SERVICE MANUAL
COFFEE MACHINE

ZENIUS ZN 100 PRO

CONTENTS

PREFACE

The purpose of this service manual is to provide the service personnel with all necessary information with regards to correct handling, maintenance and repair of the coffee machines ZN100 PRO.

This manual should be used by the technicians as a valuable aid to guarantee the permanent readiness for use of the machines. In order to take full advantage of all the functions, it is absolutely necessary to follow the instructions in this manual.

Visit the Nespresso technical website periodically to check for upgrades, technical modifications, counter measures etc. for these coffee machines:

https://business.nespresso.com

A movie is available for dismantling and test explanation..

DOCUMENT CHANGE HISTORY

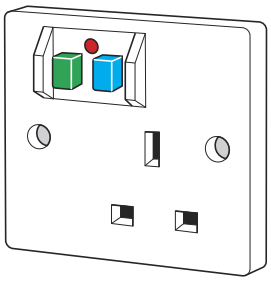
Date	Edition	Modification(s)	Pages
11.09.2013	V 2.0	Y- to T-connector changed	13, 14, 51, 54
11.09.2013	V 2.0	Button message	19
11.09.2013	V 2.0	Repair and mounting tips	40
11.09.2013	V 2.0	Handle mounting	43
11.09.2013	V 2.0	Antenna guiding modified	46
11.09.2013	V 2.0	Replacing electronically board	49-50
11.09.2013	V 2.0	Triac connector added	51, 52, 54
11.09.2013	V 2.0	FEP Tube 230 mm (pump-evalve lower)	77, 81 (Pos. 41)
11.09.2013	V 2.0	Exploded drawings updated	76 to 77
11.09.2013	V 2.0	Wiring diagrams VDE and UL/JP added	78 to 79
11.09.2013	V 2.0	Spare parts list updated	80 to 83
20.06.2014	V 3.0	Water level sensor calibration	25
20.06.2014	V 3.0	Removing the front panel	48
20.06.2014	V 3.0	Spare parts list updated	80 to 83
23.09.2015	V 4.0	Neslink module removed from current appliances	44 to 79
23.09.2015	V 4.0	Replacement of O-rings on solenoid valves	57
23.09.2015	V 4.0	Spare parts list updated	80 to 83
26.10.2016	V 5.0	Different dismantling of metal or plastic housing parts	44 to 45
26.10.2016	V 5.0	Different protective tests of metal or plastic housing	68 to 71
26.10.2016	V 5.0	Spare parts list removed from the manual	80 to 83
21.11.2018	V 6.0	New solenoid valves added	10 to 81
21.11.2018	V 6.0	Instructions for brewing capsule replacement added	62 to 63

1 GENERAL SAFETY NOTES

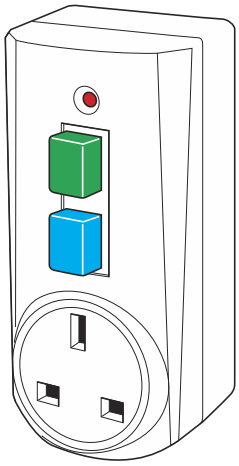
Risk of fatal electrical shock and fire!
Mains voltage inside the coffee machine.

- **Unplug appliance before cleaning.**
- **Never clean wet or immerse plug, cord or appliance in any fluid.**
- **Disconnect the mains plug before disassembly - the appliance must be free of voltage.**

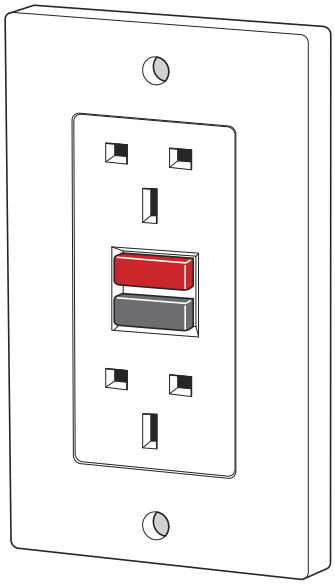
As an additional safety measure, the use of a residual current device (RCD), also called a ground fault circuit interrupter (GFCI), in the repair centre is highly recommended.



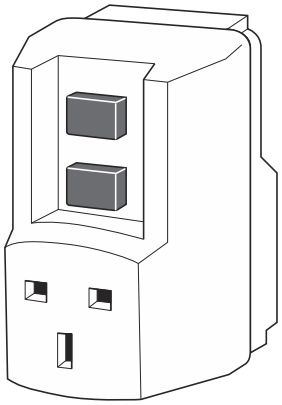
1) RCD protected socket-outlet



2) Plug-in RCD unit



3) GFCI socket



4) Plug-in GFCI

Danger of burns!
Hot parts and water under pressure inside the coffee machine (particularly in the thermoblock).

- **Let coffee machine cool down before cleaning or disassembly.**

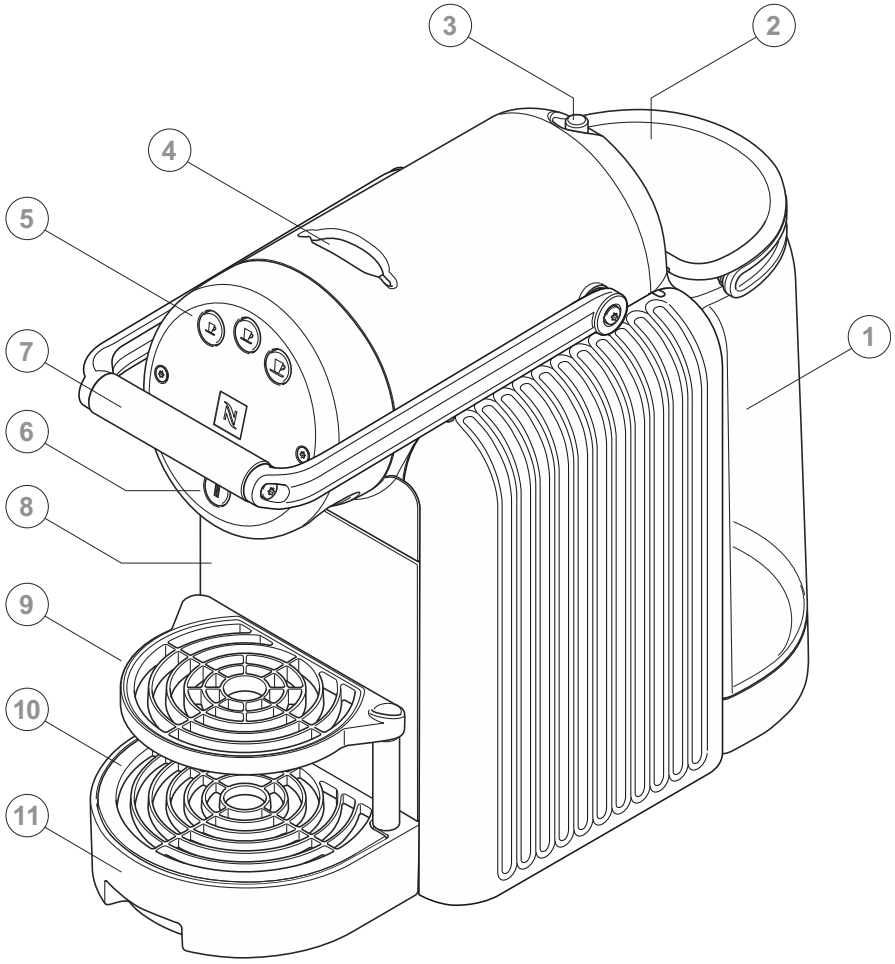
This device does not protect against electrical shock due to contact with both circuit conductors.

Example illustrations of typical devices.

Use a GFCI with a trip level of 4 - 6 mA (USA) resp. a RCD with a trip level of 15 - 30 mA (Europe). A trip level above 30 mA provides only very limited protection against harm from an electric shock.

2 MAIN COMPONENTS

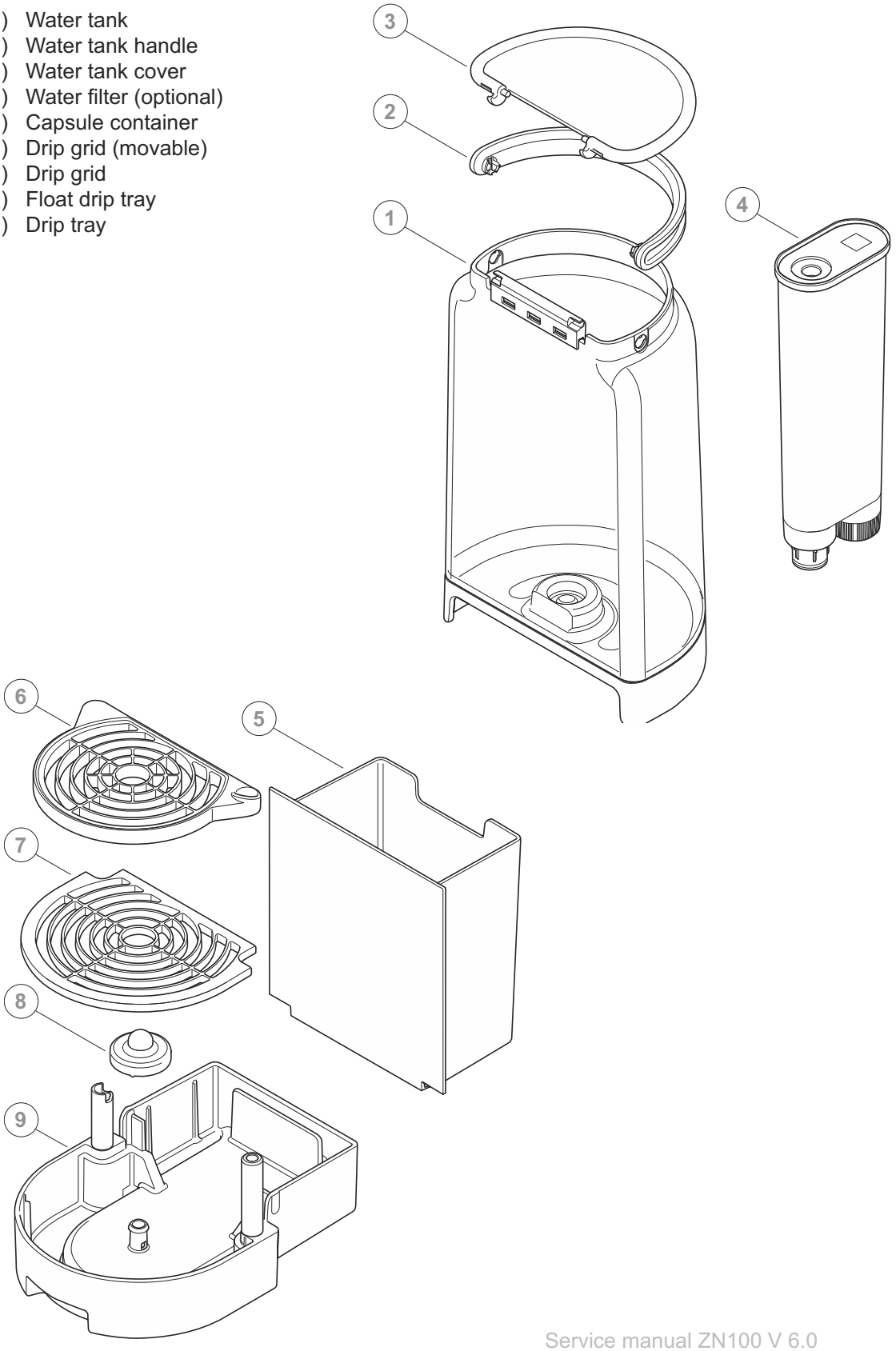
2.1 Overview - front side



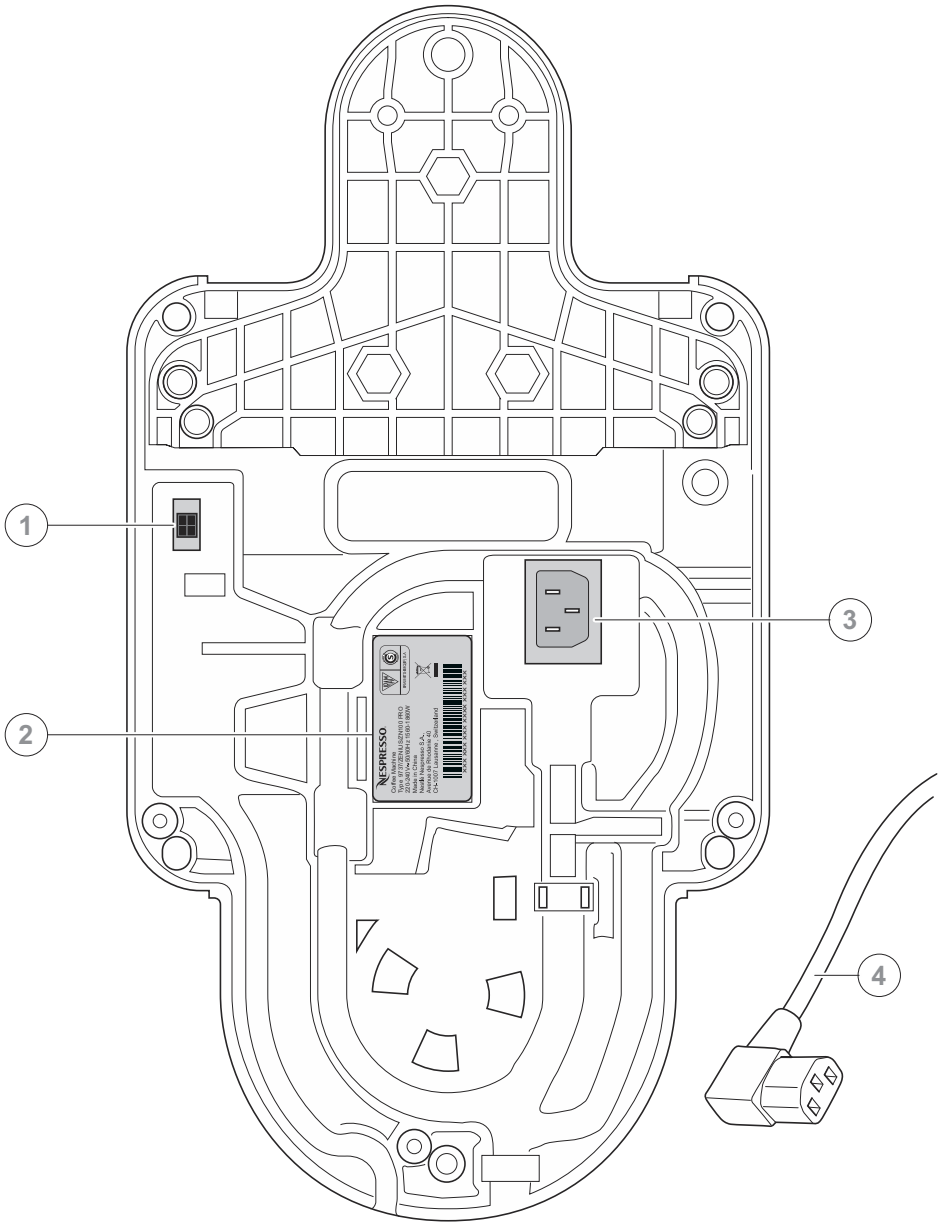
1) Water tank
2) Water tank cover
3) Power on switch
4) Capsule slot with safety lid
5) Coffee (MMI) buttons
6) Hot water button
7) Handle
8) Capsule container
9) Drip grid (movable)
10) Drip grid
11) Drip tray opening with support

2.2 Overview - removable parts

1) Water tank
2) Water tank handle
3) Water tank cover
4) Water filter (optional)
5) Capsule container
6) Drip grid (movable)
7) Drip grid
8) Float drip tray
9) Drip tray

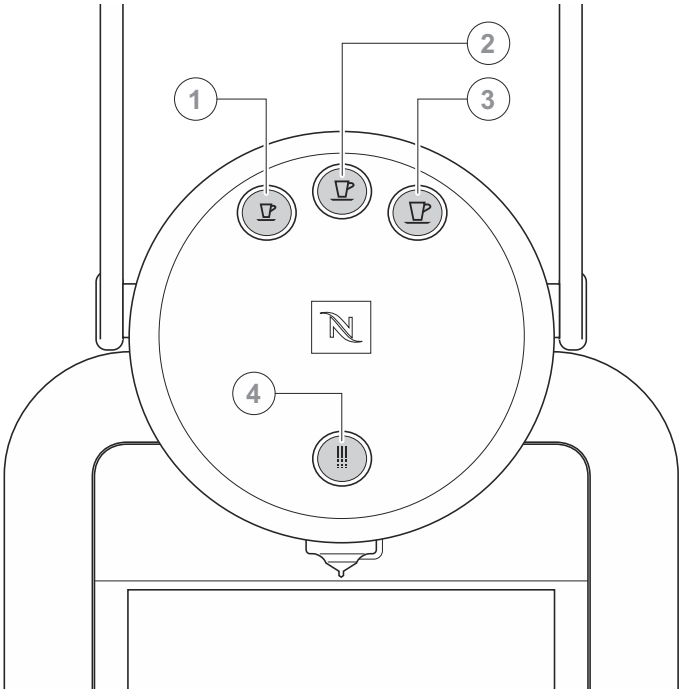


2.3 Overview - left side and bottom



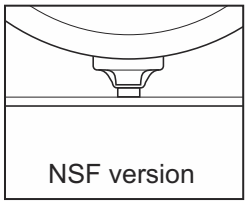
1) PC connector (with dongle)
2) Type plate
3) Mains connector
4) Mains cable

2.4 Overview - operating elements

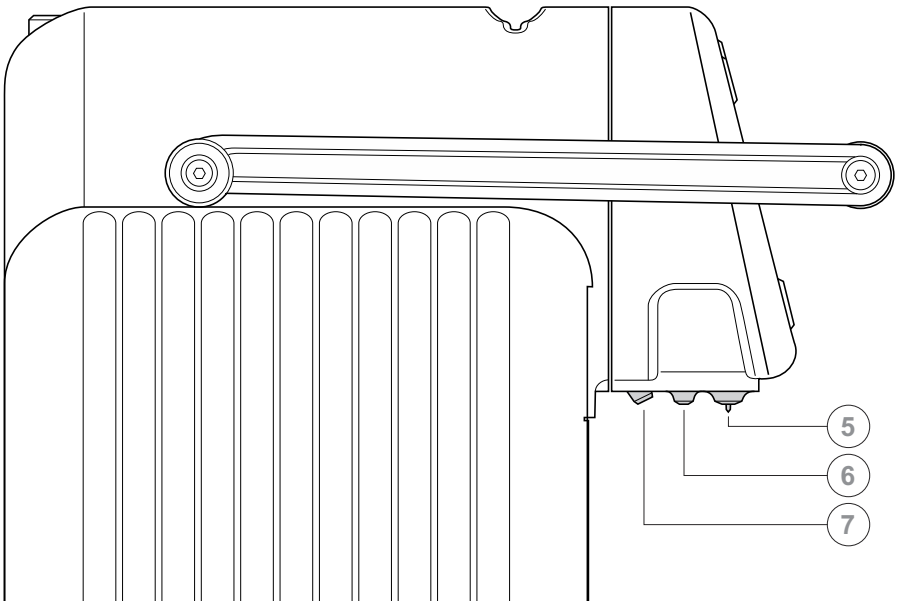


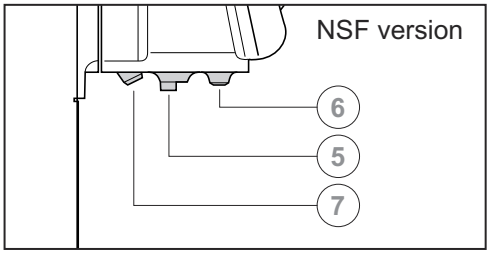
NSF -
National science foundation USA

Food safety certification



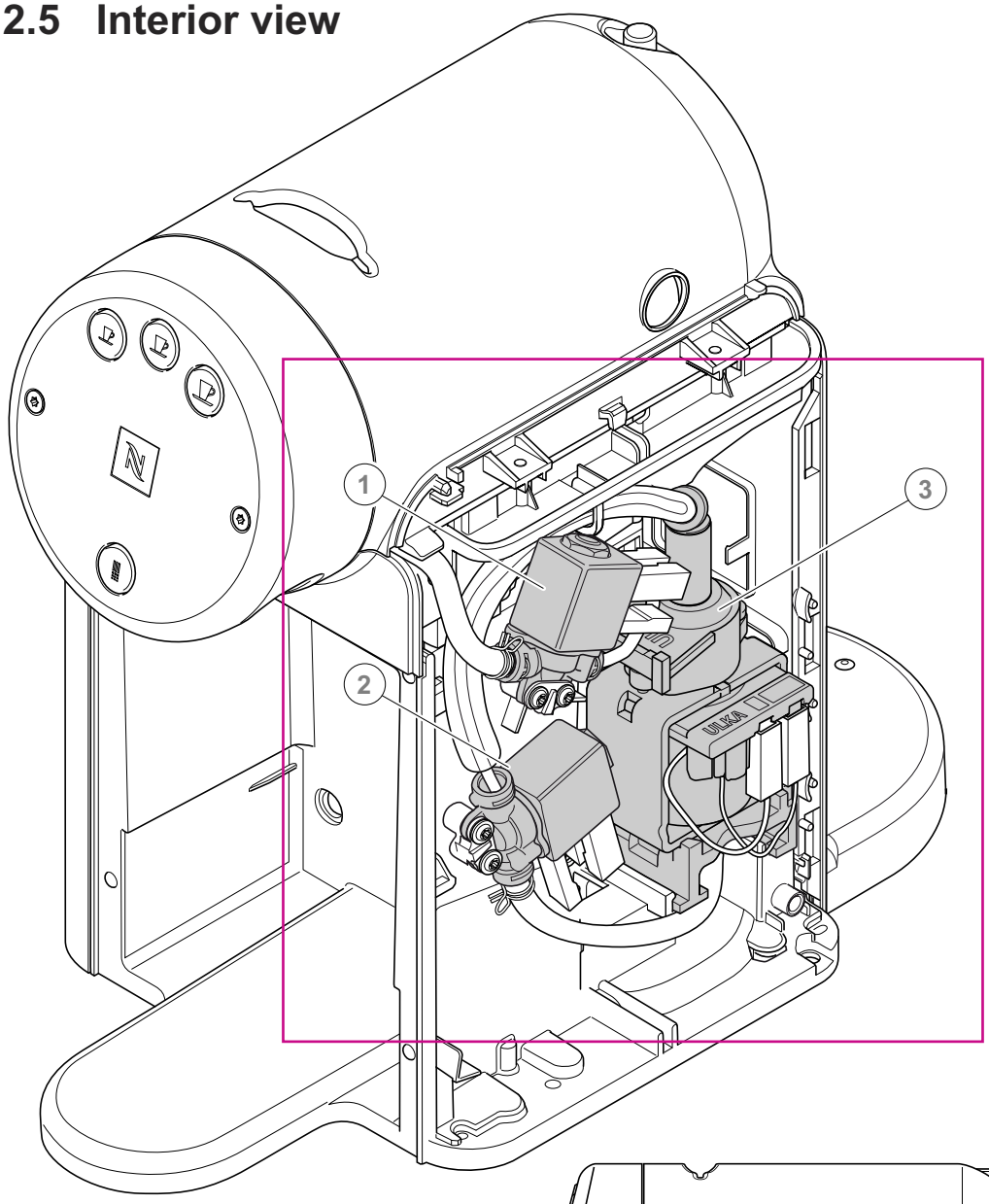
1) Ristretto button
2) Espresso button
3) Lungo button
4) Hot water button

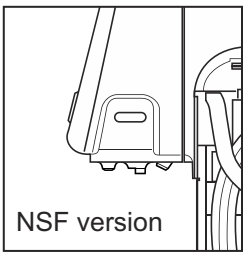


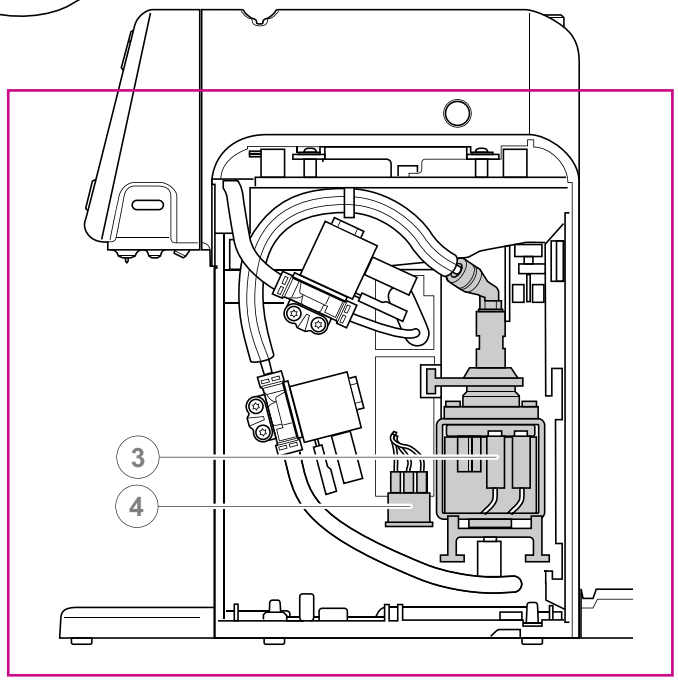


5) Coffee outlet
6) Hot water outlet
7) Cup lighting

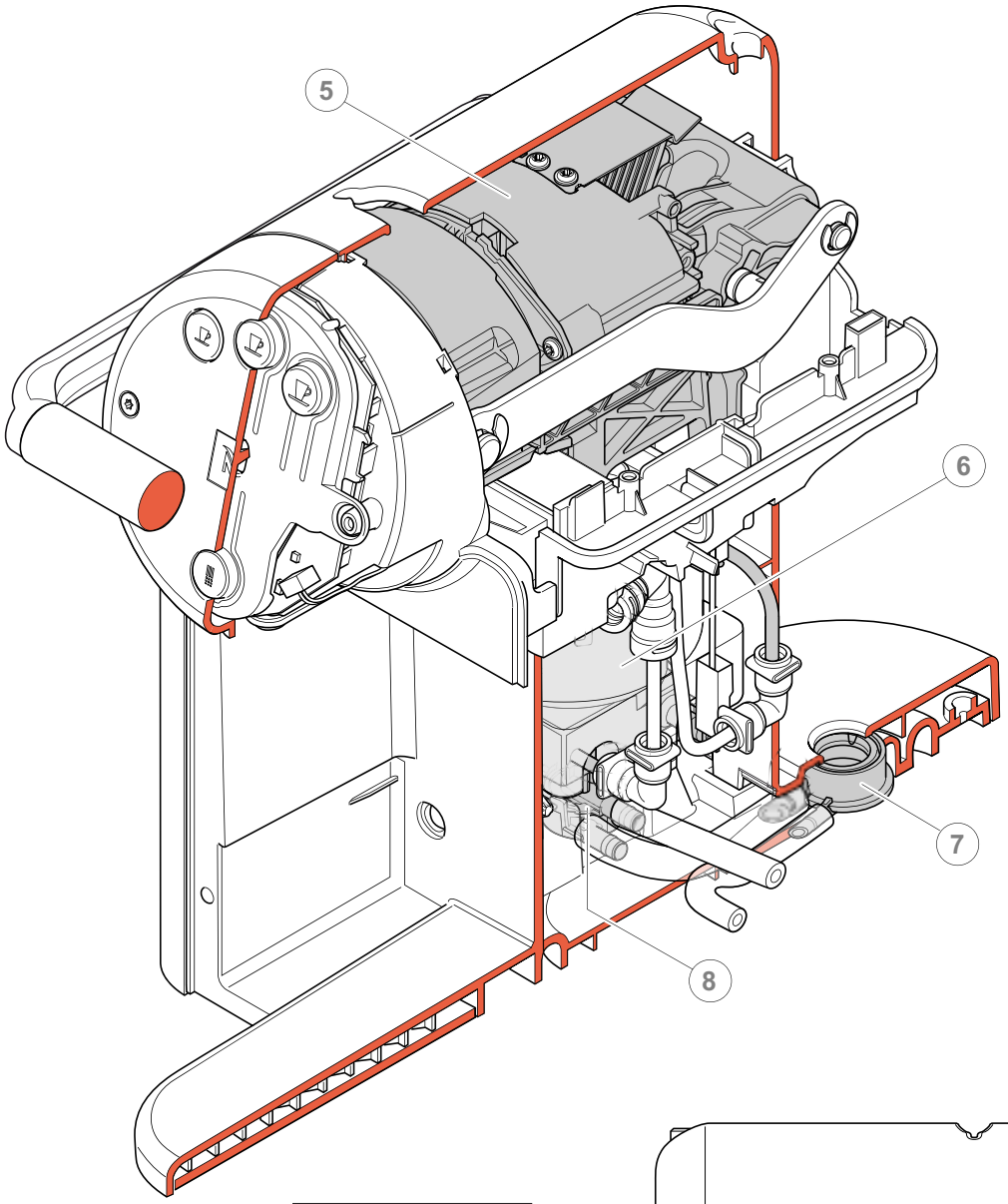
2.5 Interior view

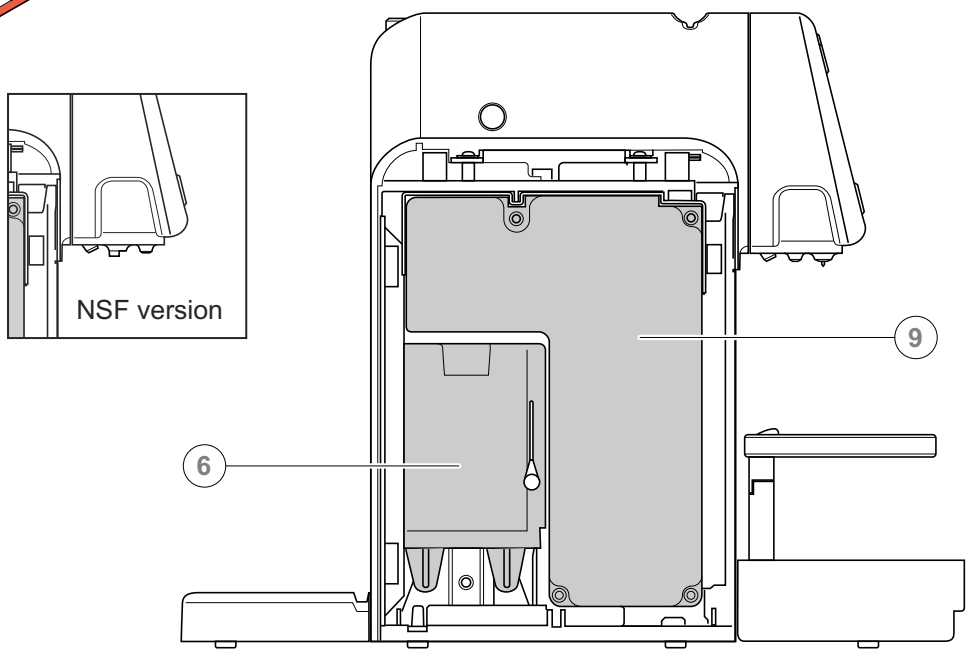






1) Solenoid valve (hot water)
2) Solenoid valve (drain)
3) Pump CP4-SP C2
4) Power socket

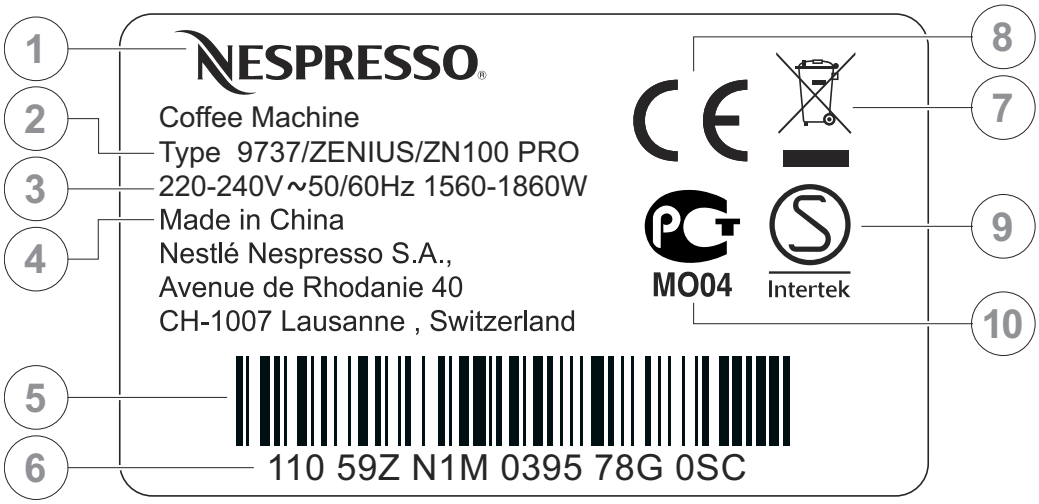




5) Extraction unit
6) Thermoblock TB
7) Water tank connector
8) Flow meter
9) Power pcb

2.6 Type plate

The type plate
- can be found at the bottom side of the coffee machine,
- carries the following information:



