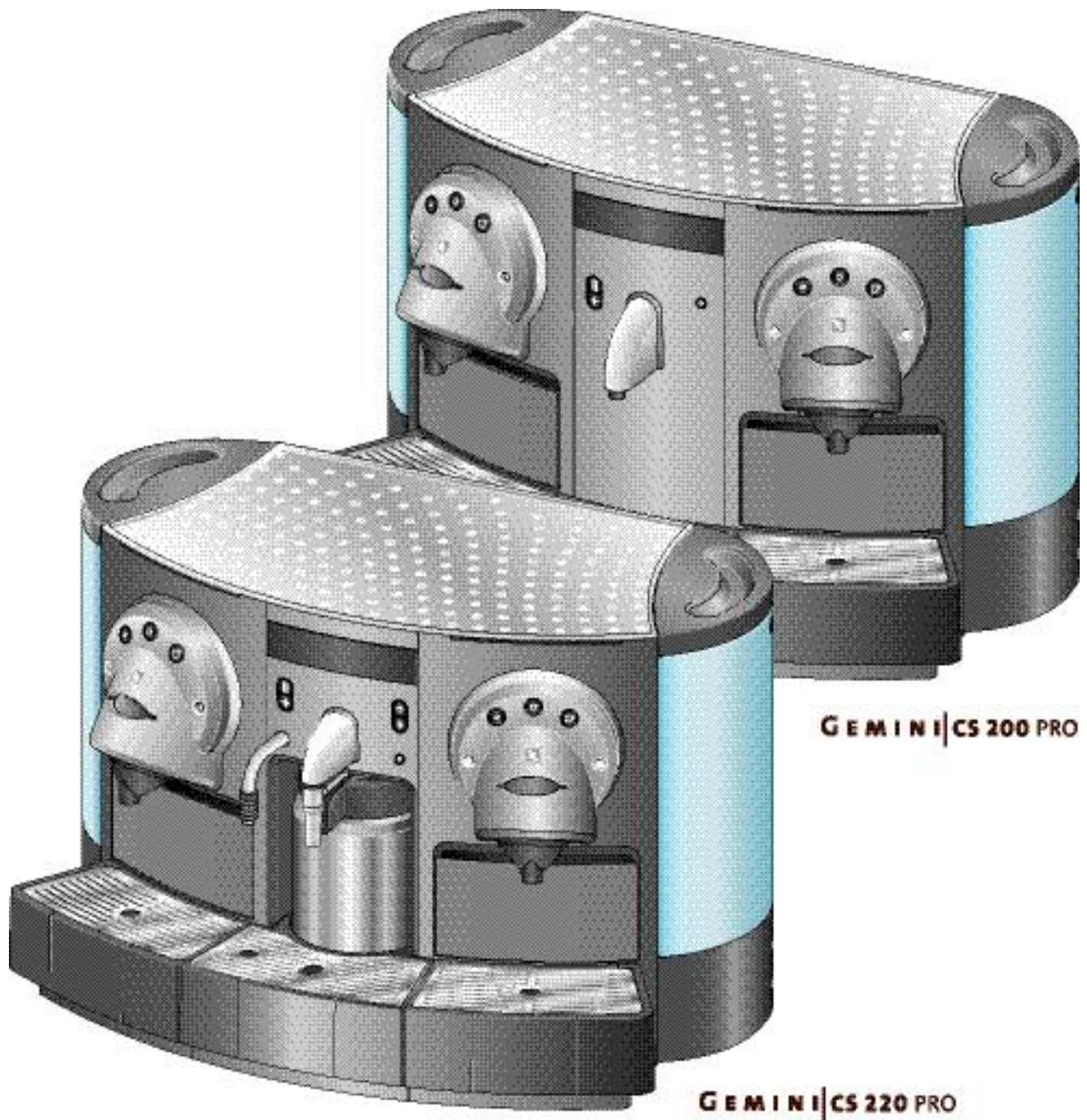


SERVICE MANUAL COFFEE MACHINE



Gemini CS220 PRO
Gemini CS200 PRO

EF 702
EF 705





CONTENTS

1 Main Components	6
1.1 Overview - front side of Gemini CS220	6
1.2 Overview - front side of Gemini CS200	7
1.3 Overview - removable parts	8
1.4 Overview - rear side	9
1.5 Overview - operating elements and display	10
1.6 Interior view	11
1.7 Type plate	13
1.8 Fluid system	14
1.8.1 Fluid system of Gemini CS220	14
1.8.2 Fluid system of Gemini CS200	15
1.9 Technical data	15
2 Operation	17
2.1 General information	17
2.2 Preparation (for test in After Sales Center)	18
2.2.1 Direct water connection	20
2.3 Preparing coffee	23
2.4 Preparing hot water	23
2.5 Preparing cappuccino (CS220)	24
2.6 Coffee machine displays	25
2.6.1 Button colors	25
2.6.2 Display messages	25
3 Programming	27
3.1 Programming the cup volume by push-button	27
3.2 Power user menu	27
3.2.1 Access to power user menu	28
3.2.2 Power user menu selection	29
3.2.3 Power user menu points	30
3.3 After sales menu	31
3.3.1 Access to after sales menu	31
3.3.2 After sales menu selection	32
3.3.3 After sales menu points	32
3.4 Service Stick	37
3.4.1 Service Stick menu	37
3.4.2 Customer settings (Client PC Software)	38
4 Maintenance	39
4.1 Clean milk container	39
4.1.1 Reset a locked cappuccinatore unit	40
4.2 Daily maintenance and cleaning	41
4.3 Change filter elements (optional)	42
4.3.1 Filter cartridge exchange time	43
4.3.2 Filter cartridge exchange procedure	43



4.4	Descaling	45
4.4.1	Accessory	46
4.4.2	Safety instructions	46
4.4.3	Preparation	47
4.4.4	Descaling and rinsing procedure for CS220	48
4.4.5	Descaling and rinsing procedure for CS200	54
4.5	Extraction unit maintenance	59
4.5.1	Security check	59
4.5.2	Wearing parts	60
4.5.3	Lubrication of extraction unit.....	61
5	Troubleshooting	63
5.1	Check list	63
5.2	Diagnostic with Service Stick	64
5.2.1	Function test menu	64
5.2.2	Statistic data	65
5.3	Error messages	66
5.3.1	Descaling needed - call service center	66
5.3.2	Capsule not ejected - call service center	67
5.3.3	Machine blocked - call service center	68
5.4	Drip tray display messages	69
5.5	Coffee capsule falls through	69
5.6	Only hot water during coffee preparation	70
5.7	No or too less steam for milk preparation	70
5.8	Noisy extraction unit	70
5.9	Direct water connection problems.....	71
6	Repairs	73
6.1	Safety instructions	73
6.1.1	Security check	73
6.2	General	74
6.2.1	Repair and mounting tips.....	74
6.2.2	Tools and accessories	75
6.2.3	Overview of plug-in modules	76
6.3	General disassembly	77
6.3.1	Opening the casing.....	77
6.4	Coffee pump / flow meter module	79
6.4.1	Removing coffee pump / flow meter module	79
6.4.2	Replacing coffee pump	80
6.4.3	Replacing thermostat of coffee pump	81
6.4.4	Replacing flow meter	82
6.4.5	Replacing left / right contact bank	83
6.5	Extraction unit	84
6.5.1	Replacing worn parts	84
6.5.2	Replacing extraction unit	86
6.5.3	Replacing motor and spindle of extraction unit.....	87
6.5.4	Replacing safety lid with micro switch	88
6.6	Hot water / steam module (CS220 only)	90
6.6.1	Removing display with logic modul.....	90



6.6.2	Removing hot water / steam module	91
6.6.3	Replacing steam thermoblock of hot water / steam module	92
6.6.4	Replacing pump of hot water / steam module.....	93
6.6.5	Replacing cappuccino keyboard of hot water / steam module.....	94
6.6.6	Replacing cappuccino module of hot water / steam module.....	95
6.6.7	Replacing solenoid valves of hot water / steam module	96
6.6.8	Replacing steam outlet of hot water / steam module	97
6.6.9	Replacing micro switch for milk container detection	98
6.6.10	Replacing micro switch for middle drip tray detection.....	99
6.7	Hot water module (CS200 only).....	100
6.7.1	Removing display with logic module	100
6.7.2	Removing hot water module	101
6.7.3	Replacing hot water keyboard	102
6.7.4	Replacing hot water outlet	103
6.7.5	Replacing middle contact bank	104
6.8	Basic coffee machine - non-modular parts.....	105
6.8.1	Replacing coffee thermoblocks	105
6.8.2	Replacing solenoid valves	109
6.8.3	Replacing display, pcbs and transformer	112
6.8.4	Replacing keyboards	116
6.8.5	Replacing detection sensors.....	118
6.8.6	Replacing micro switches	121
6.8.7	Replacing illumination components	123
6.9	Wiring diagrams	124
6.9.1	Wiring diagrams of CS220 coffee machine (EF 702).....	124
6.9.2	Wiring diagrams of CS200 coffee machine (EF 705).....	128
7	Function tests	132
7.1	Safety instructions.....	132
7.2	Required equipment.....	133
7.3	Security check of safety lids.....	134
7.4	Measure coffee temperature	135
7.5	Measure flow rate of coffee units	137
7.5.1	Preparation	137
7.5.2	Test run.....	139
7.6	Pressure and leakage checks for coffee units	140
7.6.1	Preparation	140
7.6.2	Test run.....	140
7.7	Performance checks for cappuccinatore unit (CS220 only).....	143
8	Exploded drawings	146
8.1	Exploded drawings of CS220 coffee machine (EF 702)	146
8.2	Exploded drawings of CS200 coffee machine (EF 705)	158
9	Notes	169



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 EF 702 and EF 705.

This Service Manual is based on the Gemini CS220 (EF 702) coffee machine mainly. Differences compared to the Gemini CS200 (EF 705) coffee machine are mentioned and illustrated if necessary.

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.

For fast access to information directly from the PC or MAC monitor, this manual is also available on CD-ROM. The required utility (Adobe Reader®), also on this CD-ROM, runs on PC and MAC computers.

This service manual is available as PDF-file. The required utility software to read PDF files (Adobe Reader®) for PCs and MAC computers

- is included on the Gemini Service CD-ROM,
- can be downloaded (under <http://www.adobe.com>) for free - please click the logo:

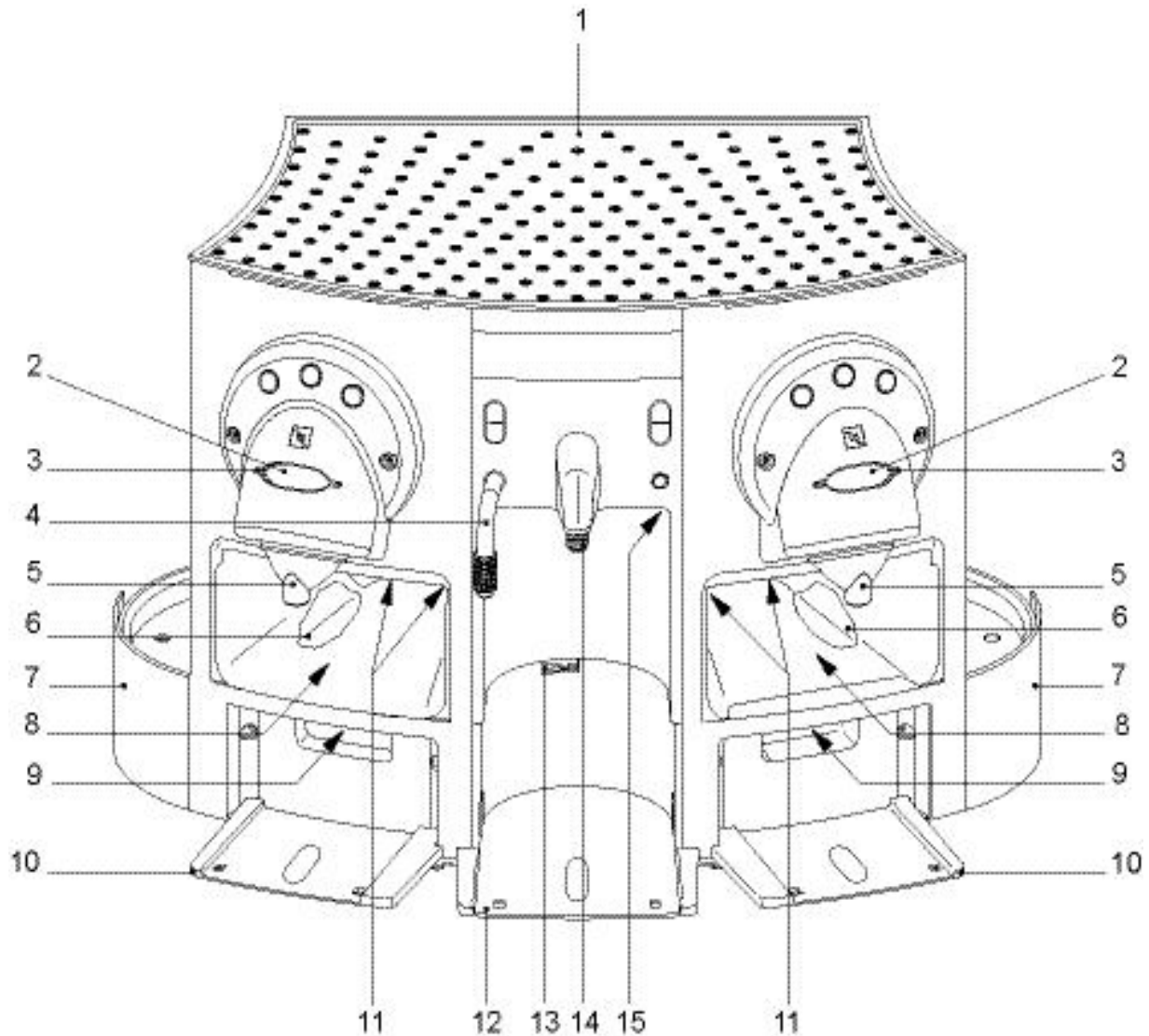


i Please keep this manual together with the corresponding service documentation. This way you are assured to have the necessary information.



1 MAIN COMPONENTS

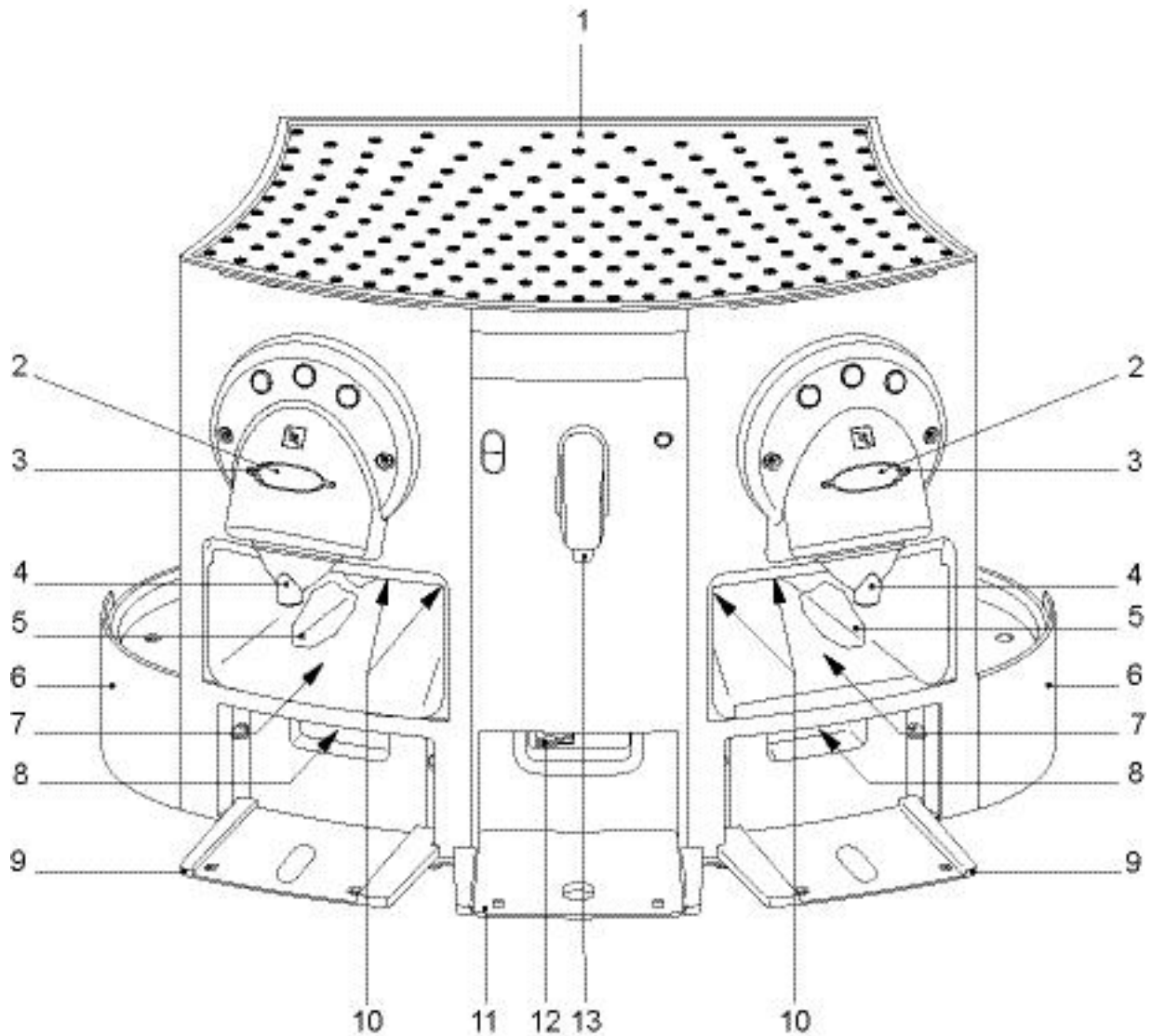
1.1 Overview - front side of Gemini CS220



- | | |
|--|--|
| 1) Heating plate | 9) Drip tray contacts (left, right) |
| 2) Safety lid (left, right) | 10) Drip tray support (left, right) |
| 3) Capsule slot (left, right) | 11) Micro switches for capsule container detection (left, right) |
| 4) Hot water tube | 12) Support for drip tray with thermos |
| 5) Coffee outlet (left, right) | 13) Micro switch for drip tray detection |
| 6) Cover for capsule ejection hole (left, right) | 14) Steam nozzle |
| 7) Water tank support (left, right) | 15) Cam switch for milk tank detection |
| 8) Opening for capsule container (left, right) | |



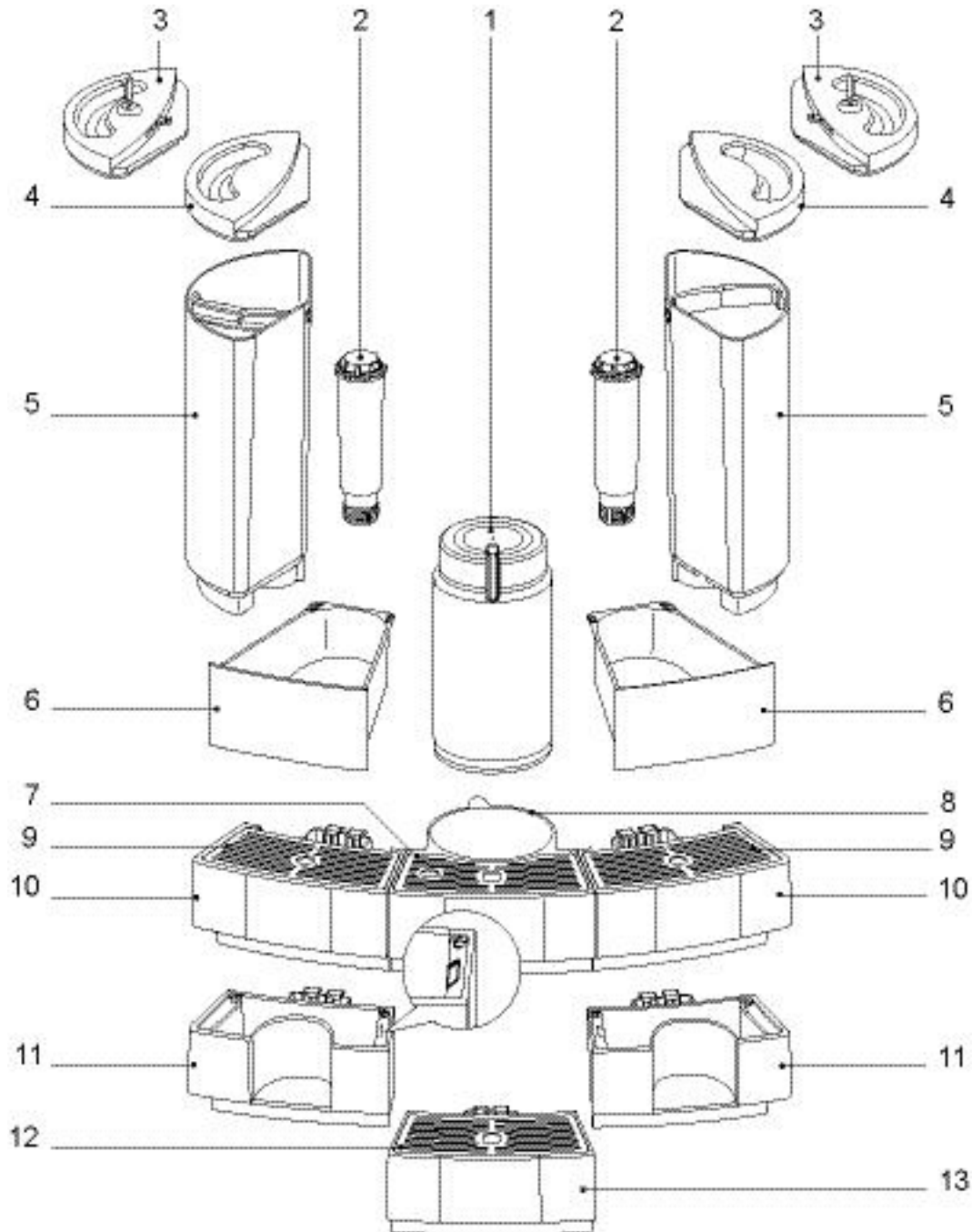
1.2 Overview - front side of Gemini CS200



- | | |
|--|--|
| 1) Heating plate | 8) Drip tray contacts (left, right) |
| 2) Safety lid (left, right) | 9) Drip tray support (left, right) |
| 3) Capsule slot (left, right) | 10) Micro switches for capsule container detection (left, right) |
| 4) Coffee outlet (left, right) | 11) Support for middle drip tray |
| 5) Cover for capsule ejection hole (left, right) | 12) Micro switch for drip tray detection |
| 6) Water tank support (left, right) | 13) Hot water tube |
| 7) Opening for capsule container (left, right) | |



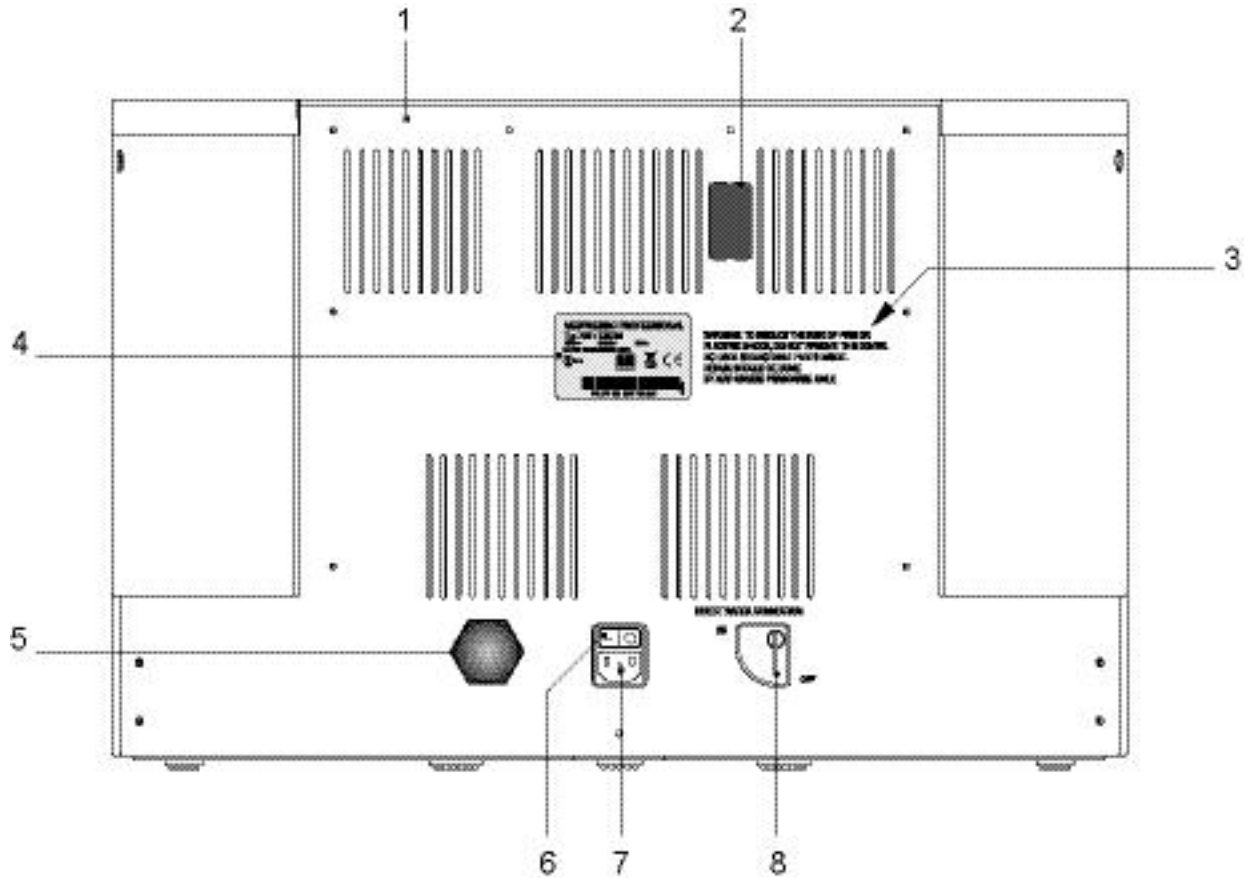
1.3 Overview - removable parts



- | | |
|---|--|
| 1) Milk container (thermos, 2 pcs.) | 6) Capsule container (left, right) |
| 2) Water filter (optional, left, right) | 7) Drip grid (middle, CS220) |
| 3) Water tank cover with lock (left, right),
necessary for direct water connection | 8) Drip tray with thermos support (middle, CS220) |
| 4) Water tank cover (left, right) | 9) Drip grid (left, right) |
| 5) Water tank (left, right) with
- carrying handle (hinged)
- magnetic floater level control
- water valve | 10) Drip tray with water level detection (left, right) |
| | 11) Drip tray with water level detection (left, right,
necessary for direct water connection) |
| | 12) Drip grid (middle, CS200) |
| | 13) Drip tray (middle, CS200) |



1.4 Overview - rear side

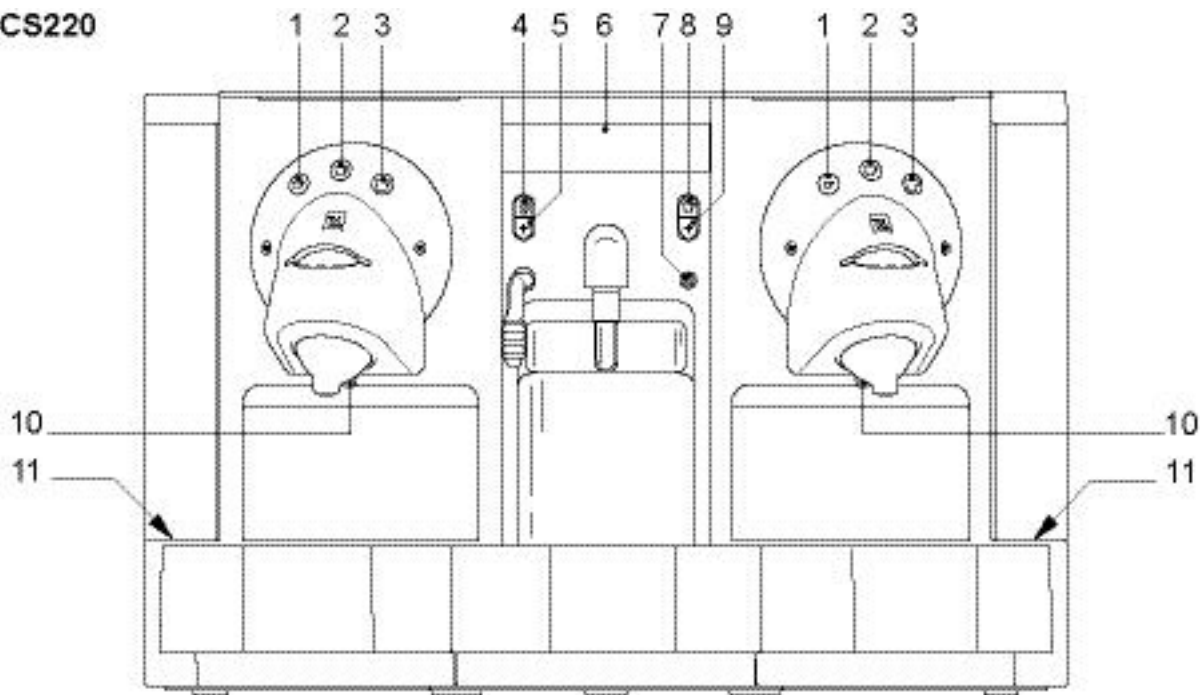


- | | |
|------------------------------------|--|
| 1) Back wall | 5) Direct water connection |
| 2) Service Stick connector (cover) | 6) Mains switch |
| 3) Safety instruction text | 7) Mains connection |
| 4) Type plate | 8) Water tank connection valve (direct water ON/OFF) |

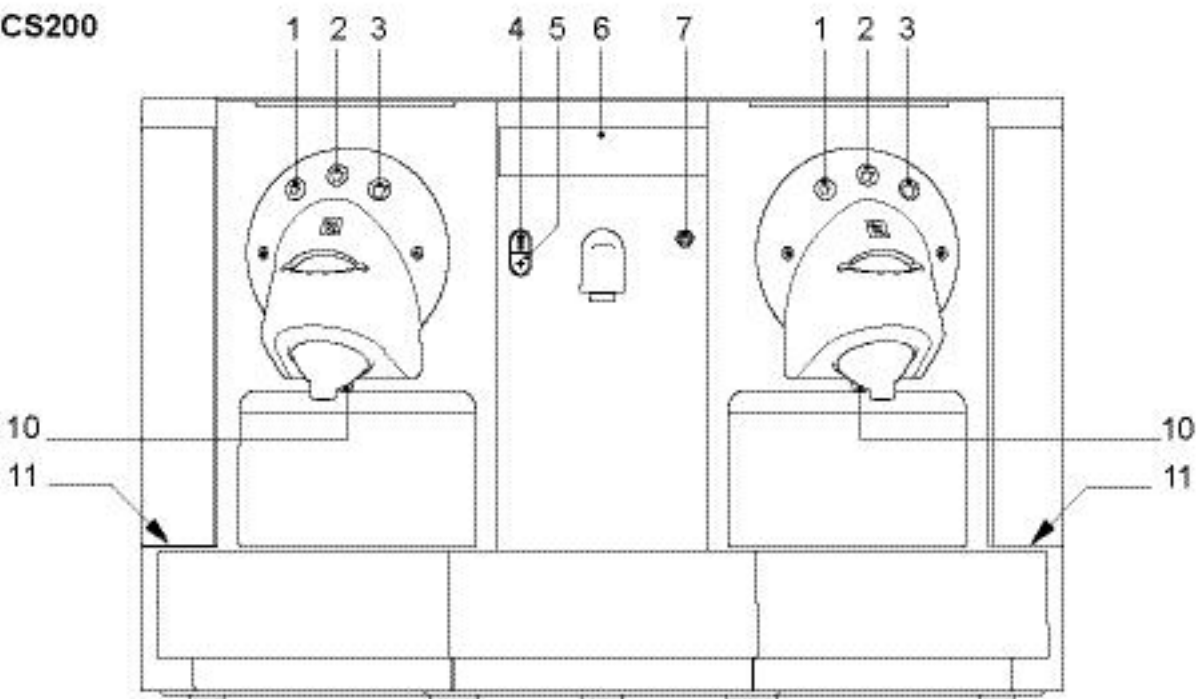


1.5 Overview - operating elements and display

CS220



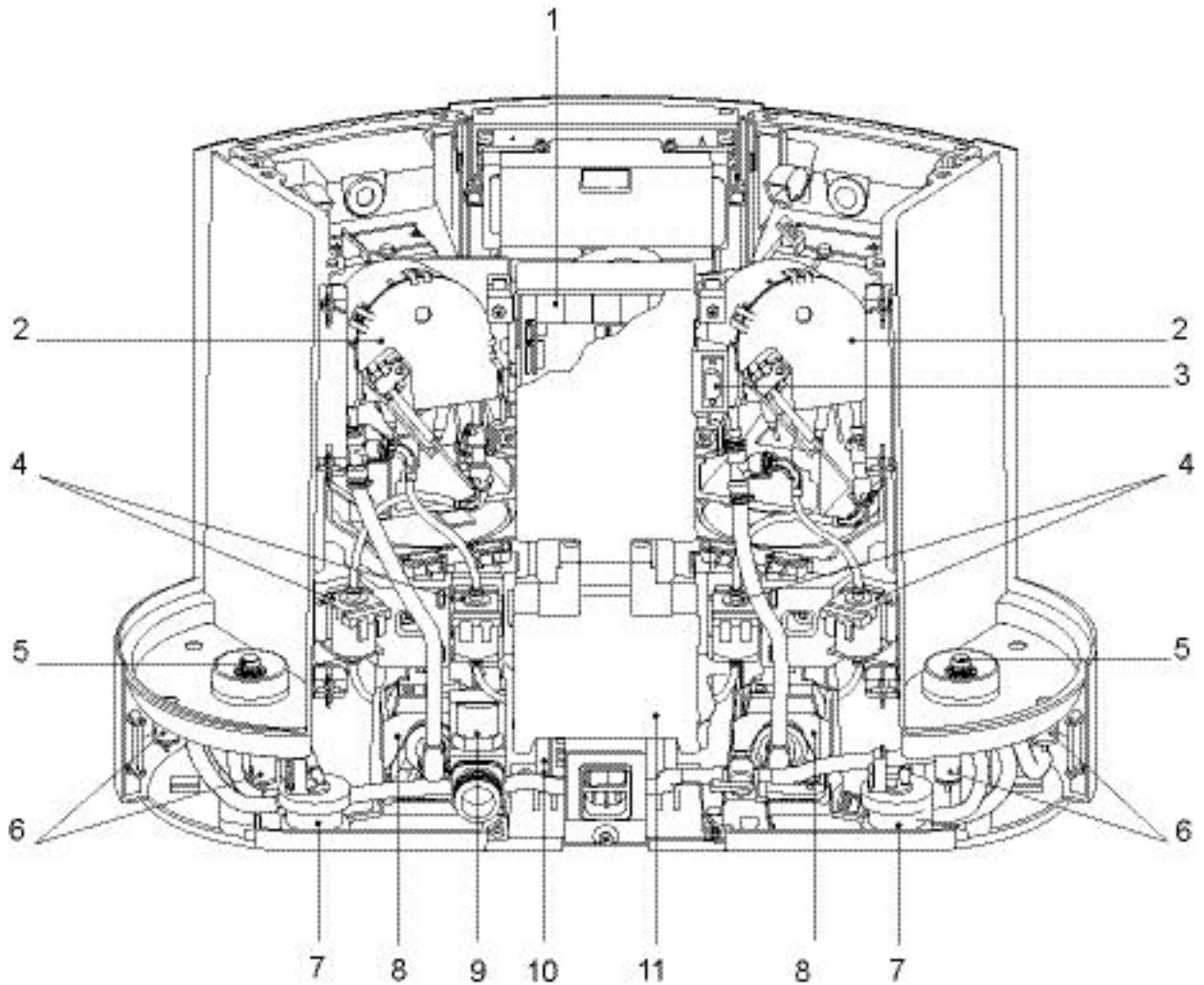
CS200



- | | |
|---|--|
| 1) Coffee button "small cup" (left, right, back lighted) | 6) Passive display (LCD, back lighted) |
| 2) Coffee button "medium cup" (left, right, back lighted) | 7) Stand-by button (back lighted) |
| 3) Coffee button "large cup" (left, right, back lighted) | 8) Portion button for hot milk (CS220, back lighted) |
| 4) Portion button for hot water (back lighted) | 9) Fill up button for hot milk (CS220, back lighted) |
| 5) Fill up button for hot water (back lighted) | 10) Cup illumination (left, right, white / yellow) |
| | 11) Water tank illumination (left, right, white) |



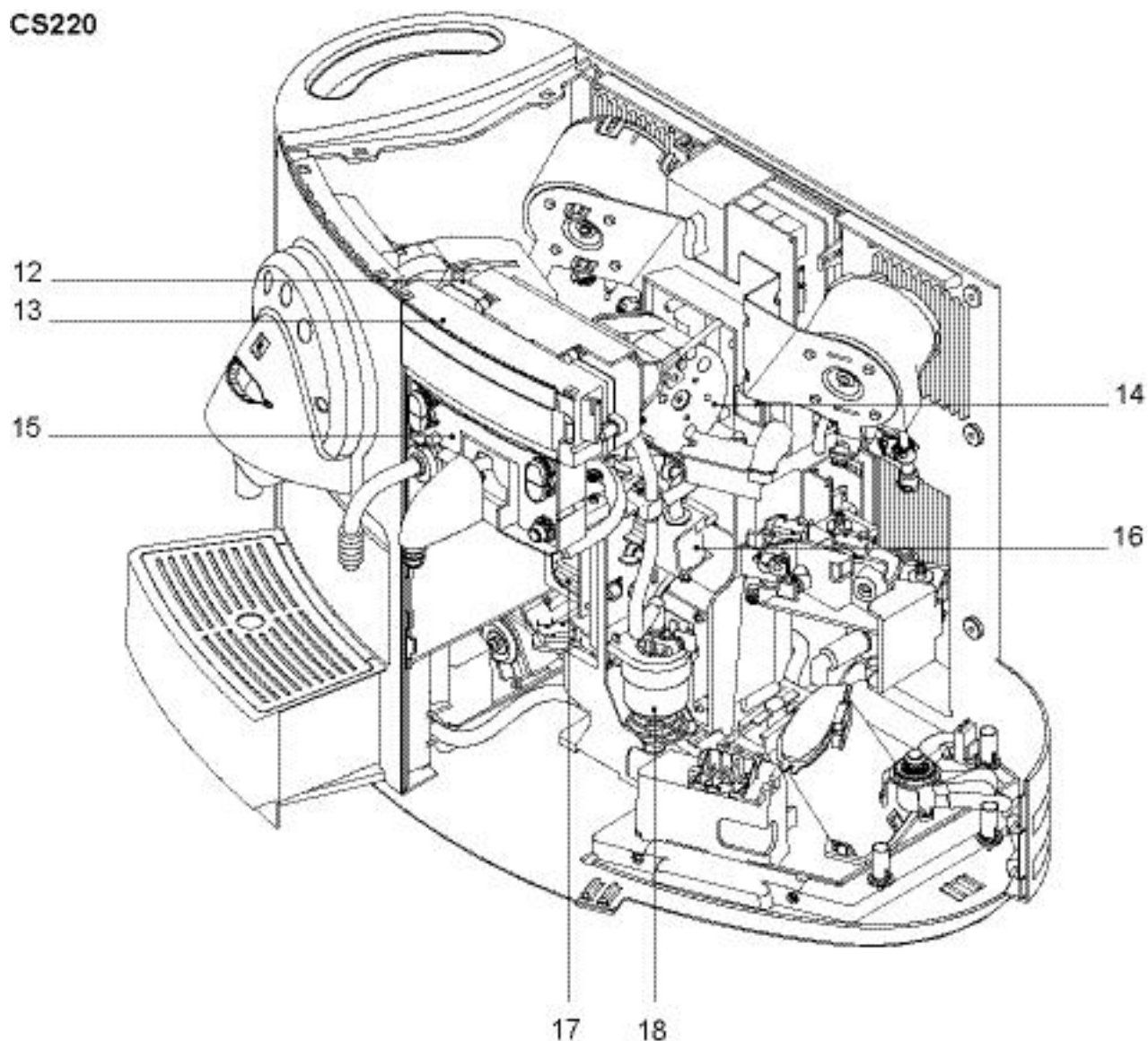
1.6 Interior view



- | | |
|------------------------------|---|
| 1) Main module pcb | 7) Flow meter |
| 2) Thermoblock TB 2003 | 8) Pump CP4-SP C2 |
| 3) Service Stick connector | 9) Solenoid valve (direct water connection) |
| 4) Solenoid valve (bistable) | 10) Transformer |
| 5) Valve lifter | 11) Power module pcb |
| 6) Water tank lighting | |



CS220



- 12) Logic module pcb
- 13) Display module
- 14) Thermoblock TB 2003
- 15) Keyboard module

- 16) Solenoid valve (bistable)
- 17) Cappuccino module pcb (CS220)
- 18) Pump MPP1

 Refer to "Exploded drawings" on page 146 to locate other components not visible in this illustration.



1.7 Type plate

The type plate

- can be found at the backside of the coffee machine,
- carries the following information:

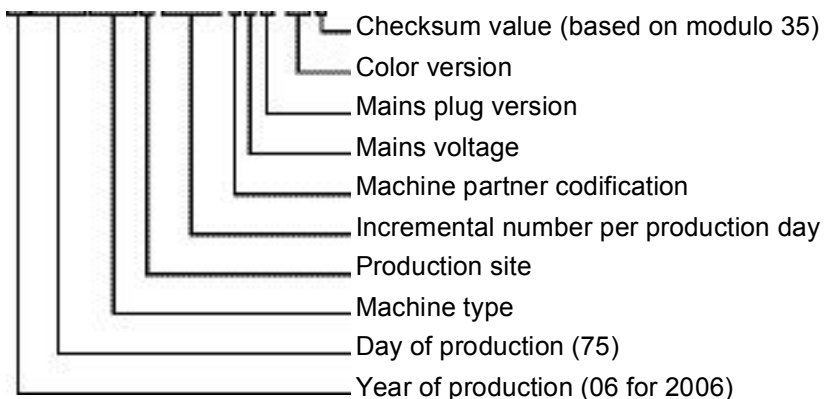


- 1) Brand name
- 2) Machine type
- 3) Rated voltage and power consumption
- 4) Origin
- 5) National approval seal
- 6) RoHS compliance sign (Restriction of the use of certain Hazardous Substances)
- 7) Bar code
- 8) Serial number
- 9) Non-waste disposal symbol
- 10) Mark of conformity
- 11) Article number of the type plate

Serial number codification

Example:

06 075 702 1 0365 78A 0U h





1.8 Fluid system

Coffee preparation

Each coffee outlet has its own circuit. Both coffee outlets can work simultaneously.

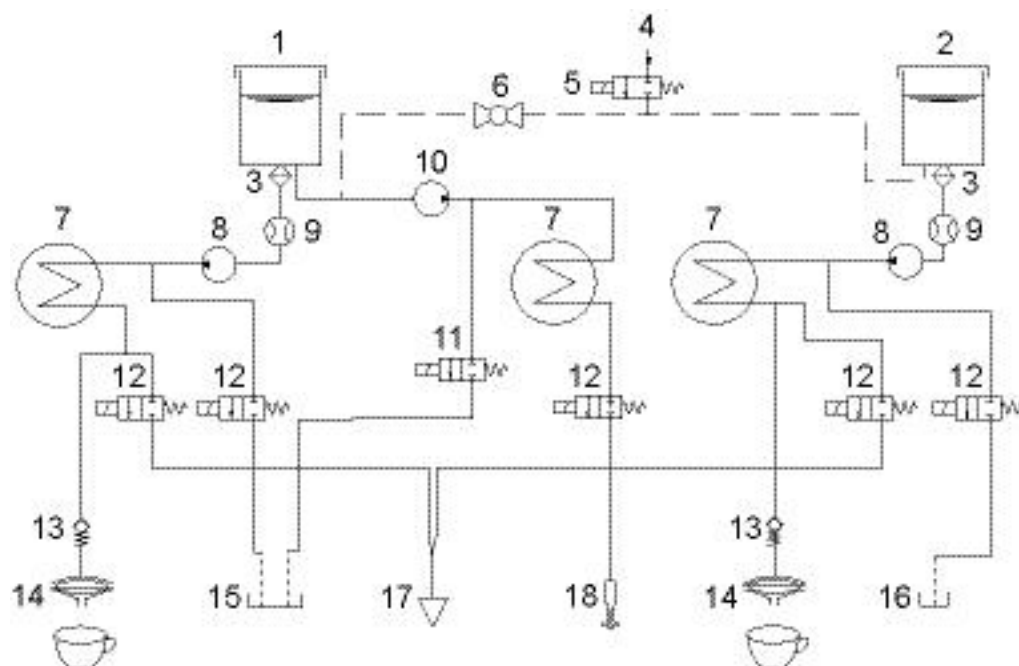
Hot water preparation

Both pumps (8) and thermoblocks (7) work simultaneously if there is no coffee preparation at the same time. Both water tanks (1 and 2) are emptied equally.

Steam preparation (CS220)

The steam outlet (18) has its own circuit which is supplied from the left water tank (1) only.

1.8.1 Fluid system of Gemini CS220

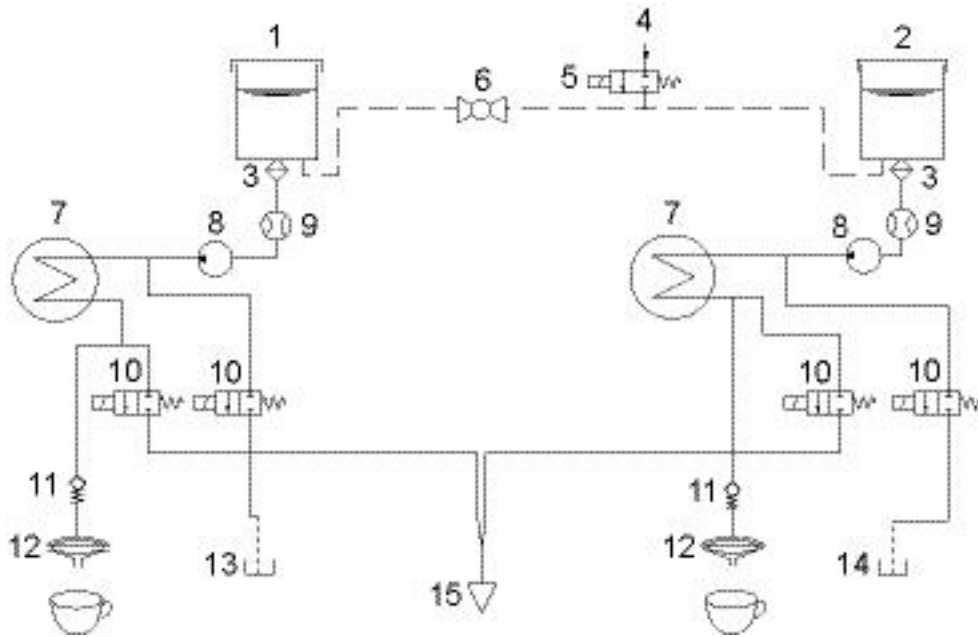


- | | |
|--|---|
| 1) Water tank 1 | 10) Pump MPP1 |
| 2) Water tank 2 | 11) Bistable solenoid valve (reversed assembled)* |
| 3) Water tank connector | 12) Bistable solenoid valve (5x) |
| 4) Direct water connection | 13) Counterpressure valve (2x) |
| 5) Solenoid stop valve 2/2 way | 14) Brewing chamber (2x) |
| 6) Water tank connection valve (direct water ON/OFF) | 15) Drip tray, left |
| 7) Thermoblock TB 2003 (3x) | 16) Drip tray, right |
| 8) Pump CP4-SP C2 (2x) | 17) Hot water tube |
| 9) Flow meter (2x) | 18) Steam nozzle |

* Point 11: Bistable solenoid valves have a built-in overpressure protection: The closed valve opens if the pressure exceeds approx. 12 bar.



1.8.2 Fluid system of Gemini CS200



- | | |
|--|----------------------------------|
| 1) Water tank 1 | 8) Pump CP4-SP C2 (2x) |
| 2) Water tank 2 | 9) Flow meter (2x) |
| 3) Water tank connector | 10) Bistable solenoid valve (4x) |
| 4) Direct water connection | 11) Counterpressure valve (2x) |
| 5) Solenoid stop valve 2/2 way | 12) Brewing chamber (2x) |
| 6) Water tank connection valve (direct water ON/OFF) | 13) Drip tray, left |
| 7) Thermoblock TB 2003 (2x) | 14) Drip tray, right |
| | 15) Hot water tube |

1.9 Technical data

Mains voltage versions 220-240 V, 50/60 Hz,
2100 - 2300 W

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

Power ratings - CS220
(for all voltages and frequencies)

3 thermoblocks each 1'080 W
2 pumps CP4 SP each 60 W
1 pump MPP1 28 W
Total power consumption max. 2410 W

Power ratings - CS200
(for all voltages and frequencies)

2 thermoblocks each 1'080 W
2 pumps CP4 SP each 60 W
Total power consumption max. 2410 W



Consumption data - CS220

Preheating time approx.....	67 s
Heating up.....	24.5 Wh
1 medium coffee cup (40 ml*)	4 Wh
2 medium coffee cups (2 x 40 ml* simultaneously)	6 Wh
1 large coffee cup (110 ml*)	11 Wh
2 large coffee cups (2 x 110 ml* simultaneously)	20.5 Wh
Hot water (125 ml*)	8 Wh
Foam milk (100ml*)	13.5 Wh
Standby ON (1 h)	51 Wh
Standby OFF (1 h)	5 Wh

* Default settings

Consumption data - CS200

Preheating time approx.....	49 s
Heating up.....	22 Wh
1 medium coffee cup (40 ml*)	3 Wh
2 medium coffee cups (2 x 40 ml* simultaneously)	6.5 Wh
1 large coffee cup (110 ml*)	12.5 Wh
2 large coffee cups (2 x 110 ml* simultaneously)	23 Wh
Hot water (125 ml*)	8 Wh
Standby ON (1 h)	28 Wh
Standby OFF (1 h)	5.5 Wh

* Default settings

Pumps CP4 SP (2 pcs.)

Pump pressure	
- max. permissible	17,5 bar ±1,5 bar
- during coffee preparation (depending on the type of coffee)	9 - 16 bar
Flow performance	120 - 240 ml/min. at 12 bar

Pump MPP1 (CS220 only)

Pump pressure	
- max. permissible	4 - 5 bar
- during steam preparation	2 bar
Flow performance	35 - 50 ml/min. at 2 bar

D.C. Motors (2 pcs.) for extraction units

Voltage.....	16 VDC
--------------	--------

Bistable solenoid valves

Voltage.....	240 V / 50 Hz
Overpressure release approx.	12 bar

Capacities

2 water tanks	each 3 l
Milk thermos (CS220 only).....	1 l
3 drip trays	each 600 ml
2 capsule containers	each 30 pcs. min.

Various data

Steam thermoblock (CS220 only).....	216° C
Coffee / hot water thermoblock.....	167° C
Coffee temperature at outlet	86° C ± 3° C
Hot water temperature at outlet	≥ 78° C
Steam temperature at thermoblock (CS220 only).....	140° C
Dimensions (width x depth x height).....	56 x 39.2 x 37 cm
Cable length approx.....	2 m (USA) 1.83 m
Weight of coffee machine (without water)	
CS220 approx.	18 kg
CS200 approx.	15 kg




2 OPERATION

2.1 General information

For an overview of the operational controls see "Overview - operating elements and display" on page 10.

Preset filling amounts

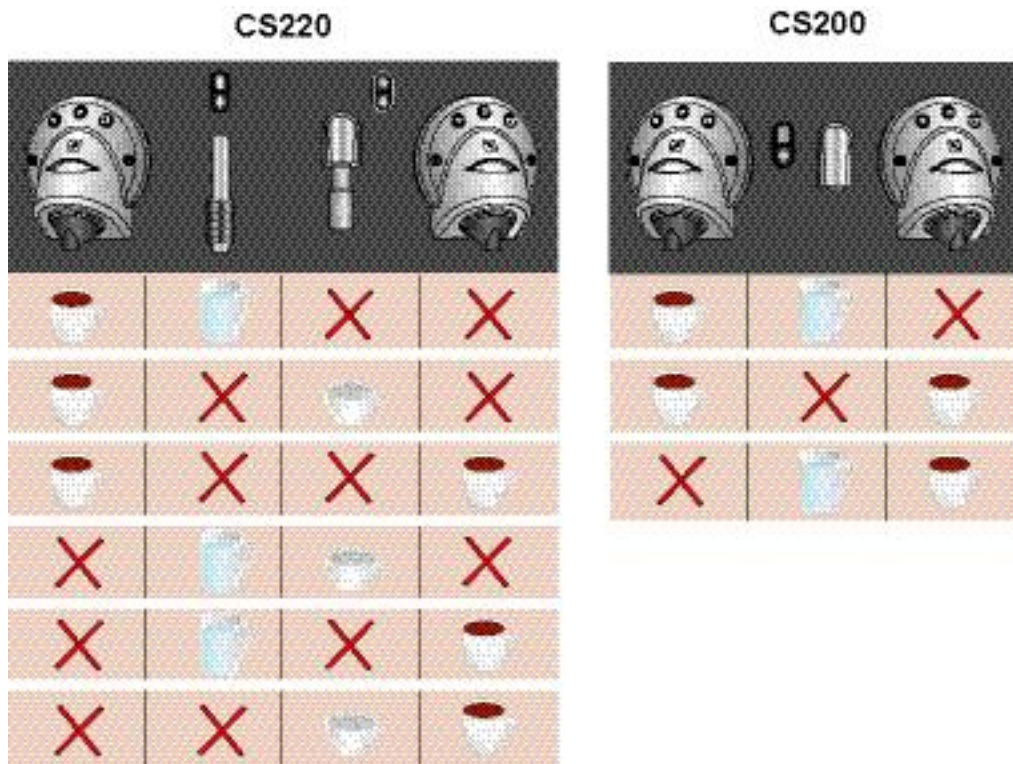
 Coffee-, portion- and fill up buttons have preset filling amounts that can be modified (see "Programming the cup volume by push-button" on page 27).

The operation of these buttons is time controlled:

- Pressing a button for a maximum up to 1 sec releases the preset filling amount.
- Pressing a button longer than 5 sec changes the presetting (depending on the power user menu setting).

Multiple procurements

The coffee machine can perform two servings at the same time:

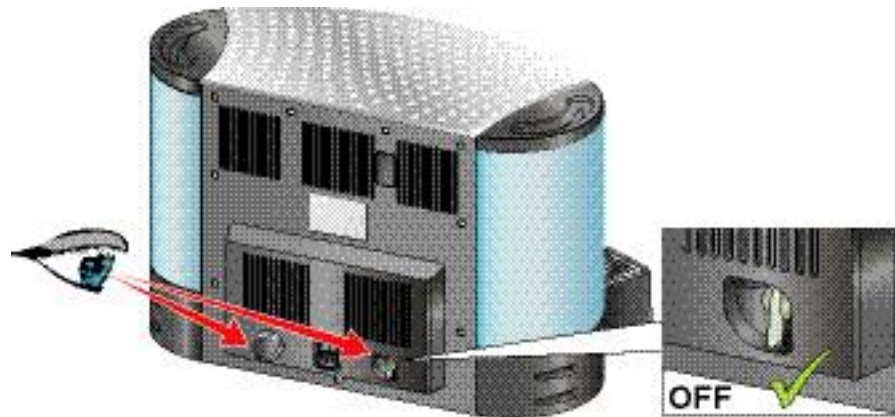


An error message appears if three servings are ordered at the same time.

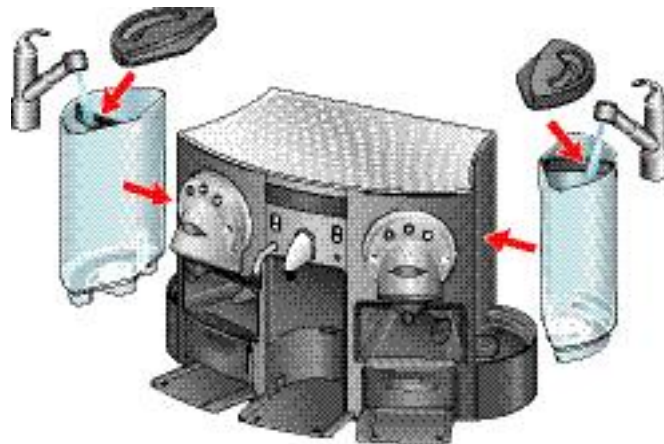



2.2 Preparation (for test in After Sales Center)

For a function control and some function tests (see "Function tests" on page 132) it is necessary to make the coffee machine ready for operation.



1. Check if cover is mounted on direct water connection and water tank connection valve is turned off.

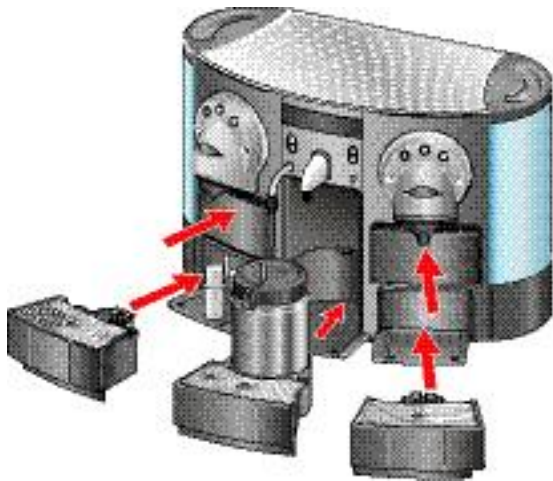


2. Fill both water tanks with fresh water.
 **A minimum water quantity is required to lift the magnetic float in the water tanks. Otherwise the display message "Fill water" will appear.**

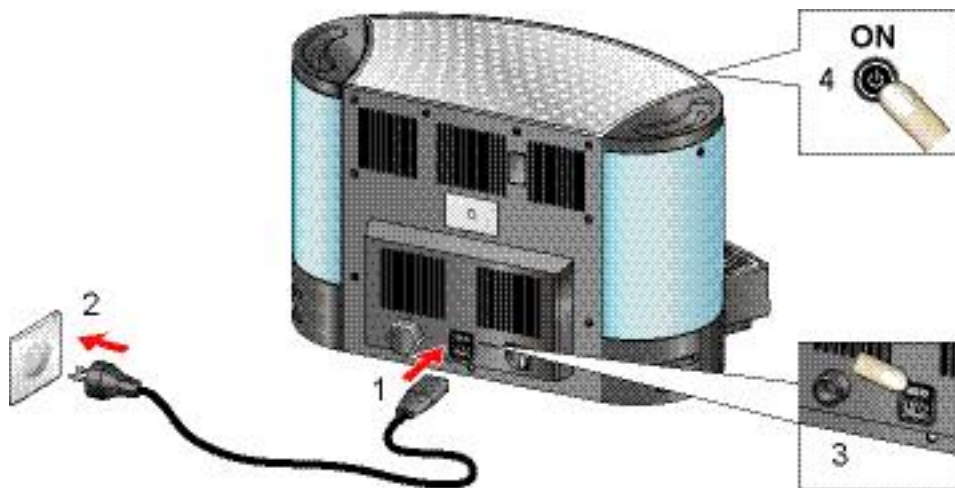


3. For testing the cappuccinatore unit (CS220)
 - fill a milk container with enough cold milk,
 - insert a straw with disposable foam device in milk container.

i For connection to the water supply refer to "Direct water connection" on page 20.



4. Insert milk container with drip tray in machine (CS220). Check correct fit of all drip trays and capsule containers at the same time.



5. Connect coffee machine to mains (1, 2) and switch on mains switch (3).
6. Press stand-by button (4) and wait (50 - 70 sec.) till coffee machine is heated up and push-button illumination turns to white.

☛ An automatic rinsing of the coffee outlets is performed.



7. Press fill up button for approx. 20 sec to clean steam outlet (CS220).
8. Place disposable foam device on steam outlet afterwards (CS220).

⚠ Danger of burns!
Hot steam and splashes of water.
Be distant from steam outlet of CS220.



2.2.1 Direct water connection

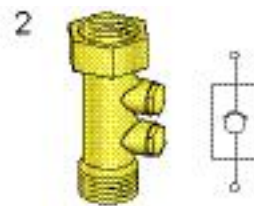
The coffee machine is equipped with a direct water connection at the back wall to allow the automatic filling of the water tanks.

For testing the direct water connection, the water supply has to meet the following requirements:

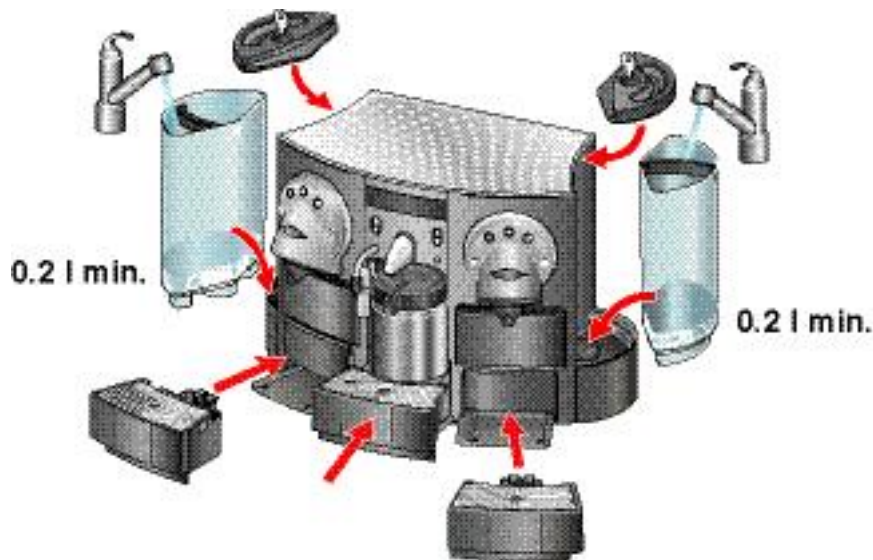
Max. water pressure	10 bar
Min. water pressure	0.8 bar
Water temperature	max. 25 °C
Water quality	clean, potable water (use water filter)

Minimal required installation material:

i Refer to separate manual "Installation guide for direct water connection" for additional installation material and special equipment for coffee machine.



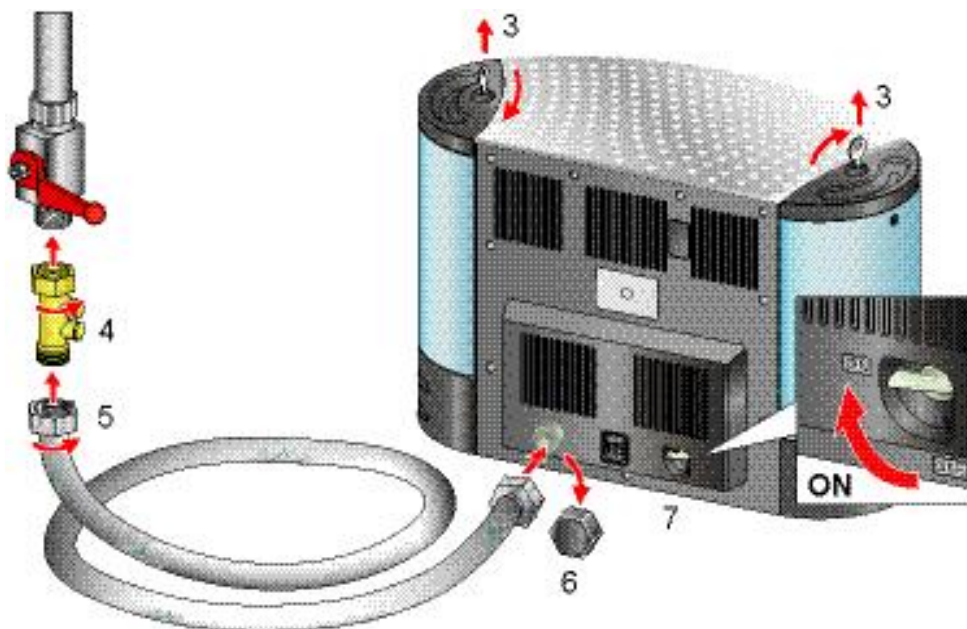
- 1) Stop valve on the water supply (symbolic illustration)
- 2) No-return valve (symbolic illustration), legal rule to avoid a water backflow into the water supply
- 3) High-pressure reinforced hose with suitable connections (G 3/4" for coffee machine)



1. Fill both water tanks with fresh water.

⚠ A minimum water quantity of 0.2 l in each water tank avoids
 - air bubbles in the fluid system,
 - splashing during initial operation.

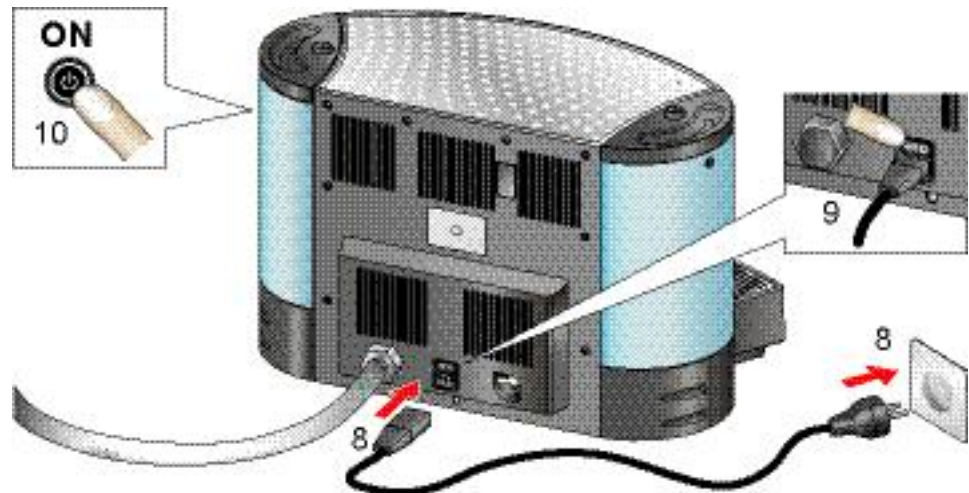
2. Insert water tanks and check correct fit of all drip trays (left and right drip trays especially) and capsule containers at the same time.




