WITTENBORG

Drink Vending Machine
FB 7100

Service Manual

75521400
January, 2005

© Published by Wittenborg A/S, Odense, Denmark
January 2005

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1 Preface and safety instructions

1.1 Preface / how to use this manual

1.1.1 General

Introduction	This service manual is intended for trained service technicians, who have gone through the product training courses of this machine.
Purpose	The purpose of this service manual is to learn about the technical details of the machine. It can be considered and used as a reference manual.

1.1.2 Structurre of the manual

Chapters	The service manual is divided into chapters, numbered from 1 to 10.
Sections	Chapters may be divided into sections. Example: Chapter 5 Function contains nine subsections, each representing a specific function in the machine.
Subsection	Each section is divided into subsections. Each subsection has the same build-up, see example on next page.

Example

The Brewing system serves as an example and it can be found under:

Chapter	***5 Functions***
Section	***B Brewing system***
Subsection	**1 Adjustments** - This subsection describes all possible adjustments for this section, regarding timing, calibration, etc.
	2 (Dis-)assemblies - This subsection explains in detail how a certain part, belonging to this section, has to be assembled, disassembled or replaced.
	3 Functional description - This subsection explains in detail how a certain system in the machine works and how the different parts in the system interact.
	4 Electrical diagrams - Here you can find a description of electrical inputs and outputs of the Brewing system.
	5 Technical specifications - The technical specifications for the Brewing system, described in this section are given here.
	6 Overview of options - Available options, specially for the Brewing system.
	7 Accessories - Accessories to the Brewing system.

Service information

As the vending machine is subject to changes, consecutively numbered service messages (named 'technical information') will inform you on these changes. The service messages are to be filed as chapter 8 in this service manual.

General note

The concept of this manual is designed in such a way that it is valid for different types of machines. If a machine is not equipped with a certain component, the corresponding section is mentioned, but will be blank. The complete numbering has not been changed. Some of the subsections, e.g. the one on *External Options', can be completed by the service technician with respect to specific countries if required.

1.1.3 Definitions of options and accessories

Definition

Options and accessories are also described in this manual. They are defined as follows:

Definition	Description
Options	Various options result in different versions, types or models.
Accessories	Parts that a Service Technician can build into your machine to enable new or different options for your machine.
External options	Parts that can provide special functions or features for your machine, without need to build them into the machine.

1.2 Safety instructions

Introduction

This subsection is intended as an overview of the instructions and warnings used in this manual, and which you must observe.

The following general safety precautions apply to the operation and maintenance of the machine and must always be observed. Non-observance of these instructions or any other safety precautions mentioned in this manual could impair the safety standards of the coffee machine.

Hazard intensity level

There are three levels of hazard intensity identified by signal words - **Danger**, **Warning** and **Caution**. The level of hazard is determined by the following definitions:

Danger 	-	Immediate hazard **will** result in severe personal injury or death.
Warning 	-	Hazards of unsafe practices which **could** result in severe personal injury or death.
Caution 	-	Hazards of unsafe practices which could result in minor personal injury or product or property damage.

General instructions

The instructions in this manual must always be followed. Non-observance can lead to dangerous situations. The manufacturer cannot be held responsible for damage, resulting from not following prescribed procedures.

The technicians must have read the service manual and the operator manual thoroughly, and understood both, before they can install the machine and put it into operation. The service technician must hand over and explain the operator manual to the customer.

Installation, start-up, programming and, if required, repair of the machine must be performed by trained and authorised service technijcians only.

When the customer sells the vending machine to another party, he must also hand over the complete documentation, delivered with the machine.

1.2.1 Various safety instructions

Introduction

Below is listed the instructions divided into the hazard intensity levels

- Danger
- Warning
- Caution

Danger

- Never insert the power supply plug of the machine in a wet or damp socket. The plug itself must not be wet or damp either. Also never insert or remove the plug from the socket with wet hands.
- Safety devices must not be bridged or put out of function.
- If the power supply cord of the machine is damaged, it must be replaced by trained service technicians.
- Before cleaning the vending machine, ensure that it is switched off.

Warning

- The vending machine must be connected to the mains in accordance with all official regulations and local regulations laid down by the electricity and water companies.
- Ensure that the supply voltage corresponds to the voltage indicated on the rating plate which is located on the rear wall of the machine.
- The vending machine must be connected to an electric circuit which is secured by an extra fuse. The connection to a supply with an integrated fault current safety switch is recommended. If missing, we recommend to install a fault current safety switch. The connection must be made using an earthed safety plug socket complying with valid instructions.
- Check the drinking water quality prior to installation.
- The vending machine is suitable for indoor use only.
- Use only genuine spare parts when replacing components and / or carrying out work on the vending machine, otherwise the manufacturer will accept no liablility in the event of damage.
- Rinse the machine before putting it into operation.
- The beverages delivered by the machine are hot! In order to prevent scalds, hands (and/or other parts of the body) must be kept out of the drink delivery area during drink preparation and function tests.
- Keep children away from the machine!
- Carry out a functional test of the machine when the work is completed.
- Door switch:
  When the door is opened, a special switch ensures that there is no access to electrical or moving parts.
  Any operation requiring the machine to be energized with the door opened must be carried out exclusively by qualified technicians informed about the specific risks of such situation.
  The machine may be energized by qualified technicians by inserting

the yellow service key into the door switch.
Before starting any maintenance or repair of energized or moving parts, the machine must always be disconnected at the mains plug.

- When the yellow service key is inserted in the slot of the door key, the machine is re-energized.
  The door can be closed only after removing the key from the door switch.
  If power is turned on, be careful not to touch moving parts and electrical components.

Caution

- To ensure proper hygiene and operation of the machine, it must be cleaned regularly. Watch out for possible sharp edges when cleaning the machine. Danger of scratches or cuts.
- Do not switch off the machine between beverage dispensings in order to keep the optimum water temperature in the boiler. Set ‘energy saving’ in programming instead.
- Clean the inside and outside of the machine using a clean damp cloth and do not splash/rinse it. To clean the machine, only use cleaning agents approved by the food industry.
- Never use high-pressure sprays for cleaning.

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2 Installation

2.1 Transport / Handling

2.1.1 Dimensions and general transport instructions

Dimensions

The following table states the dimensions of the machine

Topic	Measurement
Height	870 mm
Width	450 mm
Depth	378 mm (cabinet), 475 mm (cabinet+door)

Weight

Approx. 50 kg (without ingredients).

General transport instructions

Observe the following instructions / cautions:

- Transport the machine carefully in its original packaging.
- Only transport the machine in upright position.
- Do not turn the vending machine upside down.
- Do not lift the vending machine from the side.
- Do not lift the vending machine with whatever sling or rope.
- Do not place one packed machine on top of another..

General storing instructions

- When storing machine, ensure that it is only stored indoors and take precautions against parasites and frost.
- Keep the machine away from unusual odours.

2.1.2 Transport and storage conditions

General Note

To prevent damage to the machine, (un)load and handle the machine with special care.

It is possible to lift the machine, both with a motor or hand operated fork lift, placing the forks in the front or rear side of the pallet.

Precautions before transportation and storage

Before storing or transporting a used vending machine to a new location the following steps must be taken

Step	Action
1.	Switch off the main switch and disconnect the power supply plug.
2.	Disconnect the machine from the water supply.
3.	Empty the ingredient canisters.

Step	Action
4.	Drain the boiler completely.  Danger of being scalded by hot water.
5.	Ensure that the water system is drained completely when machine is to be stored for a longer period of time or in a room with temperatures below 0°C. It is recommended to disassemble individual parts of water system to empty system completely.
6.	Loosen and remove possible wall securing brackets. (Special parts).
7.	Pack the vending machine in such a manner that a safe transport is guaranteed. Use the original packaging, if possible.

Ambient temperature

Min. 5°C - max. 36°C (min. 41°F - max. 97°F) at 80% RH.

Storage requirements

The machine must be stored in dry and frost proof ambient conditions and must not be exposed to sunlight.

- Before storing the machine for a longer period, it must have been cleaned correctly.
- When used machines are stored intermediately for a long time, the inlet valve of the water supply hose towards the boiler must be disconnected in order to ensure that the hose is empty. In this way future spoiling of the tast is avoided.

2.2 Installation requirements

2.2.1 Prerequisites to water supply

Customer's site

- Water supply line with stop valve and non return valve.
- Connection to cold water line only with suitable supply lines.
- Supply system requirements:

Description	Data
Water flow:	25 ml/sec.
Min. back pressure (dynamic):	0.8 bar
Max. pressure (static):	10 bar

Machine

The connector of the supply hose has to be ordered separately according to the local connections at the installation site.

Special conditions to be observed

- Observe safety precautions and local regulations.
- When selecting the supply hoses, only use material that is neutral in taste and compliant with local regulations.
- Check the drinking water quality. A drinking water filter is recommended.
- If machine is provided with a water purifying filter, always observe the data stated by supplier in question.

2.2.2 Prerequisites to electricity supply

Customer's site

Recommended:

- Fault current safety switch and an isolating switch.

Requirements:

- The mains connection must match the machine output (socket), refer to the rating plate of the machine. The machine must be protected individually by means of fuses, value 10A.
- The power supply voltage must be 230 V.
- The connection must be earthed.

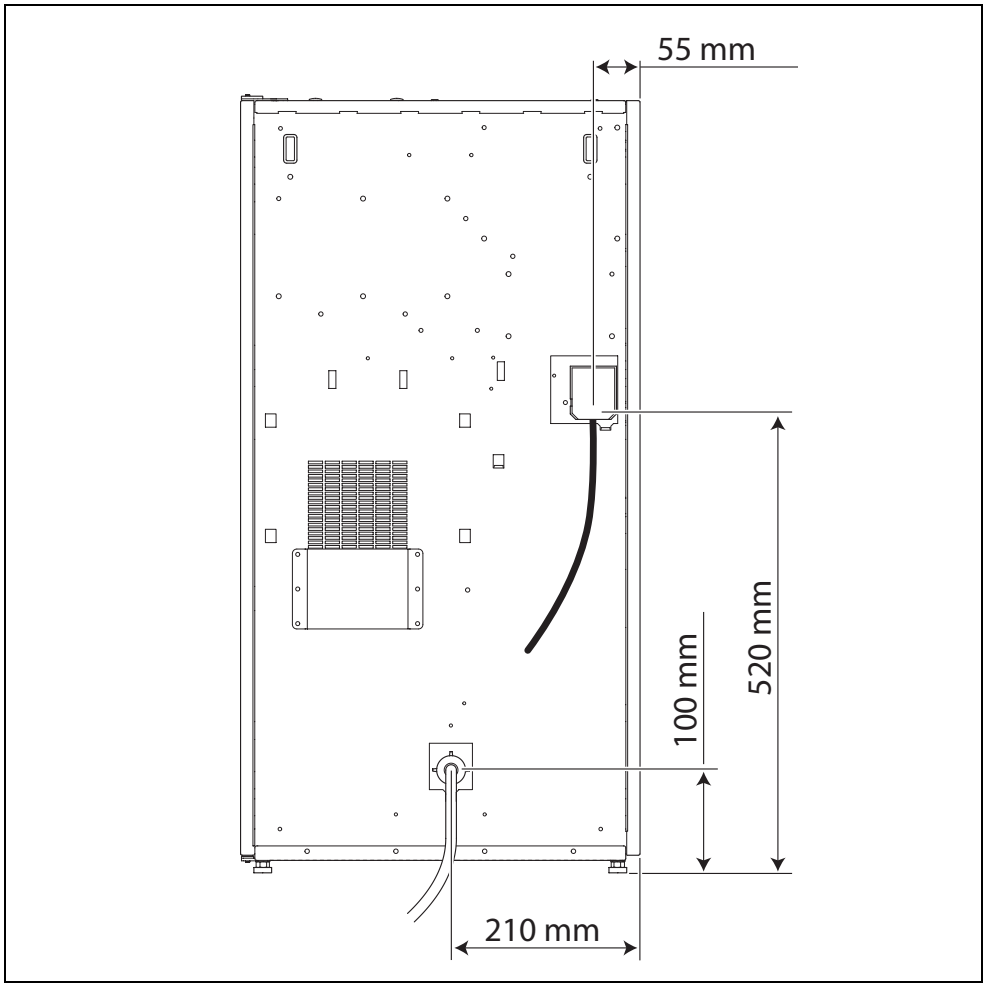
The machine housing will be carrying voltage if no earthed conductor is connected! (mains filter).

Machine

- National plug on power supply cable.
- Length of the power supply cable approx. 3500 mm.

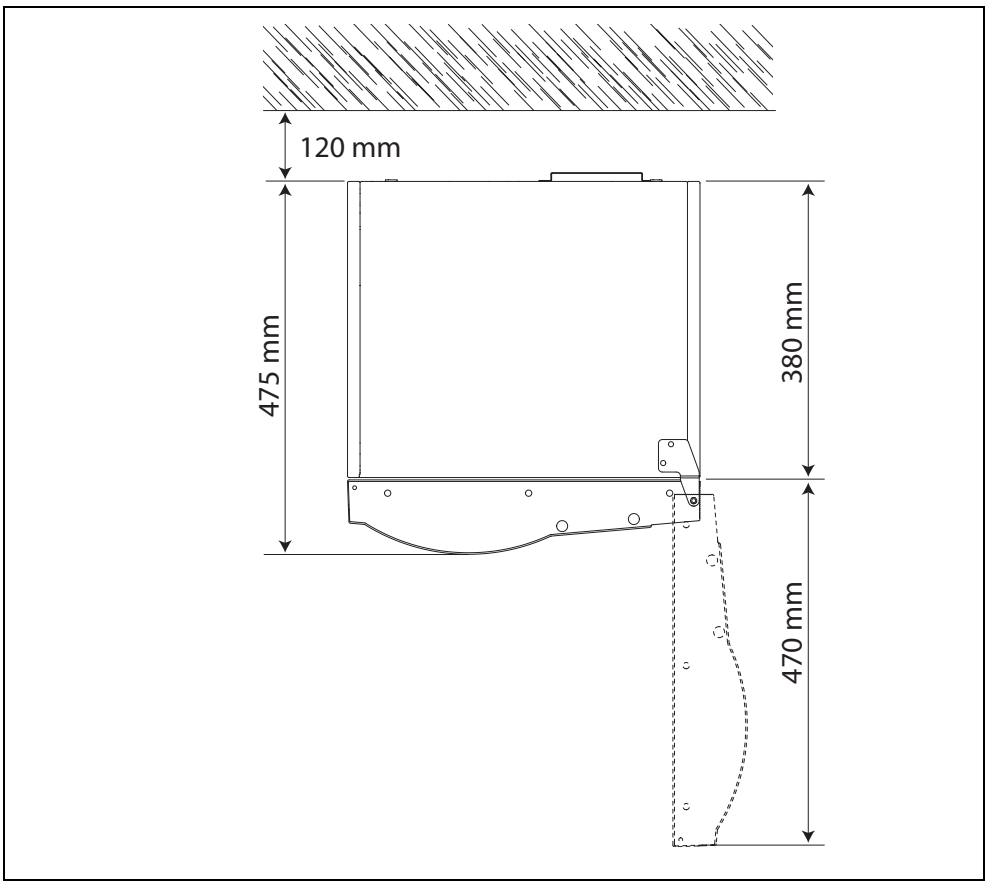
Diagram

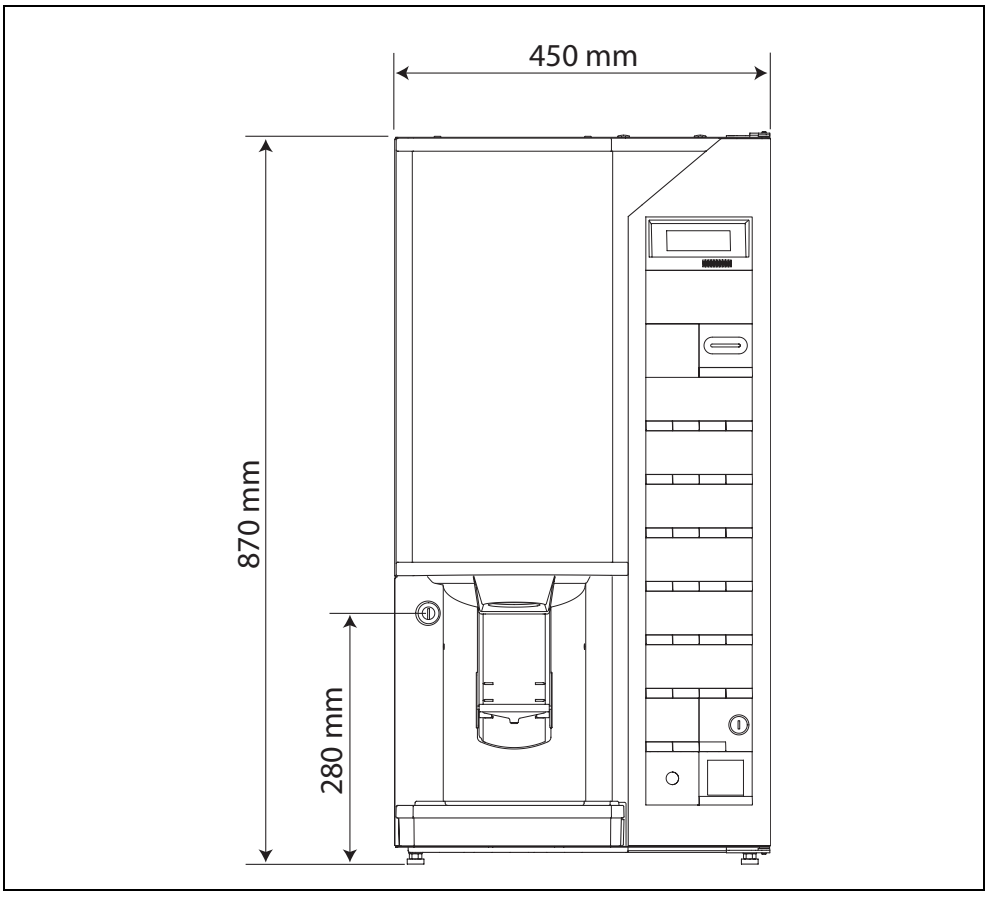
The diagram illustrates the dimensions of the electrical inlet and water inlet to machine in relation to rear side of macine:


55 mm
520 mm
100 mm
210 mm

2.2.3 Physical dimensions of required space

Diagram





2.3 Unpacking

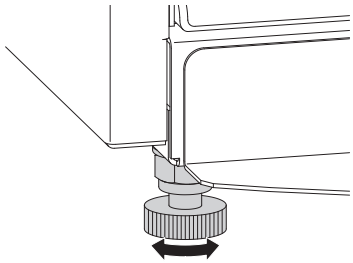
2.3.1 How to unpack the machine

Note

Do not use any sharp utensils in order to avoid scratches on the machine.

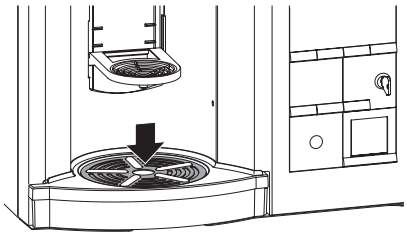
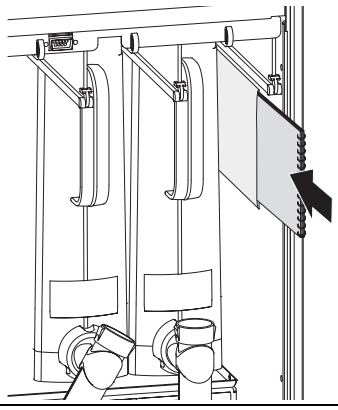
Unpacking

Follow these steps to unpack the machine:

Step	Action	
1.	Ensure that the machine has not been damaged during transportation.	
2.	Remove pallet from machine and position the machine on proper site.	
3.	Level the machine by adjusting the feet. It is essential that the machine is completely level.	
4.	Remove the transport protections located inside the machine.	
5.	Check the list of all items delivered with the machine. *see this section, page 2-9.*	
6.	Position all parts delivered with machine, see Positioning below.	

Positioning parts delivered with macine

Follow these steps to locate the parts delivered with the machine:

Step	Action	
1.	Place the drip tray in door.	
2.	Place the quick reference card and the operator manual in manual holder between ingredient canister and cabinet wall.	

Wall securing brackets

The rear wall of the machine is provided with holes to allow wall securing brackets to be fitted to the machine. The wall securing brackets have to be ordered separately.

2.3.2 List of all items, delivered with the vending machine

List

The items listed with the machine are:
- Bag of cleansing agent, 10 g
- Drip tray
- Yellow service key
- Quick reference card
- Operator manual

Check that all items listed are available and intact.

2.3.3 Disposal of packaging and vending machine at the end of the lifetime.

General note

Disposal of material must always be done in accordance with national, legal, safety, and environmental requirements.

Packing materials used

The packing material for the vending machine consist of
- Cardboard
- Polyethylene
- Wood

2.4 Installation requirements and safety notes

Prerequisite for installation

Before starting the installation:

- Check for adequate space for correct ventilation.
  A distance of 120 mm is required from the rear side of the machine to the wall.
- Check for clear space of 470 mm in front of the machine to allow the door to be fully opened.
- Ensure that the supply voltage corresponds to the voltage indicated on the rating plate which is located on the rear wall of the machine.
- Check the connections and make sure that the national voltages and tolerances are provided.
  The machine must be earthed.
- Ensure that the fuse of the group to which the machine is connected is in accordance with the national regulations.
- If required, ask for detailed information on voltage and tolerance values at the local energy supply companies.

Safety notes on installation

Attention:

- The machine is suitable for indoor use only.

Warnings:

- Check drinking water quality.
- The machine must be connected to the mains in accordance with all official regulations and local regulations laid down by the electricity and water companies. Observe the local regulations.
- Ensure that the supply voltage corresponds to the voltage indicated on the rating plate which is located on the rear wall of the machine.
- The machine must be connected to an earthed electric circuit which is secured by an extra fuse.
- Rinse the machine before putting it into operation.

2.5 Installing the vending machine

Introduction

The installation instructions can be divided into the below topics:

- Connecting machine to mains and putting into operation
- Attaching loose parts
- Adjusting manual price indication
- Adjusting electronic price indication
- Checking valve settings
- Preparing machine for vend

Connecting machine to mains and putting it into operation

Follow these steps to put machine into operation:

Step	Action
1.	Follow the instructions of section “How to unpack the vending machine”.
2.	Connect the water supply and open the water stop valve.
3.	Insert the power supply plug and switch on power.
4.	Open door of machine.
5.	Remove ingredient canisters.
6.	Switch on main switch. - Water should now flow into the boiler.
7.	Check for leakages.

Attaching loose parts

- Attach stickers to the machine.
- Unpack and relocate possible parts located in the waste bucket.

Adjusting manual price indication (Direct selection)

Follow instruction in Chapter 5 Section C, Housing/Cabinet:

- Removing the coin mechanism, *see chap. 5.G.2.2, page 5G-2*
- Removing the coin chute, *see chap. 5.G.2.3, page 5G-3*
- Replacing the selection signs, *see chap. 5.G.2.4, page 5G-4.*

Adjusting electronic price indication

Not yet implemented.

Checking valve settings

When boiler is filled, check valve settings and possibly manufacturer’s settings.

Preparing machine for vend

- Rinse entire dispensing system twice.
- Fill ingredient canisters and insert on proper place.
- Close door and test all drink dispensings.

2.6 Checklist of customer instructions

2.7 Technical specifications (total overview)

Dimensions and Weight

Table of dimensions of machine with or without packing:

Description	Dimensions with packing	Dimensions without packing
Height)	1010 mm	870 mm
Width	670 mm	450 mm
Depth	575 mm	378 mm (Cabinet) 475 mm (Cabinet+door)
Weight	75 kg	64 kg (without ingredients)

Water supply

Connect the vending machine to a cold water supply (potable water).

Type of pressure	Hot machine, only	Hot and cold machine
Min. back pressure (dynamic)	0.8 bar	1.5 bar
Max. pressure (static)	10 bar	8 bar

Power consumption

Machine without cold unit	213W
- Heating element:	2000W
- Power consumption: according to EVA-EMS	124,5Wh/l
- Power consumtion at 24 hours of standby: according to EVA-EMS	2940 Wh

Power Supply

Power supply:	230V AC
Fuses:	
- Line:	10A
- Neutral:	10A
- Transformer, primary	2A
- Transformer, secondary (on VMC)	8A
Frequency:	50 Hz
Outlet valves (solenoid valves)	24V DC
Inlet valve (solenoid valve)	24V DC
Whipper motors	24V DC
Ingredient motors	12V DC

Phases

Single phase+neutral+earth (IEC-standard)

Brown:	Phase
Blue:	Neutral
Yellow/green:	Earth

The machine must be connected to an earthed electric circuit which is secured by an extra fuse. The connection to a supply with an integrated fault current safety switch is recommended. If missing, it is recommended to install a fault current safety switch. The connection must be made using an earthed safety plug socket complying with valid instructions.

Connecting cable

Mains cable:	Approximately 3500 mm

Temperature

Hot water temperature:	95°C-97°C ±1% (203°F-207°F)
Cold water temperature:	max. 25°C (77°F)

Requirements

Table of requirements to installation and environment

Installation	Up to 2000 m above MSL, when using the machine in greater heights it must be changed over by the service.
Environment	The machine may only be used indoors (IP 20).

Storing temperature

-20°C to 36°C (68°F to 97°F)

Ambient temperature

5°C to 36°C (41°F to 97°F).

Boiler

Capacity:	3.5 l

Boil over sensor

Triggering temperature: 80°C (176°F)
(Temperature reestablished: 85°C (185°F)).

Boiler temperature sensor

Adjustable: Recommended value 94°C - 96°C (201°F - 205°F)

Dry boiling protection

Triggering temperature: 120°C (248°F)

Relative humidity

Max. 80% RH (relative humidity) at 36°C (-2/+0) (97°F).

Capacities

Waste containers:

Coffee waste bucket: 6.7 l
Drip tray: 0.6 l

Freshbrew ingredient canisters:

- Standard freshbrew product canister 5.5 l / approximately 2 kg ground coffee

Portions per filling:
at 7 g.: 285 cups
at 10 g: 200 cups

Instant ingredient canisters:

- standard: 2.6 l

Standard machine: 3 x standard size

Cash box: 0,7 litres.
(*Operator cover not included*).

Cup and jug dimensions

Dimensions of cup or jug:

	Cup	Jug
Min. height	60 mm	128 mm
Max. height	140 mm	238 mm
Min. int. diameter	60 mm	60 mm
Max. ext. diameter	80 mm	165 mm
Min. jug hole diameter	-	60 mm

Payment system

The machine is equipped with all electrical prearrangement for systems with
Executive / Protocol A
MDB
BDV
2 price parallel coin mechanism
Coin validator

Beside the coin mechanism housing, suitable space is provided for the installation (optional) of the most widely used payment systems.

Data Communication

RS232 connection
Infrared (option)
Up Key

Data exchange protocols

Industry standard and PC standard protocols

Directives

The machine is marked with the CE label and conforms to the legislative directions of the directives
- 89/336/EEC- Electro magnetic Compatibility
- 73/23/EEC - Low voltage
and further amendments and intergrations.

Approvals

IMQ.

Noise level

Max. 45dB(A) at a distance of one meter in stand by

Lock system

Standard 1 point lock. Euro-lock.

Options and Accessories

Definition:

- Options must be specified upon ordering.
- Accessories are parts that can be ordered separately.

Diagram below shows availabilities

Description	Accessory	Option
Different photographic panels / posters	x	x
Wall mounting kit	x	
Base cabinet, accomodating space for cold unit & water filter. Tray for cups, spoons, etc.	x	x
Water tank: 20 litres in base cabinet (no connection to mains water)	x	
Table to be mounted between table top and base stand	x	
Small cold unit ready and easy to install in cupboard	x	
Hygiene kit	x	
Water filter (Brita, Everpure or Cuno)	x	
Operator cover for coin box	x	
Cabinet colour (RAL)		x
Rielda lock (programmable)	x	x
Quick connection drain kit to external waste bucket		x
Harness for payment system		x
FB creme kit	x	x
Mechanical counter	x	x

Note

Different adjustments for individual customers were not considered.

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3 Event recording and troubleshooting

3.1 Events indicated in the display

Introduction

This section lists in alphabetical order events indicated in the display, explanations to these events and corrective action in cases where this is necessary.

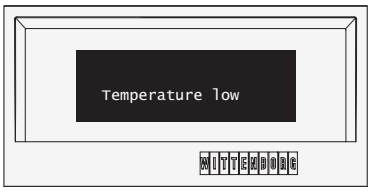
Event indications

Events in the machine are shown in the credit display for as long as they interrupt normal operation of the machine. These may be considered as active events. Subsequently, they are listed in the Event log book found in the Operator menu.

The Event log book registers the date and time of the first and last occurrence of each event and the number of times it has occurred.

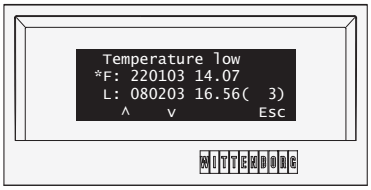
Example: Indication of event in the credit display

Active events are shown in the credit display in the following way:

Message in credit display	Explanation
	This message indicates that the water temperature in the boiler has not reached the required temperature. The message stays in the display for as long as the machine is not operable. If two events are present at the same time, the last occurred event will be shown.

Example: Indication of event in the Event log book

Events are stored in the Event log book and are shown in the display in the following way:

Message in Event log book	Explanation
	F: = First time of occurrence (date+time) L: = Latest occurrence (date+time) (xxx): = number of times of occurrence

3.1.1 Event messages in connection with Diagnostic/Test

Diagnostic/Test messages

Event messages that may appear during the testing of any of the machine's functions are explained in chapter 4 Programming, section 4.3.11 Diagnostic/Test menu, page 4-79 as these messages are closely connected to the testing procedures.

3.1.2 Event messages in event book and credit display

Basetray full

This message indicates that the drip tray is full or that another problem related to the drip tray has caused the machine to stop operating.

Possible cause	Remedy
Drip tray full	Switch machine off, empty drip tray and dry sensors. See *chap. 5C, page 5C-6*
Drip tray sensors soiled	Clean and wipe dry sensors. See *chap. 5C, page 5C-6*
Drip tray sensors defective	Check, replace if necessary. See *chap. 5C, page 5C-4*
Harness for drip tray sensors defective	Check, replace if necessary. See *chap. 5C, page 5C-4*

Door closed (log book only)

The purpose of the "Door closed" message is to record the time and date of door closings. However, the message is also being given when power is returned to the machine.

Door open (log book only)

This message is either a status indication similar to the message above "Door closed" or an indication of a problem with the door.

Possible cause	Remedy
Door not closed properly	Close door properly.
Door switch defective	Check, replace if necessary. *See.chap. 5G, page 5G-11 and 5.chap. 5G, page 5G-12.*
Door harness defective	Check, replace if necessary.

Factory info xxx (log book only)

This message indicates an internal application error which may or may not cause the machine to stop operating.

Possible cause	Remedy
System error	Note! Report error to manufacturer together with error no. (XXX) and CPU program version.

FB assemble error (log book only)

This message indicates that the brewer has not been assembled correctly or that a problem related to the brewer has caused the machine to stop operating.

Possible cause	Remedy
Filter plate or cylinder incorrectly mounted or not mounted at all	Mount filter plate and brewer cylinder correctly. See *chap. 5B, page 5B-7*
Defective harness between FB print and switches	Replace harness. See *chap. 5K, page 5K-10*
Micro switches maladjusted or worn	Adjust or replace switches. See *chap. 5B, page 5B-24*

FB error (log book only)

This message indicates a blockage of the brewer causing the machine to stop operating. The message “Out of service” appears in credit display.

Possible cause	Remedy
Foreign body stuck between piston and filter plate	Remove foreign body from brewer. See *chap. 5B, page 5B-7*
Harness for brewer defective or disconnected	Check, replace if necessary. See *chap. 5B, page 5B-19*
FB print defective	Check, replace if necessary. See *chap. 5K, page 5K-10*

FB filter plate (log book only)

This message indicates a problem with the brewer causing the machine to stop operating. The message “Out of service” appears in credit display

Possible cause	Remedy
Filter plate blocked up.	Clean / Descale filter. See *chap. 5B, page 5B-27*
Defective brewer motor	Check brewer motor, replace if necessary. See *chap. 5B, page 5B-19*

FB Ing motor t.out (log book only)

This message indicates that the brewer ingredient motor is not running correctly. The message “Out of service” appears in credit display.

Possible cause	Remedy
Calibration error	Check calibration of ingredients. See *chap. 4, page 4-64*
Hardware error on FB print	Check, replace if necessary. See *chap. 5K, page 5K-10*

FB motor error (log book only)

This message indicates a brewer motor error causing the machine to stop operating. The message “Out of service” appears in the credit display

Possible cause	Remedy
Defective brewer motor	Check brewer motor and brewer connections. Adjust, repair or replace defective part if necessary. See *chap. 5B, page 5B-4*
Defective harness between FB print and switches	
Defective harness for brewer motor	
Defective FB print	Check, replace if necessary. See *chap. 5K, page 5K-10*

FB short circuit (log book only)

This message indicates a brewer motor error related to the FB print. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective brewer motor	Check motor. See *chap. 5B, page 5B-19*
Defective FB print	Check, replace print if necessary. See *chap. 5K, page 5K-10*

FB unexp. current (log book only)

This message indicates an unexpected current from brewer causing the machine to stop operation. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective FB print	Check print, replace if necessary. See *chap. 5K, page 5K-10*

FB unexpected tacho (log book only)

This message indicates an unexpected motion of the brewer motor or ingredient motor. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective FB print	Check print, replace if necessary. See *chap. 5K, page 5K-10*

IngMotor xx error (log book only)

This message indicates an error related to one of the instant ingredient motors causing the machine to stop operating. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective instant ingredient motor	Check motor, replace if necessary. See *chap. 5C, page 5C-8*
Defective VMC	Check VMC, replace if necessary. See *chap. 5K, page 5K-12*
Defective harness	Check harness, replace if necessary.

IngMotor xx overload (log book only)

This message indicates an overload of one of the instant ingredient motors causing the machine to stop operating. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Moist ingredient powder blocking motor	Check ingredient motor. See *chap. 5C, page 5C-8*
Instant ingredient canister not properly positioned	Reposition canister.
Outlet spout of instant ingredient canister closed	Open outlet spout of canister.
Outlet spout of instant ingredient canister blocked up	Clean Instant ingredient canister and outlet spout. See *Operator manual*

No payment comm.

This message appears if a coin mechanism has been selected in the menu system, (4.3.8.2 Set payment type) but the connection between the coin mechanism and the machine is missing.

Possible cause	Remedy
The coin mechanism has not been connected to the machine	Connect the coin mechanism cable to the coin mechanism switch inside the machine door. See *chap. 5P, page 5P-3*

Possible cause	Remedy
Defective harness for coin mechanism	Check cable, replace if necessary. See *chap. 5P, page 5P-3*
Defective SPC	Check, replace if necessary. See *chap. 5K, page 5K-13*

Out of service

This message appears in the credit display if the credit display if the machine is temporarily unable to operate due to a technical or a mechanical problem.

The cause of the error will be registered in the Event log book, e.g. as “FB motor error”. This and other possible error messages can be found in this alphabetical error list.

SPC short circuit (log book only)

This message indicates a short circuit of the SPC print causing the machine to stop operating. The message “Out of service” appears in credit display.

Possible cause	Remedy
Defective SPC	Check, replace if necessary. See *chap. 5K, page 5K-13*

Temperature low

This message indicates that the machine is not able to deliver hot drinks due to the water temperature being too low.

Possible cause	Remedy
The machine has been turned on recently	Wait until the water is heated sufficiently (maximum 13 minutes). The display is automatically cleared when the water in the boiler reaches the correct temperature.
Heating element defective	Check the heating element, replace if necessary. See *chap. 5A, page 5A-10*
Harness for heating element defective	Check harness, replace if necessary. See *chap. 5A, page 5A-10*
Temperature sensor or harness for temperature sensor defective	Check sensor and harness, replace if necessary. *See.chap. 5A, page 5A-7*
Dry boiling thermostat has triggered	Press the reset button. See *chap. 5A, page 5A-11.* If the heating element is not heating again or dry boiling thermostat triggers repeatedly, check for other types of errors or check temperature setting. See *chap. 4, page 4-65*

VMC short circuit (log book only)

This message indicates a short circuit causing the machine to stop operating. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Short circuit in Harness.	Check harness, replace if necessary.
Defective motor for instant ingredients, whipper or pump	Check motors, replace if necessary. See • *chap. 5C, page 5C-8, (instant ingredient motor)* • *chap. 5C, page 5C-6, (whipper motor)* *or* • *chap. 5A, page 5A-6, (pump)*
Defective VMC	Check, replace if necessary. See *chap. 5K, page 5K-12*

Water level low

This message appears if the boiler has not filled within three minutes after the machine has been switched on.

Switch the machine off, open the water tap, check water connection and hoses. If the error remains, investigate the possibilities in the table below.

Possible cause	Remedy
Inlet valve defective or blocked by limescale build-up	Check, descale or replace if necessary. See *chap. 5A, page 5A-12*
Blocked water filter	Remove impurities and clean, replace filter if necessary.
Water supply connection blocked	Remove impurities.

Water pump error (log book only)

This message indicates an error in the water pump causing the machine to stop operating. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective pump	Check motor, replace if necessary. See.*chap. 5A, page 5A-6*
Defective VMC	Check VMC, replace if necessary. See *chap. 5K, page 5K-12*
Defective harness	Check harness, replace if necessary.

Water pump overload (log book only)

This message indicates an overload of the water pump causing the machine to stop operating. The message “Out of service” appears in credit display.

Possible cause	Remedy
Limescale build-up blocking pump	Descale pump. See *chap. 5A, page 5A-6*

Possible cause	Remedy
Foreign body blocking pump	Disassemble water system, remove foreign body. See *chap. 5A, page 5A-6*

Water tank overboil

This message indicates that the water temperature has reached boiling point, causing the machine to stop operating.

Possible cause	Remedy
Overboil thermostat has triggered	Press the reset button. See *chap. 5A, page 5A-8*
Overboil thermostat is defective	Check the overboil thermostat, replace if necessary. See *chap. 5A, page 5A-8*
Harness for overboil thermostat is defective	Check, replace if necessary. See *chap. 5A, page 5A-8*
Temperature sensor is defective	Check, replace if necessary. See *chap. 5A, page 5A-7*
Harness for temperature sensor is defective	Check, replace if necessary. See *chap. 5A, page 5A-7*

Whipper xx error (log book only)

This message indicates a problem with one of the whipper motors causing the machine to stop operating. The message “Out of service” appears in the credit display.

Possible cause	Remedy
Defective whipper motor	Check motor, replace if necessary. See *chap. 5C, page 5C-6*
Defective VMC	Check VMC, replace if necessary. See *chap. 5K, page 5K-12*
Defective harness	Check harness, replace if necessary.

Whipper xx overload (logbook only)

This message indicates an overload of one of the whippers causing the machine to stop operating. The message “Out of service” appears in credit display.

Possible cause	Remedy
Instant ingredient system blocked up	Clean Instant ingredient system (whipper, mixing funnel, powder trap). See *Operator manual*
Foreign body blocking instant ingredient system	Remove foreign body.

3.2 Errors not shown in display

Introduction

This section describes errors that are *not* indicated in the credit display and Event log book, and suggestions for remedy.

Machine is out of function no display

Possible cause	Remedy
Power supply interrupted	Check the power supply.
Main switch defective	Check the main switch, replace if necessary.
Power supply cable defective	Check, replace if necessary. See *chap. 5K, page 5K-2*
Plug contact fault	Check contacts, replace if necessary.
Fuse defective	Check the power supply, replace the fuse if necessary. See *chap. 5K, page 5K-4*

No drinks delivered

Possible cause	Remedy
Harness or sensor for water level control blocked by limescale build-up or incorrectly mounted	Check, descale or replace if necessary. See *chap. 5A, page 5A-9*
Water in hose between bottom of boiler and overflow thermostat	Empty hose into waste bucket.

Water system overflows

Note: It is important that the possible causes be checked in the order listed in the table.

Open the machine, leave the power supply on and the water tap open.
Remove cover for water system (*see chap. 5A, page 5A-2)* and check for the following types of errors:

Possible cause	Remedy
Inlet valve defective	Check valve by removing one of the terminals from the inlet valve. • If the problem persists, replace the inlet valve. See *chap. 5A, page 5A-12* • If the water stops running, the valve is ok.
Harness or sensor for water level control blocked by limescale build-up or incorrectly mounted	Check, descale or replace if necessary. See *chap. 5A, page 5A-9*

Possible cause	Remedy
Short-circuit on print board	Using a voltmeter, measure voltage across inlet valve terminal. • A constant voltage (of 24 V DC) indicates a controller fault. • Change the VMC. See *chap. 5K, page 5K-12*

Coins stuck

Possible cause	Remedy
Coin may be stuck in the coin mechanism	Press the coin return button.
Coin track dirty or greasy	Open coin rejector and clean coin track. *See manual for coin mechanism*
Foreign body stuck in coin track	Open coin rejector and remove foreign body. *See manual for coin mechanism*

Drinks are too cold

Possible cause	Remedy
Wrong temperature setting	Readjust temperature setting either via the Technician menu, *(*see *chap. 4, page 4-65)* or from a pc.

The water quantity delivered is too low or irregular

Possible cause	Remedy
Boiler blocked by limescale build-up or defective	Check boiler and descale if required or replace. See *chap. 5A, page 5A-4*
Water supply lines are blocked	Check the water supply lines and clean them if required.
Water valves are incorrectly calibrated	Calibrate the water valves either via the Technician menu (see *chap. 4, page 4-64*) or from a pc.

No water is dispensed

Possible cause	Remedy
Water supply lines are blocked	Check the water supply lines and clean them if required.

Only water is dispensed

Possible cause	Remedy
Canister is empty	Refill.

Possible cause	Remedy
Canister dislocated	Relocate canister.
Blocked up mixing funnels	Check, and clean if necessary.

Quantity of drink is inadequate

Possible cause	Remedy
Ingredient residue blocking funnel/ whipper housing/delivery tube	Clean/replace blocked component(s).
Dispensing hose has a kink	Check hoses. Install hose of correct length.

Delivered coffee is not whipped

Possible cause	Remedy
Mixing unit dirty	Clean the mixing unit.
Whipper motor defective	Check the motor and replace if necessary. See *chap. 5C, page 5C-6.*

Flavour of drink unsatisfactory

Possible cause	Remedy
Wrong ingredients	Use correct ingredients, i.e. correct whitener for coffee and tea.
Dispensing system dirty	Clean/replace components.
Expiry date overdue	Replace ingredients.

Ingredients are moist and become lumpy in canisters

Possible cause	Remedy
Steam rising from mixing funnel	Working from outside, remove dust from the grille at rear of machine or from inside remove dust from fan. See *chap. 5G, page 5G-1*
Powder traps or suction hoses blocked	Check powder traps and their suction hoses. Clean if necessary.

Mixing system overflows

Possible cause	Remedy
Mixing unit blocked	• Clean or replace blocked part or parts. Check if they are positioned correctly. • Check powder traps and corresponding extraction tubes.

Leak in mixing system

Possible cause	Remedy
Funnel/Whipper housing not correctly connected	Reinstall and reconnect components.
Seal for whipper housing leaking or not installed	Replace seal.

Machine does not block when bucket is full

Possible cause	Remedy
Foreign body clogging sensors for buckets	Clean sensors.
Sensors not in bucket	Reposition sensor (sensor must be in bucket).
Sensor defective	Replace sensor.

Liquid escaping from vending machine

Possible cause	Remedy
Bucket/canister/whipper housing/mixing funnels/delivery hoses not correctly inserted	Install component or components correctly.

Table of contents

4 Programming

Software version

This chapter describes the FB 7100 menu system, software release 6.0.

4.1 Menu navigation

Introduction

In this section the menu system and the way to find your way through it is introduced.

The following topics are covered:
- Presentation of the navigation buttons and the display, see below.
- Description of the various functions of the four navigation buttons in the menu system, see page 4-4.

4.1.1 Navigation buttons and display

Navigation buttons

When the machine is in Menu selection mode, the four pre-selection buttons in the top row of the selection panel are used for retrieval of data and for settings, (see illustration below).

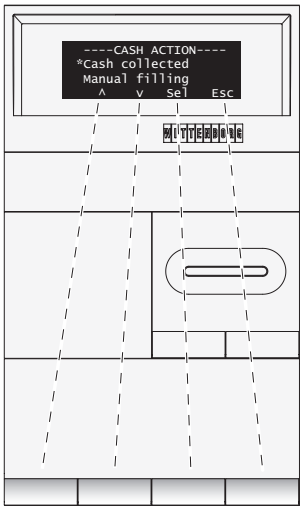
Display

The display shows the current menu in the first line, and lists the available sub-menus below.

The bottom line indicates the functions of the four navigation buttons, e.g., '^' 'V' 'Sel' 'Esc'. The functions of the buttons depend on which action is needed.

A selection marker '*' in front of a menu or sub menu shows which menu item will be selected when 'Sel' is pressed.

Illustration



The display shows the current functions of the navigation buttons.

4.1.2 Button functions

Introduction

The two tables below show the functions of the navigation buttons. The functions vary according to which part of the menu system you are in and which options are at hand.

The bottom line of the display always indicates the current functions of the keys.

Table 1

This table describes how the four pre-selection buttons are used for navigation in the menu system.

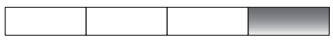
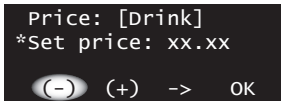
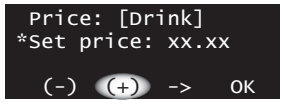
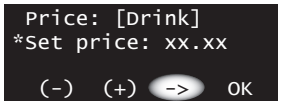
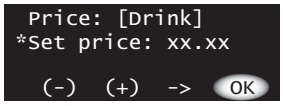
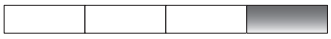
Display	Button	Function
----SALES AUDIT---- *Total number Total turnover ^ v Sel Esc		'Up' button. The button is used to move from one menu item to the one above within a menu (e.g. from "Total turnover" to "Total number" in the Sales audit menu.)
----SALES AUDIT---- *Total number Total turnover ^ v Sel Esc		'Down' button. The button is used to move from one menu item to the one below within a menu (e.g. from "Total number" to "Total turnover" in the Sales audit menu.)
----SALES AUDIT---- *Total number Total turnover ^ v Sel Esc		'Select' button. With this button you select the menu item indicated by the selection marker *, i.e. you either move one level further into the menu system or activate a function.
----SALES AUDIT---- *Total number Total turnover ^ v Sel Esc		'Esc' button. The button is used to move back one level in the menu system, i.e. opposite of the 'Select' button.

Table 2

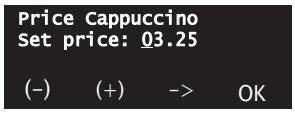
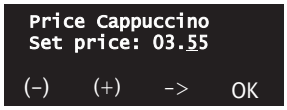
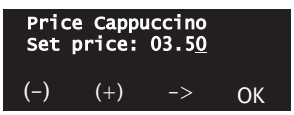
This table describes how the buttons are used to enter or change numbers, e.g., price or quantity settings.

Display	Button	Function
		'Minus' button. The button is used to decrease a numeric value in increments of one.
		'Plus' button. The button is used to increase a numeric value in increments of one.
		'Next' button The button is used to continue to the next letter or digit, e.g., in price setting menus.
		'OK' button Pressing the button will save changes to settings in the system.

Example

This table illustrates how you change a price setting in the machine.

Example: Change price of a drink from 3.25 to 3.50.

Step	Action	Display
1.	Navigate to "Price per drink" in the Basic operations menu and press 'Sel'. Press 'v' one or more times to find the name of the drink, and press 'Sel'.	
2.	Press '->' twice to move the cursor to the digit 2. Press '(+)' three times. The display now reads 3.55	
3.	Press '->' once to move to the next digit. Press '(-)' five times to decrease the number by 5. The display now reads 3.50.	

Step	Action	Display
4.	Press 'OK' to save the new price in the system	

4.1.3 Short cuts

Introduction

Some functions of the menu system can be reached quickly through short cuts.

