Data Sheet and Service Manual

ELBA   EL45CCM BUILT-IN COFFEE MAKER - 0132273264

Date: 21.11.2023

1   Table of Contents

2 TECHNICAL DATA

Voltage – Frequency – Input Power	220-240V / 50-60Hz – 1350 W

COMPONENTS

Pump	ULKA EP5 48W – 15Bar
Grinder motor	230VAC
Transmission motor	230VDC with position encoder
Solenoid valves EV1, EV2	230VAC

Coffee Section

- Temperature probe	NTC sensor
- Thermal fuse TCO	192°C
- Heating element	230 VAC – 1200W (600W + 600W)

Steam Section

- Temperature probe	NTC sensor
- Thermal fuse TCO	318°C
- Heating element	230VAC – 1000W

3   HYDRAULIC DIAGRAM

Hydraulic diagram labels: PUMP, FLOW METER, WATER TANK, THERMOBLOCK (1200W), MECHANICAL VALVE, EV1 SOLENOID VALVE (3 WAYS), STEAMER (1000W), EV2 SOLENOID VALVE (2 WAYS), IFD NOZZLE, DRIP TRAY
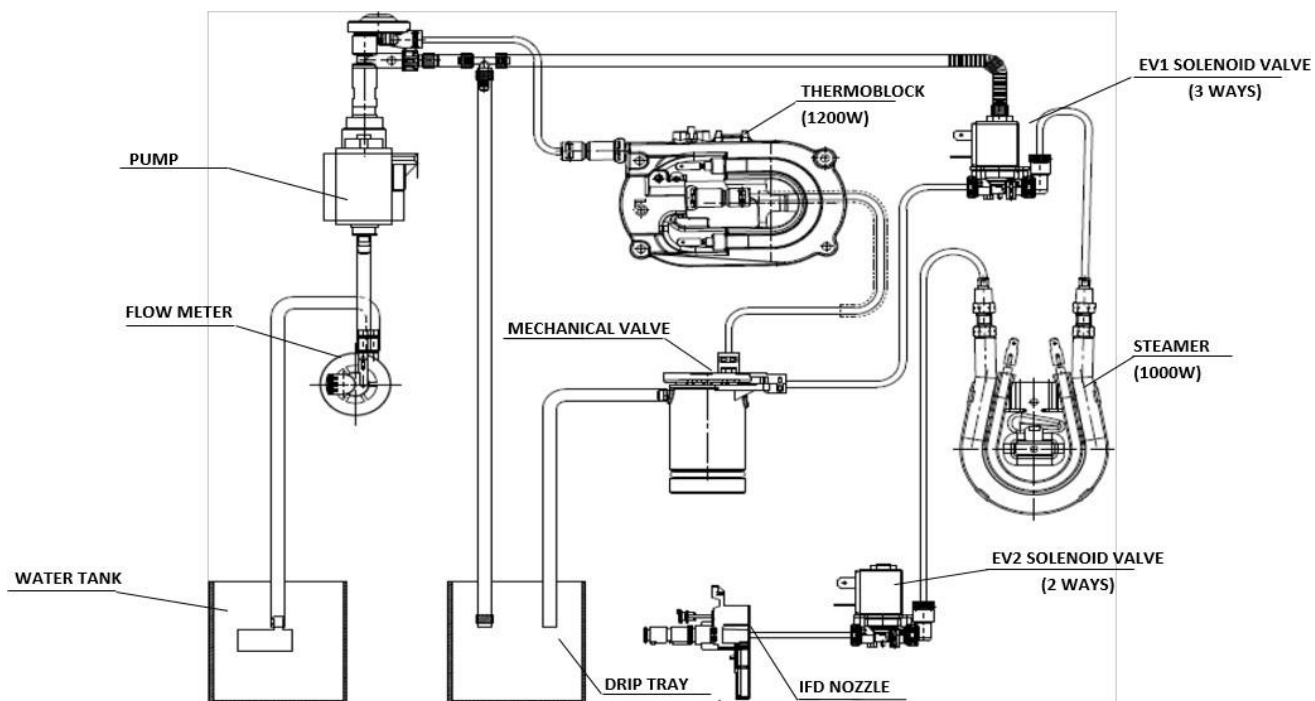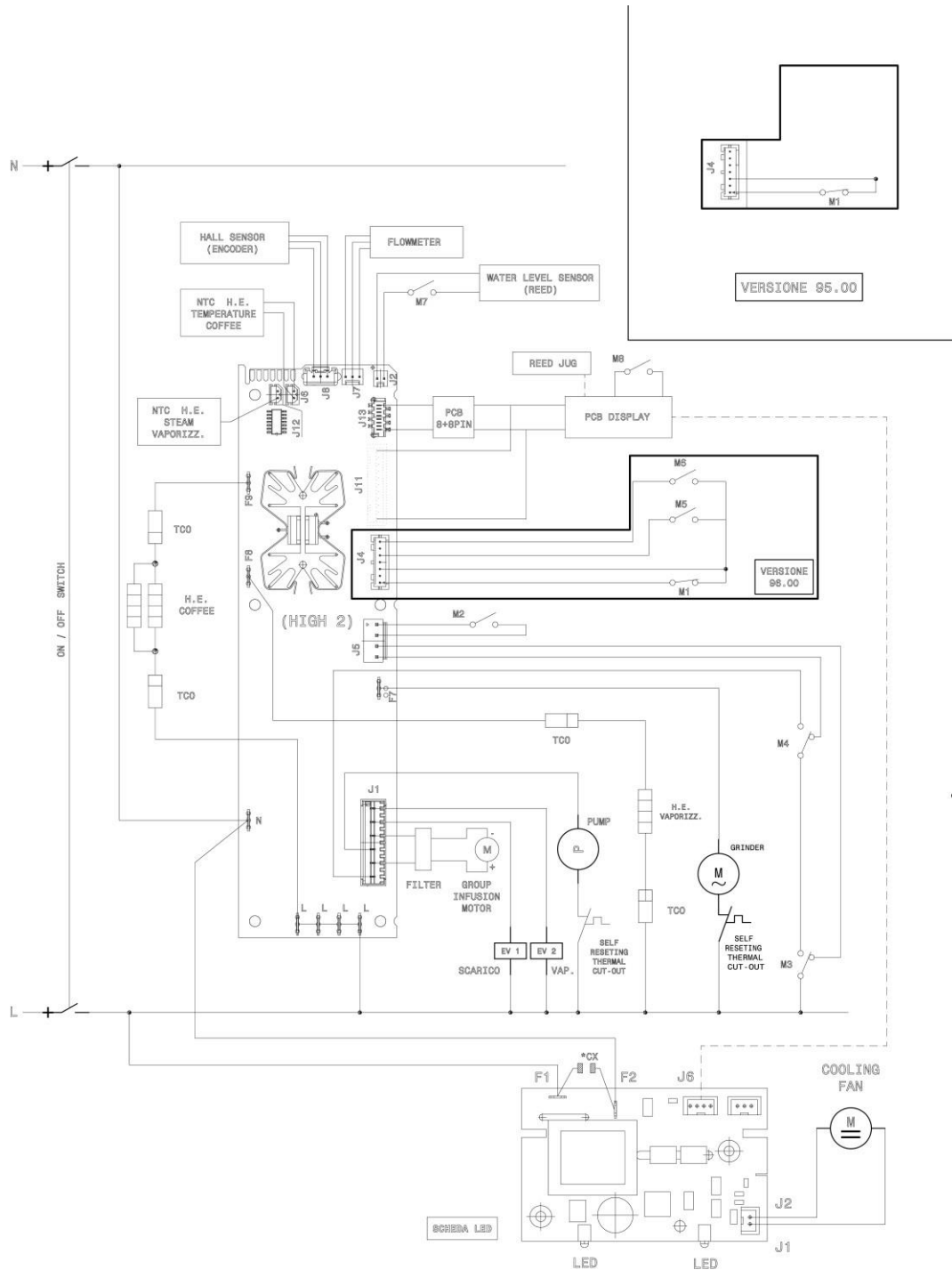
4   WIRING DIAGRAM

