Data Sheet and Service Manual

MAGNIFICA EVO

ECAM29X.2Y, ECAM29X.3Y, ECAM29X.4Y

Date: 11.05.2021

TABLE OF CONTENTS:

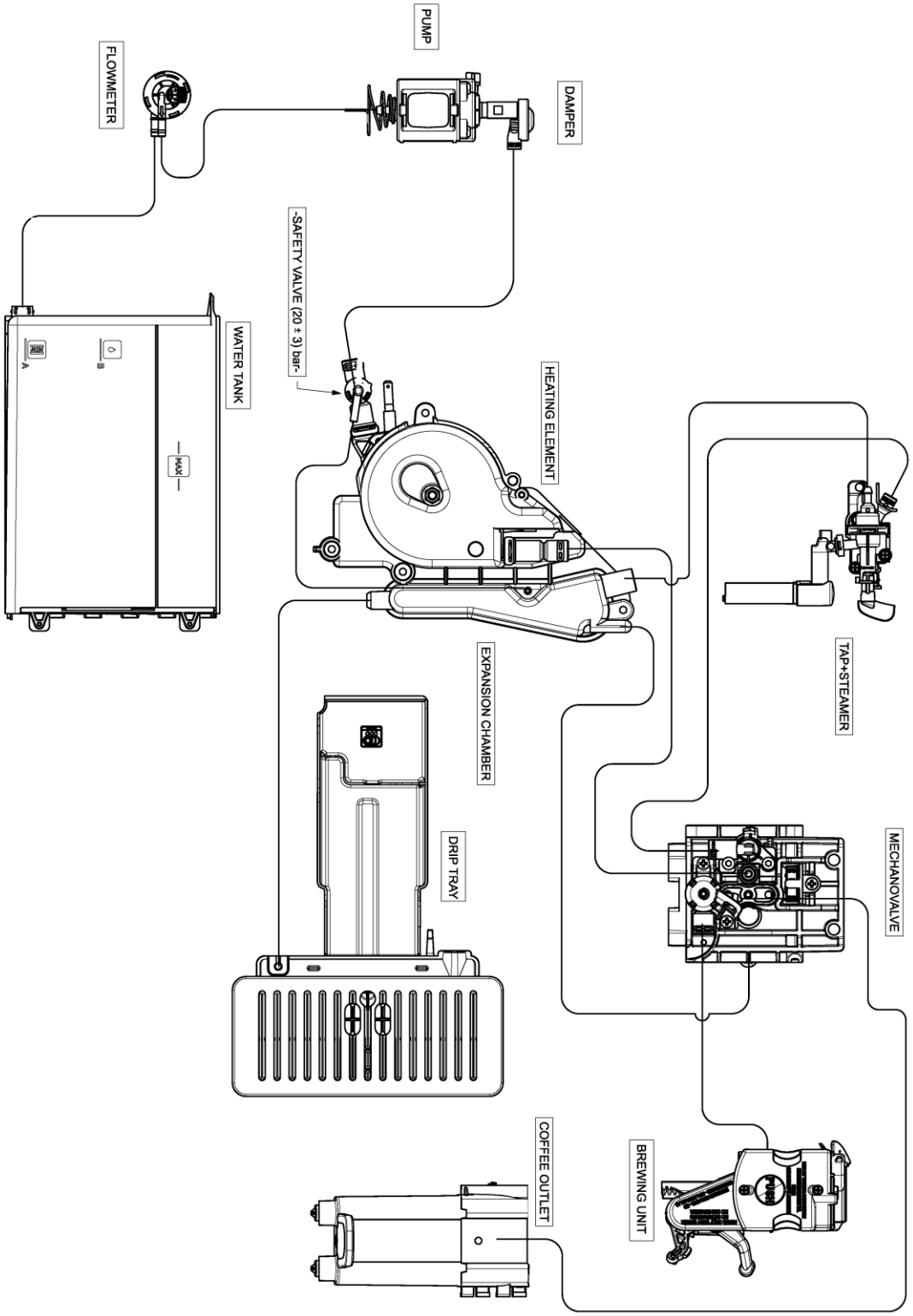
1. TECHNICAL DATA

Voltage	220-240V / 50-60 Hz
MAX. Input power	1450 W
Stand-by Button OFF	0,19 Wh (plug inserted but machine OFF)

