Data Sheet and Service Manual

ESAM460.75- ESAM460.80
PERFECTA EVO

Date: 31.10.2019



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1. TECHNICAL DATA

Voltage	220-240V / 50-60 Hz
MAX. Input power	1350 W
Stand-by Button OFF	0,33W

COMPONENTS

Pump	230V AC - 48 W – Bar 15
Grinder motor	230V AC
Transmission motor	230V DC with position encoder
Solenoid valves EV1 EV2 EV3	230V AC

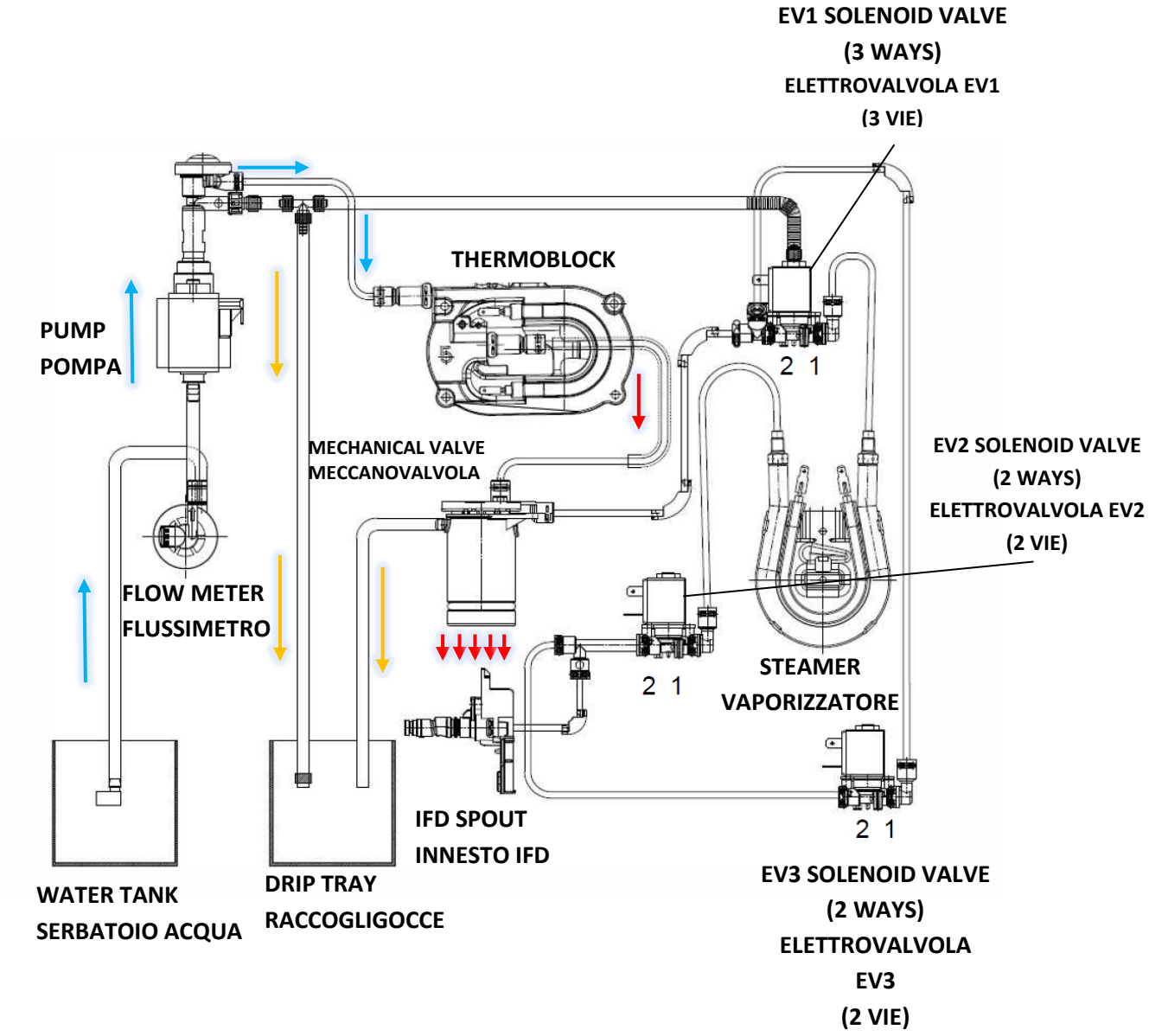
Coffee thermoblock

- Working temperature probe	Type NTC
- Thermal fuse TCO	192 °C
- Heating element	230V AC – 1200 W (600W+600W)

Steam generator

- Working temperature probe	Type NTC
- Thermal fuse TCO	318 °C
- Heating element	230V AC – 1000 W