1) Brand name
2) Machine type
3) Rated voltage and power consumption
4) Origin
5) Bar code
6) Serial number
7) Non-waste disposal symbols
8-10) Marks of conformity

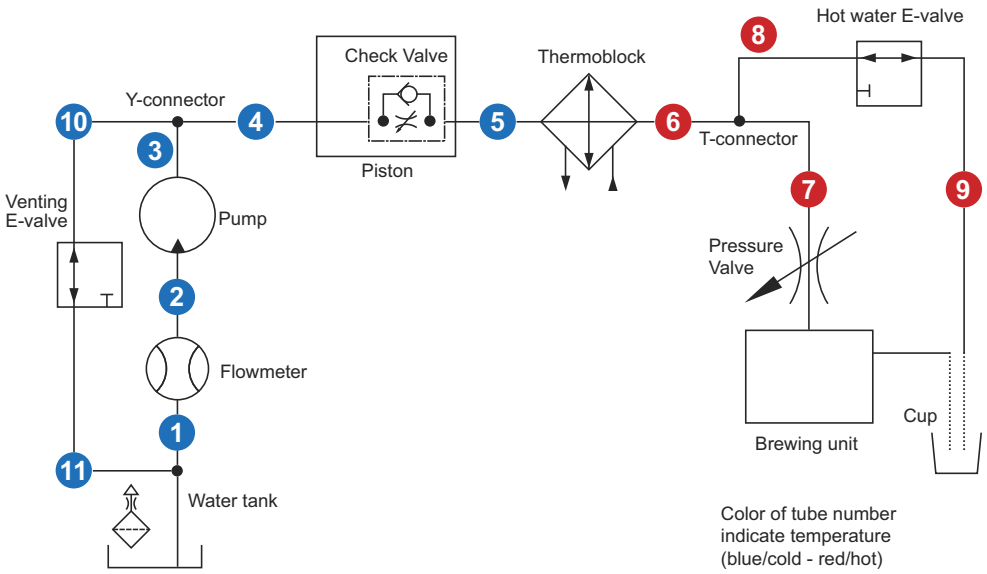
Serial number codification

Example:

110 59Z N1M 0395 78G 0SC

- Checksum value (based on module 35)
- Color version
- Mains plug version
- Mains voltage
- Machine partner codification
- Incremental number per production day
- Production site
- Machine type
- Day of production (59 = 28.2.)
- Year of production (2011)

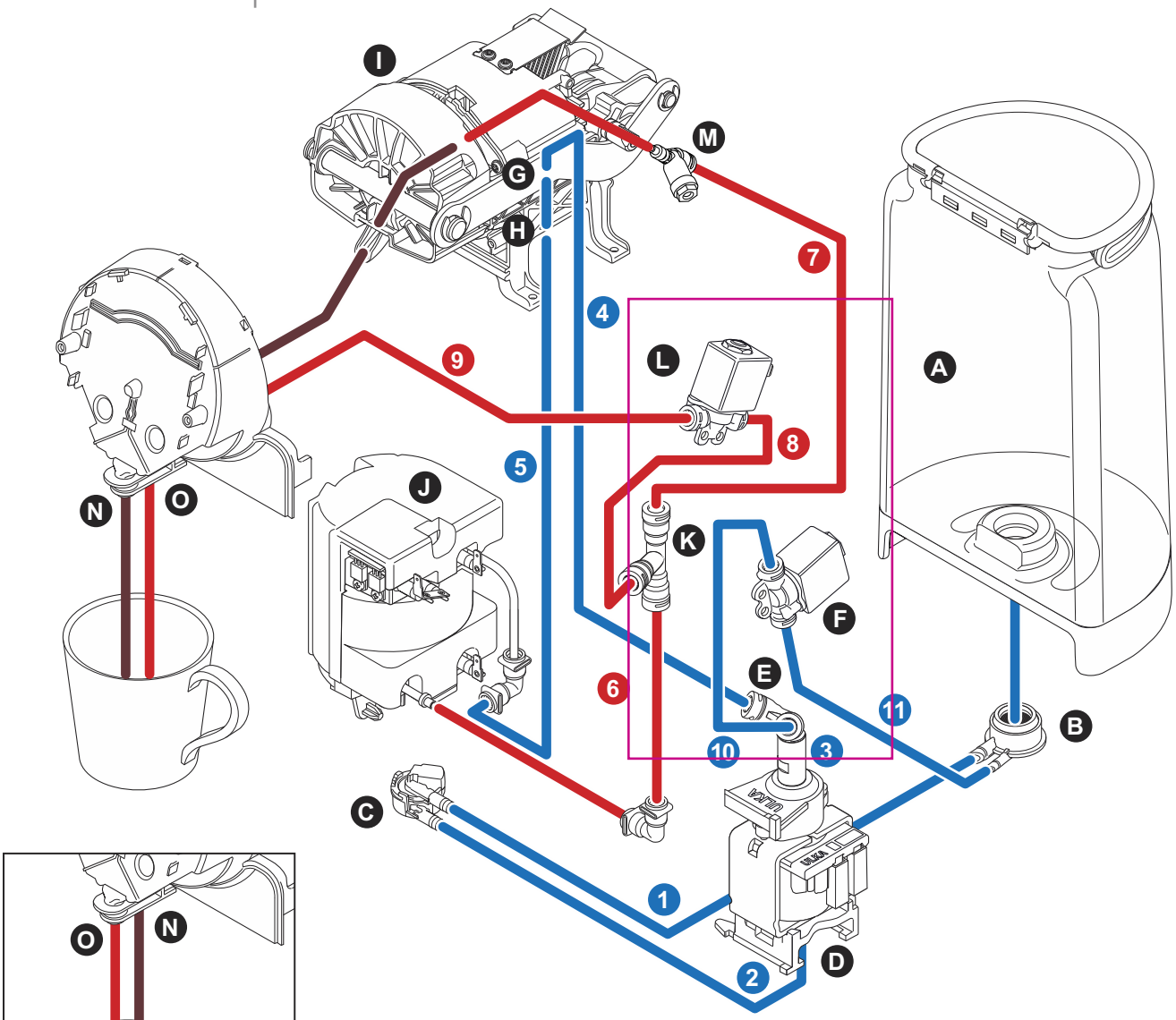
2.7 Fluid system

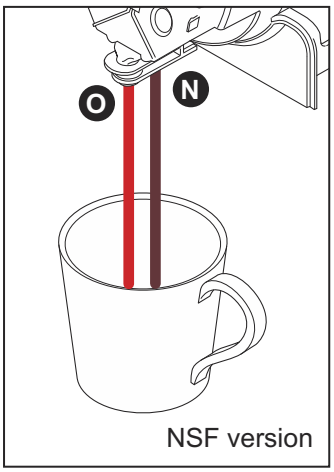


Water flowing through machine keep fluid system (illustrate blue and red water flow)

Tube list

Nr.	Con A	Con B	Temperature
1.	Water tank connector	Flowmeter	Cold
2.	Flowmeter	Pump	Cold
3.	Pump	Y-connector	Cold
4.	Y-connector	Check valve	Cold
5.	Check valve	Thermoblock	Cold
6.	Thermoblock	T-connector	Hot
7.	T-connector	Pressure valve	Hot
8.	T-connector	Hot water E-valve	Hot
9.	Hot water E-valve	Hot water outlet	Hot
10.	Y-connector	Venting E-valve	Cold
11.	Venting E-valve	Water tank connector	Cold





A) Water tank
B) Water tank connector
C) Flow meter
D) Pump
E) Y-connector
F) Venting E-valve
G) Piston
H) Check valve
I) Brewing unit
J) Thermoblock
K) T-connector
L) Hot water E-valve
M) Pressure valve
N) Coffee outlet
O) Hot water outlet

2.8 Technical data

Main voltage versions..... 220-240 V, 50/60 Hz

Approvals..... BSMI, CB, CCC, CE, C-Tick, C-Tick RCM, CSA; ESTI, Gost-r, IRAM, KTE, SASO, SABS, UL com

Consumption data

Preheating time aprrox. ..... 35 s
Heating up .....10.8 Wh
1 medium coffee cup (40 ml*) .....2.7 Wh
1 large coffee cup (110 ml*) .....9 Wh
Hot water (125 ml*) ..... 6.6 Wh
Standby (1 h) .....14 Wh
Auto power OFF (2 h*).....0 Wh

* Default settings

Power ratings

Thermoblock (230V) ..... 1630 W
Thermoblock (120V) .....1580 W
Thermoblock (100V) .....1400 W
Pump CP4 SP ..... 60 W
Solenoid Valve.....10 W

Capacities

Watertank.....2.2 l
Drip tray .....350 ml
Capsule container ..... 25 pcs. max.

Various data

Safety temperature (thermal cut-off) ..... 167°C
Coffee temperature at outlet ..... 86° C ± 3° C
Hot water temperature at outlet ..... > 90° C
Dimensions
(width x depth x height) ..... 19.0 x 39.8 x 31.5 cm
Cable length approx..... 1.2 m
Weight of coffee machine (without water) .....7.3 kg

Pump EP4GW

Pump pressure
- max. permissible ..... 19 - 21 bar
- during coffee preparation
(depending on the type of coffee) ..... 9 -16 bar
Flow performance ..... ≧ 180 ml/min. at 12 bar

Machine versions

Machine version	Technical version (Voltage/Hz/power)
Nespresso Professional Zenius ZN100/AR	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/BR	120-127V/60Hz/1610-1810W
Nespresso Professional Zenius ZN100/BR3	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/CN	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/EUR	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/JP	100V/50-60Hz/1450W
Nespresso Professional Zenius ZN100/KR	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/SG	220-240V/50-60Hz/1560-1860W
Nespresso Professional Zenius ZN100/TW	100V/50-60Hz/1450W
Nespresso Professional Zenius ZN100/UL	120-127V/60Hz/1610-1810W
Nespresso Professional Zenius ZN100/ZA	220-240V/50-60Hz/1560-1860W

3 OPERATION

3.1 General information

For an overview of the operational controls see "Overview - operating elements" on page 9.

Preset filling amounts

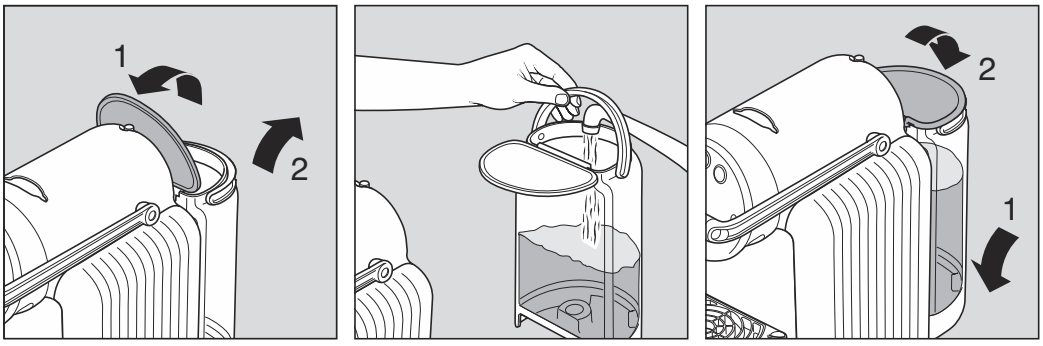
Coffee-, portion- and fill up buttons have preset filling amounts that can be modified (see "Programming the cup volume by push-button" on page 20).

Procurements

The coffee machine can perfom only one serving at the same time (coffee or hot water).

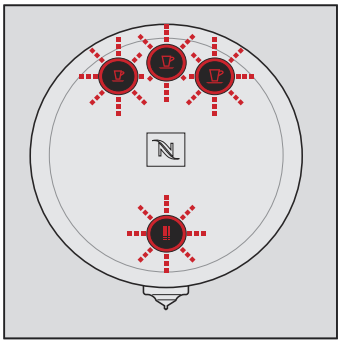
3.2 Preparation (for test in After Sales Center)

For a function control and some function tests (see "Function tests" on page 62) it is necessary to make the coffee machine ready for operation.

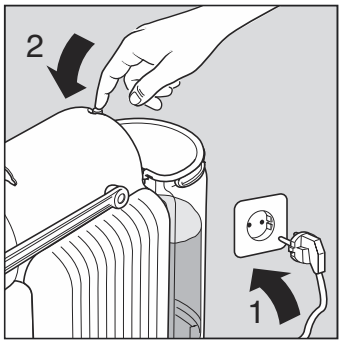


2. Fill the water tank with fresh, potable water.

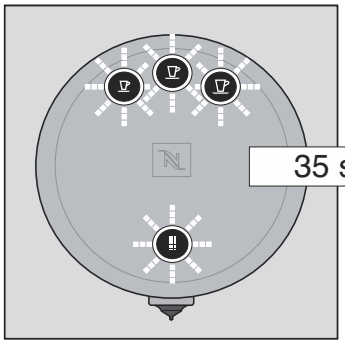
A minimum water quantity is required to let the capacitive sensor detect water in the tank. Otherwise the LED MMI will show “water tank empty” signal
(All 4 buttons blink red permanently)



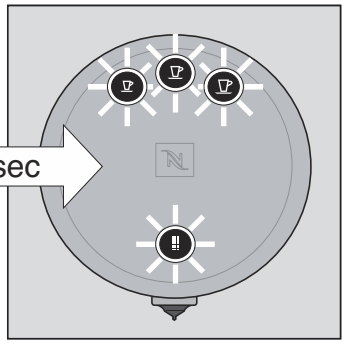
Start-up



1. Connect coffee machine to main. Switch on mains switch.

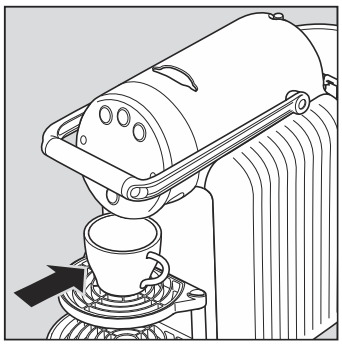


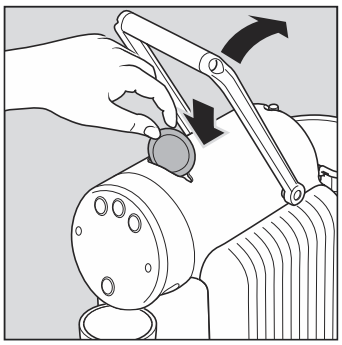
2. Wait (approx. 35 sec.) till coffee machine is heated up…

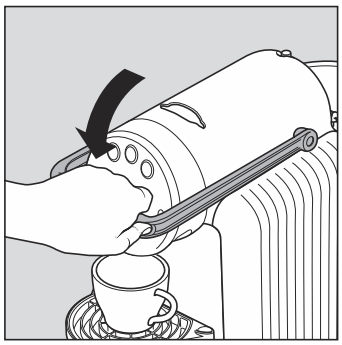


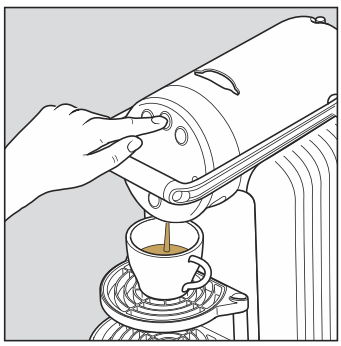
3. …and button illumination turns to white.

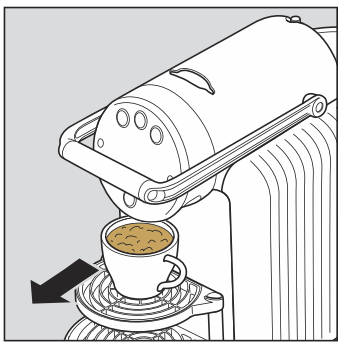
3.3 Preparing coffee

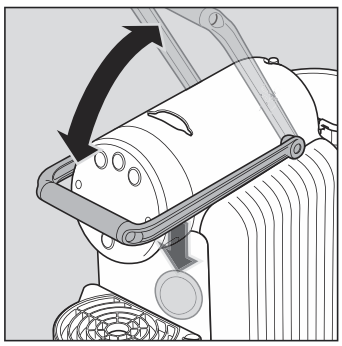








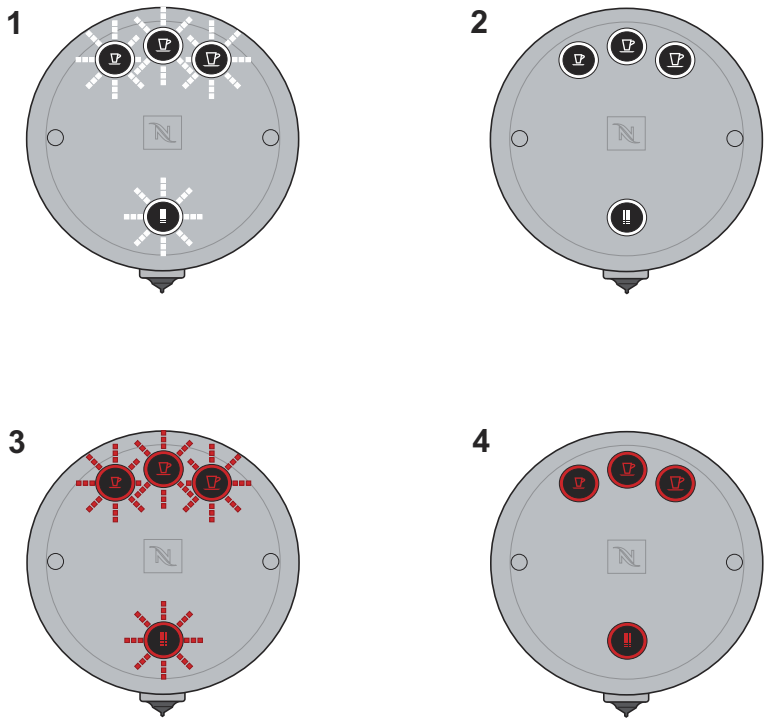




Coffee preparation can be aborted by pressing the same coffee button again (e.g. cup too small for preset filling amount).

3.4 Coffee machine displays

3.4.1 Button colors

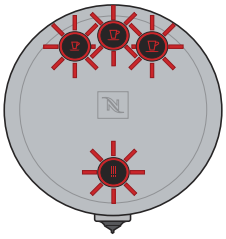


1) White, blinking backlight..... coffee machine is heating up
2) White backlight .....ready for operation
3) Red, blinking backlight ..... water tank empty or missing
4) Red backlight ..... error, user or service intervention necessary

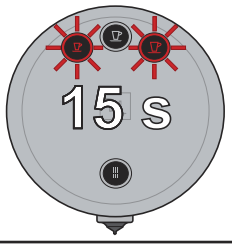
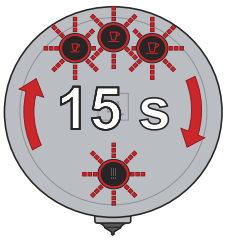
A red backlight on buttons locates the error.

Button colors for coffee and hot water preparation can be different, depending on operation mode.

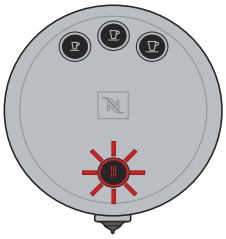
Operation

Button message	Reason	Remedy
Fill water 	Water tank empty. Floater in water tank stucked. Water sensor defective. Exchange of the back panel (Incl. water level PCBA).	Fill water tank. Clean floater chamber in water tank. Replace water sensor. Calibrate water sensor.

Maintenance

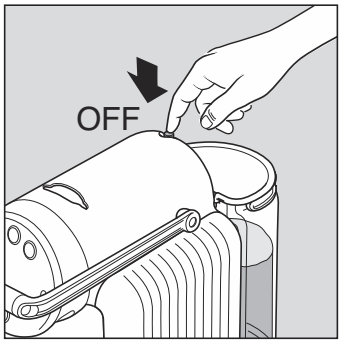
Button message	Reason	Remedy
Change filter 	Preset service life of water filter reached.	Replace water filter in water tank. .
Descaling needed 	Preset operating time reached (depending on water hardness).	Perform descaling. Some additional servings are possible till coffee machine locks up to prevent damage.

Errors

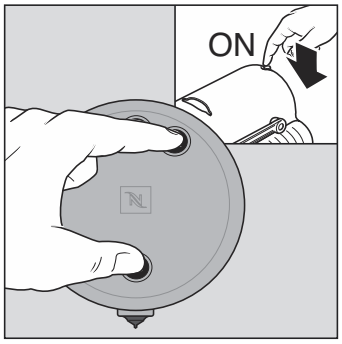
Button message	Reason	Remedy
Overheat 	Machine is too hot.	This alarm is blocking the machine (no machine usage allowed when alarm is on), machine is blocked during about 10 minutes until the temperature is again normal Hot water button blinking red (until the temperature is again back at normal level), other buttons Off. All buttons are inactive.
Temporary defect 	Reasons for alarm: - Flow-meter defective - pump defective - water tank sensor defective (even if there are no more water, the sensor don't detect an empty water tank) - machine scaled	Indication in the user manual: - Switch on/off the machine. - If alarm is repeated after switch on/off several times: Descale machine - If alarm is repeated after descaling: Call Nespresso B2B service centre
Fatal defect 	Reasons for alarm: - Thermoblock defective - NTC defective - Newton defective - Machine software not updated, or no serial number recorded	Check related parts and change if defect.

4 PROGRAMMING

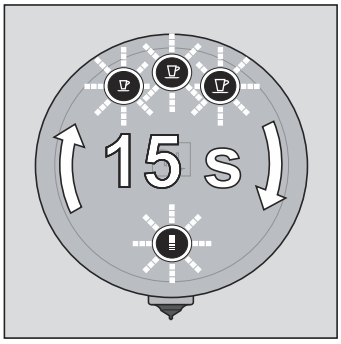
4.1 Programming the cup volume by push-button

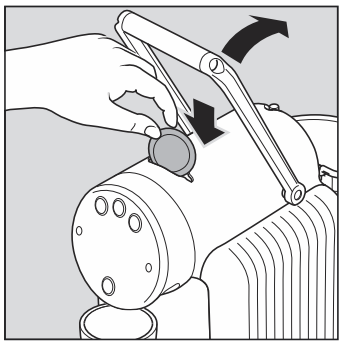


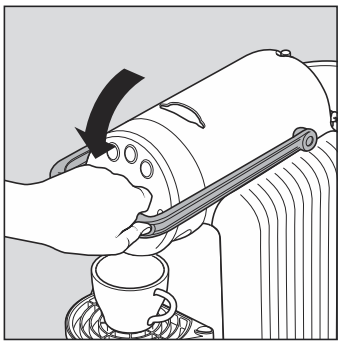
1. Switch off coffee machine.

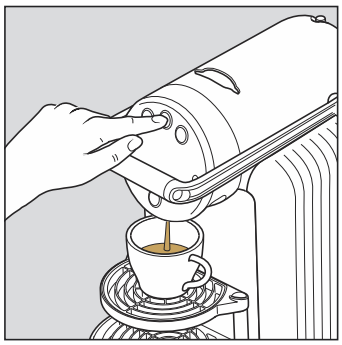


2. Press and hold Lungo and Hot water buttons while turning on the machine.

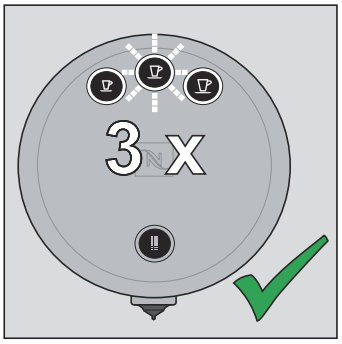








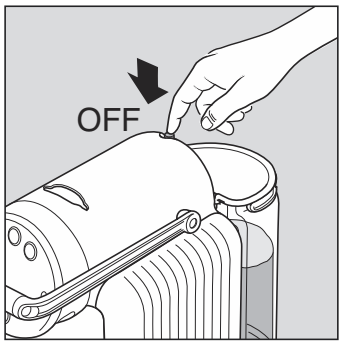
6. Press and hold cup button during blinking cycle. Release once desired volume is served.



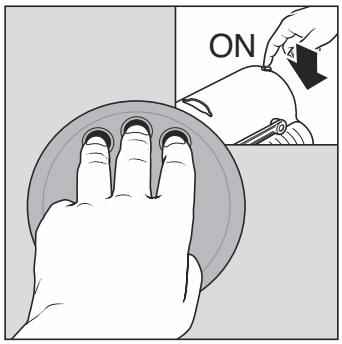
7. Confirmation of selection. Example for Espresso new cup volume setting.

To adjust hot water cup volume no capsule is necessary.

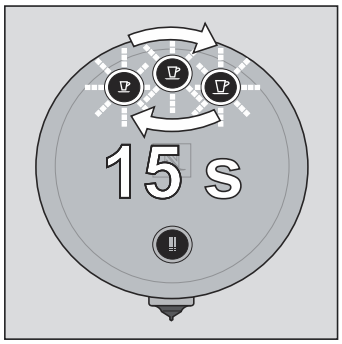
4.2 Programming the coffee temperature



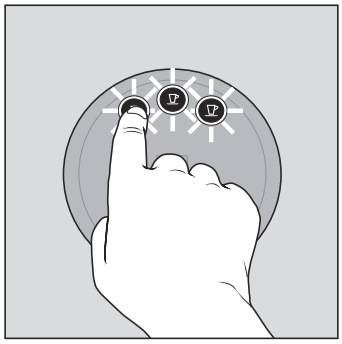
1. Switch off coffee machine.



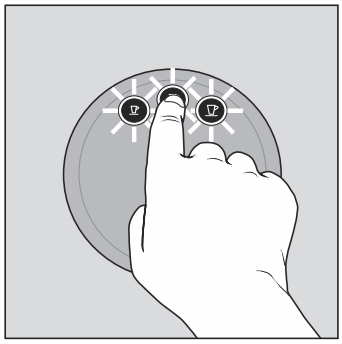
2. Press and hold all 3 coffee buttons while turning on the machine.



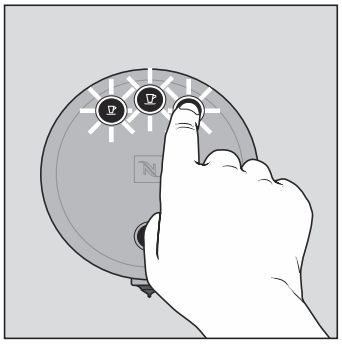
3. To programm coffee temperature, press during blinking cycle.



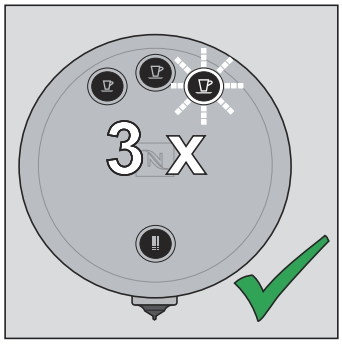
4. Low temperature.



5. Medium temperature.

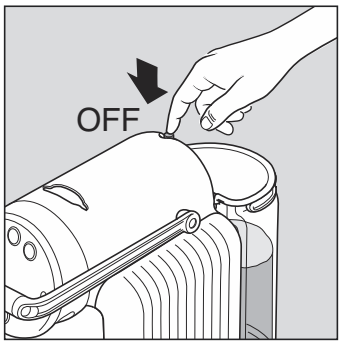


6. High temperature.

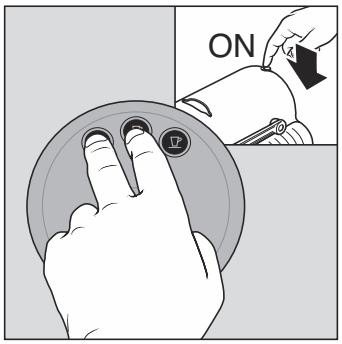


7. Confirmation of selection. Example for high temperature setting.

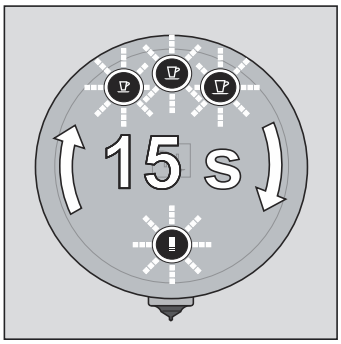
4.3 Programming the water hardness settings



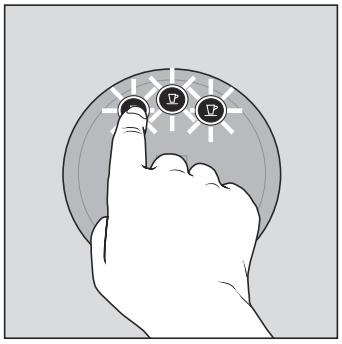
1. Switch off coffee machine.



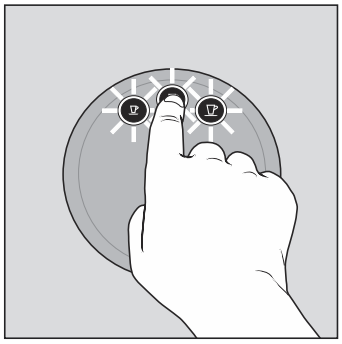
2. Press and hold Ristretto and Espresso buttons while turning on the machine.



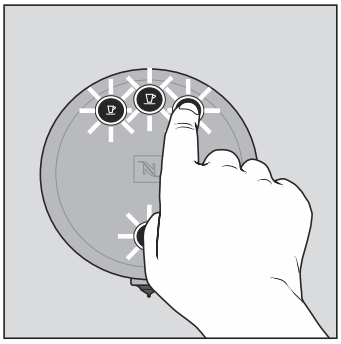
3. To select water hardness setting, press during blinking cycle.



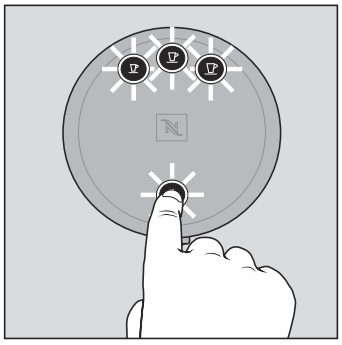
4. Soft



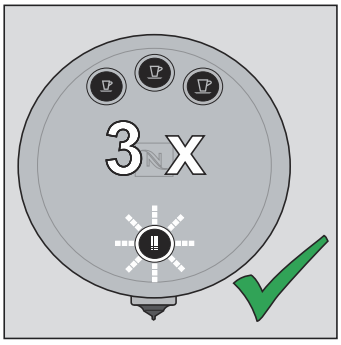
5. Medium (factory setting)



6. Hard

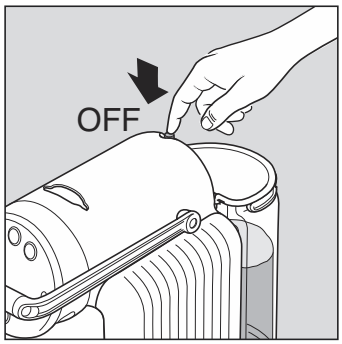


7. Hery hard

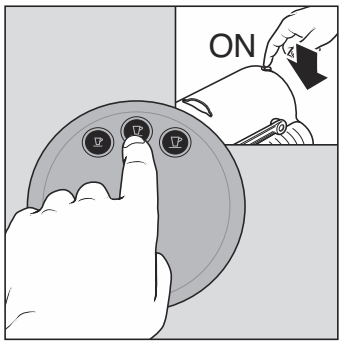


8. Confirmation of selection. Example: water hardness selection “very hard”.

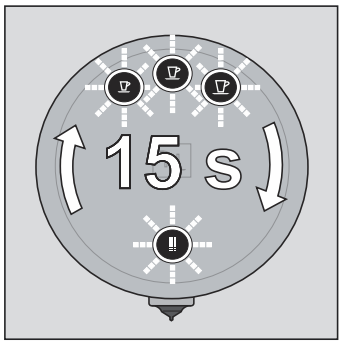
4.4 Programming the energy saving settings



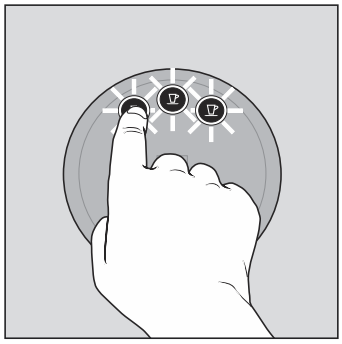
1. Switch off coffee machine.



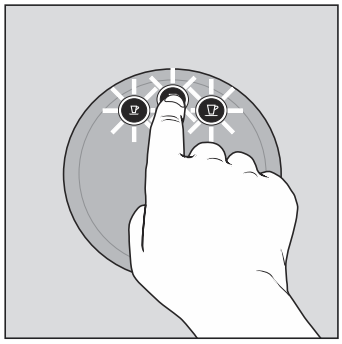
2. Press and hold Espresso button while turning on the machine.



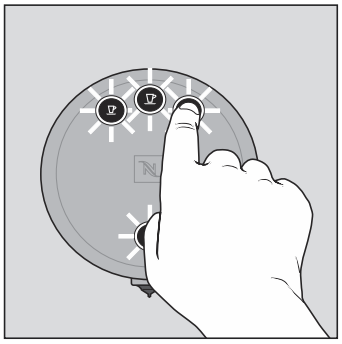
3. To select auto power off setting, press during blinking cycle.



