

Data Sheet

ECAM350.55 EX:4, ECAM350.75 EX:4

Date: 15.12.2022



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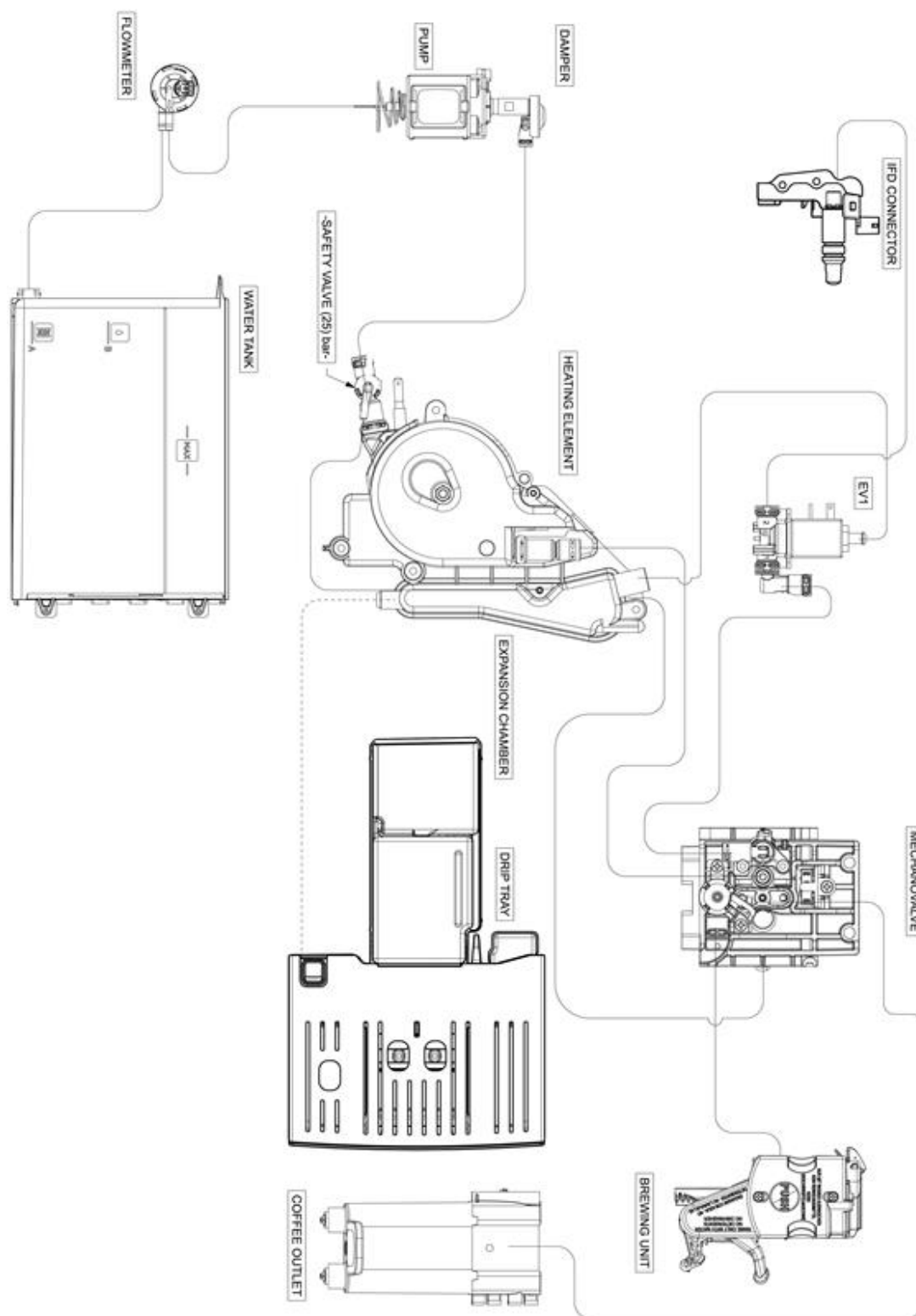
1. TECHNICAL DATA

Voltage	220-240V / 50-60Hz
MAX. Input power	1450 W
Stand-by Button OFF	0,25 W/h (plug inserted but machine OFF)

