TRAINING FM850

Aarburg, Thursday, July 17, 2014

COFFEE
SYSTEMS

FRANKE

FM850

Participant:

- John Do
- Johny Does
- Joe Did
- Joey Dun

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FM850
Overview

- Introduction
- Technical construction
- Operation
- Programming
- Water flow circuit diagram
- Commissioning
- Product adjustment
- Troubleshooting
- Cleaning

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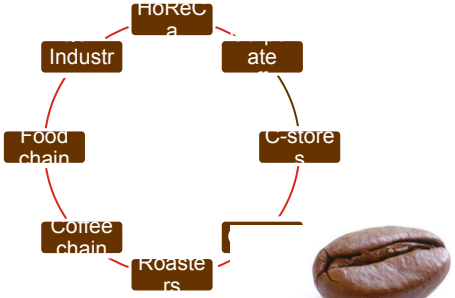
FM850
Positioning/target groups



80 – 150 cups/day

150 – 250 cups/day

250+ cups/day

As with its predecessor the Spectra Foam Master, the FM850 serves as a trendy drinks station without losing any existing coffee preparation expertise. Thanks to the USP “dispensing hot and cold milk foam in different automatically-adjustable consistencies” the FM850 is even more clearly setting itself apart from traditional high-end devices and the Spectra Foam Master thanks to its wide range of product specialties. The FM850 will replace the Spectra Foam Master on the basis of these strengths.

Supplementing the FM850 with the Flavour Station add-on unit is opening new doors in the world of fully automatic beverage preparation. You will not find beverages quite like these anywhere else on the market.

The target groups are therefore enterprises who would like to offer their customers a diverse choice of products.

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Introduction
Dimensions FM850

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PERFORMANS (DOUBLE CUP) / OUTPUT PER HOUR
PER DIN 18873-2

Espresso	162 (232)
Coffee	115 (151)
Cappuccino	161 (232)
Chocolate (Instant)	156
Hot water	168 (2dl container)

ENERGY LOSS PER DAY
PER DIN 18873-2

FM850 with KE300	1.98 kWh

MACHINE MODEL	****ELECTRICAL CONNECTION***
FM850	400V 3L N PE, 50/60Hz, 16A, 7500W
	220-240V 1L N PE, 50/60Hz, 30A , 4500 - 5400W
	220-240V 3L PE, 50/60Hz, 30A , 3600 - 5400W
	200-240V 3L PE, 60Hz, 30A , 3600 - 5400W (USA)
	200-240V 2L PE, 60Hz, 30A , 3600 - 5400W (USA)

ADD-ON UNITS	****ELECTRICAL CONNECTION***
Refrigeration unit KE300 (12lt)	200-240V 1LN PE, 50/60HZ, 10A, 100W
Undercounter refrigeration unit UT320(12lt)	200-240V 1LN PE, 50/60HZ, 10A, 100W
Flavour Station	100-240V 1LN PE, 50/60HZ, 10A, 75W
Cup warmer	200-240V 1LN PE, 50/60HZ, 10A, 300W

COLOR
High gloss black

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Introduction
Machine overview

Powder dosing unit with one or two chambers (instead of the left grinder) for milk and chocolate powder
2-liter container, or in case of two chambers, 1 litre per chamber
Volume monitoring

Up to three grinders with ceramic grinding discs
Container capacity of 1.2 kg respectively

FoamMaster™ technology with milk volume monitoring

10.4-inch touchscreen with adjustable edge lighting

Flavour Station for 3 syrups

Different refrigeration unit models

Autosteam AS

Hot water dispenser

Automatically height-adjustable combined outlet (70–180 mm)

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Introduction
Available version and options

BASIC MODEL
FM850 with one grinder
hot water dispenser
Black Line casing color

POSSIBLE REFRIGERATION UNIT
KE300 FM850 with 12-litre milk container
UT320 FM850 with 12-litre milk container
TWIN

OPTIONS
- 2nd grinder
- 3rd grinder
- Powder dosing unit
- Double powder dosing unit
- Autosteam
- Special outlet for jug
- Self-service
- Cup positioning guide
- Cup recognition
- Grounds ejection

ADD-ON UNITS (OPTION)
- Flavour Station FM850
- Cup warmer
- Billing unit system


FM850 KE300 left


FM850 KE300 Twin Flavour Station


FM850 UT320


FM850 UT320 Twin Flavour Station

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Example FM850 model code: **T 2M 1P H FM KE300**

Model Code	Component	Coments
T	FM850 with VETRO TOUCH	FOAM MASTER 800 with VETRO TOUCH
1M / 2M / 3M	Numbers of grinders	
1P / 2P	Single or double powder dosing unit	Always left hand side
H	Hot water dispenser	Left hand side
AS	Autosteam	
FM	Milk system (Foam Master)	Pump in fridge
KE	Refrigeration unit	KE300 = width 300mm
TW	Cup warmer	Separate unit
FS3	Flavour Station (3 types of syrup)	Separate unit

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Introduction
Scope of delivery

Cleaning tablets

Cleaning solution

Cleaning brushes

Microfiber cloth

Base fastener

Operating instruction

Key

Water connection gasket

Cleaning brush

Grinder adjusting

Cleaning container

USB Stick

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- Short milk tubes between refrigerator and coffee machine
- Milk pumps in the refrigerator
- Improved cleaning possibilities of the coverplate
- Automatic rinsing, cleaning and sanitizing program (ARCS)
- Simple assembly and disassembly of the combined coffee, milk and instant outlet.
- HACCP compliant (**H**azard **A**nalysis and **C**ritical **C**ontrol **P**oints)

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REVOLUTIONARY TOUCHSCREEN

The FM850 is revolutionizing the world of coffee machines with its 10.4 inch touchscreen and four flexible operating modes – in both full service and self-service areas.

The intuitive menu navigation with swipe technology allows for simple and efficient operation of the machine.

The range of products can be easily and individually adapted to suit requirements with up to four operating modes.

Images and advertising messages can be uploaded to the touchscreen via USB (media pool) to inform the user about special offers or to display company messages.

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Introduction
The 4 operating modes

“INSPIRE ME”

«QUICK SELECT»

«CASH REGISTER»

«CUSTOM MODE»

SELF-SERVICED

«INSPIRE ME»
- Maximum of six customizable menu cards for the display of seasonal beverages
- The beverages can be displayed within the menu cards as with “QUICK SELECT”

«QUICK SELECT»
- Display of 6, 12 or 20 beverages per page (max. 5 pages)
- Possible to use the selection function (cup size, flavours, etc.)

COSTOM MODE
«Quick Select»
- Display of 6, 12 or 20 beverages per page (max. 5 pages)
- Use of customized images

SERVICE-ASSISTED (NON-SELF-SERVICE)
«CASH REGISTER»
- Display of 4, 9 or 16 beverages per page (max. 5 pages)
- Pre-selection options displaying the pre-selected beverages

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The menu cards can be used to display a pre-selected choice of beverages.

- A maximum of six customizable menu cards can be created

For example:

- Seasonal display to suggest popular summer or winter beverages
- Display according to recipe, classic or flavored beverages as well as cold beverages

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Introduction
Quick Selection

- Number of beverages: 6, 12 or 20 per page (max. 5 pages)
- Use of Franke beverage images
- Display the prices per beverage in billing mode
- Customer-specific positioning of beverages

Restrictions

- Only possible for single orders, no pre-selection of cups is possible

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Introduction
Quick select with upselling ideas

- Characteristics as described under “QUICK SELECT”
- Selection buttons for beverage sizes, milk selection, coffee selection (decaf), flavour

The additional screen offers up-selling potential which in turn allows the restaurateur to make additional sales. This operating mode can be individually programmed for each product.

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Introduction
Cash Register

- Number of beverages: 4, 9 or 16 per page (max. 5 pages)
- Use of Franke beverage images or icons
- Customer-specific positioning of beverages
- Display of selected beverages in the pre-selection area (queue) in the order that they were entered
  It is possible to delete pre-selected beverages from the cup pre-selection area at any time
- Selection buttons for beverage sizes, milk selection, coffee selection (decaf), flavour (selection function can be hidden)

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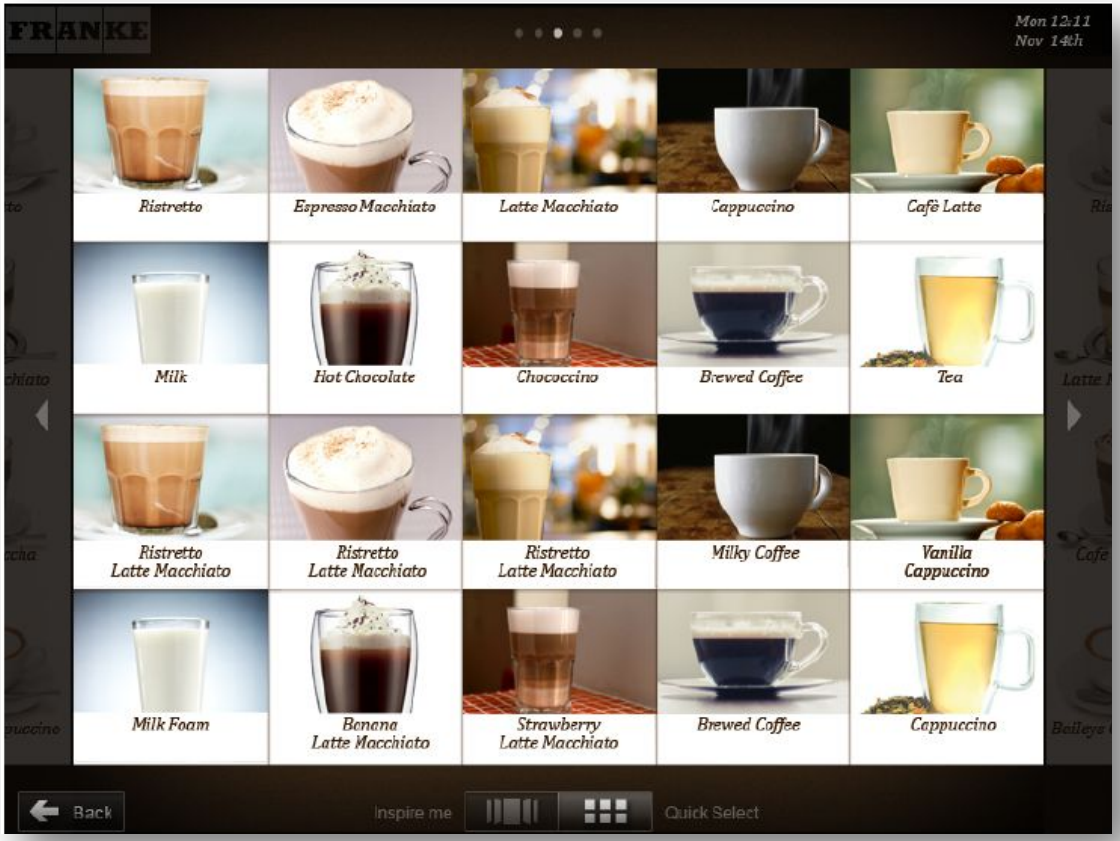
Introduction
Custom Mode



Customers can customize the “QUICK SELECT” mode by uploading their own images to create their own specific menu navigation.
Own product images can be uploaded to the touchscreen via USB and the media pool, and can be allocated to the corresponding recipes.

- Display of 6, 12 or 20 beverages per page (max. 5 pages)

RESTRICTIONS
Simultaneous use of own images and Franke images is not possible.

Switching between “INSPIRE ME” and “CUSTOM MODE” is not possible.

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Introduction
Error message

Error messages generally appear in the dashboard and light up in different colours.

A detailed description of the error message is displayed in a message box by selecting the corresponding symbol or banner.

If user intervention is necessary, this can be carried out via the message box directly. The user will be guided through the necessary steps with the help of images.

COLOR CODE AND MEANING OD ERROR MESSAGES

YELLOW
FM850 is in fully functioning order
E.g. advance notice of “Empty grounds container”

ORANGE
FM850 has limited functionality
E.g. “Milk container empty” - products with added milk can no longer be selected

RED
FM850 is no longer functioning
E.g. “Door open”

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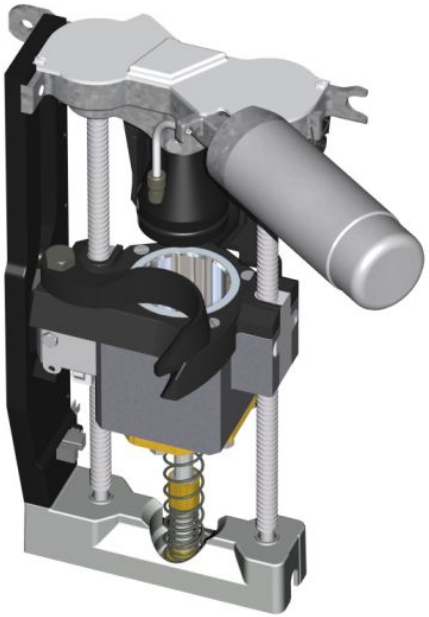
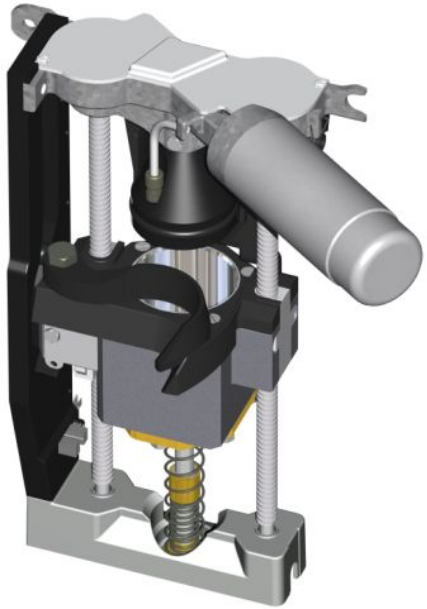
Introduction
Available version / brewing unit



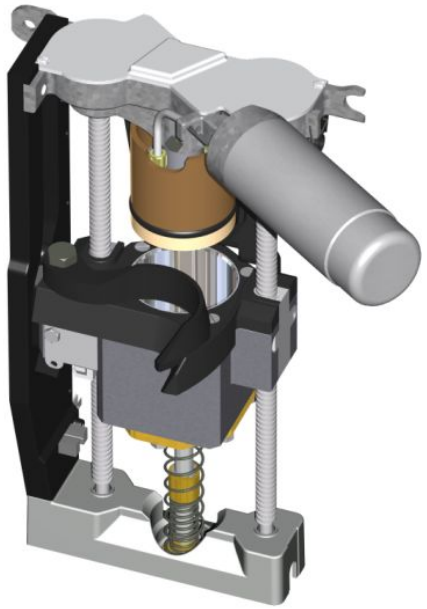
43E

One brewing system for single & double shots. For classic Espresso and perfect milk and coffee specialties



50E

One brewing system for double & triple shots. For high outputs



50N

One brewing system for espresso shots & single cup brewing combined. Unique combination: Espresso and single-cup brewed coffee from one and the same machine

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Technical construction
Overview

- Water connection
- Pump
- Valves (Plastic)
- Heating unit
- Thermoblock
- Cold water valve block
- Flow meter with pressure block
- Coffee boiler
- Hotwater block
- Brewing valve
- Tea / steam boiler
- Steam block
- Hot water valve
- Drainage valve
- Brewing unit
- Coffee outlet
- Front door
- Coverplate
- Instant
- Grinder / bean monotoring
- Milk system FM (Foam Master)
- Electronic overview
- Power board 3.1
- Vetro Touch

Digital input

Analog input

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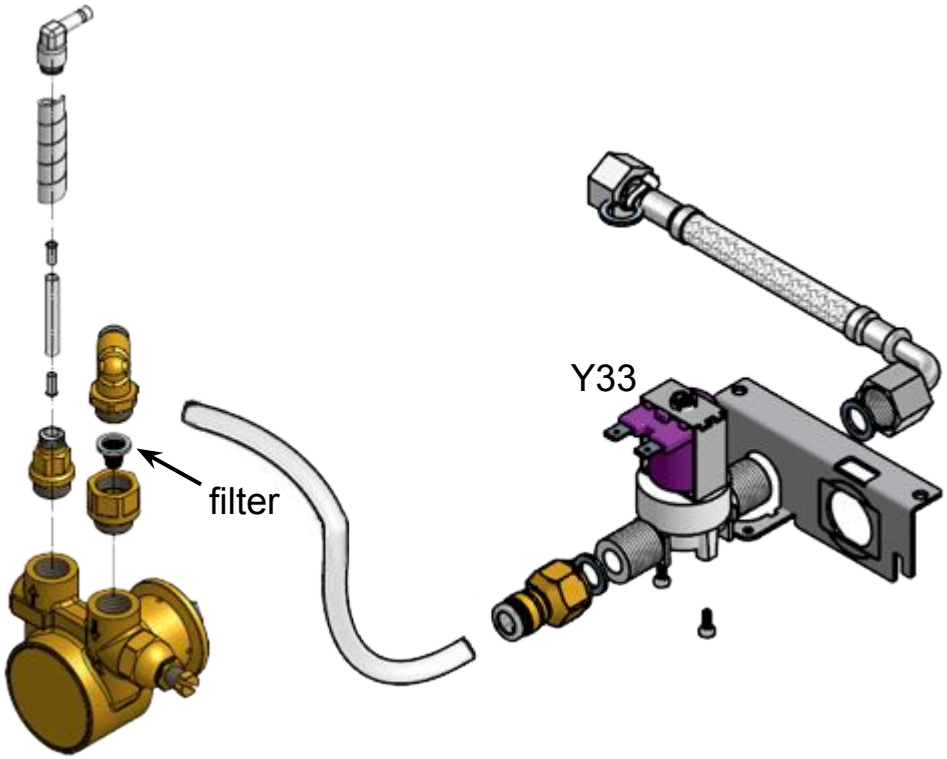
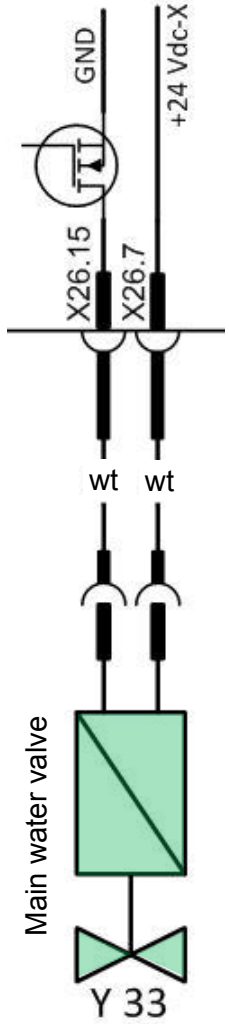
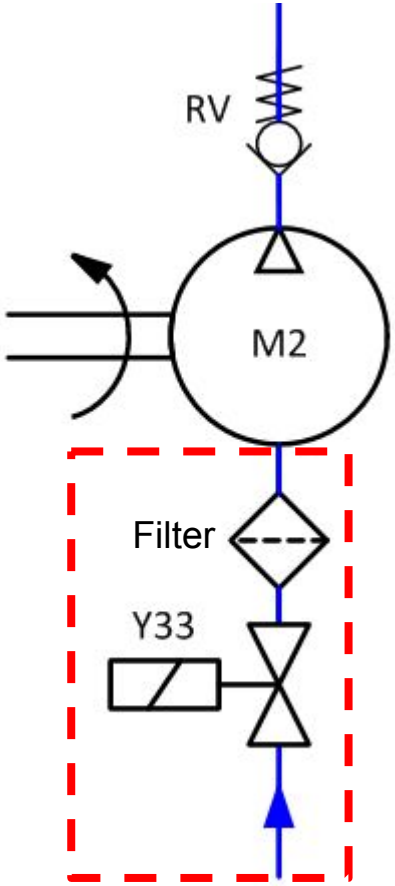
Technical construction
Water connection



Electrical



Water flow



Pressure main water
80-800Pa
0.8 – 8 bar

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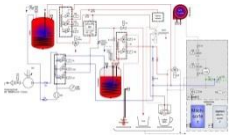
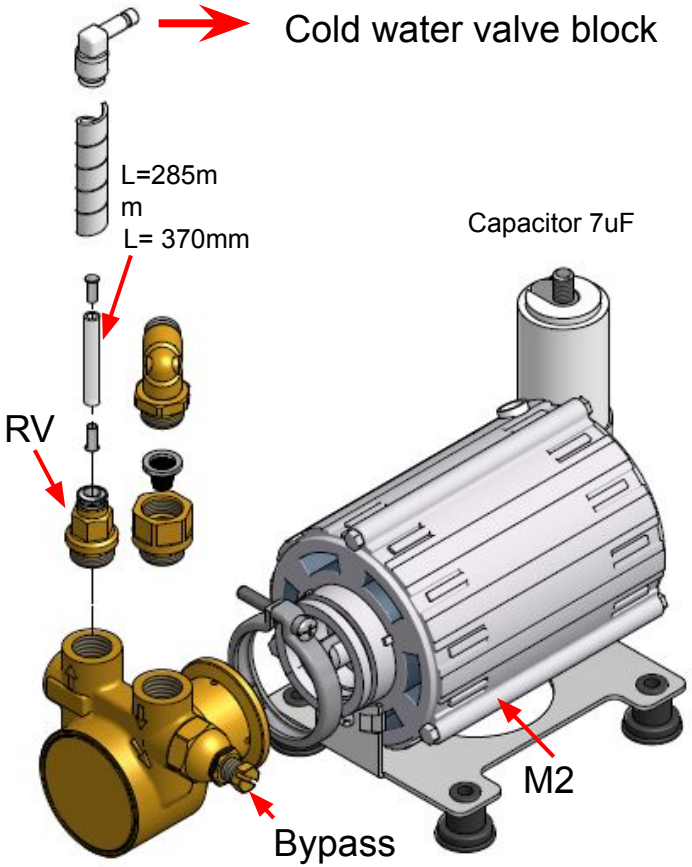
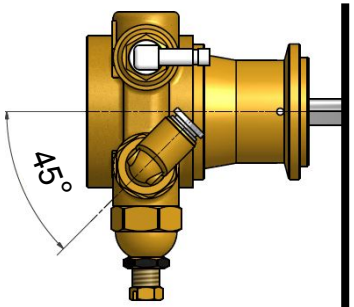
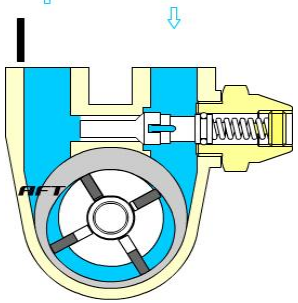
Technical construction
Pump

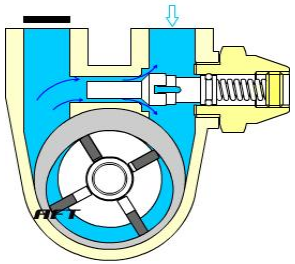






Bypass
Adjustment of water pressure





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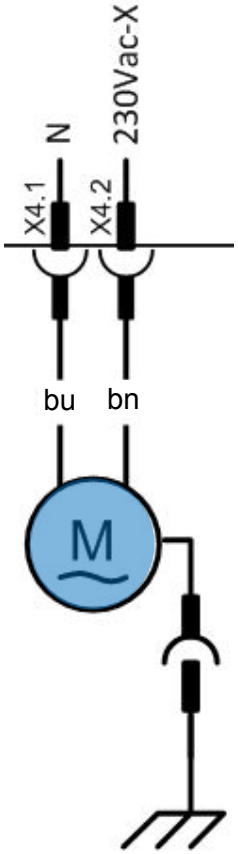
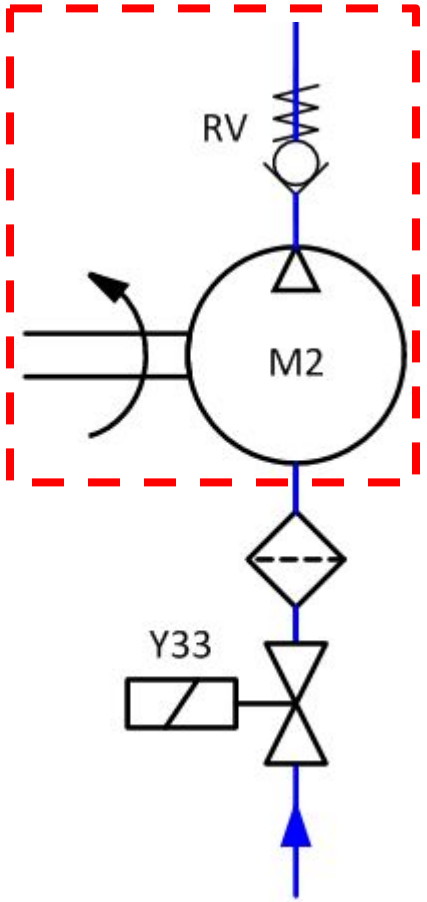


Water flow



Pressure main water
80-800Pa
0.8 – 8 bar

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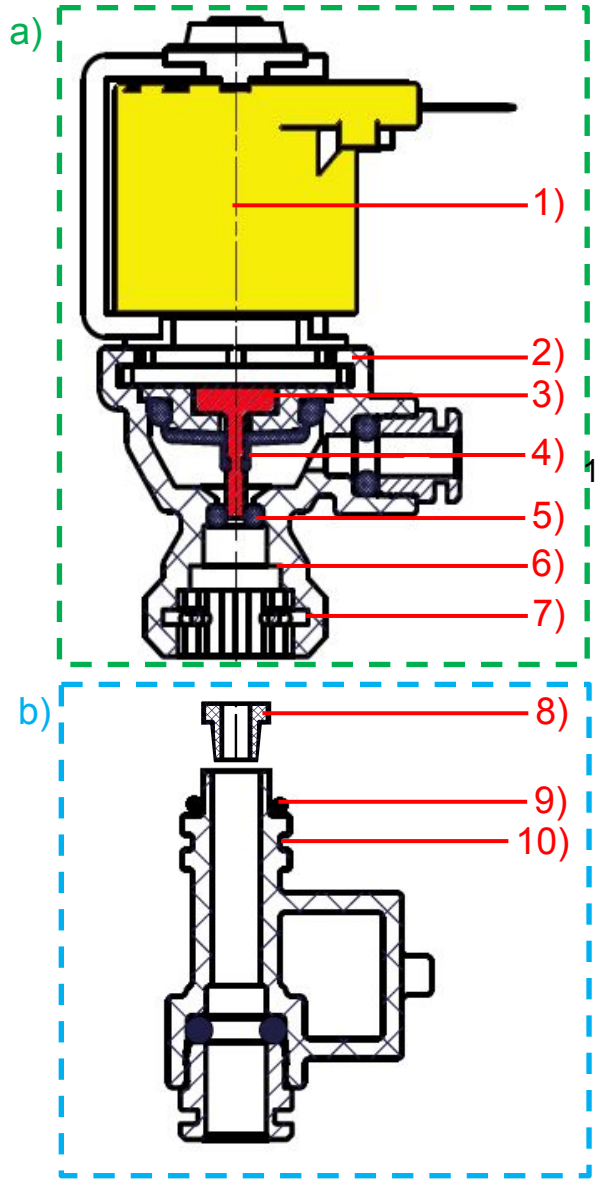
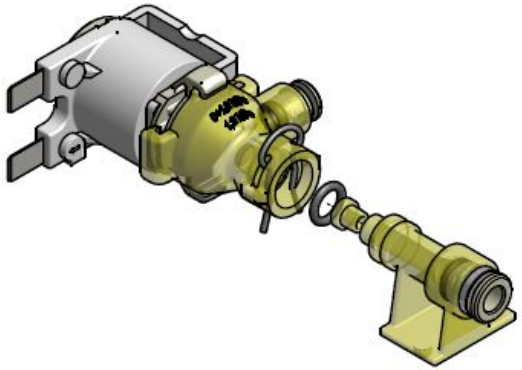
Technical construction
2/2- way plastic valve



1) Coil
2) Bayonet lock
3) Plunger with ram (stainless steel)
4) Sealing diaphragm EPDM (ethylene propylene diene monomer)
5) O-ring (ram seal)
6) Sealing surface
7) Guide clamp
8) Valve body seat
9) O-ring (seals on sealing surface 6)
10) Groove for clamp



These plastic valves are less susceptible to scaling and easier to replace on account of their modular design. Due to the diaphragm, the rear part of the plunger is not submerged (separate from medium). There is no overseat or underseat and the valves can open on both sides in case of excessive operating pressure. The valves were specially designed for Franke Kaffeemaschinen AG.

