Data Sheet and Service Manual

EC890 – DEDICA DUO

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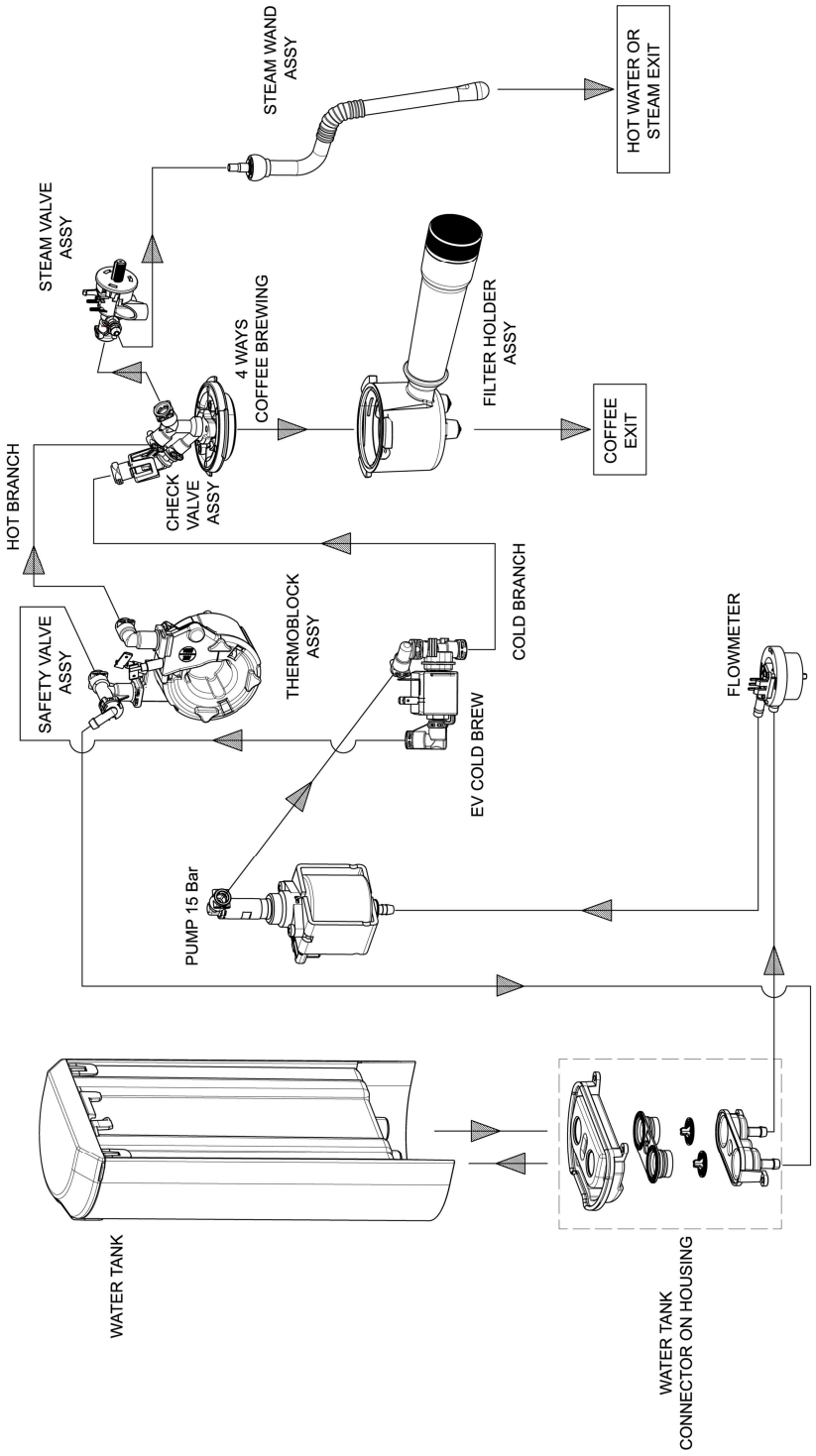
1 TECHNICAL DATA

