROR: The indication **DOOR** does not change; check the Microswitch for the door and the wiring (JP14).
Note: without the Dreg Drawer correctly inserted the DOOR indication cannot change!

Press **Z7** " ⏻ " to move to the next screen



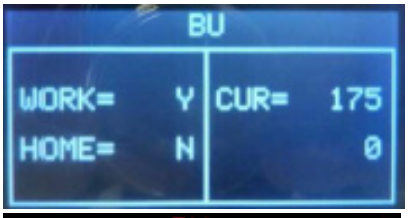
The machine passes to the Page 3 **(BU PAGE)**

Page 3 (BU)



Start condition

Press the Z1 button to move the BU to Work
IMPORTANT NOTE: If the DREGDRAWER is not inserted or the DOOR is not closed the BU test cannot be performed. If these 2 inputs are not in the right position, a warning message will be shown and the display turns to red.



When the BU reaches the work position the indication **WORK** changes from "N" to "Y", the number of the current is less than 200mA (without BU) or 300mA (with BU).

ERROR: The indication **WORK** doesn't change and remain "N", the display backlight changes from white to red; Check the work microswitch (broken?), the BU motor (blocked?) and the wiring (JP16).

ERROR: (**Without BU**) The absorbed current is more than 200mA, the display backlight changes from white to red; check the BU and the motor.

ERROR: (With BU) The absorbed current is more than 300mA, the display backlight changes from white to red; check the BU and the motor

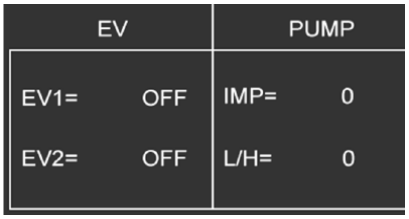
Press the Z3 button to move the BU to Home
When the BU reaches the home position the indication **HOME** changes from "N" to "Y", the number of the current is minus than 200mA (without BU) or 300mA (with BU).

ERROR: The indication **HOME** doesn't change and remain "N", the display backlight changes from white to red; Check the work microswitch (is broken), the BU motor (is blocked) and the wiring (JP16

ERROR: (Without BU) The absorbed current is higher than 200mA, the display backlight changes from white to red; check the BU and the motor.

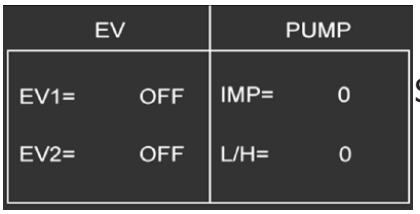
ERROR: (With BU) The absorbed current is higher than 300mA, the display backlight changes from white to red; check the BU and the motor.

Press **Z7** " ⏻ " to move to the next screen

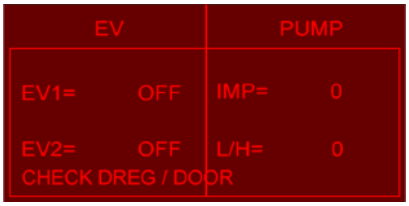


The machine passes to the Page 4 **(EV - PUMP)**

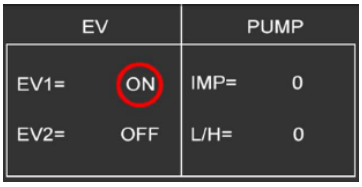
Page 4 (EV - PUMP)



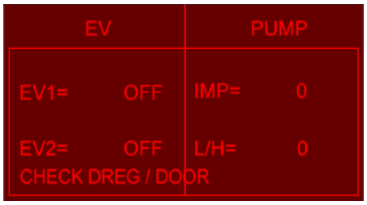
Start condition



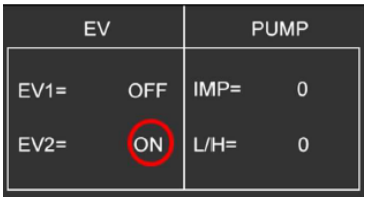
Press the Z1 button to open the Electro Valve
IMPORTANT NOTE: If the DREGDRAWER is not inserted or the DOOR is not closed the EV test cannot be performed. If these 2 inputs are not in the right position, a warning message will be shown and the display turns to red.



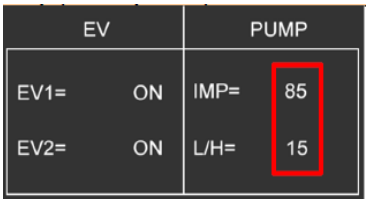
It is possible to hear the "click" from Electro Valve. The indication beside the **EV1** changes from "OFF" to "ON".



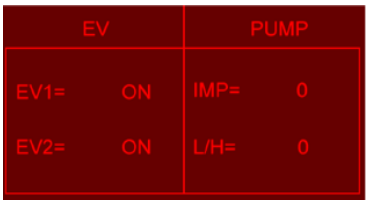
Press the Z2 button to open the Electro Valve
IMPORTANT NOTE: If the DREGDRAWER is not inserted or the DOOR is not closed the EV test cannot be performed. If these 2 inputs are not in the right position, a warning message will be shown and the display turns to red.



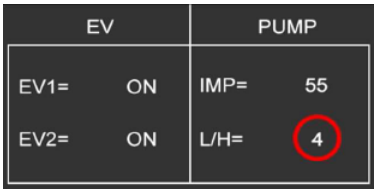
It is possible to hear the "click" from Electro Valve. The indication beside the **EV2** changes from "OFF" to "ON".



Press and Release the Z4 button to switch on the pump (100 impulses)
The water goes out from the pipe and the indication **IMP** shows increasing numbers. The indication L/H must be within the range 10-18.



ERROR: The display backlight changes from white to red and the impulse remains 0; If water comes out the pipe: check the wiring from the flowmeter to the CPU/POWER board (JP5). If no water comes out the pipe: check the pump and the wiring from the pump to the CPU/POWER board (JP24).

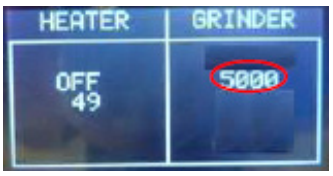


ERROR: The L/H is zero or very low; the Electro Valve does not open. Check the wiring from the Electro Valve to the CPU/POWER board (JP3) and the Electro Valve.

Press **Z7** " ⏻ " to move to the next screen

230V

The machine passes to the level 5 (Heater-Grinder)



Press the Z4 button to switch on the grinder.
The grinder rotates and in the indication **GRINDER** the number increasing up to 5000 (5seconds test). The other numbers inside the **GRINDER** box are not important for this test.