4.1   PRACTICAL OUTLINE
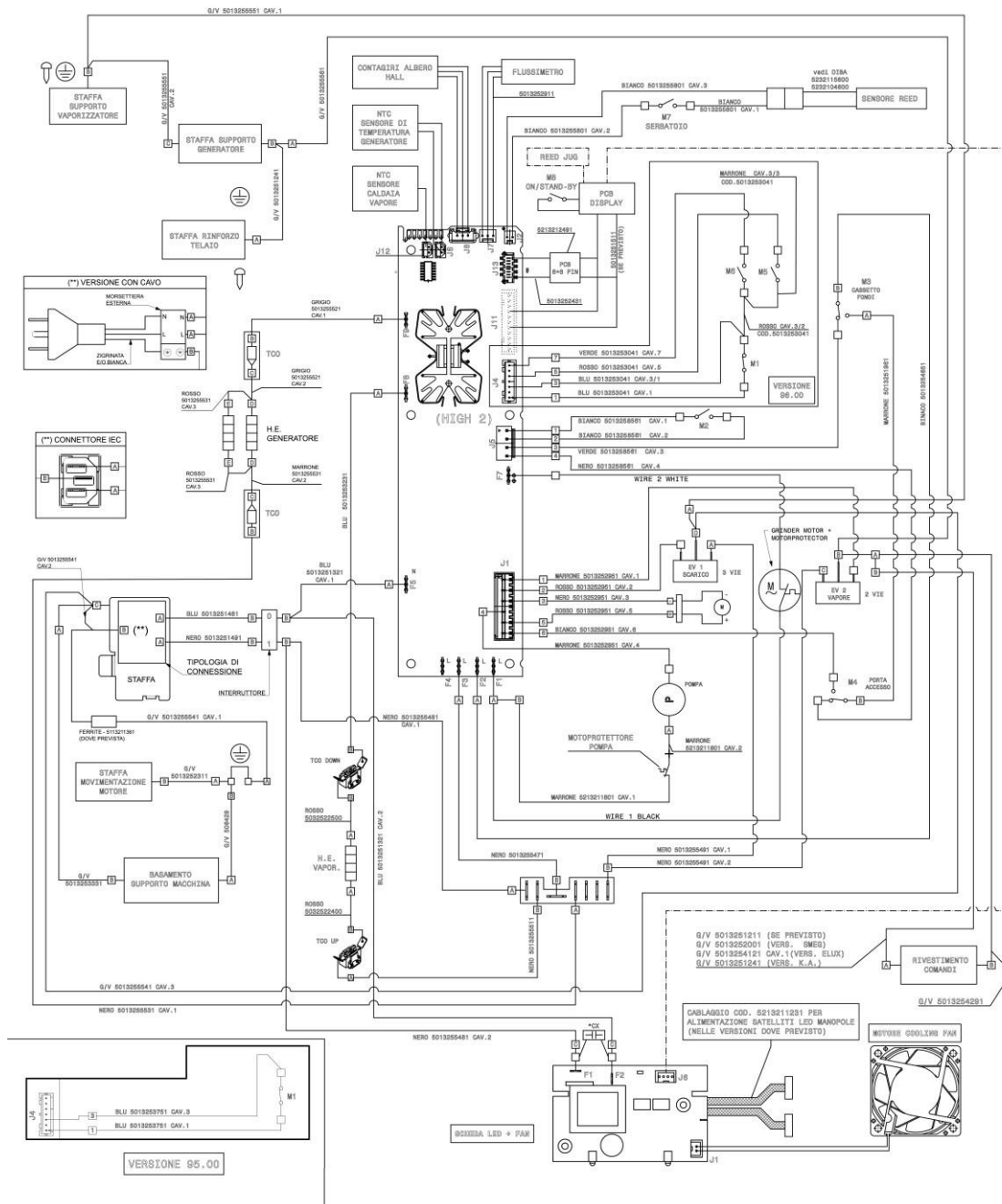
4.2 THEORETICAL OUTLINE

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LEGENDA / LEGEND :

M1   = GRUPPO ALTO
       UPPER MICROSWITCH  (GROUP INFUSION MOTOR)
M2   = GRUPPO BASSO
       LOWER MICROSWITCH  (GROUP INFUSION MOTOR)
M3   = CASSETTO FONDI
       DRAWER MICROSWITCH
M4   = PORTA ACCESSO
       DOOR MICROSWITCH
M5   = PRESENZA IFD
       IFD PRESENCE
M6   = PRESENZA PIPETTA
       H2O SUPPL. PRESENCE
M7   = PRESENZA SERBATOIO ACQUA (OPTIONAL)
       WATER TANK PRESENCE (OPTIONAL)
M8   = MICROSWITCH ON/STAND-BY
EV1  = ELETTROVALVOLA 3 VIE SCARICO
       3 WAYS ELECTROVALVE (WAY OUT)
EV2  = ELETTROVALVOLA 2 VIE VAPORE
       2 WAYS ELECTROVALVE (STEAM)
L    = FASE
       PHASE/LIVE
N    = NEUTRO
       NEUTRAL
TCO  = TERMOFUSIBILE
       THERMAL CUT OFF
H.E. = ELEMENTO RISCALDANTE
       HEATING ELEMENT
CX   = 0,22 F
       *OPTIONAL:WHERE INDICATED IN THE TECHNICAL LIST
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5 WORKING PRINCIPLE