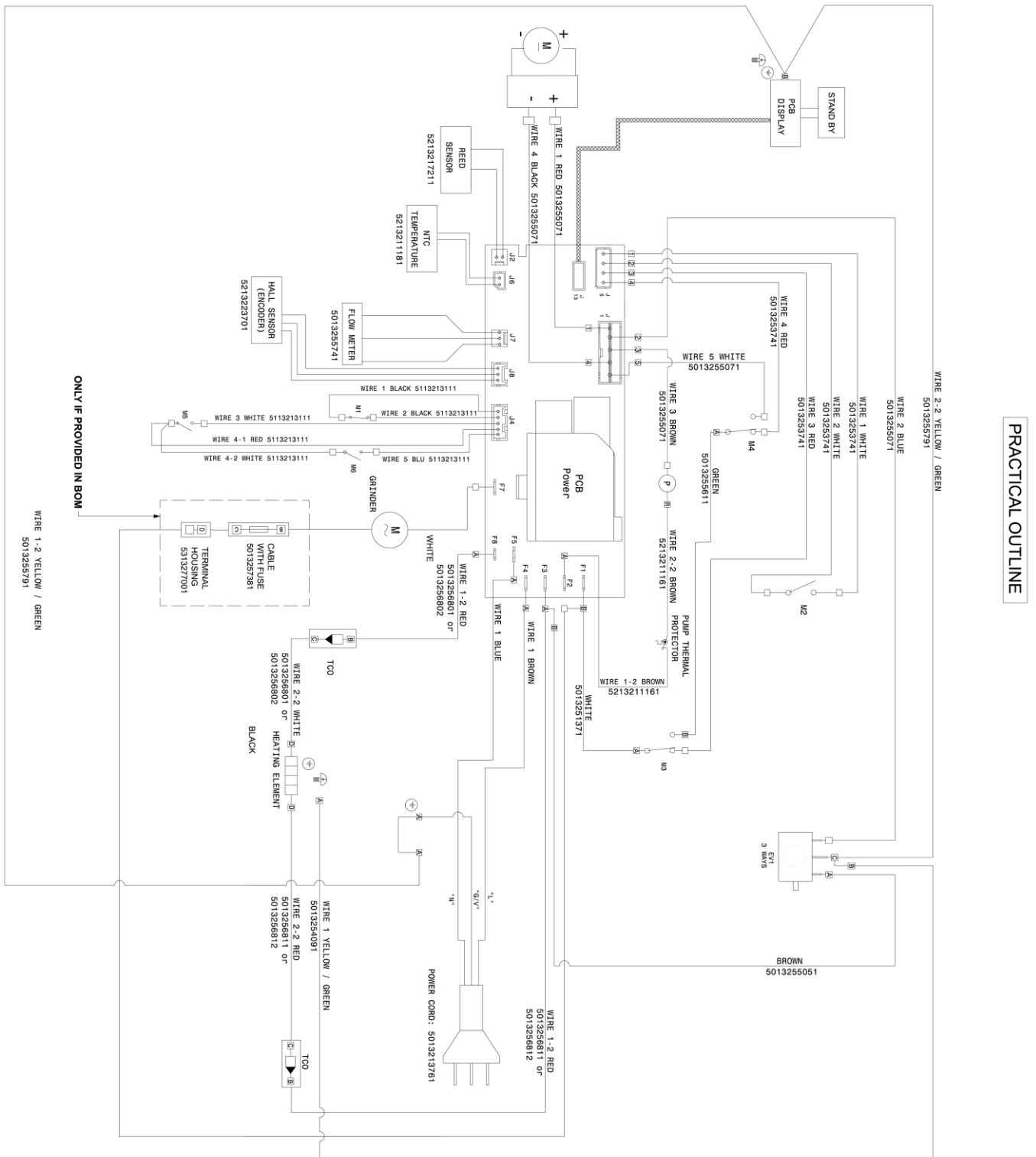
COMPONENTS

Pump	230V AC - 48 W - 15 Bar
Grinder motor	230V AC
Transmission motor	230V DC with position encoder
EV1 solenoid valve	230V AC
Thermoblock	
- Temperature probe	NTC sensor: operating set point
- Thermal fuse TCO	192 °C
- Heating element	230V AC - 1400 W