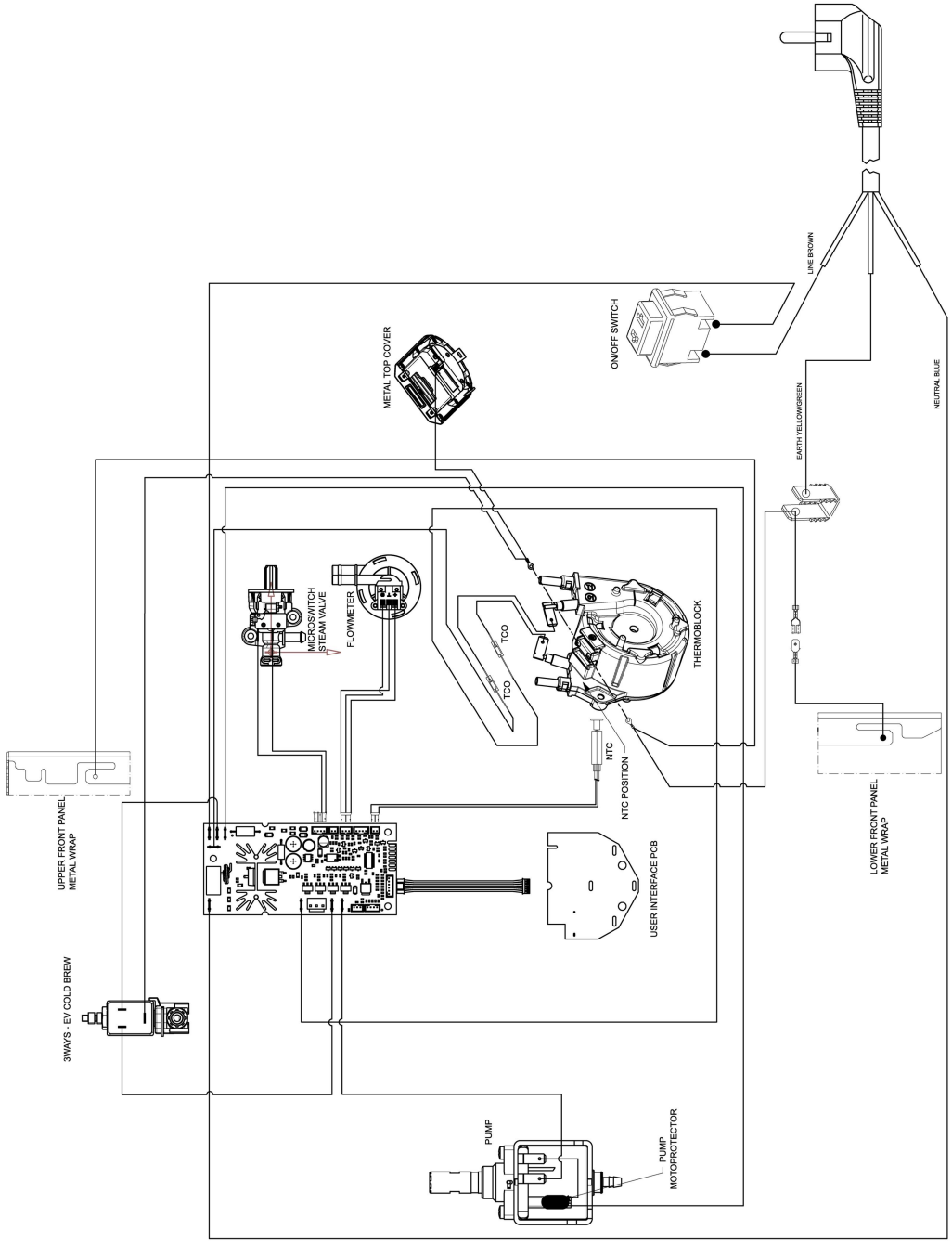
GENERAL INFO	
Voltage – Frequency – Input Power	220 / 240V – 50 / 60Hz – 1450W
COMPONENTS	
Pump	230VAC – 48W – 15bar
Solenoid valves (EV1)	230VAC
Thermoblock:	
Temperature probe	NTC sensor
Thermal fuse TCO	192°C
Heating element	230VAC – 1400W