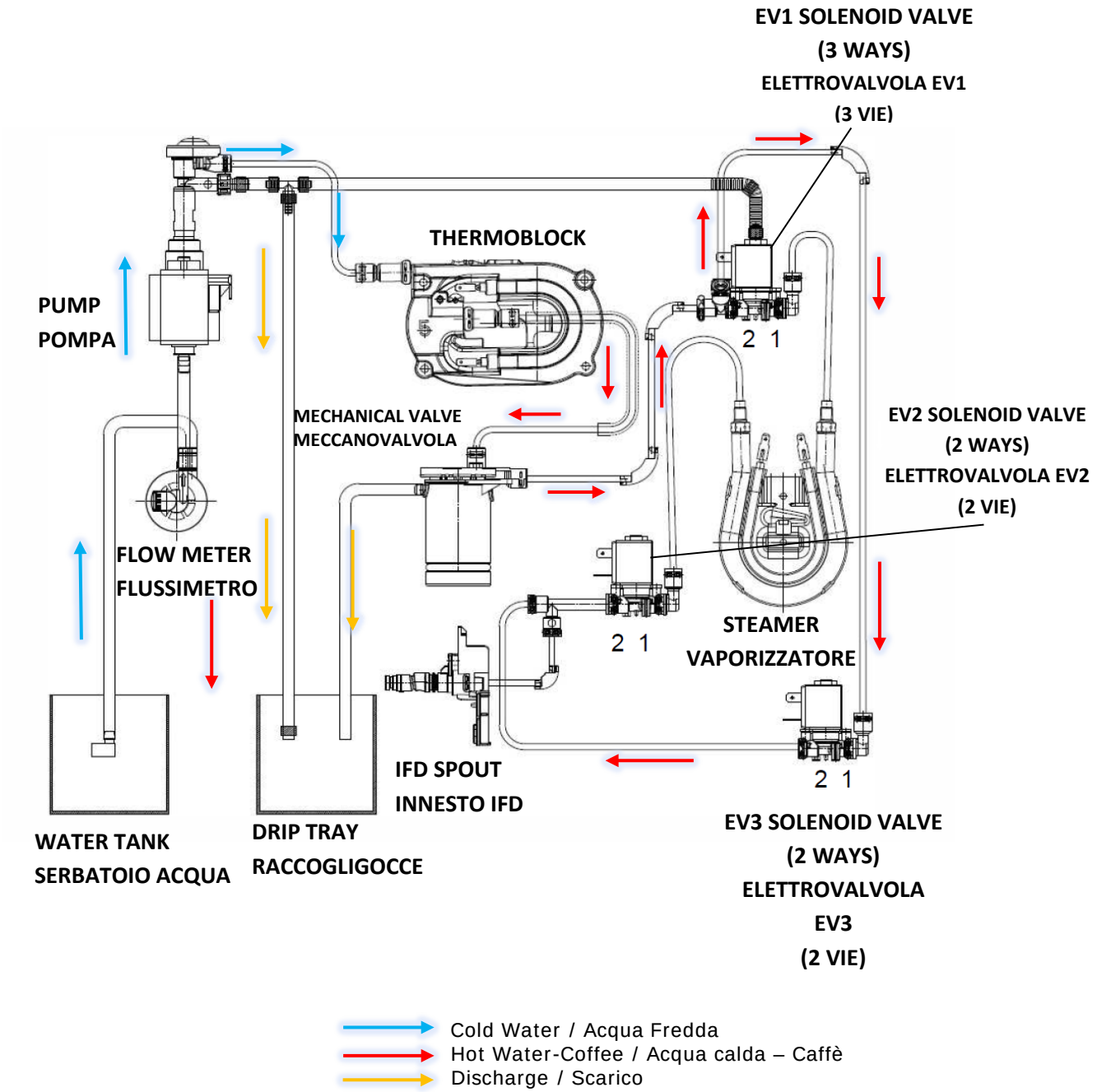
2. HYDRAULIC DIAGRAM (COFFEE) / CIRCUITO IDRAULICO (CAFFE')



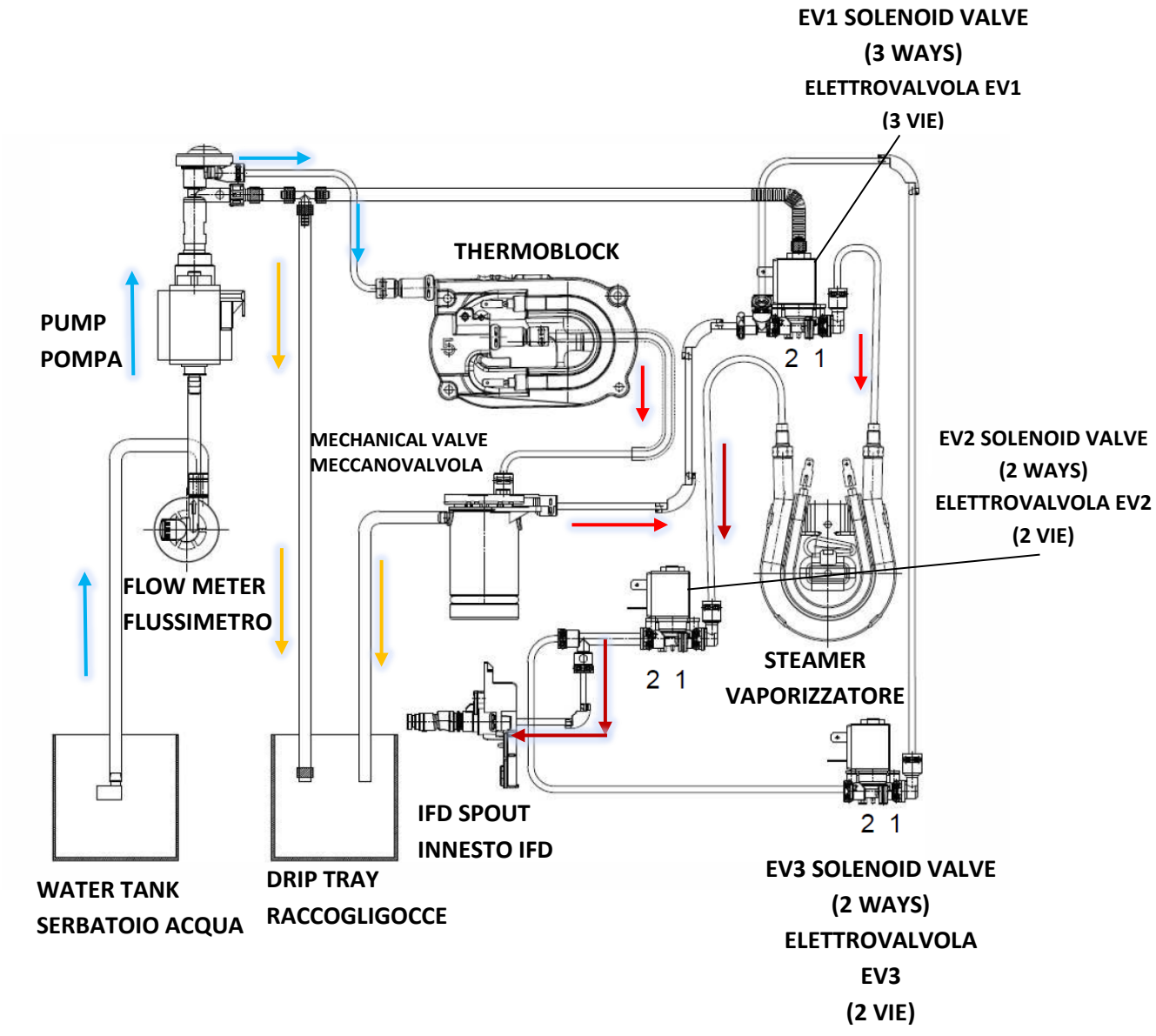
Cold Water / Acqua Fredda
Hot Water-Coffee / Acqua calda – Caffè
Discharge / Scarico