ERROR: The number remains 0 or the grinder does not run, the display backlight changes from white to red; check the Grinder and the wiring from the Grinder to the CPU/POWER board (JP8)

Check the temperature
The number shows the heater temperature.

ERROR: In the indication **HEATER** appears **"SHORT"**, the **NTC** temperature-sensor is shorted, the display backlight changes from white to red; check the wiring from the NTC temperature-sensor to the CPU/POWER board (JP13).

ERROR: In the indication **HEATER** appears **"OPEN"**, the **NTC** temperature-sensor is detached or broken, the display backlight changes from white to red; check the wiring from the NTC temperature-sensor to the CPU/POWER board (JP13).

Press the Z1 button to switch on the Heater
The absorbed current (Amperometer on the main supply) is OK, the indication **HEATER** changes from "OFF" to "ON" and the temperature starts increasing.

If temperature is over 100°C, the backlight change from WHITE to RED. This is a ALERT message to avoid heating the HEATER element over dangerous temperature.

ERROR: the absorbed current is KO or the temperature does not increase; check the wiring from the heater to the CPU/POWER board (JP19) and the wiring of the NTC temperature-sensor (JP13).

4.2. Grinder Tuning

Start condition

Press the **Z5** button for 3sec to reset a parameter of the Grinder

The aging parameter of the grinder is setted to his initial value ⟶ a screen with the text "RESET GRINDER PARAMETERS" is showed for 3sec.

ERROR: The display doesn't change

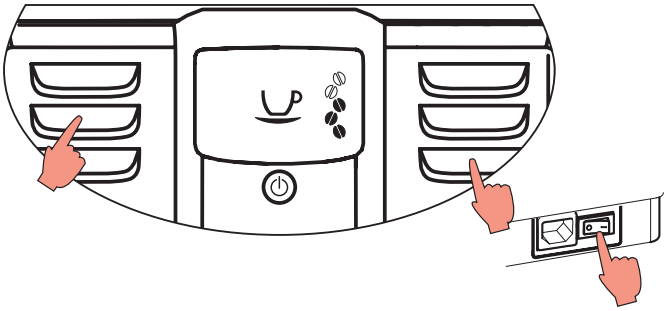
4.3. SteamOut

Not mandatory, but if necessary, before executing the steam out procedure, descale the machine taking care to remouve the Aquaclean filter from the appliance.
In case the filter on the machine is active (or it's in the machine) provide the consumer with a new one.

This document describes the Steam-Out procedure; the application is used in order to empty the heater.

To enter in SteamOut

The machine enters in Steam-Out mode by holding pressed together:
the **"Coffee"** button and the **MENU** button;
while switching on the machine by main switch behind the machine.



Once entered the Steam Out mode the display shows the **"STEAM OUT"** indication. Buttons can be released.

IMPORTANT NOTE: to execute the Steam-out procedure the Ntc sensor must work correctly; if some errors occurs on Ntc during the steam-out, the procedure can't continue and an error message is shown on the display.

IMPORTANT NOTE: to execute the Steam-Out procedure the DREG-DRAWER must be in place and the DOOR must be closed.
If these 2 conditions are not respected a warning message is shown on the display and the Steam-Out is interrupted.

The machine starts the Steam Out and in the display appears the indication "ON".
While the Steam Out runs the Electro valve is opened and water comes out the Water/Steam pipe.

When the Steam Out is complete the message "COMPLETE" is shown on the Display.The Electro valves automatically closes and the machine can be switched off.

When the Steam-Out is complete the following parameters are reset to their default values		
Parameters	**Default value**	**Description**
Espresso_pulses_qty	150	Length "Espresso" product
Coffee_pulses_qty	360	Length "Coffee" product
Cappuccino_pulses_qty	150	Length "Cappuccino" product – Number of flow meter impulses during coffee cycle
Cappuccino_milk_brew_time	230	Length "Cappuccino" product – Time of milk brewing (x100ms)
Lattemacchiato_pulses_qty	150	Length "Latte Macchiato" product – Number of flow meter impulses during coffee cycle
Lattemacchiato_milk_brew_ time	360	Length "Latte Macchiato" product – Time of milk brewing (x100ms)
Americano_coffee_pulses_qty	150	Length "Americano" product – Number of flow meter impulses during coffee cycle
Americano_water_ puls-es_qty	310	Length "Americano" product – Number of flow meter impulses during hot water cycle
CafeAuLait_pulses_qty	280	Length "Cafè au lait" product – Number of flow meter impulses during coffee cycle
CafeAuLait _milk_brew_ time	160	Length "Cafè au lait" product – Time of milk brewing (x100ms)
FrothMilk_milk_brew_time	320	Length "Froth Milk" product – Time of milk brewing (x100ms)
Coffee_Grinder	0	Number of grounds in dregs drawer
Alarm_Refill	TRUE	Request priming circuit next power-on of the machine
Bu_Loaded	FALSE	Set Brew-unit clean and not fill with coffee
Aroma_Espresso	3 Beans	Aroma for high pressure products
Aroma_Drip	4 Beans	Aroma for low pressure products (not used in Incan-to machine)
TimeSleep	15 minutes	Timer for enter in stand-by from normal mode
Filter_Present	FALSE	Presence of Aqua Clean filter in machine
LastErrorLogged	0	Last error saved in machine
Gr_bu_uc_arr[jj]	150	Array of last 4 brew unit effort during rinsing cycle (in milliamperes). Autozero for new autodose system
Gr_time_aroma[Light]	3000	Grinding time for aroma 1 (ms)
Gr_time_aroma[Medium]	3500	Grinding time for aroma 2 e aroma 3 (ms)
Gr_time_aroma[Strong]	4000	Grinding time for aroma 4 e aroma 5 (ms)
Coffe_Duct_empty	TRUE	Set grinder conduct clean – used to increase grinding time for first grinding product next power-on.
DebugGrinder	FALSE	If true machine enter in debug mode next power-on.
Filter_autonomy	0	Autonomy of last Aqua clean filter actived
Filter_counter	0	Number of Aqua clean filter actived in aquaclean chain
Filter_startup_qty	5000	Counter of water for enable first Aqua Clean filter; if expire, the machine need a descaling action to activate a new filter.
InstallFilterRemind	TRUE	Request Aqua clean filter activation next poweron

4.4. Error codes

ERROR CODES	DESCRIPTION
01	The coffee grinder is blocked
02	The grinder is disconnected
03	The brewing unit is blocked in work position
04	The brewing unit is blocked in home position
05	The hydraulic circuit is clogged
10	The temperature sensor is in short circuit
11	The temperature sensor is opened
14	The temperature was up to 170°
15	The machine doesn’t heat up
19	The net is not stable
22	The keyboard is not recognized

CHAPTER 5

ESPRESSO PHILIPS SERVICE CENTER

5.1. Espresso Philips Service Center (EPSC)

The EPSC is a Service tool developed to upload the SW on the machine and run the diagnostic mode.
It can be downloaded from the following link: https://www.epsc.philips.com/ServiceCenterPortal/
The application can be used only in combination with the Saeco Programming Device:
Cod. 996530009845 “KIT PROGRAMMER SERKIT SSC2”.
It can be ordered as Spare part and includes the programmer + connection cables.
All details related to the registration and operation are explained in the enclosed Quick start guide (QSG).