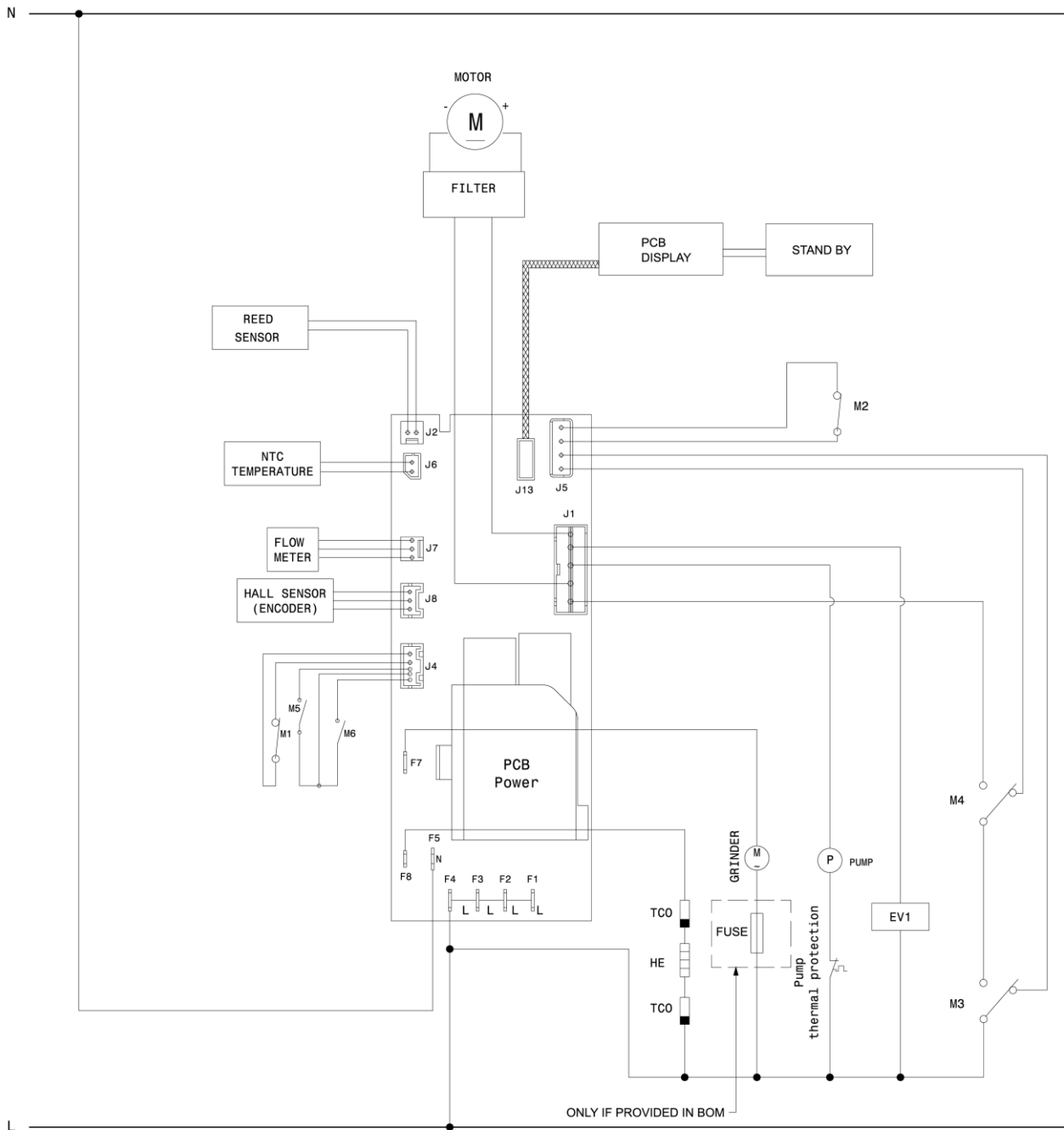
2. HYDRAULIC DIAGRAM



3. WIRING DIAGRAM



THEORETICAL OUTLINE



LEGEND:

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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 IFD CONNECTOR (MILK JUG)
M6 : MICROSWITCH WATER PIPE
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4. WORKING PRINCIPLE