5.1 MICROSWITCHES, SENSORS, SOLENOID VALVES AND MECHANICAL COMPONENTS

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
M4 = GROUNDS CONTAINER MICRO SWITCH	Detects when the grounds container is in correct position	Change-over micro switch. When the grounds container is inserted: - the contact for the grounds container detection is OPEN; - the contact for the transmission motor power supply is CLOSED.
EV1 = 3-WAYS SOLENOID VALVE	Switches between Coffee Preparation and Hot Water/Steam Preparation	- It opens when the machine prepares needs to deliver Hot Water or Steam. - It is closed when Hot Water and Steam deliveries finish and the residual pressure discharges.
EV2 = 2-WAYS SOLENOID VALVE	Manages Hot Water/Steam delivery from the nozzle.	- It opens to deliver Hot Water and Steam. - It closes when the Hot Water and Steam delivery finishes.

REED AND ENCODER	Function	Logic
HALL SENSOR ENCODER	Detects rotations of transmission motor	

6 TEST MODE

To access the **Test Mode**, make sure the machine is in stand-by mode (machine OFF but main switch on the side in I position). Then, open the service door and press at the same time the icons B2 (**SETTINGS**), B10 (**1 CUP OF COFFEE**) and B13 (**HOT WATER**):
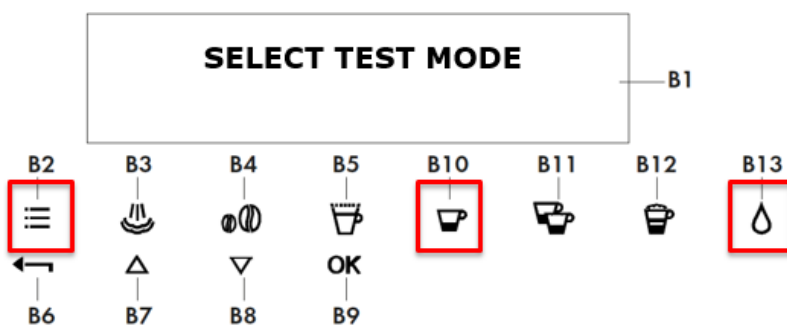
Hold the three icons pressed until the display will show the inscription **SELECT TEST MODE**. At this point, **within 5 seconds**:

- release the three icons;

- close the front service door;

- select one of the below test modes as indicated in the following paragraphs.

IMPORTANT: The usage of the Test Mode is allowed **only to the Service Engineers of the authorized Repair Centres**.

6.1   LOAD TEST MODE

After having accessed the Test Mode as described previously, press the B3 icon (**RINSE**), the message **LOAD TEST MODE** will be shown on the display:
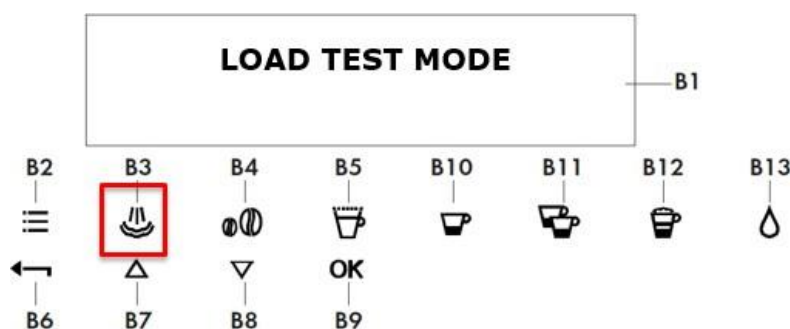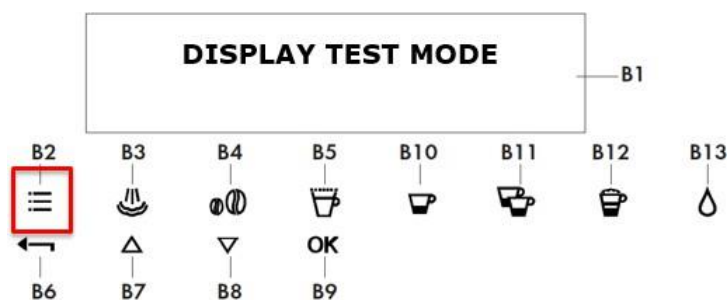