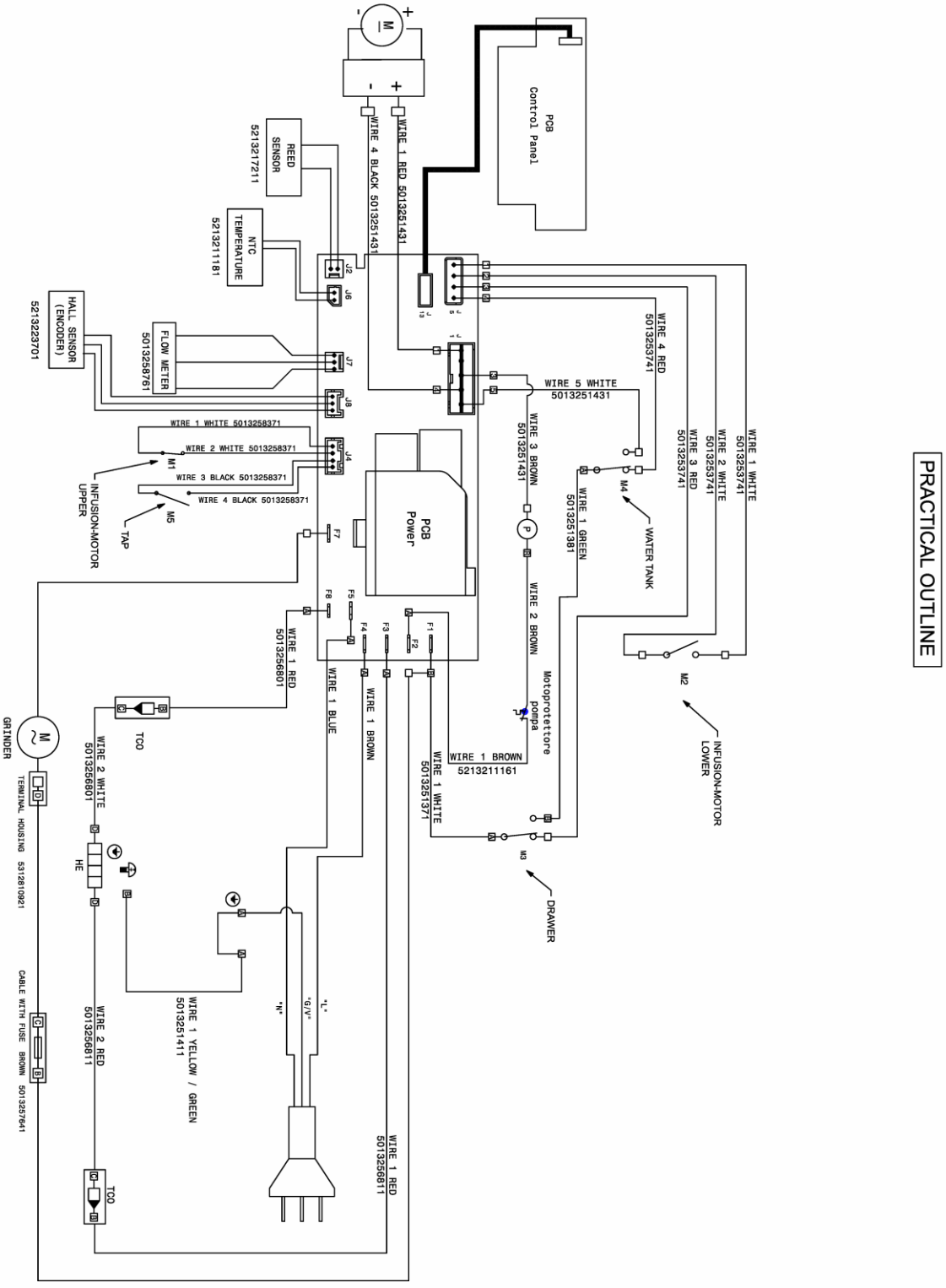
COMPONENTS

Pump	220-240V AC - 48 W – Bar 15
Grinder motor	230V AC
Transmission motor	230V DC with position encoder
Thermoblock	
- Temperature probe	NTC sensor: operating set point
- Thermal fuse TCO	192 °C
- Heating element	230V AC – 1400 W

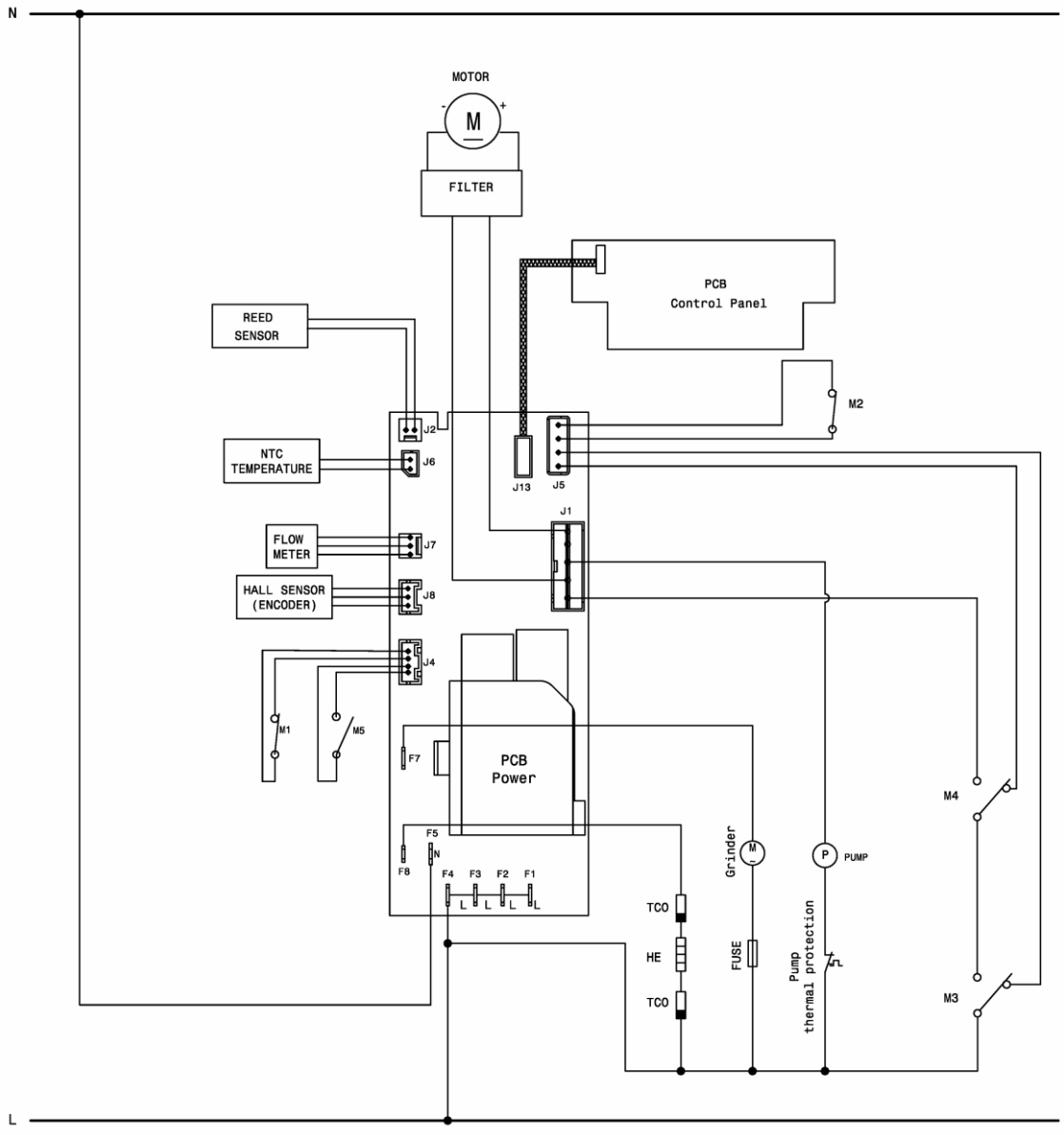
2. HYDRAULIC DIAGRAM



3. WIRING DIAGRAM



THEORETICAL OUTLINE



CAPTION:

L : PHASE/LINE
N : NEUTRAL
TCO : THERMAL CUT OFF/THERMAL LINK
HE : HEATING ELEMENT
M1 : MICROSWITCH UPPER (GROUP INFUSION-MOTOR)
M2 : MICROSWITCH LOWER (GROUP INFUSION-MOTOR)
M3 : MICROSWITCH DRAWER
M4 : MICROSWITCH WATER TANK
M5 : MICROSWITCH TAP

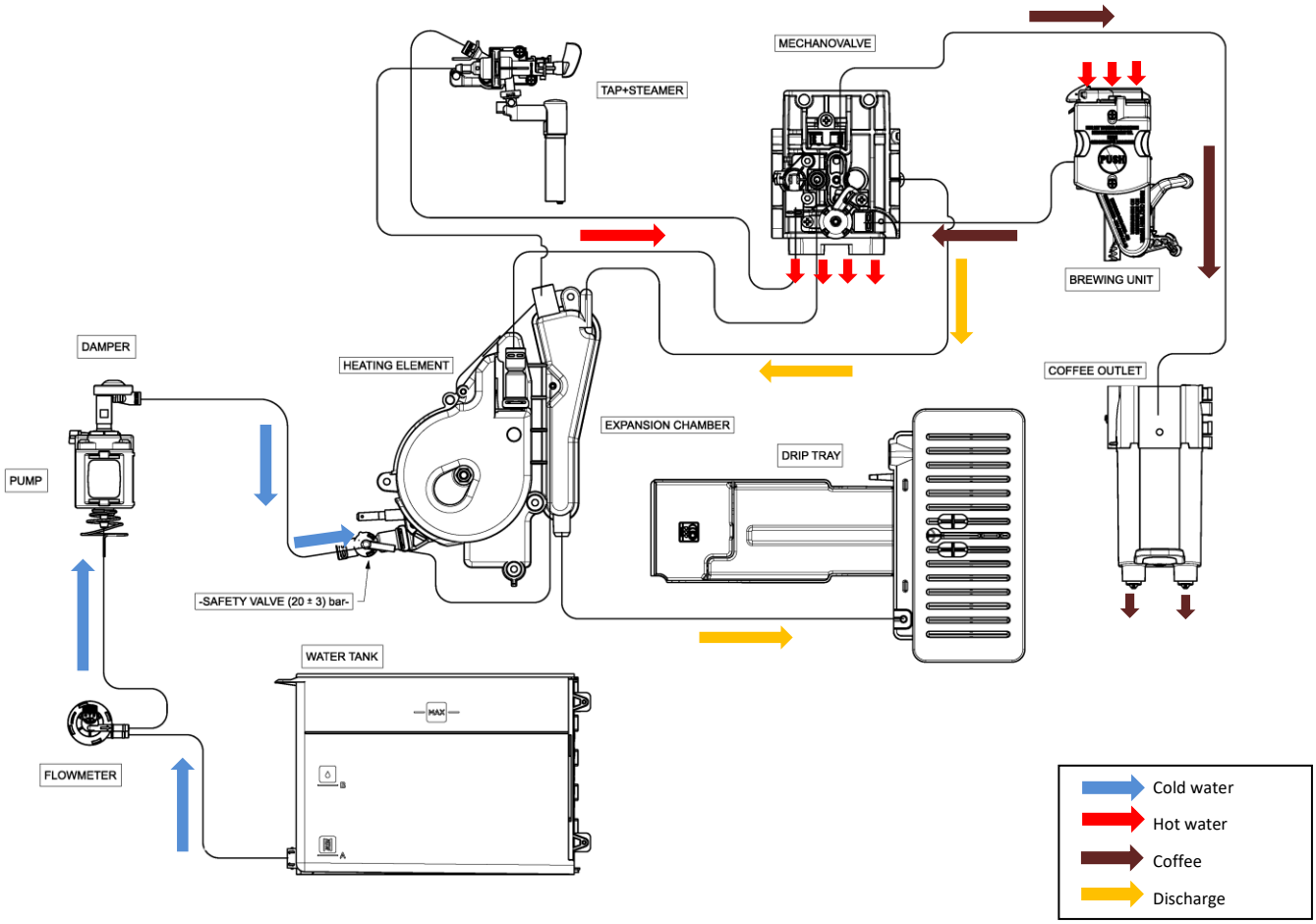
4. WORKING PRINCIPLE

4.1. MICROSWITCHES AND SENSORS

MICROSWITCHES	Function	Logic
M1 = UPPER MICROSWITCH	Detects when the infuser is on top position	"NC", it opens when the infuser is in top position
M2 = LOWER MICROSWITCH	Detects when the infuser is on down position	"NO", it closes when the infuser is in down position
M3 = DRAWER MICROSWITCH	Detects when the drip tray is in correct position	Changeover micro switch. When the drip tray is inserted: - the contact for the drip tray detection is OPEN; - the contact for the transmission motor power supply is CLOSED.
M4 = WATER TANK MICROSWITCH	Detects the presence of the water tank	Changeover micro switch. When the water tank is inserted: - the contact for the water tank detection is OPEN; - the contact for the transmission motor power supply is CLOSED.
M5 = HOT WATER TAP MICROSWITCH	Detects when the hot water tap is in I position.	"NO", it closes when the hot water tap is in I position.