2.HYDRAULIC DIAGRAM (HOT WATER) /

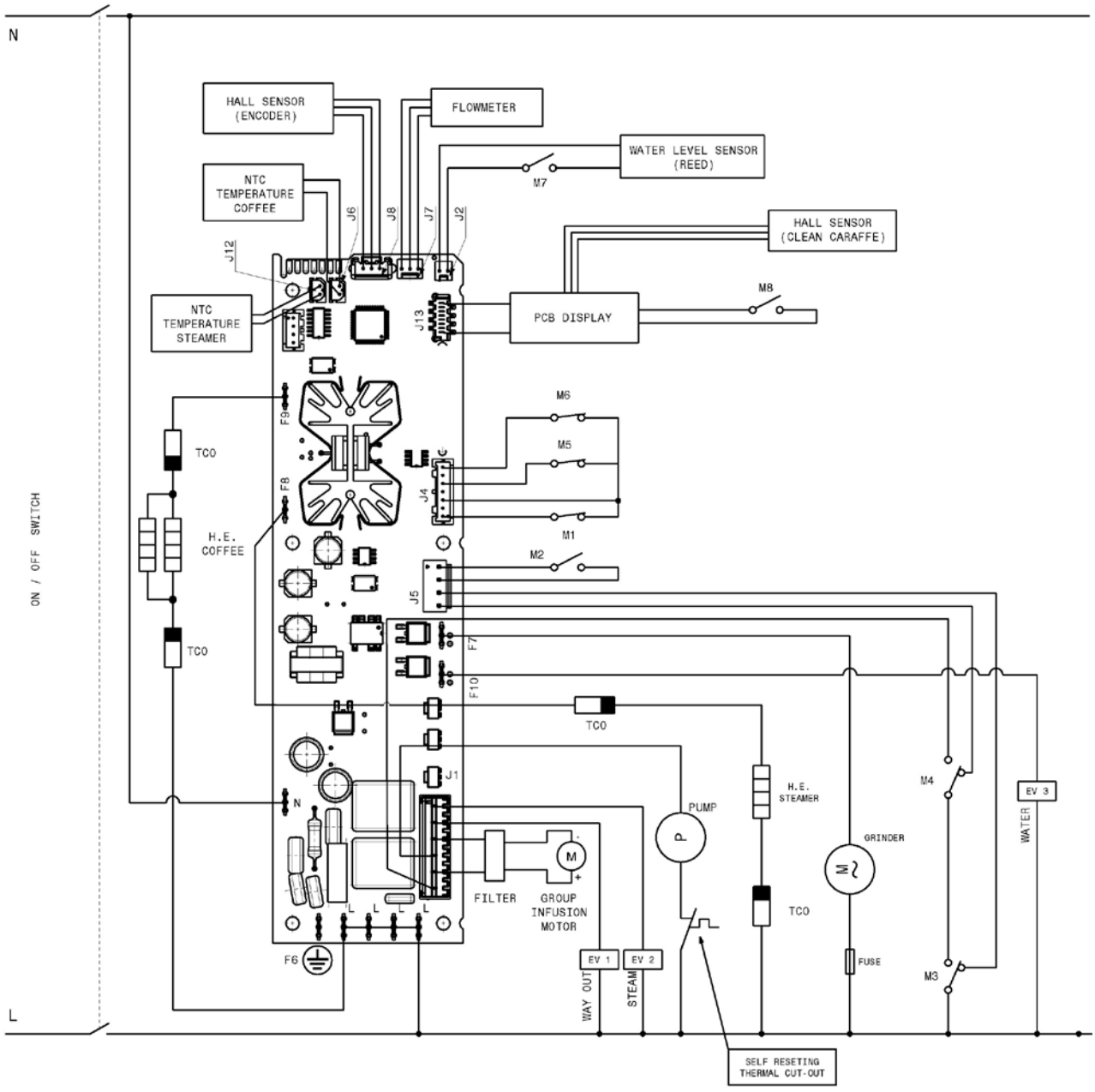
CIRCUITO IDRAULICO (ACQUA CALDA)



2.HYDRAULIC DIAGRAM (STEAM) / CIRCUITO IDRAULICO (VAPORE)