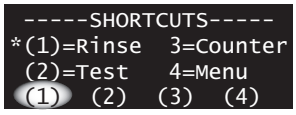
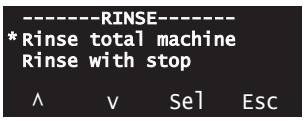
Using a short cut

Press one of the buttons 1 to 4 to enter a function via a short cut. The following functions can be reached:

- Rinse functions, see *4.2.5, Filling / Clean, on page 4-25.*
- Test functions, see *4.2.11, Test menu, on page 4-46*.
- Counters, see *4.2.6, Counters menu, on page 4-26*
- Menu: jumps to the top of the menu system, see *4.2.4, Operator menu flow, on page 4-9.*

Example

This table shows how the Rinse functions are reached via the short cut menu.

Step	Action	Display
1.	Unlock and open the door. The display will show the short cut selection window.	
2.	Press "1"  and close the door to go directly to the Rinse menu. From here you can select one of the available rinse functions.	

WITTENBORG

4.2 Operator menu

4.2.1 Purpose of the Operator menu

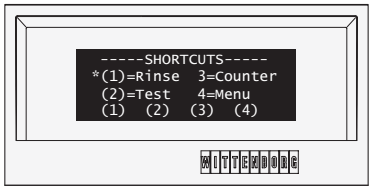
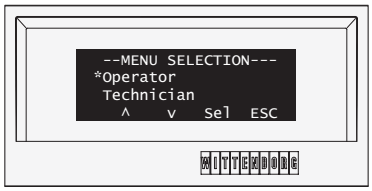
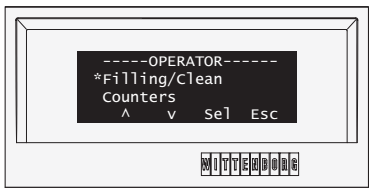
Purpose

The Operator menu is intended for persons with a daily responsibility for the running and maintenance of the machine e.g., cleaning, setting up prices, managing sales turnover and performing light adjustments to ensure a faultless operation.

4.2.2 How to access the Operator menu

Accessing the Operator menu

Follow the steps below to access the Operator menu.

Step	Action	Display
1.	Unlock and open the door. The display now shows a short cut selection window.	
2.	Press ‘4’ (Menu) to proceed to the “MENU SELECTION” window. The selection marker ‘*’, by default, is placed next to "Operator". 1	
3.	Press ‘Sel’ to enter the Operator menu.	

1. Applies to the default setting. Local settings may bring the user to a different starting position in the menu system.

Returning to vend mode

1 Close the door.
2 Press ‘Esc’ once. Wait for a maximum of 20 seconds till the machine is back in vend mode.

4.2.3 Sub menus of the Operator menu

Presentation

This table gives a short presentation of the main contents of the Operator menu.

The Operator menu can be accessed by all users.

Menu	Purpose
Filling / Clean	Assists in filling or rinsing the machine.
Counters	Displays recorded data regarding • the number of drinks dispensed • turnover • cash balance and enables resetting and printing of those counters.
Cash action	Assists in emptying and refilling coin tubes.
Basic Operations	Assists in price and quantity settings for the individual drinks.
Service Information	Contains error reports and machine data.
Machine settings	Allows for setting the machine according to individual preferences.
Test	Allows for dispensing of drinks for test without affecting sales counters.

4.2.4 Operator menu flow

This diagram displays the full flow of the Operator menu.

- Operator
  - Filling/Clean
    - Rinse
      - Rinse Total Machine
      - Rinse With Stop FB1
  - Counters
    - Sales Audit
      - Total number, nres
      - Total turnover,nres
      - Total number, res
      - Total turnover,res
      - No. per drink, nres
      - No. per drink, res
      - Turn. p. drink,nres
      - Turn. p. drink,res
      - No. per group, nres
      - No. per group, res
      - Turn. p. group,nres
      - Turn. p. group,res
    - Cash Audit
      - Money to tubes
      - Money to cash box
      - Collected money
      - Manually filled
      - Manually delivered
      - Value overpay
      - Dispensed change
    - Cashless Audit
      - Revalued amount
    - Free vend audit
      - Total no. ,nres
      - Total no. ,res
      - No. per drink, nres
      - No. per drink, res
      - No. per group, nres
      - No. per group, res
    - MB. discount audit
      - MB. number, nres
      - MB. turnover, nres
      - MB. number, res
      - MB. turnover, res
    - Discount key audit
      - D.Key number ,nres
      - D.Key turnov. ,nres
      - D.Key number ,res
      - D.Key turnov. ,res

- Step prices audit
  - SP. turnover ,nres
  - SP. turnover ,res
- Test Audit
  - Test no. ,nres
  - Test no. ,res
  - No. per group, nres
  - No. per group, res
- Reset Counters
  - Reset sales audit
  - Reset cash audit
  - Reset Test audit
- Printing
  - Not Resetable
  - Resetable

Cash action

- Cash collected
- Dispense coins
- Manual filling

Basic operations

- Change prices
  - Global price
  - Price per drink
  - Step prices
    - Step price on/off
    - Set Step price(s)
    - Global stepprice(+)
    - Global stepprice(-)
- Change quantities
- Drink On/Off
- Change group

Service information

- Event log book
- Reset log book
- Program versions
- Show menufile ver.

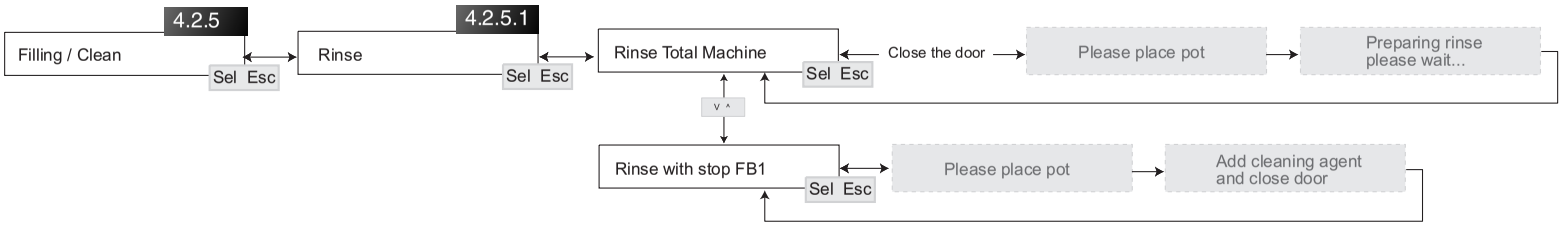
Machine settings

- Set Freevend,global
- Set Beep mode
- Clock on display
- Temp. on display
- Set date and time
- Key discount
- Machine Info
  - Machine Code
  - Operator Code
  - Show Install. Date
  - Set Install. Date
- Energy saving
  - Save Energy On/Off
  - Set Day(s)
  - Set Time
  - Set Temperature
  - Set Doorlight

	Set counters on/off
	Selfcheck setting
Test	
	Complete selections

The following pages contain the individual sub menus of the Operator menu. For further information about the menus, please refer to sections indicated by numbers in black boxes.

Filling / Clean menu

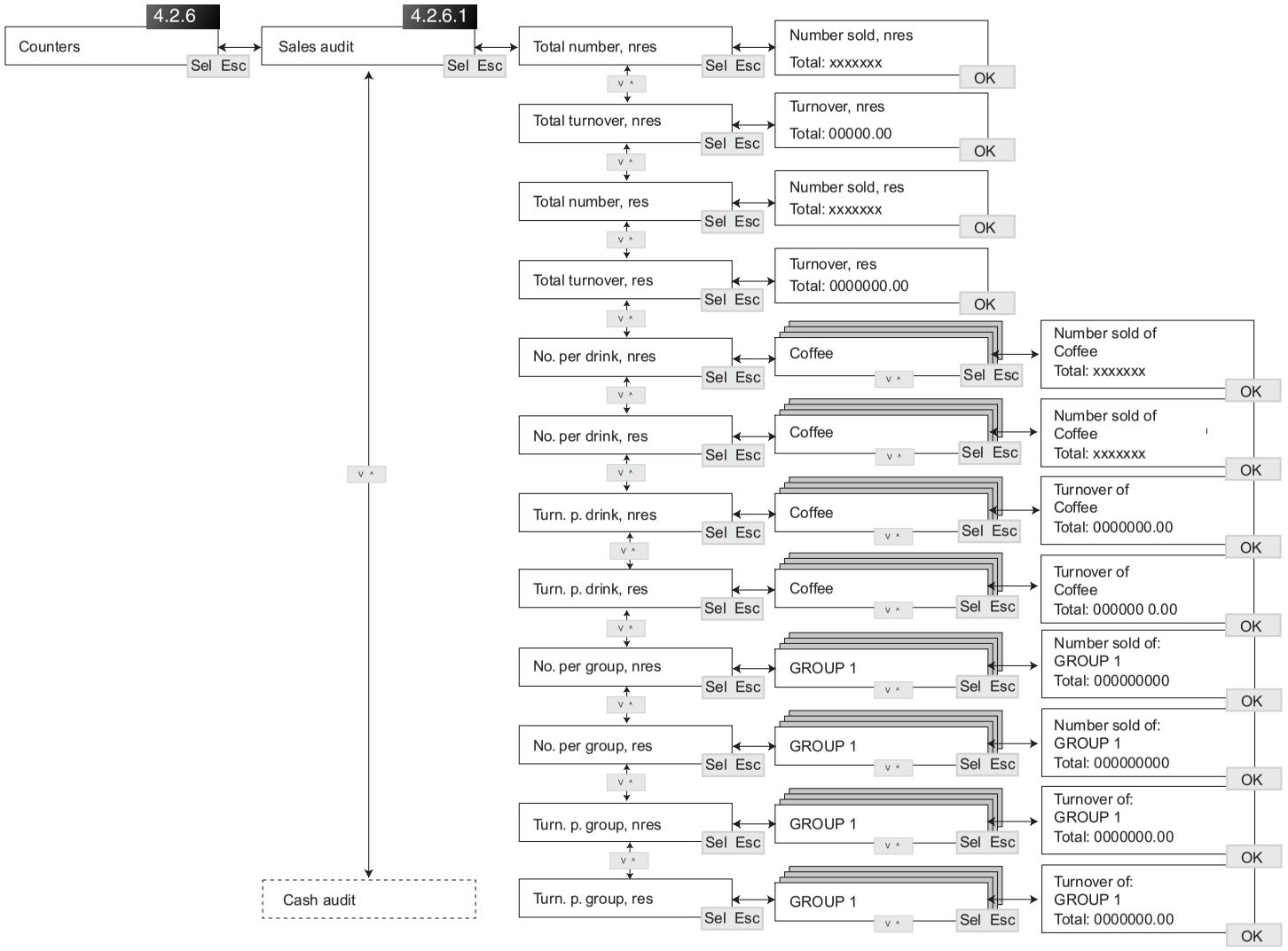


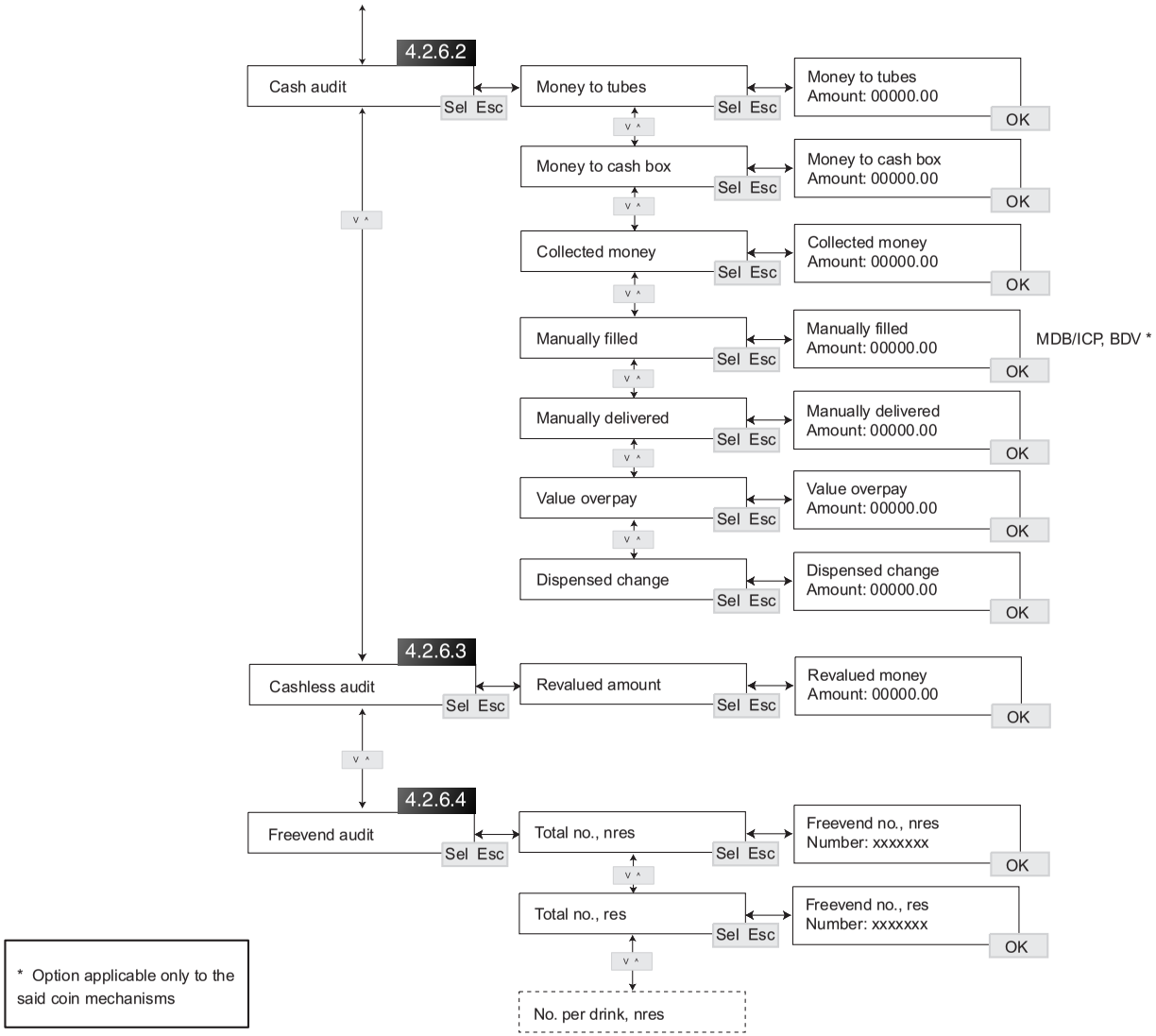
Short cuts for pc users

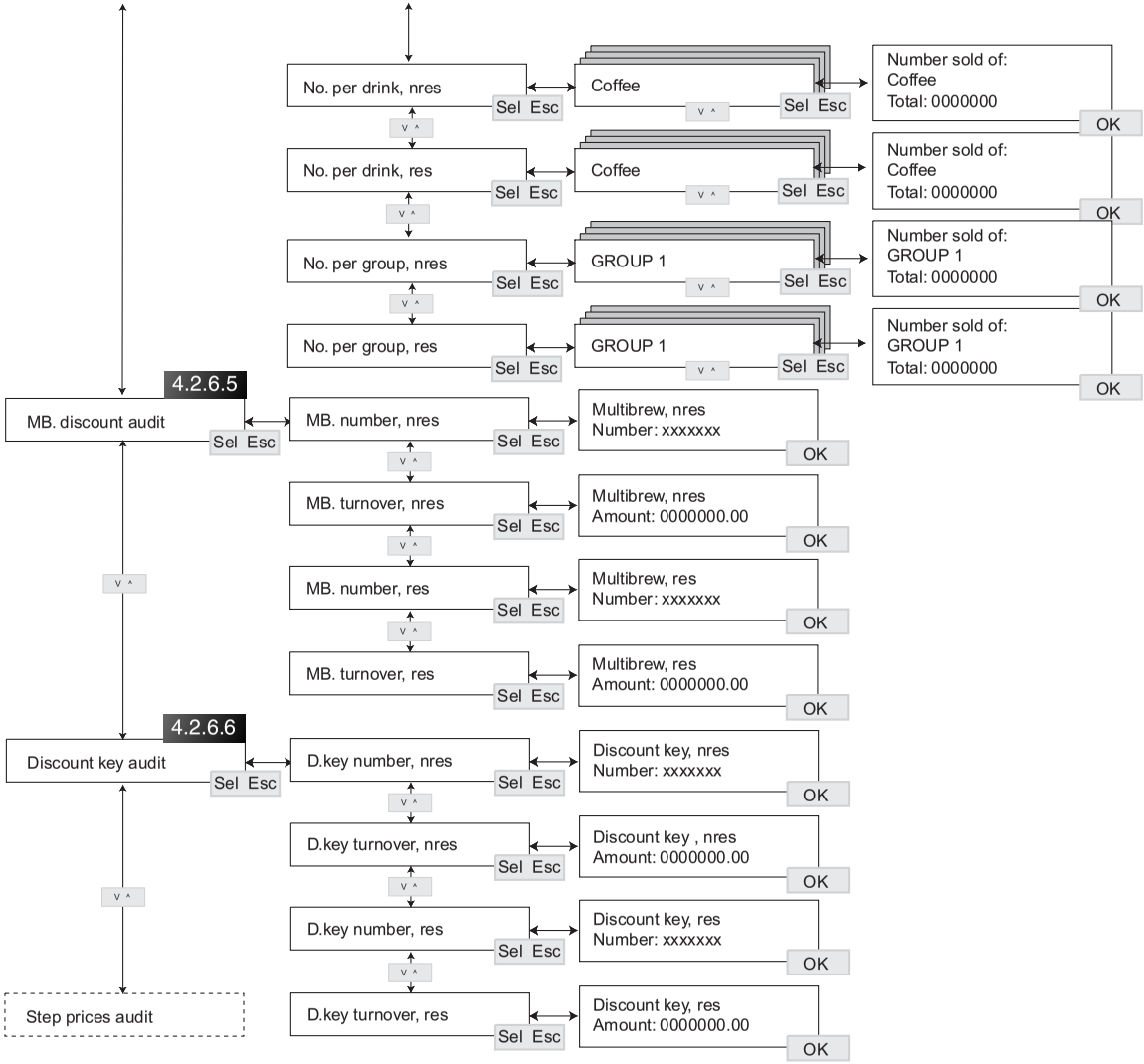
If you are viewing this manual on a computer screen, simply place your cursor on any of the numbers in black boxes and click to go directly to the section that describes the menu in question.

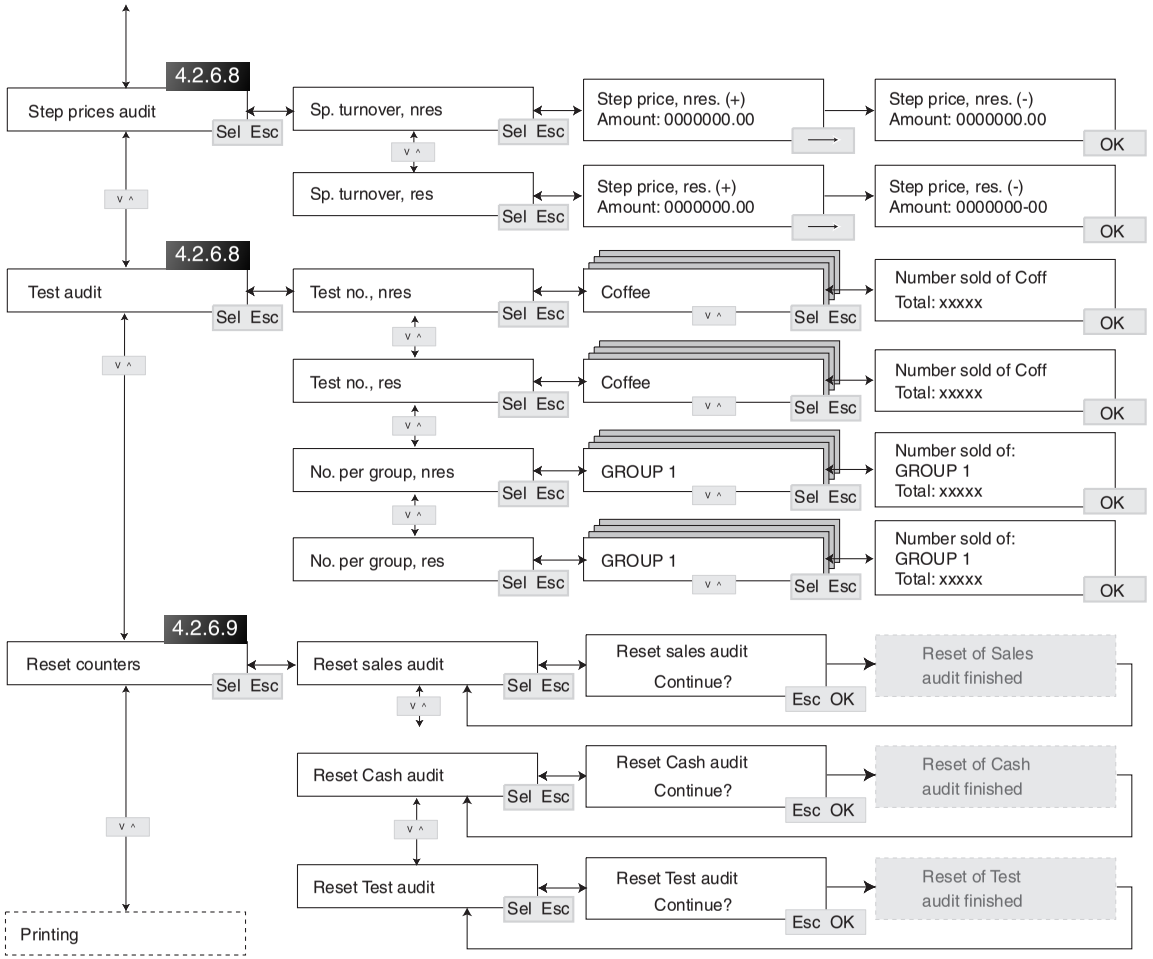
To go back, rightclick and select “Go to previous view”.

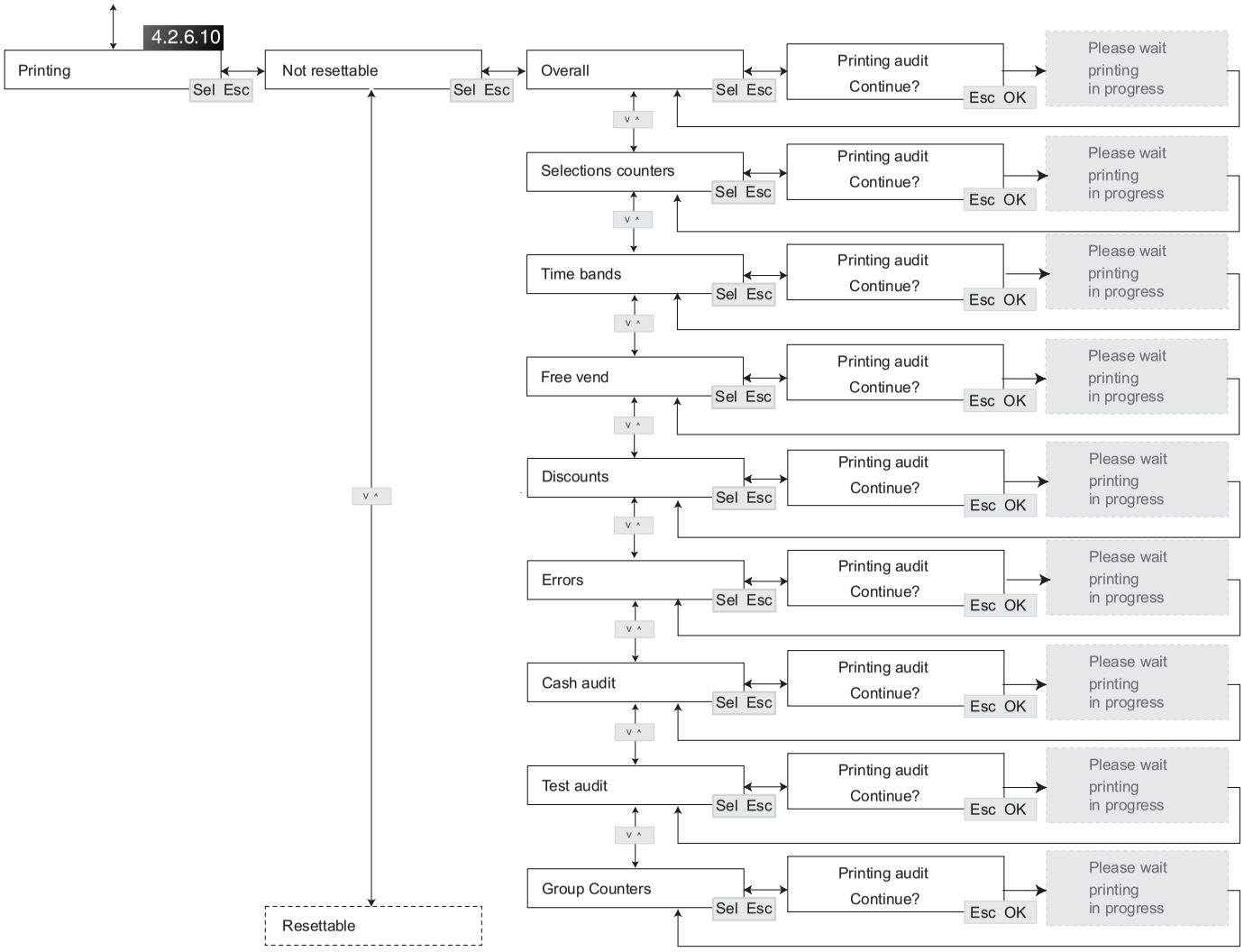
Counters menu

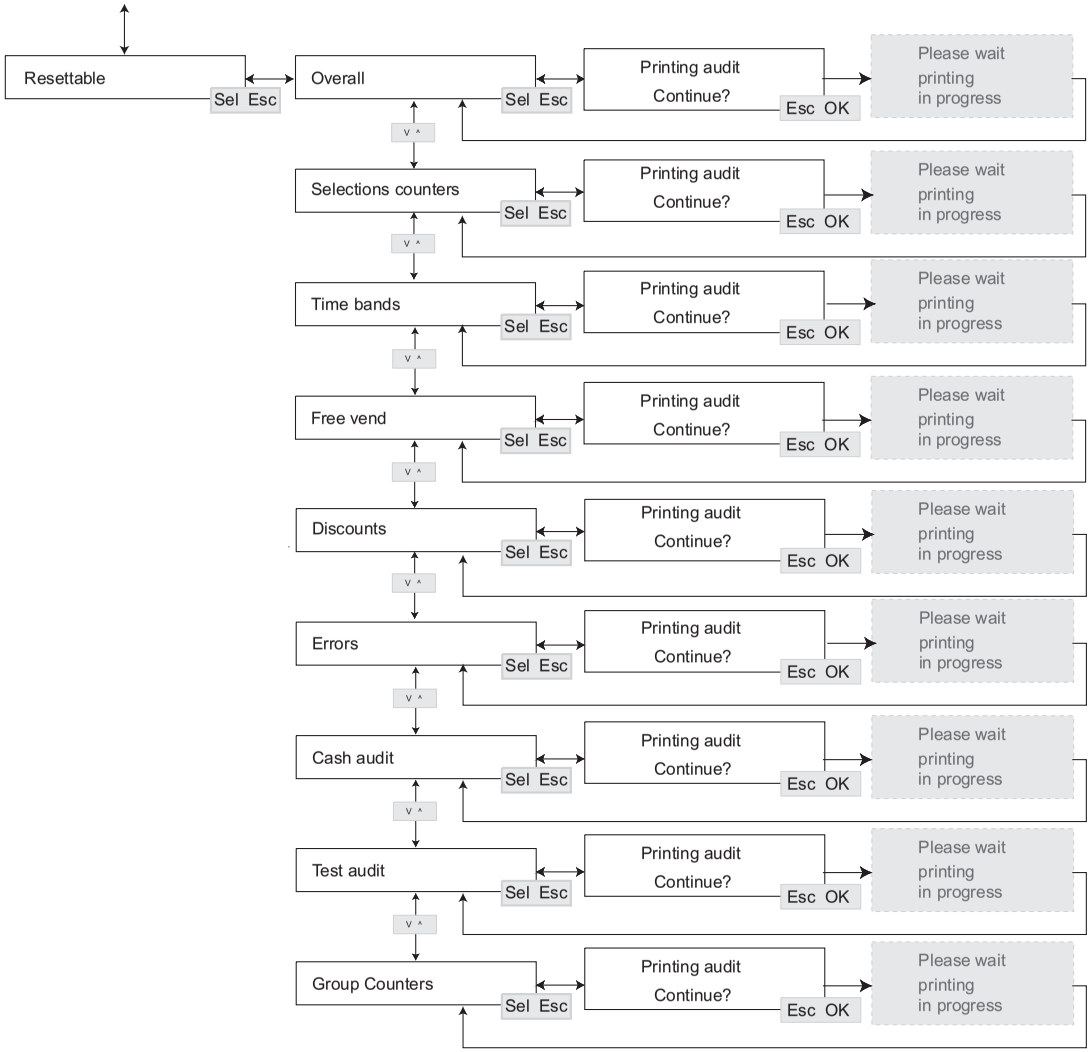



4.2.6.2
Cash audit
Sel Esc
Money to tubes
Sel Esc
Money to tubes
Amount: 00000.00
OK
Money to cash box
Money to cash box
Amount: 00000.00
Collected money
Collected money
Amount: 00000.00
Manually filled
Manually filled
Amount: 00000.00
MDB/ICP, BDV *
Manually delivered
Manually delivered
Amount: 00000.00
Value overpay
Value overpay
Amount: 00000.00
Dispensed change
Dispensed change
Amount: 00000.00
4.2.6.3
Cashless audit
Revalued amount
Revalued money
Amount: 00000.00
4.2.6.4
Freevend audit
Total no., nres
Freevend no., nres
Number: xxxxxxx
Total no., res
Freevend no., res
Number: xxxxxxx
No. per drink, nres
* Option applicable only to the said coin mechanisms

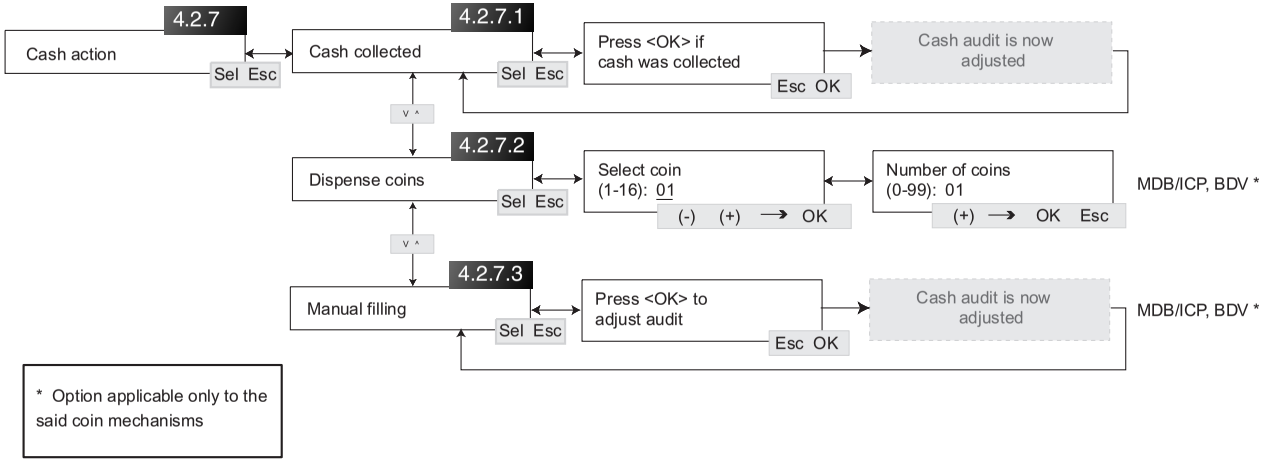

No. per drink, nres
Sel Esc
Coffee
Sel Esc
Number sold of:
Coffee
Total: 0000000
OK
No. per drink, res
Coffee
Number sold of:
Coffee
Total: 0000000
OK
No. per group, nres
GROUP 1
Number sold of:
GROUP 1
Total: 0000000
OK
No. per group, res
GROUP 1
Number sold of:
GROUP 1
Total: 0000000
OK
4.2.6.5
MB. discount audit
MB. number, nres
Multibrew, nres
Number: xxxxxxx
MB. turnover, nres
Multibrew, nres
Amount: 0000000.00
MB. number, res
Multibrew, res
Number: xxxxxxx
MB. turnover, res
Multibrew, res
Amount: 0000000.00
4.2.6.6
Discount key audit
D.key number, nres
Discount key, nres
Number: xxxxxxx
D.key turnover, nres
Discount key , nres
Amount: 0000000.00
D.key number, res
Discount key, res
Number: xxxxxxx
Step prices audit
D.key turnover, res
Discount key, res
Amount: 0000000.00


4.2.6.8
Step prices audit
Sel Esc
Sp. turnover, nres
Sel Esc
Step price, nres. (+)
Amount: 0000000.00
Step price, nres. (-)
Amount: 0000000.00
OK
Sp. turnover, res
Sel Esc
Step price, res. (+)
Amount: 0000000.00
Step price, res. (-)
Amount: 0000000-00
OK
4.2.6.8
Test audit
Sel Esc
Test no., nres
Sel Esc
Coffee
Sel Esc
Number sold of Coff
Total: xxxxx
OK
Test no., res
Sel Esc
Coffee
Sel Esc
Number sold of Coff
Total: xxxxx
OK
No. per group, nres
Sel Esc
GROUP 1
Sel Esc
Number sold of:
GROUP 1
Total: xxxxx
OK
No. per group, res
Sel Esc
GROUP 1
Sel Esc
Number sold of:
GROUP 1
Total: xxxxx
OK
4.2.6.9
Reset counters
Sel Esc
Reset sales audit
Sel Esc
Reset sales audit
Continue?
Esc OK
Reset of Sales
audit finished
Reset Cash audit
Sel Esc
Reset Cash audit
Continue?
Esc OK
Reset of Cash
audit finished
Reset Test audit
Sel Esc
Reset Test audit
Continue?
Esc OK
Reset of Test
audit finished
Printing

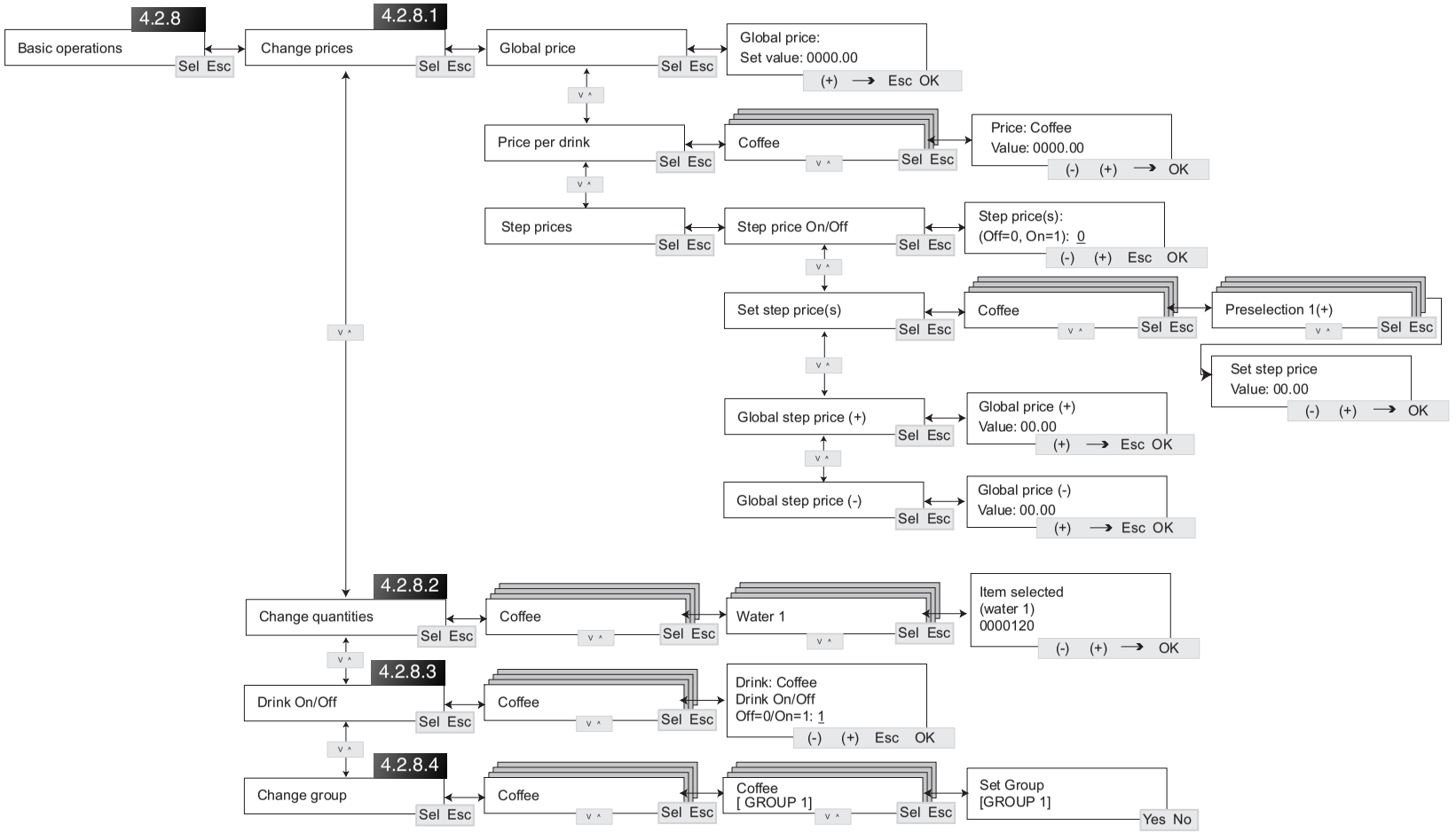

4.2.6.10
Printing
Sel Esc
Not resettable
Sel Esc
Overall
Selections counters
Time bands
Free vend
Discounts
Errors
Cash audit
Test audit
Group Counters
Sel Esc
Printing audit
Continue?
Esc OK
Please wait
printing
in progress
V ^
Resettable


Resettable
Sel Esc
Overall
Sel Esc
Printing audit
Continue?
Esc OK
Please wait
printing
in progress
v ^
Selections counters
Time bands
Free vend
Discounts
Errors
Cash audit
Test audit
Group Counters

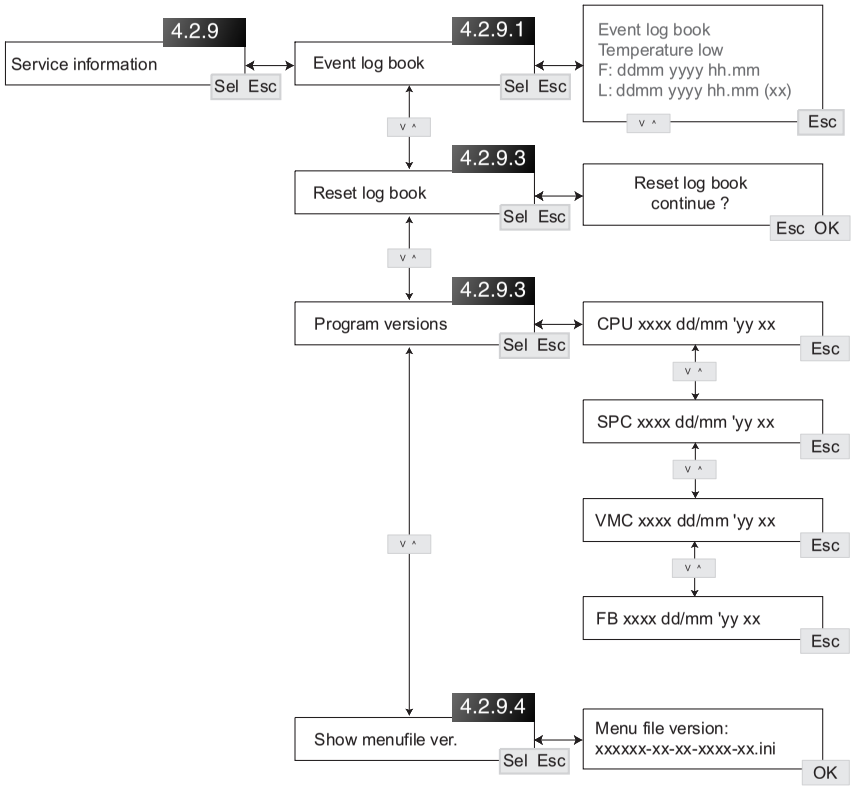
Cash action menu



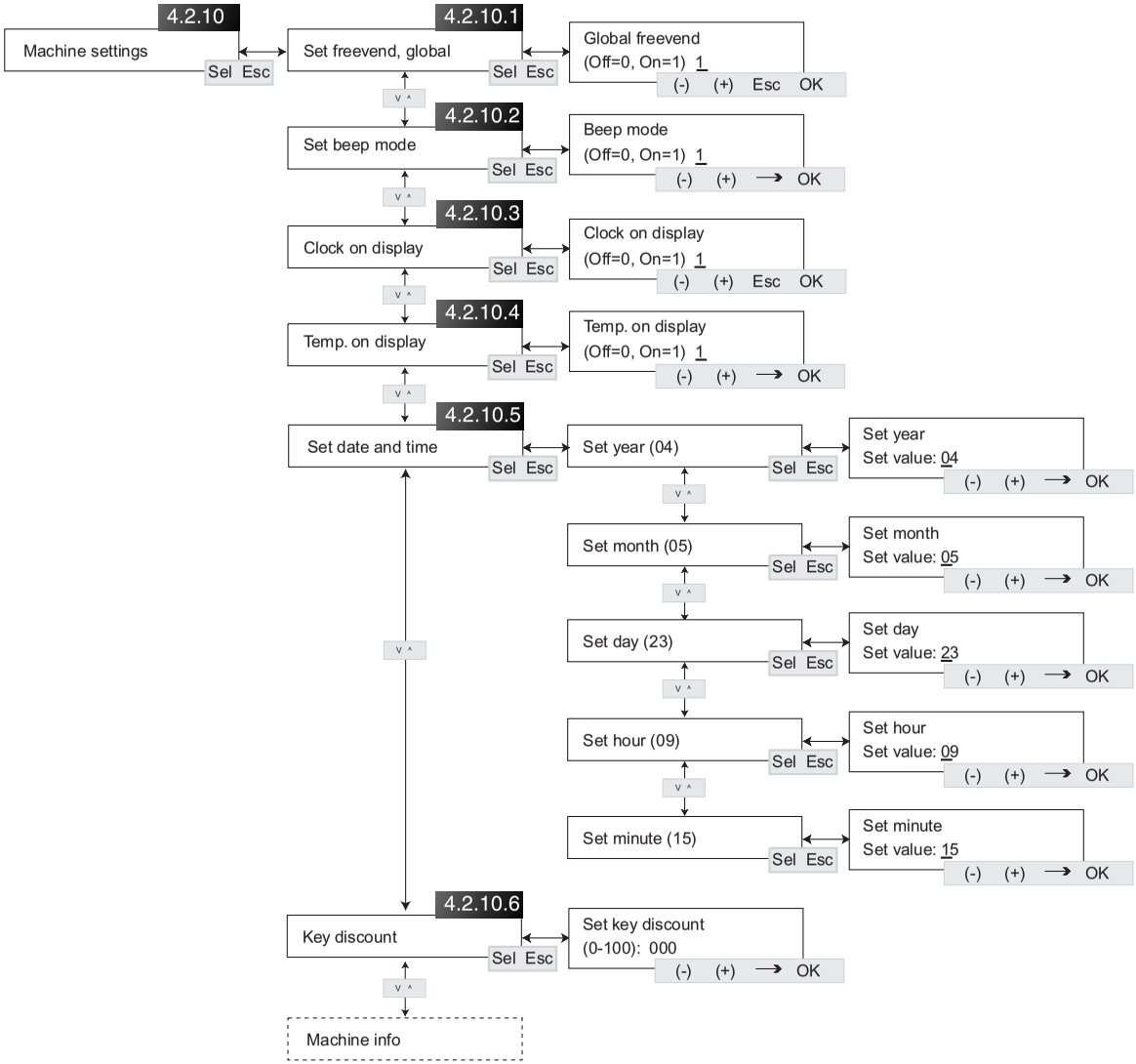
Basic operations menu

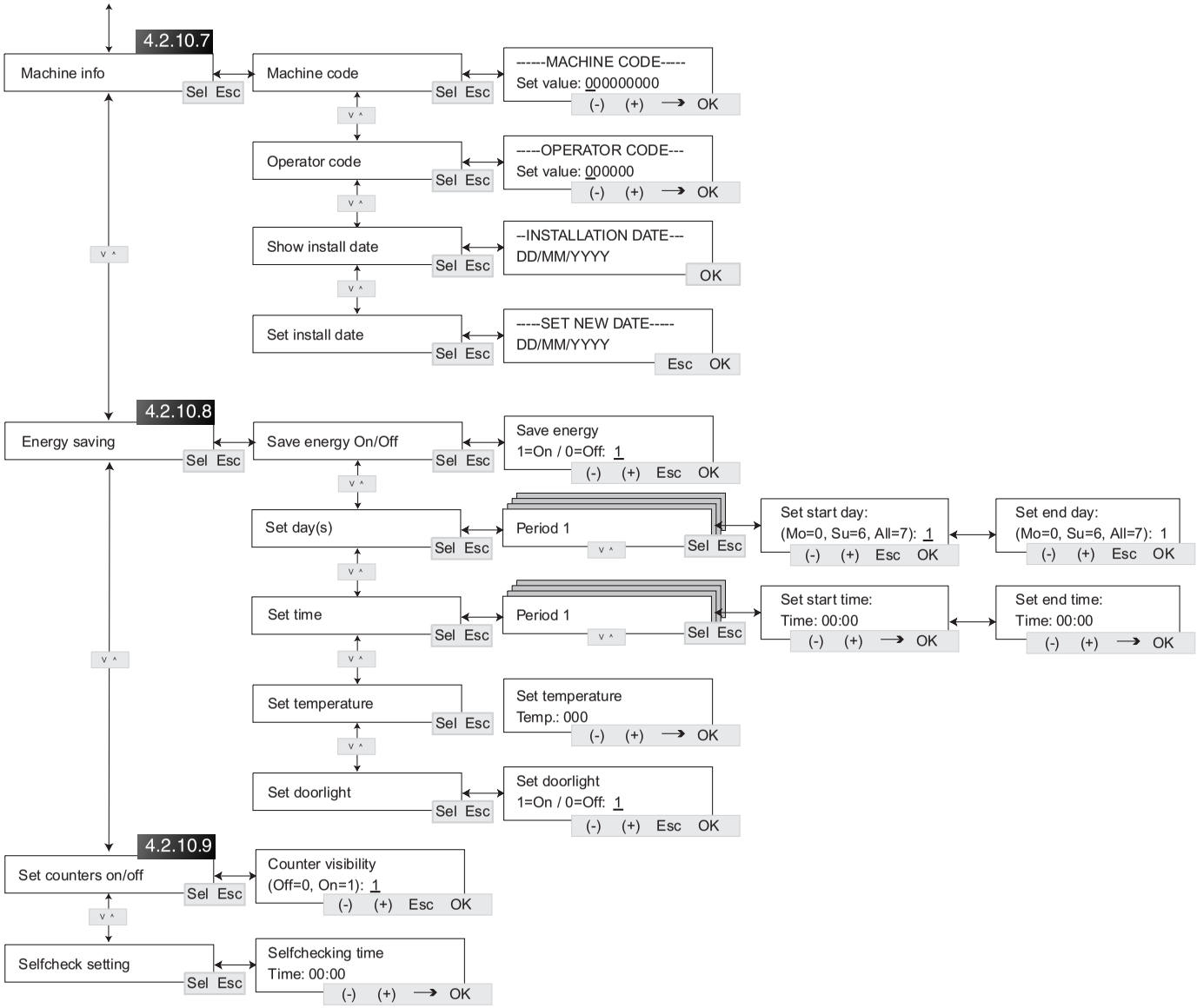


Service information menu



Machine settings menu




4.2.10.7
Machine info
Sel Esc
Machine code
Sel Esc
-----MACHINE CODE-----
Set value: 000000000
(-) (+) → OK
Operator code
Sel Esc
-----OPERATOR CODE---
Set value: 000000
(-) (+) → OK
Show install date
Sel Esc
--INSTALLATION DATE---
DD/MM/YYYY
OK
Set install date
Sel Esc
-----SET NEW DATE-----
DD/MM/YYYY
Esc OK
4.2.10.8
Energy saving
Sel Esc
Save energy On/Off
Sel Esc
Save energy
1=On / 0=Off: 1
(-) (+) Esc OK
Set day(s)
Sel Esc
Period 1
Sel Esc
Set start day:
(Mo=0, Su=6, All=7): 1
(-) (+) Esc OK
Set end day:
(Mo=0, Su=6, All=7): 1
(-) (+) Esc OK
Set time
Sel Esc
Period 1
Sel Esc
Set start time:
Time: 00:00
(-) (+) → OK
Set end time:
Time: 00:00
(-) (+) → OK
Set temperature
Sel Esc
Set temperature
Temp.: 000
(-) (+) → OK
Set doorlight
Sel Esc
Set doorlight
1=On / 0=Off: 1
(-) (+) Esc OK
4.2.10.9
Set counters on/off
Sel Esc
Counter visibility
(Off=0, On=1): 1
(-) (+) Esc OK
Selfcheck setting
Sel Esc
Selfchecking time
Time: 00:00
(-) (+) → OK

Test menu


4.2.11
Test
Sel Esc
4.2.11.1
Complete selections
Sel Esc
Close the door
DISPENSING TEST
Select drink
from selection panel
DISPENSING TEST
Coffee w. sugar

4.2.5 Filling / Clean

Introduction

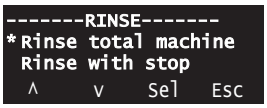
The Filling / Clean options assist in filling the ingredient canisters and in rinsing the machine.