At this point, it will be possible to perform the **test of the single components of the appliance**, by pressing the icons indicated in the below table:

Icon/Button	Component	Display Message	Note
B10 (1 Cup)	Thermoblock	Heater ON	The water tank must NOT be empty
ON/Stand-By	Steamer	Vaporizer ON	
B2 (Settings)	Motor going UP	Motor UP (Limit Switch UP)	
B3 (Rinse)	Motor going DOWN	Motor DOWN (Limit Switch DOWN)	
B4 (Taste)	Grinder	Grinder ON	
B5 (Length)	Pump	Pump ON	
B11 (2 Cups)	EV1 Solenoid Valve + Fan	EV1 ON + FAN	
B12 (Cappuccino)	EV1 and EV2 Solenoid Valves + Light	EV1 EV2 LIGHT ON	One of the two accessories must be inserted
B13 (Hot Water)	EV2 Solenoid Valve	EV2 ON	

6.2   DISPLAY TEST MODE

After having accessed the Test Mode as described previously, press the B2 icon (**SETTINGS**), the message **DISPLAY TEST MODE** will be shown on the display:


At this point, it will be possible to perform the **test of the buttons and of the icons of the appliance**, by pressing the icons and buttons indicated in the below table:

Icon/Button	Message on Display
ON/Stand-By	BUTTON 0
B2 (Settings)	BUTTON 1
B5 (Length)	BUTTON 2
B4 (Taste)	BUTTON 3
B3 (Rinse)	BUTTON 4
B13 (Hot Water)	BUTTON 5
B11 (2 Cups)	BUTTON 8
B10 (1 Cup)	BUTTON 9
B12 (Cappuccino)	BUTTON 10

IMPORTANT: The execution of the **DISPLAY TEST MODE** will put the machine back to "**first use**", i.e. once restarted the machine will ask again to select the language and to perform the water circuit filling.

6.3   ENCODER RESET

After having accessed the Test Mode as described previously, press the B5 icon (**LENGTH**), the machine will perform the **reset of the maximum height of the infuser** (i.e. the reset of the maximum number of RPMs required to the motor to move the infuser to the UP limit position):
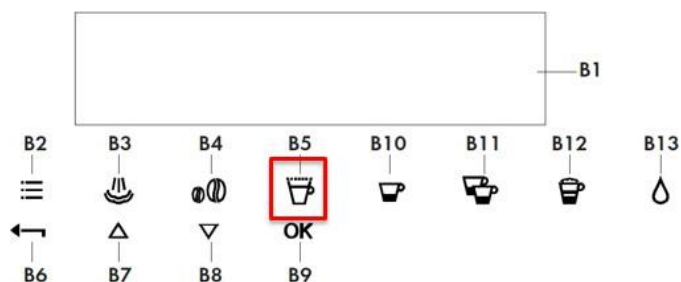
IMPORTANT: To complete correctly the operation and to **record the new value**, it will be necessary to **restart the machine in normal mode** and **perform a manual rinsing**.

7   HEATING ELEMENTS RESISTANCE CHECK

Thermoblock Resistance Value: ≈ 44 Ohms.

Steamer Resistance Value: ≈ 53 Ohms.

Resistance/temperature characteristics for the Thermoblock's NTCs:

| 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

8   COFFEE TEMPERATURE TEST

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:

1. Turn the appliance ON.
2. Make sure the temperature setting will be at the MAX level.
3. Perform a RINSE process (refer to the user manual for more details).
4. Select to prepare a **Long Espresso** beverage (refer to the user manual for more details)
5. Wait until at least 20ml of will be delivered into the cup
6. Measure the coffee flow temperature at about 2÷10mm from the coffee spout, as shown in the below picture:
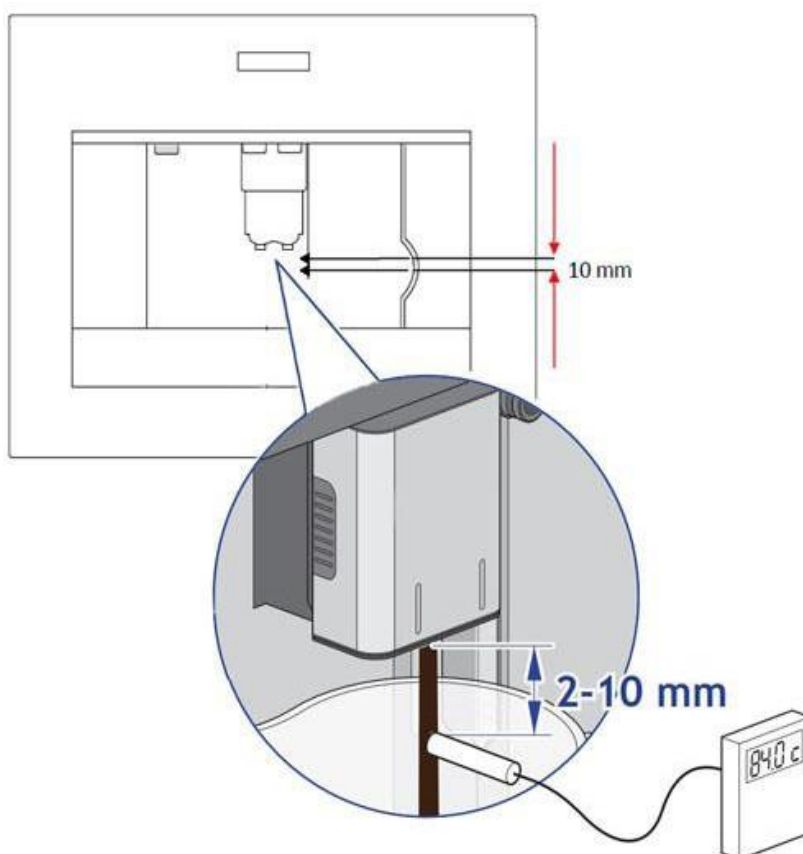

The **optimal indicative temperature measurement** for coffee should be **80°C ± 5°C**.

9 FROTHED MILK CONSISTENCY AND TEMPERATURE TEST

This test can be useful each time the end user will complain about poor quality of the froth and low temperature of the milk during the milk-based beverages preparations.

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

1. Turn the appliance ON.

2. Fill the milk jug with at least 200ml of semi-skimmed milk at a temperature of 5°C±2°C. Put the lid on the milk jug and connect it to the machine.

3. Put the slider of the froth adjustment to the maximum level of froth.

4. Place a 250ml graduated PIREX container under the milk spout.

5. Select the HOT MILK beverage and wait until at least 100ml of frothed milk will be delivered into the container.

6. Measure the temperature of the milk flow during the delivery at about 2÷10mm from the milk spout, as shown in the below picture:
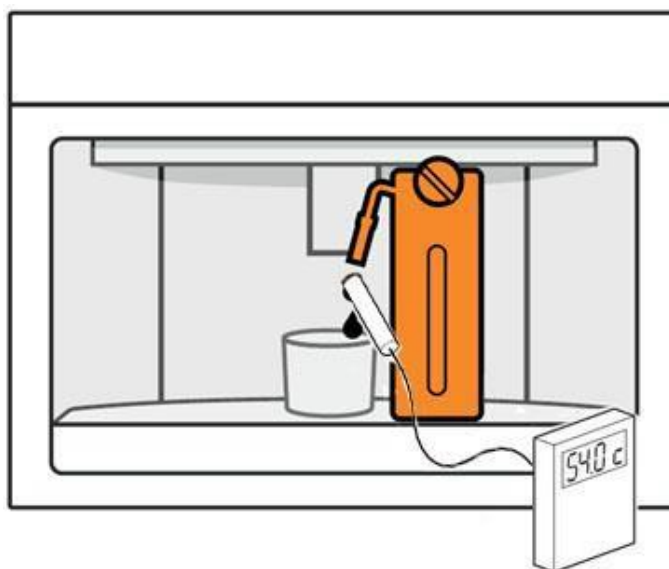
The optimal conditions for the frothed milk should be as follows:

- **Froth aspect: small bubbles without splashes.**
- **Milk temperature: 50°C±5°C.**
- **Froth amount: at the end of the delivery, the PIREX must contain 50% milk and 50% froth.**