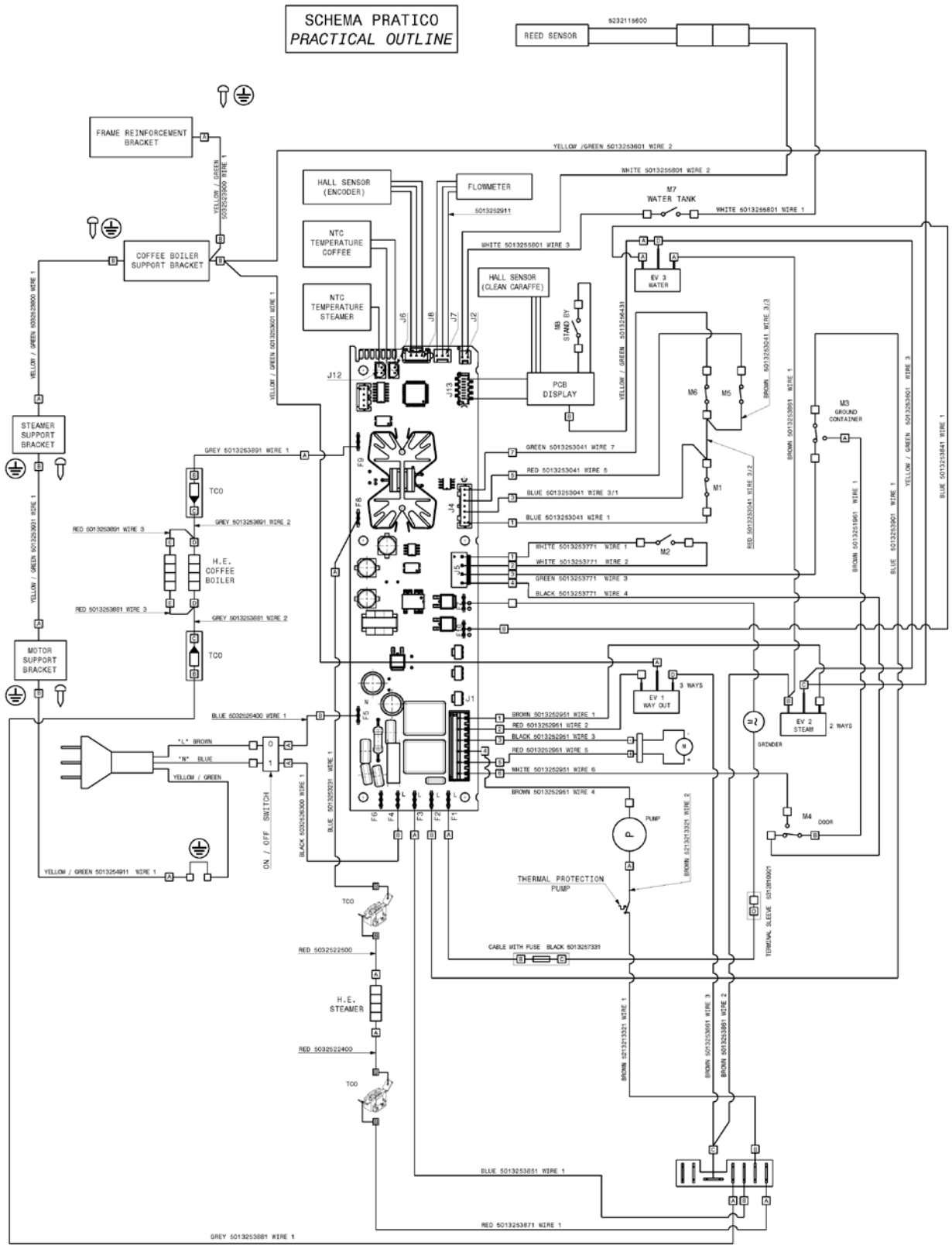


3.WIRING DIAGRAM



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 CIOCCOLATA - CHOCOLATE PRESENCE
M6 = PRESENZA IFD - IFD PRESENCE
M7 = PRESENZA SERBATOIO ACQUA - WATER TANK PRESENCE
M8 = INTERRUTTORE STAND BY - STAND BY SWITCH
EV1 = ELETTROVALVOLA 3 VIE SCARICO - 3 WAYS ELECTROVALVE (WAY OUT)
EV2 = ELETTROVALVOLA 2 VIE VAPORE - 2 WAYS ELECTROVALVE (STEAM)
EV3 = ELETTROVALVOLA 2 VIE ACQUA - 2 WAYS ELECTROVALVE(WATER)
L = FASE - PHASE/LIVE
N = NEUTRO - NEUTRAL
TCO = TERMOFUSIBILE - THERMAL CUT OFF
H.E. = ELEMENTO RISCALDANTE - HEATING ELEMENT


SCHEMA PRATICO
PRACTICAL OUTLINE
REED SENSOR
5232115600
FRAME REINFORCEMENT BRACKET
COFFEE BOILER SUPPORT BRACKET
STEAMER SUPPORT BRACKET
MOTOR SUPPORT BRACKET
HALL SENSOR (ENCODER)
FLOWMETER
M7 WATER TANK
NTC TEMPERATURE COFFEE
NTC TEMPERATURE STEAMER
HALL SENSOR (CLEAN CARAFFE)
M8 STAND BY
EV 3 WATER
PCB DISPLAY
M6
M5
M1
M2
M3 GROUND CONTAINER
TCO
H.E. COFFEE BOILER
H.E. STEAMER
EV 1 3 WAYS WAY OUT
EV 2 STEAM 2 WAYS
GRINDER
PUMP
M4 DOOR
THERMAL PROTECTION PUMP
ON / OFF SWITCH
"L" BROWN
"N" BLUE
YELLOW / GREEN
CABLE WITH FUSE BLACK 5013257331
TERMINAL SLEEVE 5313010021
YELLOW /GREEN 5013253601 WIRE 2
WHITE 5013255801 WIRE 2
WHITE 5013255801 WIRE 1
WHITE 5013255801 WIRE 3
YELLOW / GREEN 5032529600 WIRE 1
YELLOW / GREEN 5013253601 WIRE 1
YELLOW / GREEN 5013254911 WIRE 1
BLUE 5032526400 WIRE 1
BLUE 5013253321 WIRE 1
BLACK 5032526300 WIRE 1
GREY 5013253891 WIRE 1
GREY 5013253891 WIRE 2
RED 5013253891 WIRE 3
GREEN 5013253041 WIRE 7
RED 5013253041 WIRE 5
BLUE 5013253041 WIRE 3/1
BLUE 5013253041 WIRE 1
WHITE 5013253771 WIRE 1
WHITE 5013253771 WIRE 2
GREEN 5013253771 WIRE 3
BLACK 5013253771 WIRE 4
BROWN 5013252951 WIRE 1
RED 5013252961 WIRE 2
BLACK 5013252961 WIRE 3
RED 5013252961 WIRE 5
WHITE 5013252951 WIRE 6
BROWN 5013252951 WIRE 4
RED 5032522500
RED 5032522400
BLUE 5013253851 WIRE 1
RED 5013253871 WIRE 1
GREY 5013253881 WIRE 1
BROWN 5013253321 WIRE 2
BROWN 5013253321 WIRE 1
BROWN 5013253891 WIRE 3
BROWN 5013253881 WIRE 2
BROWN 5013253041 WIRE 3/3
RED 5013253041 WIRE 3/2
BROWN 5013253851 WIRE 1
BROWN 5013251961 WIRE 1
BLUE 5013253901 WIRE 1
YELLOW / GREEN 5013253901 WIRE 3
BLUE 5013253841 WIRE 1