Technical data:

Test pressure:	12 bar
Operating pressure:	8 bar
Valve body material:	Radel (polyphenylsulfone, PPSU)
Room temperature:	up to 80°C
Medium temperature:	up to 140°C
Voltage:	24 V
Power output:	11.8 W

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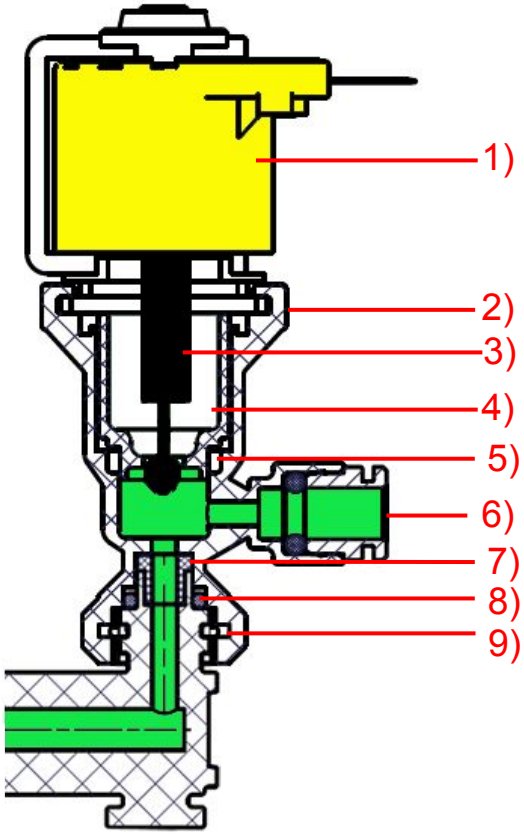
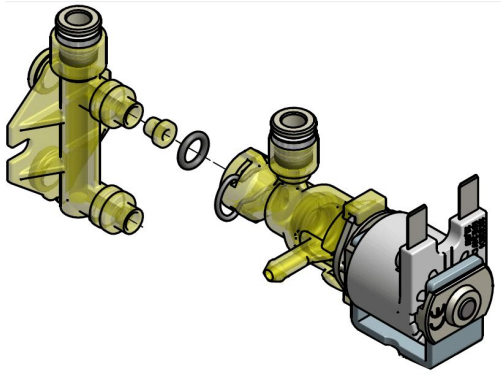
Technical construction
3/2 way plastic valve



1) Coil
2) Bayonet lock
3) Plunger with ram (plastic)
4) Internal part (positionable over 180°)
5) O-ring
6) AVS quick-release lock
7) Valve body seat
8) O-ring
9) Groove for clamp



These plastic valves are less susceptible to scaling and easier to replace on account of their modular design. In this valve, too, the rear part of the plunger is not submerged (separate from medium). The valves were specially designed for Franke Kaffeemaschinen AG.

Technical data:

Test pressure:	5 bar
Operating pressure:	4 bar
Valve body material:	Radel (polyphenylsulfone, PPSU)
Room temperature:	up to 80°C
Medium temperature:	up to 140°C
Voltage:	24 V
Power output:	11.8 W

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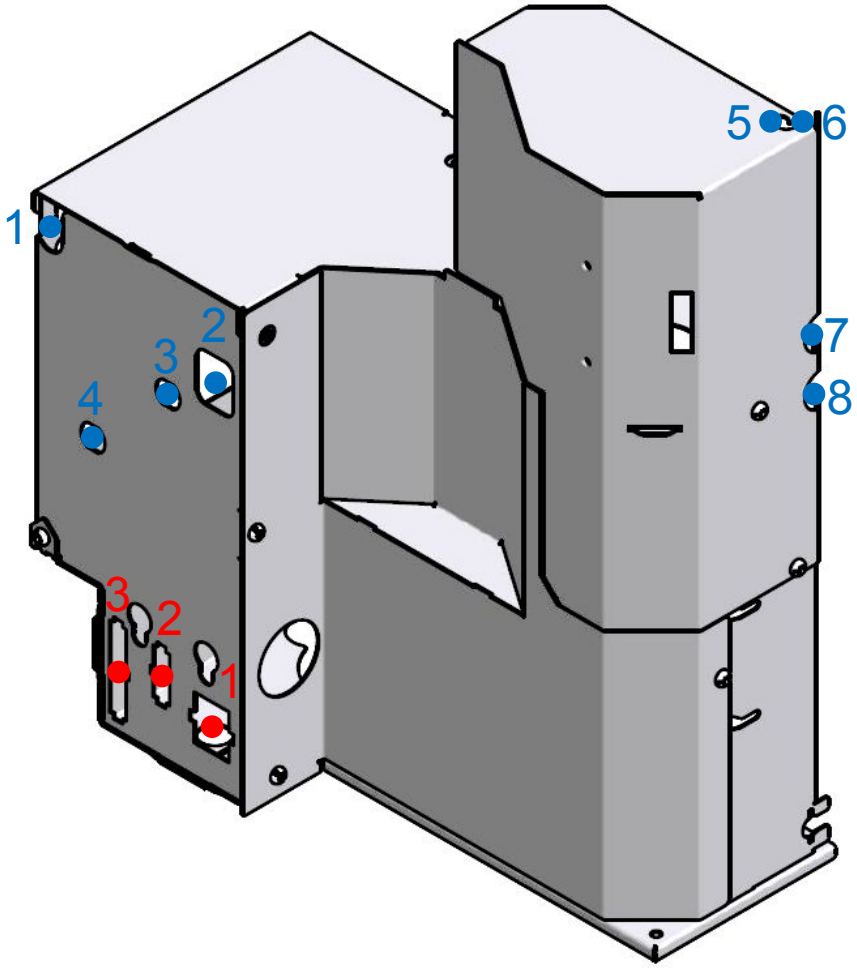
Technical construction
Heating unit V3

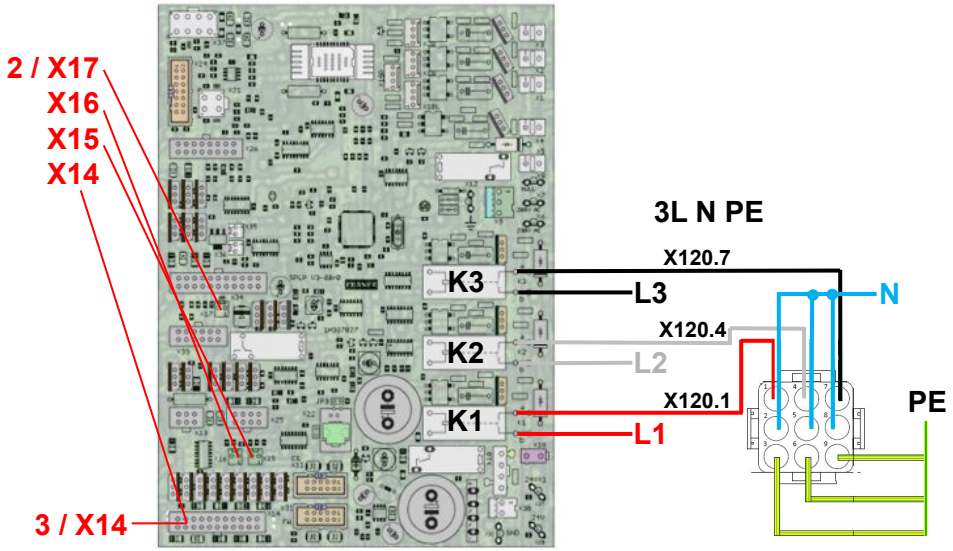


a) Hydraulic connections

1 = Water (main input)
2 = Brewing valve
3 = Instant
4 = Drainage
5 = Milk
6 = Milk rinse
7 = Steam/milk/coffee bypass
8 = Hot water

b) Electrical connections

1 = Boiler/thermoblock heating
2 = NTC sensors, level sensor, flowmeter
3 = Valves



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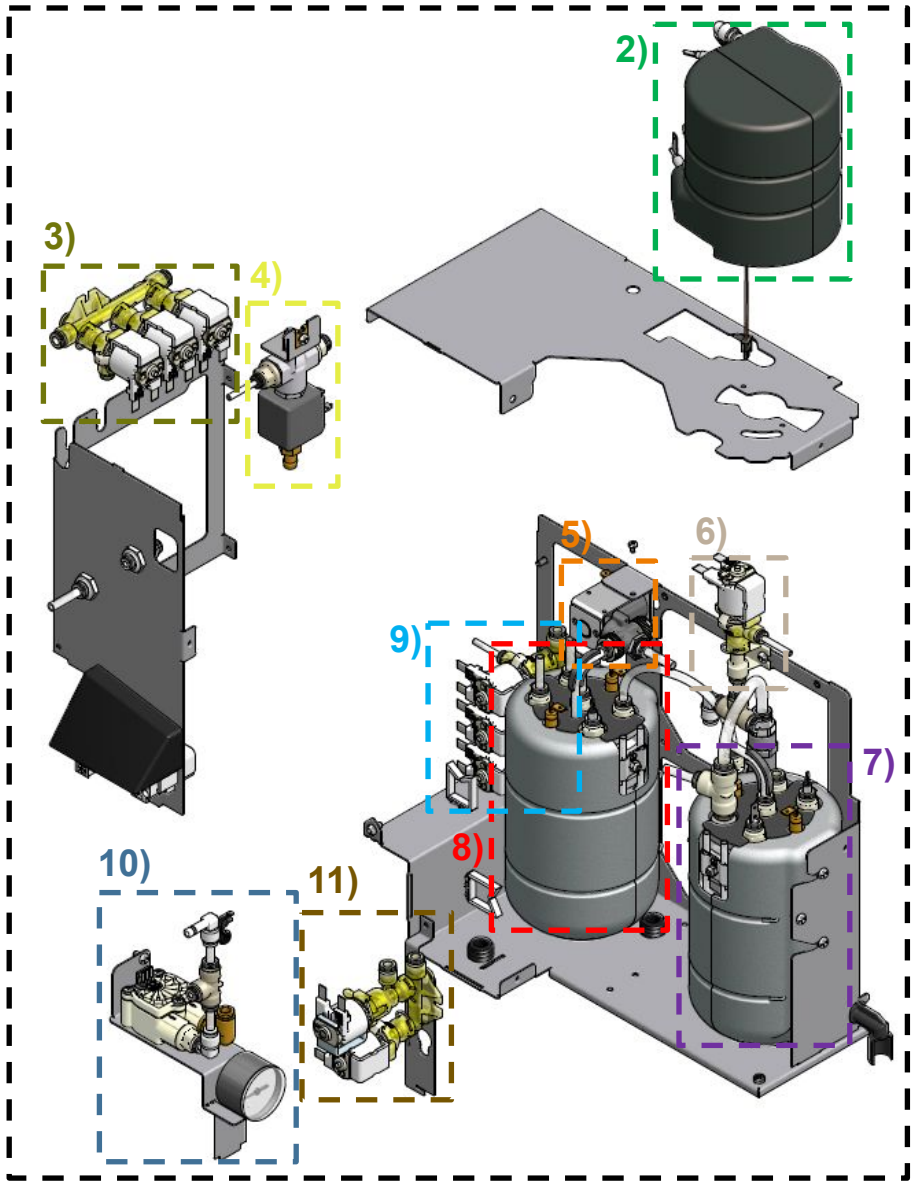
Technical construction
Heating unit V3



1) **Heating unit module V3**

2) **Thermoblock (continuous flow heater)**

3) **Cold water block**

4) **Brewing valve Y1**

5) **Drainage valve Y39**

6) **Hot water valve Y4**

7) **Tea/steam boiler (0.9l)**

8) **Coffee boiler (0.9l)**

9) **Hot water block**

10) **Flowmeter with pressure gauge**

11) **Steam block**

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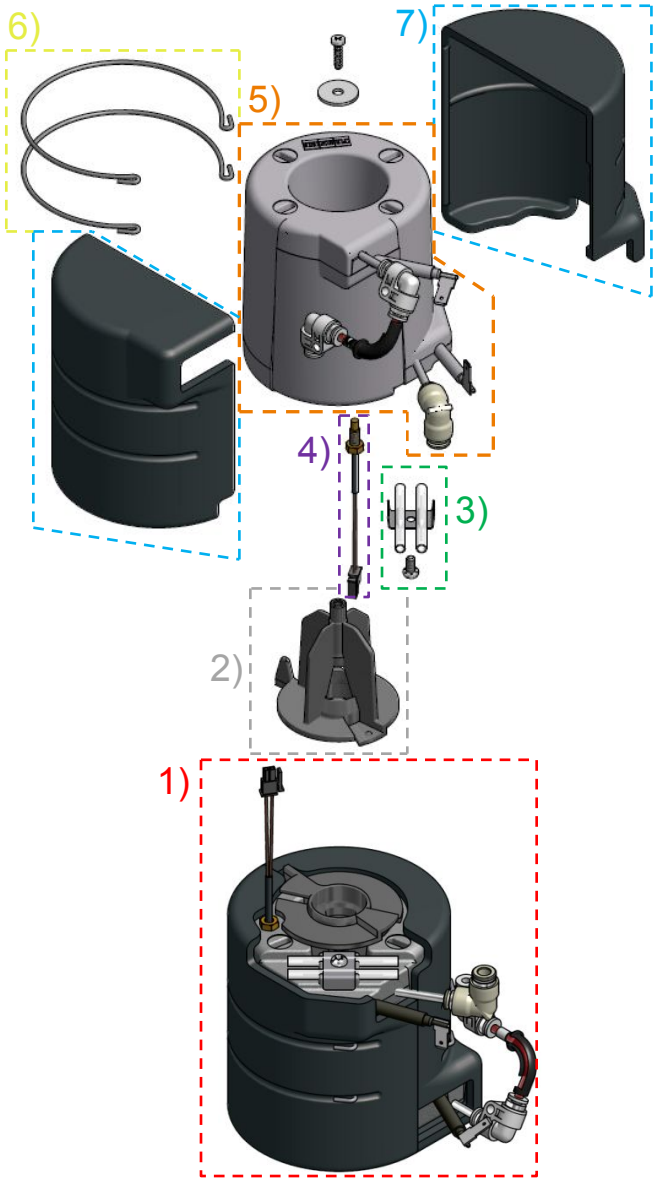
Technical construction
Thermoblock



1) Thermoblock module
2) Holding cone
3) Thermal fuse (safety fuse) 144°C
4) Temperature sensor
5) Thermoblock
6) Boiler clamp
7) Thermoblock insulation

Thermoblock 2 kW:
No standard thermoblock on the market meets the required performance characteristics (temperature, speed and heating power). Therefore, we developed our own thermoblock. The temperature is monitored by a temperature sensor (fixed value at 68°C) and controlled by the software. For reasons of safety, two thermal fuses are mounted on the thermoblock, which are integrated in the phase and neutral line as a safety switch-off mechanism.

Technical data:
Temperature sensor

Sensor element:	glass NTC 10 kΩ
Measuring range:	10°C to 150°C
Max. temperature	-50°C to 250°C
Tolerance:	+-0.2°K

Safety thermal fuse (must be replaced when activated)

Type:	D142
Cut-out temperature:	144°C
Resistive current load:	16.7A
Tmax*:	180°C

* Tmax = maximum permitted temperature after cut-out

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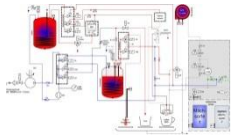
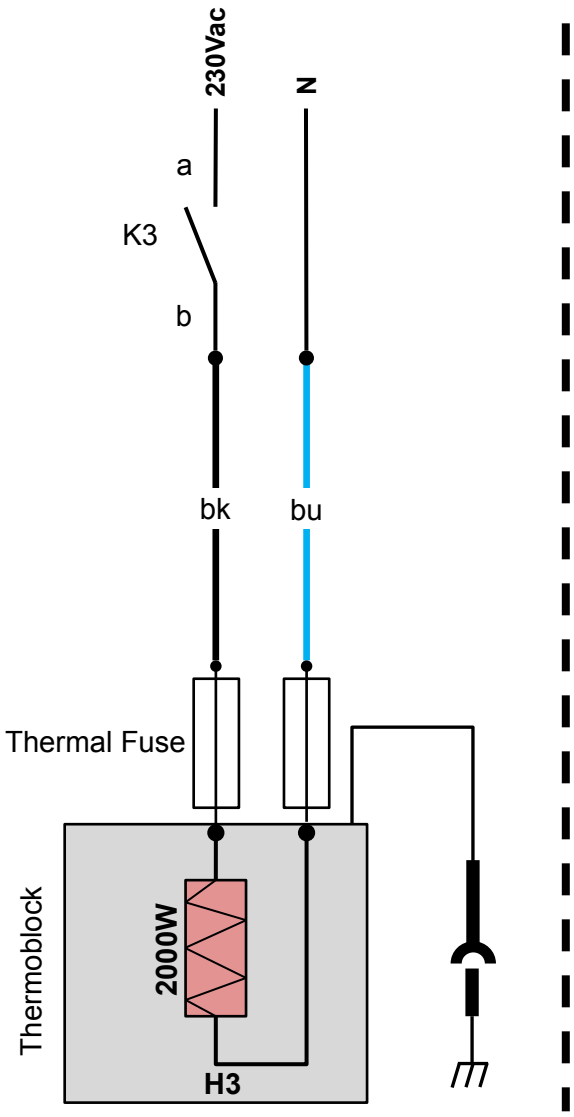
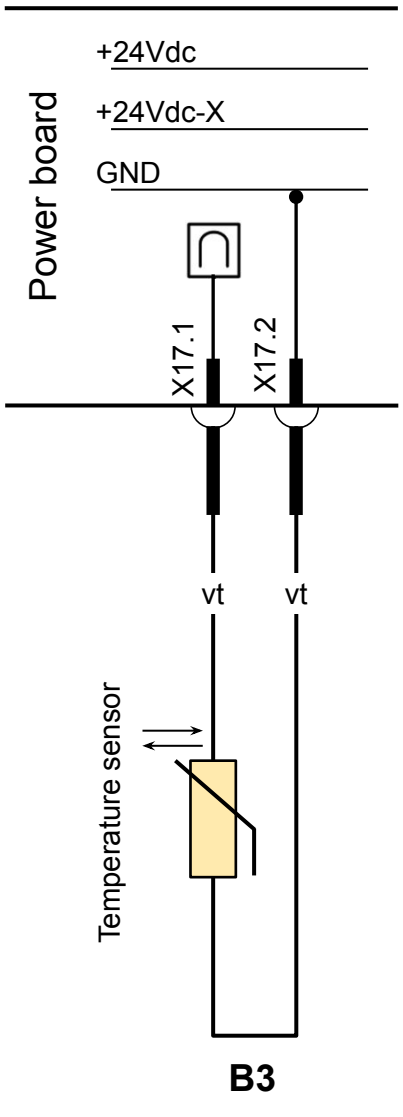
Technical construction
Thermoblock

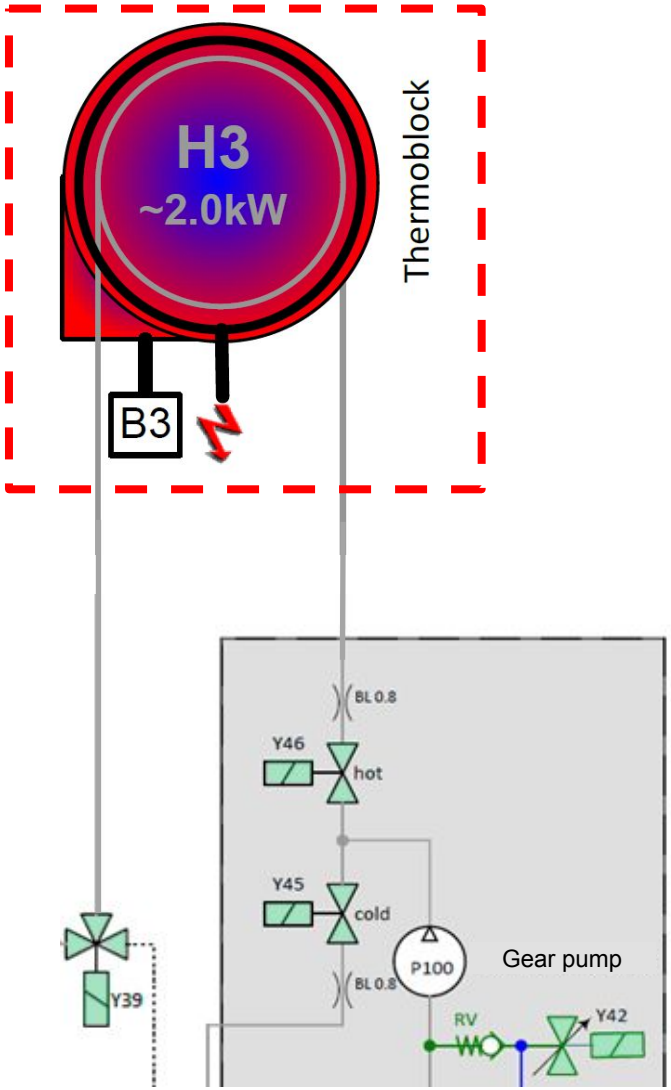


Electrical





Water flow



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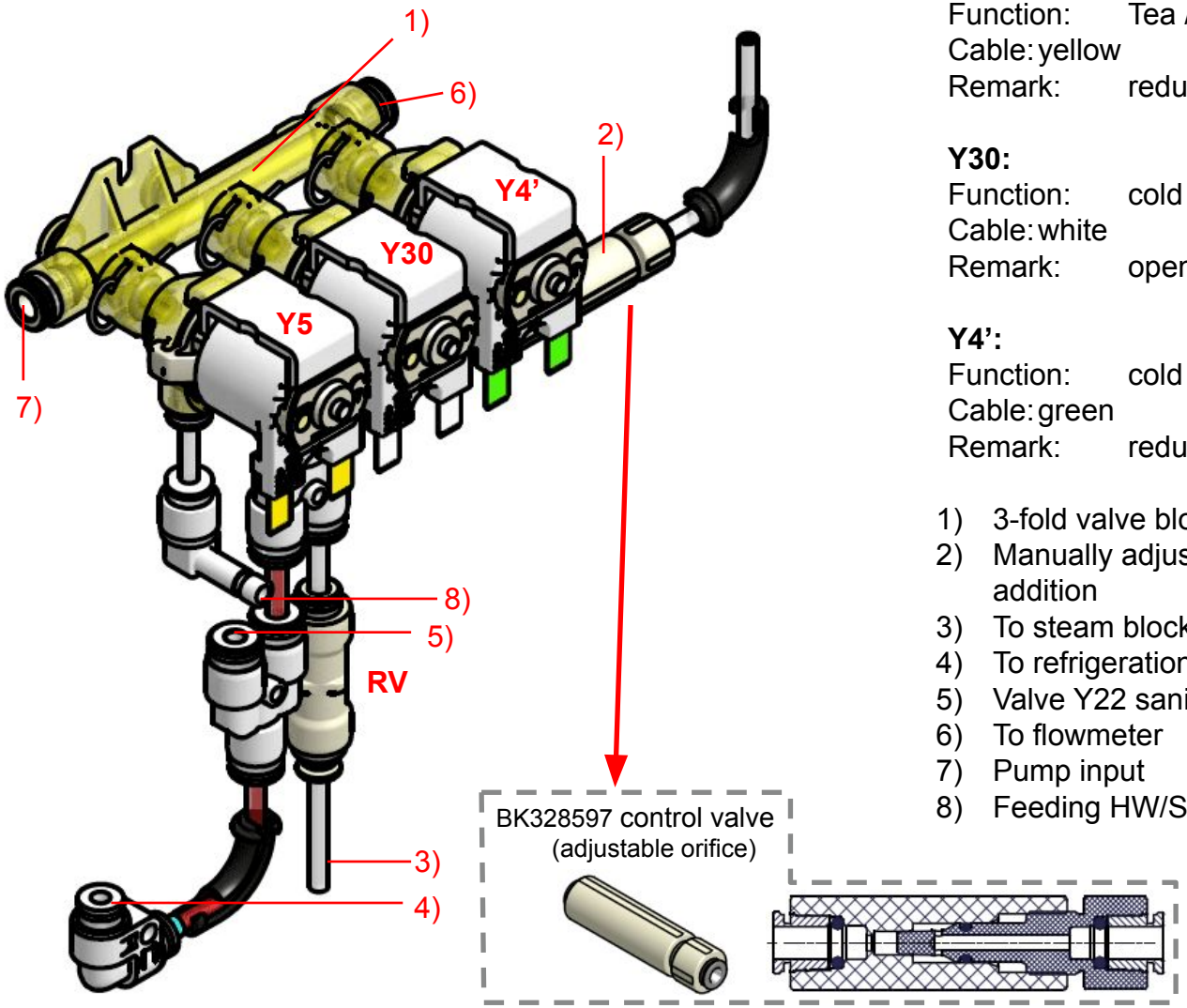
Technical construction
Cold water valve block