Espresso Philips Service Center– Quick Start Guide

Press the icon to view the document
To open the attached document is necessary to save the service manual on your PC.

The main Diagnostic Parameters description is available on the GDA_114331.

CHAPTER 6

MACHINE REPAIR FLOW

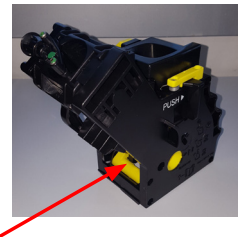
6.1. Repair Flow

Proces stap	Saeco no.	Action
Intake	1	Visual inspection (transport damage) take care for pictures
	2	Check Type/serialnumber
	3	Log all available accessory, counter check with info from consumer
Diagnosis	4	**Check product for consumer complaint and main function** (NFF contact consumer)
	5	Run Diagnostic to get error codes and relevant set statistics (EPSC) refer SDA_114585
	6	Opening machine
Repair	7	Repairing the fault(s) encountered (view Symptom Cure)
	8	Checking any modifications (view Symptom Cure, new software, etc.) **Refer Annex tabs per family (if available)**
	9	**Basic Functional test while the appliance is open** (linked to consumer complaint or what you may have detected)
Coffee		*Make e 2 cups at the same time. Are the volumes equal*
- Crema		*Blow on the coffee. Does the crema come back together*
		Is the crema colour correct (Hazelnut)
- Temperature		*Is the coffee temperature within spec refer SDA_97832*
Steam		*Does the steam work*
Hot Water		*Does the hot water work*
Milk		*(if applicable)*
- Cappuccino		*Does the cappuccinatore produce good froth*
	10	check water circuit for any leakage, such as Oetiker clamps, boiler and valve connection and hoses
	11	Check mechanism for good movement and unexpected noise
	12	Assembly
Inspection	13	Do cabinet parts fit well together
- visual	14	Check for damages
- Power check	15	Will the set switch on
- Accessories	16	Do the accessories match with the intake
- Consumer complaint	17	Check the product for the consumer complaint
Quick Functional test	18	Make 2 cups at the same time. Are the volumes equal
Coffee	19	Is the sound normal ?
Leakage	20	Did the product leak during the testing
Steam Out	21	**Steam out** before shipping out, if temperature is below 0° to prevent any damaged due to frozen water. **No need for those families** Minuto Family (all platform); Incanto Family New .; Pico Baristo ; Gran Baristo; Intelia V2 ; Philips 2000 – 2100 ; Incanto Executive; Xelsis-New; Moltio Family (all Platform) **Please also check for GDA_113455**
Reset Error code	22	New devices like Xelsis-New have the possibility to reset the error code, once captured it need to be reset to see if it appear afterwards again
Claim Administration	23	**Provide precise IRIS code, according dedicated code table for Garment Care products. The location code from the part you have worked on MUST be completed always with the part reference from exploded view !** **Primary fault and corresponding IRIS code should be claimed first.**
Cleaning	25	Clean water reservoir, bean reservoir, brew chamber and conveyor
	26	Clean and dry brew unit, coffee bin and drip tray
	27	External cleaning (housing surface)
Safety check	28	Earth leakage, Isolation test, resistor of earth wire grounding, as requested in certain country's (VDE, ISO) or H-POT TEST
Visual	29	Check the mains cord for damages
Packing	30	Packing
	31	Check completeness (accessories) according income log refer #3
	32	Neatly pack the product
Documentation	33	Info for Consumer by packed ? e.g. service brochure, FAQ, NFF letter, s/c etc....
	34	Descaling instruction with changed procedure (S/C) if available
Repair report	35	Is there an answer to **ALL** consumer questions/complaints (see complaint)
	36	add set statistic and give, if needed clear instruction towards consumer
	37	Is it indicated which documents are added
	38	Are there tips how to prevent issues

CHAPTER 7

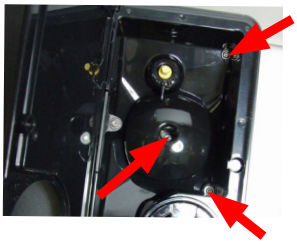
DISASSEMBLY

7.1. Outer Shell



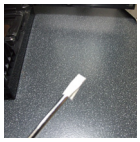
Remove the water tank, coffee container cover, drip tray, dreg drawer, brewing unit.

Upper cover



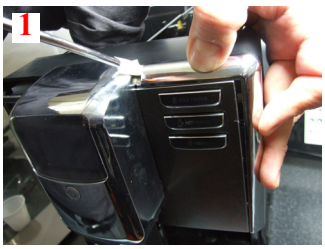
Unscrew the screws shown

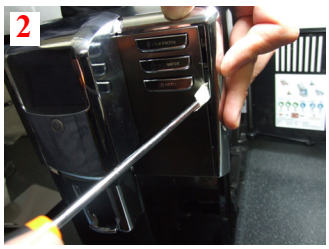
Remove the cover as in the photo. In case of any issues please you can try with the alternative way below described.



Cover a screwdriver with adhesive paper to prevent scratching the chromed shell.

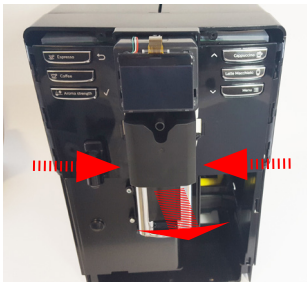
Remove the cover as in the photo:





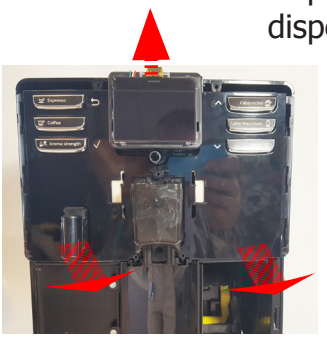
Unscrew the screw shown and remove the cover.