REED AND ENCODER	Function	Logic
REED SENSOR LOW WATER TANK	Detects when the water level is at minimum	
HALL SENSOR ENCODER	Detects rotations of transmission motor	

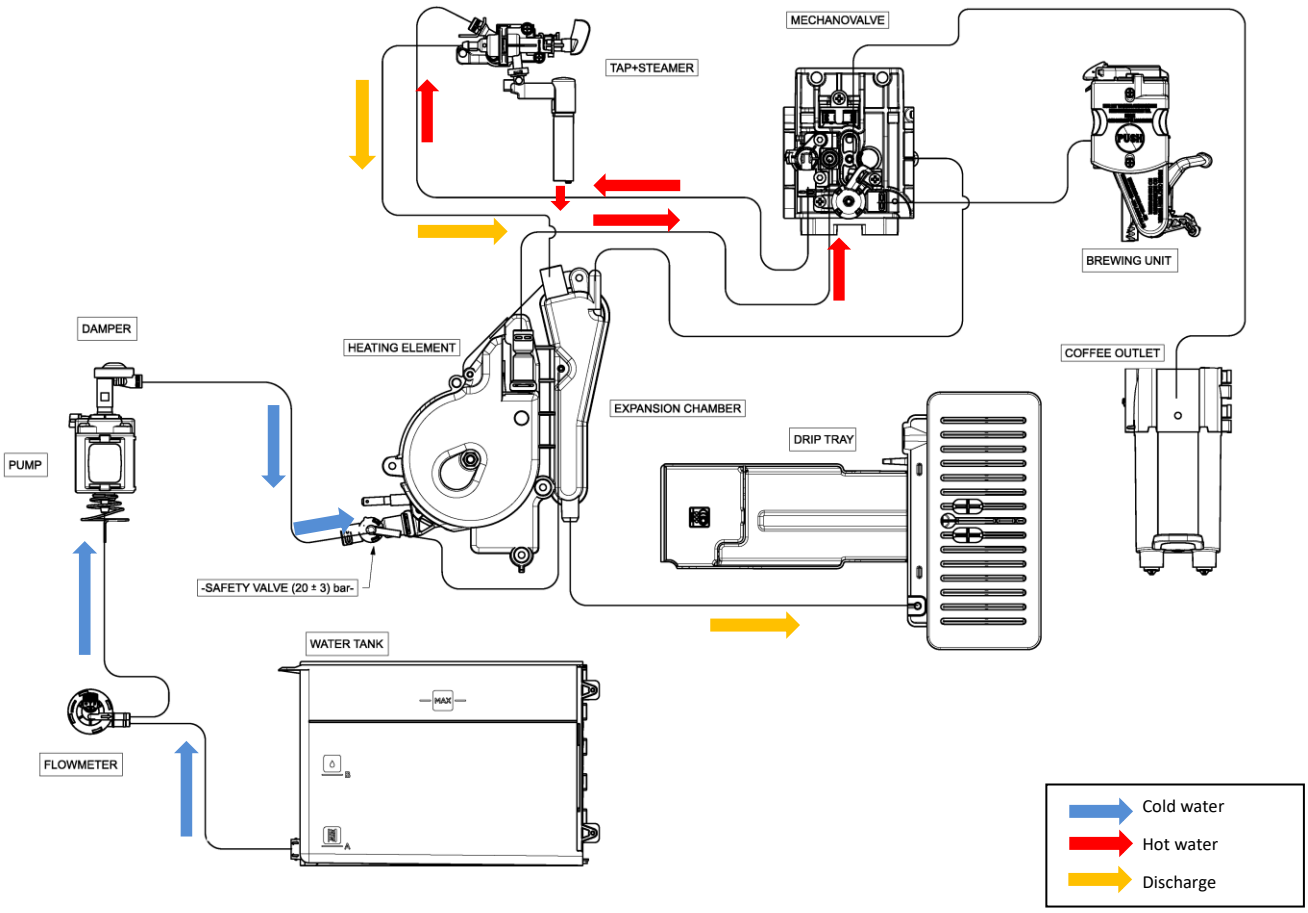
4.2. COFFEE DELIVERY



Espresso delivery steps:

- Thermoblock is activated
- Grinder is activated for a certain timing (based on the coffee taste selection)
- Infuser moves to the mechanical valve
- Pump is activated for a couple of seconds for pre-infusion
- Pump restarts for coffee delivering
- Pump and thermoblock stop
- Infuser moves away from the mechanical valve and releases the coffee pod
- Mechanical valve discharges excess water/coffee to the expansion chamber and drip tray
- Infuser is moved back to the “Coffee Ready” position