Y5:
Function: Tea / steam boiler supply
Cable: yellow
Remark: reduced opening 1.0 mm

Y30:
Function: cold water rinsing line
Cable: white
Remark: opening 3.0 mm

Y4':
Function: cold water by-pass valve
Cable: green
Remark: reduced opening 1.0 mm

1) 3-fold valve block (Basis)
2) Manually adjustable restrictor for cold water addition
3) To steam block Y-piece
4) To refrigeration unit
5) Valve Y22 sanitizing
6) To flowmeter
7) Pump input
8) Feeding HW/S boiler

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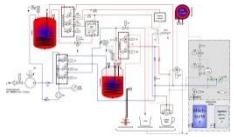
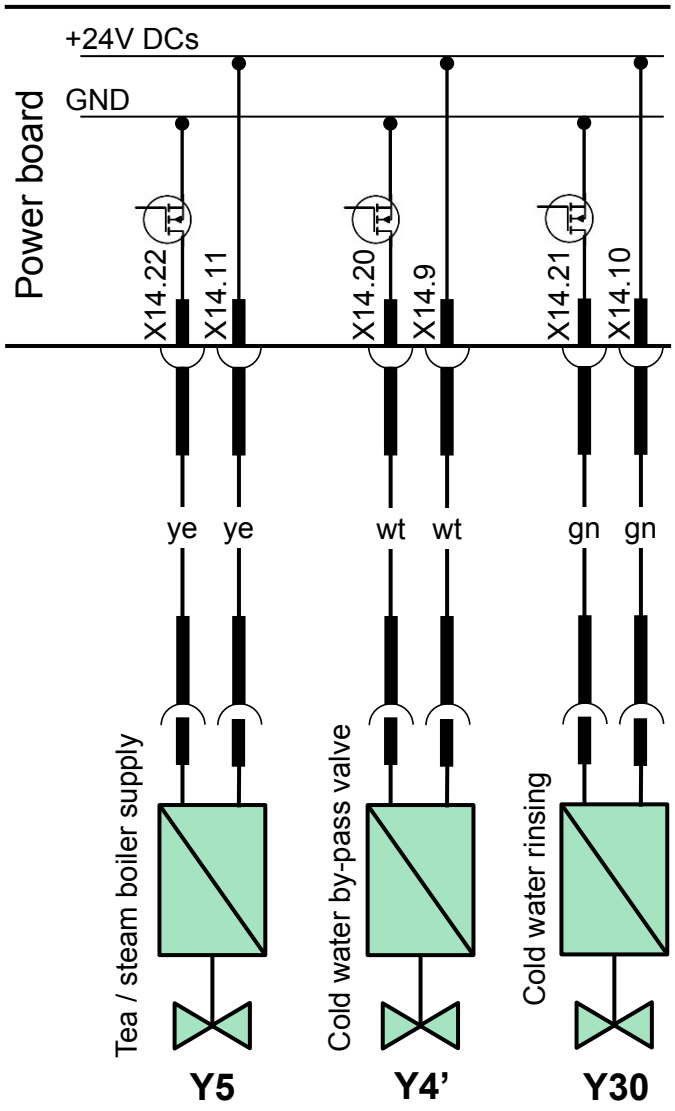
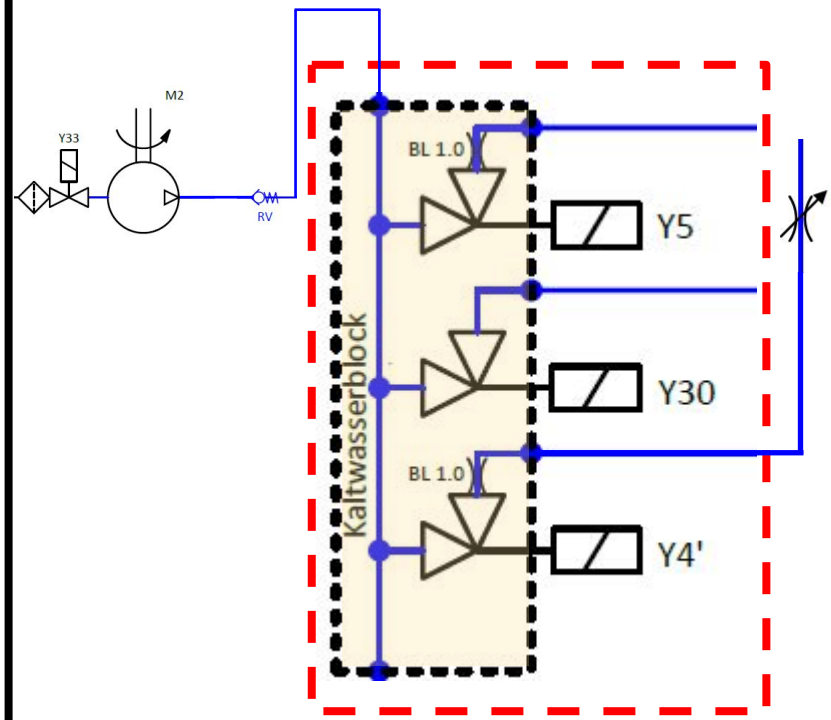
Technical construction
Cold water valve block



Electrical



Water flow



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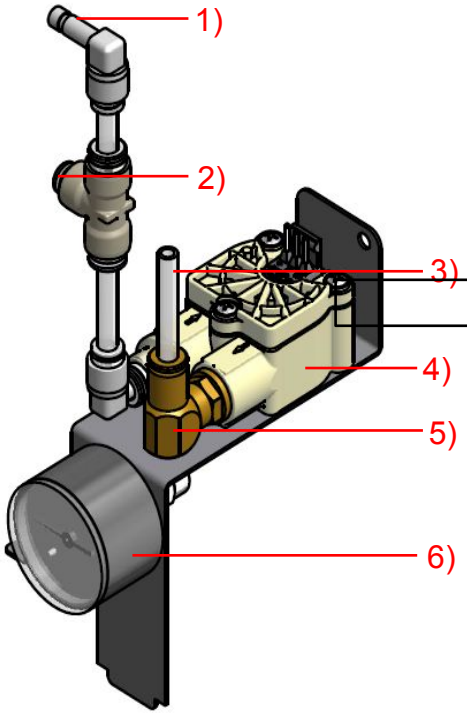
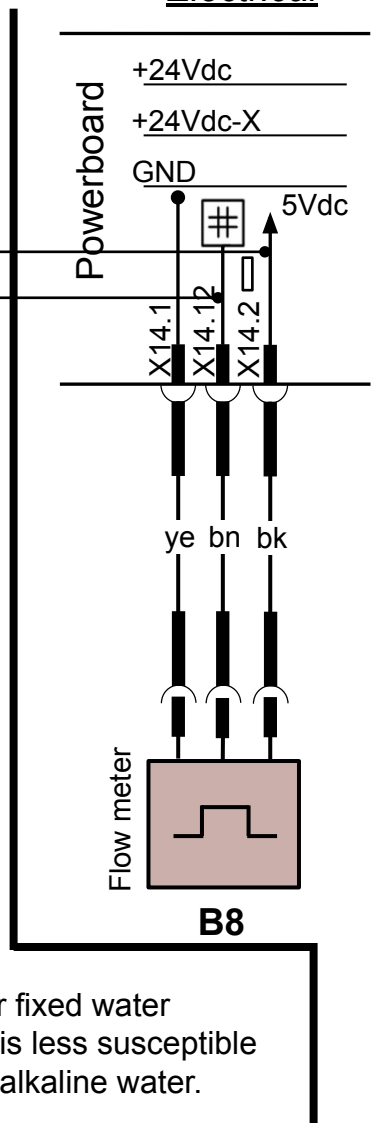
Technical construction
Flow meter



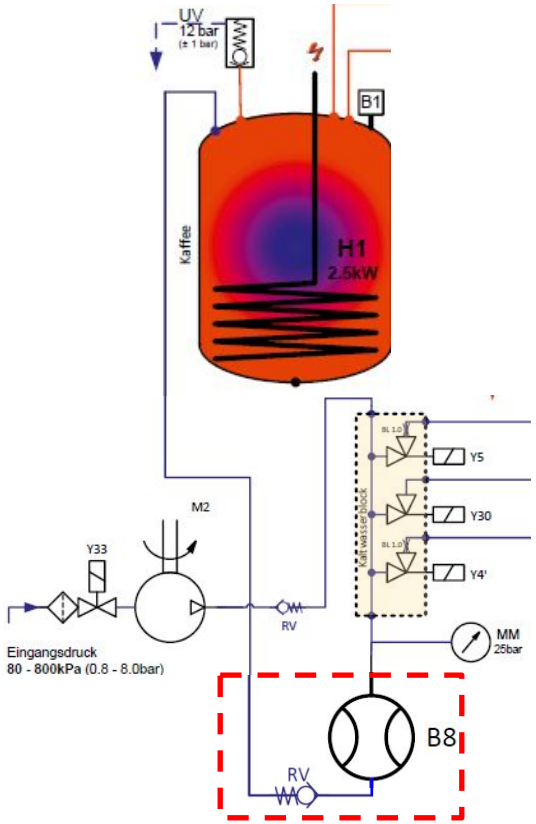
Flow meter:

1) From cold water block
2) To pressure gauge
3) Coffee boiler supply
4) Flow meter
5) Check valve
6) Pressure gauge

Electrical



Water flow



The flowmeter is also used in the Flair fixed water connection. As it is made of plastic, it is less susceptible to scaling and damage from acidic or alkaline water.

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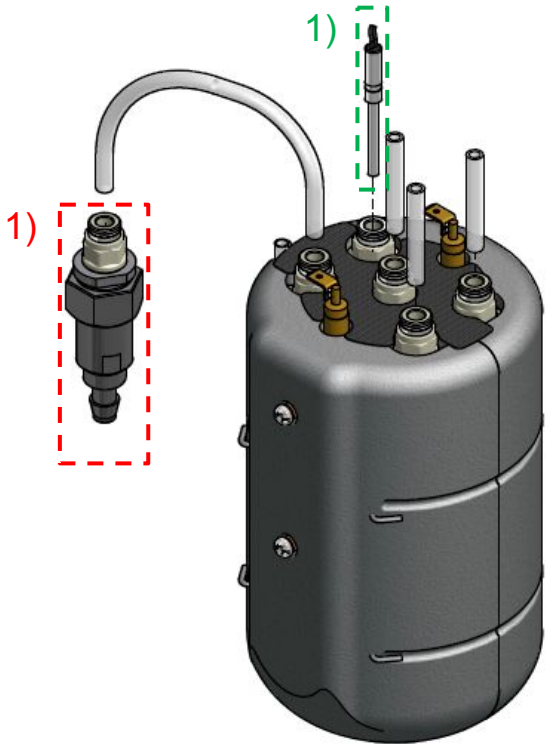
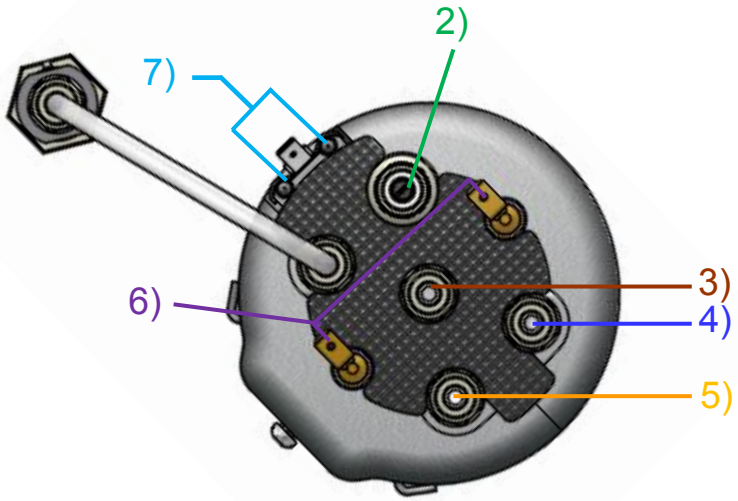
Technical construction
Coffee boiler, 2.5kW (0.9l)



1) Safety valve12 bar (Spectra)
2) NTC temperature sensor
3) Coffee boiler supply
4) Output hot water block
5) Output brewing valve
6) Electrical connection, heating element
7) Thermal fuse (safety fuse) 144°C



The coffee boiler is the same as the tea / steam boiler. The design is identical. The safety switch-off is achieved using two safety fuses. The maximum pressure remains at 12 bar and the maximum operating pressure remains at 8 bar.

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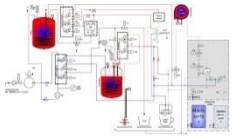
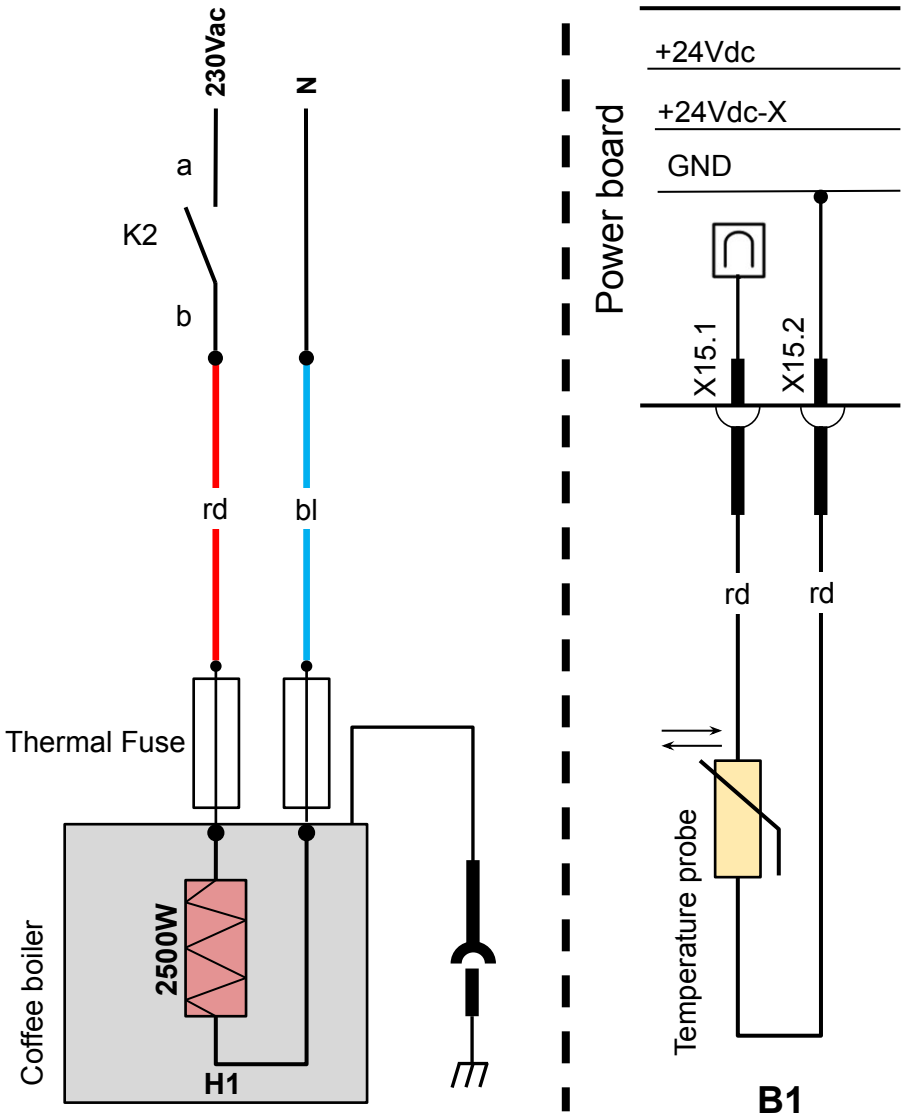
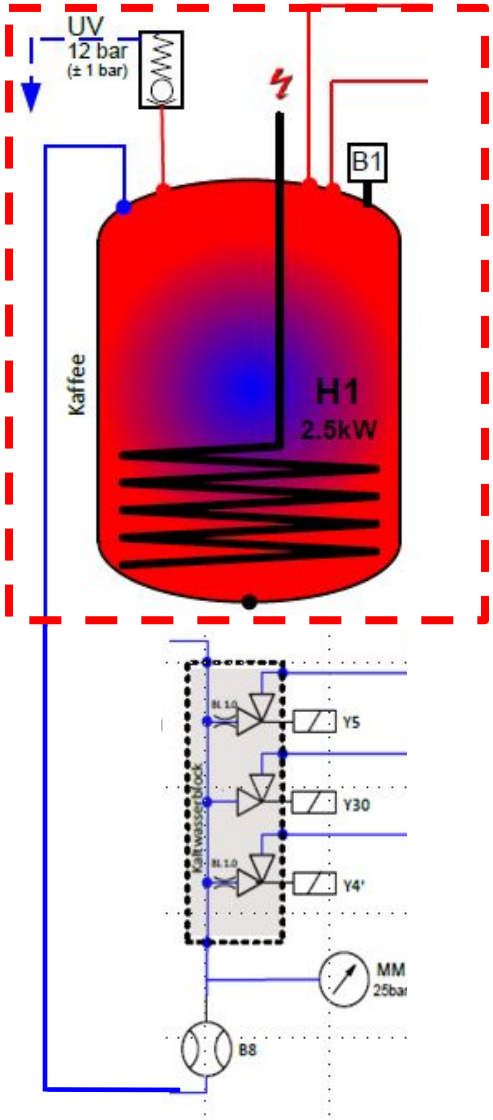
Technical construction
Coffee boiler 2.5kW



Electrical



Water flow



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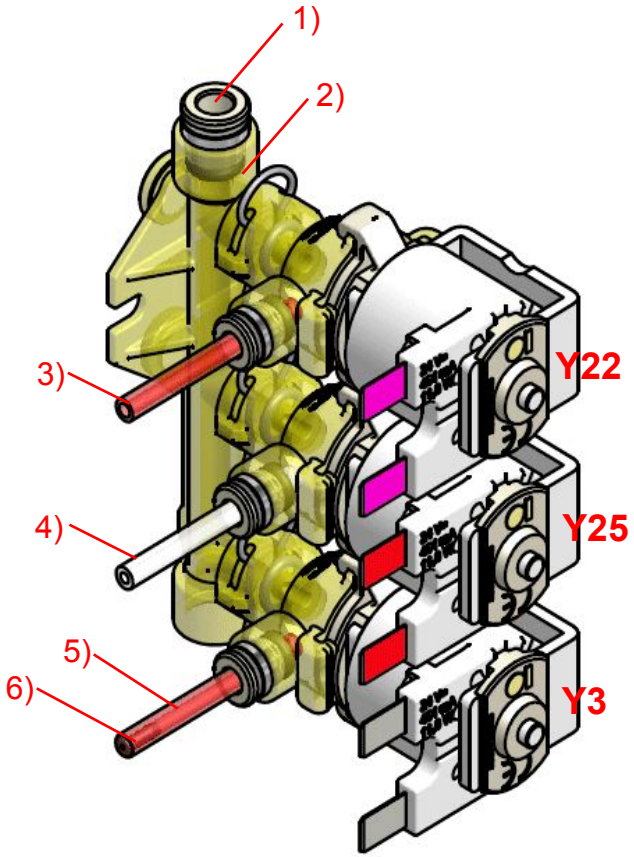
Technical construction
Hot water valve block

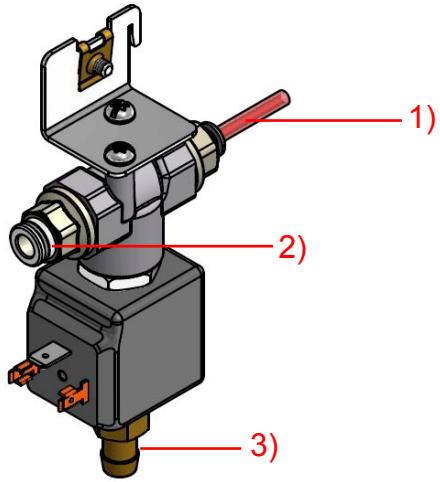


Hot water valve block:
Y22:
Function: hot water rinsing line (sanitizing)
Cable: pink
Remark: opening 3.0 mm

Y25:
Function: instant valve
Cable: red
Remark: reduced opening 1.0 mm

Y3:
Function: bypass valve
Cable: gray
Remark: reduced opening 1.0 mm

1) Coffee boiler input
2) 3-fold valve block (Basis)
3) To Y-piece from valve Y30
4) To instant mixer
5) To Y-piece in the front door
6) Restrictor 0.8 mm



Brewing valve Y1:
Function: brewing valve
Cable: orange

1) To brewing unit
2) From coffee boiler
3) Drainage of brewing unit (dribble box)

