## 7 FAULT DIAGNOSTICS

- Checking the appliance .......................................................... 54
- Temperature measurement .................................................. 56
- Service mode ................................................................. 58
- Diagnostic mode ............................................................... 59
- Fault codes ........................................................................ 60

## 8 TECHNICAL SPECIFICATIONS

- Rating plate ....................................................................... 62
- Power ................................................................................. 63
- Temperatures .................................................................... 63
- Dimensions and weight.................................................... 64
- Filling amounts .................................................................. 64
1 SAFETY

1.1 Safety instructions

Danger!

- Repairs may be carried out by a qualified electrician only!
- The user may be put at considerable risk and injured by improper repairs!
- Electric shock may occur if live components are touched inside the appliance!
- Do not touch components in the appliance. Even the modules can be live!
- Before commencing repairs, ALWAYS disconnect the appliance from the power supply!
- If tests have to be conducted while the appliance is live, ALWAYS use a residual-current-operated circuit-breaker!
- The protective conductor connection must not exceed the standardised values! This is essential for personal safety and appliance function!
- When repairs are complete, perform a test in accordance with VDE 0701 or the corresponding national regulations!
- Following each repair, conduct a leak and performance test.

1.2 Repair instructions

Caution!

- NEVER attempt repairs by randomly replacing components!
- ALWAYS proceed systematically and comply with the technical documentation for the appliance!
- Components become hot during operation. Before commencing repairs, leave the appliance to cool down.
- As a rule, printed-circuit boards are not repaired but are completely replaced with original spare parts. Exceptions are documented separately.

⚠️ Risk of injury!

Do not insert fingers through the door of the capsule infeed. The cup heater becomes hot, do not touch.
Do not switch on the appliance without the coffee outlet and capsule holder.

⚠️ Risk of scalding!

Hot water/steam nozzle and the CAPPUCCINO/CAFFELATTE frothing-up nozzle become very hot. Take hold of the nozzles by the plastic parts only and do not point towards parts of the body.
2 INSTALLATION

2.1 Installation

- The installation location must be level and dry.
- Protect the appliance from splash water.
- There must be a minimum filling height of 360 mm.
- Connect and operate the appliance only in accordance with the specifications on the rating plate.
- Operate the appliance indoors and at room temperature only.

2.2 Scope of delivery

The following parts are included in delivery:

- Welcome box
- CAPPUCINO / CAFFELATTE nozzle
- Hot water / steam nozzle

2.2.1 Welcome box

A Welcome box is included in delivery. This box contains all parts required to start up the appliance.

(A) Ring binder with information on capsules, club and machine.
(B) 12 capsules in transparent box (1 capsule per coffee type).
(C) 1 lungo cup with saucer.
(D) 1 espresso cup with saucer.
3 OPERATION

3.1 Controls

1. Button On/Stand-by
2. Button – Small cup
3. Button + Large cup
4. Button P Steam
5. Display
6. Cup heater for prewarming cups
7. Lid for water tank
8. Water tank
9. Hot water / steam lever
10. Steam pipe
11. Adapter
12. CAPPUCCINO-/CAFFELATTE frothing up nozzle
   (Device for frothing and heating milk)
14. Drip tray
15. Capsule container with drip grille
16. Float
17. Mains switch I/O
18. Coffee outlet
19. Capsule support
20. Ledge (with capsule infeed)
3.2 NESPRESSO® capsules

For this appliance use NESPRESSO® capsules only. Capsules are offered in 12 different flavours and strengths.

ATTENTION:

The NESPRESSO® capsules must not be damaged before use. Deformed or torn capsules may become jammed in the appliance and damage it.

Each capsule contains exactly the correct amount of ground coffee for one cup.

In the hermetically sealed aluminium capsule (A) all qualities and flavours of the freshly roasted coffee (B) are retained for at least nine months.

A high-pressure pump (19 bar) ensures that all the flavours of the espresso develop and that a fine crema forms.

Coffee is extracted through the membrane (C) directly to the coffee outlet of the machine.

Order address is given in ring binder:
NESPRESSO®-Club, www.nespresso.com

Purchase capsules in Germany:
- On the Internet: www.nespresso.com
- By telephone 0800 1818 444 (freephone)
- By fax 0800 1818 400 (freephone)
- By post to Nespresso-Club
  Postfach 19 01 61
  D-40111 Düsseldorf
  Germany
3.3 Preparing coffee

To ensure a successful coffee, prewarm the cups on the cup heater or fill the cups with hot water and rinse out. The appliance must be switched on and ready to use. **Ready** is indicated on display.

- Insert NESPRESSO® capsule with the membrane face down into the capsule infeed.
- Place a prewarmed cup under the coffee outlet.
- Press the “on” button – (2) or + (3).

The cup is filled. The coffee outlet is automatically stopped when the programmed amount of liquid has run through.

Then **Ready** is displayed again.

The used capsule is automatically emptied into the capsule container.

If the “on” buttons are pressed during the infeed process or during the ejection of a capsule, this has no effect on function.

3.3.1 Preparing coffee immediately after drawing steam

If coffee is drawn immediately after drawing steam by pressing the “on” button – (2) or “on” button + (3), the appliance automatically cools down before the coffee runs out of the coffee outlet.

3.3.2 Stopping the coffee outlet prematurely

Press the “on” button – (2) or “on” button + (3) again during the coffee brewing process:

The coffee brewing process is stopped.

3.3.3 Additional amount of liquid

Press the “on” button – (2) or “on” button + (3) again within four seconds after the coffee outlet has stopped:

The same amount of water is conveyed a second time through the same capsule.
### 3.3.4 Permanently changing the amount of liquid

The preset amount for a small or a large coffee can be changed permanently.

- Insert capsule with the membrane face down into the capsule infeed.
- Place a cup or glass under the coffee outlet.
- Press button – (2) or button + (3) for at least 3 sec. and hold down until the required amount has run through.

The amounts can be changed again at any time.

#### 3.3.4.1 Standard filling amounts

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Small cup</td>
<td>40 ml</td>
</tr>
<tr>
<td>Large cup</td>
<td>100 ml</td>
</tr>
</tbody>
</table>

Filling amounts between 20 ml and 300 ml can be programmed for each cup.

### 3.3.5 Preparing latte macchiato

Latte macchiato is a milk coffee which is prepared and served in a tall glass.

**Preparation:**

- Prepare milk froth and fill a suitable glass approx. 2/3 full.
- Then immediately press the steam button (4) to cool the thermal block. The appliance gives off steam into the drip tray.
- Remove drip tray (A) with capsule container. Do **not** take notice of the display.
- Place the glass containing the milk froth under the coffee outlet.
- Insert a capsule and press the “on” button (3).
- When the coffee has run through, remove the glass and re-insert the drip tray with the capsule container.

The capsule is not ejected until the drip tray and capsule container are re-inserted.
### 3.4 Drawing hot water

*Risk of burns!*

The nozzle becomes very hot. Take hold of the nozzle by the plastic part only.

- Connect the steam nozzle to the adapter (A) on the steam pipe and lock the nozzle by rotating it.
- Place a glass or a cup under the steam nozzle.
- Put the hot water/steam lever (B) in a horizontal position.

Hot water runs out of the steam nozzle. Hot water temperature is at least 72 °C.

- To stop drawing hot water, put the hot water/steam lever (B) back in an upright position.

*Wait* is displayed briefly and switches back to *Ready* after a cooling-down phase.

### 3.5 Drawing steam

*Risk of scalding!*

Steam is very hot. It may cause liquid to splash.

- Screw the steam nozzle onto the adapter (A) on the steam pipe.
- Press steam button P (4).

The thermal block is heated to steam temperature (~140 °C). The display flashes alternately between *Steam* and *Wait*.