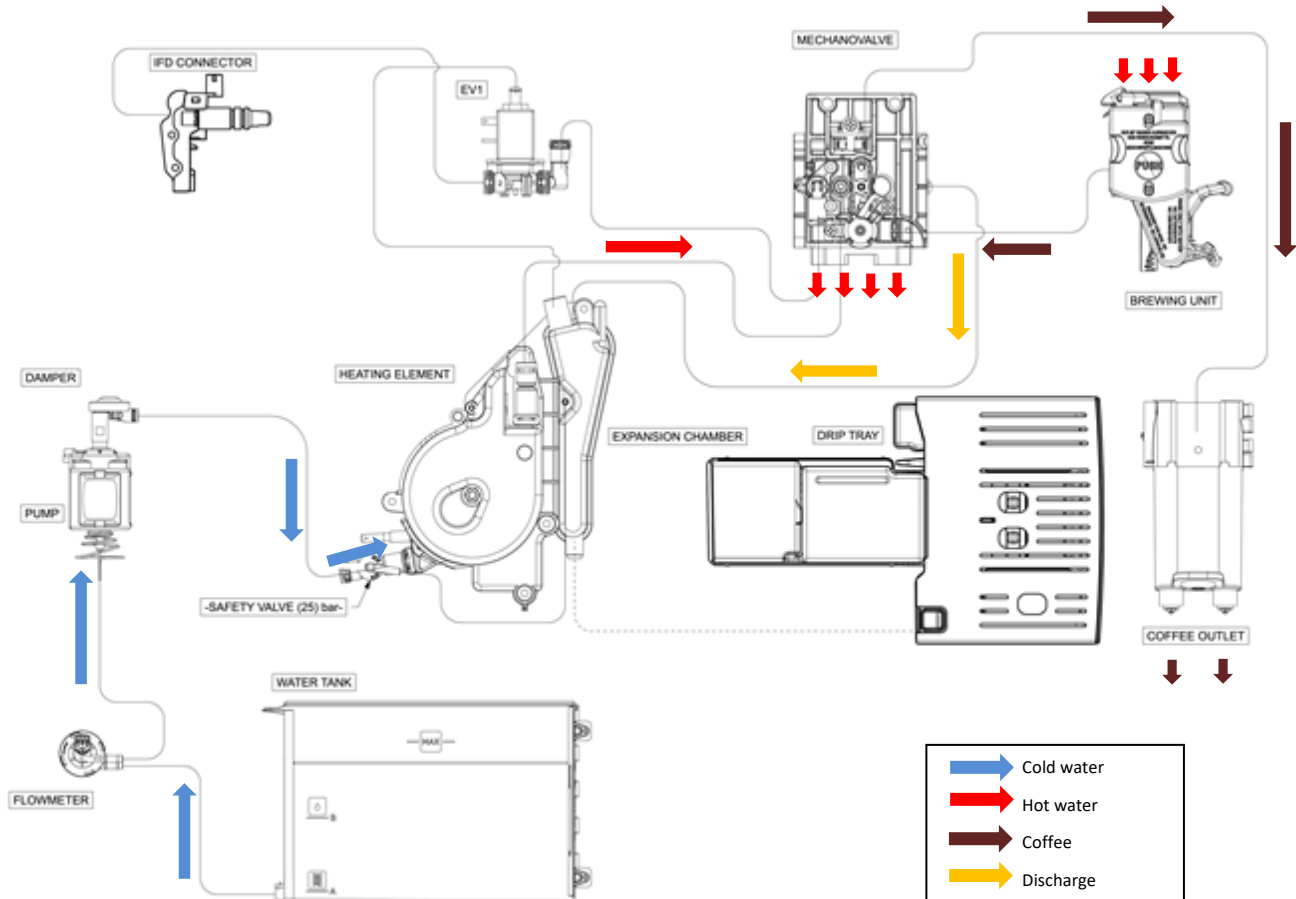
4.1. MICROSWITCHES, SENSORS AND SOLENOID VALVES

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 = IFD CONNECTOR MICROSWITCH	Detects when the IFD connector is attached to the machine	"NO", it closes when the IFD connector is attached.
M6 = HOT WATER SPOUT MICROSWITCH	Detects when the hot water spout is attached to the machine	"NO", it closes when the hot water spout is attached.

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	

SOLENOID VALVE	Function	Logic
EV1 SOLENOID VALVE	3-Ways solenoid valve	It opens to deliver hot water through the hot water spout and steam to the milk jug for milk frothing. When it closes, it allows the discharge of the residual pressure to the expansion chamber and drip tray.