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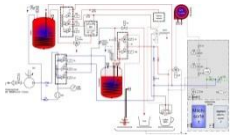
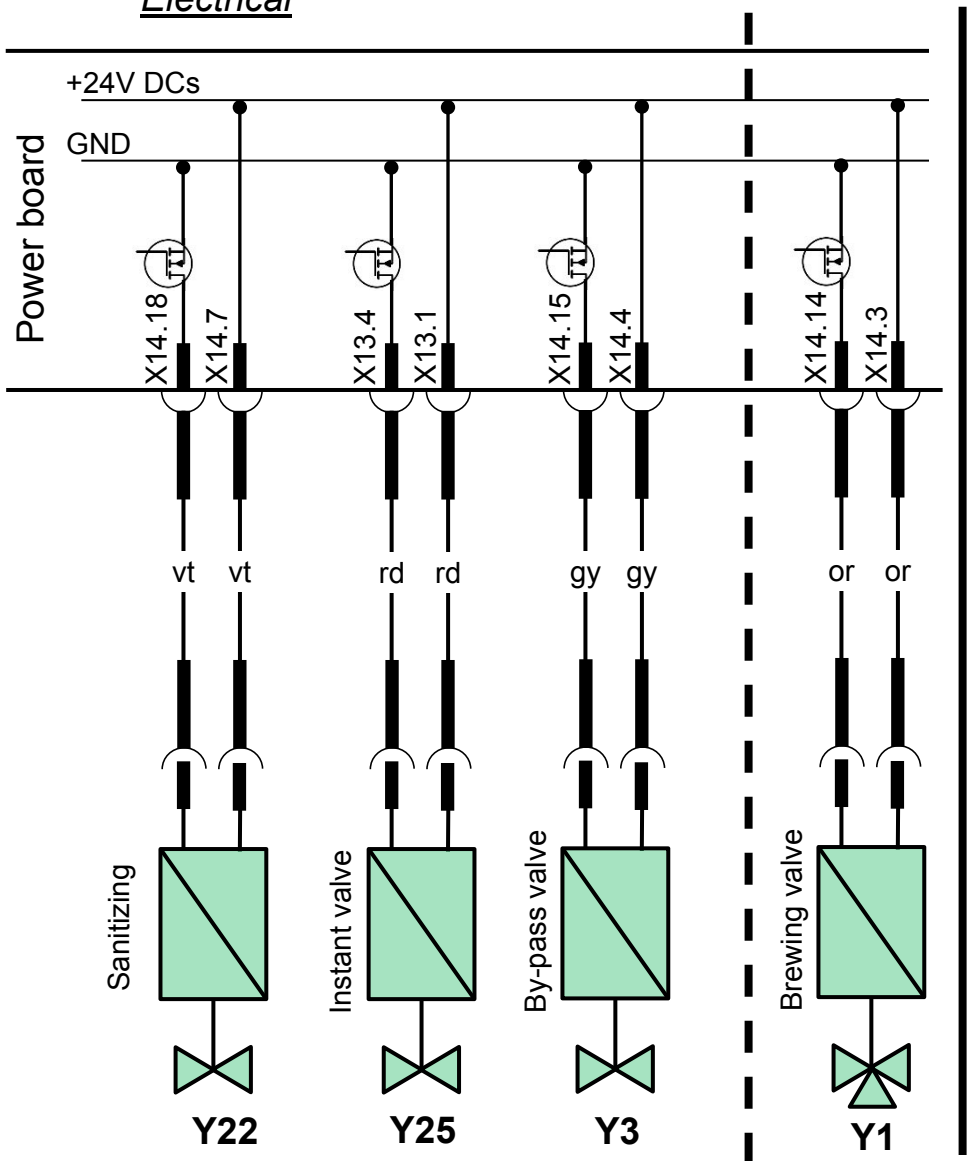
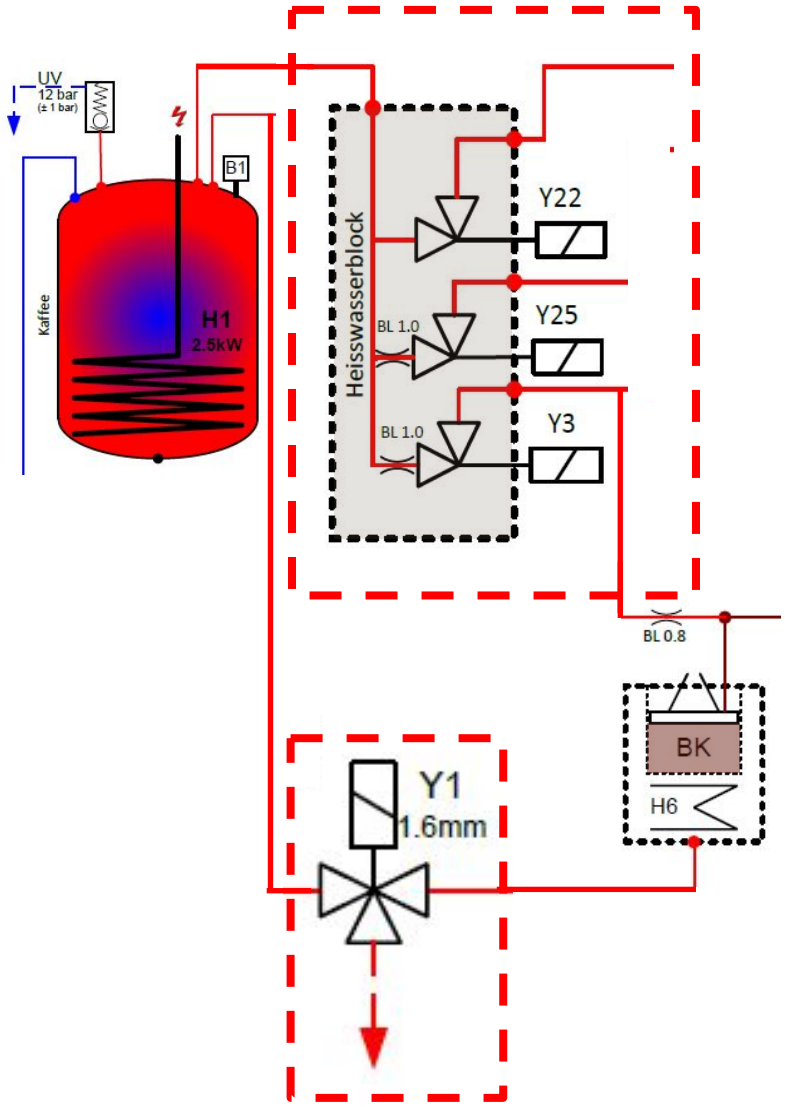
Technical construction
Hot water valve block



Electrical



Water flow



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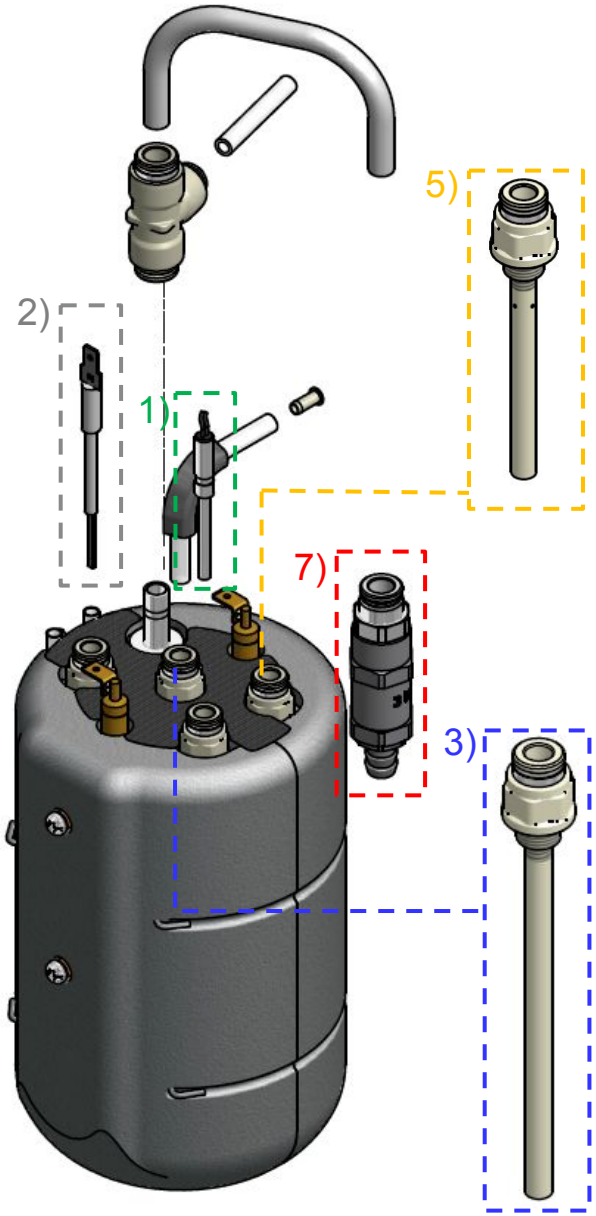
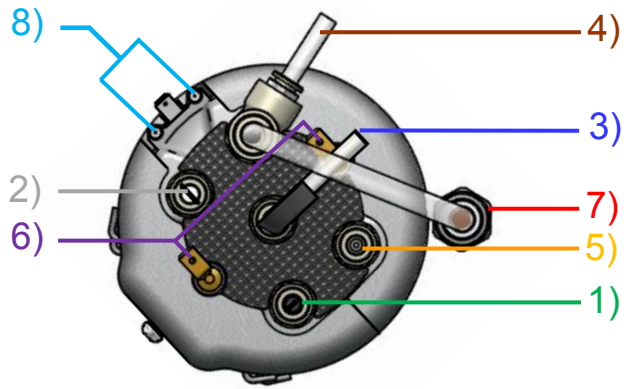
Technical construction
Tea / steam boiler, 2.5kW (0.9l/0.6l)



1) NTC temperature sensor
2) Level sensor l=84 mm
3) Hot water valve output
4) Steam block output
5) Tea / steam boiler supply
6) Electrical connection, heating element
7) Pressure relief valve 3 bar (Pura)
8) Thermal fuse (safety fuse) 152°C



The HW/S boiler is a modified version of the Pura standard boiler. The safety fuses as those used for the thermoblock are used, which can be replaced from the outside if they are activated. Due to the design change with the thermoblock, the default temperature in the boiler is set to 120°C instead of 130°C (old FM). Thus, only a 3-bar safety valve is used.

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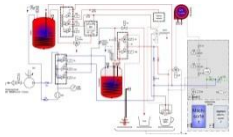
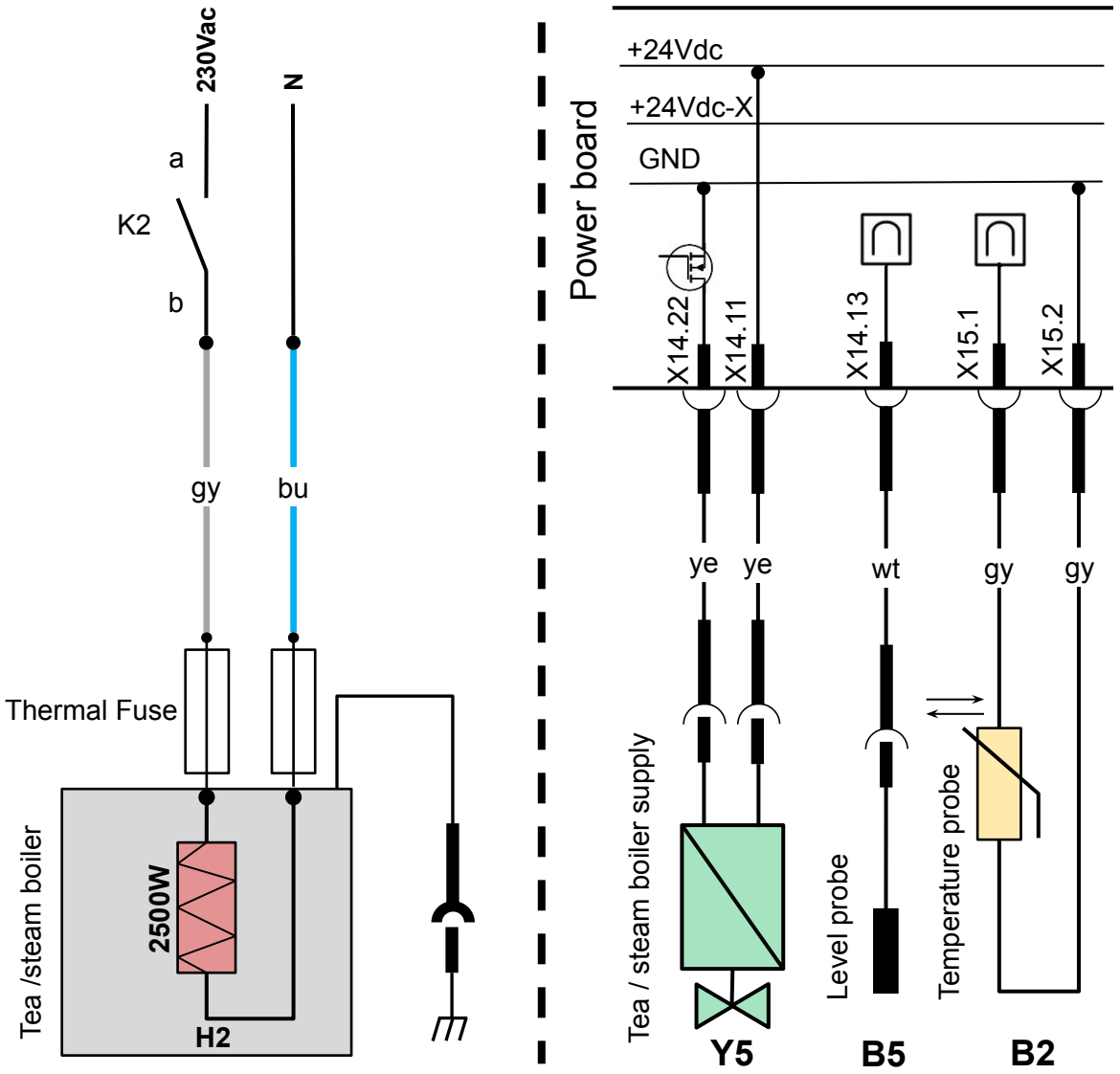
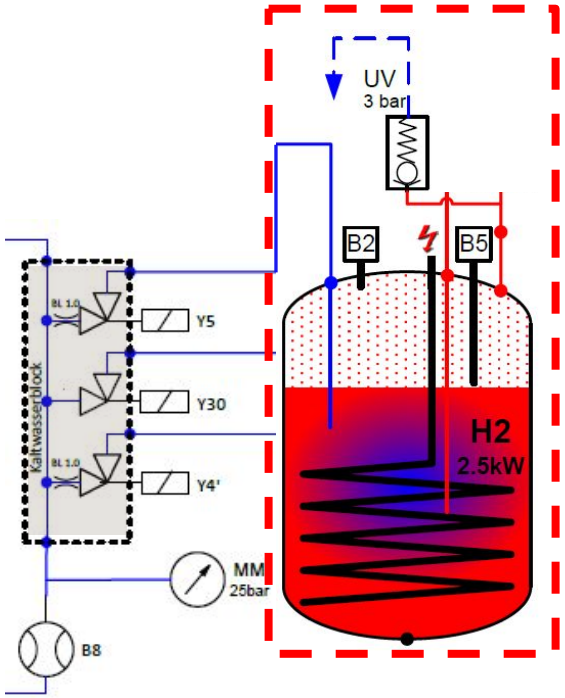
Technical construction
Tea / steam boiler, 2.5kW



Electrical



Water flow



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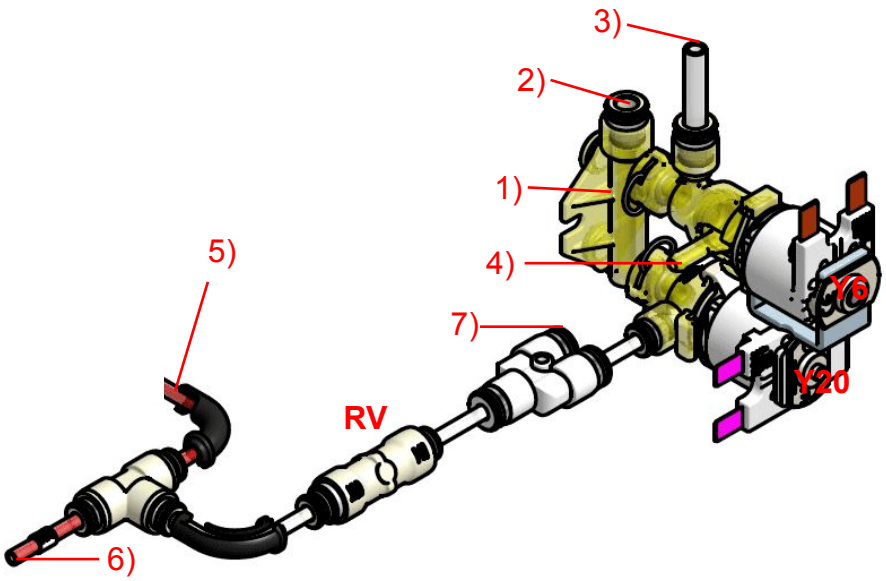
Technical construction
Steam valve block



Y6:
Function: Autosteam (3/2-way valve)
Cable: brown
Marking: white, opening 3.0 mm

Y20:
Function: milk steam
Cable: violet
Marking: white, opening 2.0 mm

1) 2-fold valve block (Basis)
2) Input from HW/S boiler
3) To front plug-in connection
4) Bleed (dribble box)
5) From drainage valve
6) Milk line to outlet Y-piece
7) To rinsing line

The Y20 is designed to heat the milk further after it has already been heated by the thermoblock, without causing it to caramelize. Products with a temperature of up to 80° C can be produced without spraying.

The Y6 is for the Autosteam option and is always installed.

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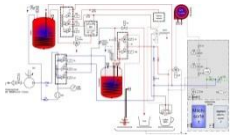
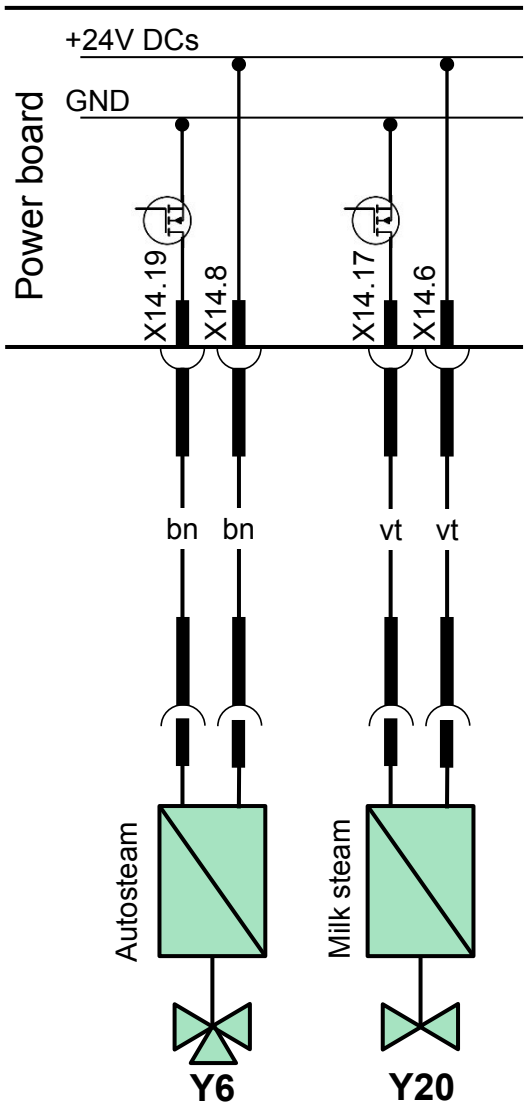
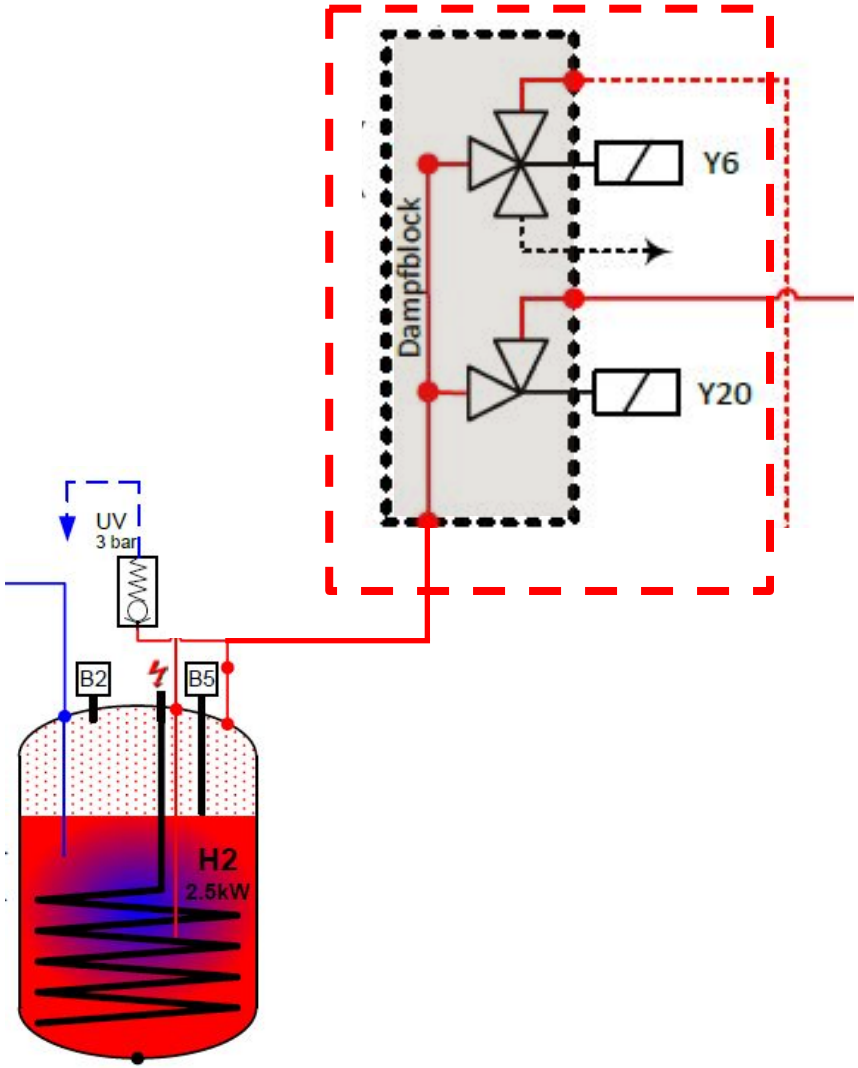
Technical construction
Steam valve block



Electrical



Water flow



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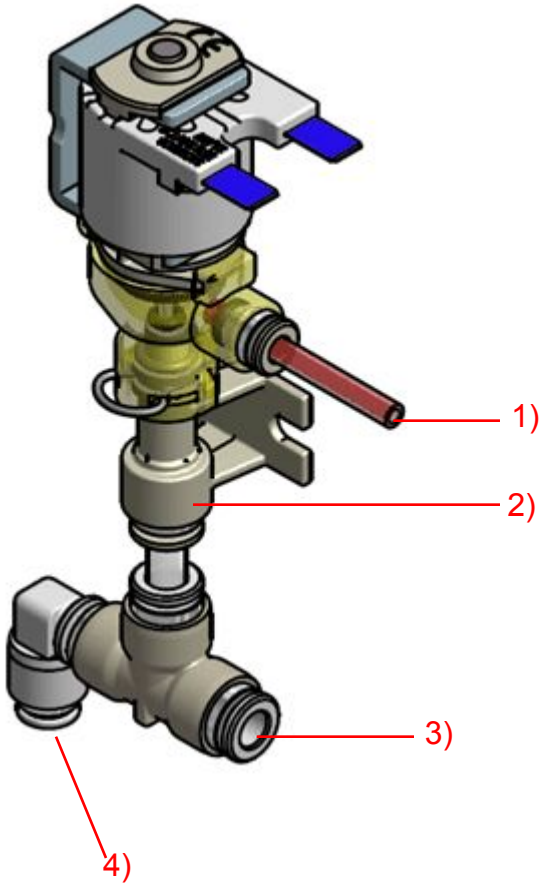
Technical construction
Hot water valve



Y4:
Function: hot water/tea
Cable: blue
Remark: opening 3.0 mm

1) To front plug-in connection
2) 1-fold valve block
3) From HW/S boiler
4) From cold water block (regulating valve)

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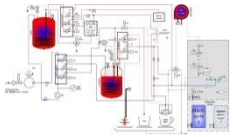
Technical construction
Steam valve block



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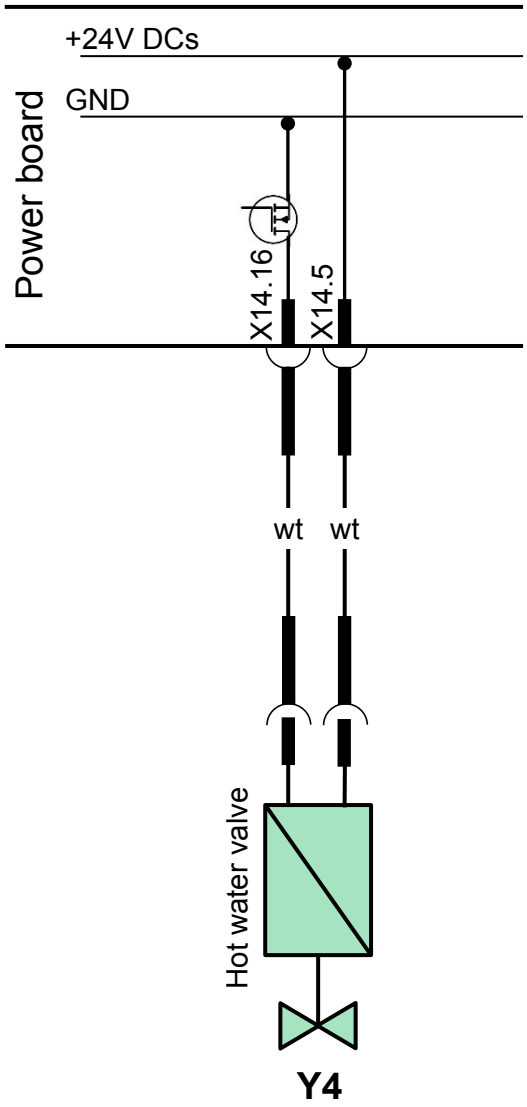
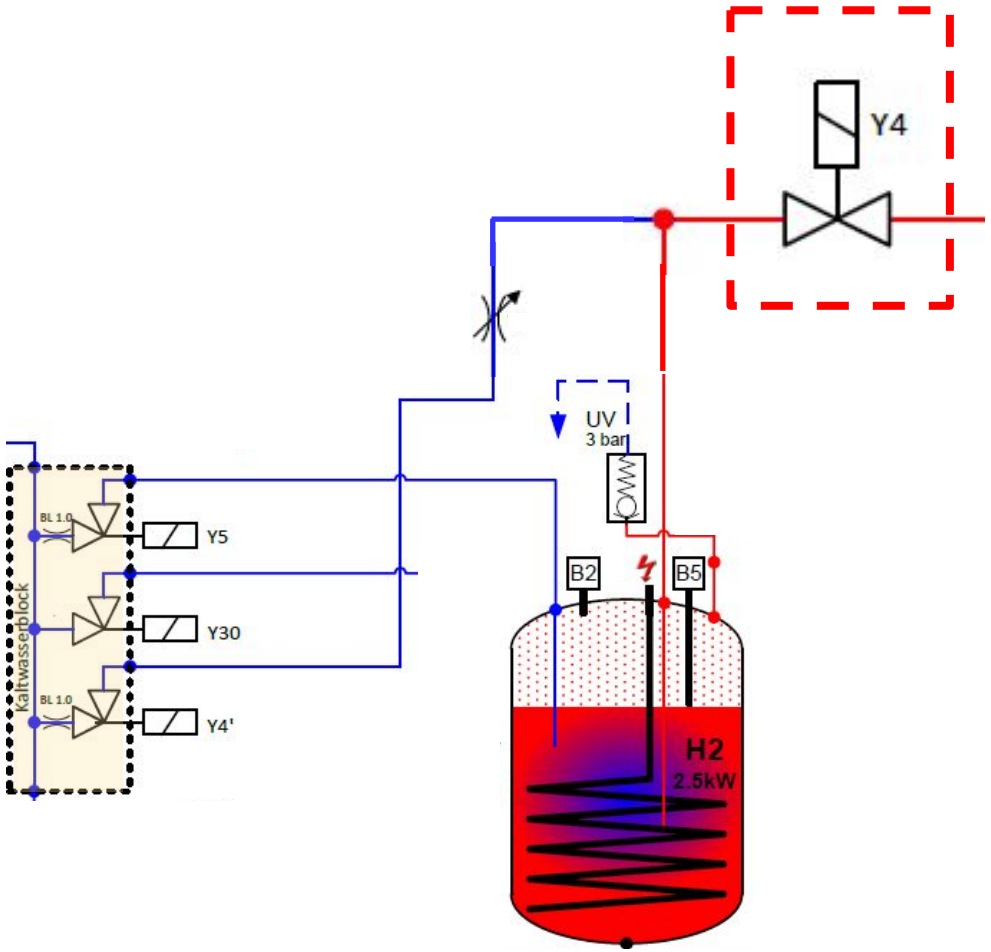


Water flow



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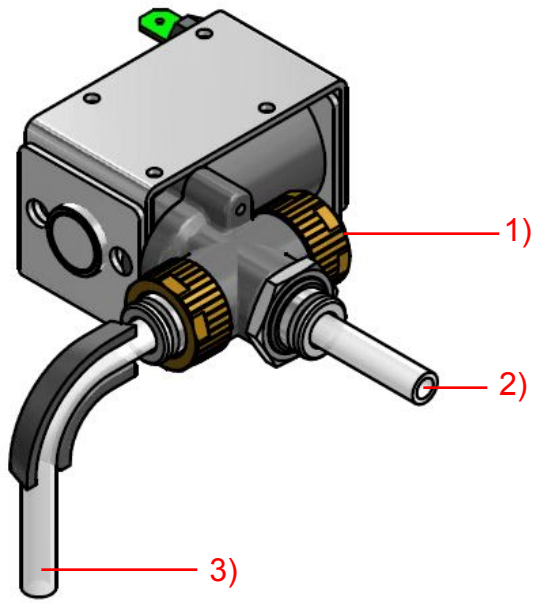
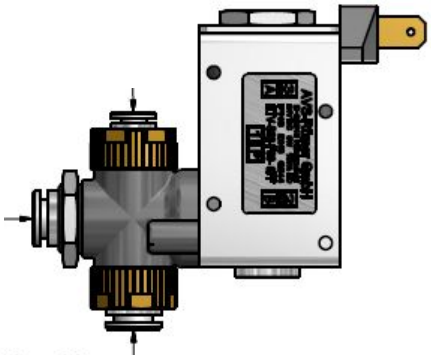
Technical construction
Drainage valve



Y39:
Function: drainage
Cable: green



1) To outlet
2) From thermoblock
3) To bulkhead connection (drain)

The drainage valve has two functions:

- To ensure that residual water does not flow into the cup when the first product is dispensed after rinsing.
- To ensure that when preparing an espresso macchiato, the milk quantity dispensed into the cup is not too high.