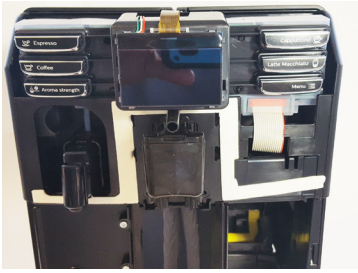
Unscrew the screw shown



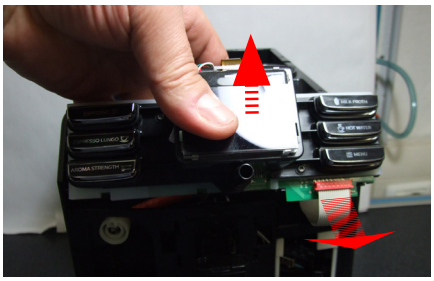
Press the sides and remove the cover and dispenser. Insert as before to reassemble the dispenser in the rail and then the coverage.

Unscrew the screws shown

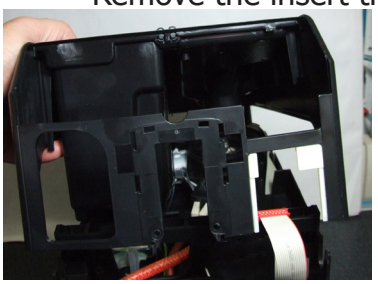


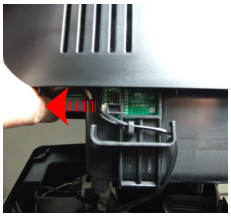


Remove the insert the upper cover

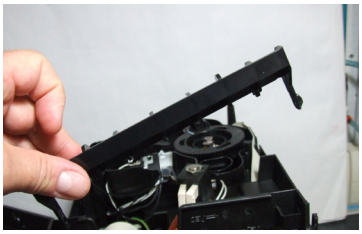


Remove the support KYB assy. and disconnect the flat cable.



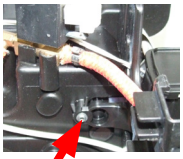


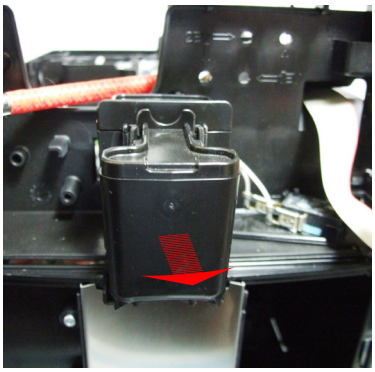
Remove the upper cover and remove the electrical and water circuit connections.



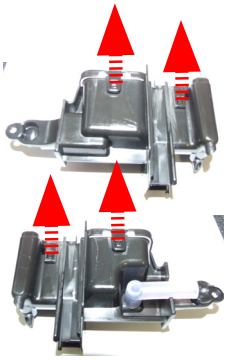
remove the block support KYB assy.

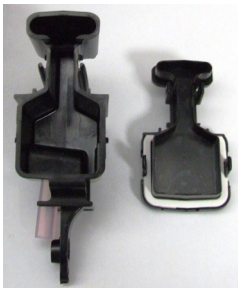
7.2. Dispenser





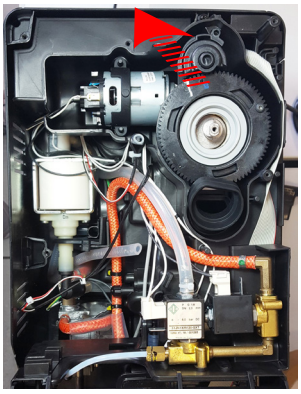
Unscrew the screws shown and remove the dispenser

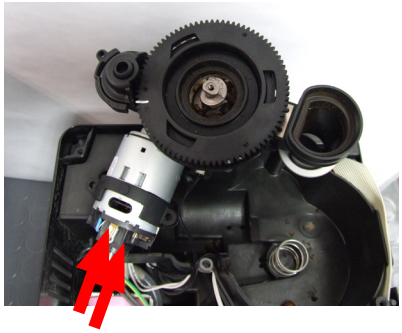




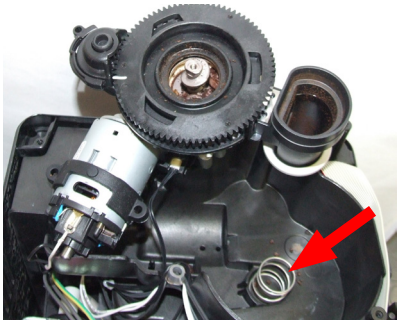
unlock where highlighted and remove the cover in the dispenser

7.3. Coffee grinder

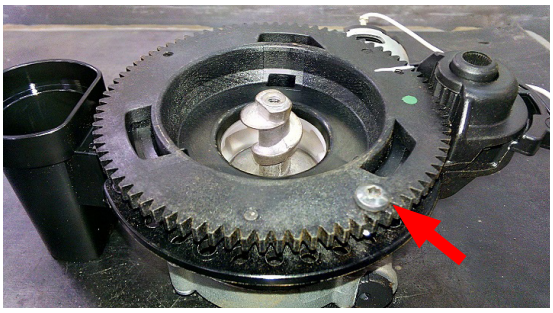




Raise the coffee grinder and remove the connections.

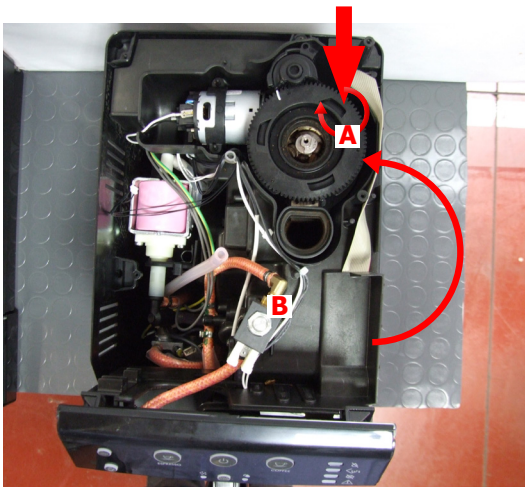


When reassembling the coffee grinder, make sure the spring is repositioned correctly (see photo).