Options

The Filling / Clean menu includes the following option:
- Rinse, see 4.2.5.1.

4.2.5.1 Rinse

The Rinse menu assists in rinsing the machine.



Sub menu	Description
Rinse total machine	To be activated when a complete rinse of the machine's dispensing system is required, i.e. both the IN and FB dispensing systems.
Rinse with stop FB1	To be activated when a rinse or descaling of the brewer is required. Cleaning or descaling agent can be added to brewer 1 during this rinse procedure.

Please refer to the Operator manual for a detailed explanation of the rinsing procedures.

4.2.6 Counters menu

Introduction

The Counters menu stores detailed information regarding the number of drinks dispensed and the turnover.

Furthermore, the Counters menu enables resetting of the individual counters and printing of reports.

Options

The Counters menu includes the following options:
- Sales audit, see 4.2.6.1
- Cash audit, see 4.2.6.2
- Cashless audit, see 4.2.6.3
- Free vend audit, see 4.2.6.4
- MB. discount audit, see 4.2.6.5
- Discount key audit, see 4.2.6.6
- Step prices counter, see 4.2.6.7
- Test audit, see 4.2.6.8
- Reset counters, see 4.2.6.9
- Printing, see 4.2.6.10

4.2.6.1 Sales audit

The options of the Sales audit menu are described in this table

Sub menu	Description
Total number, nres	Shows the total number of drinks dispensed since the machine was put into operation. (Non resettable counter.)
Total turnover, nres	Shows the total amount sold for since the machine was put into operation. (Non resettable counters)
Total number, res	Shows the total number of drinks dispensed since the last Sales audit resetting
Total turnover, res	Shows the total amount sold for since the last Sales audit resetting.
No. p. drink, nres	Shows the number of drinks sold per type of drink since the machine was put into operation. (Non resettable counter)
No. p. drink, res	Shows the number of drinks sold per type of drink since the last Sales audit resetting.
Turn. p. drink, nres	Shows the turnover per type of drink since the machine was put into operation. (Non resettable counter)
Turn. p. drink, res	Shows the turnover per type of drink since the last Sales audit resetting.

Sub menu	Description
No. p. group, nres	Shows the number of drinks sold per group since the machine was put into operation. (Non resettable counter)
No. p. group, res	Shows the number of drinks sold per group since the last Sales audit resetting.
Turn. p. group, nres	Shows the turnover per group since the machine was put into operation. (Non resettable counter)
Turn. p. group, res	Shows the turnover per group since the last Sales audit resetting.

4.2.6.2 Cash audit

The options of the Cash audit menu are described in this table.

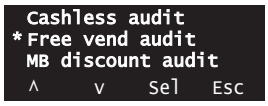
Sub menu	Description
Money to tubes	Shows the total amount of money routed to the coin tubes since the last Cash audit resetting.
Money to cash box	Shows the total amount of money routed to the cash box since the last Cash audit resetting. Coins are dropped into the cash box when the matching coin tubes are full or if there is no coin tube for the coin type inserted.
Collected money	Shows the amount of money removed from the cash box since the last Cash audit resetting. Precondition: The amount is registered only if the removal of the cash has been electronically recorded in the Cash collected menu, 4.2.7.1.
Manually filled (Applicable only if the machine is equipped with BDV or MDB/ICO coin mechanism.)	Shows the amount of money which has been inserted and registered as manually inserted change in the Manual filling menu, 4.2.7.3.
Manually delivered	Shows the amount of money which has been paid out from the coin tubes when operators have either pressed the coin dispense button on the coin unit inside the machine or used the Dispense couns menu, 4.2.7.2.
Value overpay	Shows the amount of money which could not be returned due to lack of coins in coin unit,i.e. when one or more coin tubes have run low and the display shows “Use exact change”.
Dispensed change	Shows the amount of money which has been paid out as change to customers.

4.2.6.3 Cashless audit

The Cashless audit option is described in this table.

Sub menu	Description
Revalued amount	Shows the total amount which has been inserted in the machine to add value to cards.

4.2.6.4 Free vend audit



The Free vend audit option keeps track of the number of drinks dispensed for free when the machine is in Free vend mode.

Free vend is turned on or off in the sub menu “Free vend” see *4.2.10, Machine settings menu, on page 4-40.*

The menu consists of both resettable and non resettable counters.

Sub menu	Description
Total no., nres	Shows the total number of free drinks dispensed since the machine was put into operation. (non resettable counter).
Total no., res	Shows the total number of free drinks dispensed since the last Sales audit resetting.
No. per drink, nres	Shows the number of free drinks dispensed per type of drink since the machine was put into operation. (Non resettable counter)
No. per drink, res	Shows the total number of free drinks dispensed per type of drink since the last Sales audit resetting.
No. per group, nres	Shows the number of free drinks dispensed per group since the machine was put into operation. (Non resettable counter)
No. per group, res	Shows the total number of free drinks dispensed per group since the last sales audit resetting.

4.2.6.5 MB discount audit

The MB (multibrew) discount audit option makes it possible to view the number of drinks dispensed as multibrew and the total discount amount given on multibrew vends.

Sub menu	Description
MB. number, nres	Shows the total number of portions dispensed as multibrew since the machine was put into operation. (non resettable counter)
MB. turnover, nres	Shows the total amount of discount granted on multibrew vends since the machine was put into operation. (non resettable counter)
MB. number, res	Shows the total number of portions dispensed as multibrew since the last Sales audit resetting.
MB. turnover, res	Shows the total amount of discount granted on multibrew vends since the last Sales audit resetting.

4.2.6.6 Discount key audit

The Discount key audit option makes it possible to view the number of drinks dispensed and the amount given as discount on discount key vends.

Key discount is defined in the sub menu “Key discount” see *4.2.10, Machine settings menu, on page 4-40.*

Sub menu	Description
D. key number, nres	Shows the total number of drinks dispensed at a key discount since the machine was put into operation. (non resettable counter)
D. key turnover, nres	Shows the total key discount amount granted since the machine was put into operation. (non resettable counter)
D. key number, res	Shows the total number of drinks dispensed at a key discount since the last Sales audit resetting.
D. key turnover, res	Shows the total key discount amount granted since the last Sales audit resetting.

4.2.6.7 Step prices audit

The Step prices audit options show the amounts that have been added to and deducted from the standard drink prices due to pre-selections.

Sub menu	Description
Sp turnover, nres	The first window “Step price, nres. (+)” shows the total amount that has been *added to* standard drink prices when customers have used a pre-selection button to increase strength, amount of sugar, whitener etc. The second window “Step price, nres. (-)” shows the total amount that has been *deducted from* standard drink prices when customers have used a preselection button to decrease strength, amount of sugar, whitener etc. (non-resettable counters)
Sp turnover, res	Same as above, but ressettable counters.

The the positive and negative amounts from the step price audit are balanced against the total turnover, see *4.2.6.1, Sales audit, on page 4-26.*

4.2.6.8 Test audit

The Test audit function shows how many test drinks have been dispensed.

Sub menu	Description
Test no., nres	Shows the total number of test drinks dispensed since the machine was put into operation. Each type of drink is shown separately. (non-resettable counters)
Test no., res	Shows the total number of test drinks dispensed since the last Test audit resetting. Each type of drink is shown separately.
No. per group, nres	Shows the number of test drinks dispensed per group since the machine was put into operation. (non resettable counter)
No. per group, res	Shows the total number of test drinks dispensed per group since the last sales audit resetting.

4.2.6.9 Reset counters

The options of the Reset counters menu are described in this table.

Sub menu	Description
Reset sales audit	Resets the counters from the Sales audit, Cashless audit, Cup audit, Free vend audit, MB discount audit, Discount key audit and Step price audit menus.
Reset Cash audit	Resets the registrations from the Cash audit menu, i.e. the amounts of money inserted into coin tubes and cash box plus the amount removed manually or paid out as change.
Reset Test audit	Resets the Test vend counter.

4.2.6.10 Printing

The Printing menu provides a number of different reports on turnover data and errors to print out on a printer connected to the machine.

The Printing menu is divided into two groups of counters, non-resettable and resettable, respectively:

- All reports printed from the sub menu “Not resettable” show the current status of the selected counters in totals summed up from the day the vending machine was taken into operation.
- All reports printed from the sub menu “Resettable” show the current status of the selected counters in totals summed up from the last time the counters were reset.

Non resettable and Resettable counters

This table shows the options of the Printing menu. The sub menus Resettable and Not resettable are identical and are therefore described in the same table.

Sub menu	Description
Overall	Prints a report that includes all of the categories mentioned below.
Selections counters	Prints a report on a selection of counters including • total number of drinks dispensed. • total number of drinks dispensed per type of drink.
Time bands (this function still remains to be implemented)	Prints a report that corresponds to the “Selections counters” report (above) but divided into time bands.

Sub menu	Description
Free vend	Prints a report on the number of free drinks dispensed.
Discounts	Prints a report on the total number of drinks sold at a discount and the total discount amount granted.
Errors	Prints a report on error messages registered in the Event book. (Registrations in the Event book that are not considered errors are omitted from this report.)
Cash audit	Prints a report with details on the flow of cash in and out of the vending machine: • Money to tubes: See Cash audit 4.2.6.2. • Money to cash box: See Cash audit 4.2.6.2. • Collected money: See Cash audit 4.2.6.2. • Manually filled: See Cash audit 4.2.6.2 • Manually delivered: See Cash audit 4.2.6.2. • Value overpay: See Cash audit 4.2.6.2 • Dispensed change: Amount of change paid out to customers. • Value of bill in: Total amount of money inserted in the form of notes. • Revalued amount: See Cashless audit 4.2.6.3 • Number of slugs: Number of false coins detected in the coin mechanism (applies to MDB coin mechanisms) • Number of token: Number of free drinks dispensed on tokens.
Test audit	Prints a report on the number of test drinks dispensed. Each type of drink is shown separately.
Group audit	Prints a report on the number of drinks sold per group.

All printed reports, furthermore, state the program versions, machine code, operator code and the date of installation. (See *4.2.10.7, Machine info, on page 4-42* for further information.)

4.2.7 Cash action menu

Introduction

The Cash action menu is used to set handling of coins:

Options

The Cash action menu includes the following options:
- Cash collected, see 4.2.7.1
- Dispense coins, see 4.2.7.2
- Manual filling, see 4.2.7.3

4.2.7.1 Cash collected

The function of the Cash collected menu is described in this table.

Sub menu	Description
Cash collected	The Cash collected option is used to electronically confirm the amount of money which is removed manually from the cash box. The cash amount removed is registered in the Cash audit menu under "Collected money", and, subsequently, the "Money to cash box" counter is reset to zero (See *4.2.6.2, Cash audit, on page 4-27)*.

4.2.7.2 Dispense coins

The Dispense coins option is used to manually pay out a number of coins from the coin tubes of the coin unit.

Note: The function is applicable if the vending machine is equipped with a BDV or an MDB/ICP coin mechanism. If the machine is equipped with an Executive coin unit, coins can be paid out from the coin tubes by pressing the coin dispense button on the coin unit.

Sub menu	Description
Dispense coins	1. Select a coin number (1-16) 2. Enter the number of coins (1-99) to be paid out. The coins are paid out into the coin return cup.

4.2.7.3 Manual filling

The Manual filling option is described in this table.

Note: The option is applicable only if the vending machine is equipped with a BDV or an MDB/ICP coin mechanism.

Sub menu	Description
Manual filling	This function converts a cash sum inserted from normal credit to cash for change. The coins inserted are distributed to the appropriate tubes in the coin unit. If the tubes in question are full, the coins are routed into the cash box. The inserted cash amount is recorded in the Manually filled, 4.2.6.2.

4.2.8 Basic operations menu

Introduction

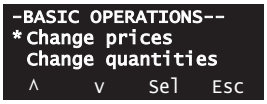
The Basic operations menu is used for price settings.

Options

The Basic operations menu includes the following options:
- Change prices, see 4.2.8.1
- Change quantities, see 4.2.8.2
- Drink On/Off, see 4.2.8.3
- Change group, see 4.2.8.4

4.2.8.1 Change prices

Settings of global and individual prices of drinks are described in this table.



Sub menu	Description
Global price	This function makes it possible to set one price which will apply to all drinks. Subsequently, prices of individual drinks can be changed if required. See “Price per drink” below. If individual prices have been set prior to the setting of the Global price, the price of the first drink will be suggested when you enter the “Global price” function. Note: All individual price settings will be overwritten when you set a global price.
Price per drink	Prices of each of the drinks available in the machine are set or changed in this menu.

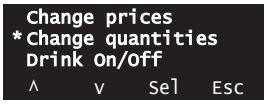
Sub menu	Description
Step prices	A step price will be added to or subtracted from the standard price every time a customer presses a pre-selection button one or more times to increase or decrease the default setting of strength, amount of whitener or sugar, etc. Step prices can be set for individual drinks and pre-selections or as global step prices applying to all drinks and pre-selections. The step prices function is divided into four sub menus: *1. Price On/Off:* If you select 'On', selling of drinks at graduated prices according to pre-selections, e.g. strength, is enabled. 2. *Set step price* Setting of step prices for individual drinks and pre-selections. A. Select a drink. B. Select pre-selection group, 1-4 (+) or 1-4 (-), where 1(+) and 1(-) correspond to the left-most pre-selection button on the payment panel, 2(+) and 2(-) correspond to the second pre-selection button from left, etc. Select a group number with a '+' to define a price to be *added* to the standard price, and select a group number with a '-' to define a price to be *subtracted* from the standard price. C. Enter a step price for the selected group. *3. Global step price (+)* Setting of a common step price that will be *added* to the standard prices of all available drinks no matter which pre-selection button is pressed. *4. Global step price (-)* Setting of a common step price that will be *subtracted* from the standard prices of all available drinks no matter which pre-selection button is pressed. *Note: Setting of global step prices will overwrite all step prices that may have been set for individual drinks, see step 2 above.*

How to set a price

The way prices are entered or changed is explained in *4.1.2, Button functions, on page 4-4*.

4.2.8.2 Change quantities

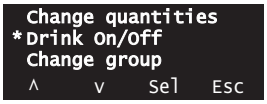
The function of the Change quantities menu is described in this table.



Sub menu	Description
Change quantities	Quantities of water and ingredient powder for each drink available can be adjusted in this menu. Note: The mixer speed must be set at 100% or <51%.

4.2.8.3 Drink On/Off

The function of the Drink On/Off menu is described in this table.



Sub menu	Description
Drink On/Off	Individual drinks can be made temporarily unavailable. Select the drink and press “Off” to make it unavailable. Select “On” to make it available again. If a user presses the button of a drink which has been turned off, the display will read “Product not available.”

4.2.8.4 Change group

The function of the Change group menu is described in this table.

Sub menu	Description
Change group	All available drinks can be grouped in one of nine possible groups. Special counters for each group can be found in the Sales audit, the Free vend audit and Test audit menus. Select a drink, and then select a group number for the drink in question. All drinks by default belong to Group no. 1.

4.2.9 Service information menu

Introduction

Detailed information about operation errors and events is registered in the Service information menu.

Furthermore, information about the machine's software program versions is found in this menu.

Options

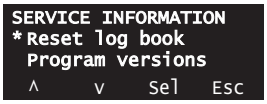
The Service information menu includes the following options:
- Event log book, see 4.2.9.1.
- Reset log book, see 4.2.9.2.
- Program versions, see 4.2.9.3.
- Show menu file ver., see 4.2.9.4

4.2.9.1 Event log book

The structure of the Event log book is explained in this table.

Sub menu	Description
Event log book	Each operation error or unexpected event is registered in the event log.  F = First time of occurrence L = Last time of occurrence DDMMYY = Day month year HH.MM = Time (XX) = Number of times the error has occurred. See *chapter 3 Event recording and troubleshooting* for an explanation of the messages that may occur in the Event log book and suggestions for remedy.

4.2.9.2 Reset log book



The function of the Reset log book menu is described in this table.

Sub menu	Description
Reset log book	Deletes all errors and events registered in the Event log book. Note: Errors that are still active will not be deleted from the log book.

4.2.9.3 Program versions

The sub menu available in the Program versions menu is described in this table.

Sub menu	Description
Program versions	Shows the program versions of the software installed in the machine, i.e., CPU, SPC, VMC and FB (fresh brewer.)

4.2.9.4 Show menu file ver.

The sub menu available in the Show menu file ver. menu is described in this table.

Sub menu	Description
Show menu file ver.	Shows information about the menu file version installed in the machine, i.e. release no., machine type and language.

4.2.10 Machine settings menu

Introduction

The Machine settings menu allows for setting the machine according to individual preferences.

Options

The Machine settings menu includes the following options:

- Set free vend, global, see 4.2.10.1
- Set beep mode, see 4.2.10.2
- Clock on display, see 4.2.10.3
- Temp. on display, see 4.2.10.4
- Set date and time, see 4.2.10.5
- Key discount, see 4.2.10.6
- Machine info, see 4.2.10.7
- Energy saving, see 4.2.10.8
- Set counters on/off, see 4.2.10.9
- Selfcheck setting, see 4.2.10.10

4.2.10.1 Set free vend, global

The Set free vend, global option is explained in this table.

Sub menu	Description
Set free vend, global	By selecting 'On', you set the machine to dispense all drinks for free.

4.2.10.2 Set beep mode

The Set beep mode option is explained in this table.

Sub menu	Description
Set beep mode	By selecting 'On', you set the machine to give a beep signal • every time a button is pressed in the menu system • when the machine has finished dispensing a drink.

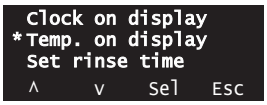
4.2.10.3 Clock on display

The Clock on display option is explained in this table.

Sub menu	Description
Clock on display	By selecting 'On', you set the display to show the time (hour and minute) when the machine is in vend mode. To set the time, see *4.2.10.5, Set date and time, on page 4-41*.

4.2.10.4 Temp. on display

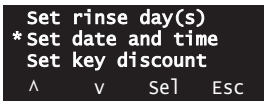
The Temp. on display option is explained in this table.



Sub menu	Description
Temp. on display	By selecting 'On', you set the display to show the current water temperature when the machine is in vend mode.

4.2.10.5 Set date and time

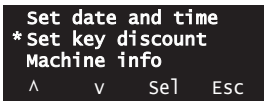
The Set date and time option is described in this table.



Sub menu	Description
Set year	Setting of year (two digits), e.g. 03
Set month	Setting of month, e.g. 04
Set day	Setting of day, e.g. 12
Set hour	Setting of hour, e.g. 11
Set minute	Setting of minute, e.g. 42

4.2.10.6 Key discount

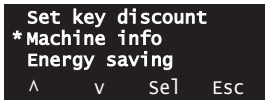
The key discount option is described in this table.



Sub menu	Description
Set key discount	The key discount option makes it possible to set a percentage rate which is given as a discount on all drinks when the discount key is used. Example: A setting of 20 results in a discount of 20% when the key discount is activated. A setting of 100 means free vend. (Se also *Key discount and Multibrew settings, on page 4-77.)*

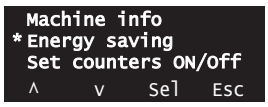
4.2.10.7 Machine info

The Machine info option is described in this table.



Sub menu	Description
Machine code	A machine code can be entered to give the machine a unique number for identification when retrieving data electronically. The number will be written on printed reports (see *4.2.6.10*).
Operator code	A number identifying the operator can be entered for identification when retrieving data electronically. The number will be written on printed reports (see 4.2.6.10).
Show install date	Shows the date of installation of the machine as recorded under “Set install date”, see below. The number will be written on printed reports (see 4.2.6.10).
Set install date	This option makes it possible to record the date of installation. Pressing ‘OK’ will enter today’s date in the system.

4.2.10.8 Energy saving



To save energy, the machine can be set to lower the water temperature over a certain time period at fixed intervals. Up to seven energy saving periods can be set in the machine.

The following table describes the options of the Energy saving function.

Se also explanation in the paragraph *Setting energy saving periods, on page 4-43*.

Sub menu	Description
Save energy On/Off	If Save energy is set to “Off”, no energy saving periods will be active. If Save energy is set to “On”, the energy saving function will be active in the defined periods.

Sub menu	Description
Set day(s)	Up to seven automatic rinse periods can be set in the machine. In this menu days are defined: The setting of day(s) is carried out in two steps: 1. Select a period (1-7). 2. Set the start day and end day for the selected period. 0 = Monday 1 = Tuesday etc. 7 = All (every day of the week).
Set time	In this menu time (hours and minutes) for each period is defined. The setting of time is carried out in two steps: 1. Select a period (1-7). 2. Set the start time and end time for the selected period. The time is set in 24-hour format.
Set temperature	In this menu the required low temperature is set, e.g 65° C. The water temperature will lower to this temperature during the defined periods.
Set doorlight	If this option is set to “On”, the light in the machine door will be turned off during the energy saving periods. If the option is set to “Off”, the light will stay on during the energy saving periods.

Setting energy saving periods

- Seven energy saving periods can be programmed on a weekly basis: the week days are identified by progressive numbers: (0=Monday, 1=Tuesday, etc.) and all weekdays (ALL=7).
- The same time period cannot include days from different weeks, i.e. a period cannot be set from Monday to Monday.
- A period cannot have a ‘start time’ later than the ‘end time’, see Non Example 2.
- If the periods are set overlapping, the energy saving will be active for as long as it is covered by one of these periods, cf. Example: Period 3.
- Two energy savings in a period require two period settings, cf. Example: Period 1 and 2.
- Non Examples 1 and 2 describe settings which will give unintended results.

Example

The vending machine is to run Monday to Friday from 07:00 till 22:00. The remaining time of the week and during the weekend the machine is set to energy saving. Three periods have to be set as follows:

Period 1			
Set start day	ALL=7	Set start time	22:00
Set end day	ALL=7	Set end time	23:59
Result: The machine is 'shut down' from Midnight 00:00 till 07:00 in the morning the same day.			
Period 2			
Set start day	ALL=7	Set start time	00:00
Set end day	ALL=7	Set end time	07:00
Result: The machine is 'shut down' every day from 22:00 till Midnight the same day.			
Period 3			
Set start day	Fr=4	Set start time	22:00
Set end day	Su=6	Set end time	23:59
Result: The machine is shut down from Friday evening at 22:00 till Sunday evening at 23:59.			

Non example 1

Period 1			
Set start day	Mo=0	Set start time	22:00
Set end day	Fr=4	Set end time	07:00
Result: The machine will be 'shut down' Monday at 22:00 till Friday at 07:00 which was not the intention.			

Non example 2

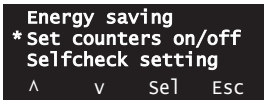
Period 1			
Set start day	All=7	Set start time	22:00
Set end day	All=7	Set end time	07:00
Result: The machine is not 'shut down' as the *end time* must not be earlier than the *start time* for the same 'day' or 'ALL'.			

Note

If a selection button is activated during an energy saving period, the machine leaves the energy saving mode and returns to vend mode. As soon as the temperature in the water tank has reached the 'nominal temperature', the selected drink is dispensed.

When the selection buttons have been left untouched for more than 10 minutes after the last drinks dispensing, and an energy saving period is still in force, the machine returns to the energy saving mode.

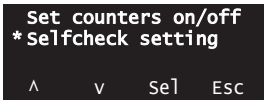
4.2.10.9 Set counters on/off



The Set counters on/off option makes it possible to have the display show the number of drinks dispensed (resettable and non resettable counters) during initialization of the machine.
(Initialization = during start up and when returning from menu system to vend mode.)

Sub menu	Description
Set counters on/off	Select 'On' to have the display show the number of drinks dispensed. Select 'Off' to turn the function off.

4.2.10.10 Selfcheck setting



An automatic check of the software is carried out daily. By default the check is performed from midnight, but if an other time is preferred, a starting time can be set via this menu.

Sub menu	Description
Set hours and minutes	Enter the starting hour and minutes for the daily software check.

4.2.11 Test menu

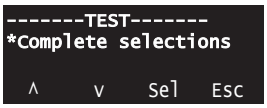
Introduction

The Test menu makes it possible to perform various tests of the dispensing system.

Options

The Test menu includes the following option:
- Complete selections, see 4.2.11.1.

4.2.11.1 Complete selections



The Complete selections option makes it possible to dispense any of the available drinks for testing.

Drinks that are dispensed as test drinks are registered in separate Test audit counters and do not affect the sales counters.

Sub menu	Description
Complete selections	Close the door. When the display reads “DISPENSING TEST”, press any selection key to have the machine dispense a test drink.

4.3 Technician menu

4.3.1 Purpose of the Technician menu

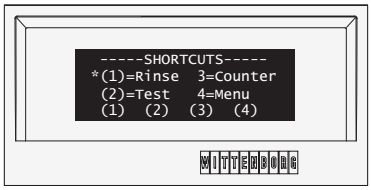
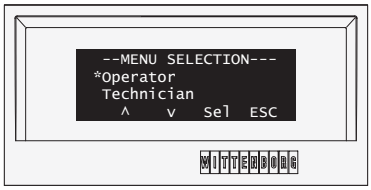
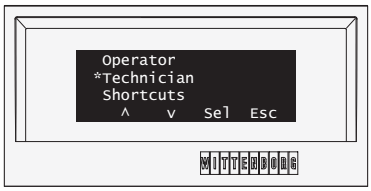
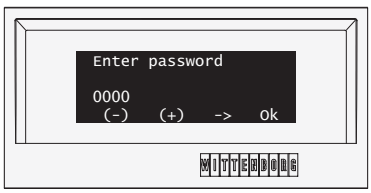
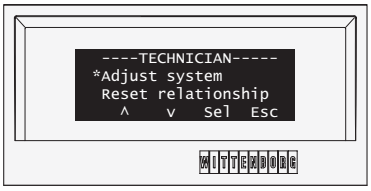
Purpose

The Technician menu is intended for trained service technicians who have gone through the product training courses of this vending machine.

4.3.2 How to access the Technician menu

Accessing the Technician menu

Follow the steps below to access the Technician menu.

Step	Action	
1.	Unlock and open the door. The display now shows a short cut selection window.	
2.	Press ‘4’ (Menu) to proceed to the “MENU SELECTION” window. The selection marker ‘*’, by default, is placed next to "Operator".	
3.	In the “MENU SELECTION” window, press “v” once to move to "Technician".	
4.	Enter password, and press ‘OK’.	
5.	Press ‘Sel’ to enter the Technician menu.	

Returning to vend mode

1 Close the door. Turn the key counterclockwise to lock the door
2 Press ‘Esc’ once. Wait for a maximum of 30 seconds until the machine is back in vend mode.

4.3.3 Sub menus of the Technician menu

Presentation

This table gives a short presentation of the main contents of the Technician menu.

Menu	Description
Adjust system	• For calibration of valves and ingredients. • Water temperature settings • Cup sensor settings • Brewer position settings • Pot sensor settings
Reset relationship	Removal of electronic lock between vending machine and portable data collector.
Change comm. route	To define the mode of data read-out to a pc or a hand-held terminal (via infra-red or cable).
Payment settings	Handling of payment, e.g. coin mechanisms and multi vend/single vend.
Multibrew settings	Setting of the multibrew function (number of portions, means of activation, and discount).
Change config. files	Changing of language, recipe and menu files.
Diagnostic/Test	Test of various parts and functions of the vending machine.
Change password	Changing of the password that gives access to the Technician menu.

4.3.4 Technician menu flow

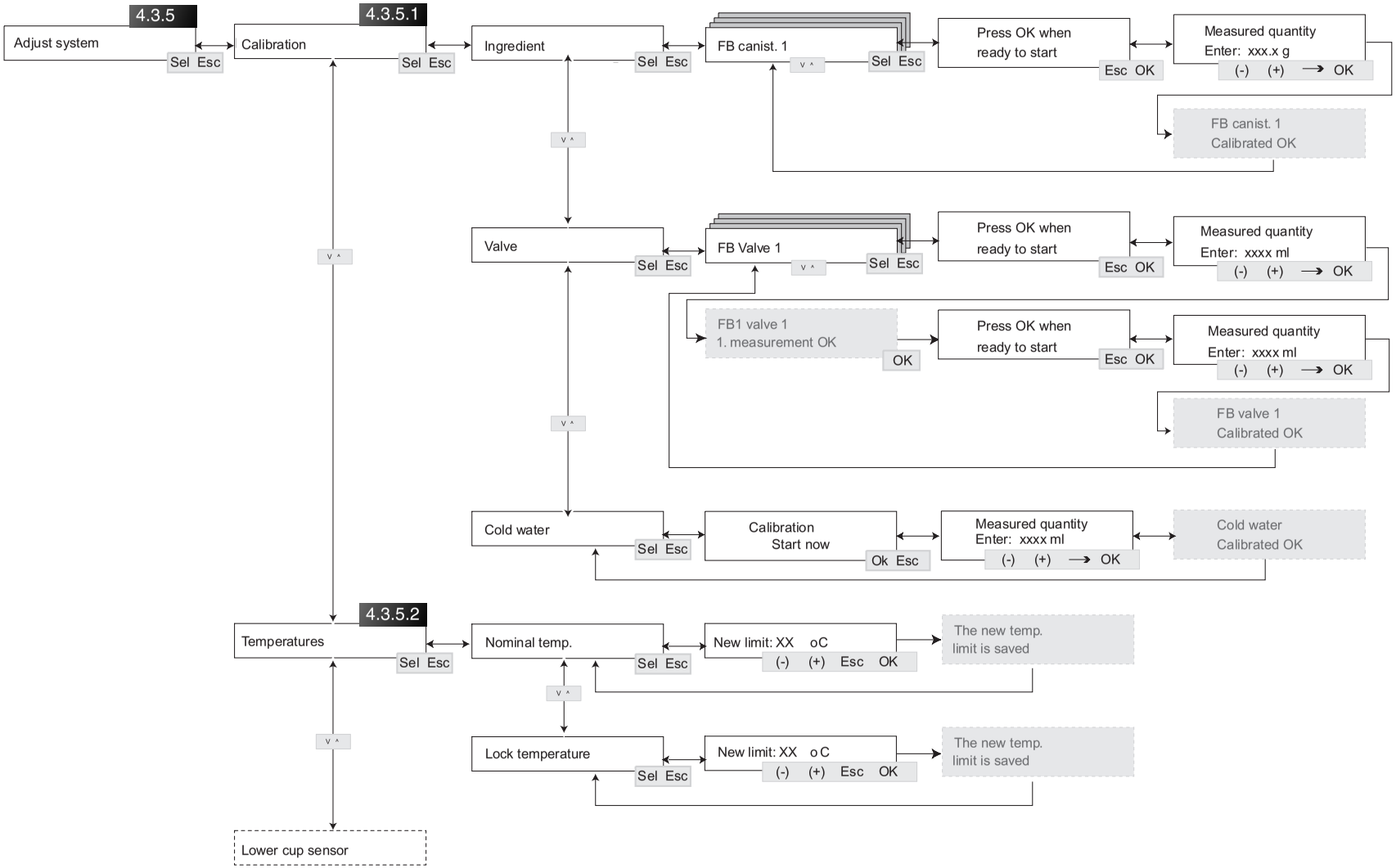
This diagram displays the full flow of the Technician menu.

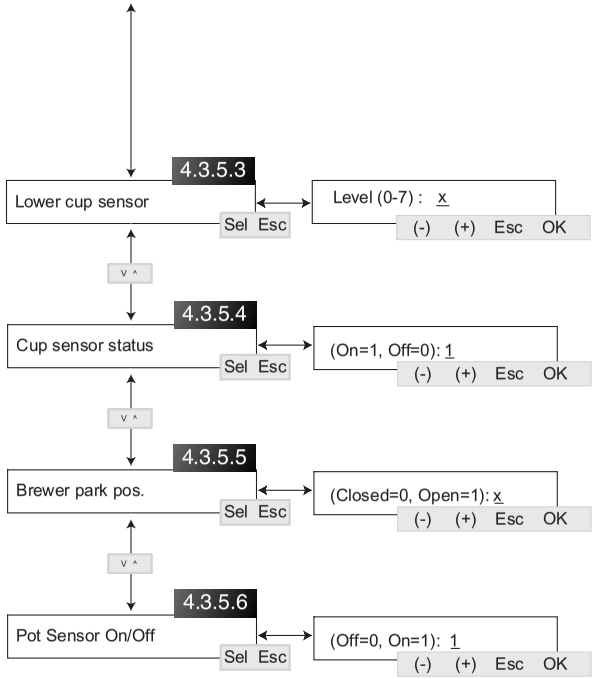
- Technician
  - Adjust system
    - Calibration
      - Ingredient
      - Valve
      - Cold water
    - Temperatures
    - Lower cup sensor
    - Cup sensor status
    - Brewer park pos.
    - Pot Sensor On/Off
  - Reset relationship
  - Change Comm. route
    - Closed door
      - Serial XModem
      - Serial EDDCMP
      - IR XModem
      - IR EDDCMP
      - Back to terminal
    - Opened door
      - Terminal Mode
      - Configurator Mode
  - Payment settings
    - Single/Multi vend
    - Set payment type
    - Set max credit
    - Set max change
    - Obligation to buy
    - Coin inhibit
    - Low change inhibit
    - Audit unit Ext/Int
    - Exact change eq.
    - Exact change offset
    - Keyboard inhibit
    - Price mode
    - Revalue
    - Immediate change
    - Currency code(auto)
      - EUR
      - DKR
      - GBP
      - SKR
      - NOK
    - Currency code(man)
    - Coin validator

Multibrew settings		
	Preset value	
	Min value	
	Max value	
	Means of action	
	MB Discount	
Change config files		
	Set language file	
	Set recipe file	
	Set menu file	
Diagnostics/Test		
	Overall functions	
		Wittlink test
		Full dispense test
		Test vend
	Cup handling	
		Sensor test
	User interface	
		Button/Key test
		Display test
		Pre. sel. led test
		Door light toggle
		Test Init.text
		Coin return motor
	Water/power/heat	
		Water sensors
		Pump on/off
		Heater on/off
		Fan on/off
		Test whipper no. X
		Test all whippers
		Test valve no. X
		Test all IN valves
		Test IN motor no.X
		Test all IN motors
	Freshbrewer 1	
		Test FB1 positions
		Move piston up
		Move piston down
		Test in motor 1
Change password		

The page shows the full layout of the of Adjust system options in the Technician menu. For further information about the menus, please refer to sections indicated by numbers in black boxes.

Adjust system menu



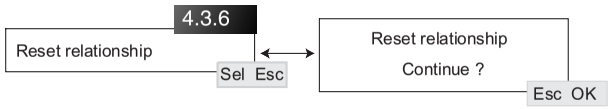


Short cuts for pc users

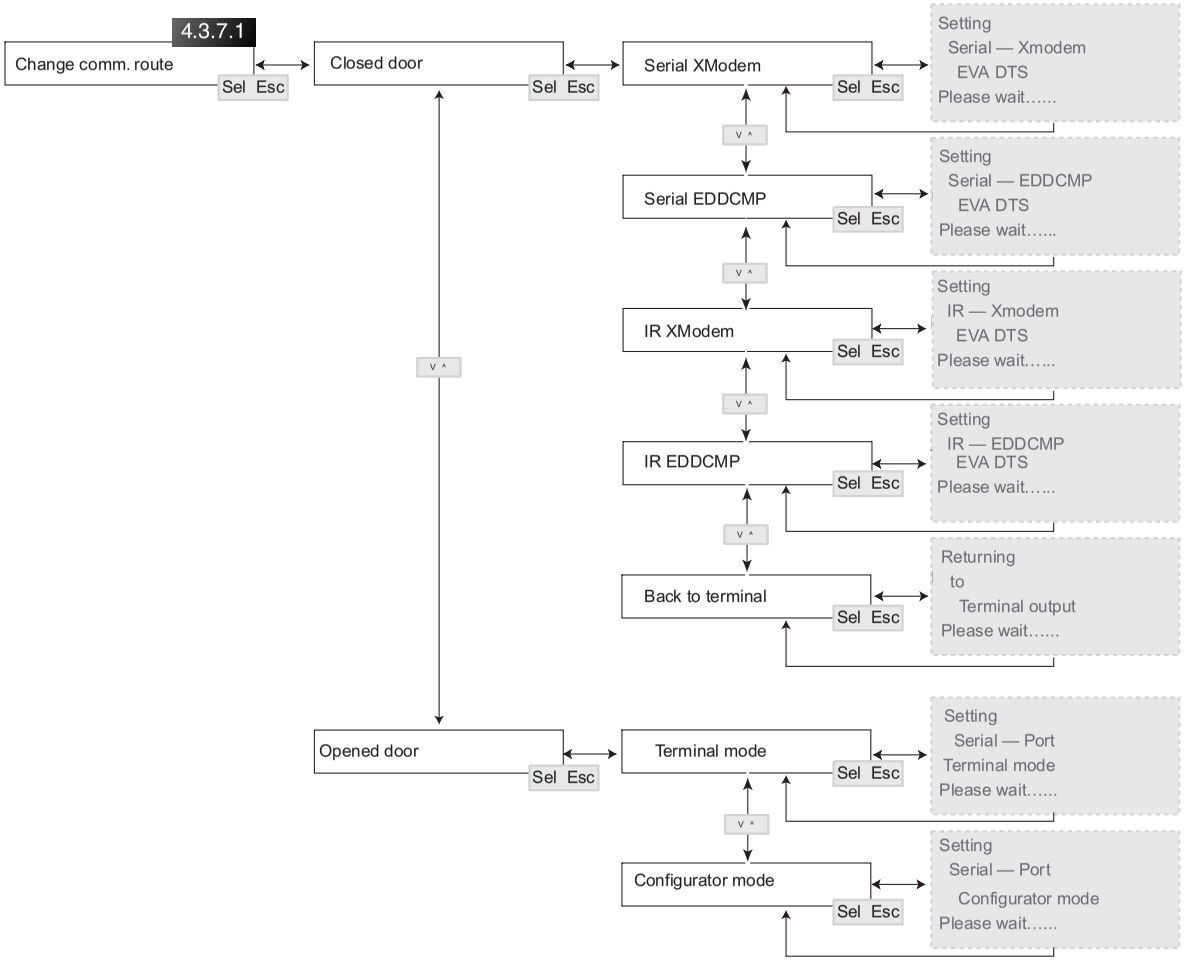
If you are viewing this manual on a computer screen, simply place your cursor on any of the numbers in black boxes and click to go directly to the section that describes the menu in question.

To go back, rightclick and select “Go to previous view”.