2 HYDRAULIC DIAGRAM

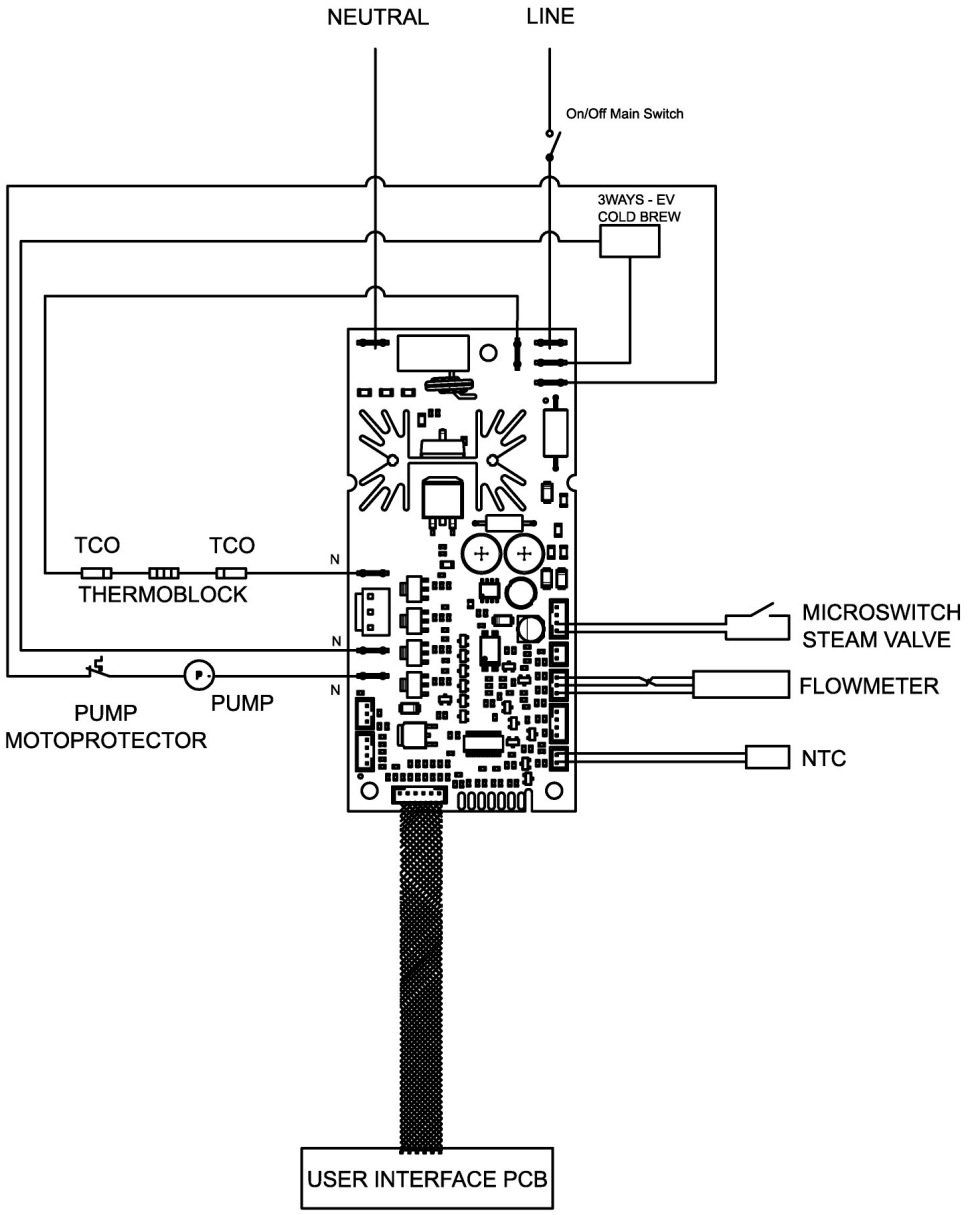


3 WIRING DIAGRAM

3.1 PRACTICAL OUTLINE



3.2 THEORETICAL OUTLINE

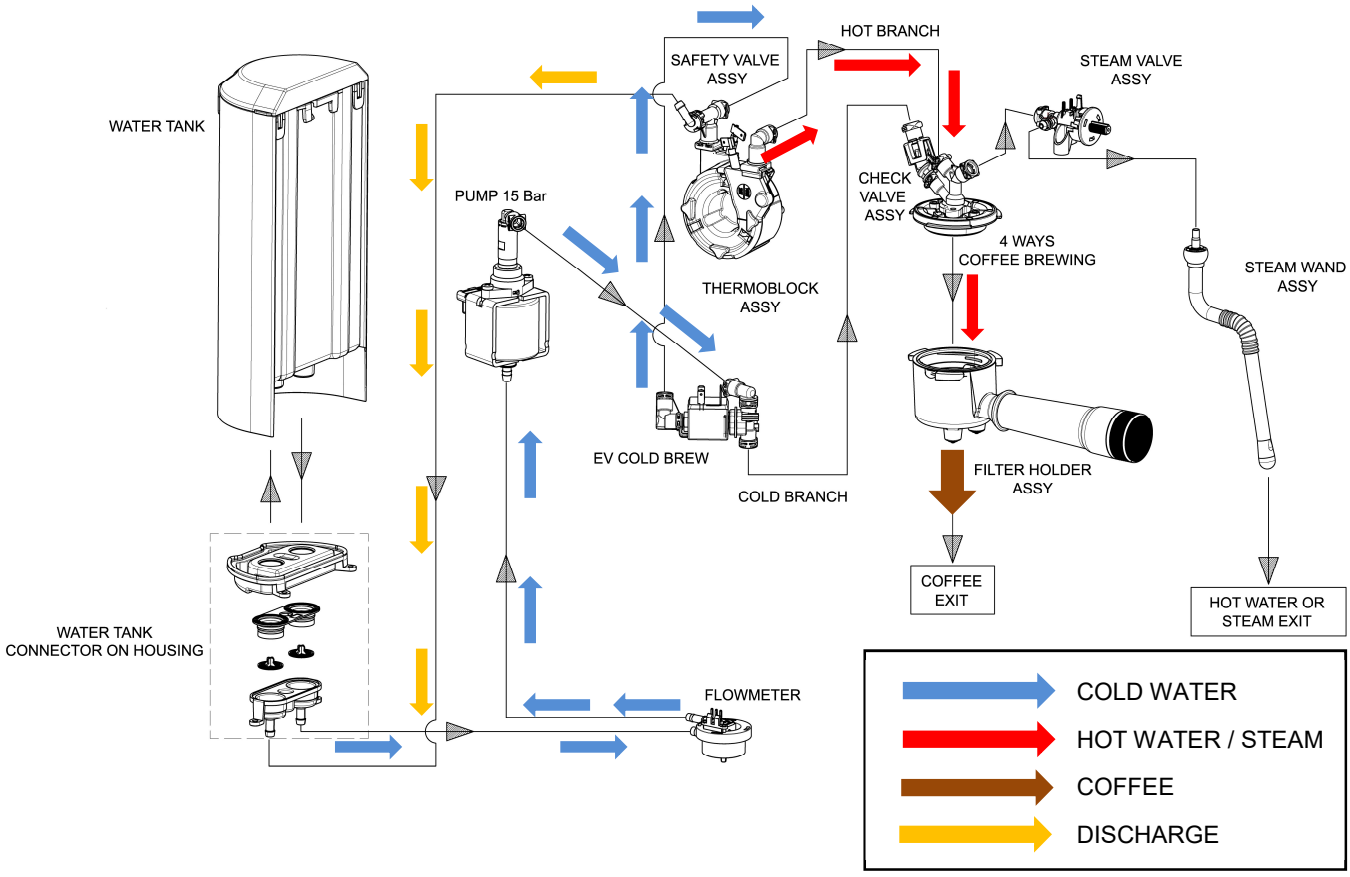


4 WORKING PRINCIPLE

4.1 PECULIAR COMPONENTS

MICROSWITCHES	Function	Logic
MICROSWITCH STEAM VALVE	Detect when the STEAM KNOB is open.	"NO", it closes when the STEAM KNOB is on OFF position.
SOLENOID VALVES	**Function**	**Logic**
EV = 3-way solenoid valve	Switch the flow of the water from the **hot beverages** circuit to the **cold brew** circuit.	It **opens** to allow the water coming from the pump to flow through the **cold brew** circuit. It **closes** to allow the water coming from the pump to flow through the Thermoblock (**hot coffee, hot water and steam circuits**).
SENSORS	**Function**	**Logic**
NTC BOILER	Measure the temperature of the water in the Thermoblock.	It changes its Ohmic value according to the temperature of the boiler.