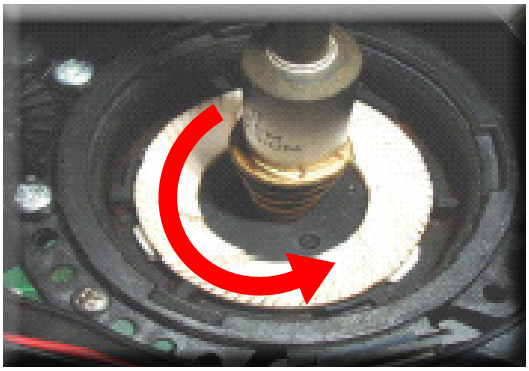
The new machines have a coffee grinder with the screw to prevent the disassembly of the upper coffee grinder support (see photo).

7.4. Grinder blades

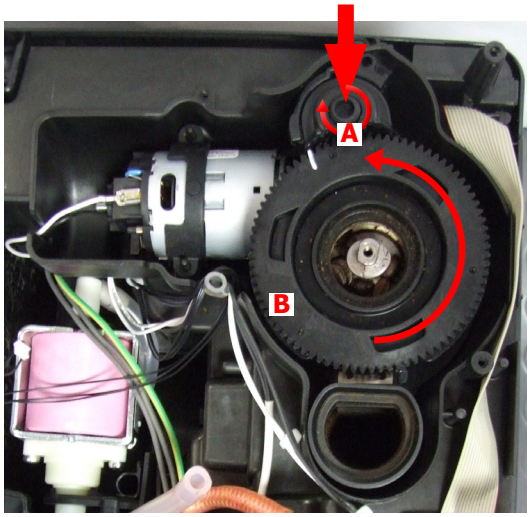


Caution in the new coffee grinder with the screw, Unscrew this last, before disassembly of the upper coffee grinder support.

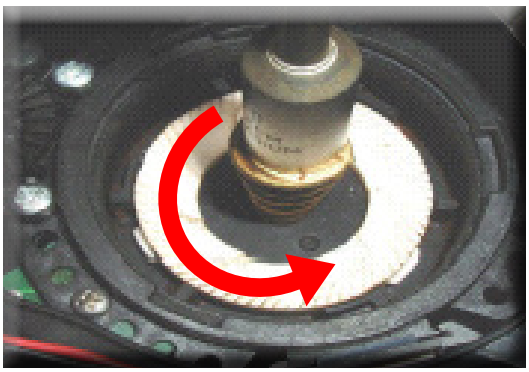
To extract the top support of the appliance, press on the grinding adjustment spindle (A) and turn the support anticlockwise until it unhooks.



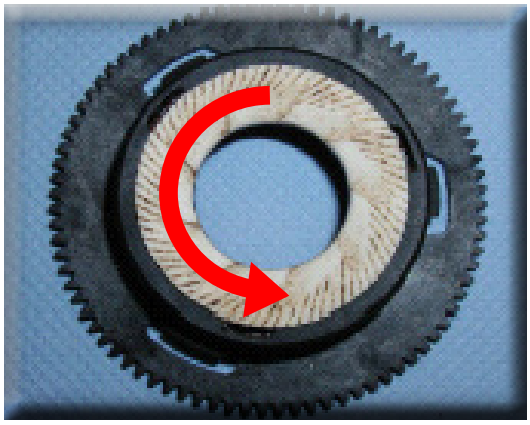
Turn the grinder blades anticlockwise out of the support.



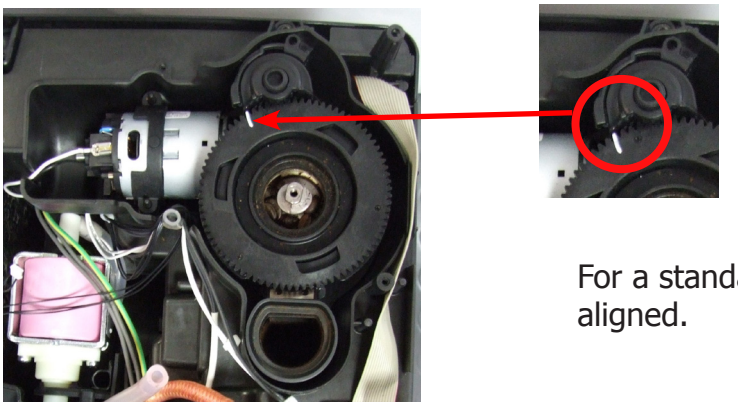
To extract the top support of the appliance, press on the grinding adjustment spindle (A) and turn the support anticlockwise until it unhooks.



Turn the grinder blades anticlockwise out of the support.

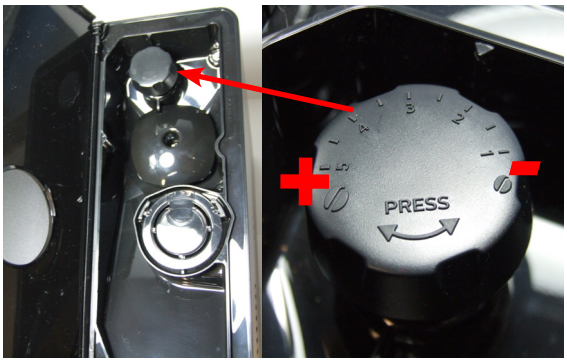


Turn the grinder blades clockwise out of the support. The bayonet connections can be accessed from the rear.



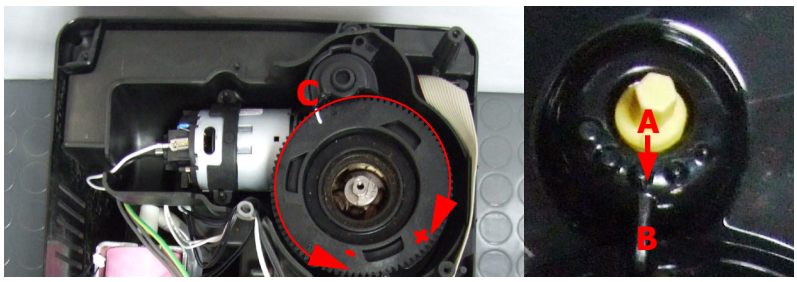
For a standard adjustment, both markings must be aligned.