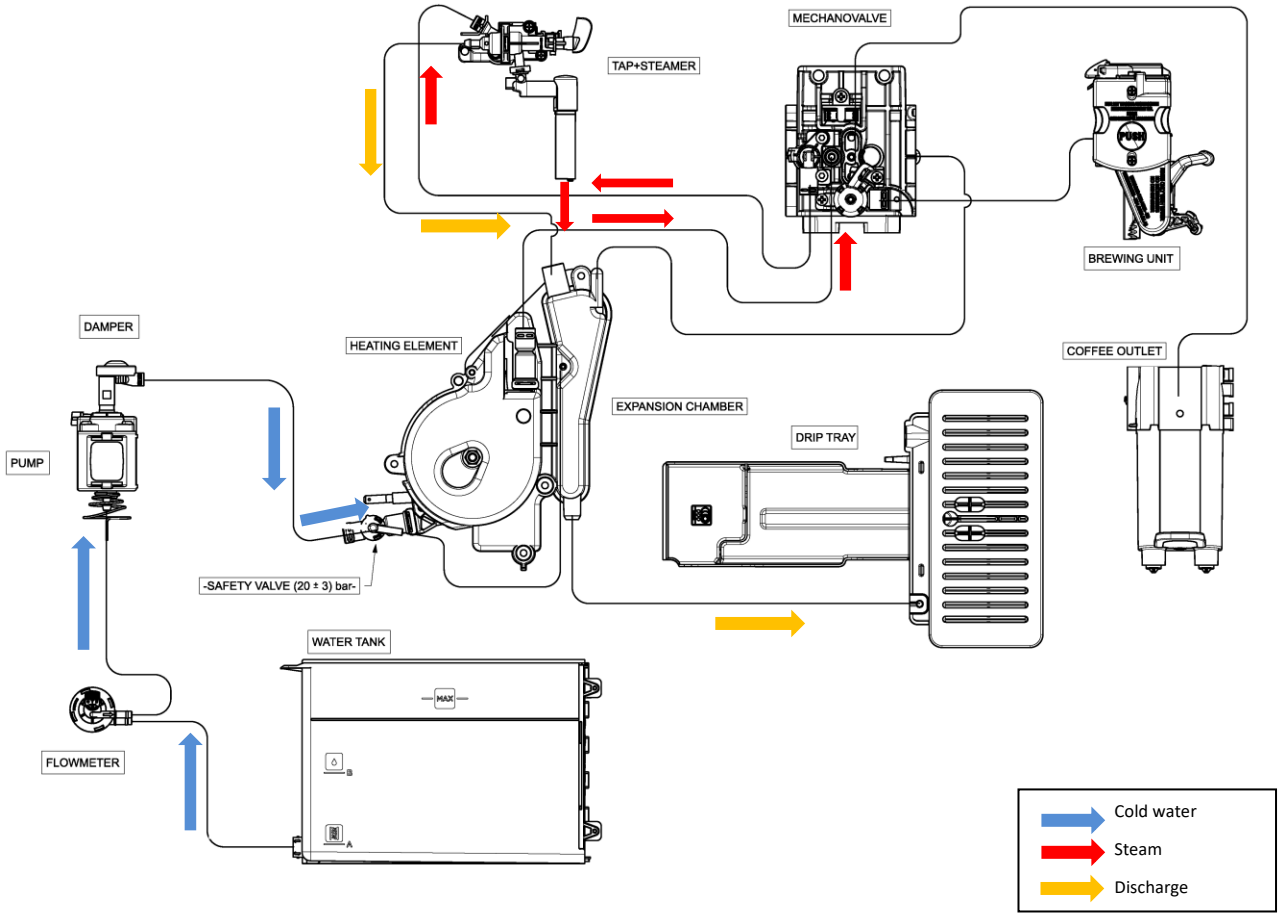
4.3. HOT WATER DELIVERY



Hot water delivery steps:

- Thermoblock is activated
- Pump is activated in fast pulsing mode for a certain timing
- Hot water is delivered through the hot water spout
- Pump stops, Thermoblock is deactivated

4.4. STEAM PREPARATION



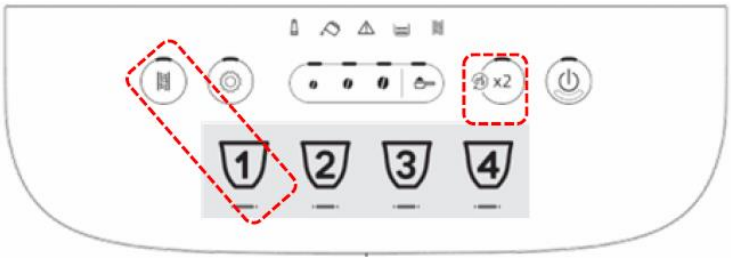
Steam delivery steps:

- Thermoblock is activated (**setting temperature higher than 100°C**)
- Pump is activated in slow pulsing mode for a certain timing
- The steam is delivered from the spout
- Pump stops, Thermoblock is deactivated

5. TEST MODE

5.1. PROCEDURE TO ACTIVATE TEST MODES

- The appliance must be plugged-in and in stand-by mode.
- Remove the drip tray. The GROUNDS CONTAINER icon will flash
- Hold the combination of the below three button pressed (depending on the model):



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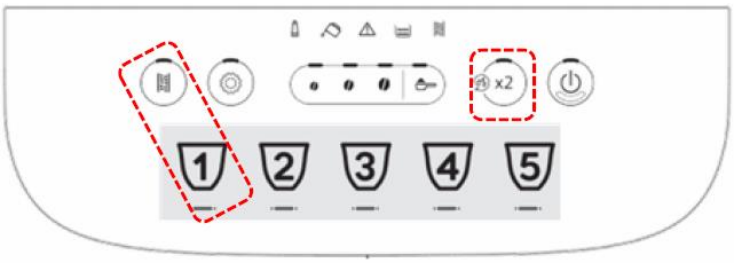
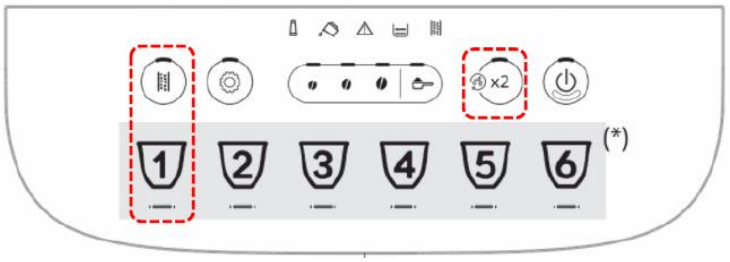
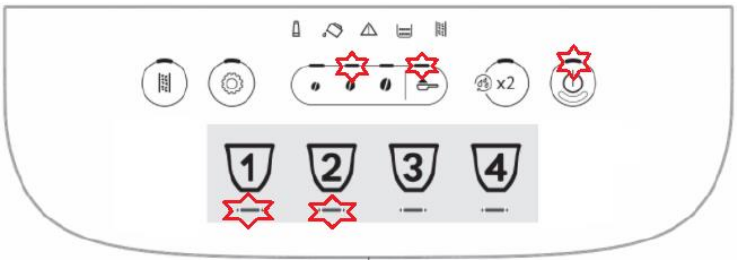


ECAM29X.3Y



ECAM29X.4Y

until the GROUNDS CONTAINER icon will turn OFF and the LEDs of the below buttons (depending on the model) will start flashing:



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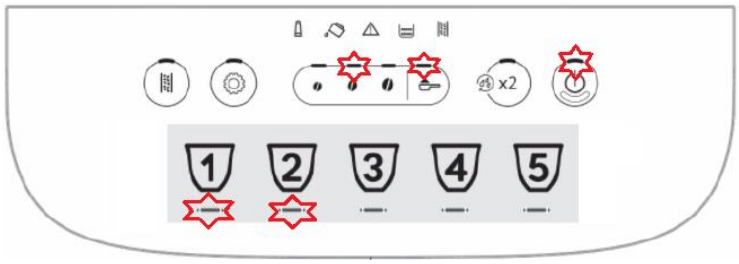

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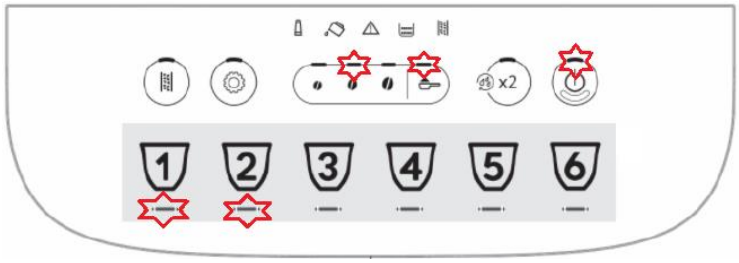

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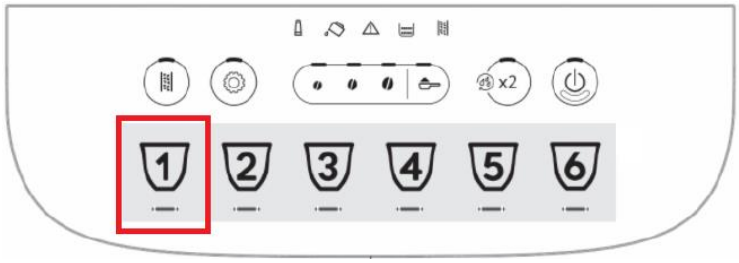
- Insert the grounds container and press one of the buttons indicated in the next paragraphs to start the corresponding test function.

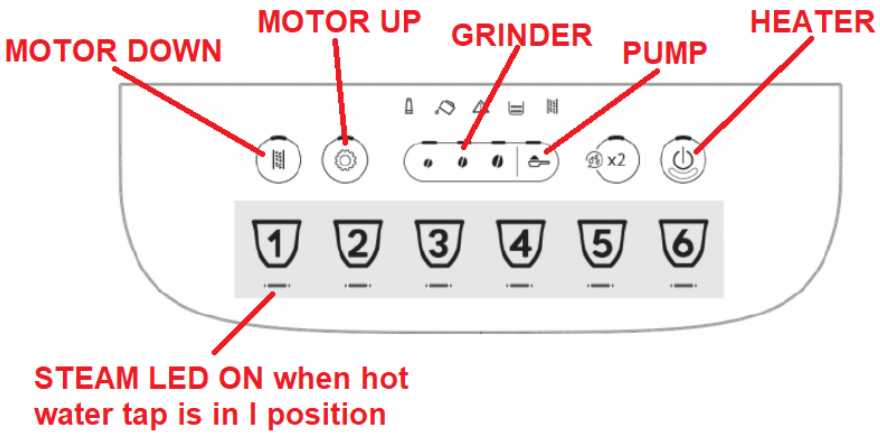
<u>IMPORTANT NOTICE</u>: The access to the desired test function must be done within 10 seconds, otherwise the machine will automatically come back to stand-by mode.

5.2. LOAD TEST MODE

After having accessed the test mode as indicated on paragraph 5.1, press the first beverage icon from the left (**STEAM** button) to access the **LOAD TEST MODE**:



The LED of each button linked to the activation of a component will illuminate steadily white. Hold the desired button pressed to activate the corresponding load, the LED of the button will flash slowly to indicate the activation of the load:

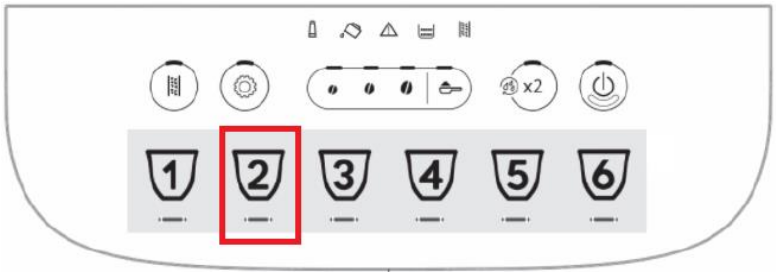


NOTICE: When the **DOWN** micro switch is reached by the infuser, the **DESCALE** LED will blink fast.

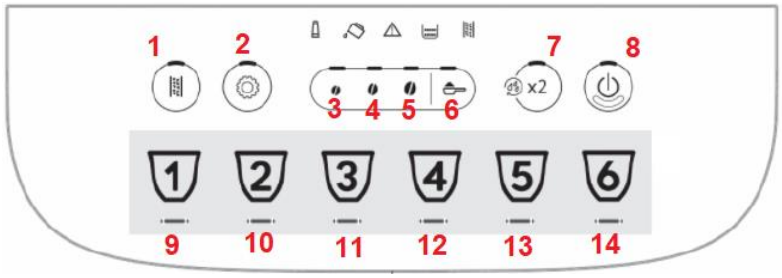
NOTICE: When the **UP** micro switch is reached by the infuser, the **SETTINGS** LED will blink fast.