As soon as the display flashes alternately between *Steam* and *Ready*, steam can be drawn.

- Put the hot water/steam lever (B) in a horizontal position. Steam flows out of the steam nozzle.

To stop drawing steam, put the hot water/steam lever (B) back in an upright position.

The display switches to *Steam* and *Ready*.

The appliance automatically cools down after approx. 1 minute.
3.6 Frothing up or heating milk

⚠️ Risk of scalding!
Steam is very hot.
Touch the frothing-up device by the plastic part only.

Note:
After frothing up milk, immediately clean frothing-up aids by drawing hot water. Dried on milk residue is very difficult to remove and will impair the formation of milk froth.

Firmly assemble the frothing-up device for CAPPUCCINO / CAFFELATTE. There must be no gaps.
The notched end (A) of the intake hose must be inserted into the receptacle containing the milk.

Preferably use cold UHT milk (5°C – 10°C) which has a fat content of 1.5%. Milk with a higher fat content, fresh full milk or non-homogenised milk is not recommended.

3.6.1 Procedure

• Firmly connect the frothing-up device to the adapter on the steam pipe.
• Insert the notched end of the hose into a receptacle containing milk.
• Place a cup or a glass under the nozzle of the frothing-up device.
• Set the selector on the frothing-up device to CAPPUCCINO or CAFFE-LATTE.
• Press the steam button P (4) to draw steam.
• As soon as the display flashes alternately between Steam and Ready, steam can be drawn and milk can be frothed up.
• Put the hot water/steam lever in a horizontal position. Milk is drawn in, heated and frothed up.
3.6.2 Settings

- Set the selector on the frothing-up device to CAPPUCCINO. Milk and milk froth are conveyed.
  The milk froth and the temperature of the milk can be varied in the CAPPUCCINO area by rotating the selector.

- Set the selector on the frothing-up device to CAFFELATTE. Hot milk is conveyed.
  The temperature of the milk can be varied between 50 °C and 75 °C in the CAFFELATTE area by rotating the selector.

3.6.3 Stopping the steam

To stop drawing steam, put the hot water/steam lever back in an upright position.

The display switches to Steam and Ready.

The appliance remains in steam mode for approx. one minute.

The appliance then cools down automatically. Ready is displayed again.

To cool the appliance manually, press the steam button P (4). The appliance gives off steam into the drip tray.
3.7 Changing standard settings

The appliance has been set at the factory so that coffee can be brewed without any additional programming. To change these settings, use the function buttons under the display. These buttons also have additional functions:

Button (1) standby = Save settings.
Button (2) - = – selection button
Button (3) - = + selection button
Button (4) P = Access programming mode

The following settings can be changed:
- Displayed language
- Water hardness
- Energy-saving mode
- Cup heater

3.7.1 Programming

Note: Before the programming can be changed, the appliance must be in brewing mode.

Ready is indicated on display.

Press and hold down button P (4) for at least three seconds.
- Programming mode is activated.
  - Press button P (4) to select the required setting, e.g. Hardness // Setting 3
  - To change the setting, press the – or + button, e.g. Hardness // Setting 2
  - Press Standby button (1). The changed setting is saved. Ready is indicated on display again.
### 3.7.2 Changing the display language

Display languages which can be set:

<table>
<thead>
<tr>
<th>Language</th>
<th>Deutsch</th>
<th>Francais</th>
<th>Italiano</th>
<th>Nederlands</th>
<th>Español</th>
<th>Português</th>
<th>Norsk</th>
<th>Svenska</th>
<th>Dansk</th>
<th>Suomi</th>
<th>Русский</th>
<th>English</th>
</tr>
</thead>
</table>

The appliance has been set at the factory so that Sprache and Deutsch are indicated alternately on the display.

To acknowledge Deutsch, press button P (4).

To set another language, select the required language with the – (2) or + (3) buttons and save with the Standby (1) button.

### 3.7.3 Changing the water hardness

Determine the water hardness with the enclosed test strip or ask your local water supplier.

**Hardness setting 3** has been pre-selected.

The following settings are available:

| Setting | Setting 1 | Setting 2 | Setting 3 | Setting 4 | Setting – – |

Setting - - means that no water hardness has been set. The appliance no longer automatically signals when it should be descaled.

To change the water hardness setting, press button P (4). To change the water hardness, select the required setting with the – (2) or + (3) buttons and save with the P (4) button.

Inputting the water hardness is important for the descaling programme. If using external water softening systems or filtered water, select water hardness setting - -.

#### 3.7.3.1 Degree of water hardness

<table>
<thead>
<tr>
<th>Setting</th>
<th>German ('dH)</th>
<th>French ('fH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- -</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>1 – 7</td>
<td>1 – 13</td>
</tr>
<tr>
<td>2</td>
<td>8 – 15</td>
<td>14 – 27</td>
</tr>
<tr>
<td>3</td>
<td>16 – 23</td>
<td>28 – 42</td>
</tr>
<tr>
<td>4</td>
<td>24 – 30</td>
<td>43 – 54</td>
</tr>
</tbody>
</table>
3.7.4 Energy-saving mode

The appliance switches automatically to energy-saving mode if it was not used for 1 hour.

When energy-saving mode is active, the heater switches off, the cup heater remains active.

Energy-saving mode is displayed.

Energy-saving mode can be changed from **energy-saving mode - on** to **energy-saving mode - off**.

When the appliance is switched on again from energy-saving mode, first wait for the heating up phase.

3.7.5 Cup heater

The function of the cup heater can be changed from **cup heater - off** to **cup heater - on**.

For a successful coffee preheat the cups on the cup heater:

The temperature of the cup heater may increase to 50 °C.
3.8 Cleaning

⚠️ Risk of electric shock!
► Before cleaning the appliance, pull out the mains plug.
► Never immerse the appliance in water.
► Do not use a steam cleaner.

3.8.1 Daily cleaning of the appliance
► Rinse out the water tank and fill with fresh water.
► Pull the drip tray and capsule container forwards (A), empty (B) and clean with a mild detergent solution. When re-inserting the parts, ensure that they are fitted together correctly.

Pull out the coffee outlet (C) forwards and then the capsule holder (D). Clean with a mild detergent solution (not dishwasher-proof).

First re-insert the capsule holder (E) and then the coffee outlet.
**Note:** If the appliance is cold when switched on, the appliance is rinsed automatically.
3.8.2 Cleaning the CAPPUCCINO / CAFFELATTE nozzle

The nozzle and valve must be **cleaned immediately** to ensure **optimum milk froth**. Even the slightest milk residue will impair the frothing up result!

- After each frothing up process, switch to **Draw hot water** and flush the **frothing up nozzle** with hot water.
- Clean **daily** by placing the hose in a glass/receptacle containing hot water and repeat the (frothing up) process – except now with drawn in water. Milk residue is dissolved and flushed out.

To clean **thoroughly**, disassemble all parts and clean with a soft brush in a mild detergent solution.

Clean particularly inaccessible locations with a blunt needle. Rinse all parts with hot water and dry. Parts are dishwasher-proof.

**Attention:** When re-assembling the parts, ensure that the smooth end of the milk hose is connected to the frothing-up aid. Insert the notched end (A) into the milk container. Connect all parts firmly together. Ensure that there are no gaps between the individual parts.
3.9 Descaling

The lime content in drinking water causes calcification of the thermal block in the appliance. This affects the flavour of the coffee and reduces the service life of the appliance.

To ensure optimum quality, descale the appliance regularly.

If **Needs to be descaled** is displayed, the appliance must be descaled immediately.

Descaling programme

Warning!

► Never descale the appliance with vinegar or vinegar-based substances.
► Do not interrupt the descaling programme.
► Never drink the liquid

3.9.1 Descaling programme

The descaling programme lasts approx. **20 minutes**. The display runs through the descaling programme.