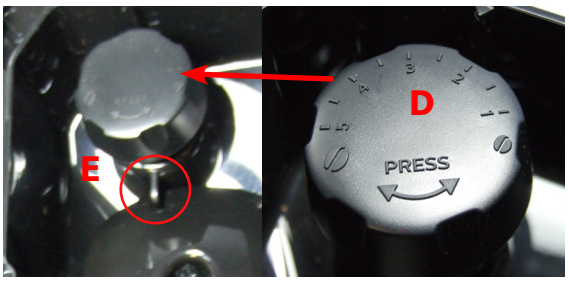
7.5. Coffee grinder adjustment



The grinding adjustment can be set by the user pressing and turning the grinder adjustment knob

Adjustment by a service center



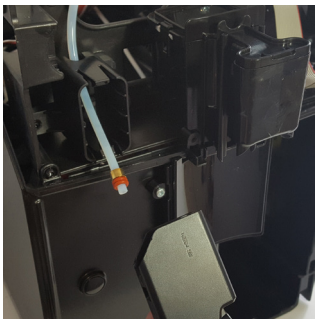


To adjust grinding further, the engineer can work directly on the coffee grinder by pressing and turning the ring nut (C) shown. (clockwise + to increase the particle size of the coffee and anticlockwise - to decrease it).
If there are any remains of coffee powder between the two grinding blades it is recommended to tighten by max. two marks at a time.
Lastly, move the arrow (A) on the adjustment knob to the center of the adjustment dots on the cover (B) ascertain that the center line of the “PRESS” (D) is in correspondence of the fin (E).

7.6. Carafe connection / hot steam water dispenser

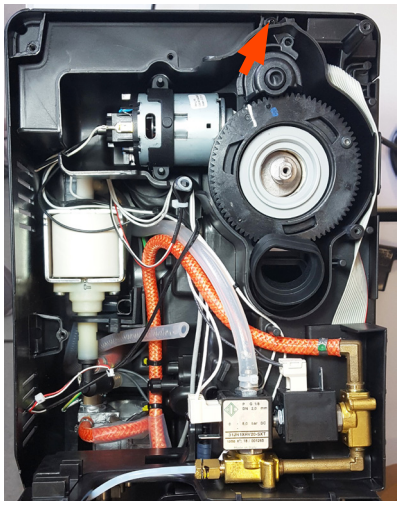
Remove the cover using the screwdriver as in the photo.

Slide out the fork as illustrated

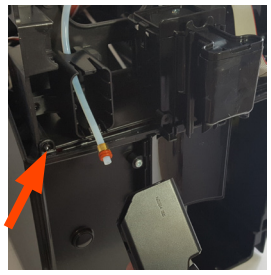


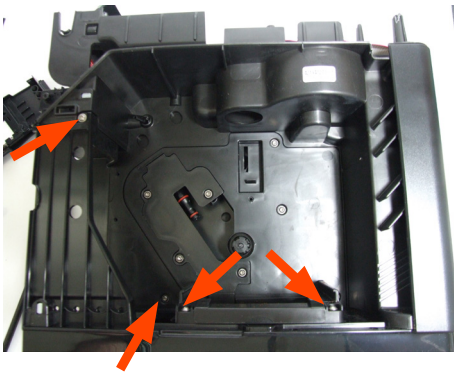
When reassembling the assembly to be careful to correctly position.

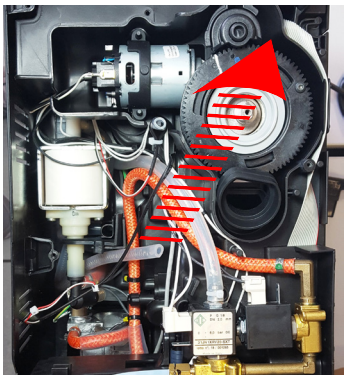
7.7. Central plate



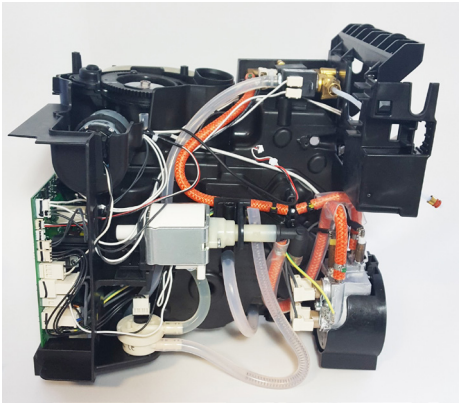
unscrew the screws shown



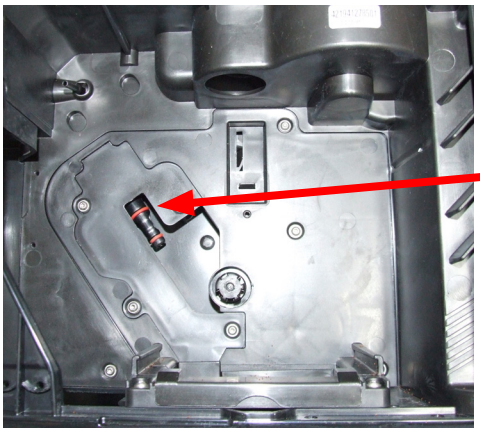


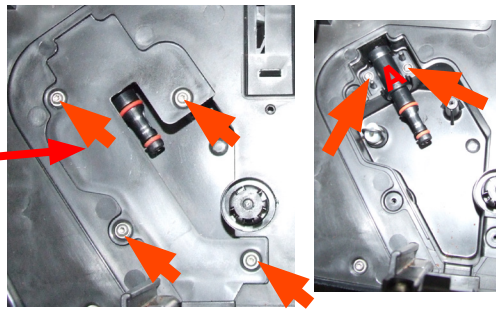


Lift up the center plate



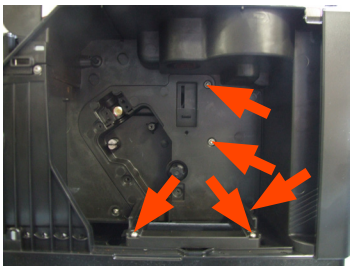
7.8. Pin boiler



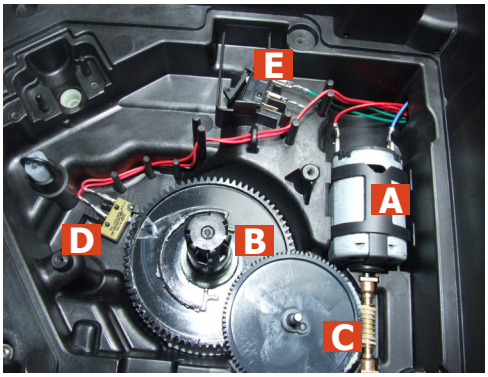


Loosen the screws as illustrated and remove the boiler pin (A).