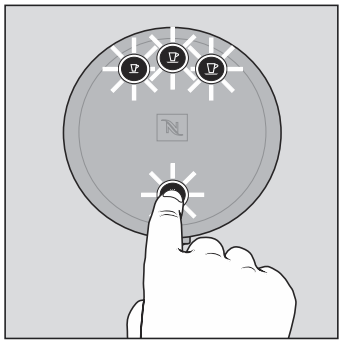
4. “30 min”



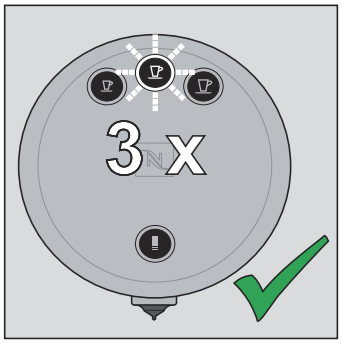
5. “1 h”



6. “2 h”

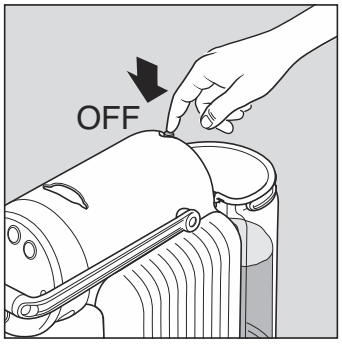


7. “12 h”

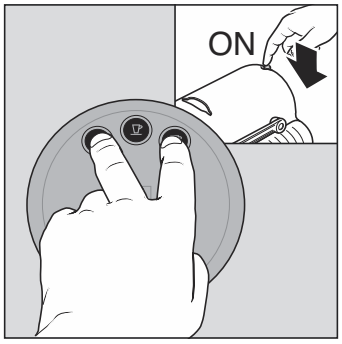


8. Confirmation of selection. Example: auto power off setting “1 h”.

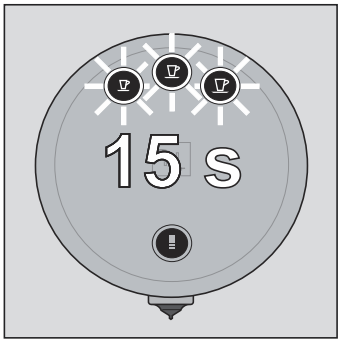
4.5 Descaling alarm on/off



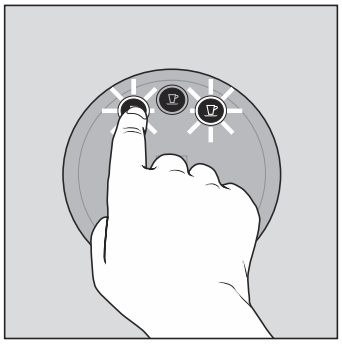
1. Switch off coffee machine.



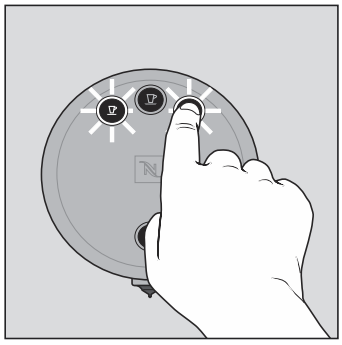
2. Press and hold Ristretto and Lungo buttons while turning on the machine.



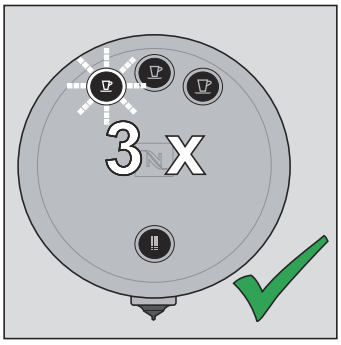
3. To select alarm ON or alarm OFF, press during blinking cycle.



4. Alarm ON

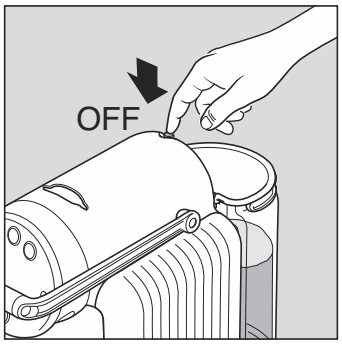


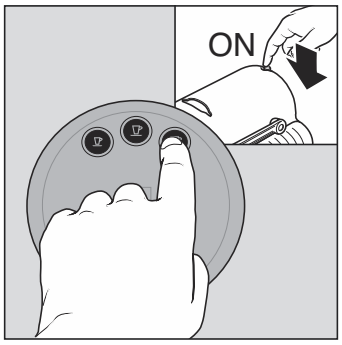
5. Alarm OFF



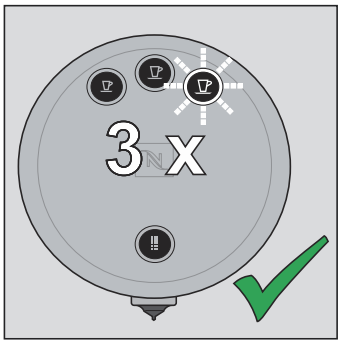
6. Confirmation of selection: Example for alarm ON

4.6 Reset to factory settings





2. Press and hold Lungo button while turning on the machine.

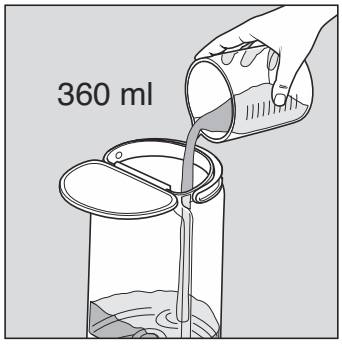


3. Confirmation of selection: Reset to factory settings.

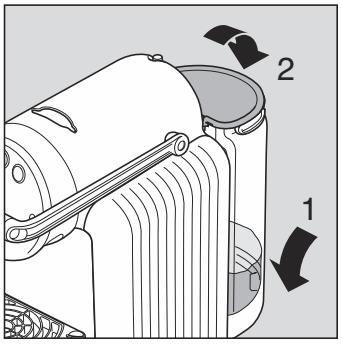
Values for factory settings:
- energy saving = 30 min
- water hardness = medium
- coffee temperature = medium
- Ristretto volume: 25 ml
- Espresso volume: 40 ml
- Lungo volume: 110 ml
- Hot water volume: 125 ml

4.7 Water level calibration

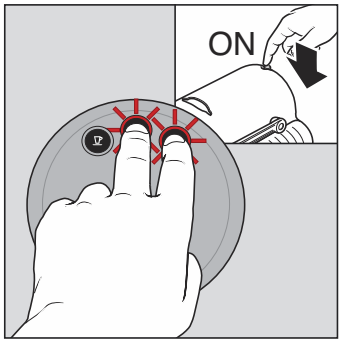
Calibration is needed after exchanging of the back panel (with water level PCBA).
(See page 47, 7.3.5 Remove the rear panel).



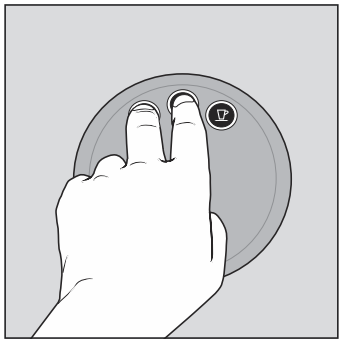
1. Fill the water tank with 360 ml water.



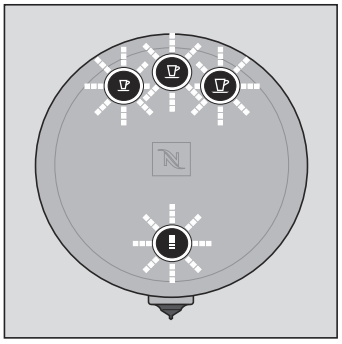
2. Place filled water tank into the machine and let the water calm down.



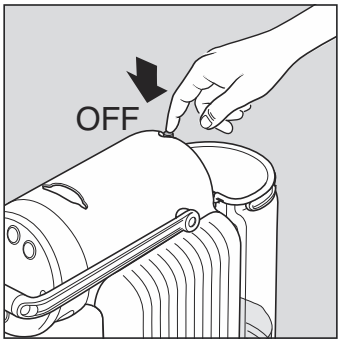
3. Press Espresso and Lungo button while switching on the machine. Wait for the pressed buttons to light up red.



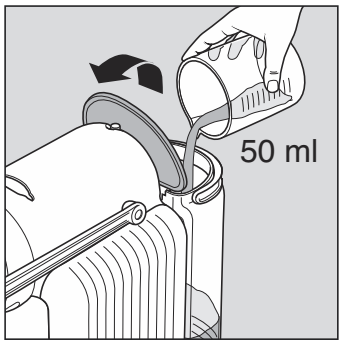
4. Within 1 second press Ristretto and Espresso button simultaneously.



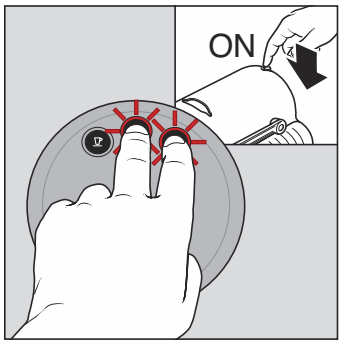
5. Wait for all buttons blinking white.



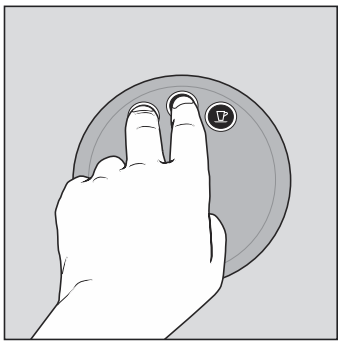
6. Power off the machine.



7. Add 50 ml water to the water tank {now 410 ml total water) and let the water calm down.



8. Press Espresso and Lungo button while switching on the machine. Wait for the pressed buttons to light up red.



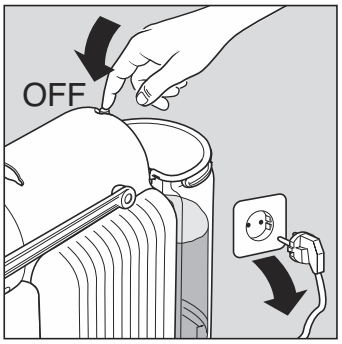
9. Within 1 second press Ristretto and Espresso button simultaneously.
10. Wait for all buttons blinking white.
11. Power off the machine, calibration is finished.

5 MAINTENANCE

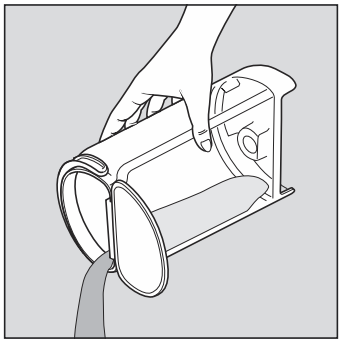
This chapter contains basic maintenance work done by the customer as well as special maintenance instructions for the service technician.

5.1 Daily maintenance and cleaning

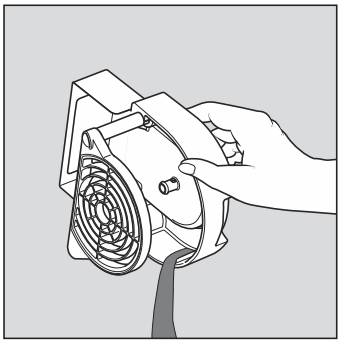
Inform customer that daily cleaning and maintenance of the coffee machine is very important to obtain the best coffee quality in cup and avoid bad smells.



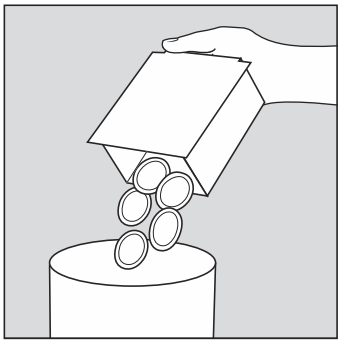
1. Switch off coffee machine.
   Disconnect mains plug.



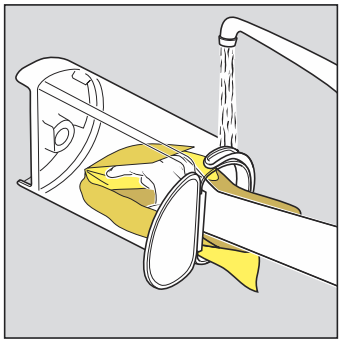
2. Empty water tank.

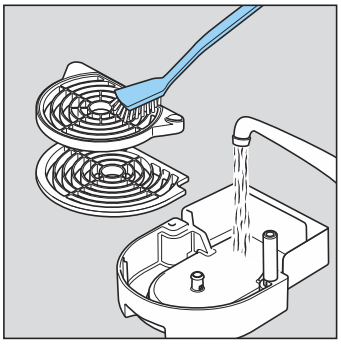


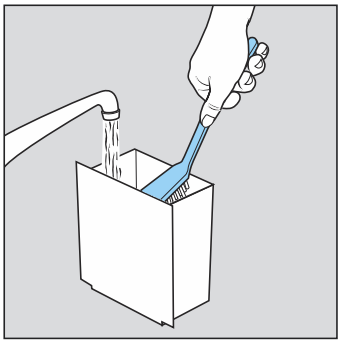
3. Empty drip tray.



4. Empty capsule container.

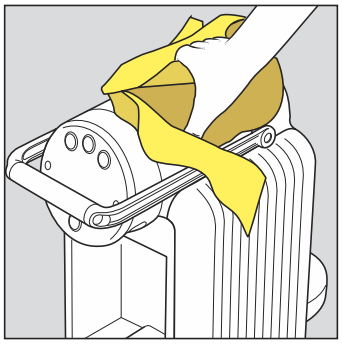


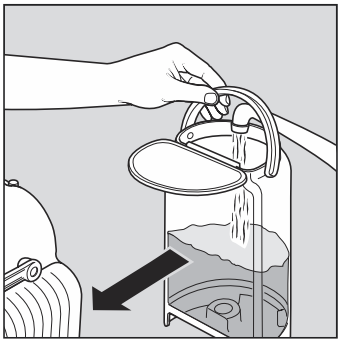


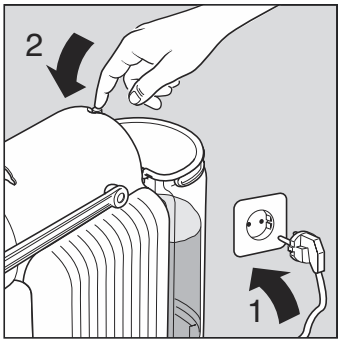


5.-7. Clean and flush accessories thoroughly.

The cleaning must also be performed by the technician after repair.







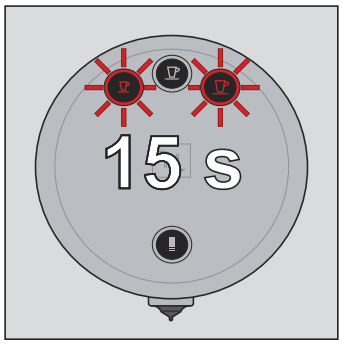
8. Clean coffee machine with a moistened towel.

5.2 Change water filter (optional)

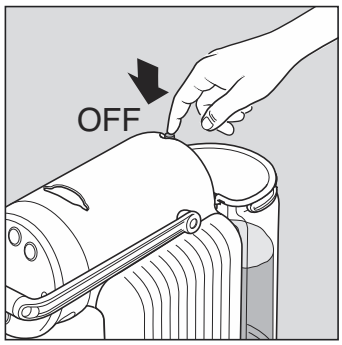
The water filter does not prevent descaling completely. Additional to the exchange of the filter cartridge it is recommended to descale the coffee machine once a year at least.

The water filter cartridge exchange time is determined by the water quantity passing through the water filter.

Life-time of the Nespresso “Aqua Clarity” filter is 4 months.

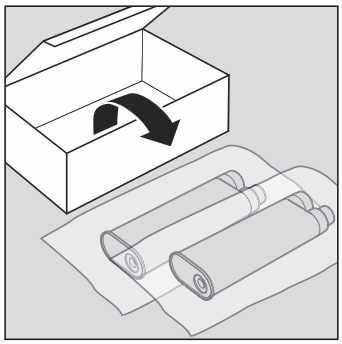


1. Change filter alarm.



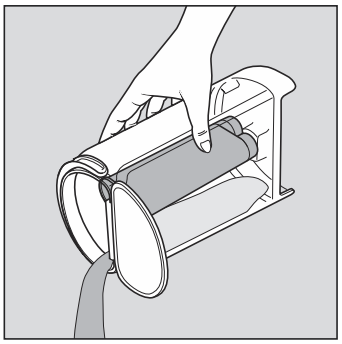
2. Switch off main switch during blinking cycle.

5.2.1 Accessory

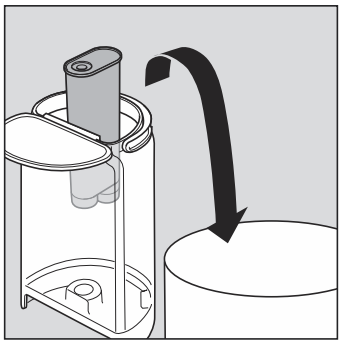


Filter usage is recommended for all water hardness, exept for soft water hardness (less than 7°dH / 13°fH) with consumptions less than 300 preparationes/month.

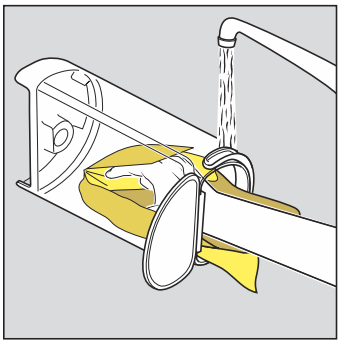
5.2.2 Filter cartridge exchange procedure



1. Empty water tank.

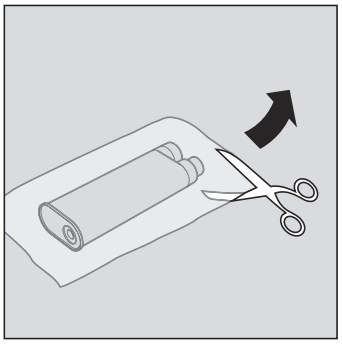


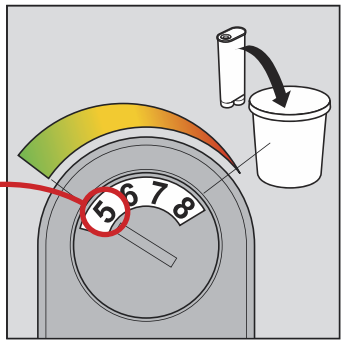
2. Remove used filter cartridge and discard it.



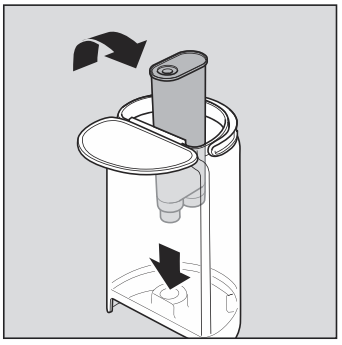
3. Clean and flush watertank with a soft towel.

Life-time of the Nespresso “Aqua Clarity” filter is 4 months.

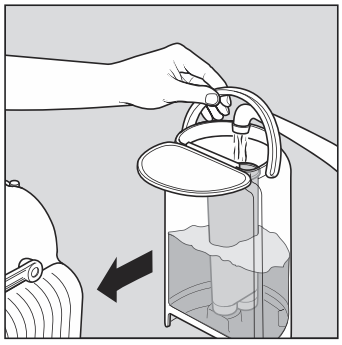




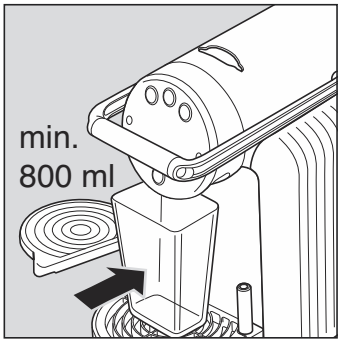
A new filter cartridge must be rinsed for faultless function.

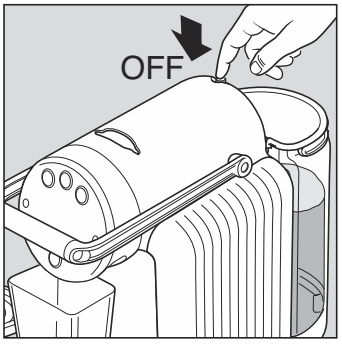


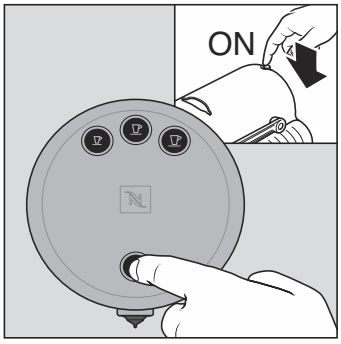
7. Insert the filter cartridge in the watertank.



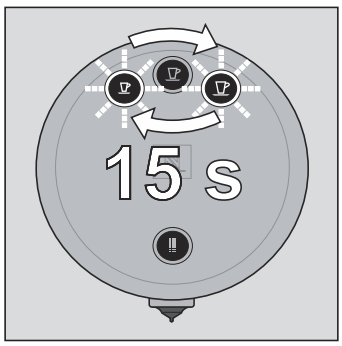
8. Fill water tank with fresh potable water and insert it in the coffee machine.

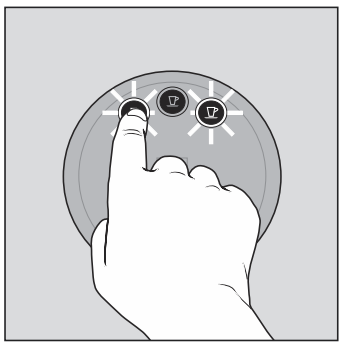




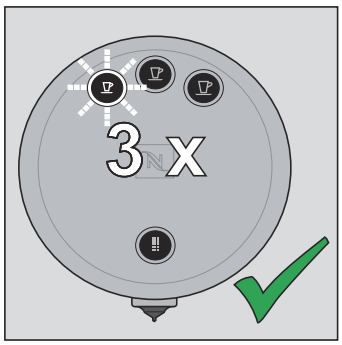


11. Press and hold Hot water button while turning on the machine.

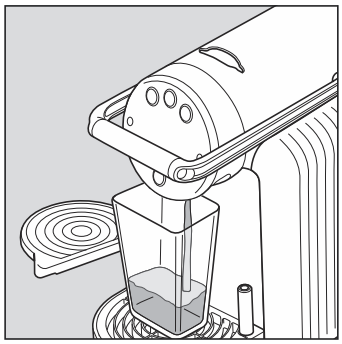




13. To select new filter, press Ristretto button during blinking cycle.



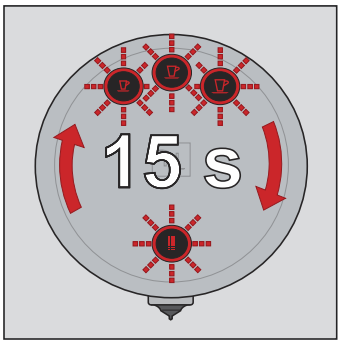
14. Confirmation of selection: New filter is selected.



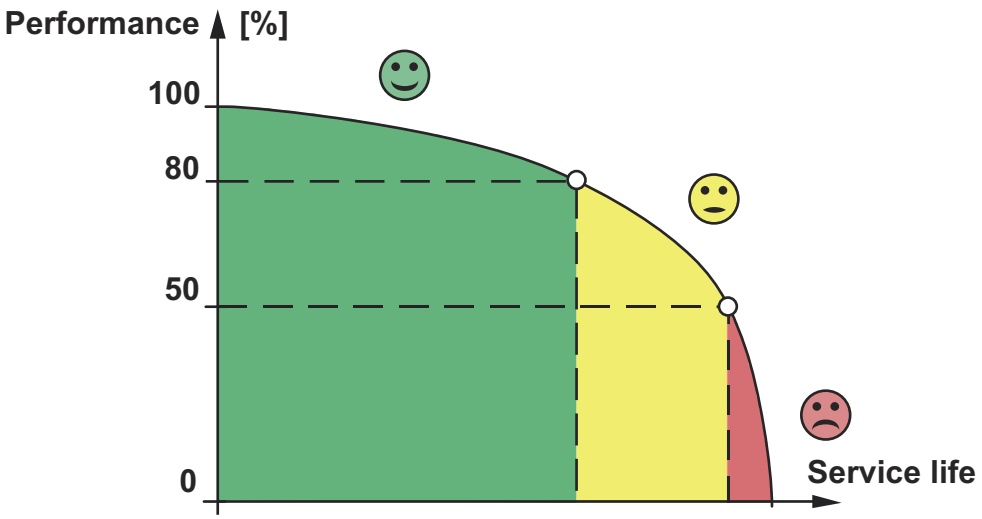
About 150 ml cold water flows out of the hot water outlet within approx. 50 sec. Afterwards the coffee machine switches to stand-by mode resp. starts to heat up.

5.3 Descaling

The coffee machine displays this alarm, if descaling is necessary.



This alarm appears only, if the descaling alarm is ON. (See page 24)



Instruct the customer to call the service partner or to perform descaling himself immediately after the first descaling alarm.

5.3.1 Accessory

Two descaling kits are available for this coffee machine:

Stock number 5035/CS100	Stock number 5034
 This kit contains 2 descaling packages and a descaling manual.	

Both descaling packages are needed for one descaling process.

The following descaling description is based on this descaling manual but contains additional information.

5.3.2 Safety instructions

In case of emergency interrupt descaling procedure:

- switch off mains switch of the coffee machine,
- or disconnect mains plug of the coffee machine.

After a premature termination of the descaling procedure, a rinsing is executed. Afterwards the descaling procedure can only be restarted from the beginning.

The decalcifier solution is detrimental to health and irritating to eyes and skin.

Protective measures

Observe the safety instructions on the package of the decalcifier:

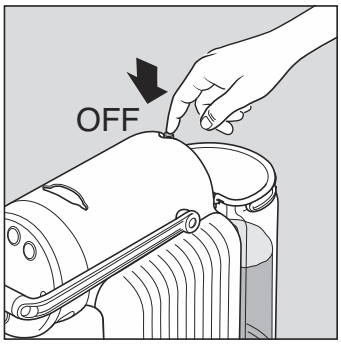
- Keep out of reach of children.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- If swallowed, seek medical advice immediately and show decalcifier package for countermeasures.

The decalcifier is aggressive to surfaces.

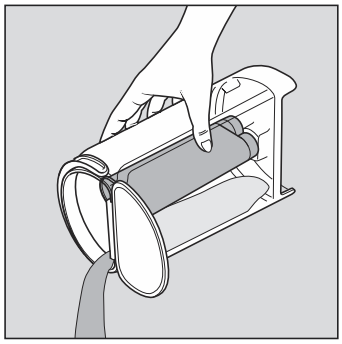
Protective measures

- Only use Nespresso decalcifier - never use vinegar!
- Wipe off decalcifier splashes with a wet cleaning rag immediatley.

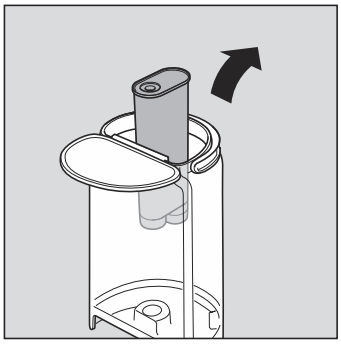
5.3.3 Descaling and rinsing procedure



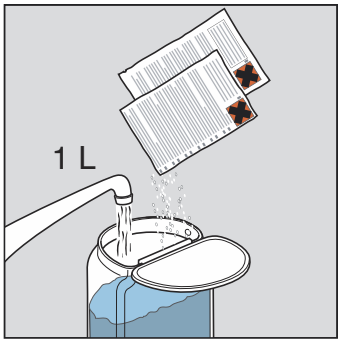
1. Switch off coffee machine.



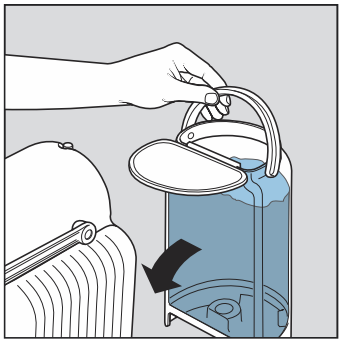
2. Remove and empty water tank.



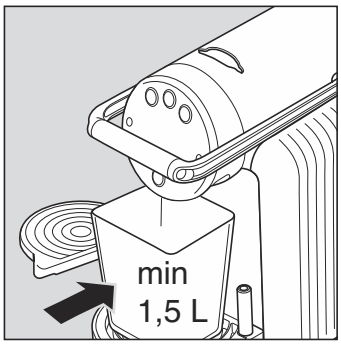
3. Remove filter.



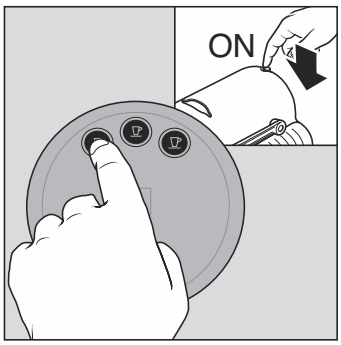
4. Fill water tank with indicated dose of descaling fluid and water.



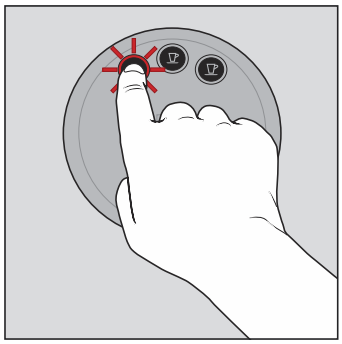
5. Insert water tank into the coffee machine.



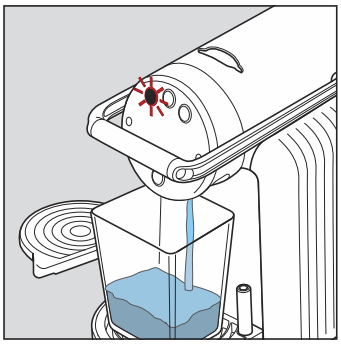
6. Place a receptable under both outlets of coffee machine.

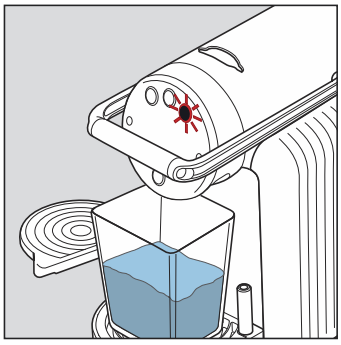


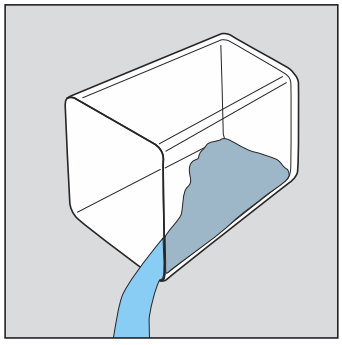
7. Press and hold Ristretto button while turning on the machine.



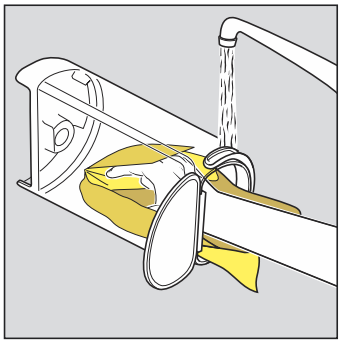
8. To start descaling procedure, press Ristretto button.



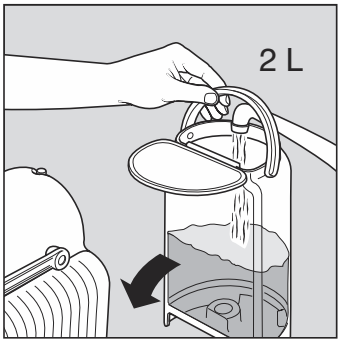




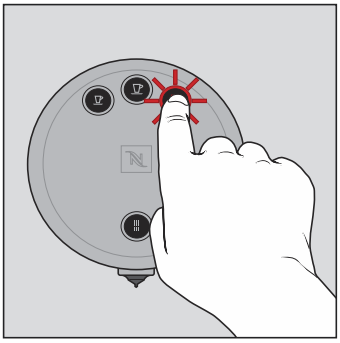
11. Empty receptable and drip tray.



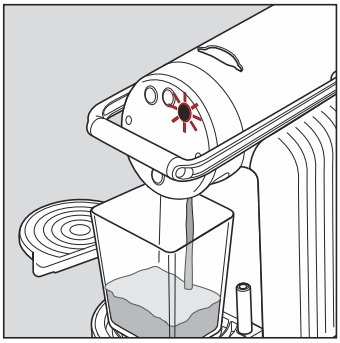
12. Clean water tank thoroughly.