3. Lock both water tank covers (special types) for safety reasons (3).
4. Connect no-return valve to water supply.
5. Connect high pressure hose to water supply.
6. Remove cover and connect high pressure hose to solenoid valve.
7. Turn water tank connection valve to position ON.



OPERATION




8. Connect coffee machine to mains.
9. Switch on mains switch.
10. Press stand-by button: Depending on the water level in the tanks the message "Fill water" appears on the display.
11. Open stop valve of the water mains supply. Check tightness of the high pressure hose connections.

 **An automatic rinsing of the coffee outlets is performed.**

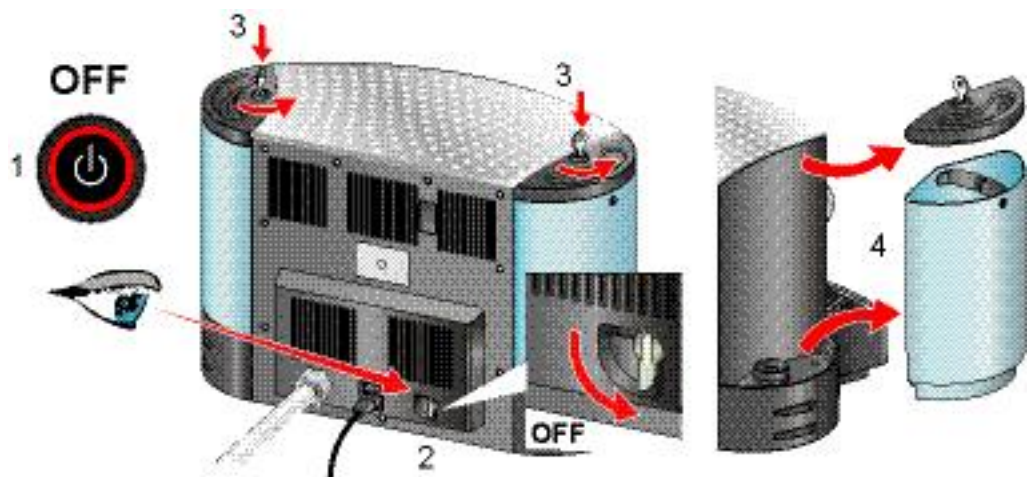
12. Wait (50 - 70 sec.) till coffee machine is heated up and push-button illumination turns to white. Then prepare hot water several times and check if water is replenished in the water tanks.

 **In case of problems refer to "Direct water connection problems" on page 71.**

Safety measures

 **Operating errors can cause a flooding!**

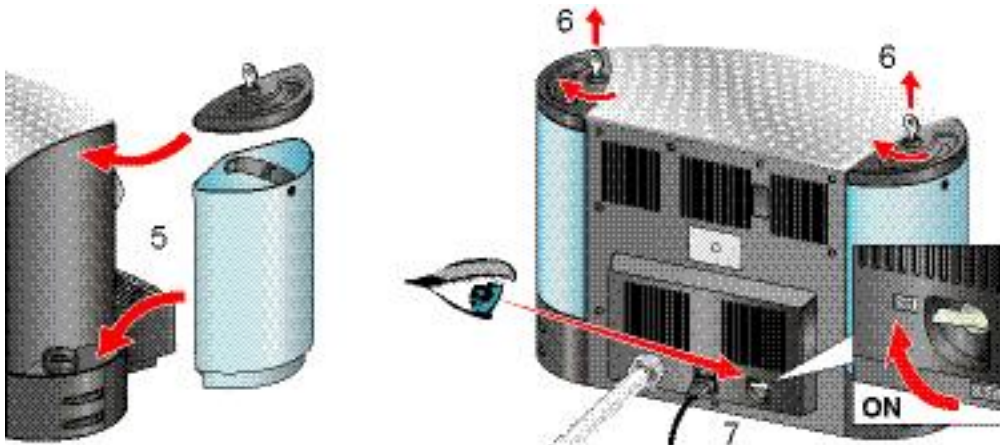
- If no responsible person is present (e.g. at meal time, night etc.), the stop valve of the water mains supply must be closed.
- Adhere strictly to the following procedure for removal of water tanks:



1. Switch off stand-by button (1).
2. Turn water tank connection valve (2) to position OFF.
3. Unlock cover of water tank(s) (3).
4. Remove water tank(s) (4).



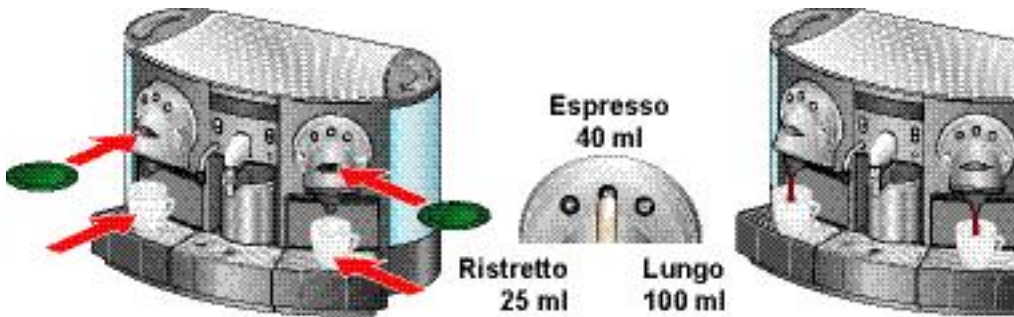
- ☞ If one or both water tanks are removed for a prolonged time, turn off stop valve of water supply as additional safety measure.



5. Reinsert water tank(s).
6. Lock cover of water tank(s) again.
7. Turn water tank connection valve to position ON.

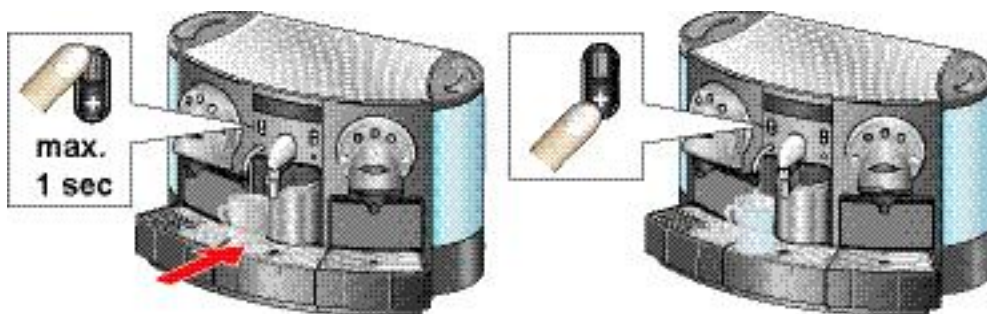
2.3 Preparing coffee

The procedure is identical for both coffee outlets:



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

2.4 Preparing hot water



1. Press portion button maximal 1 sec for a preset filling amount of hot water.
2. For additional hot water, press fill up button (+) as long as desired.



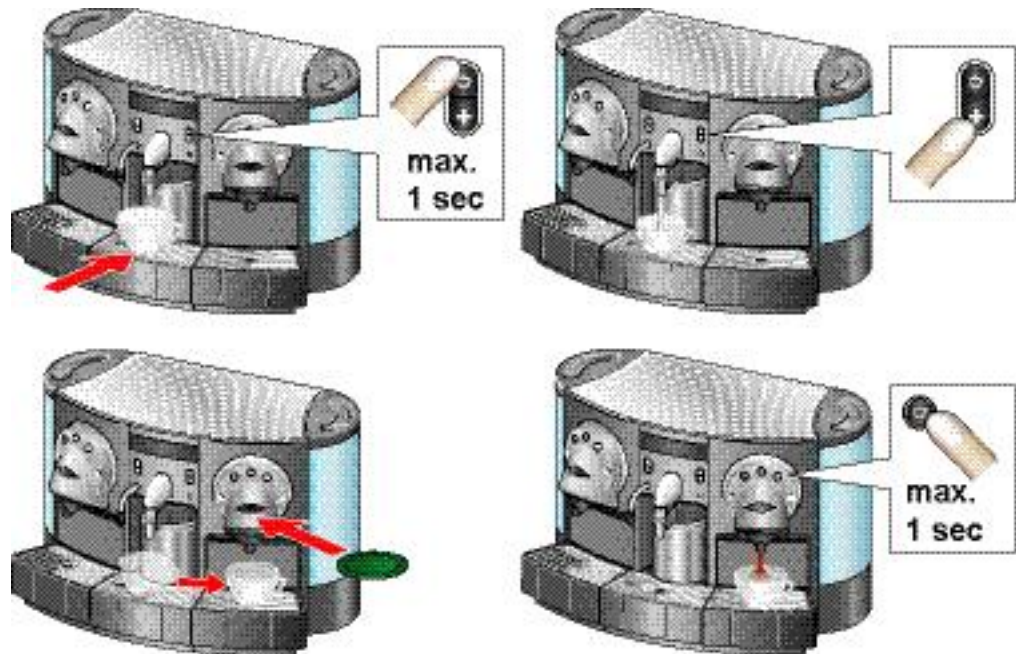
OPERATION

 **Hot water preparation can be aborted by pressing the portion button again (e.g. cup too small for preset filling amount).**

If there is no simultaneous coffee preparation, hot water is generated rapidly with the thermoblocks and pumps of both coffee units (refer to "Fluid system" on page 14).

2.5 Preparing cappuccino (CS220)

i The steam for the milk foam is generated with water from the left water tank only (refer to "Fluid system of Gemini CS220" on page 14).



1. Press portion button maximal 1 sec for a preset amount of milk foam.
2. For additional milk foam, press fill up button (+) as long as desired.

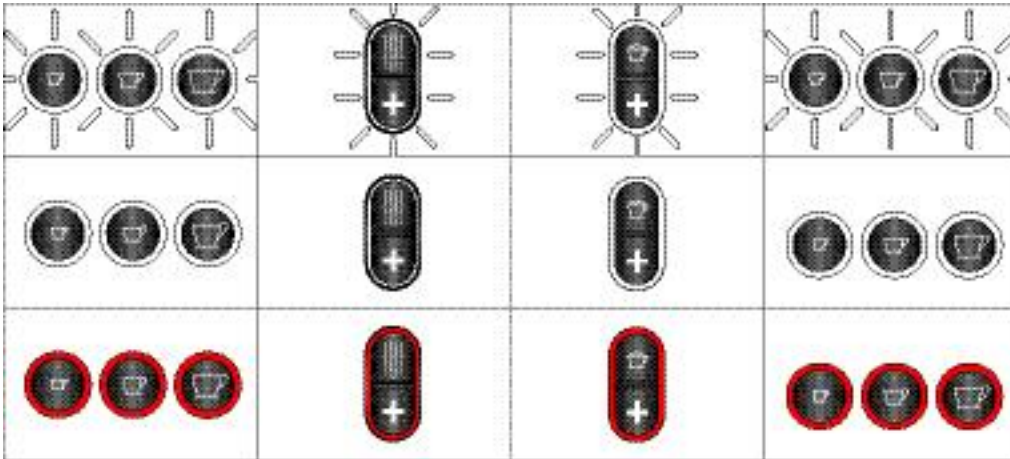
 **Milk foam preparation can be aborted by pressing the portion button again (e.g. cup too small for preset filling amount).**

3. Place cup under coffee outlet and prepare cappuccino.



2.6 Coffee machine displays

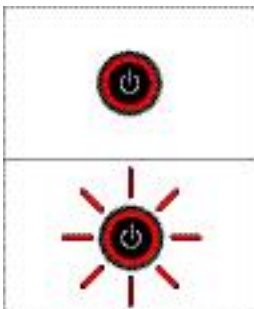
2.6.1 Button colors



White, blinking backlight coffee machine is heating up
 White backlight..... ready for operation
 Red backlight error, user or service intervention necessary

i A red backlight on these buttons locates the error and is accompanied by an error display message.

Button colors of coffee and cappuccino or hot water units can be different, depending on cause of error or operation mode.



The stand-by mode of the coffee machine is indicated by a red backlighted stand-by button.

During the shut-down procedure of the coffee machine (approx. 30 sec.), the stand-by button is blinking red.

2.6.2 Display messages

The following display messages

- are considerations for use,
- appear when a user intervention is necessary or in case of a malfunction.

An arrow in the display shows for which coffee or cappuccino resp. hot water unit the message is valid.

⚠ Bear in mind that more than one error can occur at the same time. The display shows the most important message first.

i To change the user language of the display messages, refer to "Power user menu" on page 27.



Operation

Display message	Reason	Remedy
Fill water	Water tank empty. Floater in water tank stucked. Water sensor defective.	Fill water tank. Clean floater chamber in water tank. Replace water sensor.
No drip tray	Drip tray missing or not inserted correctly. Contact bank for level sensor defective.	Reinsert drip tray. Align contacts or replace contact bank.
No capsule container	Capsule container missing or not inserted correctly. Micro switch(es) defective.	Reinsert capsule container. Replace micro switch(es).
No milk container	Milk container or cover of milk container missing. Micro switch defective.	Insert milk container correctly. Replace micro switch.
Drip tray full	Water in drip tray reaches contacts of level sensor.	Empty drip tray.
Capsule container full	Max. filling amount reached. IR-Sensor dirty or defective.	Empty capsule container. Clean sensor optics or replace IR-sensor.
Max. volume achieved	Programming the cup volume by push-button: Maximum of 240 ml for coffee or 1275 ml for hot water reached.	Reprogram cup volume if desired.
Only two servings at a time	Attempt to activate three outlets at the same time.	Wait until only one outlet is active before starting the next serving.

Maintenance

Display message	Reason	Remedy
Clean milk container	Predetermined residence time of milk container in coffee machine reached (8h or 1h for USA).	Replace milk container with second one out of refrigerator. If no milk is used (milk container empty and clean): Remove drip tray with milk container and reinsert it after min. 4 sec.
Change filter	Preset service life of water filter reached.	Replace water filter in water tank resp. in water supply line.
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

Display message	Reason	Remedy
Descaling needed Call service center	Preset operating time exceeded, coffee machine locked up.	Perform descaling instantly.
Capsule not ejected	Used capsule stucked in extraction unit.	Coffee machine tries to eject stucked capsule automatically. User intervention not necessary yet.
Capsule not ejected Call service center	Used capsule stucked in extraction unit. Automatic ejection attempts failed.	Remove capsule container of concerning coffee unit. Reach for stucked capsule in ejection slot and remove it by hand. For additional information refer to "Capsule not ejected - call service center" on page 67.
Machine blocked Call service center	Coffee machine not in working order.	Servicing necessary. Refer to "Machine blocked - call service center" on page 68.

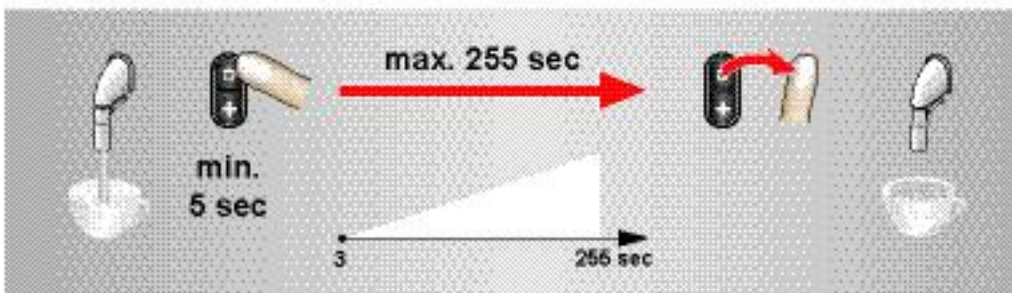
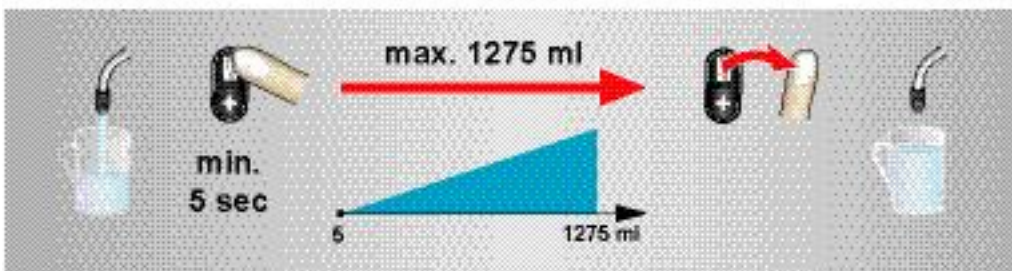
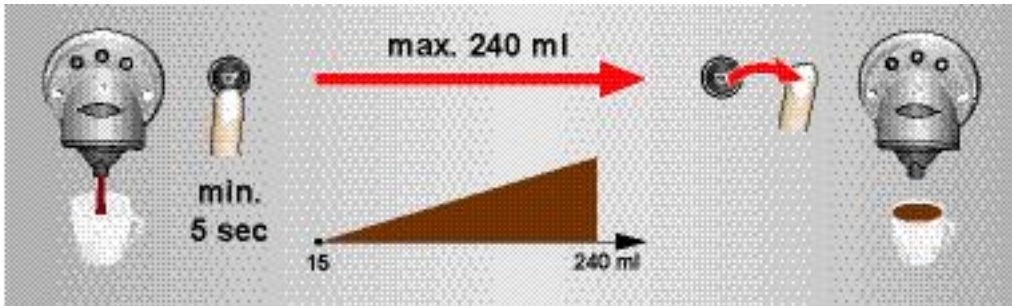


3 PROGRAMMING

3.1 Programming the cup volume by push-button

This feature has to be enabled in the power user menu at first (program cup length ON, see "Power user menu points" on page 30).

i Cup volumes can be defined in the customer settings of the Service Stick software also (see "Customer settings (Client PC Software)" on page 38).



Simply press and hold a coffee or portion button, until the desired filling amount is in the cup - then release the push-button. A display message appears if the maximum value is reached.

☞ Set menu point "program cup length" to OFF afterwards to avoid changes by operating errors.

3.2 Power user menu

This menu

- is for the experienced user and for service technicians,
- allows basic settings and configurations,
- has different menu points, dependent if a water filter with ion exchanger is installed or descaling is necessary.

☞ The customer setting file of the Service Stick software contains settings and configurations out of the power user menu (see "Customer settings (Client PC Software)" on page 38).

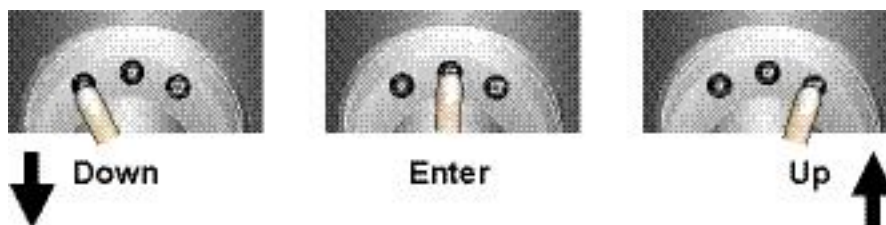


3.2.1 Access to power user menu



1. Switch coffee machine to stand-by mode.
2. Press all coffee buttons of one coffee unit simultaneously, until the first menu point is displayed.

i Right and left coffee buttons correspond to the UP and DOWN ARROW keys on a keyboard. The middle coffee button corresponds to the ENTER key.



3. Use right and left coffee buttons to scroll up/down in the menu.
4. Use middle coffee button to
 - to select a menu point,
 - execute commands like "Exit" or "Descaling",
 - edit and confirm the settings of menu points.

Example: Change display language

1. Press middle coffee button to select language.

The language is now marked with arrows.

2. Use left and/or right coffee button to choose a language.

3. Press middle coffee button to confirm new language.

The display changes to the new language. The arrows disappear.

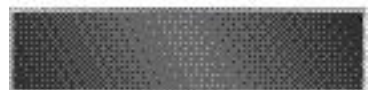
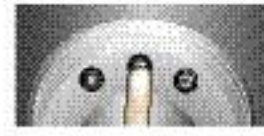




- Use left and/or right coffee button to display EXIT command.

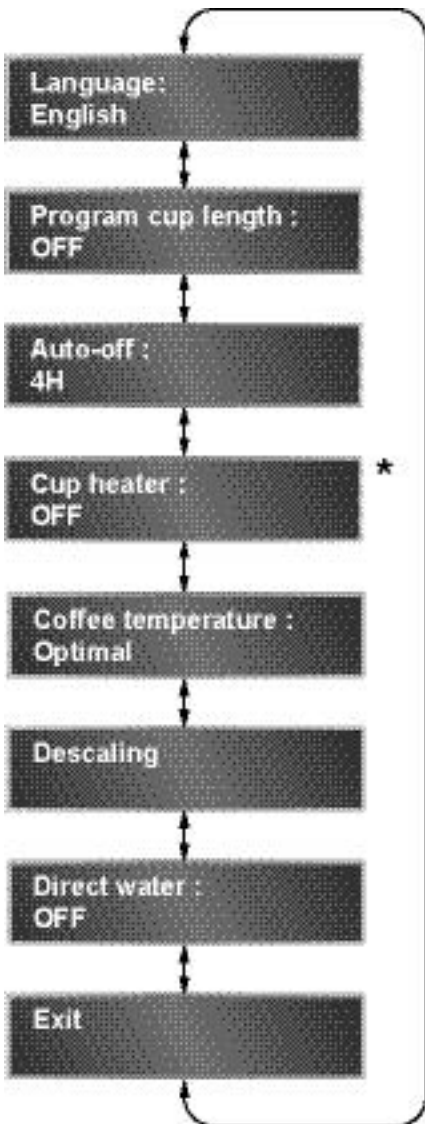


- Press middle coffee button to confirm and terminate power user menu.

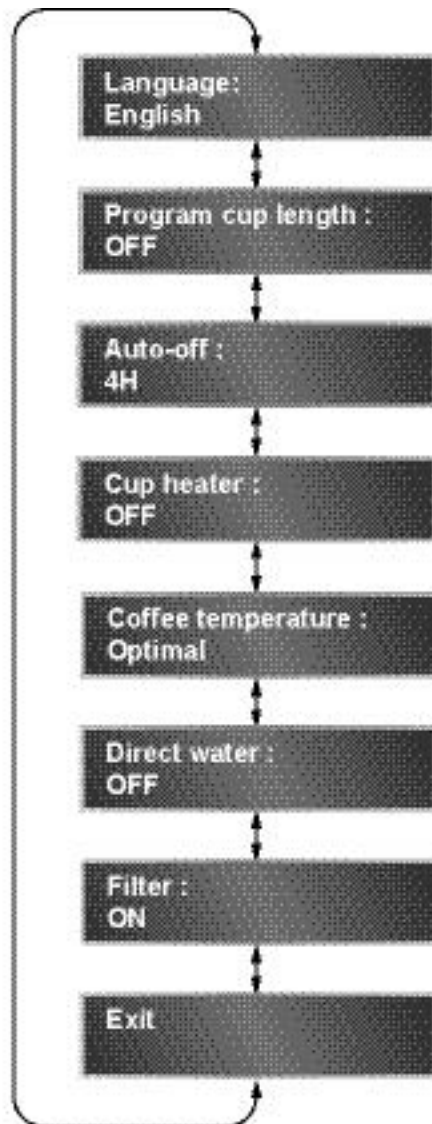


3.2.2 Power user menu selection

Without filter(s):



With installed filter(s):



i The primary water filter setting is part of the after sales menu (see page 31).

* Only Gemini CS200




3.2.3 Power user menu points

Language

Settings: English / German / French / Customer
Factory setting: German

Use this menu point to choose the display language. Beside the standard languages an additional customer specific language is available under the "Customer" setting.

 **A customer specific language has to be uploaded to the coffee machine by Service Stick (see "Service Stick menu" on page 37).**

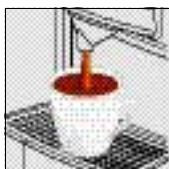


Program cup length

Settings: OFF / ON
Factory setting: OFF

Use this menu point to inhibit or enable the programming of the cup volume by push-button (see page 27).

 **By pressing a coffee or portion button too long, a user can change preset filling amounts inadvertently.**



Auto-off

Settings: OFF / 0.5h / 1h / ... / 10 h
Factory setting: 4h

Use this menu point to determine the rest period after that the coffee machine switches to stand-by. The "OFF" setting inhibits the stand-by mode.



Cup Heater (only for Gemini CS200)

Settings: OFF / ON
Factory setting: OFF

Use this menu point to switch on/off the cup heater.



Coffee temperature


Settings: Low / Optimal / High
Factory setting: Optimal

Use this menu point to change the optimal coffee temperature (86 °C) at the outlet if colder or hotter coffee is required.



Descaling

Use this command to start the descaling of the coffee machine. Refer to "Descaling" on page 45 for required accessories, preparations and descaling sequence.

 **This menu point appears only if the water filter setting is OFF in the after sales menu.**






Direct water

Settings: OFF / ON
Factory setting: OFF

Set this menu point to

- "OFF" if the water tanks are filled manually.
- "ON" only if the coffee machine is connected to the water supply.

 See "Direct water connection" on page 20 for more information.

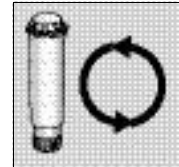


Filter: ON

Commands: Change filter (left/right arrow) / Exit

Use this menu point to replace a used water filter once the message "Change filter" appears on the display (see "Change filter elements (optional)" on page 42).

 This menu point has to be enabled in the after sales menu (see page 32).



Exit


Use this command to exit the power user menu and to resume stand-by mode.



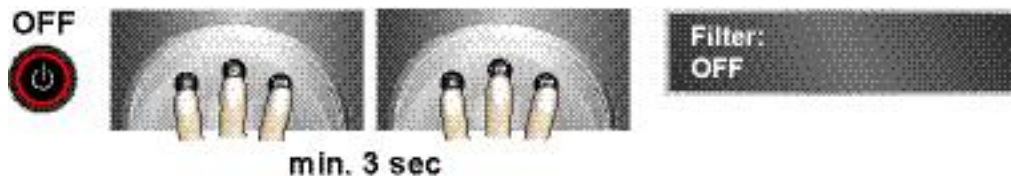
3.3 After sales menu

This menu

- is for service technicians only,
- allows basic settings and configurations,
- has two interdependent menu points ("Filter" and "Water hardness"),
- affects the power user menu structure.

 The customer setting file of the Service Stick software contains settings and configurations out of the after sales menu (see "Customer settings (Client PC Software)" on page 38).

3.3.1 Access to after sales menu



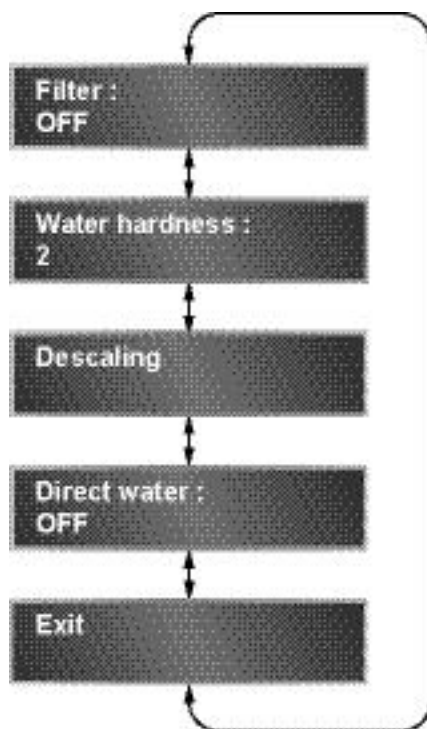
1. Switch coffee machine to stand-by mode.
2. Press all coffee buttons of both coffee units simultaneously, until the first menu point is displayed.

 For menu navigation refer to "Access to power user menu" on page 28.

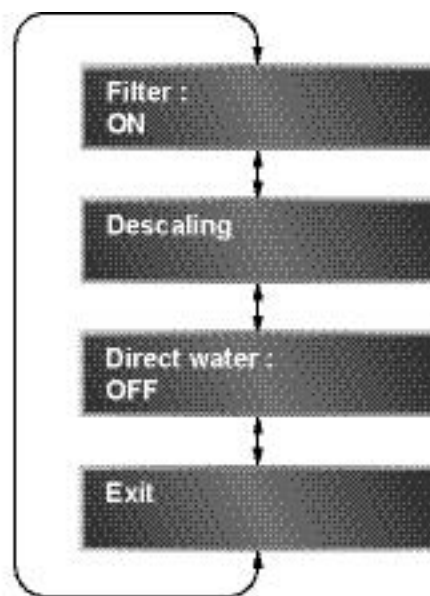


3.3.2 After sales menu selection

Without filter(s):



With installed filter(s):



3.3.3 After sales menu points

The menu points "Filter" and "Descaling" are similar resp. identical to those in the power user menu.

Filter: ON

Commands and Settings

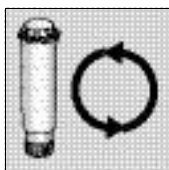
- ON activated: Change filter (left/right arrow) / Exit / OFF
- OFF activated: ON / Exit / OFF

Factory setting: OFF

Use this menu point to determine water filter installation:

Water filter(s)	After sales menu settings	Remarks
No water filter(s)	Filter : OFF	<ul style="list-style-type: none"> • Menu point "Water hardness" enabled • Menu point "Descaling" enabled in power user menu • Menu point "Filter" inhibited in power user menu
Filter in water tanks (internal)	Filter : ON Direct water: OFF	<ul style="list-style-type: none"> • Menu point "Water hardness" inhibited • Menu point "Descaling" inhibited in power user menu • Menu point "Filter" enabled in power user menu
Filter for direct water connection (external)	Filter : ON Direct water: ON	<ul style="list-style-type: none"> • Menu point "Water hardness" inhibited • Menu point "Descaling" inhibited in power user menu • Menu point "Filter" enabled in power user menu

 For additional information refer to "Change filter elements (optional)" on page 42.





Water hardness

Settings: 0 / 1 / 2 / 3

Factory setting: 2

Use this menu point to determine the descaling interval, depending on the water hardness.

 This menu point appears only if "Filter" is set to OFF in the after sales menu.

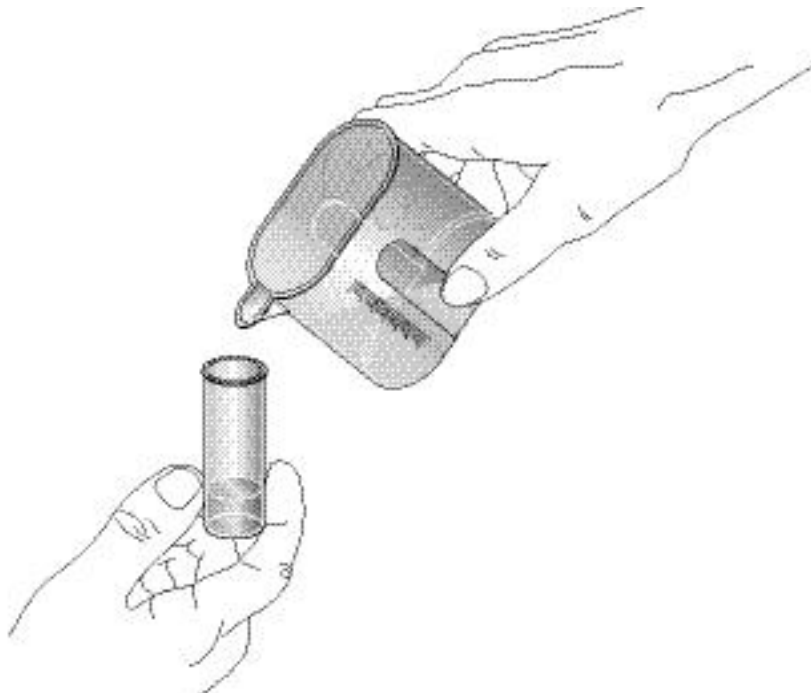
The available settings (0 - 3) correspond to

- a preset water volume, measured with the flow meters in the coffee machine,
- the water hardness.

Water hardness level	Water hardness range	Preparations (at 70 ml each)	Fixed water volume until descaling message	Water reserve until machine is blocked
0	very soft / < 3.0° dH	-	-	-
1	soft / 3.0-10° dH	2100	150 l	10 l
2	medium / 11-20° dH	1400	100 l	10 l
3	hard / > 20° dH	600	40 l	10 l


Determine water hardness

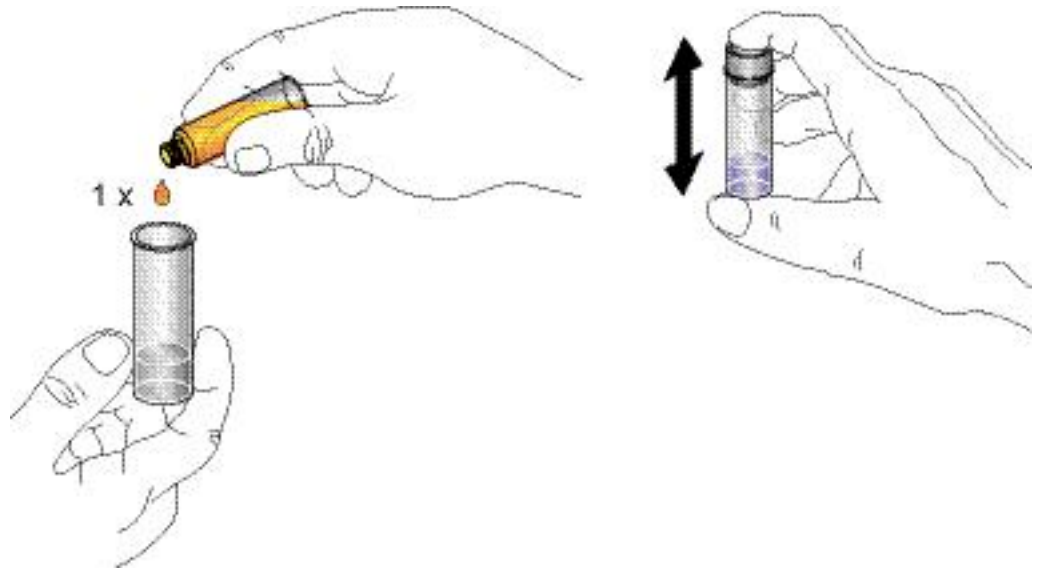
Use a Brita® Professional Indicator Set (NNSA 5036) as follow:



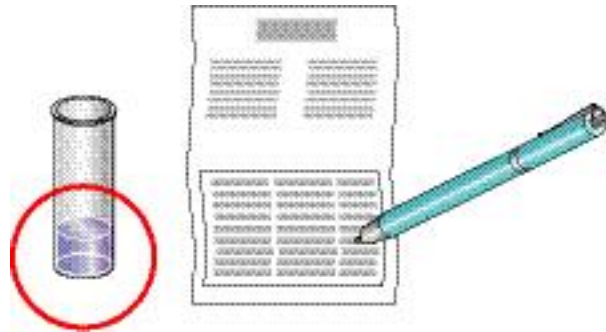
1. Fill the test tube with water up to the 5 ml mark.



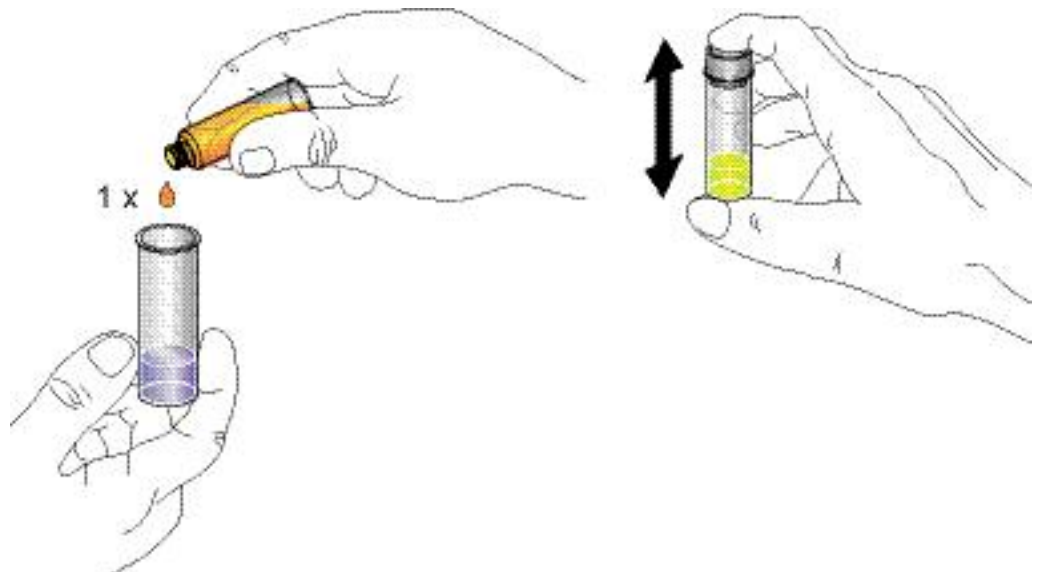
 As alternative, call the water company for information about the local water hardness.



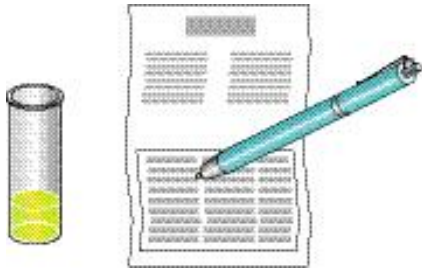
2. Add one drop of indicator liquid and mix.



3. Compare with Brita water hardness table.



4. Continue adding one drop at a time and mix until solution turns yellow.



5. Calculate the water hardness by comparing the number of drops used to the Brita water hardness water table.

Use the following table to allocate the local water hardness to the correct water level setting:

Water hardness level	Carbonate hardness				
	°dH - °KH	°e	°f	ppm (CaCO ₃)	mMol/l
0	1	1.253	1,78	17.8	0,179
	2	2.5	3,6	35.6	0,4
	3	3.8	5,3	53.4	0,5
1	4	5.0	7,1	71.2	0,7
	5	6.3	8,9	89.0	0,9
	6	7.5	10,7	106.8	1,1
	7	8.8	12,5	124.6	1,3
	8	10.0	14,2	142.4	1,4
2	9	11.3	16,0	160.2	1,6
	10	12.5	17,8	178.0	1,8
	11	13.8	19,6	195.8	2,0
	12	15.0	21,4	213.6	2,1
	13	16.3	23,1	231.4	2,3
	14	17.5	24,9	249.2	2,5
	15	18.8	26,7	267.0	2,7
3	16	20.0	28,5	284.8	2,9
	17	21.3	30,3	302.6	3,0
	18	22.6	32,0	320.4	3,2
	19	23.8	33,8	338.2	3,4
	20	25.1	35,6	356.0	3,6
	21	26.3	37,4	373.8	3,8
	22	27.6	39,2	391.6	3,9
	23	28.8	40,9	409.4	4,1
	24	30.1	42,7	427.2	4,3
	25	31.3	44,5	445.0	4,5
	26	32.6	46,3	462.8	4,7
	27	33.8	48,1	480.6	4,8
	28	35.1	49,8	498.4	5,0
	29	36.3	51,6	516.2	5,2
	30	37.6	53,4	534.0	5,4

National water hardness units

- German degree °dH
 English degree °e
 French degree °f
 USA ppm (CaCO₃)
 SI-unit mMol/l



⚠ Danger of malfunction!

If menu point "Direct water" is set to ON, water filters must not be placed in the water tanks. Only an external water filter is permitted.



PROGRAMMING

Descaling

Use this command to start the descaling of the coffee machine. Refer to "Descaling" on page 45 for required accessories, preparations and descaling sequence.


Direct water

Settings: OFF / ON

Factory setting: OFF

Set this menu point to

- "OFF" if the water tanks are filled manually.
- "ON" only if the coffee machine is connected to the water supply.

 See "Direct water connection" on page 20 for more information.

This menu point influences the water measurement of the coffee machine with installed water filter(s):

- If "Direct water" is set to ON, the display message "Change filter" will occur when the total water flow of left and right flow meters reaches the setting (correct for external water filter).
- If "Direct water" is set to OFF, the display message "Change filter" will occur if the left or right flow meter reaches the fixed value of 50 l (correct for filter cartridges in water tanks).

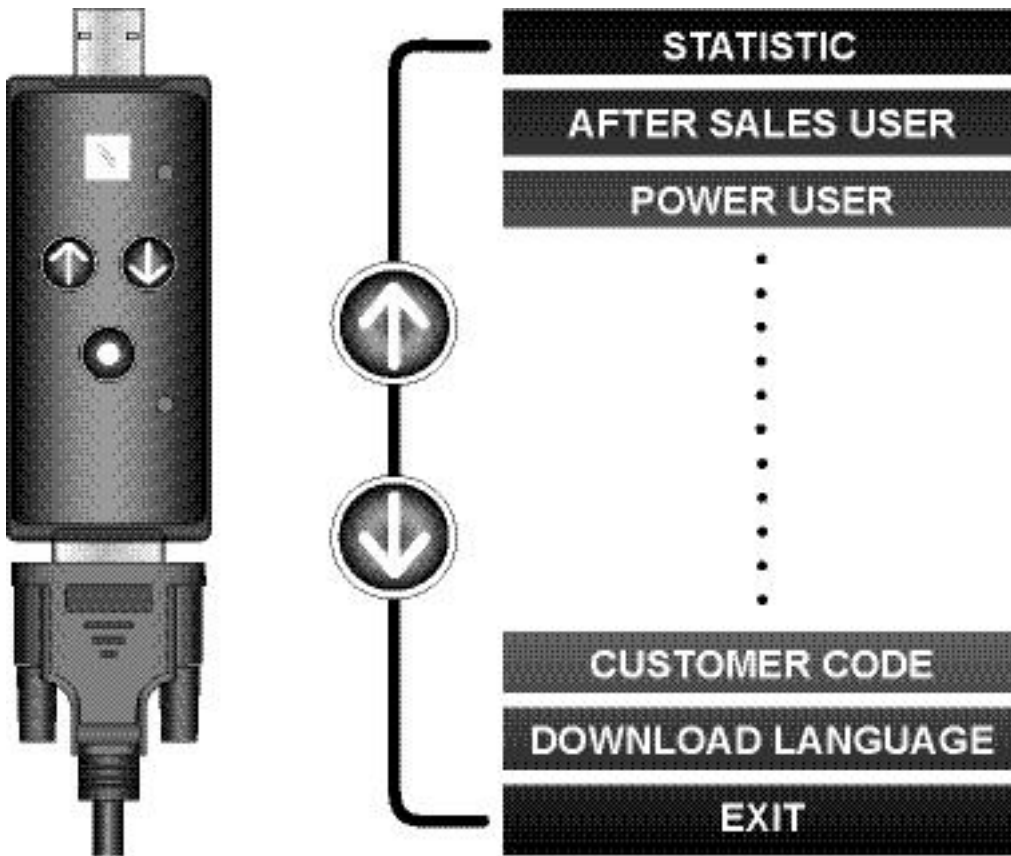
Exit

Use this command to exit the after sales menu and to resume stand-by mode.



3.4 Service Stick

3.4.1 Service Stick menu



This menu appears on the display of the coffee machine after the Service Stick is connected to the interface connector on the back wall of the machine.

Refer to the Service Stick user manual for instructions and menu explanation (delivered with Nespresso article no. 5716).

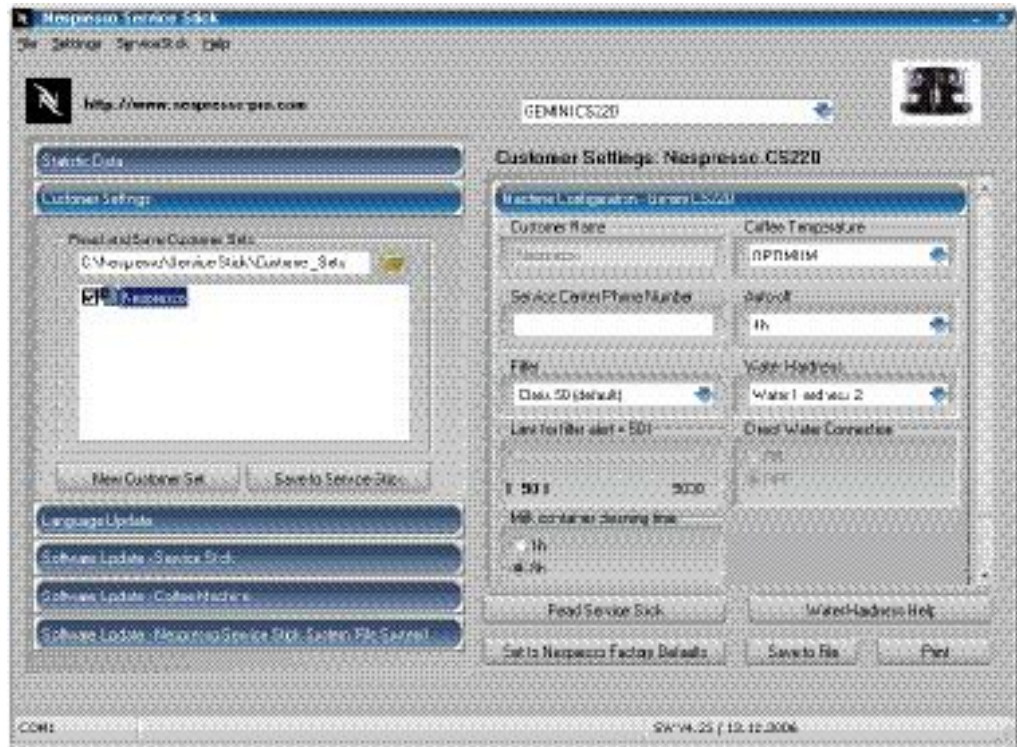
i The Service Stick is an optional accessory for initial operation, maintenance and after-sales service of the coffee machine. It is programmed with the Client PC Software.

i Depending on the software version, this menu example is subject to alterations.



3.4.2 Customer settings (Client PC Software)

i Depending on the software version, this screenshot is subject to alterations.



Screenshot from Client PC Software for Service Stick

Customer settings are data files that

- contain the settings of the power user and after sales menu,
- can be generated and edited with the Client PC Software,
- can be downloaded to the coffee machine with the help of the Service Stick.

- ☞ The Client PC Software is delivered with the Service Stick and has to be installed on a PC.**
- ☞ Predefined customer settings are an easy way to customize one or several coffee machines of the CS range. Refer to the Service Stick user manual for instructions and explanations of the respective settings.**
- ☞ Check and adapt customer settings if the coffee machine is moved to a new site.**



4 MAINTENANCE

4.1 Clean milk container

Although the milk container is designed as thermos, the milk heats up slowly during coffee machine operation and can spoil. Therefore a timer limits the residence time of the milk container in the coffee machine.

☛ The insulation of the milk container is designed for an internal temperature rise of max. 10 °C in 8 hours based on a room temperature of 20 °C.

If the predetermined residence time of 8 hours (resp. 1 hour for USA) is reached

- a display message appears,
- the cappuccinatore unit is blocked,
- and the milk container has to be replaced.

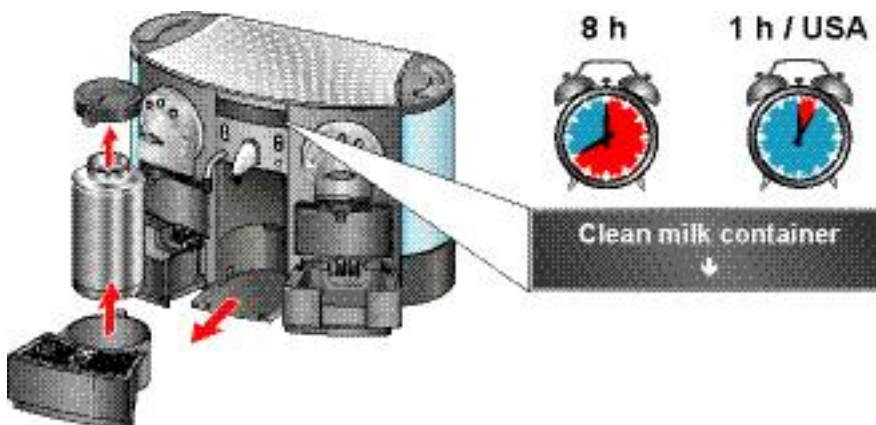
Inform customer

- to pay attention to national hygiene standards,
- to reduce the residence time of the milk container for locations with high room temperature.



1. Detach disposable foam device from steam outlet and swing it sideways.
2. Press fill up button for approx. 20 sec to clean steam nozzle.

☛ During stand-by operation drops of milk can be sucked up from the disposable foam device into the steam nozzle by low pressure. This milk residue can curdle and clog the steam nozzle.



3. Pull out milk container with drip tray from coffee machine.
4. Remove disposable foam device from milk container.

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

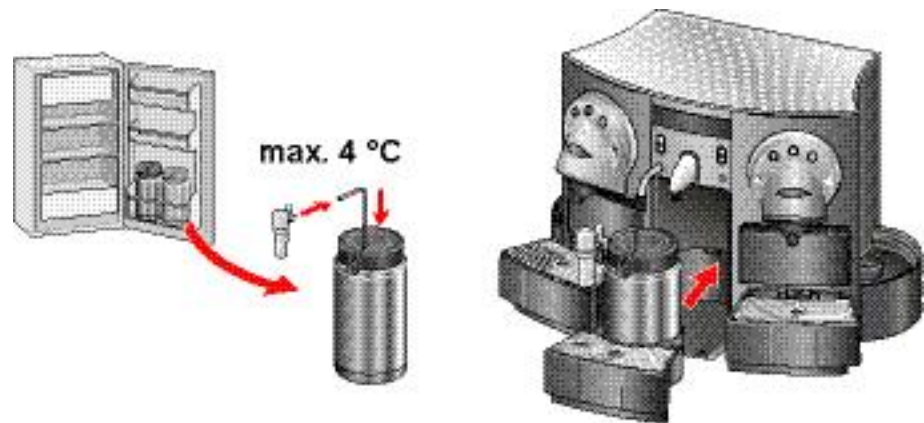
⚠ Health hazard - spoiled milk is detrimental to health!

⚠ Danger of burns! Hot steam and splashes of water. Be distant from steam outlet.



5. Clean and refill milk container.
6. Store milk container in refrigerator.

i Use both supplied milk containers and circulate them.



7. Replace used milk container with second one out of refrigerator.
8. Insert a straw with disposable foam device in milk container.
9. Insert milk container with drip tray in coffee machine.
The cappuccinatore unit resumes operation and the timer is reset.
10. Attach disposable foam device to steam outlet.

4.1.1 Reset a locked cappuccinatore unit

⚠ Health hazard !
Do not prolong the residence time of a filled milk container in the coffee machine with this method.

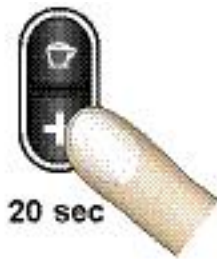
If no milk is used (milk container empty and clean): Pull out drip tray with milk container from coffee machine and reinsert it after approx. 4 sec.

- 🔧 The timer, which limits the residence time of the milk container**
- cannot be adjusted individually,
 - cannot be deactivated.



4.2 Daily maintenance and cleaning

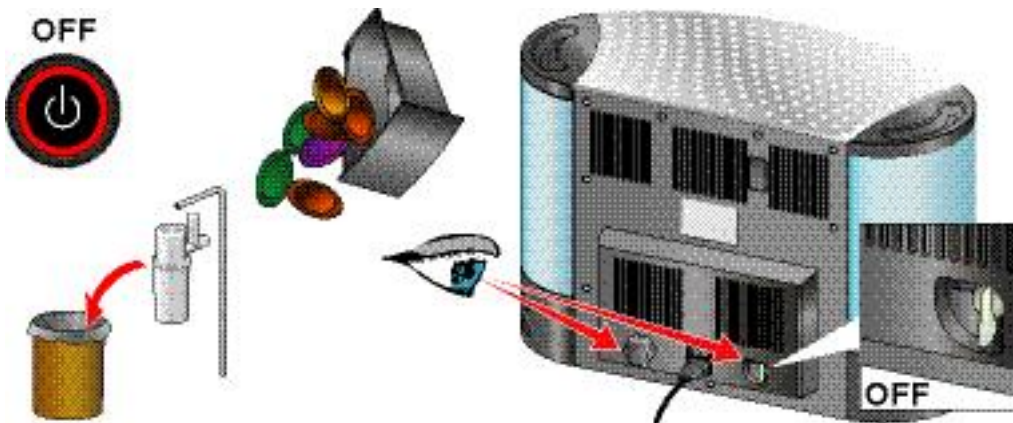
☞ Inform customer that daily cleaning and maintenance of the coffee machine is of utter importance, especially for the cappuccinatore unit.



⚠ Danger of burns!
Hot steam and splashes of water. Be distant from steam outlet.

1. Detach disposable foam device from steam outlet and swing it sideways.
2. Press fill up button for approx. 20 sec to clean steam nozzle.

☞ During stand-by operation drops of milk can be sucked up from the disposable foam device into the steam nozzle by low pressure. This milk residues can curdle and clog the steam nozzle.



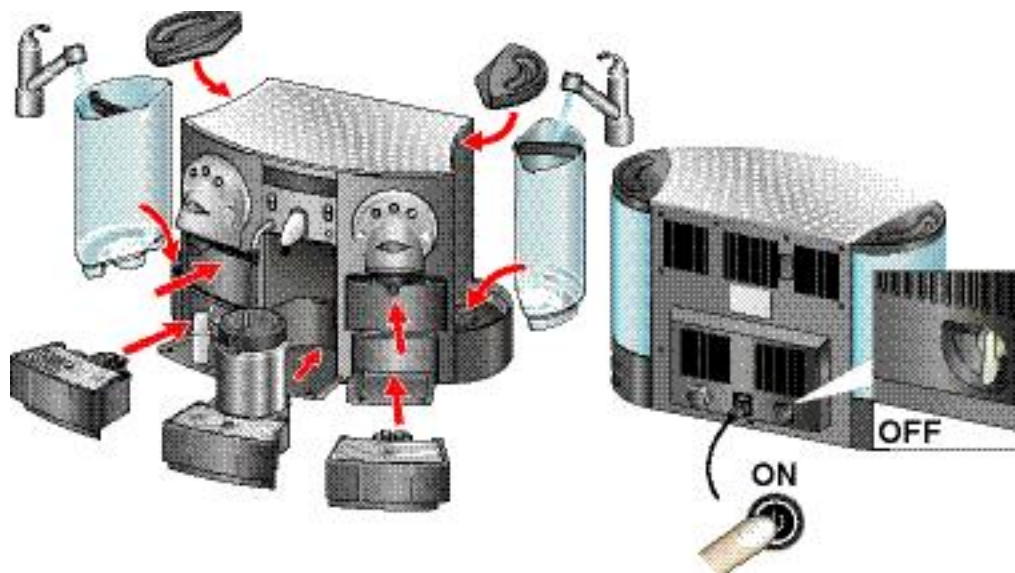
⚠ Maintenance errors can cause a flooding, if coffee machine is equipped with a direct water connection. Refer to "Safety measures" in "Direct water connection" on page 22 for instructions.

3. Switch coffee machine to stand-by.
4. Remove milk container and throw away disposable foam device with straw.
5. Empty both capsule containers.
6. Check if water tank connection valve is set to OFF.



7. Clean and flush accessories thoroughly. Dry drip tray contacts.

☞ Daily cleaning of water tanks is not necessary for a coffee machine with a direct water connection. In that case, clean water tanks with hot soap water once a week.

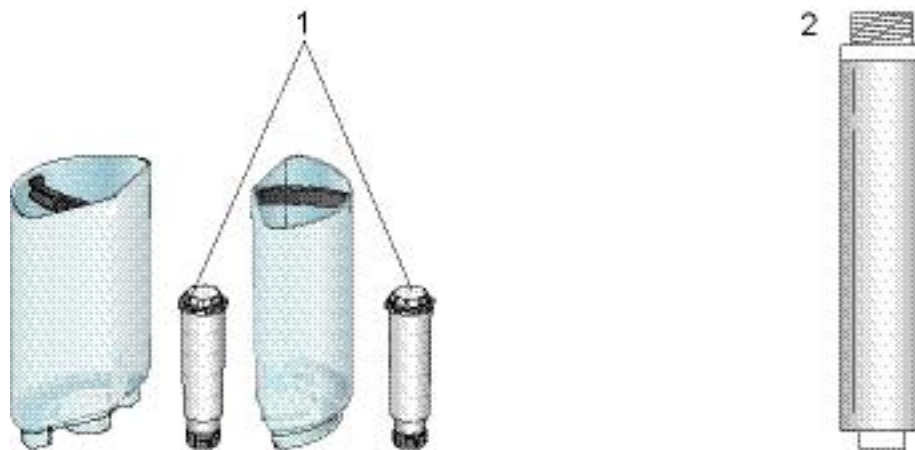


8. Fill water tanks and reassemble coffee machine.
9. Check if water tank connection valve is set to OFF. Then switch on coffee machine.

4.3 Change filter elements (optional)

Depending on the water supply of the coffee machine, different water filters are used.

i Water filters do not prevent descaling completely. Additional to the exchange of the filter cartridges it is recommended to descale the coffee machine once a year.



⚠ **Water tank filters must not be used in combination with a direct water connection.**

- 1) Claris water tank filters (with fix counter setting of 50 l)
- 2) External water filter for direct water connection (e.g. Brita 06-BC, Brita AquaQuell). Individual counter setting: 200 - 5000 l for filtered water volume

i For water tank filters only: As the water consumption is different between the two water tanks, the "change filter" display message can appear at different times for the left and right water tank.

The coffee machine displays a message, if a filter cartridge in a water tank or an external water filter has to be replaced.



4.3.1 Filter cartridge exchange time

The filter cartridge exchange time is determined by the water quantity passing through the water filter. This water quantity is measured with the flow meters of the coffee machine.

Water tank filters

The water quantity for each water tank filter is set to 50 l permanently. The display message "Change filter" will occur if the left **OR** right water flow meter reaches the setting.

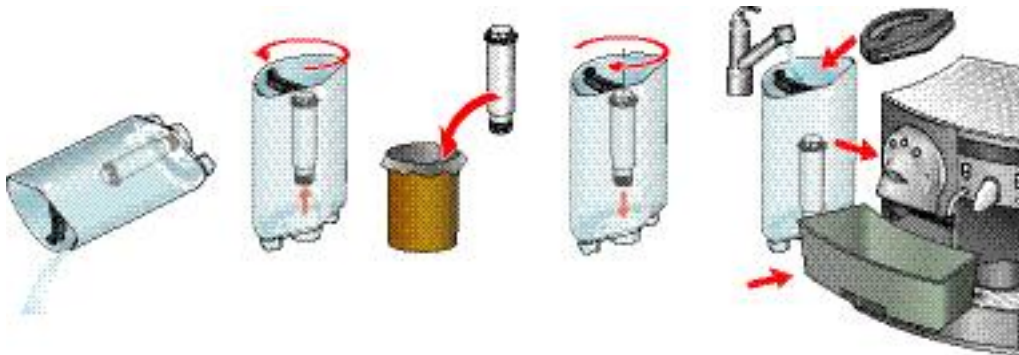
External water filter

With a direct water connection and an external water filter, it is possible to set the filtered water volume up to 5000 l with the help of the Service Stick. Refer to "Service Stick menu" on page 37 to localize the menu point "Filter volume setting" or consult the Service Stick user manual.


The display message "Change filter" will occur when the total flow of left **AND** right water flow meter reaches the setting.

4.3.2 Filter cartridge exchange procedure

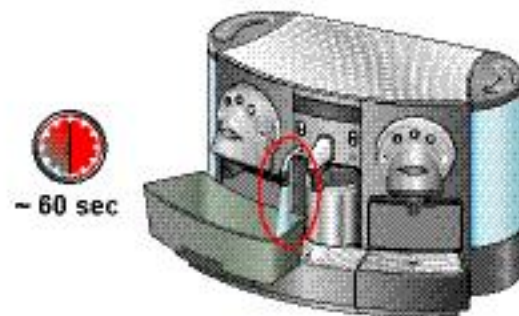
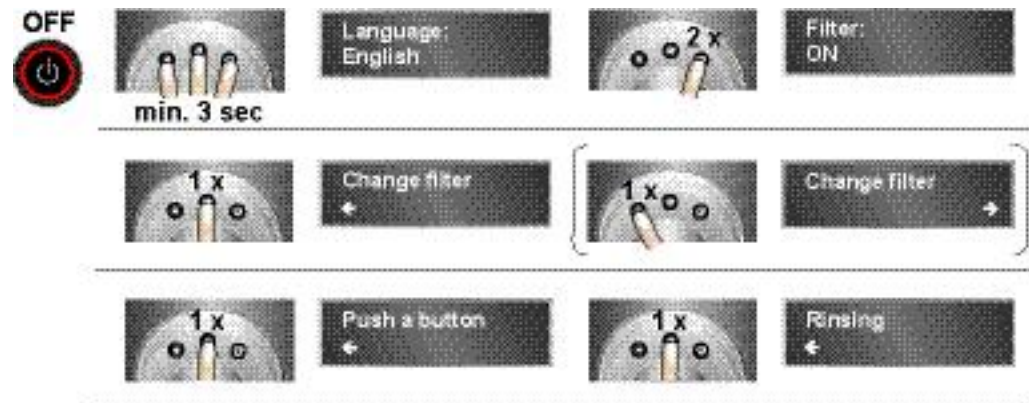
 This section describes the exchange of filter cartridges in the water tanks only. For the external water filter refer to the supplier documentation.



1. Check display which filter cartridge has to be exchanged (see arrow).

 **Left and right water tank have a different water consumption, dependent on the usage of the cappuccinatore unit.**

2. Empty water tank. Remove and dispose used filter cartridge.
3. Insert a new filter cartridge in the water tank. Fill water tank with fresh water and insert it in the coffee machine.
4. Place a receptacle (e.g. from the descaling kit) under the hot water outlet.

**Example with power user menu:****Rinse left (right) water filter cartridge**

5. Rinse the new filter cartridge for proper function with the command "Change filter". About 300 ml cold water flows out of the hot water outlet.

The command "Change Filter" can be selected in the after sales menu also (see menu point "Filter" in "After sales menu points" on page 32).

 **The water tank selection for rinsing is skipped, if the menu point "Direct water" is set to ON (external water filter).**

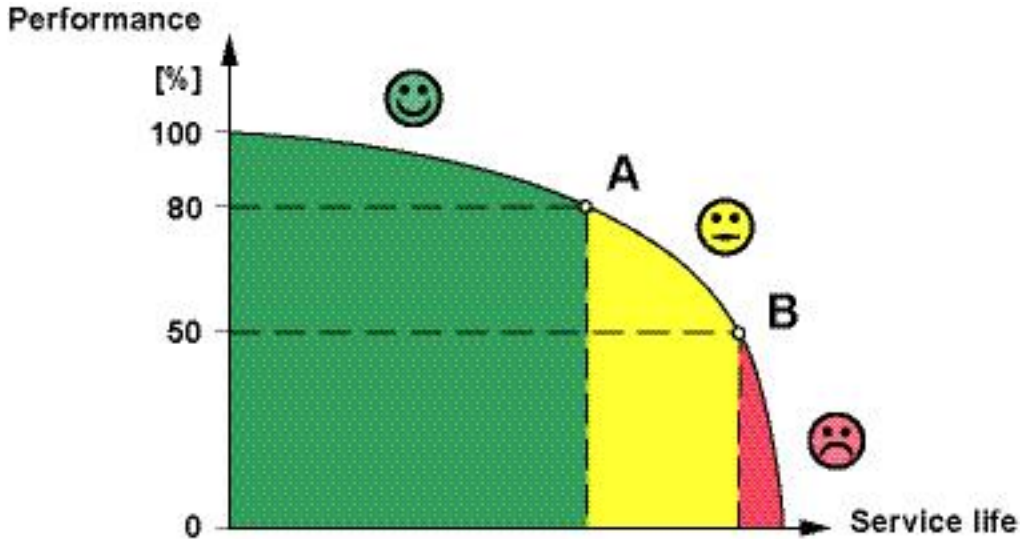


4.4 Descaling



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

☛ This message appears only, if the water filter setting is OFF in the after sales menu.



A.....First display message "Descaling needed"
 B..... Second display message "Descaling needed - call service center" (coffee machine blocked)

After the display message "Descaling needed" appears, a safety margin of 10 l water can be used until the coffee machine is blocked for safety reasons.

☛ Instruct the customer to call the service partner or to perform descaling himself immediately after the first display message "Descaling needed".

The blockage of the coffee machine assures the correct maintenance of the fluid system.

The consequences of de-blocking are:

- Insufficient coffee quality
- Longer preparation times
- A clogged fluid system and costly repairs

i When the message "Descaling needed" is displayed, the coffee machine locks up after a given number of servings (protective measure).

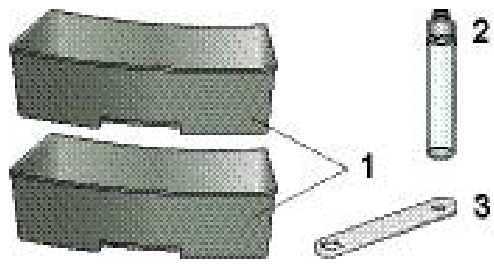
⚠ Under no circumstances de-block a coffee machine without descaling!



4.4.1 Accessory

The following descaling kits are available:

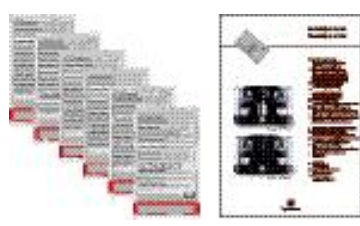
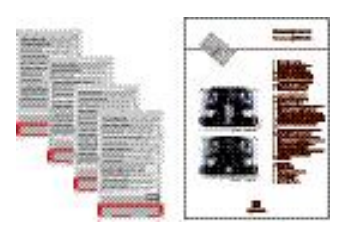

Stock number 5035/GEMINI



- 1) Two special designed receptables with enough capacity for descaling and rinsing fluid amounts.
- 2) A plastic pipe with threaded connection for steam outlet.
- 3) Special wrench for steam nozzle (CS220 only).

This kit contains basic and reusable accessory for the descaling procedure.

i All 6 respectively 4 descaling packages are needed for one descaling process.

<p>Stock number 5035/CS220</p>  <p>This kit for the CS220 coffee machine contains 6 descaling packages and a descaling manual.</p>	<p>Stock number 5035/CS200</p>  <p>This kit for the CS200 coffee machine contains 4 descaling packages and a descaling manual.</p>	<p>Stock number 5034</p>  <p>Can with 5 litres of Nespresso descaling agent for after sales service.</p>
---	--	---

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

4.4.2 Safety instructions

🔧 After a premature termination of the descaling procedure, a rinsing is executed (see display messages "Push a button"). Afterwards the descaling procedure can only be restarted from the beginning.