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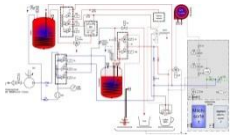
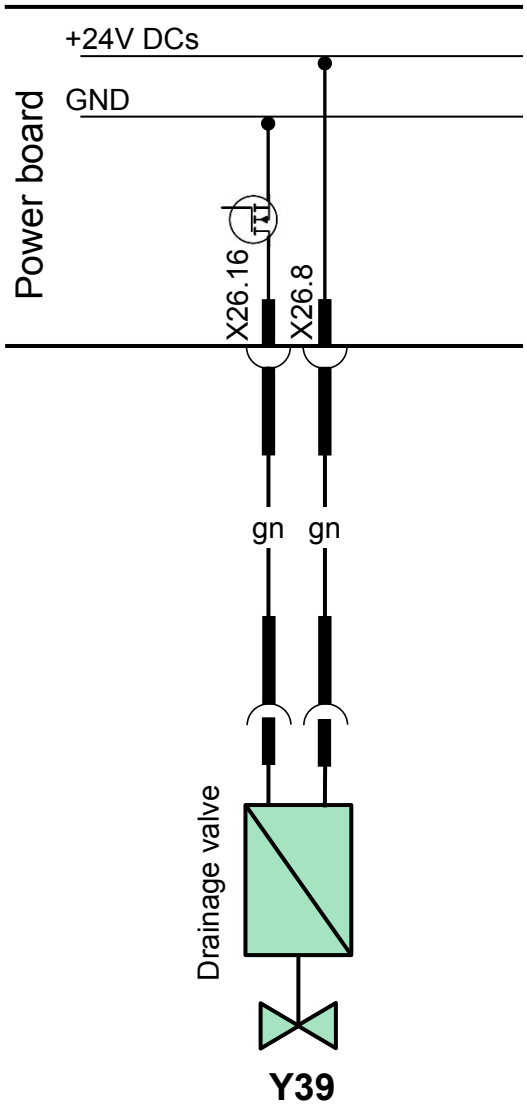
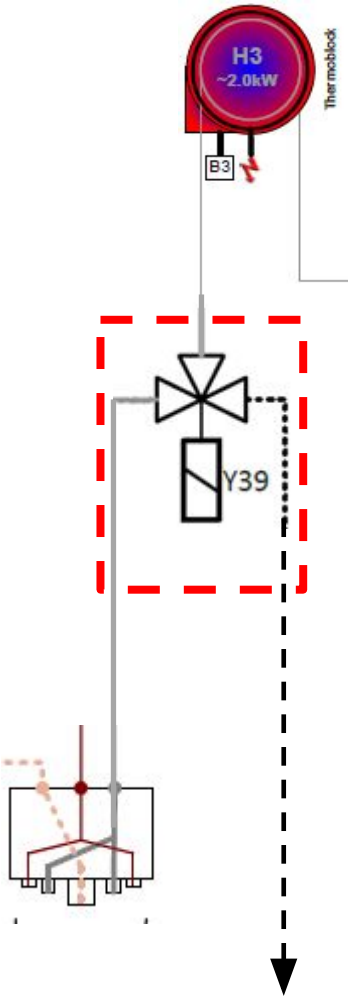
Technical construction
Steam valve block



Electrical



Water flow



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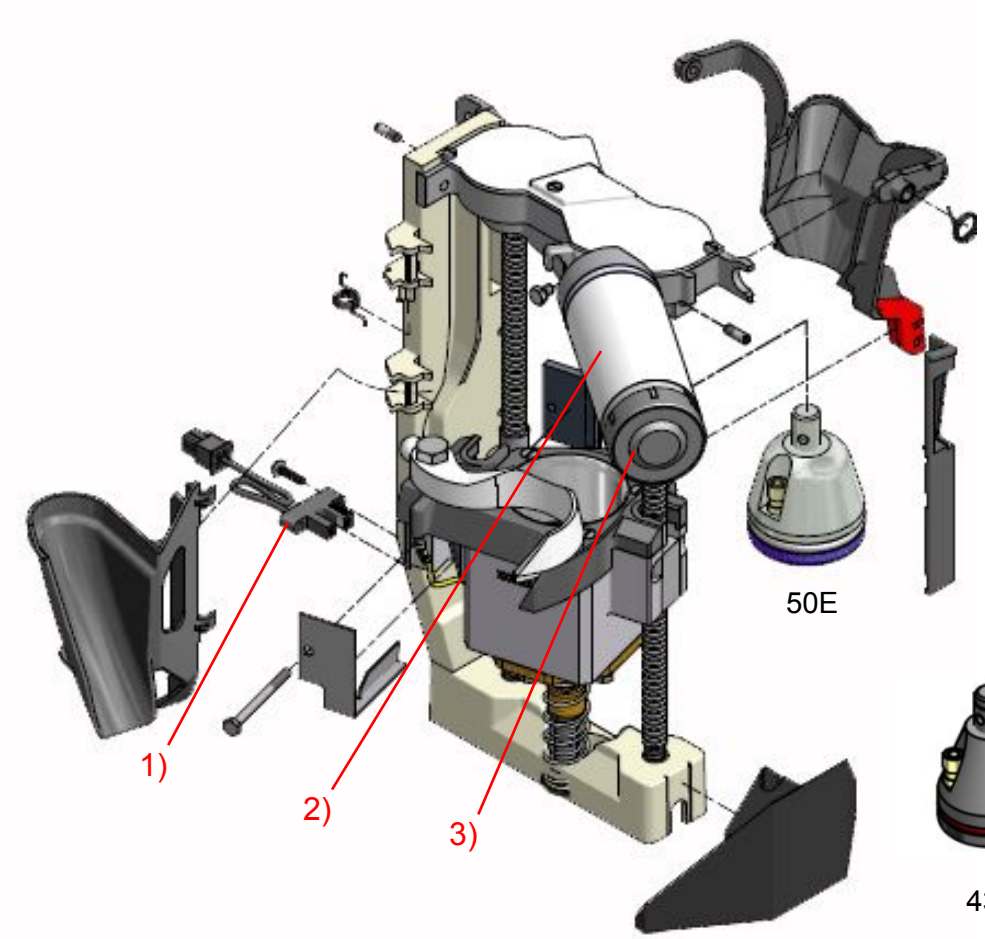
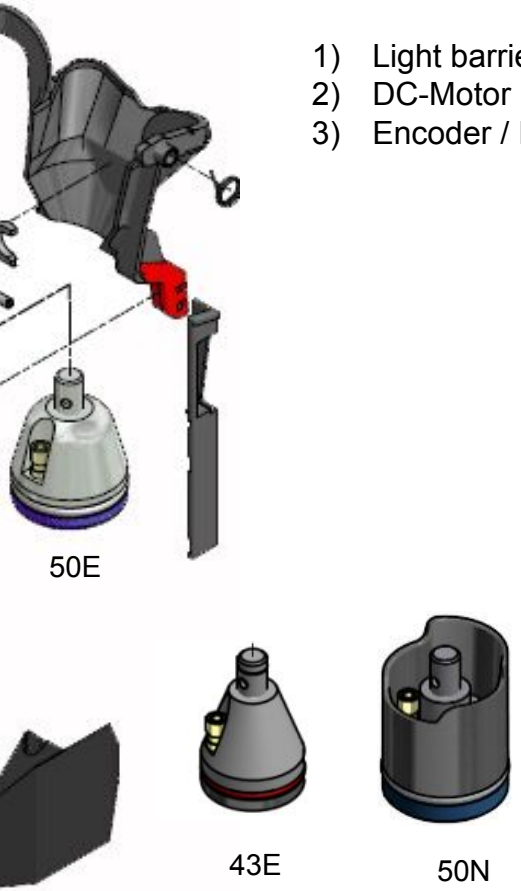
Technical construction
Brewing Unit 43E / 50E / 50N



1) Light barrier
2) DC-Motor
3) Encoder / Increment



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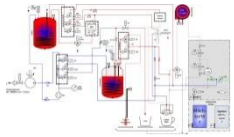
Technical construction
Brewing Unit



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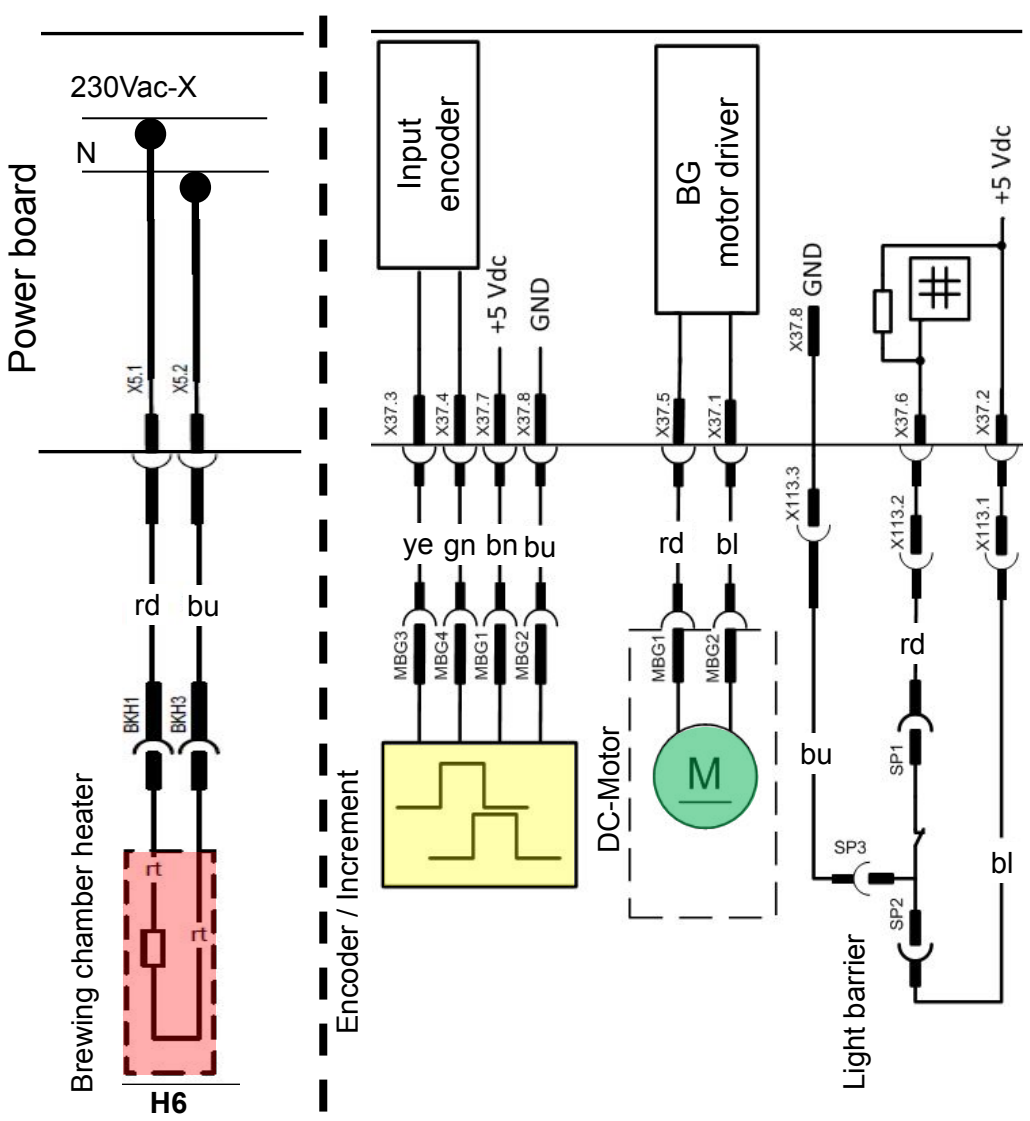
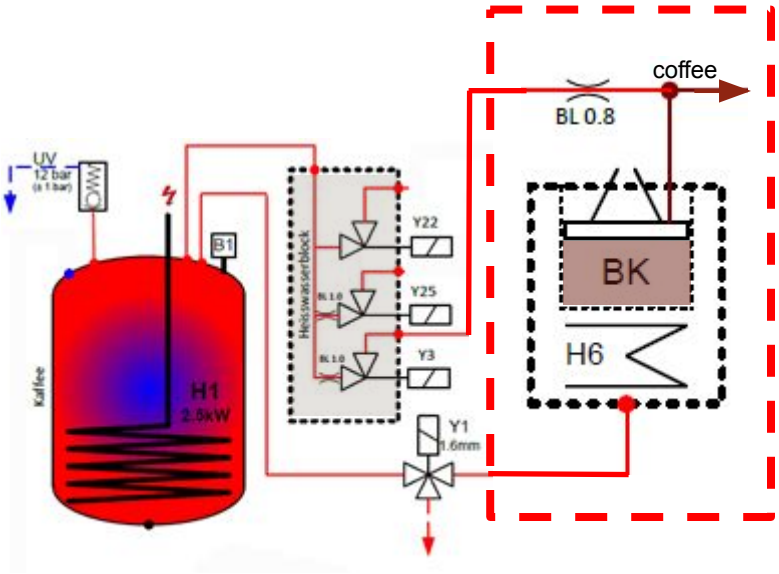


Water flow



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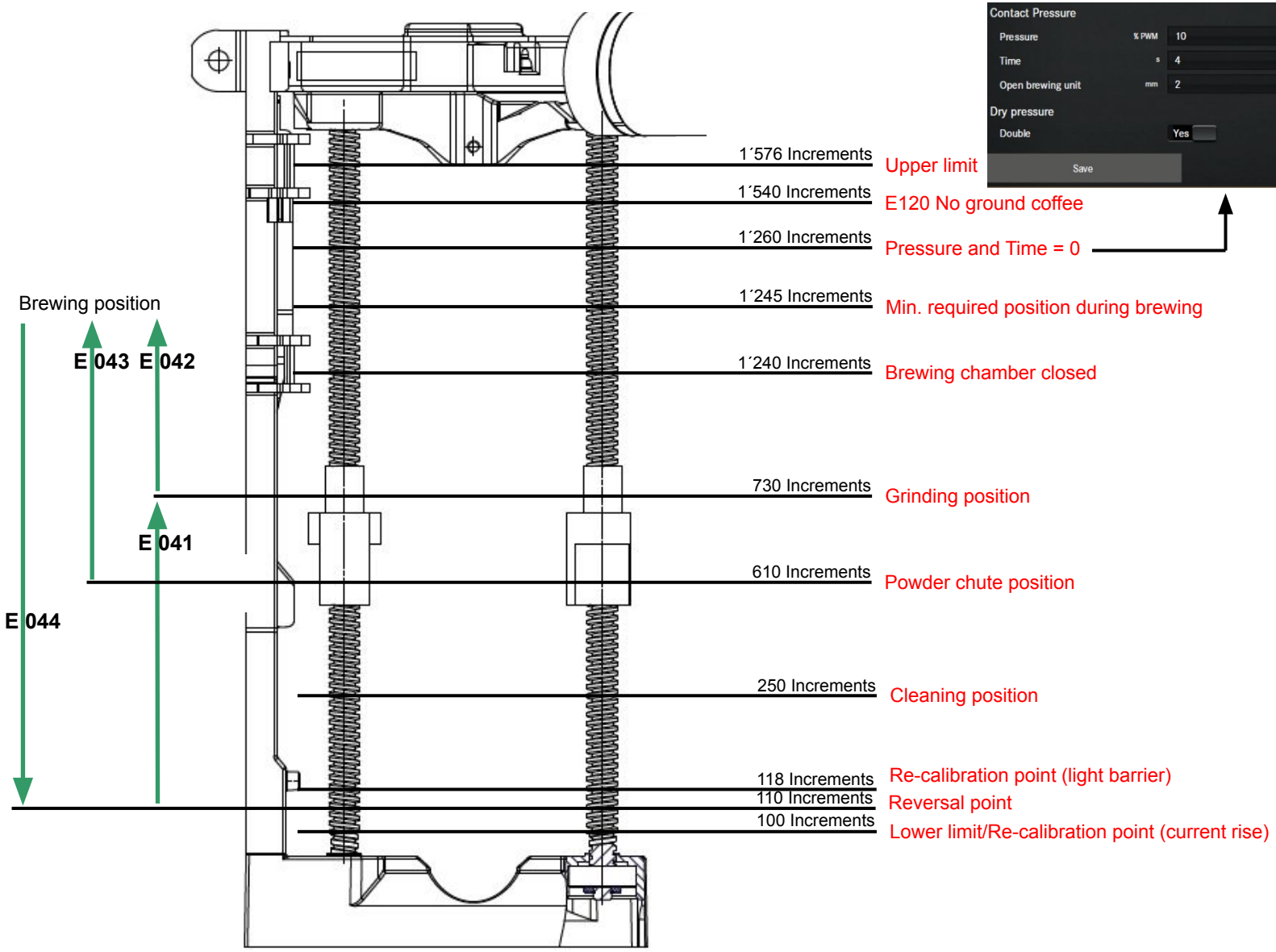
Technical construction
Fixed increment positions



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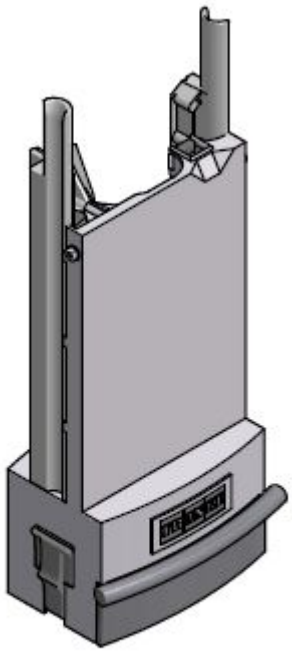
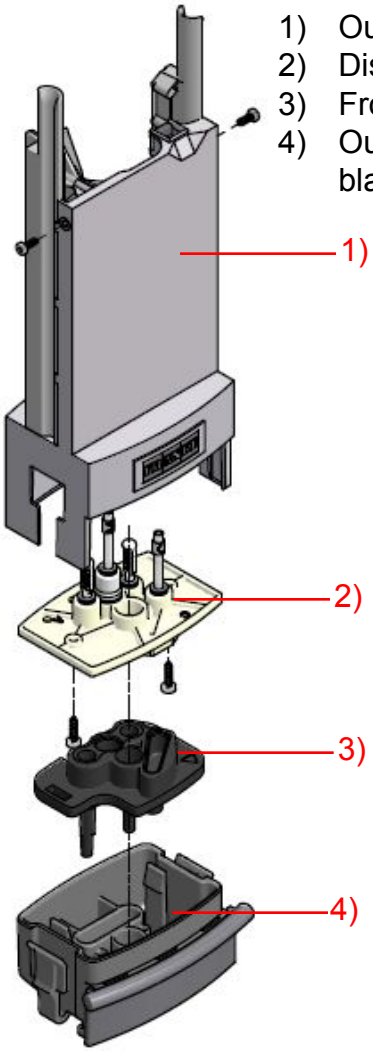
Technical construction
Coffee outlet



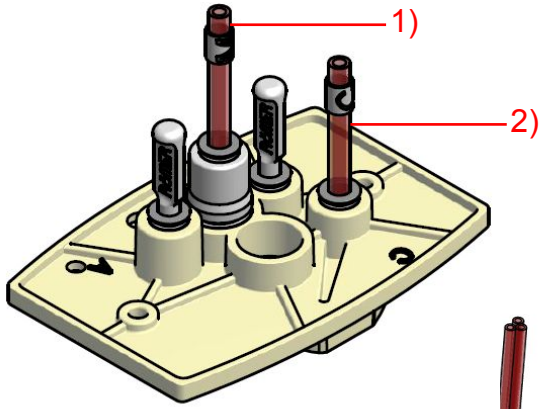


Coffee outlet:

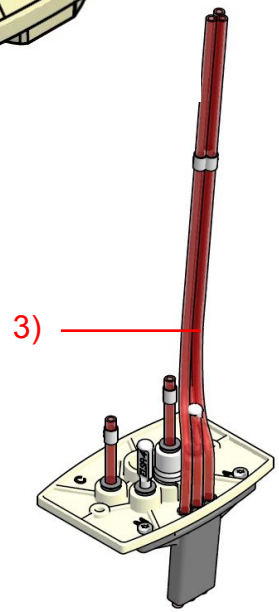
1) Outlet supporter top
2) Distributor FM
3) Frother
4) Outlet bottom part cpl. black

Distributor FM:

1) Cold or hot milk
2) Coffee



Option
Distributor FM FS:
3) Syrup tubes



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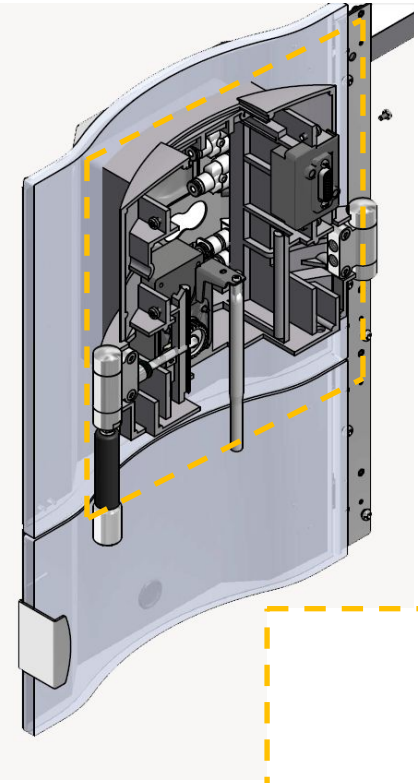
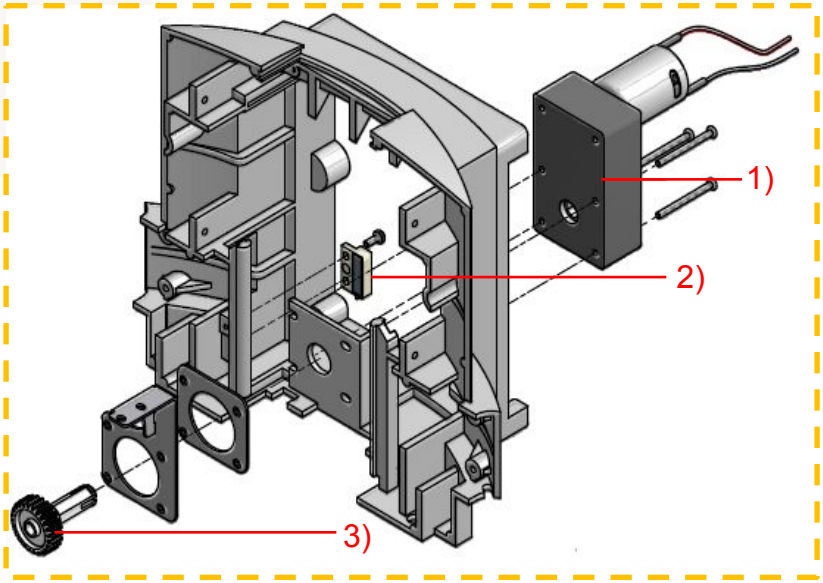
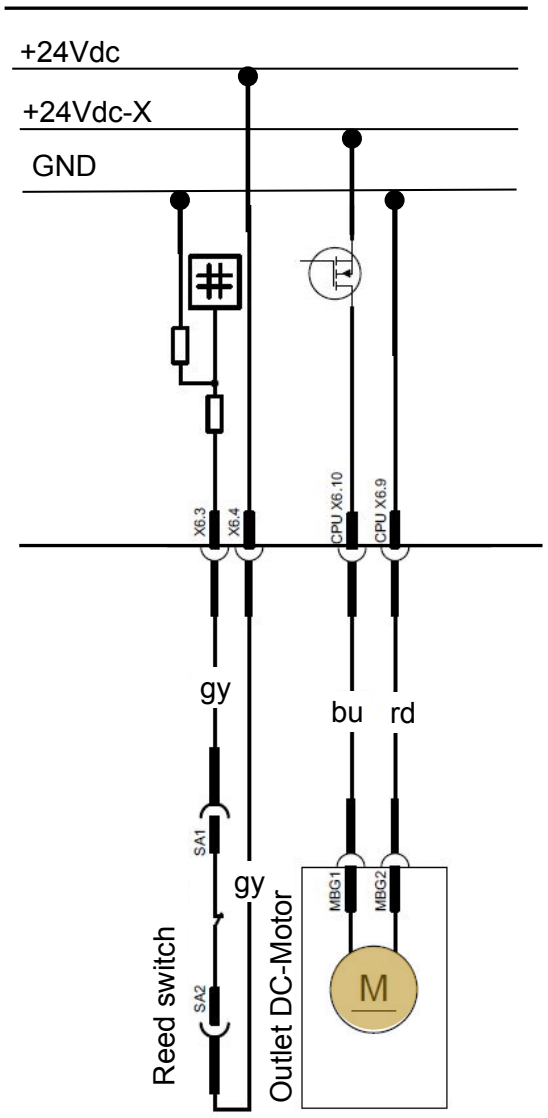
Technical construction
Front door



1) Outlet DC-Motor 24VDC
2) Reed switch
3) Gear wheel to the outlet



Electrical



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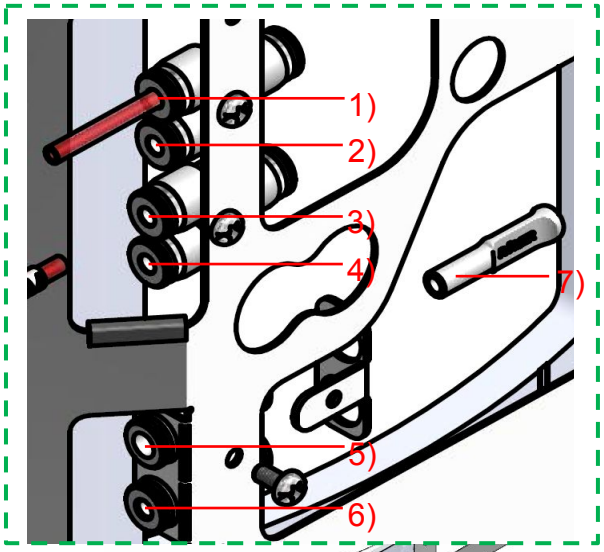
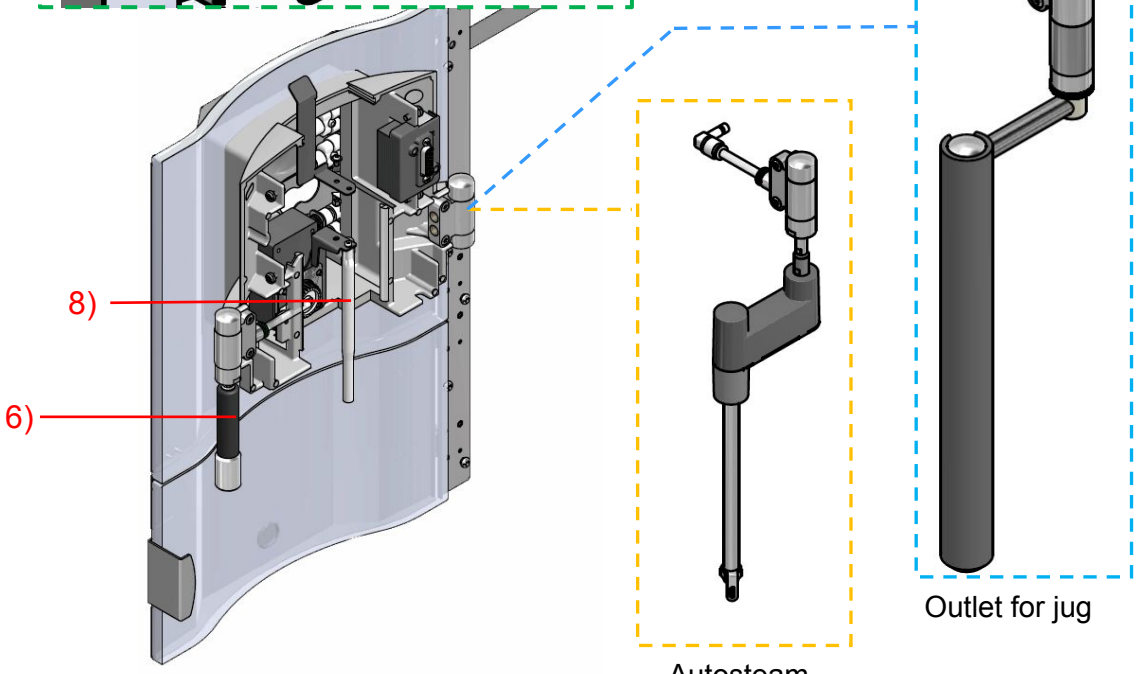
Technical construction
Front door



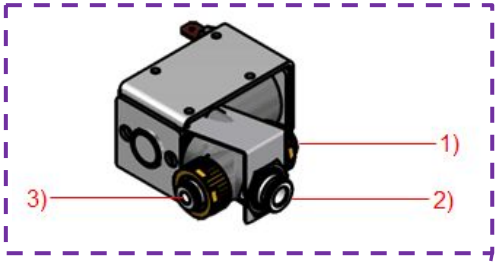
Front door:

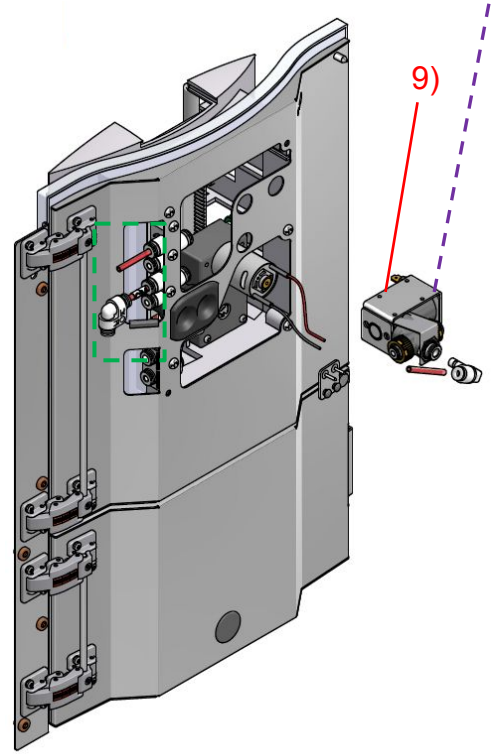
1) Brewing unit
2) Bypass
3) Cold milk
4) Hot milk
5) Autosteam (outlet on right)
6) Hot water dispenser (outlet on left)
7) Only in machines without Autosteam
8) Instant outlet
9) Valve outlet switch



Valve outlet switch:

1) To the jug outlet
2) From the brewing unit
3) To the coffee outlet





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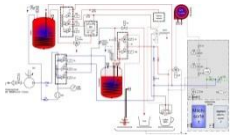
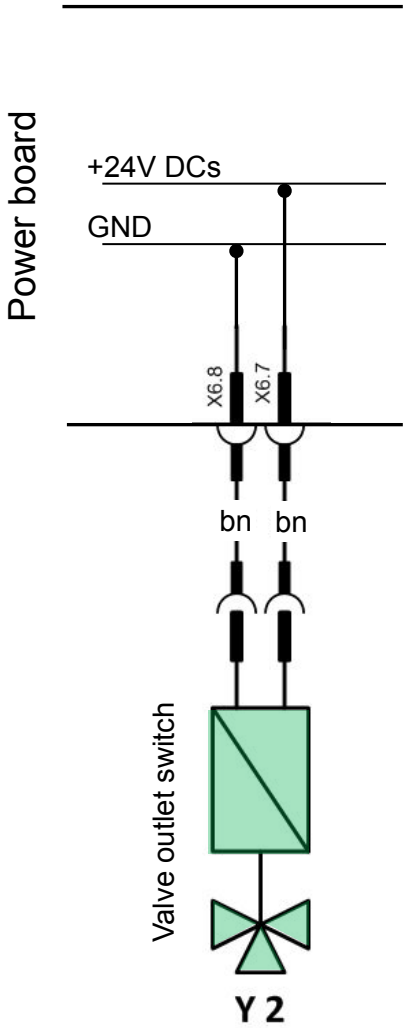
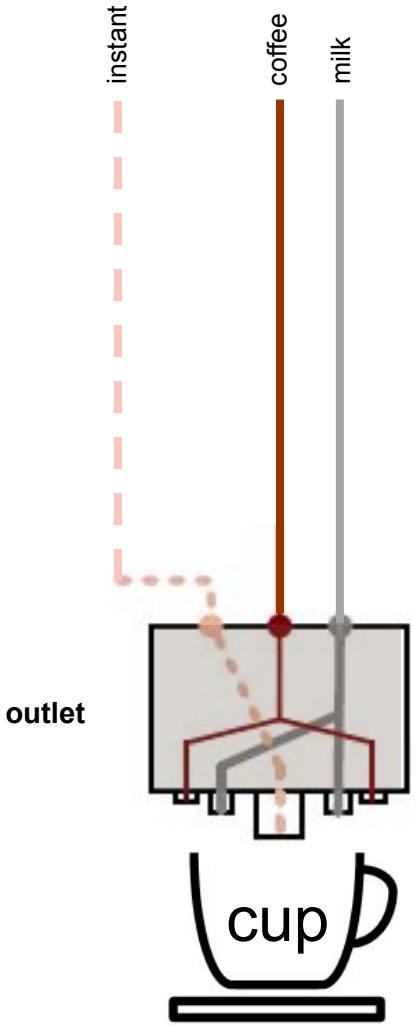
Technical construction
Brewing Unit



Electrical



Water flow



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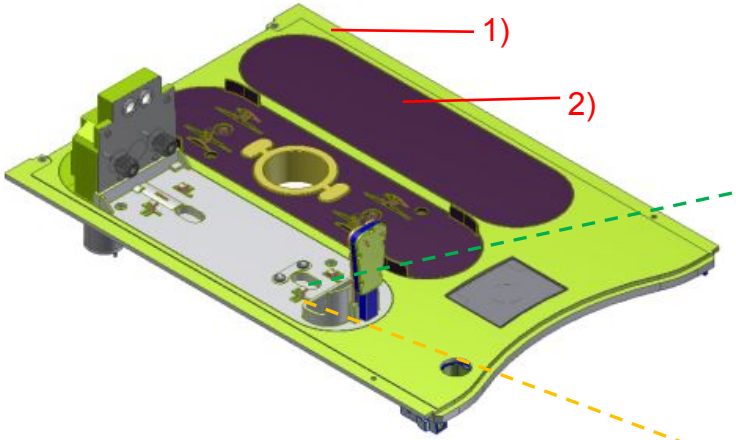
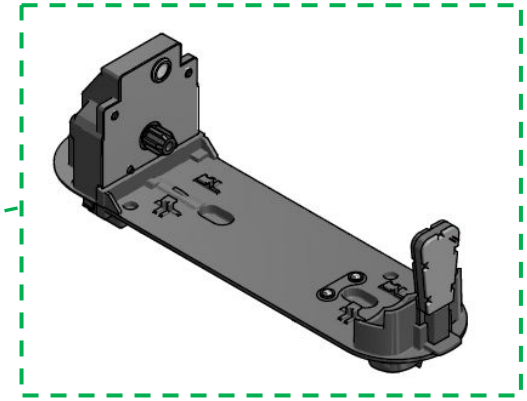
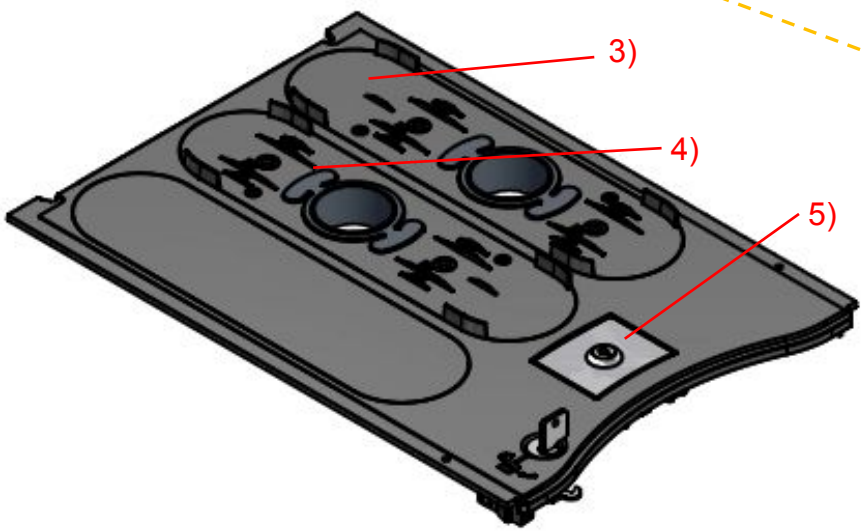
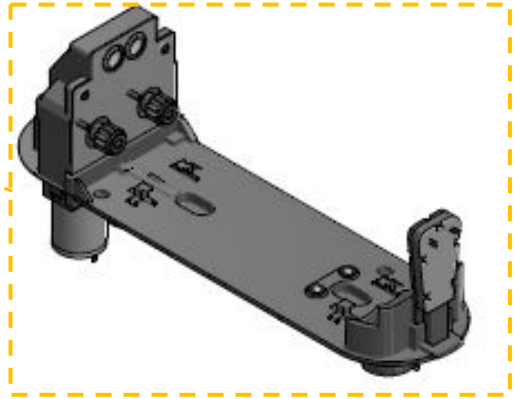
Technical construction
Coverplate





Powder dosing unit





Double powder dosing unit

1) Coverplate
2) Blind lid
3) Support grinder outside
4) Support grinder center
5) Cover cpl. / Cover cpl. locked

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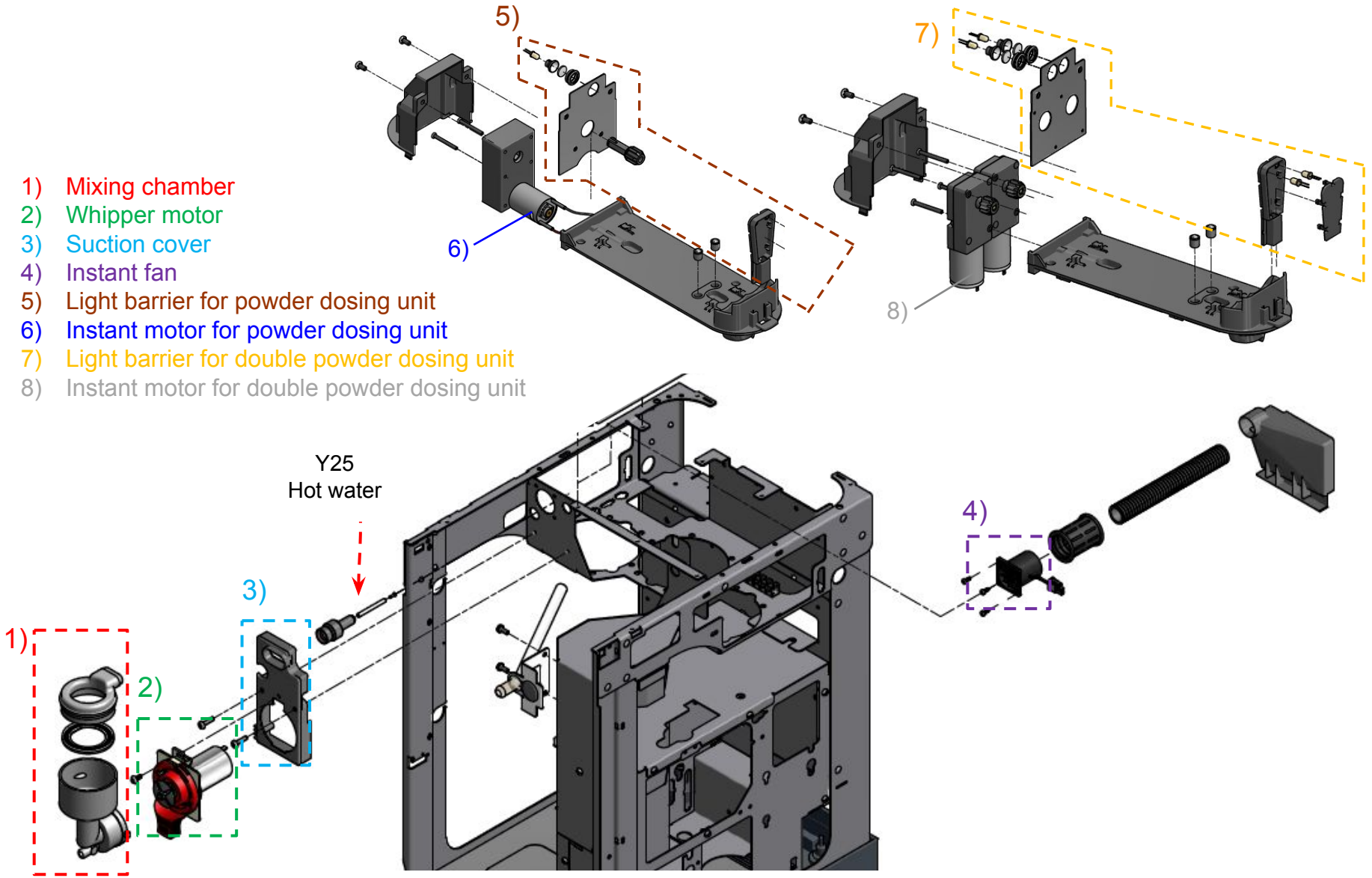
Technical construction
Instant

1) Mixing chamber
2) Whipper motor
3) Suction cover
4) Instant fan
5) Light barrier for powder dosing unit
6) Instant motor for powder dosing unit
7) Light barrier for double powder dosing unit
8) Instant motor for double powder dosing unit



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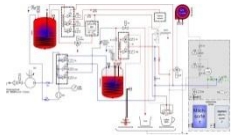
Technical construction
Instant



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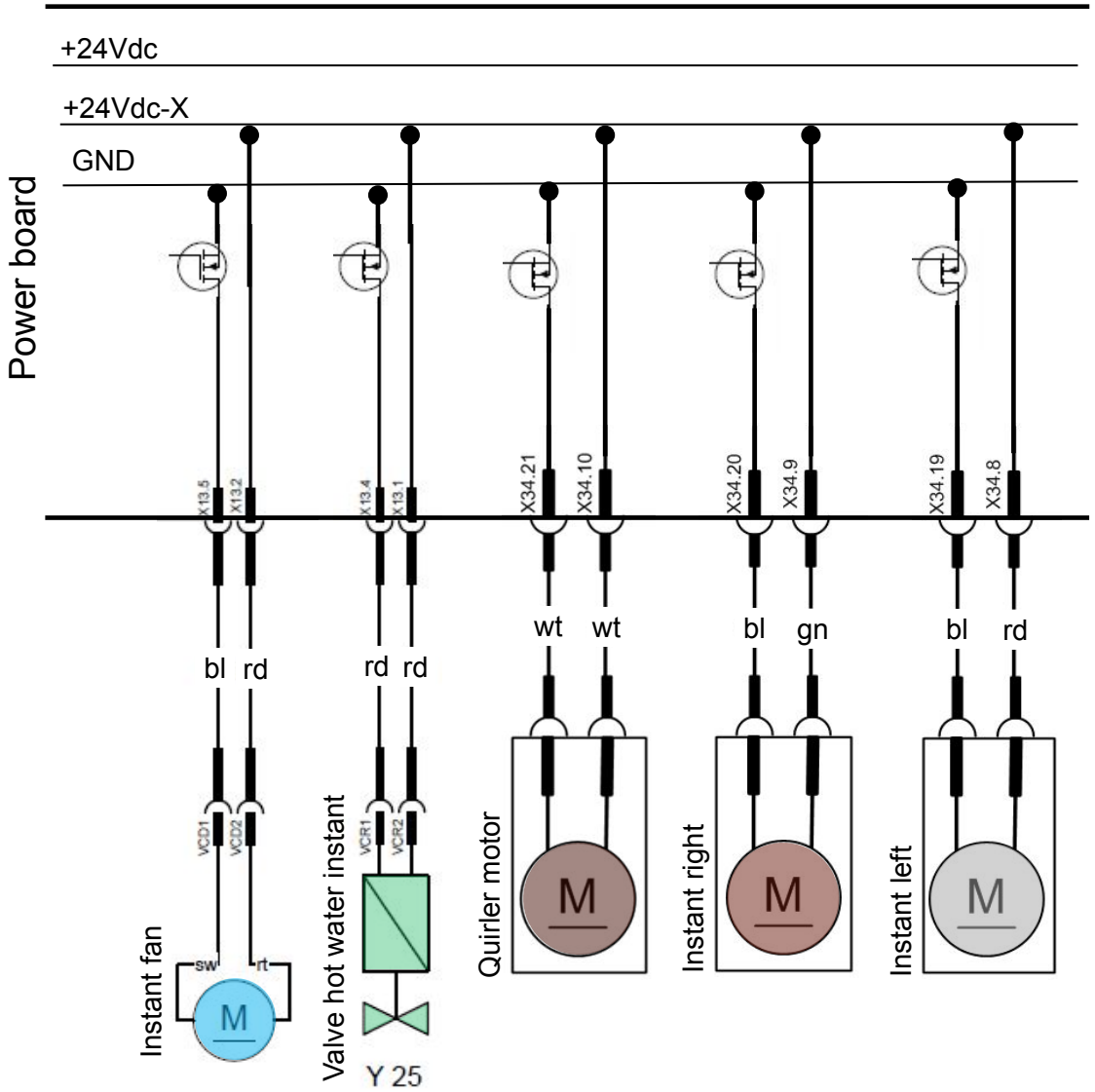
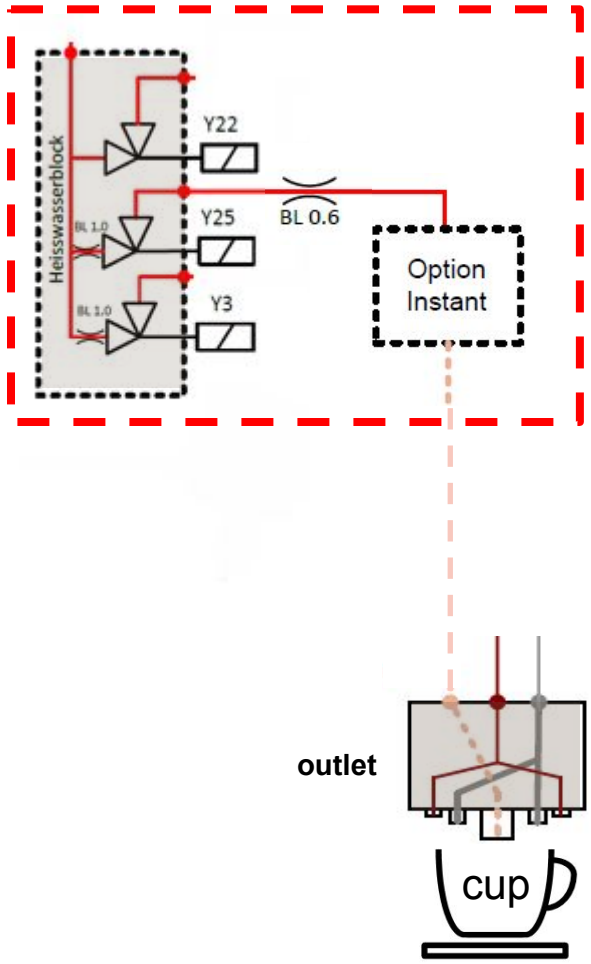