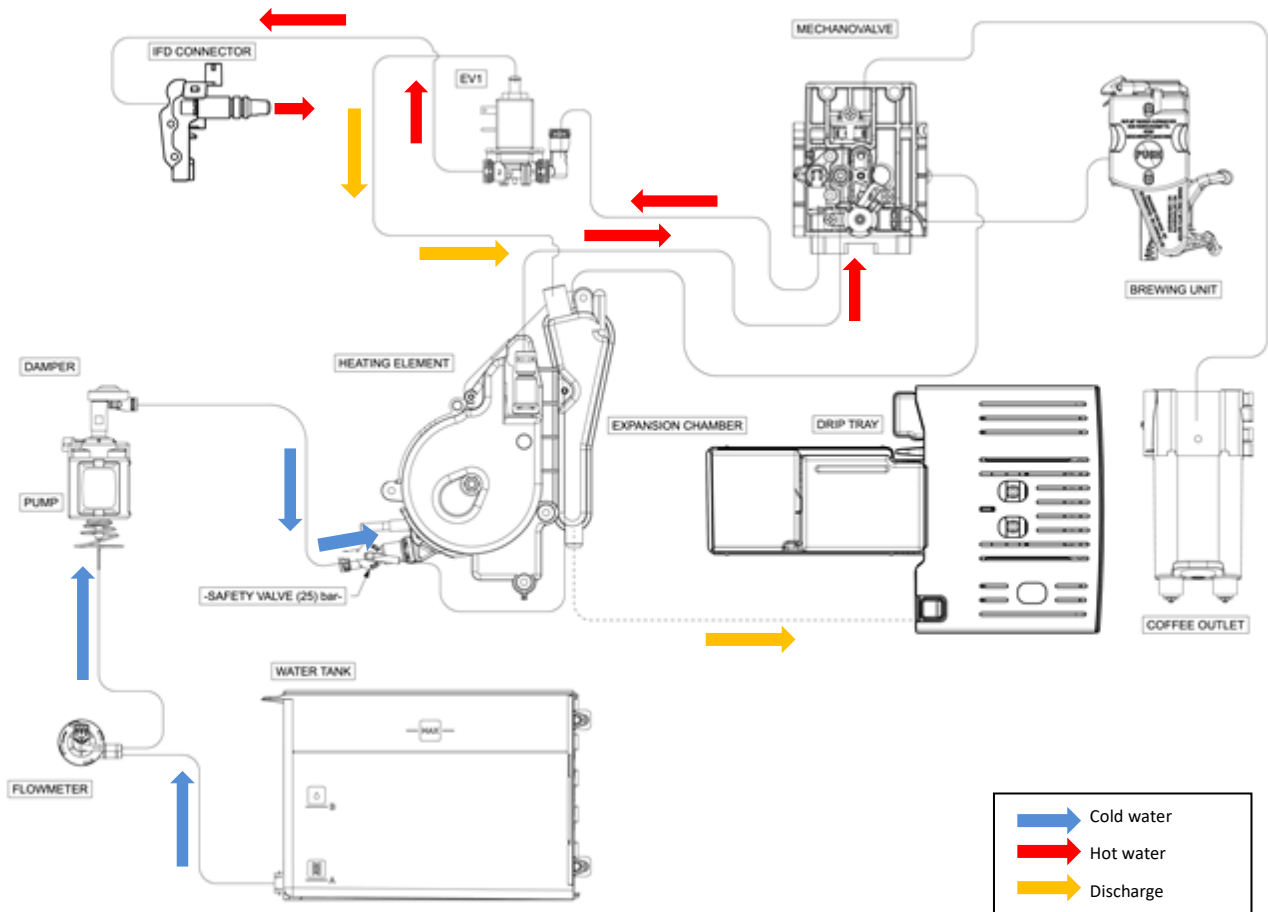
4.2. COFFEE DELIVERY



Coffee 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 expansion chamber
- Infuser is moved back to the "Coffee Ready" position