⚠️ In case of emergency interrupt descaling procedure by pressing the stand-by button or switch off coffee machine with mains switch on back wall.

⚠️ 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.



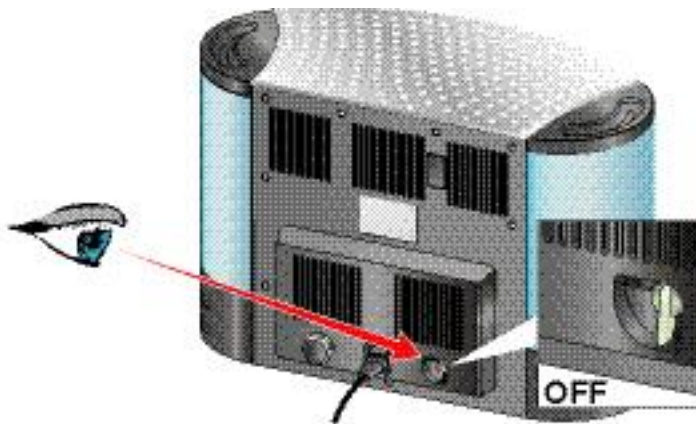
Protective measures

- Only use Nespresso decalcifier - never use vinegar!
- Wipe off decalcifier splashes with a wet cleaning rag immediately.
- During cleaning of the drip trays, pay attention to the contact surfaces.

The decalcifier is aggressive to surfaces and corrodes the contacts on the left and right drip tray.

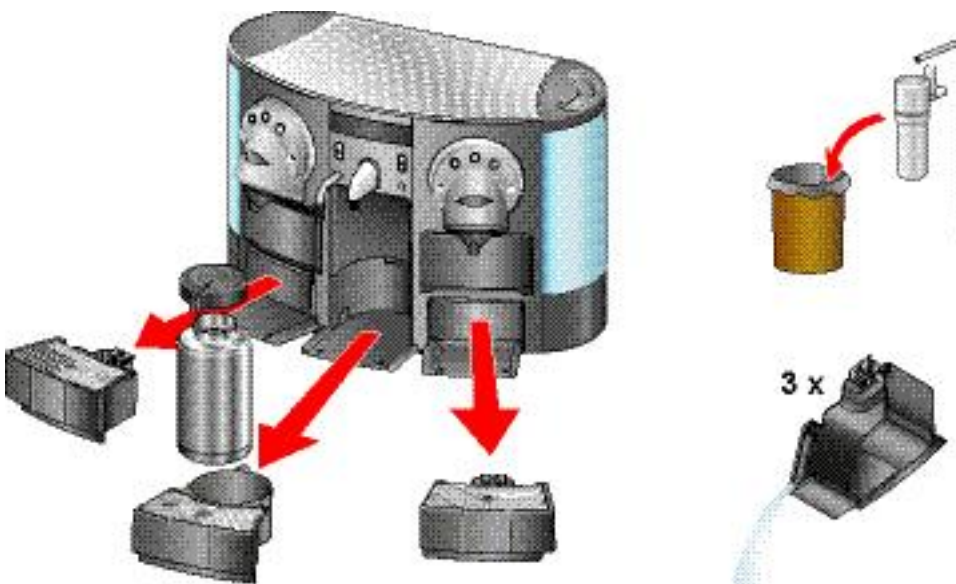
4.4.3 Preparation

It is a good idea to perform the first descaling together with the responsible person for the coffee machine.

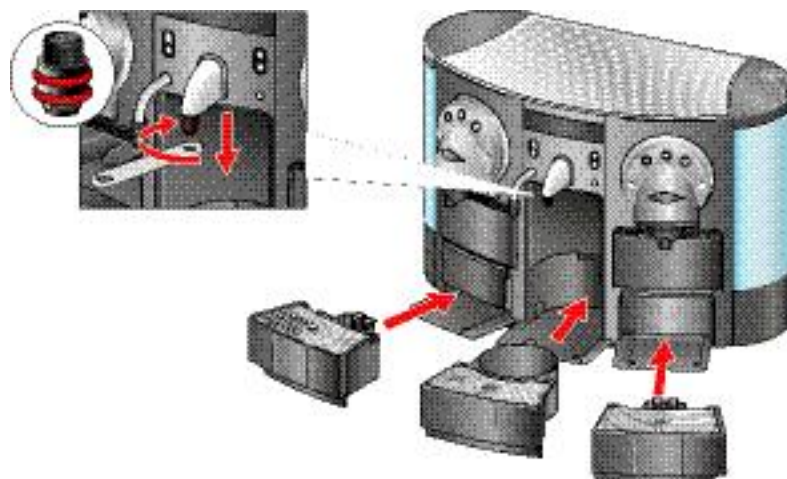


Estimate a good quarter hour for the complete descaling process.


1. Switch coffee machine to stand-by.
2. Check if water tank connection valve at back wall is set to OFF.



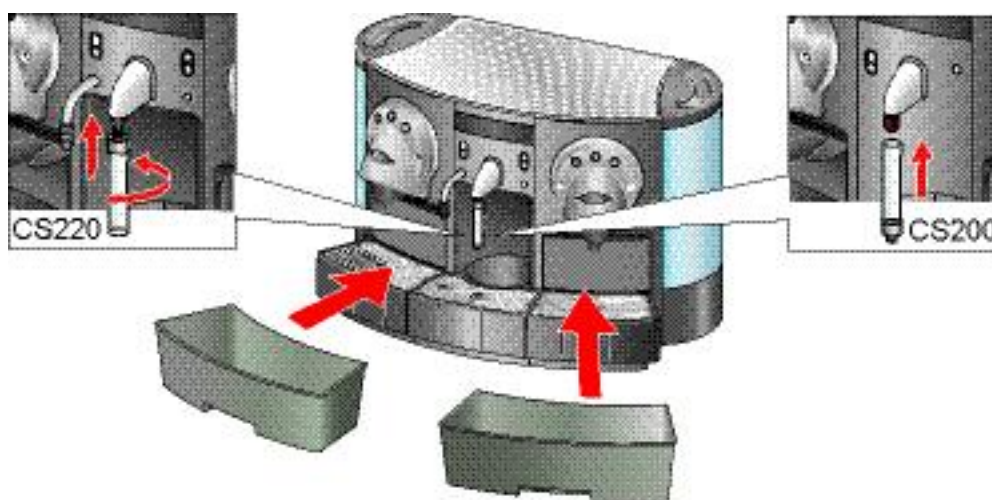
3. Remove and empty all three drip trays.
- For locations with high room temperature: Store milk container in refrigerator during descaling procedure (CS220 only).
4. Throw away disposable foam device with straw (CS220 only).



5. Unscrew nozzle from steam outlet (CS220 only).

 **Use special wrench (for CS220 only) supplied with descaling kit 5035/ GEMINI.**

6. Reinsert drip trays.



7. Screw plastic pipe in steam outlet (CS220) resp. connect plastic pipe to hot water outlet (CS200).

8. Place both receptacles under outlets of coffee machine.

4.4.4 Descaling and rinsing procedure for CS220

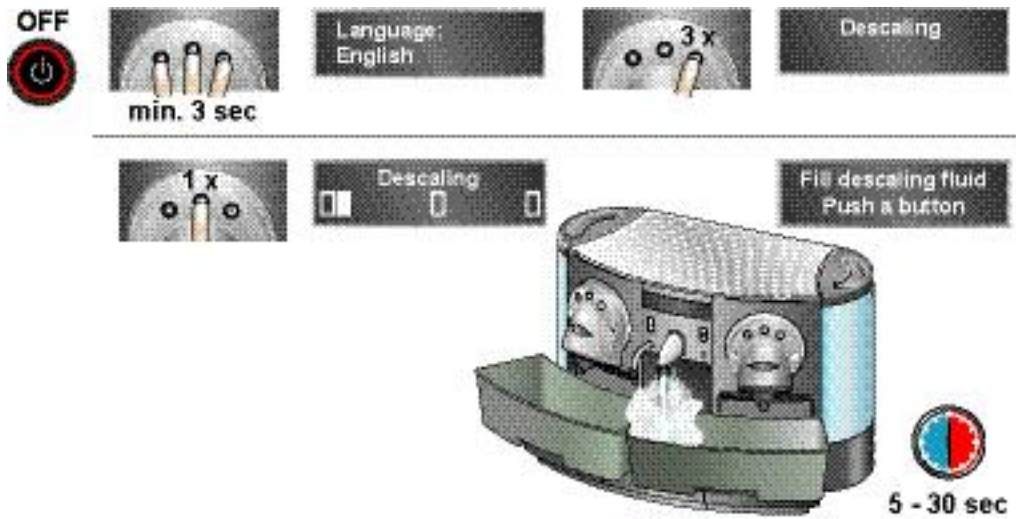
The command "Descaling"

- can be started out of the power user menu only if the water filter setting is OFF (in the after sales menu),
- can be started out of the after sales menu anytime,
- performs the complete descaling and rinsing procedure.

 **A display message appears if user intervention is necessary.**

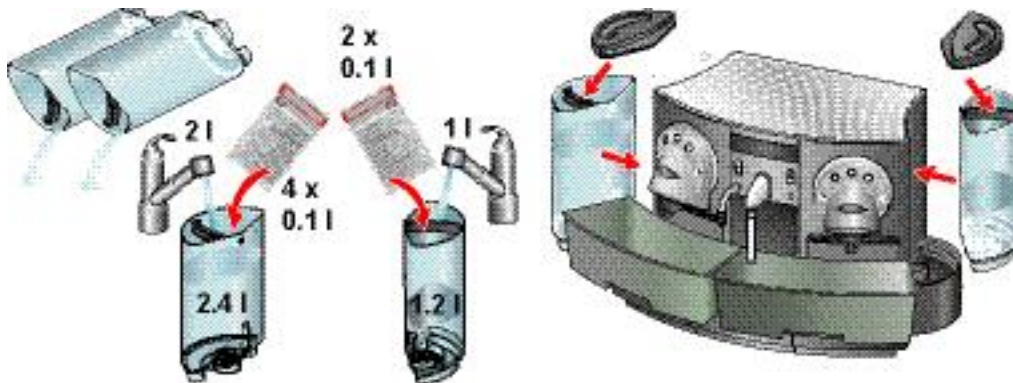


Example with power user menu:



1. Start descaling procedure.
The thermoblock which is responsible for steam production is cooled down.

☞ This step is skipped, if the thermoblock is cold already (e.g. after switch-on of the coffee machine).

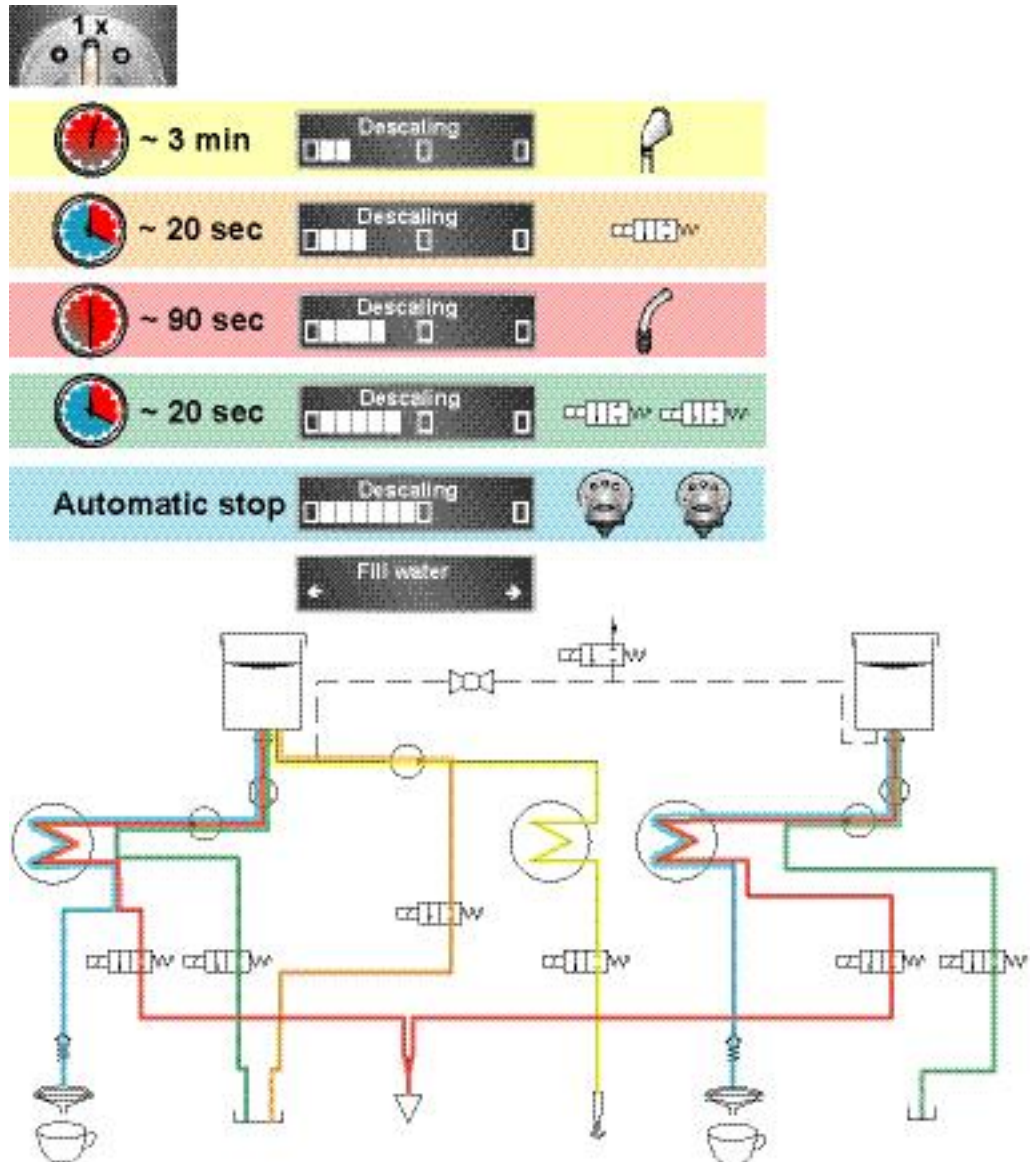


2. Remove and empty both water tanks.
3. Fill water tanks with indicated doses of descaling fluid and water.

☞ Use a measuring beaker to fill in water.

4. Insert water tanks in coffee machine.

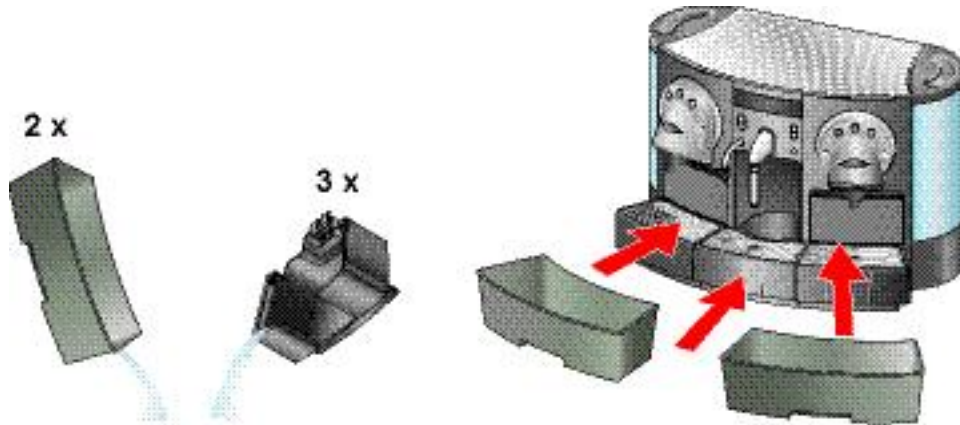
☞ Do not exchange left with right water tank by mistake.



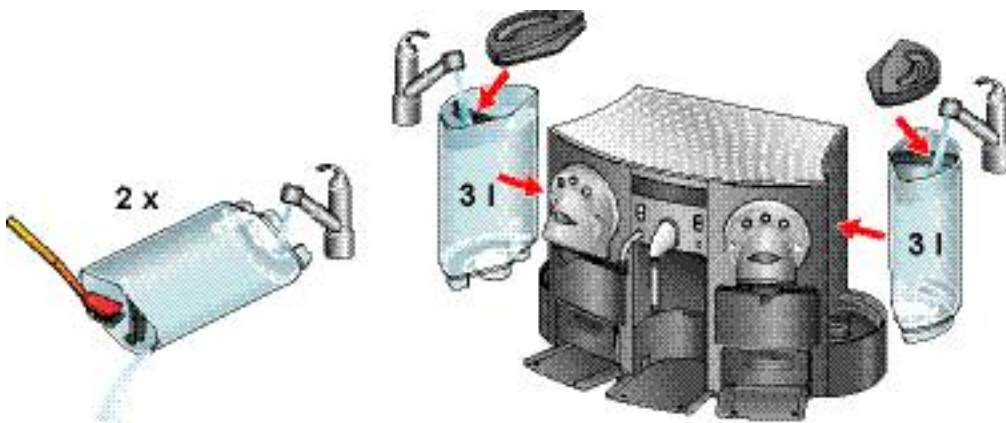
5. Continue descaling procedure by pressing a button.

Refer to illustration for descaling steps and fluid course:

- First the descaling fluid runs through the steam outlet into the receptable.
- Next the descaling fluid runs through the associated drip tray valve into the left drip tray.
- Next the descaling fluid runs through both hot water valves towards the hot water tube and into the receptable.
- Next the descaling fluid runs through both drip tray valves of the coffee units into the left and right drip tray.
- At the end the descaling fluid runs through both coffee outlets into the receptables until the water tanks are empty.



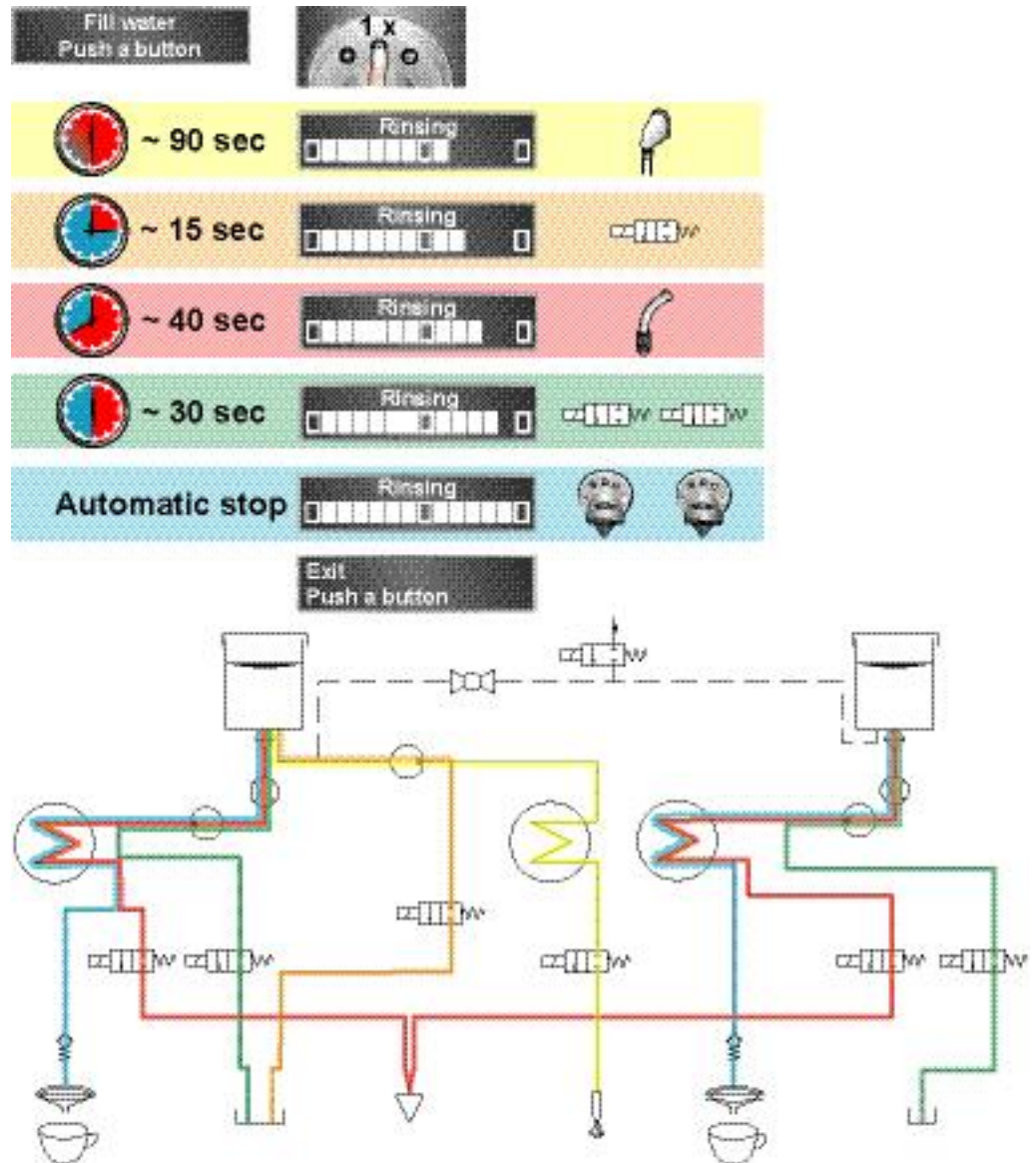
6. Empty all receptables and drip trays and reinsert them into coffee machine.



7. Empty water tanks and clean them thoroughly.
8. Fill water tanks with 3 l of fresh water each and insert them into coffee machine. The display message changes.



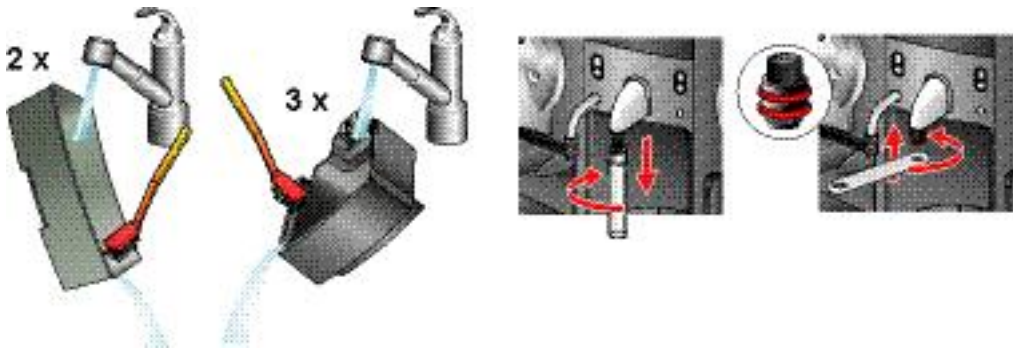
MAINTENANCE



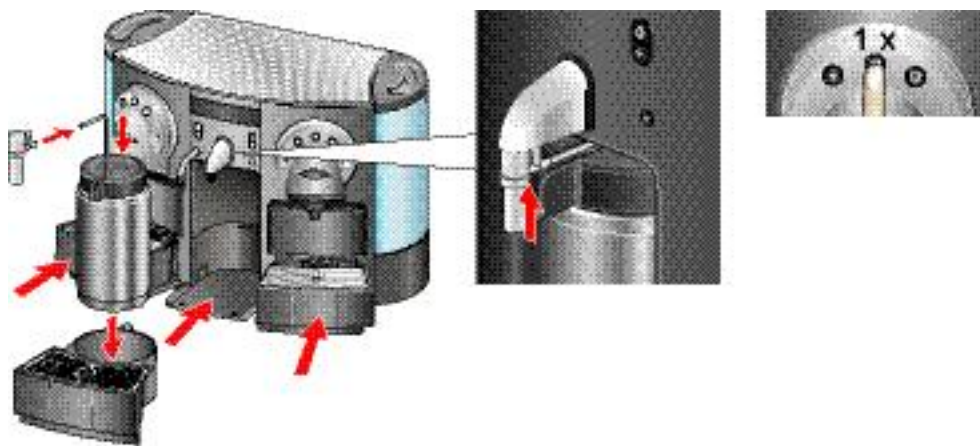
9. Start rinsing procedure by pressing a button.

Refer to illustration for rinsing steps and water course:

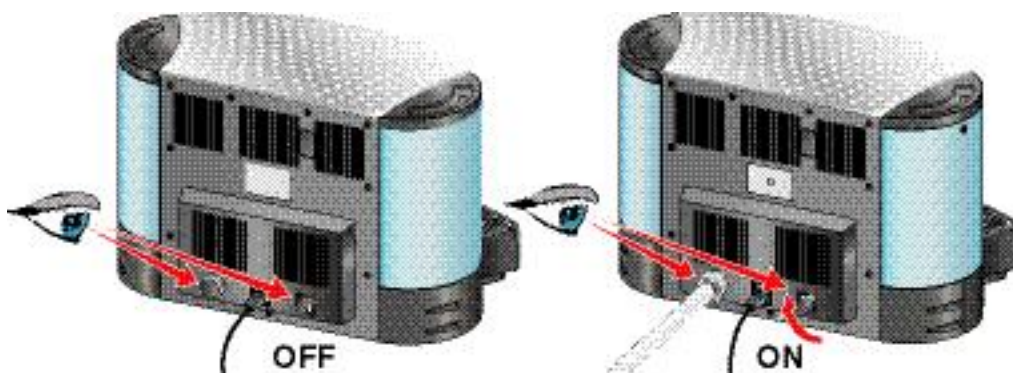
- First the water runs through the steam outlet into the receptable.
- Next the water runs through the associated drip tray valve into the left drip tray.
- Next the water runs through both hot water valves towards the hot water tube and into the receptable.
- Next the water runs through both drip tray valves of the coffee units into the left and right drip tray.
- At the end the water runs through both coffee outlets into the receptables until the water tanks are empty.



10. Empty and clean all receptacles and drip trays. Dry drip tray contacts.
11. Detach plastic tube from steam outlet and mount steam nozzle.



12. Reinsert drip trays with milk container in coffee machine.
13. Attach disposable foam device to steam nozzle.
14. Refill water tanks if coffee machine has no direct water connection.
15. Press button to start normal operation.



16. Check position of water tank connection valve: Only if a direct water connection is existing, set valve to ON.

End of the descaling and rinsing procedure for the CS220 coffee machine.



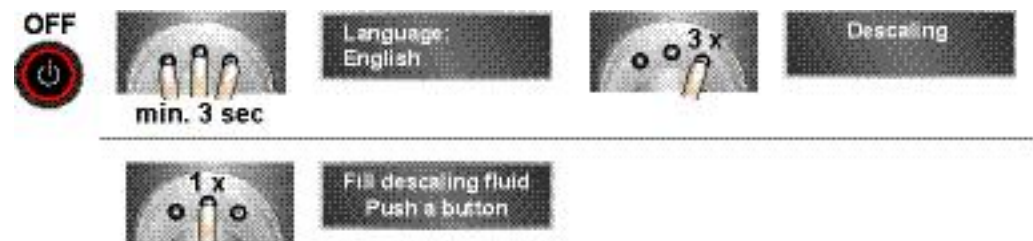
4.4.5 Descaling and rinsing procedure for CS200

The command "Descaling"

- can be started out of the power user menu only if the water filter setting is OFF (in the after sales menu),
- can be started out of the after sales menu anytime,
- performs the complete descaling and rinsing procedure.

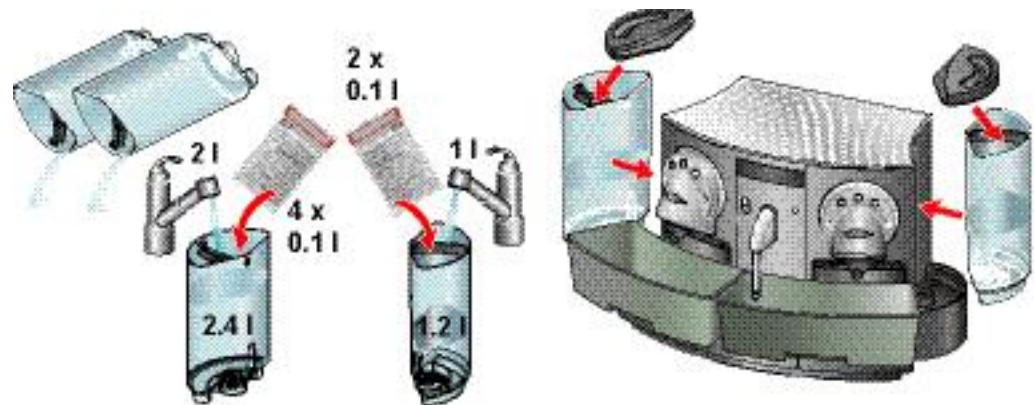
 A display message appears if user intervention is necessary.

Example with power user menu:



1. Start descaling procedure.
The thermoblock which is responsible for steam production is cooled down.

 This step is skipped, if the thermoblock is cold already (e.g. after switch-on of the coffee machine).

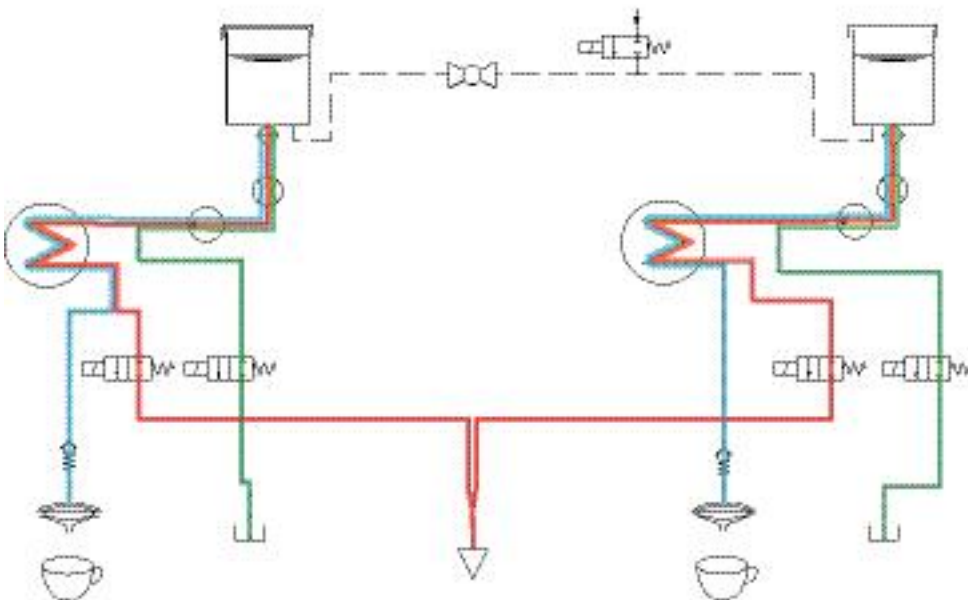
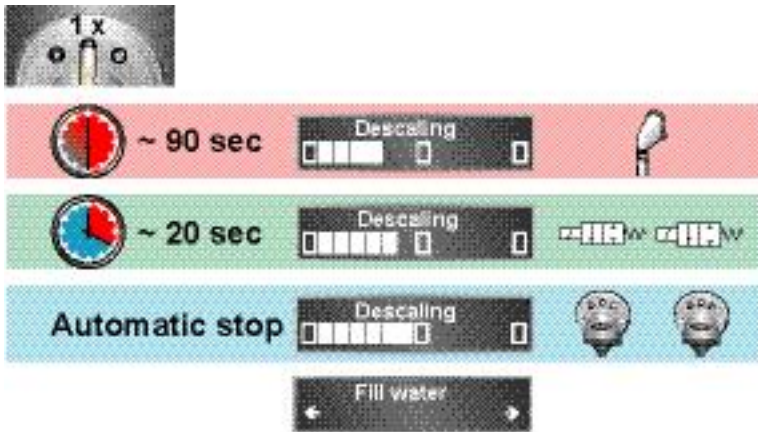


2. Remove and empty both water tanks.
3. Fill water tanks with indicated doses of descaling fluid and water.

 Use a measuring beaker to fill in water.

4. Insert water tanks in coffee machine.

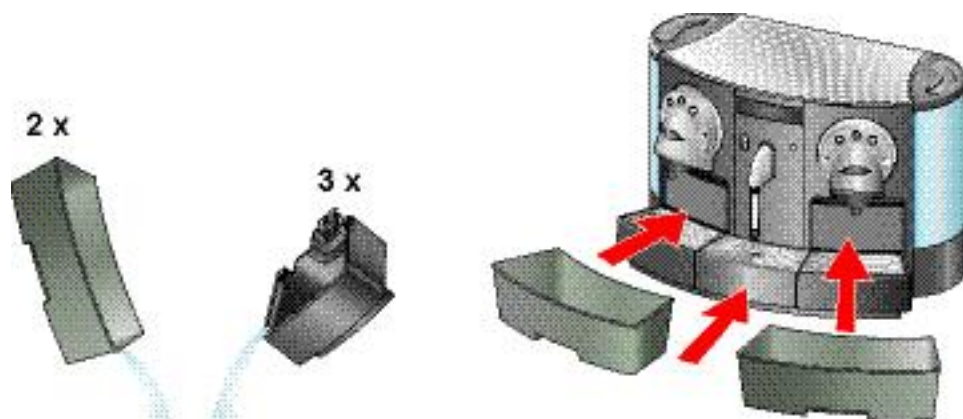
 Do not exchange left with right water tank by mistake.



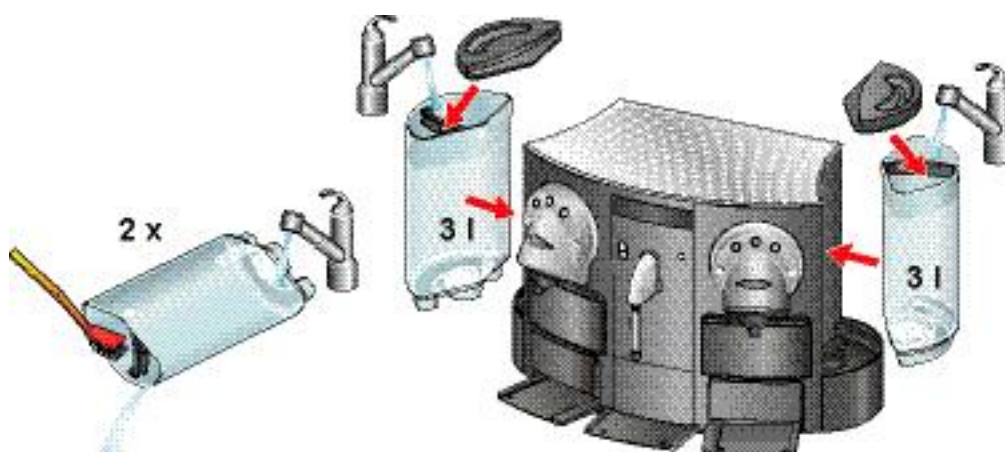
5. Continue descaling procedure by pressing a button.

Refer to illustration for descaling steps and fluid course:

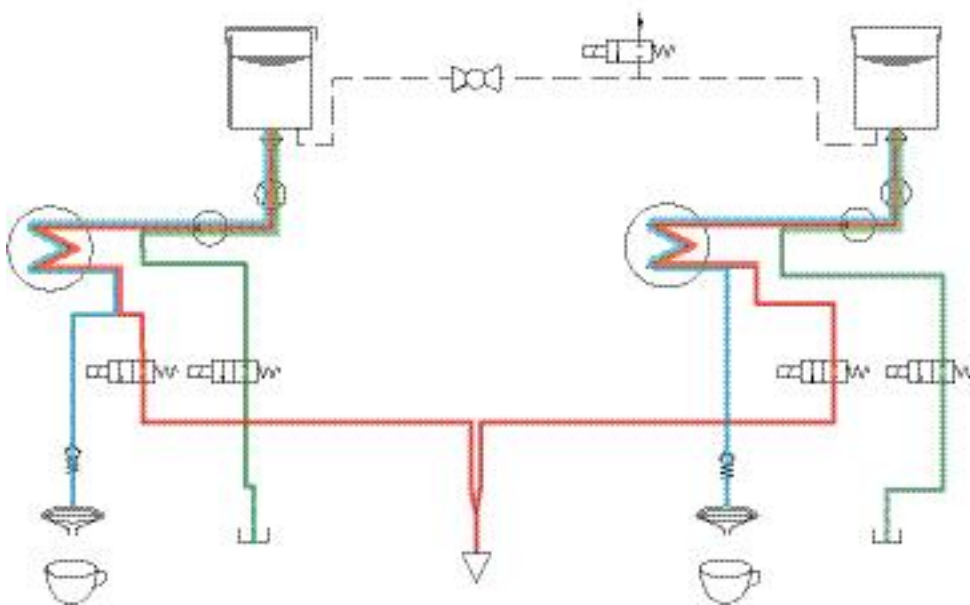
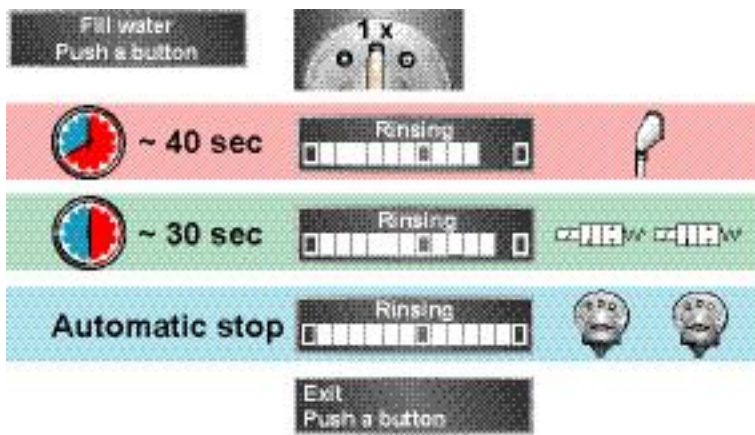
- First the descaling fluid runs through both hot water valves towards the hot water outlet and into the receptable.
- Next the descaling fluid runs through both drip tray valves of the coffee units into the left and right drip tray.
- At the end the descaling fluid runs through both coffee outlets into the receptables until the water tanks are empty.



6. Empty all receptables and drip trays and reinsert them into coffee machine.



7. Empty water tanks and clean them thoroughly.
8. Fill water tanks with 3 l of fresh water each and insert them into coffee machine.
The display message changes.



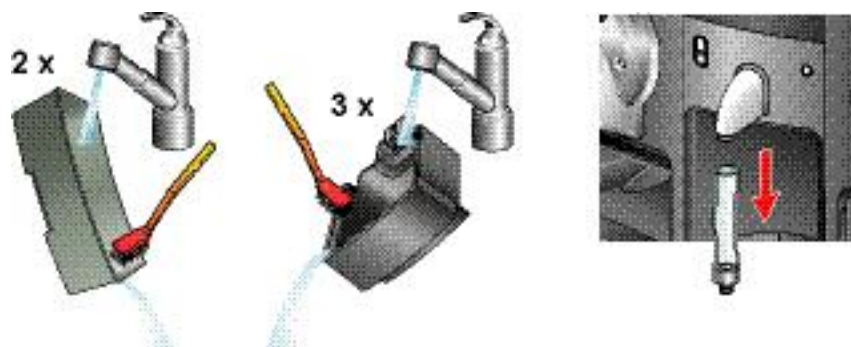
9. Start rinsing procedure by pressing a button.

Refer to illustration for rinsing steps and water course:

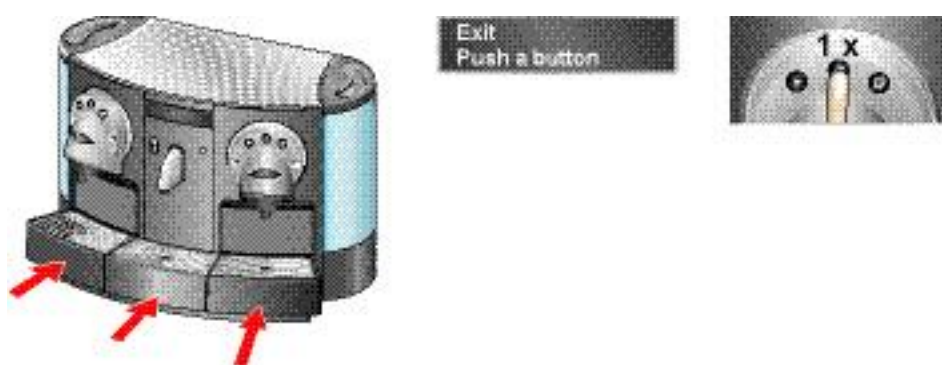
- First the water runs through both hot water valves towards the hot water outlet and into the receptable.
- Next the water runs through both drip tray valves of the coffee units into the left and right drip tray.
- At the end the water runs through both coffee outlets into the receptables until the water tanks are empty.



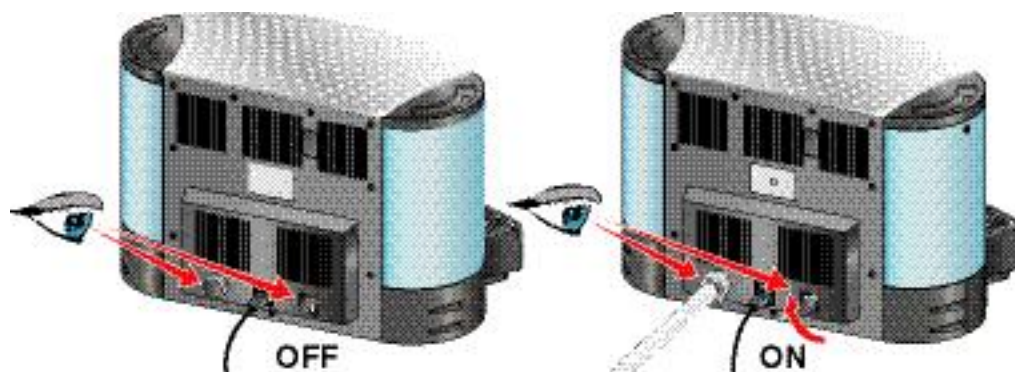
MAINTENANCE



10. Empty and clean all receptacles and drip trays. Dry drip tray contacts.
11. Detach plastic tube from hot water outlet.



12. Reinsert drip trays in coffee machine.
13. Refill water tanks if coffee machine has no direct water connection.
14. Press button to start normal operation.



15. Check position of water tank connection valve: Only if a direct water connection is existing, set valve to ON.

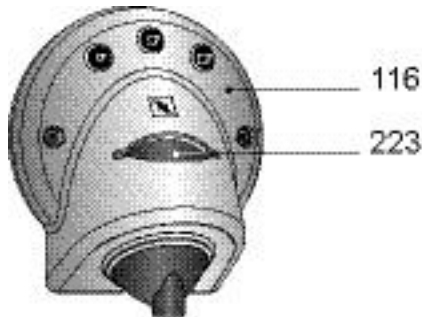
End of the descaling and rinsing procedure for the CS200 coffee machine.



4.5 Extraction unit maintenance

The extraction units are exposed to wear and tear during operation and contain wearing parts. Within the scope of a maintenance agreement it is advisable to exchange the wearing parts periodically.

4.5.1 Security check



⚠ Malfunction of the safety lid (223) can cause injuries!
Finger tips that are inserted in the capsule slot can be squeezed.

Whenever a faceplate (116) is detached during maintenance, the correct function of the associated safety lid (223) must be tested after reassembly.

Procedure

1. Insert an obstacle (e.g. screwdriver, pencil etc.) in the capsule slot.
2. Switch on mains switch and press stand-by button.
3. The coffee machine performs a self-test and closes/opens the extraction units.
4. As soon as the safety lid detects the obstacle, the concerning extraction unit stops and the display message "Machine blocked - call service center" appears.
5. Remove the obstacle.

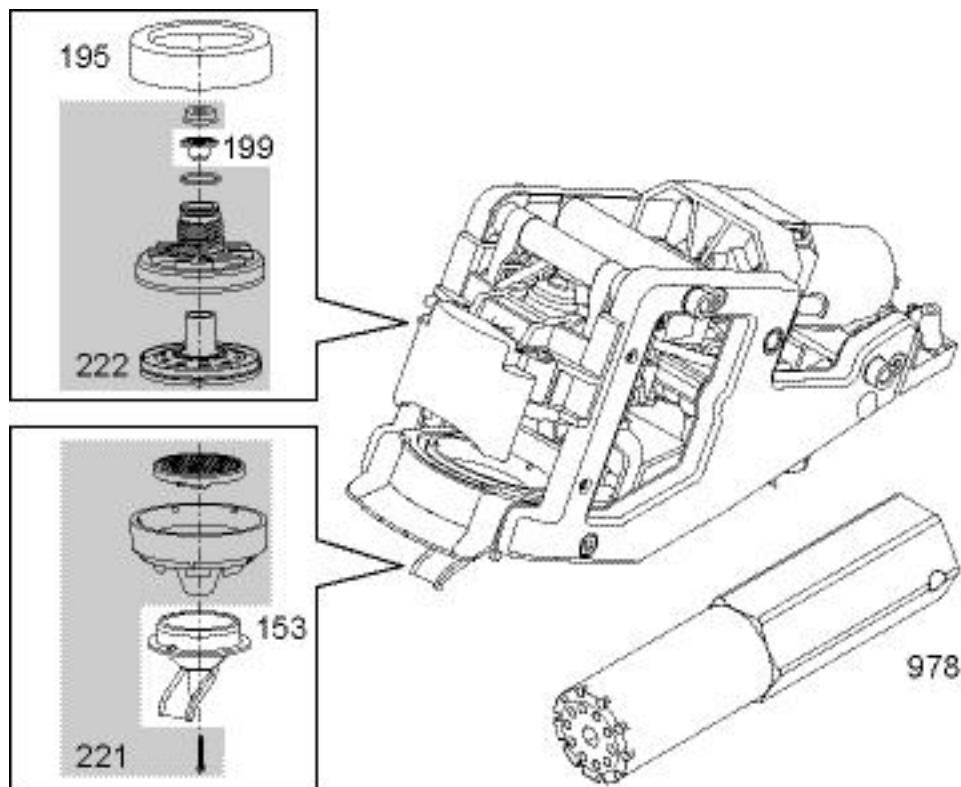
If the obstacle is clamped in the extraction unit or damaged:

- Check wiring of safety lid (223).
- Replace a defect safety lid (refer to page 88).
- Repeat security check.



4.5.2 Wearing parts

i The special mounting tool (978) is necessary to remove the shower, a part of the spare support plate (222).



Pos.	Designation	Replacement	
		mandatory	optional
153	Outlet 702, extract unit, black		X
195	Seal 758, extract head V2, black, 80 shore, 2x0.5mm, embossed		X
199	Thrust ring 702, seal, black, extract unit	X	
221	Spare kit pyramid plate 702/705	X	
222	Spare kit support plate 702/705		X
978	Mounting tool 702, alu (EFR no. 44269)	—	—

Keep in stock the following wearing parts: Pos. no. 195, 199, 221, 222

i Refer to "Replacing worn parts" on page 84.



Maintenance work after every 5000 coffee preparations per extraction unit:

- Replace pyramid plate and its support with set (221).
- Clean or replace coffee outlet (153).
- Clean brewing chamber and coffee outlet cover (117).



4.5.3 Lubrication of extraction unit

Specified lubricant for extraction unit



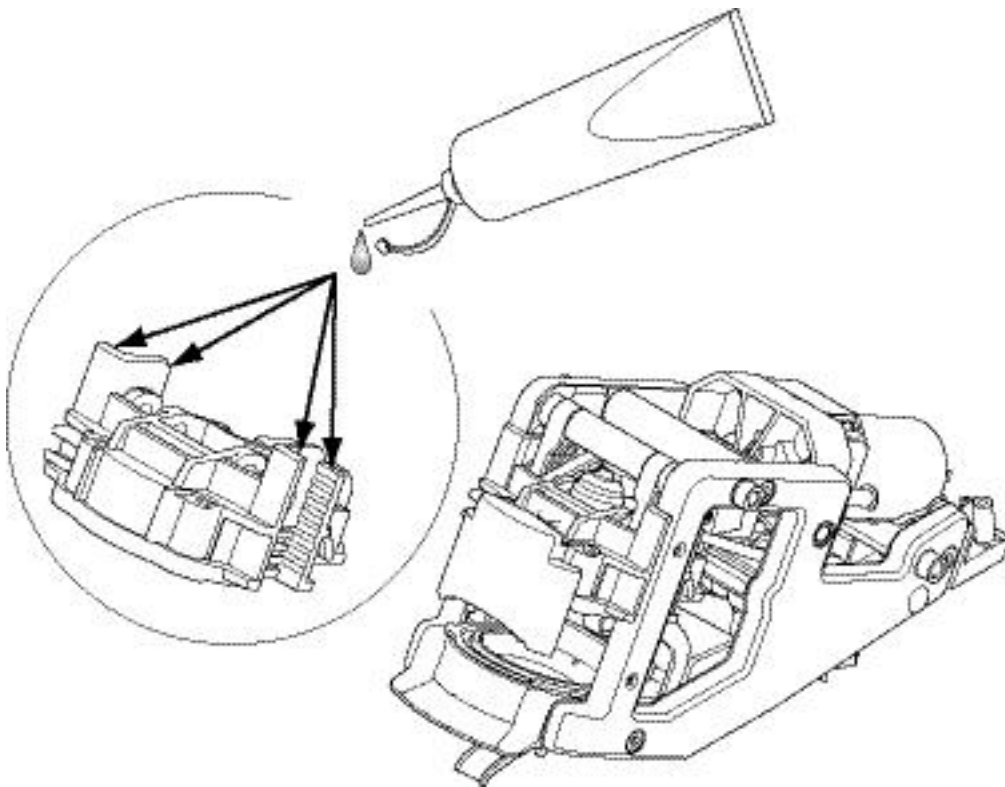
Molykote PG65 Plastislip, art. no: 01945866



Use only specified lubricant!
Improper lubricants can decrease the service life of the extraction unit.

Use this lubricant for **vertical guiding ways** and **2nd generation motor spindles** only.

Vertical guiding ways



Lubricating points on extraction unit

Lubrication intervall

Production date	all generations
Lubrication	after every 10'000 coffee preparations


Procedure

1. Remove extraction unit (refer to page 86).
2. Lubricate the vertical guiding ways with a little grease.
3. Check smooth and quiet running of mechanism.



Motor spindle


Due to further development, there exist 3 different spindle models:

Spindle	1 st generation	2 nd generation	3 rd generation
Production date	till end of March 2007	April 2007	under development
Appearance	plastic spindle	metallic spindle	coated metallic spindle
Lubrication	NO (see below) 	NO (except if noisy)	NO

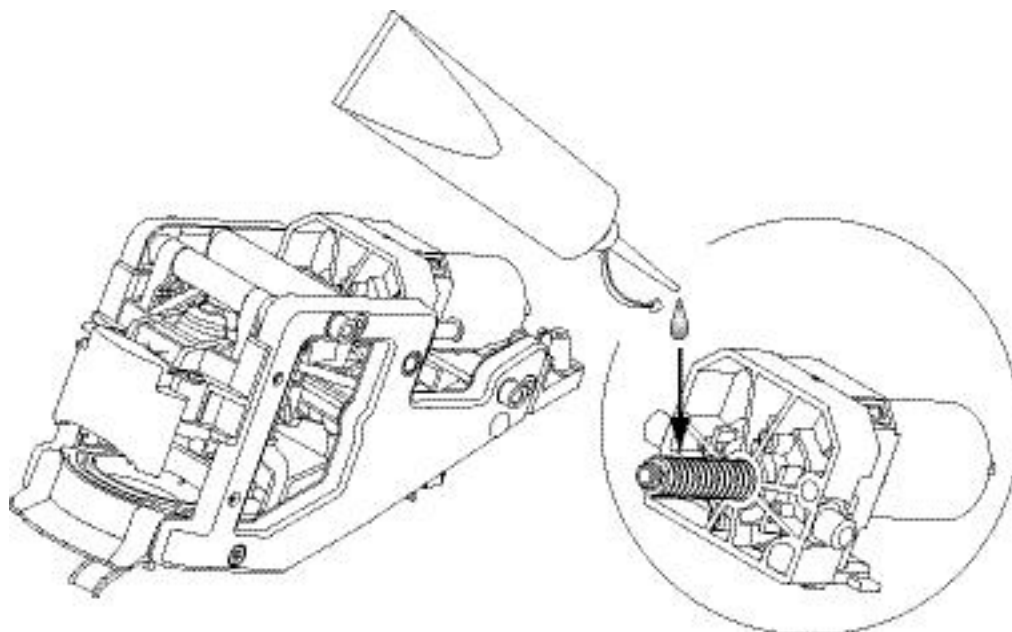


Replace a plastic spindle after 10'000 coffee preparations with kit "metallic spindle and grease", EF no. 0050973.

Lubrication of 2nd generation spindle (if noisy)

 Do not lubricate a plastic motor spindle!

This type of motor spindle is self-lubricating. Lubricants can cause cracks and breakage.



Spindle lubrication

Procedure

1. Remove extraction unit (refer to page 86).
2. Lubricate a noisy motor spindle (2nd generation only) with a little grease.



5 TROUBLESHOOTING

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

5.1 Check list

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	<ul style="list-style-type: none"> • Replace damaged or broken housing parts • Replace a damaged power cord
2 Inspect accessory parts (milk container, water tanks, capsule containers, drip trays)	<ul style="list-style-type: none"> • Replace incomplete, damaged, broken or missing accessories • Clean dirty or bad smelling accessory parts (use only detergents that do not affect plastic) • Clean and polish corroded contact surfaces of drip trays • Remove filter cartridges from water tanks
3 Fill water tanks	<ul style="list-style-type: none"> • Check tightness of water tank valves • Replace leaking water tank(s)
4 Prepare coffee machine for operation and switch on mains switch	<p>If stand-by button is not red backlighted and no cup lighting is visible for some seconds:</p> <ul style="list-style-type: none"> • Check mains voltage • Check power cord • Check thermo fuses • Check secondary voltages of transformer
5 Read data with Service Stick (refer to the procedure on Service Stick manual)	<ul style="list-style-type: none"> • Connect, verify software version, update if necessary • Save machine's data on PC (machine follow-up) • Analyse machine's data
6 Turn machine on (press stand-by button)	<ul style="list-style-type: none"> • Check display for messages
7 Prepare <ul style="list-style-type: none"> - coffee (both coffee outlets) - hot water - steam (CS220 only) 	<ul style="list-style-type: none"> • Check display for messages • Check capsule insertion and ejection • Check if coffee machine is leaking
8 Perform function tests (see page 132)	
9 Check the coffee unit counters using the Service Stick (refer to chapter "Statistic" in the Service Stick manual)	<ul style="list-style-type: none"> • If machine has reached 5'000 coffees (per extraction unit), replace extraction chamber parts (pyramid plate and coffee outlet)
10 Descale coffee machine if necessary (see page 45)	
11 Save statistic data on PC (refer to the procedure on Service Stick manual)	
12 Clean coffee machine (see page 41)	
End of check list	




5.2 Diagnostic with Service Stick

i The Service Stick is an optional accessory for initial operation, maintenance and after-sales service of the coffee machine. It is programmed with the Client PC Software.

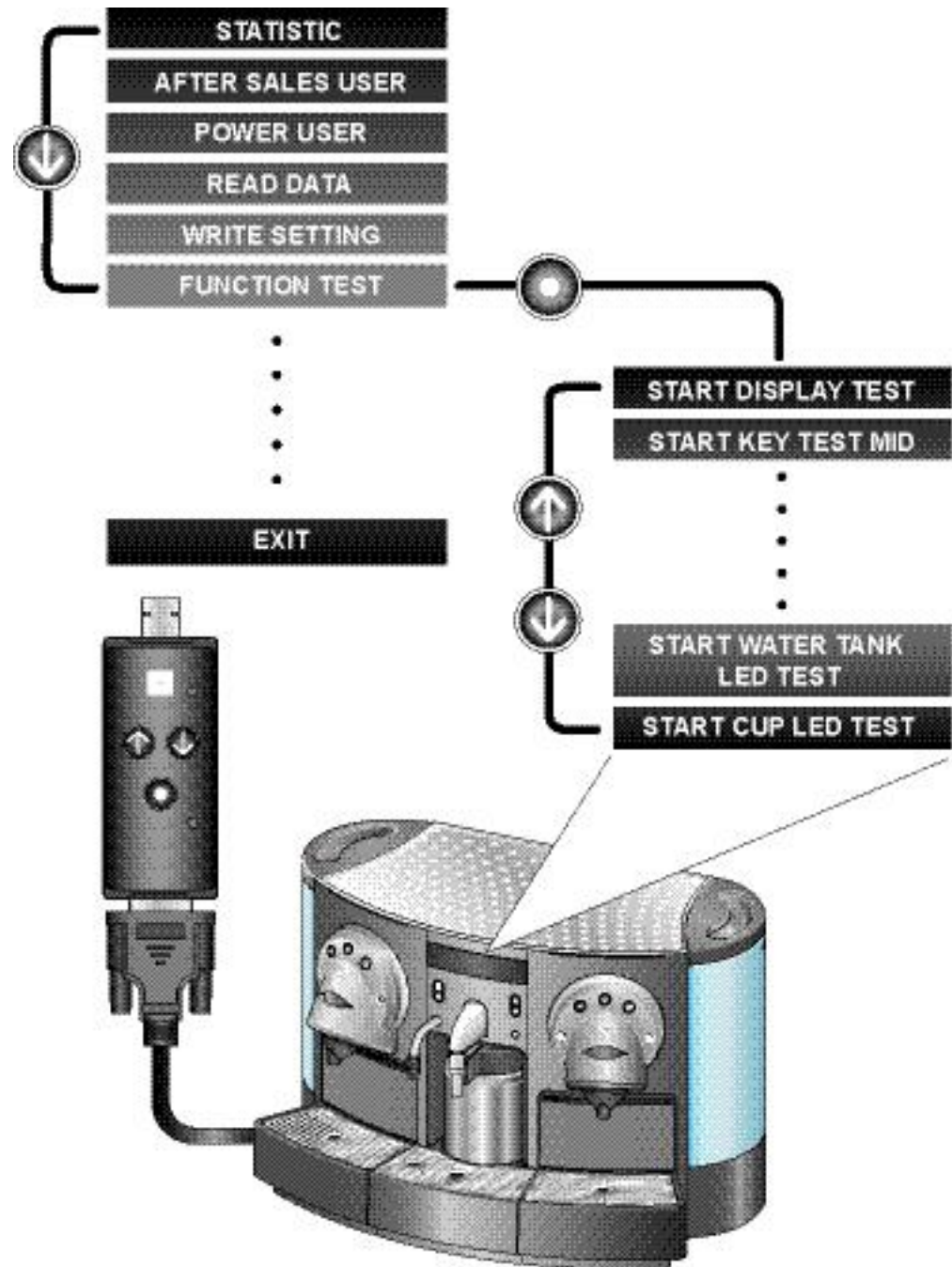
With the help of the Service Stick

- a quick and simple function test of the operating elements is possible,
- statistic data can be retrieved and displayed.

 Refer to the Service Stick user manual for detailed instructions and explanations.

5.2.1 Function test menu

i Depending on the software version, this menu example is subject to alterations.





Use the function test menu to test the


- display,
- buttons (without stand-by button and mains switch),
- Led-lighting of buttons, coffee cups and water tanks.

5.2.2 Statistic data

Statistic data are a summary of operational data like the count of various counters, which are stored in the coffee machine. With the analysis of statistic data the maintenance rate can be appointed and preventive maintenance can be carried out.

With the help of the Service Stick, statistic data can be

- displayed at the coffee machine line by line,
- stored and transferred to a computer.

 **The coffee machine displays only a counter number and the linked value. For an explanation of these counter numbers see the following example or refer to the Service Stick user manual.**


Example of a CS220 statistic data file (excerpt)


```
001; ---- CUSTOMER -----
002; customer number;6
;      ; ( Name: Mr MULLER
;      ; Firm: MULLER &Co
;      ; Address: Muller address
;      ; Phone 1: +41 (0) 123 56 66
;      ; Phone 2: +41 (0) 123 56 67
;      ; Fax: +41 (0) 123 56 68
;      ; Mobile:
;      ; eMail: muller@mullercompany.com
;      ; )
003; first install date;D:20 M:04 Y:2006

004; ---- HEAD -----
005; software version main;EF702M V03.08
006; software version display;EF702D V03.04
007; software / parameter updated;D:13 M:12 Y:2006
008; machine code;2EEE20A4

009; ---- PRODUCTION -----
010; machine number;0
011; parameter version main;65278
012; production date;D:06 M:11 Y:2005

013; ---- Intake Counters -----
014; Counter_01: Total of Ristretto cup left;27
015; Counter_02: Total of Espresso cup left;23
016; Counter_03: Total of Lungo cup left;12
017; Counter_04: Total of Ristretto cup right;25
018; Counter_05: Total of Espresso cup right;22
```

 Statistic data can be compared with an odometer in a car. They give information about the working life of the coffee machine.

 This statistic data file example is subject to alterations.



019; Counter_06: Total of Lungo cup right;9
 020; Counter_07: Total of coffees without capsule left;6
 021; Counter_08: Total of coffees without capsule right;9
 022; Counter_09: Total of steam intakes;118
 023; Counter_10: Total of hot water intakes;130
 024; Counter_11: Total of all coffees left (servicecounter);62
 025; Counter_12: Total of all coffees right (servicecounter);56
 026; Counter_13: Total of steam time (min);21
 027; Counter_14: Total of hot water volume (dl);166

028; ---- Cleaning -----
 029; Counter_15: Total of cold start rinsing left & right;3
 030; Counter_16: Total of coffee water + rinse water left (dl);1
 031; Counter_17: Total of coffee water + rinse water right (dl);1

etc.


Important counters out of statistic data

The values of the following counters are important for maintenance planning:

Intake Counters	
Counter_11	Total of all coffees left (service counter)
Counter_12	Total of all coffees right (service counter)
Counter_13	Total of steam time (min), CS220 only
Counter_14	Total of hot water volume (dl)

5.3 Error messages

The coffee machine displays only three real error messages. The other messages concern operating errors or service notes (refer to "Display messages" on page 25).

 **Bear in mind that more than one error can occur at the same time. The display shows the most important message first.**

5.3.1 Descaling needed - call service center

When the display message "Descaling needed" is ignored, the coffee machine locks up as protective measure after a determined water consumption of 10 litres (see "Water hardness" in "After sales menu points" on page 32).

The buttons of both coffee units and the capuccino unit turn to red.

Remedy

- Perform descaling instantly (see page 45).

 **You can use the menu point "Descaling" either out of the power user menu or out of the after sales menu.**

i This cause of trouble can be reduced, if water filters are used (descaling only once a year).

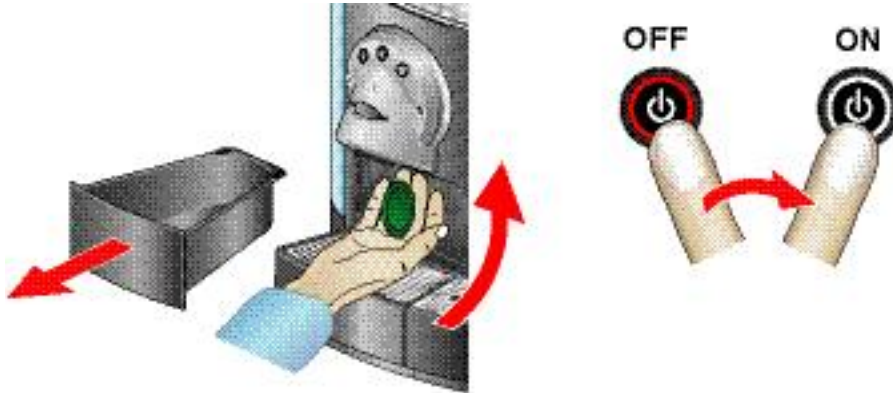
i After descaling, the coffee machine de-blocks automatically.




5.3.2 Capsule not ejected - call service center

This error message appears after coffee preparation, if no ejected capsule has been detected by the light barrier under the extraction unit. After 3 unsuccessful ejection attempts, the concerning coffee unit will be locked and its coffee buttons turn to red.

Quick fix



 Instruct customer by phone to perform this quick fix.

- 1) Remove capsule container of locked coffee unit.
- 2) Reach into ejection hole and detach stuck capsule.

 **There is no risk of getting hurt or burned.**

- 3) Reset coffee machine: Switch stand-by button OFF and ON again to resume operation.


 **Do not reset coffee machine without removing the stuck capsule first completely. If parts of a damaged capsule remain in the coffee extraction unit, this error can reappear.**

Additional measures (if safety lid is open)

1. Lit through capsule slot into brewing chamber with a pocket lamp.
2. Insert tea-spoon etc. through capsule slot and remove foreign object(s) completely and carefully.


 **Pay special attention to the shower at the top of the brewing chamber.**

3. Reset coffee machine: Switch stand-by button OFF and ON again to resume operation.

 Check ejector mechanism of extraction unit, if error happens again (refer to "Extraction unit" on page 84).



5.3.3 Machine blocked - call service center


 For fault localization, check first which buttons of the coffee/capuccino units turn to red in combination with this error message.

Possible reasons:

- Defective NTC temperature sensor on thermoblock
- NTC temperature sensor is not fixed
- Thermoblock defective
- Flow meter defective
- Micro switch of safety lid defective
- Motor of extraction unit blocked or defective

Remedy:

- Check the history bit counters in the statistic data file (refer to Service Stick manual).

 Every problem that leads to a "machine blocked" message is tracked and monitored by history bits. For each history bit, two counters are in use: one which cannot be reset, and a resettable one.

Example of history bit counters (excerpt)

```
075; ----- History Bit counters -----  
076; NTC short (left side);0  
077; NTC disconnected (left side);0  
078; brew unit can't reach a position (left side);0  
079; not possible to initialize the brew unit (left side);0  
080; Brew unit door switch (left side);0  
081; flowmetertimeout (left side);0  
082; flowmetertimeout by rinsing (left side);0  
083; heating up error by coldstart (left side);0  
084; Capsule was not possible to throw off (left side);0  
085; Decalc Alert Level 2 (left side);0  
086; NTC short (right side);0  
087; NTC disconnected (right side);0  
088; brew unit can't reach a position (right side);0  
089; not possible to initialize the brew unit (right side);0  
090; Brew unit door switch (right side);0  
091; flowmetertimeout (right side);0  
092; flowmetertimeout by rinsing (right side);0  
093; heating up error by coldstart (right side);0  
094; Capsule was not possible to throw off (right side);0  
095; Decalc Alert Level 2 (right side);0  
096; NTC short (middle);0  
097; NTC disconnected (middle);0  
098; heating up error by coldstart (middle);0  
099; Decalc Alert Level 2 (middle);0  
100; descaling aborted;0  
101; Direct water problem;0
```

i This excerpt of a statistic data file is subject to alterations.