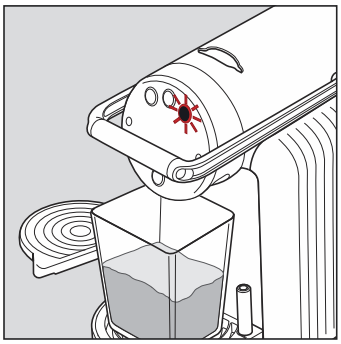


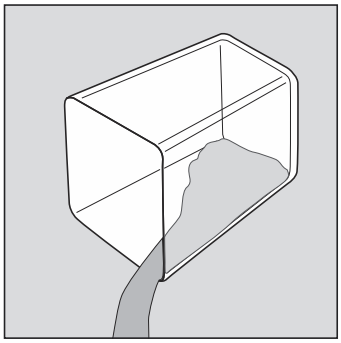
13. Place receptable (1,5 l) under outlets. Fill the water tank with fresh, potable water (2 l). Insert it to the coffee machine.



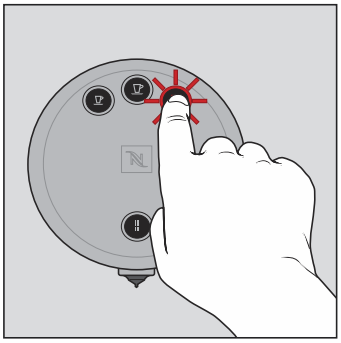
14. To start rinsing procedure, press Lungo button.



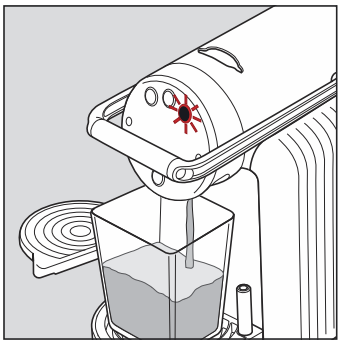


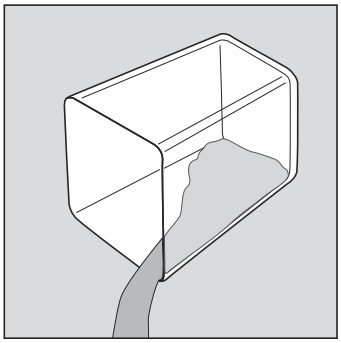


17. Empty receptable.



18. Continue rinsing procedure by pressing Lungo button.



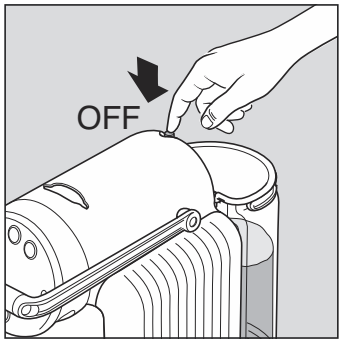


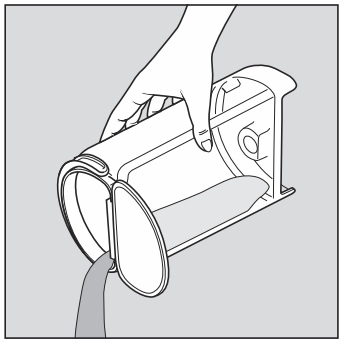
20. Complete descaling finished. Empty receptable.

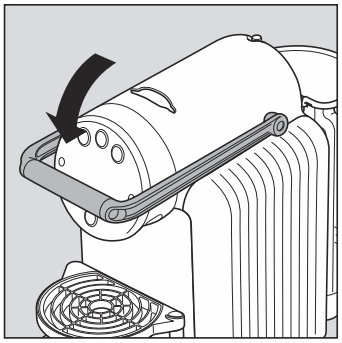
5.4 Empty fluid system

After operation, residual water remains in the fluid system of the coffee machine.

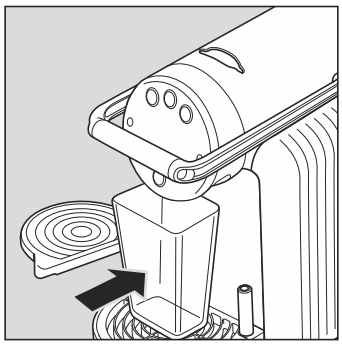
This residual water can be removed
- before a longer period of non-use,
- for frost protection,
- before repair and following shipping.

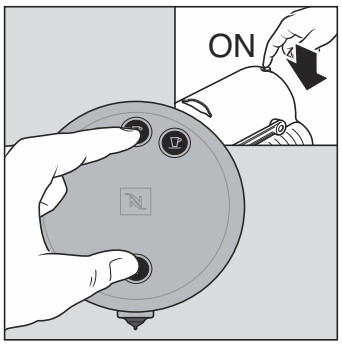




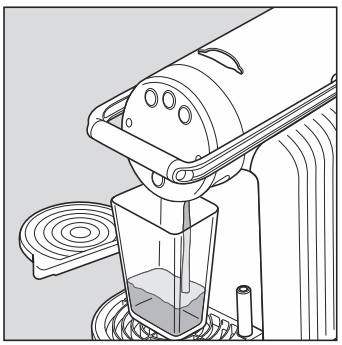


1. Switch off coffee machine.





5. Press and hold Espresso and Hot water buttons, while holding turn on the machine.



6. When machine is empty, it turns off automatically.

6 TROUBLESHOOTING

This chapter gives useful hints and information for fault finding. It is not intended as a complete list of possible errors and malfunctions.

6.1 Check list adapt to zenius machine

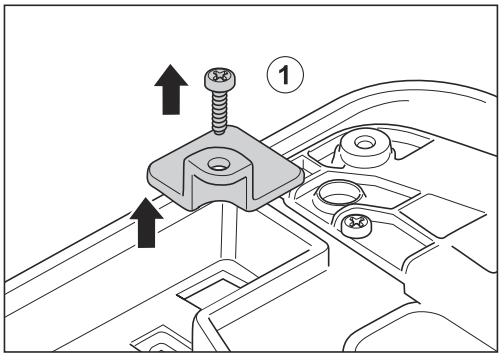
With an acceptance check in accordance with this checklist, common errors are quickly found and corrected. Therefore, adhere to the sequence of the check list.
Repair every occurring error and work the check list until it is completed.

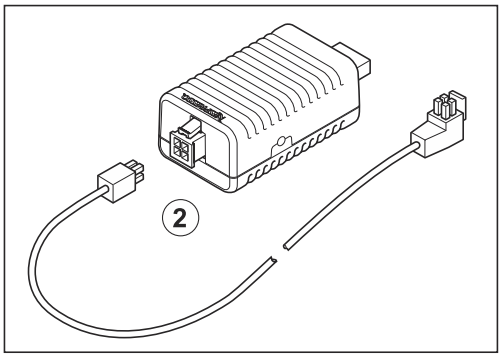
Procedures	Checks / repair works
1 Inspect housing of the coffee machine for visible damage	• Replace damaged or broken housing parts • Replace a damaged power cord
2 Inspect removable parts (water tank, capsule container, drip tray)	• Replace incomplete, damaged, broken or missing accessories • Clean dirty or bad smelling removable parts (use only detergents that do not affect plastic) • Remove and replace filter cartridge if date is over or next to
3 Fill water tank	• Check tightness of water tank valve • Replace a leaking water tank
4 Prepare coffee machine for operation and switch on mains switch	Check if machine switch on. If not, check following points: • Check mains voltage • Check power cord • Check thermo fuse
5 Read data with computer (refer to the procedure on separated manual)	• Connect, verify software version, update if necessary • Save machine's data on PC (machine follow-up) • Analyse machine's data
6 Prepare coffee and hot water	• Check LED functions • Check capsule insertion and ejection • Check if coffee machine is leaking
7 Perform function tests (see page 64)	• Follow instruction of chapter 8 – function tests
8 Descale coffee machine if necessary (see page 30)	
9 Save statistic data on PC (refer to the procedure on separated manual)	
10 Clean coffee machine (see page 26)	
	End of check list

6.2 Diagnostic with USB Dongle

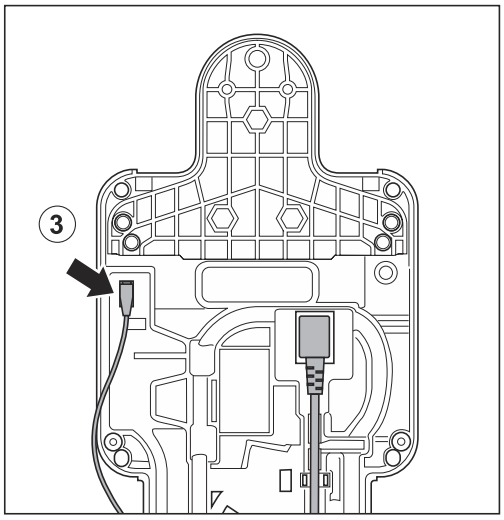
With the help of the service software,
- a quick and simple function test of the operating elements is possible,
- statistic data can be retrieved and displayed.
- troubleshooting
- updates of machines software

Refer to the separated user manual for detailed instructions and explanations.





1. Unscrew the screw and remove the small cover from the bottom side.
2. Connect the dongle and the interface (3) with the appendant cable.



6.3 Coffee capsule falls through

An inserted new coffee capsule falls through the brewing unit into the capsule container immediately.

Possible reasons:

- The used capsule has a deformed border.
- A used capsule is stucked into the extraction chamber.
- The limit stop or the ejector in the extraction unit is stucked or damaged.

Remedy:

- Try again using a new capsule (without deformation).
- Check for stucked capsule in extraction unit (use a spoon to remove it).
- Check ejection mechanism.
- Replace complete extraction unit if defective.

6.4 Only hot water during coffee preparation

The used coffee capsule is not or only partly perforated on both sides.

Possible reasons:

- A second capsule is stucked in the brewing chamber of the extraction unit.
- The capsule is not well positioned in the brewing chamber.
- A deformed capsule border - the hot water flows straight to the coffee outlet.

Remedy:

- Check for stucked capsule(s) in extraction unit.
- Try again using a new capsule (without deformation).

6.5 Wrong water empty signal

Water empty signal, but the water tank is full.

Possible reasons:

- Floater in water tank stucked.
- Water sensor defective.
- Exchange of the back panel (incl. water level PCBA).

Remedy:

- Clean floater chamber in water tank.
- Replace water sensor.
- Calibrate water sensor.

7 REPAIRS

These repair instructions:
- help to localize components of the Zenius coffee machine with general drawings, are based on exploded drawings combined with repair and mounting tips, presuppose basic knowledge in repairing Nespresso coffee machines.

7.1 Safety instructions

Danger of electrocution!
Mains voltage inside the coffee machine.
Disconnect the mains plug before disassembly - the coffee machine must be voltage free.

Danger of burns!
Hot parts and water under pressure inside the coffee machine (particularly in the thermoblock).
Let coffee machine cool down before disassembly.

7.2 General

7.2.1 Repair and mounting tips

These general advices are completed with specific repair tips in this chapter.

Additional information

For components not mentioned in this repair chapter, refer to "Spare parts" on page 80.

Screw connections

Do not overtighten screws. Plastic threads and inserts are delicate.

Snap connections

Parts of the case and components of the coffee machine are connected screwless with latches.

When loosening these connections, proceed with care and patience to avoid causing any damage.

Designation of spare parts

The components in the following illustrations are indexed with position numbers. See separate spare parts list for corresponding spare part numbers.

Electrostatic discharge protection

When installing a new printed circuit board, the service technician must be earthed with a grounding band.
When dismounting an old printed circuit board, it is necessary to de-energize the capacitor (see page 49).

Wiring arrangement

Random changes in the wiring arrangement during a repair can cause
- electromagnetic interferences,
- squeezed wires,
- insulation defects due to contact with hot parts,
- insulation problems if low and high voltage wires are not separated.

Protective measures
- Do not change the course of internal wiring during repair.
- Make sure that wires are distant form hot parts - use existing cable guides and clips.

Residual water

- If it is necessary to pull off hoses from components, hold ready a small beaker and a towel to collect and wipe away leaking water.
- Empty the fluid system of the coffee machine for repair or shipment (refer to page 35).

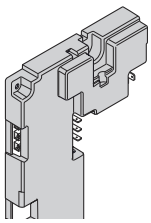
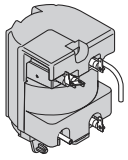
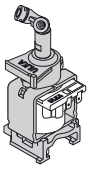
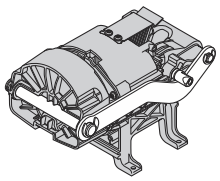
7.2.2 Tools and accessories

With the following assortment of tools, all repairs described can be made:

- TORX-screwdriver set TX6, TX10, TX15, TX20, TX25, TX30
  (can be substituted partly by torx bits of special mounting tool)
- Slotted screwdriver no. 4
- Phillips (crosstip) screwdriver no. 0
- Flat wrench, span 14 mm, 10 mm AF
- Flat wrench, span 8 mm
- Long-nosed pliers
- Straight tweezers with long, fine tips
- O-ring pick with hook
- Torch
- Beaker and towel

7.2.3 Overview of plug-in modules

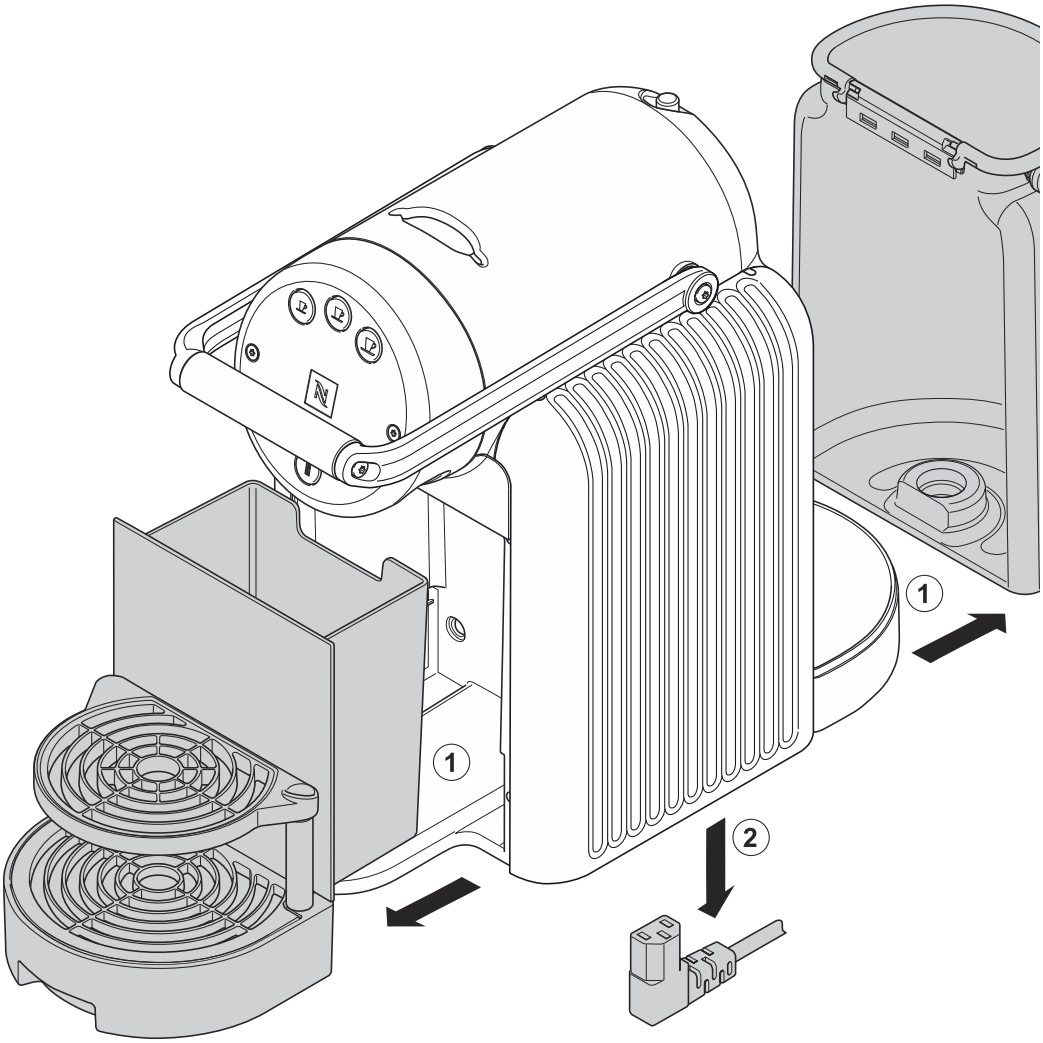
The coffee machine has a modular design for ease of servicing:

Position	Module	Spare part number
1	Electronic board 	16
2	Thermoblock assembly 	15
3	Pump assy 	5
4	Extraction unit 	2

7.3 General disassembly

This subchapter gives information how
- to open the casing of the coffee machine for a basic inspection and leakage check,
- the parts of the casing are mounted.

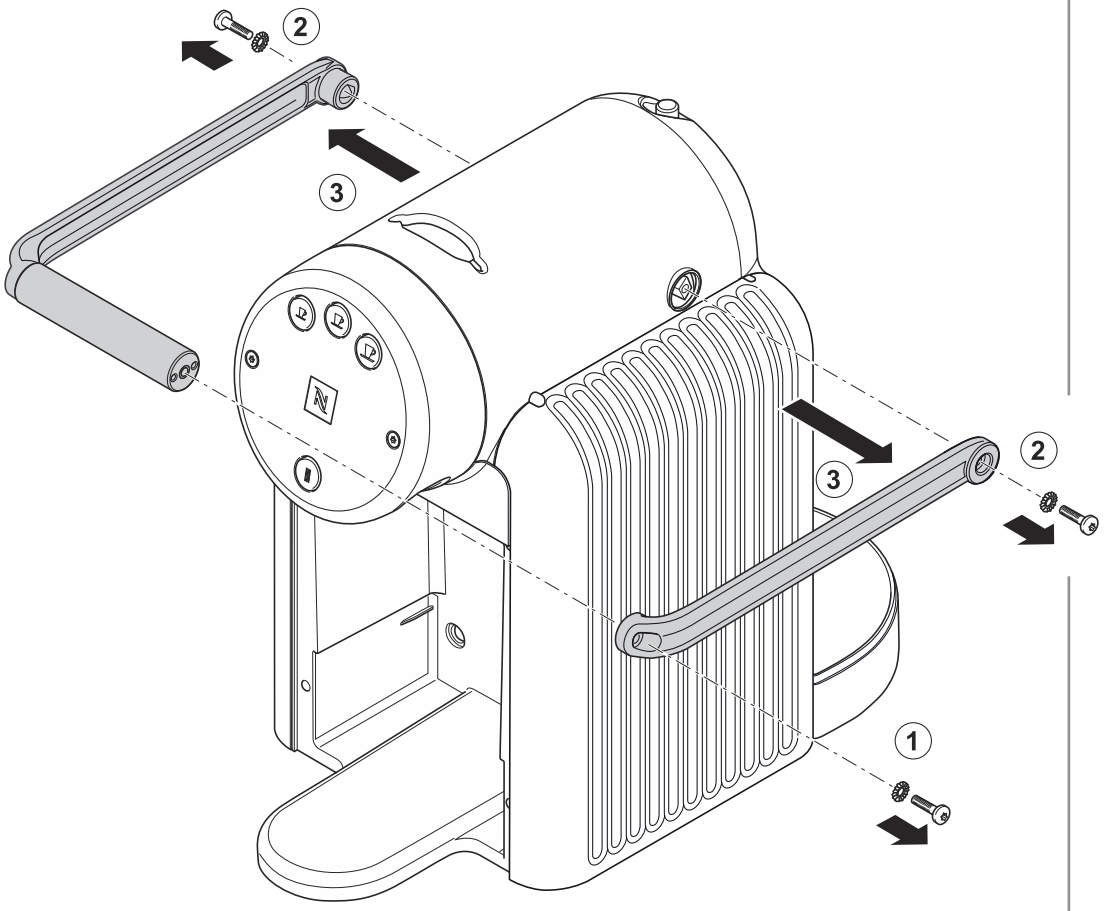
The following disassembly steps are required for most of the repair work.



1. Remove water tank, drip tray and capsule container if not already done.
2. Disconnect mains plug, if mains cable is not removed.

7.3.1 Handle

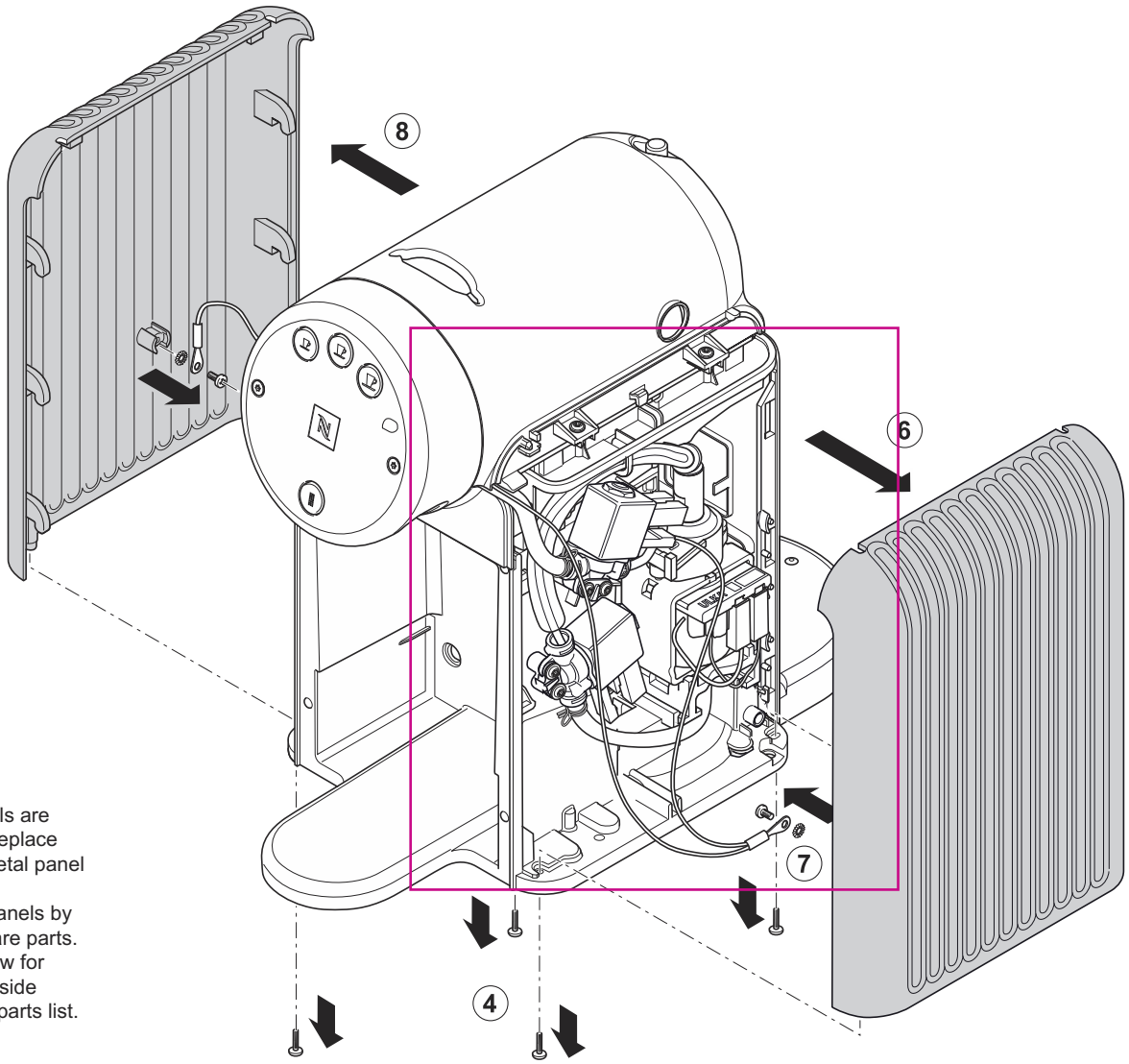
These general advices are completed with specific repair tips in this chapter.



1. Unscrew one of the screws on the handle.
2. Then unscrew both rear screws completely out of the unit.
3. Now remove the lever completely by pulling both lever arms out of the seats in the rear housing.
   (When re-assembling the handle, dip the ends of the screws into Loctite 243 to ensure good fixation. Failure to do so might result in machine not being able to brew coffees.)

7.3.2 Side panels

This disassembly step builds on the preceding step and is not feasible without it.

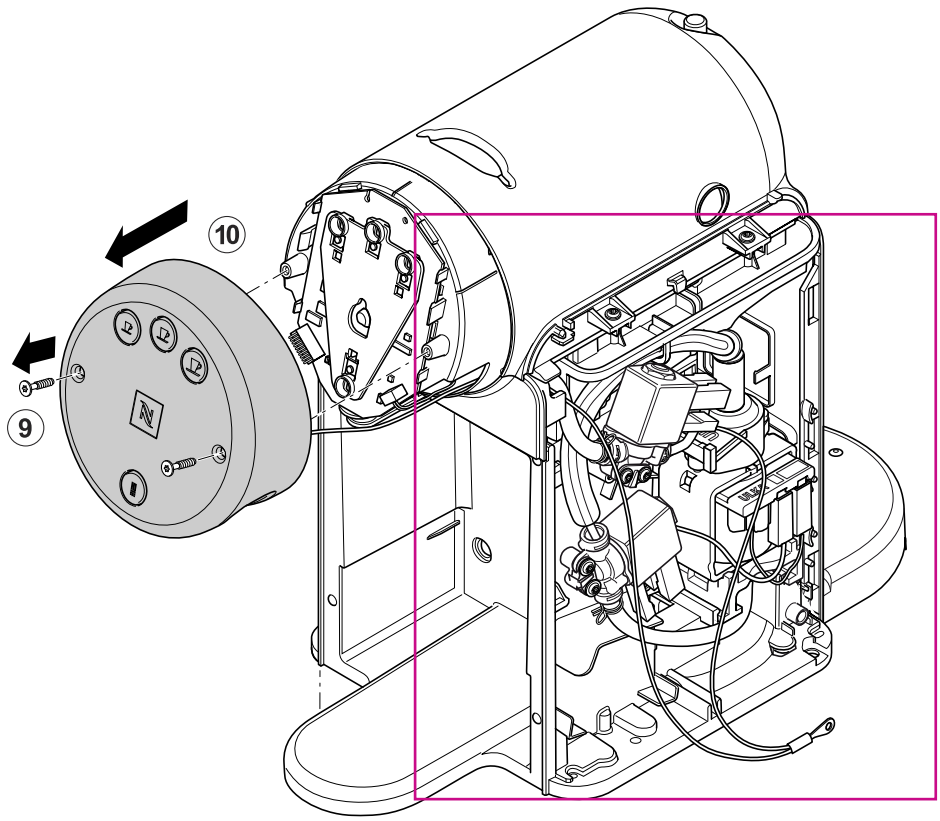


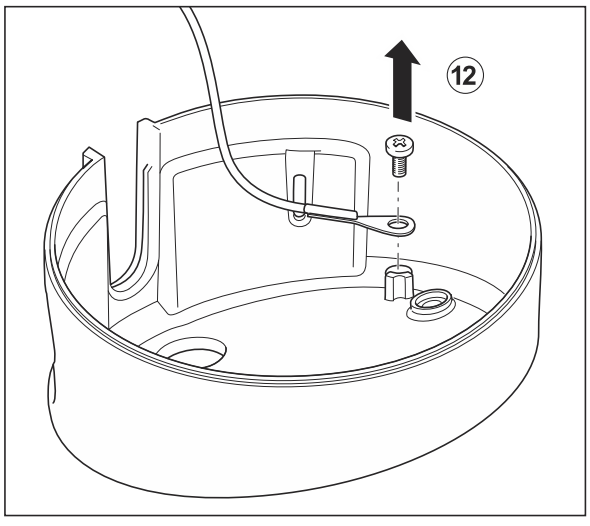
If side panels are damaged, replace metal panel by metal panel spare parts.
Replace plastic panels by plastic panels spare parts.
Use different screw for metal and plastic side panel, see spare parts list.

4. Set the unit on its side and unscrew completely the 2 screws with which a side panel is mounted on the unit.
5. Now stand the unit upright again.
6. Lift the side panel slightly so as then to remove it.
7. For metal panel version, unscrew the ground cable from the internal side.
8. Repeat steps 4-7 if necessary with the opposite side piece.

7.3.3 Removing the front cover

This disassembly step is feasible independent of the other steps.



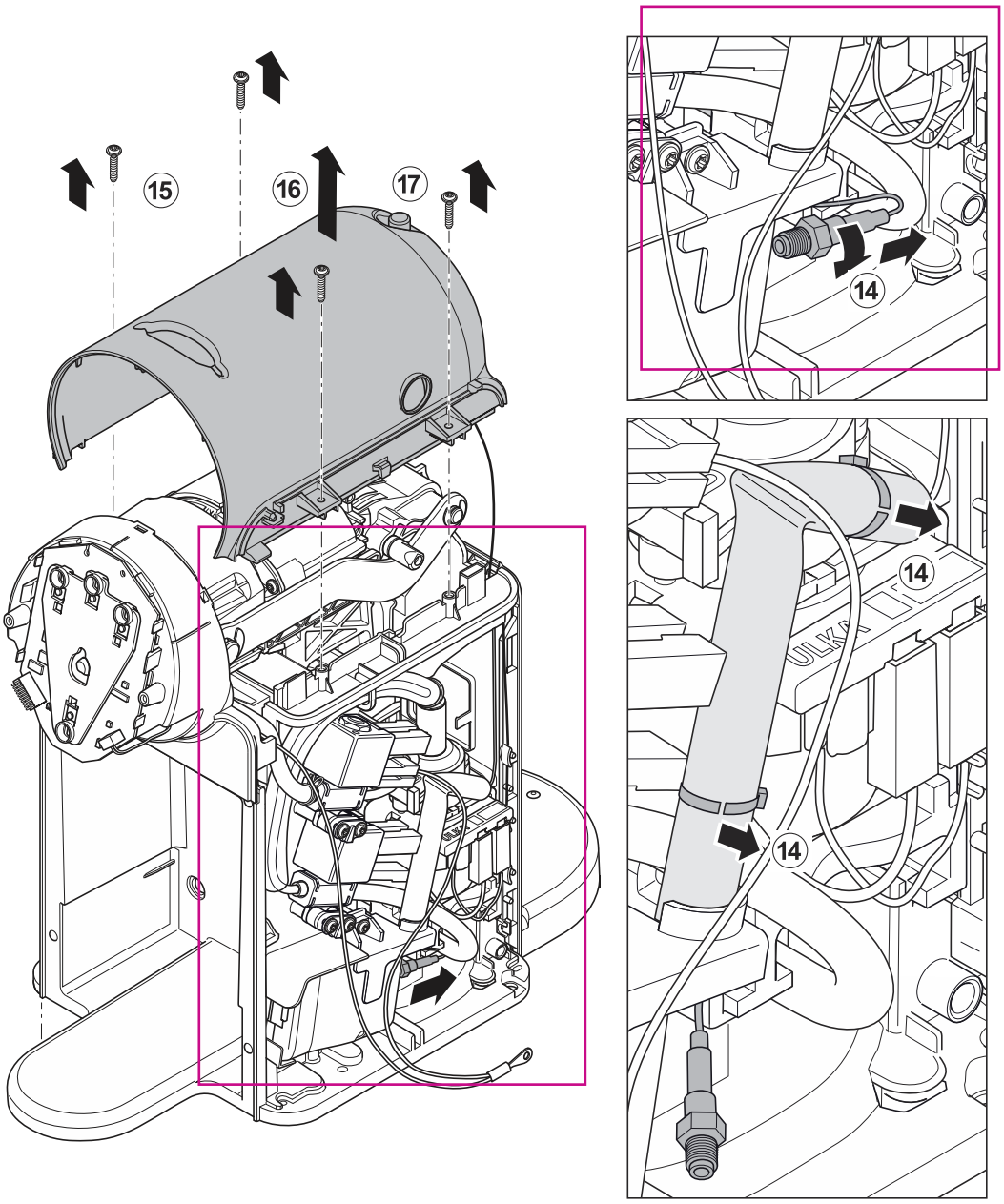


If front cover is damaged, replace metal cover by metal cover spare part. Replace plastic cover by plastic cover spare part.

9. Unscrew completely both screws from the front cover.
10. Carefully remove the front cover from the housing.
11. Then tilt the front cover downward; the button panel with the operational controls stays on the front cover.
12. For metal panel version, unscrew the ground cable from the internal side.
13. You can now remove the front cover.