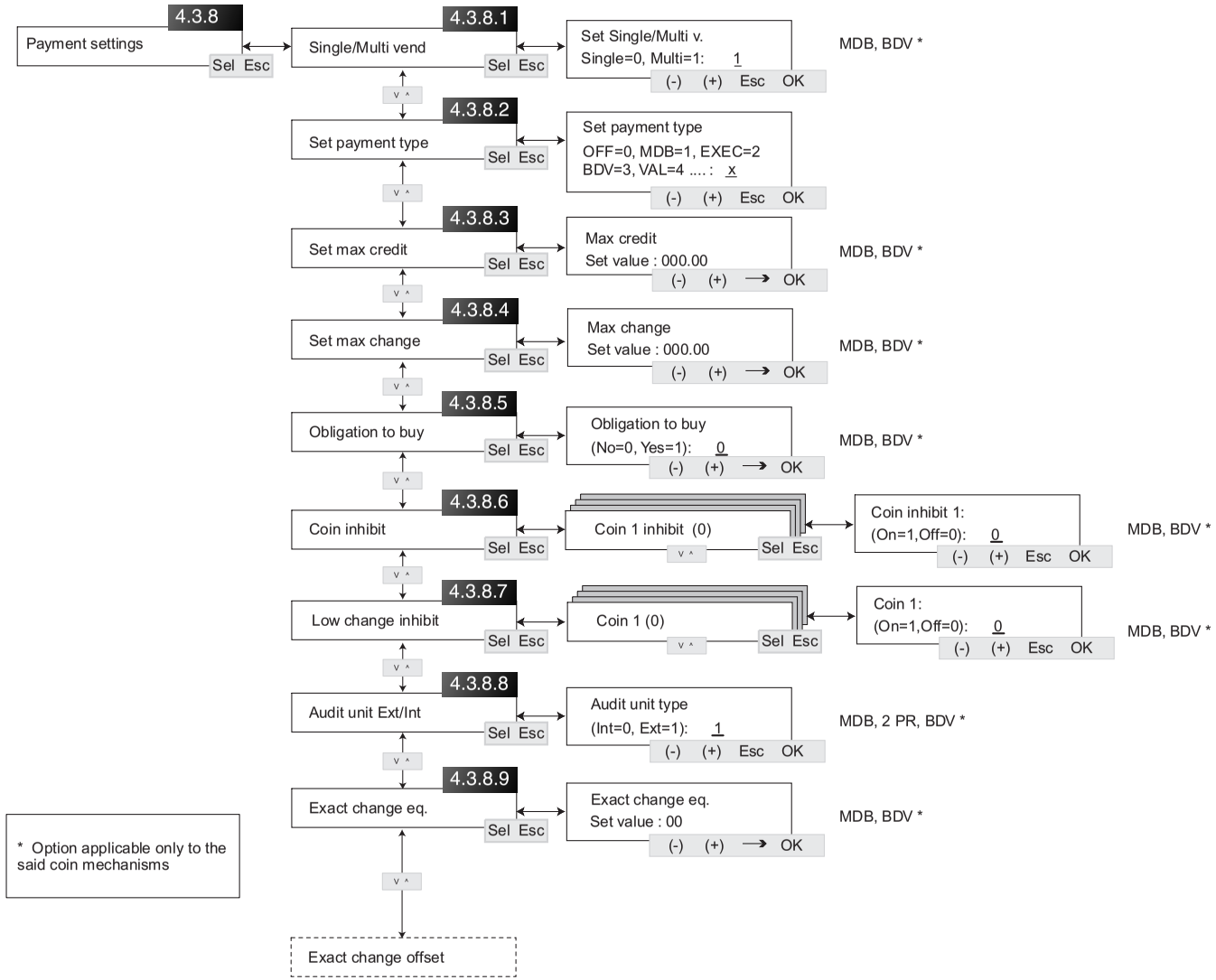
Reset relationship menu

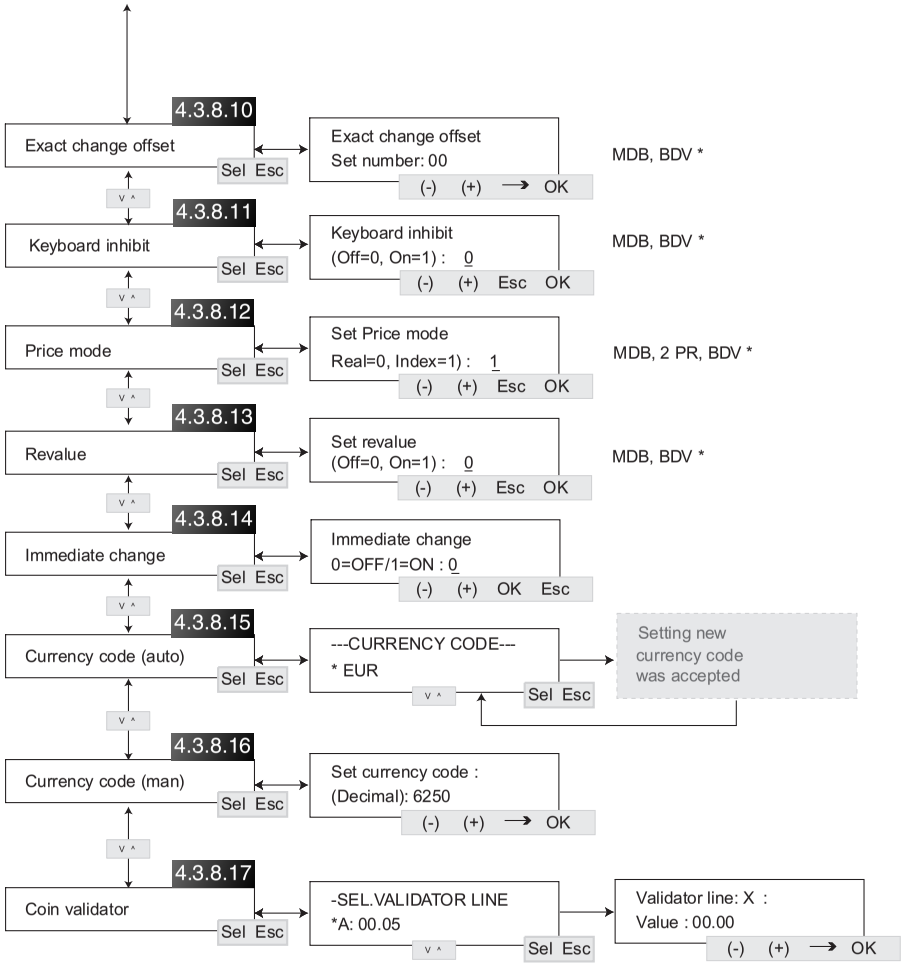


Change comm. route menu



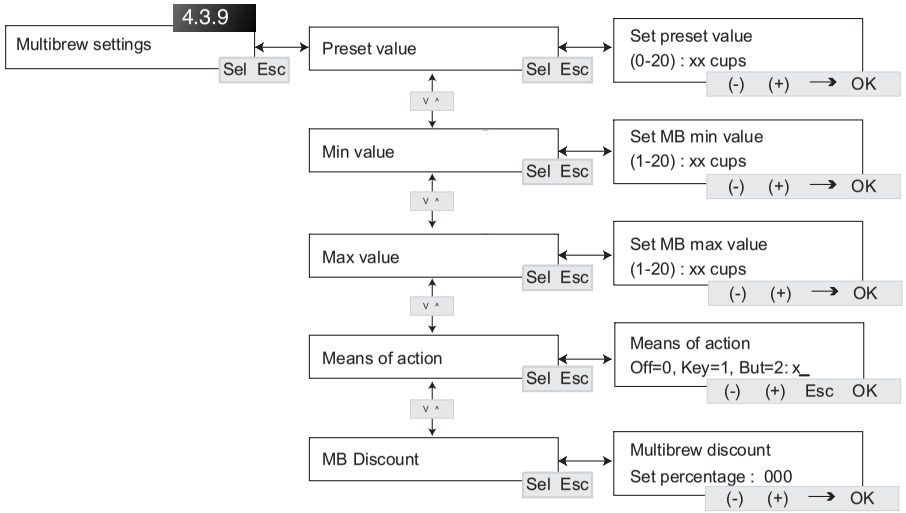
Payment settings menu



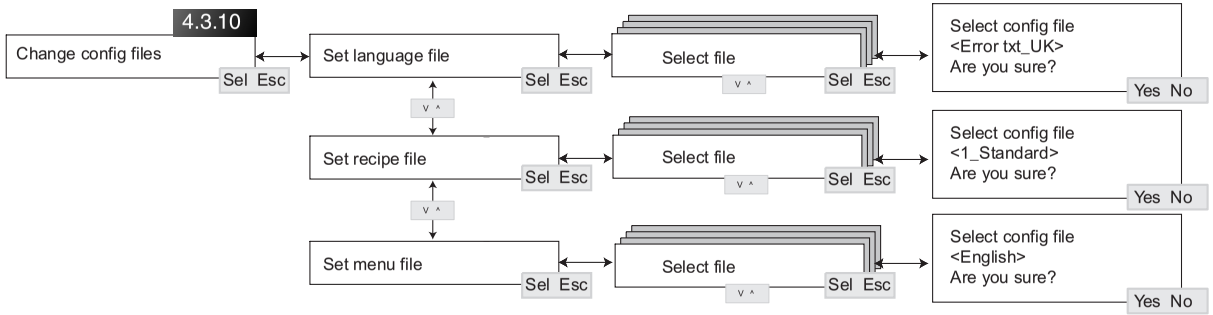


* Option applicable only to the said coin mechanisms

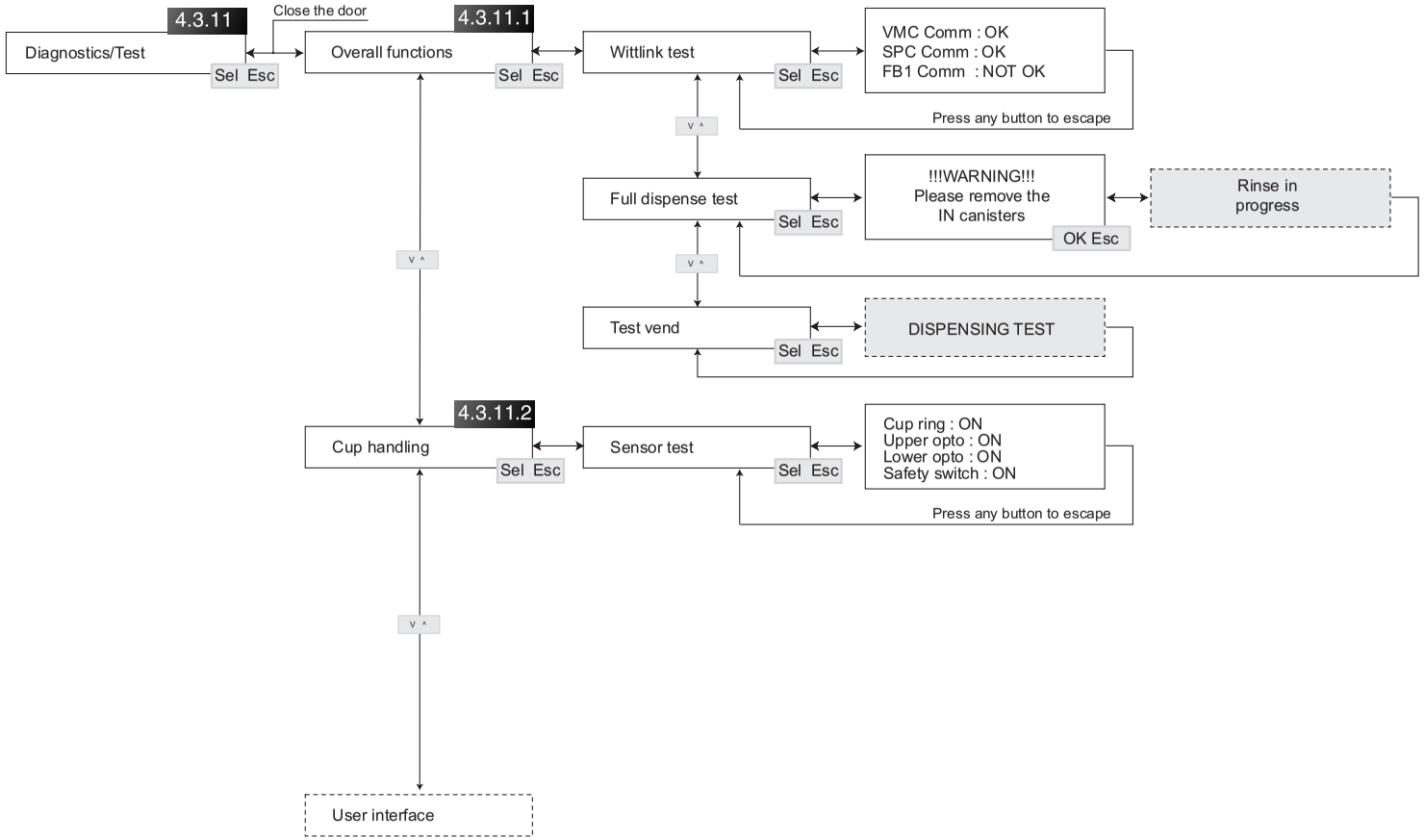
Multibrew settings menu

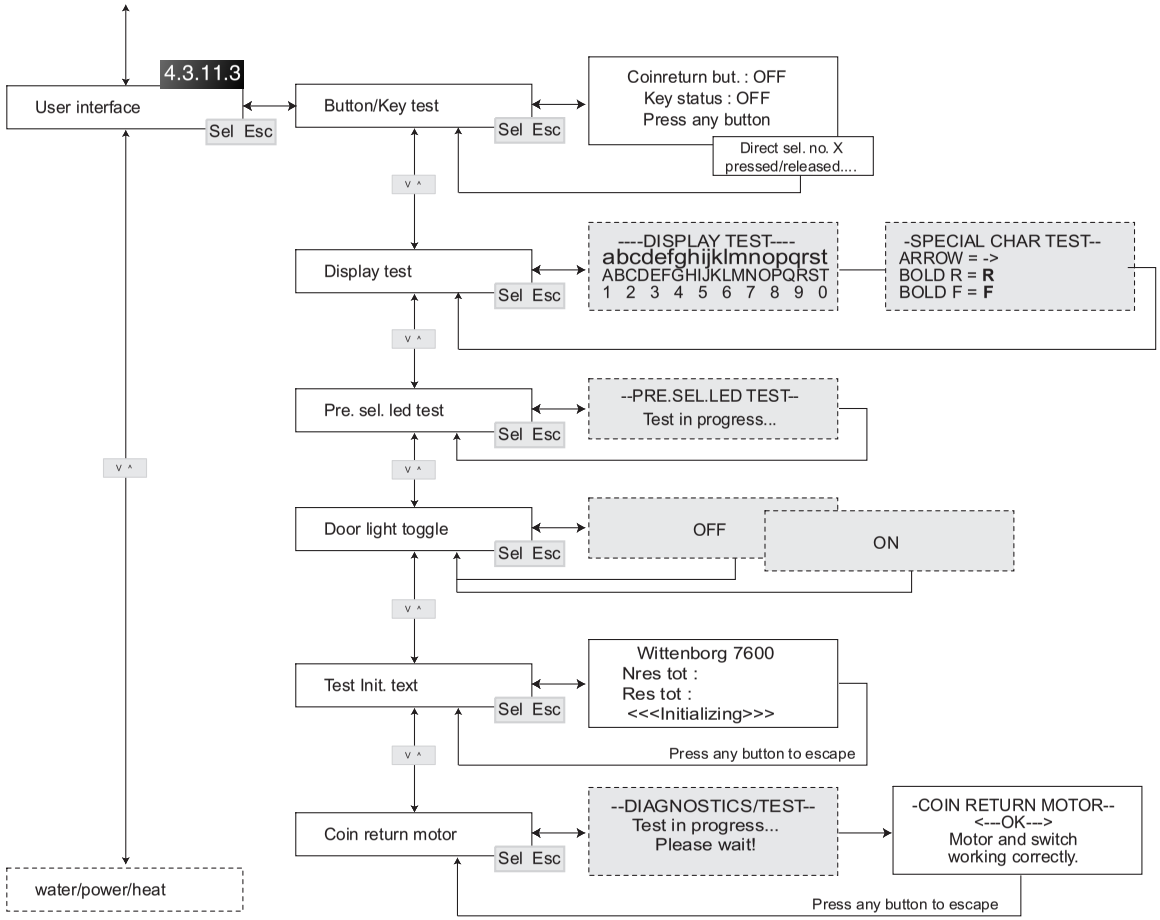


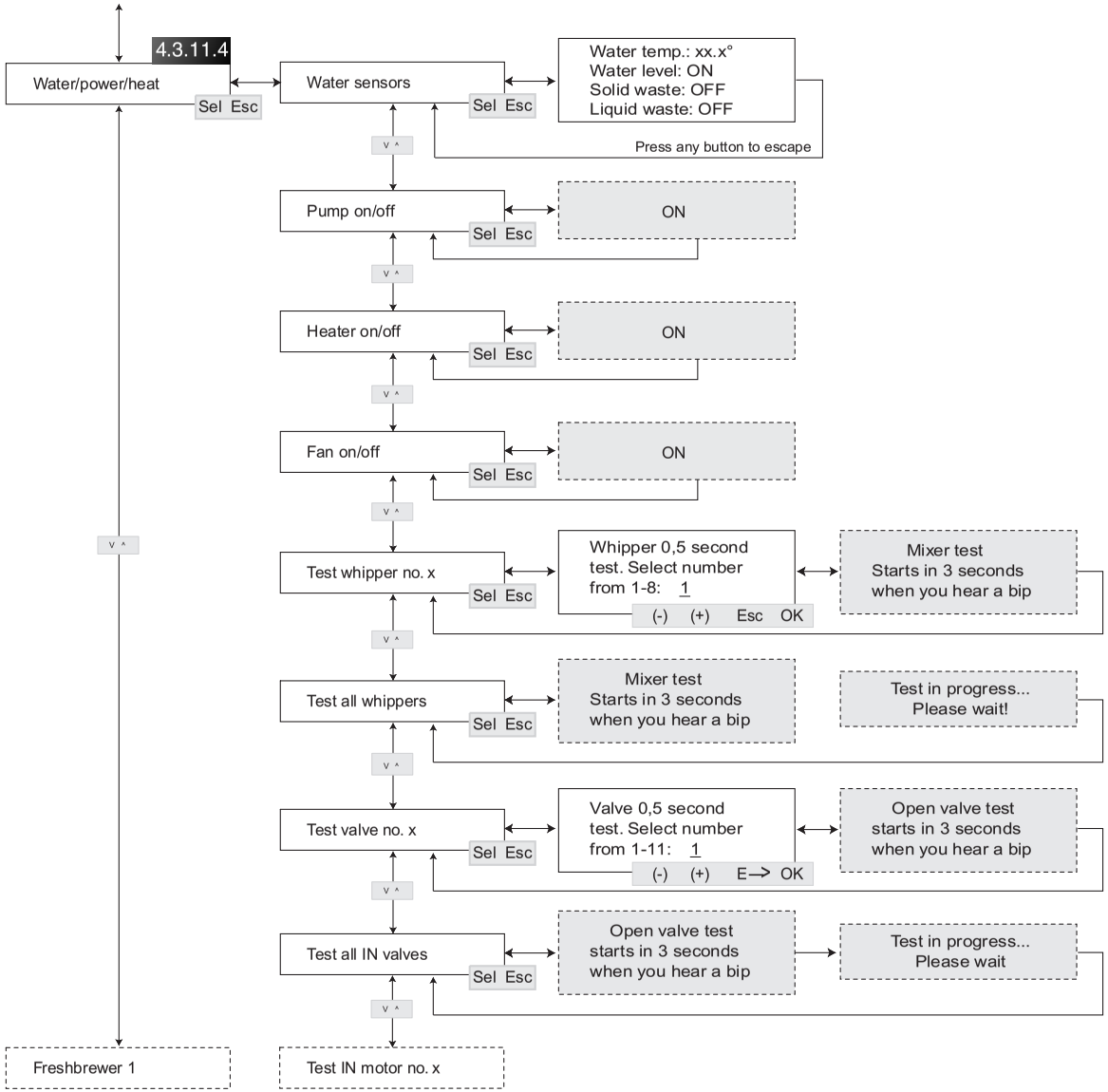
Change config files menu

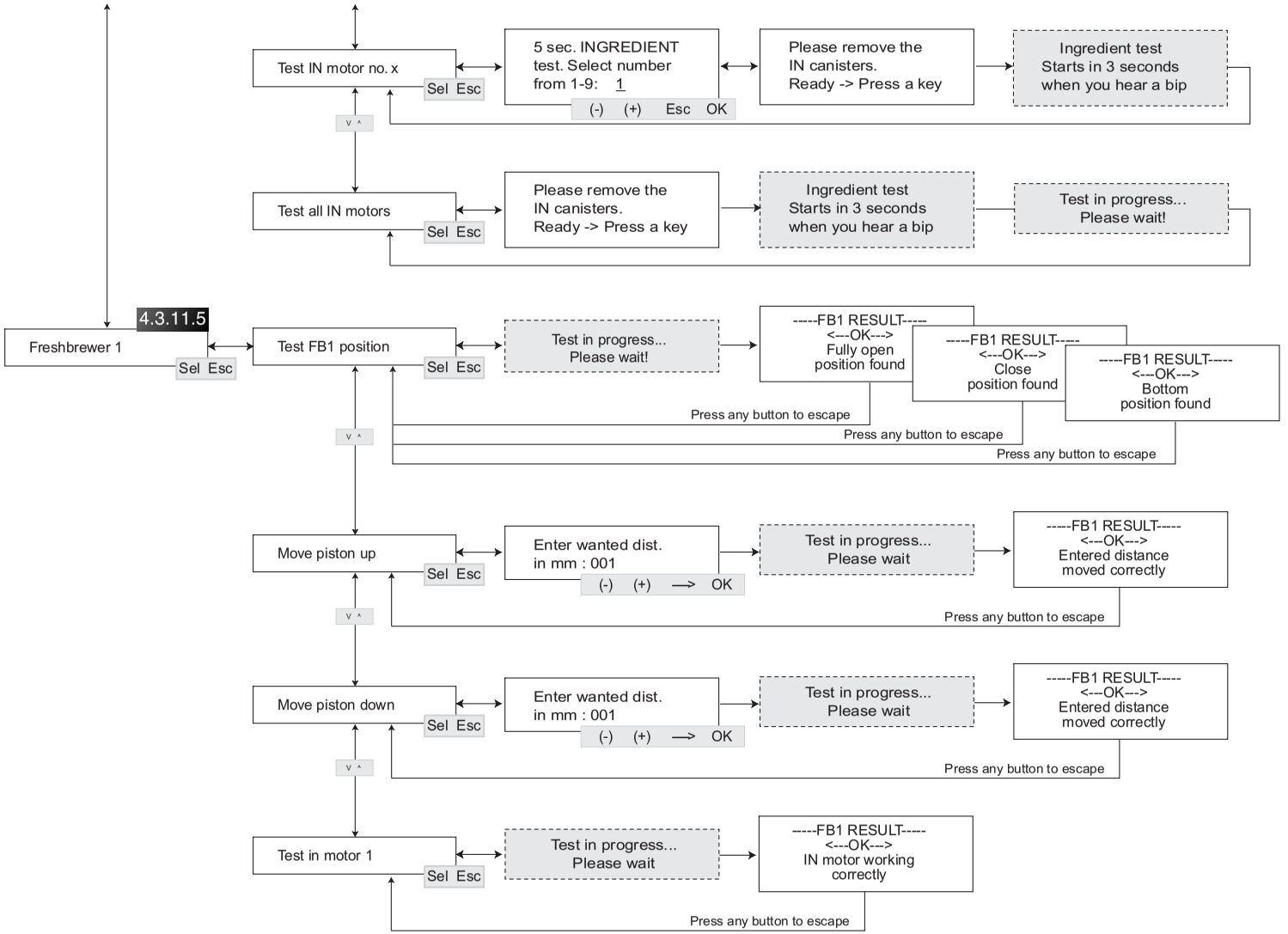


Diagnostics/Test menu

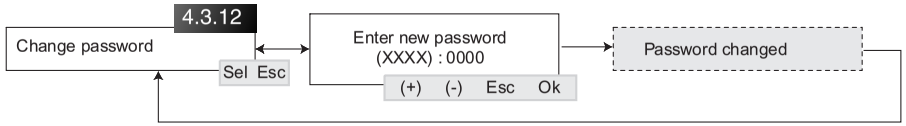



4.3.11.3
User interface
Sel Esc
Button/Key test
Sel Esc
Coinreturn but. : OFF
Key status : OFF
Press any button
Direct sel. no. X
pressed/released....
v ^
Display test
Sel Esc
----DISPLAY TEST----
abcdefghijklmnopqrst
ABCDEFGHIJKLMNOPQRST
1 2 3 4 5 6 7 8 9 0
-SPECIAL CHAR TEST--
ARROW = ->
BOLD R = R
BOLD F = F
Pre. sel. led test
Sel Esc
--PRE.SEL.LED TEST--
Test in progress...
Door light toggle
Sel Esc
OFF
ON
Test Init. text
Sel Esc
Wittenborg 7600
Nres tot :
Res tot :
<<<Initializing>>>
Press any button to escape
Coin return motor
Sel Esc
--DIAGNOSTICS/TEST--
Test in progress...
Please wait!
-COIN RETURN MOTOR--
<---OK--->
Motor and switch
working correctly.
Press any button to escape
water/power/heat


4.3.11.4
Water/power/heat
Sel Esc
Water sensors
Sel Esc
Water temp.: xx.x°
Water level: ON
Solid waste: OFF
Liquid waste: OFF
Press any button to escape
V ^
Pump on/off
Sel Esc
ON
Heater on/off
Sel Esc
ON
Fan on/off
Sel Esc
ON
Test whipper no. x
Sel Esc
Whipper 0,5 second
test. Select number
from 1-8: 1
(-) (+) Esc OK
Mixer test
Starts in 3 seconds
when you hear a bip
Test all whippers
Sel Esc
Mixer test
Starts in 3 seconds
when you hear a bip
Test in progress...
Please wait!
Test valve no. x
Sel Esc
Valve 0,5 second
test. Select number
from 1-11: 1
(-) (+) E—> OK
Open valve test
starts in 3 seconds
when you hear a bip
Test all IN valves
Sel Esc
Open valve test
starts in 3 seconds
when you hear a bip
Test in progress...
Please wait
Freshbrewer 1
Test IN motor no. x


Test IN motor no. x
Sel Esc
5 sec. INGREDIENT test. Select number from 1-9: 1
(-) (+) Esc OK
Please remove the IN canisters. Ready -> Press a key
Ingredient test Starts in 3 seconds when you hear a bip
V ^
Test all IN motors
Sel Esc
Please remove the IN canisters. Ready -> Press a key
Ingredient test Starts in 3 seconds when you hear a bip
Test in progress... Please wait!
4.3.11.5
Freshbrewer 1
Sel Esc
Test FB1 position
Sel Esc
Test in progress... Please wait!
-----FB1 RESULT-----
<---OK--->
Fully open position found
-----FB1 RESULT-----
<---OK--->
Close position found
-----FB1 RESULT-----
<---OK--->
Bottom position found
Press any button to escape
Press any button to escape
Press any button to escape
Move piston up
Sel Esc
Enter wanted dist. in mm : 001
(-) (+) —> OK
Test in progress... Please wait
-----FB1 RESULT-----
<---OK--->
Entered distance moved correctly
Press any button to escape
Move piston down
Sel Esc
Enter wanted dist. in mm : 001
(-) (+) —> OK
Test in progress... Please wait
-----FB1 RESULT-----
<---OK--->
Entered distance moved correctly
Press any button to escape
Test in motor 1
Sel Esc
Test in progress... Please wait
-----FB1 RESULT-----
<---OK--->
IN motor working correctly
Press any button to escape

Change password menu



4.3.5 Adjust system menu

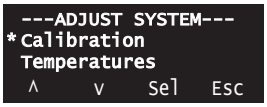
Introduction

The Adjust system menu makes it possible to calibrate the valves and canisters.

Options

The Adjust system menu includes the following options:
- Calibration, see 4.3.5.1
- Temperatures, see 4.3.5.2
- Lower cup sensor, see 4.3.5.3
- Cup sensor status, see 4.3.5.4
- Brewer park pos., see 4.3.5.5
- Pot sensor On/Off, see 4.3.5.6

4.3.5.1 Calibration



This table describes the options of the Calibration menu.

Sub menu	Description
Ingredient	Calibration of the amounts of ingredients delivered from the canisters. The amounts are measured in mg per second.
Valve	Calibration of the amounts of water delivered through the IN valves and the hot water valves. Two calibrations must be made for each valve, the first one measures the delivered amount of water at the minimum pump speed, and the second one measures the delivered amount of water at the maximum pump speed. The amounts are measured in ml per second.
Cold water	Calibration of the amount of water delivered through the cold water valve. The amount is measured in ml per second.

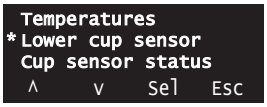
- Have beaker graduated in ml ready for calibration of valves.
- Have cup and a pair of scales ready for calibration of ingredients.
- Press ‘Sel’ to select a valve.
- Press ‘OK’ to start the calibration
- Adjust value if the shown amount deviates from the measuring.

4.3.5.2 Temperatures

This table describes the options of the Temperatures menu.

Sub menu	Description
Nominal temp.	Setting of maximum water temperature in the boiler. Default settings are: For freshbrew machines: 95 °C. For instant machines: 84°
Lock temperature	Setting of low temperature limit, e.g. 85 °C. If the water temperature reaches the low temperature limit or falls below it, dispensing of drinks is blocked until the water is sufficiently heated again. (The message “Temperature low” is shown in the display for as long as the machine is not operable.)

4.3.5.3 Lower cup sensor



This table describes the Lower cup sensor option.

Sub menu	Description
Lower cup sensor	The sensitivity of the infra-redinfra-red lower cup sensor can be adjusted to fit the transparency of the cups used. The sensitivity can be graded from 0 to 7. The higher the value, the less likely the sensor is to detect a transparent cup or a cup made of a thin material. Default setting is 3. *The lower cup sensor detects whether the customer inserts own cup or jug or the machine should dispense a cup.*

4.3.5.4 Cup sensor status

This table describes the cup sensor option.

Sub menu	Description
Cup sensor status	Use the Cup sensor option to turn the cup sensor on or off. *The option is set to off if the cups used are low and do not reach to the sensors or if cups of a transparent material, e.g. glass, are used.*

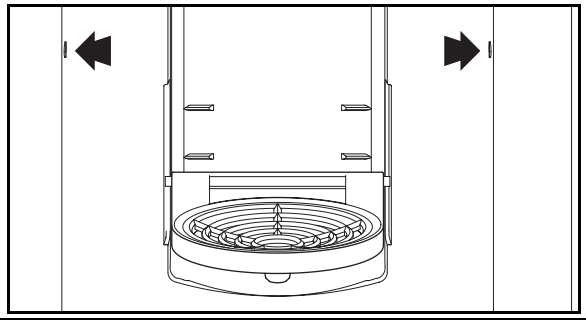
4.3.5.5 Brewer park position

The brewer can be set to stop in an open or closed position when in stand-by.

Sub menu	Description
Brewer park pos.	Open: the scraper is parked at front of brewer and the brewer cylinder in a sligthly elevated position. Closed: the scraper is parked at rear of brewer and the brewer cylinder in a lowered position.

4.3.5.6 Pot sensor On/Off

This table describes the Pot sensor On/Off option.

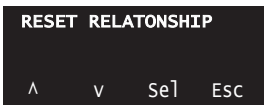
Sub menu	Description
Pot sensor On/Off	The Pot sensor on/off option is used in connection with multibrew: On: When the multibrew button/key is pressed/ turned, the sensor must detect a pot on the platform before dispensing of drinks can take place. Off: The machine will dispense multibrew drinks without detecting a pot on the platform. *Note: The option should be set to off if the pots used are low and do not reach to the sensors or if pots of a transparent material, e.g. glass, are used.* 

4.3.6 Reset relationship menu

Introduction

The Reset relationship menu is used to remove the electronic lock that links the vending machine to a specific portable data carrier.

The first time a data carrier is used with the vending machine, the machine is electronically locked to this particular data carrier in order to protect data from being retrieved and reset by other data carriers.



Sub menu	Description
Reset relationship Continue?	Press ‘OK’ to remove the electronic lock between vending machine and data carrier.

4.3.7 Change comm. route menu

Introduction

The Change comm. route menu is used to set the mode of data read-out to a pc or a hand held terminal. Data can be retrieved via infra-red connection or via a serial data cable

4.3.7.1 Change comm. route

This table describes the options of the Change comm. route menu. First, select 'Closed door' or 'Opened door' depending on the type of data retrieval device. Secondly, select the communication route.

Sub menu	Description
Closed door (key switch activated)	Serial XModem For data retrieval via a serial data cable and XModem protocol. Serial EDDCMP: For data retrieval via a serial data cable and EDDCMP. IR XModem: For data retrieval via infra-red connection and XModem protocol. IR EDDCMP: For data retrieval via infra-red connection and EDDCMP. Back to terminal: This option is used to enable communication between the vending machine and a pc, e.g. to change the setup of data in the machine.
Opened door (key switch deactivated)	Terminal mode: This option is used to enable communication between the vending machine and a pc, e.g. to change the setup of data in the machine. Configurator mode For data retrieval via a PSION hand-held terminal or configurator tool.

4.3.8 Payment settings menu

Introduction

The Payment system menu allows for handling of payment, e.g. coin mechanisms and multi vend/single vend.

Options

The Payment system menu includes the following options:

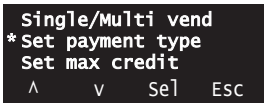
- Single/Multi vend, see 4.3.8.1
- Set payment type, see 4.3.8.2
- Set max credit, see 4.3.8.3
- Set max change, see 4.3.8.4
- Obligation to buy, see 4.3.8.5
- Coin inhibit, see 4.3.8.6
- Low change inhibit, see 4.3.8.7
- Audit unit Ext/Int, see 4.3.8.8
- Exact change eq., see 4.3.8.9
- Exact change offset, see 4.3.8.10
- Keyboard inhibit, see 4.3.8.11
- Price mode, see 4.3.8.12
- Revalue, see 4.3.8.13
- Immediate change, see 4.3.8.14
- Currency code (auto), see 4.3.8.15
- Currency code (man), see 4.3.8.16
- Coin validator, see 4.3.8.17

4.3.8.1 Single/Multi vend

This option is used to switch between the two options Single and Multi vend.

Sub menu	Description
Single/Multi vend	The machine can be set for either single or multi vend: *Single vend*: Possible change is returned or the card released after each vend. *Multi vend*: Several drinks may be purchased one after the other from one cash or card payment as long as sufficient credit is available.

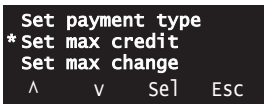
4.3.8.2 Set payment type



This option is used to define the payment type, ie the type of coin mechanism in the vending machine.

Sub menu	Description
Payment type (0-4)	Setting of the coin mechanism type available in the machine. Options: 0 = OFF (no coin mechanism) 1 = MDB 2 = EXEC (Executive) 3 = BDV 4 = VAL (coin validator)

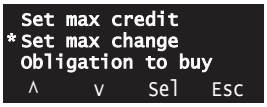
4.3.8.3 Set max credit



This option is used to set an amount for the maximum allowed credit.

Sub menu	Description
Set max credit	Definition of the maximum amount which can be inserted in one vend when the system is set to multi-vend.

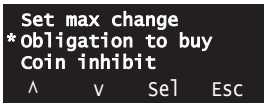
4.3.8.4 Set max change



This option is used to set an amount for the maximum allowed change.

Sub menu	Description
Set max change	Definition of the maximum amount which the coin mechanism can return after a vend when the system is set to multi-vend. If the coin credit remaining following a multi-vend is greater than the programmed max change value, no change will be paid out. The full credit will be retained until further purchases are made reducing the credit below the maximum change level.

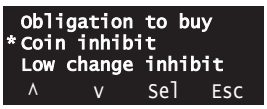
4.3.8.5 Obligation to buy



This option is used to set the Obligation to buy option on or off.

Sub menu	Description
Obligation to buy	If this option is set to “On”, the customers have to make at least one vend before the coin mechanism will return the change. The purpose of the function is to prevent that the vending machine be used as a change giver.

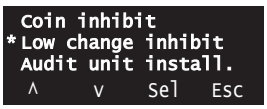
4.3.8.6 Coin inhibit



This option is used to set the Coin inhibit status for the individual coin values in the coin unit.

Sub menu	Description
Coin inhibit (1-16)	The coin inhibit option makes it possible to set the coin unit to reject coins that are normally accepted in the coin unit. “Coin 1“ is the lowest-value coin. Status for up to 16 coin values can be defined.

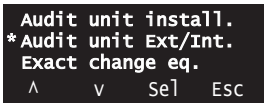
4.3.8.7 Low change inhibit



This option is used to set the Low change inhibit status for individual coins.

Sub menu	Description
Low change inhibit (1-16)	The Low change inhibit option makes it possible to set the coin unit to reject coins that are normally accepted when the stock of coins in the coin tubes run low. “Coin 1“ is the lowest-value coin. Status for up to 16 coin values can be defined.

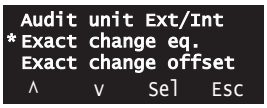
4.3.8.8 Audit unit Ext/Int



This option is used to shift between the activation of an internal and an external audit unit.

Sub menu	Description
Audit unit Ext/Int	If an external audit unit has been installed, it must be activated through this option. Once activated, the external unit will take over all handling of audit data sent from the coin mechanism, and at the same time the standard internal unit will be deactivated. Select “Ext” to activate the external audit unit. Select “Int” if you want to deactivate the external audit unit and go back to using the machine’s internal audit unit.

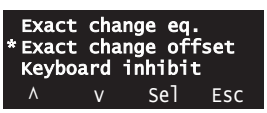
4.3.8.9 Exact change eq.



This option is used to set parameters for the exact change equation.

Sub menu	Description
Exact change eq.	The purpose of the Exact change equation option is to specify the preconditions for when the coin unit should switch to “Coin tubes empty” mode and the vending machine displays “Use exact change”. Choose a value between 0 and 15 according to the combinations of tube empty states as defined in the manual of the coin unit.

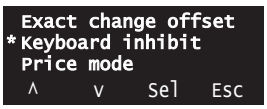
4.3.8.10 Exact change offset



This option is used to set parameters for the exact change offset.

Sub menu	Description
Exact change offs.	The “Exact change offset” option renders the possibility of adding a number of coins to the preprogrammed empty numbers in the coin tubes in order that the customer is requested to insert the exact amount before the coin unit switches to “Coin tubes empty” mode. (See 4.3.8.9 “Exact change equation”.) Example: The Exact change offset is set to 10. The Exact change equation (4.3.8.9) is set to ‘A and B only’, (i.e. when the coin tubes A and B run low, the machine will assume a “Coin tubes empty” state). Result: When the amount of coins in the tubes A or B is down to 10 above the empty mark, the customer will be requested to insert exact change.

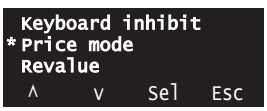
4.3.8.11 Keyboard inhibit.



The Keyboard inhibit option is used to activate or deactivate the keyboard of the coin unit.

Sub menu	Description
Keyboard inhibit.	If the coin unit is equipped with a keypad, it is possible to deactivate it. Select “On” to deactivate the keyboard.

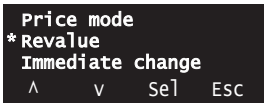
4.3.8.12 Price mode



This option is used to select one of the price setting modes, Index or Real.

Sub menu	Description
Price mode	The choice of Price mode depends on whether prices are set in the coin unit or directly in the price settings menu, 4.2.8.1: *Index:* Prices of each drink are defined in the coin unit, and only the index numbers that relate to each drink in the coin unit are set in the price settings menu, 4.2.8.1. *Real:* The actual prices of each drink are entered in the price settings menu, 4.2.8.1.

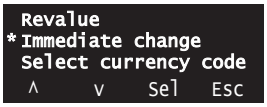
4.3.8.13 Revalue



This option is used to activate or deactivate the card revaluation option.

Sub menu	Description
Revalue	The Revalue option makes it possible to let customers add value to the credit amount on their cards. Select “On” to enable the Revalue option.

4.3.8.14 Immediate change

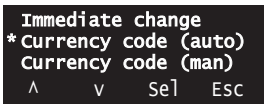


With the Immediate change option the system can be set to claim credit and return possible change right after a vend has been initiated. The Immediate change option reduces vend time.

If something goes wrong during delivery of the drink, the system will not return the inserted amount when Immediate change is activated.

Sub menu	Description
Immediate change	‘On’: The amount of credit inserted is claimed before the drink is dispensed, i.e., right after the drink selection has been made. Note: If ‘Singlevend’ is set to ‘On’, possible change will be paid out immediately. ‘Off’: The credit will be claimed after the dispensing of the drink.

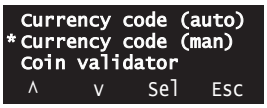
4.3.8.15 Currency code (auto)



This option is used to select one of the currency codes that are preset in the machine.

Sub menu	Description
Currency code	Setting of the currency available in the machine. Options: EUR DKR GBP SKR NOK Note: If the required currency is not available, see manual setting option below.

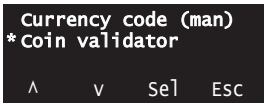
4.3.8.16 Currency code (man)



If the required currency code is not available among one of the preset currency codes (see option above), the curency can be entered as a numeric code.

Sub menu	Description
Currency code (man)	Enter the four-digit numeric code of the required currency as defined in the MDP/ICP protocol specification. For example, the code for EUR is ‘1978’

4.3.8.17 Coin validator



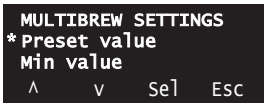
This option is used to configure the menu system in accordance with the coin validator installed in the vending machine.

Sub menu	Description
Coin validator	The values listed under A, B, C etc. in this menu, must correspond to the list of values marked on the side of the coin validator. It is possible to change the individual values if they disagree with the values indicated on the coin validator.

4.3.9 Multibrew settings menu

Introduction

The Multibrew settings menu is used to set parameters for the multibrew function.

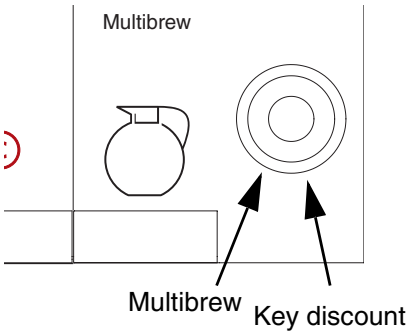
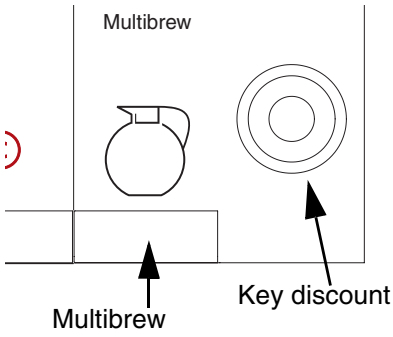


This table describes the options of the Multibrew settings menu.

Sub menu	Description
Preset value	The function is used to define a preset number of portions between 0 and 20 to be dispensed when the multibrew function is activated. Example: A setting of 6 results in an automatic dispensing of six portions when the multibrew function is activated provided that this number is not changed by the user prior to activating.)
Min value	A number can be set to define a minimum of portions to be dispensed during a multibrew vend. The minimum possible number of portions is 1.
Max value	A number can be set to define a maximum of portions to be dispensed during a multibrew vend. The maximum possible number of portions is 20.
Means of action	This function is used to define how multibrew vends should be activated. The options are: Off: Multibrew is not possible Key: Multibrew is activated by a key. But: Multibrew is activated by pressing the Multibrew button. (See also section *Key discount and Multibrew settings, on page 4-77*.)
MB Discount	The discount option makes it possible to set a discount rate which is given on multibrew vends. Example: A setting of 20 results in a discount of 20% when the multibrew function is activated. A setting of 100 means free vend.

Key discount and Multibrew settings

This table describes how the Key discount function (4.2.10.6) works together with different settings of the Multibrew function.

 Both key discount and multibrew activated by key.	 Multibrew activated by multibrew button and key discount activated by key.
Key discount: Key discount on drinks dispensed in cups is not possible.	**Key discount:** Key discount on drinks dispensed in cups is possible.
Multibrew: Multibrew is possible. If a discount has been defined for both key discount and multibrew, the higher discount rate will be granted.	**Multibrew:** Multibrew is possible. If a higher discount has been defined for key discount than for multibrew, the higher discount is obtained when the discount key is inserted during the multibrew.

4.3.10 Change config. files menu

Introduction

The Change config. files menu is used to choose menu language, recipe settings and menu configurations.

This table describes the options of the Change config files menu.

Sub menu	Description
Set language file	The function is used to select the required language file for the texts used in display and Event logbook.
Set recipe file	The function is used to select the required recipe file. *Note: When changing the recipe file, please be aware that the existing drink counters will be overwritten by new ones with new text labels, giving the impression that the present figures in the non resettable counters apply to the new text labels, (e.g. 'Coffee with milk' may be replaced by 'Chocolate').* *To avoid erroneous information about the number sold and turnover of individual drinks it may therefore be recommended to read out the status of the non resettable counters before switching to a new recipe file.*
Set menu file	The function is used to select the required menu file.

4.3.11 Diagnostic/Test menu

Introduction

The Diagnostic/Test menu is used to manually test the functioning of various parts of the vending machine.

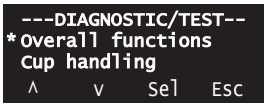
Options

The Diagnostic/Test menu includes the following submenus:
- Overall functions, see 4.3.11.
- Cup handling, see 4.3.11.2.
- User interface, see 4.3.11.3.
- Water/Power/Heat, see 4.3.11.4.
- Freshbrewer 1, see 4.3.11.5.

During most of the tests, the door of the vending machine must be closed. A warning message will appear if attempts are made to start a test while the door is open.

In the Diagnostics/Test menu the system will time out after three minutes of inactivity. Immediately before the time-out, four warning beeps (three short and one long) will sound.

4.3.11.1 Overall functions



In the submenu Overall functions, the wittlink communication is tested, i.e. the communication between the main prints. Furthermore, tests of the dispensing system can be made.

Sub menu	Description
Wittlink test	Tests the Wittlink communication status: • VMC: Comm.: status OK or Not OK. • SPC: Comm.: status OK or Not OK. • FB1: Comm.: status OK or Not OK. If the message 'Not OK' is given, it is due to one of the following reasons: • Defective or not properly connected print. See how prints are assembled or replaced in *chap. 5K, page 5K-8 - 5K-13.* • PIC micro controller incorrectly inserted (turned upside down) or missing. See how PIC micro controller is inserted in *chap. 5K, page 5K-15.*

Sub menu	Description
Full dispense test	Note: During this test it is not required that the door is closed. The test will reveal if any of the components of the dispensing system have been incorrectly assembled. Press 'Sel' to start the test. The message 'Please remove the IN canisters' now appears in the display. You may either remove the canisters or ignore the message and continue the test by pressing OK. Note: If you run the test with the canisters still in the machine, ingredient powder will be dropped into the mixing funnels, but no water is used in this test. Therefore, the funnels should be emptied after the test. A test of the individual parts of the dispensing system is performed in the following order: • Fan: Tests if fan is running correctly by turning it on for five seconds. • Pump: Tests if pump is running correctly by turning it on for five seconds. • Brewer: Brewer is closed and water pressed through cylinder to check valve and dispenser motor. (In machines with two brewers, the right most brewer is checked first). • IN module: A five second test of each instant module one at a time is carried out in the following order from left to right: ingredient motor 1, whipper 1, water inlet into mixing funnel 1, ingredient motor 2, whipper 2 etc. Note: If the test order varies from the left-to-right order, e.g. if ingredient motor 3 starts before ingredient motor 2, it is an indication that the modules have been assembled incorrectly.
Test vend	The Test vend option makes it possible to dispense any of the available drinks for testing. To perform the test, close the door. When the display reads "DISPENSING TEST", press any selection key to have the machine dispense a test drink.

4.3.11.2 Cup handling

In the submenu Cup handling, sensors related to the dispensing system are tested.

General error message

The following message may occur in the submenu of the Cup handling menu: “No response from SPC. Check comm. and PCB”

The message appears if nothing has happened within 20 seconds after the start of the test.
Possible causes: Wittlink error, defective print. Perform the Wittlink test (see first test of the Diagnostic/Test menu).

Sub menu	Description
Sensor test	The following sensors are tested: • Lower opto: status On or Off. To carry out the test of the sensor, an object, eg. a cup or a pot must be placed on the platform or held in front of the sensor and removed again. The status should be “On” when the sensor detects an object, and “Off” when it is removed. If the status of the sensor does not switch from ‘On’ to ‘Off’ or vice versa when an object is inserted or removed, it is an indication that the switch or sensor is defect or not positioned correctly. Check the sensor and replace if necessary. See how sensor is replaced in *chap. 5D, page 5D-1.*

4.3.11.3 User interface

The user interface submenu is a test of selection buttons, display, pre-selection LEDs, doorlight, initialization text and coin return motor.

General error message

The following message may occur in all of the submenus of the User interface menu: ‘No response from SPC. Check comm. and PCB’

The message appears if nothing has happened within 20 seconds after the start of the test.
Possible causes: Wittlink error, defective print. Perform the Wittlink test (see first test of the Diagnostic/Test menu) and/or check print.

Sub menu	Description
Button/Key test	Tests the operating panel buttons and key. To perform the test: • Press the coin return button. The status will change from Off to On until released. • Turn the Multibrew/Discount key. The status will change from Off to On or vice versa. • Press any selection, pre-selection, multibrew or cancel button. The display will show the index number of the pressed key until it is released. To leave this menu wait for the system to time out after 10 seconds of inactivity. A timer shown in the lower right corner of the display counts down from 10 to 0. The message “Error!! Button hanging” is shown if a button on the selection panel is stuck. In most cases it will be sufficient to loosen the selection panel and nudge the button into place again. If that, however, does not help, the selection panel must be taken out and the button(s) in question adjusted or replaced. See how selection buttons are replaced in *chap. 5G, page 5G-7*.
Display test	Shows the selected character set used in the display. The first window shows letters and numbers, the second shows special characters. A sure indicator that the wrong display has been installed is if the arrow shown in the special characters window does not have a proper arrow head.
Pre. sel. led test	Tests the LEDs above the preselection buttons. To perform the test, press ‘Sel’. The machine runs a test of the LEDs from left to right. A beep will sound when the test is completed.
Door light toggle	Tests poster doorlight. To perform the test, press ‘Sel’ to turn doorlight on or off, (the display shows whether it is turned on or off).
Test Init. text	Runs the initialization text, i.e. the text that is shown in the display during power up of the machine or when it is switching from menu to vend mode. To perform the test, press ‘Sel’. The display will run the initialization text. Press any button to stop the test.

Sub menu	Description
Coin return motor	Performs a test run of coin return motor. After a successful test the message 'Motor and switch working correctly' is given. If the test is not successful, either the general error message mentioned at the beginning of this section or the following message will appear in the display: • "Switch or motor not correctly connected" Possible causes: - Motor disconnected, defective wire, defective motor, defective switch. See how the coin mechanism is removed in *chap. 5G, page 5G-2.* - Defective SPC.See how SPC is replaced in *chap. 5K, page 5K-13* - Foreign body is blocking the movement of the coin return motor, e.g. if the coin mechanism has been incorrectly installed.

4.3.11.4 Water/Power/Heat

The Water/Power/Heat submenu checks the VMC (Vending Machine Controller) by performing test runs of the water sensors, the pump, the water heater, the fan, the whippers, the valves and the IN motors.

General error message

The following message may occur in all of the submenus of the Water/ Power/Heat menu. 'No response from VMC. Check comm. and PCB.

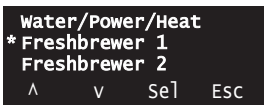
The message appears if nothing has happened within 20 seconds after the start of the test.
Possible causes: Wittlink error, defective print. Perform the Wittlink test (see first test of the Diagnostic/Test menu) and/or check print.

Sub menu	Description
Water sensors	Status of the following sensors is shown: • Temperature sensor: current temperature shown. • Water level sensor: status OK or low. • Solid waste sensor (in coffee waste bucket): status On or Off. • Liquid waste sensor (in waste bucket or drip tray, depending on machine type): status On or Off.
Pump on/off	Tests if the pump is running correctly by turning it on for two seconds.
Heater on/off	Tests if the heater is functioning correctly by turning it on for five seconds.

Sub menu	Description
Fan on/off	Tests if the fan is running correctly by turning it on for five seconds.
Test whipper no. x	Runs a test of selected whipper for 0.5 seconds. To perform the test, press 'Sel', select whipper no. (no. 1 = left most whipper) and press 'OK'. More whippers can be tested subsequently.
Test all whippers	Runs a test of all whippers in a sequence from left to right. To perform the test, press 'Sel'. A beep will sound after the testing of each whipper. Press any button to stop the test.
Test valve no. x	Runs a test of selected valve for 0.5 seconds. To perform the test, press 'Sel', select valve no., and press 'OK'. More valves can be tested subsequently.
Test all IN valves	Runs a test of all IN valves in a sequence. To perform the test, press 'Sel'. A beep will sound after the testing of each valve. Press any button to stop the test.
Test IN motor no. x	Runs a test of selected IN motor for two seconds. To perform the test, press 'Sel', select IN motor no. (no. 1 = left most IN motor), and press 'OK'. The message "Please remove the IN canisters" now appears in the display. You may either remove the canisters or ignore the message and continue the test by pressing any key. Note: If you run the test with the canisters still in the machine, ingredient powder will be dropped into the mixing funnels, but no water is used in this test. Therefore, the funnels should be emptied after the test. More IN motors can be tested subsequently. If the test run is not successful, either the general error message mentioned at the beginning of this section or the following message will appear in the display:
Test IN motor no. x (continued)	• "Ing. motor x overload" Possible causes: - Worn motor or gear. See how motor is changed in *chap. 5C, page 5C-8.* - Ingredient canister spout is closed. If you run the test without removing the ingredient canisters, the spouts must be open during testing. Open spout(s) and retry.

Sub menu	Description
Test all IN motors	Runs a test of all IN motors in a sequence from left to right. To perform the test, press 'Sel'. The message "Please remove the IN canisters" now appears in the display. You may either remove the canisters or ignore the message and continue the test by pressing any key. Note: If you run the test with the canisters still in the machine, ingredient powder will be dropped into the mixing funnels, but no water is used in this test. Therefore, the funnels should be emptied after the test. Press any button to stop the test. If the test run is not successul, either the general error message mentioned at the beginning of this section or one of the following messages will appear in the display: • "Ing. motor x overload" Possible causes: - Worn motor or gear. See how motor is changed in *chap. 5C, page 5C-8*. - Ingredient canister spout is closed. If you run the test without removing the ingredient canisters, the spouts must be open during testing. Open spout(s) and retry.

4.3.11.5 Freshbrewer 1



The Freshbrewer 1 submenu tests the freshbrewer and the IN motor 1.

General error message

The following message may occur in all of the submenus of the Freshbrewer 1 submenu: "No response from FB1. Check comm. and PCB"

The message appears if nothing has happened within 40 seconds after the start of the test.
Possible causes: Wittlink error, defective print. Perform the Wittlink test (see first test of the Diagnostic/Test menu) and/or check print.