5.3. DISPLAY TEST MODE

After having accessed the test mode as indicated on paragraph 5.1, press the second beverage icon from the left (**ESPRESSO** button) to access the **DISPLAY TEST MODE**:



During the display test mode all the LEDs are lit up. When a button is pressed, only the LED of that button remains ON, while those of all the other buttons will be turned OFF:



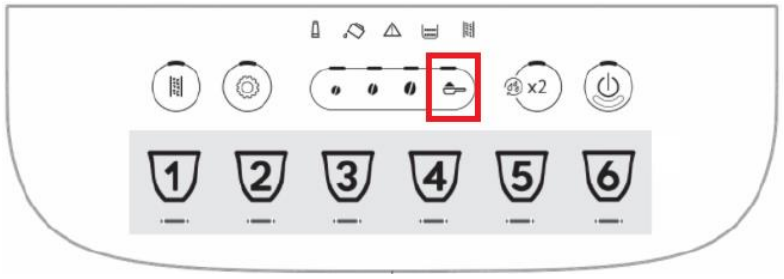
In particular, by pressing **each of the AROMA buttons**, in addition to the button LED, also the two neighbor warning LEDs will illuminate steadily:

NOTICE: The **DISPLAY TEST MODE** will reset the following settings in the appliance:

- **First run**: the machine will ask again for hydraulic circuit filling.
- **Filter installation**: if the filter installation function was enabled, it will be disabled.

5.4 ENCODER RESET

After having accessed the test mode as indicated on paragraph 5.1, press the **PRE-GROUND** button to perform the **ENCODER RESET**, i.e. the reset of the value of the maximum height of the infuser:



The PRE-GROUND LED will remain steady ON while the reset is in progress, then it will go OFF when the reset is completed.

IMPORTANT: To complete the encoder reset procedure, start the appliance normally and **perform a manual rinse** with the dedicated button.

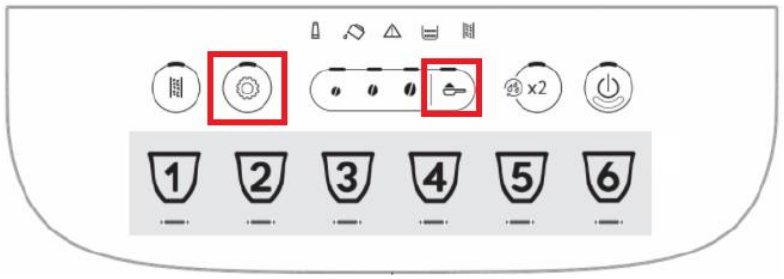
The infuser must be clean and smooth in its movements to allow the encoder reset to be validated correctly.

6. STATISTICS READING

The appliance allows the reading of the statistics data to understand exactly how the machine operated along the time.

To access the **STATISTICS** function:

- make sure the appliance is **ready to use** (i.e. in ready-for-coffee mode);
- hold the **SETTINGS** and **PRE-GROUND** buttons **pressed for at least 5 seconds**:

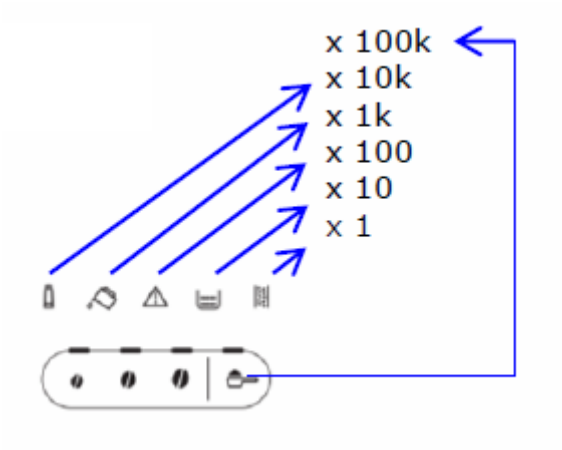


The LEDs of the buttons dedicated to read the statistics values will illuminate steadily.

Press the desired button to display the corresponding statistics data:

BUTTON	STATISTIC DATA
ESPRESSO (Beverage 2)	Number of Coffee Beverages
STEAM (Beverage 1)	Number of Steam Deliveries
DESCALE	Number of Descaling Processes
X2/RINSE	Litres of Water
MID AROMA COFFEE BEAN	Number of Filters Installed

After having pressed the desired button, the appliance will display the corresponding statistic value with the sequential flashing of the below lights:



Example: To display a total amount of 24 coffee beverages, the appliance will display:

- *4 flashings of the DESCALE light;*
- *followed by 2 flashings of the GROUNDS CONTAINER light.*

NOTICE: To exit the statistics mode, press the **SETTINGS** button again or wait for 120 seconds without operating on the machine. The appliance will come back to the ready to use mode.

7. TROUBLESHOOTING

7.1. POSSIBLE TESTS WHICH CAN BE EXECUTED FROM THE TEST MODE

A. COFFEE CIRCUIT FLOW ACTIVATION

- Move the infuser to the UP position (MOTOR UP).
- Activate the pump.

The water will pass through the flow meter, the Thermoblock, the mechanical valve, the infuser and will come out from the coffee spout.

B. HOT WATER CIRCUIT FLOW ACTIVATION

- The infuser does **not** have to be in upper position.
- Open the hot water tap.
- Activate the pump.

The water will pass through the flow meter, the Thermoblock, the hot water tap. Finally it will come out from the hot water spout.

7.2. ELECTRIC CHECKS DIRECTLY ON THE COMPONENTS

A. HEATING ELEMENTS RESISTANCE CHECK

- Thermoblock resistance value: **≈ 35 Ohms**.