7.3.4 Removing the top cover

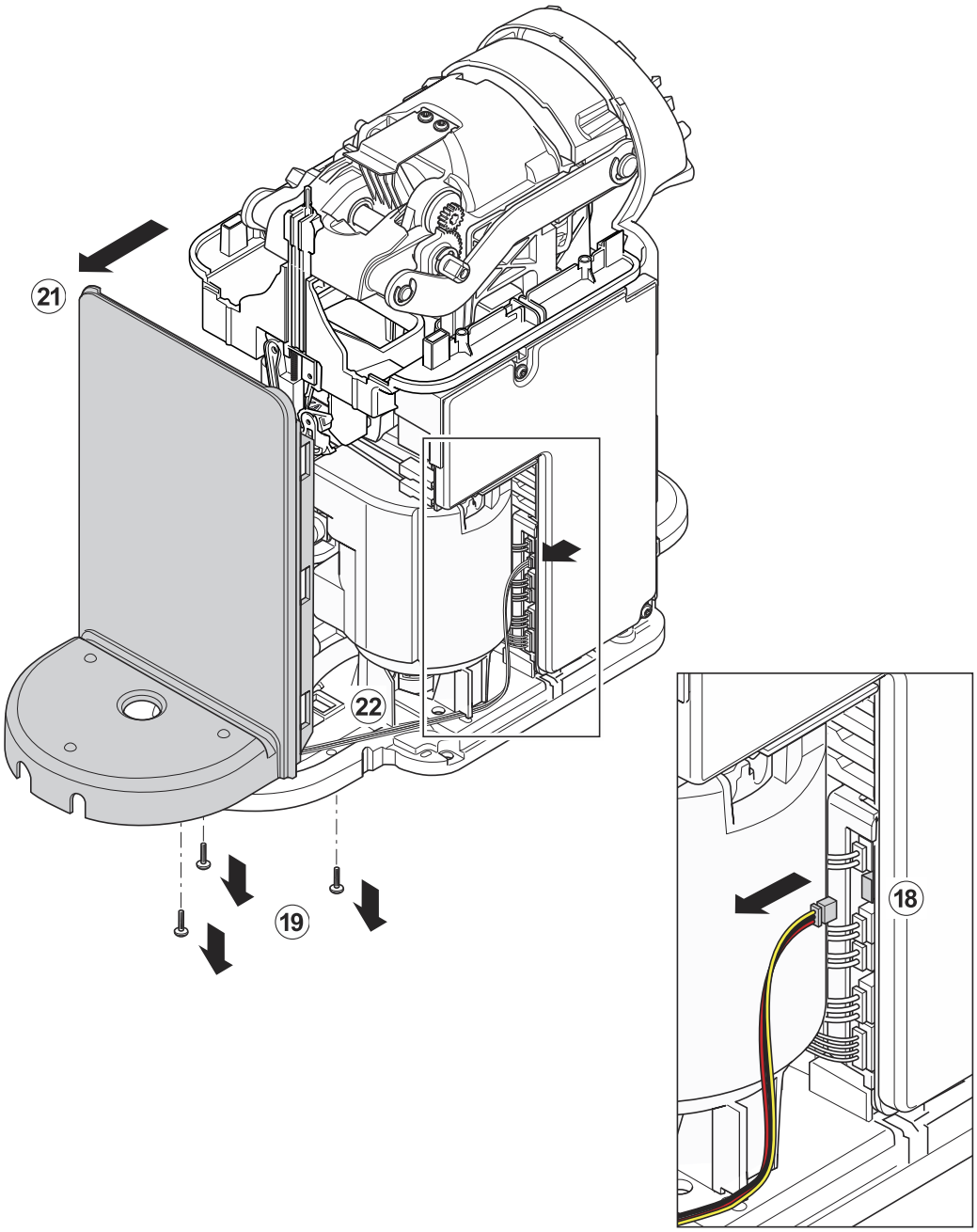
This disassembly step builds on the preceding step and is not feasible without it.



14. In the case of older models, use a suitable tool to unscrew the antenna cable from the GSM module and remove the cable ties of the antenna.
15. Now unscrew completely the 4 screws from the upper part of the housing.
16. Now remove the upper part of the housing from the rest of the housing in a steady manner.
17. Please note that the master switch button remains loose in the upper part of the housing during the removal.
    For reassembly invert all working steps and screw the antenna connector carefully with a torque driver applying 5.0+/- 0.5 kg·cm and new cable ties.

7.3.5 Removing the rear panel

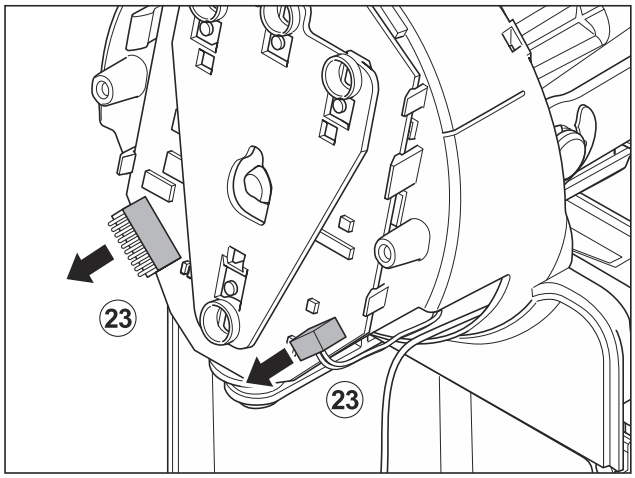
This disassembly step builds on the preceding step and is not feasible without it.

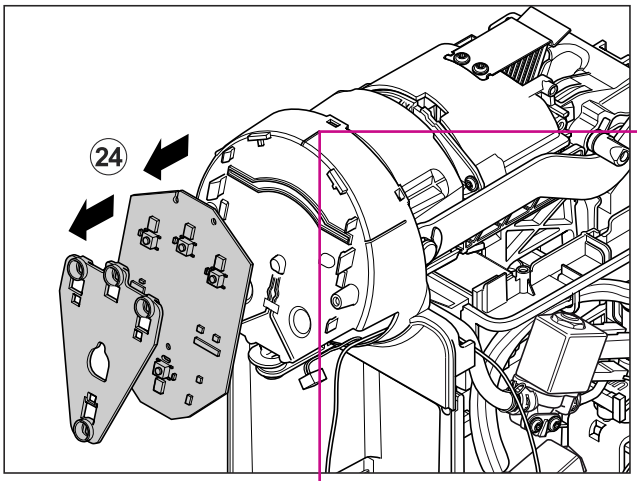


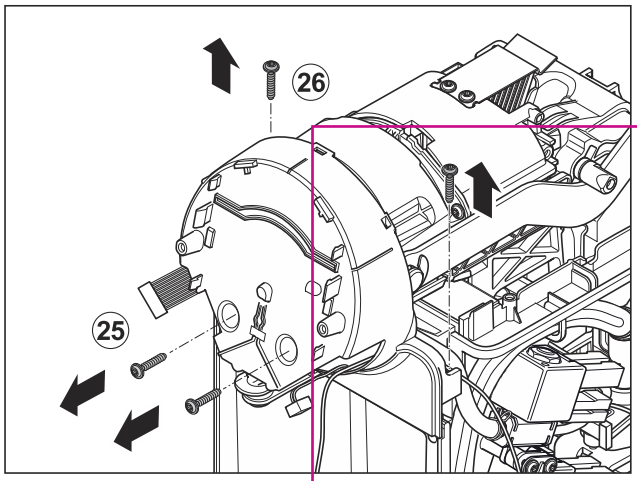
18. With your fingers or an appropriate tool disconnect the water sensor PC board's connection cable connector from the mainboard.
19. Set the unit on its side and unscrew the 3 screws from the rear of the housing bottom.
20. Stand the unit upright again.
21. Raise the back slightly and remove it from the rest of the housing.
22. Now carefully remove the back and the connection cable from the housing.

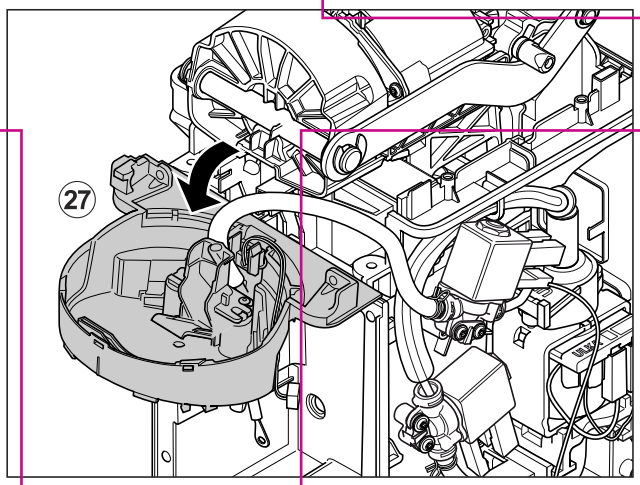
7.3.6 Removing the front panel

This disassembly step builds on the steps 7.3.1 to 7.3.4 and is not feasible without it.

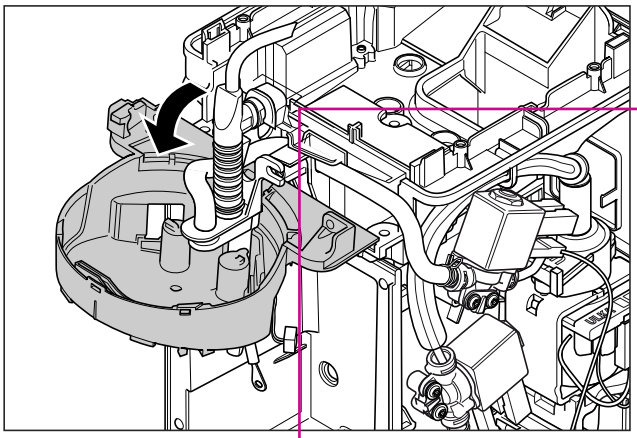








23. Remove the plugs on the MMI.
24. Remove the light guide and the MMI.
25. Now unscrew the two screws that fasten the the front panel.
26. Unscrew the two vertical screws.
27. Now turn down the front panel.



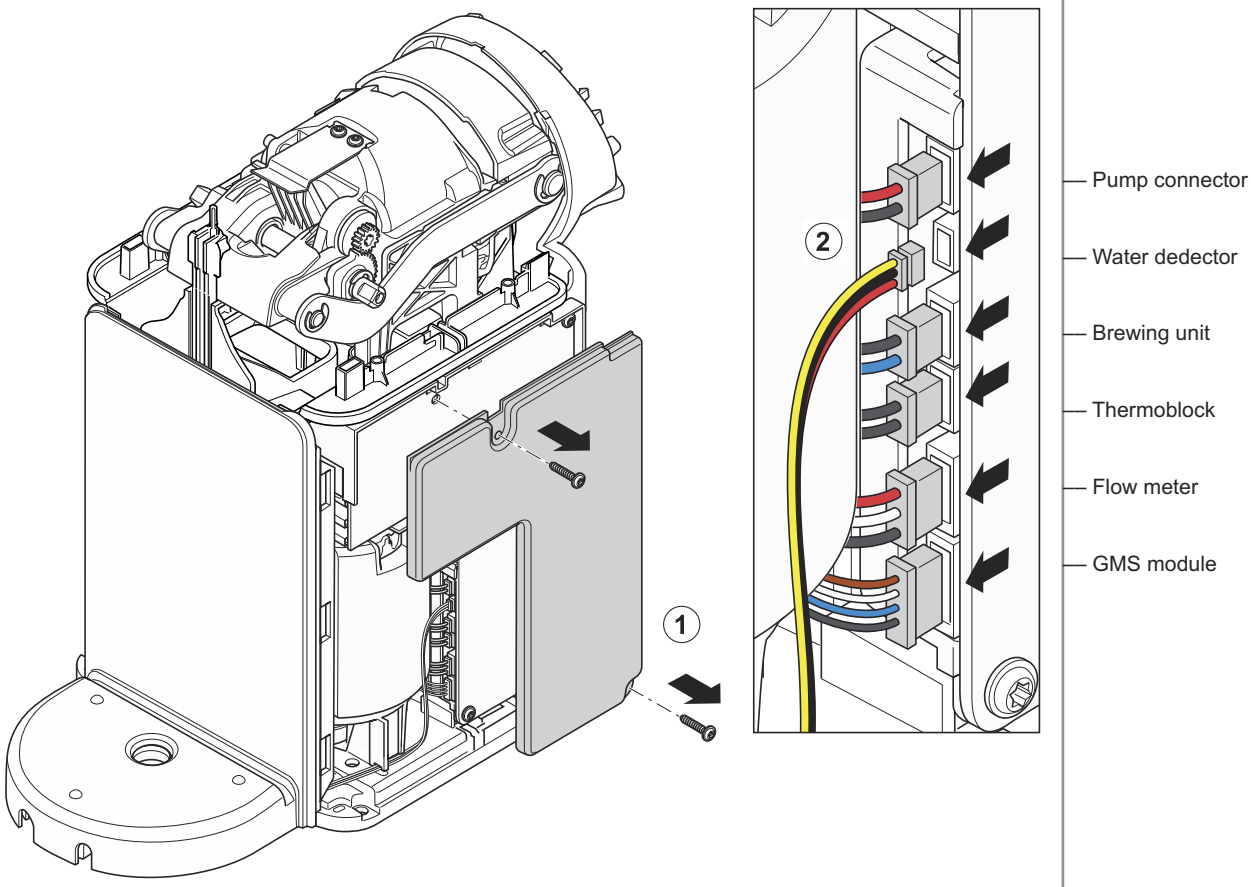
NSF version

7.4 Replacing plug-in modules

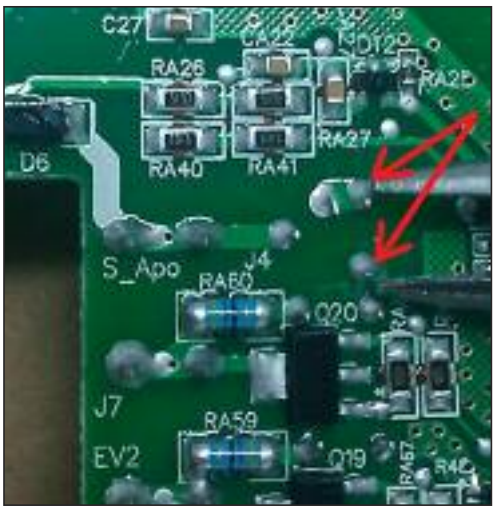
This subchapter gives information how
- to open the casing of the coffee machine for a basic inspection and leakage check,
- the parts of the casing are mounted.

7.4.1 Replacing electronic board

Bevor changing the electronic board, repairing operation 7.3.2 has to be completed.



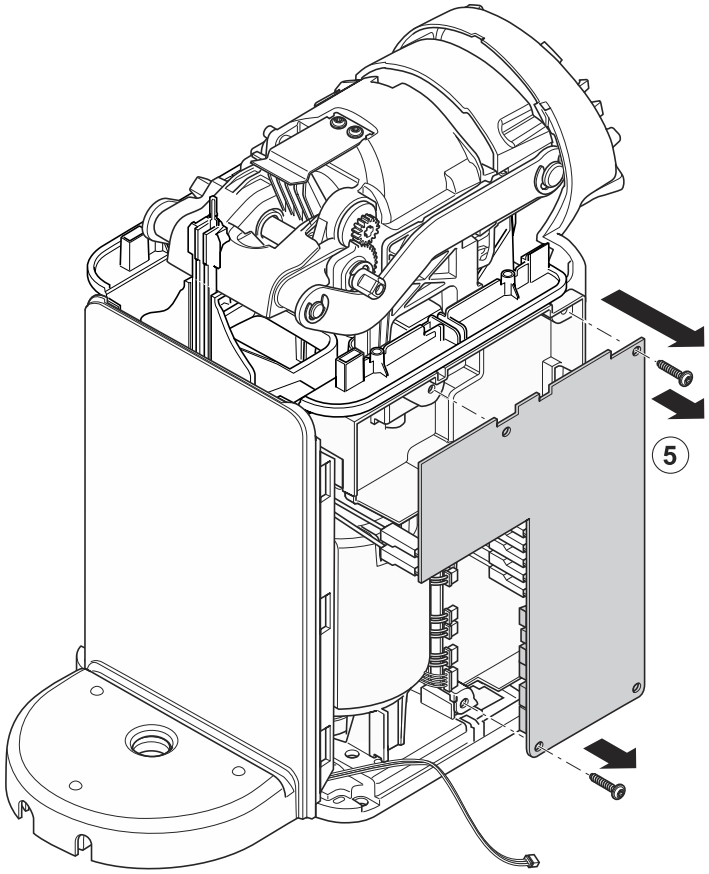
1. Unscrew both screws from the mainboard cover and remove it.
2. With the aid of an appropriate tool unplug the 6 small connectors on the left-hand side of the mainboard.



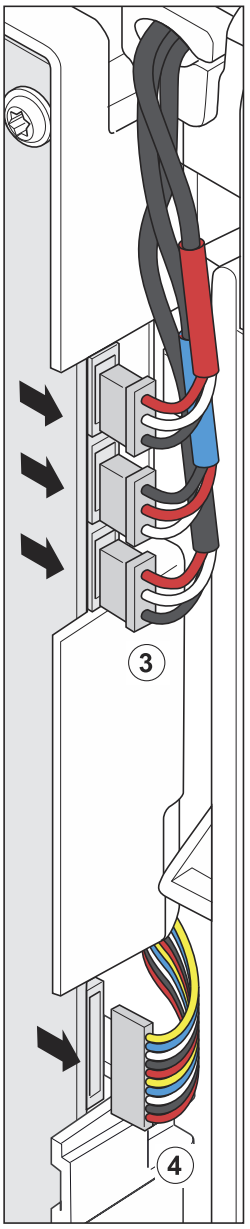
Caution! Safety!

After removing the outer cover of the printed circuit board, de-energize the capacitor. Use metal pliers with isolated handles to connect both legs of the capacitor, as shown in the picture.

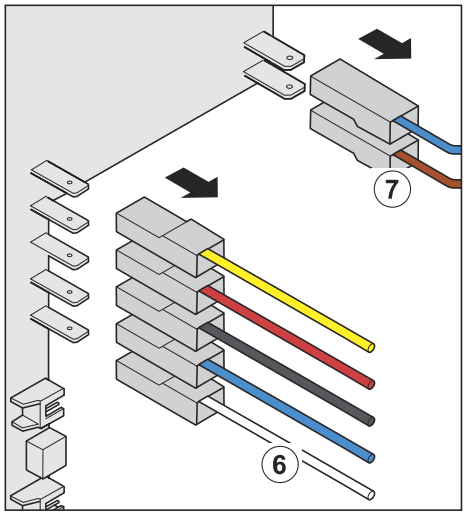
Refer to the wiring diagram for connection plan on page 62/63.



For new BU, no need connect these 3 cables (red, blue, black).



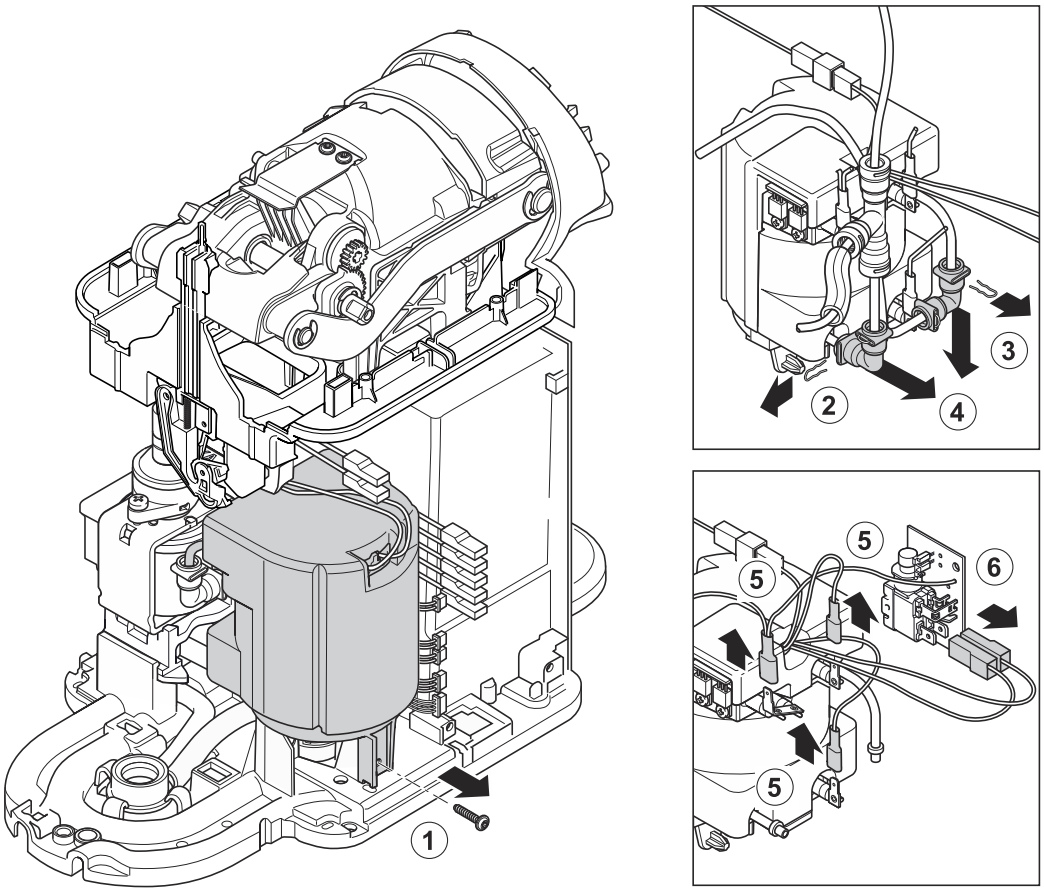
3. Repeat the process with the 3 connectors on the right-hand side of the mainboard.
4. Then carefully unplug the 10-pin connector strip also on the right-hand side of the mainboard.
5. Now unscrew the two screws that fasten the mainboard to the unit and pull the board slightly from the housing.
6. Remove the 5 colored cables from the rear of the mainboard.
7. Then remove the two remaining connectors (double brown and double blue) so as to subsequently remove the mainboard and the mainboard housing.
8. After replacement of the printed circuit board, update the latest machine software on the machine with the use of dongle cable. Make sure to check that the machine serial number is uploaded in the PCBA. If not or wrong, insert the serial number from the machine type plate and save the settings. Refer to the Machine Software manual on Nespresso Extranet.



Refer to the wiring diagram for connection plan on page 62/63.

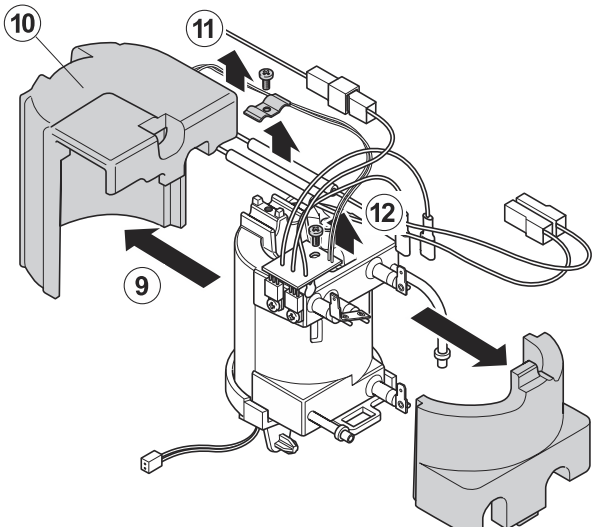
7.4.2 Replacing thermoblock with add-on pieces

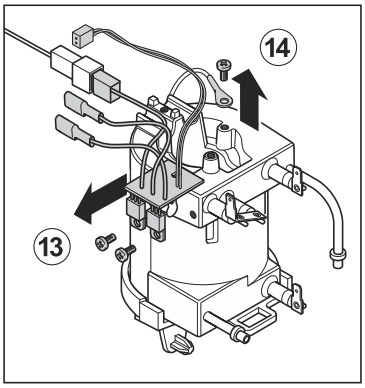
Before changing the thermoblock, repairing operations 7.3.2, 7.3.4 and 7.3.5 have to be completed.



1. Unscrew completely the screw from the base of the thermoblock.
2. On the opposite side pull the clip out of the elbow to the left at the bottom with an appropriate pair of pliers.
3. Repeat this step with the elbow on the right-hand side.
4. Remove both elbows from the thermoblock's metal tubes.
5. Pull the 3 connectors off the contacts.
6. Remove both connectors from the APO PCB
7. If you have not already done so, remove the thermoblock's 2-pin connector from the mainboard.
8. Pull the thermoblock out of the housing as far as possible.

Take care of the fuse position (between the thermoblock and the fix metal part) in order to ensure the correct temperature control.



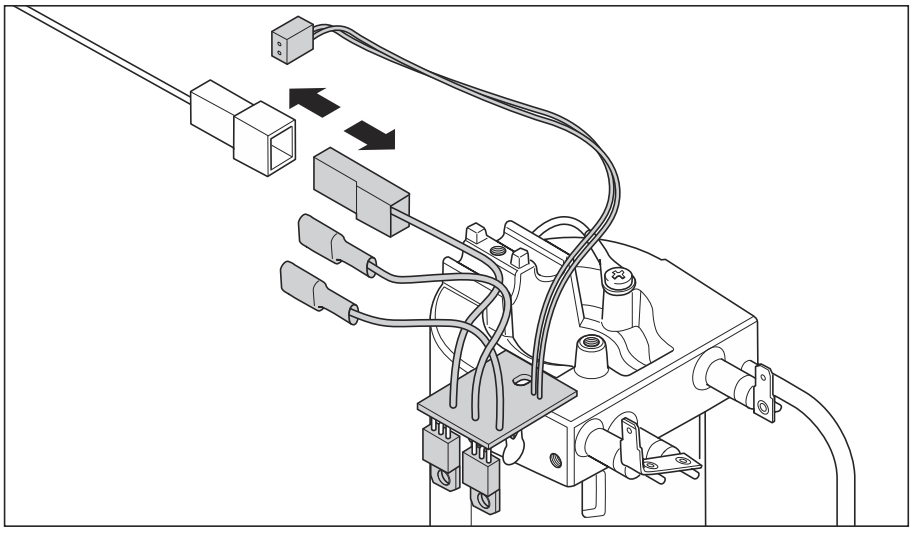


9. Remove both foam insulators from the heater.
10. Make sure that the cables can be withdrawn via the gap on the side of the larger insulator piece.
11. Now remove the two overheat control cables' retaining plate.
12. Unscrew the upper PCB screw from the housing.
13. Remove the two screws on the side so as to subsequently remove the PCB.
14. Unscrew the ground cable and remove the thermoblock.

Optional replacing triac board only

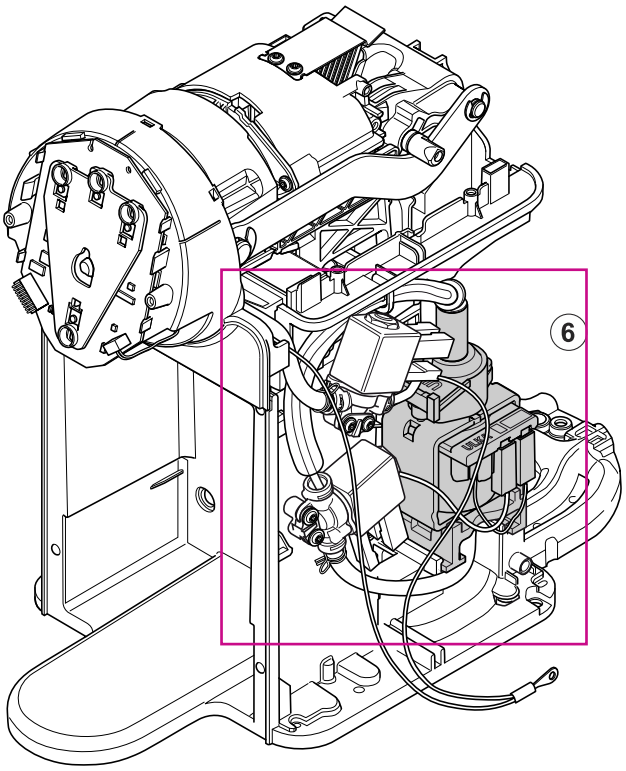
Follow instruction of chapter 7.4.2. until step 13., then:

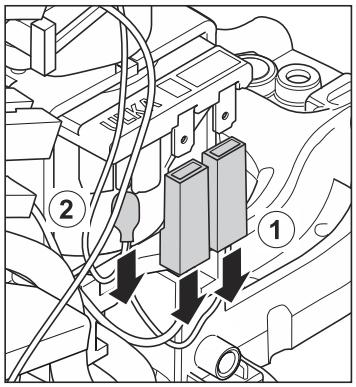
1. Disconnect triac connector from the wire harness and replace by spare part.
2. Follow steps 1-13 backwards and assemble the thermoblock parts together.

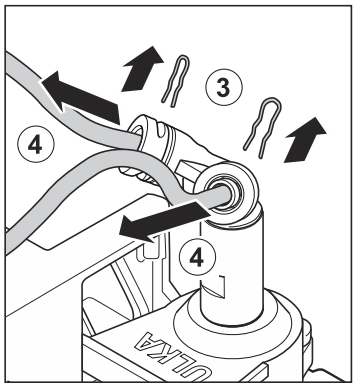


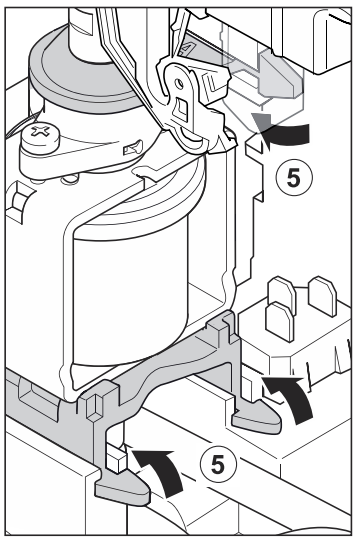
7.4.3 Replacing pump

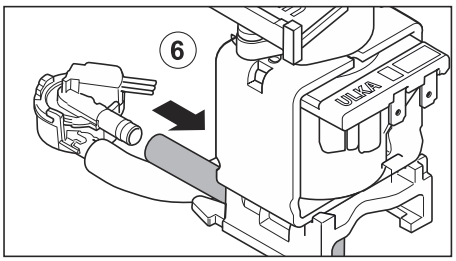
Before changing the pump, repairing operations 7.3.2, 7.3.4 and 7.3.5 have to be completed.







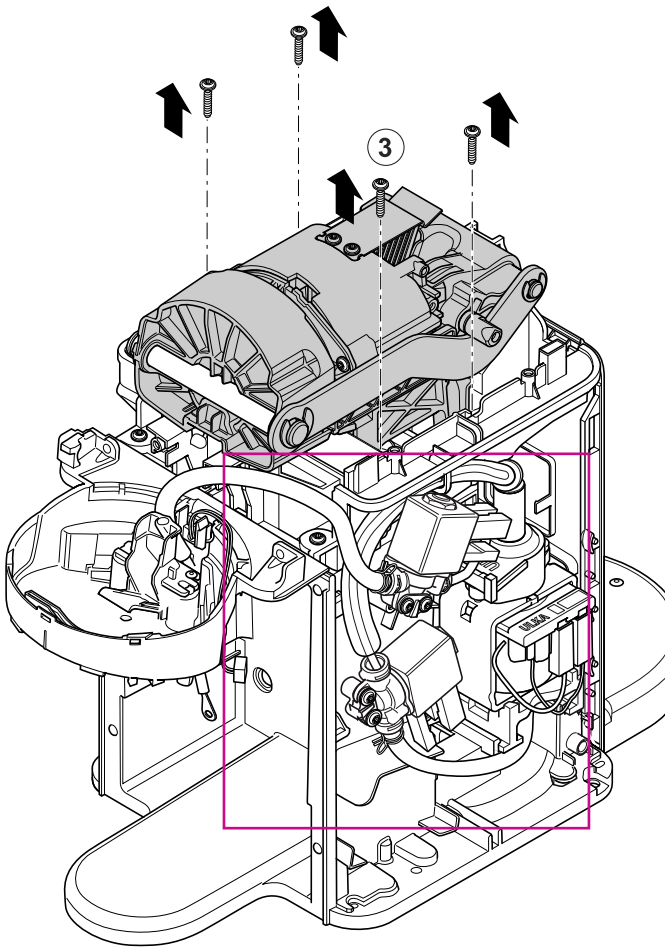


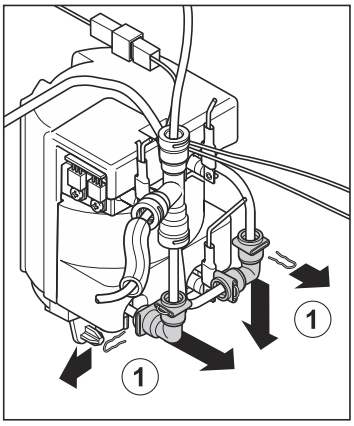


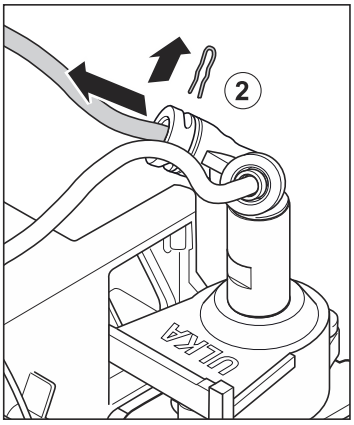
1. Remove both connectors from the pump contacts.
2. Pull the thermostat off the housing.
3. With an appropriate pair of pliers remove both clips from the Y-connector.
4. Remove both hoses.
5. To disconnect the pump bend the two lower rubber tabs at the rear upward just as you bend the upper tab to the left.
6. Disconnect the connecting hose on the flowmeter and remove the pump.