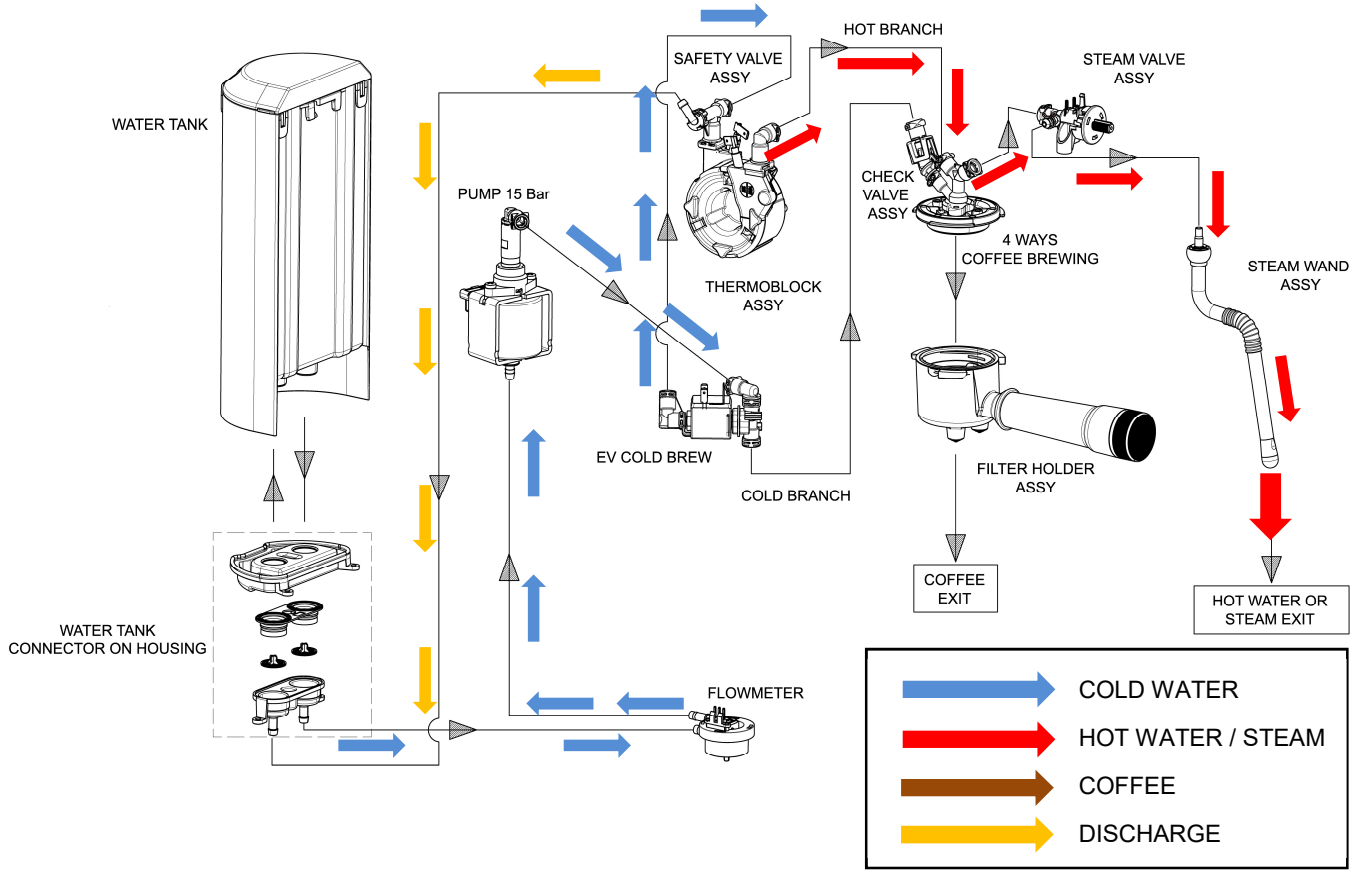
4.2 ESPRESSO COFFEE PREPARATION



Espresso Coffee Preparation steps:

1. The Thermoblock is activated.
2. The solenoid valve EV is deactivated (to enable the HOT branch).
3. The Pump is activated for a couple of seconds for pre-infusion.
4. The Pump restarts in **continuous mode** to deliver the espresso coffee.
5. The Espresso Coffee is delivered through the coffee spouts.
6. The Pump stops, the Thermoblock is deactivated.