4. WORKING PRICIPLE

MICROSWITCHES, SENSORS AND SOLENOID VALVES

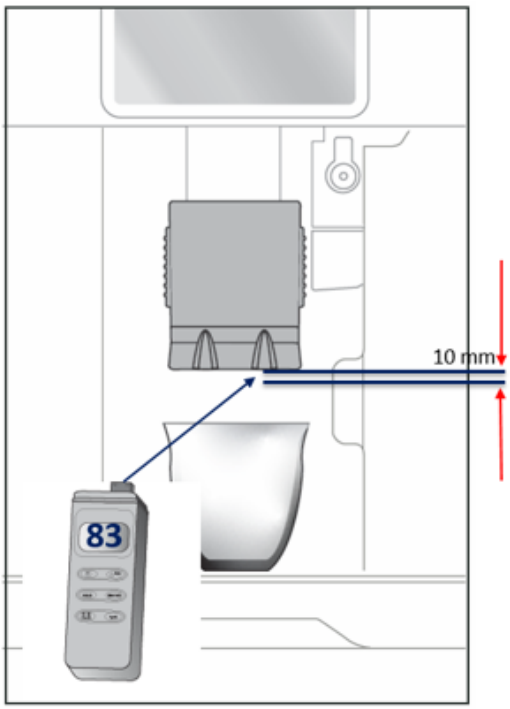
MICROSWITCHES	Function	Logic
M1 = UPPER LIMIT MICROSWITCH	Detects when the infuser is on top position	"NC", Opens when infuser in top position
M2 = LOWER LIMIT MICROSWITCH	Detects when the infuser is on down position	"NO", Closes when the infuser is in down position
M3 = DRAWER MICROSWITCH	Detects when the drip tray is in correct position	3 PINS CHANGE OVER SWITCH
M4 = DOOR MICROSWITCH	Detects when the front door is closed	3 PINS CHANGE OVER SWITCH
M5 = CHOCO MICROSWITCH	Not present on this model	
M6 = IFD MICROSWITCH	Detects the presence of the Milk jug	"NC", Opens when the accessory is present
M7 = WATER TANK MICROSWITCH	Detects the presence of the Water tank	"NO" Opens when the water tank is present
M8 = ON/STAND-BY MICROSWITCH	Detects when the ON/STAND-BY button is pressed	"NO", closes when the button is pressed

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 VALVES	Function	Logic
EV1 = 3 ways DISCHARGE solenoid valve	Allows the excess of steam/hot water to be discharged	
EV2 = 2 ways STEAM solenoid valve	Allows the steam flow from the generator to the external connector	Activated when Steam is delivered
EV3 = 2 ways HOT WATER solenoid valve	Allows the hot water flow from the generator to the external connector	Activated when hot water is delivered

5. COFFEE AND MILK TEMPERATURE TEST

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.

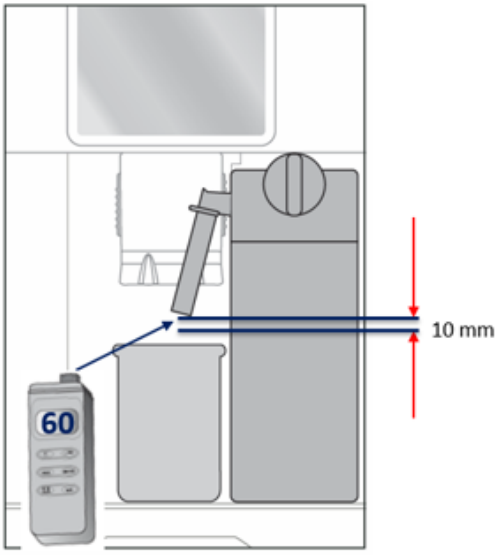
A **coffee temperature measurement** is required all the times any of these complaints are encountered.

How To Perform The Temperature Test

1. Turn the machine on.
2. Run a rinsing cycle (refer to the user manual).
3. Set the temperature to the maximum level.
4. Select the option "Long Espresso Coffee" from the appliance menu.
5. Wait until at least 20ml of coffee have been poured into the container.
6. Measure the coffee flow temperature at about 2÷10mm from the spouts (as shown in the picture).

Optimal Indicative Temperature: 83°C ± 3°C

Milk Temperature Test



This test can be required whenever the serviceman is getting complains by the end user about the quality or the temperature of milk beverages.