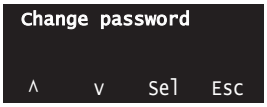
Sub menu	Description
Test FB1 positions	Tests that Freshbrewer 1 can move to three positions: Fully open, Close and Bottom. To perform the test: 1. Press ‘Sel’. The brewer will move to “Fully open” position. 2. Press any key to go back, and press ‘Sel’ again. The fresh brewer now moves to “Close position”. 3. Repeat to go to the “Bottom position”. If the test is not successful, either the general error message mentioned at the beginning of this section or one of the following messages will appear in the display: 1. “Brewer moved but no switch activation” Possible causes: Brewer is not working satisfactory. Disassemble brewer and check. See *chap. 5B, page 5B-4.* 2. “Brewer clogged up, filter needs cleaning” Remove filter plate. Clean, descale or replace filter, see *Operating instructions.* 3. “Brewer blocked or not connected” Possible causes: - Foreign body stuck between piston and filter plate. - No tacho received or no current. This error may arise if the door has been opened and closed again while the brewer tried to find its position. Otherwise, check wire connections. - Wires for brewer disconnected or defective. - FB print defective, see how print is replaced in *chap. 5K, page 5K-10.* 4. “Unexpec. current” Possible causes: Unexpected current from brewer. Short circuit of FB1 print or defective FB1 print. Check print, replace if necessary, see *chap. 5K, page 5K-10.* 5. “FB1 short circuit” Possible cause: Fatal short circuit of FB1 print. Replace print, see *chap. 5K, page 5K-10.* 6. “Brewer or IN motor moved unexpectedly” Possible causes: The brewer or IN motor has made unexpected movement, e.g. if IN motor has been turned by hand.
Move piston up	Tests that the piston can move to a selected position (upwards in cylinder). To perform the test, press ‘Sel’, enter a value between 0 and 255 millimetres to tell the system how far you want the piston to move. Press ‘Sel’ again to start the test. Now two things may happen:

Sub menu	Description
Move piston up (continued)	1. The piston stops when the cylinder has moved the selected distance, and the message “Entered distance moved correctly” is given. 2. The piston stops when one of the positions “Fully open” “Closed” or “Bottom” is reached, and the message “Could not move dist. Close/End pos. found” appears. If the test is not successful, the same messages as apply to the FB1 positions test above may appear in the display.
Move piston down	Tests that the piston can move down (downwards in cylinder) The test is performed in the same way as ‘Move piston up’, above.
Test IN motor 1	Performs a testrun of IN motor 1 (brewer motor). To perform the test, press ‘Sel’. The motor will run for five seconds. After a successful test the message “IN motor working correctly” is given. If the test is not successful, either the general error message mentioned at the beginning of this section or one of the following message will appear in the display: 1. “IN motor did not move or no tacho received” Possible causes: - Motor disconnected, defective wire, defective switch. see how IN motor is disassembled in *chap. 5B, page 5B-4.* - Tacho circuit defective, see how tacho board is disassembled in *chap. 5B, page 5B-17* 2. The messages mentioned under items 4-6 in the FB1 positions test above applies to this test as well.

4.3.12 Change password menu

Introduction

The Change password menu is used to change the password used to access the Technician menu.



Sub menu	Description
Enter new password	Enter a new four-digit password and press ‘OK’ to confirm.

Table of contents

5 Functions

5.1 Total Overview - Components of FB 7100

- Refer to Spare Parts List, chapter 10.

5.2 General safety instructions

DANGER:	**The work described in this chapter must only be carried out by trained service technicians.**
DANGER:	**Safety devices must not be changed or bridged.**
DANGER	**Before starting the work, disconnect the dispenser from the electrical mains supply and close the water tap.**
DANGER	**When carrying out disassemblies at the boiler, there is the danger of being scalded by hot water (see chap. “Disassembly of the boiler”).**
DANGER	**After the repair work ensure that the waste bucket, its sensor, and the overflow hose are mounted correctly.**
DANGER	**When carrying out any kind of work, ensure that the earth connectors are mounted correctly in order to guarantee faultfree ground connection.**
DANGER	**All metal parts must be connected with metal screws. Beneath the screw head there must be a lock washer. Fasten the screws tightly (ground connection).**
WARNING	**The manufacturer cannot be held liable or responsible when other than original spare parts are used for repair work.**
WARNING	**Cable harnesses must not be repaired, but must be replaced completely.**
CAUTION	**In any case, observe the safety instruction of each chapter.**
CAUTION	**When the work has been finished, always carry out a functional test.**
CAUTION	**Make sure that all earthed conductor connections are connected and fastened tightly.**

There is an increased risk of injuries when the main switch is activated. The white cables carry 230V.

Be careful when the boiler cover has been dismounted. There is an increased risk of being scalded.

When working on the boiler or pump there is no protection against unintentionally pulling out a component and spilling hot water as a result.

Replace cable harnesses only as complete original spare parts!

Never repair the cable harness of the heating system. There is a risk of a fire!

For safety reasons the heating element and the cable harness of the heating system may only be replaced completely and together with the assembly group boiler or spare part boiler cover.

When disconnecting electrical connections hold the components to avoid draining the boiler. There is a risk of being scalded!

A Water System

A.1 Adjustments

General adjustments

Water temperature	Adjustable via software, see Chap. 4 “Programming”
Recirculation valve	Close the adjusting screw on the valve. Then unscrew 1.5 rotations using an Allen key (wrench size 5 mm).
Boiler temperature sensor	Adjustable via software, see Chap. 4 “Programming” Recommended value for boiler temperature sensor is 94°C - 96°C (201°F - 205°F).

A.2.(Dis-)assemblies

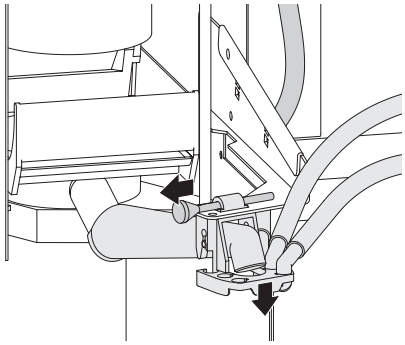
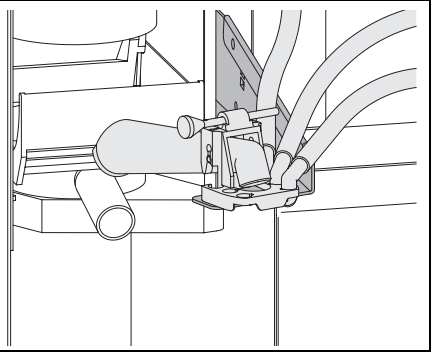
A.2.1 Releasing the distributor head

Preparation

- Open the door.
- Switch off the main switch

Releasing

Follow these steps to release the distributor head:

Step	Action	Illustration
1.	Remove green retaining pin from distributor head.	
2.	Pull delivery spout free of hose, and rest the distributor head on top of mounting arm.	

Installation

Installation is done in reverse order.

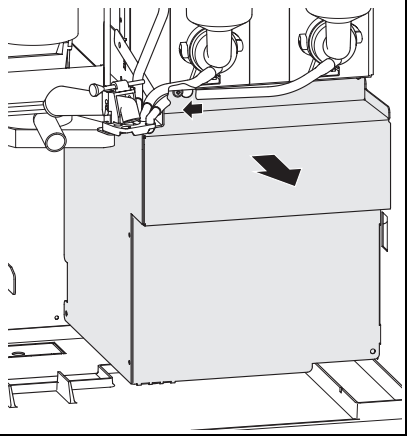
A.2.2 Removing the cover for water system

Preparation

- Open the door.
- Switch off the main switch.
- Remove the coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2.*

Removal

Follow these steps to remove cover:

Step	Action	Illustration
1.	Loosen one screw.	
2.	Pull cover to the left and lift it off.	

Assembly

Assembly is done in reverse order.

A.2.3 Draining water from the boiler

Preparation

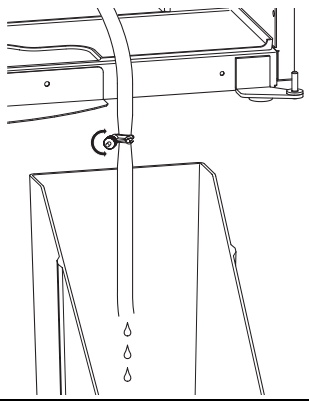
Before draining water from the boiler

- Open the door
- Switch off the main switch.
- Remove the coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

There is the danger of being scalded by hot water.

Draining the boiler

Follow these steps to drain water from the boiler:

Step	Action	Illustration
1.	Empty the waste bucket	
2.	Pull the outlet drain out of the boiler and place the outlet of the drainage hose in the empty waste bucket	
3.	Loosen the screw of the hose clamp located on the drainage hose and let the water drain completely from the boiler.	

- Remember to tighten screw of hose clamp after draining.

A.2.4 Removing the water system (boiler and pump)

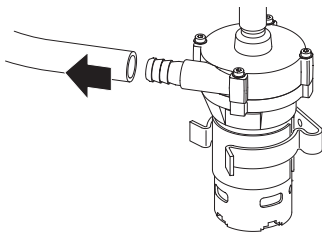
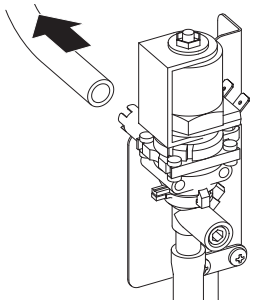
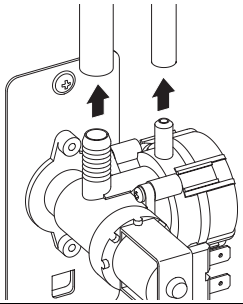
Preparation

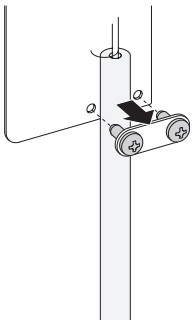
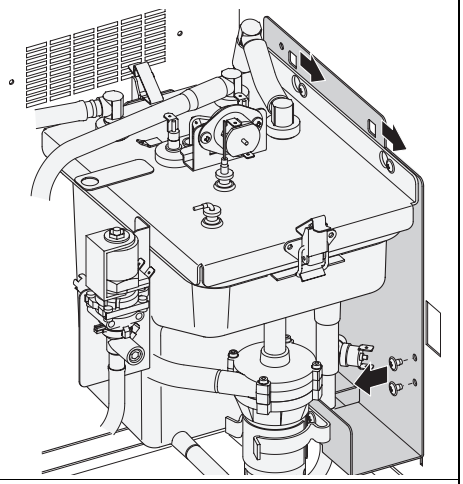
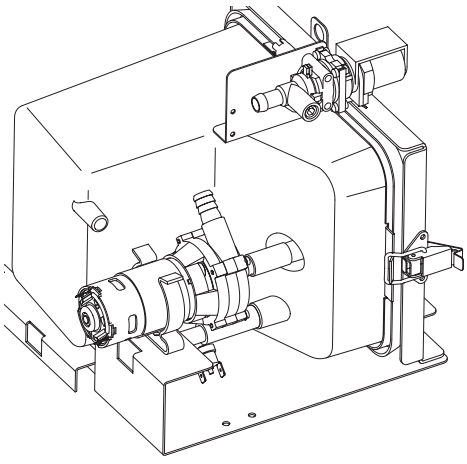
Before removing the boiler
- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.
- Drain the boiler completely, see *this section, page 5A-3*.

Hot water, risk of being scalded.

Removal

Follow these steps to remove the water system after having drained the water from it:

Step	Action	Illustration
1.	Remove hoses from 1. pump, 2. recirculation valve and 3. inlet valve (two pieces).	  

Step	Action	Illustration
2.	Remove electrical connections to • pump • inlet valve • overboil safety cut-out • temperature sensor • water level sensor • recirculation valve	
3	Loosen two screws from base sensor bracket, and pull out sensor.	
4	Remove the two screws from mounting bracket for water system.	
5	Slide complete water system forwards to release the hooks in the side of the cabinet. Tilt water system sligthly, remove earth wire and electrical connections to heater, and lift out watersystem.	
6	Place water system on the side on a plane surface outside of machine.	

Installation

Installation is done in reverse order. Clean hoses before refitting to pump or replace by new ones to prevent blocking of the pump because of lime-scale.

A.2.5 Disassembling the water system (boiler and pump)

Preparation

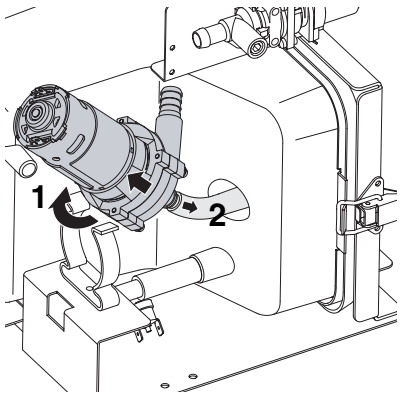
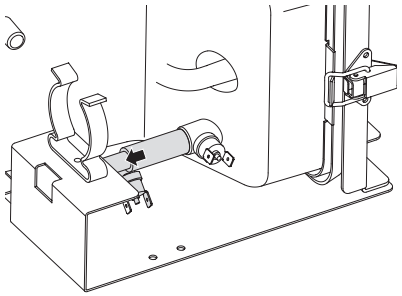
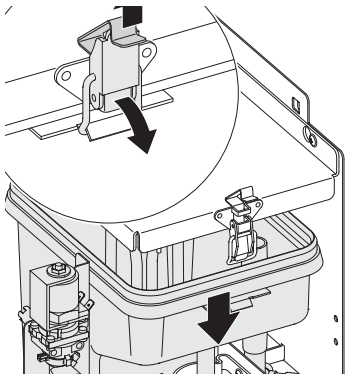
Before disassembling the water system

- Open the door .
- Switch off the main switch..
- Remove coffee waste bucket and pull forward the base tray
- Release distributor head and rest it on top of its mouting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.
- Drain the boiler completely, see *this section, page 5A-3*.
- Remove water system, see *this section, page 5A-4*.

Hot water, risk of being scalded.

Disassembly

Follow these steps to disassemble the water system after having removed it from the machine:

Step	Action	Illustration
1	Detach the pump from its clip (1) and hold the pump in a sligthly tilted position while removing hose from pump and boiler (2). This prevents limescale from falling into the pump.	
2.	Remove T-piece for overflow.	
3	Unclip boiler in both sides, and remove it.	

Assembly

Assembly is done in reverse order. Clean hoses before refitting to pump or replace by new ones to prevent blocking of the pump because of scales.

- Clean pump feed hose before refitting to pump or replace by new one to prevent blocking of the pump or valves because of scales.
- Inspect suction spout and pressure spout of pump for scaling, if necessary flush the pump before reinstallation.

A.2.6 Removing the temperature sensor (thermal feeler)

Preparation

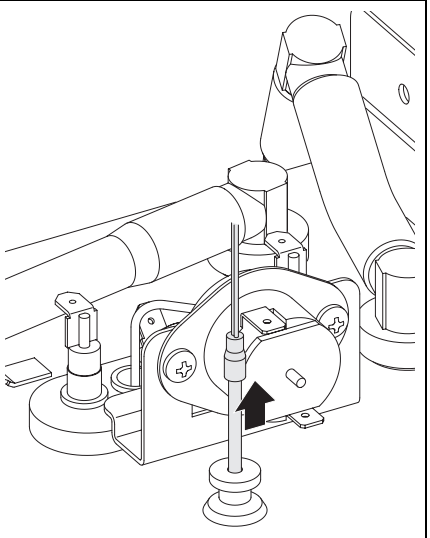
Before removing the temperature sensor

- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Hot water, risk of being scalded.

Removal

Follow these steps to remove the temperature sensor after having drained the boiler for water:

Step	Action	Illustration
1	Pull off the electrical connection.	
2	Pull the temperature sensor out of the boiler	

Installation

Installation is done in reverse order. Apply water on installation.

When the temperature sensor has been removed, a new sensor rubber bushing has to be used, as the old rubber bushing can damaged on removal of the sensor.

If the temperature sensor is not connected properly electrically, the heating element will not be switched off as long as the machine is switched on (boiling over).

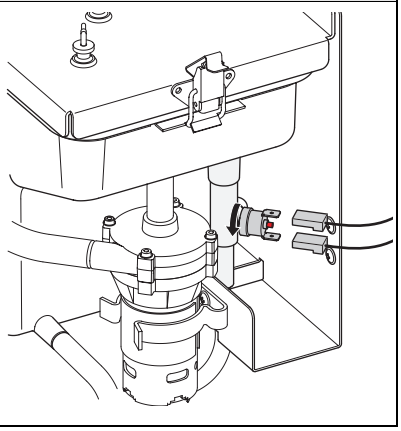
A.2.7 Removing the overboil thermostat

Preparation

Before removing the safety cut-out thermostat
- Open the door
- Switch off the main switch
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Removal

Follow these steps to remove the safety cut-out:

Step	Action	Illustration
1	Pull off the electrical connection.	
2	Unscrew the overboil thermostat from the overflow pipe.	

Installation

Installation is done in reverse order.

A.2.8 Resetting the overboil thermostat

Preparation

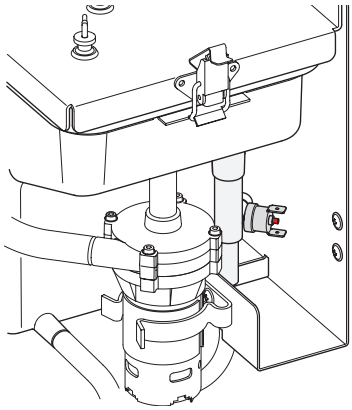
Before resetting the overboil thermostat
- Open the door
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Resetting

Press the reset button of the overboil thermostat.

Illustration

The overboil thermostat is located at the front of the boiler as illustrated below:



Installation

Installation is done in reverse order.

A.2.9 Removing the water level sensor (electrode)

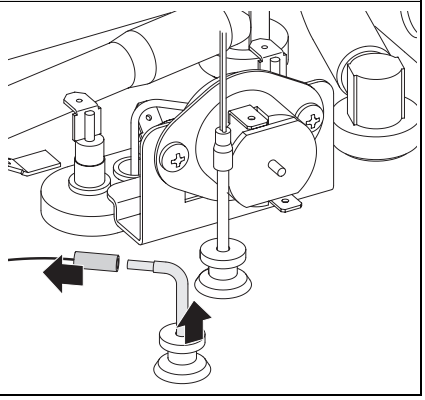
Preparation

Before removing the water level sensor

- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Removal

Follow these steps to remove the water level sensor:

Step	Action	Illustration
1	Pull off the electrical connection.	
2	Pull the water level sensor out of its holder.	

Installation

Installation is done in reverse order. Apply water on reinstallation.

Check the sensor holder for tear and brittleness, replace it if necessary. Check that the electrical connection is properly connected, as otherwise the water intake is not stopped automatically when the water reaches the water level sensor.

A.2.10 Disassembling the heating element and dry-boiling thermostat

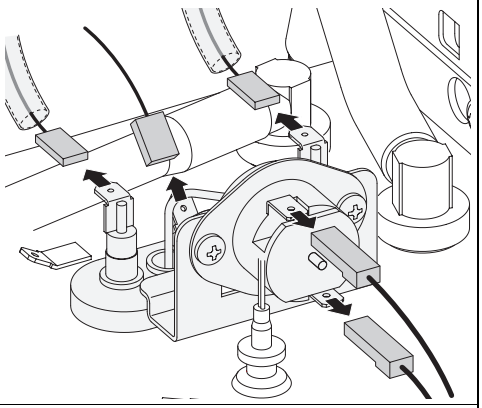
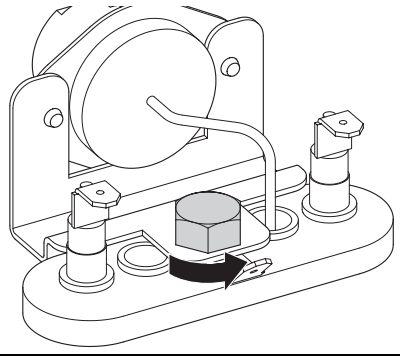
Preparation

Before disassembling the heating element and the dry-boiling thermostat

- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.
- Drain the boiler completely, see this section, page 5A-3.
- Remove the water system, see this section, page 5A-4.
- Remove the boiler, see this section, page 5A-4.

Disassembly

Follow these steps to disassemble the heating element:

Step	Action	Illustration
1	• Pull the insulating hoses off the heating element contacts • Disconnect the electrical connections as well as the earth wire.	
2	Loosen the nut at the heating element, and remove the heating element with the dry-boiling thermostat.	

Installation

Installation is done in reverse order.

A.2.11 Resetting the dry-boiling thermostat

Preparation

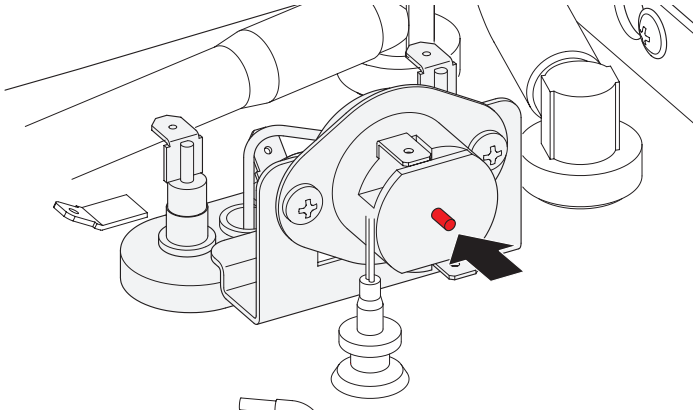
Before resetting the dry-boiling thermostat
- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Resetting

Press the reset button of the dry-boiling thermostat (see illustration below).

Illustration

The dry-running thermostat is located at the heating element on lid for boiler as illustrated below:



Assembly

Assembly is done in reverse order.

A.2.12 Disassembling the reflux valve and the supply hose

Preparation

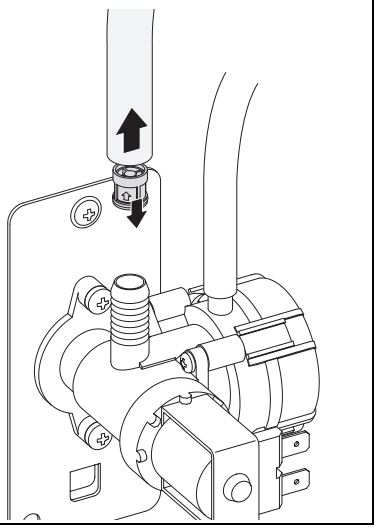
Before disassembling the water inlet parts
- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mouting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.
- Drain the boiler completely, see this section, page 5A-3.

Hot water, risk of being scalded.

Drain the boiler before you proceed. If the boiler is not drained, hot water will flow from the hoses as soon as the hoses are disconnected.

Disassembly

Follow these steps to disassemble the water inlet parts:

Step	Action	Illustration
1	Remove the inlet valve hose.	
2	Remove the reflux valve from inside the tube and check for impurities.	

Assembly

Assembly is done in reverse order.

A.2.13 Disassembling the inlet valve

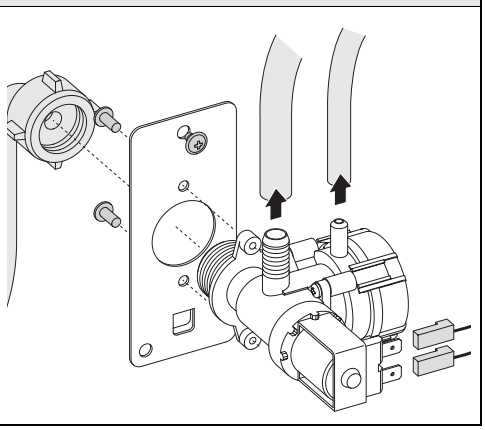
Preparation

Before removing the inlet valve

- Open the door.
- Switch off the main switch, and close the water tap.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mouting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Disassembly

Follow these steps to disassemble the inlet valve and connecting hose:

Step	Action	Illustration
1	Disconnect the electrical plug connections of the inlet valve.	
2	Remove hoses from the inlet valve. 1) Connecting hose 2) Hose from overflow 3) Hose from bottom of boiler	
3	Loosen screw of holder for inlet valve slide upward and lift out.	
4	Loosen and remove two screws to remove inlet valve.	

Assembly

Assembly is done in reverse order.

A.2.14 Resetting the pressure security valve of the inlet valve

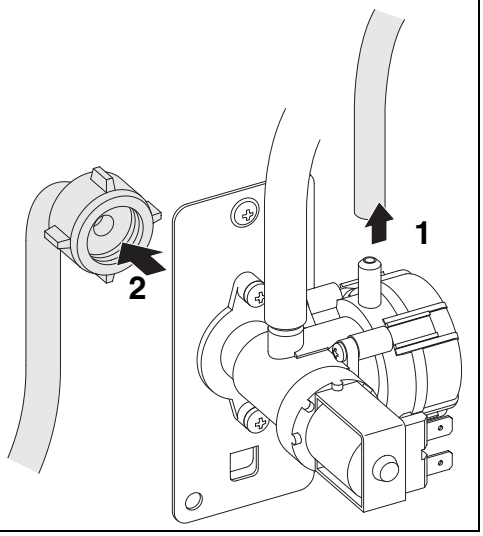
Preparation

Before removing the inlet valve

- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its holder arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Resetting

Follow these steps to reset the overflow thermostat

Step	Action	Illustration
1	Disconnect hose at pressure security valve(1).	
2	Empty water from the hose into waste bucket.	
3	Unscrew hose connection to connecting hose to release the pressure in inlet valve (2).	

Assembly

Assembly is done in reverse order.

A.2.15 Disassembing the recirculation valve

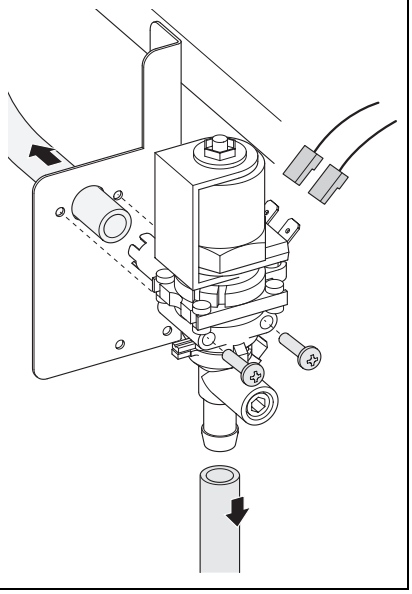
Preparation

Before removing the recirculation valve

- Open the door.
- Switch off the main switch.
- Remove coffee waste bucket and pull forward the base tray.
- Release distributor head and rest it on top of its mounting arm, see *this section, page 5A-2*.
- Remove cover for water system, see *this section, page 5A-2*.

Disassembly

Follow these steps to disassemble the recirculation valve:

Step	Action	Illustration
1	Disconnect the electrical plug connections of the valve	
2	Loosen two screws and pull the valve out of the bracket.	
3	Remove hoses from the outlet spouts of the valve.	

Assembly

Installation is done in reverse order.

A.2.16 Disassembling a dispensing valve for instant ingredients

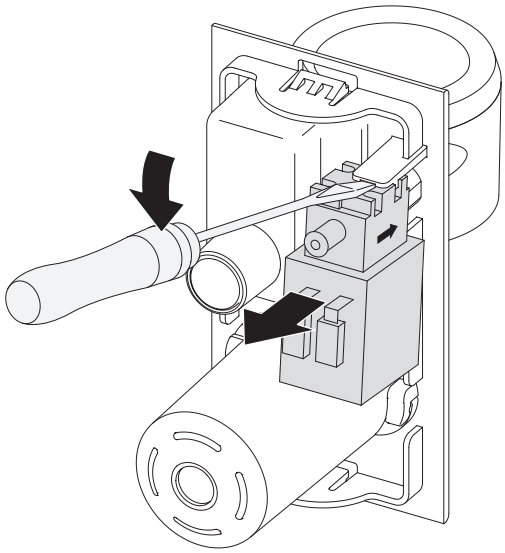
Preparation

Before disassembling a dispensing valve
- Open the door.
- Switch off the main switch
- Remove the instant ingredient mixing unit in question, *see chap. 5.C.2.1, page 5C-2*.

Disassembly

Use a flat screw driver to lift the locking tab as shown in the illustration below, and pull out the dispensing valve of the outlet tube module plate.

Illustration



Installation

Installation is done in reverse order.

Ensure that valve is properly seated in the outlet tube, which is simultaneously acting as a seal.

Note the flow direction of the outlet tube which should align with the direction marked on the outlet valve.

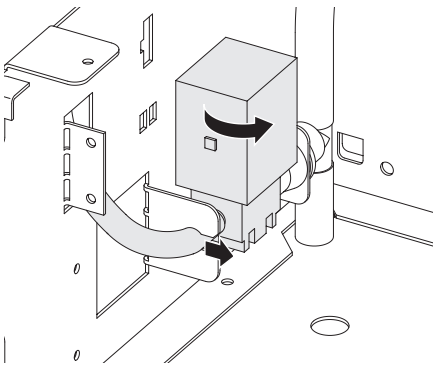
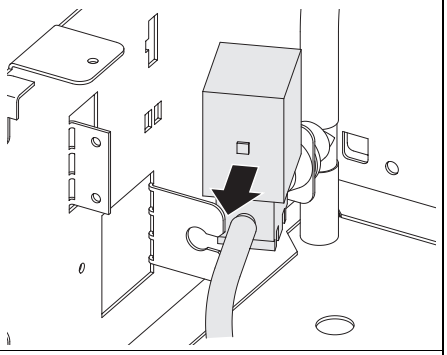
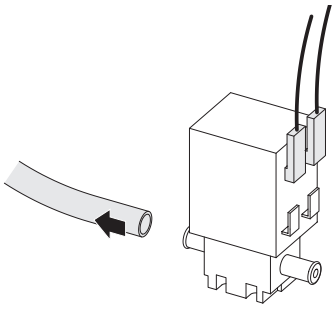
A.2.17 Disassembling the dispensing valve for freshbrewer unit

Preparation

- Open the door.
- Switch off the main switch.
- Remove instant ingredient canisters.
- Remove cover plate for instant ingredient module, *see chap. 5.C.2.3, page 5C-3*.

Dissassembly

Follow these steps to disassemble the dispensing valve for freshbrewer unit:

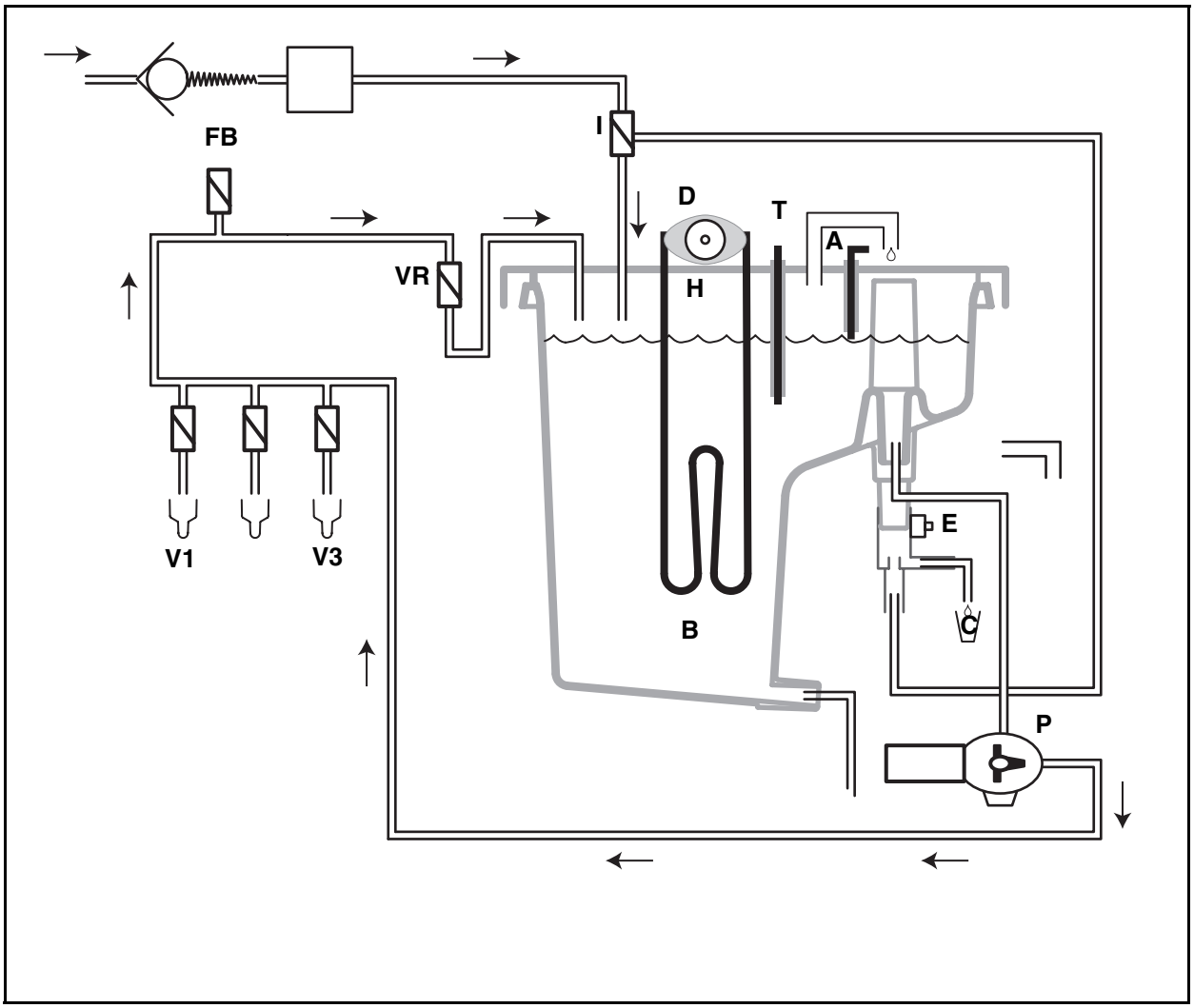
Step	Action	Illustration
1	Rotate the valve to release front part from side mounting.	
2	Pull valve out of silicone T-piece.	
3	Disconnect the electrical plug connections	
4	Disconnect the dispensing valve from the silicone hose.	

Installation

Installation is done in reverse order.

A.3. Functional descriptions

A.3.1 Total overview of the water system



Legend

A Water level sensor
B Boiler
C Recipient, e.g. cup
D Dry boiling protection
E Overboil sensor
H Heating element
P Pump
T Temperature sensor
VR Recirculation valve
V1 - V3 IN Dispensing valves
FB FB Dispensing valve

A.3.2 Function: Inlet valve and water inlet into the boiler

Description

- The inlet valve '**I**' is opened until the water level sensor '**A**' recognizes that the boiler '**B**' is filled.
- When the correct filling level in the boiler is reached, the water inlet valve is closed.

If the correct filling level has not been reached within threeminutes after the inlet valve has been opened, the error message "Water level low" is given.

If the boiler 'B' is filled for the first time, an error message is given if the correct water level has not been reached within three minutes.

A.3.3 Function: heating and temperature regulation

Description

- The heating element '**H**' is switched on as soon as the water level reaches the water level sensor '**A**'.
- The temperature sensor '**T**' measures the temperature in the boiler and controls the switching on/off of the heating element according to the value set in technician mode, *see chap. 4, page 64*.
- The dry running protection '**D**' triggers and switches off the heating element, if the temperature rises above 100°C. To enable the heating element again, you must reset the dry boiling protection manually and restart the machine, *see this section, page 5A-11*.
- The overboil sensor '**E**' is located in the overflow hose. If the sensor detects steam or water in the overflow hose, it will switch off the heating element '**H**'. To enable the heating element again, you must reset the overboil thermostat manually and restart the machine, *see this section, page 5A-8*.
- Water from the overflow hose is led into recipient '**C**' at the end of the overflow hose, e.g. a cup.
- If water is continuously running through the overboil hose, the water is led back to the inlet valve. When the water pressure in the mechanical pressure security valve of the inlet valve reaches a certain level, the pressure security valve triggers and closes the inlet valve. The hoses to the inlet valve has to be disconnected and reconnected to release the pressure in the inlet valve and the pressure security valve, *see **this section, page 5A-13***

A.3.4 Function: water outlet system and outlet valves

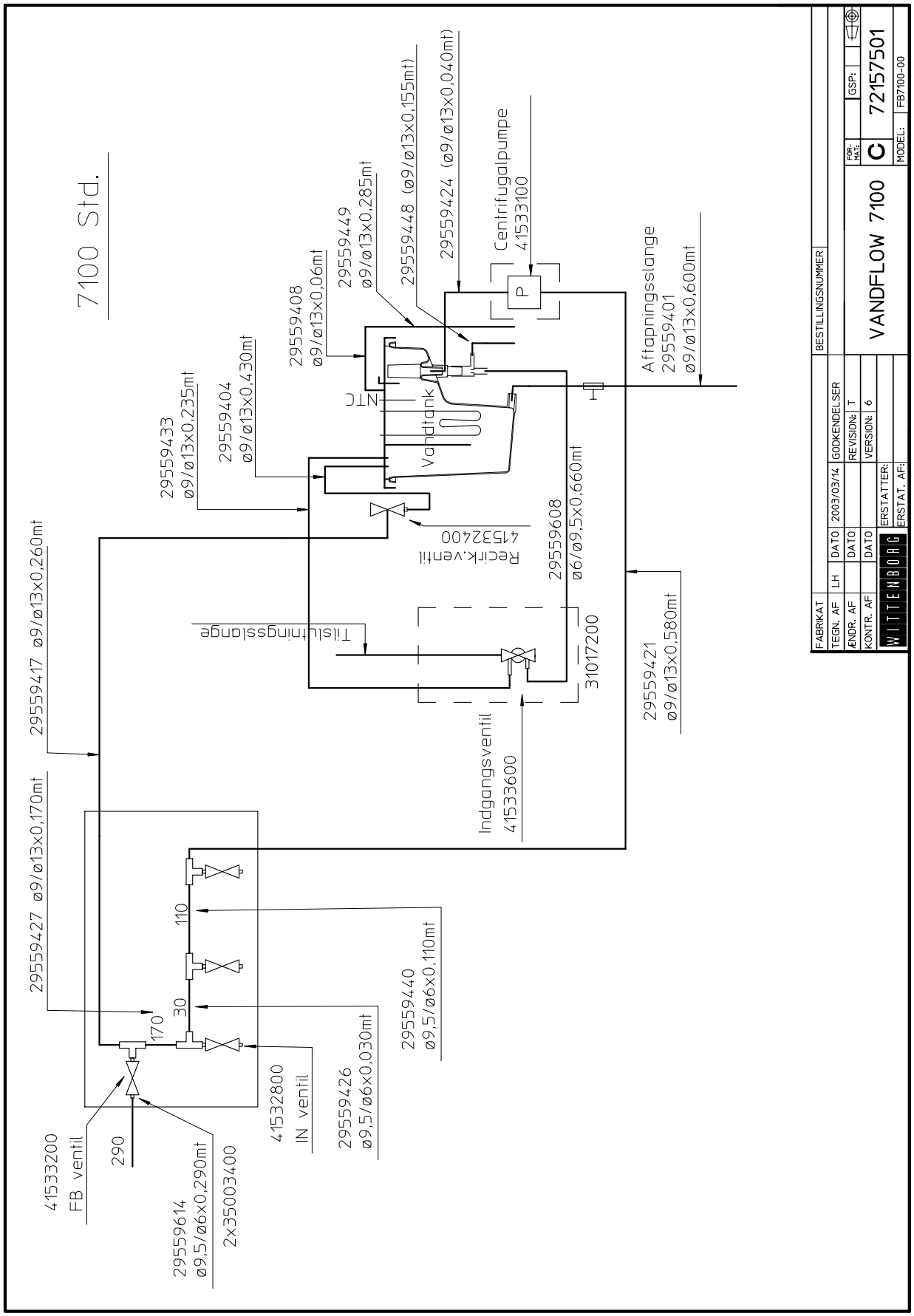
Description

When a hot drink is to be dispensed, the machine will open valve '**VR**' and start pump '**P**' simultaneously. The valve '**Vx**' remains closed.

The water of high temperature now runs from the boiler and circulates through the entire hose system and back into the boiler through the valve '**VR**' for approximately two seconds, thus ensuring that the hottest temperature is obtained and that possible air bobbles are removed from the hose system.

After this circulation the required water quantity is supplied by closing the valve '**VR**' and opening one or more of the valves from '**V1**' through '**V3**' in sequentiel order. When the required water quantity is obtained, the dispensing valve/s in question '**V1**' through '**V3**' close, and the pump 'P' stops.

A.4. Water flow diagram



A.5.Technical specifications

Not available here.

A.6.Options

Not available here.

A.7. Accessories

Not available yet.

B Brewer System

B.1 Adjustments

General adjustments

Water volume, minimum + maximum (depending on the flow and the corresponding valve adjustments (l/min.))

- Machine adjustments min. 60 ml - max. 80 ml
- Programming max. 240 ml

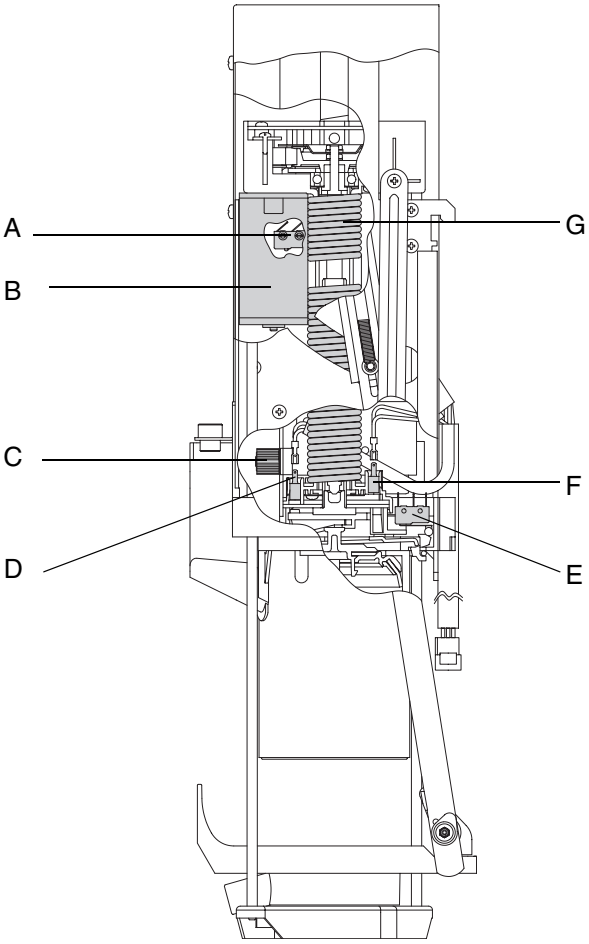
Scraper position (adjustable via programming)

- Front
- Rear

B.2 Overview of brewer parts

Parts and functions

This illustration shows the location of the brewer components



Legend for figure:

Part		Function
A	Safety switch	switches as soon as the brewer moves beyond the closing position. E.g. seal of the filter plate, filter plate, or brewer cylinder not installed.
B	Brewer (actuator) motor	drives the actuator, controls the brewing process.
C	Ingredient motor	drives the dosing unit, controls the ingredient quantity.
D	Brewer closed switch	switches as soon as the brewer cylinder and the filter plate form a chamber.
E	Brewer cylinder position switch	ensures correct position of cylinder.
F	Brewer at end switch	switches on both end positions of the brewer, e.g. scraper in end position or lower plunger position.
G	Actuator	controls the movements of the filter plate, the plunger and the scraper during the brewing process.

B.3 (Dis-)assemblies

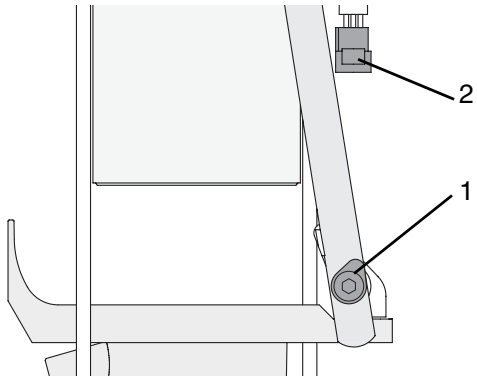
B.3.1 Safety instructions

Installation and repair works on the machine may only be carried out by trained service technicians.

General Mounting Instructions

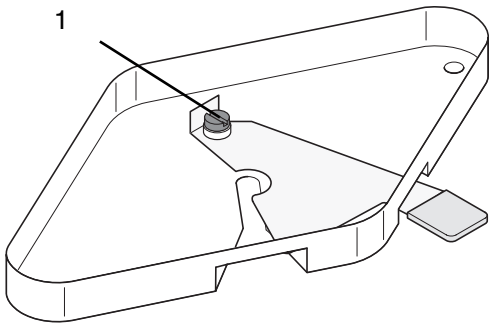
Scraper guide

Follow this instruction to assemble the scraper guide:

Instruction		
•	The guiding lugs (**1**) have to point towards the brewer's fastening holes (rear side) and the cable harness (**2**).	

Support

Follow this instruction to assemble the support:

Instruction		
•	The screw. (**1**) has to be fastened by means of Locktite.	

B.3.2 Dismounting the brewer unit

When repairing the brewer unit, these safety rules must be observed:

- **Beware of sharp edges**
- **Beware of spring loaded actuator, if defective**

Tools needed: Clamp (if actuator is taken out of the brewer unit)

Preparation Follow these steps to prepare the brewer unit for removal:

Step	Action
1	Remove the coffee canister.
2	Detach the filter roll bracket from its location peg. (if applied)
3	Pull off coffee outlet hose
4	Place a piece of eg. corrugated paper on the filter plate and bring the brewer cylinder into transport position. Warning! Keep hands and loose objects away from the brewer! Warning! If the cylinder is not closed you must be careful when proceeding with the removal. If nut, plunger holder or spindle are defective the actuator spring load may be released causing danger of injury!
5	Switch off the main switch, disconnect the power supply, and close the water tap.
6	Pull of the hot water hose.
7	Remove the water inlet elbow tube from the brewer, and push it to the side.

Warning **If it was not possible to move the brewer into transport position, only touch the brewer on its outside. Do not reach underneath the brewer cylinder, as there is a risk of injuries if the actuator is defective.**

Continued ...

Removal

Follow these steps to remove the brewer unit

Step	Action
1	If necessary, remove the filter plate, the scraper, and the brewer cylinder.
2	Unscrew 2 screws and lift out brewer. Warning! If brewer cylinder is not closed, lift out brewer by the sides. Do not touch underneath the unit!
3	Disconnect the 15-pole plug of the harness at the back of the brewer.
4	If necessary, assemble the filter plate, the scraper, and the brewer cylinder.

Installation

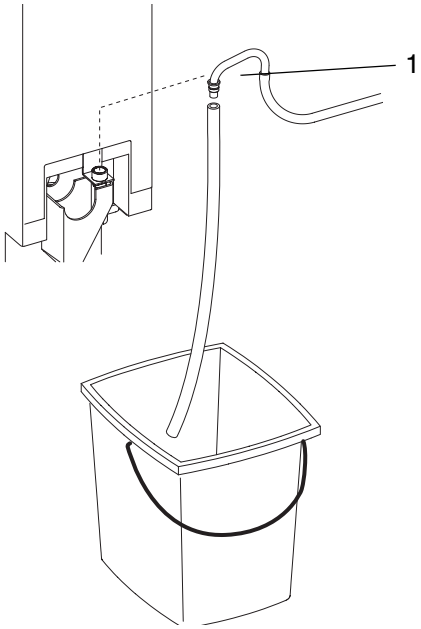
Installation is done in reverse order.

B.3.3 Testing the brewer unit next to the machine

There is an increased risk of injuries. Keep parts of your body and loose clothing away from the brewer.

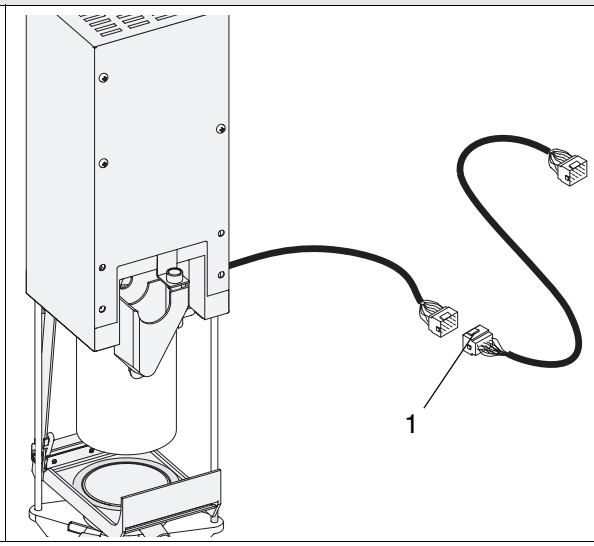
Preparation

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Connect a hose to the water inlet elbow tube (**1**), and put the end of the tube into a container, so that the water does not run into the machine.