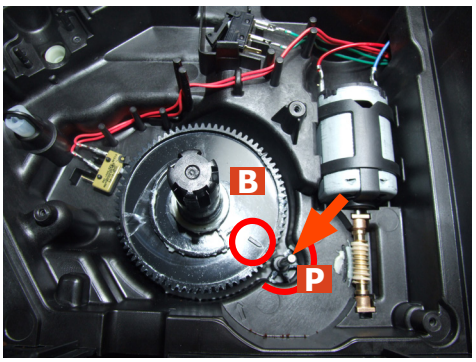
7.9. Gear motor



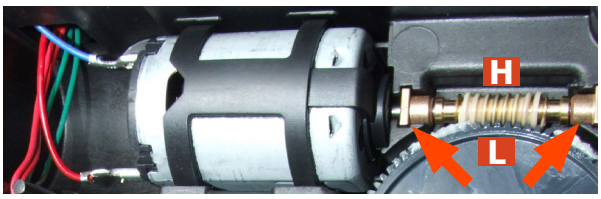
Loosen the screws as illustrated and remove the gear motor cover.



The following are located inside the compartment protected by the casing:
- Electric motor (A) with gears (B) and (C) for transmission and timing of the dispenser.
- Brewing unit present microswitch (E).
- Microswitch (D) detecting brewing unit home and work positions.
- Remove the gear (C) that meshes with the motor transmission shaft.
- Remove the large gear (B).
- Remove the motor (A), complete with transmission shaft.

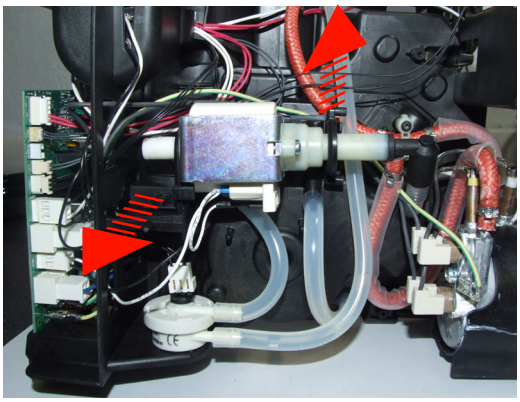


Replace the gear (B), making sure that the imprint of the arrow is aligned with the opening containing the pin (P).

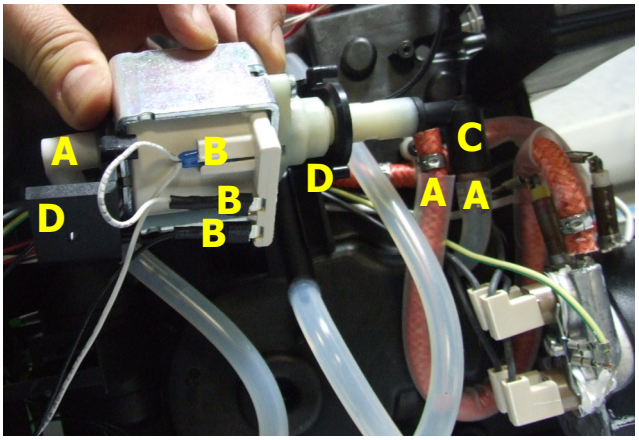


When replacing the motor and the transmission shaft, make sure the guide runners (L) are in the right position.
Grease the shaft thoroughly and evenly.

7.10. Pump

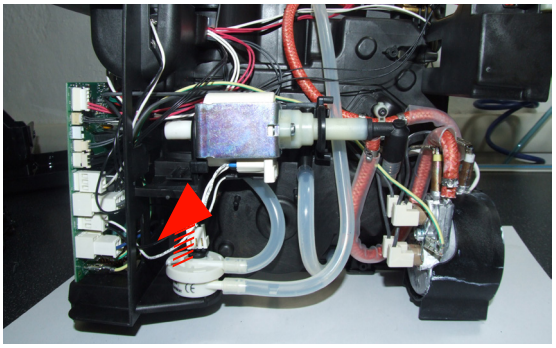


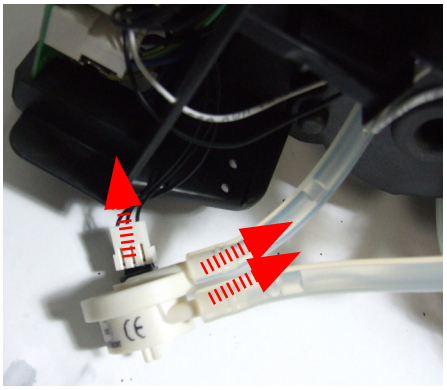
Unhook the pump from the supports.



Disconnect the water circuit connections (A) and electrical connections (B), loosen the safety valve (C) and slide the pump off the brackets (D).

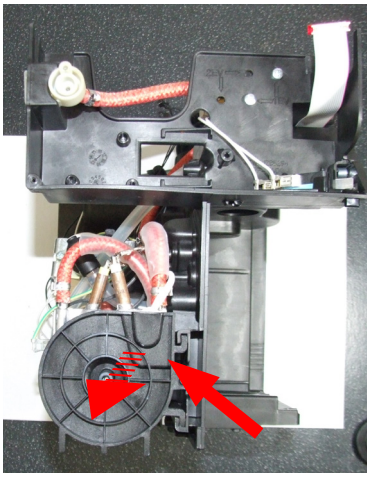
7.11. Flow-meter



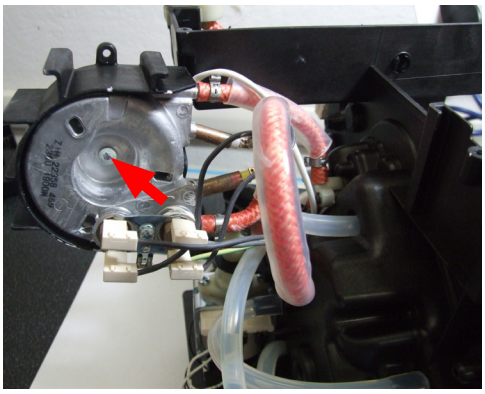


Lift the flow meter out of the casing assembly and remove the electrical and water circuit connections.

7.12. Boiler

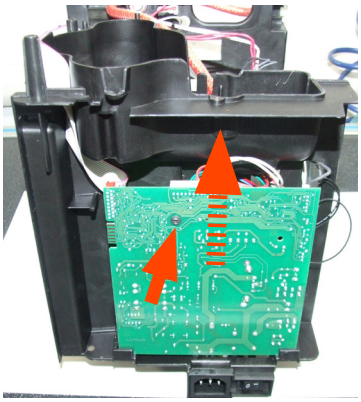


Unscrew the screw shown at unthread the support boiler



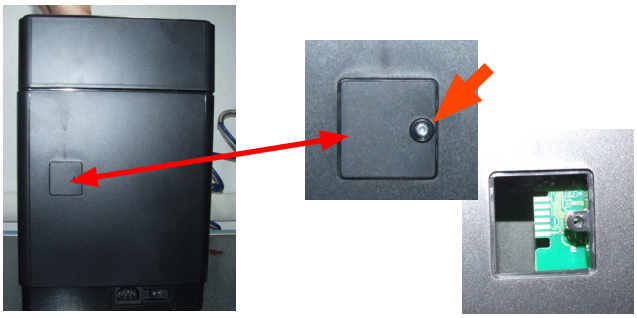
Unscrew the screw shown and remove the electrical and water circuit connections.