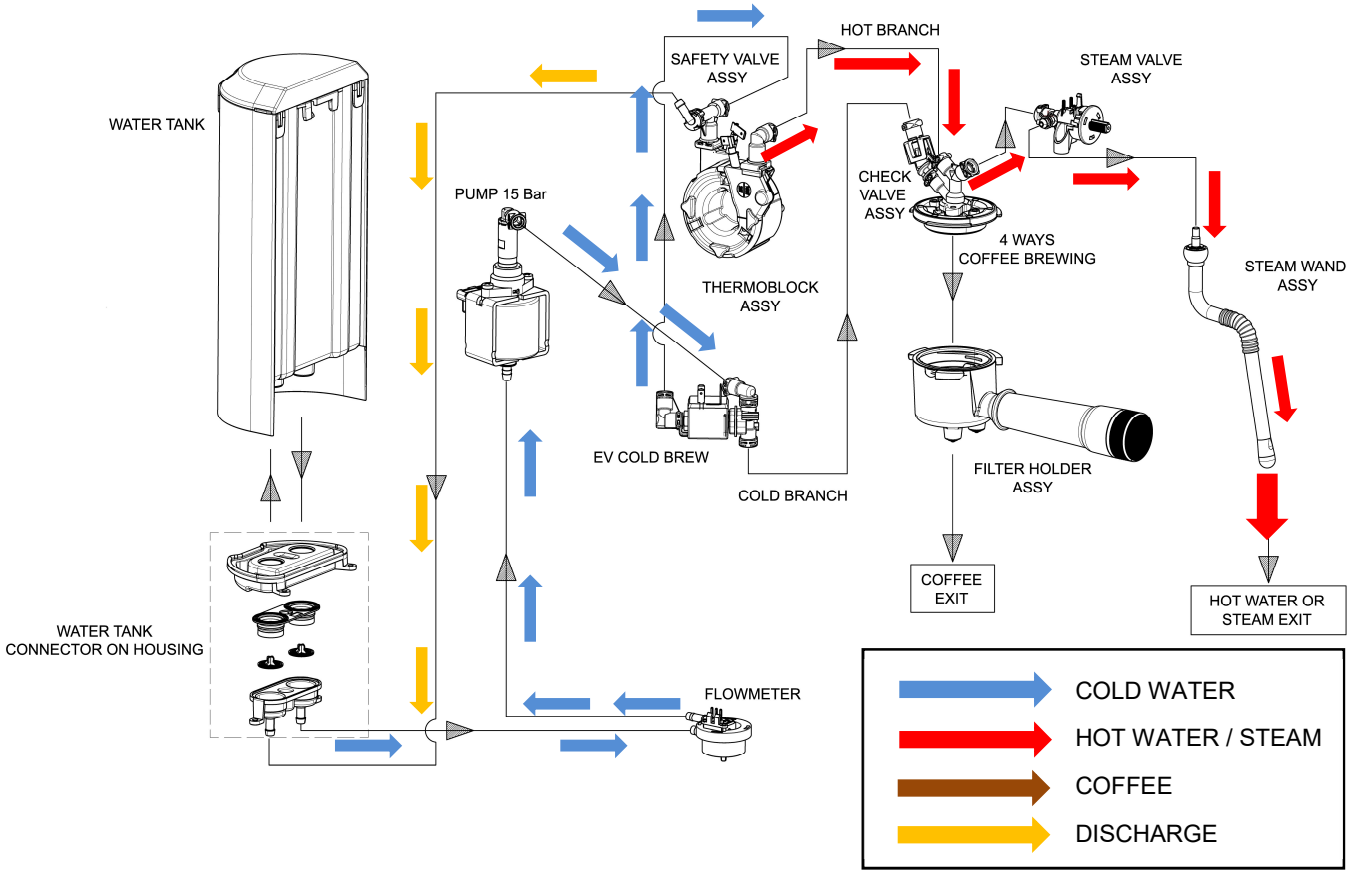
4.3 HOT WATER PREPARATION



Hot Water Preparation steps:

1. The Thermoblock is activated.
2. The solenoid valve EV is deactivated (to enable the HOT branch).
3. The Pump is activated in **fast pulsing mode** for a certain timing.
4. The hot water is delivered through the steam wand.
5. The Pump stops, the Thermoblock is deactivated.