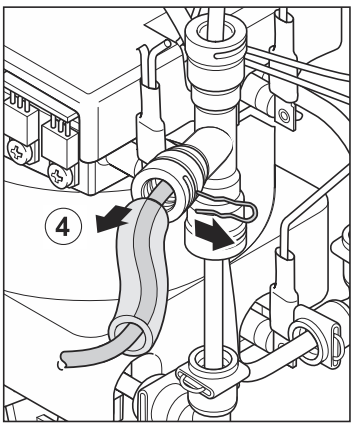
7.4.4 Replacing extraction unit

Before changing the extraction unit repairing operations 7.3.2, 7.3.3, 7.3.4, 7.3.5 and 7.3.6 have to be completed.

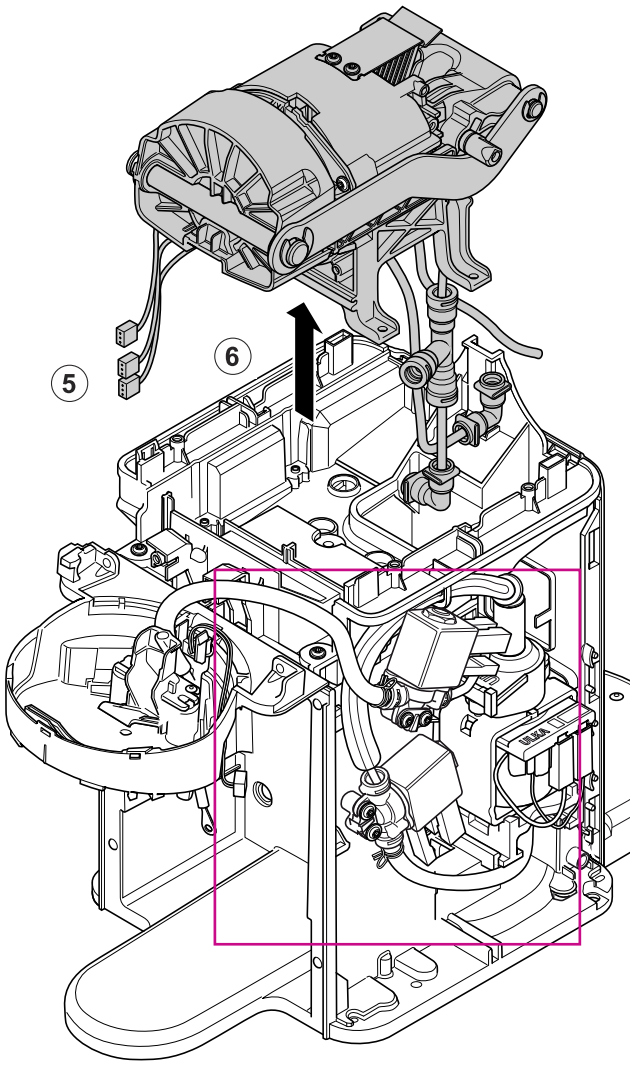






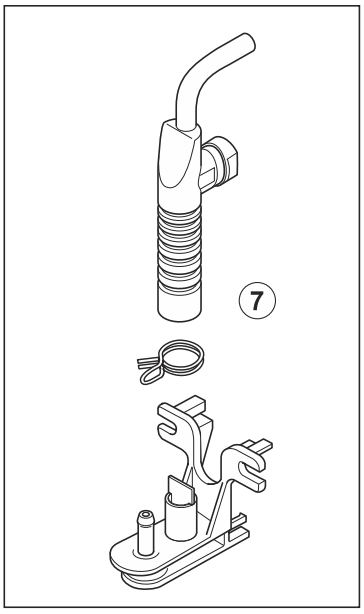


1. Disconnect the elbows from the two tubes on the thermoblock by pulling out the clips with an appropriate pair of pliers.
2. Disconnect the tube that connects to the pump by removing the retaining clip.
3. Unscrew the 4 screws that connect the brewing unit to the upper part of the housing.
4. Remove the connecting hose between T-connector and hot water solenoid valve.

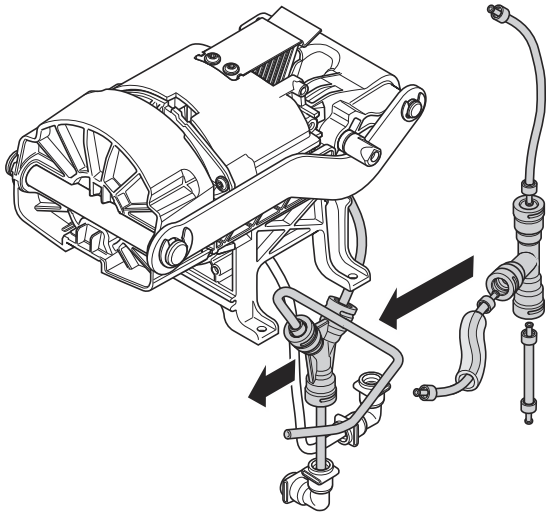


5. Check whether all connectors are disconnected from the logicboards.
   For a new brewing unit, no need connect these 3 cables (red, blue, black)
6. You can now carefully remove the brewing unit, including all hoses and cables still connected, from the housing.

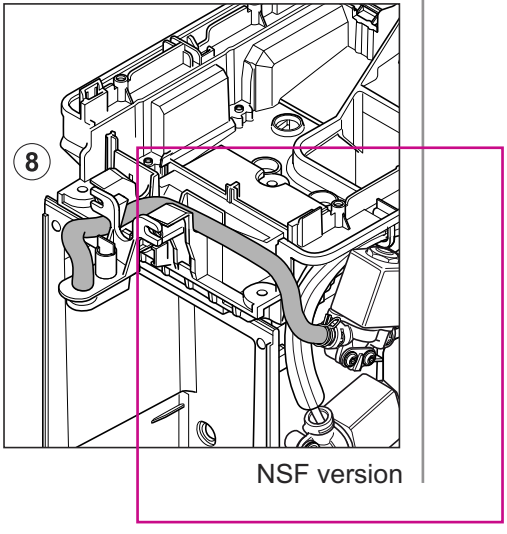
Update the software of machine to latest version when change the brewing unit from old version with Newton (with 3 cables) to new version without Newton (no 3 cables).



7. For UL NSF machine, after replace an old brewing unit with a new BU, need to replace a new coffee outlet and related tube (9310397201).
8. Regard the tube routing of the hot water hose of the NSF version.



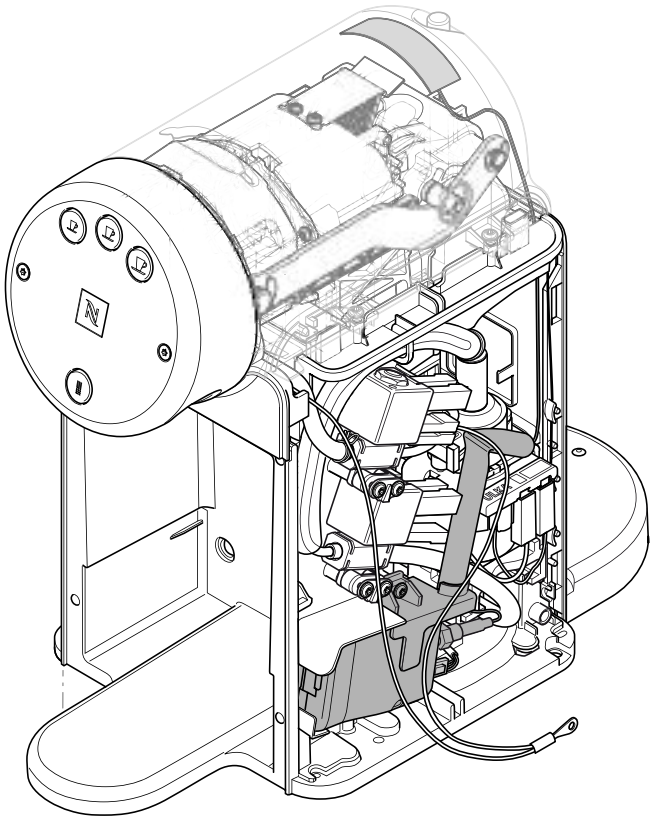
In case of leakage by previous machines, replace Y connector by T connector , the related 3 tubes also need to be changed.



NSF version

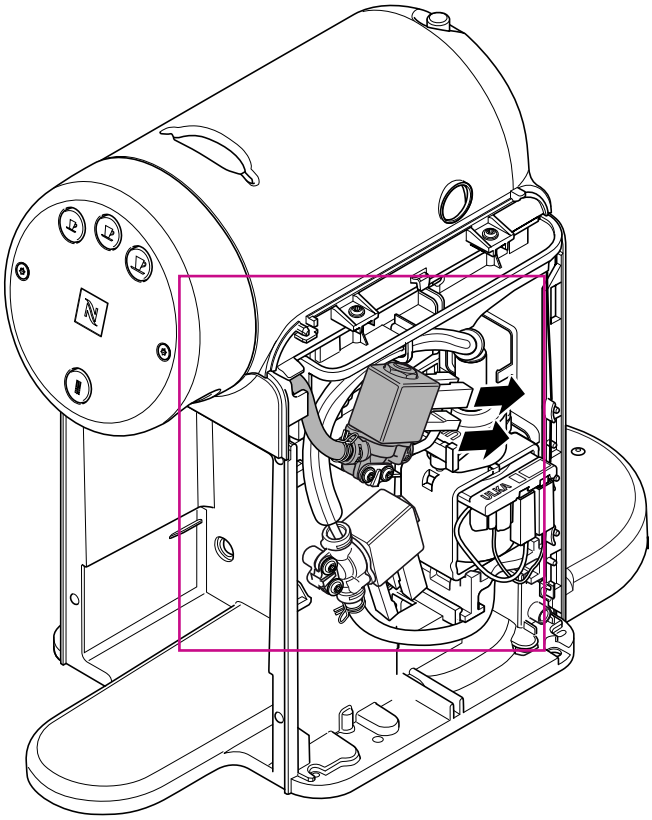
7.5 Appliances with GSM module

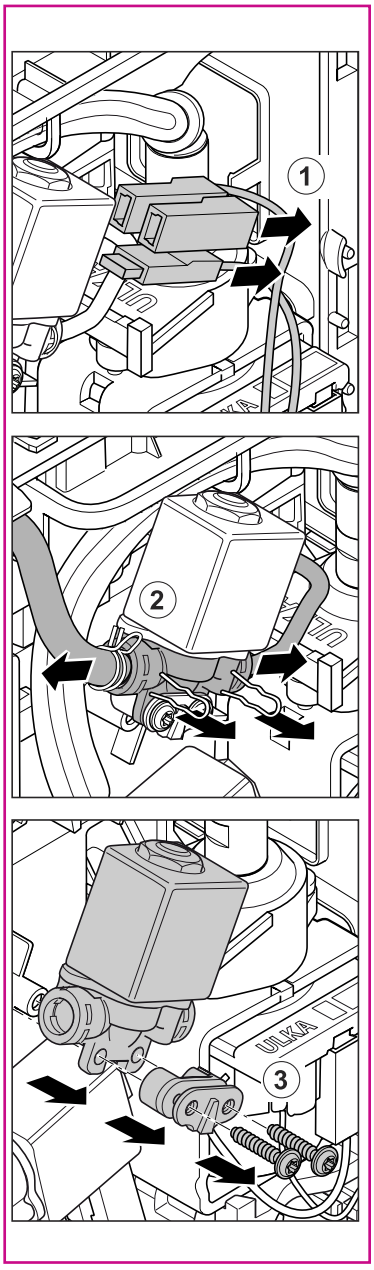
Appliances fitted with a GSM module:
Do not dismantle the Neslink module, antenna and connecting cable or replace them with new parts.



7.6 Solenoid valves

Before changing the solenoid valves repairing operation 7.3.2 has to be completed.

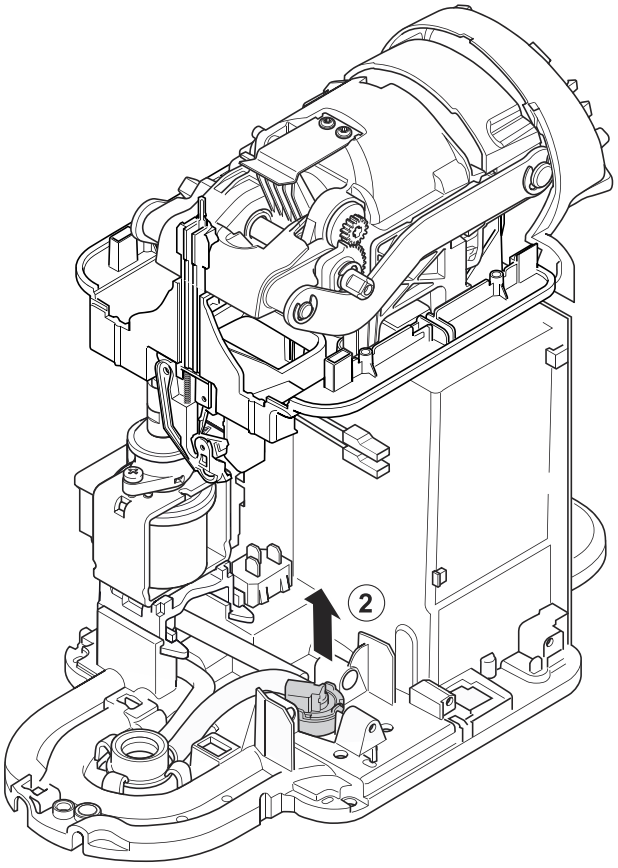


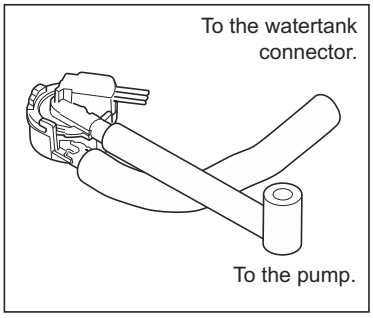


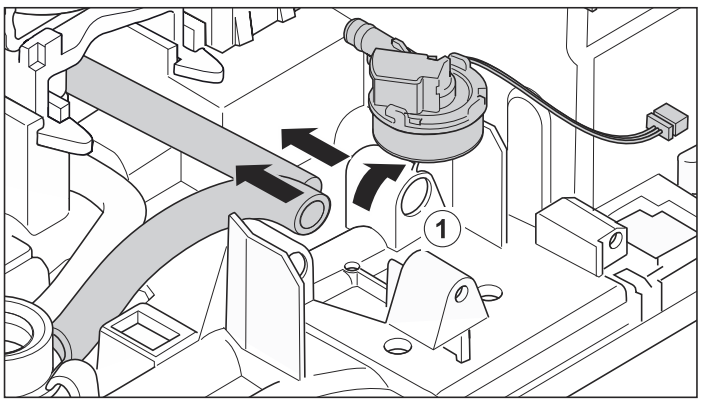
1. Pull both upper connectors and the double connector (ground) off the hot water solenoid valve contacts.
2. Disconnect both hoses on the valve by pulling out the retaining clips.
3. Unscrew the two screws that fasten the valve to the housing. Remove the valve.
4. Repeat steps 1-3 if you want to remove the second valve.
5. Use a new red O-ring (93247) when the valve is re-assembled with the tube.

7.7 Flowmeter

Before changing the Flowmeter repairing operations 7.3.2, 7.3.4 and 7.3.5 has to be completed.



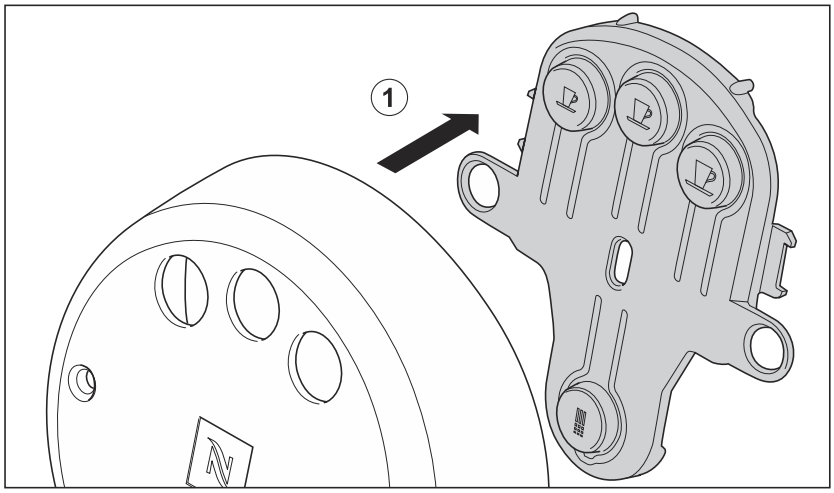


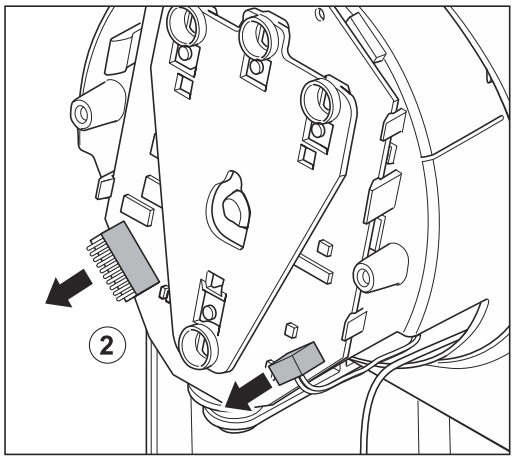


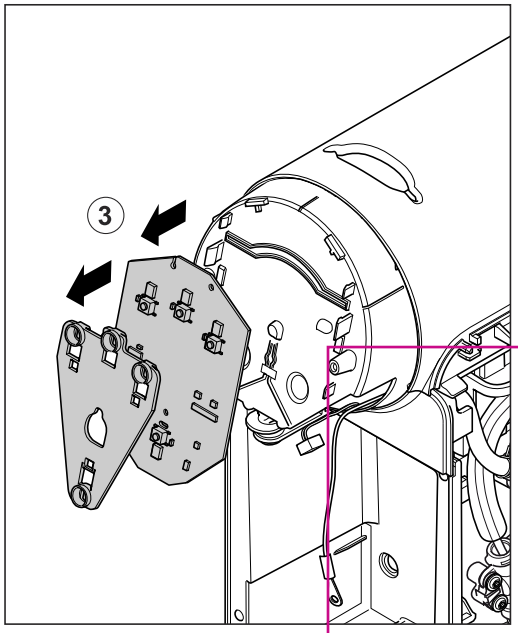
1. Raise the flowmeter and remove the hoses that connect to the water tank connector and to the pump.
2. Remove the flowmeter.

7.8 Coffee buttons

Before changing the coffee buttons/MMI PCB repairing operation 7.3.3 has to be completed.



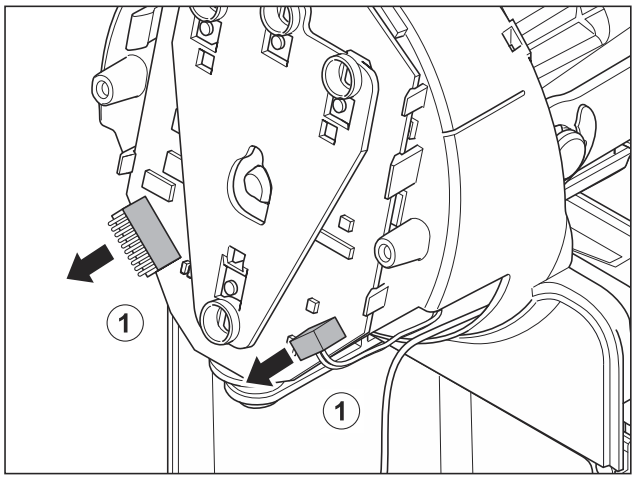


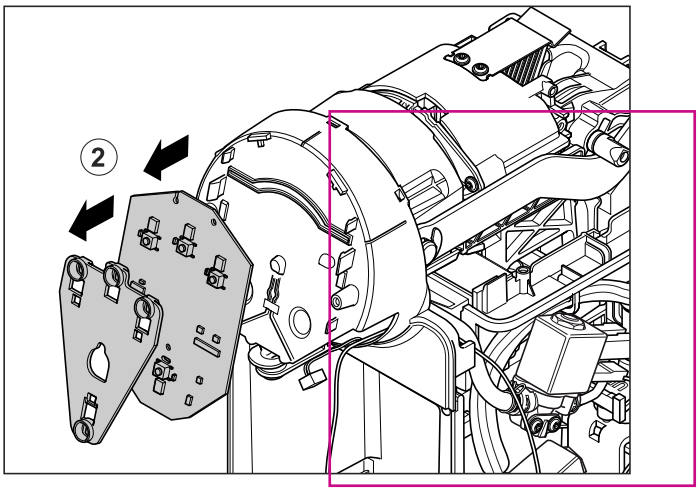


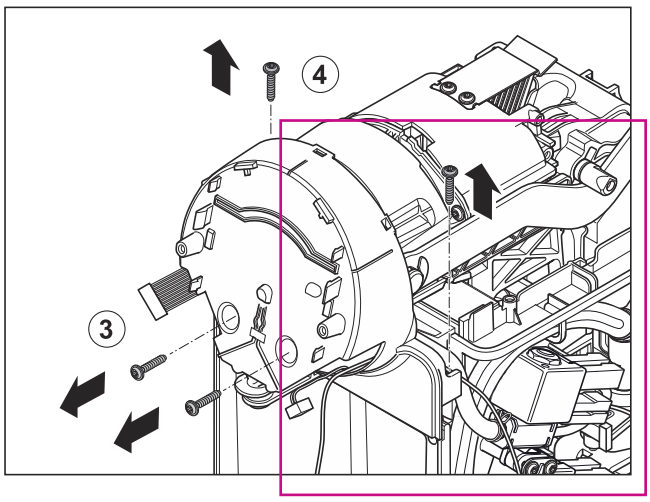
1. Remove the buttonplate from the inside of the front cover.
2. Remove the plugs on the MMI.
3. Remove the light guide and the MMI.

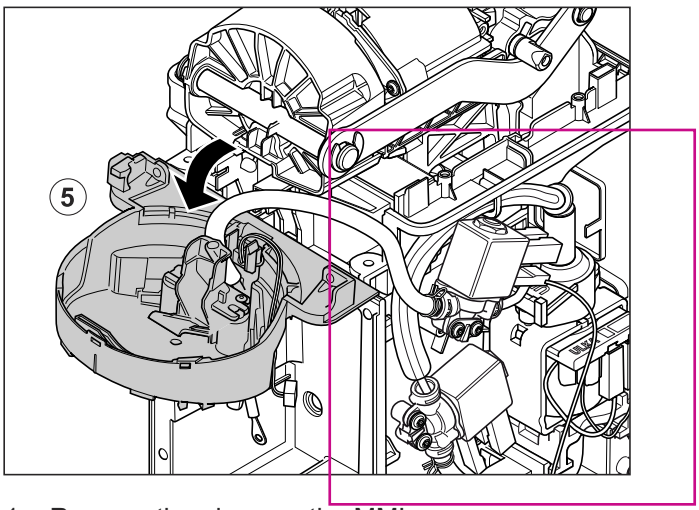
7.9 Replacing illumination components

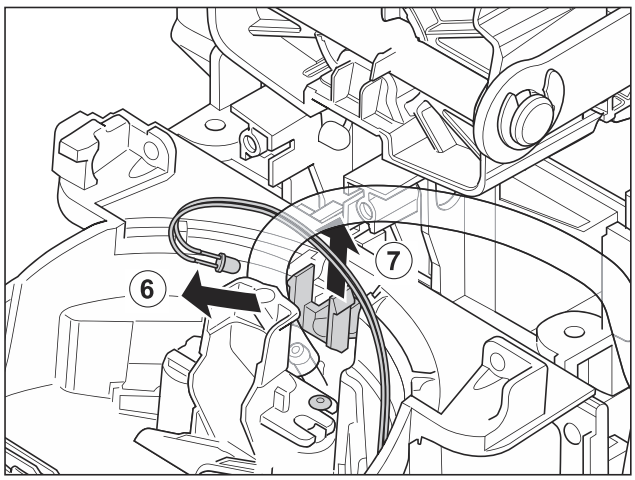
Before changing the illumination components repairing operations 7.3.3 and 7.3.4 have to be completed.







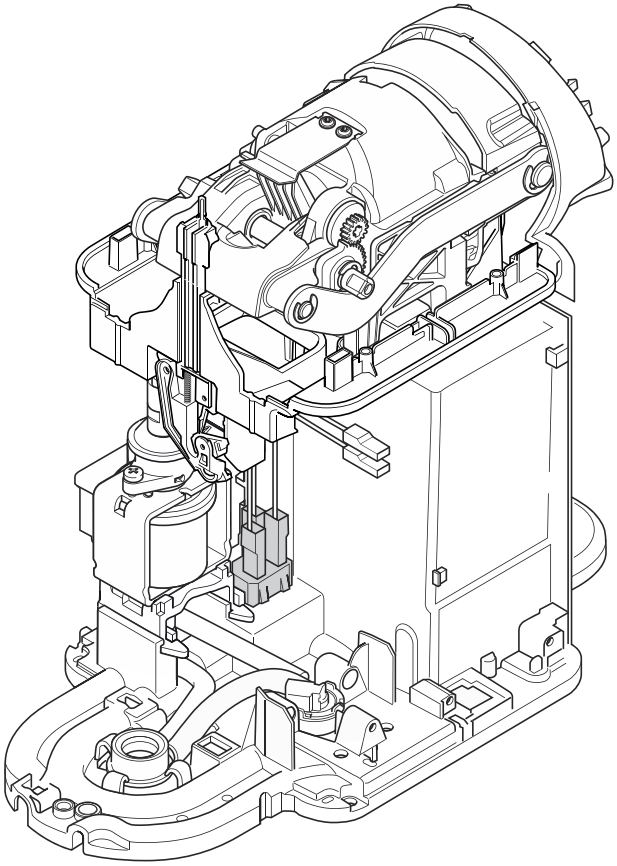


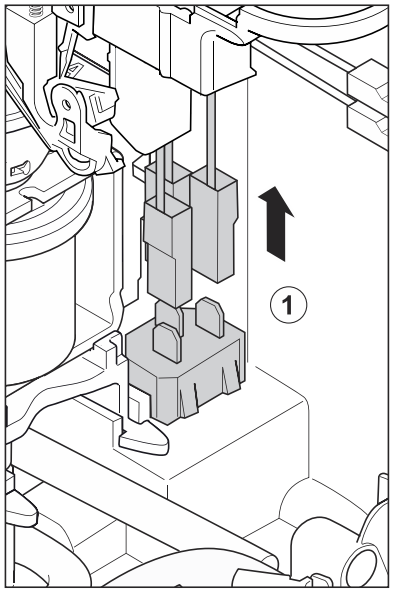


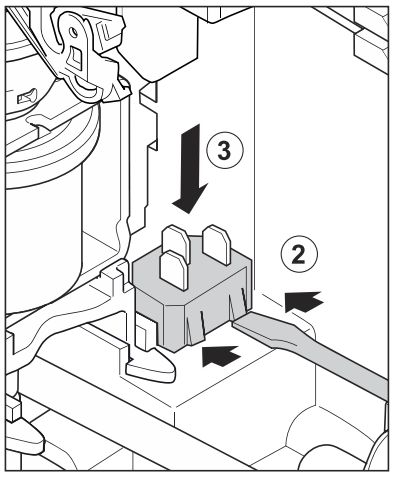
1. Remove the plugs on the MMI.
2. Remove the light guide and the MMI.
3. Now unscrew the two screws that. fasten the front panel.
4. Unscrew the two vertical screws.
5. Now turn down the front panel.
6. Remove the LED (cup light).
7. Remove the LED support from the front.

7.10 Change power socket

Before changing the power socket, the pump should be removed.



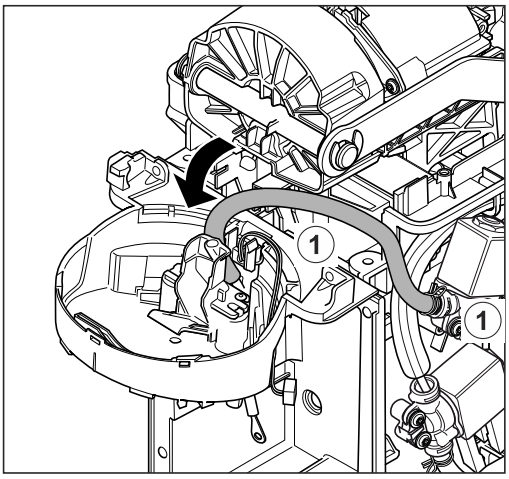


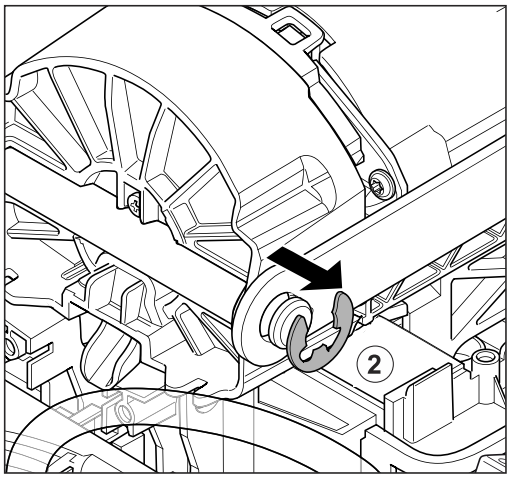


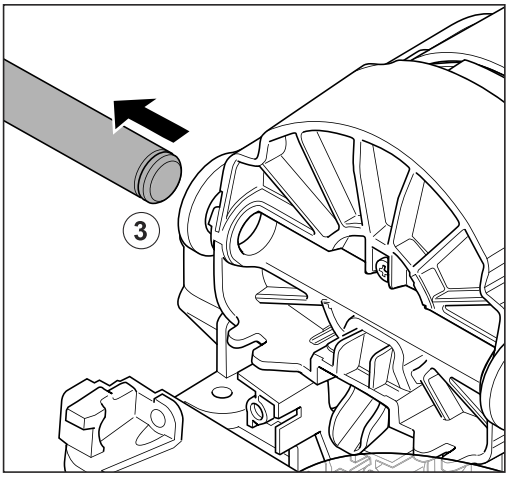
1. Remove the power plugs from the socket.
2. Press the 4 clipping hooks on the socket with a suitable tool.
3. Push the power socket out of the bottom panel.

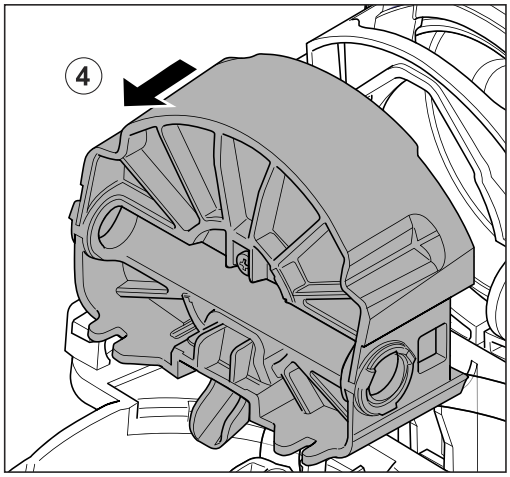
7.11 Exchanging the coffee capsule seal

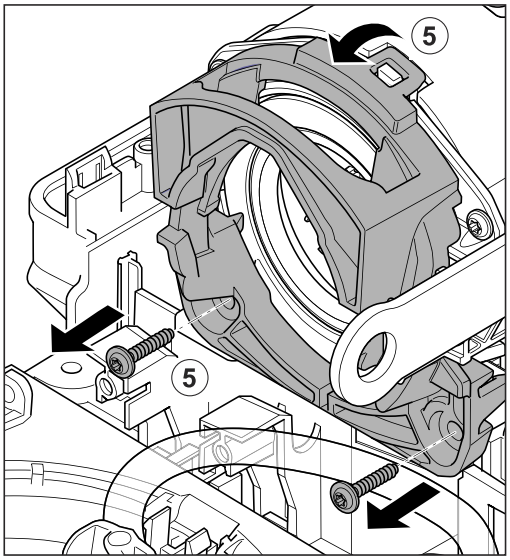
Before changing the illumination components repairing operations 7.3.2 to 7.3.4 and 7.3.6 have to be completed.