5.4 Drip tray display messages

The left and right drip tray, as well as the middle drip tray of the CS200 coffee machine have contacts that are inserted in a contact bank for water level and attendance detection. These contact points can be the reason of irrational display messages concerning the drip trays.

Erroneous display message and possible reasons

No drip tray

Consequence of corroded or defective contact(s):

- Contacts can corrode if exposed to a descaling agent.
- A deformed contact bank can be the reason for defective contacts.

Drip tray full

- Consequence of wet and short-out contacts by water drops (rarely reason, eg. after cleaning the drip trays).
- An internal leak can affect the cable connectors of the contact bank wiring.

Remedy:

1. Inspect contacts on drip tray:
Dry, clean and polish contacts with a emery paper if necessary.
2. Inspect associated contact bank in coffee machine:
Dry, clean and align contacts. Replace a corroded contact bank, refer to
- "Replacing left / right contact bank" on page 83,
- "Replacing middle contact bank" on page 104.
3. Check coffee machine for water leaks (see page 140).

Instruct customer to

- **dry contacts after cleaning the drip trays,**
- **clean drip tray contacts carefully and immediately after descaling.**

5.5 Coffee capsule falls through

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

Possible reasons:

- The extraction unit is not opened completely.
- The limit stop or the ejector in the extraction unit is stucked or damaged.

Remedy:

- Check for stucked capsule(s) in extraction unit (refer to "Capsule not ejected - call service center" on page 67).
- Check ejection mechanism.
- Replace complete extraction unit if defective.



5.6 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.

5.7 No or too less steam for milk preparation

Possible reasons:

- The steam nozzle is clogged.

Milk residues can curdle and clog the steam nozzle outlet.

- The cappuccinatore unit is calcified.
- An internal leak can reduce the rate of steam flow.

Remedy:

- Unscrew steam nozzle. Clean nozzle or replace steam nozzle.

Inform customer to clean steam nozzle with a steam jet periodically (see "Daily maintenance and cleaning" on page 41).

- Perform descaling.
- Check for leaks and replace faulty parts (refer to "Performance checks for cappuccinatore unit (CS220 only)" on page 143).

5.8 Noisy extraction unit

Abnormal noises (grumbling) during the opening and closing of the extraction unit.

Possible reasons:

- Dry running guiding ways in extraction unit.
- Drive unit defective (electric motor with gear box)

Remedy:

1. Remove extraction unit (refer to "Extraction unit" on page 84) and check if mechanism is running smoothly and quietly.
2. Overhaul and grease extraction unit if necessary (refer to "Lubrication of extraction unit" on page 61).



5.9 Direct water connection problems

Stick to the following procedure if the direct water connection does not work after installation.

Check water supply installation

- Machine correctly connected to the cold water supply?
- Water supply opened?
- Water pressure within limits (0.8 - 10 bar)?
- No-return valve mounted inversed?
(See arrow head or similar sign on housing.)


Check coffee machine setting

- Water tank connection valve set to ON?
- Menu point "Direct water" set to ON in after sales menu?


Check if coffee machine is clogged


The water circuit of the coffee machine is

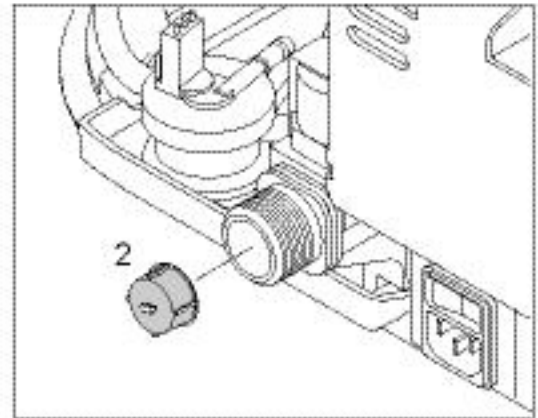
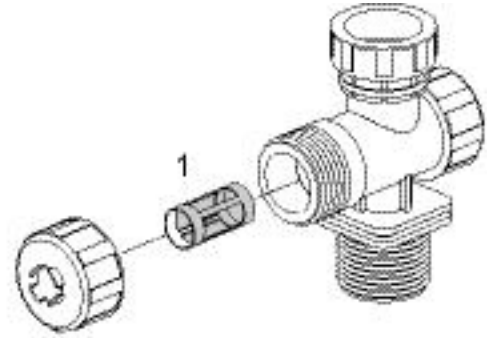
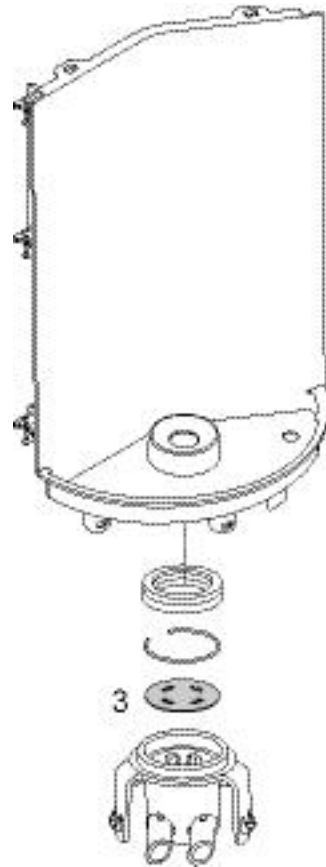
- susceptible to floating particles,
- protected by filter elements that can be clogged.

 **Especially a high water consumption with a direct water connection can lead to clogging-up. Therefore an additional filter in the water pipe of the direct water connection is recommended.**

For a troublefree flow of water it is necessary to inspect and clean all filter elements regularly.

 **Rinse water supply pipe first, if it was not used for a long time! Dirty water can clog the coffee machine.**

 **Close connection to water supply first, when checking the filter elements.**



- 1) External water filter (example)
- 2) Filter insert in direct water solenoid valve
- 3) Mesh bottom in valve lifters (2x)

 **For maintenance of an external water filter, refer to the supplier documentation.**



6 REPAIRS

These repair instructions

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

🔧 As a rule, identical components (eg. pumps, thermoblocks etc.) are presented in detail only once.

⚠️ This chapter contains special safety and assembly notices. Disregarding them may lead to injuries and damages.

6.1 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 (all thermoblocks in particular).

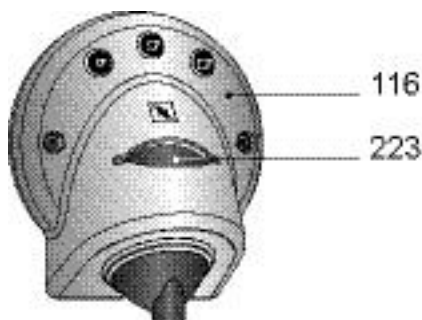
Let coffee machine cool down before disassembly.



Danger of flooding in regard to the direct water connection!

During repair of the coffee machine on-site, turn off and lock stop valve of direct water connection. Attach a danger sign to prevent unauthorized operation.

6.1.1 Security check



⚠️ Malfunction of the safety lid (223) can cause injuries! Finger tips that are inserted in the capsule slot can be squeezed.

Whenever a faceplate (116) is detached during service or repair, the correct function of the associated safety lid (223) must be tested after reassembly.

Procedure

1. Insert an obstacle (e.g. screwdriver, pencil etc.) in the capsule slot.
2. Switch on mains switch and press stand-by button.
3. The coffee machine performs a self-test and closes/opens the extraction units.
4. As soon as the safety lid detects the obstacle, the concerning extraction unit stops and the display message "Machine blocked - call service center" appears.
5. Remove the obstacle.



If the obstacle is clamped in the extraction unit or damaged:

- Check wiring of safety lid (223).
- Replace a defect safety lid (refer to page 88).
- Repeat security check.

6.2 General

6.2.1 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 the exploded drawings in chapter "Exploded drawings" on page 146.

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. Added position numbers in brackets refer to similar, mirror-inverted parts not shown in the illustration.

See separate spare parts list for corresponding spare part numbers.

 **Distinguish between spare parts of the CS220 and CS200 coffee machine.**

Electrostatic discharge protection

When installing a new printed circuit board, the service technician must be earthed with a grounding band.

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 from hot parts - use existing cable clips.

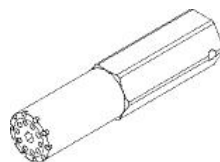
Residual water

- 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.
- A special procedure is necessary to empty the fluid system of the coffee machine for repair or shipment:
 1. Check if there is no display message "Drip tray full". Empty full drip trays if necessary.
 2. Switch machine to stand-by (stand-by button turns red after shut-down procedure).
 3. Remove both water tanks.
 4. Press and hold for 5 s: Portion and fill up buttons for hot water together with middle coffee button "medium cup" of right coffee unit.

6.2.2 Tools and accessories

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

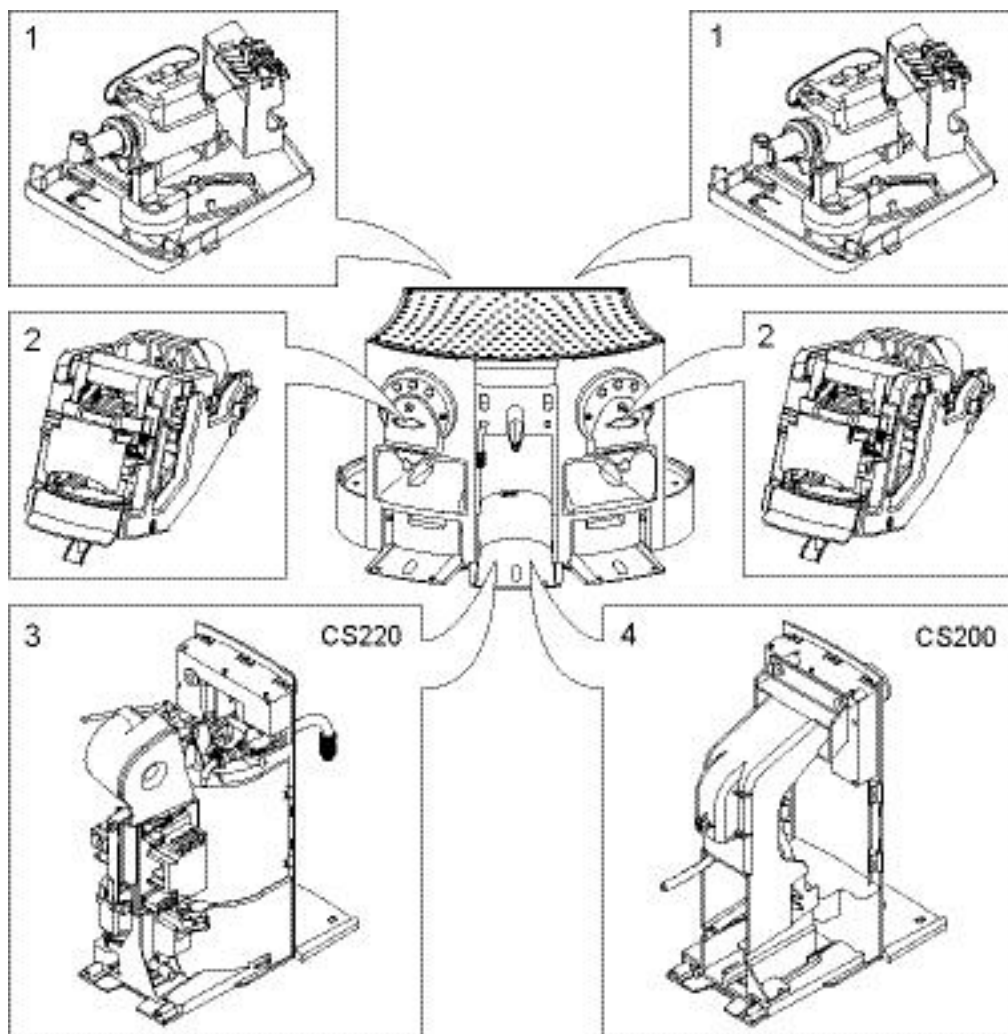
- TORX-screwdriver set TX6, TX10, TX15, TX20, TX25, TX30 (can be substituted partly by torx bits of special mounting tool)
- Slotted screwdriver no. 4
- Phillips (cross tip) screwdriver no. 0
- Flat wrench, span 14 mm, 10 mm AF
- Flat wrench, span 8 mm
- Long-nosed pliers
- Straight tweezers with long, fine tips
- O-ring pick with hook
- Torch
- Beaker and towel
- Special mounting tool with Torx bits (pos. no. 978, EF article no. 0044269) for shower in extraction unit





6.2.3 Overview of plug-in modules

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



Position	Module	Components	Reference
1	Coffee pump / flow meter modul	Pump	page 79
		Flow meter	
		Contact bank	
2	Extraction unit	Wearing parts	page 84
		DC motor	
		Spindle	
3	Hot water / steam module (CS220 only)	Keyboard	page 90
		Thermoblock	
		Pump	
		Cappuccino module pcb	
4	Hot water module (CS200 only)	Micro switches	page 100
		Keyboard	
		Contact bank	

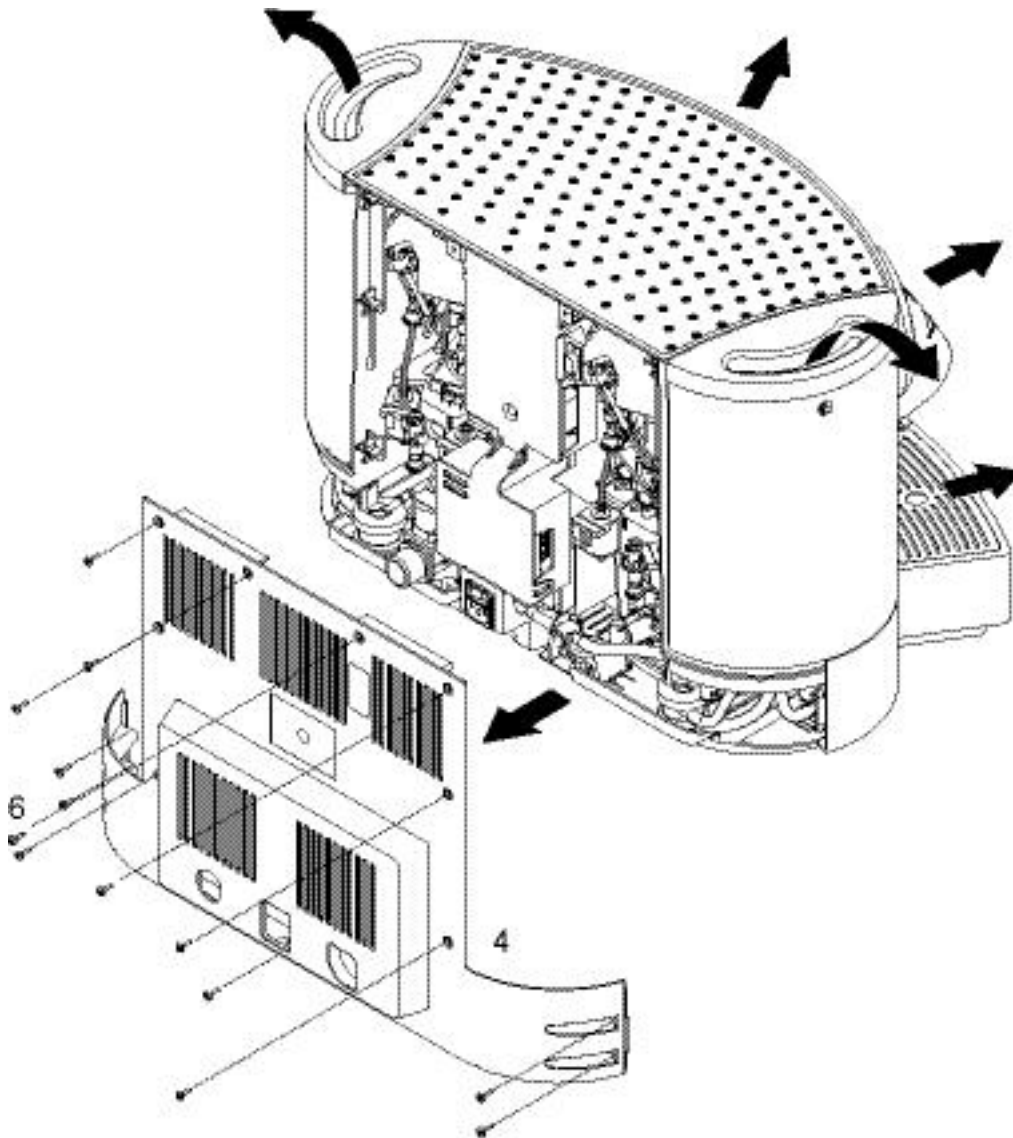


6.3 General disassembly

This subchapter gives information how

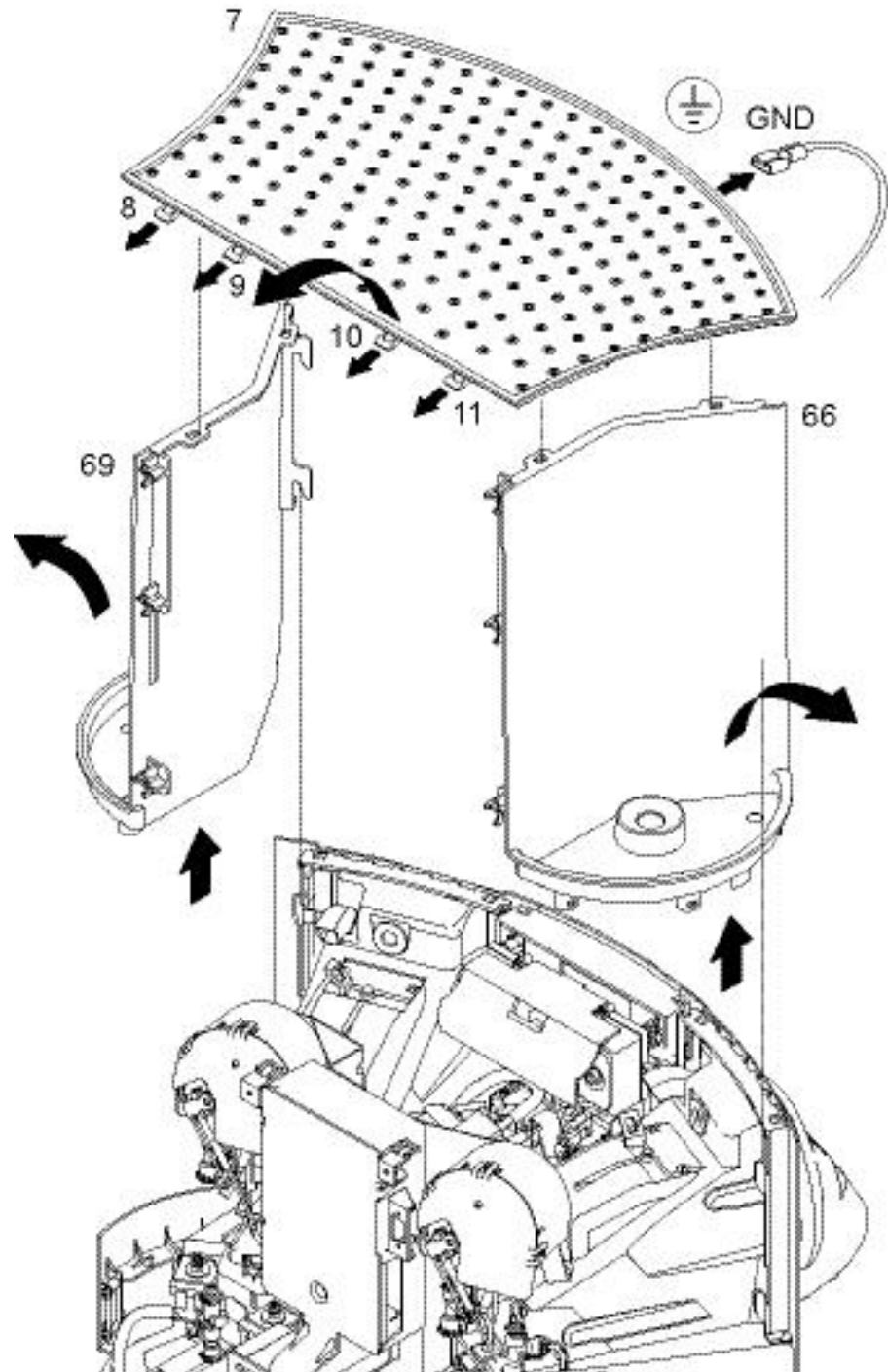
- to open the casing of the coffee machine for a basic inspection and leakage check,
- the parts of the casing are mounted.


6.3.1 Opening the casing




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

1. Remove power cord and all accessories first: water tanks, drip trays and capsule containers.
2. Unscrew cover from direct water connection and turn water tank connection valve to position ON (align lever with aperture in back wall).
3. Unscrew all 13 screws (6) and remove back wall (4).



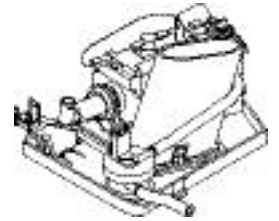
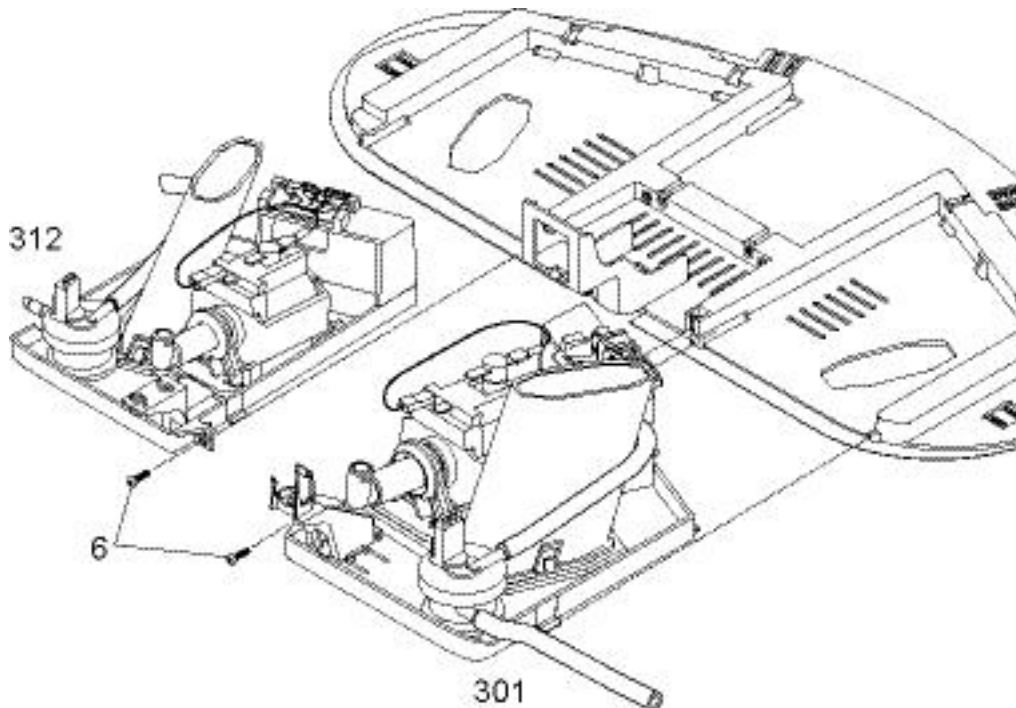
 When laying down the water tank supports (66, 69), do not tension the wiring of the water tank lighting.

4. Use long-nosed plier or a flat plier to pull out 4 locking levers (8, 9, 10, 11) under the heating plate (7).
-  **The locking levers are attached with elongated holes to the heating plate and have a limit stop.**
5. Lift heating plate (7) a little at the backside until all lateral pins are out of the positioning holes. Then lift remaining pins out of the positioning holes at the front side.
 6. Detach ground wire at the underside of the heating plate (7).
 7. To get access to lateral placed components of the coffee machine: Simply lift right and left water tank supports (66, 69) out of the anchoring.

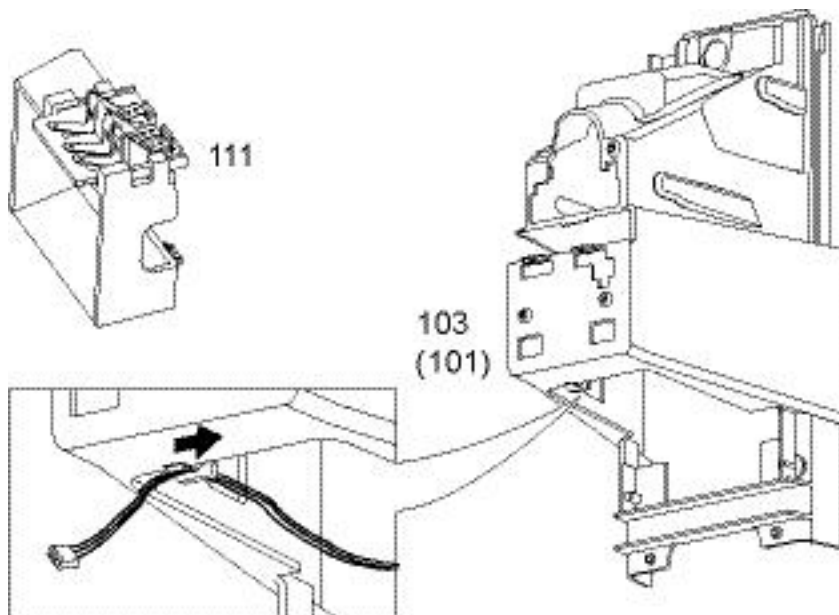


6.4 Coffee pump / flow meter module

6.4.1 Removing coffee pump / flow meter module



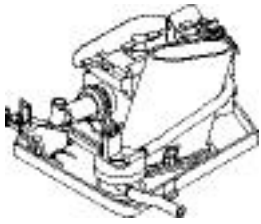
- Loosen screw (6) and pull out drawer (301 or 312) partially.
- Disconnect resp. disassemble all restricting cable and hose connections.



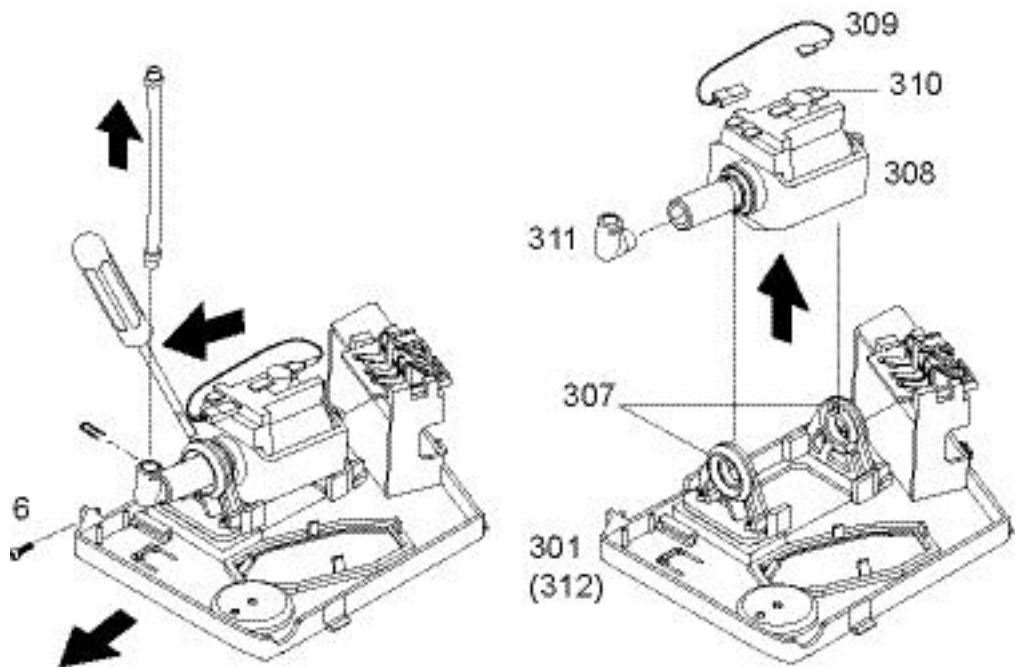
- ☞ The wiring of contact plate (111) is fixed with a cable clip at the underside of the extraction unit holder (103 or 101). Make sure to remove wiring from cable clip before pulling out drawer.



6.4.2 Replacing coffee pump



i The pump on the right coffee pump / flow meter module is illustrated as example.



Pos.	Designation
301	Drawer 702, right, black
312	Drawer 702, left, black
307	Pump holder 680, black, 64 sh, D13,5mm
308	Pump CP.04.117.0/ST/S/P, 230V 50Hz, light blue, professional, V2
309	Thermostat 115C/10,0A 1NT01L, connection 2xFZ6,3x0,8mm, straight
310	Clip thermostat, 1NT/01
311	Fluid connection elbow 702, neutral

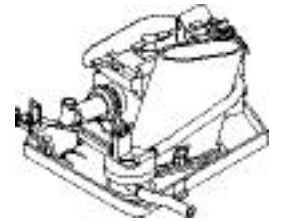
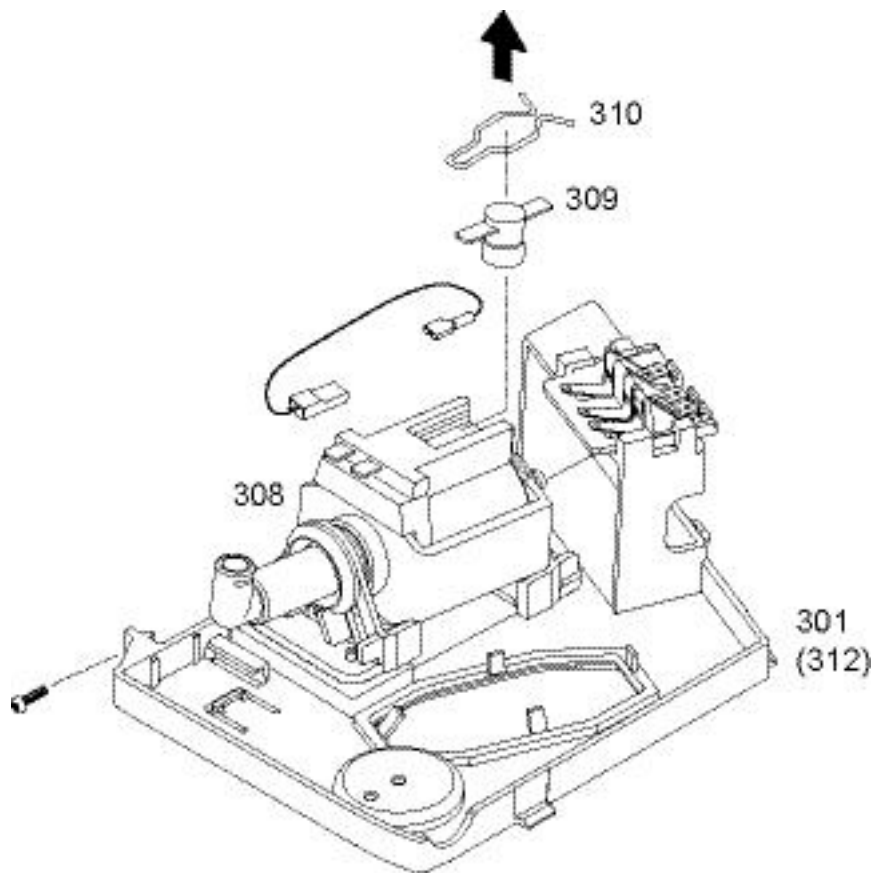
Repair tips

- When installing a new pump the angled hose connection may have to be realigned. The white plastic lid on the pump is rotatable and has two flat surfaces onto which the flat wrench can be placed.
- To avoid possible flow fluctuations make sure not to kink hoses during reassembly.

🔧 The white fluid connection elbow (311) is specially designed to avoid the clogging of the pump (less noise due to 0.6 mm hole diameter). Do not replace it with a standard fluid connection elbow (black case) used in other coffee machines.



6.4.3 Replacing thermostat of coffee pump

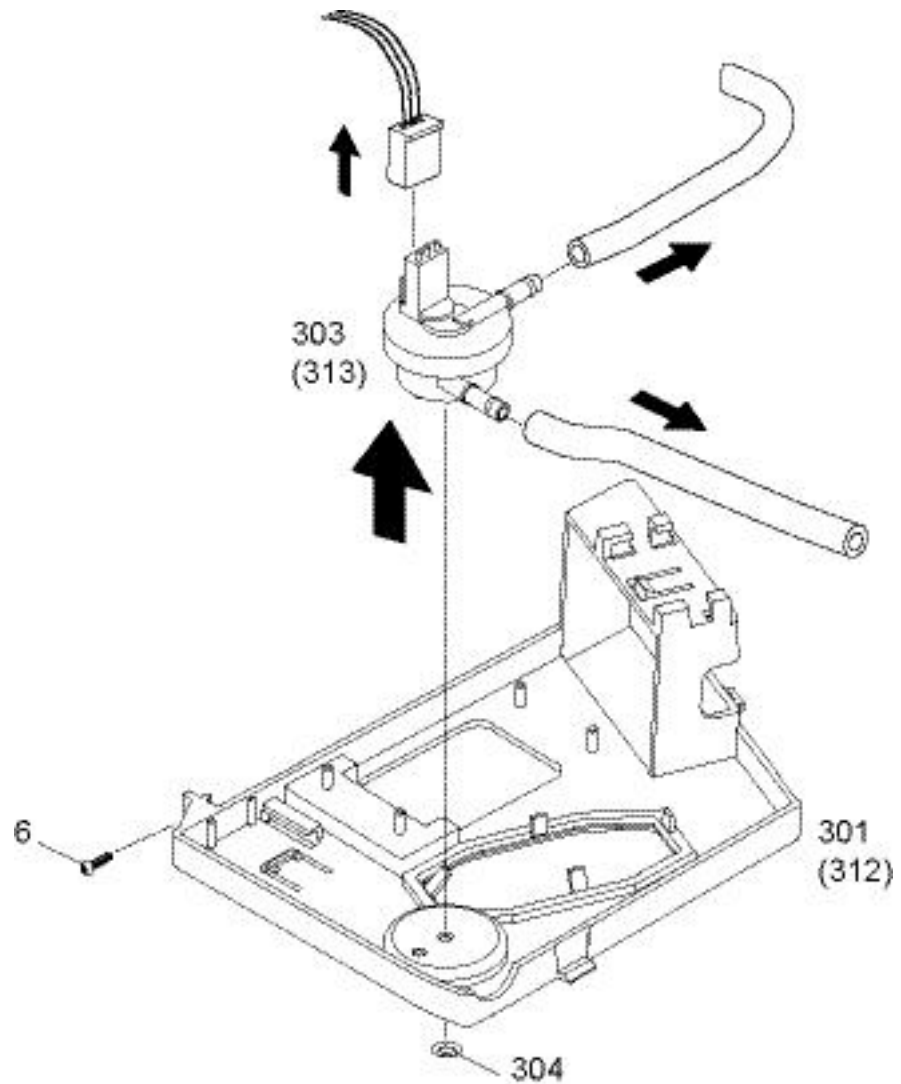
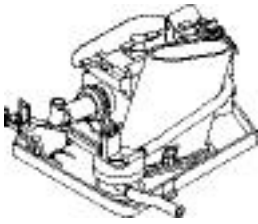


i The pump of the right coffee pump / flow meter module is shown as example.

Pos.	Designation
301	Drawer 702, right, black
308	Pump CP.04.117.0/ST/S/P, 230V 50Hz, light blue, professional, V2
309	Thermostat 115C/10,0A 1NT01L, connection 2xFZ6.3x0.8mm, straight
310	Clip thermostat, 1NT/01
312	Drawer 702, left, black



6.4.4 Replacing flow meter



i The flow meter on the right coffee pump / flow meter module is illustrated as example.

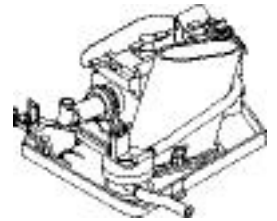
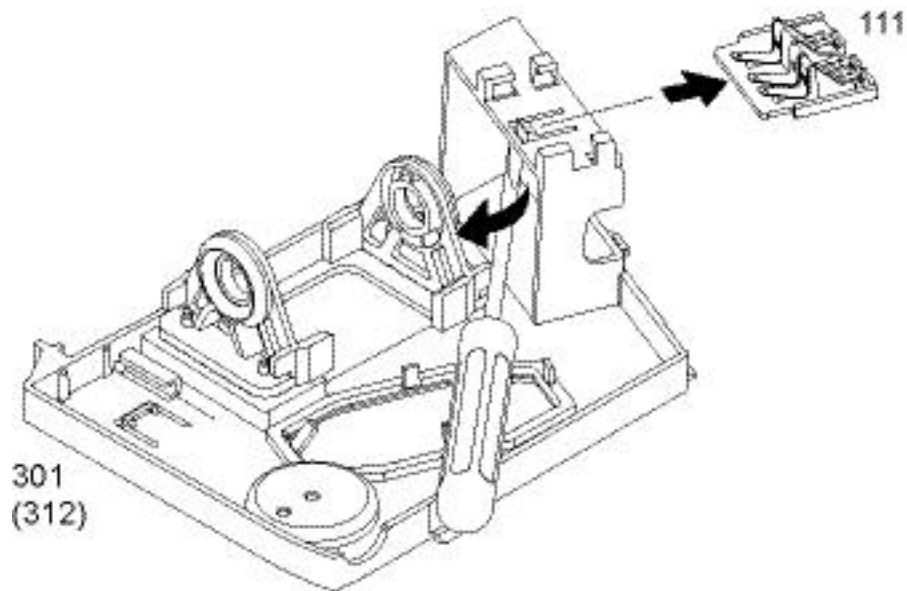
Pos.	Designation
6	Screw KST/PT, 3.0x12, blue galvanized, round head, Torx-10, CA point
301	Drawer 702, right, black
303	Flow meter FHKSC12R, 270 grade, V2, 4 lugs
304	Holding ring, D=3mm, type Starlock P-6490
312	Drawer 702, left, black
313	Flow meter FHKSC12R, 90 grade, V2, 4 lugs


Repair tip

- Loosen screw (6) and pull out drawer (301, 312) partially to gain access to the flow meter (303, 313). Replace holding ring (304).



6.4.5 Replacing left / right contact bank



 The contact bank on the right coffee pump / flow meter module is illustrated as example.

Pos.	Designation
111	Spare contact plate 702/705, complete
301	Drawer 702, right, black
312	Drawer 702, left, black

Repair tips

- For access to the contact bank (111) remove coffee pump / flow meter module.
- In case of corroded contacts check the other contact bank(s) also.



6.5 Extraction unit

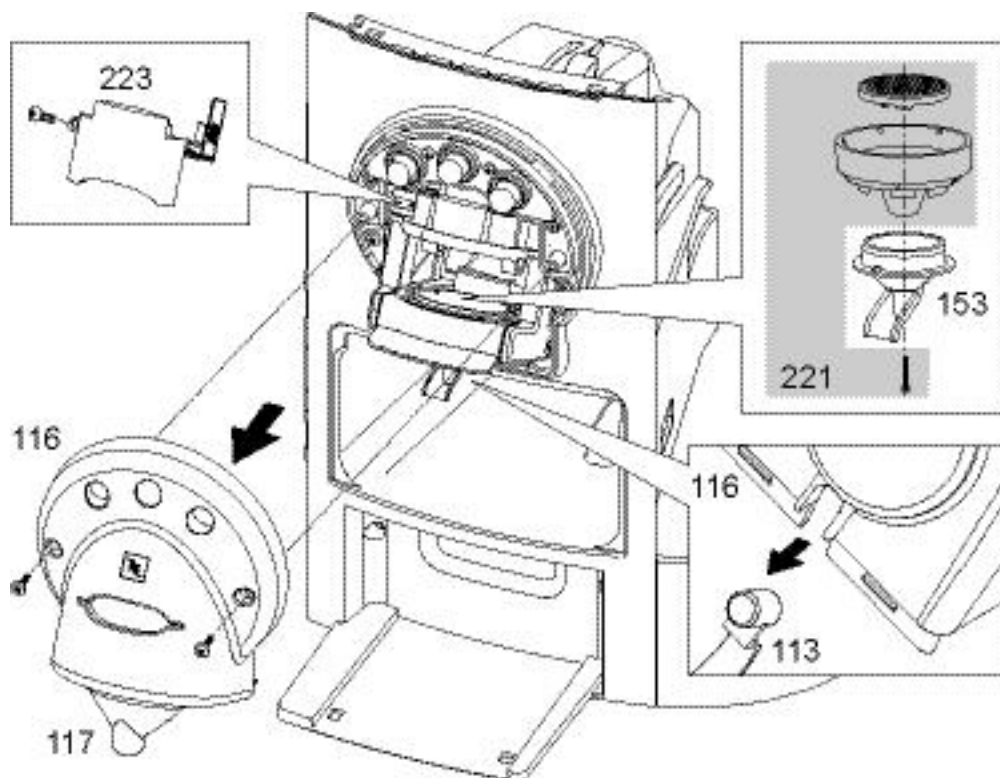
The left and right extraction units

- are identical and interchangeable,
- can be serviced and repaired the same way.



6.5.1 Replacing worn parts

The wearing parts of the brewing chamber can be replaced on-site without removing the extraction unit.




General repair tips

- The jaw must be open and the safety lid (223) must be unscrewed to remove worn parts.



How to open a closed jaw:

1. Switch machine to stand-by mode.
2. Enter power user menu (jaw of extraction unit opens automatically).
3. Exit power user menu.
4. Switch machine off with mains switch.

 The cup lighting (113) is inserted in a recess at the underside of the faceplate (116).

- Hold fast the cup lighting (113), when removing the faceplate (116) with cover (117) from the coffee outlet.
- When mounting the faceplate (116) again, make sure that the cup lighting (113) is inserted in the recess correctly.
- Perform a security check with the safety lid (203) after reassembly (refer to page 73).



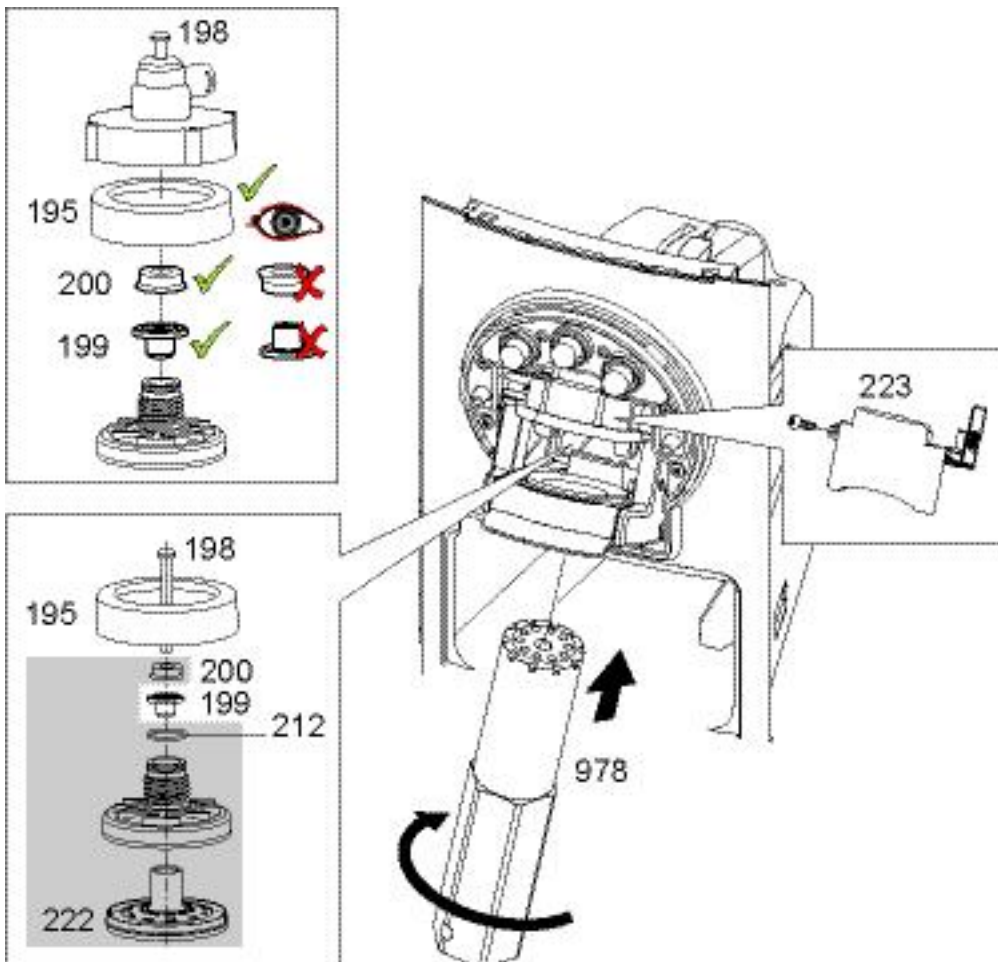
Worn parts of lower brewing chamber (set no. 221)

Repair tips (refer to preceding illustration)

- While loosening screw (152) press down and fix pyramid plate (156) with finger.
- Lift ejector and lever up a stuck pyramid plate support (155) with a slotted screwdriver if necessary. Then remove outlet (153).
- Before mounting new parts
 - exchange worn parts of upper brewing chamber first if needed,
 - clean coffee outlet (153) or replace it if needed,
 - clean brewing chamber.
- When mounting the outlet (153) again, make sure that the centering pin is in the recess of the diecast part. Do not over-tighten screw (152).



Worn parts of upper brewing chamber (set no. 222)



i To get access to the upper brewing chamber, all wearing parts of the lower brewing chamber must be removed first.

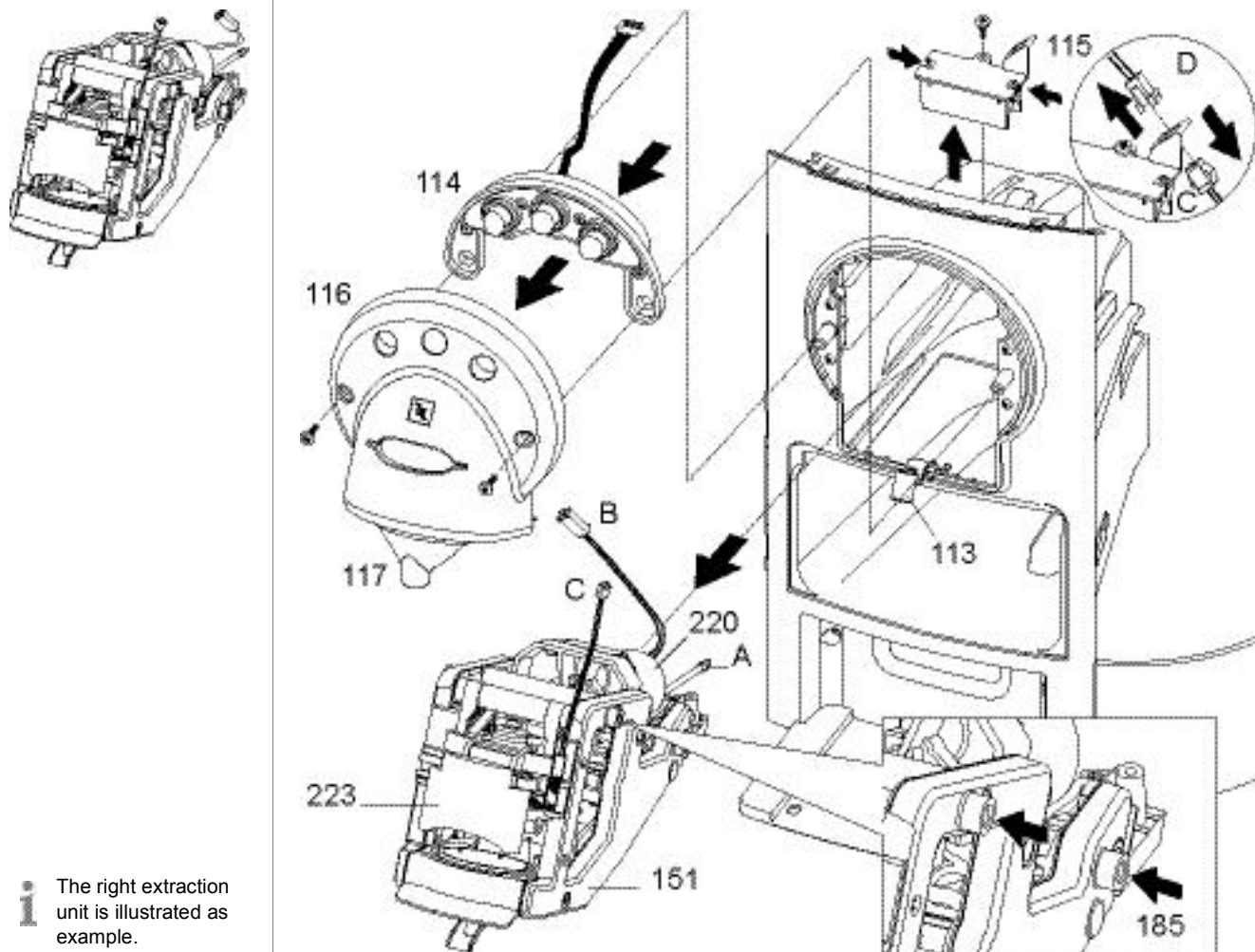
Repair tips

- Unscrew shower (193) with special mounting tool (978, EF article no. 0044269) only.
- Pay attention not to lose the thrust ring (199).
- The sleeve (200) can be stuck and may be difficult to remove. Use an o-ring pick-up tool or a dental pick to remove it.
- All parts from set (222) must be mounted.



- When mounting new parts, check the correct fitting position of sleeve (200), thrust ring (199) and seal (195) - see detail drawing.

6.5.2 Replacing extraction unit



i The right extraction unit is illustrated as example.

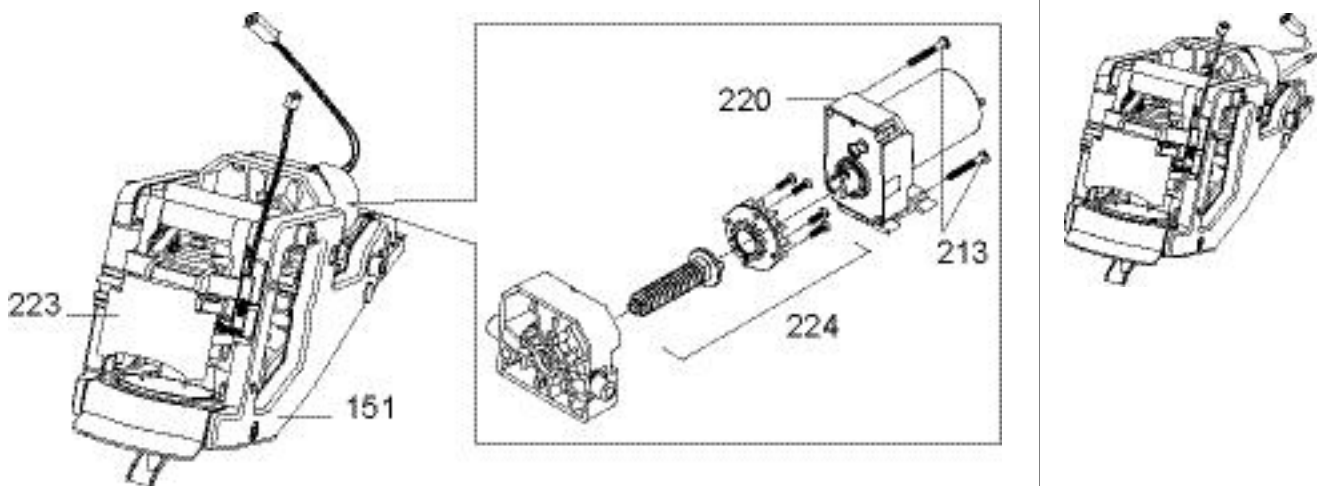
1. Remove hose (A) from fluid connector (462) at thermoblock.
2. Remove protective cover (504), (refer to "Replacing display, pcs and transformer" on page 112).
3. Unplug connector (B) of d.c. motor (220) from main power module pcb.
4. Disconnect cable connection to micro switch of safety lid (223), see detail (D).
5. Remove cable connector (C) from holder (115), see detail (D).
6. Unscrew holder (115). Then press the two latches together and remove holder from casing.
7. Unscrew faceplate (116) with cover (117).
8. Hold fast the cup lighting (113), when removing faceplate (116) with cover (117) from coffee outlet.
9. Remove keyboard module (114) and let it hang down on its cable.
10. Hold and press down cup lighting (113) while pulling out the extraction unit (151).



Repair tips

- Pay attention to the 4 shock absorbers (185) on the extraction unit (151). They can fall off easily.
- Hold and press down cup lighting (113) while inserting the extraction unit (151) back into the casing.
- After reassembly of the extraction unit, make sure that there is a sufficient cable loop at the cable duct (104) to guarantee a checkless movement of the safety lid (203).
- When mounting the faceplate (116) again, check if the cup lighting (113) is inserted in the recess correctly.
- Perform a security check with the safety lid (223) after reassembly (refer to page 73).

6.5.3 Replacing motor and spindle of extraction unit



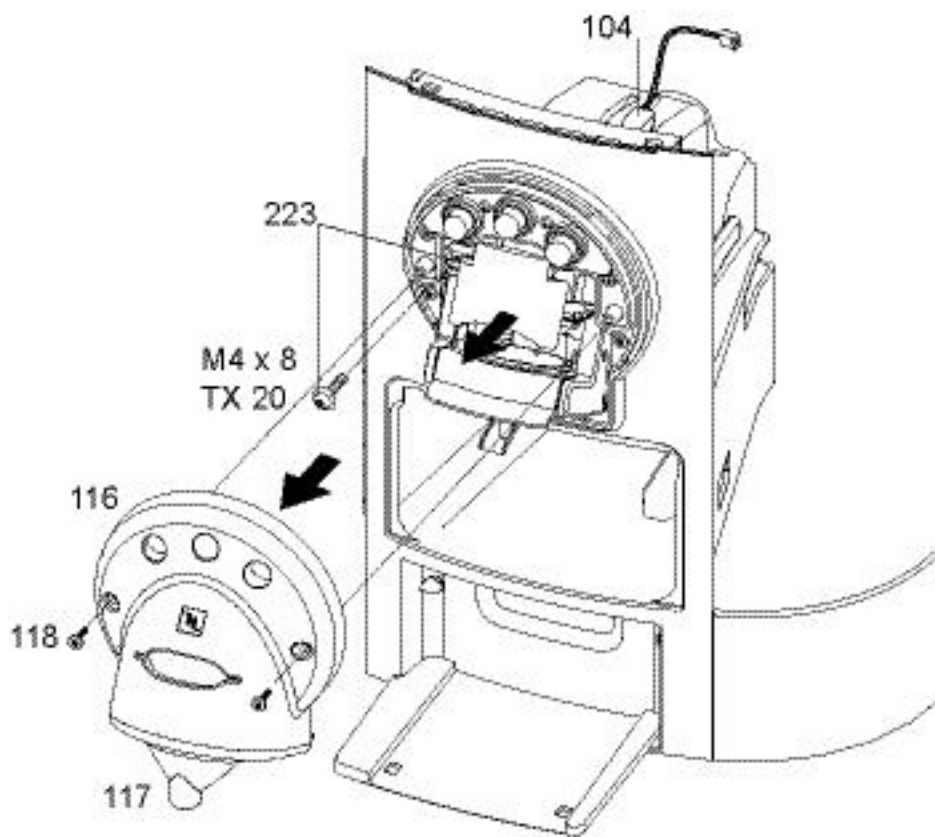
Pos.	Designation
213	Screw KST/PT 3.0x25 blue galvanized, round head, Torx-10, CA point
220	Spare driver 702, extract unit, complete
224	Spare spindle 702/705, complete

Repair tips

- The jaw of the extraction unit must be closed to remove the motor (restricted access to motor fastening screws (213)).
- For lubrication of the extraction unit refer to page 61.
- Perform a security check with the safety lid (223) after reassembly (refer to page 73).



6.5.4 Replacing safety lid with micro switch

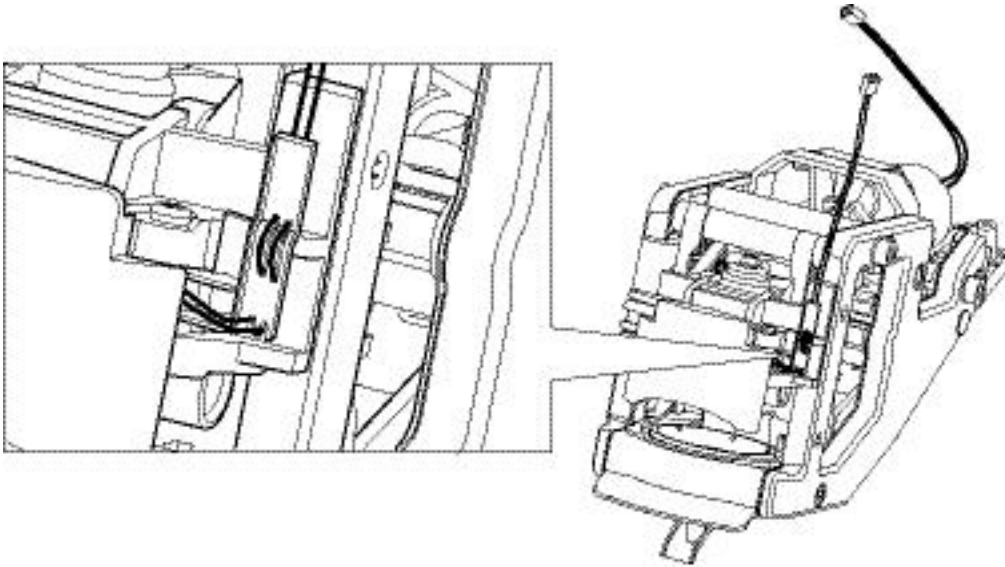


Pos.	Designation
104	Cable duct 702, black
116	Faceplate 702 outlet, chrome plated
117	Cover 702, outlet, black
118	Screw M3x6, blue galvanized, flat head, Torx-20
203	Screw M3x6, blue galvanized, flat head, Torx-20
223	Spare safety lid 702

Repair tips

- After exchange of the safety lid (223), make sure that there is a sufficient cable loop at the cable duct (104) to prevent any stress on the micro switch cable during the up-and-down motion of the extraction unit.
- Perform a security check with the safety lid (223) after reassembly (refer to page 73).

 **The micro switch can only be replaced together with the complete safety lid.**

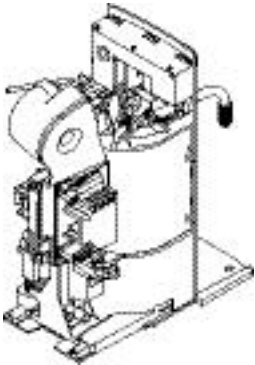


- Pay attention to correct wiring of micro switch cable during reassembly.

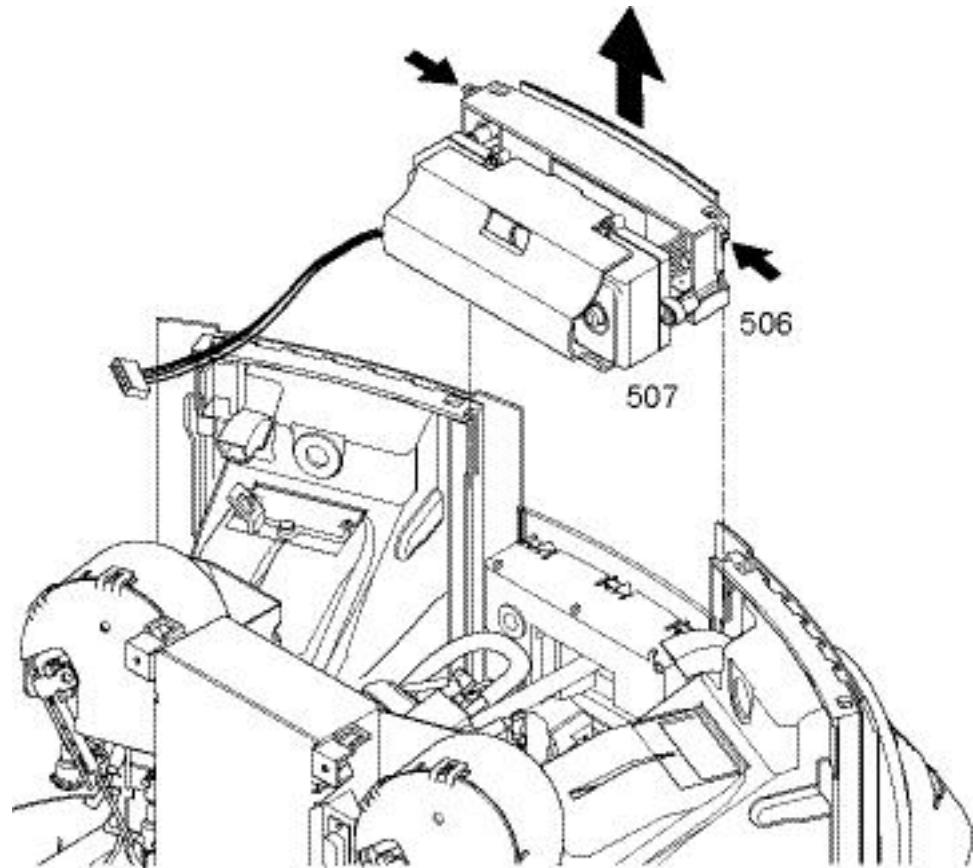


6.6 Hot water / steam module (CS220 only)

6.6.1 Removing display with logic modul



i This step is necessary for the removal of the hot water / steam module.

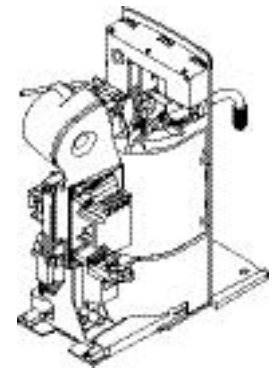
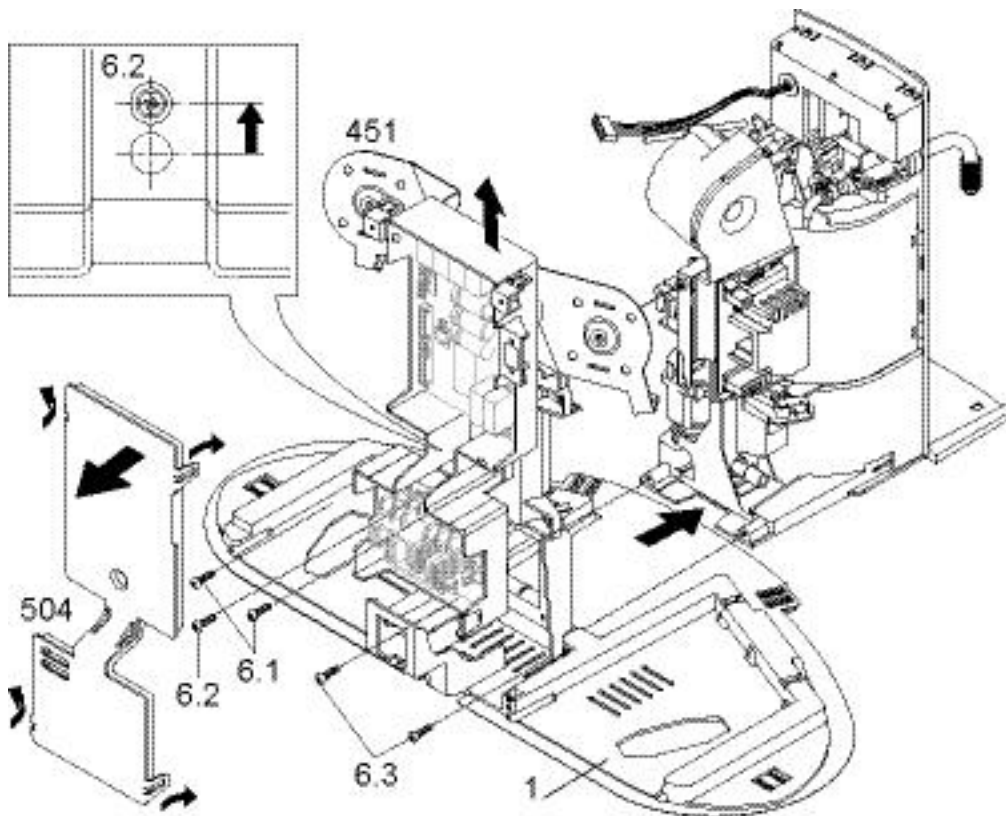


1. Remove display module (506) with logic module pcb (507): Press 2 lateral latches and lift unit out of guiding slots.
2. Lay down unit on coffee machine with display upward.

🔧 Now it is possible to replace the cappuccino keyboard without removing the hot water / steam module at first (refer to page 94).



6.6.2 Removing hot water / steam module



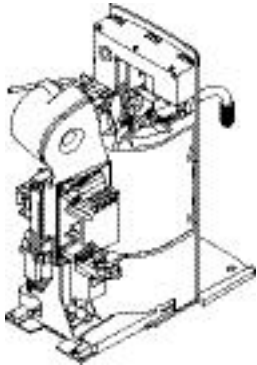
Remove hot water / steam module to get access to following components:

- Thermoblock (607)
- Solenoid valve (571)
- Pump (612)
- Cappuccino module pcb (604)
- Micro switch (603)

1. Unlatch cover (504) of pcb casing (4 latches).
2. Unscrew 2 fastening screws (6.1) of pcb casing.
3. Slide pcb casing up the holder (451) until central fastening screw (6.2) is visible through hole (see detail drawing).
4. Unscrew central fastening screw (6.2) of the hot water / steam module.
5. Unscrew 2 screws (6.3) at the base (1).
6. Pull out hot water / steam module at the front of the coffee machine.
7. Unplug restricting cable and hose connections.