Water flow



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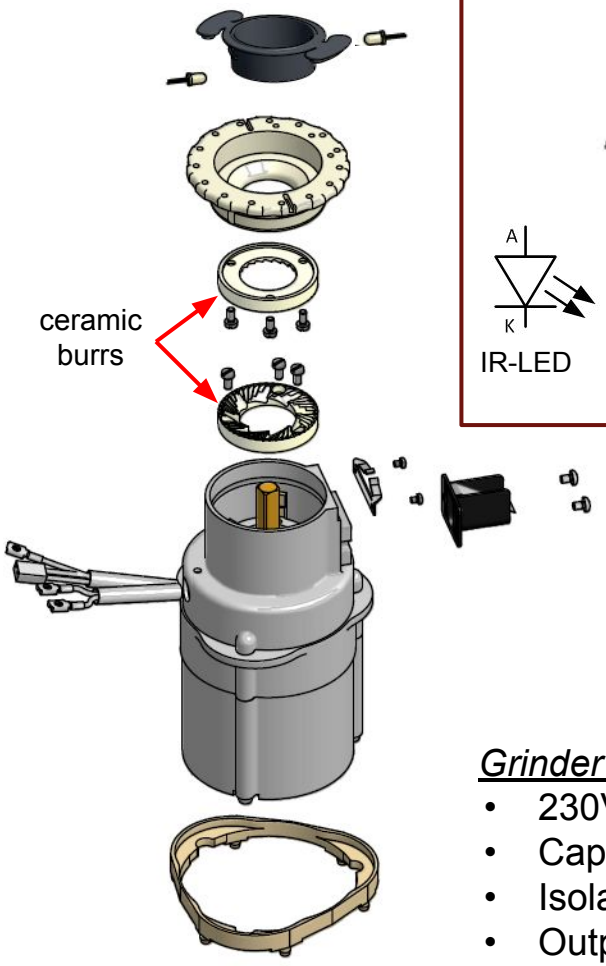
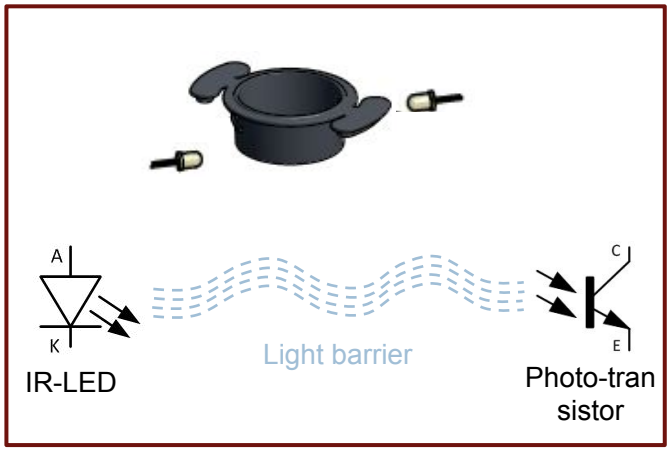
Technical construction
Grinder / bean monitoring

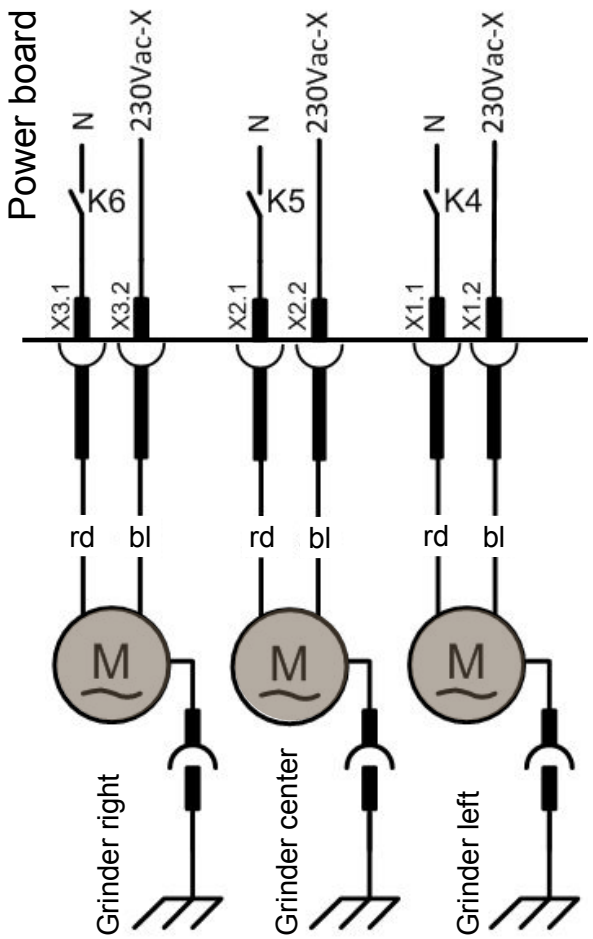




Grinder specification:

- 230V 50/60Hz
- Capacitor 14uF
- Isolation class «F»
- Output min. 3gr. / sec.
- UL approved

Electrical



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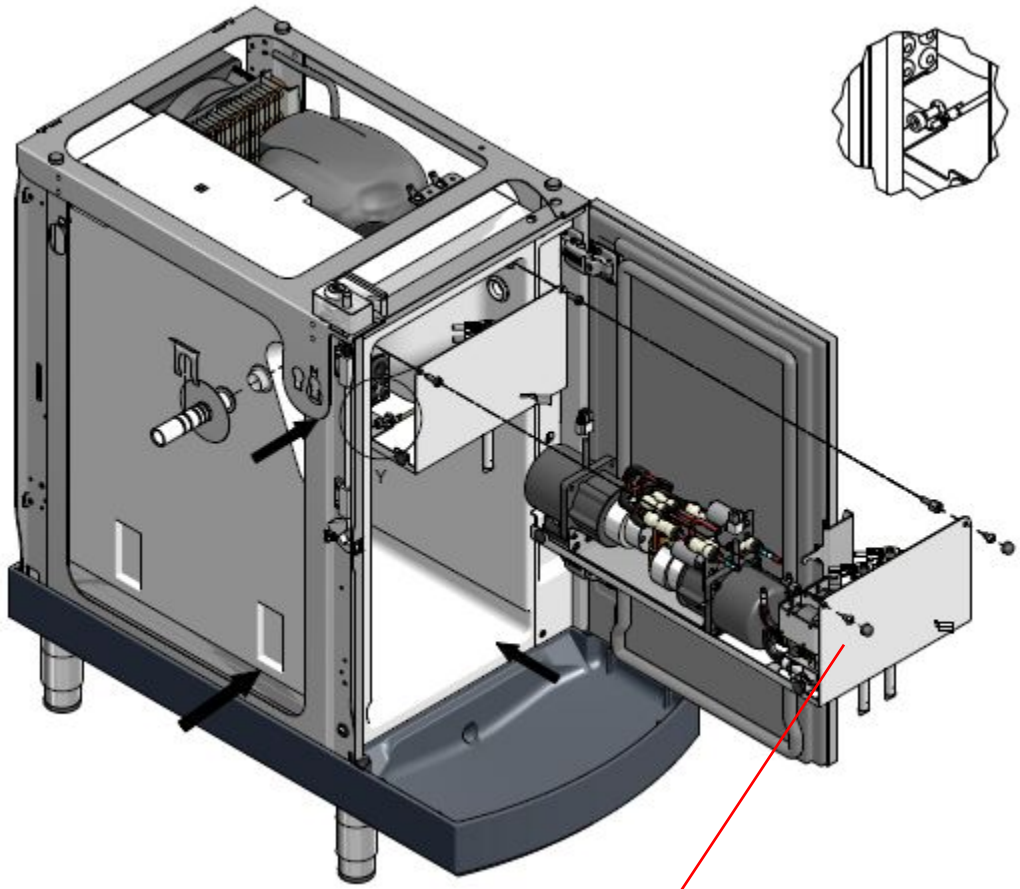
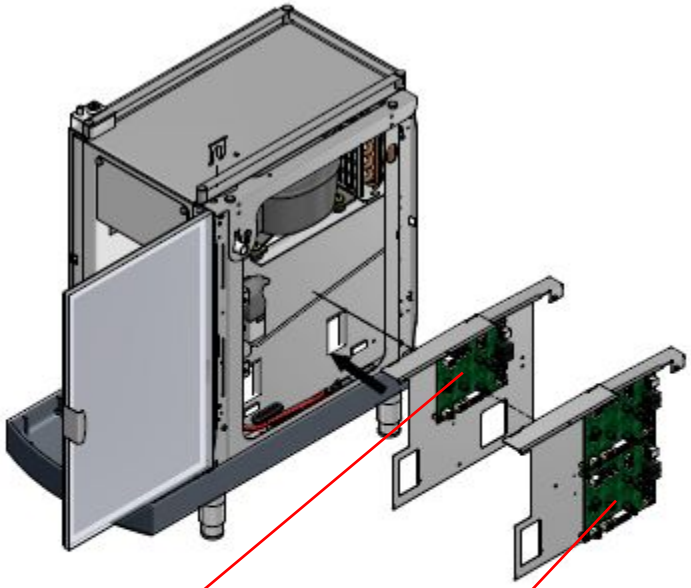
Technical construction
Milk system FM (Foam Master)





1 Coffee machine, 1 milk

2 Coffee machine, 1 milk

Milk slide in module

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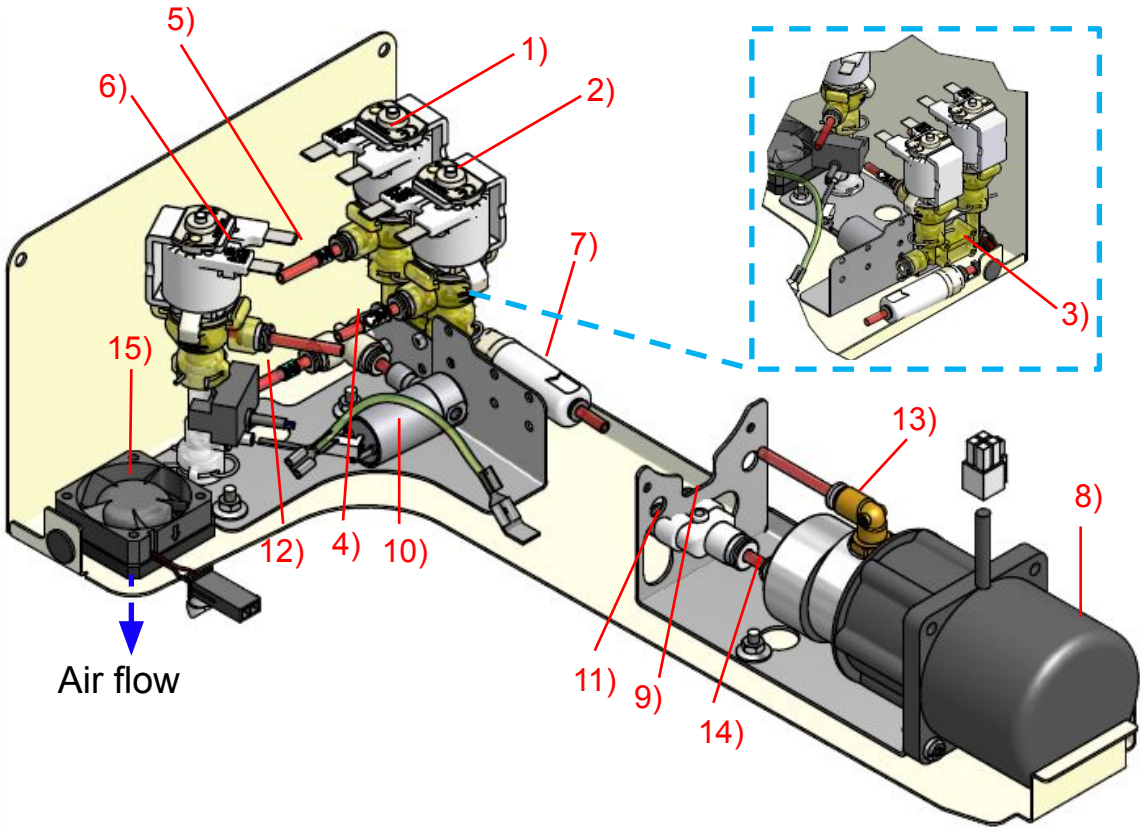
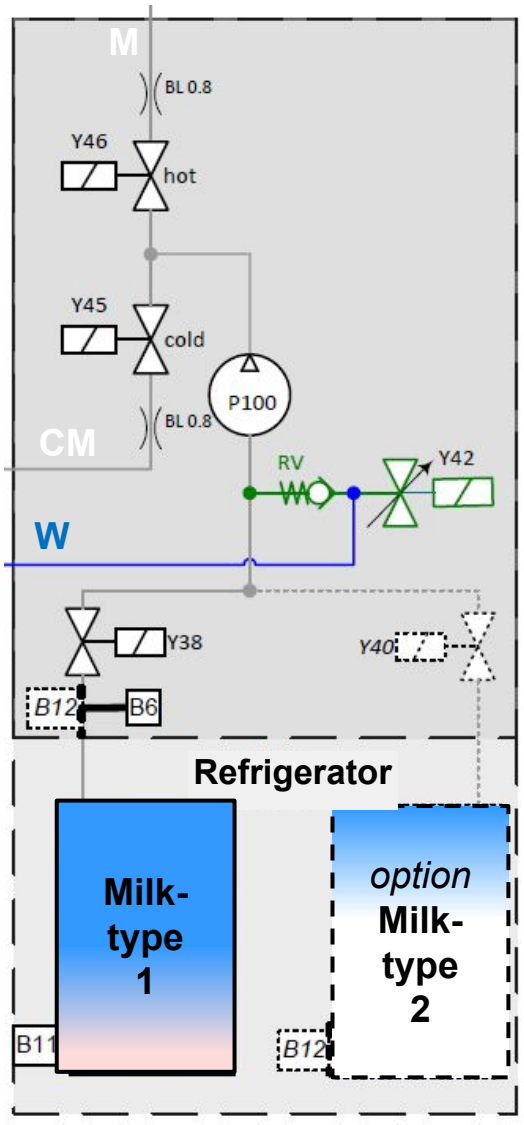
Technical construction
Milk slide in module



Left slide-in module:

1) Valve Y46, Hot Milk
2) Valve Y45, Cold Milk
3) From gear pump P100
4) Cold milk output (CM)
5) Hot milk output (M)
6) Milk intake valve Y38 (Option Inline Sensor)
7) Check valve
8) Gear pump P100
9) From check valve
10) Air pulse valve Y42
11) To milk intake Y38
12) Cold water rinsing line (W)
13) Pump output
14) Pump input
15) Fan

Water flow



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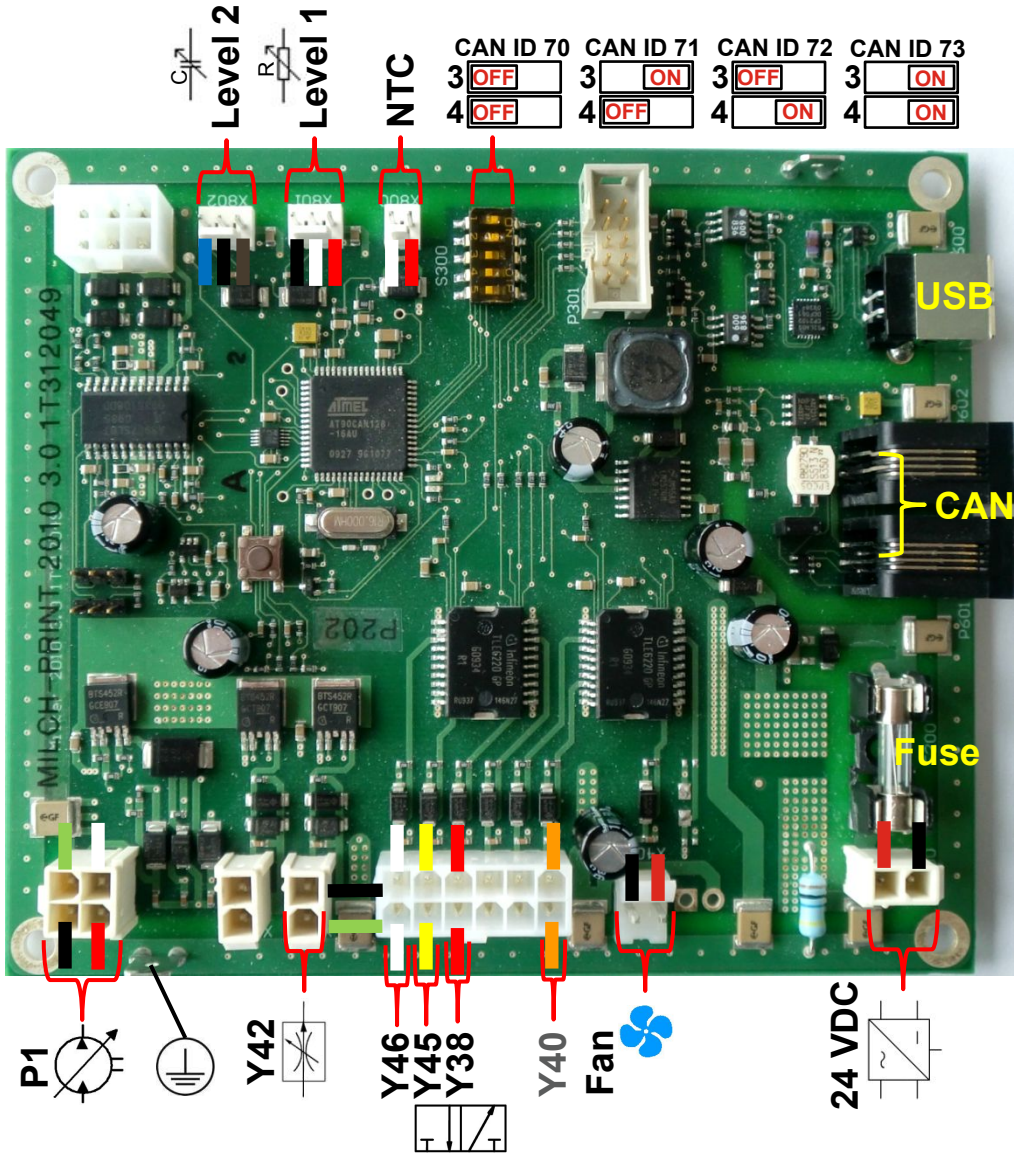
Technical construction
Foam Master PCB



Item	Meaning
P1	Gear pump
⏚	Earth connection
Y42	Air valve
Y45	Change valve hot&cold
Y38	Milk selection valve
Fan	Pump plate fan (front/rear)
24VDC	Power connection
Fuse	Fuse FST 5x20 3.15 A
CAN	CAN-bus connections
USB	USB connection for software updates with Service Tool 3
CAN-ID	CAN-ID configuration via DIP switches 3 and 4
NTC	Milk temperature sensor connection
Level 1	Milk detection (conductive sensor)
Level 2	Milk level (capacitive sensor)

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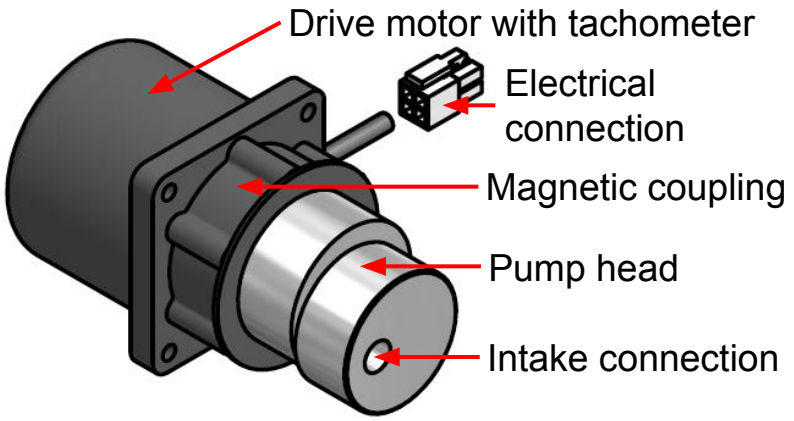
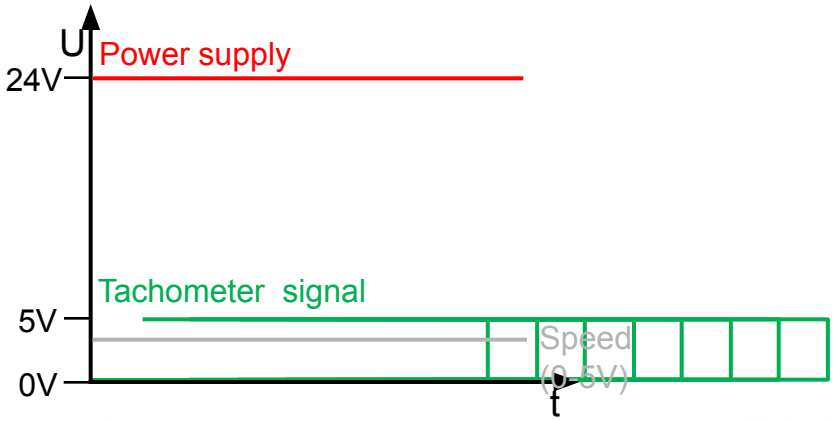
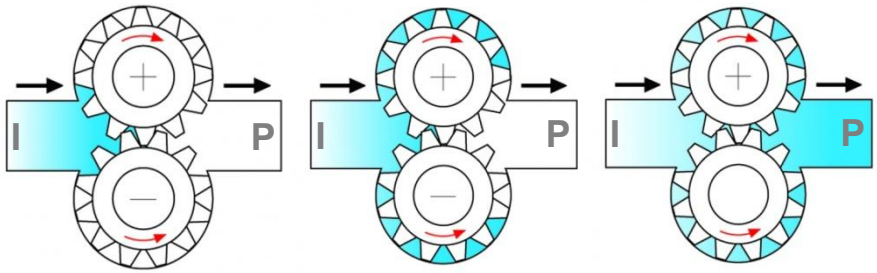
Technical construction
Gear pump







Construction and functionality

The gear pump is a rotary pump consisting of two toothed gears rotating in opposite directions, which engage on the intake side of the pump. Both an intake connection (I) and a pressure line connection (P) are located on the pump head. The drive gear is linked to the drive motor via the magnetic coupling and drives the other toothed gear. Milk is drawn into the open space between the shoulders of the gears and the housing and transported to the pressure side. After the milk reaches the pressure side, the teeth on both gears fill the open spaces. This results in the pulsation-free conveying of the milk. The pump motor electronics are supplied with 24 VDC. Speed of revolution is set by using a DC voltage signal of 0 - 5 VDC. The tachometer sends a total of 4 impulses to the Foam Master controls with each revolution. The flow rate is 1000 ml/min and the output pressure is 4 bar.

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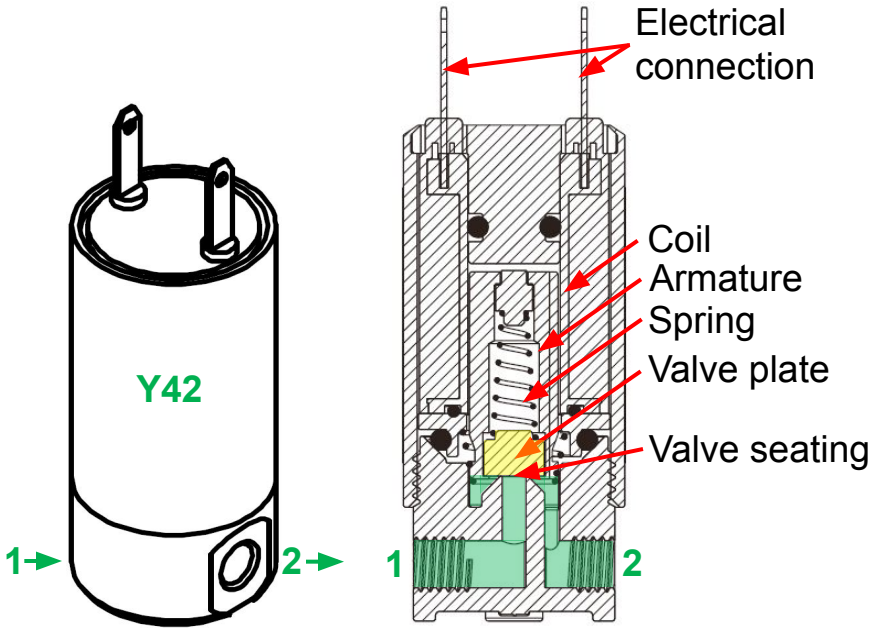

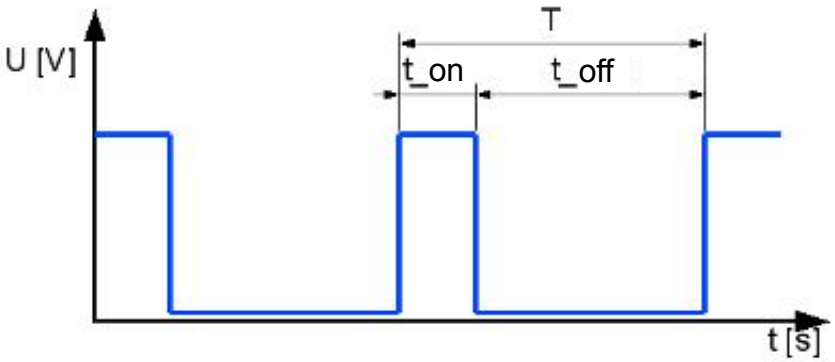

Construction and functionality

The valve plate (sealing element) is directly linked to the armature. In the power-off state, spring tension causes it to press against the valve seating, which closes off the path between connection 1 and connection 2.
Applying a voltage to the coil creates a magnetic field, which pulls the armature upward, opening the path between connection 1 and connection 2.
In the application in the Foam Master, the air valve is controlled by the Foam Master PCB with a PWM (**p**ulse **w**idth **m**odulation) signal with a frequency of 10 Hz.
The higher the air percentage value set in the product configuration,

- The longer the duration of the pulse (t_on) relative to the pulse interval (t_off).
- the longer the average time the valve is open.
- The larger the quantity of air added.
- The dense the milk foam.