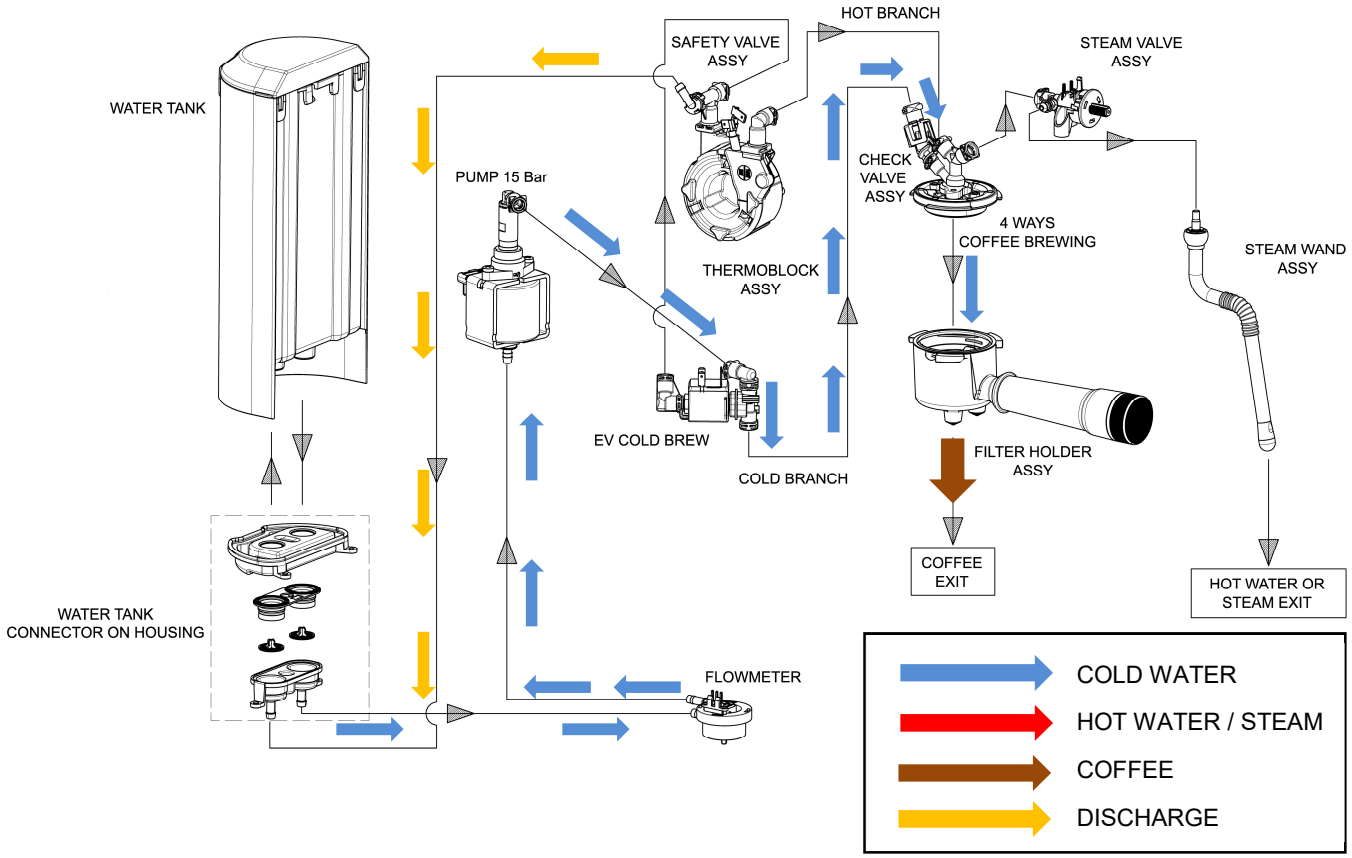
4.4 STEAM PREPARATION



Steam Preparation steps:

1. The Thermoblock is activated (setting temperature higher than 100°C).
2. The solenoid valve EV is deactivated (to enable the HOT branch).
3. The Pump is activated in **slow pulsing mode** for a certain timing.
4. The steam is delivered through the steam wand.
5. The Pump stops, the Thermoblock is deactivated.

4.5 COLD BREW PREPARATION



Cold Brew Preparation steps:

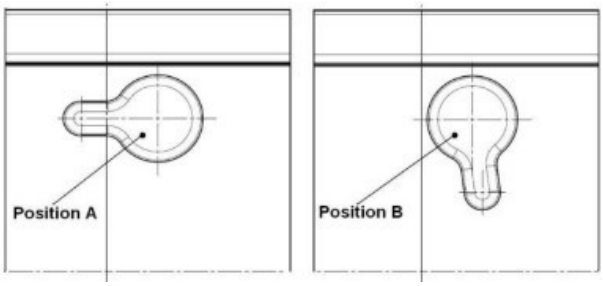
1. The Thermoblock is deactivated.
2. The solenoid valve EV is activated (to enable the COLD branch).
3. The pump is activated in **very slow pulsing mode** for certain timing.
4. The Cold Brew Coffee is delivered through the coffee spouts slowly (drop by drop).
5. At the end of the Cold Brew coffee delivery, the pump stops, EV is deactivated.