B. RESISTANCE/TEMPERATURE CHARACTERISTICS FOR NTC SENSOR

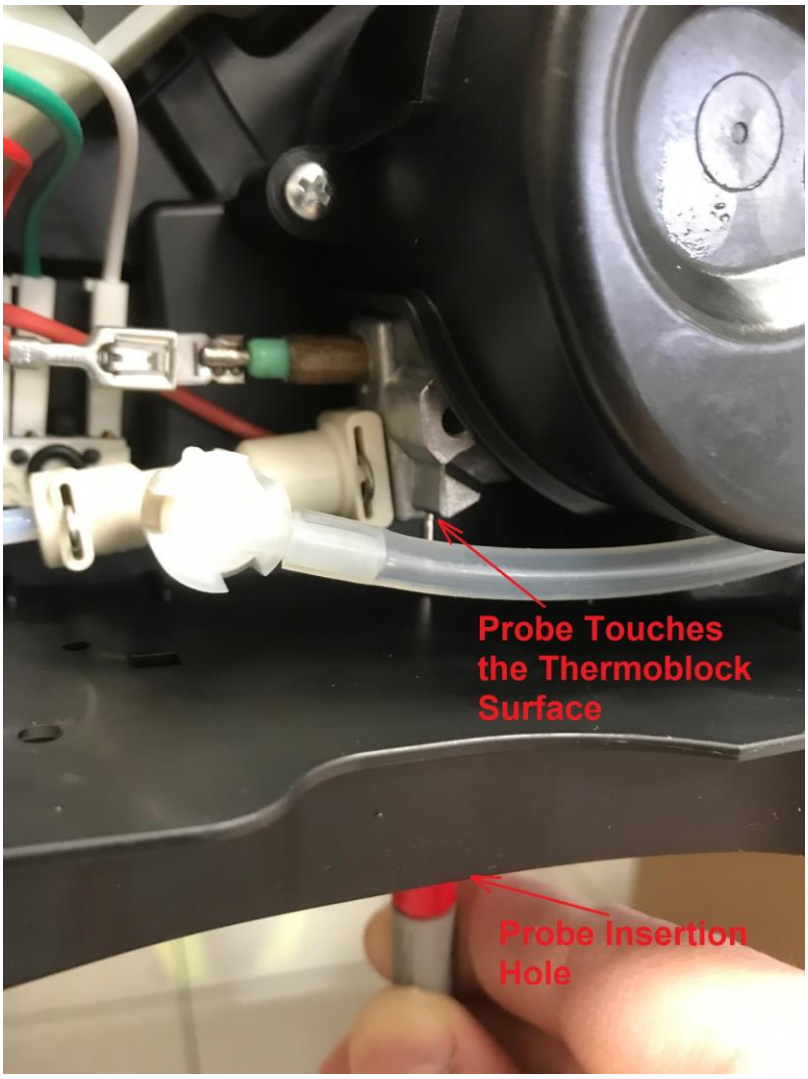
- Resistance/temperature characteristics for the thermoblock NTC:

RESISTANCE - TEMPERATURE CHARACTERISTICS

TEMP. °C	MINIMUM kΩ	NOMINAL kΩ	MAXIMUM kΩ	Temp. Accy °C	Resi.Accy %
0.0	310.0	328.9	348.8	± 1.17	± 6.05
20.0	118.6	124.6	130.9	± 1.10	± 5.00
40.0	50.75	52.85	55.02	± 1.01	± 4.10
60.0	23.82	24.61	25.43	± 0.92	± 3.31
80.0	12.09	12.41	12.73	± 0.81	± 2.62
100.0	6.557	6.691	6.825	± 0.60	± 2.00
120.0	3.664	3.759	3.855	± 0.94	± 2.55
140.0	2.161	2.228	2.296	± 1.22	± 3.06
160.0	1.327	1.375	1.423	± 1.51	± 3.51
180.0	0.8445	0.8781	0.9126	± 1.82	± 3.93
200.0	0.5541	0.5783	0.6033	± 2.14	± 4.32

C. GROUND CHECK POINT FOR THE APPLIANCE

In order to check the main ground connection of the appliance insert the ground tester probe from the round hole located on the basement of the appliance on the Thermoblock side until it will touch the Thermoblock metal surface, as displayed in the below picture:



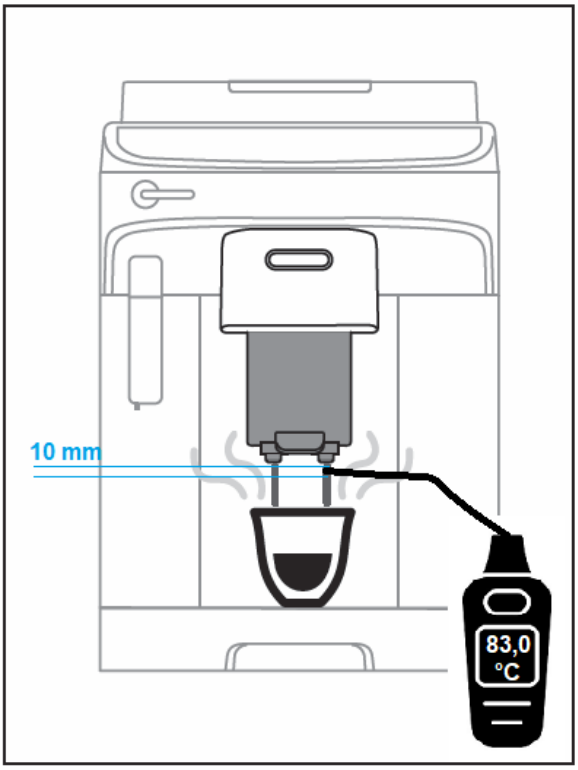
7.3. COFFEE TEMPERATURE TEST

Complains from end users about coffee temperature are quite frequent. They are mainly due to incorrect appliance adjustments or to an incorrect expectation by the customer.

A **coffee temperature measurement** is required all the times any of these complaints are encountered.

To perform the coffee temperature test, follow in sequence the below steps:

- Turn the appliance ON.
- Set the temperature to MAX level.
- Run 1-2 rinse cycles, to warm up the hydraulic circuit.
- Set the temperature to the maximum level.
- Select to prepare an **X2 ESPRESSO COFFEE** (2 cups recipe, refer to the user manual for more details).
- Start the coffee preparation.
- Wait until at least 20ml of coffee have been delivered into the cup.
- Measure the coffee flow temperature at about 2÷10mm from the coffee spout, as shown in the below picture:



The **optimal indicative temperature measurement** for coffee should be **83°C±3°C**.