Initiating Test

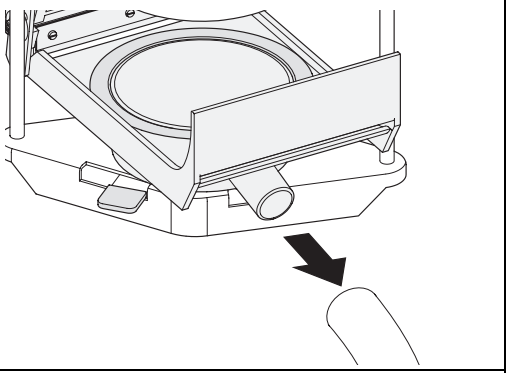
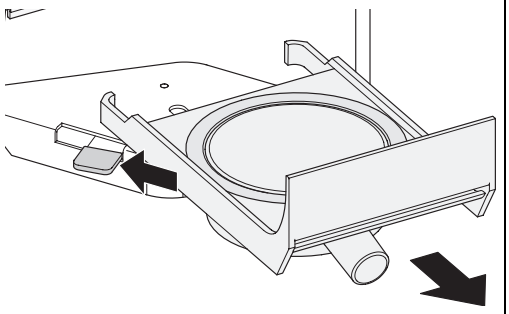
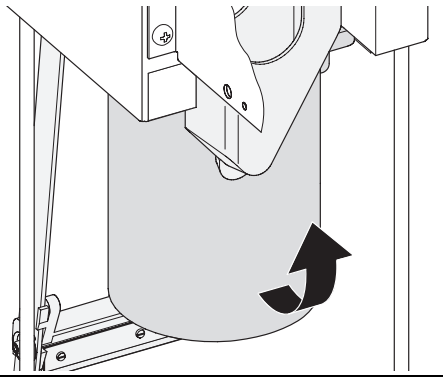
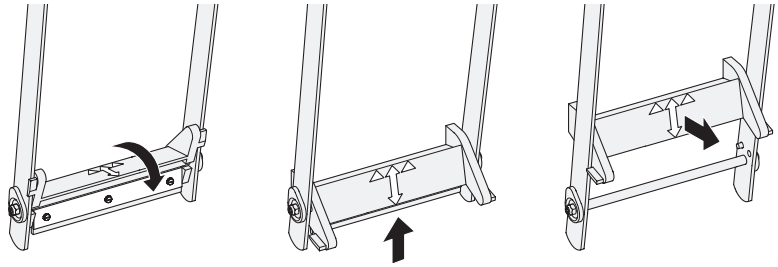
Follow these steps to initiate test of the brewer unit outside the machine.

Step	Action	
1	Plug the adapter cable harness (**1**) between the 15-pole plug of the brewer unit and the connection socket of the brewer unit in the machine. Note: For service parts refer to the spare parts list)	
2	Reconnect the power supply, switch on the main switch, and open the water tap.	
3	Actuate the safety switch.	

B.3.4 Removing the brewer cylinder, filter plate holder and scraper

Removal

Follow these steps to remove the parts:

Step	Action	
1	Remove the outlet pipe from the filter plate.	
2	Press lock at the filter plate support backwards and withdraw filter plate holder with filter plate.	
3	Take hold of the brewer cylinder by placing your thumb on the outside and the rest of your fingers inside the “brewing chamber”, tilt the cylinder smoothly and remove cylinder.	
4	Remove scraper by turning and lifting it straight up.	

Assembly

Assembly is done in reverse order.

B.3.5 Removing the brewer housing

Preparation

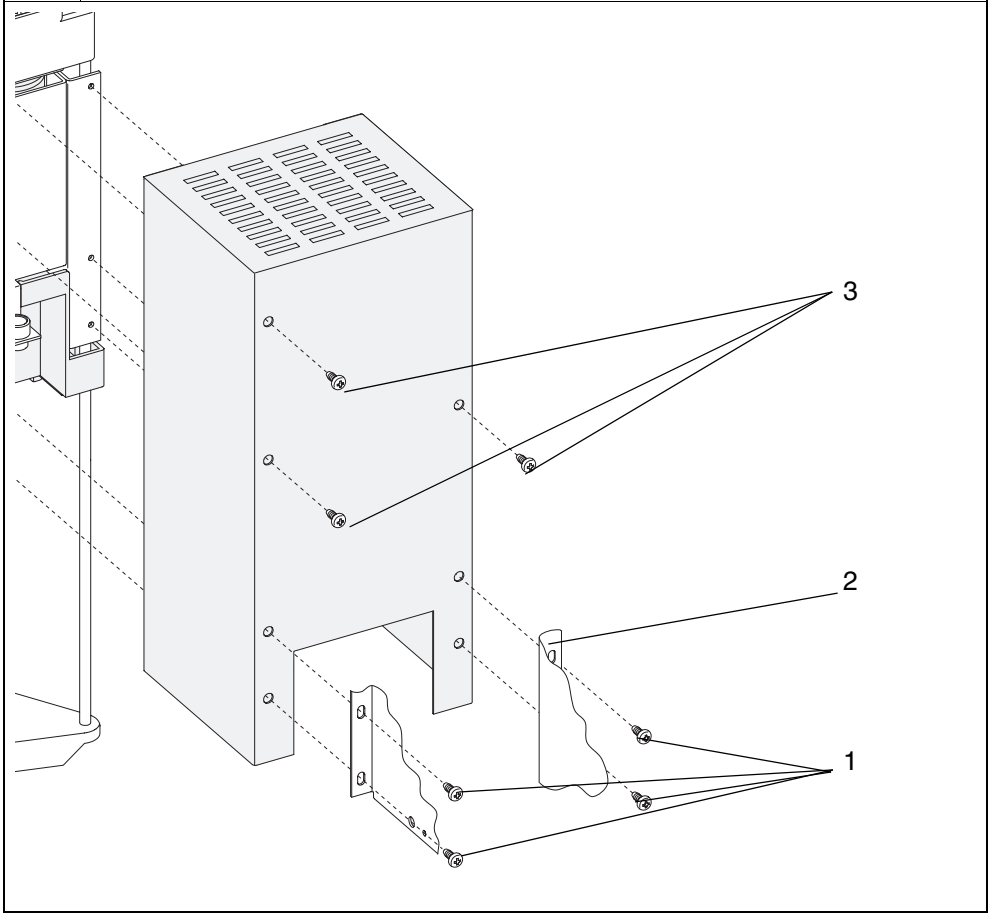
Before removing the brewer housing

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*
- Remove the brewer cylinder, the filter plate holder, and the scraper, *see this section, page 5B-7*.

Removal

Follow these steps to remove the brewer housing:

Step	Action
1	Remove the four screws (**1**).
2	Remove the coffee canister bracket (**2**).
3	Remove the three screws (**3**).
4	Remove the brewer housing.



Assembly

Assembly is done in reverse order.

Note: Consider screws of different lengths!

B.3.6 Disassembling the tie rods

Preparation

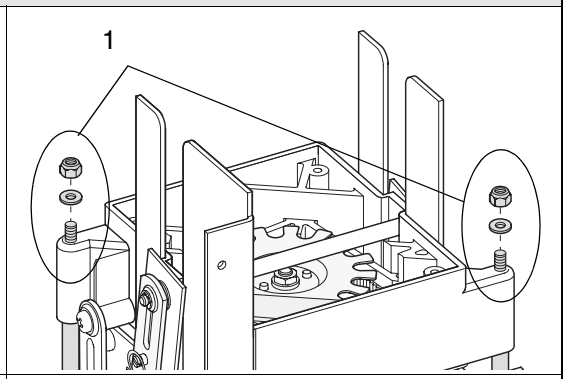
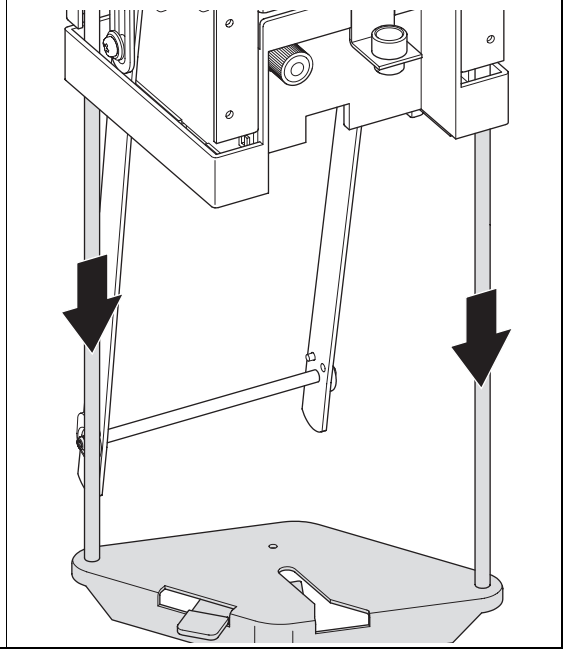
Before disassembling the tie rods:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder, and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.

The actuator of the brewer is provided with a heavy spring under tension. Always turn the top and bottom of brewer away from any person before removing the scraper, as a defective actuator could expand suddenly. There is an increased risk of injuries.

Disassembly

Follow these steps to disassemble the tie rods:

Step	Action	
1	Loosen the tie rods (**1**) (2 self-locking nuts with washers).	
2	Pull out the tie rods together with the filter plate support.	

Assembly

Assembly is done in reverse order.

Continued on next page..

- The self-locking nuts must be exchanged.
- Do not retighten the self-locking nuts too tight when reassembling the tie rods.

B.3.7 Disassembling the ingredient motor

Preparation

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.

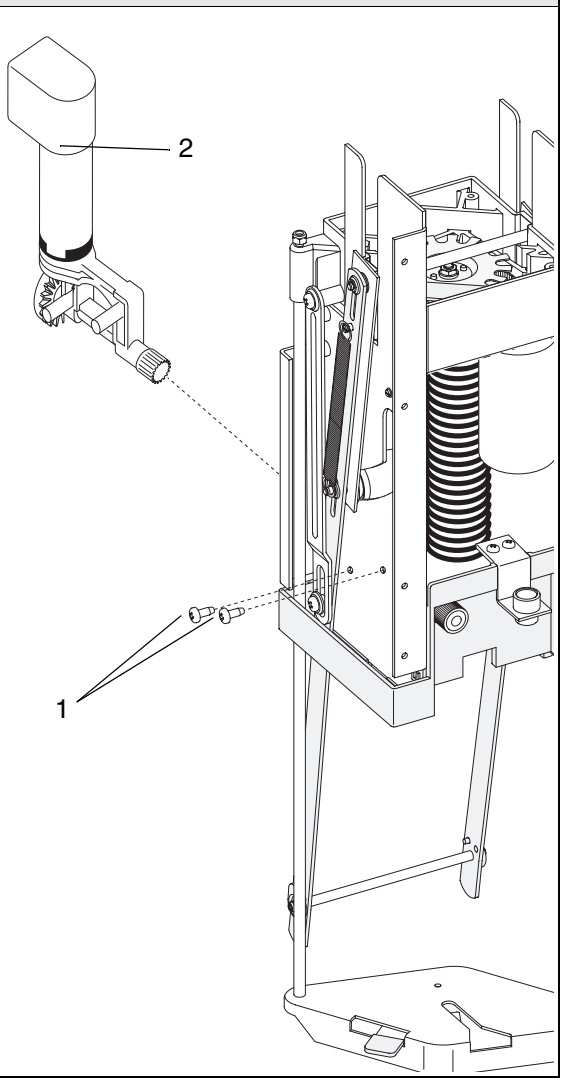
Note

When disassembling the dosing motor, the scraper has to be in the rear position. If not remove scraper arm before proceeding.

Disassembly

Follow these steps to disassemble the ingredient motor:

Step	Action
1	Remove the two screws (**1**).
2	Pull the ingredient motor backwards (**2**).
3	Disconnect the plug connection.
4	Remove the ingredient motor.



Assembly

Assembly is done in reverse order.

Continued on next page...

When the ingredient motor stucks, check whether the fastening of the base console to the brewer base is defective. In this case, press the actuator against the brewer base. There is the possibility that the fastening domes were broken so that the actuator slided from the brewer base towards the top.

B.3.8 Disassembling the scraper arms

Preparation

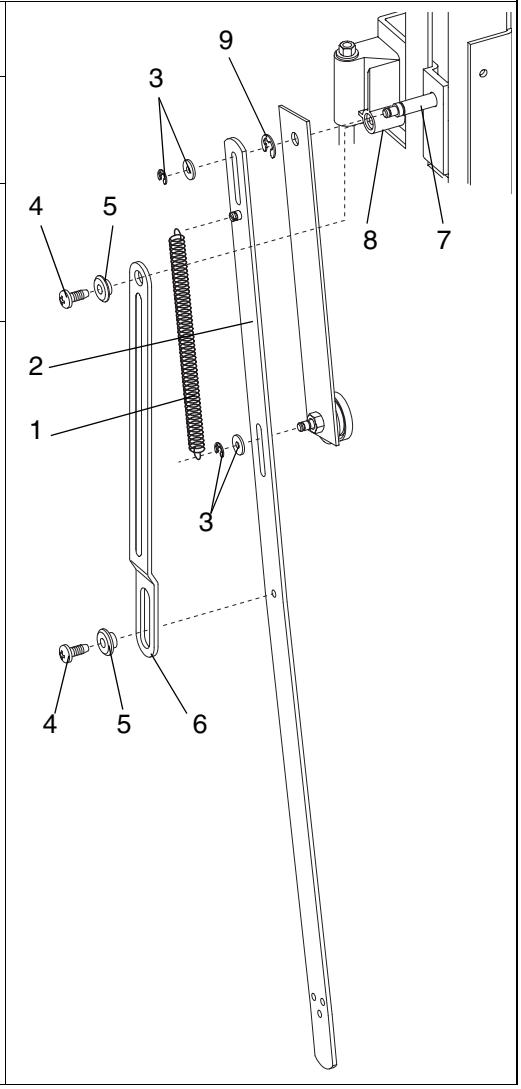
Before disassembling the scraper:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.

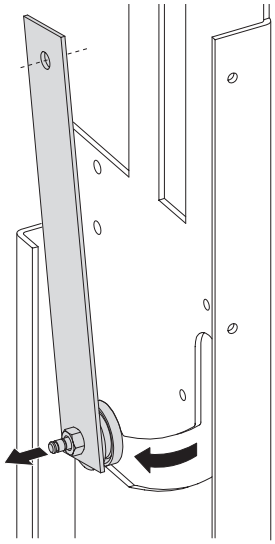
The actuator of the brewer is provided with a heavy spring under tension. Always turn the top and bottom of brewer away from any person before removing the scraper, as a defective actuator could expand suddenly. There is an increased risk of injuries.

Disassembly

Follow these steps to disassemble the scraper:

Step	Action	Illustration
1	Follow next steps to both right and left side of brewer	
2	Unhinge the spring (**1**) on the outer scraper arm (**2**).	
3	Remove the retaining rings (**3**) and the washers in front of the outer scraper arm (**2**).	
4	Remove the fastening screws (**4**) and the collar bushes (**5**) of the lever arms (**6**) on the bearing housing (**8**).	
5	Pull the outer scraper arm (**2**) from the axle (**7**), remove the retaining ring (**9**) (above the inner scraper arm) on one side of the axle, then pull the axle (**7**) out of the other side of the bearing housing (**8**).	

Continued on next page ..

Step	Action	Illustration
6	If necessary, remove the inner scraper arm through the lower bore in the side plate.	

Assembly

Assembly is done in reverse order.

B.3.9 Removing the actuator

Preparation

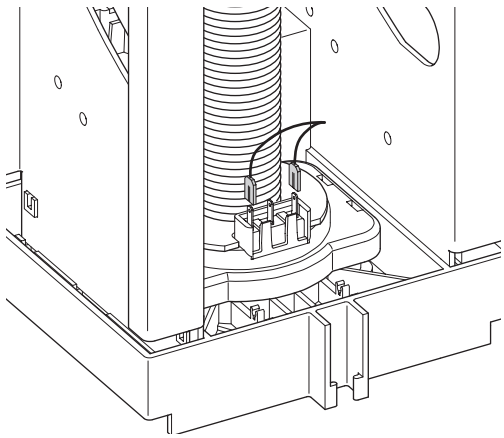
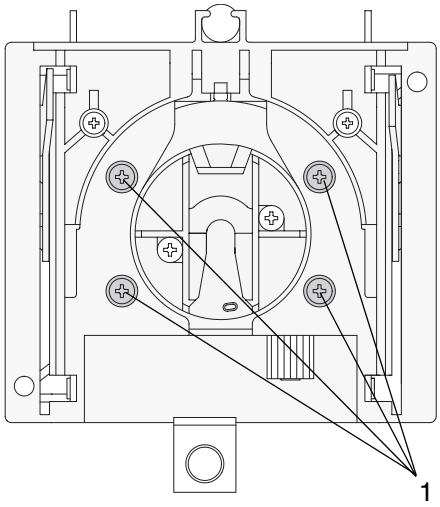
Before removing the actuator:

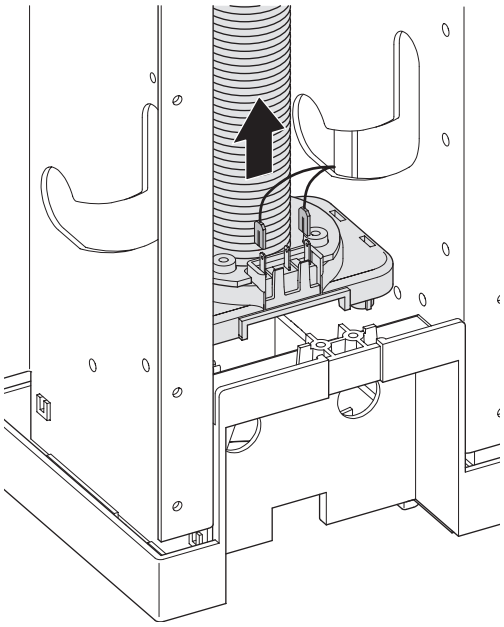
- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.
- Disassemble the tie rods with the filter plate support, *see this section, page 5B-9*.
- Disassemble the ingredient motor, *see this section, page 5B-11*.
- Disassembling the scraper arms, *see this section, page 5B-13*.

The actuator of the brewer is provided with a heavy spring under tension. Always turn the top and bottom of brewer away from any person before removing the scraper, as a defective actuator could expand suddenly. There is an increased risk of injuries.

Removal

Follow these steps to remove the actuator from the brewer unit:

Step	Action	Illustration
1	Unplug the cable of the brewer at end switch	
2	Remove the four screws (**1**) from the base of the brewer	

Step	Action	Illustration
		Continued on next page ..
3	Carefully pull out the actuator, and simultaneously unplug the cable of the brewer closed switch	

Installation

Installation is done in reverse order.

B.3.10 Disassembling the tachoboard

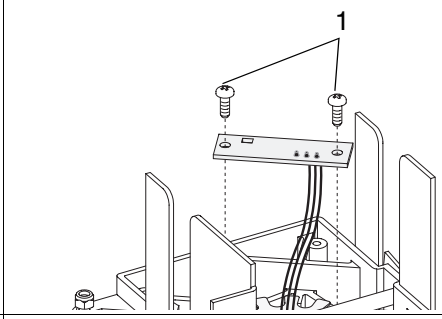
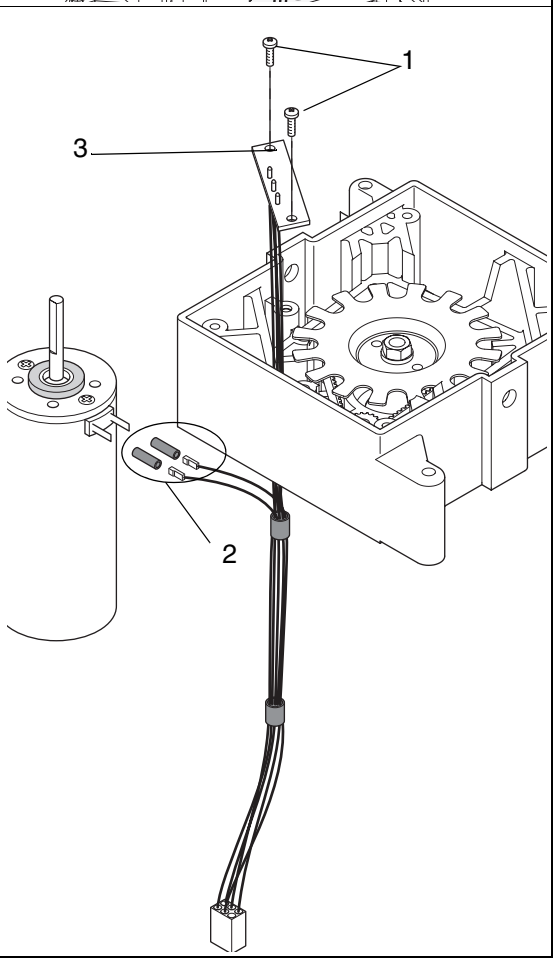
Preparation

Before disassembling the tachoboard:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer housing, *see this section, page 5B-8*.

Disassembly

Follow these steps to disassemble the tachoboard:

Step	Action	Illustration
1	Remove the two screws (**1**).	
2	Disconnect the 6-pole plug connection console/ tachoboard	
3	Pull off the two cable plug connections (**2**) from the actuator motor.	
4	Remove the tachoboard (**3**) together with the cable harness.	

Assembly

Assembly is done in reverse order.

When reassembling:

- **Observe the correct polarity.**
  The higher number (irrespectively of roman numbers or multiple-digit numbers) on the stranded wire connections represents the negative pole.
- **When using a new tachoboard, ensure that rubber sleeves are applied to the plug connections for the actuator motor.**

If the toothing of the tachodisc is bent, there is danger of a short circuit on the tachoboard. Observe the correct installation position of the tachoboard. Cables and sound indicator have to point towards the magnet, i.e. towards the inside.

B.3.11 Removing the actuator motor

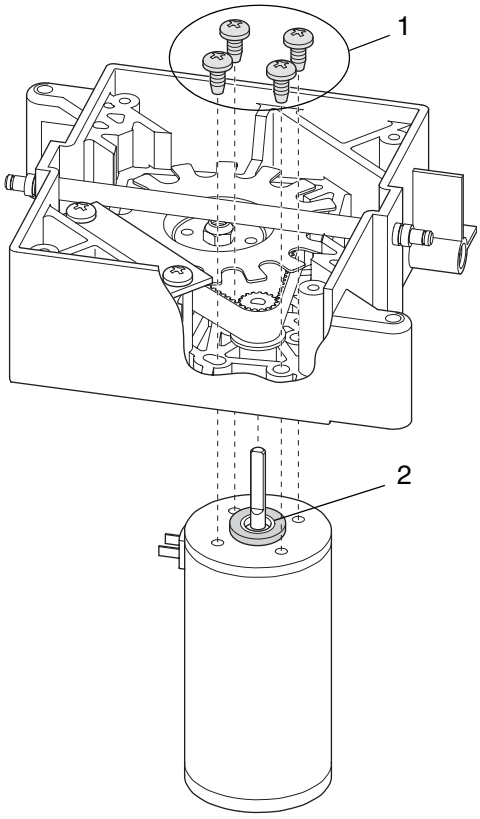
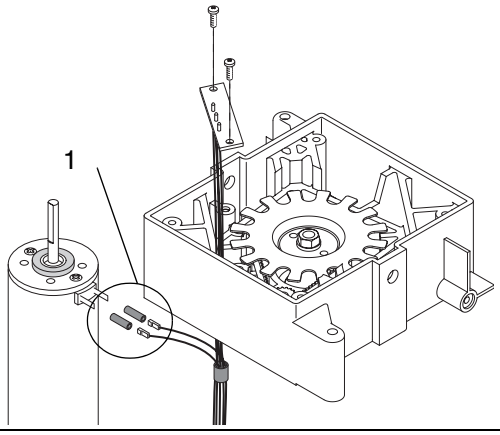
Preparation

Before removing the actuator motor:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer housing, *see this section, page 5B-8*.

Disassembly

Follow these steps to disassemble the actuator motor:

Step	Action	Illustration
1	Remove the four screws (**1**). **Note!** Do not remove the loose spacer ring (**2**).	
2	Pull off the two cable plug connections (**1**) to the tachoboard.	
3	Remove the motor	

Assembly

Assembly is done in reverse order.

When reassembling:

- **Observe the correct polarity.**
  The higher number (irrespectively of roman numbers or multiple-digit numbers) on the stranded wire connections represents the negative pole.
- **When using a new tachoboard, ensure that rubber sleeves are applied to the plug connections for the actuator motor.**

If the toothing of the tachodisc is bent, there is danger of a short circuit on the tachoboard.

B.3.12 Disassembling the actuator and its driving Parts

Preparation

Before disassembling the actuator and the driving parts:

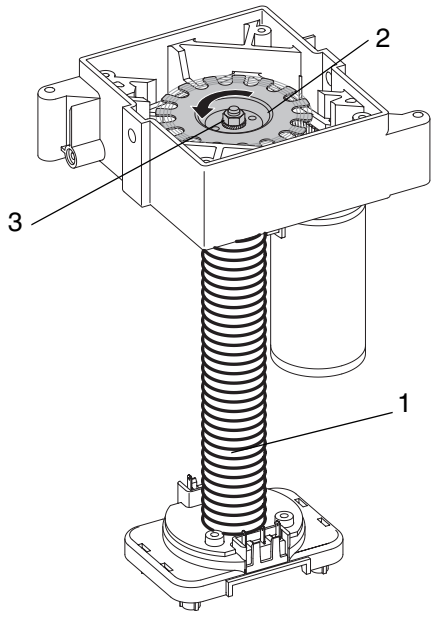
- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.
- Disassemble the tie rods with the filter plate support, *see this section, page 5B-9*.
- Disassemble the ingredient motor, *see this section, page 5B-11*.
- Disassembling the scraper arms, *see this section, page 5B-13*.
- Remove the actuator from the brewer unit, *see this section, page 5B-15*.
- Disassemble the tachoboard, s*ee this section, page 5B-17*.
- Disassemble the actuator motor, *see this section, page 5B-19*.

When disassembling the actuator do never disassemble the driving parts first! When rotating the tachodisc the nut must rotate together with it and must not loosen.

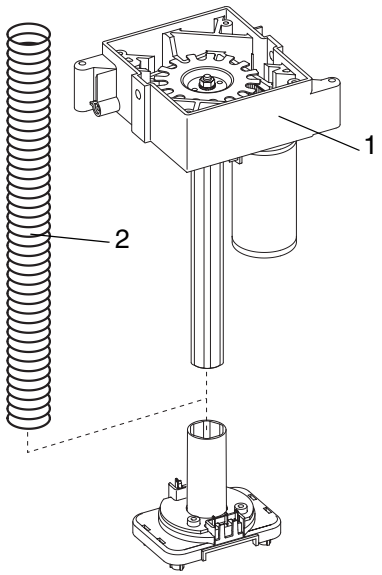
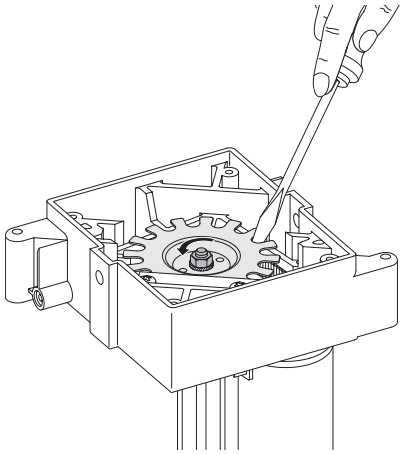
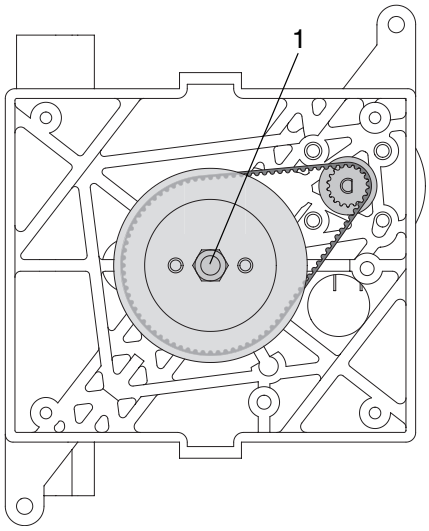
The actuator of the brewer is provided with a heavy spring under tension. Always turn the top and bottom of actuator away from any person before handling, as a defective actuator could expand suddenly. There is an increased risk of injuries.

Disassembly

Follow these steps to disassemble the actuator and the driving parts:

Step	Action	Illustration
1	Release the actuator spring (**1**) by turning the tachodisc (**2**) anti-clockwise, or by turning the nut (**3**) of the tachodisc anti-clockwise. **Caution**: nut must not loosen.	

Continued on next page ..

Step	Action	Illustration
2	Remove the bearing housing (**1**) and the spring (**2**).	
3	Fix the tachodisc by means of eg. a screwdriver while unscrewing the nut.	
4	Hold the large gear wheel tightly and remove the nut (**1**).	
5	Remove the large gear wheel with toothed belt and small gear consecutively.	

Assembly

Assembly is done in reverse order.

B.3.13 Disassembling driving parts of actuator without removing actuator

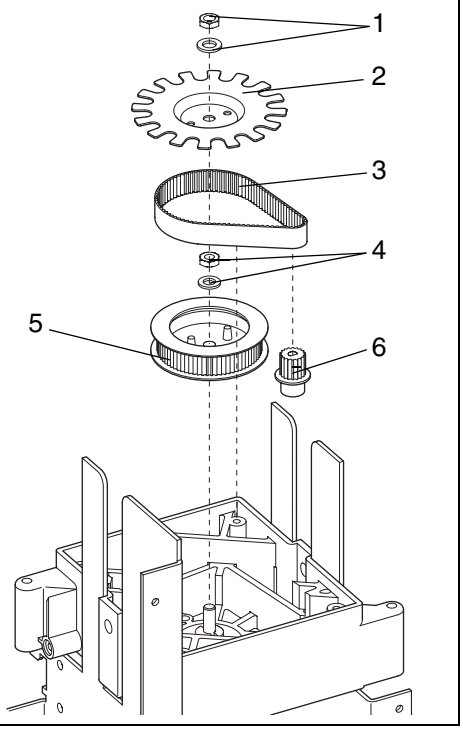
Preparation

Before disassembling the driving parts of the actuator:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.
- Disassembling the scraper arms, *see this section, page 5B-13*.
- Disassemble the tachoboard, s*ee this section, page 5B-17*.
- Disassemble the actuator motor, *see this section, page 5B-19*.

Disassembly

Follow these steps to disassemble the driving parts:

Step	Action	Illustration
1	Remove the hexagon nut and the washer (**1**)	
2	Remove the tacho-generator disc (**2**).	
3	Remove the toothed belt (**3**).	
4	Remove nut and washer (**4**).	
5	Pull off the large toothed wheel (**5**), teeth = 72.	
6	Pull the small toothed wheel (**6**), teeth = 18, off the actuator motor.	

Note:

Both toothed wheels and the toothed belt should only be replaced together.

During re-installation make sure that under all circumstances the scraper arms are in the correct position.

B.3.14 Replacing the microswitch BSSW

Definition

BSSW is an abbreviation of brewer safety switch.

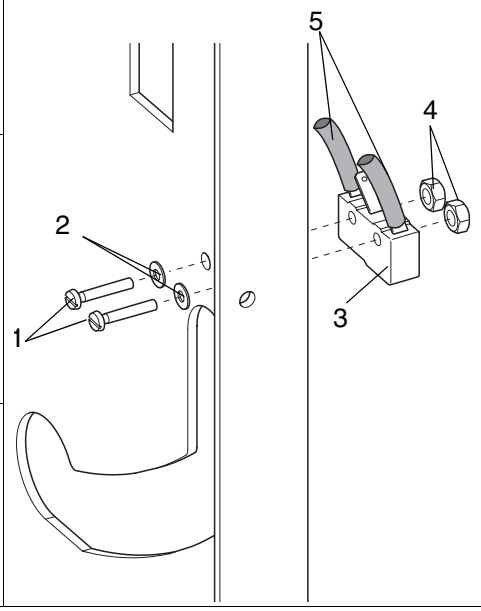
Preparation

Before replacing the brewer safety switch:

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.
- Remove the brewer housing, *see this section, page 5B-8*.
- Disassembling the scraper arms, *see this section, page 5B-13*.
-

Replacement

Follow these steps to replace the brewer safety switch:

Step	Action	Illustration
1	Remove the fastening screws (**1**) with washers (**2**) and nuts (**4**) to replace microswitch (**3**) with new switch.	
2	Unplug the cable lugs from the defective microswitch, and connect them to the new microswitch on the outer contact pins (**5**). Make sure that the insulation hose is positioned correctly.	
3	Fasten the new microswitch as illustrated on drawing. Observe that the screws are not fastened too tight.	
4	Check the function of the microswitch.	

Horizontally place the microswitch into the 3 mm holes in the highest position possible.

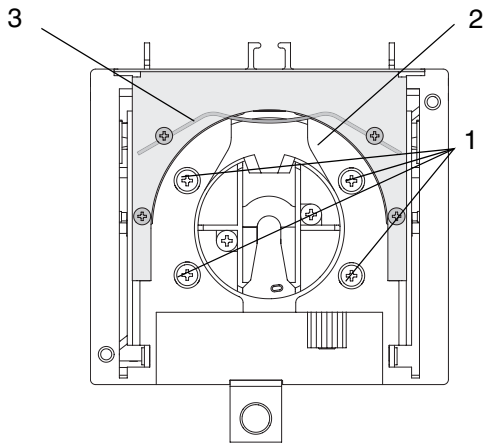
B.3.15 Replacing the ejector spring

Preparation

- Switch off the main switch, disconnect the power supply, and close the water tap.
- Remove the brewer, *see this section, page 5B-4*.
- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7*.

Disassembly

Follow these steps to remove the ejector spring:

Step	Action	Illustration
1	Remove the four screws (**1**) of the brewer cylinder support (**2**)	
2	Press the spring (**3**) towards the back by means of a screwdriver, and remove it to the side.	

Assembly

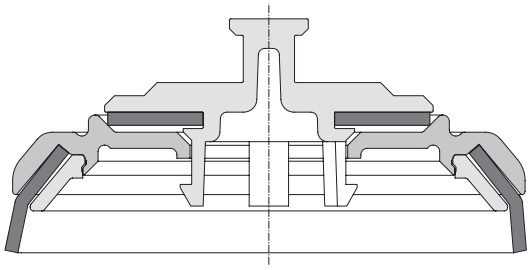
Assembly is done in reverse order.

When reassembling:

- The spring has to be placed between the fastening domes and the spring guide, see illustration above.

B.3.16 Replacing the gaskets of the plunger

The gaskets of the plunger is contained in a valve, located in the centre of the plunger:



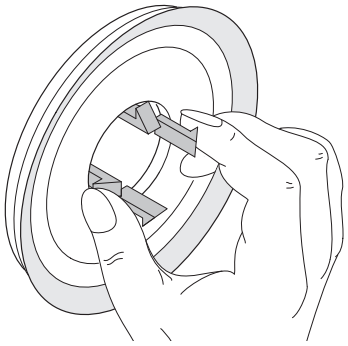
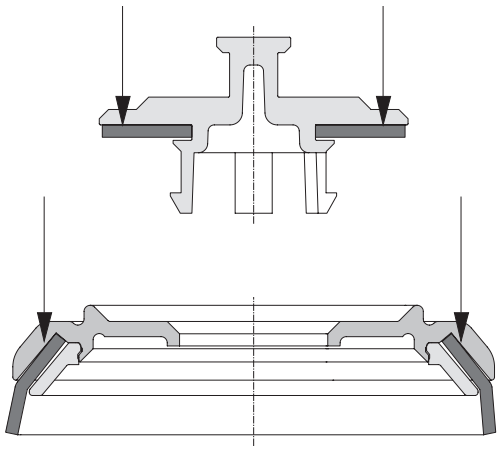
Preparation

Before replacing the gaskets:

- Remove the brewer cylinder, the filter plate holder and the scraper, *see this section, page 5B-7.*
- Remove the plunger from the brewer cylinder, *see Operator Manual.*

Disassembly

Follow these steps to replace the gaskets of the plunger

Step	Action	Illustration
1	Press the 4 supports of the valve together and pull it out.	
2	Remove the gaskets by pulling the seal lips.	
3	Replace gaskets and reassemble plunger in reverse order.	

Assembly

Assembly is done in reverse order.

B.3.17 Removing and decscaling the filter plate

The filter plate has to be descaled on a regular bases after approx. 1000 dispensings (depending on the hardness of the water and the coffee type (oil)).

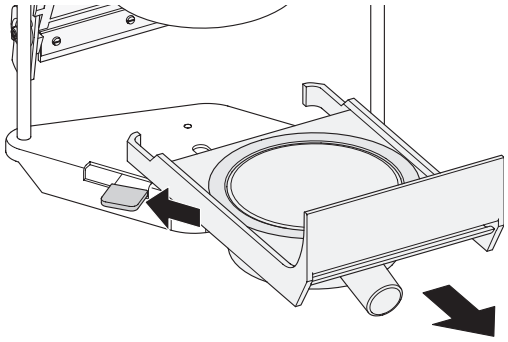
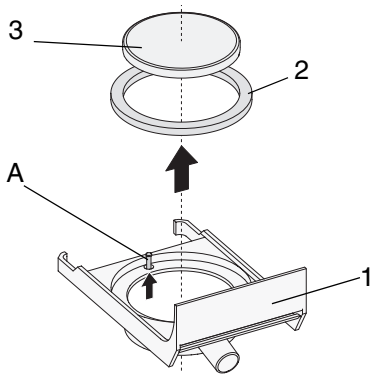
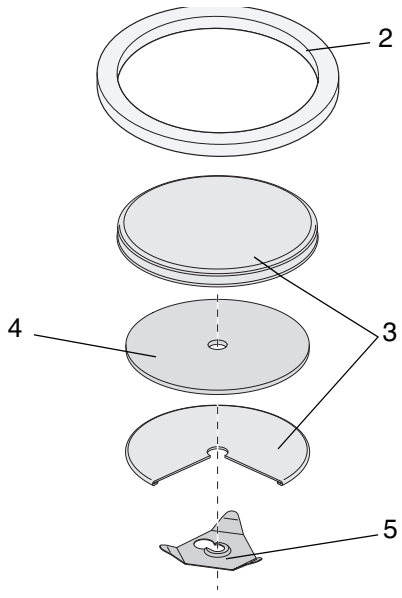
Preparation

Before disassembling the filter plate

- Remove the filter plate roll holder (if fitted), *see Operator Manual*.

Disassembly

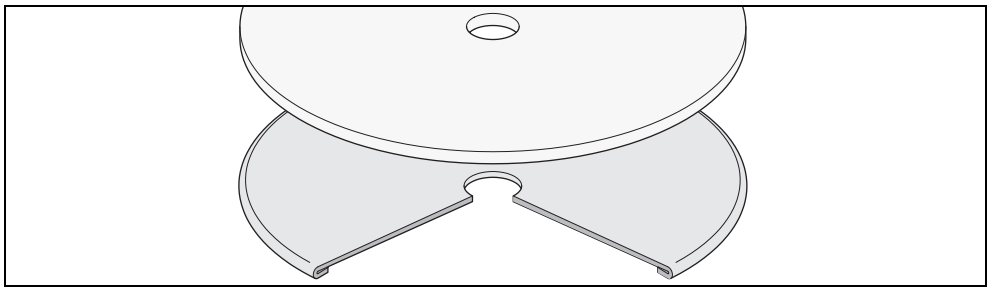
Follow these steps to remove and descale the filter plate

Step	Action	Illustration
1	Press the lock at the support backwards and pull out the filter plate holder.	
	Press out the sealing ring (**2**) and the filter plate (**3**) by means of the ejector pin (**A**) of the filter plate holder (**1**).	
2	Remove the tension plate (**5**) from the filter plate.	
3	Descale all metal parts of the filter plate (**3**)	
4	Clean the rubber sealing (**4**), the sealing ring (**2**) and the filter plate holder in hot water.	

Assembly

Assembly is done in reverse order.

- Make sure that the disc is positioned correctly, i.e. the smooth side must face the rubber sealing (see ill.)
- Avoid damage of the fine-pore filter.

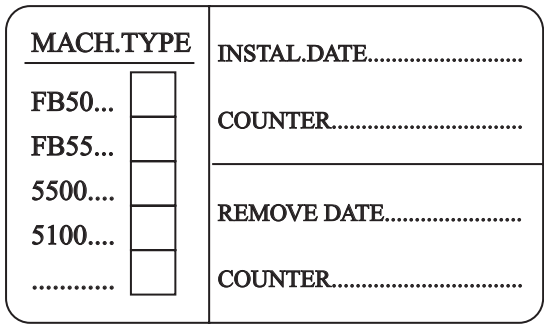


B.3.18 General notes

All actuators/brewers as well as recycled actuators/brewers are equipped with an additional label for brewer (Part-no. 35207300):

Label for brewer

The label looks like this:



How to complete the label

The table below explains which fields of the label to complete given the type of procedure performed:

IF Brewer/Actuator is to be ...	THEN fields to be filled in ...	by ... and how
Installed	• MACH.TYPE (1) • INSTAL.DATE (2) • COUNTER (3)	Manufacturer From factory
Replaced	• MACH.TYPE (1) • INSTAL.DATE (2) • COUNTER (3)	Service technician On site
Removed	• REMOVE DATE (4) • COUNTER (5)	Service technician On site

B.4 Function of the brewer

Introduction

Through an electronically controlled brewing process the brewer takes in coffee and water and dispenses freshly brewed coffee.

The principle of the brewing process is that a plunger moves down inside a cylinder pressing the freshly brewed coffee through a filter plate.

Brewing process

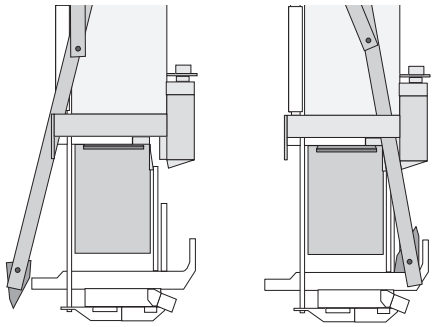
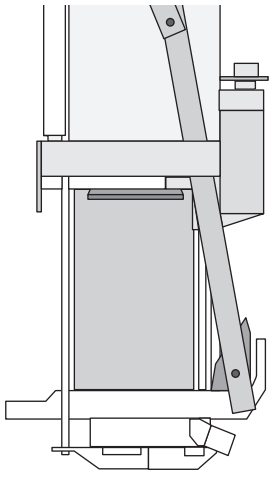
The brewing process can be divided into the following phases:
- Brewer preparing a brewing chamber
- Dosing of ingredients
- Extraction time
- Dispensing of drink
- Brewer returning to start position

Table brewing process

This table shows the various phases of the brewing process and the stages in each phase":

Phases

- **Brewer preparing a brewing chamber**

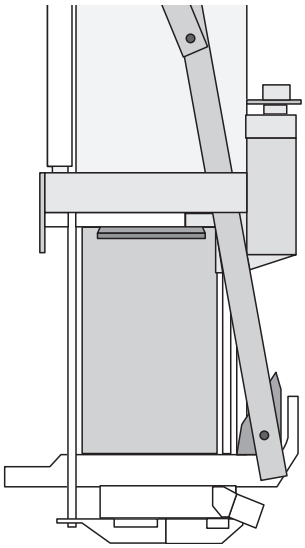
Stage	Description of function	Illustration
1	Control switches actuator motor on to drive actuator/spindle.	
2	Actuator spring winds up Spindle: • opens the switch BAE (Brewer at end), and • presses down the plunger.	
3	Scraper moves forward (if set to starting position at rear) Filter Plate closes the brewer cylinder. **Note:** Counterpressure of brewer cylinder prevents the filter plate and the actuator from further ascending	
4	Control stops the actuator motor when the pin on the plunger holder does not operate the microswitch BC (Brewer closed) any longer (illustration).	

Continued...

Phases

Continued from previous page..

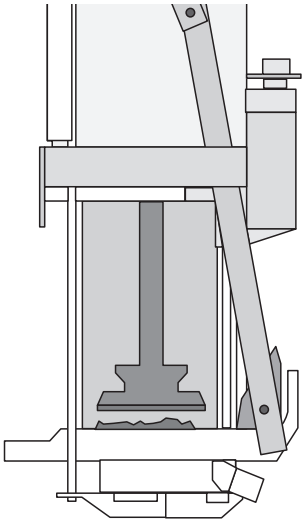
- **Dosing of ingredients**

Stage	Description of function	Illustration
1	The dosing motor is driven and the outlet valve dispenses water.	
2	The water flushes the coffee powder into the brewing chamber.	

- **Extraction time**

Note: The extraction time corresponds to the top-stop time set in the programming.

- **Dispensing of a drink**

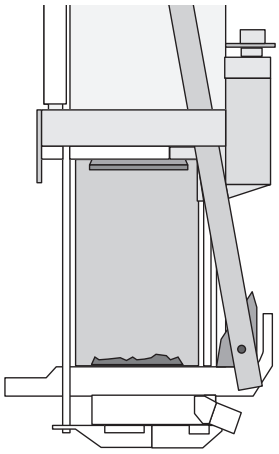
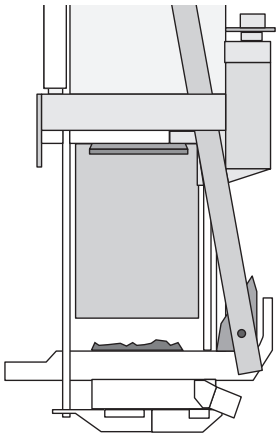
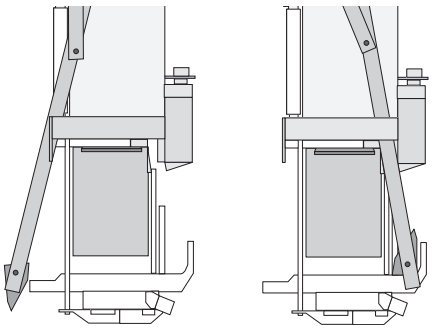
Stage	Description of function	Illustration
1	The actuator motor descends the plunger in the brewer cylinder via the spindle.	
2	The beverage is filtered through the filter plate (1) and dispensed into the cup via the outlet spout (2).	

Continued...

Phases

Continued from previous page..

- **Brewer returning to start position**

Stage	Description of function	Illustration
1	The actuator motor stops as soon as the guiding nut closes the microswitch BAE (Brewer at End). The plunger is now in lower end position.	
2	The control switches the actuator motor to reverse motion, whereby the plunger ascends.	
3	The pin on the plunge holder operates the microswitch BC (Brewer Closed - opener), when the plunge holder reaches its upper position.	
4	The brewer cylinder opens, and the scraper is guided in such a way that the dried coffee grounds as well as the filter paper[a] are pushed into the coffee grounds container.	
5	The filter papera is rolled off the paper roll and aligned into position.	
6	The microswitch BAE (Brewer at End) is actuated, when the scraper is in its rear or front position (depends on programmed setting).	
7	The control stops the actuator motor	

a. Optional for coffee filling.

B.5 Electrical diagrams

Not available here.

B.6 Technical specifications

Not available here.

B.7 Options

Not available yet.

B.8 Accessories

- Filter plate for tea
- Filter plate for coffee
- Filter paper holder.

C Dosing System

C.1 Adjustments

General adjustments

The basic elements of a recipe may be adjusted via the Operator menu. More advanced settings of recipes have to be carried out via the Wittenborg Configurator tool.

Adjustments via Operator menu and/or Wittenborg configurator

This table gives a brief overview of the possible adjustments to recipes.