Press and hold down steam button P (4) for at least three seconds.

Select **Start descaling procedure?** with steam button P (4).

Select **Yes** with – button or + button.

Press steam button P (4).

Display: **Empty container and press P** is indicated.

Empty and re-insert drip tray and capsule container.

► Press button P (4)

Display: **Fill agent + water and open tap** is indicated.

► Mix 100 ml descaling agent (mat. no. 31 0451) and 500 ml water and pour into the empty water tank.
► Place an adequately large receptacle under the steam pipe.
► Put the hot water/steam lever in a horizontal position.

Display: **Descaling in progress** is indicated.

The solution runs into the receptacle.
3.9.2 Descaling programme

Display: **Return descaling solution to water tank.**

**Close tap and press P** is indicated.

- Carefully transfer the descaling solution which has run through the appliance back into the water tank.
- Put the hot water/steam lever in an upright position.
- Place the empty receptacle under the coffee outlet.
- Press button P (4).

Display: **Descaling in progress** is indicated.

Initially the solution can be seen running out of the coffee outlet into the receptacle and then, concealed by the appliance, runs into the drip tray.

Display: **Fill water and press P** is indicated.

- Rinse out the water tank thoroughly and fill with 500 ml water.
- Place the empty receptacle under the coffee outlet.
- Press button P (4).

Display: **Rinsing** is indicated.

The appliance is rinsed.

Display: **Open tap** is indicated.

- Place the empty receptacle under the steam pipe.
- Put the hot water/steam lever in a horizontal position.

Display: **Rinsing** is indicated.

The appliance is rinsed until the water tank has been emptied.

Display: **Close tap + empty container** is indicated.

- Put the hot water/steam lever in the upright position.
- Empty, clean and re-insert drip tray and capsule container.
- Fill water tank with fresh water and re-insert.

**Ready** is displayed again.

The descaling alarm is automatically cancelled.

If the descaling process is terminated, the descaling alarm is not cancelled and the appliance requests the customer to completely rinse the appliance according to the instructions on the display.

**Warning:**

If inadequate descaling solution or inadequate fresh rinsing water was poured into the appliance, the appliance moves back one step and the prompt to add descaling solution or water is redisplayed.
3.9.3 Manually resetting the descaling alarm

If the appliance is descaled manually, the Needs to be descaled display can be deleted.

- Press and hold down button P (4) for at least three seconds.
- Select Descaling alarm reset? with button P (4).
- Select Yes with – button or + button.
- Press button P (4).

Warning:
To prevent damage, descale appliance regularly.
4 COMPONENTS

4.1 Flowmeter

The composition of the coffee mixture is a well guarded secret of the coffee roasting establishments. To ensure that an excellent coffee can be produced from this secret, the coffee beans must be roasted carefully and the coffee machine controlled precisely – unless the dosage is constant, the quality of the coffee cannot be maintained.

The flowmeter (A) is installed on the suction side between the water tank (B) and pump (C). To ensure a precise measurement result, the flowmeter must be operated in a horizontal position.

4.1.1 Design and function

Water is pumped in from the water tank and flows through the flowmeter.

Water is supplied via the connection pipe in the lower section of the housing (D).

Water is discharged via the connection pipe in the upper section of the housing (A).

The two halves of the housing are sealed with a silicone seal (B).

The fan impeller (C) with the two attached magnets is rotated by the water flow.

The Hall-IC in the upper section of the housing (A) generates square pulses which measure the actually required amount of water.

When installing the flowmeter, ensure that the direction of flow is correct. An arrow on the flowmeter housing indicates the direction of flow.
The flowmeter itself does not supply an output voltage but simply switches the signal connection to 0 volt earth (actuated) or leaves it open (unactuated). Square pulses are generated in the upper section of the housing via the Hall-IC.

Wrong connection of + voltage, signal and earth destroys the flowmeter.

Prevent inductive faults via the cable!
Do not lay the cable together with supply cables to consumers.
4.2 Heater and NTC-sensor

4.2.1 Heater (Instantaneous water heater)

In the instantaneous water heater the water for coffee production or hot water/steam purchase is heated up.

Therefore the water is pumped in a stainless-steel pipe (A), which is cast in together with a heating resistor (B) in an aluminum block.
### 4.2.2 Characteristic of NTC-sensor

<table>
<thead>
<tr>
<th>Temperature</th>
<th>$R_{\text{min}}$</th>
<th>$R_{\text{nom}}$</th>
<th>$R_{\text{max}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 °C</td>
<td>93.801k</td>
<td>100k</td>
<td>106.199k</td>
</tr>
<tr>
<td>95 °C</td>
<td>6.414k</td>
<td>6.624k</td>
<td>6.834k</td>
</tr>
<tr>
<td>140 °C</td>
<td>1.696k</td>
<td>1.771k</td>
<td>1.845k</td>
</tr>
</tbody>
</table>
4.3 Brewing unit

The brewing unit forms the central element in the espresso machine.

**Operating principle:**

The capsule cage (C) encloses the coffee capsule (D) from above and presses the edge of the capsule cage against the pyramid plate (F). The capsule cage and coffee capsule form the pressure-tight brewing chamber.

Three spikes (B) in the upper part of the capsule cage pierce the aluminium jacket of the coffee capsule. Hot water (A) is forced under pressure by the pump into the brewing chamber. The pressure inside the coffee capsule increases and bursts the membrane (E) on the underside.

The coffee is brewed in the coffee capsule and is conveyed into the holder (G) and then to the coffee outlet (H) via the pyramid plate (F).

**Note:**
A dirty pyramid plate (F) impairs the run-out and taste of the coffee.

4.3.1 Pyramid plate

The water pressure inside the coffee capsule increases and bursts the membrane on the underside. The coffee is brewed via the pyramid plate and conveyed to the coffee outlet.

A dirty pyramid plate impairs the run-out and taste of the coffee.

If the coffee is only dripping out of the coffee outlet, the pyramid plate could be dirty and clogged with coffee residue.

To clean the pyramid plate, start a coffee brewing process without a capsule.

To clean the pyramid plate manually, remove the capsule holder together with the pyramid plate. Re-insert the pyramid plate in the correct position.
4.4 Hot water / steam nozzle

Attachment nozzle which is connected to the steam pipe, for drawing hot water and for drawing steam to heat drinks in a receptacle.

Hot water production for preparation of hot drinks.

Connect nozzle to the adapter on the steam pipe and screw on.

The steam flows through the steam pipe (A) and the connected steam nozzle and generates a vacuum inside the steam nozzle. This vacuum is compensated by fresh air which flows in through the openings (B) in the nozzle holder and (C) in the nozzle body.

If the nozzle is immersed in cold milk above the side opening (C) and steam is drawn, fresh air flows in through the opening (B) in the nozzle holder. In addition milk is drawn in through the opening (C) into this air flow, is swirled with the steam flow and dispensed again at the tip of the steam nozzle.

The resulting circuit consisting of drawn in, swirled and redispensed milk heats the latter continuously and provides the milk with an increasing proportion of air bubbles. This proportion of froth increases the volume by up to 100%.
5 FUNCTIONS

5.1 The perfect espresso

A genuine espresso is prepared according to a specific extraction process in which the water is forced under high pressure through finely ground coffee in order to release all the flavours.

The excellent quality of the result in the cup depends on the selection and composition of the raw coffee from different countries of origin, the degree of roasting, the fineness of the grinding and the extraction method: Applied pressure, water temperature and extraction duration.

A perfect espresso can be identified by its distinctive taste, intensive flavours and a dense body, refined by a crema of perfect consistency.

5.2 The brewing procedure

The capsule cage (A) encloses the coffee capsule (B) from above and presses the capsule against the pyramid plate (C). The capsule cage and coffee capsule form the pressure-tight brewing chamber.