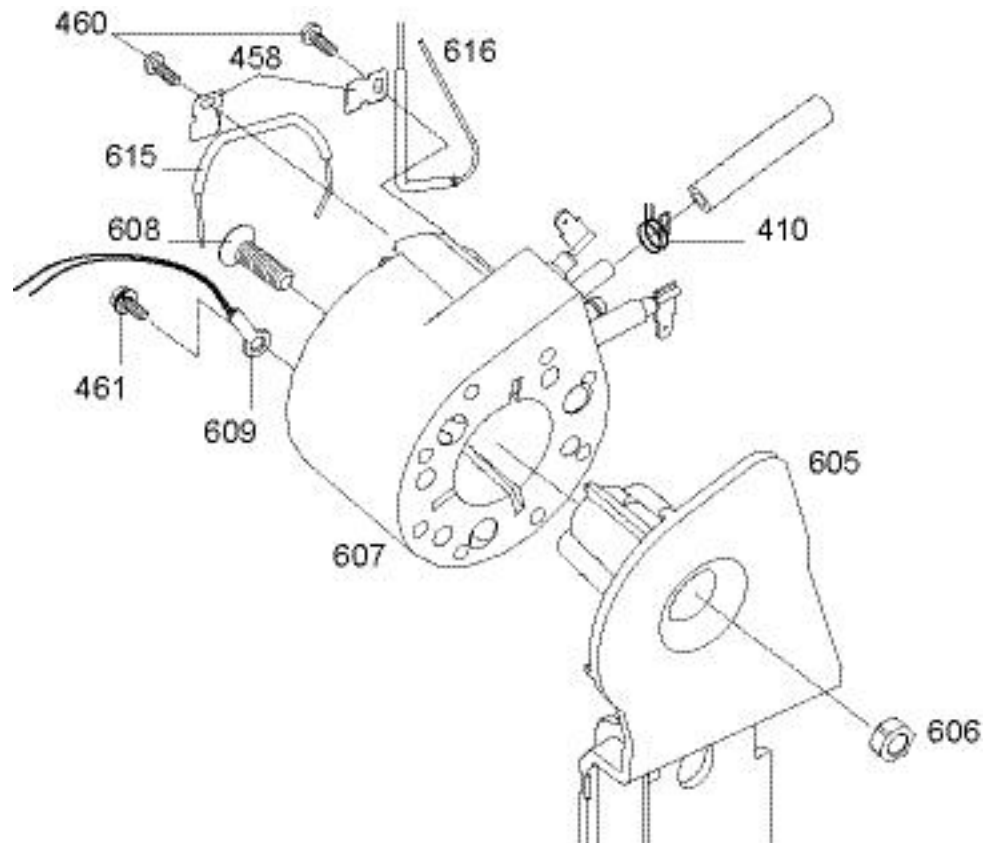


6.6.3 Replacing steam thermoblock of hot water / steam module



i The steam thermoblock (607) is for the hot water / steam module (CS220) only. Do not exchange with a coffee thermoblock by mistake.

i The NTC temperature sensor (609) and the temperature fuses (615, 616) are for the steam thermoblock (607) only. Do not exchange with versions for coffee thermoblocks by mistake.



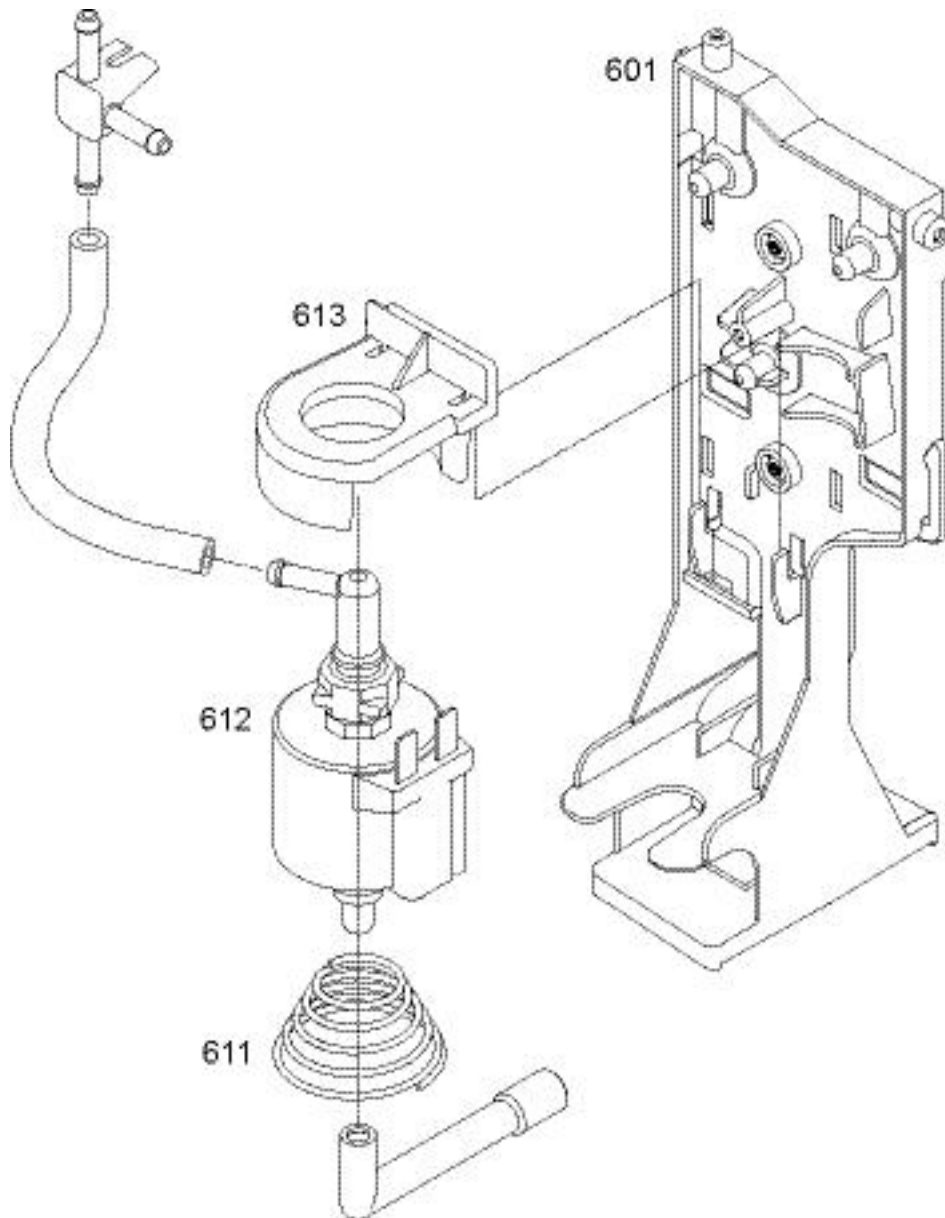
Pos.	Designation
410	Spring clip, D=1.3mm, V2, silicone hose
458	Clip TCO, TB2001, 0,5x10,0x21,0mm
460	Screw GF/Tapt. M4.0x 8, blue galvanized, round head, spring ring, Torx-20
461	Screw GF/Tapt., M5,0x 8, geomet, round head/spring ring, Torx-25, greased
605	Holder 702, thermoblock 2003, cappuccino
606	Nut M6, 6-face, blue galvanized
607	Thermoblock 2003/N 230V/1080W, V2, nipples, tabs, M5-thread
608	Screw M6x16, blue galvanized, countersunk head, Torx-30
609	Sensor 640, thermoblock, complete, L=200mm, m/JST plug & M5 ring lug
615	Temperature fuse (228 °C)
616	Temperature fuse (228 °C)

Repair tips

- For access to the steam thermoblock (parts 607, 609, 615 and 616), refer to "Removing hot water / steam module" on page 91.
- Handle the delicate wires of the NTC temperature sensor (609) with care.
- When mounting a safety clip (458), make sure that the housing of the temperature fuse is positioned exactly below the safety clip.



6.6.4 Replacing pump of hot water / steam module



i The pump of the hot water / steam module has no replaceable thermostat.

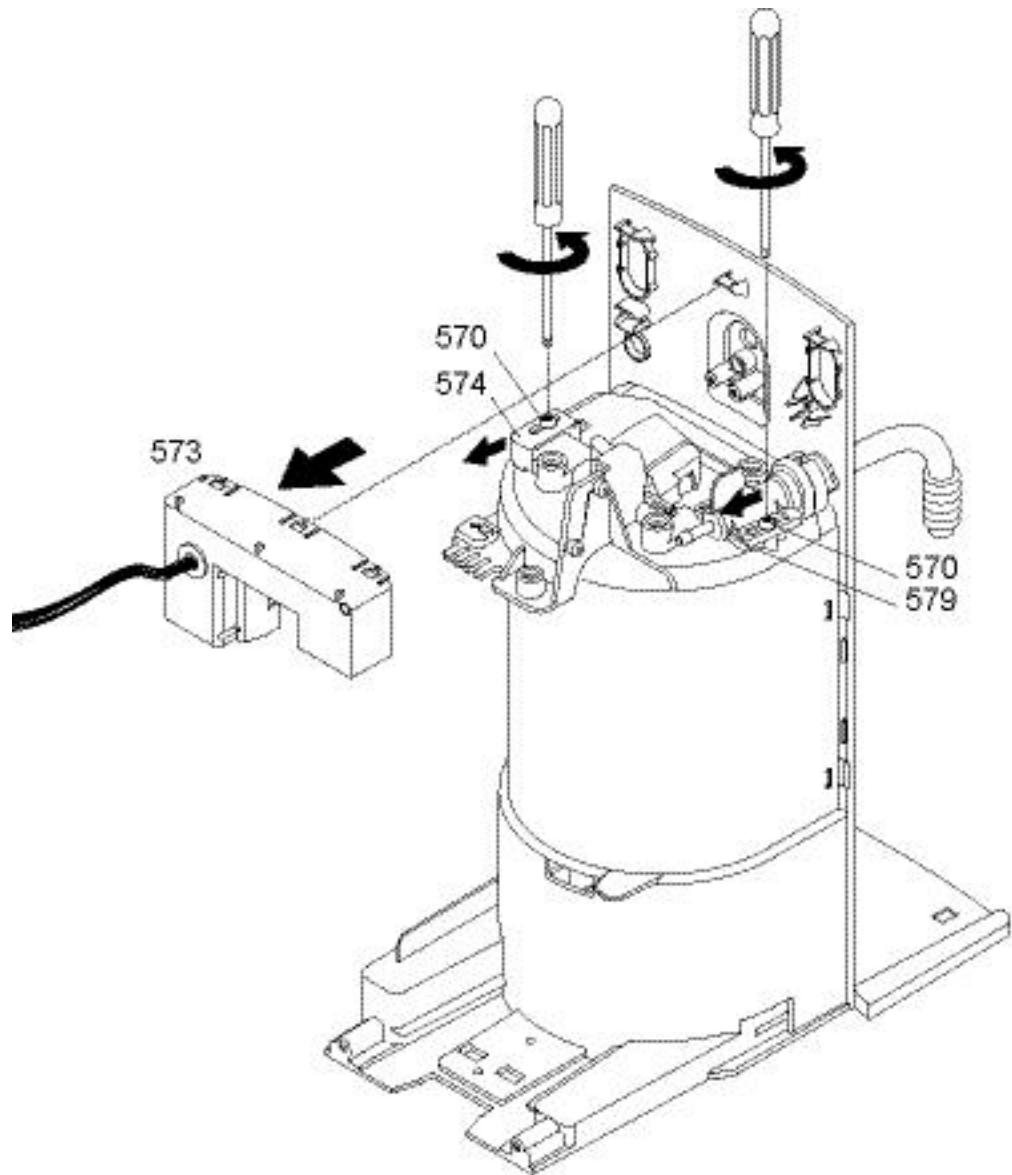
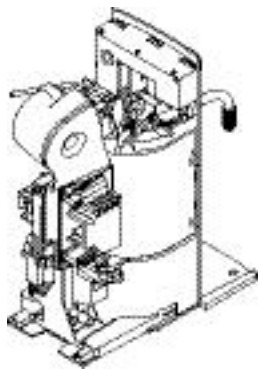
Pos.	Designation
601	Holder 702, black, cappuccino
611	Pressure spring, concentric, 1,6xD17,0/38,0mm, L=21,0mm, n= 4,5 (pump)
612	Pump 702, 230V/50Hz, thermostat fix mounted
613	Pump holder 702, black, 70 shore, cappuccino

Repair tips

- For access to the pump (612), refer to "Removing hot water / steam module" on page 91.
- To avoid possible flow fluctuations, make sure not to twist hoses during reassembly.



6.6.5 Replacing cappuccino keyboard of hot water / steam module



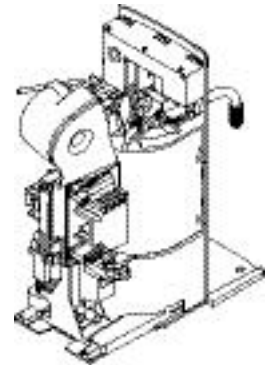
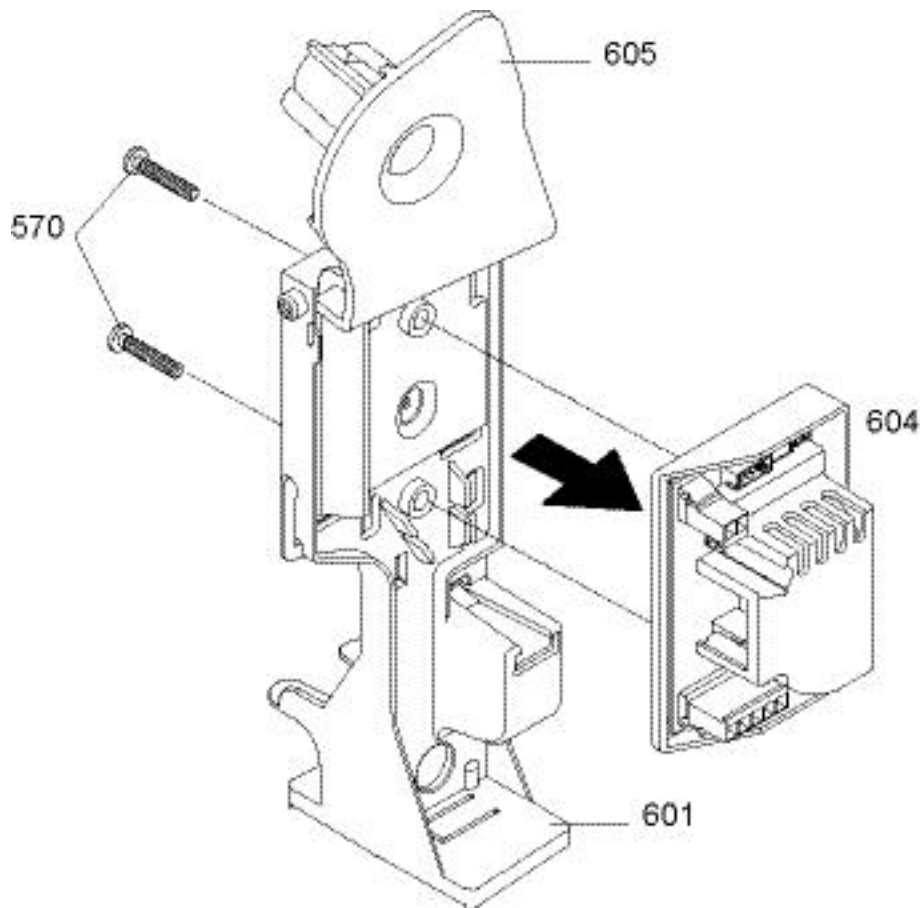
Pos.	Designation
570	Screw KST/PT, 3.0x10, blue galvanized, round head, Torx-10 (WN 1452)
573	Keyboard module 702 (on/off, steam, hot water)
574	Holder 702, left, black
579	Support 702, hot water tube, black

Repair tip

- The cappuccino keyboard (573) can be replaced without pulling out the complete hot water / steam module. Remove display with logic module first (see page 90).



6.6.6 Replacing cappuccino module of hot water / steam module



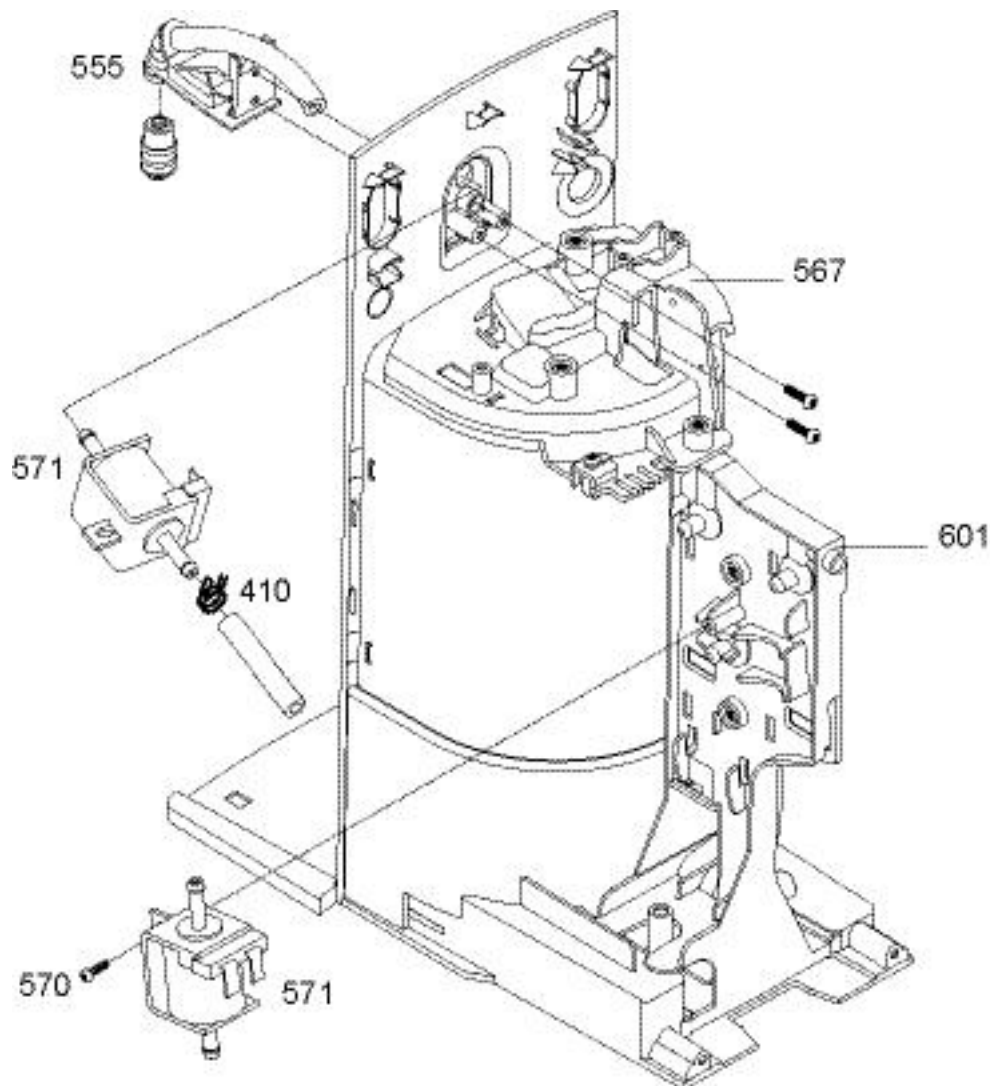
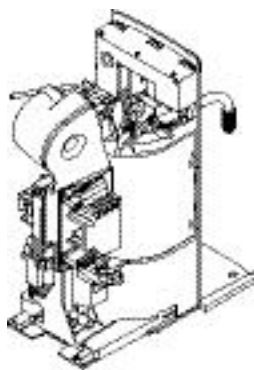
Pos.	Designation
570	Screw KST/PT, 3.0x10, blue galvanized, round head, Torx-10 (WN 1452)
601	Holder 702, black, cappuccino
604	Power PCB 702, 220-230V, steam
605	Holder 702, thermoblock 2003, cappuccino

Repair tip

- For access to the cappuccino module (604), refer to "Removing hot water / steam module" on page 91.
- Additional to the screwed connection, the protective case of the cappuccino module is attached with 4 latches to the holder (601).



6.6.7 Replacing solenoid valves of hot water / steam module



i These valves are fail-safe, that is a closed valve opens if subjected to an overpressure of approx. 12 bar. Therefore the fitting position of the valves is crucial. Do not exchange with standard solenoid valves by mistake!

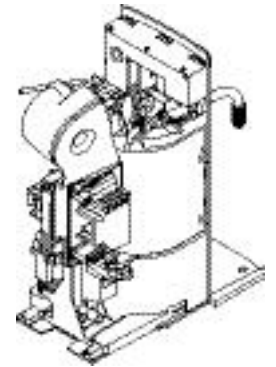
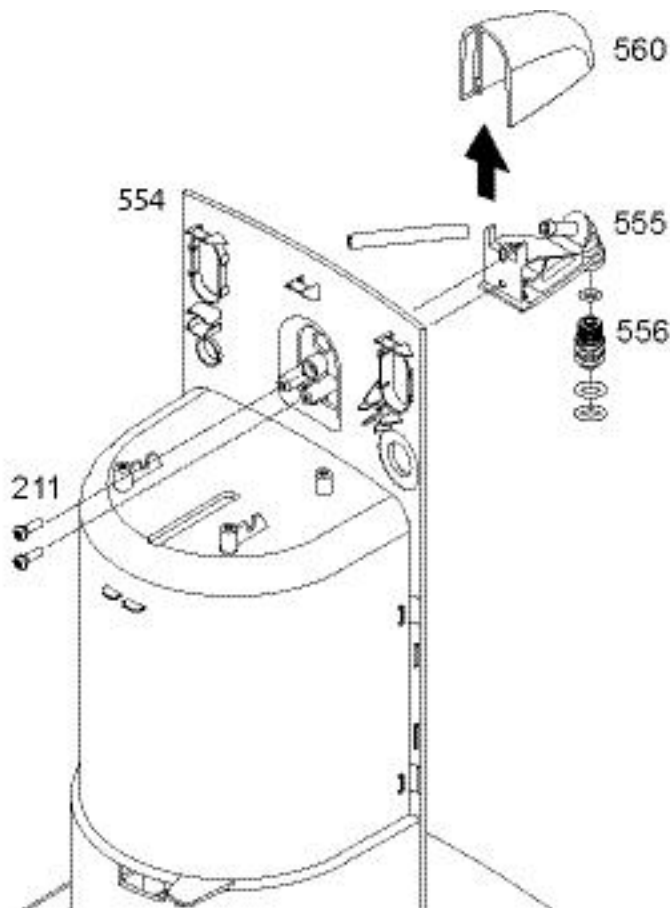
Pos.	Designation
410	Spring clip, D=1.3mm, V2, silicone hose
567	Plate 702, hood, cappuccino, black
570	Screw KST/PT, 3.0x10, blue galvanized, round head, Torx-10 (WN 1452)
571	Magnetic valve, DEV122, 240V, type 1586, 2-side connection
601	Holder 702, black, cappuccino


Repair tips

- The solenoid valve at the steam outlet (555) can be replaced without pulling out the complete hot water / steam module. Refer to "Removing display with logic modul" on page 90.
- The solenoid valve at the steam outlet (555) must not be built in reversed. Check fitting position of valve before replacement. The other solenoid valve can be mounted only in the correct position.
- For access to the lower solenoid valve, refer to "Removing hot water / steam module" on page 91.



6.6.8 Replacing steam outlet of hot water / steam module




 Outlet and cover of the CS200 steam outlet are assembled identically.

Pos.	Designation
211	Screw KST/PT 3,0x10, blue galvanized, round head, Torx-10 (EJOT PT)
554	Front panel 702, cappuccino, black, print: Nespresso Professional, silver
555	Outlet 702, cappuccino, black
556	Spare nozzle body 702, complete, cappuccino
560	Cover 702, cappuccino chrome

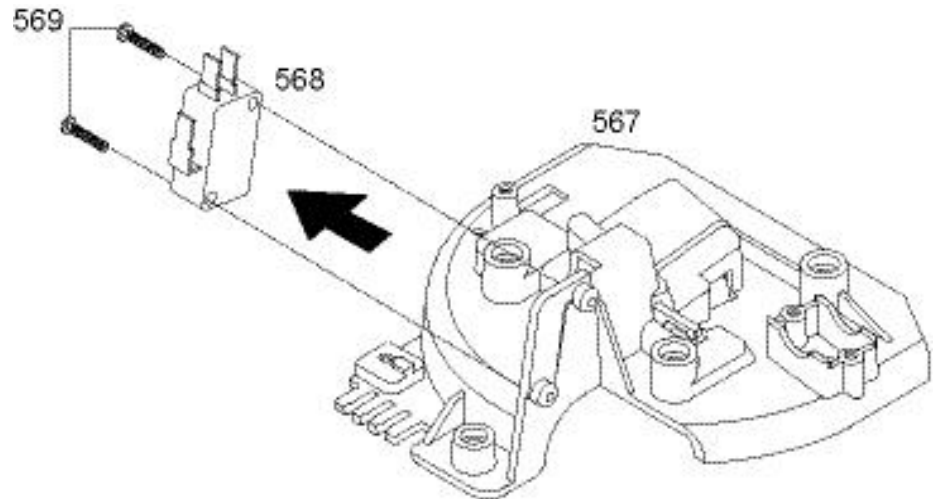
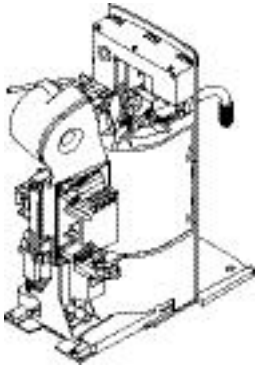
Repair tips

- To unscrew steam nozzle (556), use a flat wrench with 8 mm span.
- To detach the gripped-in cover (560), unscrew the steam outlet (555) first.

 Take care not to damage the cover.



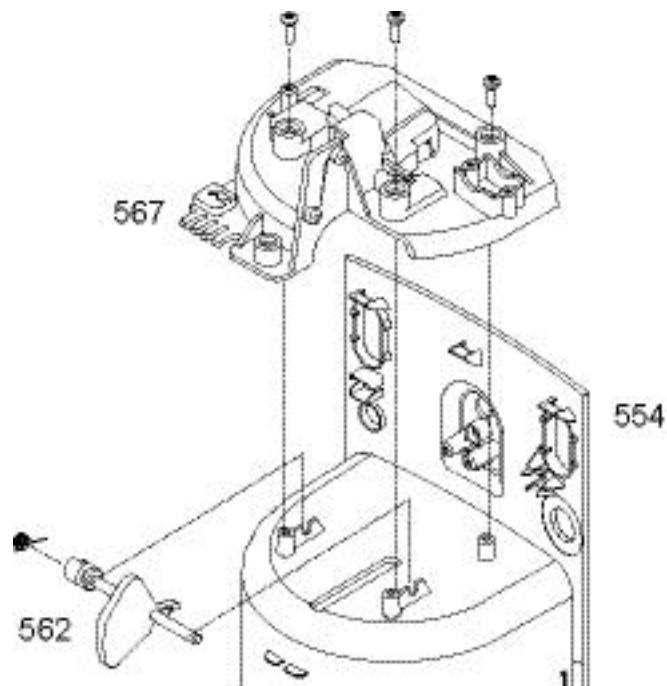
6.6.9 Replacing micro switch for milk container detection



Pos.	Designation
567	Plate 702, hood, cappuccino, black
568	Micro switch D41R-QGAC V2, 0.1A/250V, connection 4.8x0.8mm, 100k
569	Screw KST/PT, 3.0x16, blue galvanized, round head, Torx-10, CA point

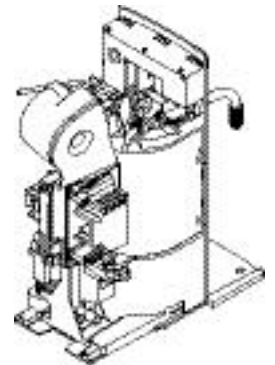
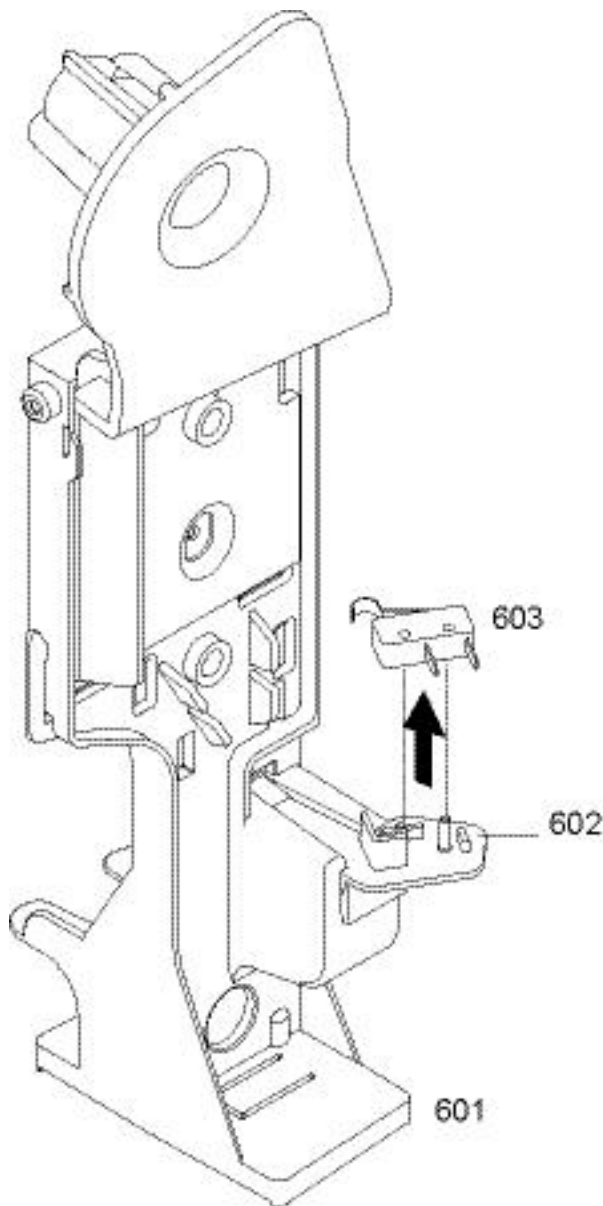
Repair tip

- For access to cappuccino module refer to "Removing hot water / steam module" on page 91.
- For cam switch (562) replacing, see following illustration:





6.6.10 Replacing micro switch for middle drip tray detection



Note Note that the CS200 middle drip tray is detected with a contact bank instead.

Pos.	Designation
601	Holder 702, black, cappuccino
602	Holder 702, switch, cappuccino, black
603	Micro switch, XCG55V-81-LZ187, lever

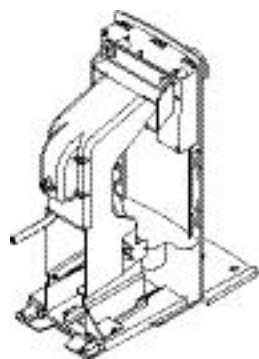
Repair tip

- For access to the micro switch (603), refer to "Removing hot water / steam module" on page 91.

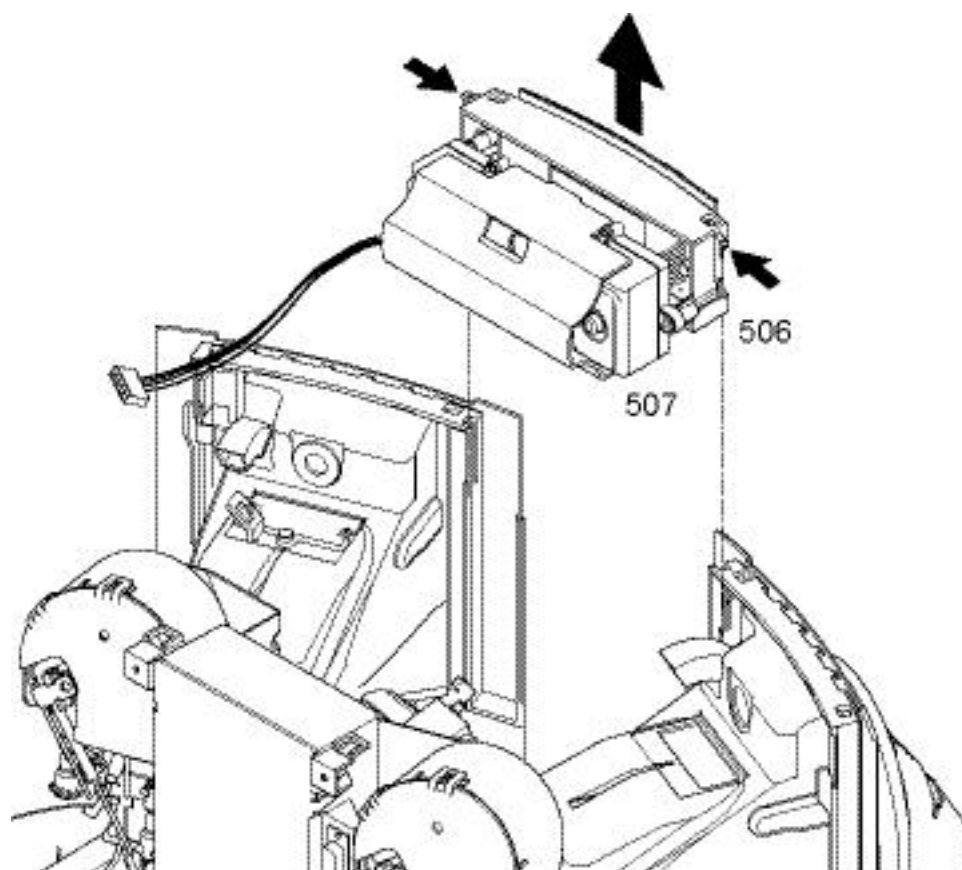


6.7 Hot water module (CS200 only)

6.7.1 Removing display with logic module



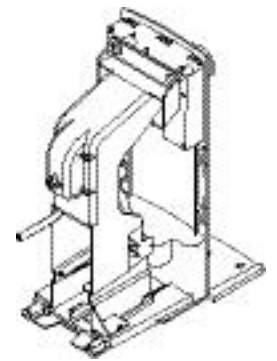
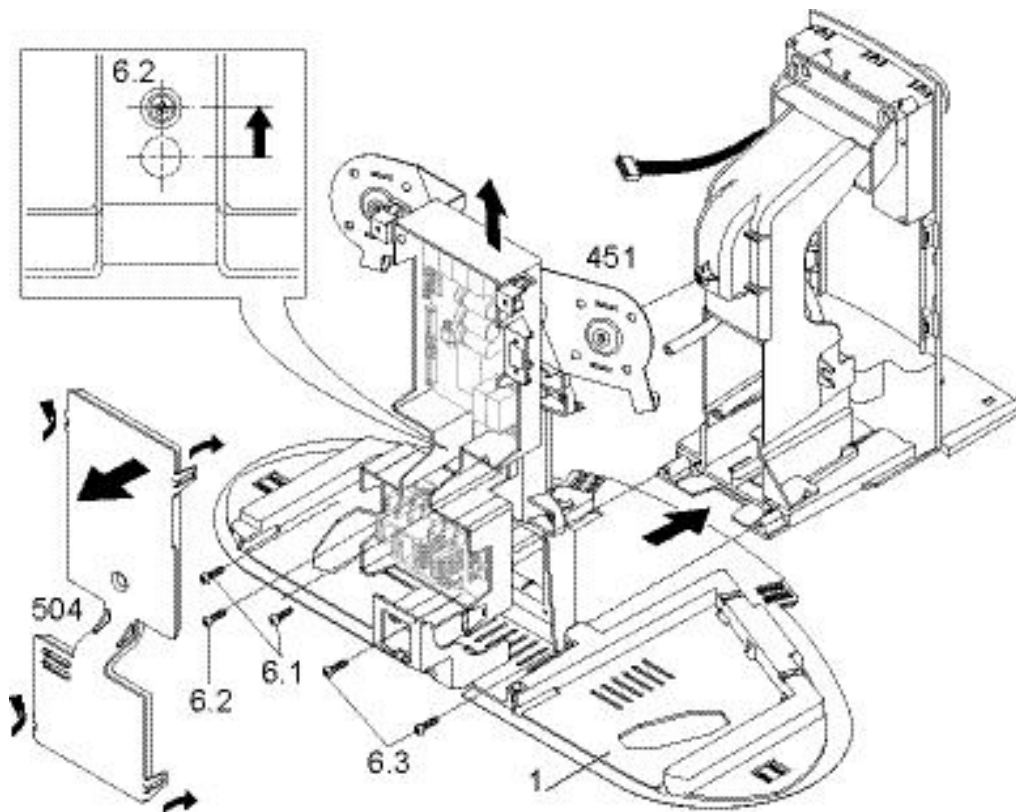
i This step is necessary for the removal of the hot water module.




1. Remove display module (506) with logic module pcb (507): Press 2 lateral latches and lift unit out of guiding slots.
2. Lay down unit on coffee machine with display upward.



6.7.2 Removing hot water module



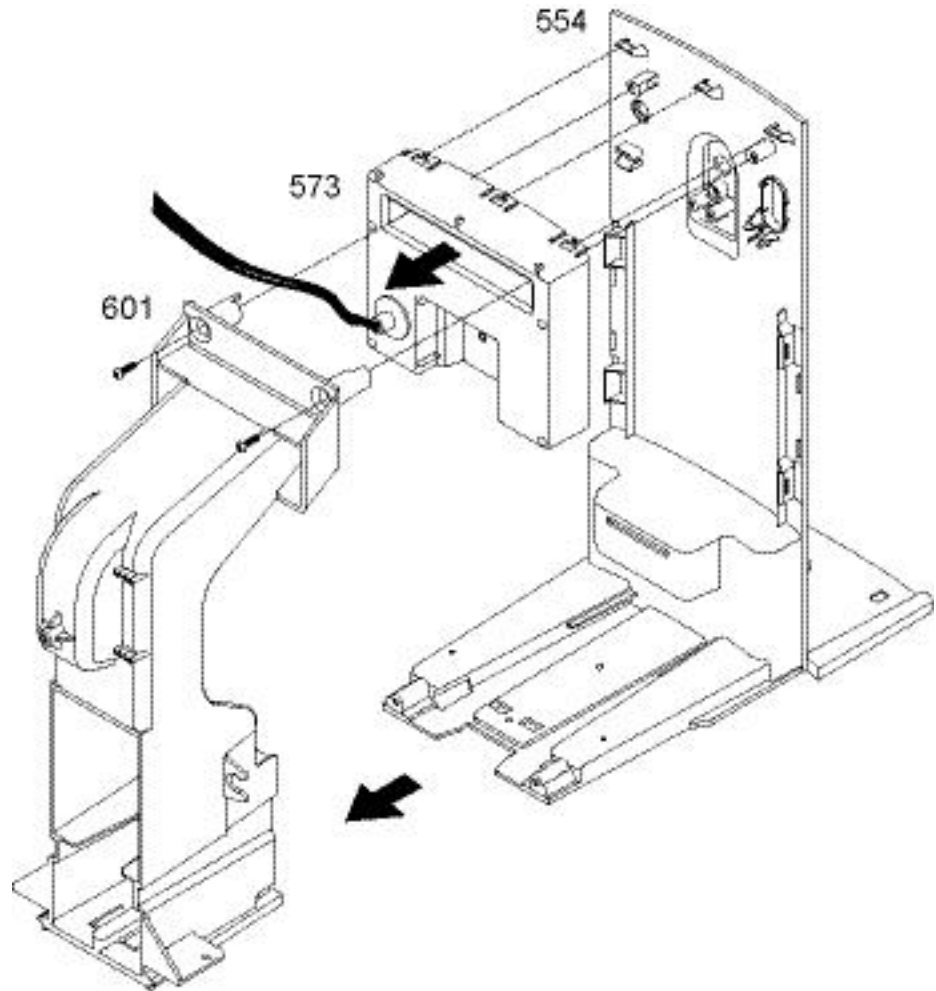
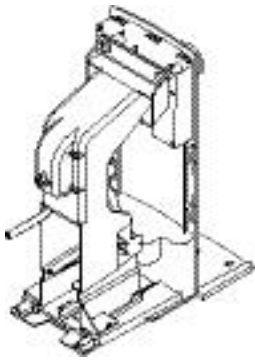
 Remove hot water module to get access to following components:

- Hot water keyboard (573)
- Hot water outlet (555, 560)
- Contact bank (111)

1. Unlatch cover (504) of pcb casing (4 latches).
2. Unscrew 2 fastening screws (6.1) of pcb casing.
3. Slide pcb casing up the holder (451) until central fastening screw (6.2) is visible through hole (see detail drawing).
4. Unscrew central fastening screw (6.2) of the hot water module.
5. Unscrew 2 screws (6.3) at the base (1).
6. Pull out hot water module at the front of the coffee machine.
7. Unplug restricting cable connections.



6.7.3 Replacing hot water keyboard



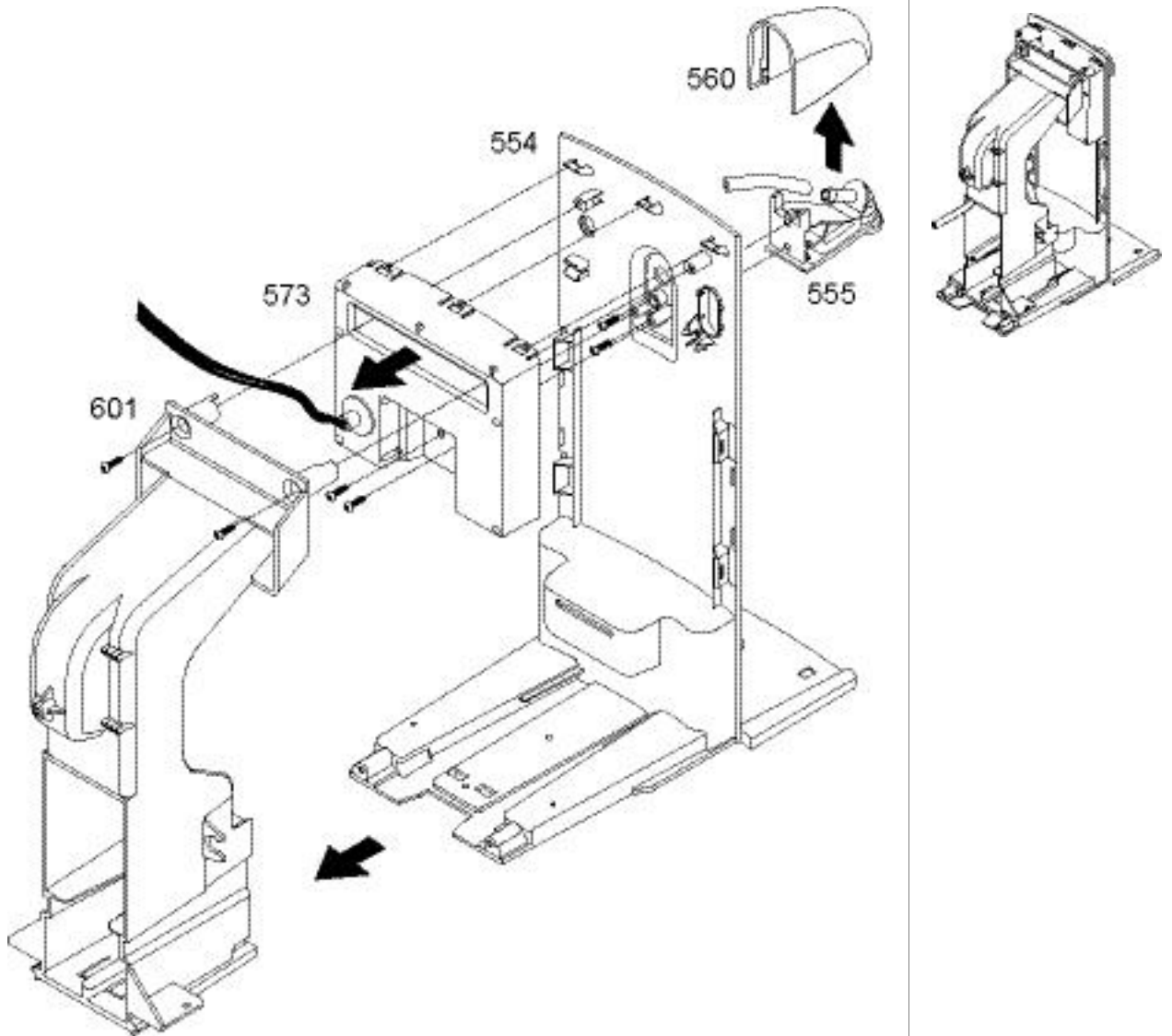
Pos.	Designation
554	Front faceplate 705, water, black, print: Nespresso Professional, silver
573	Keyboard module 705, hot water
601	Holder 705, black

Repair tip

- For access to the hot water keyboard (573), refer to "Hot water module (CS200 only)" on page 100.




6.7.4 Replacing hot water outlet



Pos.	Designation
554	Front faceplate 705, water, black, print: Nespresso Professional, silver
555	Outlet 702, cappuccino, black
560	Cover 702, cappuccino chrome
573	Keyboard module 705, hot water
601	Holder 705, black

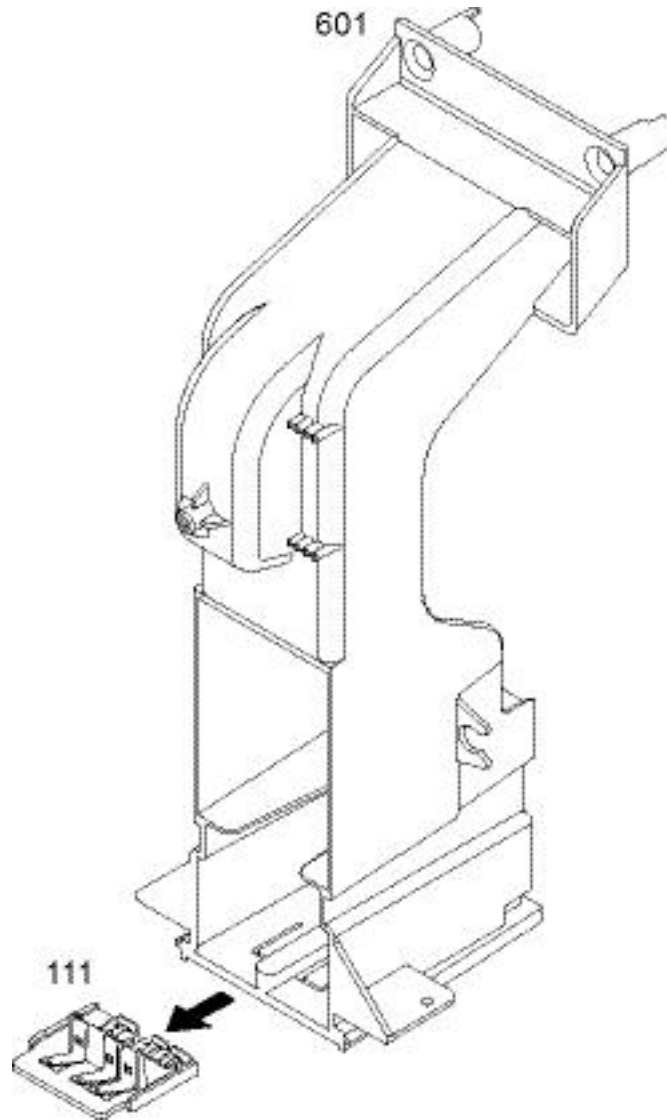
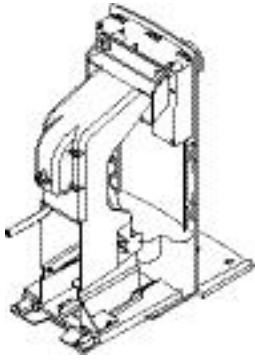
Repair tip

- To detach the gripped-in cover (560), unscrew the steam outlet (555) first.

 Take care not to damage the cover.



6.7.5 Replacing middle contact bank




Pos.	Designation
111	Spare contact plate 702/705, complete
601	Holder 702, black, cappuccino

Repair tip

- In case of corroded contacts check the other contact banks also.

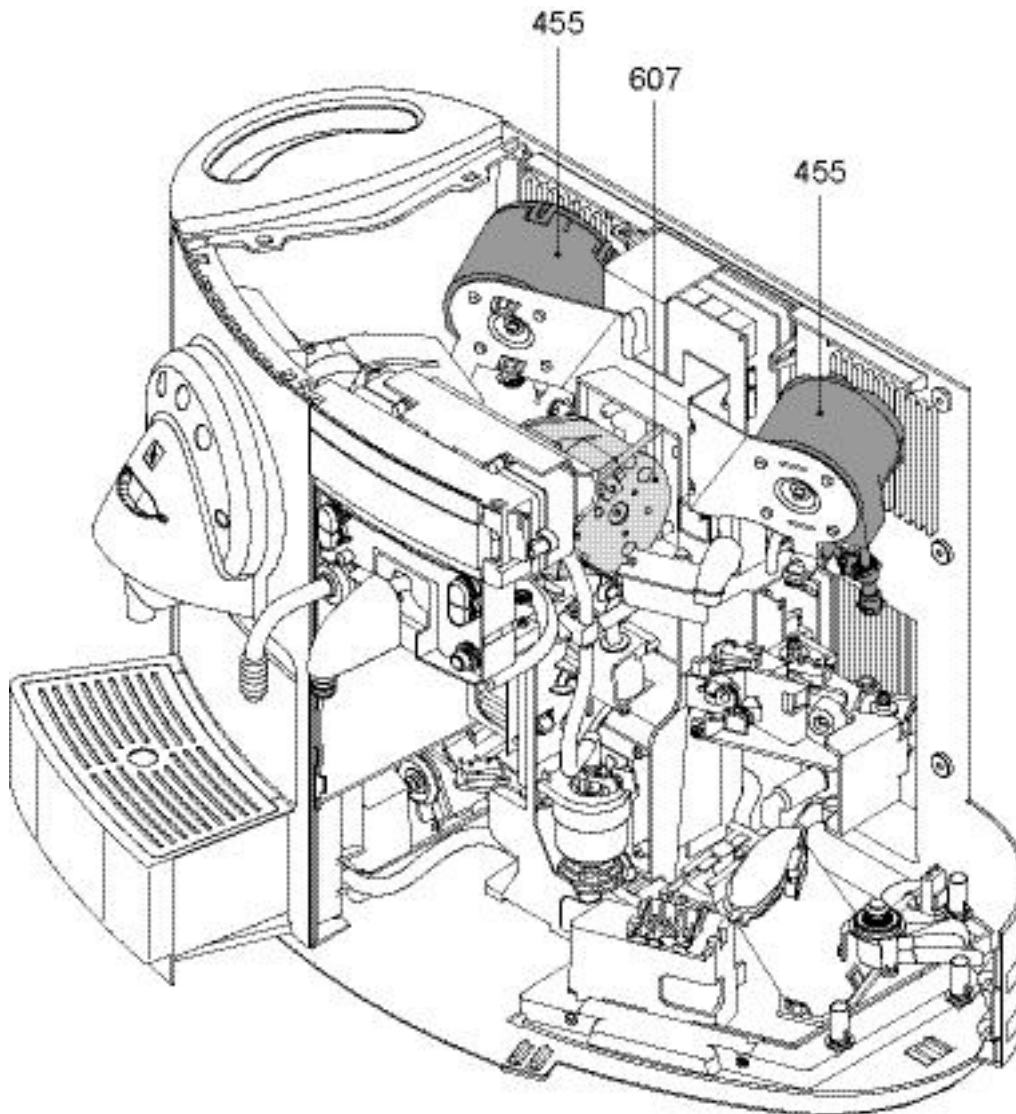


6.8 Basic coffee machine - non-modular parts

 In the general drawings the components to repair or to replace are shaded for easy recognition. Similar components of the plug-in modules are light shaded for reference.

6.8.1 Replacing coffee thermoblocks

Position of components

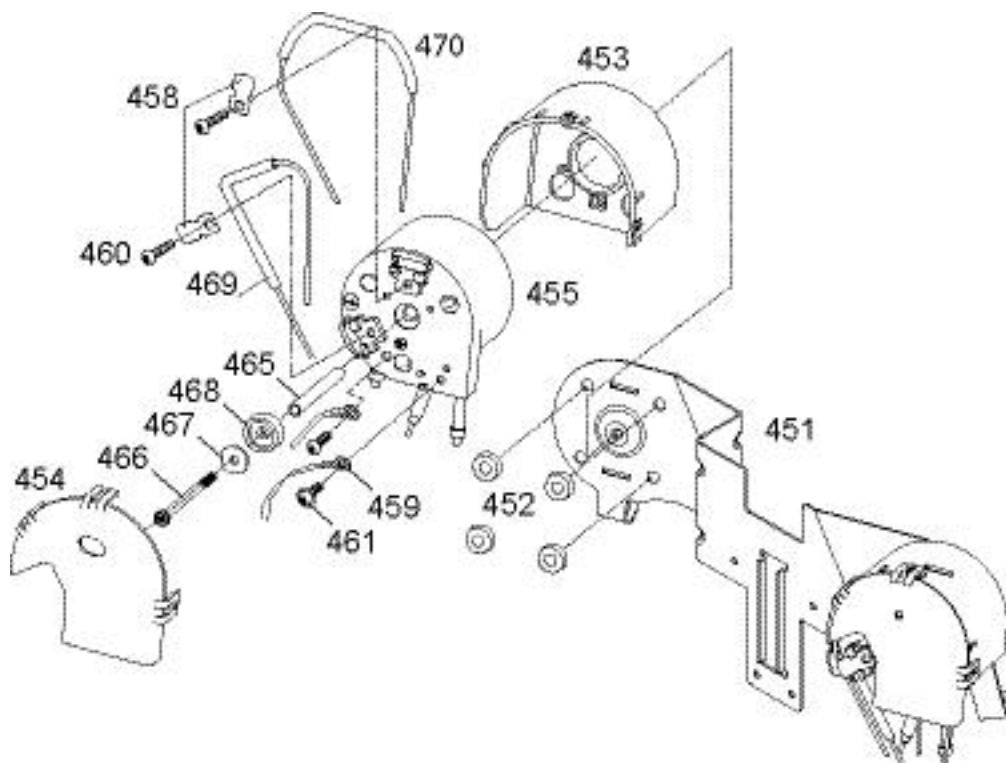


Pos.	Designation
455	Thermoblock 2003/L 230V/1080W, welded nipples, connection FZ4,8x0,8
607	Thermoblock 2003/N 230V/1080W, V2, nipples, tabs, M5-thread

 For replacing steam thermoblock (607), refer to page 92.



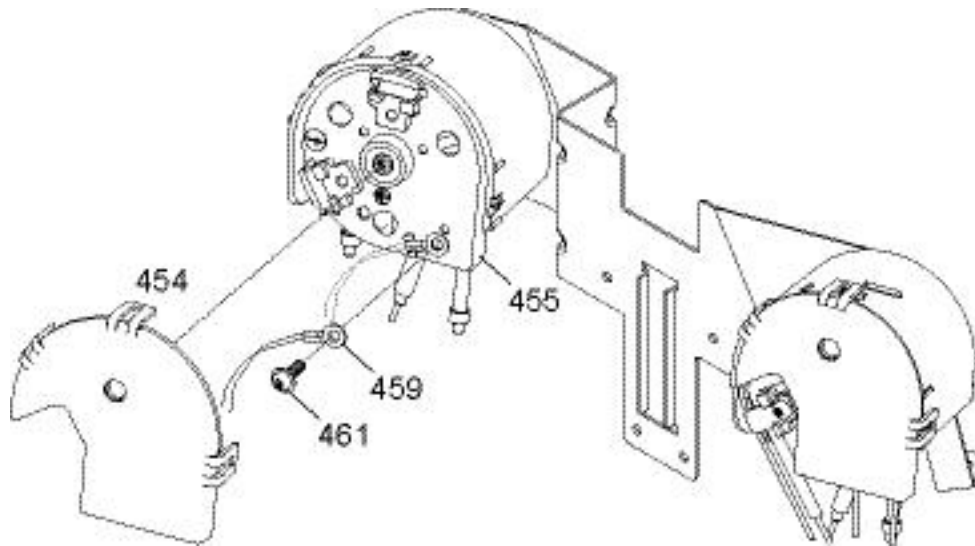
Coffee thermoblock - component parts



Pos.	Designation
451	Holder 702, thermoblock 2003, zinc plated
452	Insulation holder 737, neutral, 40 shore
453	Cover 702, thermoblock, neutral
454	Cover 702, thermoblock, neutral
455	Thermoblock 2003/L 230V/1080W, welded nipples, connection FZ4,8x0,8
458	Clip TCO, TB2001, 0,5x10,0x21,0mm
459	Sensor 770 thermoblock, complete, L=170mm, m/JST plug & M5 ring lug
460	Screw GF/Tapt. M4.0x 8, blue galvanized, round head, spring ring, Torx-20
461	Screw GF/Tapt., M5,0x 8, geomet, round head/spring ring, Torx-25, greased
465	Spacer sleeve 737, blue zinc plated, Di=4,5/Da=6,0/L=52mm
466	Screw GF/Tapt., M4,0x60, blue galvanized, round head, Torx-20, m/shaft, greased
467	Lock washer, D4,3x14,0x1,6, blue galvanized, M4
468	Insulation ring 737, silicone, 40 shore
469	Temperature fuse (152 °C)
470	Temperature fuse (152 °C)



Replacing NTC temperature sensor



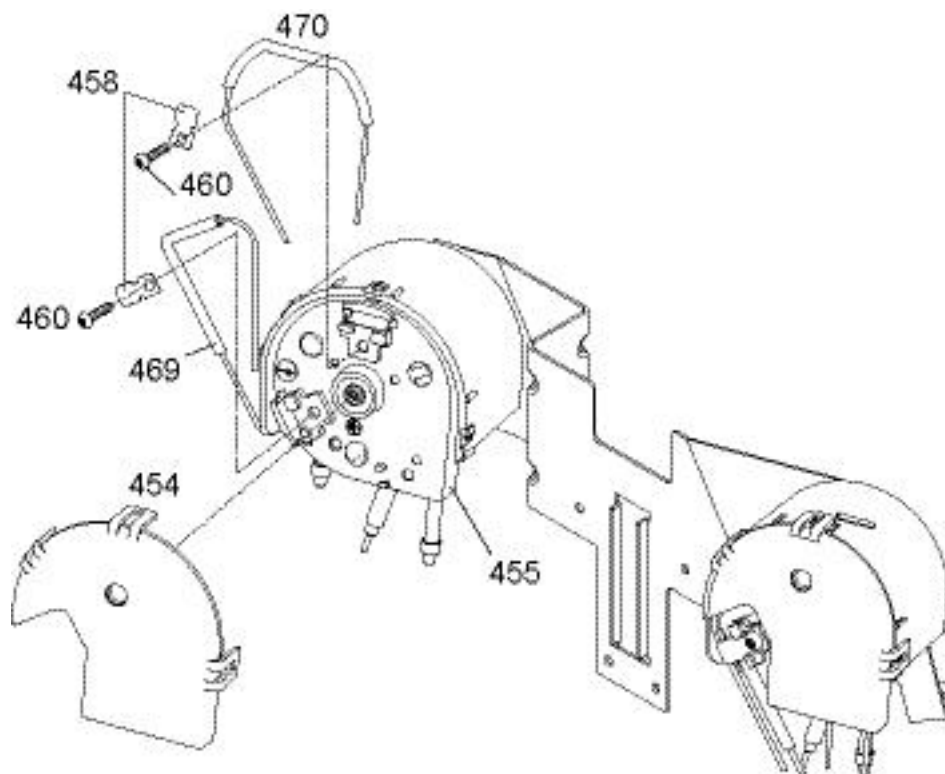
Pos.	Designation
454	Cover 702, thermoblock, neutral
455	Thermoblock 2003/L 230V/1080W, welded nipples, connection FZ4.8x0.8
459	Sensor 770 thermoblock, complete, L=170mm, m/JST plug & M5 ring lug
461	Screw GF/Tapt., M5.0x8, Geomet, round head, spring ring, Torx-25, greased

Repair tip

- Handle the delicate wires of the NTC sensor (459) with care.



Replacing temperature fuses



Pos.	Designation
454	Cover 702, thermoblock, neutral
455	Thermoblock 2003/L 230V/1080W, welded nipples, connection FZ4.8x0.8
458	Clip TCO, TB2001, 0.5x10.0x21.0mm
460	Screw GF/Tapt. M4.0x 8, blue galvanized, round head, spring ring, Torx-20
469	Temperature fuse (152 °C)
470	Temperature fuse (152 °C)

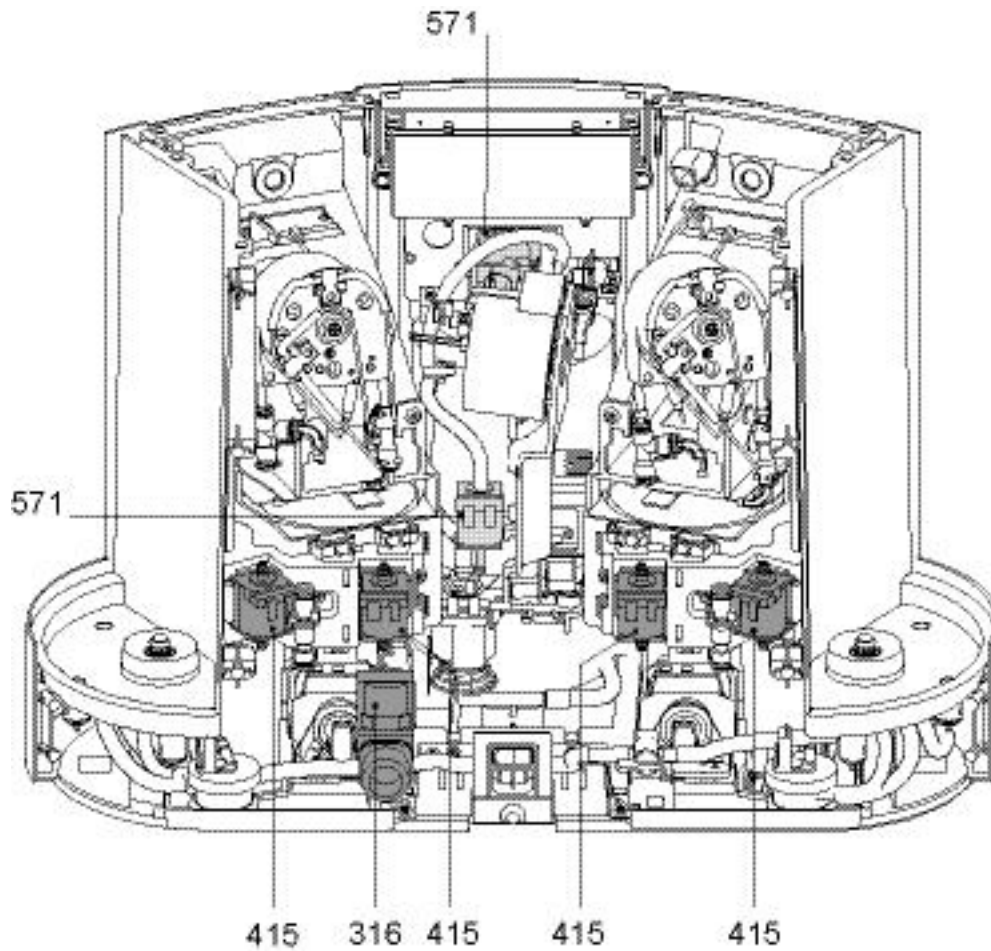
Repair tip

- When mounting a safety clip (458), make sure that the housing of the temperature fuse is positioned exactly below the safety clip.



6.8.2 Replacing solenoid valves

Position of components

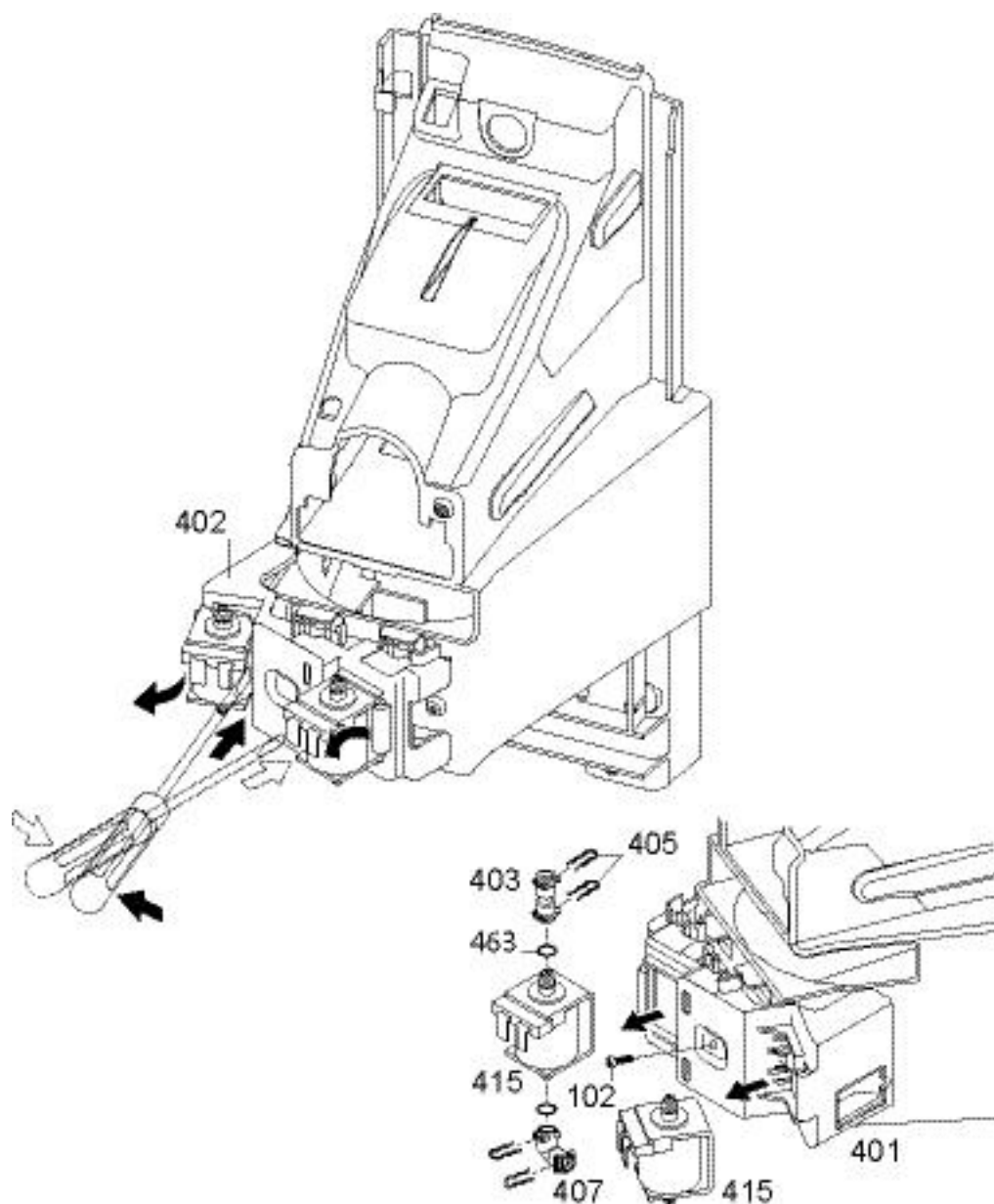


Pos.	Designation
316	Magnetic valve, 220-240V, 2/2-way, closed, type 1.007.126-E3-00-E
415	Magnetic valve DEV122 240V, 2-side, FEP, connection long
571	Magnetic valve, DEV122, 240V, type1586, 2-side connection

 For replacing solenoid valves (571), refer to page 96.