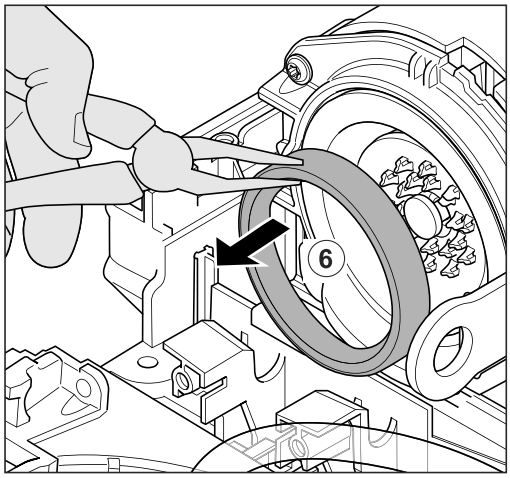


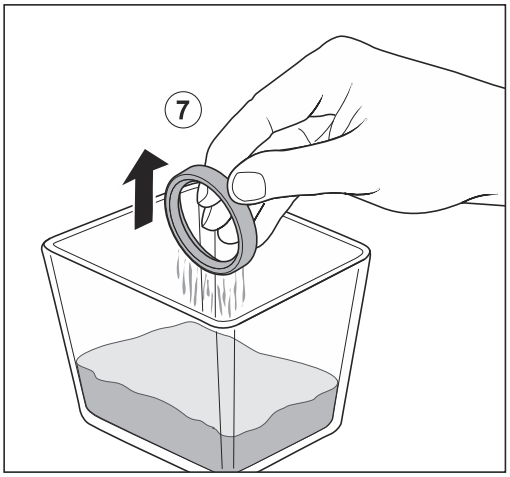


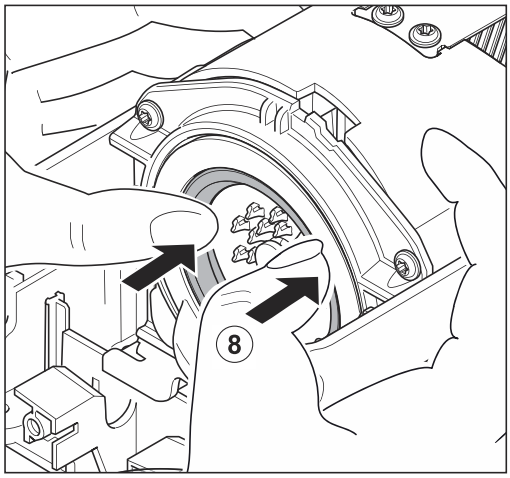


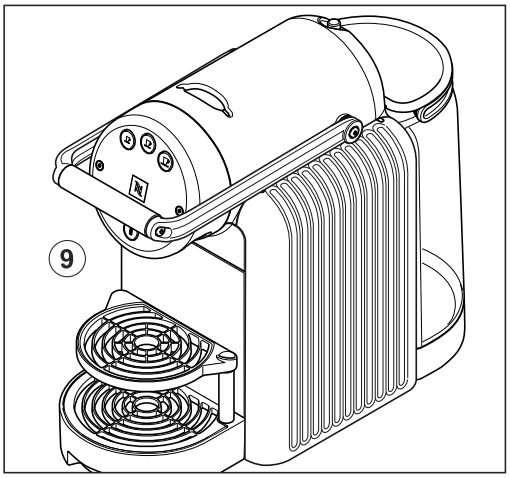


1. Please ensure that the connecting tube leading to the hot water valve is not subject to excess tension. If this is the case, loosen the tube connection at the hot water solenoid valve by pulling out the retaining clip.
2. Remove the circlip at the front axis of the brewing unit closing mechanism.
3. Pull the front axis completely out of the connecting rods.
4. Remove the front of the brewing unit.
5. Loosen the 2 screws on the capsule retain and lever these out of the brewing unit.

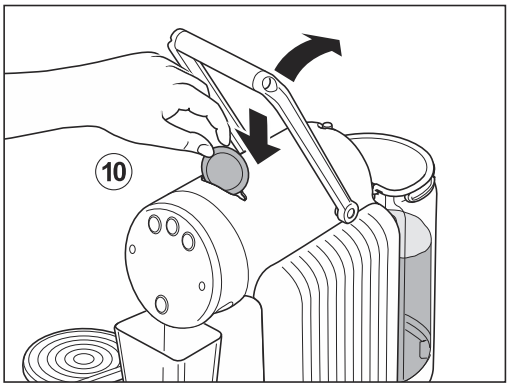


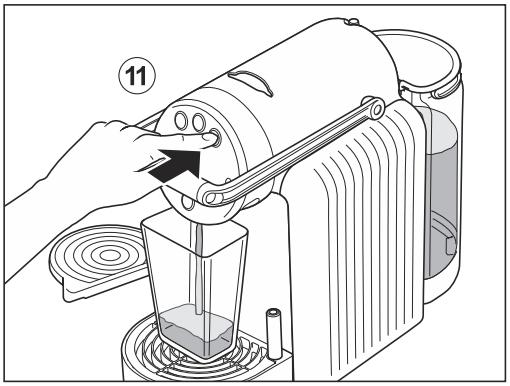






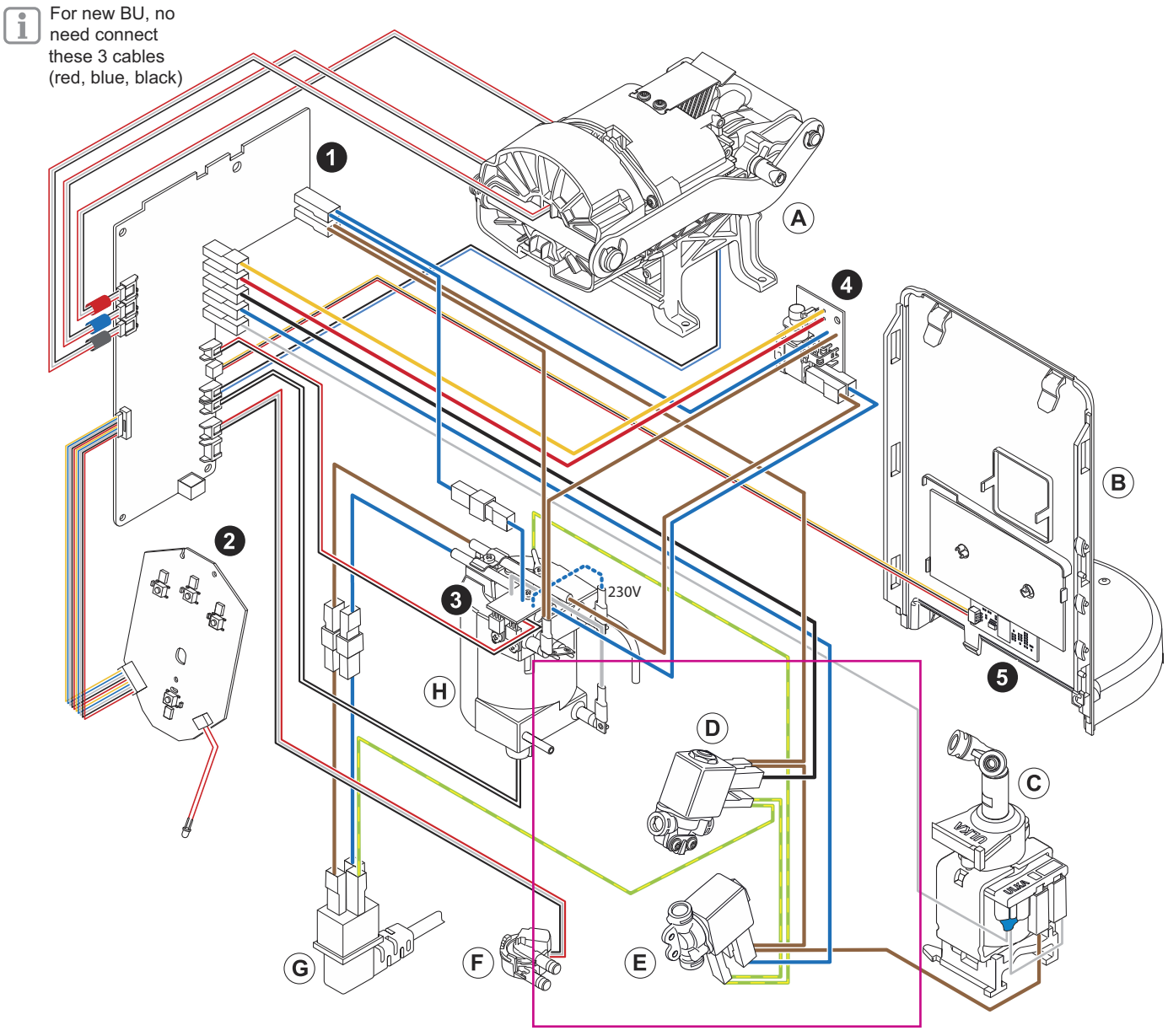
6. Use a small set of pliers to grip the coffee capsule seal and pull it out.
7. A seal that has been soaked in water must then be taken out of its container.
8. Use your fingers to press in the new seal to the desired depth until it is positioned correctly.
9. Reassemble the coffee machine in its entirety.
10. Then perform a test run using a genuine coffee capsule.
11. Ensure that the coffee is output correctly and that there is sufficient pressure build-up in the brewing unit.





7.12 PCB and wiring diagram

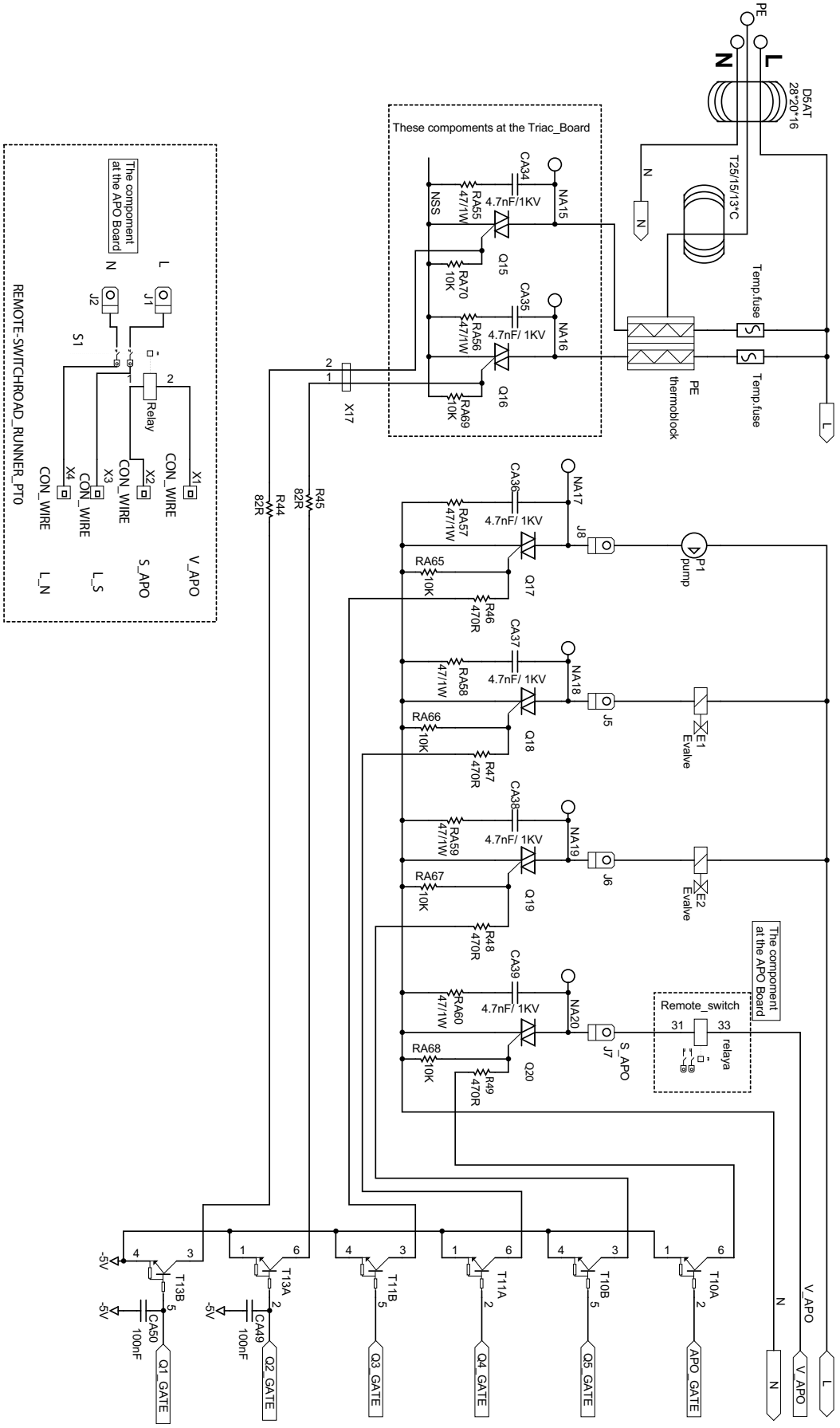
This drawing show the connections of the electric and electronic components.



1) Main PCB
2) MMI PCB
3) Triac PCB
4) APO PCB
5) Water level sensor PCB

A) Brewing unit
B) Rear cover
C) Pump
D) Hot water E-valve
E) Venting E-valve
F) Flowmeter
G) Power plug
H) Thermoblock

7.13 Wiring schematic drawing



8 FUNCTION TESTS

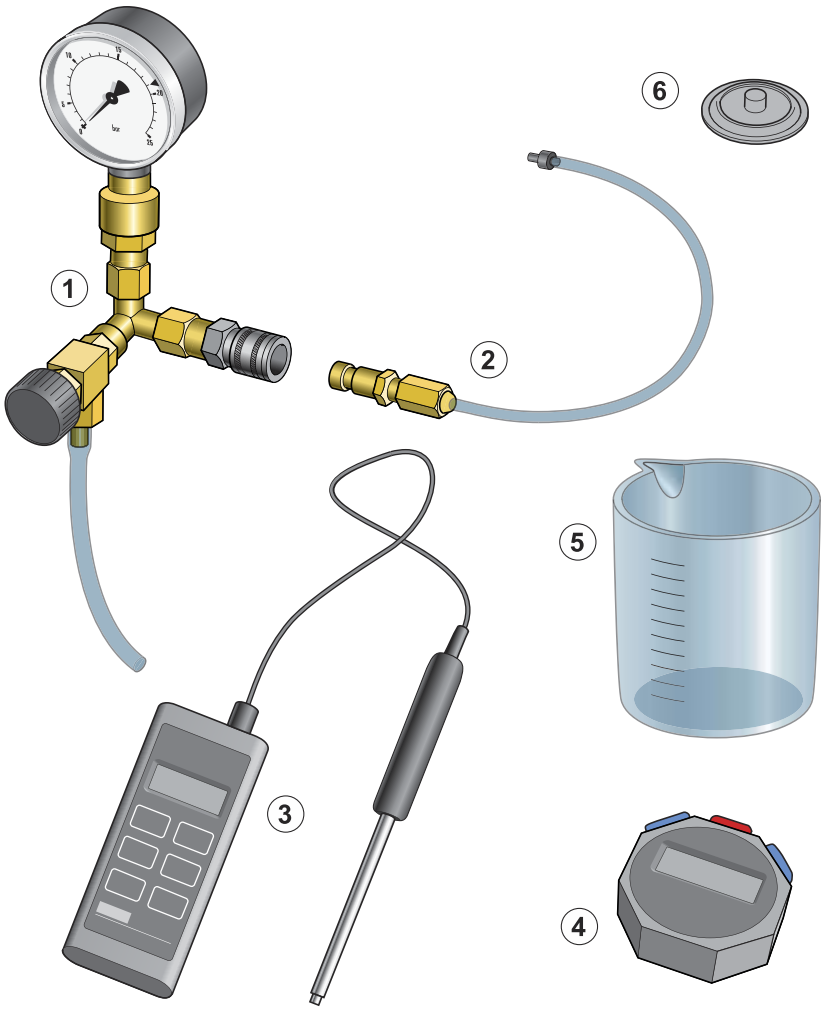
8.1 Safety instructions

Some function tests are performed with an energized, partly opened coffee machine.

Danger of electrocution!
Mains voltage inside the coffee machine.
Do not touch any live part while performing tests.

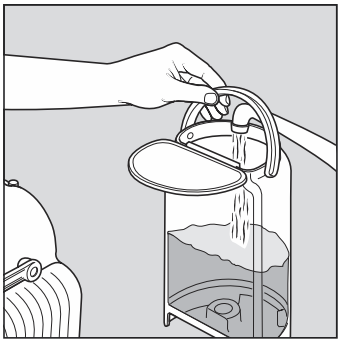
Danger of burns!
Hot parts and water under pressure inside the coffee machine.
Do not touch any hot parts while checking for leakages!
Always wear protective goggles.

8.2 Required equipment

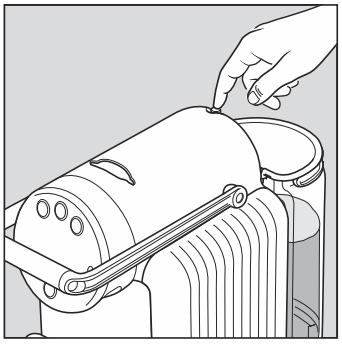


1) Pressure tester (EFR no. 42213)
2) Zenius pressure adapter (WIK 9310244000). This part is delivered together with the dummy capsule (pos. 6).
3) Electronic thermometer (or digital multimeter suitable for temperature measurement).
4) Timer
5) Measuring beaker
6) Dummy capsule. This part is delivered together with the pressure adapter pos. 2 (WIK 9310244000).

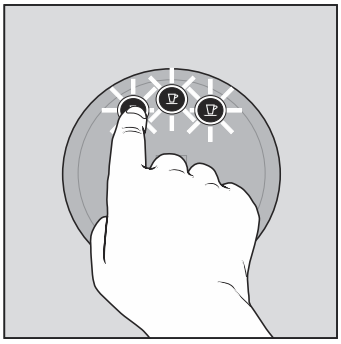
8.3 Measure coffee temperature



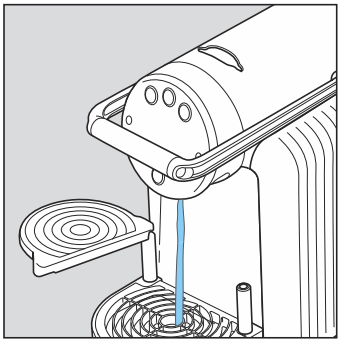
1. Fill water tank with cold water.



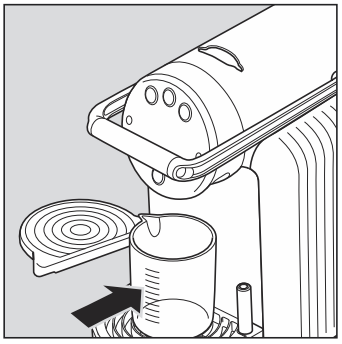
2. Switch on mains switch.



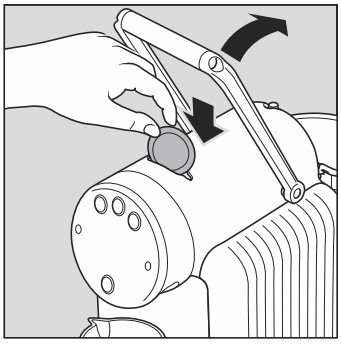
3. After the heating up period, press the “Ristretto” button…



4. …to preheat the coffee outlet with hot water.

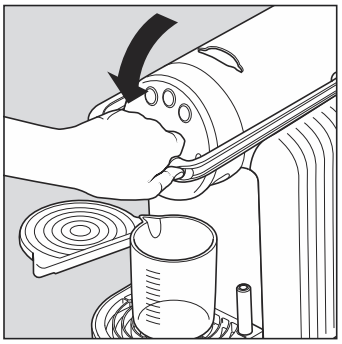


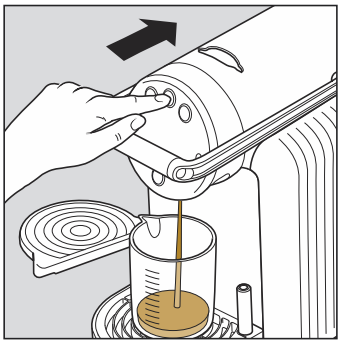
5. Place a measuring beaker under the coffee outlet.

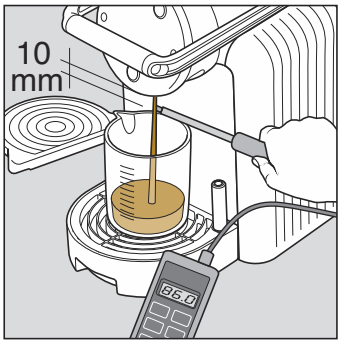


6. Insert a capsule in the capsule slot.

The programmed cup lenght should be 40 ml or more.







The coffee temperature should be 86°C ±3°C (187°F ±5.4°F).

8. Press “Nespresso” button. Wait until the measuring baker contains 20 ml of coffee.

9. Then measure the coffee temperature approx. 5-10 mm under the coffee outlet.

If necessary, change coffee temperature gradually with the help of menu point 4.2 “Programming the coffee temperature” (see on page 21).

8.4 Protective earth (PE) continuity test

8.4.1 What is the protective earth test about?

This test is necessary
- for class 1 equipment (three-wire power cord with protective earth),
- after a repair whenever a general disassembly was performed.

Depending on the earth connection circuit, only the last part connected to earth can be controlled (if the earth wiring is in serie and not parallel).

8.4.2 General

Legal regulation

In case of a repair/modification of the coffee machine, the repair centre is bound by law to protect the user/consumer by
- restoring the regular condition of the appliance and,
- performing the respective tests according to EN/IEC 60335-1 “Safety of household and similar electrical appliances” and national regulations (e.g. DIN VDE 0701).

Description

Protective earth continuity measurements are made between the protective earth terminal of the power plug and
- the thermoblock,
- both side panels,
- the front cover.

This test assures that
- the ground (earth) connection does not have an interruption between the mains plug of the power cord and the thermoblock as well as side panels,
- the permissible ground resistance is less than 0.3 Ohms (with a test current of 200 mA DC).

Test equipment

Special test equipment is needed that complies with the regulations to perform protective earth continuity measurements. Detailed requirements and tolerances must be verified by your local authorities or measurement supplier in any case.

Ask Nespresso for recommendations about test equipment.

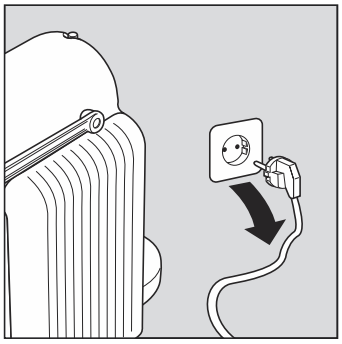
Test report

For legal reasons a repair or test report should be prepared and filed with following information
- customer (name, address)
- type and serial number of coffee machine
- date of repair/test(s)
- performed test(s)/measuring value(s)
- used test equipment
- signature

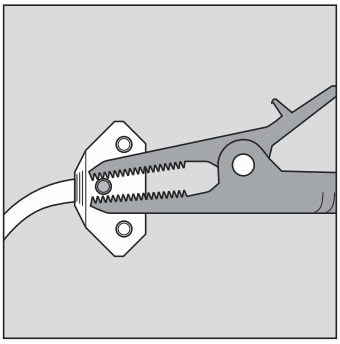
8.4.3 Test sequence

This test sequence is not applicable for coffee machines with two-wire power cords (without ground pin).

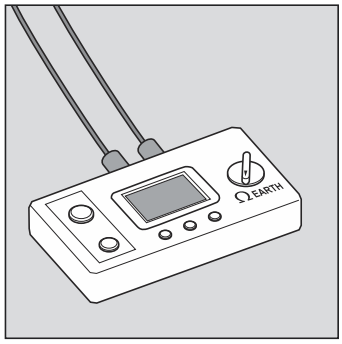
Danger of electrocution!
Do not plug in the coffee machine during the protective earth continuity test.
Read observe safety instrutions in user manual of test equipment.



1. Unplug mains connector and remove water tank.



2. Connect black measuring cable to ground pin of power plug with an alligator clip. (Example shown: Swiss power plug)

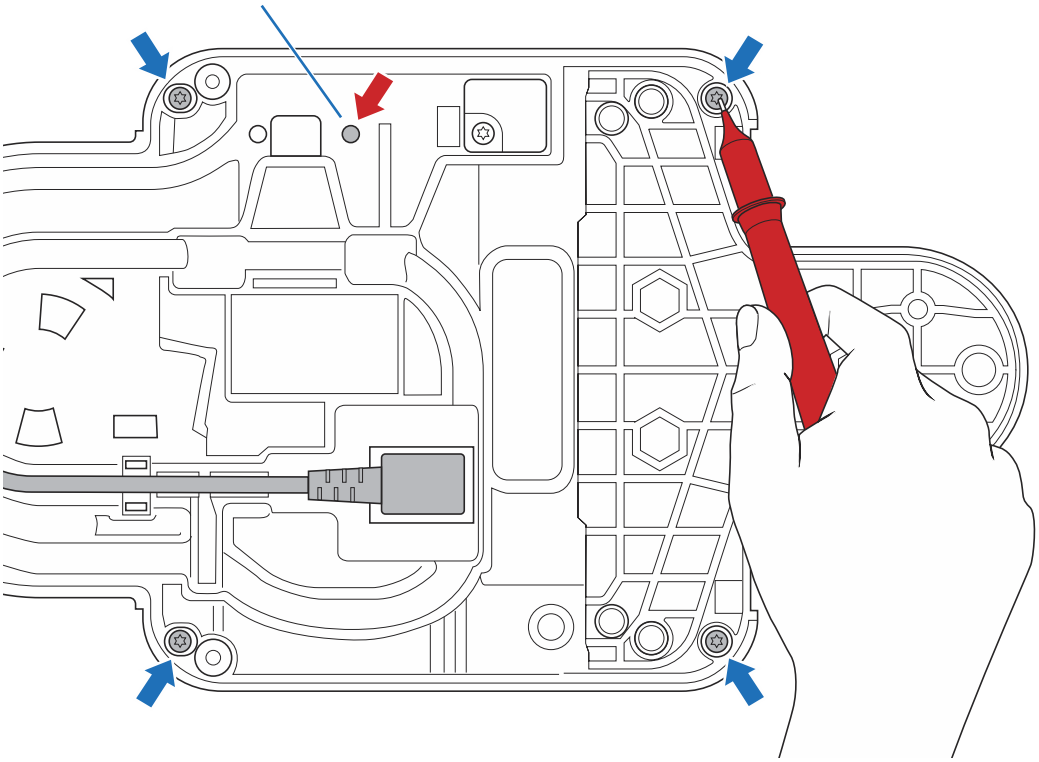


3. Switch on test equipment and select protective earth test.

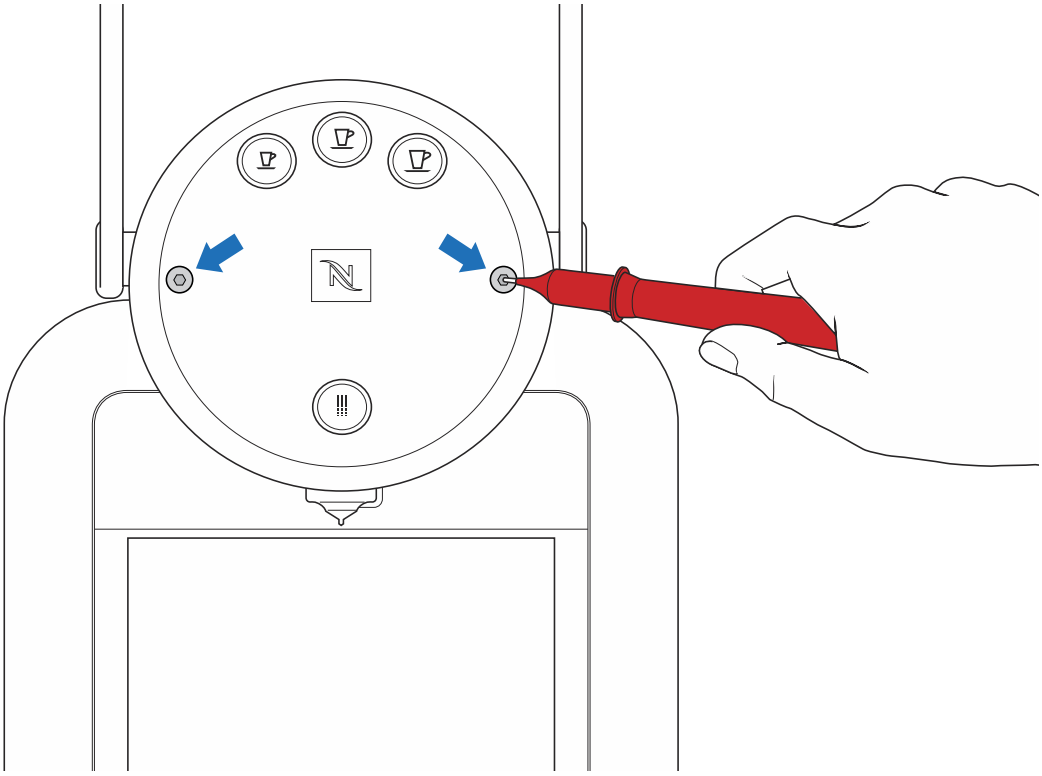
Touch with the probe the measuring points highlighted in blue/red.
For each measuring point press measure button and read off displayed resistance.

The resistance must be lower than 0.3 Ohm.

Recommended probe for this position with diameter 2 mm and length 65 mm.



For metal panel machine, measuring points highlighted in blue and red must be tested. For plastic panel machine, only measuring points highlighted in red must be tested.



8.4.4 What to do if the protective earth test fails?

- Check/measure ground wire connection of power cord; replace if necessary.
- Check and retighten terminal screws on side panels if necessary.

8.5 Protective insulation test

Perform the protective earth (PE) continuity test at first, if it is mandatory.

8.5.1 What is the protective insulation test about?

This test is necessary
- for class 1 and 2 equipment (with/without protective earth),
- after a repair whenever a general disassembly was performed.

8.5.2 General

Legal regulation

In case of a repair/modification of the coffee machine, the repair centre is bound by law to protect the user/consumer by
- restoring the regular condition of the appliance and,
- performing the respective tests according to EN/IEC 60335-1 “Safety of house hold and similar electrical appliances” and national regulations (e.g. DIN VDE 0701).

Description

The insulation test
- assures that wiring and insulation of the coffee machine fullfill the normative requirements after a repair,
- rates the insulation capability of the coffee machine,
- is a very dangerous test because of a high test voltage (500 V DC).

For the insulation test, phase and neutral wire are shunted at the power plug. Then a test voltage is applied between phase/neutral and selected parts of the coffee machine.

Test equipment

Ask Nespresso for recommendations about test equipment.

Special test equipment is needed that complies with the regulations to perform insulation and withstanding voltage tests. Detailed requirements and tolerances must be verified with your local authorities or measurement supplier in any case.
Ideally the test equipment has a national power socket for testing, so that the coffee machine can plugged in directly. Otherwise a special shunt is necessary to connect the phase and neutral pin of the coffee machine’s power plug.

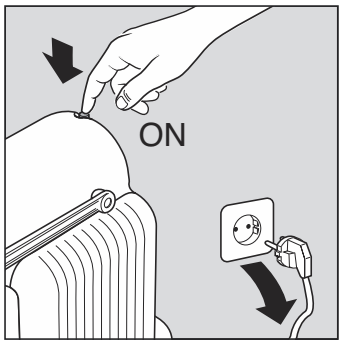
Test report

For legal reasons a repair or test report should be prepared and filed with following information
- customer (name, address)
- type and serial number of coffee machine
- date of repair/test(s)
- performed test(s)/measuring value(s), test points
- used test equipment
- signature

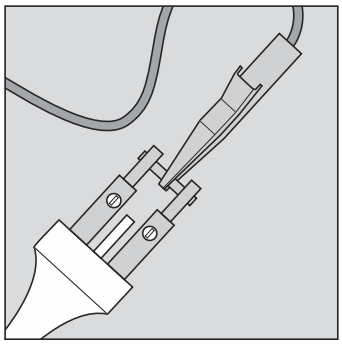
8.5.3 Test sequence

Danger of electrical shock/short circuit!
Do not plug in the coffee machine during insulation test.

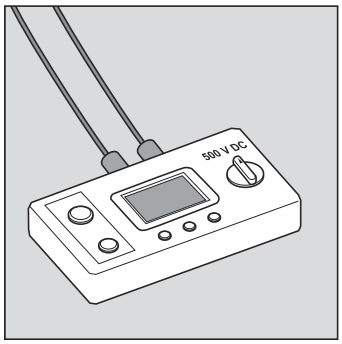
Danger of electrical shock!
Do not touch tip of test probes.
Do not touch metallic parts of coffee machine during test.
Read and observe safety instructions in user manual of test eqipment.



1. Unplug mains connector and remove water tank. Switch on coffee machine.



2. Connect the phase and neutral pin of the power plug together with a test adapter (procured by the repair centre). (Example shown: Swiss power plug)

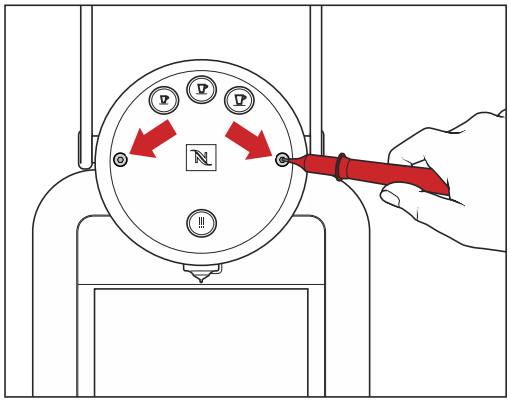


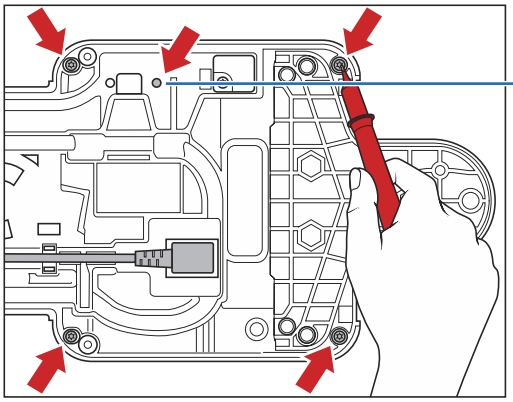
3. Connect the black measuring cable to the test adapter. Switch on test equipment and select an insulation test voltage of 500 V DC.