5 TEST MODE

5.1 HOW TO ENTER THE VARIOUS TEST MODES

UI panel description:





Title	Description	Title	Description
A	ESPRESSOx1 button	Position A	Close
B	ESPRESSOx2 button	Position B	Open
C	STEAM button		
D	COLD BREW button		
A.1	ESPRESSOx1 LED		
B.1	ESPRESSOx2 LED		
C.1	STEAM LED white		
D.1	COLD BREW LED blue		
E.1	DESCALE LED red		

To activate the TEST MODES, proceed as follows:

- Turn on the coffee machine by the main switch while the KNOB is in Position B (open).
- Wait until the initial animation ends and then press ESPRESSO + COLD BREW buttons for 3s, at least.
- Depending on the position of the knob there are two test functions:

KNOB POSITION	TEST
Position A	UI TEST
Position B	LOAD TEST

- To exit from the test mode switch off the coffee machine by the main switch.

5.2 USER INTERFACE TEST

KNOB POSITION	TEST
Position A	UI TEST

In this phase all LEDs are OFF unless a button is pressed (see table below).

5.2.1 LEDs, BUTTONS AND BUZZER TEST

BUTTONS PUSHED	LED STATE				
	A.1	B.1	C.1	D.1	E.1
A	ON	OFF	OFF	OFF	OFF
B	OFF	ON	OFF	OFF	OFF
C	OFF	OFF	ON	OFF	OFF
D	OFF	OFF	OFF	ON	OFF
A+D	OFF	OFF	OFF	OFF	ON
A+B	BUZZER ON				

5.2.2 COFFEE CIRCUIT TEST

Keep A and C buttons pressed to activate the pump to test the hot coffee hydraulic circuit.

Keep D and C buttons pressed to activate the pump and EV to test the cold coffee hydraulic circuit.

5.3 LOAD TEST

KNOB POSITION	TEST
Position B	LOAD TEST

In this phase all LEDs are ON unless a button is pressed (see table below). Press the buttons to activate the various loads:

LOAD	LOAD STATE				
	SWITCH STATE	PUMP	HEATER	EV	LED
PUMP	A BUTTON PUSHED	ON	OFF	OFF	A.1 LED ON
HEATER	B BUTTON PUSHED	OFF	ON (110 °C)	OFF	B.1 LED ON
EV	D BUTTON PUSHED	OFF	OFF	ON	D.1 LED ON
CIRCUIT EMPTYING	C BUTTON PUSH	See description below			A.1 and C.1 LEDs turn ON alternatively

Circuit emptying:

- Phase 1: PUMP turns ON until the tank is empty.
- Phase 2: PUMP turns OFF and HEATER turns ON to dry the water in the heater.
- Phase 3: HEATER turns OFF and PUMP turns ON for 15s to remove water residues.
- Phase 4: The machine goes into standby mode.

5.4 GENERAL ALARM

When **all LEDs blink**, this indicates a **GENERAL ALARM** which cannot be reset by the user. Examples:

- There is no communication between the display PCB and main PCB because the cable is not properly connected or one of the PCBs is damaged.
- The NTC is not properly connected or the main PCB is damaged.
- The machine tries to heat, but does not see the temperature rising. It could be a burned out **TCO** or a problem with the Thermoblock.

5.5 STATISTICS

To enter **statistics mode**, turn on the coffee machine by the main switch while the KNOB is in Position B (open). Wait until the initial animation ends and then press ESPRESSO X2 + STEAM buttons for 3s, at least. Then, referring to the table below, press a button:

BUTTON	Beverage counter
Espresso X1	Total water liters
Espresso X2	Total number of coffee beverages
Steam	Total number of steam
Cold Brew	Total number of descale

The machine will show sequentially every digit of the counter by blinking the LED, corresponding to that specific digit. Each LED will blink a number of times equal to the value of the digit. At the end, all beverage LEDs blinks 2 times and the machine returns to the statistics selection.



Example: If the number to show is 12345:

- Steam LED will blink 1 time;
- Espresso LED will blink 2 times;
- Espresso X2 LED will blink 3 times;
- Cold Brew LED will blink 4 times;
- Descale LED will blink 5 times;
- End animation (beverage LEDs blinks 2 times);

6 HEATING ELEMENTS RESISTANCE CHECK

Thermoblock resistance value: ≈ 38 Ω.

Resistance / temperature characteristics for the thermoblock NTC:

TEMP. °C	MINIMUM kΩ	NOMINAL kΩ	MAXIMUN kΩ	Temp. Accy ±°C	Resi. Assy ±%
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

7 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. Set the temperature at the maximum level.
3. Run a rinse cycle to warm up the hydraulic circuit.
4. Start the brewing of the **double Espresso**.
5. 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 **86°C ± 3°C**.