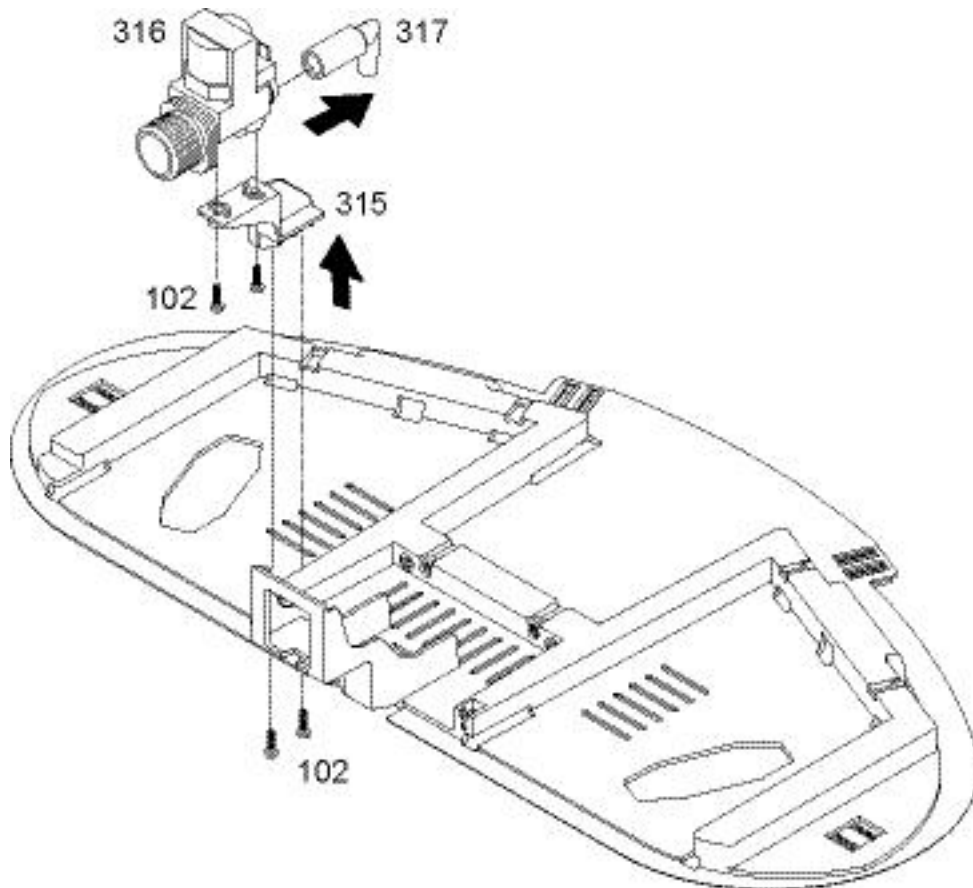
Replacing solenoid valves of coffee units



Pos.	Designation
102	Screw KST/PT, 3,5x12, blue galvanized, round head, Torx-15
401	Valve holder 702, right, black
402	Valve holder 702, left, black
403	Fluid connection, I-shape, short, anthracite, 2xF
405	Clip, D=4mm, L=12mm, Inox
407	Fluid connection, L-shape, 90°, short, anthracite, 2xF
415	Magnetic valve DEV122 240V, 2-side, FEP, connection long
463	O-ring D3,40x1,90mm, 70 shore, red, 2-components silicone



Replacing solenoid valve of direct water connection



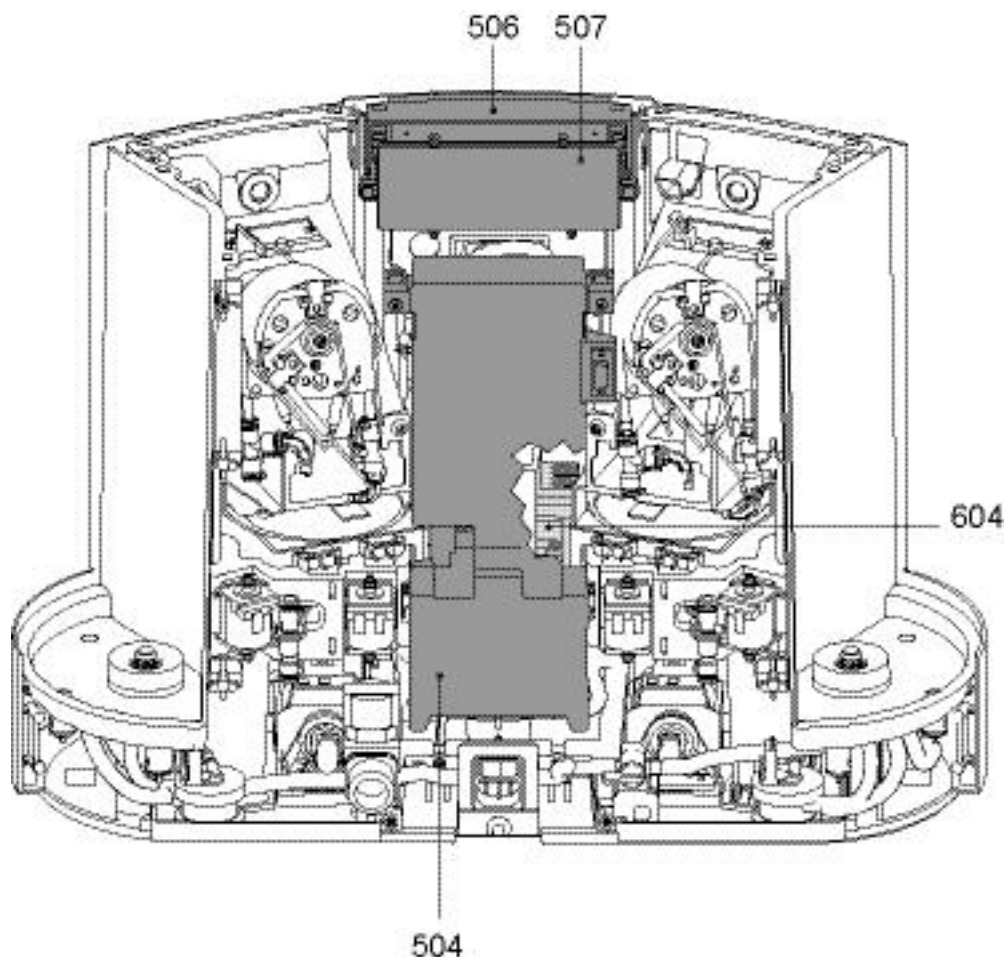
Pos.	Designation
102	Screw KST/PT, 3,5x12, blue galvanized, round head, Torx-15
315	Holder 702, valve, 2-way, black
316	Magnetic valve, 220-240V, 2/2-way, closed, type 1.007.126-E3-00-E
317	Elbow 702, silicone, transparent, water supply connection



6.8.3 Replacing display, pcs and transformer

Position of components

i Try to download the customer settings onto the service stick before replacing a pcb.



Pos.	Designation	Designation in wiring diagrams
504	Spare control PCB 702 EU, 220-230V, V-Flash parametrized	Main module and power module
506	Display module 702, 2x20 symbols, lighting	LCD 2 x 20 digits
507	Spare control PCB 702, EU logic, V-Flash parametrized	Logic module
604*	Power PCB 702, 220-230V, steam	Cappuccino module

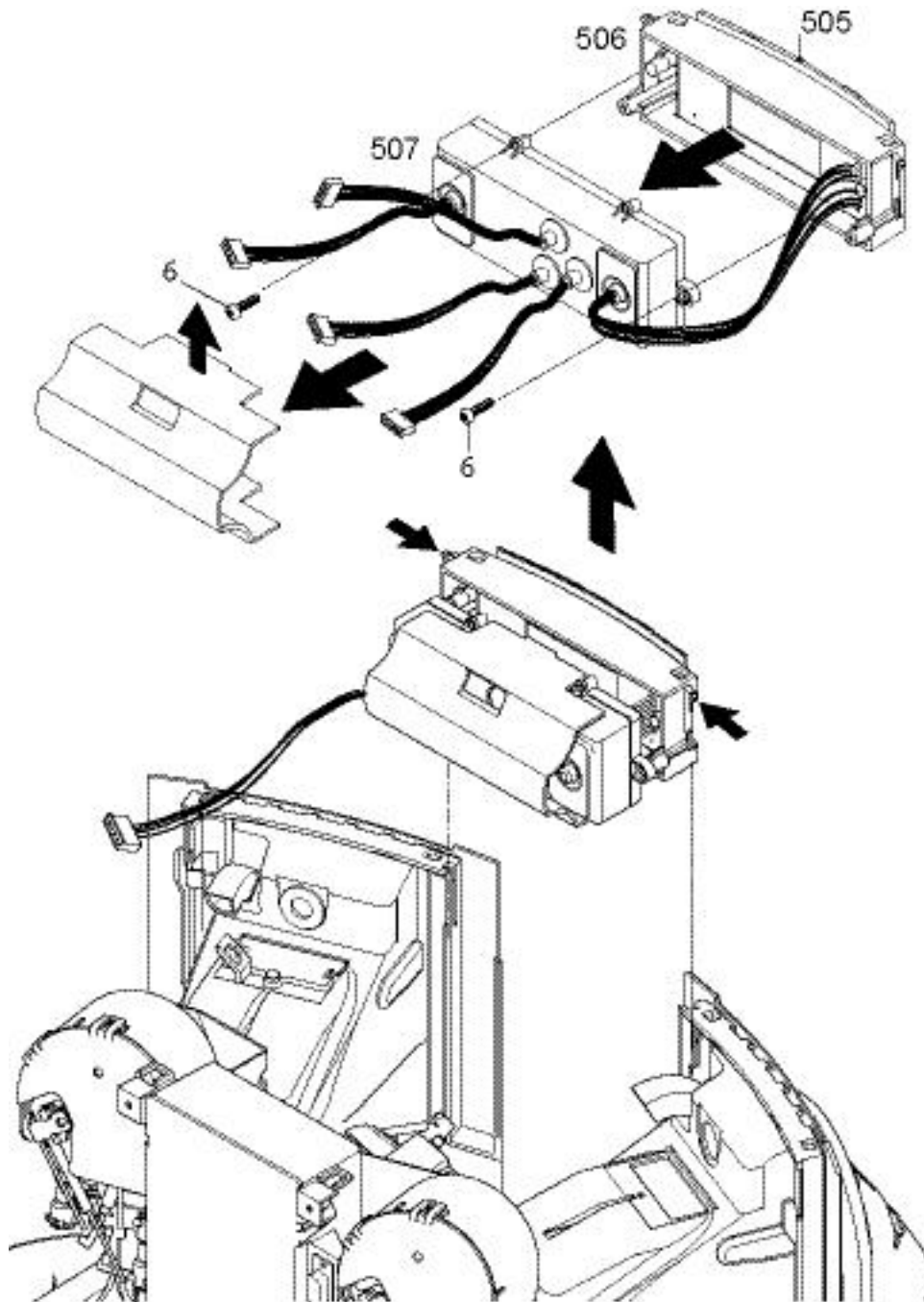
* CS220 only

See "Wiring diagrams" on page 124 for connector arrangement.

For replacing power pcb 702 (604) refer to page 95.



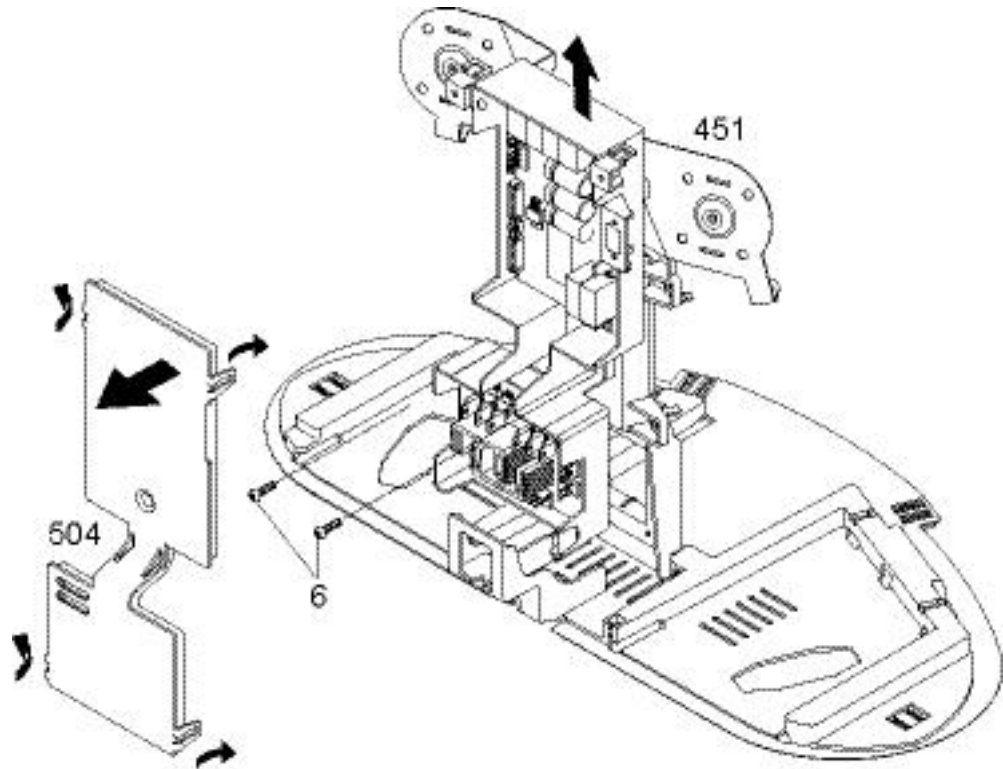
Replacing display and logic module



Pos.	Designation
6	Screw KST/PT, 3,0x12, blue galvanized, round head, Torx-10, CA point
505	Cover 705, front panel, black, print: Gemini CS200 , silver
505	Cover 702, front panel, black, print: Gemini CS220 , silver
506	Display module 702, 2x20 symbols, lighting
507	Spare control PCB 702, EU logic, V-Flash parametrized



Replacing main and power module

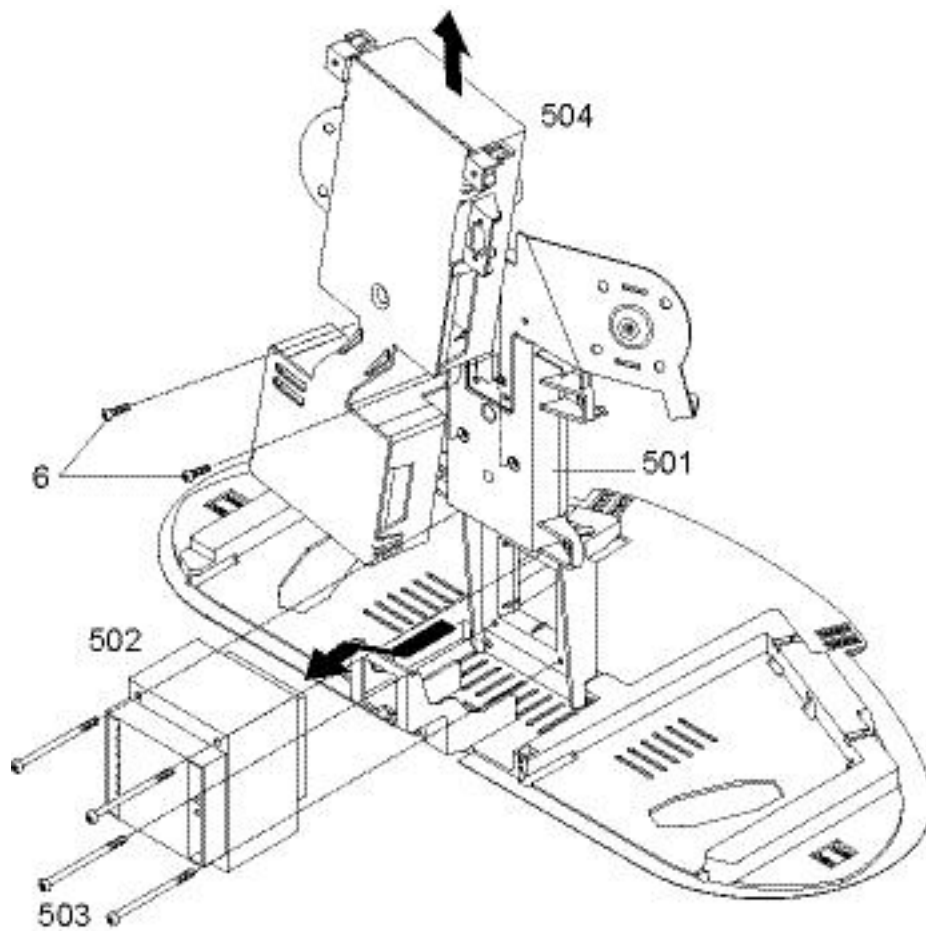


Pos.	Designation
6	Screw KST/PT, 3,0x12, blue galvanized, round head, Torx-10, CA point
451	Holder 702, thermoblock 2003, zinc plated
504	Spare control PCB 702 EU, 220-230V, V-Flash parametrized
504	Spare control PCB 702 EU, V2, 220-230V, V-Flash parametrized, track fuse

1. Unlatch cover (504) of pcb casing (4 latches).
2. Disconnect wiring.
3. Unscrew 2 fastening screws (6) of pcb casing.
4. Slide pcb casing up the holder (451) and remove.



Replacing transformer



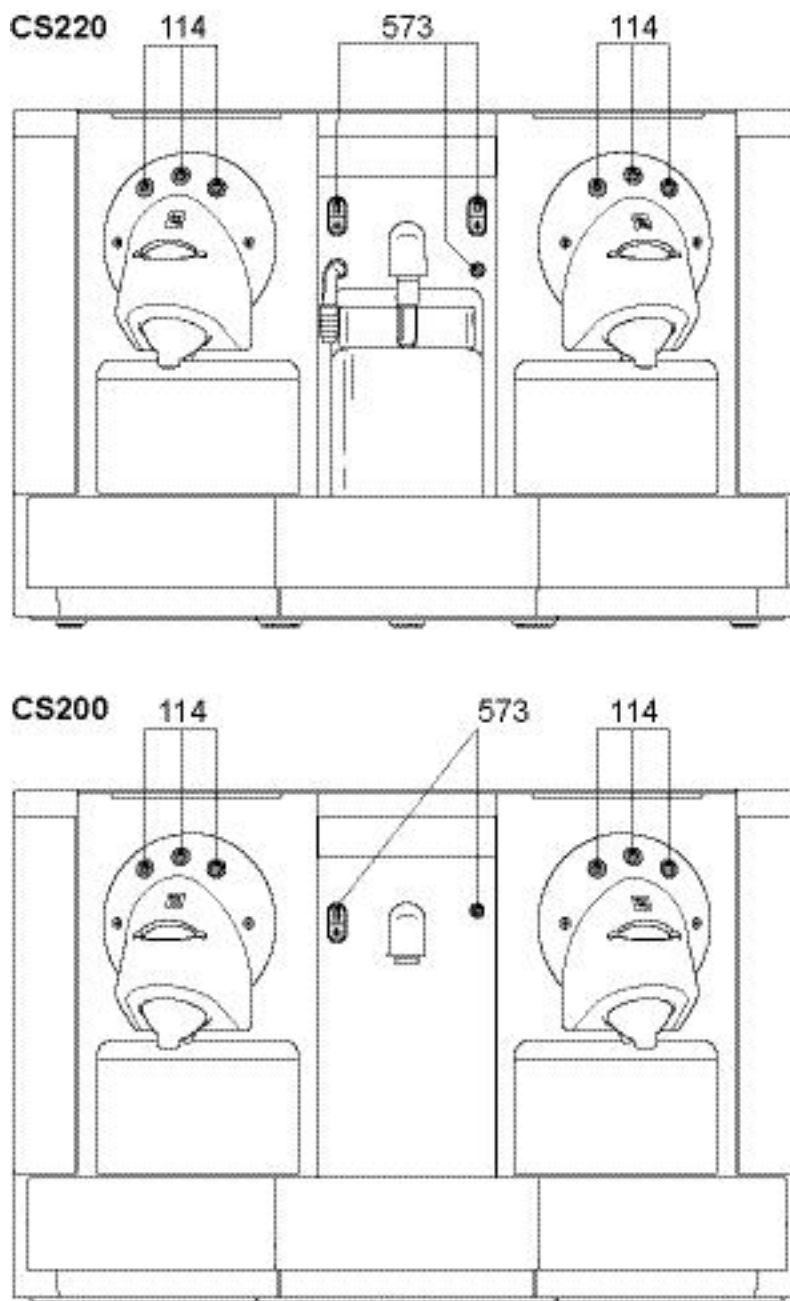
Pos.	Designation
501	Holder 702, transformer, black
502	Transformer MS6122, 230V, EI78/40LPg, 50-60Hz
503	Screw KST/PT 3,5x50, blue galvanized, round head, Torx-10 (WN 1452)
504	Spare control PCB 702 EU, 220-230V, V-Flash parametrized
504	Spare control PCB 702 EU, V2, 220-230V, V-Flash parametrized, track fuse

 **The transformer (502) has a built-in temperature fuse that cannot be replaced separately.**




6.8.4 Replacing keyboards

Position of components

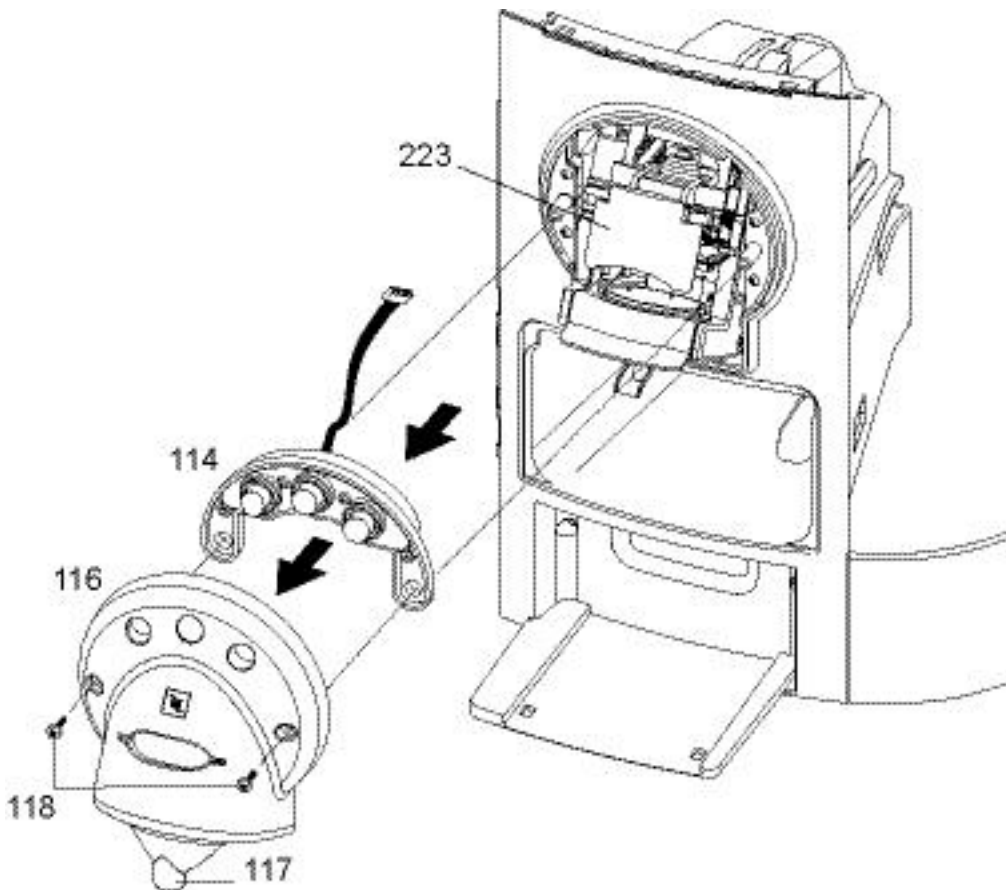


Pos.	Designation
114	Keyboard module 702, coffee, buttons lighting white
573	Keyboard module 702 (on/off, steam, hot water), CS220 only
573	Keyboard module 705 (on/off, hot water), CS200 only

-  For keyboard module (573) refer to
- "Replacing cappuccino keyboard of hot water / steam module" on page 94,
 - "Replacing hot water keyboard" on page 102.



Replacing keyboards of coffee units



The right coffee unit is illustrated as example.

Pos.	Designation
114	Keyboard module 702, coffee, buttons lighting white
116	Faceplate 702 outlet, chrome plated
117	Cover 702, outlet, black
118	Screw M3x6, blue galvanized, flat head, Torx-20

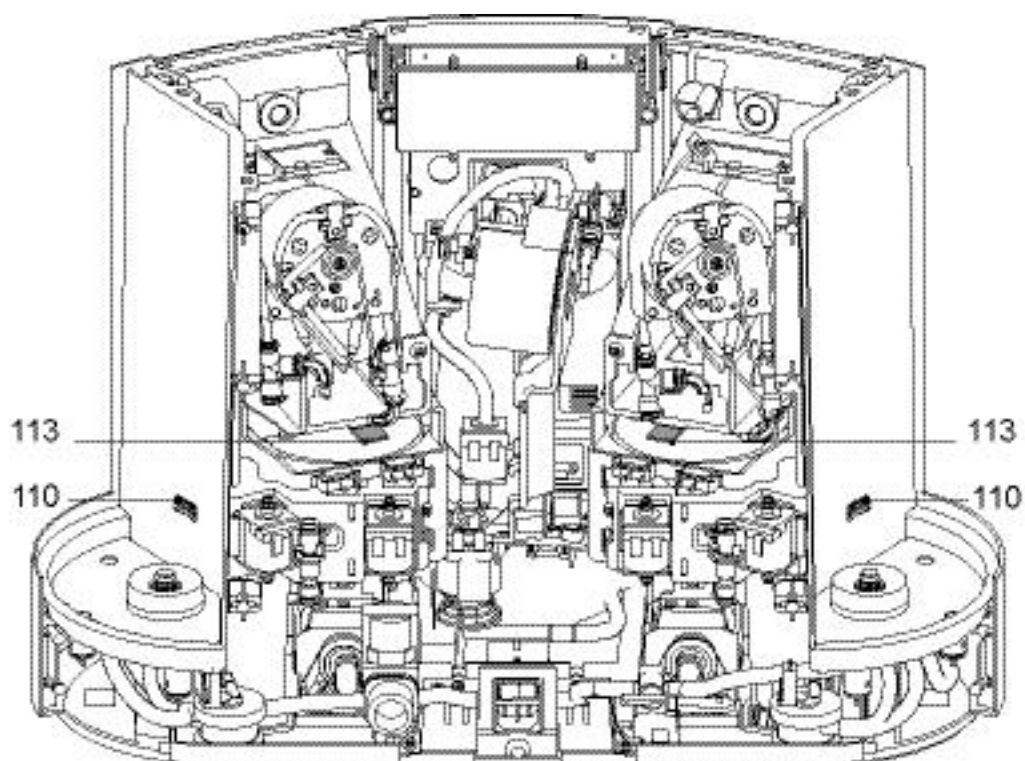
Repair tip

- Perform a security check with the safety lid (223) after reassembly (refer to page 73).



6.8.5 Replacing detection sensors

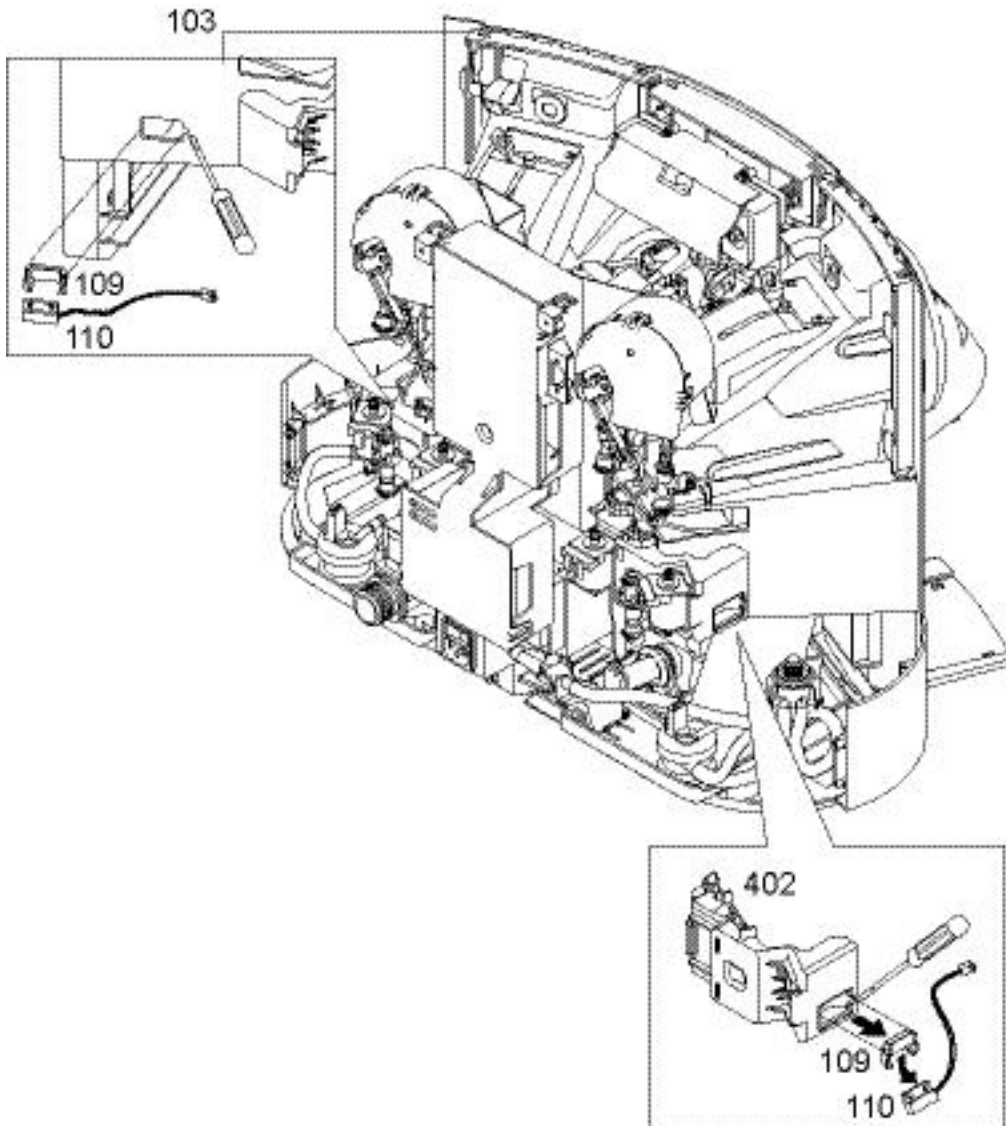
Position of components



Pos.	Designation
110	Reed sensor 640, water tank
113	IR Sensor module 702, cup lighting



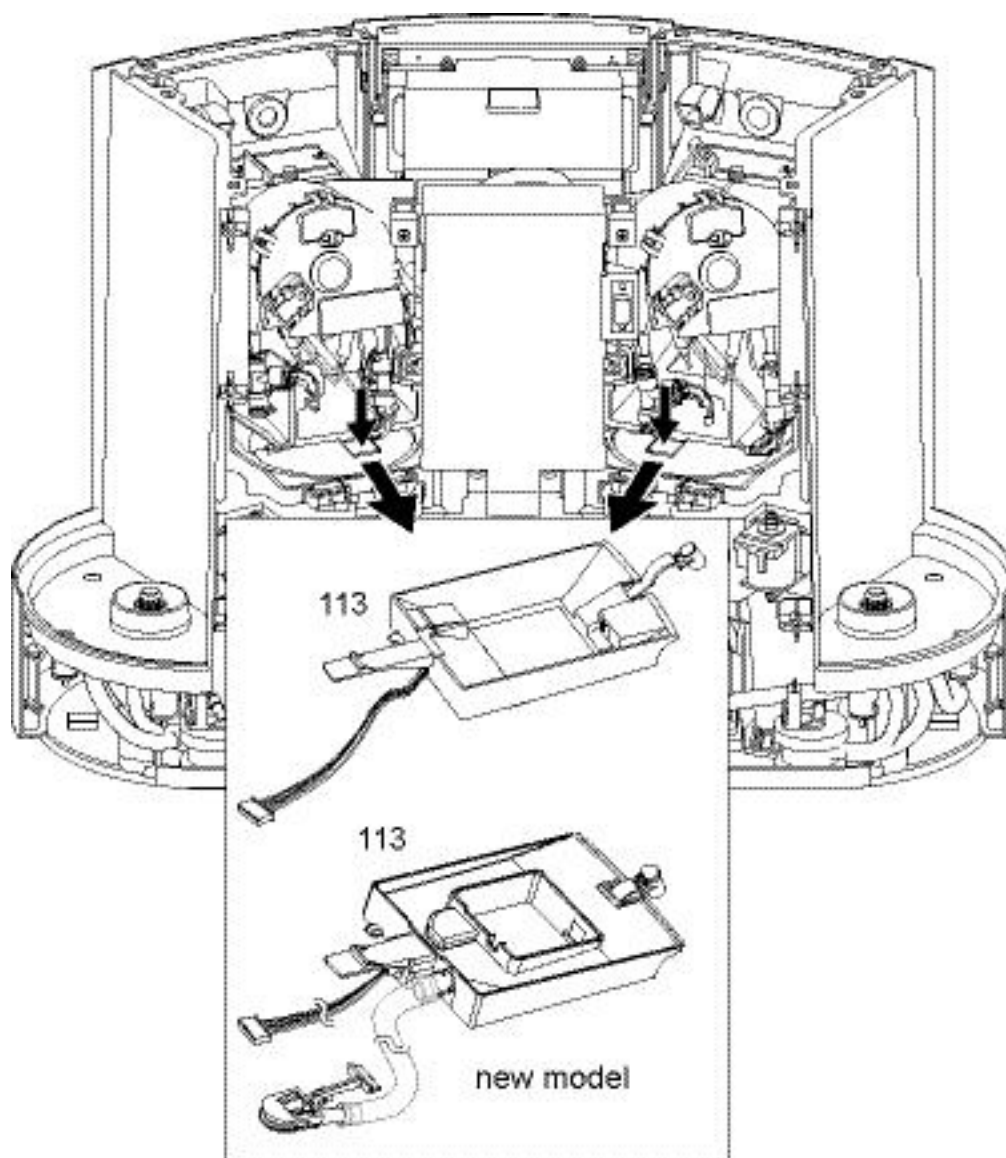
Replacing reed sensor




Pos.	Designation
103	Holder 702, extract unit, right, black
109	Support 702, reed sensor, black, water tank
110	Reed sensor 640, water tank
402	Valve holder 702, left, black



Replacing IR sensor module



Pos.	Designation
113	IR Sensor module 702, cup lighting

 **The new model of the IR sensor modul has an additional drain hose that discharges condensed water into the drip tray.**

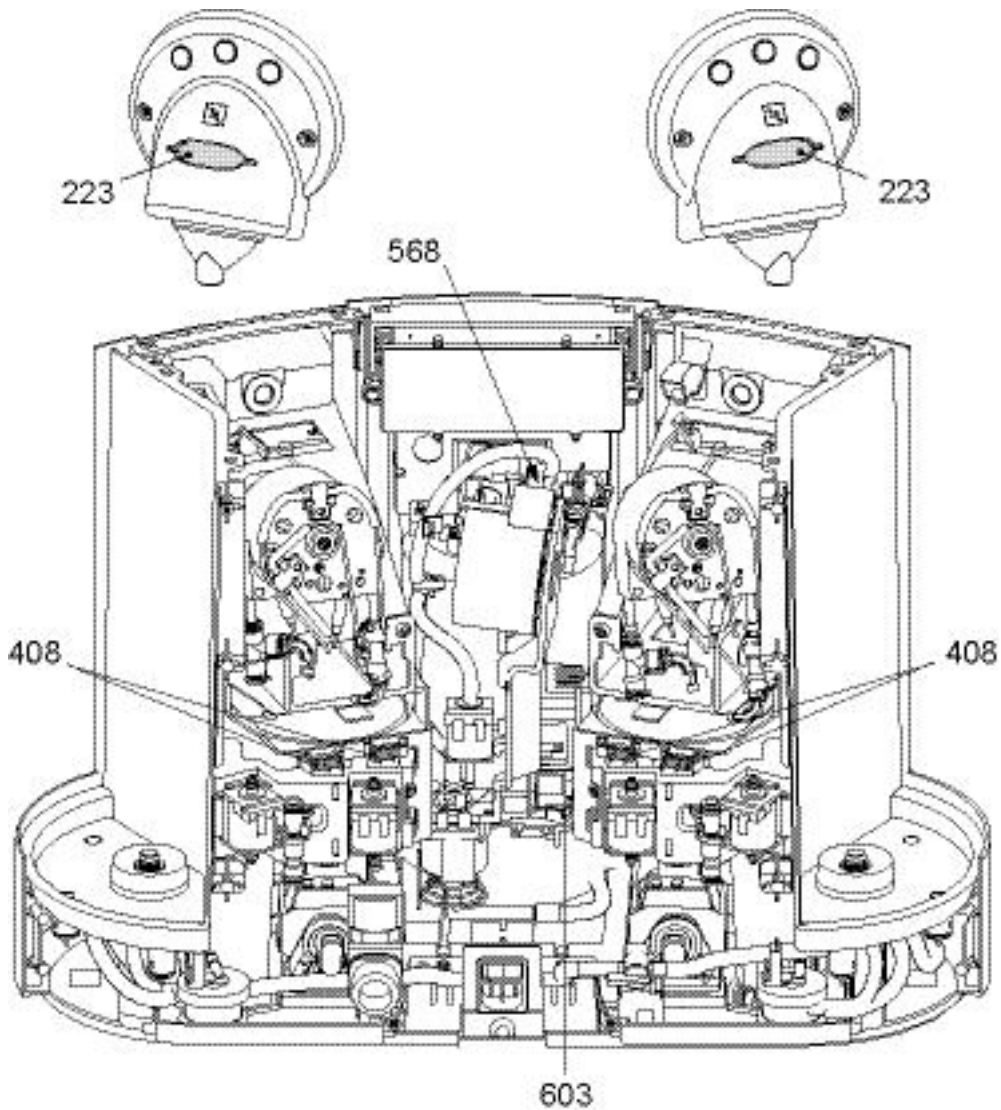
Repair tip

- To exchange the IR sensor module
 - remove extraction unit first (refer to "Replacing extraction unit" on page 86),
 - disconnect sensor cable connector,
 - disconnect drain hose (new model only),
 - detach hose at the back that blocks the access to the IR sensor modul.



6.8.6 Replacing micro switches

Position of components



All micro switches have plug contacts except the micro switch of the safety lid (223).

Pos.	Designation
223	Spare safety lid 702
408	Micro switch XCG55V-81-LZ187, lever
568	Micro switch D41R-QGAC V2, 0.1A/250V, connection 4.8x0.8mm, 100k
603	Micro switch, XCG55V-81-LZ187, lever

 For replacing safety lid (223), refer to page 88.

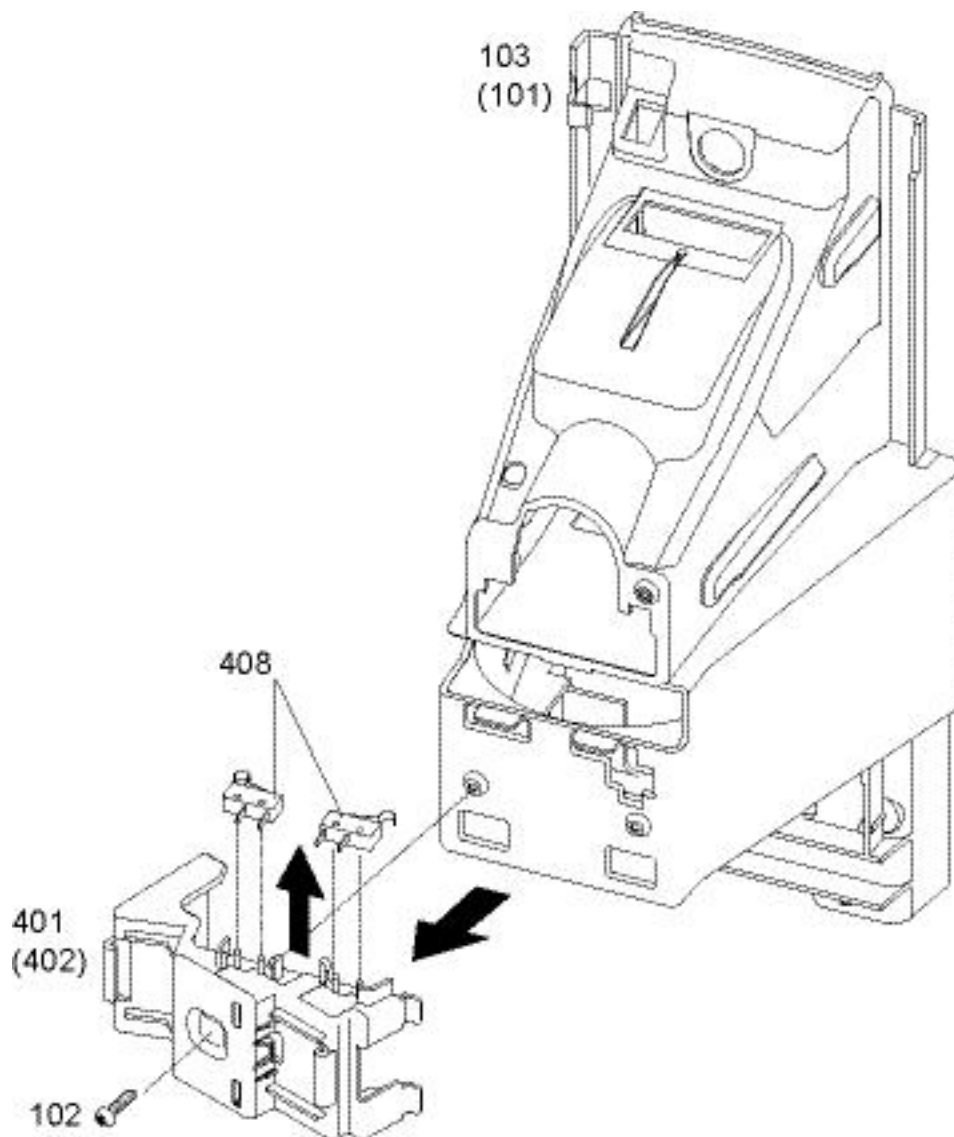
 For replacing micro switch (568), refer to page 98.

 For replacing micro switch (603), refer to page 99.



Replacing micro switches for capsule container detection

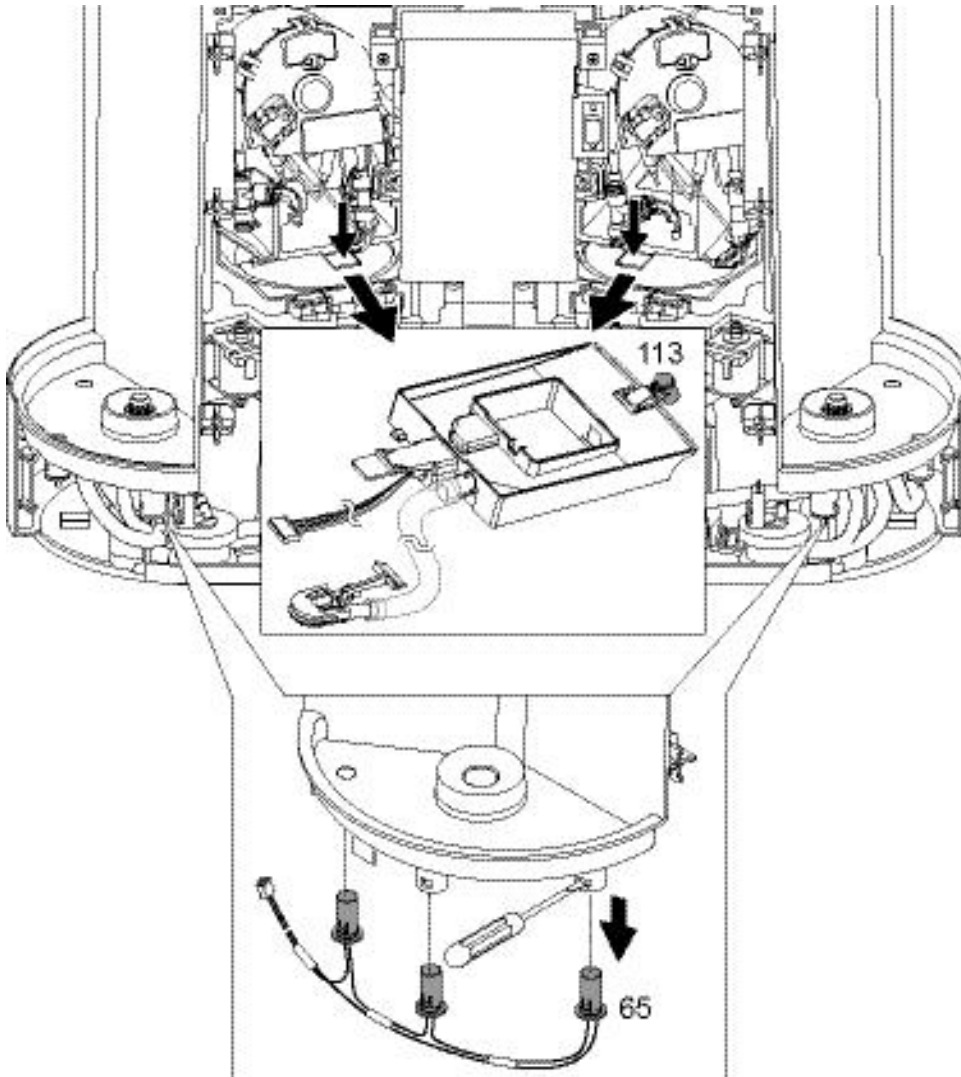
i The micro switches of the right coffee unit are illustrated as example.



Pos.	Designation
101	Holder 702, extract unit, left, black
102	Screw KST/PT, 3.5x12, blue galvanized, round head, Torx-15
103	Holder 702, extract unit, right, black
401	Valve holder 702, right, black
402	Valve holder 702, left, black
408	Micro switch XCG55V-81-LZ187, lever



6.8.7 Replacing illumination components



Pos.	Designation
65	LED tank lighting 702, complete
113	IR Sensor module 702, cup lighting

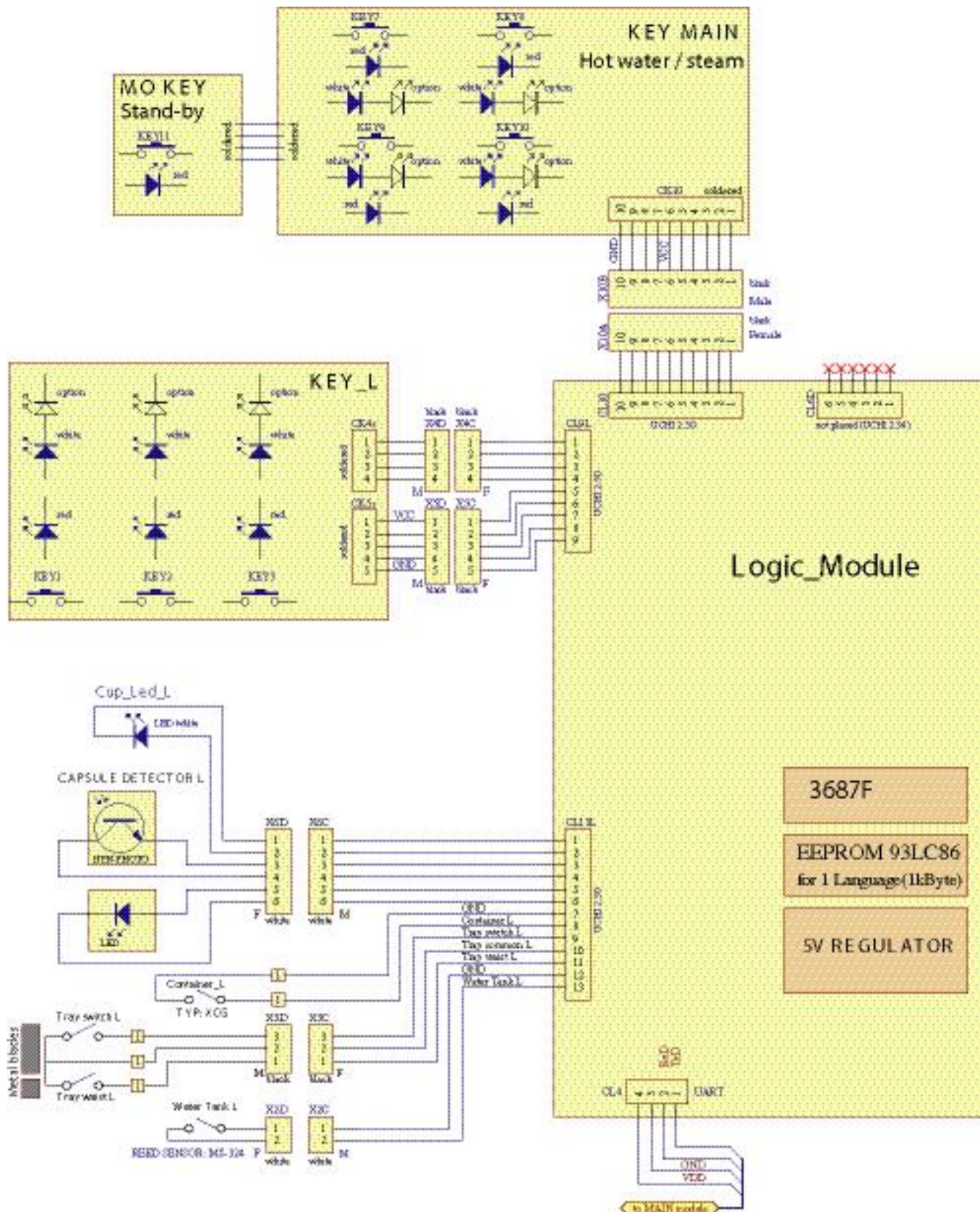
Repair tips

- The backlighting of the coffee buttons is part of the keyboard module. For replacement refer to page 116.
- The cup lighting is part of the IR sensor modul (113).
For replacement
 - remove extraction unit first (refer to page 86),
 - disconnect sensor cable connector,
 - detach drain hose (new model only),
 - detach hose at the back that blocks the access to the IR sensor modul.



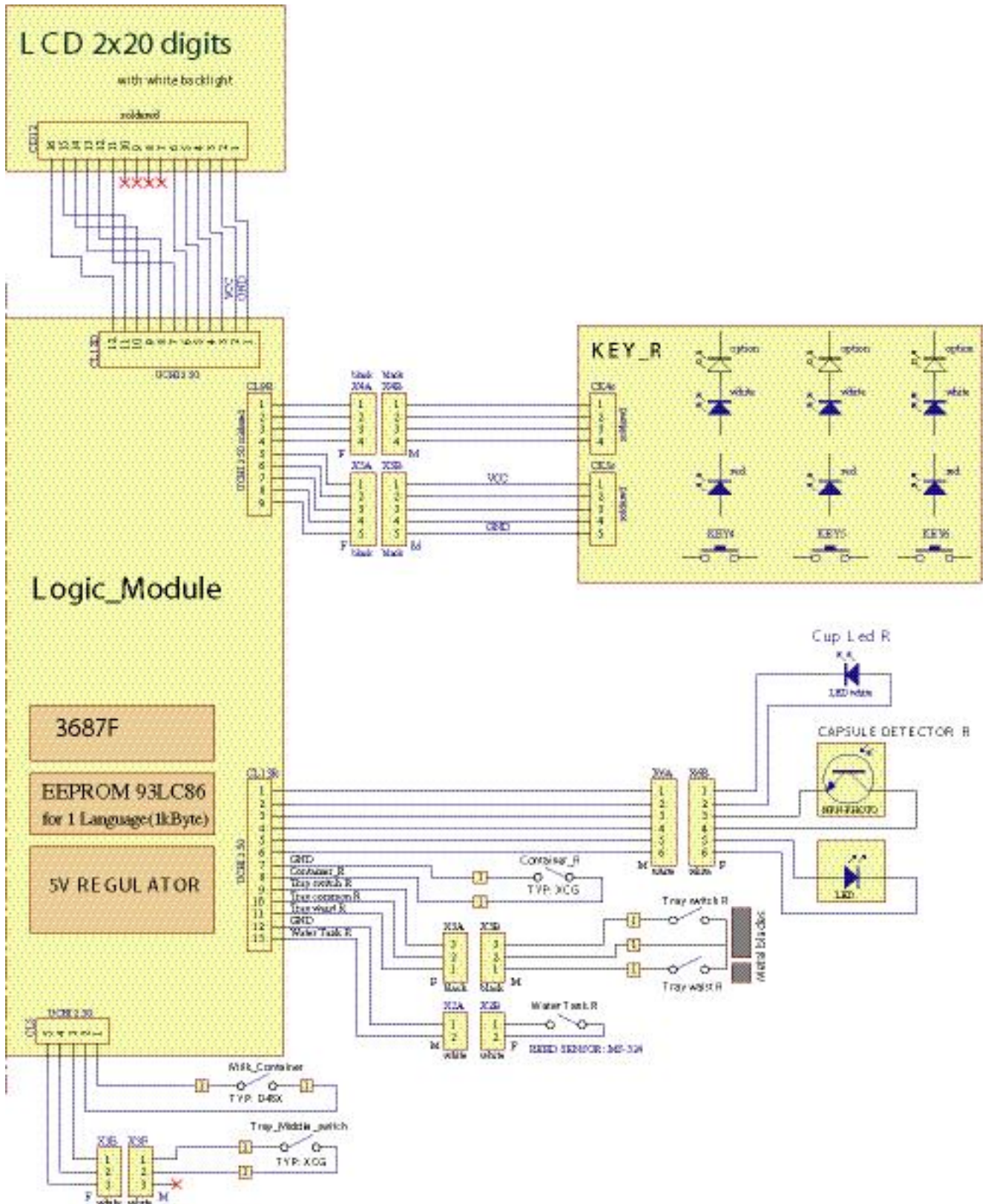
6.9 Wiring diagrams

6.9.1 Wiring diagrams of CS220 coffee machine (EF 702)



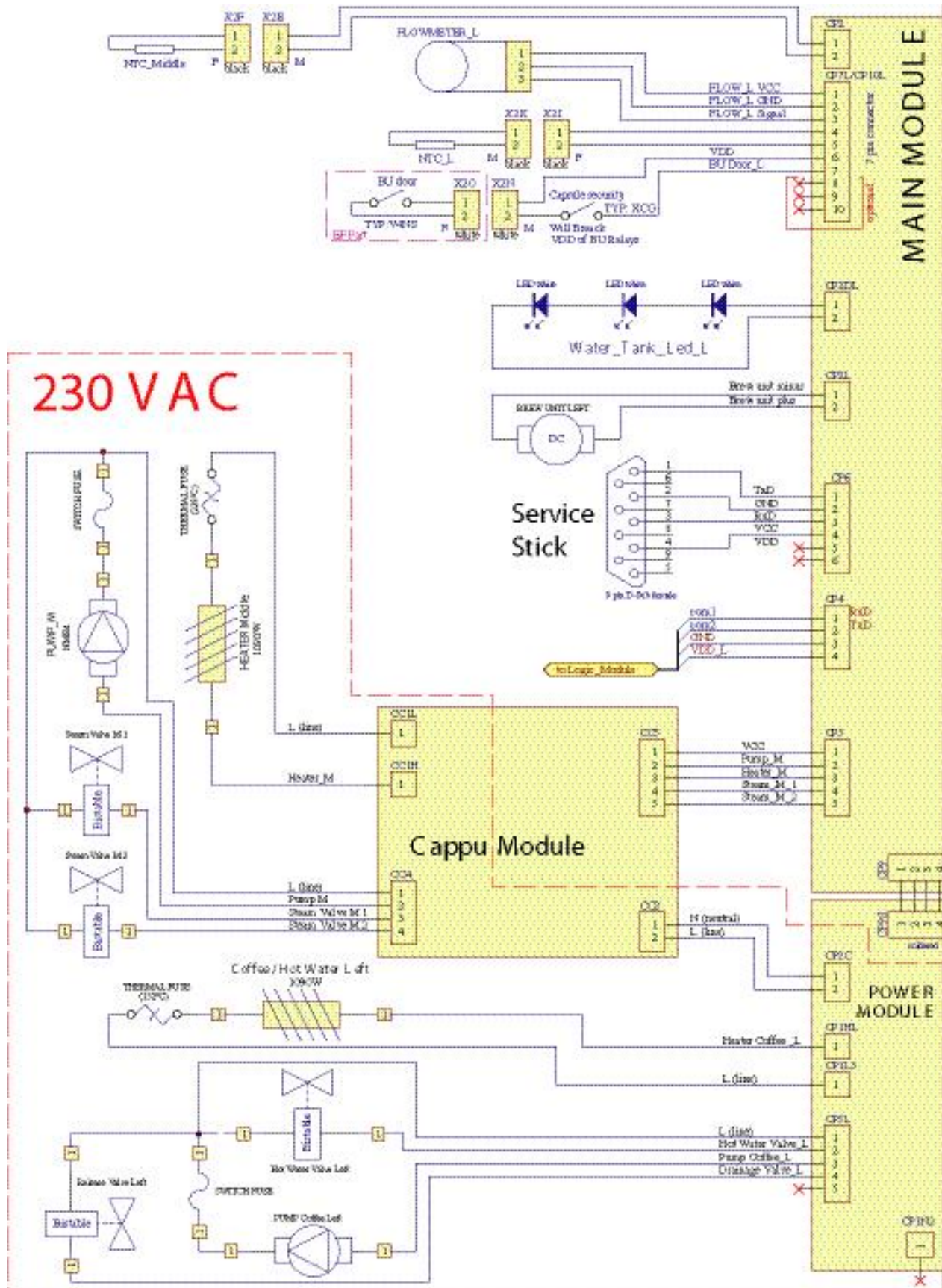


Wiring diagram (CS220)



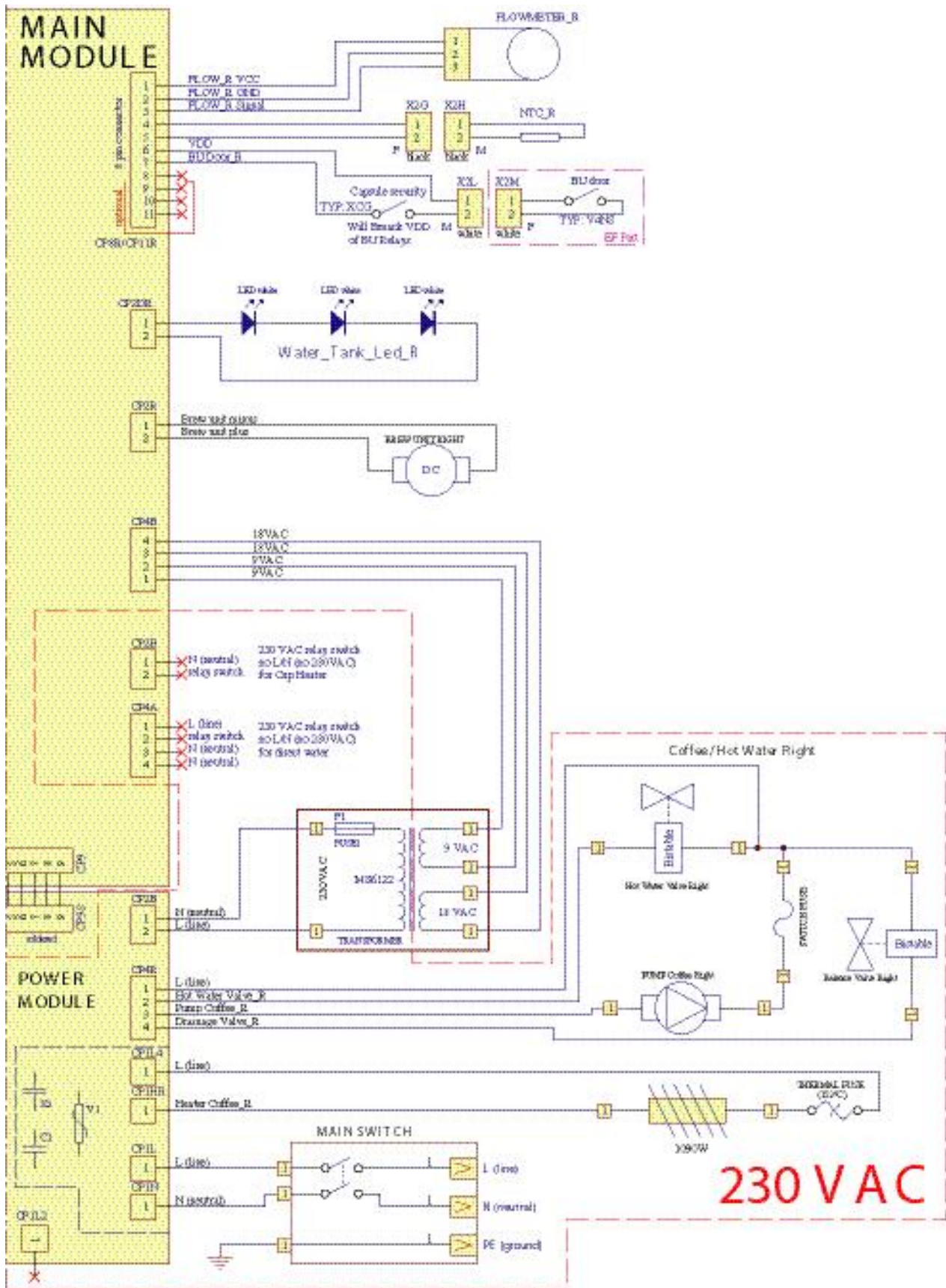


Wiring diagram (CS220)



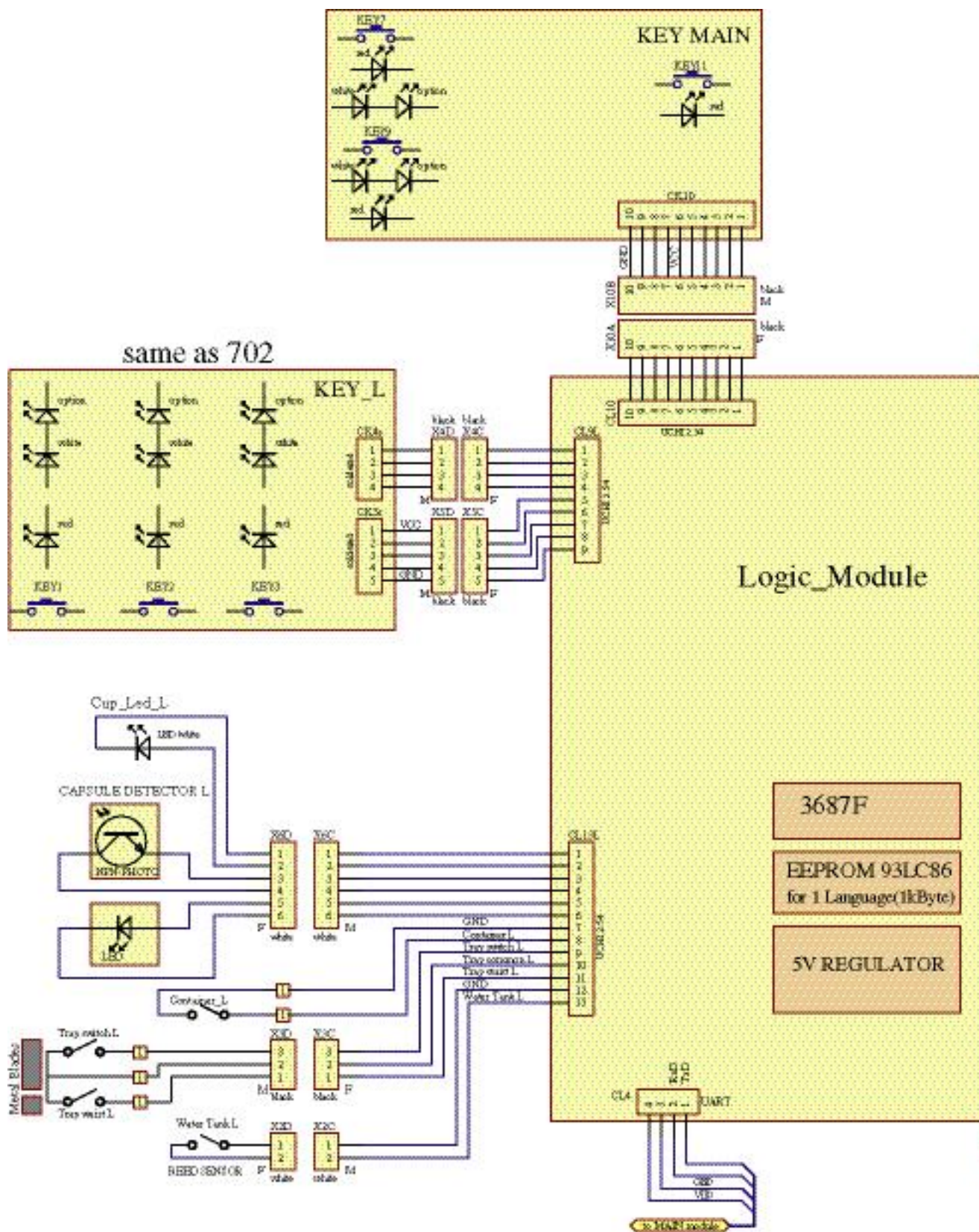


Wiring diagram (CS220)