How To Perform The Temperature Test

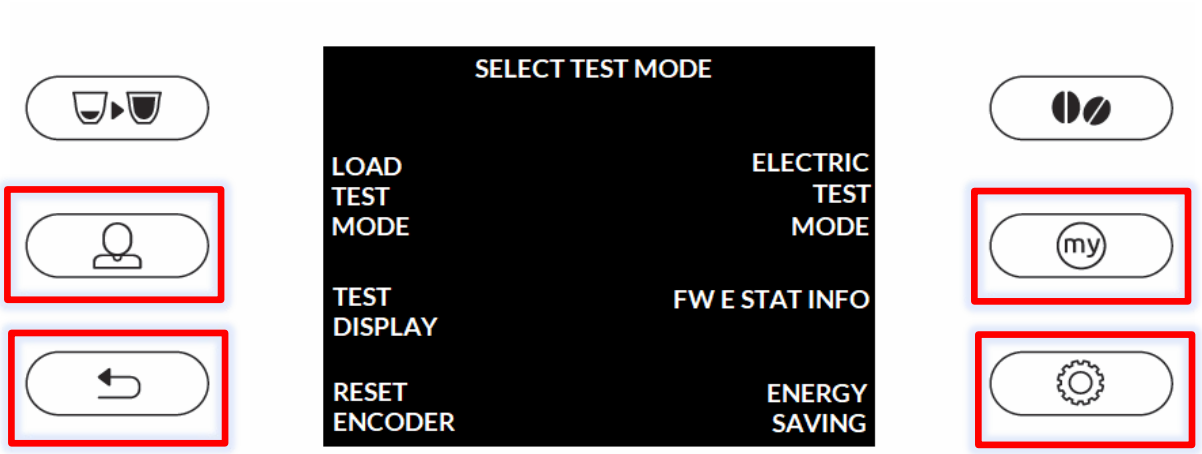
1. Turn the machine on.
2. Fill the milk jug with 200ml of semi-skimmed milk at a temperature of 5°C±1°C. Insert the lid to the jug and connect it to the appliance.
3. Set maximum level of froth from the settings menu of the appliance.
4. Place a 250ml PIREX graduated container under the milk spout.
5. Select the MILK option and wait until at least 100ml of frothed milk have been poured into the container.
6. Measure the milk flow temperature during the pouring at about 2÷10mm from the spout (as shown in the picture).

Optimal Milk Conditions:

- **Froth appearance: without splashes.**
- **Milk temperature: 60°C±5°C.**
- **Froth amount: Finally the container must have 50% milk and 50% froth**

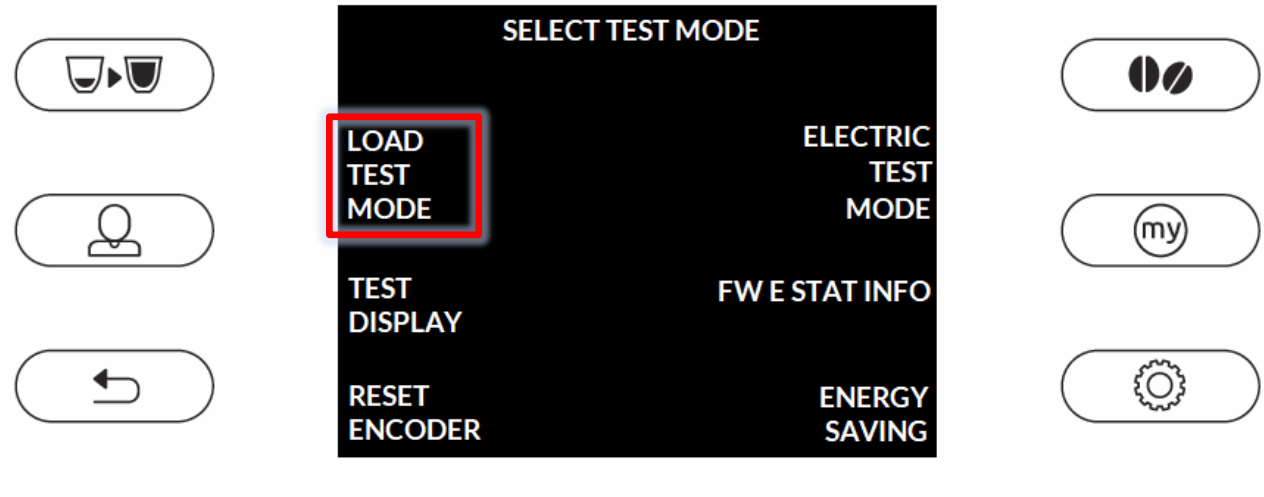
6. TEST MODE - PROCEDURE LOAD TEST MODE

By keeping the machine in stand-by mode (i.e. with the main switch in **I** position, but the machine OFF), open the front door. Then, **press at the same time** the 4 buttons shown in the below picture:



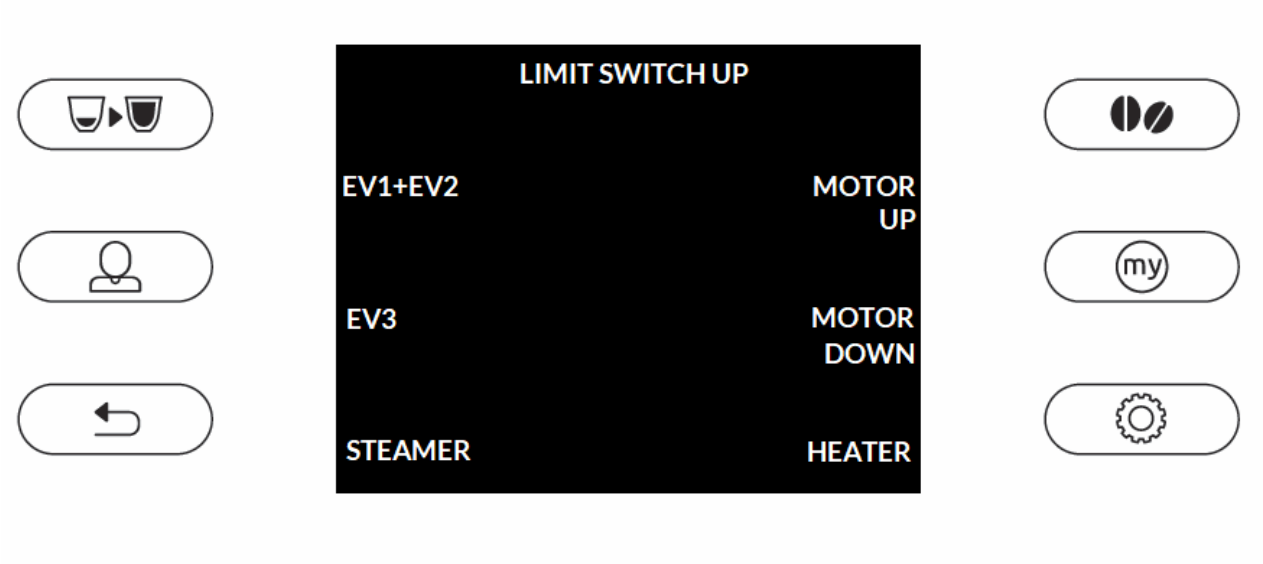
Wait for a few seconds until the message "**SELECT TEST MODE**" is displayed on the screen. Then, **within 5 seconds**, close the front door and select one of the **options** as explained in the next pages.