Three spikes in the upper part of the capsule cage pierce the aluminium jacket of the coffee capsule. Hot water is forced under pressure by the pump into the brewing chamber. The pressure inside the capsule increases and bursts the membrane on the underside of the coffee capsule.

The coffee brewed in the capsule is conveyed into the holder (D) via the pyramid plate and then to the coffee outlet.
5.3 Design

5.3.1 Overview, right side

1. Drip tray
2. Float (level indicator for drip tray)
3. Drip plate
4. Steam tube with steam nozzle
5. Coffee outlet
6. Capsule support
7. Ledge (with capsule infeed)
8. Ceramic valve (hot water/steam valve)
9. Brewing head
10. Capsule cage
11. Buttons, illuminated
12. Display
13. Cup heater for prewarming cups
14. Pressure-relief valve
15. Water tank
16. Balcony motor
17. Solenoid valve
18. Water tank connection
19. Expansion chamber
20. Heater
21. Mains switch
22. Pump
23. Flowmeter
5.3.2 Overview, left side

1. Mains transformer
2. Heater
3. Electronic mainboard
4. Drive motor for brewing head
5. Infrared sensor
6. PTC heater for cup heater
7. Cup heater for prewarming cups
8. Display
9. Buttons, illuminated
10. Gears for brewing head drive
11. Ledge (with capsule infeed)
12. Capsule support
13. Coffee outlet
5.4 Fluid system

1. Water tank
2. Water tank valve
3. Flowmeter
4. Pump
5. Heater
6. Ceramic valve (hot water/steam valve)
7. Outlet valve
8. Steam pipe and frothing aid
9. Nozzle stopper (integrated in the brewing head)
10. Brewing head
11. Pyramid plate
12. Solenoid valve
13. Expansion chamber
14. Drip tray

Attention: If there is a risk of frost, the appliance must be steamed out. If water freezes in the fluid system, the thermal block or the piping may be damaged.

Procedure:

1. Press button P “Steam” and wait until the appliance indicates **Steam ready**.
2. Press Standby-button.
5.5 Brewing cycle sequence

Requirements:

► Appliance is switched on and "Ready" is displayed.
► Press "Large coffee" or "Small coffee" button for no longer than 3 sec.

Sequence of brewing cycle:

► Check that balcony motor and spindle motor are in the correct position.
► Balcony motor start – capsule infeed moves in.
► Capsule infeed has reached its inner stop position when the "capsule infeed at rear" reed switch is closed and the voltage on the balcony motor increases.
► Balcony motor stops.
► Balcony motor starts and moves the capsule infeed back to the home position.
► Capsule infeed has reached its home position when the "capsule infeed at front" reed switch is closed and the voltage on the balcony motor increases.
► 0.5 s delay. Balcony motor runs further towards the home position to ensure that both doors are 100% closed.
► Balcony motor stops.
► Spindle motor starts and moves the capsule cage into the brewing position.
► Spindle motor is actuated a second time for approx. 1 sec. in order to strengthen the seat of the capsule cage seal.
► Pump is actuated, all buttons are locked for approx. 5 sec.
► Brewing cycle starts. The pump is actuated and conveys water out of the water tank through the flowmeter into the heater and then to the capsule cage via the ceramic valve.
► When the flow rate stored in the EEPROM is reached, the pump stops.
► 4 sec. delay in brewing position. If a "coffee" button is pressed during this time, the brewing cycle starts a second time with the same capsule at the same flow rate.
► Spindle motor starts and raises the capsule cage by approx. 8 – 9 mm.
► In this position the motor stops for approx. 1 Sec.
► Spindle motor starts and moves the capsule cage into the ejection position.
► In this position the motor stops for approx. 0.5 sec.
► Spindle motor starts and moves further towards the home position.
► Appliance is in brewing mode again. "Ready" is displayed.
### 5.6 Wiring and connecting diagram

- **CN5** Water tank transmitter
- **CN1** Water tank receiver
- **CN4** Keypad
- **CN14** Display
- **CN15** Display
- **Prog** Programming
- **CN8** Microswitch
- **CN2** Reed at front
- **CN9** Reed at rear
- **CN7** Capsule container transmitter
- **CN6** Encoder
- **M1** Balcony motor
- **M2** Brewing unit motor
- **CN13** NTC-sensor
- **CN12** Flowmeter
- **PTC** Cup heater
- **V1** Solenoid valve (closed in idle state)
- **R** Heater
- **P1** Pump
- **T1** Transformer
- **S1** Main switch

**220 – 240V 50/60Hz**
5.7 Temperature graph

The temperature graph indicates the temperature pattern on the heater during operation.

I Heating up
II Ready to brew
III Draw coffee (91 °C) / draw hot water (95 °C)
IV Heating up
V Brewing mode
VI Heating up to draw steam (140 °C)
VII Steam mode
VIII Draw steam
IX Cooling after drawing steam

A Switch on, press Standby button
B Press “on” button or draw hot water
C Stop drawing coffee / hot water
D Press the Steam button, warming up process begins
E Draw steam
F Press the Steam button, cooling down process begins

! After coffee production the equipment can be closed briefly for reheating. After steam production the equipment cools down automatically. Wait is briefly indicated on display.
## 5.8 Descaling cycle

### 5.8.1 Running the descaling programme

<table>
<thead>
<tr>
<th>Consumer action</th>
<th>Appliance response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Select Descaling menu option</td>
<td></td>
</tr>
</tbody>
</table>
| 2. Empty drip tray  
  **DISPLAY** | Empty tray and press P |
| 3. Fill with descaling solution  
  **DISPLAY** | Fill with agent + water and open tap  
  Check point: Agent in tank? (via sensor) |
| 4. | **DISPLAY**  
  Descaling solution via steam pipe  
  Pump ON until water tank is empty.  
  If tank is empty before 300 ml have flown through: back to step 3  
  Pump clock speed: Draw coffee |
| 5. | **DISPLAY**  
  Descaling solution back into water tank, rotary knob to coffee  
  Fill water tank with descaling solution, close tap and press P  
  Check point: Agent in tank? (via sensor)  
  Check point: Rotary knob on coffee? |
| 6. | **DISPLAY**  
  Descaling solution via coffee outlet  
  Pump ON until 450 ml have flown through.  
  If tank is empty before 300 ml have flown through: back to step 5.  
  If tank is empty after 300 ml: to step 7  
  Pump clock speed: Draw coffee |
### 5.8.2 Running the descaling programme

<table>
<thead>
<tr>
<th>Consumer action</th>
<th>Appliance response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7.</strong></td>
<td><strong>Descaling solution via solenoid valve</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY</td>
</tr>
<tr>
<td></td>
<td>Pump ON until water tank is empty.</td>
</tr>
<tr>
<td></td>
<td>Pump clock speed: Draw coffee</td>
</tr>
<tr>
<td><strong>8.</strong></td>
<td><strong>Fill tank with water (rinse)</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY</td>
</tr>
<tr>
<td></td>
<td>Check point: Agent in tank? (via sensor)</td>
</tr>
<tr>
<td><strong>9.</strong></td>
<td><strong>Rinsing via solenoid valve</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY</td>
</tr>
<tr>
<td></td>
<td>Pump ON until 150 ml have flown through.</td>
</tr>
<tr>
<td></td>
<td>When tank becomes empty: back to step 8</td>
</tr>
<tr>
<td></td>
<td>Pump clock speed: Draw coffee</td>
</tr>
<tr>
<td><strong>10.</strong></td>
<td><strong>Rinsing via coffee outlet</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY</td>
</tr>
<tr>
<td></td>
<td>Pump ON until 500 ml have flown through.</td>
</tr>
<tr>
<td></td>
<td>When tank becomes empty: back to step 8</td>
</tr>
<tr>
<td></td>
<td>Pump clock speed: Draw coffee</td>
</tr>
<tr>
<td><strong>11.</strong></td>
<td><strong>Rotary knob to hot water</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY</td>
</tr>
<tr>
<td></td>
<td>Check point: Rotary knob on hot water?</td>
</tr>
</tbody>
</table>
### 5.8.3 Running the descaling programme