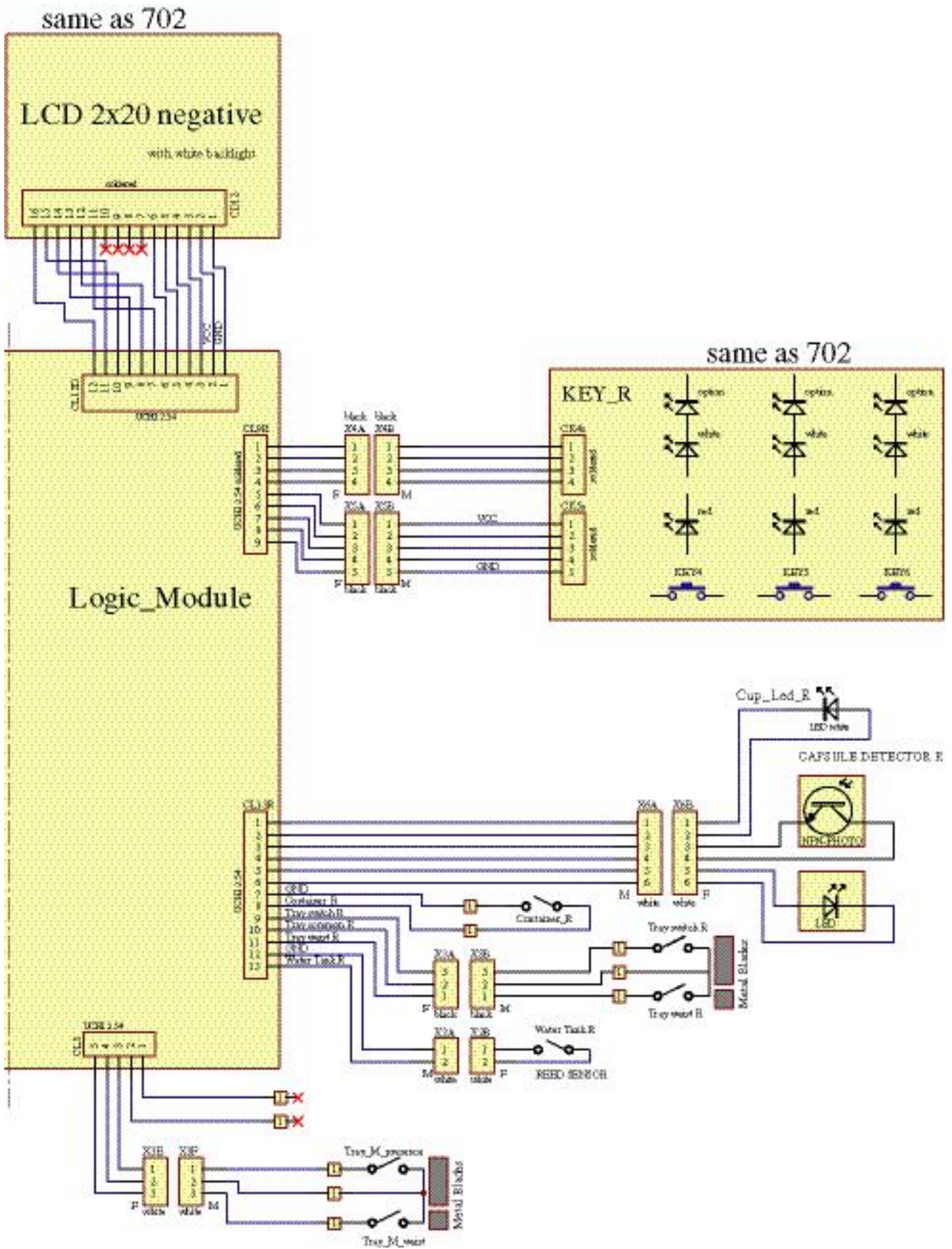


6.9.2 Wiring diagrams of CS200 coffee machine (EF 705)



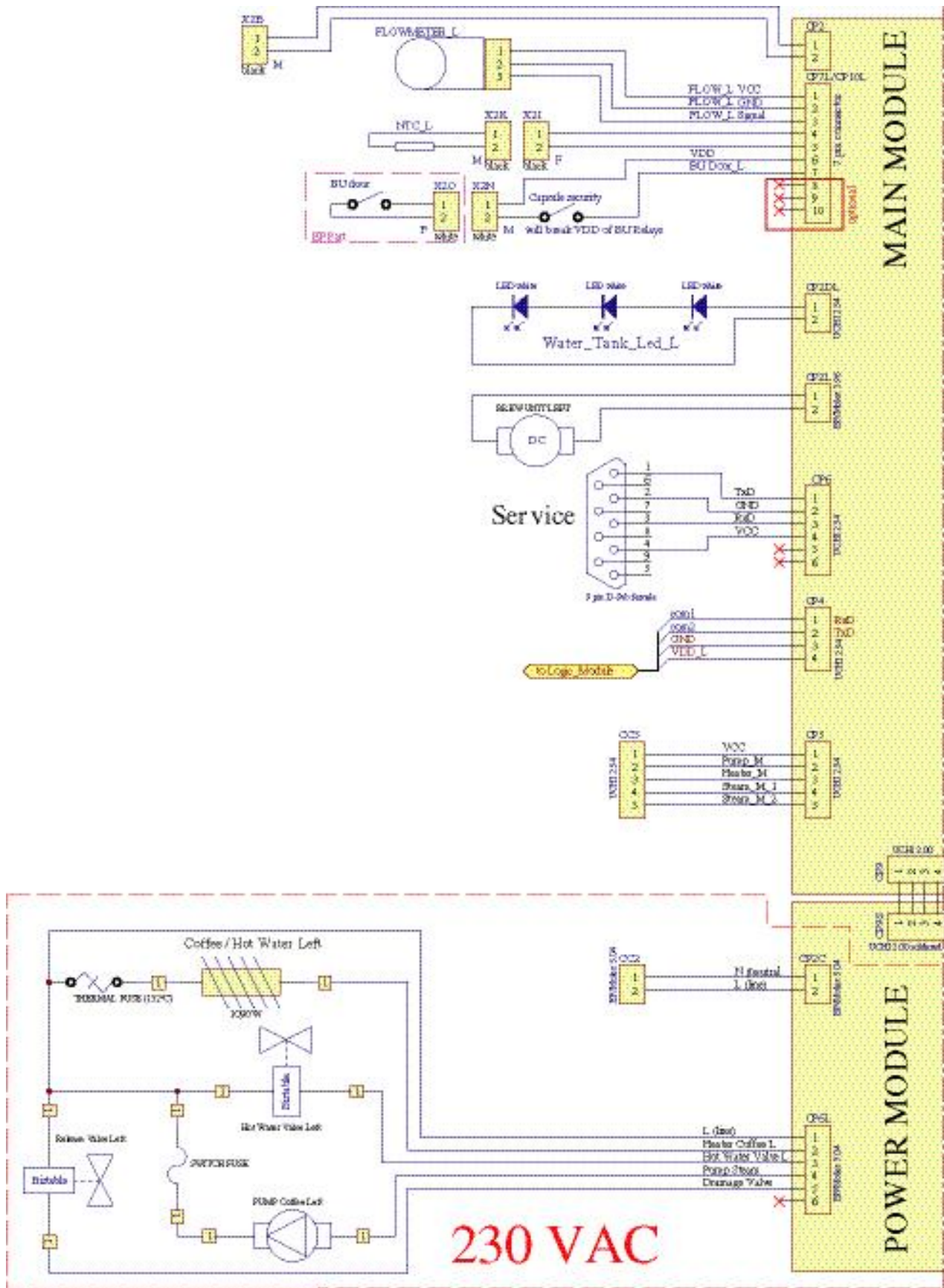


Wiring diagram (CS200)



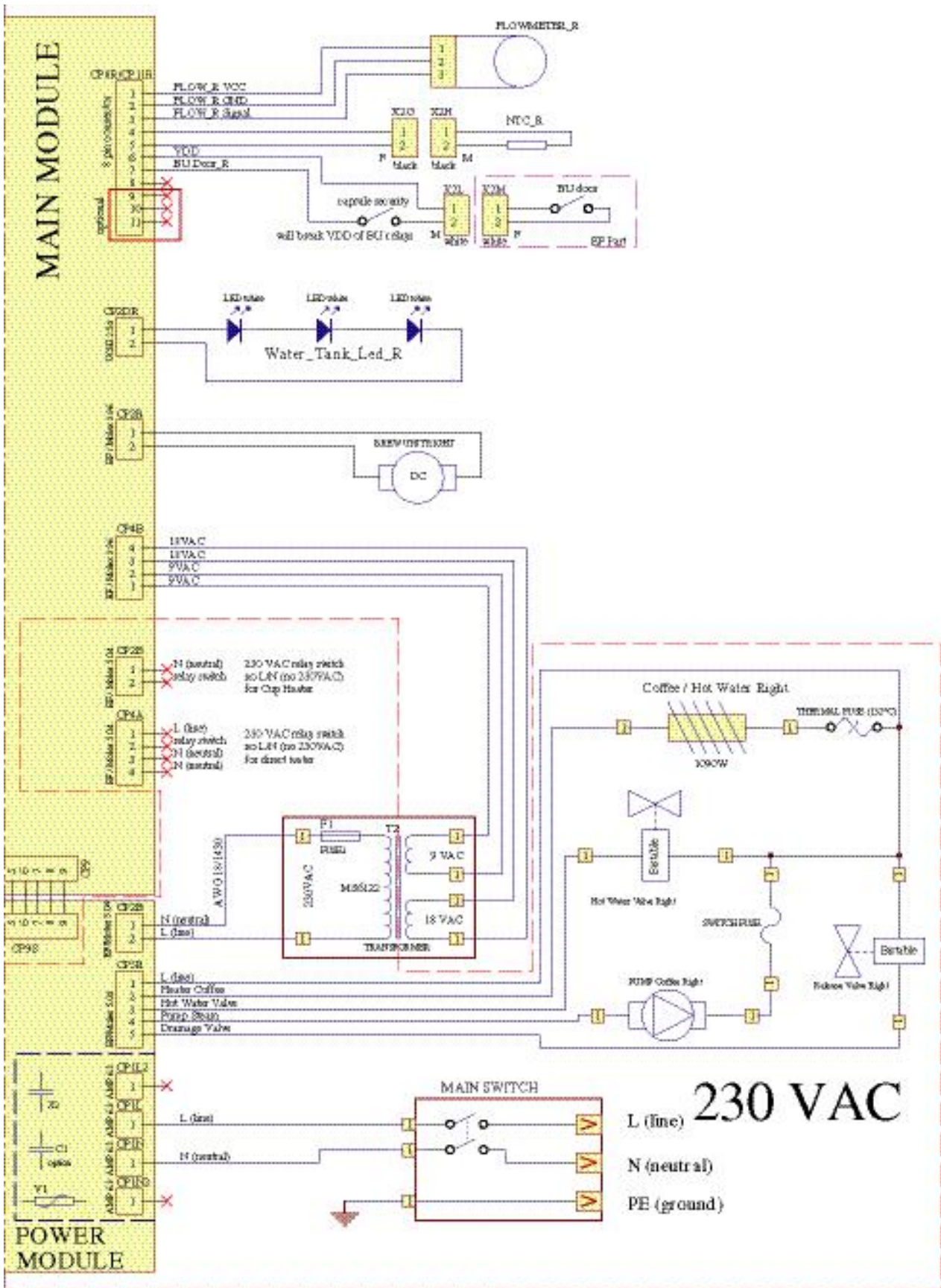


Wiring diagram (CS200)





Wiring diagram (CS200)





7 FUNCTION TESTS

7.1 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.

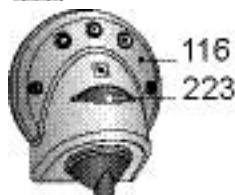


Danger of burns!

Hot parts and water under pressure inside the coffee machine.

Do not touch any hot parts while checking for leakages!

Always wear protective goggles.



Malfunction of the safety lid (223) can cause injuries!

Finger tips that are inserted in the capsule slot can be squeezed.

Whenever a faceplate (116) is detached during a function test, the correct function of the associated safety lid (223) must be tested after reassembly.



7.2 Required equipment




- 1) Pressure tester (EFR no. 42213)
- 2) Pressure adapter 702 cpl. (EFR no. 49804)
- 3) Optional - Adapter 702 (EFR no. 49803) for ES range pressure gauge (EFR no. 16195)
- 4) Safety clip
- 5) Timer
- 6) Electronic thermometer (or digital multimeter suitable for temperature measurement)
- 7) Table scales
- 8) Measuring beaker

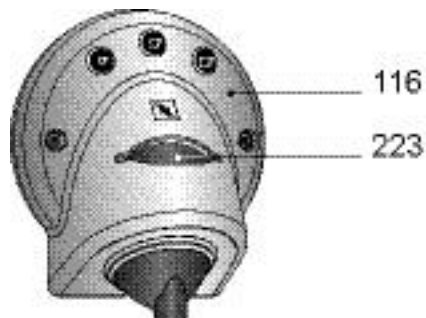
🔧 The pressure tester (1) is designed especially for the pressure adapter 702 (2). If a ES range pressure gauge (EFR no. 16195) is used instead, the optional adapter 702 (3) is necessary.

🔧 The pressure adapter (2) is delivered together with the safety clip (4).



7.3 Security check of safety lids

 **Malfunction of the safety lid (223) can cause injuries!**
Finger tips that are inserted in the capsule slot can be squeezed.



Whenever a faceplate (116) is detached during a function test, the correct function of the associated safety lid (223) must be tested after reassembly.

Procedure

1. Insert an obstacle (e.g. screwdriver, pencil etc.) in the capsule slot.
2. Switch on mains switch and press stand-by button.
3. The coffee machine performs a self-test and closes/opens the extraction units.
4. As soon as the safety lid detects the obstacle, the concerning extraction unit stops and the display message "Machine blocked - call service center" appears.
5. Remove the obstacle.

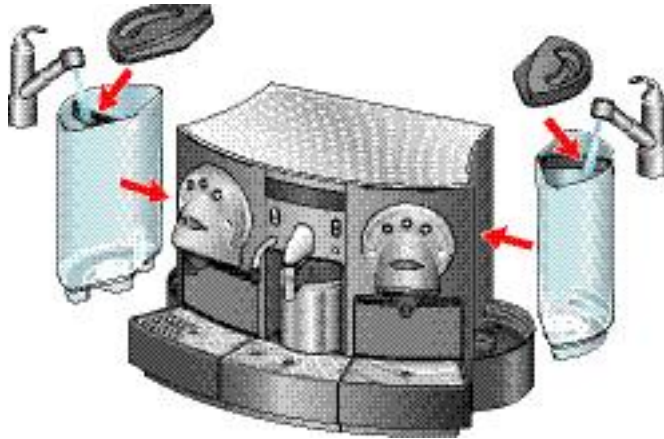
If the obstacle is clamped in the extraction unit or damaged:

- Check wiring of safety lid (223).
- Replace a defect safety lid (refer to page 88).
- Repeat security check.

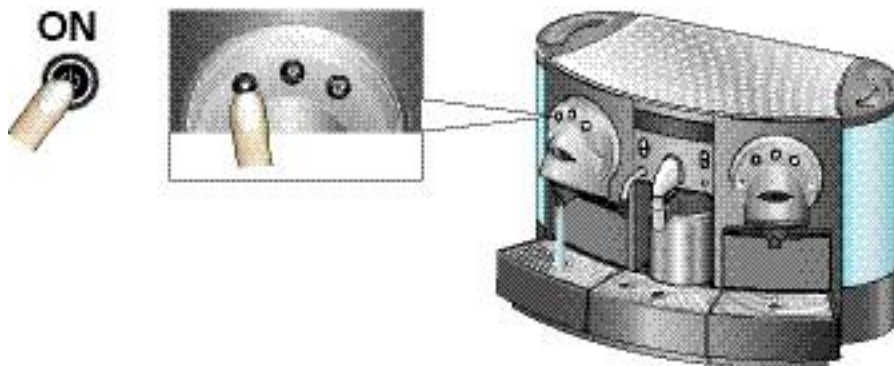


7.4 Measure coffee temperature

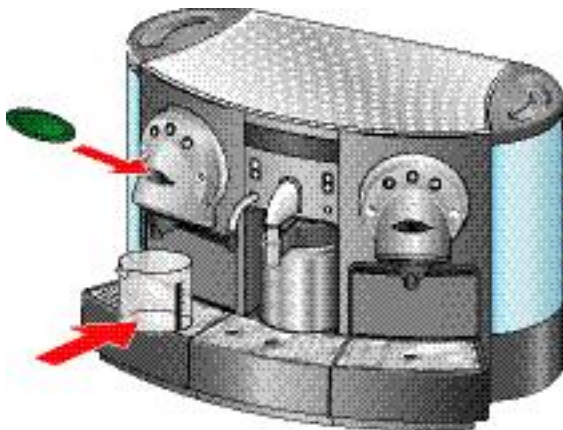
Perform the measurement of temperature for each coffee unit separately.



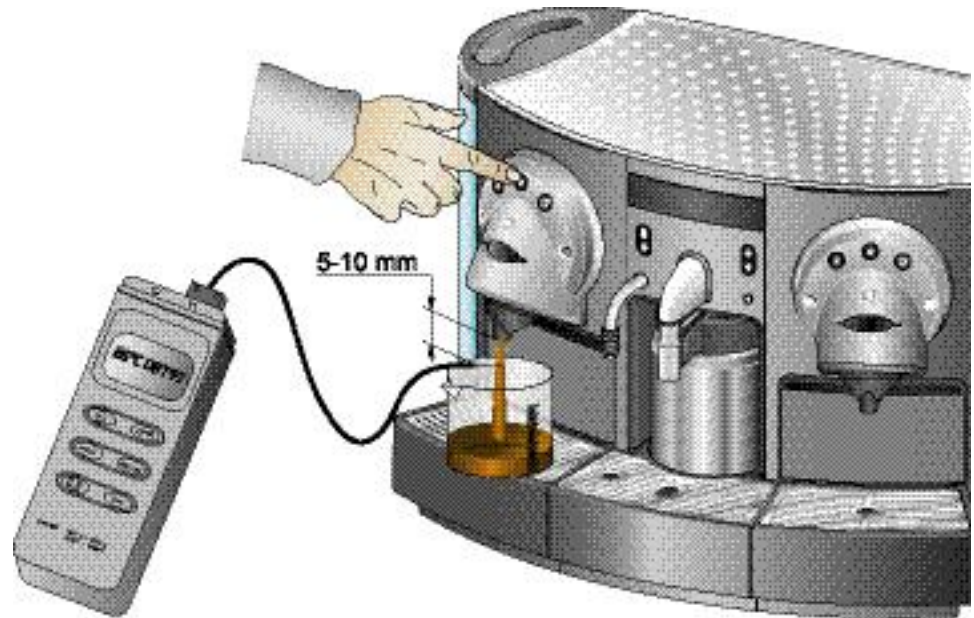
1. Fill water tanks with cold water.
Insert water tanks in coffee machine.



2. Switch on the coffee machine and press stand-by button.
3. After the heating up period, press the coffee button "small cup" to preheat the coffee outlet with hot water.



4. Place a measuring cup under the coffee outlet.
5. Insert a capsule in the capsule slot (Cosi is best suited).



6. Press coffee button "medium cup".

 **The programmed cup length should be 40 ml or more.**

7. Wait until the measuring cup contains 20 ml of coffee.

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

 **The coffee temperature should be $86\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ ($187\text{ }^{\circ}\text{F} \pm 5.4\text{ }^{\circ}\text{F}$).**

9. If necessary, change coffee temperature gradually with the help of menu point "coffee temperature" (see "Power user menu points" on page 30).

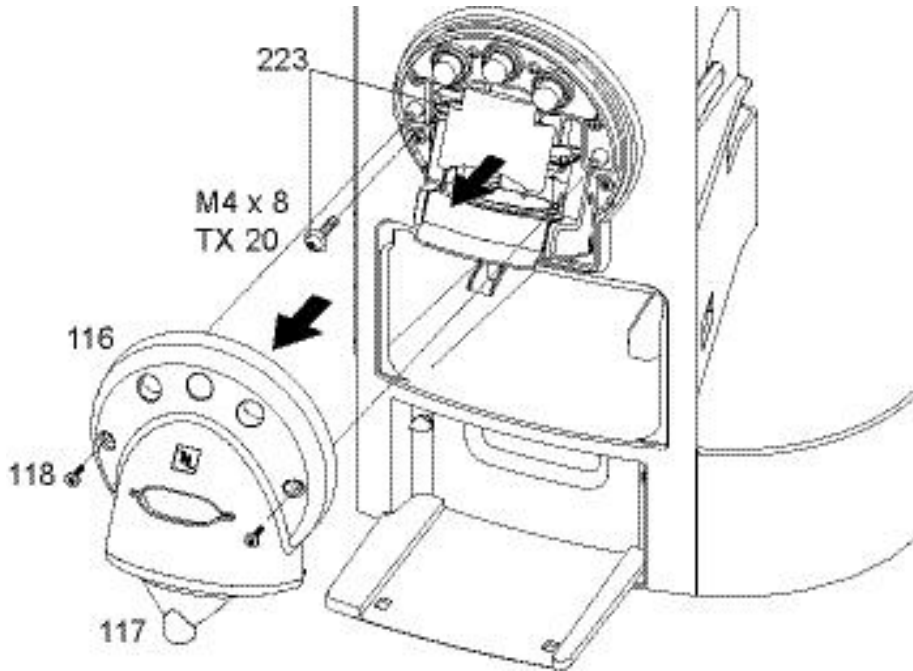
 **This menu point setting is valid for both coffee units.**




7.5 Measure flow rate of coffee units

Perform the flow rate measurement for each coffee unit separately.

7.5.1 Preparation



 The preparation and test configuration is the same as for the pressure and leakage checks.

1. Open jaw of extraction unit.




How to open a closed jaw:

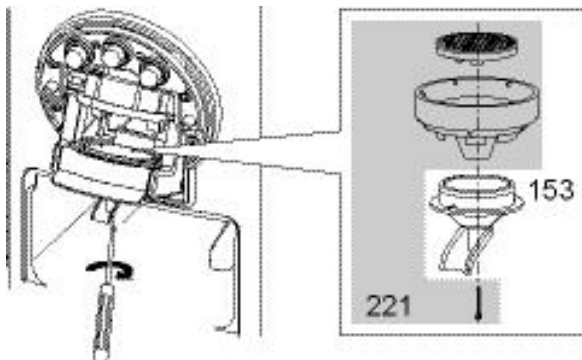
1. Switch machine to stand-by mode.
2. Enter power user menu (jaw of extraction unit opens automatically).
3. Exit power user menu.
4. Switch machine off with mains switch.

2. Remove faceplate (116) with cover (117) from the coffee outlet.

 **Hold fast the cup lighting, when removing the faceplate (116) from the coffee outlet.**

 The cup lighting is inserted in a recess at the underside of the faceplate (116).

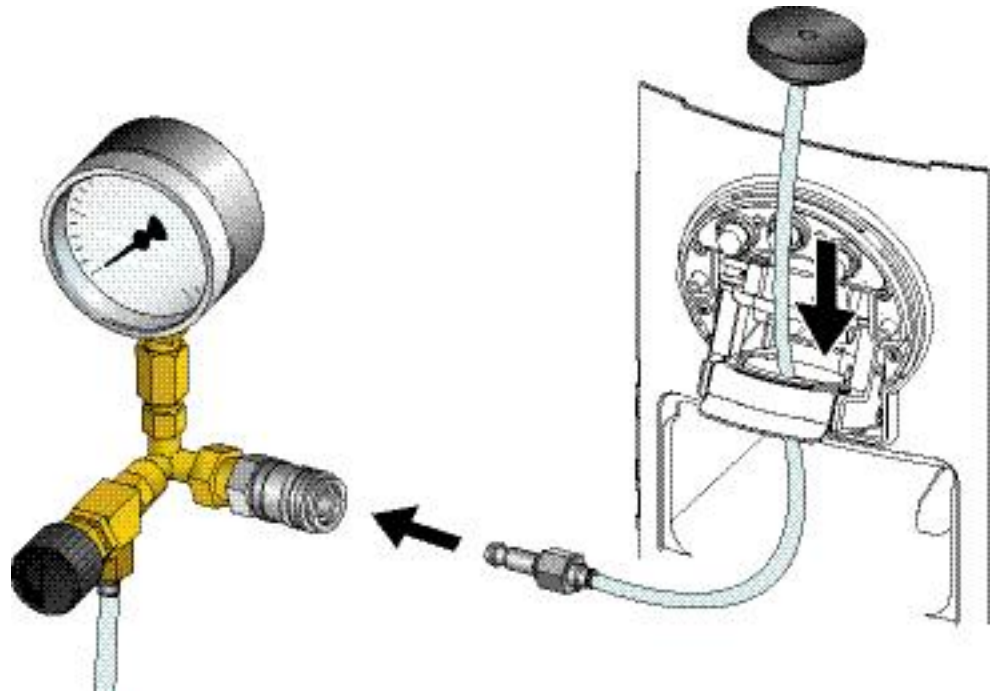
3. Remove safety lid (223).




4. Remove outlet (153) and parts of spare kit (221).

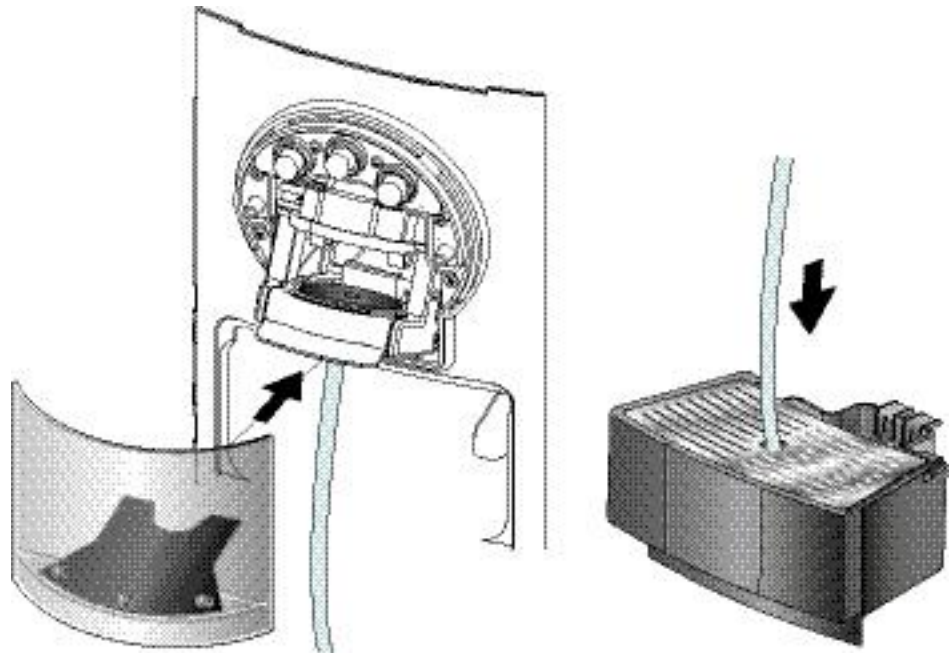


FUNCTION TESTS



5. Insert pressure adapter (EFR no. 49804) in extraction unit and connect it to pressure tester (EFR no. 42213).

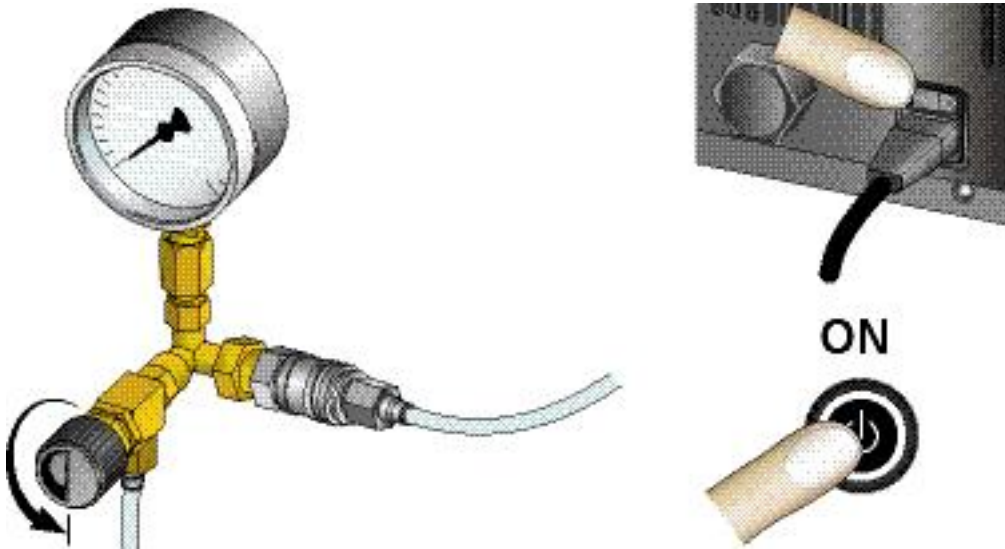
 **Danger of injuries to eyes and burns!**
Hot water under pressure can spurt out of extraction unit.
Always attach safety clip for protection.



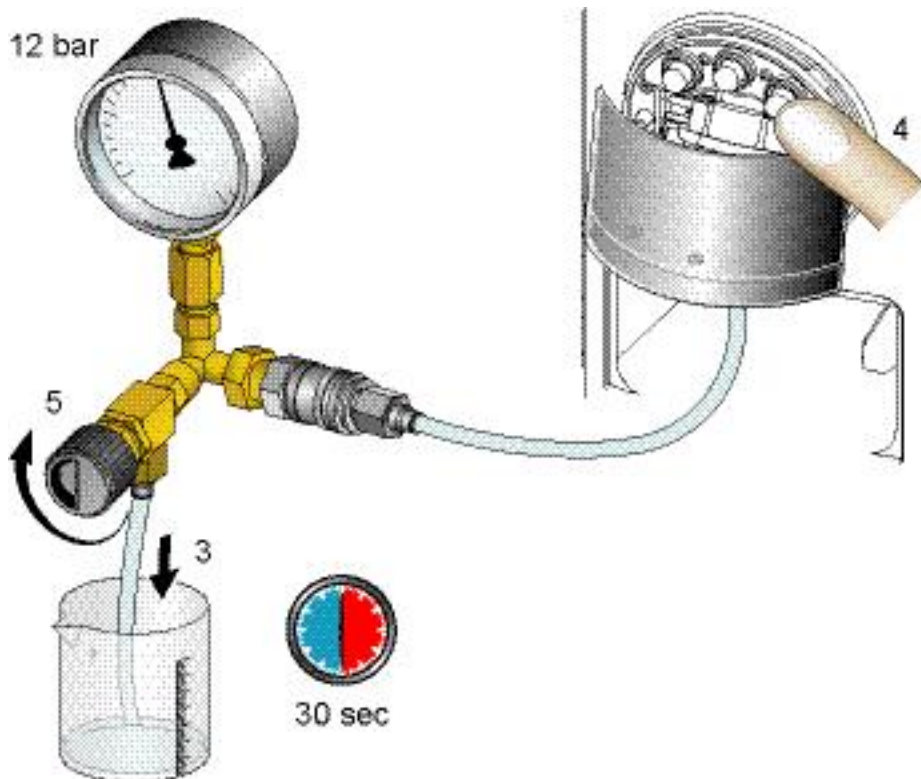
6. Attach safety clip.
7. Put drain hose of pressure tester in drip tray.



7.5.2 Test run



1. Open valve at pressure tester fully (turn counter-clockwise).
2. Switch on the coffee machine and press stand-by button. Both coffee outlets are rinsed automatically.



3. Place a measuring beaker under the drain hose of the pressure tester.
4. After heating up, press the "large cup" button.

☞ The programmed cup length should be 110 ml or more.

5. Turn the valve clockwise until the manometer indicates 12 bar.



FUNCTION TESTS

- ☞ **Constantly monitor the manometer and if required readjust the valve. As the temperature increases, so does the pressure, readjust the pressure to 12 bar when required.**

6. Carry out measurement for 30 sec.

Result:

At least 60 - 110 ml of water must be in the measuring beaker.

Conclusions:

- Should less than 60 ml leak out, then the pump is defective or there is a leak in the water system.
- Large deviations in the indicated pressure while measuring (± 4 bar) means that the pump is defective.

7.6 Pressure and leakage checks for coffee units

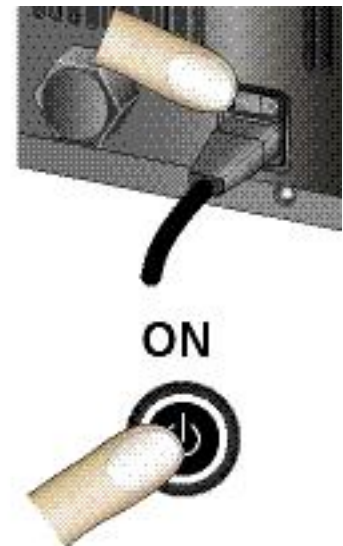
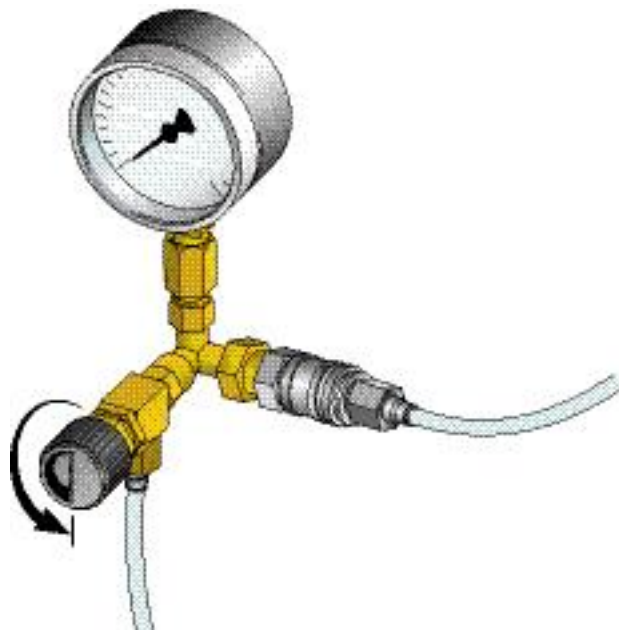
7.6.1 Preparation

1. Remove back wall and heating plate (refer to "General disassembly" on page 77).
2. Install pressure tester according to "Preparation" on page 137.

- ☞ **Instead of using a beaker, the drain hose can be put in a drip tray.**

3. Connect coffee machine to mains.

7.6.2 Test run



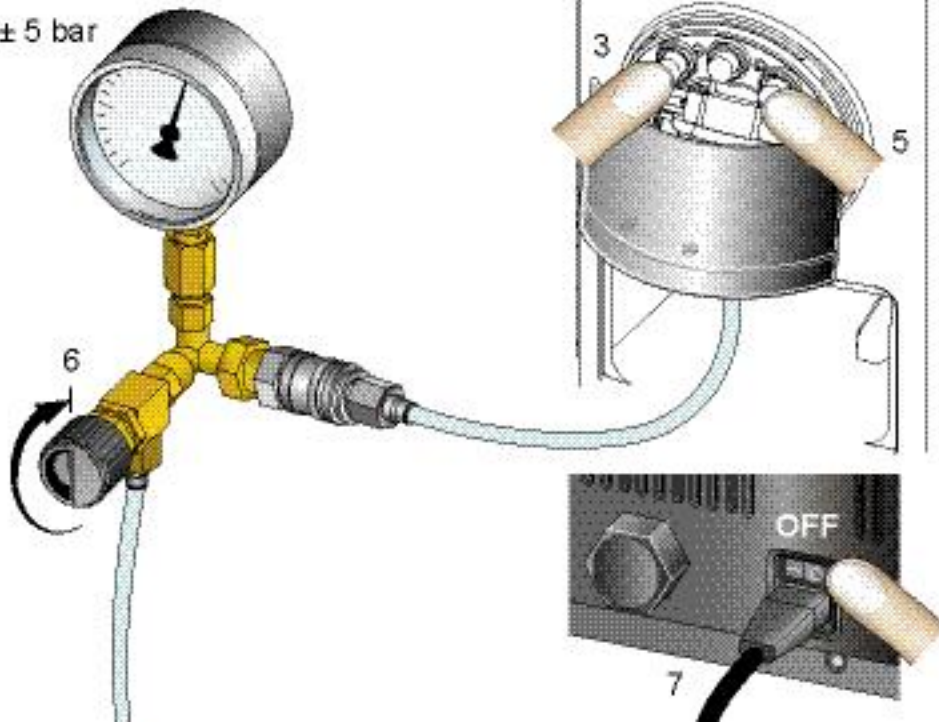
1. Open valve at pressure tester fully (turn counter-clockwise).
2. Switch on the coffee machine and press stand-by button.
Both coffee outlets are rinsed automatically.

i If possible, perform pressure and leakage checks after the flow rate measurement.

⚠ **Danger of injuries to eyes and burns!**
Hot water under pressure can spurt out of extraction unit.
Always attach safety clip for protection.



15 ± 5 bar

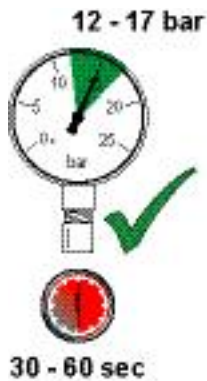


3. After heating up, press the coffee button "small cup".
4. Let the water flow out of the drain hose completely.
5. Press coffee button "large cup".
6. Close the valve completely.
7. Switch off coffee machine with mains switch as soon as the manometer shows a pressure of 15 ± 1.5 bar.



Danger of pump damage!

Do not run the pump for more than 50 sec. with the valve closed.



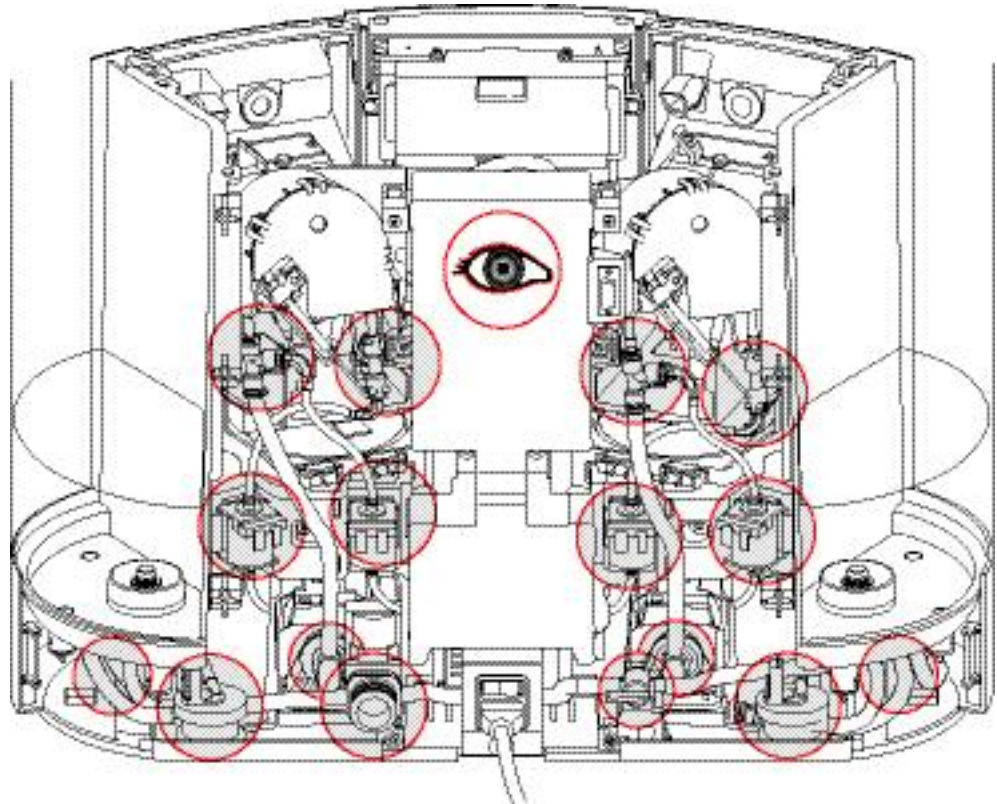
8. Check manometer reading:
 - Pressure between 12 and 17 bar after 30 till 60 seconds..... water circuit is tight
 - Pressure below 12 bar within 60 seconds water circuit is leaking
9. If water circuit is tight, open the valve and let all water flow out of the pressure tester. Then test the other coffee water circuit accordingly.
10. If the water circuit is leaking, proceed with the leakage checks.



Leakage checks

-  Search for leaks as long as the water circuit is under pressure. If necessary put coffee water circuit under pressure again until the inspection is finished.

i Checkpoints of both coffee units are shown. Check coffee water circuit under pressure only.



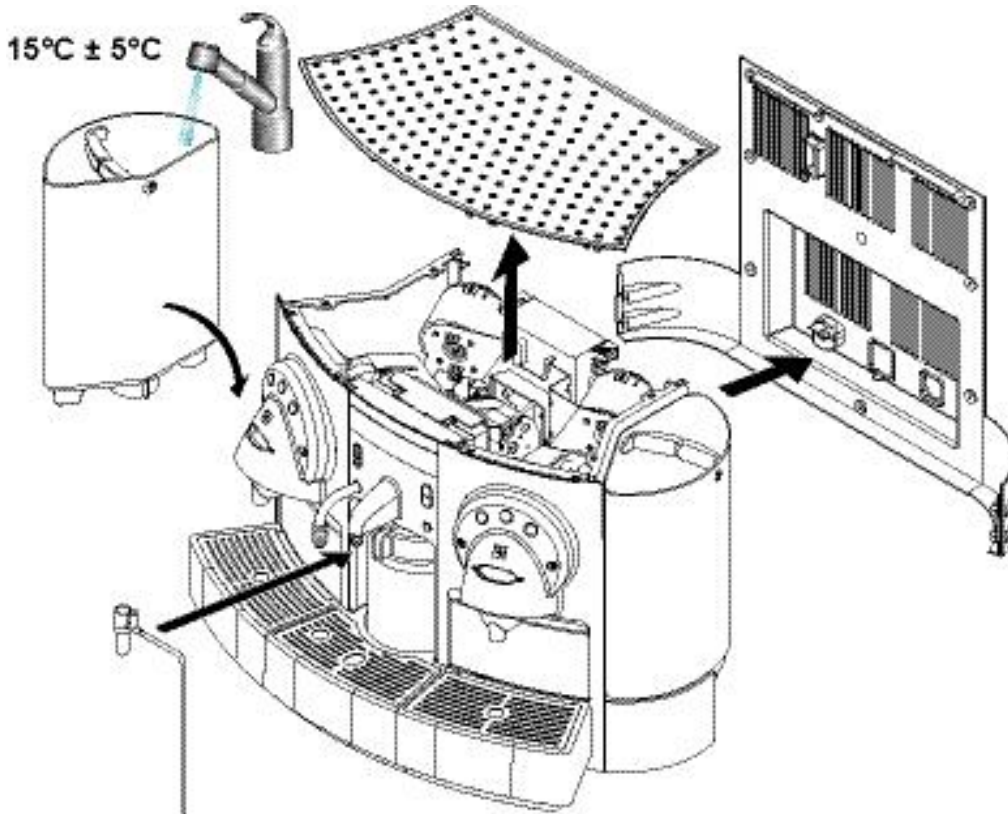
Danger of pump damage!
Do not run the pump for more than 50 sec. with the valve closed.

1. Check all the following parts under pressure for audible and visible leaks:
 - Extraction unit
 - Thermoblock
 - Pump
 - Solenoid valves
 - Hose connections
2. Check low pressure hose connections subsequently.
3. Open the valve and let all water flow out of the pressure tester.
4. Replace leaky components (refer to repairs chapter).

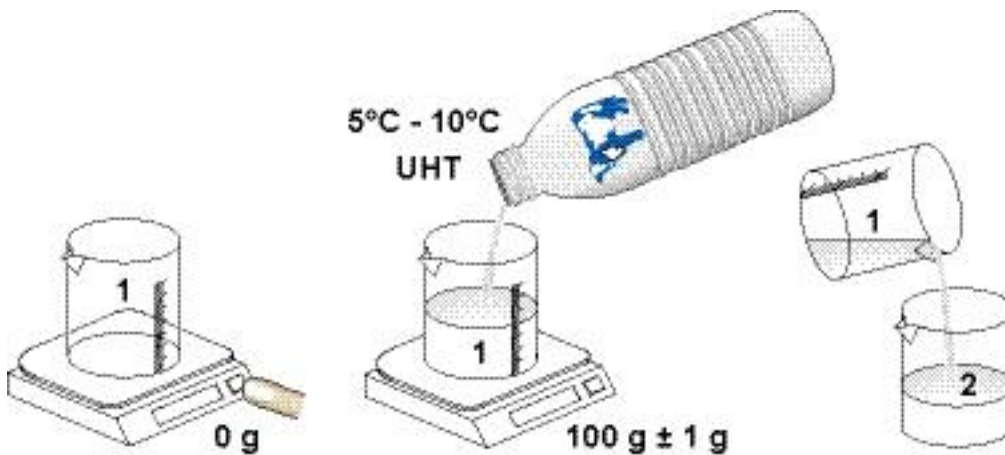


7.7 Performance checks for cappuccinatore unit (CS220 only)

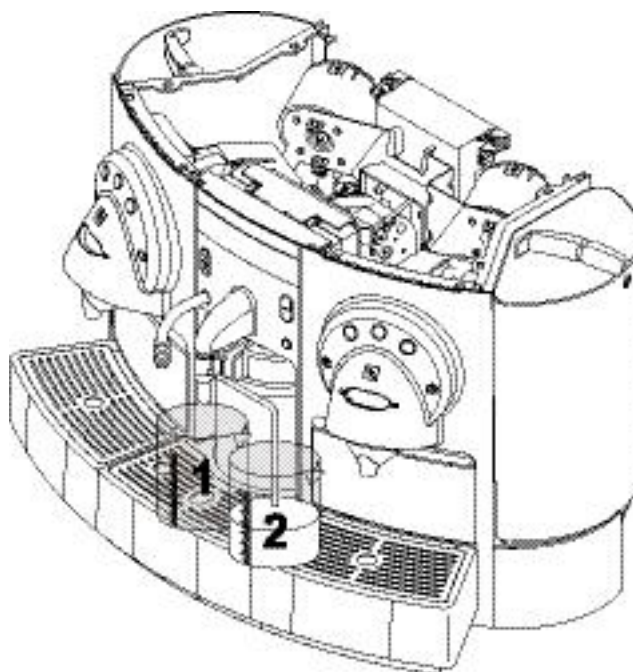
Leak test



1. Remove back wall and heating plate (refer to "General disassembly" on page 77).
2. Fill left water tank with water at $15^{\circ}\text{C} \pm 5^{\circ}\text{C}$ temperature. Insert water tank in coffee machine.
3. Place a new disposable foam device on the steam outlet and fix a straw on it.



4. Place an empty measuring beaker (1) on the table scales and tare to 0.
5. Fill measuring beaker with $100\text{ g} \pm 1\text{ g}$ of cold milk (between 5°C to 10°C).
6. Empty the milk into a second beaker.

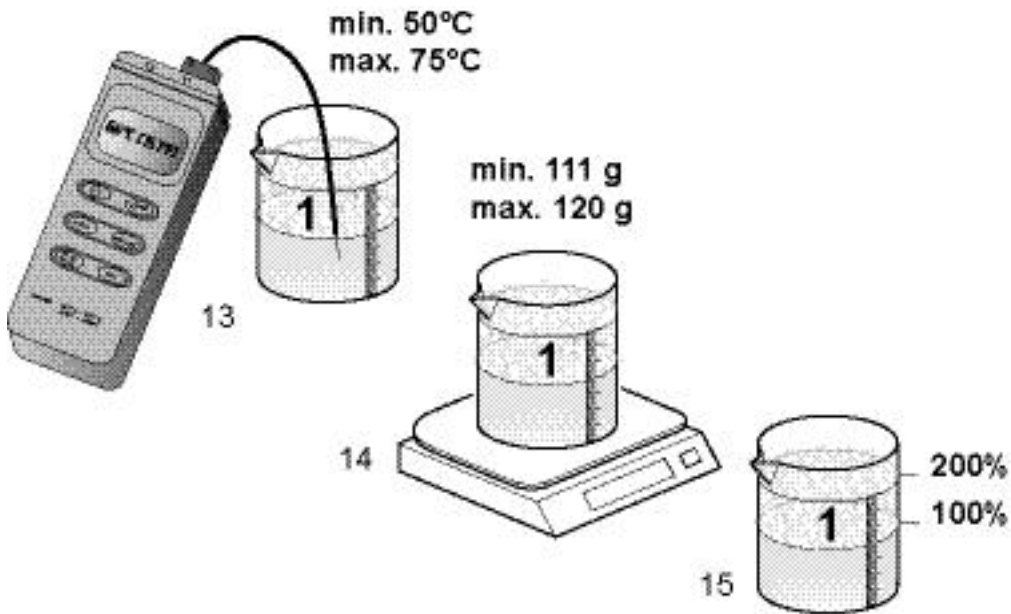


7. Place the measuring beaker (1) under the disposable foam device and the second beaker (2) under the straw.
8. Connect coffee machine to mains.
9. Switch on the coffee machine and press stand-by button.
10. After heating up, press and hold fill up button for hot milk, until the total quantity of milk has been sucked from the beaker (2).

 **Tip beaker (2) if necessary to remove rest of the milk.**

11. Check all the following parts under pressure for audible and visible leaks during milk foam preparation:
 - Pump
 - Thermoblock
 - Solenoid valves
 - Hose connections

Once all milk has been sucked out of beaker (2) and the milk foam preparation is finished, perform the following tests quickly.



Temperature Test

12. Measure the temperature of the milk in beaker (1).

The temperature should be between minimum 50°C and maximum 75°C.

Milk foam - weight increase test

13. Measure the weight of the filled beaker (1).

In comparison to 100 g of milk (see point 5), the weight increase should be as follow:

Minimum	11% (111 g)
Ideal	12 - 15% (112 - 115 g)
Maximum	20% (120 g)

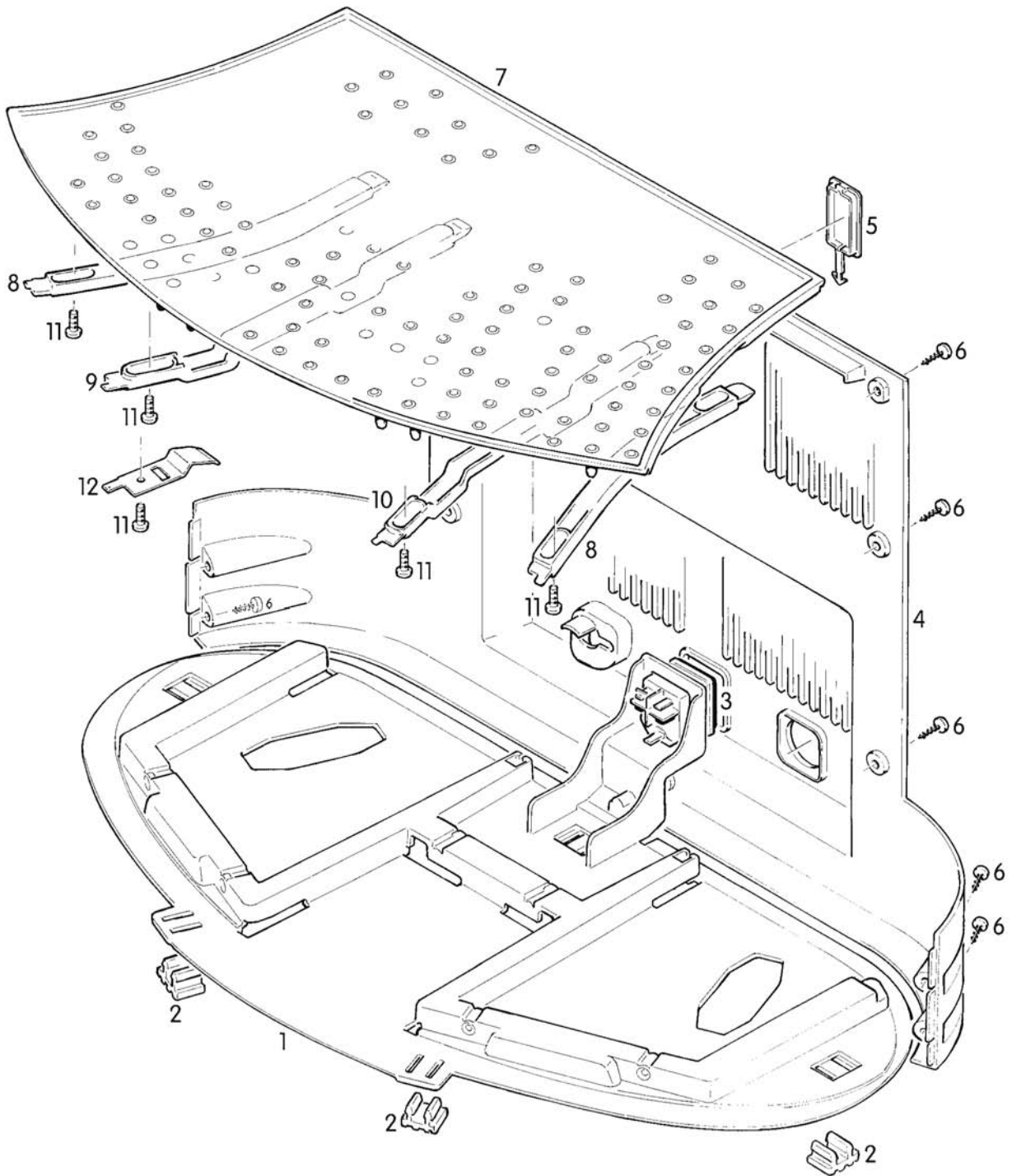
Milk foam - volume check (optional)

14. Check if the milk foam has approximately double the volume of the liquid milk before preparation.



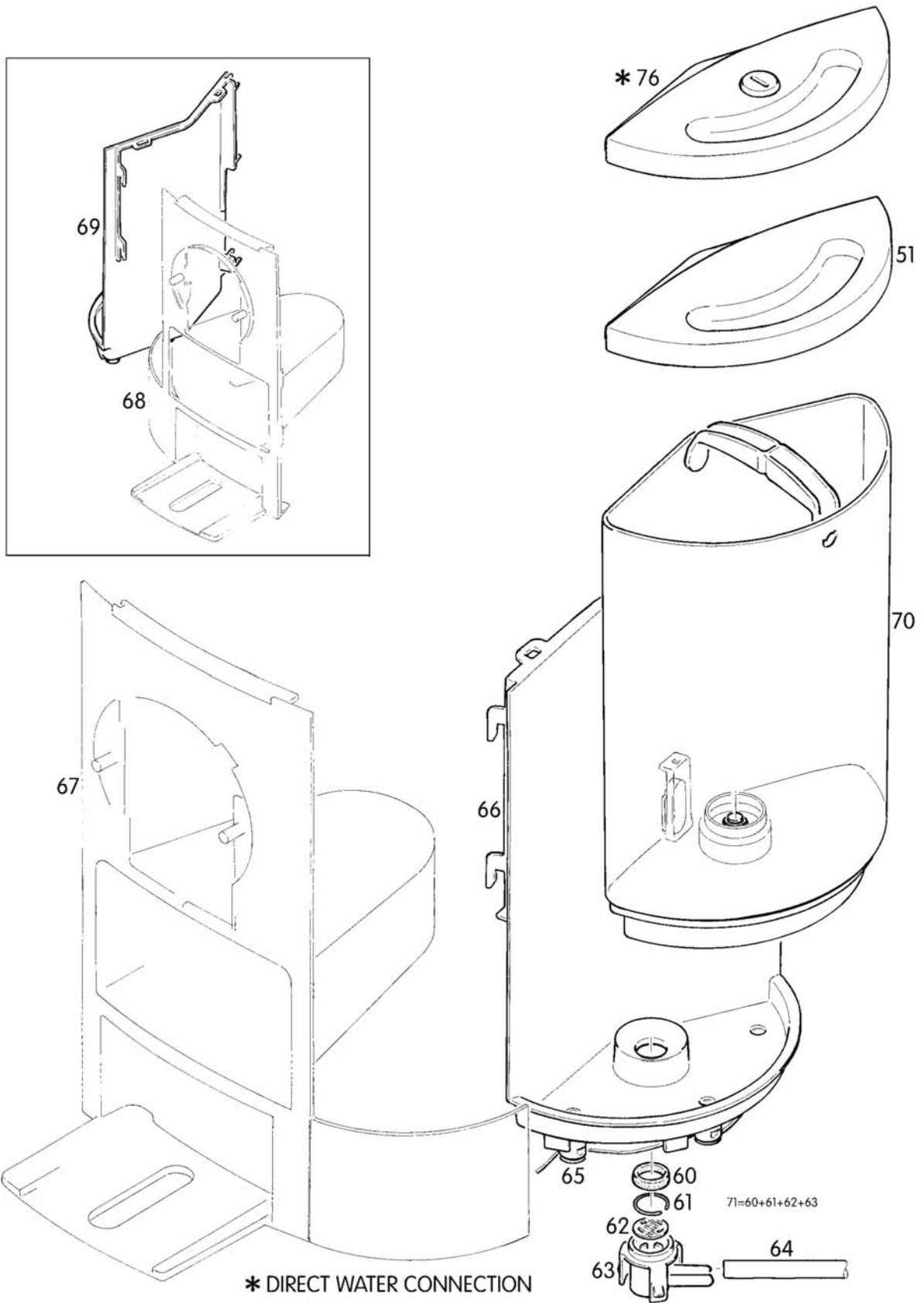
8 EXPLODED DRAWINGS

8.1 Exploded drawings of CS220 coffee machine (EF 702)



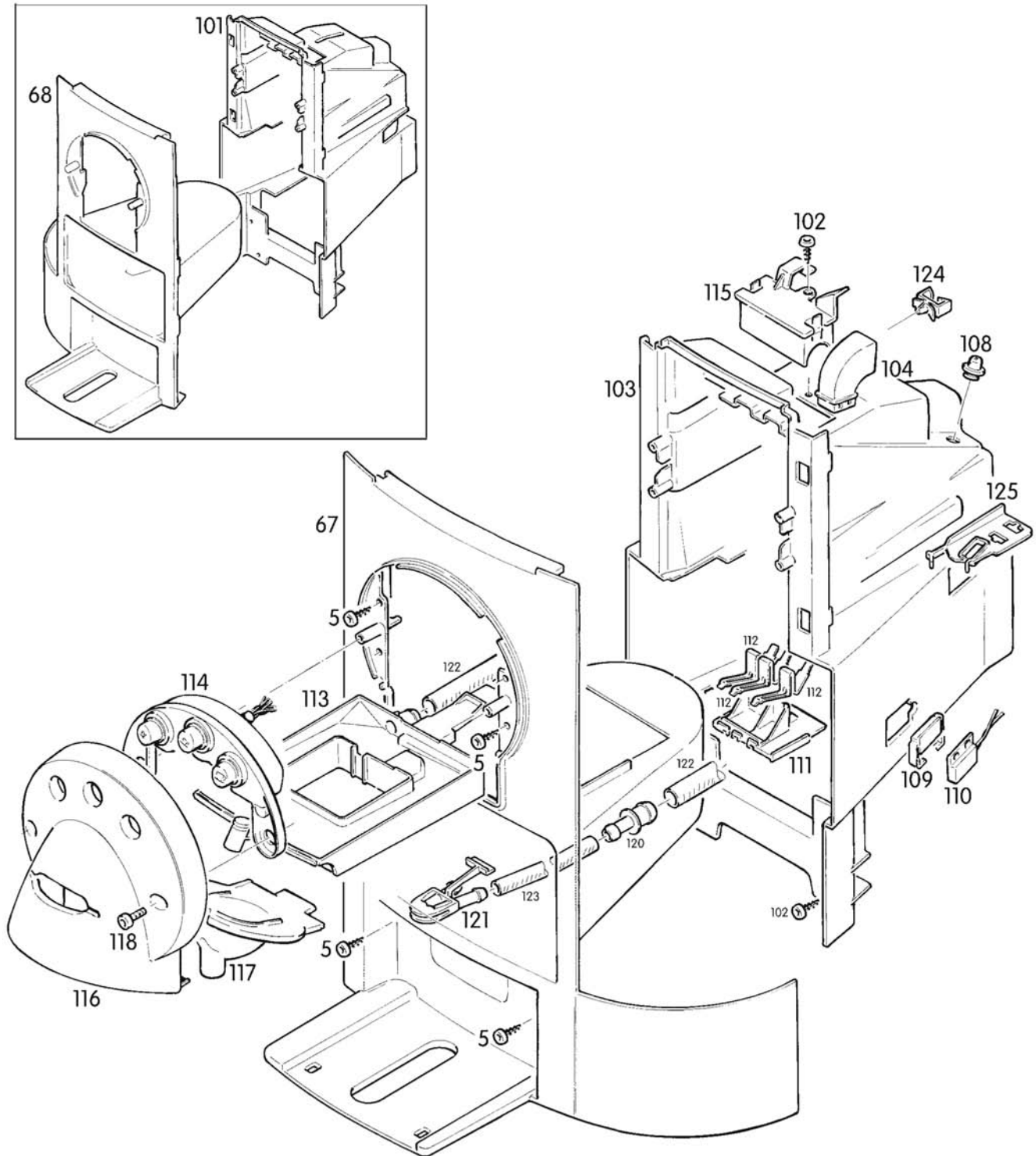


Exploded drawing (CS220)



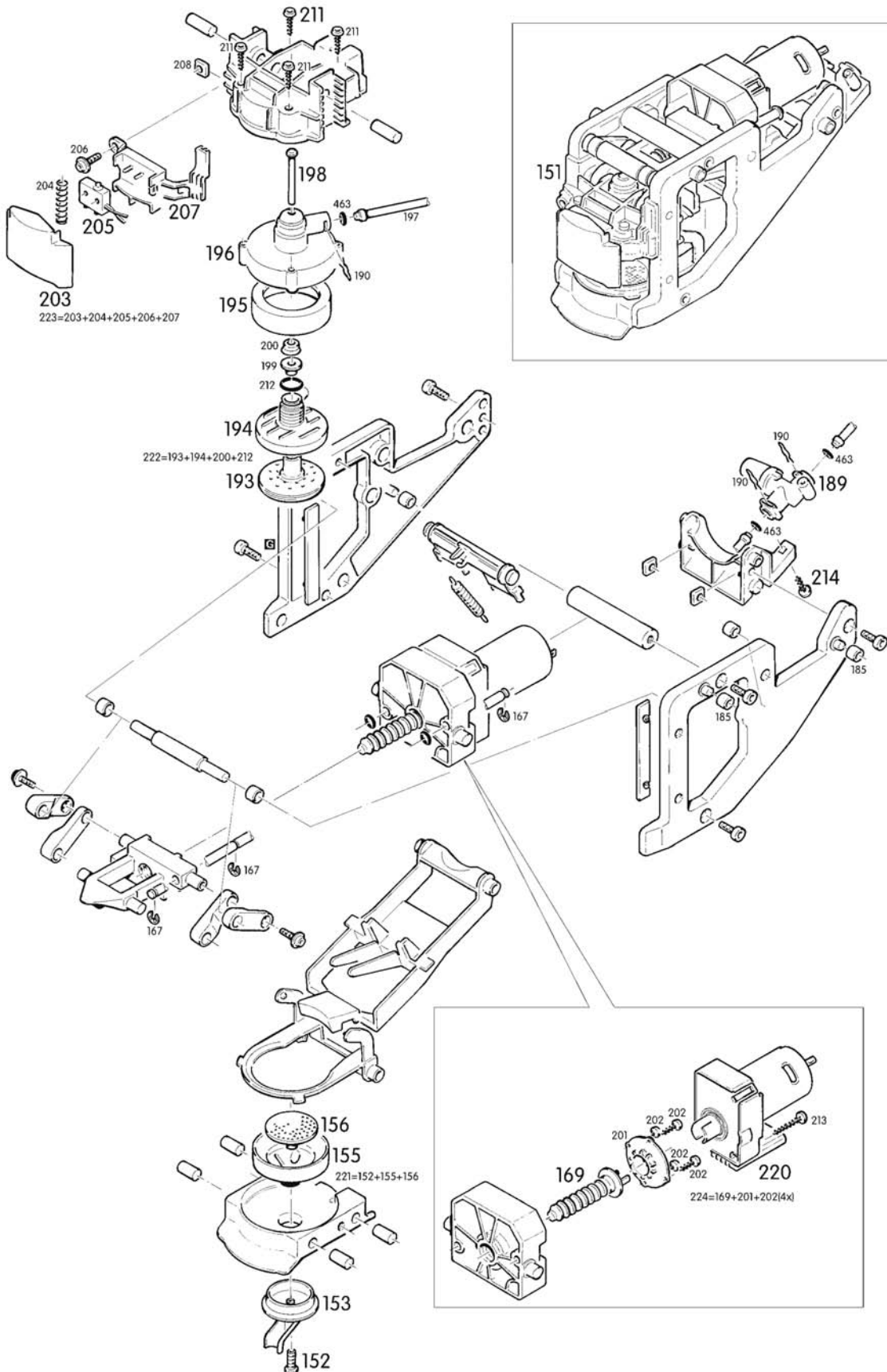


Exploded drawing (CS220)