Function	Operator menu *	Wittenborg Configurator
Dosing: (Water: ml) (Powder: mg)	x	x
Speed (Water: ml./sec.) (Powder: mg/sec.)		x
Mixer time (ms)	x	x
Mixer speed (0-100%)	x Range: 100% or <51%	x Range: 100% or <51%
Mixer delay (ms)		x
Dispensing time (ms)	x	x
Preselections		x
Selections (assignment of drinks to buttons)		x

* All adjustments via the Operator menu are carried out in the Basic settings menu, *see chap. 4, page 35.*

C.2 (Dis-)assemblies

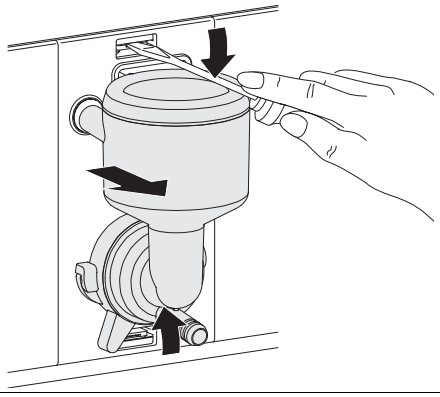
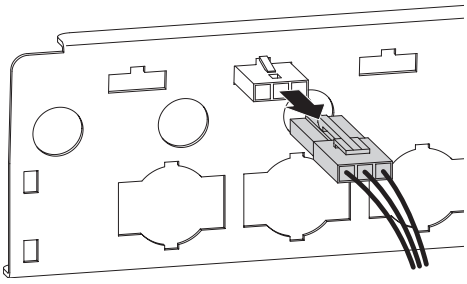
C.2.1 Removing the instant ingredient mixing units

Preparation

Before removing mixing units
- Open the door.
- Switch off the main switch.

Removing

Follow these steps to remove ingredient mixing units:

Step	Action	Illustration
1	Detach the mixing unit by pressing the flat end of a slotted tip screw driver against the upper and lower click tabs, and pull out the mixing unit from the main bracket for mixing units.	
2	Disconnect the plug connection from the connection rail.	

Installation

Installation is done in reverse order.

- Ensure that mixing unit connects properly to extraction tube coupling and valve connection when reinstalling into main bracket.
- The main bracket for mixing units is provided with holes to facilitate correct location of mixing units.

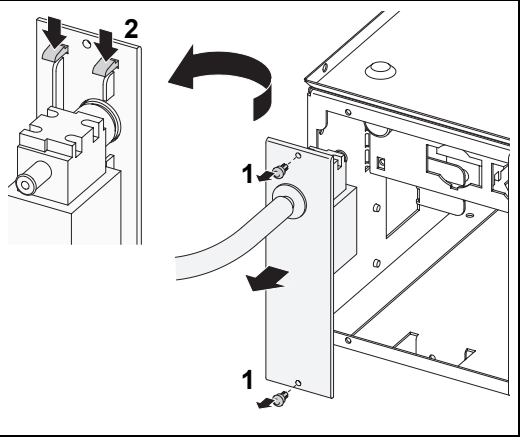
C.2.2 Removing the hot water module

Preparation

Before removing the hot water module
- Open the door.
- Switch off the main switch.
- Remove instant ingredient mixing unit next to hot water module, *see this section, page 5C-2*.

Removing

Follow these steps to remove the hot water module:

Step	Action	Illustration
1	Remove the two plastic rivets (1) from the hot water module. Detach module from bracket by flexing upper or lower locking tabs and pulling out the module.	
2	Disconnect plug connection from the connection rail.	

Installation

Installation is done in reverse order.

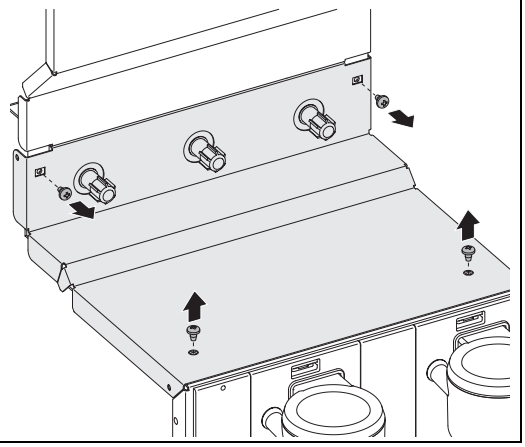
C.2.3 Removing the cover plate for the instant module

Preparation

Before removing the cover plate
- Open the door.
- Switch off the main switch.
- Remove instant ingredient canisters.
- Remove tray under canisters.

Removal

Follow these steps to remove the cover plate for instant module:

Step	Action	Illustration
1	Remove four screws from cover plate.	
2	Remove cover plate	

Installation

Installation is done in reverse order.

C.2.4 Disassembling a dispensing valve for instant ingredients

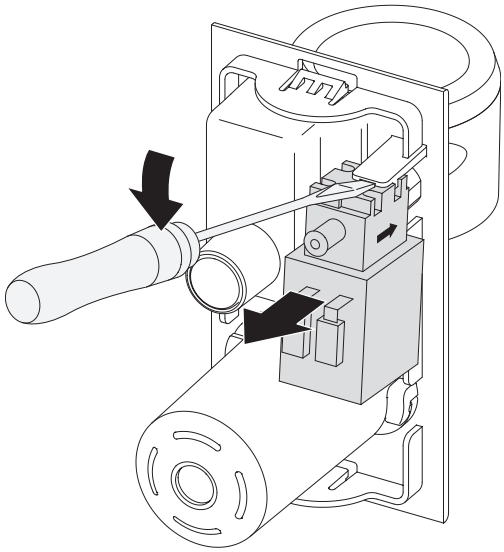
Preparation

Before disassembling a dispensing valve
- Open the door
- Switch off the main switch.
- Remove the instant ingredient mixing unit in question, *see this section, page 5C-2*.

Disassembly

Use a flat screwdriver to lift the locking tab as shown in the illustration below, and pull out the dispensing valve of the outlet tube module plate.

Illustration



Installation

Installation is done in reverse order.

Ensure that valve is properly seated in the outlet tube, which is simultaneously acting as a seal.

C.2.5 Replacing a whipper motor

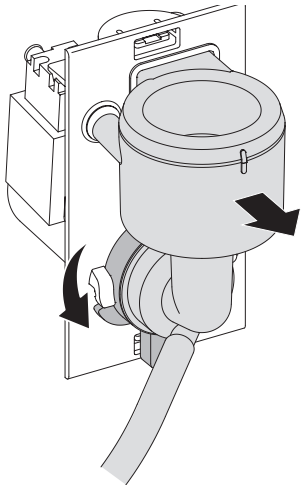
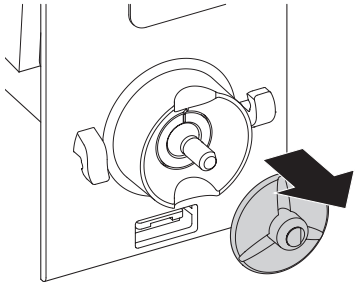
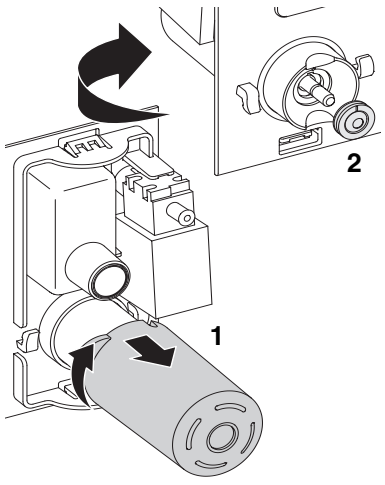
Preparation

Before replacing a whipper motor

- Open the door
- Switch off the main switch.
- Remove the instant ingredient mixing unit in question, *see this section, page 5C-2*.

Replacement

Follow these steps to replace a whipper motor:

Step	Action	Illustration
1	Detach mixing funnel from mixing unit by turning green locking ring counterclockwise. Remove funnel.	
2	Pull whipper wheel out of mixing unit.	
3	Hold the mixing unit in one hand and with the other turn the locking cover for whipper motor clockwise to release motor.	
4	Remove motor from cover and replace with new one, if necessary. (1)	
5	Check axle seal for motor and replace, if necessary.(2)	

Installation

Installation is done in reverse order.

When reinserting the whipper wheel make sure to turn it correctly concidering that the insertion hole and the connecting pin are D-shaped.

C.2.6 Removing an instant ingredient motor

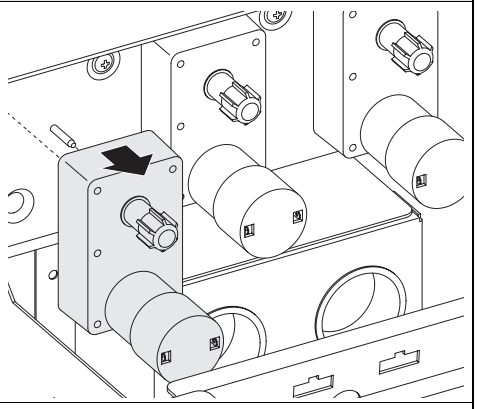
Preparation

Before removing an instant ingredient motor
- Open the door
- Switch off the main switch.
- Remove instant ingredient canisters.
- Remove tray under canisters.
- Remove cover plate for instant module, see *this section, page 5C-3*.

Remember to close the outlet spouts of instant ingredient canisters before removing canisters.

Removal

Follow these steps to remove an instant ingredient motor:

Step	Action	Illustration
1	Pull out the instant ingredient motor in question from mounting bracket on back wall of cabinet.	
2	Disconnect the electrical connections.	

Installation

Installation is done in reverse order.

Remember to open the outlet spouts of instant ingredient canisters after reinstallation.

C.2.7 Removing the spring for lid from ingredient canister

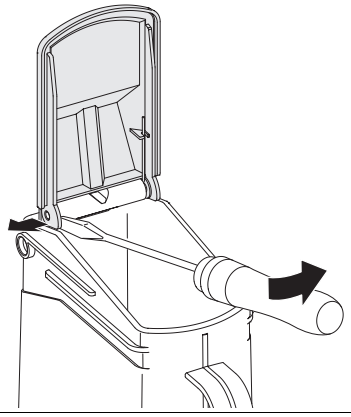
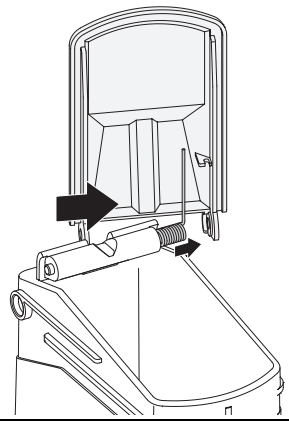
Preparation

Before removing the spring for lid from instant ingredient canisters
- Open the door
- Remove the instant ingredient canister in question, *see Operator Manual*.

Remember to close the outlet spouts of the instant ingredient canister before removing it.

Removal of spring in lid

Follow these steps to remove the spring in canister:

Step	Action	Illustration
1	Using, for example, the flat end of small slotted tip screw driver, flex the hinge tab in either side of the lid to the side, and remove the lid. (See illustration).	
2	Remove the spring from the canister.	

Installation of lid

Make sure spring is correctly positioned in lid. Put one hinge tab in its holder on the canister and let the other hinge tap click in place.

Removing the suspension for ingredient canisters

Preparation

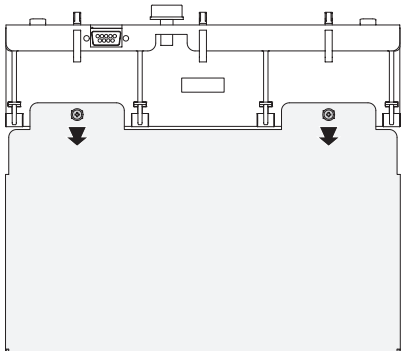
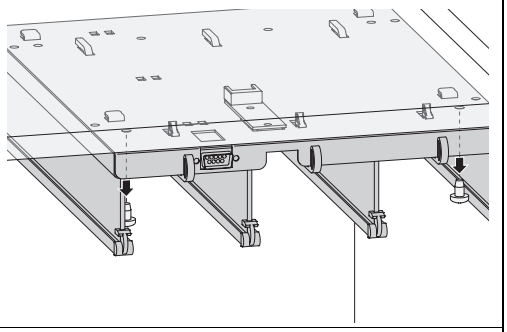
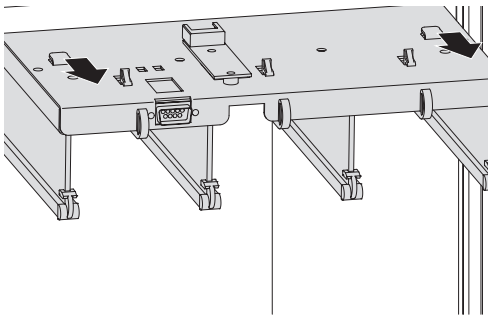
Before removing the suspension for the instant ingredient canisters

- Open the door.
- Switch off the main switch.
- Remove the instant ingredient canisters, *see Operator Manual*.

Remember to close the outlet spouts of instant ingredient canisters before removing canisters.

Removal of suspension rail

Follow these steps to remove the suspension rail for instant ingredient canisters:

Step	Action	Illustration
1	Remove the two screws from the rear cover behind the canisters. Remove rear cover.	
2	Loosen and remove the two screws in the bracket for canisters.	
3	Pull suspension rail forwards and tilt it off the hooks.	

Installation

Installation is done in the reverse order.

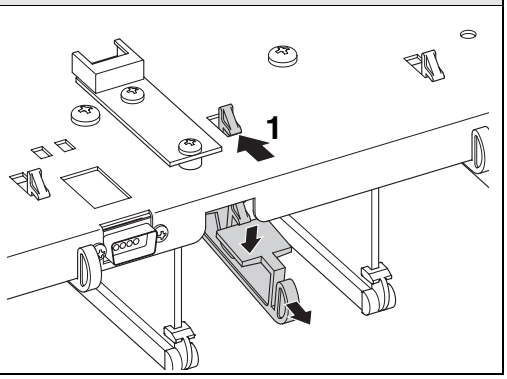
Removing the guide for ingredient canister from suspension rail

Preparation

Before removing the guide for ingredient canister from the suspension rail
- Open the door.
- Switch off the main switch.
- Remove the instant ingredient canisters, *see Operator Manual*.
- Remove suspension for ingredient canisters, *see this section, page 5C-9*.

Removal

Follow these steps to remove guide.

Step	Action	Illustration
1	Flex the locking tab on top of the suspension rail (1) and push the guide downwards.	
2	Pull guide free of suspension rail.	

Installation

Installation is done in the reverse order

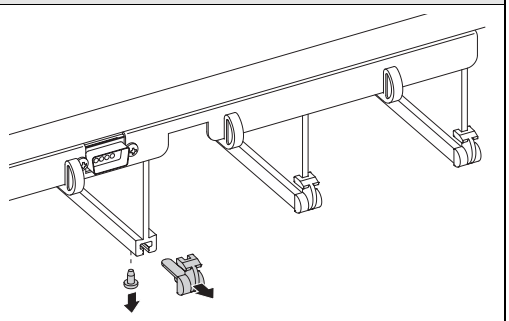
C.2.8 Removing the stop for canister from suspension rail

Preparation

Before removing the stop for canister from the suspension rail
- Open the door.
- Switch off the main switch.
- Remove the instant ingredient canisters, *see Operator Manual*.

Removal

Follow these steps to remove stop.

Step	Action	Illustration
1	Remove one screw from stop for canister.	
2	Pull out stop for canister.	

Installation

Installation is done in the reverse order

C.2.9 Removing the up-key connection from suspension rail

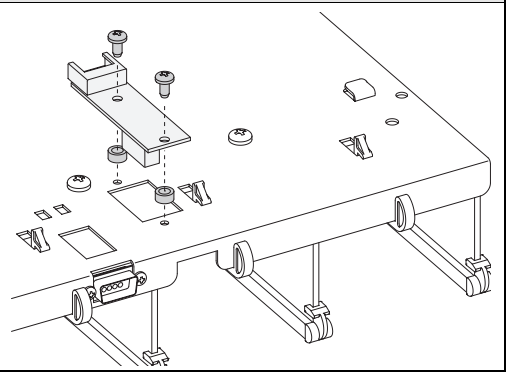
Preparation

Before removing the up-key connection from the suspension rail

- Open the door.
- Switch off the main switch.
- Remove the instant ingredient canisters, *see Operator Manual*.
- Remove suspension for ingredient canisters, *see this section, page 5C-9*.

Removal

Follow these steps to remove up-key.

Step	Action	Illustration
1	Remove two screws from up-key.	
2	Remove up-key and spacing bushes.	

Installation

Installation is done in the reverse order.

C.2.10 Removing the RS 232 print from suspension rail

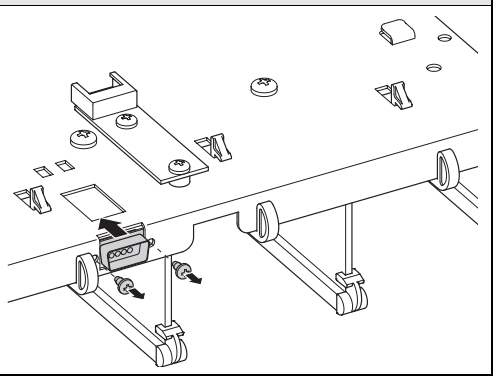
Preparation

Before removing the RS 232 print from the suspension rail

- Open the door.
- Switch off the main switch.
- Remove the instant ingredient canisters, *see Operator Manual*.
- Remove suspension for ingredient canisters, *see this section, page 5C-9*.

Removal

Follow these steps to remove RS 232 print.

Step	Action	Illustration
1	Remove two screws from RS 232 connection.	
2	Push RS 232 backwards and out of suspension rail.	

Installation

Installation is done in the reverse order

C.3 Functional descriptions

Not available here.

C.4 Electrical diagrams

Not available here.

C.5 Technical specifications

Not available here.

C.6 Options

Not available yet.

C.7 Accessories

Not available yet.

D Product Delivery

D.1 Adjustments

Not available here.

D.2 (Dis-)assemblies

D.2.1 Replacing the opto-sensor glasses for cup sensors

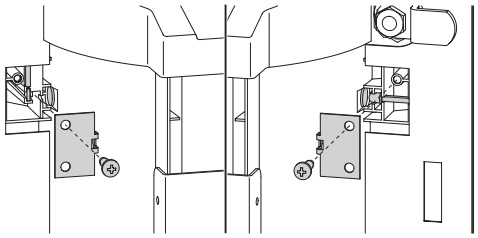
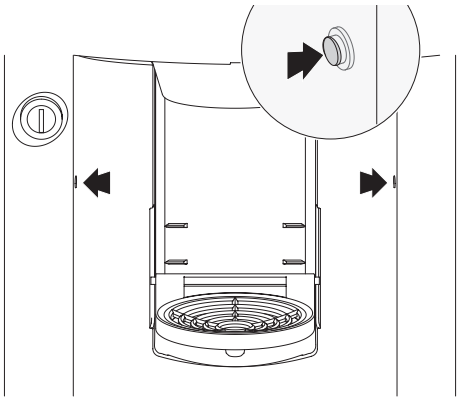
Preparation

Before replacing the opto sensor glasses for cup sensors:

- Open the door
- Switch off the main switch.

Replacement

Follow these steps to replace the opto-sensor glasses:

Step	Action	Illustration
1	Unscrew one screw of the holder for opto-diode and one screw of the holder for opto-transmitter, respectively	
2	Remove opto-diode and opto-transmitter from their holders.	
3	Push out glasses from front side of door and remove.	
4	Replace the glases for opto-diode and opto-transmitter, respectively.	

Installation

Installation is done in reverse order.

D.2.2 Removing locking catch for drip guide

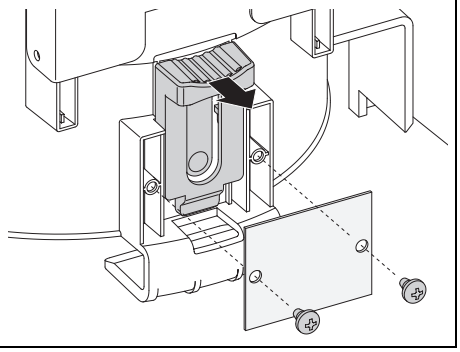
Preparation

Before removing the locking catch for drip guide

- Open the door
- Switch off the main switch.

Replacement

Follow these steps to replace the locking catch:

Step	Action	Illustration
1	Remove two screws from holder plate for locking catch	
2	Pull out locking catch.	

Installation

Installation is done in reverse order.

D.2.3 Removing the cup station

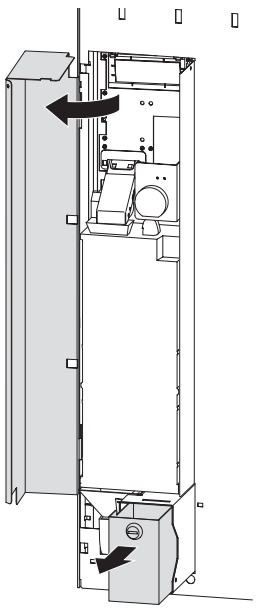
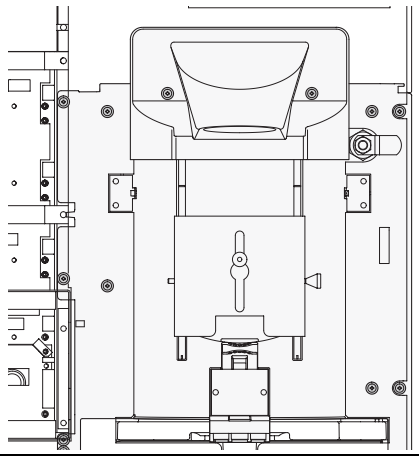
Preparation

Before removing the cup station:

- Open the door.
- Switch off the main switch.
- Pull out the drip tray, *see Operator Manual*

Removal

Follow these steps to remove the cup station.

Step	Action	Illustration
1	Swing cover for payment system open, and remove the coin box.	
2	Remove 12 screws from rear cover plate for door to release cup station.	
3	Remove cup station from front side of machine door.	

Installation

Installation is done in reverse order.

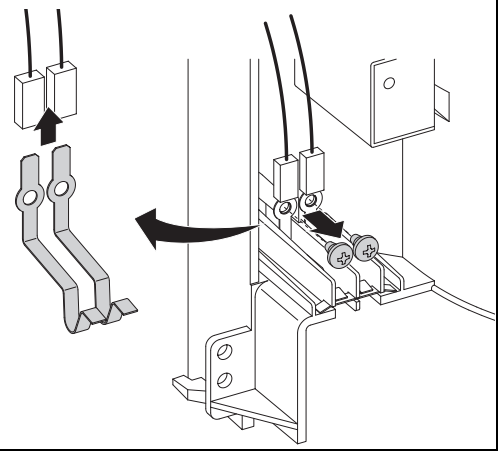
Removing the spring contacts for drip tray sensors

Preparation:

Before removing the spring contacts for drip tray sensors:
- Open the door.
- Switch off the main switch.
- Pull out the drip guide
- Remove the cup room, *see this section, page 5D-3*.

Removal

Follow these steps to remove the spring contacts:

Step	Action	Illustration
1	Remove one screw from each spring contact.	
2	Remove electrical connections, and pull out spring contacts.	

Installation

Installation is done in reverse order.

D.2.4 Changing the configuration of the cup platform positions

Preparation:

Before changing the configuration:
- Open the door.
- Switch off the main switch.

Introduction

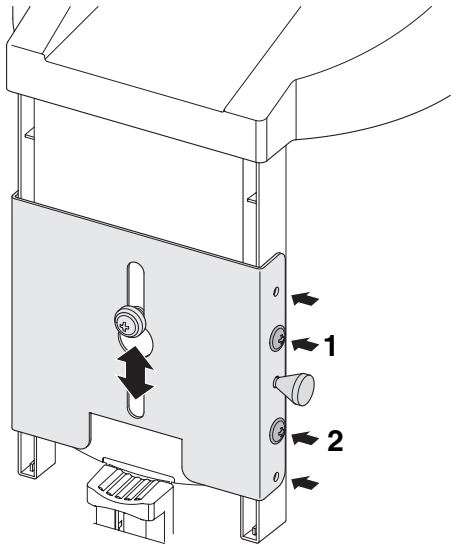
In the standard configuration it is possible to shift the cup platform between two different positions by just tilting the cup platform and sliding it up or down its groove.

Alternative positions

If alternative settings are required, for instance the possibility of using taller mugs or locking the cup platform in a fixed position, see the possibilities below:

Changing

This table shows some of the non standard alternative positions for the cup platform:

Position	Action	Illustration
Higher	Remove screw no. 1. This will allow the cup platform to be set in a higher position, e.g. for very small cups.	
Lower	Remove screw no. 2. This will allow the cup platform to be set in a lower position, e.g. for large mugs.	
Locked position lower	Move screw no. 1 to the topmost screw hole. This will lock the cup platform in the lower of the two standard positions.	
Locked position higher	Move screw no. 2 to the bottommost screw hole. This will lock the cup platform in the higher of the two standard positions	

D.3 Functional descriptions

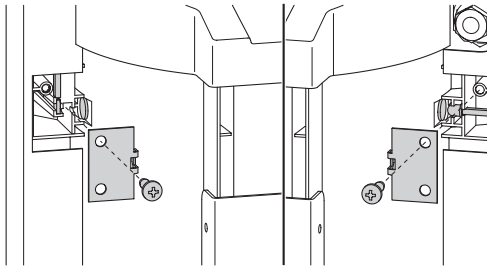
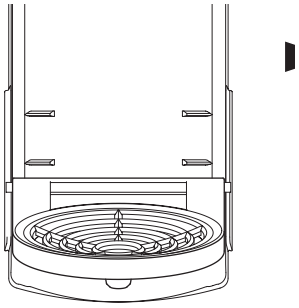
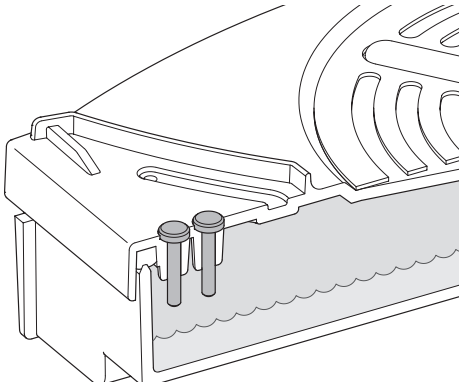
D.3.1 Total overview

Cup staton

Essential parts of the cup station:
1 Cup sensors
2 Drip grate
3 Drip tray sensors

Description

This table gives a brief description of the various parts of the cup station.

	Description	Illustration
1	The cup sensors detect if a cup is placed on the cup platform or if a pot is placed on the pot platform.	
2	The drip grate lets spilt liquid pass through to the drip tray below.	
3	The drip tray sensors detect if the drip tray needs emptying and release an error message.	

D.4 Electrical diagrams

D.5 Technical specifications

Not available here.

D.6 Options

Not available here.

D.7 Accessories

Not available here.

F Cooling

F.1 Adjustments

(Not available)

G Housing / Cabinet

G.1 Adjustments

Not available here.

G.2 (Dis-)assemblies

G.2.1 Removing the fan

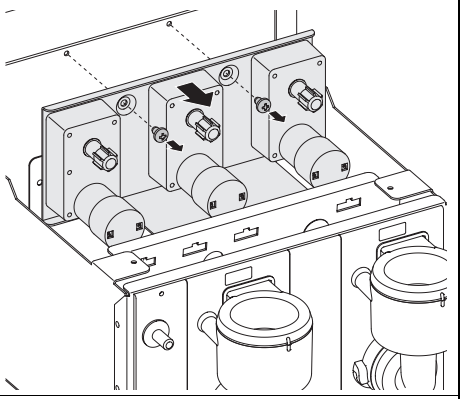
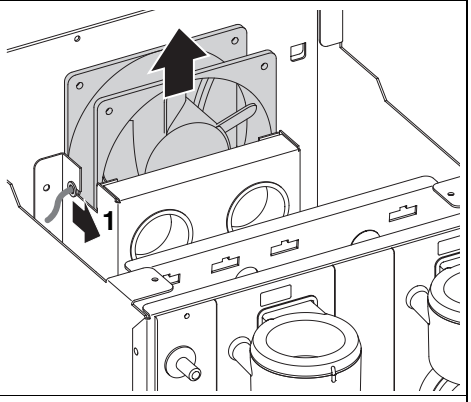
Preparation

Before removing the fan:

- Open the door
- Switch off the mains switch.
- Remove all canisters.
- Remove tray under canisters.
- Remove cover plate for instant module, *see chap. 5.C.2.3, page 5C-3*.

Removal

Follow these steps to remove the fan:

Step	Action	Illustration
1	Remove two screws from the ingredient motor bracket. Move bracket to the side, and rest it on the side of the instant module bracket. Its is not necessary to remove electrical connections.	
2	Pull the rubber busing with the elctrical wire out of the groove (1).	
3	Slide the fan out of its holder.	
4	Disconnect electrical connection to the fan.	

Installation

Installation is done in reverse order.

When remounting the fan, make sure to turn it correctly so that the air is blown out of the machine.

G.2.2 Removing the coin mechanism

Preparation

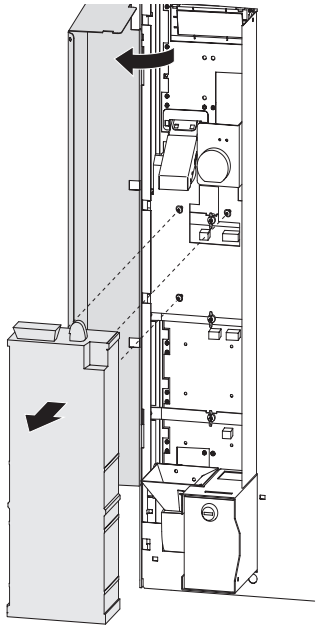
Before removing the coin mechanism:

- Open the door.
- Switch off the main switch.

Removal

Follow these steps to remove the coin mechanism:

Step	Action
1	Swing cover for payment system open.
2	Disconnect electrical connections to coin mechanism.
3	Detach the coin mechanism from the three retaining screws.



Installation

Installation is done in reverse order.

G.2.3 Removing the coin chute

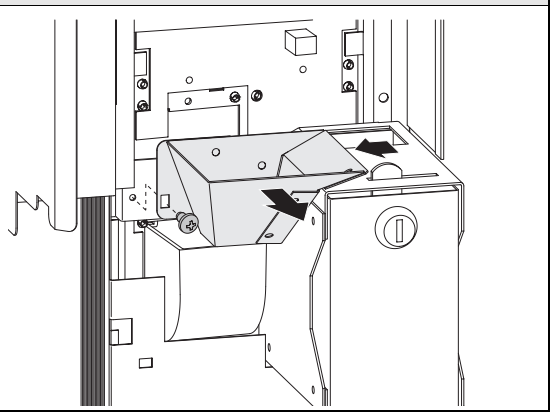
Preparation

Before removing the coin chutes:

- Open the door.
- Switch off the main switch.
- Remove the coin mechanism, *see this section, page 5G-2*.

Removal

Follow these steps to remove the coin chutes:

Step	Action	
1	Remove one screw from coin chute.	
2	Remove coin chute by pulling slightly towards the left and forwards.	

Installation

Installation is done in the reverse order.

G.2.4 Replacing the selection signs

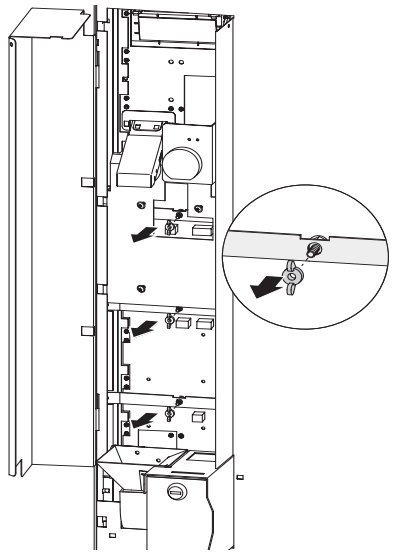
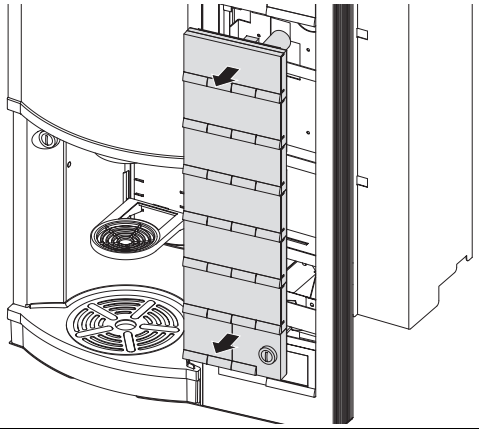
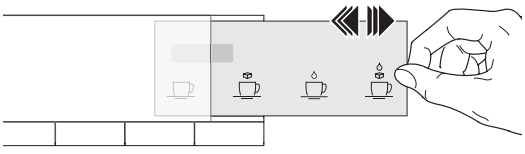
Preparation

Before replacing the selection signs:

- Open the door.
- Switch off the main switch.
- Remove the coin mechanism, *see this section, page 5G-2*.

Replacement

Follow these steps to replace the selection signs:

Step	Action	
1	Loosen the three wing nuts at the back of the selection panel.	
2	Press the selection panel out of the mounting frame	
3	Change the labels/price tickets: • Slide aside old label / price ticket and replace with with new one.	

Installation

Assembly is done in reverse order.

G.2.5 Removing the selection panel

Preparation

Before removing the selection panel:

- Open the door.
- Switch off the main switch.
- Remove the coin mechanism, see *this section, page 5G-2.*

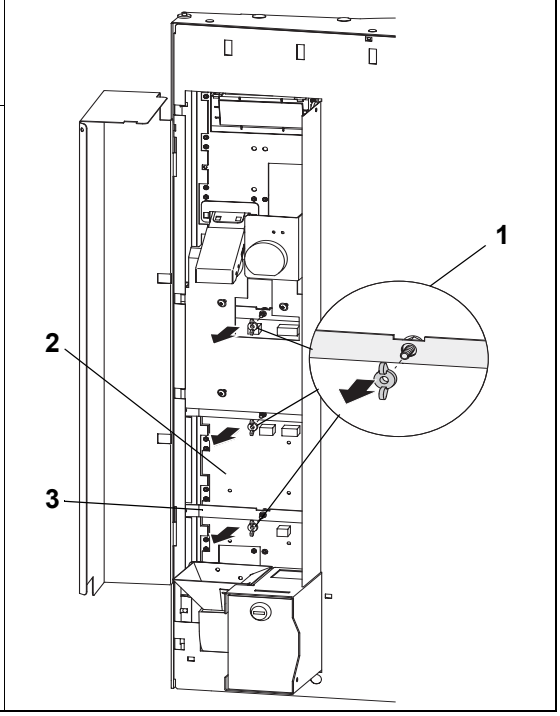
Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

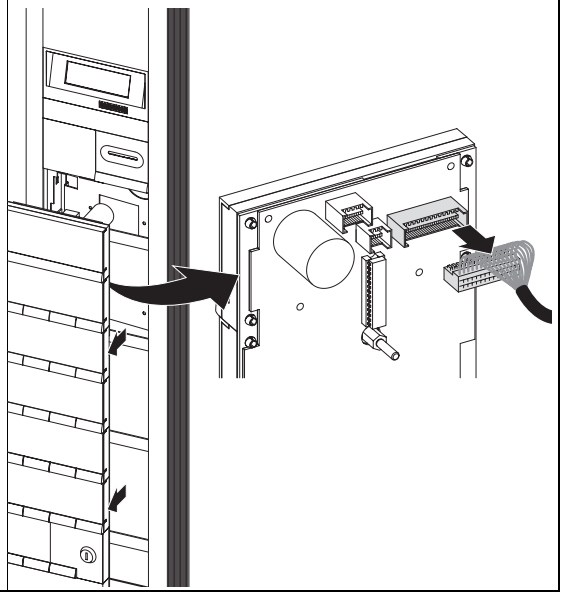
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.
- Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Removal

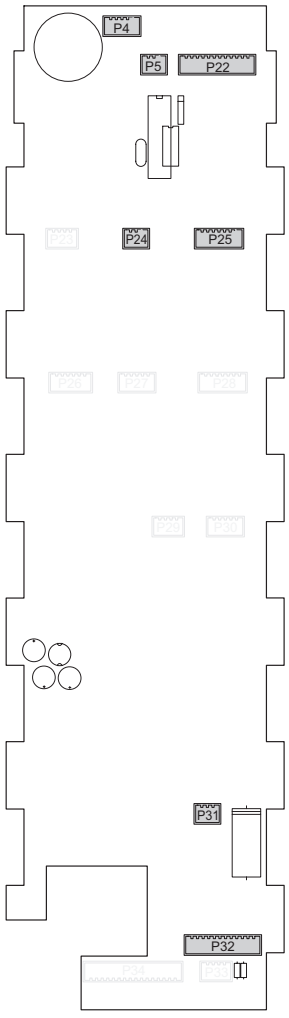
Follow these steps to remove the selection panel:

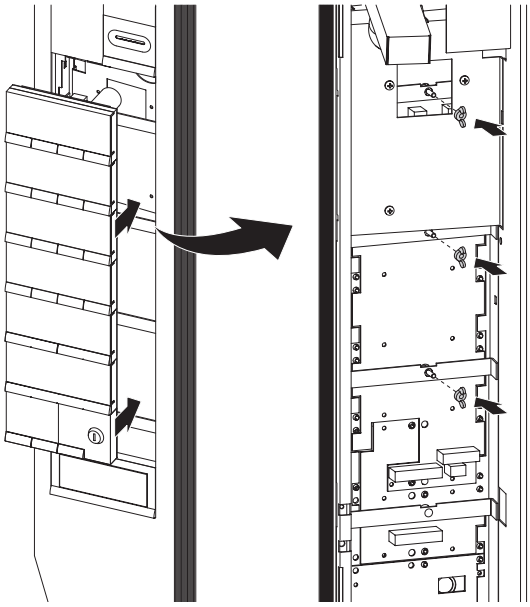
Step	Action	Illustration
1	Loosen the three wing nuts (**1**) at the back of the selection panel.	
2	From rear side of door press the selection panel (**2**) out of the mounting frame (**3**).	

Step	Action	Illustration
3	From the front side of the door disconnect all board connectors.	

Installation

Follow these steps to install the selection panel:

Step	Action	Illustration
1	From front of door reconnect the board connectors as follows: **P4**: Power **P5**: Wittlink **P22**: Display **P24**: Power for payment system MDB/BDV **P25**: Coin return **P31**: Door light relay **P32**: Cup sensor **Note:** Ensure that connectors for P5 and P24 are not switched by mistake as this may cause fatal damage to all pcbs in machine.	

Step	Action	Illustration
2	Push selection panel with SPC circuit board back into its mounting frame.	
3	From rear side of door fasten selection panel with three wing nuts.	
4	Reinstall all remaining parts in door.	

G.2.6 Replacing a selection button

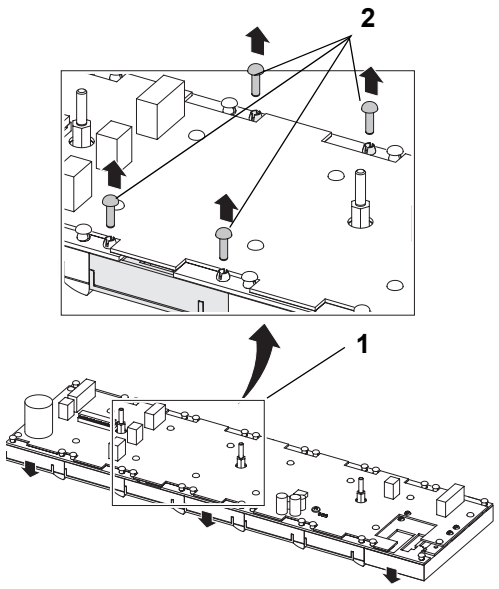
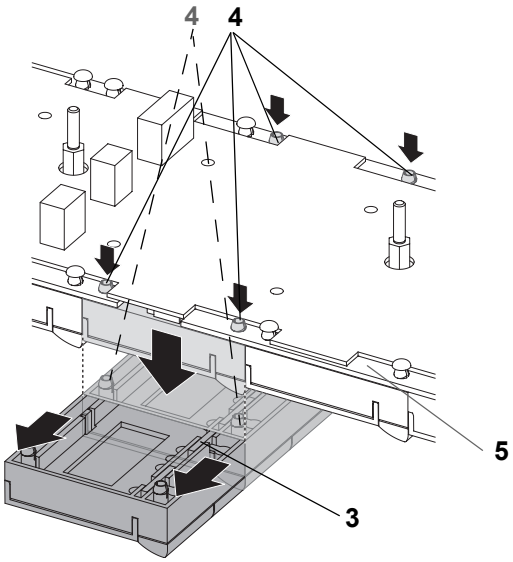
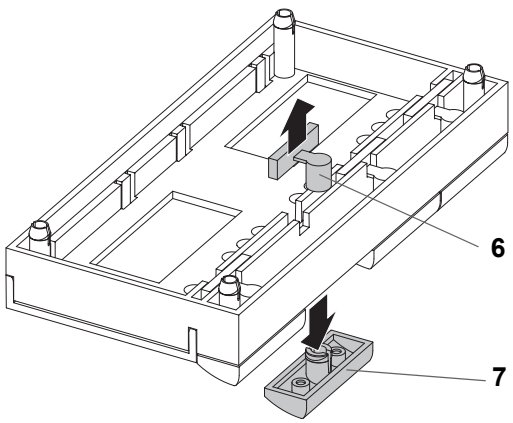
Preparation

Before replacing a selection button:

- Open the door.
- Switch off the main switch.
- Remove the coin mechanism, see *this section, page 5G-2*
- Remove the selection panel, see this section, page 5G-5

Removal

Follow these steps to remove a selection button:

Step	Action	Illustration
1	Place the selection panel (**1**) on a flat surface with the selection buttons facing downwards.	
2	Remove four rivets (**2**) from the spacing legs of the base module holding the selection button to be replaced.	
3	Release the base module (**3**) by pressing the spacing legs (**4**) out of the mounting frame (**5**).	
4	Lift the selection panel (**1**) slightly with one hand and with the other lift out the base module (**3**) without turning it.	
5	Remove the white plastic spring (**6**) from the push button in question.	
6	Push the push button (**7**) out of the base frame.	

Installation

Installation is done in reverse order.

G.2.7 Removing the advertising poster frame

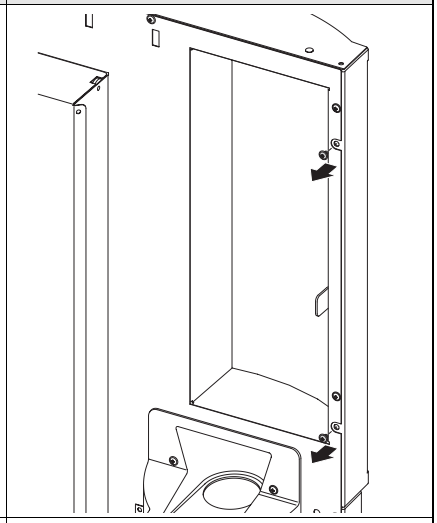
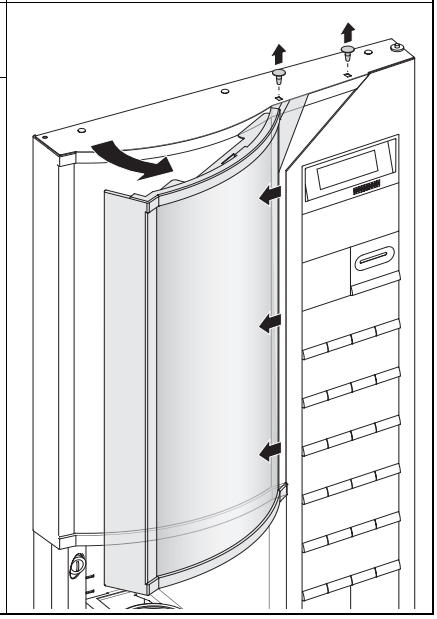
Preparation

Before removing the advertising poster frame

- Open the door
- Switch off the main switch.

Removal

The procedure for removing the advertising poster is as follows:

Step	Action	
1	Remove two screws at lock side of door.	
2	Remove the two stop pins at top of the hinge side of door.	
3	Remove advertising poster frame by first rotating and then carefully pulling leftwards out of the wing.	

Installation

Installation is done in reverse order.

G.2.8 Replacing the advertising poster

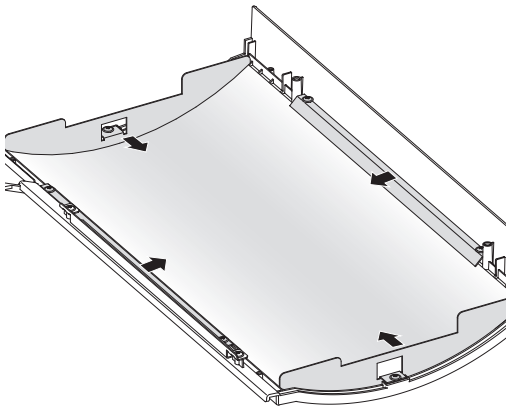
Preparation

Before replacing the advertising poster:

- Open the door.
- Switch off the main switch.
- Remove the advertising poster frame, *see this section, page 5G-9*.

Replacement

The procedure for replacing the advertising poster is as follows:

Step	Action	Illustration
1	Loosen the six screws that hold the suppport brackets.	
2	Push support brackets towards the middle to release poster.	
3	Remove diffuser plate and poster.	
4	Replace old poster by new one.	

Installation

Installation is done in reverse order, considering that the poster and the diffuser are placed carefully in the frame, in order that no light is penetrating the edges when poster frame is repositioned.

G.2.9 Removing the door switch

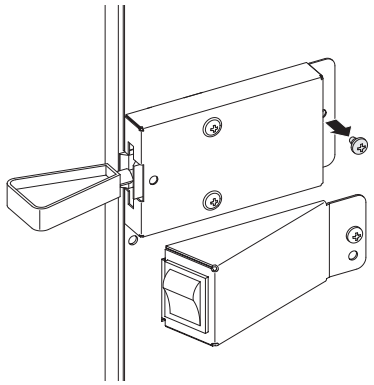
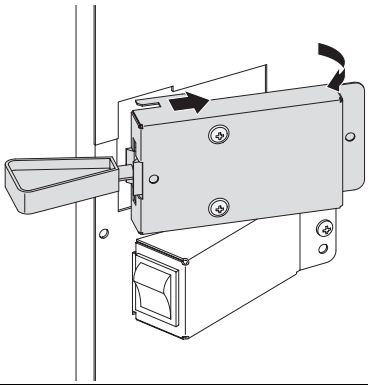
Preparation

Before replacing the advertising poster:

- Open the door.
- Switch off the main switch.
- Remove the brewer unit, *see chap. 5.B.3.2, page 5B-4.*

Removal

The procedure for removing the door switch is as follows:

Step	Action	Illustration
1	Remove one screw from the switch bracket.	
2	Slide bracket slightly backwards and pull it outwards. Disconnect electrical connection, and remove bracket from cabinet.	

Installation

Installation is done in reverse order.

G.2.10 Disassembling the door switch

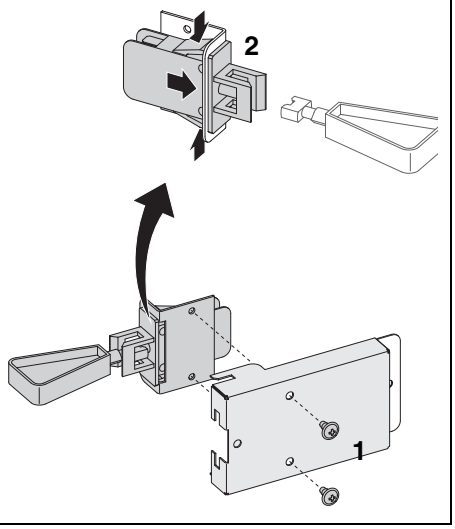
Preparation

Before replacing the advertising poster:

- Open the door.
- Switch off the main switch.
- Remove the brewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove door switch, *see this section, page 5G-11*.

Disassembly

The procedure for disassembling the door switch is as follows:

Step	Action	Illustration
1	Remove two screws and detach switch from bracket. (1)	
2	Detach the switch from the small bracket (2) by squeezing the two retaining clips together with one hand while pulling the switch with the other.	

Assembly

Assembly is done in reverse order.

G.3 Functional descriptions

Not available here.

G.4 Electrical diagrams

Not available here.