<table>
<thead>
<tr>
<th>Consumer action</th>
<th>Appliance response</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td><strong>Pump ON until water tank is empty. If tank is empty before 100 ml have flown through: back to step 8</strong></td>
</tr>
<tr>
<td>13. Rotary knob on coffee</td>
<td><strong>Rinsing via steam pipe</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY Rinsing</td>
</tr>
<tr>
<td></td>
<td>Pump clock speed: Draw coffee</td>
</tr>
<tr>
<td></td>
<td><strong>Close tap and empty container</strong></td>
</tr>
<tr>
<td>14.</td>
<td><strong>Descaling programme ends</strong></td>
</tr>
<tr>
<td></td>
<td>DISPLAY Ready</td>
</tr>
</tbody>
</table>

Amount of descaling mixture: 0.6 litres (0.5 litres of water + 0.1 litres of descaling agent)
Amount of rinsing water: 1.2 litres (full tank)

Thermal block control while descaling solution is being conveyed: 70 °C (Fluid temperature at thermal block outlet)
Thermal block control during rinsing process: 70 °C (Fluid temperature at thermal block outlet)

**If the appliance is switched off while the descaling programme is running:**

- Irrespective of where the programme is, the programme automatically jumps to **Point 8** when the appliance is switched on (to keep descaling agent out of the appliance).
- At the moment the appliance was switched off, the programme had **completed step 7**: descaling warning on the display is cancelled.
- At the moment the appliance was switched off, the programme had **not yet completed step 7**: descaling warning on the display is retained.
Before removing the appliance, pull out the mains plug. The appliance must be isolated.

6.1 General disassembly

Tools:
- Screwdriver bit for oval screws
  Mat.no.: 34 1021
- Torx screwdriver T10, T15

Procedure:
1. Remove water tank, drip tray and capsule container.
2. Remove screws (A), Torx T10, M3.0X30 Inox. Remove screws (B), oval head, M3.0X8. Remove cup heater upwards.
3. Remove screw (C), Torx T15, 4.2x8 Inox Remove hot water/steam knob (D).
4. Remove screws (E), Torx T10, M3.0x12. Remove screws (F), oval head, M3.0x20. Remove aluminium front panels (G) upwards. Remove back of housing to rear.

Attention:
When removing the back of the housing, note the length of the connecting cables to the mains switch and to the infrared sensor.
6.2 Removing display unit

The display unit and button set are supplied in the housing as spare parts pre-assembled with connecting cables only.

Tools:
- Screwdriver bit for oval screws
  Mat.no.: 34 1021
- Torx screwdriver T10

Procedure:
1. Remove water tank.
2. Remove 2 screws (A), Torx T10.
   Remove 2 screws (B), oval head.
   Remove cup heater upwards.
   Pay attention to protective conductor connections.
3. Remove 4 screws (C), Torx T10.
4. Disconnect 3 plug-in connectors (D) and remove display unit (E) upwards.

⚠️ During assembly, ensure that the protective conductor wires do not touch any gearwheels.
6.3 Removing PTC heating element

Tools:
- Screwdriver bit for oval screws
  Mat.no.: 34 1021
- Torx screwdriver T10

Procedure:
1. Remove water tank.
2. Remove 2 screws (A), Torx T10.
   Remove 2 screws (B), oval head.
   Remove cup heater upwards.
   Pay attention to protective conductor connections.
3. Remove 2 screws (C), Torx T15.
4. Remove plate (D) and remove PTC heating element (E) downwards.

⚠️ During assembly, ensure that the protective conductor wires do not touch any gearwheels.
6.4 Replacing heater

6.4.1 Removal

Tools:
- Collecting tray for water
- Torx screwdriver T10, T20
- Open-end wrench A/F 8/10 mm

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove 2 screws (A), Torx T10.
3. Disconnect wires for thermal link (blue), for heater connection (brown) and connecting cable (red) for NTC temperature sensor from the electronics board.
4. Provide a collecting tray for residual water in the thermal block.
5. Detach securing clips (B) and remove fluid connections (C) from the thermal block.
6. Pull support plate with heater out of the base group.
7. Loosen screw (D), Torx T20, on the heater and remove.
8. Loosen screw for protective conductor connection (E), Torx T20, and screw for securing clip (F), Torx T20.
9. Loosen all electrical plug-and-socket connections, earth connection and thermal link.
10. Remove NTC temperature sensor (G) from the heater.
11. Remove and replace heater.
### 6.4.2 Installation

**Procedure:**

1. Screw in NTC temperature sensor (A) with spring washer.

   *Only lightly tighten NTC temperature sensor until the spring washer is flat (0.5–0.9 Nm).*

2. Attach safety thermal cutout (B) to the heater with bracket and Torx T20 screw.

3. Insert connection wires into tabs:
   - Brown wire (br) with insulating part = below
   - Blue wire (bl) with thermal link = above

4. Attach protective conductor connection (C) to heater with Torx T20 screw.

5. Attach thermal block to the support plate with Torx T20 screw (D).

   *Whenever the fluid connections are opened, replace the O-rings.*

6. Connect O-rings (E) to fluid connection nozzle.

7. Attach fluid connections (F) to thermal block with securing clips (G).

8. Connect wires for thermal link (blue), for heater connection (brown) and connecting cable (red) for NTC temperature sensor to the electronics board.

9. Attach support plate with thermal block to the base group with 2 screws (H), Torx T10.

   *When repairs are complete, perform a pressure and leak test.*
6.5 Replacing NTC temperature sensor

Tools:

- Torx screwdriver T10
- Open-end wrench A/F 8/10 mm

Procedure:

1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove 2 screws (A), Torx T10.
3. Disconnect wires for thermal link (blue) and connecting cable (red) for NTC temperature sensor from the electronics board.
4. Pull connecting cable (red) for NTC temperature sensor back through the cable guides to the NTC temperature sensor.
4. Pull support plate with thermal block (B) as far as necessary out of the base group.
5. Remove NTC temperature sensor (C) from the thermal block and replace.
6. Screw in NTC temperature sensor with spring ring.
   **Only lightly tighten NTC temperature sensor until the spring washer is flat (0.5–0.9 Nm).**
   When screwing in the NTC temperature sensor, ensure that the connecting cable is not twisted!
7. Assemble in reverse sequence.
6.6 Replacing pump

Tools:
- Collecting tray for water
- Screwdriver bit for oval screws
  Mat. no.: 34 1021
- Open-end wrench A/F 14 mm

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove electrical plug-in connections from the pump.
3. Loosen 4 oval head screws (A) on the pump cover on the base plate and remove the pump cover (B).
4. Remove the pump support (C) from the guide pin on the base plate.
5. Remove securing clip (D) from the fluid connection bracket and remove pressure hose (E). Provide a collecting tray for water.
6. Remove supply hose (F).
7. Take pump all the way down and out of the base opening.
8. Unscrew fluid connection bracket (G) and remove pump support (C).
9. Replace the pump. Modify thermostat (I) and bracket (J) for thermostat to new pump.
10. Connect pump support, insert O-rings (H) and screw in fluid connection bracket.

Whenever the fluid connections are opened, replace the O-rings.

11. Rotate the pump extension with an open-end wrench until the fluid connection bracket is in the correct position.
12. Assemble the remaining parts in reverse sequence.