Press the "**LOAD TEST MODE**" inscription on the display of the appliance:



6.TEST MODE TEST MODE - PROCEDURE LOAD TEST MODE

From the next page, it will be possible to test the single internal Components of the coffee machine by keeping the corresponding button or display area pressed:

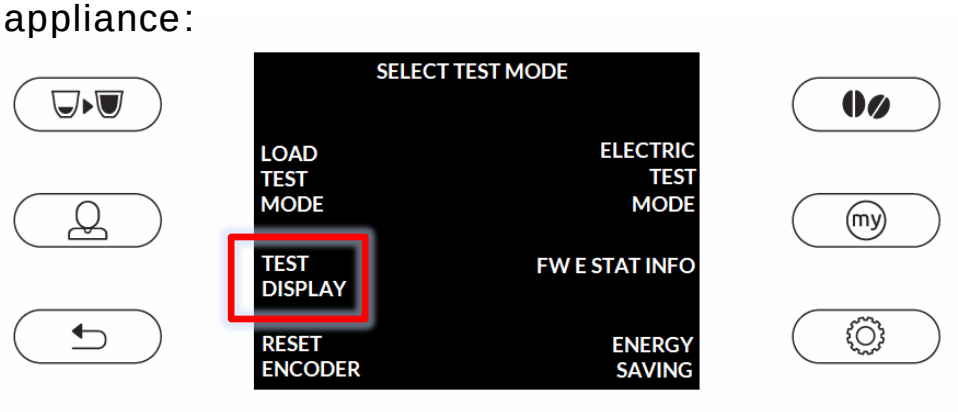


Button/Area	Component	Displayed Message
HEATER	Coffee Thermoblock	
STEAMER	Steamer	
MOTOR UP	Transmission Motor	(Limit Switch UP)
MOTOR DOWN	Transmission Motor	(Limit Switch DOWN)

Button/Area	Component	Note
AROMA	Grinder	
BEVERAGE QUANTITY	Pump	The water tank must be full
EV3	EV3 Solenoid Valve	One of the accessories must be inserted
EV1+EV2	EV1 and EV2 Solenoid Valves	

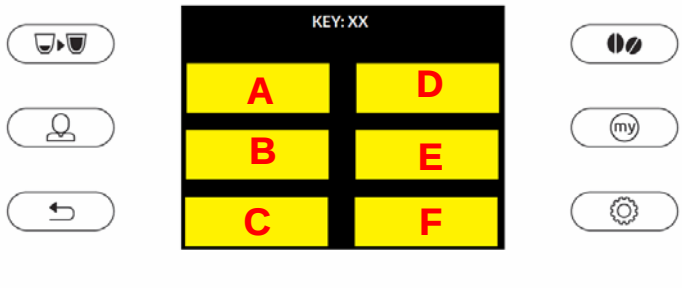
6.TEST MODE - DISPLAY TEST PROCEDURE

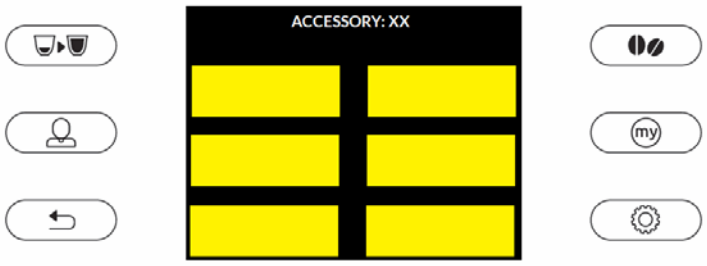
Press the "**TEST DISPLAY**" inscription on the display of the appliance:



From the next page, it will be possible to test each button or display area of the coffee machine, as well as the accessories micro switches and Reed/Hall sensor:

Button/Area	Displayed Message
BEVERAGE QUANTITY	Key: 1
PROFILE SELECTION	Key: 2
BACK BUTTON	Key: 3
A	Key: 4
B	Key: 5
C	Key: 6
D	Key: 7
E	Key: 8
F	Key: 9
AROMA	Key: 10
"MY" MENU	Key: 11
SETTINGS MENU	Key: 12
STAND-BY	Key: Stand-By