Touch with the probe the measuring points highlighted in red.
For each measuring point press measure button and read off displayed resistance.

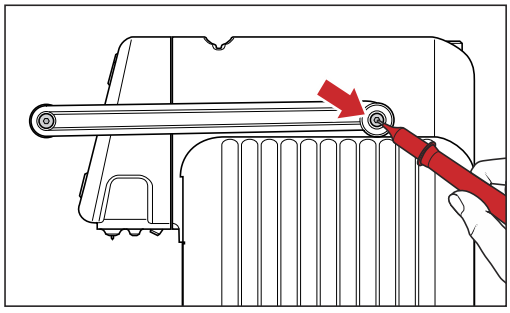
The insulation resistance must always be higher than 300 kOhm (300,000 Ohm).

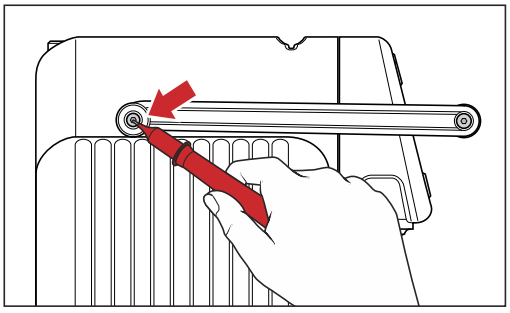
Some test equipment displays test passed or failed instead of the insulation resistance.





Recommended probe for this position with diameter 2 mm and length 65 mm.



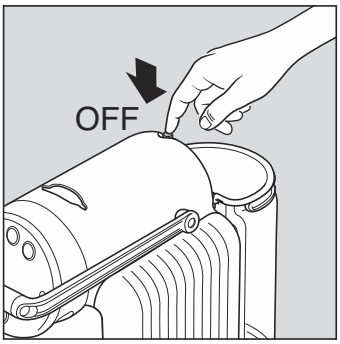


8.6 Pressure test

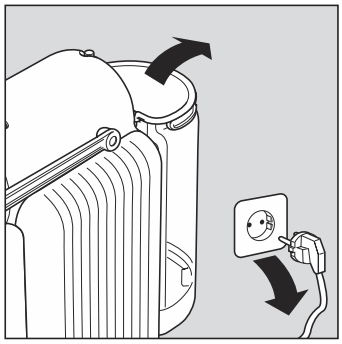
Danger of electrocution!
Mains voltage inside the coffee machine.
Danger of electrical shock.

- ASC Maintenance pressure mode must be entered (button board).
- Static pressure can be measured.
- Fluid system tightness can be measured.

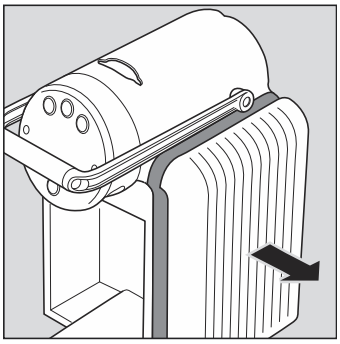
8.6.1 Preparation



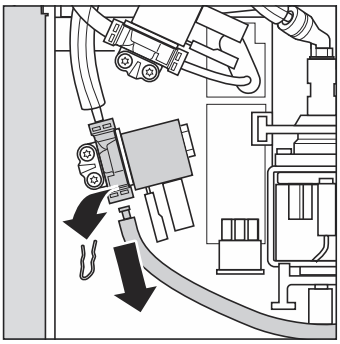
1. Switch off the coffee machine.



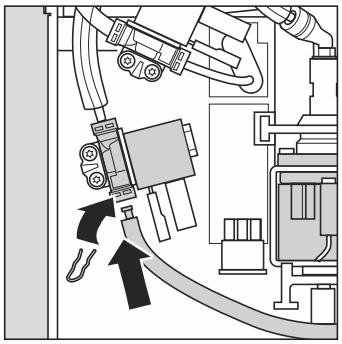
2. Remove the plug and the water tank.



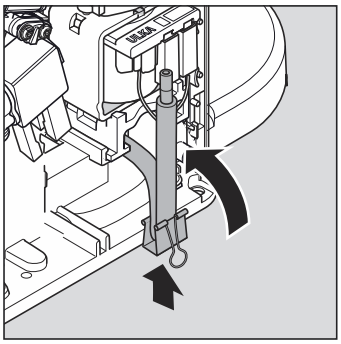
3. Remove the right side panel (see chapter 7.3.2).



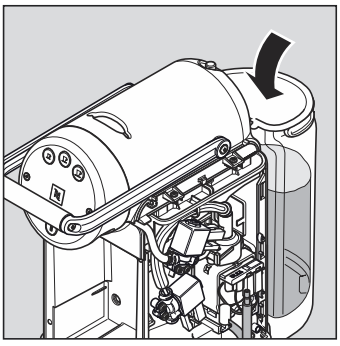
4. Pull the tube clip out of the venting E-valve exit and remove the connection hose.



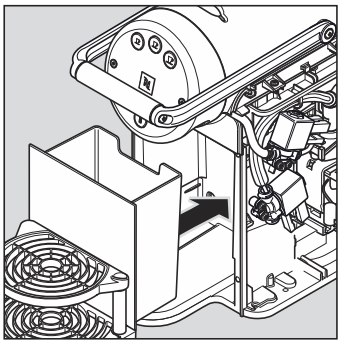
5. Put the pressure hose into the venting E-valve exit and fix it with the tube clip.



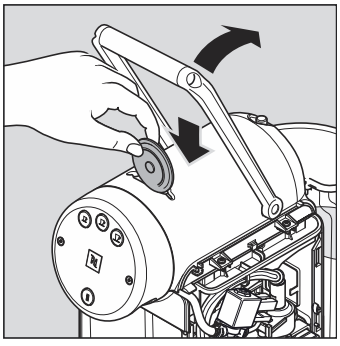
6. Snap off the connection hose and fix it with a clamp.



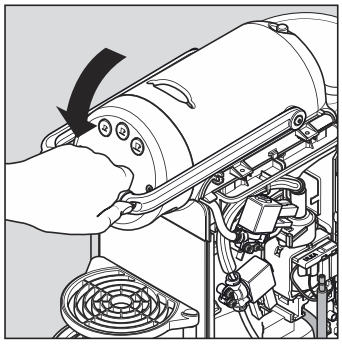
7. Fill the water tank with fresh, potable water and place it on the coffee machine.



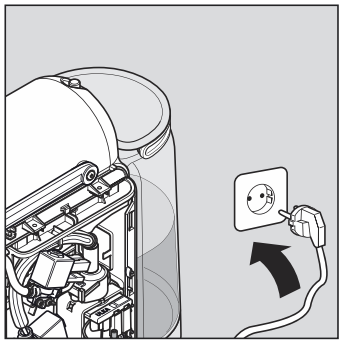
8. Remove the drip unit and the capsule container.



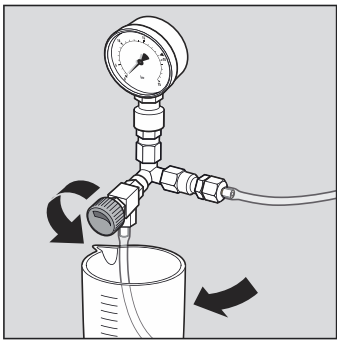
9. Insert a dummy capsule in the brewing unit to block it.



10. Close the handle…

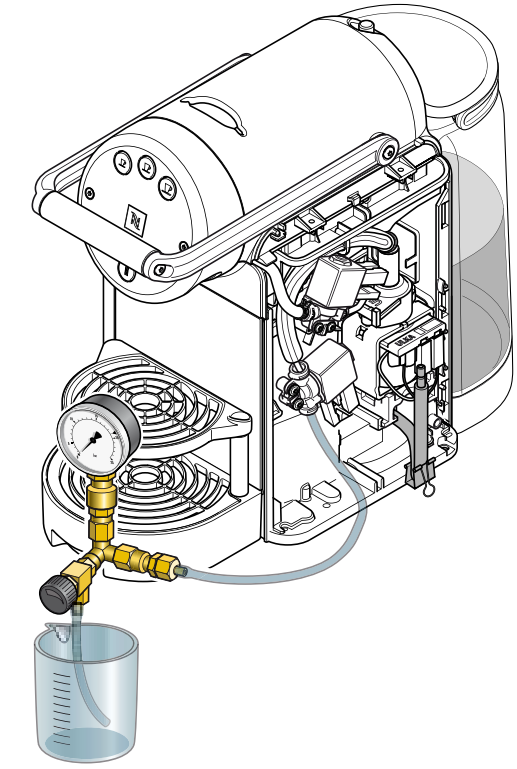


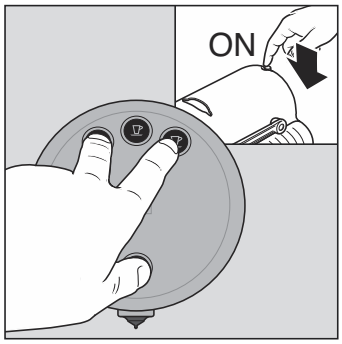
11. …and plug the cord.



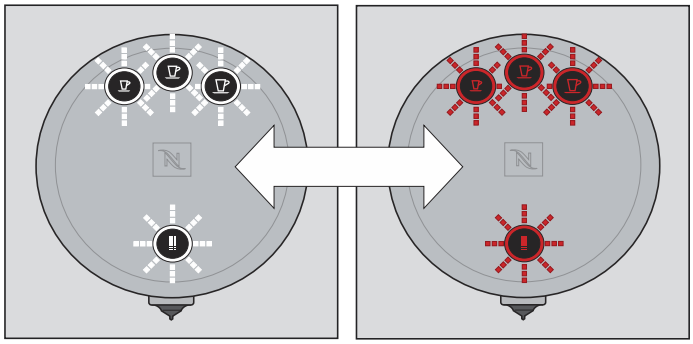
12. Open the valve from the pressure gage and place a beaker below the exit.

8.6.2 Test run



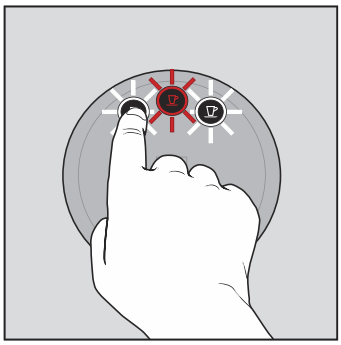


1. Press and hold Ristretto, Lungo and Hot Water buttons, while holding turn on the machine. Machine enters in the Maintenance Pressure test mode.

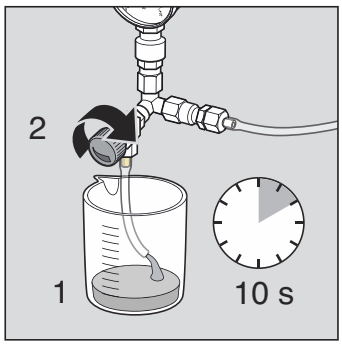


2. All the buttons are blinking red and white alternatively.

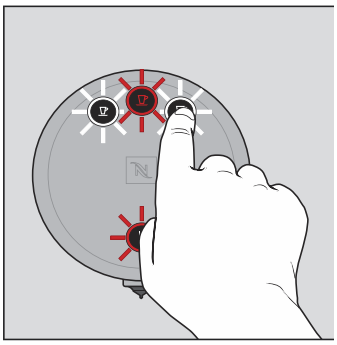
During the Mode:
- the venting e-valve is open
- the hot water e-valve is closed



4. Press a button to start the pump.

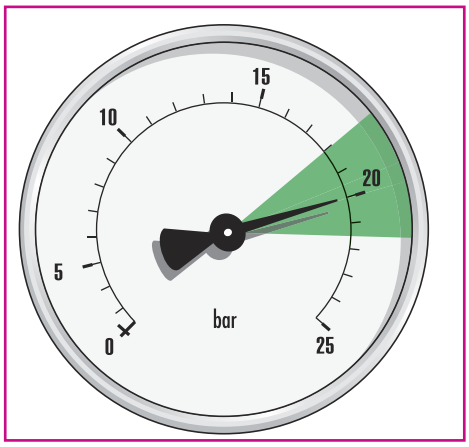


5. Let the flow run for 10 seconds and close the valve of the manometer.

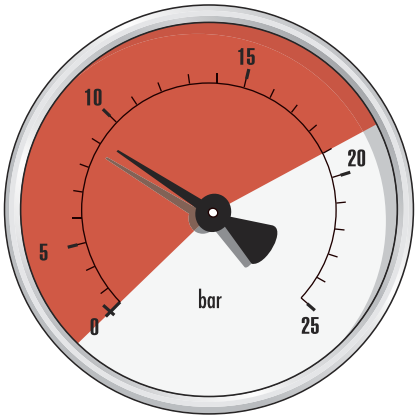


6. Once the max. pressure is reached, press a button to stop the pump (the pump acceptable pressure should be between 20 ± 1bar). Some pump can go higher than 22 bar.

⚠ Stop the pump by pressing any button latest 2 minutes after the start of the test (pump cannot works more than 2 minutes in a row). Wait 1 minute for the pump to cool down before continuing the test if needed.



- Pressure between 19 and 21 bar after 10 seconds minimum, water circuit is tight. Turn the machine off (leaving maintenance test), open the valve and let all water flows out of the pressure gage.



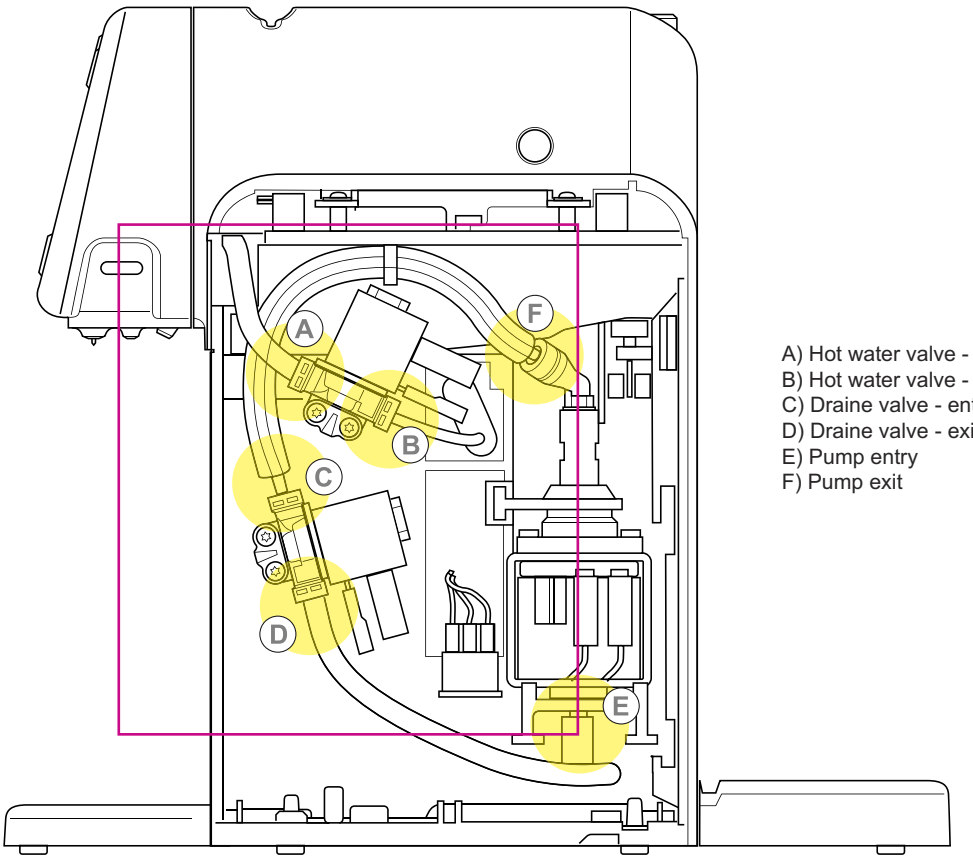
- Pressure below 19 bar after 10 seconds min., water circuit is leaking or pump is defective. Perform the test again. If the result remain the same, proceed with the leakage check (see chapter 8.7) or change the pump if no leakage can be find.

8.7 Leakage check

1. Prepare the machine according to menu 8.6.1.
2. Perform the test according to menu 8.6.2 (till point 6) a.
3. Check all the following parts under pressure for audible and visible leaks:

- Extraction unit
- Thermoblock
- Pump
- Solenoid valves
- Hose connections

Search for leaks as long as the water ciruit is under pressure.
If necessary put water circuit under pressure again untill the inspection is finished.



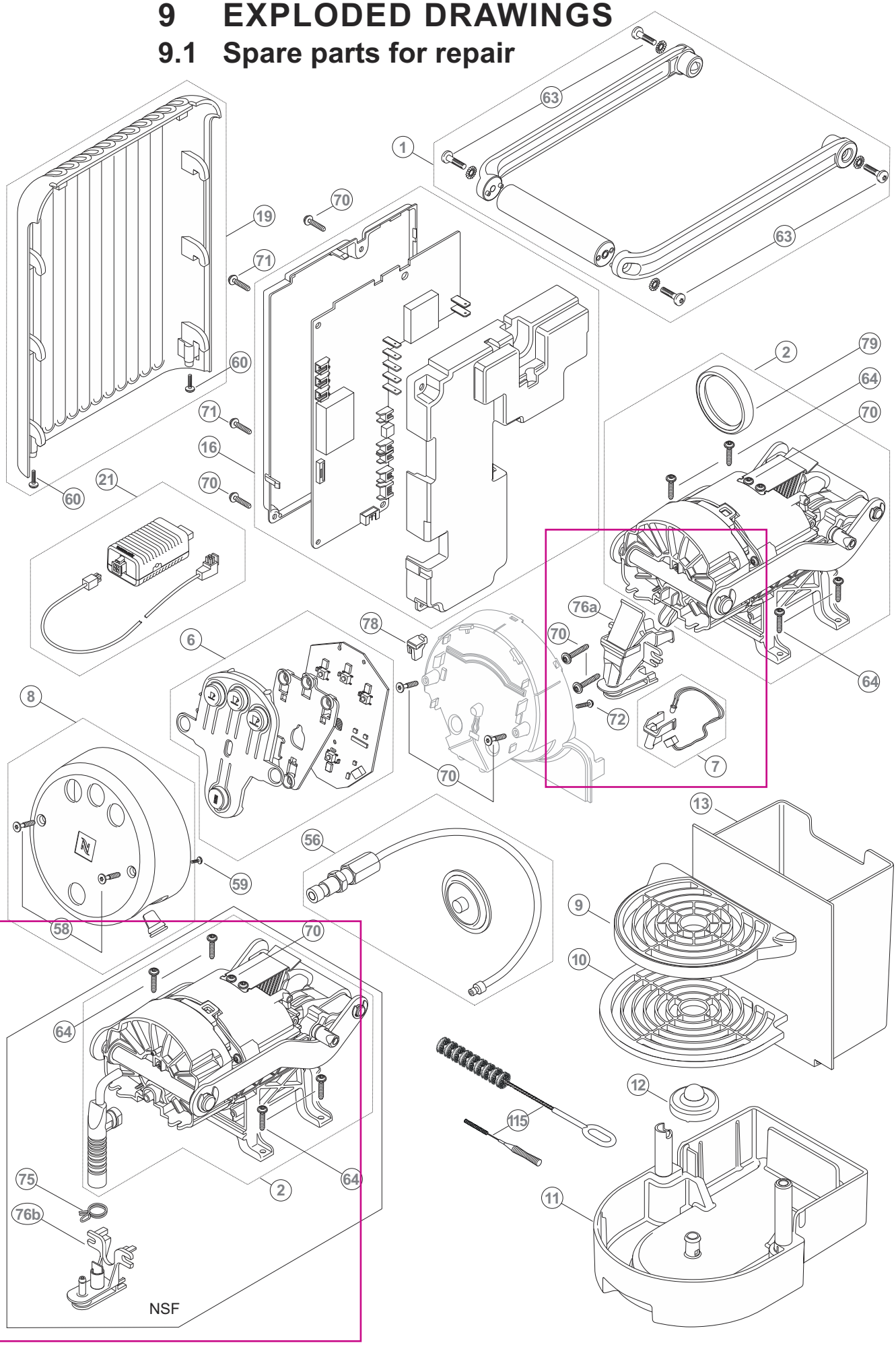
A) Hot water valve - entry
B) Hot water valve - exit
C) Draine valve - entry
D) Draine valve - exit
E) Pump entry
F) Pump exit

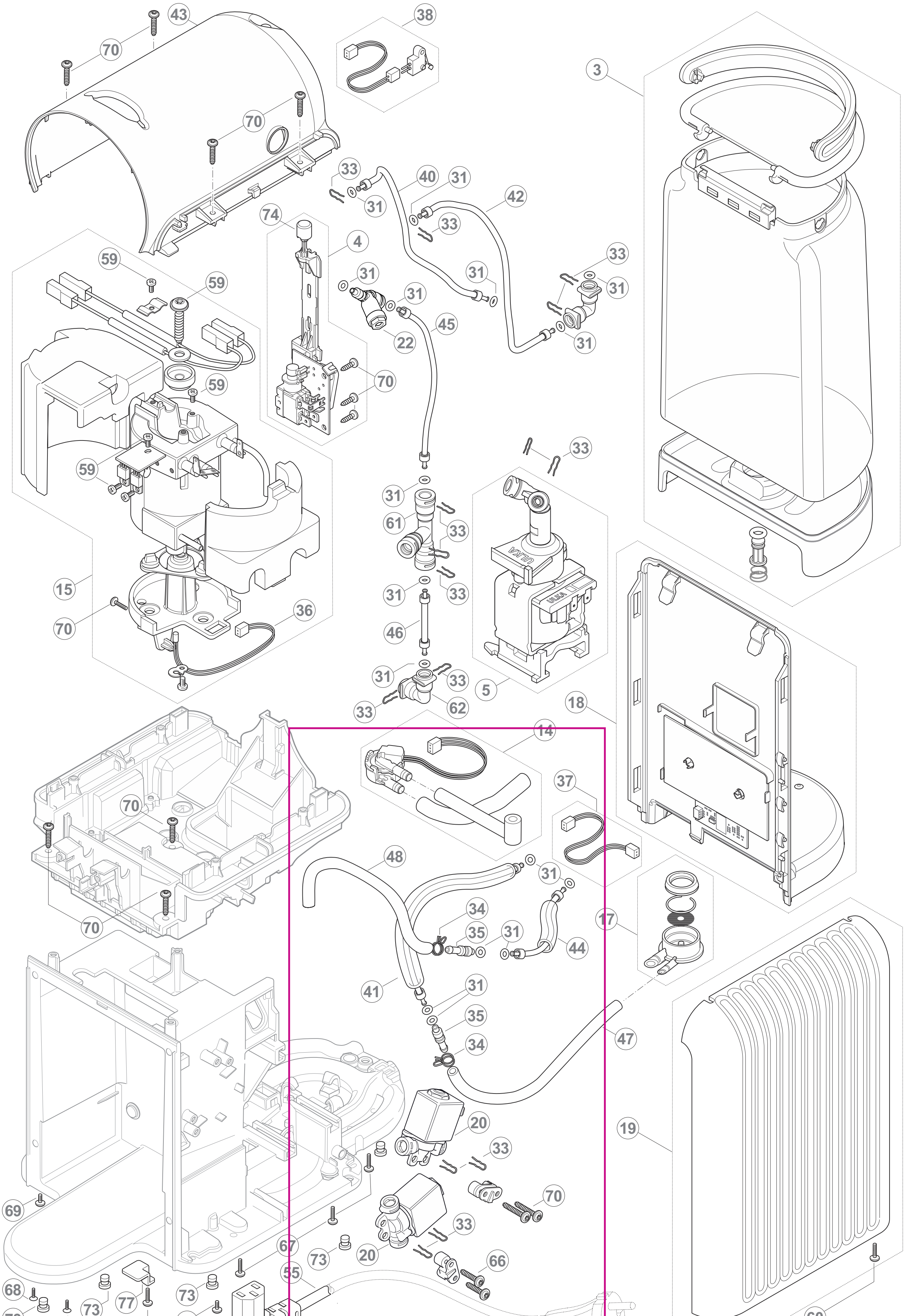
4. Check low pressure hose connections subsequently.
5. Open the valve and let all water flow out of the pressure tester.
6. Switch machine off to exit the mode.
7. Replace leaky components (refer to repairs chapter).

All black o-rings can be replaced by red O-rings with the exception of the O-rings on the electric solenoid valves.
Refer to the instructions in chapter 7.6 for replacing O-rings on the electric solenoid valves.

9 EXPLODED DRAWINGS

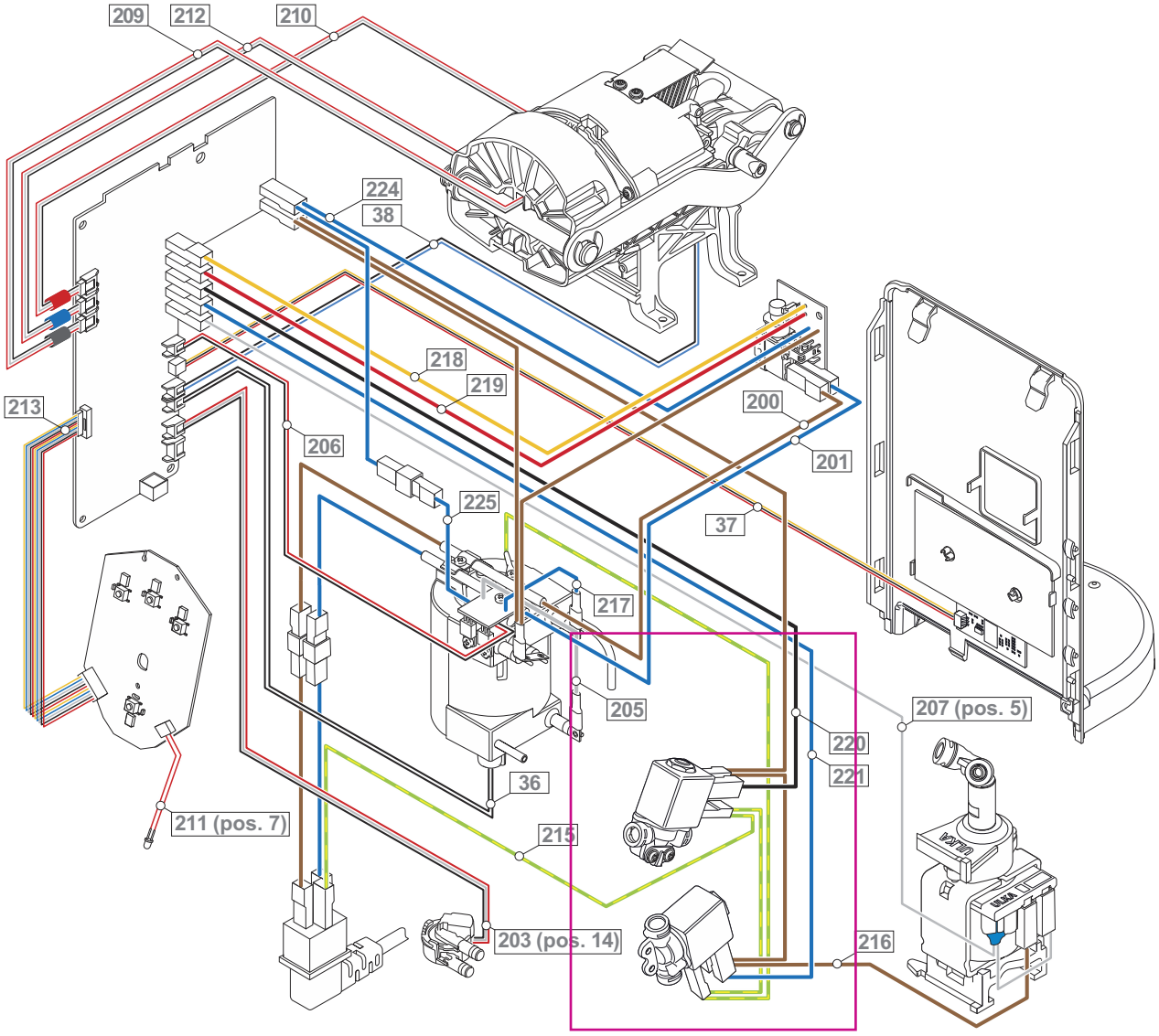
9.1 Spare parts for repair




43
70
38
3
70
33
40
31
42
31
33
74
4
59
59
31
31
33
31
31
22
45
31
59
70
59
33
31
61
33
31
33
15
70
36
46
31
33
5
33
62
18
14
70
37
48
31
34
35
31
44
17
41
31
35
47
34
20
19
33
70
69
33
67
73
20
66
55
68
73
77
73
73
68
67
69
60

9.2 Wiring diagram VDE

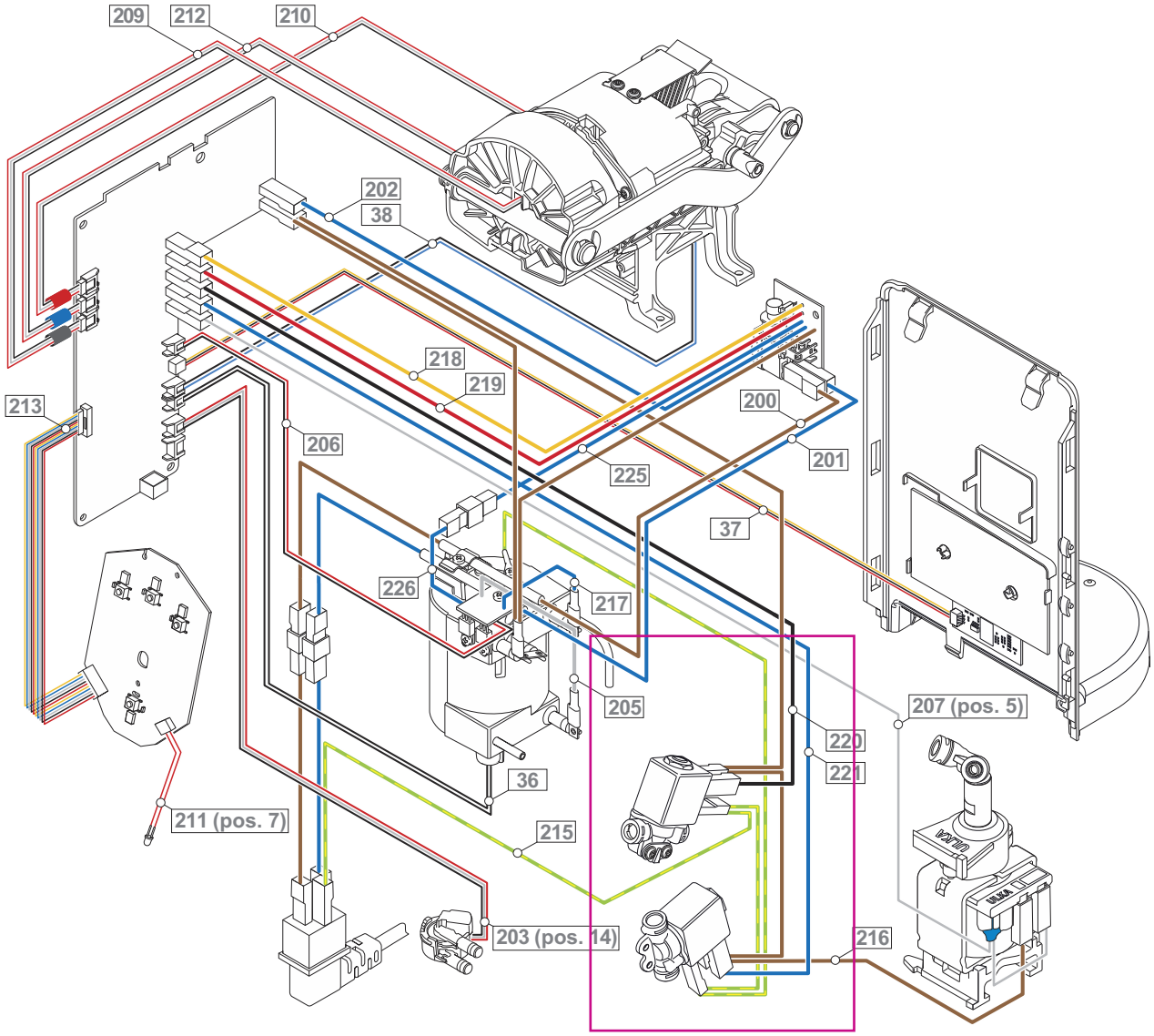
For new BU, no need connect these 3 cables (209, 210, 212)



For Zenius plastic panels version, plastic side panels and plastic front cover are not connected to the ground wire

9.3 Wiring diagram UL/JP

For new BU, no need connect these 3 cables (209, 210, 212)



For Zenius plastic panels version, plastic side panels and plastic front cover are not connected to the ground wire

10 NOTES