Check wiring of pump and thermostat after assembly.
6.7 Replacing flowmeter

Tools:
- Collecting tray for water
- Torx screwdriver T10
- Long-nosed pliers

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove electrical plug-in connection (A) from the flowmeter.
3. Remove hose (B) – to the pump – and hose (C) – to the water tank connection – from the flow meter. Provide a collecting tray for residual water.
4. Loosen 3 Torx T10 screws (D) and pull support (E) out of the guide in the base plate.
5. Remove lock washer (F) and replace flowmeter.
6. Assemble in reverse sequence.

⚠️ Risk of cracking!
Observe tightening torque for screws (B): 0.5–0.9Nm

Avoid inductive interference via the power cord of the flowmeter!
Do not lay the power cord together with supply cables to the mains switch.

Check hose connections after assembly!
6.8 Replacing holder for the water tank

Tools:
- Collecting tray for water
- Torx screwdriver T10

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove water supply hose from the flowmeter (A). Provide a collecting tray for residual water.
3. Disconnect plug-in connection for IR sensor from the electronics board and detach cable from the guide.
4. Loosen 2 screws (B), Torx T10, in position (C).
5. Remove holder for water tank to the rear (D).
6. Assemble in reverse sequence.

Heed cable guide!
Do not jam cable for IR sensor!

6.9 Replacing IR sensor and tank coupling

1. Dismantle the holder for the water tank.
2. Loosen 3 screws (A), Torx T10, on the underside of the holder for the water tank.
3. Remove cover (B) upwards. Pull IR sensor up through the opening.
4. Disengage IR sensor (C) and remove upwards.
5. Assemble in reverse sequence.

Observe installation location of the IR sensor!

To replace tank coupling:
1. Dismantle the holder for the water tank.
2. Loosen 3 clips (D), remove tank coupling downwards.
3. Assemble in reverse sequence.

Check hose connections after assembly!
6.10 Replacing the electronic mainboard

Tools:
- Torx screwdriver T10
- Long-nosed pliers

The service technician must be earthed with an earthing strap!

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Place earthing strap around the wrist and connect to the earth cable of the unplugged machine! This will prevent a potential difference.
3. Disconnect all plugs and plug-in connections on the electronic mainboard (A).
4. Loosen 3 fastening screws (B), Torx T10, and pull out housing with defective electronic mainboard.
5. Replace the electronic mainboard.
6. Assemble in reverse sequence.
   (See “Wiring and connecting diagram”)
   Plug in wires, arrange as indicated in the picture, and fasten together with cable ties.
6.11 Replacing electromagnetic valve

Tools:
- Torx screwdriver T10
- Long-nosed pliers

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Remove plug-in contacts (A) from the electromagnetic valve.
3. Remove 2 screws (B), Torx T10, from the support.
4. Detach securing clip (C) and remove fluid distributor.
5. Remove lower drainage hose (D).
6. Replace the electromagnetic valve.
7. Assemble in reverse sequence.

⚠️ Risk of cracking!
Observe tightening torque for screws (B): 0.5–0.9 Nm
6.12 Replacing steam pipe

Tools:
► Torx screwdriver T10

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Unscrew steam nozzle (A) from the steam pipe.
3. Loosen 3 Torx T10 screws (B) and pull support for the flowmeter (C) out of the guide in the base plate.
4. Pull steam pipe (D) out of the guide.
5. Install new steam pipe in reverse sequence.
   Insert new O-ring (E).

⚠️ Risk of cracking!
Observe tightening torque for screws (B): 0.5–0.9 Nm
6.13 Replacing ceramic valve

Tools:
► Torx screwdriver T10

Procedure:
1. Disassemble appliance as described in the chapter “General disassembly”.
2. Detach securing clip (A) and pull pressure hose downwards.
3. Loosen screw (B), Torx T10, and pull support plate for microswitch (C) with ceramic valve (D) upwards and out of the guide in the base plate.
4. Open 2 clips (E) and remove support plate from the ceramic valve.
5. Remove pressure hoses (F).
   Install new ceramic valve in reverse sequence.
   **Replace O-rings on the ceramic valve and on all pressure hose connections!**
  
⚠️ Observe tightening torque for screw (B): 0.5–0.9 Nm
6.14 Measuring flow rate

Tools:
- Pressure gauge (mat. no.: 34 1045)
- Adapter (mat. no.: 34 1047)
- Attachment plate (mat. no.: 34 1048)

Procedure:

1. Remove drip tray and capsule container.

2. Pull coffee outlet (A) and capsule support (B) forwards and remove.

3. Insert adapter (1) from below through the housing opening for the coffee outlet. Insert attachment plate (3) instead of the capsule holder from the front and secure adapter. Place pressure gauge (2) on the adapter connection.

4. Place a measuring cup under the outlet hose.

5. Switch on the machine.

6. Fully open the valve on the pressure gauge.

7. Press “Large cup” button.

8. Close the valve on the pressure gauge until 12 bar is indicated.

9. Conduct the measurement for approx. 30 sec.

10. There must be at least 60–120 ml of water in the measuring cup.

Note:

With a flow of < 60 ml the pump is defective or there is a leak in the system.

Large fluctuations on the pressure gauge (+/- 4 bar) during the measurement indicate a defective pump.

Always observe the pressure gauge and, if required, regulate the pressure via the valve. As the temperature rises, the pressure increases; if required, re-adjust the pressure to 12 bar.
6.15 Pressure and leakage test (1)

Check the following parts of the coffee maker for leaks:

- Brewing unit
- Hose connections
- Heater
- Pump
- Electromagnetic valve
- Flowmeter

Tools:

- Pressure gauge (mat. no.: 34 1045)
- Adapter (mat. no.: 34 1047)
- Attachment plate (mat. no.: 34 1048)

Preparing the coffee maker:

1. Disassemble as described under “General disassembly”.
2. Pull out coffee outlet and capsule support forwards.
3. Insert adapter (1) from below through the housing opening for the coffee outlet. Insert attachment plate (3) instead of the capsule holder from the front and secure adapter. Place pressure gauge (2) on the adapter connection.
4. Place a measuring cup under the drainage hose.
5. Attach filled water tank.
6. Connect power cord.

Hazardous mains voltage inside the coffee maker!
Do not operate any live parts during the leakage test!
Hot, pressurised parts inside the coffee maker!
Do not touch hot parts during the test!
Wear safety glasses during inspection!
6.16 Pressure and leakage test (2)

7. Press mains switch and “Standby” button to switch on the machine.

8. Press “Large cup” button.

9. Open valve and allow water to flow out of the drainage hose for approx. 10 sec.

10. Close valve completely.

After rising quickly, the pressure stabilises between 16–19 bar. (Pressure test). The temperature rise also causes the pressure to continue increasing slowly.

Always observe the pressure gauge! If the pressure increases above 23 bar, switch off the coffee maker and reduce the pressure via the valve.

11. Check all pressurised connections for visible and audible leaks.

The pump must not run for longer than 50 sec. with the valve closed.

12. Switch off the machine by pressing the “Standby” button.

13. Open the valve (water may flow out of the pressure gauge).

After the test release the residual pressure by opening the valve!
6.17 Replacing pyramid plate

Tools:
- Special lubricating grease PARALIQ® GTE 703
  mat. no.: 31 0574

Procedure:
1. Place steam pipe downwards and pull coffee outlet (A) forwards out of the appliance.
2. Pull capsule support (B) forwards by the lower edge.
3. Depress capsule holder and pull forwards out of the appliance (C).
4. Take capsule support completely out of the appliance.
5. Lift ejector (D) and remove pyramid plate from catch (E).
6. Replace pyramid plate.
   When inserting the pyramid plate, ensure that it is connected properly.
   During re-assembly, sparingly lubricate the slide rails for the coffee outlet with food-safe special grease PARALIQ® GTE 703.
7. Insert capsule holder and coffee outlet into the appliance in reverse sequence.
6.18 Replacing capsule cage

Tools:
- Capsule cage wrench (mat. no.: 34 1098)
- Silicone grease: Paraliq GTE703 (mat. no.: 31 0574)

Procedure:
1. Place steam pipe downwards. Pull coffee outlet (A) forwards out of the appliance. Pull capsule holder (B) forwards by the lower edge, press down and pull out of the appliance (C).