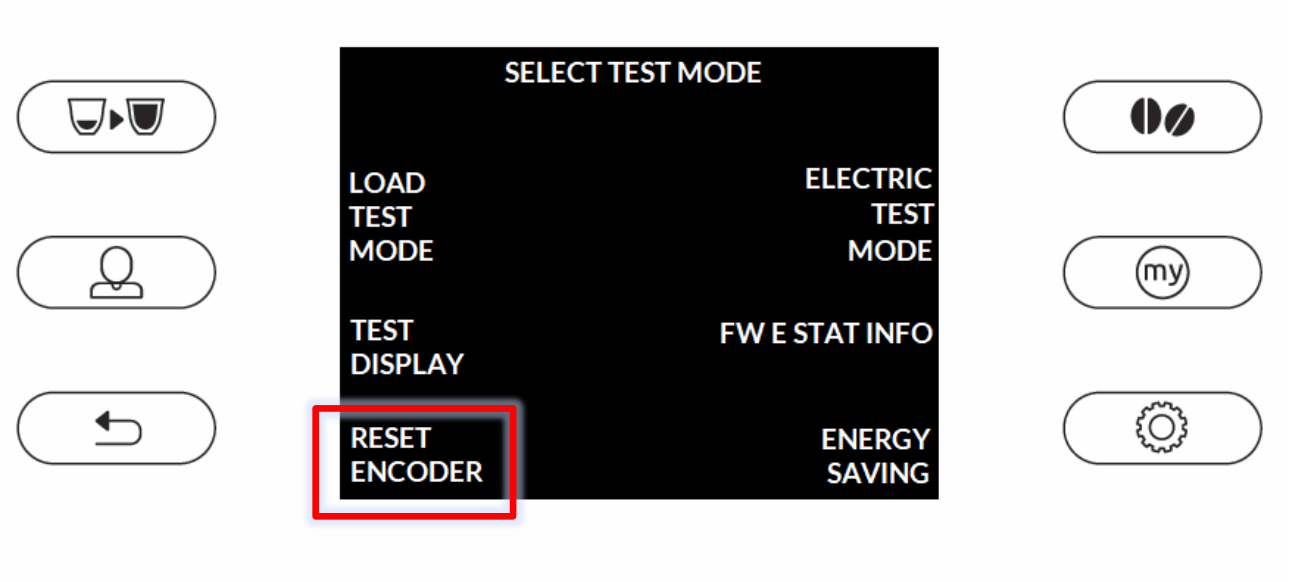


Accessory	Displayed Message
HOT WATER SPOUT	Accessory: 1
MILK CARAFE	Accessory: 2
MILK CARAFE AND KNOB IN "CLEAN" POSITION	Hall

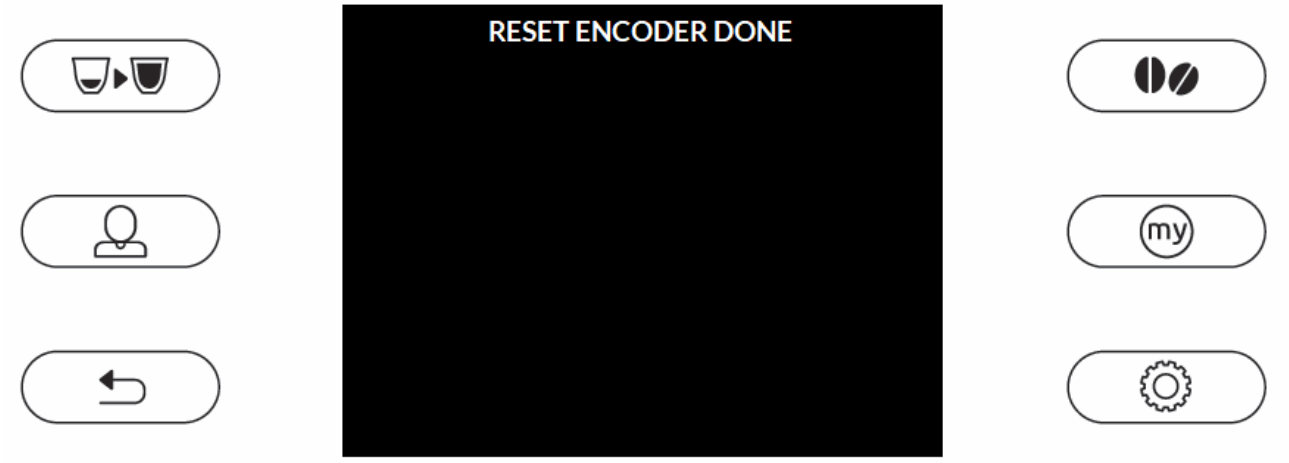
NOTE: The display test procedure will force the appliance to ask again for language selection and for initial priming.

6.TEST MODE - RESET ENCODER PROCEDURE

Press the "**RESET ENCODER**" inscription on the display of the appliance:



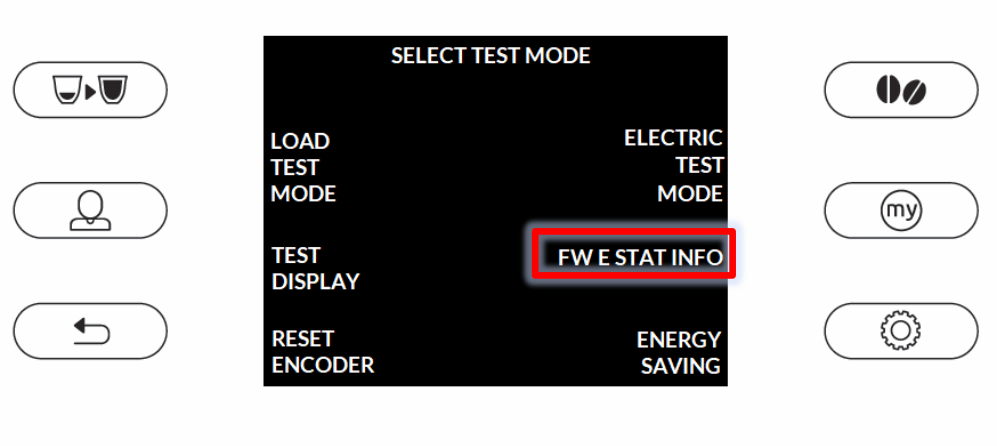
The appliance will show the message "**RESET ENCODER DONE**" on the display, thus confirming the **reset of the maximum value of the infuser position on the transmission movement**:



IMPORTANT: To complete the reset procedure, turn the appliance ON normally and perform a rinsing cycle (this will force the machine to read the maximum value of the infuser position).

6.TEST MODE - STATISTICS AND SW RELEASE PROCEDURE

Press the inscription highlighted in red in the below picture: the appliance will enter the menu to display the **software versions installed on the PCBs** and the **statistic values of the appliance**. Use the scroll arrow buttons to move scroll the list of the available values:



1. Display PCB software release;
2. Main PCB software release;
3. Total number of coffee beverages;
4. Total number of milk beverages;
5. Total number of beverages (coffee + milk);
6. Total quantity of water (in liters);
7. Total number of descaling processes performed;
8. Total number of filters installed;
9. Total number of milk jug cleaning operations;
10. Water hardness value set in the appliance;
11. Total number of beverages delivered while the DESCALING warning is ON.