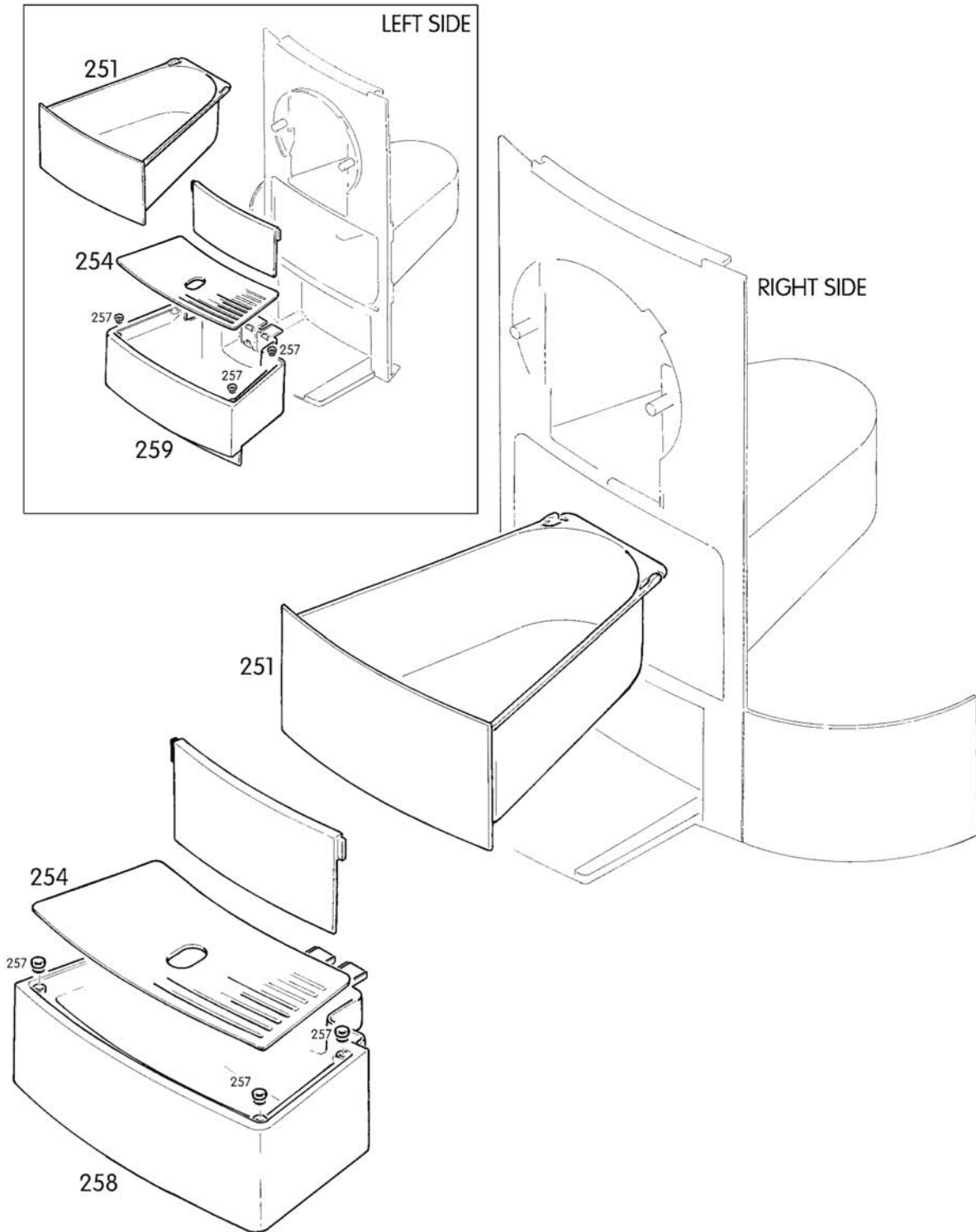


Exploded drawing (CS220)



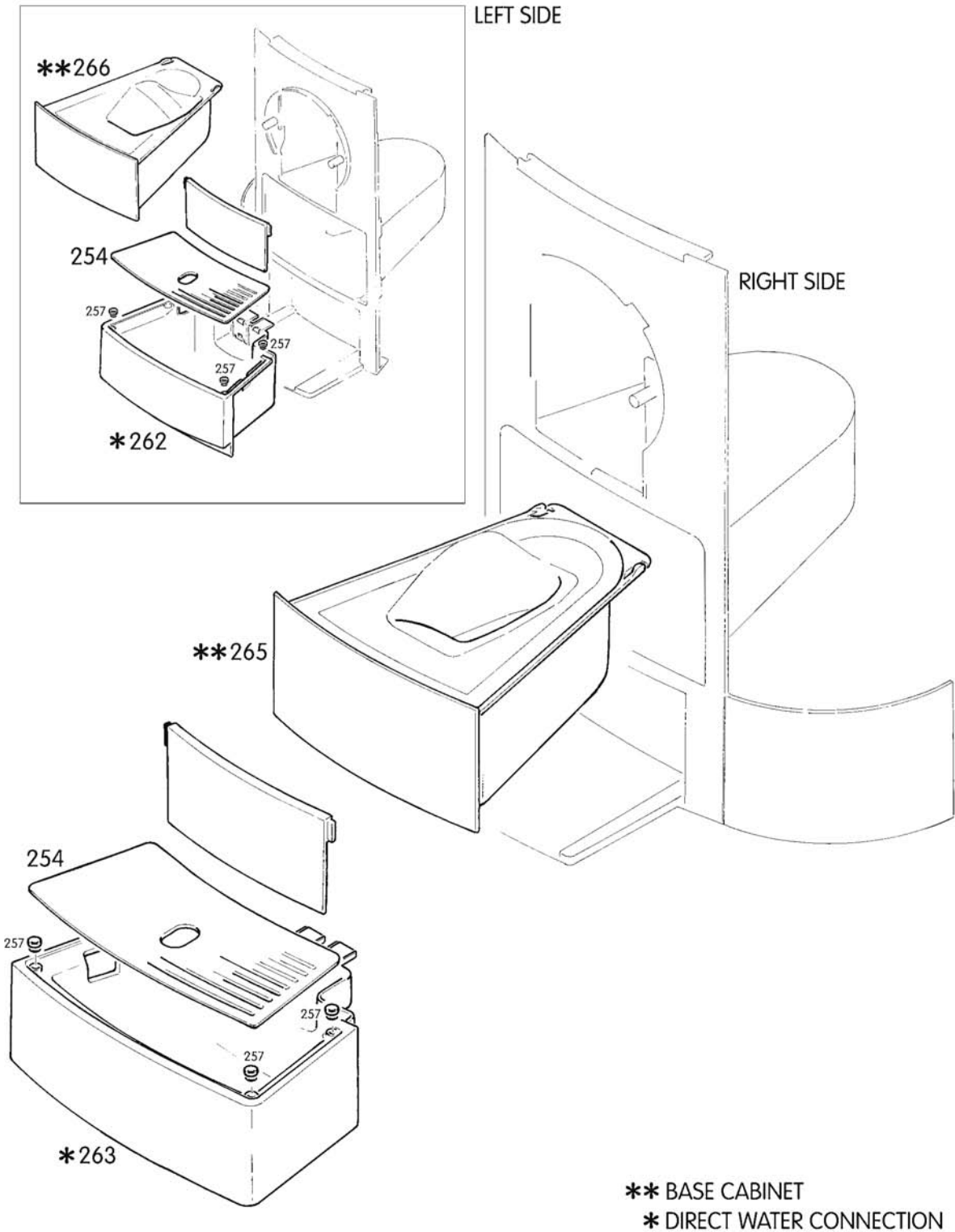


Exploded drawing (CS220)



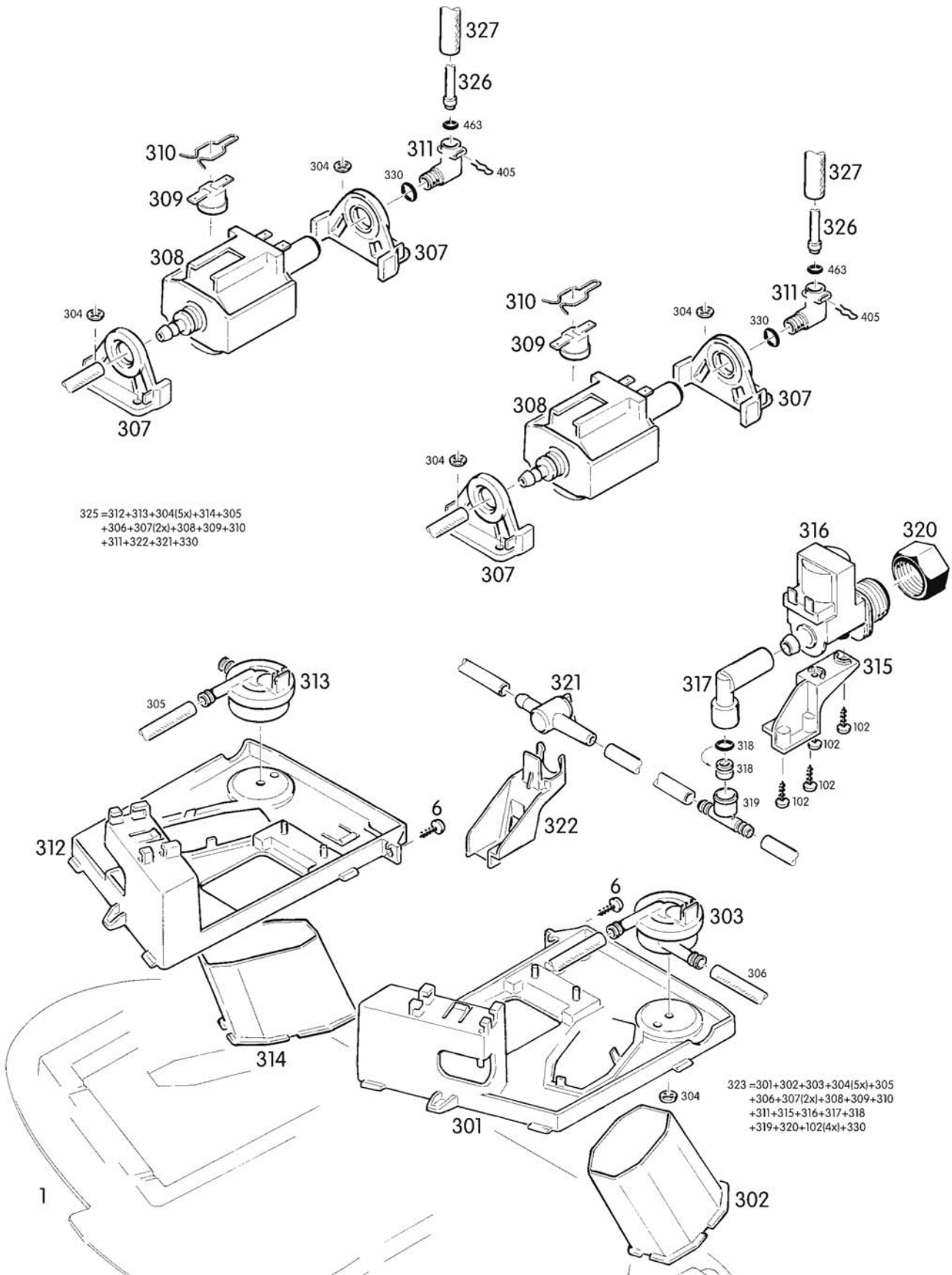


Exploded drawing (CS220)



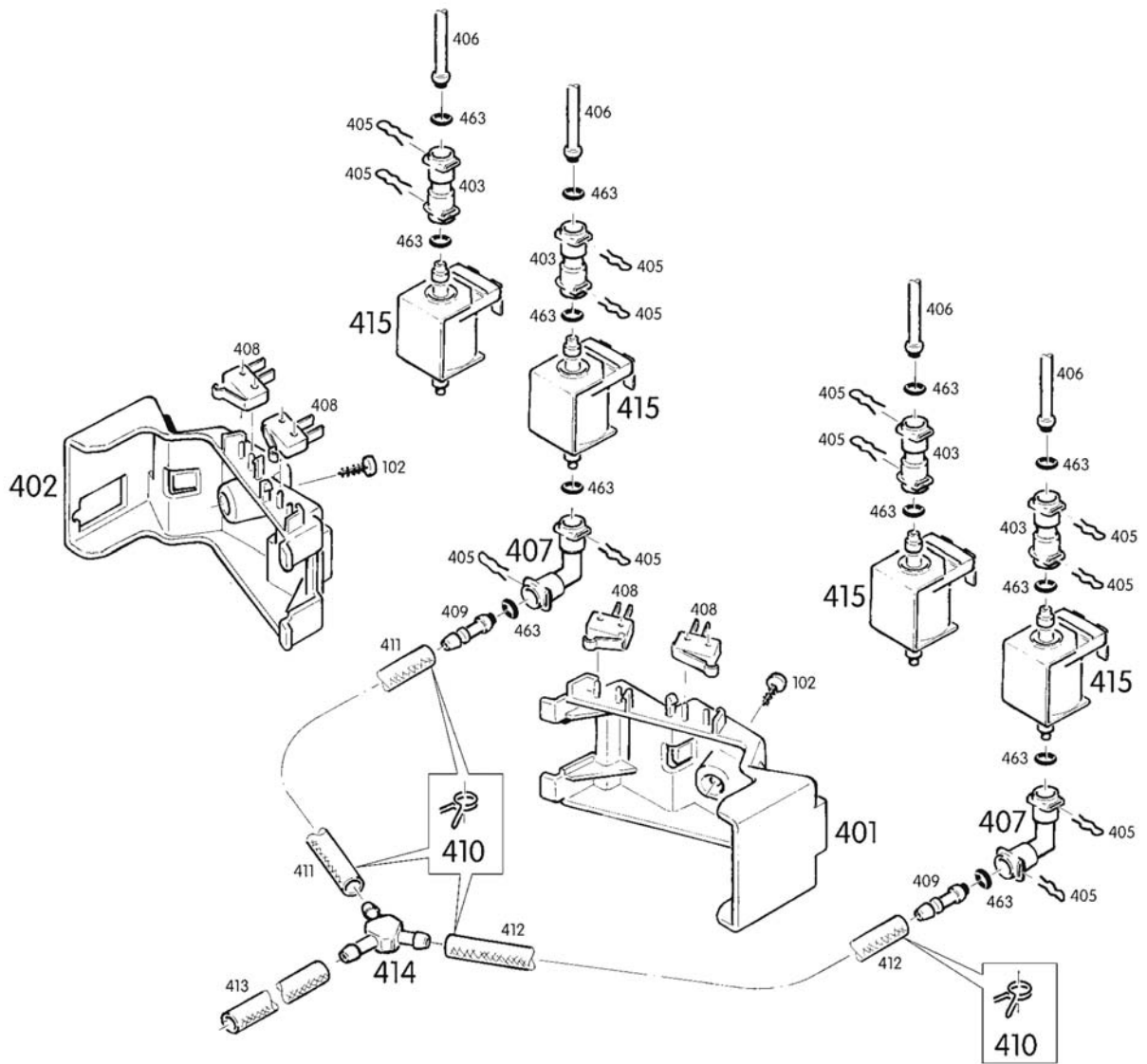


Exploded drawing (CS220)



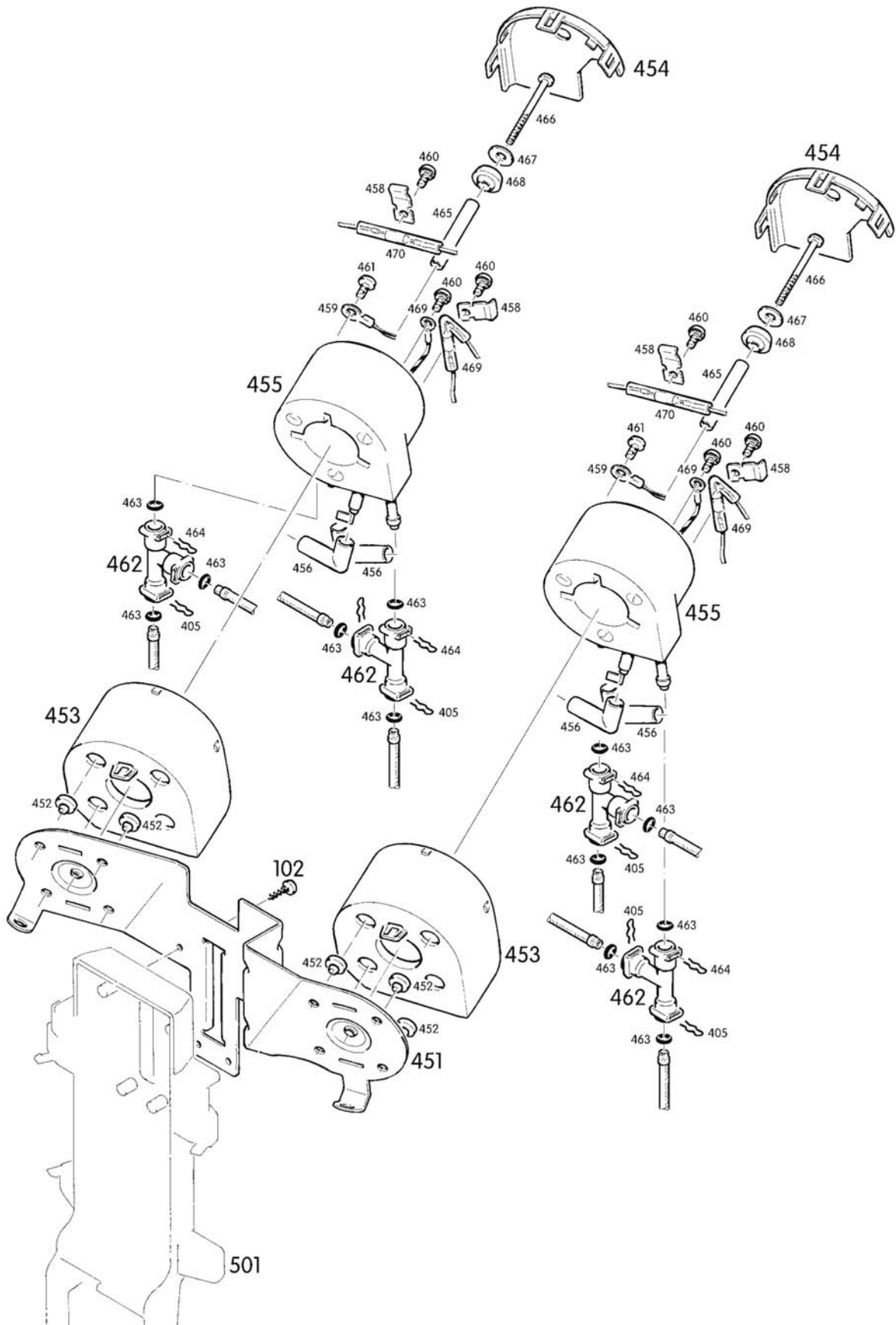


Exploded drawing (CS220)



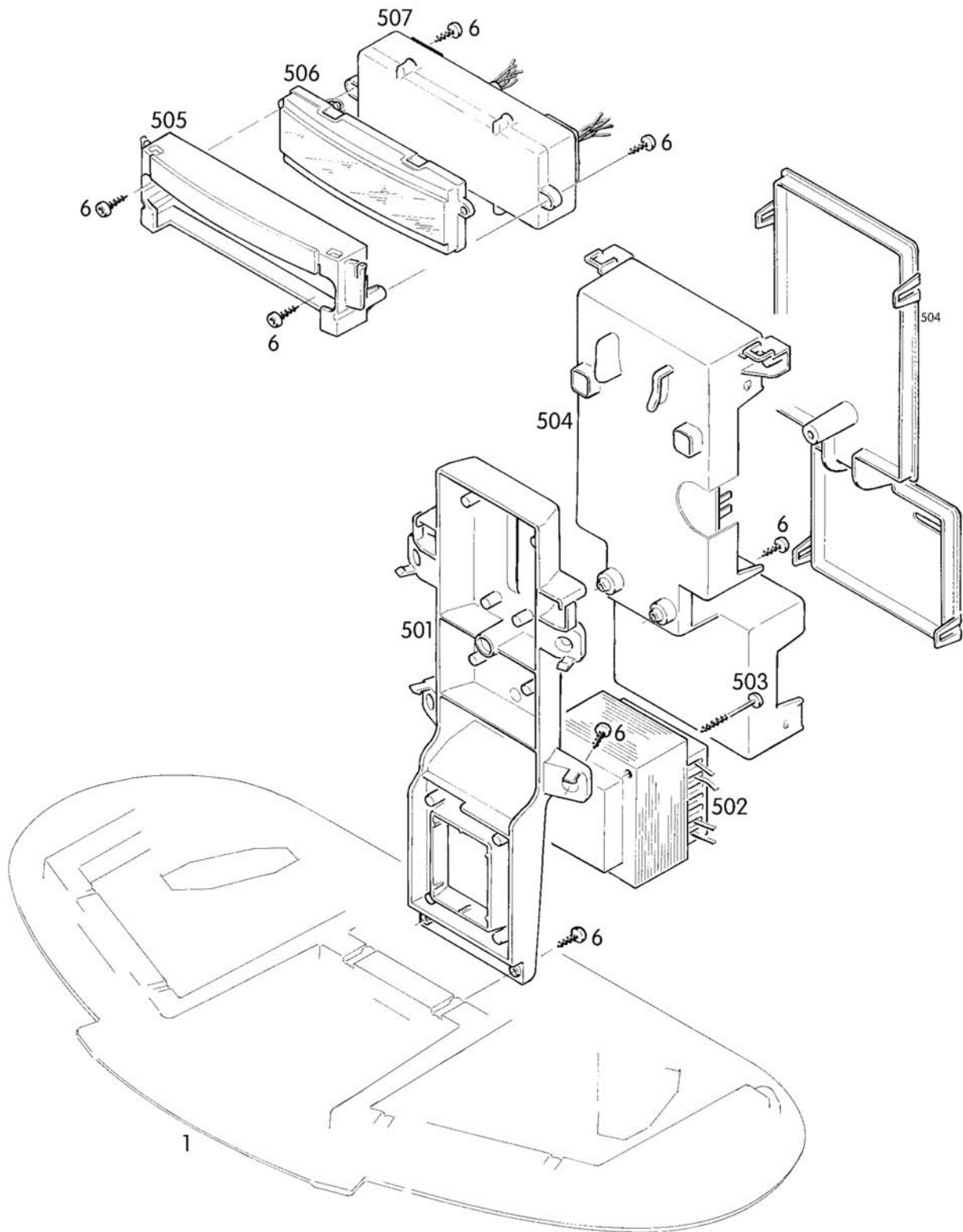


Exploded drawing (CS220)



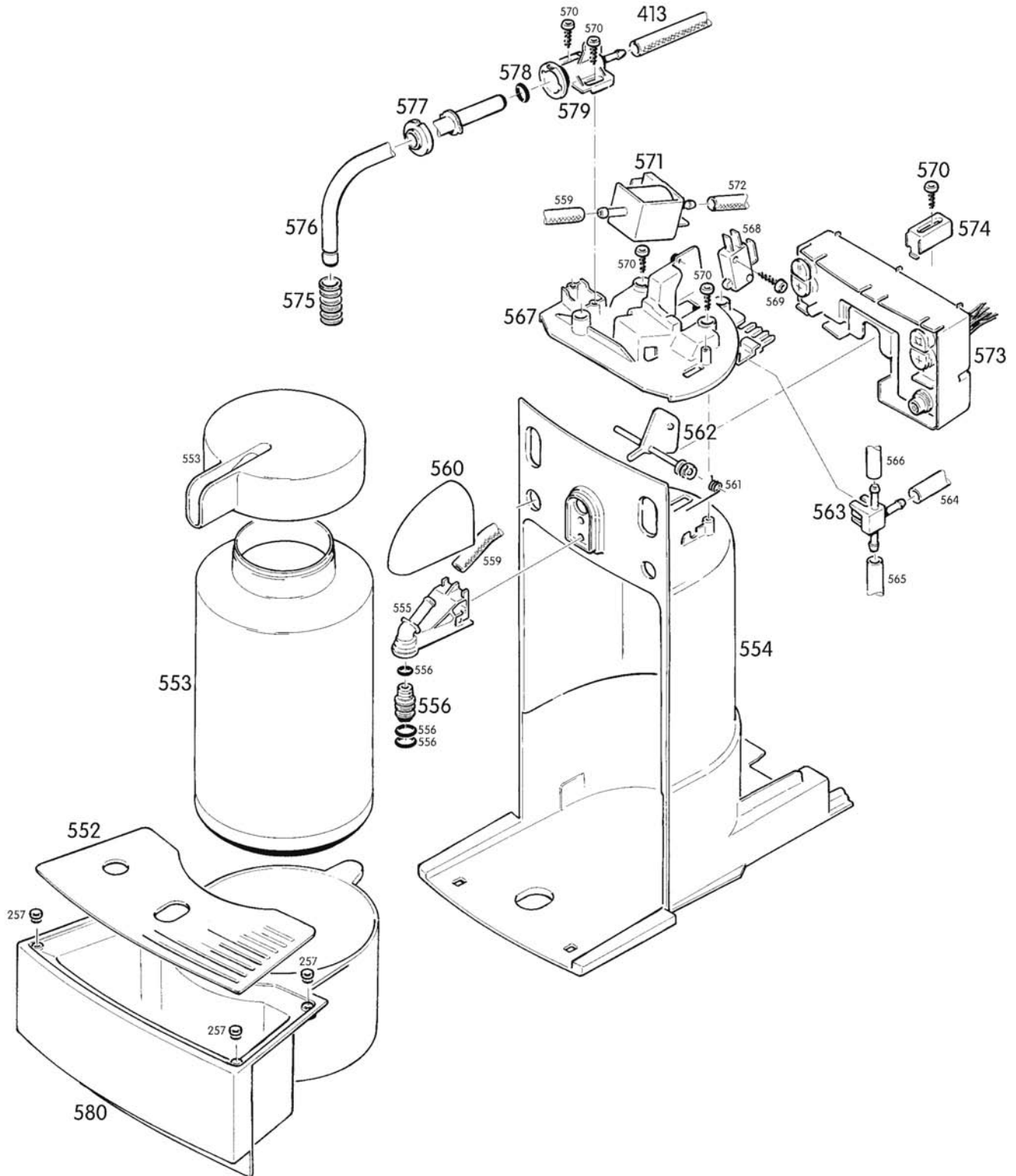


Exploded drawing (CS220)



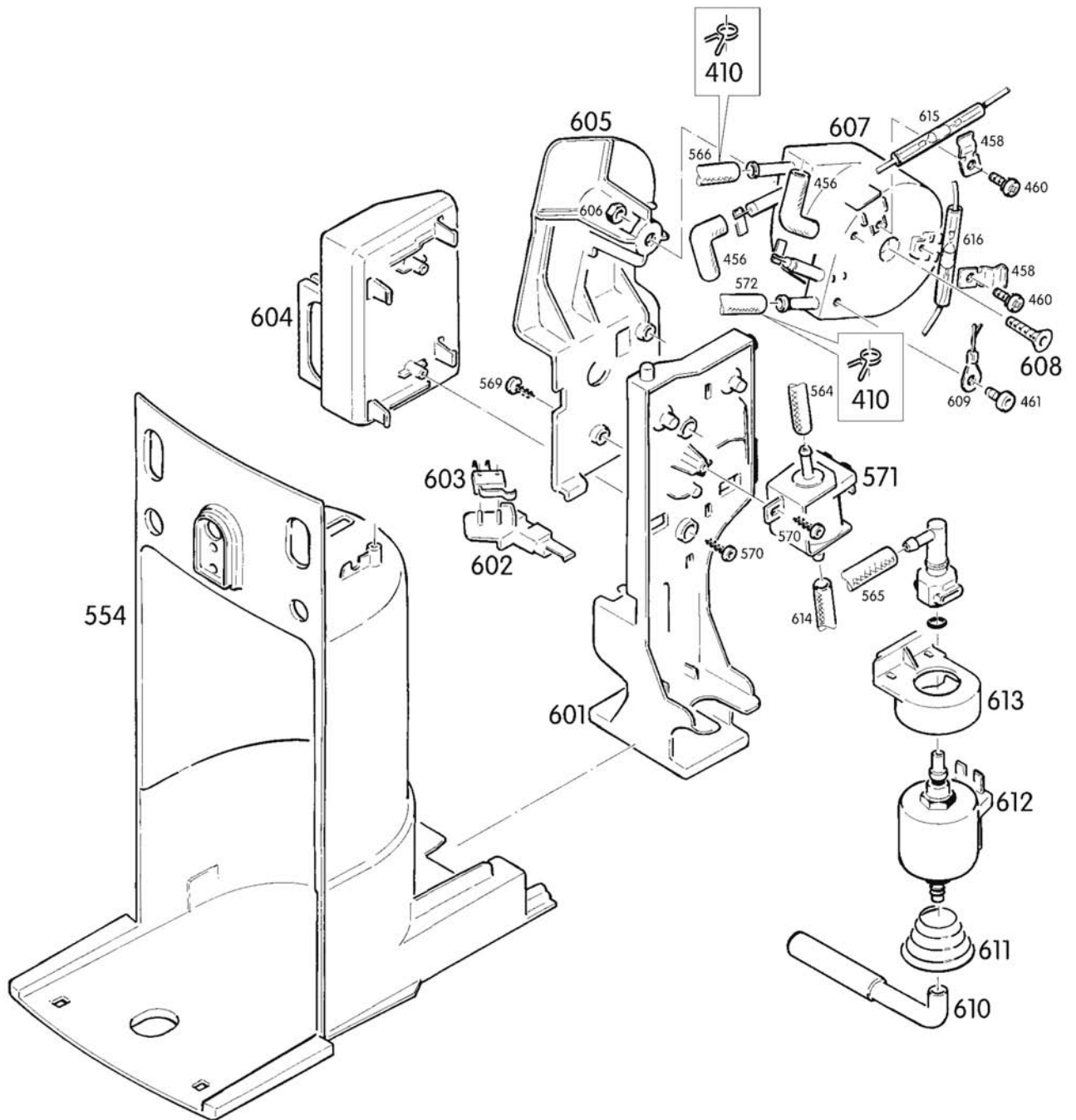


Exploded drawing (CS220)



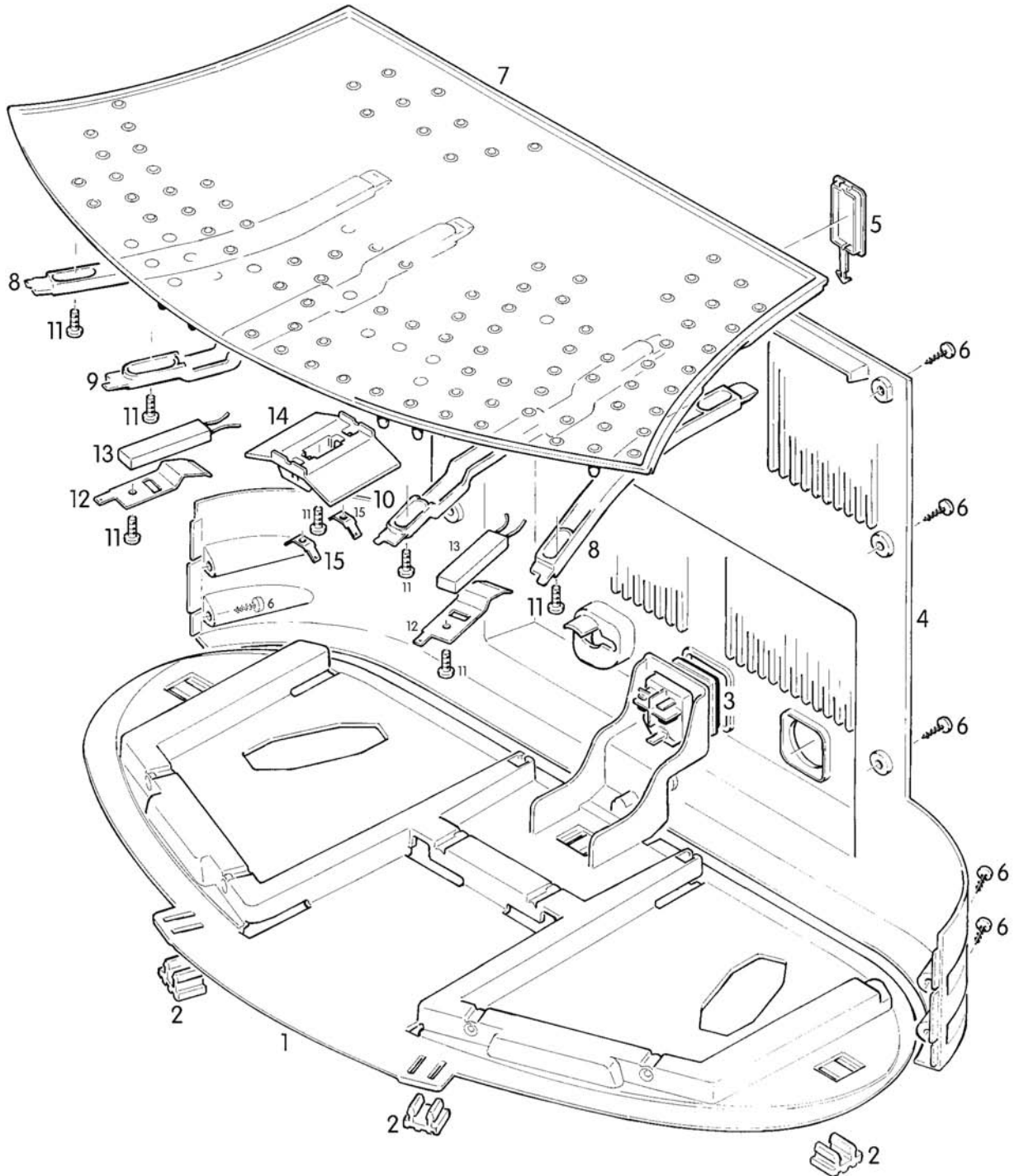


Exploded drawing (CS220)



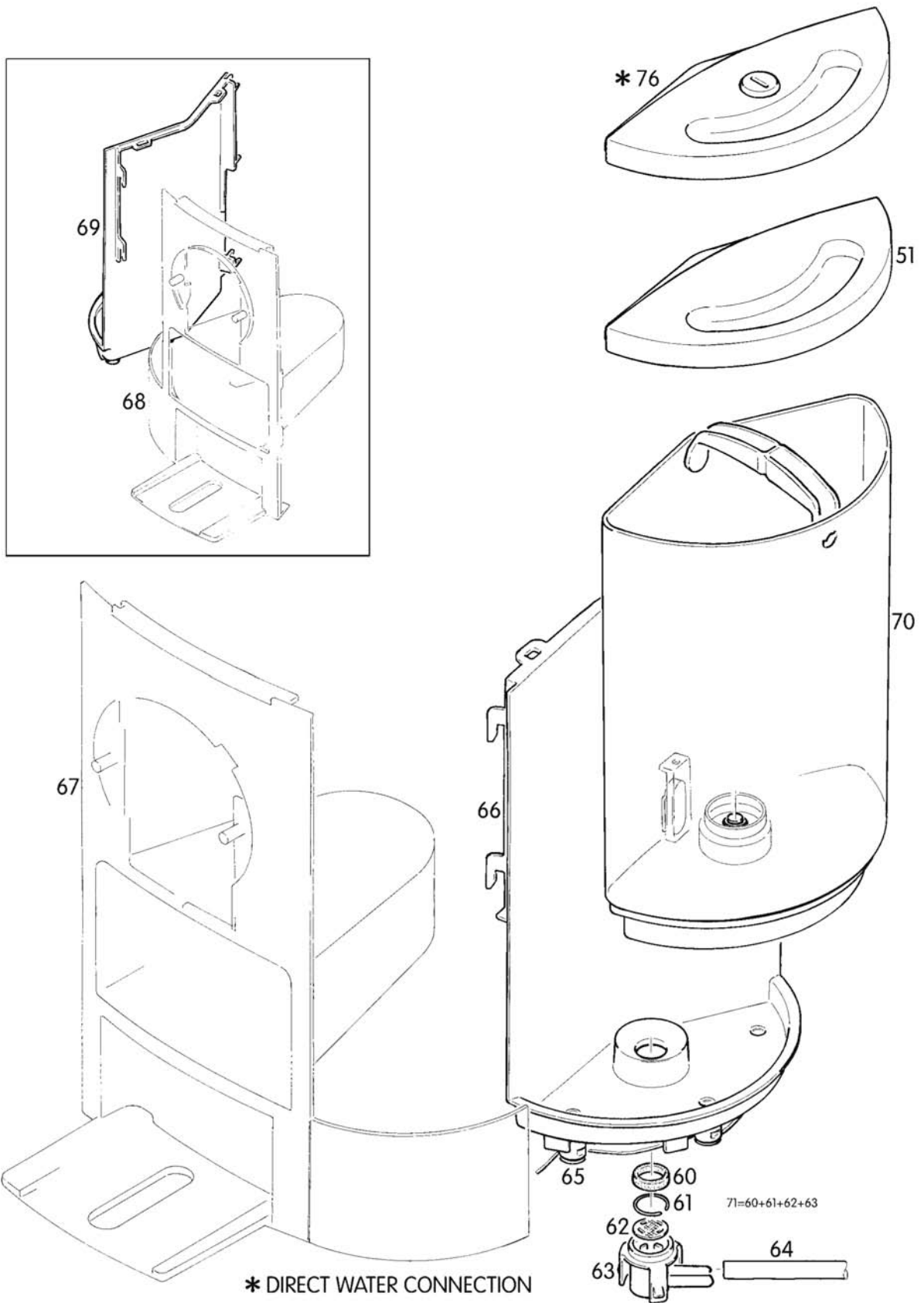


8.2 Exploded drawings of CS200 coffee machine (EF 705)



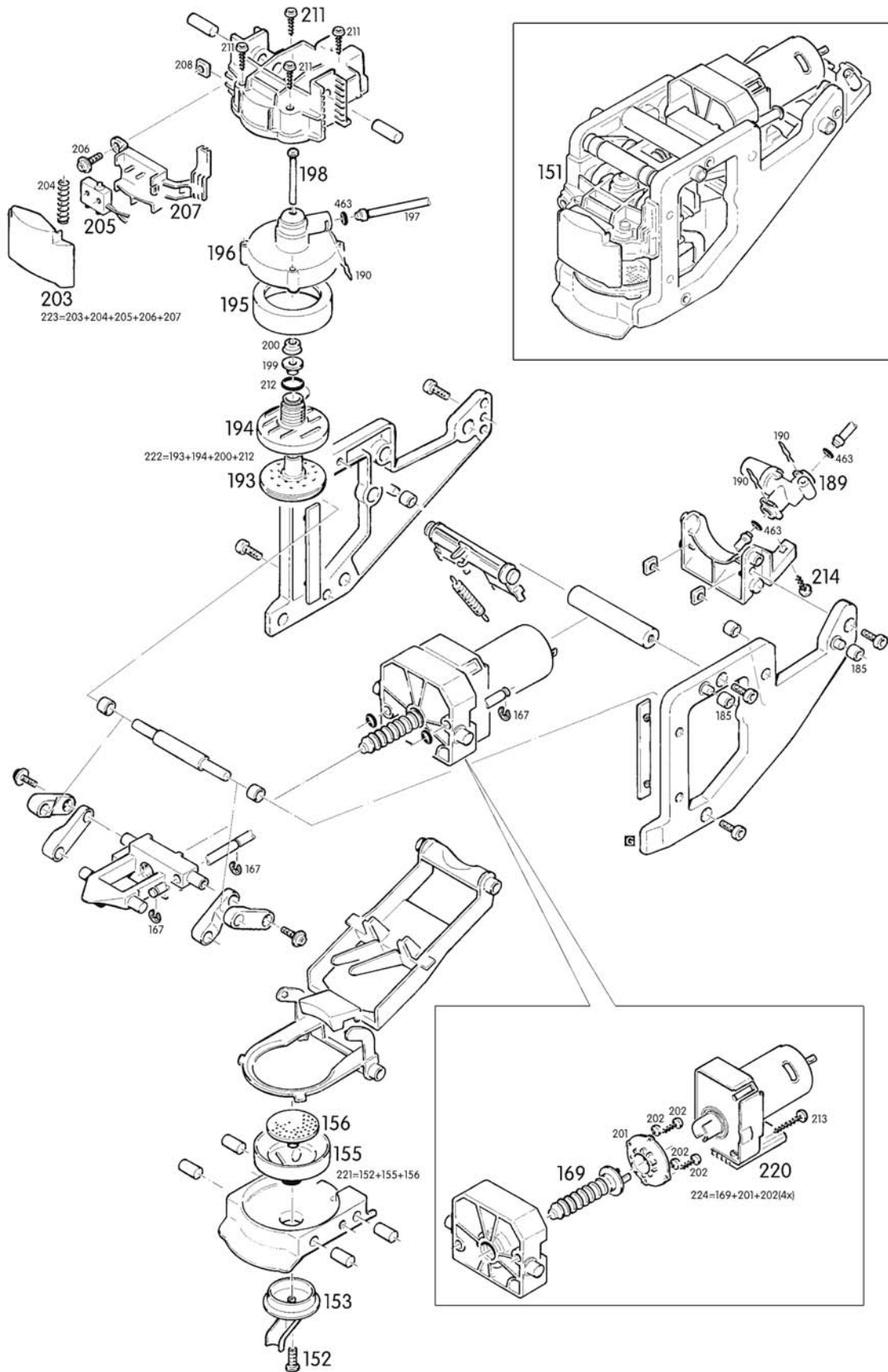


Exploded drawing (CS200)



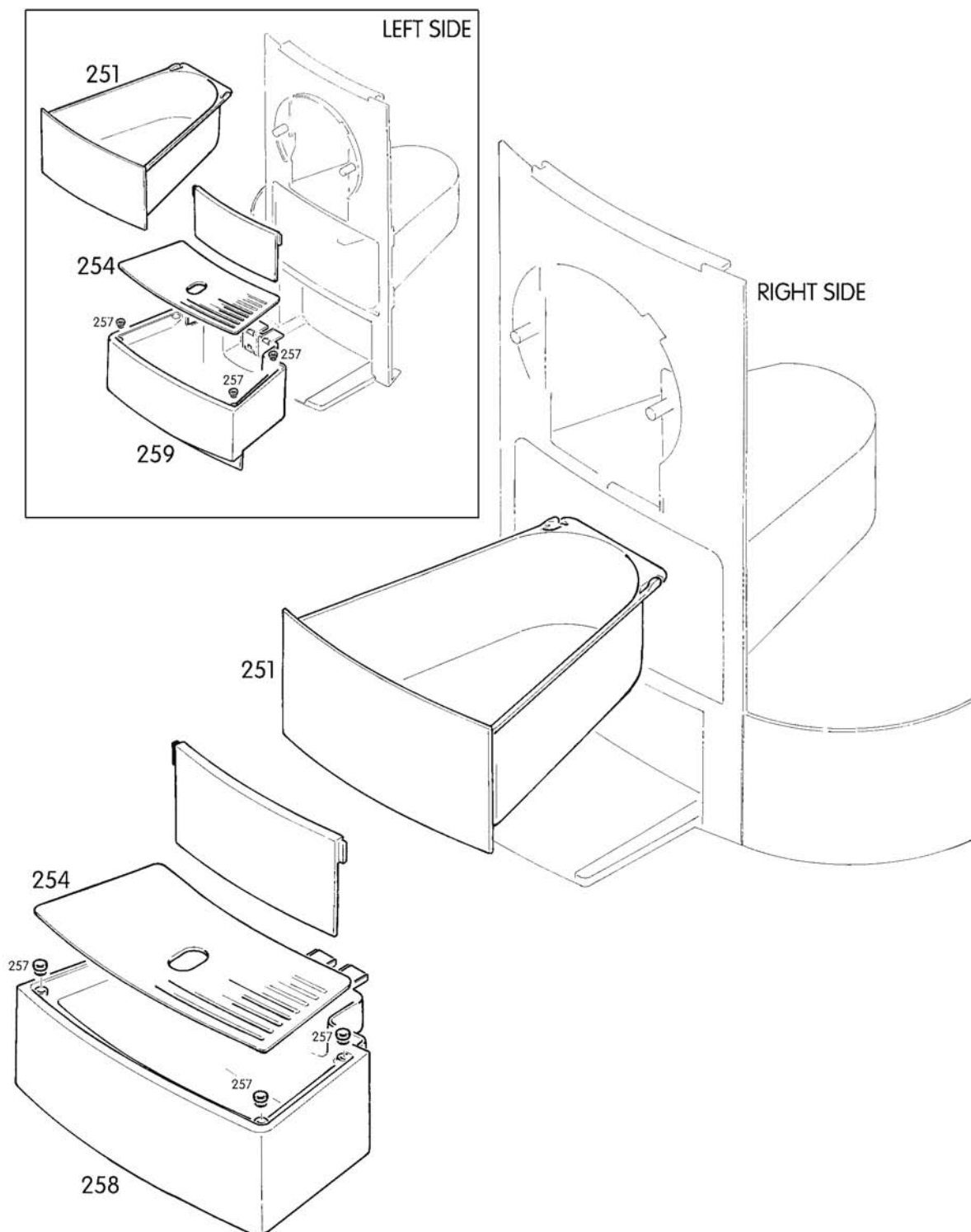


Exploded drawing (CS200)



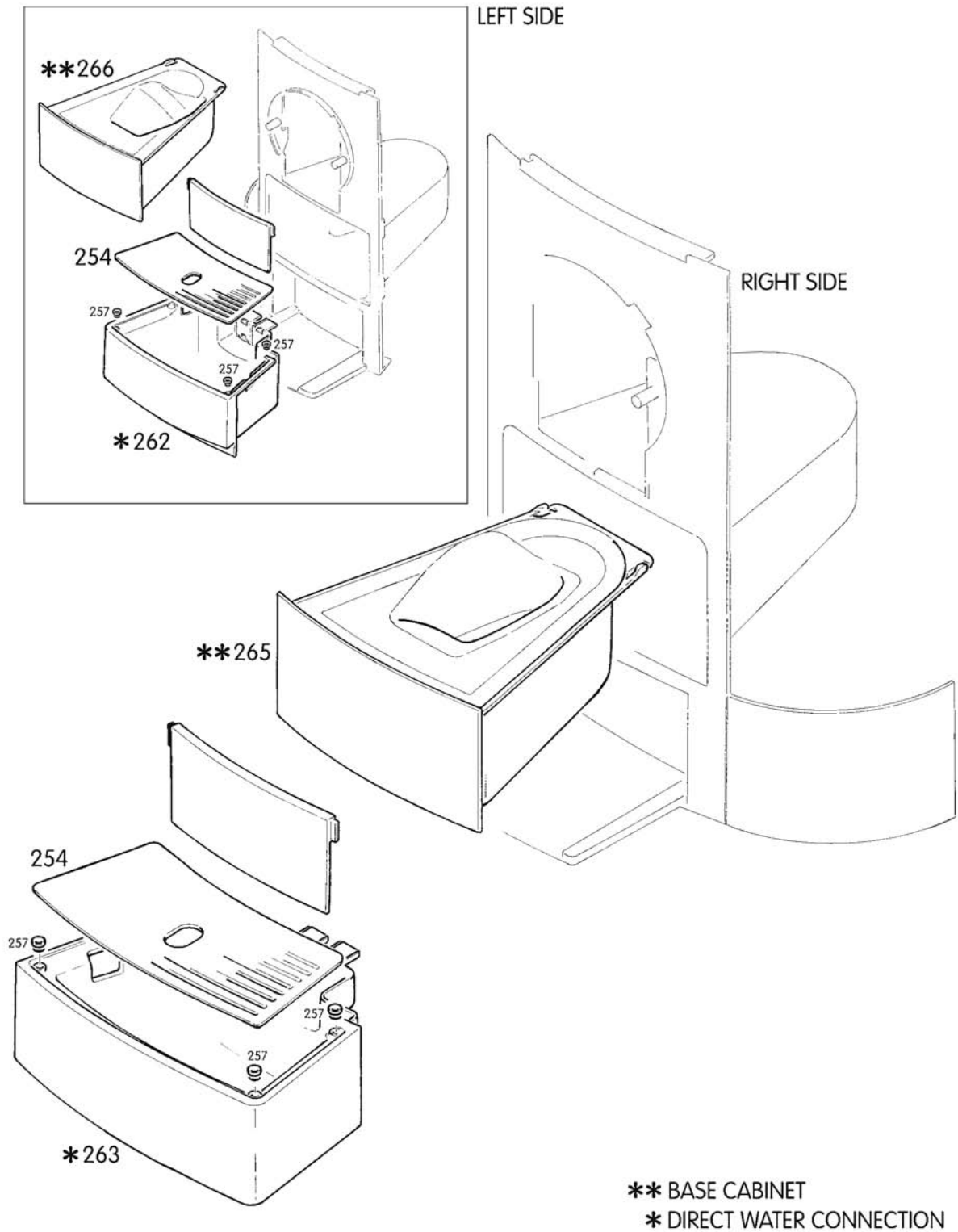


Exploded drawing (CS200)



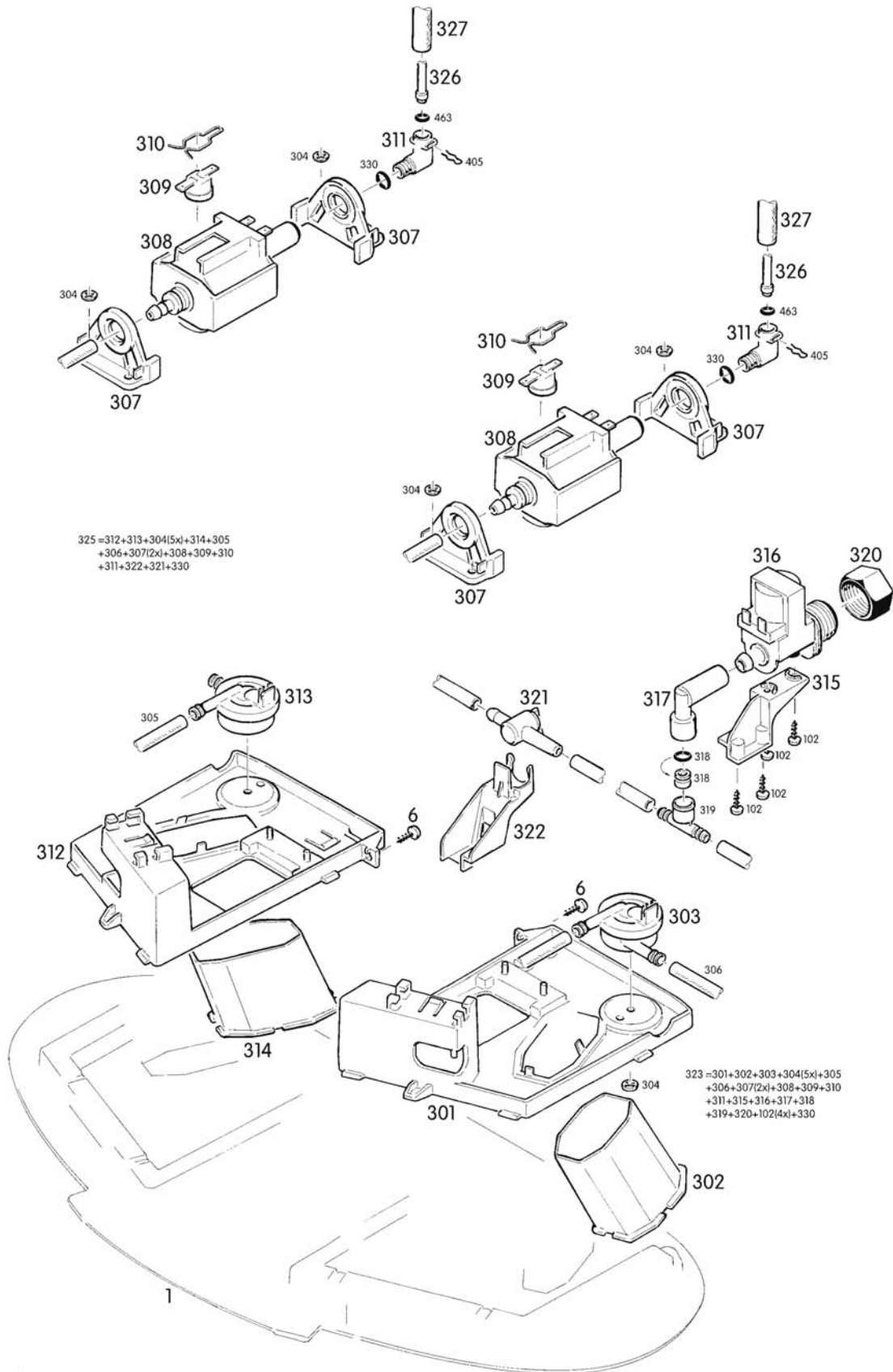


Exploded drawing (CS200)



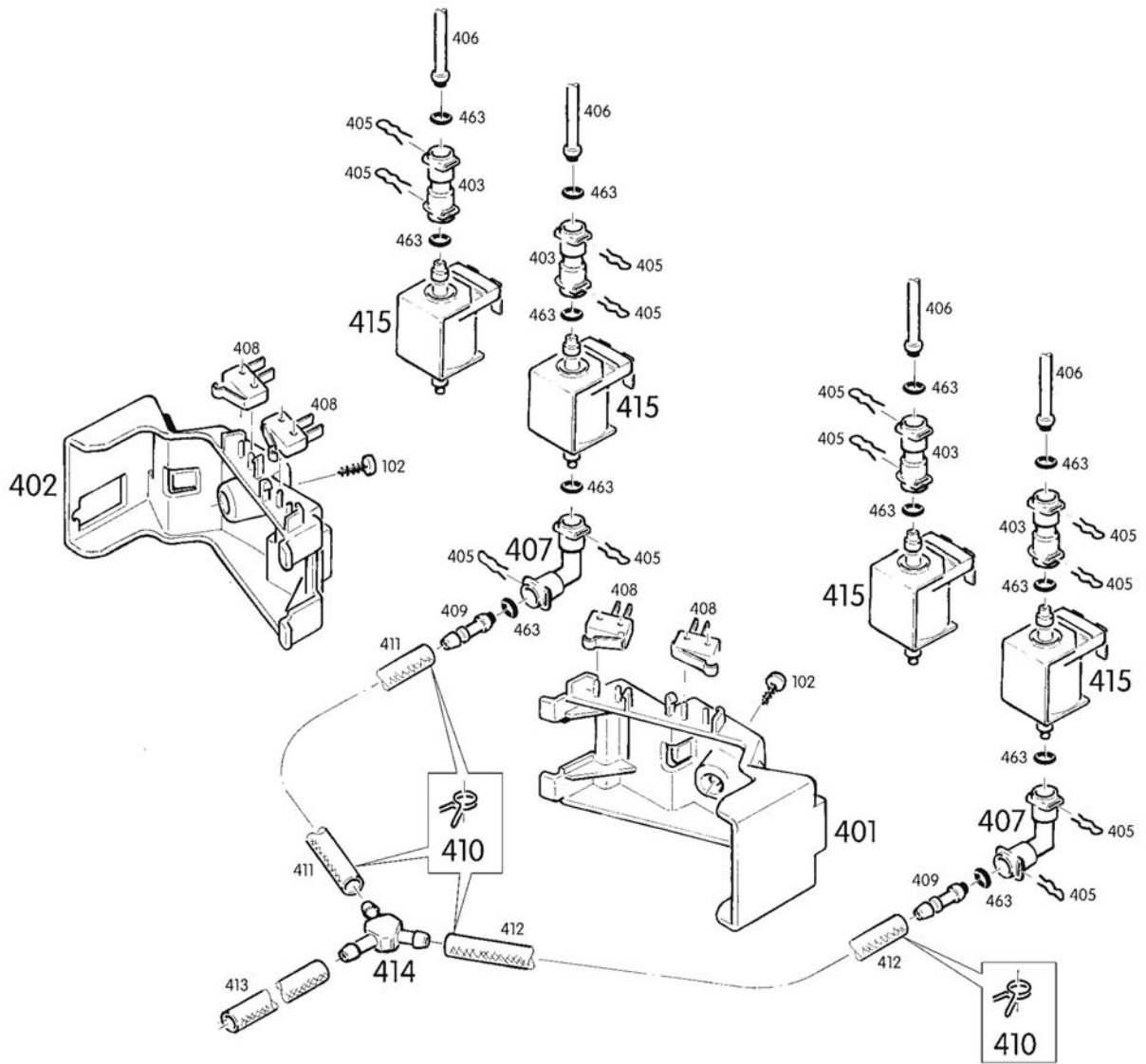


Exploded drawing (CS200)



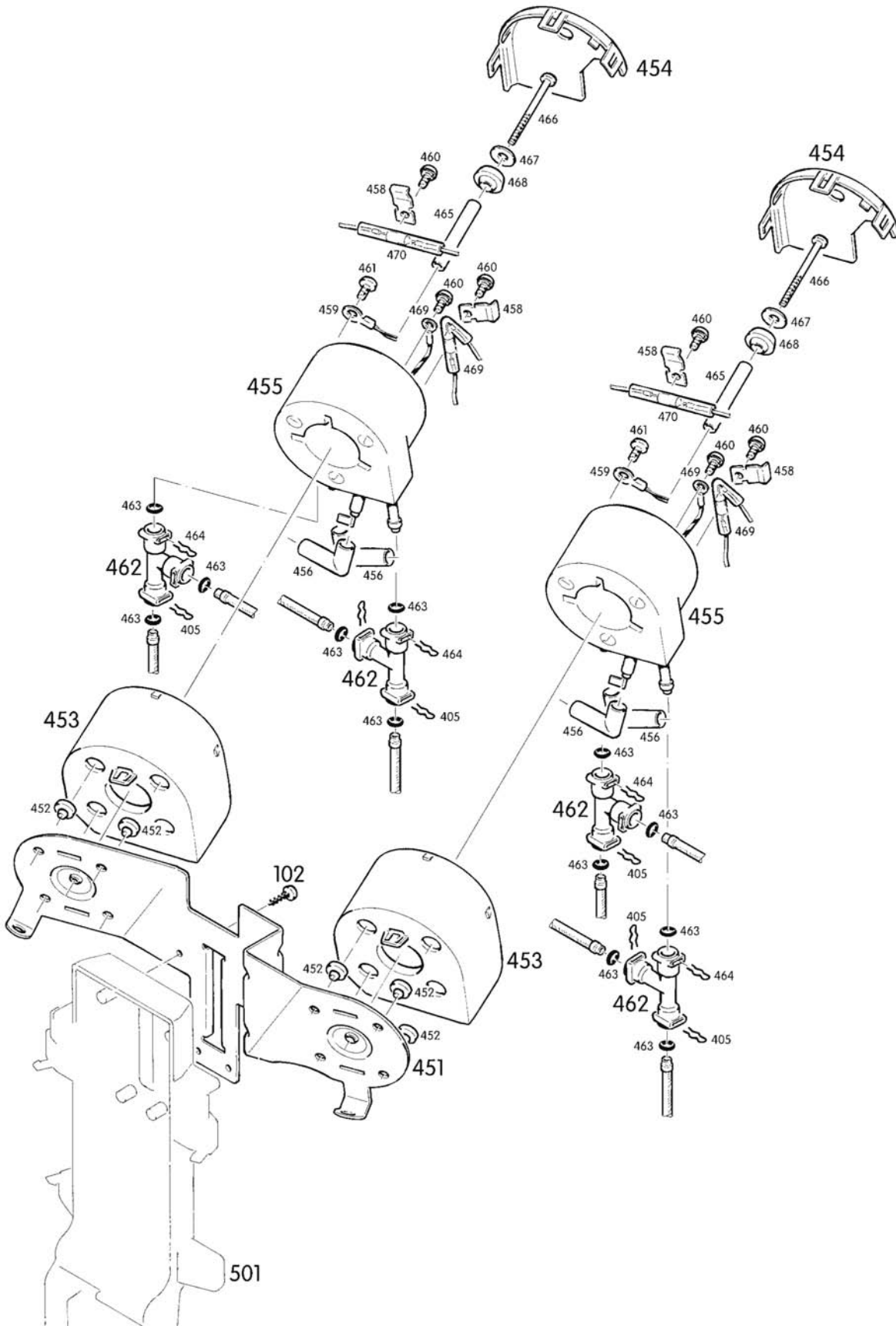


Exploded drawing (CS200)



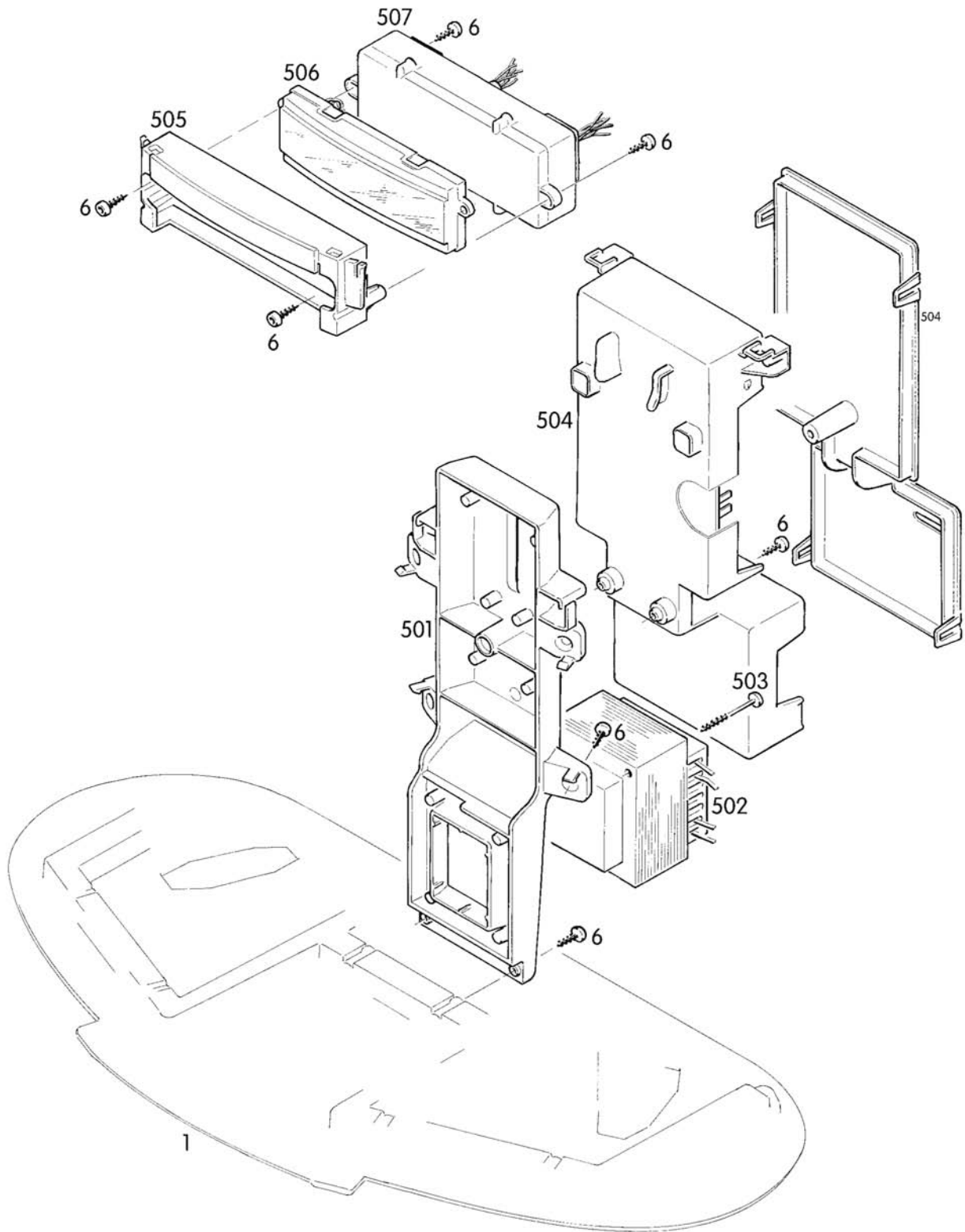


Exploded drawing (CS200)



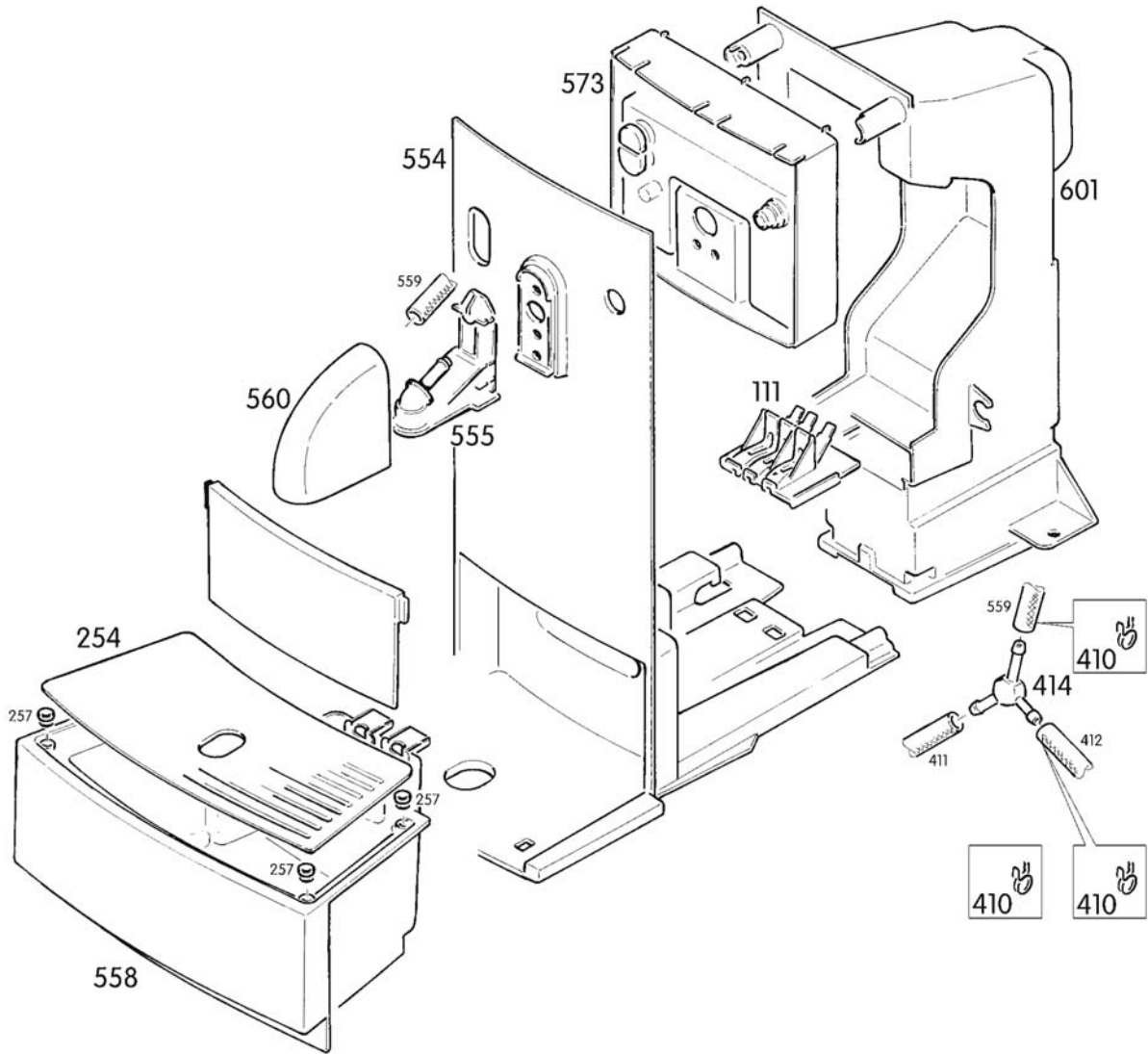


Exploded drawing (CS200)





Exploded drawing (CS200)





9 NOTES



NOTES