2. Pull drip tray and capsule container out of the appliance.
3. Switch on the appliance and start coffee brewing process by pressing a “coffee” button.
4. Switch off the appliance with the mains switch before the pump starts running.
5. Using the installation tool (E), unscrew the capsule cage (D) anti-clockwise out of the cage holder.
6. Replace nozzle body (F), replace capsule cage (D). Sparingly lubricate nozzle body (F) and sealing ring (G) with food-safe silicone grease Paraliq GTE 703.

⚠️ During re-assembly, sparingly lubricate the slide rails for the coffee outlet with food-safe special grease PARALIQ® GTE 703.
7. Assemble in reverse sequence.
7  FAULT DIAGNOSTICS

7.1  Checking the appliance

7.1.1  Receipt 1

The receipt check enables you to rapidly locate faults on the machine and to initiate appropriate repair actions.

► Follow the sequence in the table.
► Repair any faults and repeat the repair routine to the end.

1. Check machine for visual damage
   ► Housing part broken, damaged or deformed?
   ► Power cord or mains plug damaged?
   ► Has the customer opened the appliance?

2. Checking the mechanical elements
   ► Can the hot water/steam lever be opened and closed easily?
   ► Is the water tank dirty, calcified or scratched?

3. Filling and attaching the water tank
   ► Water tank leaking?
   ► Hose system leaking? Is water running out?

4. Switching on the appliance
   ► Switch on the appliance with the mains switch.
   ► Press Standby button (1). Do display and keypad come on?
   ► Is Service and then Rinse displayed?
   ► How long does the machine require to heat up?
   ► (Standard time approx. 50 sec.)
   ► Is a rinsing process taking place?
   ► Is standby indicated on the display by Ready?
   ► See "Receipt 2"
5. Coffee preparation without capsule
▶ Press “coffee” button (2) or (3). Is the capsule infeed retracted and extended again?
▶ Is the pump functioning?
▶ Is water running out of the coffee outlet?

6. Coffee preparation with capsule
▶ Place the capsule (Cosi is most suitable) with the membrane face down in the capsule infeed.
▶ Press “coffee” button (2) or (3). Is the capsule pulled in?
▶ Is coffee conveyed out of the coffee outlet?
▶ At the end of the brewing process is the capsule emptied into the capsule container?

7. Display of fault codes
▶ Is a fault code F1 to F10 displayed?
▶ See chapter “Overview of fault codes”

8. Hot water preparation
▶ Put the hot water/steam lever in a horizontal position.
▶ Is the steam valve functioning?
▶ Is the pump functioning?
▶ Is hot water running out of the steam pipe?

9. Steam generation
▶ Press button P(4).
▶ Is Service and Steam displayed alternately?
▶ Is Steam and Ready displayed alternately?
▶ Put the hot water/steam lever in a horizontal position.
▶ Is steam flowing out of the steam pipe?

10. Descaling
▶ See chapter “Descaling cycle”

11. Flow rate
▶ See chapter “Measuring the flow rate”

12. Pressure and leakage test
▶ See chapter “Pressure and leakage test”

13. Temperature measurement
▶ See chapter “Temperature measurement”

14. Cleaning
▶ See chapter “Cleaning”

15. Checking reed contacts
▶ See chapter “Checking reed contacts”
7.2 Temperature measurement

7.2.1 Measuring coffee temperature

Procedure:

1. Switch on the machine
2. Place a measuring jug (A) under the coffee outlet.
3. Wait until Ready is displayed.
4. Then press the “on” button for a large coffee to prewarm the brewing system.
5. Wait until Ready is displayed.
6. Insert a capsule (Così is most suitable).
7. Press the “on” button for a large coffee.
8. Wait until there are 20 ml of coffee in the measuring jug.
   Then measure the coffee temperature approx. 5 – 10 mm under the coffee outlet (B).
   The coffee temperature should be approx. 86 °C +/- 3 °C.
7.2.2 Measuring temperature of cup heater

Procedure:
Measure the temperature 30 minutes after the appliance was switched on. Ensure that the cup heater is activated in the standard settings.

The measuring point is situated above the PTC heater, in the middle, at the back of the cup heater.

Setpoint temperature is 50 °C +/- 5 °C
7.3 Service mode

To access the service mode, switch off the appliance with the mains switch or by pulling out the mains plug.

7.3.1 Selecting service mode:

- Press and hold down button P(4)
- Insert mains plug or switch on mains switch.
- Hold down button P(4) for another 3 seconds.

Display: Tot. Brew is indicated.

To end the service mode, press the Standby button. The brewing unit is initialised. Standby is displayed again.

7.3.2 Displays in service mode

Press button P(4) to select the next display. Number of brews and settings are indicated by changing text:

<table>
<thead>
<tr>
<th>Brew counter</th>
<th>Tot. Brew</th>
<th>84</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of water</td>
<td>Tot. Litre</td>
<td>6</td>
</tr>
<tr>
<td>Number of small cups</td>
<td>Small</td>
<td>49</td>
</tr>
<tr>
<td>Number of large cups</td>
<td>Large</td>
<td>35</td>
</tr>
<tr>
<td>Number of hot water brews</td>
<td>Tot. Water</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of steam brews</th>
<th>Tot. Steam</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litres of coffee brews</td>
<td>Coffee [L]</td>
<td>5</td>
</tr>
<tr>
<td>Litres of hot water</td>
<td>Water [L]</td>
<td>1</td>
</tr>
<tr>
<td>Litres of steam</td>
<td>Steam [L]</td>
<td>1</td>
</tr>
<tr>
<td>Number of descaling count</td>
<td>Desc.count</td>
<td>2</td>
</tr>
<tr>
<td>Number of manual resets</td>
<td>Reset</td>
<td>1</td>
</tr>
<tr>
<td>Set brewing temperature</td>
<td>Temp.</td>
<td>Standard</td>
</tr>
<tr>
<td>Increase temperature with button +</td>
<td>+2° C</td>
<td>+4° C</td>
</tr>
<tr>
<td>Reduce temperature with button –</td>
<td>–2° C</td>
<td>–4° C</td>
</tr>
<tr>
<td>Set automatic rinsing</td>
<td>Rinsing</td>
<td>Automatic</td>
</tr>
<tr>
<td>Change with button + or button –</td>
<td>Manual</td>
<td></td>
</tr>
<tr>
<td>Select diagnostic mode</td>
<td>Analysing</td>
<td>No</td>
</tr>
<tr>
<td>Change with button + or button –</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Activate diagnostic mode with</td>
<td>button P(4)</td>
<td></td>
</tr>
</tbody>
</table>
## 7.4 Diagnostic mode

In diagnostic mode individual components can be actuated via the keyboard and their function tested.

Select diagnostic mode from the **Service mode** by pressing button P(4).