G.5 Technical specifications

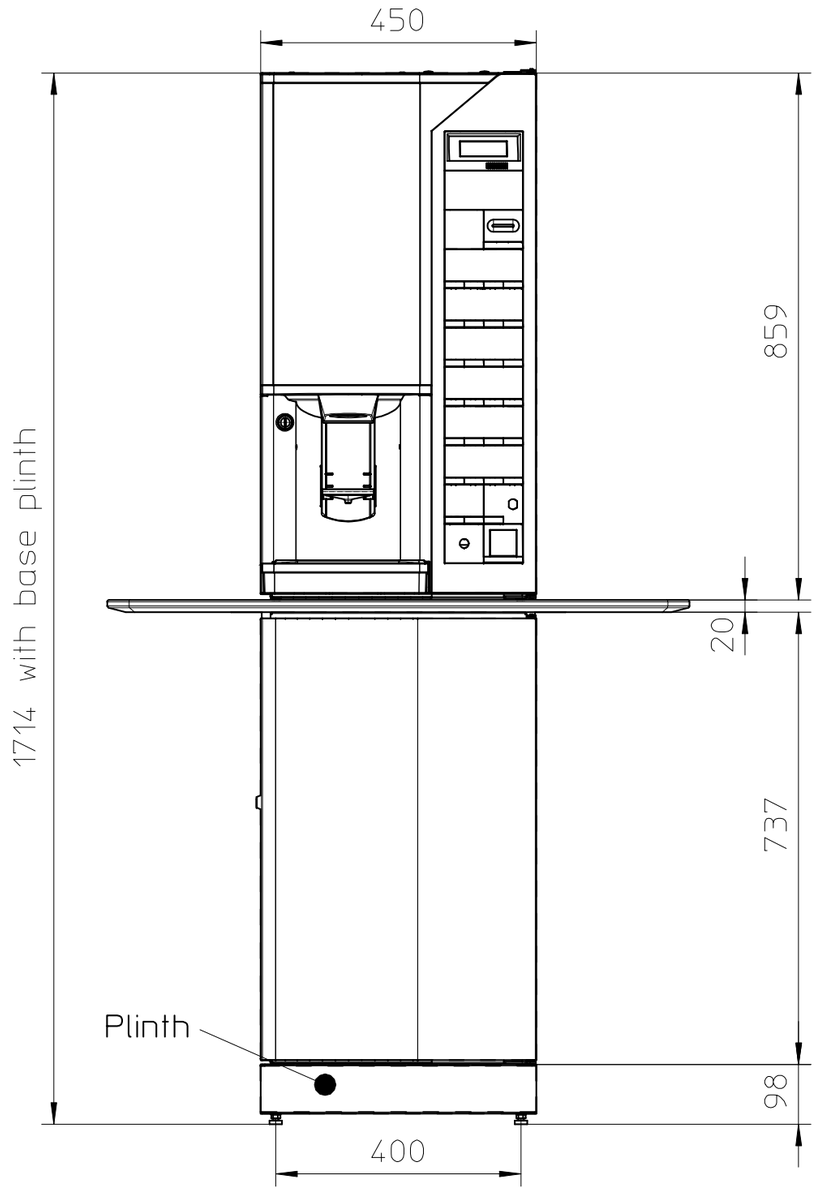
Not available here.

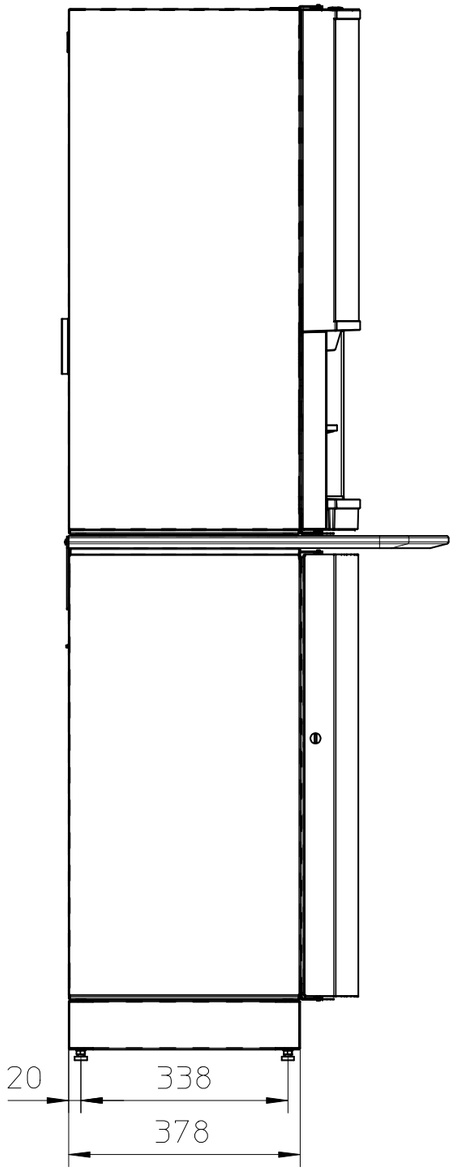
G.6 Options

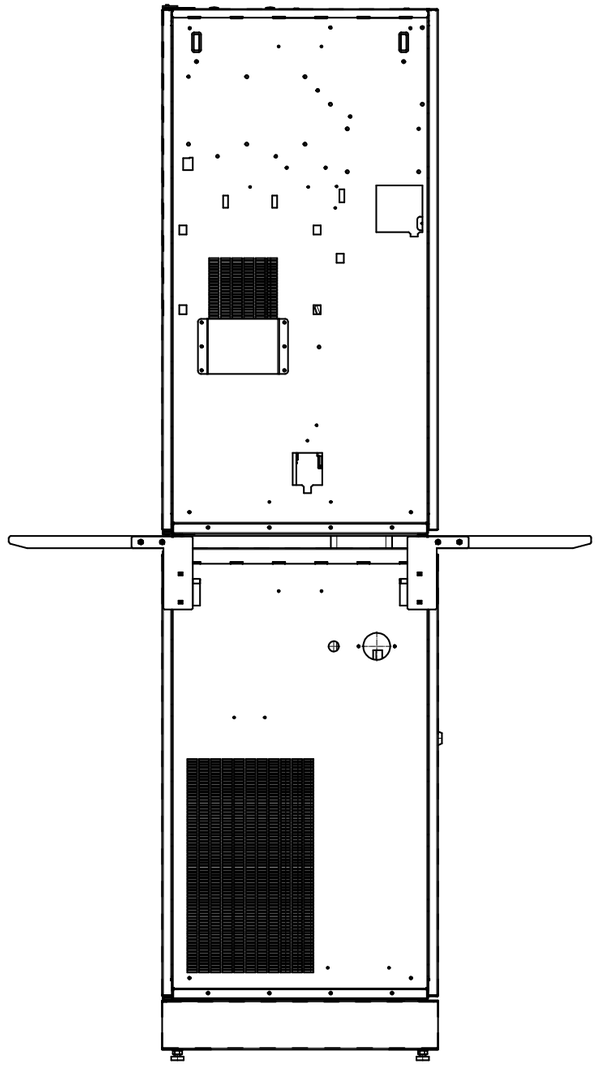
Not available yet.

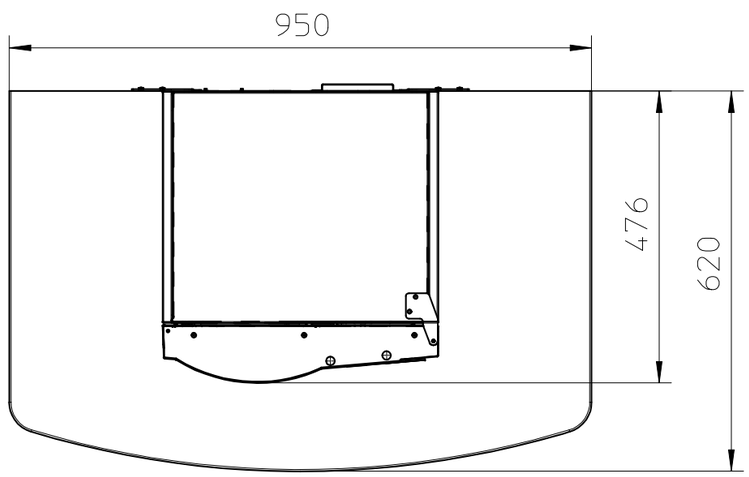
G.7 Accessories

Not available yet.









Dimension in mm

ÆNDRING:		POS.	STK.	VARENUMMER	BETEGNELSE
	·				
	·				
	·				
	·				

	MATR.:		BESKRIVELSE:			DIMENSION:	
GODKEND.:			FOR LINEÆRE MÅL UDEN TOL. ANG. IFLG. DS2768-m			LIGN.EMNE:	·
MALEKVAL.:	·	IKKE ANG. TOLERANCER FOR PLAST-EMNER DIN 16901 TOL.-GRUPPE:				MODEL:	·
KONTROLMÅL:	·		(1000) 2000 1,2 (400) 1000 0,8 (120) 400 0,5 (30) 120 0,3 (6) 30 0,2 (0,5) 6 0,1			TEGN. AF: AC	DATO: 04/08/11
EL-FORZINKE:	·					KONTR. AF:	DATO:
GRATFRI:	·	FOR VINKLER VED KLIP OG BUK UDEN TOLE-RANCEANGIVELSE: ± 1°	over	t.o.m.	±	REVISION:	T
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						7100 SEMI-AUTOMATIC	7100
							SAMLING: ·

11-08-2004 14:44:39

K Power Supply Unit and Control

K.1 Adjustments

Not available here.

K.2 (Dis-)assemblies

K.2.1 Safety instructions

Installation and repair works on the machine may only be carried out by trained service technicians.

Be extremely careful, your life can be endangered!
The vending machine controllers and power supply box parts are carrying the mains voltage if the machine is connected to the power supply.
Make sure that no splashes of the product or water get onto the vending machine controllers.

Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.

Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

K.2.2 Disassembling the power supply cord

Preparation

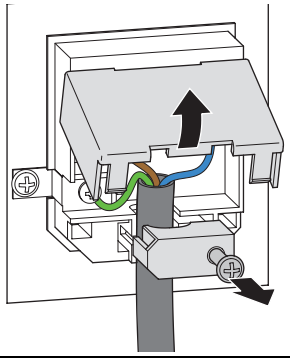
Before disassembling the power supply cable:

- Disconnect the power supply

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Disassembly

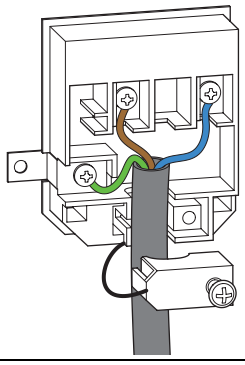
From rear side of machine follow these steps to disassemble the power supply cable:

Step	Action	Illustration
1	Remove cord unloader loosening one screw.	
2	Release the snap pins at both sides at the bottom of cover and tilt up the cover	
3	Disconnect the cable connection at the terminal strip.	
4	Remove the power supply cord.	

Assembly

Assembly is done in reverse order.

Make sure the reconnection is made correctly, see table below:

1	blue: neutral	
2	brown: line	
3	yellow / green: protective earth	

K.2.3 Removing the cover plate for power supply box, FB print and CPU

Preparation

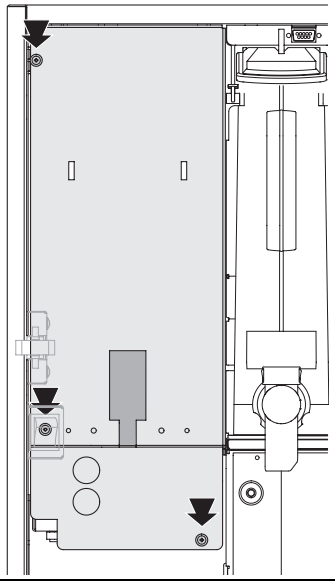
Before removing the cover plate for power supply box:

- Disconnect the power supply.
- Open the door.
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Removal

Follow these steps to remove the mounting plate for power supply box:

Step	Action	Illustration
1	Loosen three screws on mounting plate.	
2	Pull forward to release the two hooks at the top of the machine.	
3	Remove electrical connection from print board, and lift out cover plate.	

Installation

Installation is done in reverse order.

K.2.4 Disassembling the power supply box

Preparation

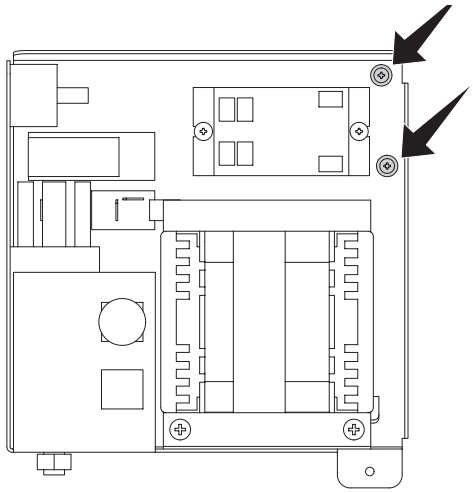
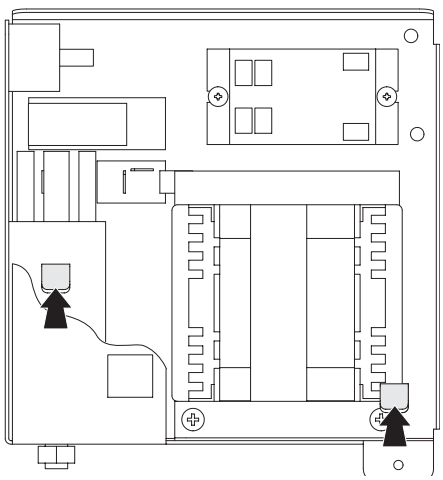
Before disassembling the power supply box:

- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Disassembly

Follow these steps to disassemble the power supply box:

Step	Action	Illustration
1	Pull off the electrical connection plugs of the electrical components in power supply box	
2	Remove the two fixing screws to the right side in rear of power supply box	
3	Lift up 2 cm to detach supply box from mounting rail. Note: The supply box is held in place by hooks.	

Assembly

Assembly is done in reverse order

Ensure that connectors are correctly fitted.

K.2.5 Removing the transformer

Preparation

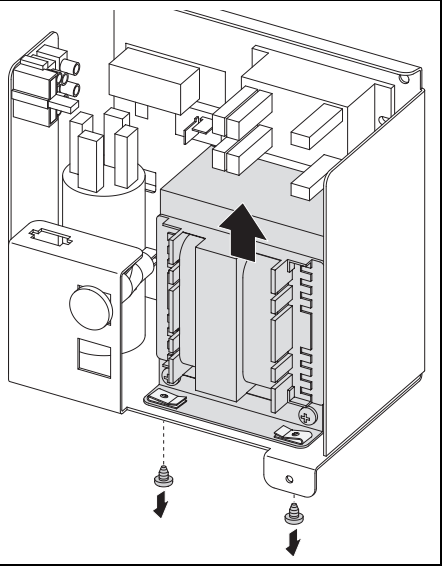
Before removing the transformer:

- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see chap. 5.K.2.3, page 5K-3*.
- Detach the power supply box, *see this section, page 5K-4*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Removal

Follow these steps to remove the transformer:

Step	Action	Illustration
1	Remove four screws.	
2	Lift off transformer.	

Installation

Installation is done in reverse order.

K.2.6 Removing the relay for heating element

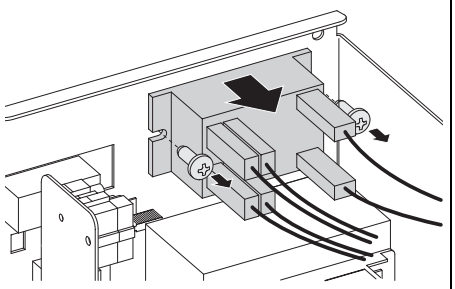
Preparation

Before removing the relay for heating element
- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*.
- Detach the power supply box, *see this section, page 5K-4*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Removal

Follow these steps to remove the relay for heating element

Step	Action	Illustration
1	Pull off the electrical connection plugs.	
2	Loosen two screws.	
3	Remove relay.	

Installation

Installation is done in reverse order.

K.2.7 Removing the noise capacitor

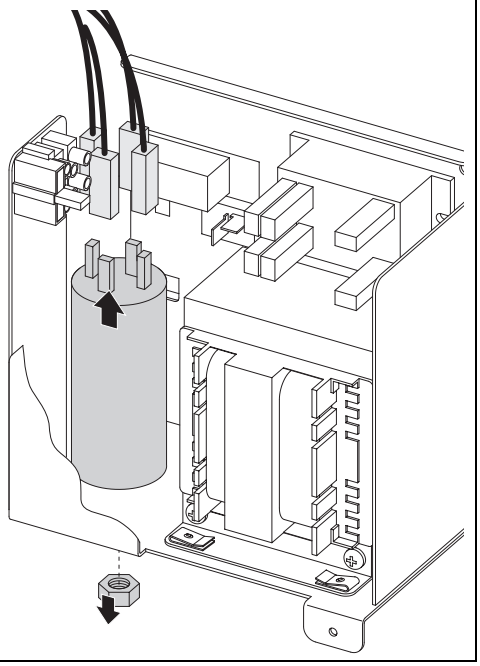
Preparation

Before removing the noise capacitor:
- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*..

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Removal

Follow these steps to remove the noise capacitor:

Step	Action	Illustration
1	Pull off the electrical connections from capacitor.	
2	Loosen nut	
3	Detach noise capacitor from its bracket.	

Installation

Installation is done in reverse order.

Ensure that connectors are correctly fitted.

K.2.8 Disassembling the ICB / CPU

Preparation

Before disassembling the printed circuit board:

- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

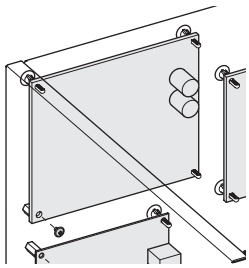
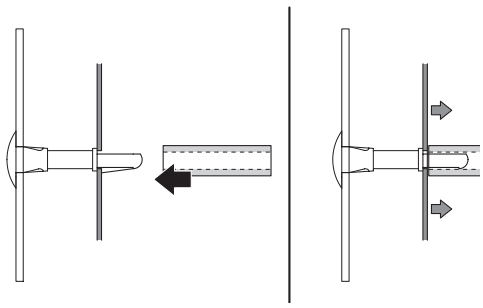
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.

Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Disassembly

Follow these steps to disassemble the printed circuit board:

Step	Action	
1	Disconnect all board connectors	
2	Remove screw at right upper corner of printed circuit board	
3	Squeeze the three fastening clips with an appropriate tool Tip : Use a piece of hard hose/ tube with internal diameter of 4 mm.	
4	Gently pull off the printed circuit board.	

Assembly

Assembly is done in reverse order.

K.2.9 Disassembling the expansion board of the ICB / CPU

Preparation

Before disassembling the printed circuit board:

- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

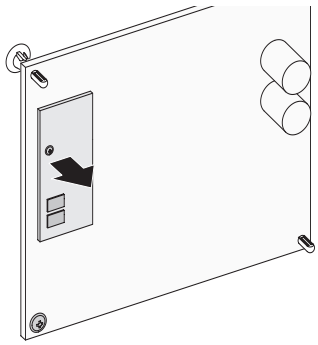
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.

Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Disassembly

Follow these steps to disassemble the printed circuit board:

Step	Action	
1	Disconnect board connection.	
2	Remove screw of printed circuit board.	
3	Remove expansion printed curcuit board.	

Assembly

Assembly is done in reverse order.

K.2.10 Disassembling the brewer printed circuit board

Preparation

Before disassembling the printed circuit board:

- Disconnect the power supply.
- Open the door
- Remove the freshbrewer unit, *see chap. 5.B.3.2, page 5B-4*.
- Remove cover plate for power supply box, FB print and CPU, *see this section, page 5K-3*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

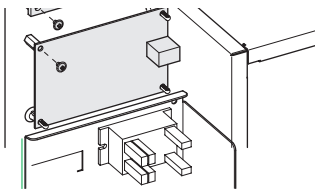
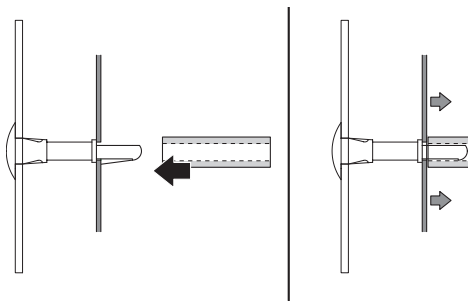
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.

Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Disassembly

Follow these steps to disassemble the printed circuit board:

Step	Action	
1	Disconnect all board connectors	
2	Remove screw at upper left corner of printed circuit board	
3	Squeeze the three fastening clips with an appropriate tool Tip : Use a piece of hard hose/ tube with internal diameter of 4 mm.	
4	Gently pull off the printed circuit board.	

Assembly

Assembly is done in reverse order.

K.2.11 Removing the cover for vending machine controller (VMC)

Preparation

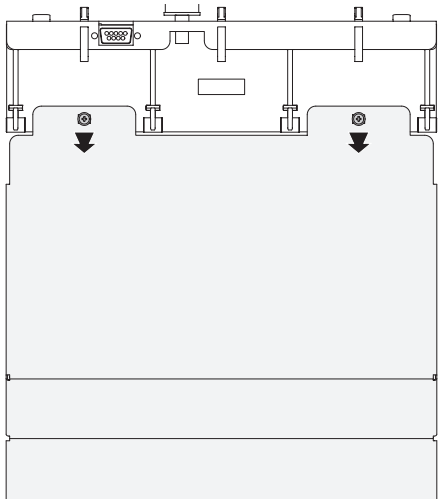
Before removing the cover for electronic box:

- Disconnect the power supply.
- Open the door
- Remove instant ingredient canisters.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Removal

Follow these steps to remove the cover for electronic box:

Step	Action	
1	Loosen two screws.	
2	Lift off the cover plate.	

Installation

Installation is done in reverse order.

K.2.12 Disassembling the vending machine controller (VMC)

Preparation

Before disassembling the vending machine controller:

- Disconnect the power supply.
- Open the door
- Remove instant ingredient canisters.
- Remove cover for VMC, *see this section, page 5K-11*.

Ensure that the machine is disconnected from the mains electrical supply! The machine is only isolated from the mains supply when the plug has been pulled out.

Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

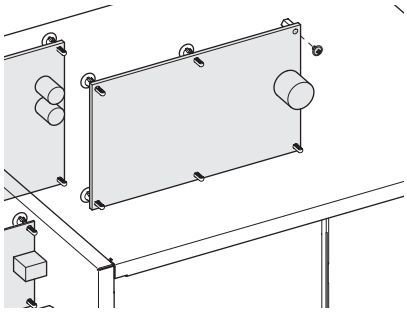
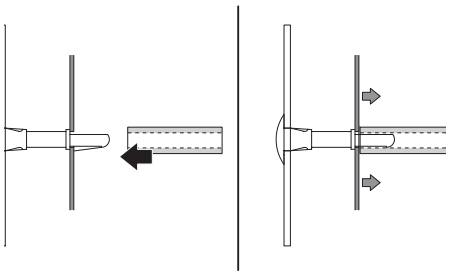
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.

Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Disassembly

Follow these steps to disassemble the printed circuit board:

Step	Action	Illustration
1	Disconnect all board connectors	
2	Remove screw at right upper corner of printed circuit board	
3	Squeeze the five fastening clips with an appropriate tool Tip : Use a piece of hard hose/ tube with internal diameter of 4 mm.	
4	Gently pull off the printed circuit board.	

Assembly

Assembly is done in reverse order.

K.2.13 Replacing the SPC circuit board

Preparation

Before replacing the SPC circuit board:

- Open the door.
- Switch off the main switch.
- Remove the coin mechanism, see *chap. 5.G.2.2, page 5G-2*.
- Remove the selection panel, see *chap. 5.G.2.5, page 5G-5*.

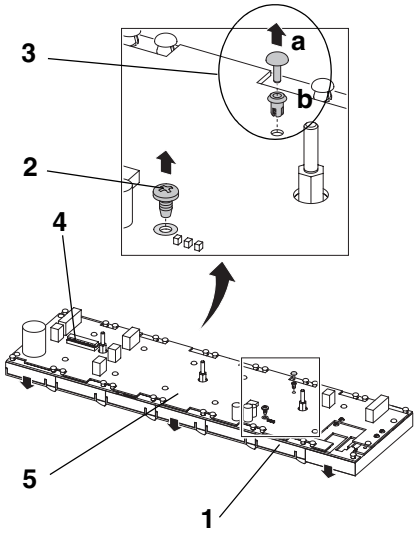
Caution:
Electrostatic discharge may cause damage to Printed Circuit Boards (PCBs) and electronic components.

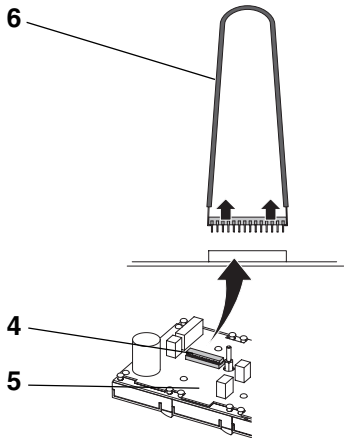
To avoid damage:

- Always wear an anti-static wrist wrap when handling PCBs or electronic components.
- Alternatively touch a metal area of the earthed cabinet to discharge static electricity from your body prior to touching any PCB or electronic component.

Replacement

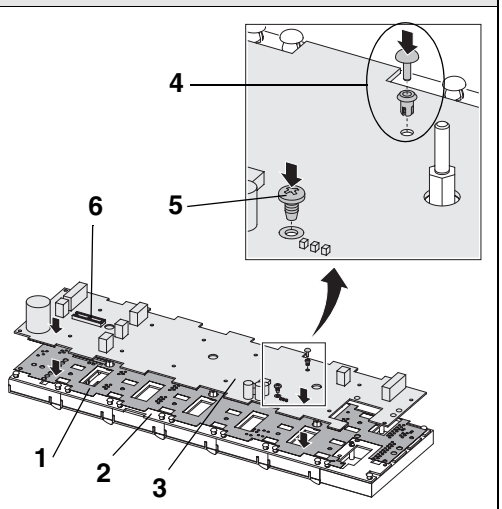
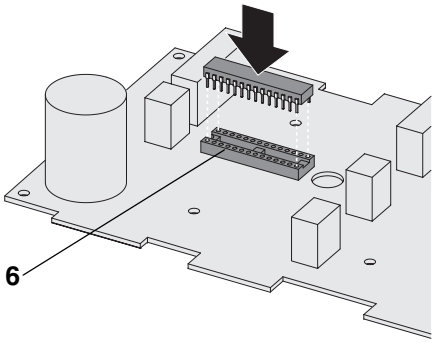
Follow these steps to replace the SPC circuit board:

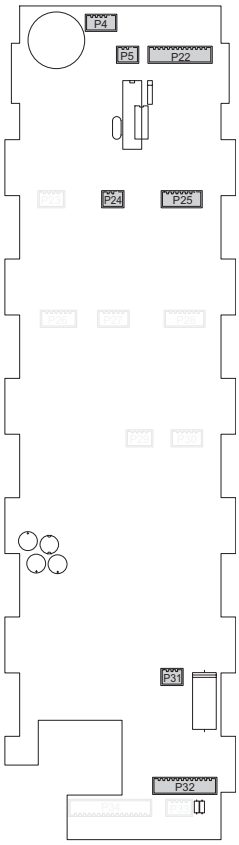
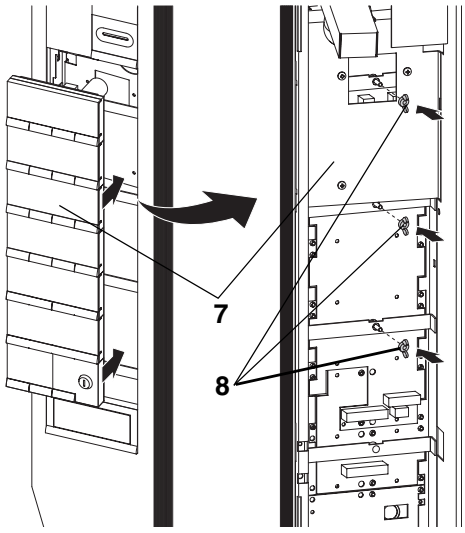
Step	Action	
1	Place the selection panel (**1**) on a flat surface with the selection buttons facing downwards.	
2	Loosen and remove earthing screw (**2**) from the SPC circuit board.	
3	Remove 15 plastic push-in rivets (**3**) (drive pin (**a**) and socket (**b**)) using a flat tool.  Take care not to damage the elements on the SPC circuit board. Do not reuse the plastic push-in rivets after removal.	

Step	Action	
4	Remove the PIC micro controller (**4**) from the SPC circuit board (**5**) using a special tool (**6**).	

Installation

Follow these steps to install the SPC circuit board:

Step	Action	
1	Place the insulating foil (**1**) on the mouting plate (**2**).	
2	Place the SPC circuit board (**3**) on the insulating foil and attach the SPC circuit board to the mounting plate using 15 new plast push-in rivets (**4**).	
3	Reinsert and fasten the earting screw (**5**) to the SPC circuit board.	
4	Place the PIC micro controller (**6**) on the new SPC circuit board. Ensure correct installation of PIC miro controller, see *"Installation of PIC micro controller"* below.	

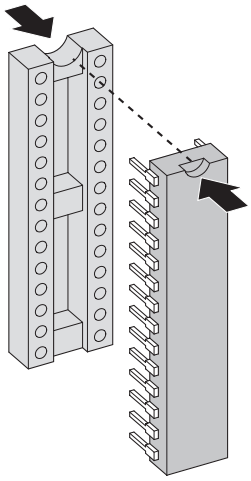
Step	Action	
5	From front of door reconnect the board connectors as follows: **P4**: Power **P5**: Wittlink **P22**: Display **P24**: Power for payment system MDB/BDV **P25**: Coin return **P31**: Door light relay **P32**: Cup elevator **Note:** Ensure that connectors for P5 and P24 are not switched by mistake as this may cause fatal damage to all pcbs in machine.	
6	Push selection panel (**7**) with SPC circuit board back into its mounting frame.	
7	From rear side of door fasten selection panel (**7**) with 4 wing nuts (**8**).	
8	Check if the PIC micro processor is communicating with the CVU, see *"Checking communication of PIC micro processor"*	
9	Switch off main switch and reassemble all remaining parts.	

Installation of PIC micro controller

It is important that the PIC micro controller is placed in the proper direction in its socket to ensure its functioning.

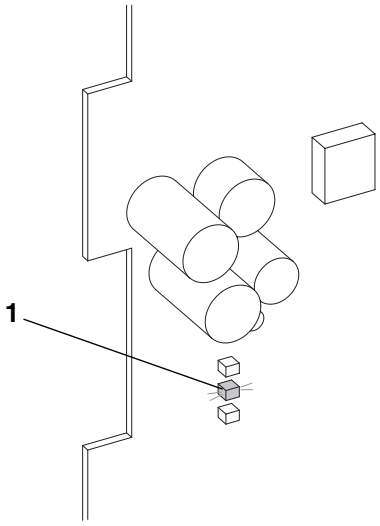
The PIC micro controller is provided with a notch at one end. This notch must point in the same direction as the notch at one end of the socket, see illustration for correct location

- Illustration of correct location of PIC micro processor



Checking communication of PIC micro processor

After installation of the new SPC circuit board and the PIC micro processor the machine should be checked for proper communication as follows:

Step	Action	
1	Switch on the main switch.	
2	Wait until the machine is ready for a vend.	
3	Look at the indicator LEDs (**1**) of the SPC circuit board	
4		

If the center LED ...	Then the PIC micro processor...
is flashing twice at a time	has a correct connection.
is flashing once at a time	has no connection. Check P5.
is not lit	has been inserted incorrectly, the PIC micro processor is defective, or no software in PIC.

K.3 Functional descriptions

Not available here.

K.4 Electrical diagrams

HARNESS F DOOR
42.3917.00

HARNESS FOR WITTLINK/POWER
VMC/BREW 42.3916.00

HARNESS FOR WITTLINK/ POWER 495/BREW 42.3924.00

WL-H
WL-L
GND
CAN-H
CAN-L
GND
STROBE
SPI-OUT
SPI-CLK
SPI-INP
GND
4 RXD MDB
5 TXD MDB
6 COM MDB
5 CLOOP RX+
6 CLOOP RX-
7 CLOOP TX+
8 CLOOP TX-

CPU BOARD
47.1256.00

HARNESS FOR
RS 232
42.3920.00

UP-KEY CONNECTION
47.1263.00

HARNESS FOR UP-KEY
42.3935.00

GND
24VAC
P4A-2
P4A-1

HARNESS F
INTERFACE 42.3945.00

DOOR SW. COM
DOOR SW. NO

COLD WATER SHOT VALVE -
INLET VALVE/COLD WATER SHOT -
34V-X

WASTE BUCKET 1 SENSOR -
WASTE BUCKET 1 SENSOR +
WASTE BUCKET 2 SENSOR -
WASTE BUCKET 2 SENSOR +

DRIP TRAY SENSOR -
DRIP TRAY SENSOR +

VMC 7X00
47.1249.02

34V
PWM OUT
GND
24VAC 3
24VAC 2
24VAC 1

SERVICE LIGHT RELAY +
SERVICE LIGHT RELAY -
HEATER RELAY +
HEATER RELAY -

34V-X
RECIRCULATION VALVE -
INLET VALVE HOT -
OVER BOIL SENSOR -
STIRRER DISPENSER RELAY -
WATER TEMPERATURE SENSOR +
WATER TEMPERATURE SENSOR -
WATER LEVEL SENSOR +

WATER PUMPE MOTOR +
WATER PUMPE MOTOR -
WATER PUMP TACHO-VCC
WATER PUMP TACHO-OC
WATER PUMP TACHO-GND

34V-X
INGREDIENT MOTOR 1 -
INGREDIENT MOTOR 2 -
INGREDIENT MOTOR 3 -
INGREDIENT MOTOR 4 -
INGREDIENT MOTOR 5 -
INGREDIENT MOTOR 6 -

34V-X
WHIPPER MOTOR 6 -
WHIPPER MOTOR 7 -
DELEVERY VALVE 6 -
DELEVERY VALVE 7 -
DELEVERY VALVE 8 -
DELEVERY VALVE 9 -

34V-X
WHIPPER MOTOR 1 -
WHIPPER MOTOR 2 -
WHIPPER MOTOR 3 -
WHIPPER MOTOR 4 -
WHIPPER MOTOR 5 -
DELEVERY VALVE 1 -
DELEVERY VALVE 2 -
DELEVERY VALVE 3 -
DELEVERY VALVE 4 -
DELEVERY VALVE 5 -
HOT WATER VALVE -
FB VALVE -

FAN +
FAN -
RED
BLACK

HARNESS F DOOR SW.
42.3959.00

DOOR SWITCH

DELTA BREWER CONTROLLER
47.1251.00

INGREDIENT MOTOR 2 TACHO OC
BREWER MOTOR TACHO OC
TACHO GND
INGREDIENT MOTOR 1 TACHO OC
TACHO VCC
BREWER CLOSED SW. C
BREWER CLOSED SW. NC
BREWER AT END SW. C
BREWER AT END SW. NC
BREWER MOTOR -
BREWER MOTOR +
INGREDIENT MOTOR 2-
INGREDIENT MOTOR 2+
INGREDIENT MOTOR 1-
INGREDIENT MOTOR 1+

E-BOX ASSEMBLY
42.3912.00

BLUE
BROWN
YELLOW/GREEN
N
L

HEATER-RELAY
P7-4
P7-3

10A 10A

230V AC
25V AC

HARNESS FOR MAIN SW.
42.3936.00

MAIN-SWITCH

HARNESS POWER SUPPLY COLD UNIT
42396100

HARNESS FOR BASE SENSOR
42.3948.00

BASE

ONLY USED WITH
MECH. COUNTER OR
COLD UNIT

MECH. COUNTER
000000

HARNESS FOR COUNTER
42.3946.00

INLET VALVE
41.5336.00

HARNESS FOR HEATER
42.3909.00

FAN

NTC ASS.
42.387300

NTC

RECIRCULATION
VALVE
41.5324.00

HARNESS FOR WATERTANK
42.3908.00

PUMPE ASS
42.3931.00

PUMPE
MOTOR

HARNESS FOR INGREDIENT
MOTOR 42.3915.00

MOTOR 1
MOTOR 2
MOTOR 3

FAN BRUSHLESS DC
WITH PLUG 42.3911.00

IN 1
IN 2

FB

HOT
WATER

WHIPPER HARNESS
42.3865.00

HARNESS FOR WHIPPERMOTOR/VALVE 42.3914.00

WHIPPER F COFFEE
42.3949.00

FB-UNIT

POWDER-MOTOR
BREWER-MOTOR

BREWER SAFETY SWITCH
BREWER CLOSED SWITCH
BREWER AT END SWITCH

HARNESS FOR
FRESHBREWER
42.3907.00

VALVE
41.5335.00

ONLY USED WITH
COLD-UNIT

COLD-UNIT

HARNESS FOR WATERPUMP 42.3958.00

EMPTYSENSOR
PUMPMOTOR-
PUMPMOTOR+
EMPTYSENSOR

WATERSUPPLY FOR
HOTWATER TANK

24V PWM
GND
PUMPMOTOR
GND
EMPTYSENSOR
STARTPUMP
24V PWM

WATERPUMP DRIVER
47.1236.00

WATERPUMP
WITH EMPTYSENSOR

OPTIONAL WATERSUPPLY (IN BASESTAND)

FABRIKAT						BESTILLINGSNUMMER	
TEGN. AF	BR	DATO	2003/12/09	GODKENDELSER			
ÆNDR. AF		DATO		REVISION:	T	MAIN DIAGRAM	FOR-SKI. A 43149900 GSP:
KONTR. AF		DATO		VERSION:	2		
WITTENBORG		ERSTATTER:					MODEL: FB 7100
		ERSTAT. AF:					

4-Jun-2006 15:09:56

HARNESS F DOOR
42.3917.00

HARNESS FOR EXECUTIVE COIN
42.3883.00

HARNESS FOR BDV COIN
42.3882.00

HARNESS FOR MDB COIN/CARD
42.3884.00

HARNESS FOR EXECUTIVE COIN/ MDB CARD
42.3886.00

HARNESS FOR BDV COIN/ MDB CARD
42.3885.00

HARN F WITTLINK/POW. BREW./SPC
42.3947.00

DISPLAY 48.5605.00

HARNESS FOR DISPLAY 42.3857.00

COINRETURN ASSEMBLY
42.3863.00

COIN RETURN
47.1254.00

SPC 47.1248.02
SELECTION PANEL CONTROLLER

HARNESS F OPTO
42.3919.00

CUPSENSOR

BDV

MDB

EXECUTIVE

MDB AND EXECUTIVE

MDB AND BDV

HARNESS FOR DRIPTRAY
42.3923.00

DRIPTRAY

HARNESS FOR INTERFACE
42.3945.00

OPTO INTERFACE
47.1258.00

PAYMENT SYSTEM

FABRIKAT					BESTILLINGSNUMMER	
TEGN. AF	BR	DATO	2004/03/04	GODKENDELSER		
ÆNDR. AF		DATO		REVISION: T		
KONTR. AF		DATO		VERSION: 1		
WITTENBORG		ERSTATTER:			DOOR DIAGRAM	FORMAT: B 43150000
		ERSTAT. AF:				MODEL: FB 7100

K.5 Technical specifications

Not available here.

K.6 Options

Not available here.

K.7 Accessories

Not available here.

L External Options

(Not available).

P Payment systems

P.1 Adjustments

Unit	Setting
BDV coins mechanism	All settings related to the BDC coin mechanism are made via the Menu System, under Payment settings, in technician mode. The following setting options exist: - Single/Multi vend - Payment type - Max credit - Max change - Obligation to buy - Coin inhibit - Low change inhibit - Audit unit internal/External - Exact change equation - Exact change offset - Keyboard inhibit - Price mode - Revalue - Immediate change - Currency code (auto) - Currency code (manual) Please refer to chapter 4.
MDB/ICP coin mechanism	All settings related to the coin MDB/ICP mechanism are made via the Menu System, under Payment settings, in technician mode. The following setting options exist: - Single/Multi vend - Payment type - Max credit - Max change - Obligation to buy - Coin inhibit - Low change inhib - Exact change equation - Exact change offset - Keyboard inhibit - Price mode - Revalue - Immediate change - Currency code (auto) - Currency code (manual) Please refer to chapter 4.
Executive	All settings related to the coin mechanism are made directly on the coin mechanism itself. Please refer to the coin mechanism manual concerning the use of these functions.

Unit	Setting
Coin validator	All settings related to the coin validator are made via the Menu System under Payment settings. The following setting options exist: - Payment type - Max credit - Coin validator Please refer to chapter 4.

P.2 (Dis-)assemblies

P.2.1 Removing the coin mechanism

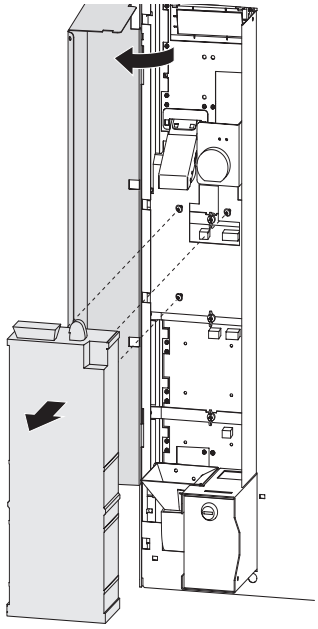
Preparation

Before removing the coin mechanism:
- Open the door.
- Switch off the main switch.

Removal

Follow these steps to remove the coin mechanism:

Step	Action
1	Swing cover for payment system open.
2	Disconnect electrical connections to coin mechanism.
3	Detach the coin mechanism from the three retaining screws.



Assembly

Assembly is done in reverse order.

For more information concerning the coin mechanism refer to the information of the manufacturer.

Never adjust the coin mechanism or disconnect the connecting cable to the vending machine while the machine is carrying voltage.

P.2.2 Disassembling the Zip card reader

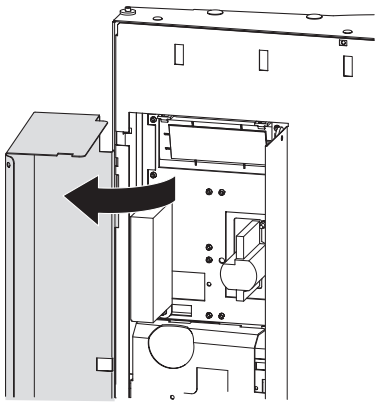
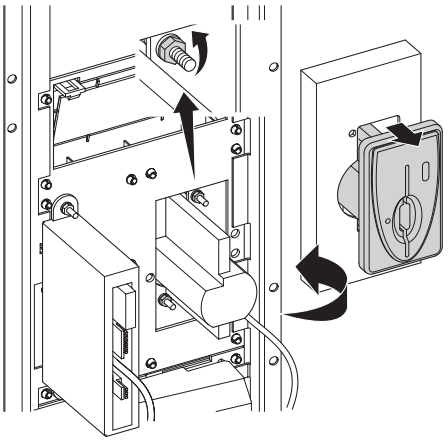
Preparation

Before disassembling the Card reader

- Open the door.
- Switch off the main switch.

Disassembly

Follow these steps to disassemble the card reader:

Step	Action	Illustration
1	Swing cover for payment system open.	
2	Disconnect the electrical connection to the card reader.	
3	Remove two nuts and pull the card reader out from the front side of the machine.	

Assembly

Assembly is done in reverse order.

For more information concerning the card reader refer to the information of the manufacturer.

P.2.3 Disassembling the CPU for the ZIP card reader

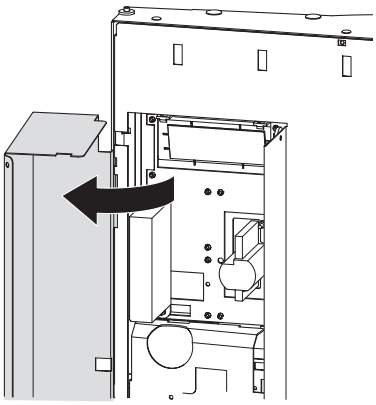
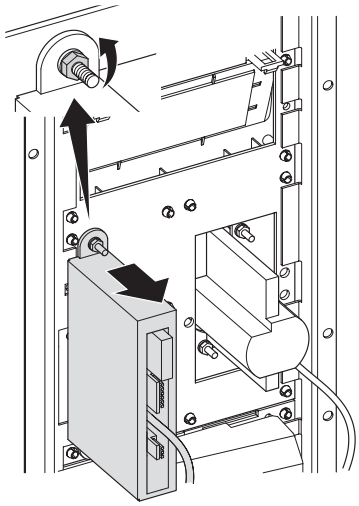
reparation

Before disassembling the Card reader

- Open the door.
- Switch off the main switch.

Disassembly

Follow these steps to disassemble the card reader:

Step	Action	Illustration
1	Swing cover for payment system open.	
2	Disconnect the electrical connection to the CPU.	
3	Remove two nuts and remove the CPU.	

Assembly

Assembly is done in reverse order.

For more information concerning the card reader refer to the information of the manufacturer.

P.2.4 Disassembling the Proton card reader (Proton = Chipper/Chipknip)

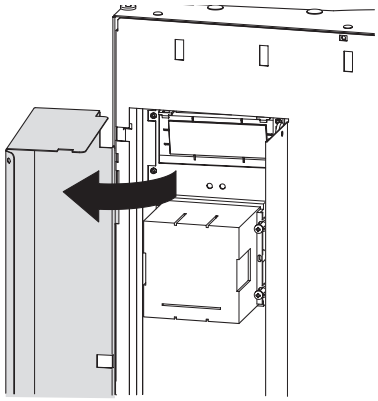
Preparation

Before disassembling the Card reader

- Open the door.
- Switch off the main switch.

Disassembly

Follow these steps to disassemble the card reader:

Step	Action	Illlustration
1	Swing cover for payment system open.	
2	Disconnect the electrical connection to the card reader	
3	Remove four screws and remove the card reader.	
4	Remove four screws to disassemble the frame from the card reader.	

Assembly

Assembly is done in reverse order.

For more information concerning the card reader refer to the information of the manufacturer.

Never adjust the coin mechanism or disconnect the connecting cable to the vending machine while the machine is carrying voltage.

P.3 Functional descriptions

P.3.1 Function of the BDV or the MDB/ICB coin mechanism

Standard

The BDV coin mechanism operates in accordance with a standard prepared by 'Bundesverband der Dienstleistungsunternehmen für Verpflegungssysteme e.V.'.

Change amount

The coin tubes can be filled manually with change money.

- Insert the coins in the usual way.
- Change the credit amount into a change amount via the menu "Manual filling".

Please refer to chapter 'Programming'.

Manual repayment

It is possible to manually pay out coins from each tube via the menu "Dispense coins".

Please refer to chapter 'Programming'.

Coin rejection?

If coins have difficulty getting accepted, it is usually due to impurities in the coin track of the validator in the coin mechanism.

P.3.2 Function of the Executive coin mechanism

Standard

The executive coin mechanism operates in accordance with a standard prepared by 'Mars Electronics'.

Change amount

- When the changegiver of the coin mechanism is idle (no vends made or coins inserted), it is possible to enter coins via the acceptor after having put the coin mechanism in a special 'filling mode'.

Cf. manual of producer.

Manual repayment

When the changegiver of the coin mechanism is idle (no vends made or coins inserted) it is possible to manually pay out coins from each change tube by depressing the relevant key on the coin mechanism.

Cf. manual of producer.

Coin rejection?.

If coins have difficulty getting accepted, it is usually due to impurities in the coin track of the validator in the coin mechanism.

Cf. manual of producer.

P.4 Electrical diagrams

Not available here.

P.5 Technical specifications

Payment System	How
BDV	Voltage from power supply print board: between 24V - 36V DC.
MDB/ICP	Voltage from power supply print board: between 24V - 36V DC.
Executive	Voltage from power supply print board: 24V AC (+10% / -15%).
Coin validator	Voltage from power supply print board: between 24V - 36V DC.

Not available here.

P.6 Options

Not available here.

P.7 Accessories

Not available here.

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6 Preventive maintenance

6.1 Preventive maintenance for the Service

Item	Action	Interval (Months)				Remarks
		3	6	12	24	
1.Scraper arms	lubricate					approximately every 50,000 dispensings
2. Water stop valve	rinse					after approx. 50,000 dispensings
3. Boiler	decalcify					Depending on the local hardness of water
4. Fan, air chute	remove dust					Depending on the ambient conditions at the location of the machine.
5. Mixer seal	replace			X		

6.2 Additional preventive maintenance instructions by the distributors

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7 Service procedures

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8 Technical Information

Table of contents

9 Modification Instructions

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10 Spare parts list