7.13. CPU board



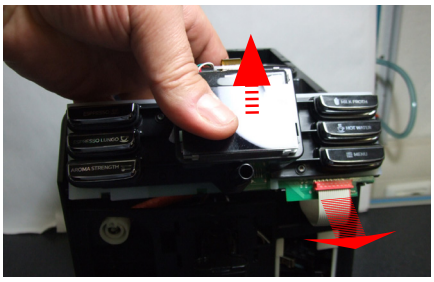
Loosen the screws slide the card off the support and disconnect the electrical connections.

7.14. Programming access for Espresso Philips Service Center (EPSC)

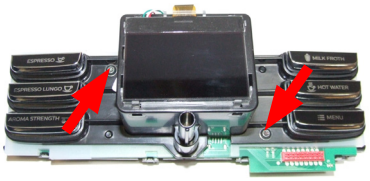


Loosen the screw for remove the cover.

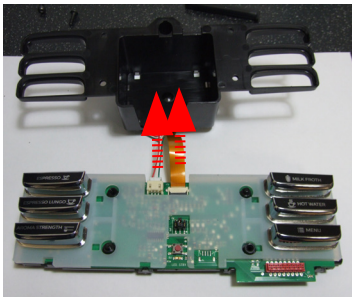
7.15. KYB interface and display



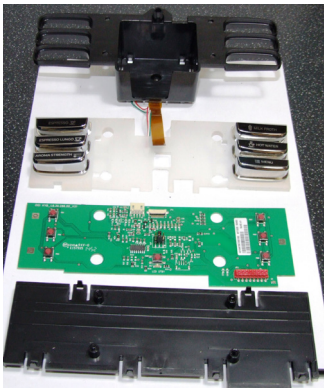
Remove the support KYB assy. and disconnect the flat cable.



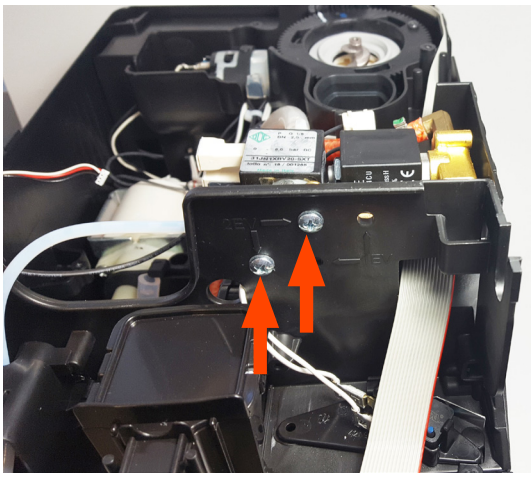
Loosen the screws for remove the cover.



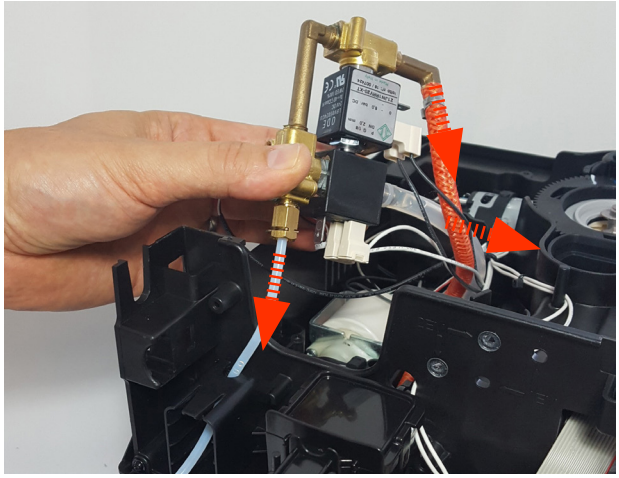
Disconnect the electrical connections.



7.16. Two/three-way solenoid valve

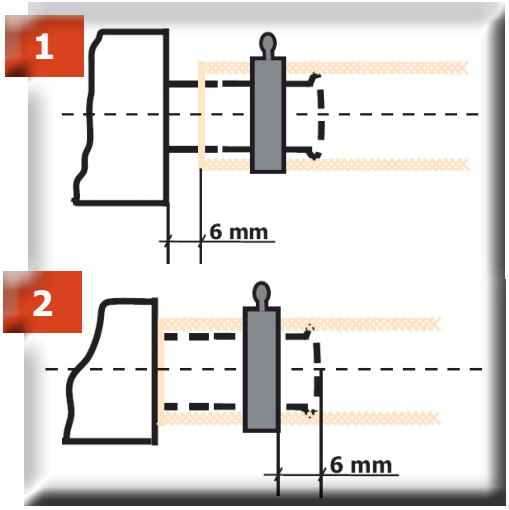


Loosen the screws holding the solenoid valve to the upper plate



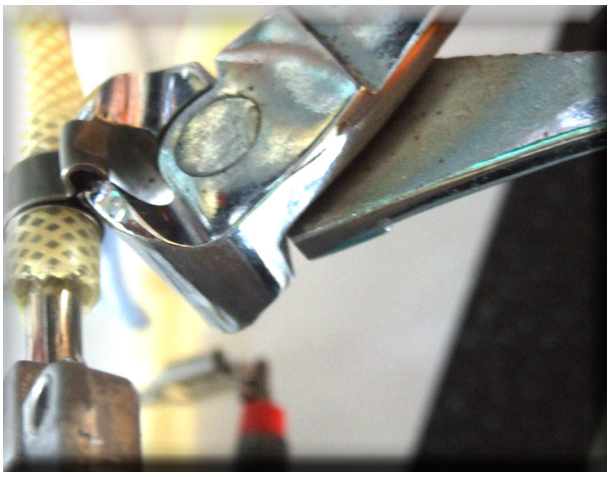
Disconnect all electrical and water circuit connections

7.17. Fitting and removing Oetiker clamps



1) Boiler connection.

2) Other connections.



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

Tighten the clamp as illustrated.