<table>
<thead>
<tr>
<th>Component</th>
<th>Action</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater (thermal block)</td>
<td>Change with <strong>button +</strong> or <strong>button –</strong></td>
<td>TB Off</td>
</tr>
<tr>
<td>Actuate balcony motor</td>
<td>Change with <strong>button +</strong> or <strong>button –</strong></td>
<td>Balc. Mot. Inside</td>
</tr>
<tr>
<td>Drive motor for brewing head</td>
<td>Change with <strong>button +</strong> or <strong>button –</strong></td>
<td>Piston Mot 91</td>
</tr>
<tr>
<td>Actuate solenoid valve</td>
<td>Change with <strong>button +</strong> or <strong>button –</strong></td>
<td>Sol.Valve Closed</td>
</tr>
<tr>
<td>Pump</td>
<td>Actuate pump with <strong>button +</strong> or <strong>button –</strong></td>
<td>Pump 0</td>
</tr>
</tbody>
</table>
### 7.5 Fault codes

#### 7.5.1 Overview of fault codes F1 - F6

<table>
<thead>
<tr>
<th>Fault code</th>
<th>Description</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Electrical malfunction</td>
<td>Reset mains *</td>
</tr>
<tr>
<td></td>
<td>NTC fault, not connected or defective</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Electrical malfunction</td>
<td>Reset mains *</td>
</tr>
<tr>
<td></td>
<td>NTC-sensor supplies wrong values</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Capsule was not ejected</td>
<td>Mechanical fault. Capsule may have been left inserted.</td>
</tr>
<tr>
<td>F3a</td>
<td>Capsule ejected, however F3 displayed</td>
<td>Remove capsule</td>
</tr>
<tr>
<td>F3b</td>
<td>Stacking fault in the capsule container without overfilling</td>
<td>Remove and empty capsule container</td>
</tr>
<tr>
<td>F3c</td>
<td>Capsule burst</td>
<td></td>
</tr>
<tr>
<td>F3d</td>
<td>Capsule in capsule cage</td>
<td>Capsule may cause an obstruction</td>
</tr>
<tr>
<td>F3f</td>
<td>Back pressure in the capsule holder with overfilling</td>
<td>Remove and empty capsule container</td>
</tr>
<tr>
<td>F4</td>
<td>No encoder signal</td>
<td>Reset mains *</td>
</tr>
<tr>
<td></td>
<td>Pyramid plate holder not inserted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safety switch spindle disconnection defective</td>
<td></td>
</tr>
<tr>
<td>F5</td>
<td>Defective encoder signals (distance problem)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No magnet in the carriage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reed contacts defective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brewing unit jamming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plug for the reed contacts not inserted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pyramid plate holder is removed while the spindle is rotating</td>
<td></td>
</tr>
<tr>
<td>F6</td>
<td>Temperature problem, thermal block is not heating</td>
<td>Check thermal block and actuation</td>
</tr>
</tbody>
</table>
### 7.5.2 Overview of fault codes F7 - F10

<table>
<thead>
<tr>
<th>Fault code</th>
<th>Description</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>F7</td>
<td>Heater too hot, above 200 °C</td>
<td></td>
</tr>
<tr>
<td>F8</td>
<td>Balcony motor does not reach the end position</td>
<td>Possible reed problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mech. malfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reset the mains</td>
</tr>
<tr>
<td>F9</td>
<td>Internal electronics fault (master/slave communication)</td>
<td>Reset mains.*</td>
</tr>
<tr>
<td>F10</td>
<td>Internal electronics fault (EEPROM write-read error)</td>
<td>Display only when appliance switched on</td>
</tr>
<tr>
<td></td>
<td>Initialisation fault, no pyramid plate holder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brewing unit jamming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Actuate coffee brewing process without pyramid plate holder</td>
<td>Check whether capsule holder has been inserted correctly</td>
</tr>
<tr>
<td></td>
<td>Safety switch spindle disconnection defective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spindle motor or safety switch not connected</td>
<td></td>
</tr>
</tbody>
</table>

* Reset mains:
  - Mechanical malfunction

  Pull out mains plug and re-insert after approx. 5 seconds
  
  Pull out mains plug and implement the following:
  A capsule may have been left inserted near the brewing unit. Remove and empty capsule container. Insert the balcony as far as possible, a capsule could block the ejector or the brewing unit. If a capsule is visible, carefully loosen with a spoon and convey into the capsule container.
8 TECHNICAL SPECIFICATIONS

8.1 Rating plate

The rating plate is situated on the base plate of the appliance.

A  Voltage
B  VIB (sales identification designation)
C  Customer service index
   Newly launched appliances are given the customer service index “01”. The customer service index is increased to “02”, “03”, etc. if customer service makes changes to the appliance.
D  Frequency
E  Production date according to BSH key.
   For example: FD8410 84 = year minus 20 (=2004)
   10 = month (October)
F  Serial number (optional)
G  Power
H  Type (works designation)
I  Field for approbation number
## 8.2 Power

### 8.2.1 Mains voltage

<table>
<thead>
<tr>
<th>EU</th>
<th>230 – 240 V / 50 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC</td>
<td>120 V / 60 Hz</td>
</tr>
</tbody>
</table>

### 8.2.2 Connected load

1300 W

### 8.2.3 Power input

- **Heater**: 1200 W
- **Pump**: 60 W
- **PTC heater**: 15 W

### 8.2.4 Power data (230 V / 50 Hz model)

- **Heating up**: 12 Wh
- **1 small cup (45 ml)**: 5.5 Wh
- **1 large cup (110 ml)**: 10.5 Wh
- **Standby mode (24 hours)**: 6.5 Wh

### 8.2.5 Pump pressure

- **During coffee preparation**: max. 16 bar
- **Static max. permitted**: 19 bar

### 8.2.6 Flow rate

120 – 240 ml/min at 12 bar, 230 – 240 V / 50 Hz

### 8.2.7 Heating up time

Without capsule – until **Ready** displayed: 30 – 50 sec.

## 8.3 Temperatures

### 8.3.1 Coffee outlet

1. Cup 1x 100 ml +/- 10 ml with “Cosi” capsule in the jet 86 °C+/−5 °
2. Cup 1x 100 ml +/- 10 ml with “Cosi” capsule in the jet 86 °C+/−3 °
3. Cup 1x 50 ml +/- 10 ml with “Roma” capsule in the jet 86 °C+/−3 °

### 8.3.2 Hot water

- **Hot water production without interruption**: > 72 °C
- **Hot water production after 1st heating-up process**: >75 °C

### 8.3.3 Steam

- **Steam production 200 ml, 1 min. (pump clocks)**: > 80 °C

### 8.3.4 Cup heater

- **Temperature after approx. 30 min. in middle at rear**: 50 °C+/−5 °

### 8.3.5 Milk

- **Setpoint temperature UHT milk 1.5%**: 5 – 10 °C
- **Warm 100 ml milk in stainless steel jug <1 min.**: 50 – 75 °C
- **Froth up 100 ml milk with steam pipe < 1 min.**: 50 – 75 °C
- **CAPPUCCINO/CAFFELATTE milk temperature**: 50 – 75 °C
8.4 Dimensions and weight

8.4.1 Appliance dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>340 mm</td>
</tr>
<tr>
<td>Width</td>
<td>240 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>370 mm</td>
</tr>
</tbody>
</table>

Height between coffee outlet and drip plate: 85 mm +/- 2 mm

8.4.2 Cable length

Approx. 1.2 m

8.4.3 Weight of machine

7.5 kg

8.5 Filling amounts

8.5.1 Capacity

<table>
<thead>
<tr>
<th>Container</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water tank</td>
<td>1.2 l</td>
</tr>
<tr>
<td>Capsule container</td>
<td>10 – 12 capsules</td>
</tr>
<tr>
<td>Drip tray</td>
<td>480 ml max.</td>
</tr>
</tbody>
</table>

8.5.2 Cup filling amounts

<table>
<thead>
<tr>
<th>Setting</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory setting, small cup</td>
<td>40 ml</td>
</tr>
<tr>
<td>Factory setting, large cup</td>
<td>100 ml</td>
</tr>
</tbody>
</table>

Filling amounts between 20 ml and 300 ml can be programmed for each cup.