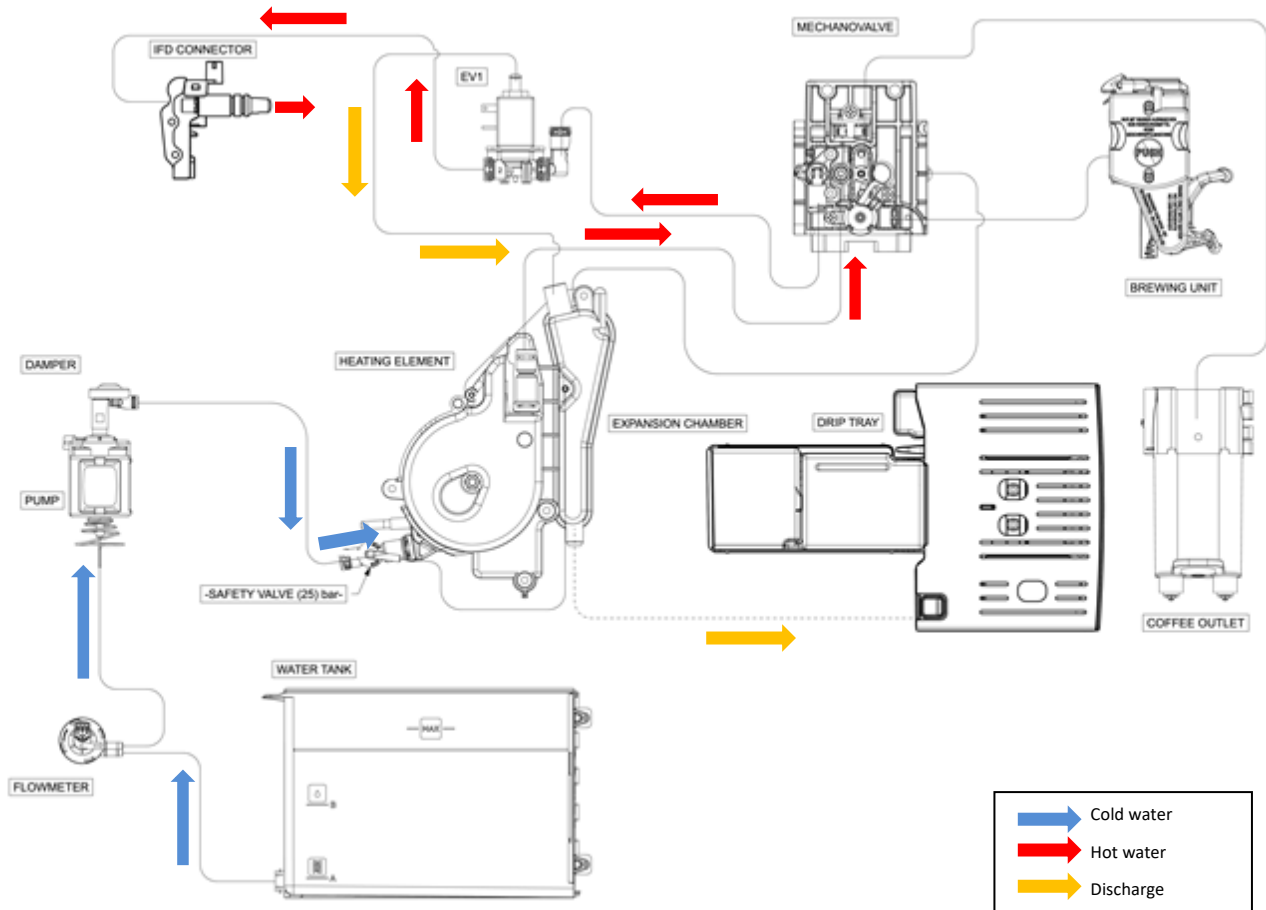
4.3. HOT WATER DELIVERY



Hot water delivery steps:

- Thermoblock is activated
- EV1 solenoid valve is activated
- Pump is activated in fast pulsing mode for a certain timing
- Hot water is delivered through the hot water spout connected to the accessory nozzle
- Pump stops, EV1 and Thermoblock are deactivated

4.4. MILK FROTHING PREPARATION



Milk frothing preparation steps:

- Thermoblock is activated (setting temperature higher than 100°C)
- EV1 solenoid valve is activated
- Pump is activated in slow pulsing mode for a certain timing
- The steam is delivered to the milk jug attached to the accessory nozzle. Here it mixes with milk and air to produce hot frothed milk.
- Pump stops, EV1 and Thermoblock are deactivated

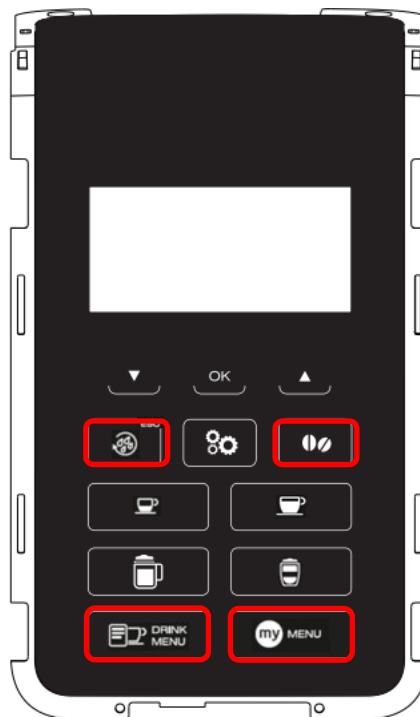
Milk jug cleaning procedure:

- Thermoblock is activated
- EV1 solenoid valve is activated
- Pump is activated in very slow pulsing mode
- Hot water is delivered through the milk jug lid to clean its internal circuit
- Pump stops, EV1 and Thermoblock are deactivated

5. TEST MODE

5.1. PROCEDURE TO ACCESS THE TEST MODES

- The appliance must be plugged-in and in stand-by mode.
- Remove the drip tray.
- When the display show the message “INSERT GROUNDS CONTAINER”, **staying within 10 s:**
 - i) Hold the combination of the below four icons pressed:



- ii) When the message “SELECT TEST MODE” is shown, insert the drip tray and ground container in their position.
- iii) Push the button corresponding to desired operation:

	: LOAD TEST MODE
	: RESET ENCODER
	: DISPLAY TEST MODE

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

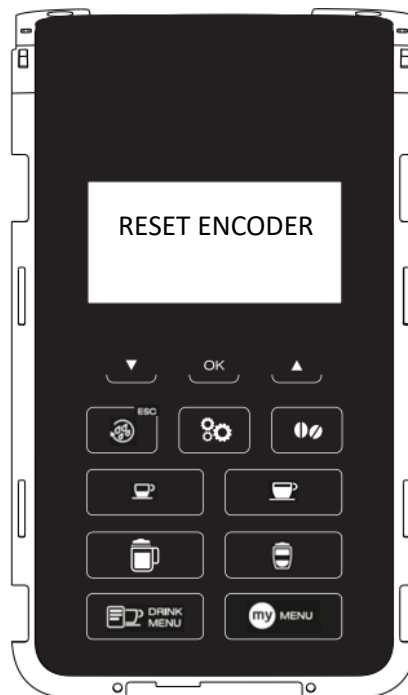
5.2. LOAD TEST MODE

After having accessed the test mode as indicated on paragraph 5.1, select the component you want check:

Motor Up	
Motor Down	
Grinder	
EV	
Pump	
Heater	

5.3. ENCODER RESET

After having pressed the encoder reset button as indicated on paragraph 5.1, machine will start procedure to reset the encoder:



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.

5.4. DISPLAY TEST MODE

After having accessed the display test mode as indicated on paragraph 5.1, press the various display buttons. Display will show the corresponding number:



NOTE: The Display Test Mode forces the machine to come back to “first use mode” (i.e. Language selection and water circuit priming).

6. TROUBLESHOOTING

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

A. COFFEE CIRCUIT FLOW ACTIVATION

- Move the infuser to the UP position (up arrow button): press and hold the button until infuser stop (reaching the UP position).
- Activate the pump (long coffee button): press and hold the button to activate the pump continuously.

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/STEAM CIRCUIT FLOW ACTIVATION

- Connect the hot water spout to the machine.
- The infuser does **not** have to be in upper position.
- Activate the EV1 solenoid valve (rinse button): press and hold the button to activate EV1.
- Activate the pump (long coffee button): press and hold the button to activate the pump continuously.

The water will pass through the flow meter, the Thermoblock, the EV1 solenoid valve. Finally it will come out from the hot water spout.

6.2. ELECTRIC CHECKS DIRECTLY ON THE COMPONENTS

A. HEATING ELEMENTS RESISTANCE CHECK

- Thermoblock resistance value: $\approx 38 \Omega$.

B. RESISTANCE/TEMPERATURE CHARACTERISTICS FOR NTC SENSOR

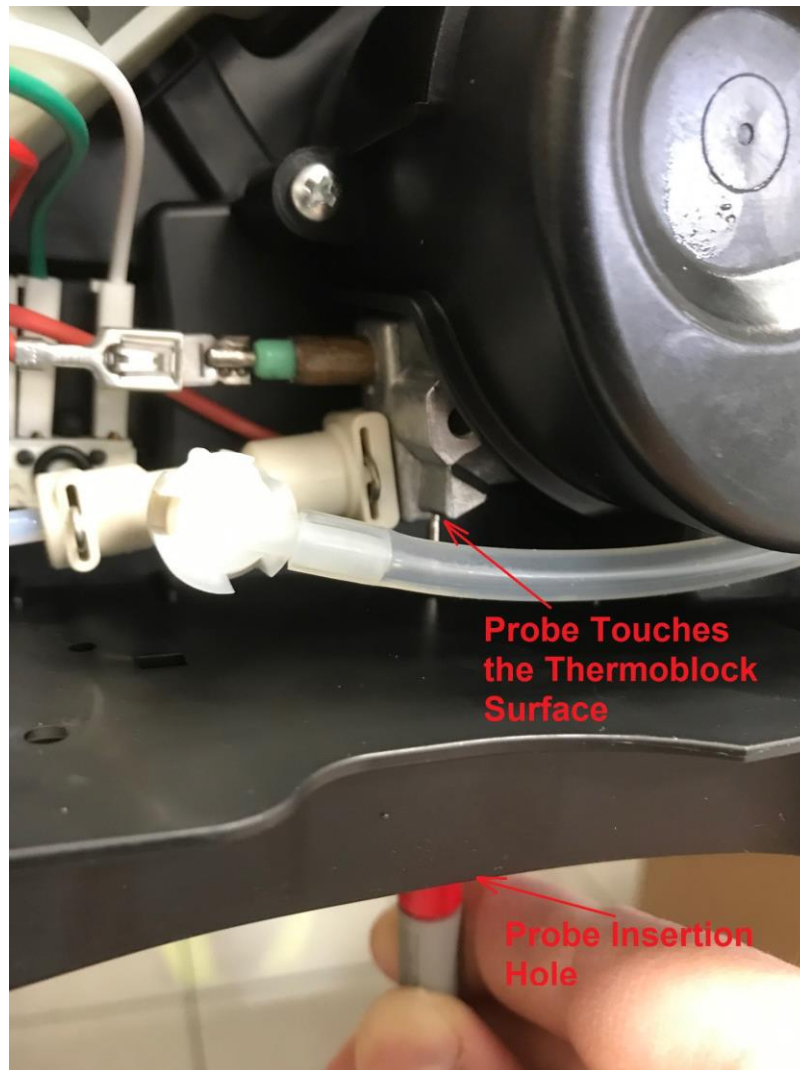
- Resistance/temperature characteristics for the thermoblock NTC:

RESISTANCE - TEMPERATURE CHARACTERISTICS

TEMP. °C	MINIMUM k Ω	NOMINAL k Ω	MAXIMUM k Ω	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:



6.3. COFFEE TEMPERATURE TEST

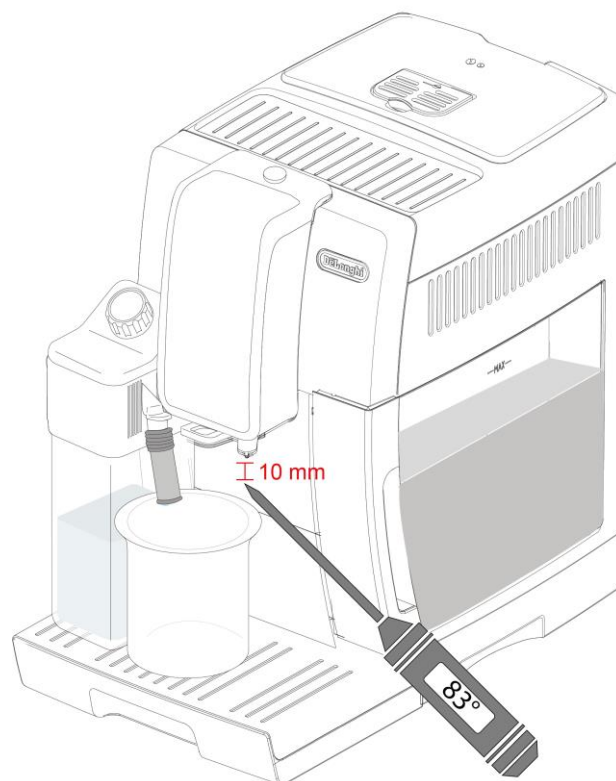
NOTE: Unlike previous versions, in this appliance the temperature can be adjusted only on 3 levels (LOW/MEDIUM/HIGH).

Complaints 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.
- Select to prepare an **EXTRA-LONG ESPRESSO COFFEE** (refer to the user manual for more details).
- Start the coffee preparation.
- Wait until at least 20 ml 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:

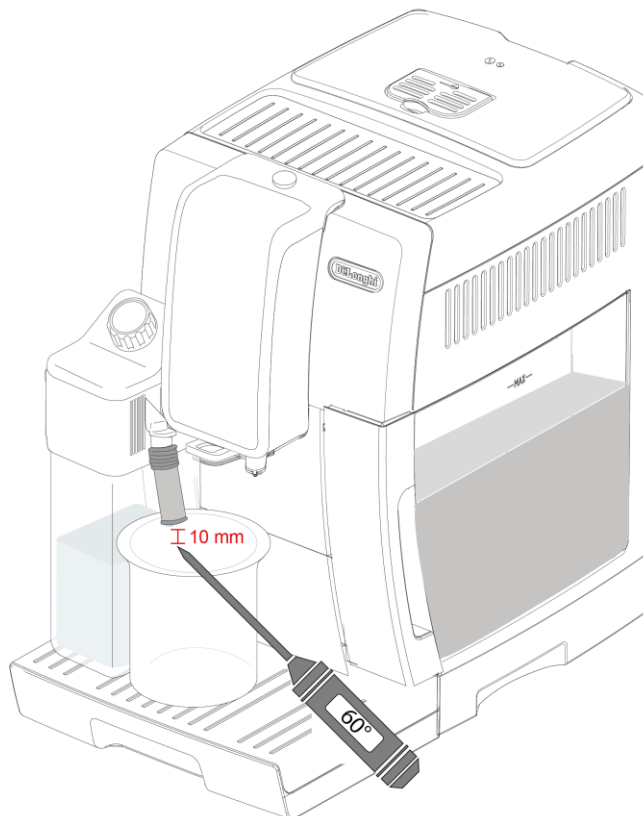


The **optimal indicative temperature measurement** for coffee should be **83°C±3°C**.

6.4. FROTHED MILK CONSISTENCY AND TEMPERATURE TEST

To perform the frothed milk consistency and temperature test, follow in sequence the below steps:

- Turn the appliance ON.
- Fill the milk jug with semi-skimmed milk at a temperature of $5^{\circ}\text{C} \pm 2^{\circ}\text{C}$ up to the MAX (2 x LATTE MACCHIATO) level. Insert the lid to the jug and connect it to the appliance.
- Place a 300ml PIREX graduated container under the milk spout.
- Select the **HOT MILK** and wait until at least 80ml of frothed milk have been delivered into the container.
- Measure the milk flow temperature during the delivery at about $2 \div 10\text{mm}$ from the spout, as shown in the below picture:



The optimal conditions for the frothed milk (without considering the coffee in cup) should be resumed below:

- **Froth appearance:** small bubbles without splashes.
- **Milk temperature:** $60^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
- **Froth amount:** finally the container must have 50% milk and 50% froth.

7. DESCALING

7.1. IMPORTANT NOTE ABOUT DESCALING

When a descaling cycle is started, **THIS MUST BE FINISHED**. If the descaling cycle is interrupted (due to a power supply failure or other problems), after restarting, the machine will ask you to perform a new descaling cycle. If the cycle is not completed successfully, it will not be possible to proceed with the preparation of the beverage.