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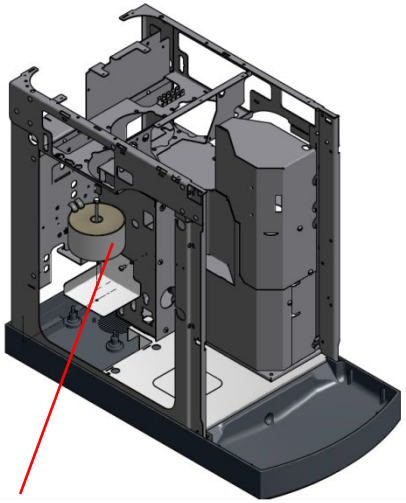
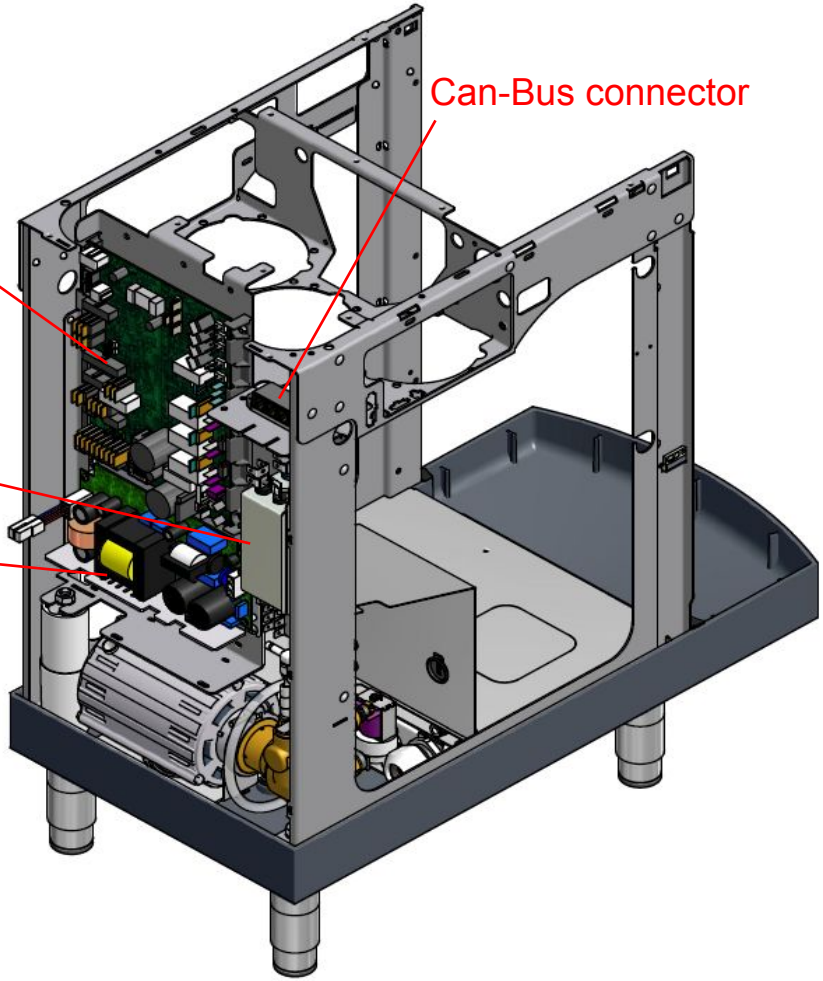
Technical construction
Overview electronic



Transformer (USA, Version)



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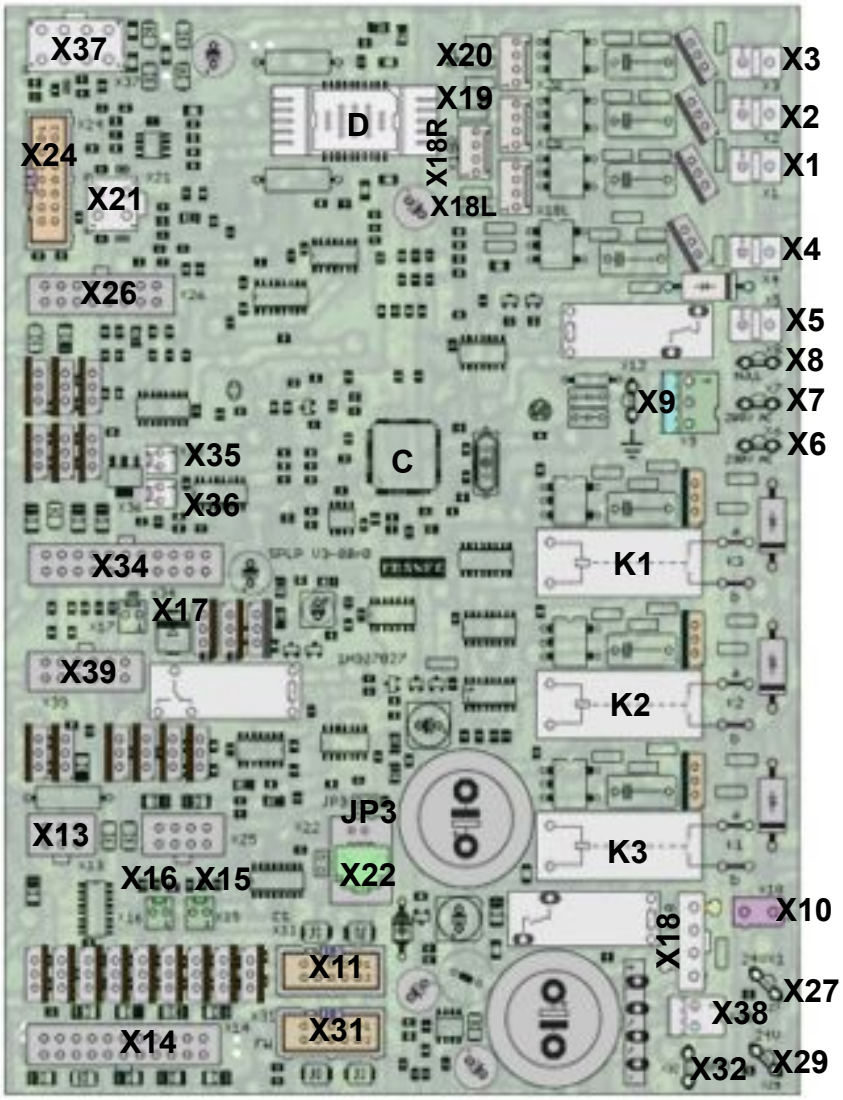
Technical construction
Power board (PCB) 3.1



K1/2/3	Heater coffee/tea_steam1/tea_steam2
X8	Connection neutral line
X7	Connection 208 Vac
X6	Connection 230 Vac
X5	Heater Brewing unit
X4	Water pump
X3/2/1	Grinder right/middle/left
X20/19/18L/R	Monitoring grinder:right/middle/left(Instant:left/right)
X27	24 Vdc X
X29	24 dc constant
X32	GND
X18	Fuse F2 very slow blow 4A (brewing unit)
X18	Fuse F1 very slow blow 4A (logic, valves)
X37	Brewing unit 24Vdc
X22	CAN-Bus internal (Power print)
JP3	Jumper CAN-End
X11	Comm. Module CCI/CSI
X31	Comm. Module FW
X39	Milk option
X35/36	Ventilator 1&2
X34	Instant option
X9	Transformer primary
X38	Transformer secondary 24Vac
X10	Power from the switching power supply
X24	Communication CPU
X21	Supply front panel 24Vdc
X15	NTC tea/steam boiler
X16	NTC coffee boiler
X17	NTC Thermoblock
X26	Input/output
X13	Options boiler module
X14	Connection boiler module
C	Processor FUJI
D	Motor driver brew unit

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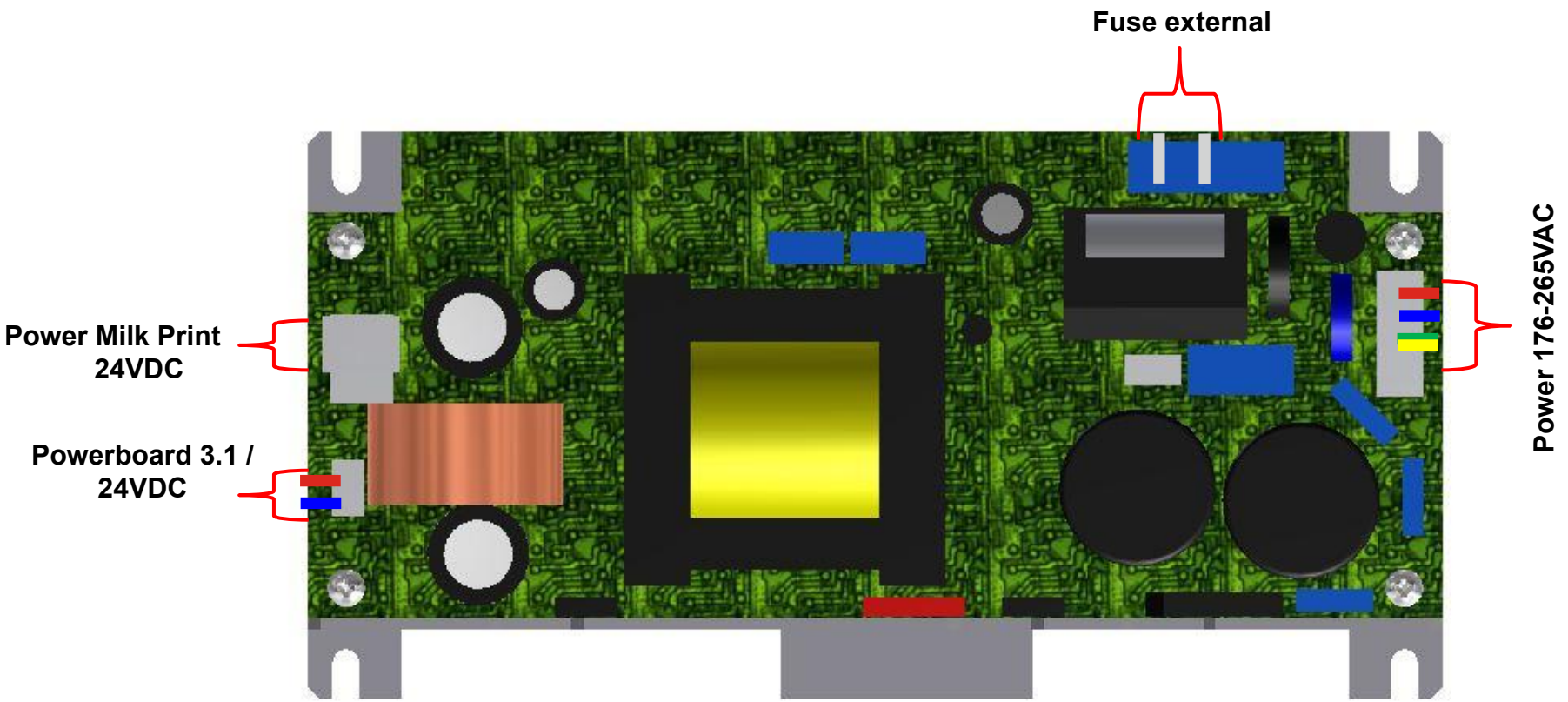
Technical construction
Switch-mode power supply



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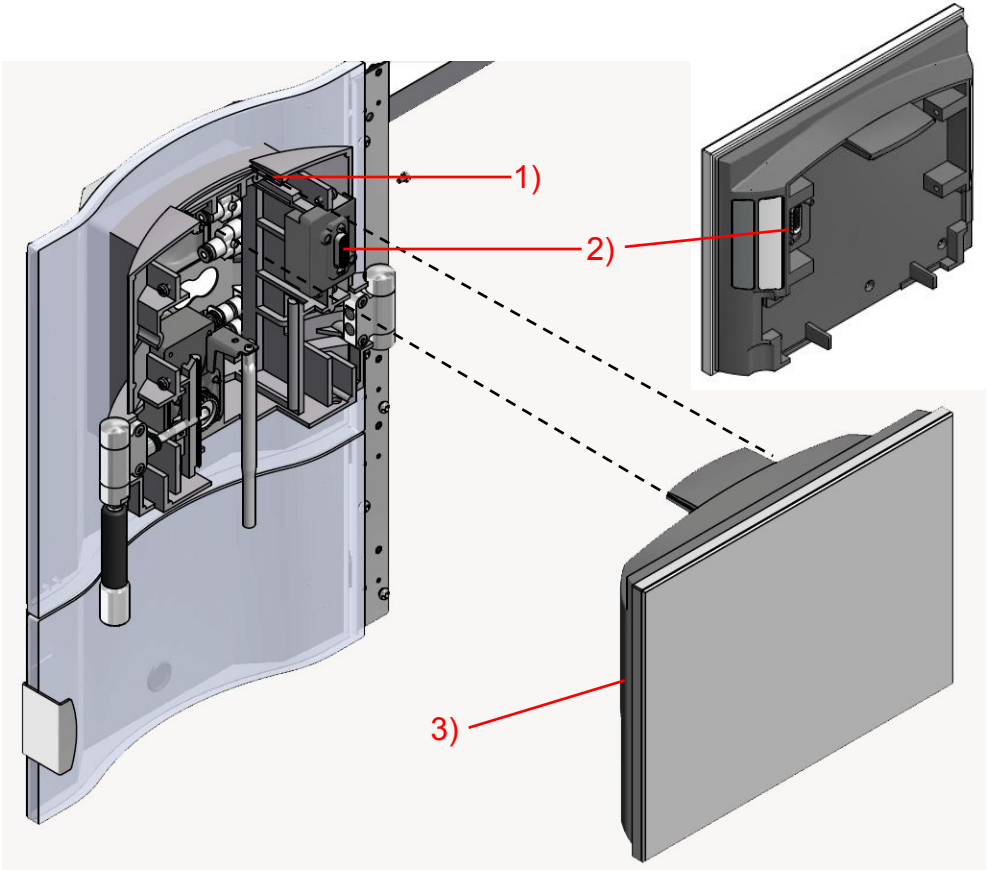
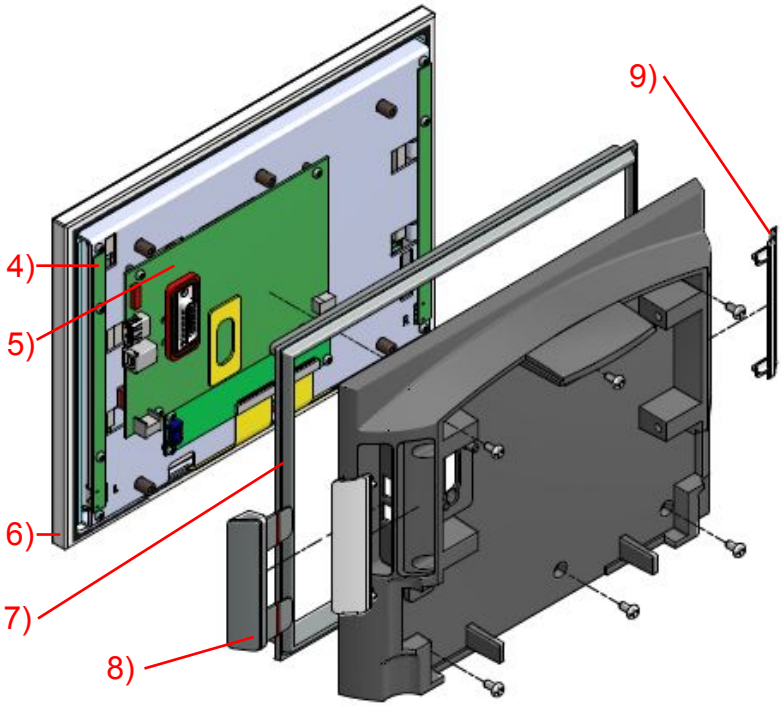
Technical construction
Operator panel / Vetro Touch



1) Panel holder guide
2) Panel connection
3) Panel
4) Edge illumination
5) CPU operator panel
6) Touch / Plexiglass
7) Panel sealing
8) USB-Stick protection
9) Screw cover



When changing the panel, it is essential that the machine is de-energized first.

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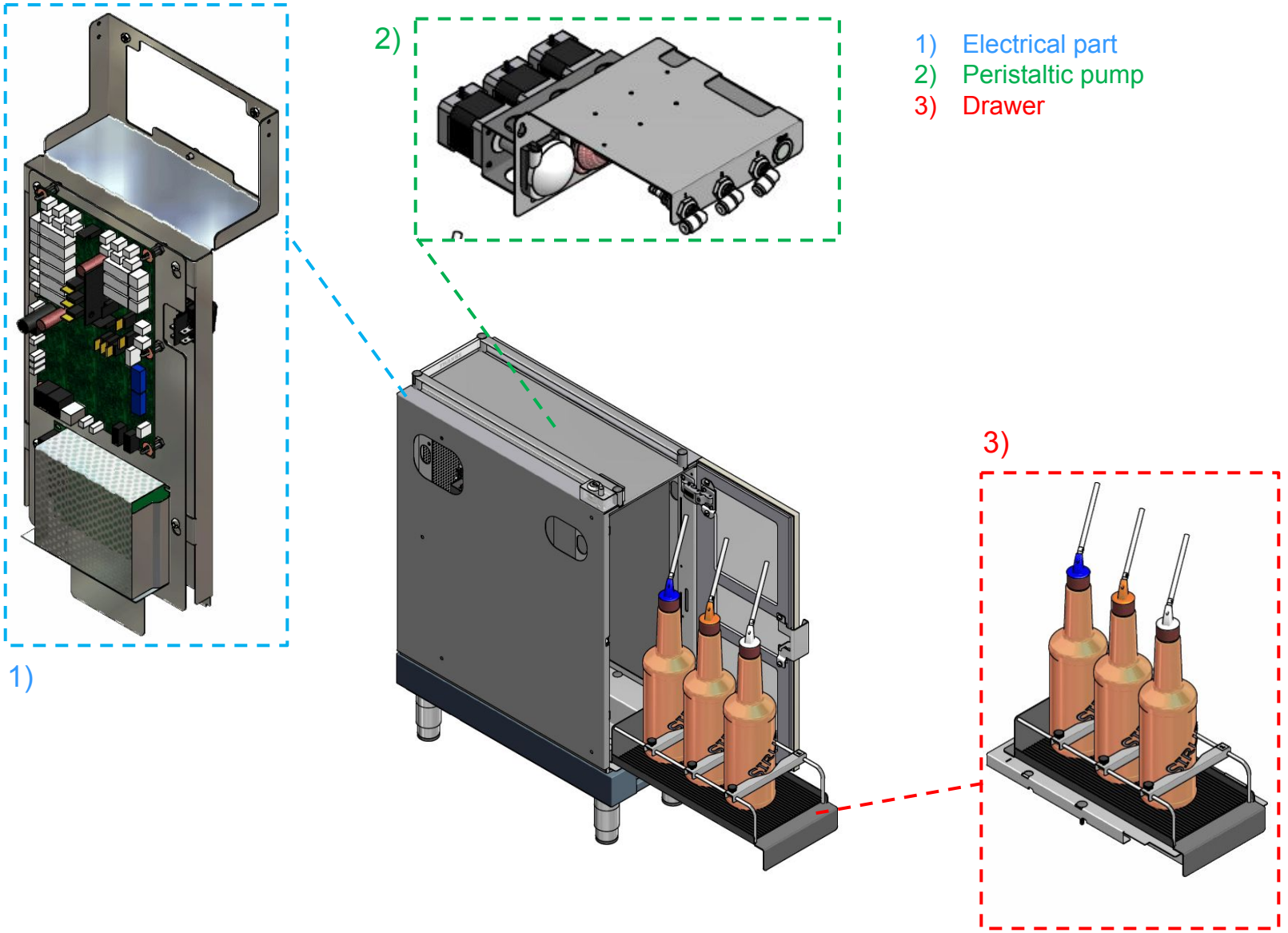
Technical construction
Flavour Station (Option)



1) Electrical part
2) Peristaltic pump
3) Drawer

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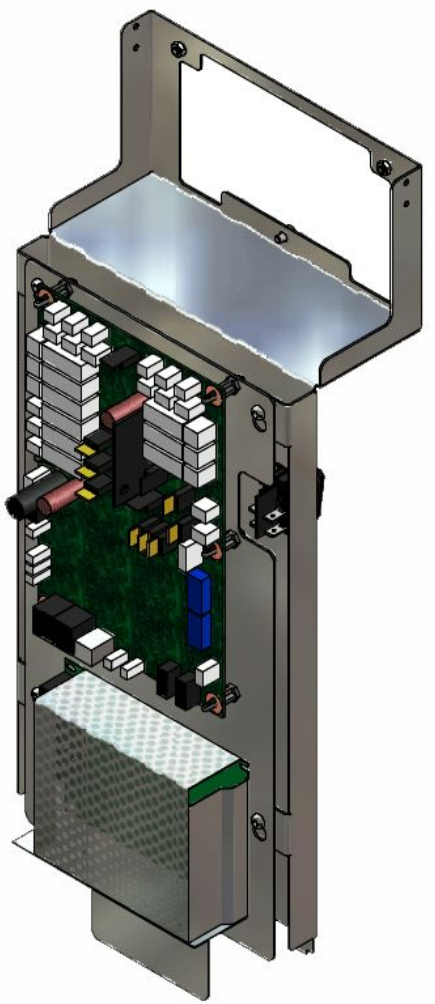
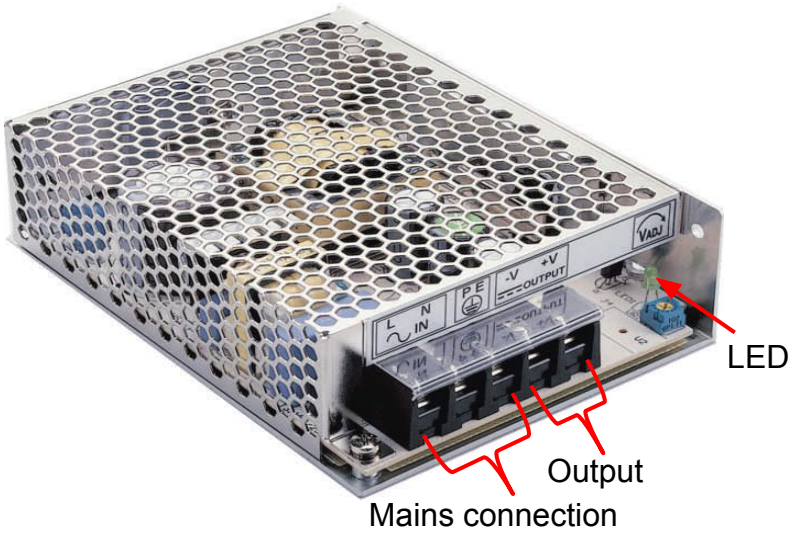
Technical construction
Flavour Station / electrical part





Function
The switching power supply is supplied with mains voltage via the flavour station power switch and delivers 24 VDC to the flavour station PCB.
In contrast to the power supply on the Foam Master system power supply is completely separate from that of the coffee machine. This requires that the flavour station always be switched on, during operation as well as cleaning.

Technical data
Input voltage range: 85 - 264 VAC / 120 - 375 VDC
Output voltage: 24 VDC
Max. output current: 3.2 A
The output is short-circuit proofed.
When the switching power supply is receiving mains voltage, the green LED lights up.

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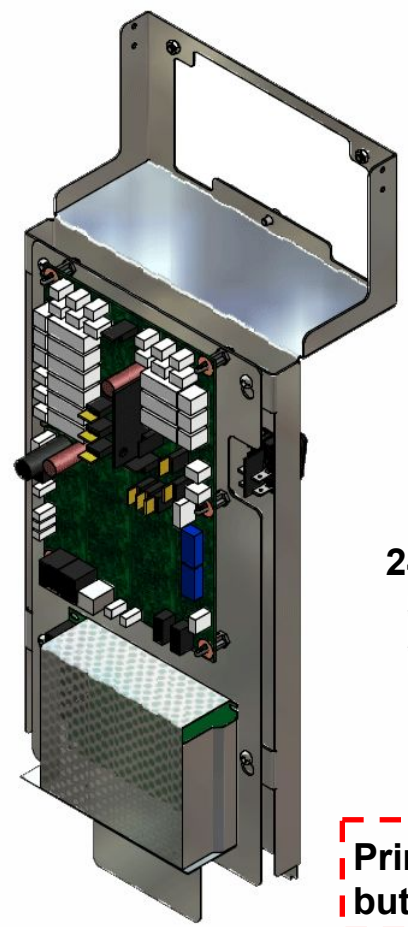
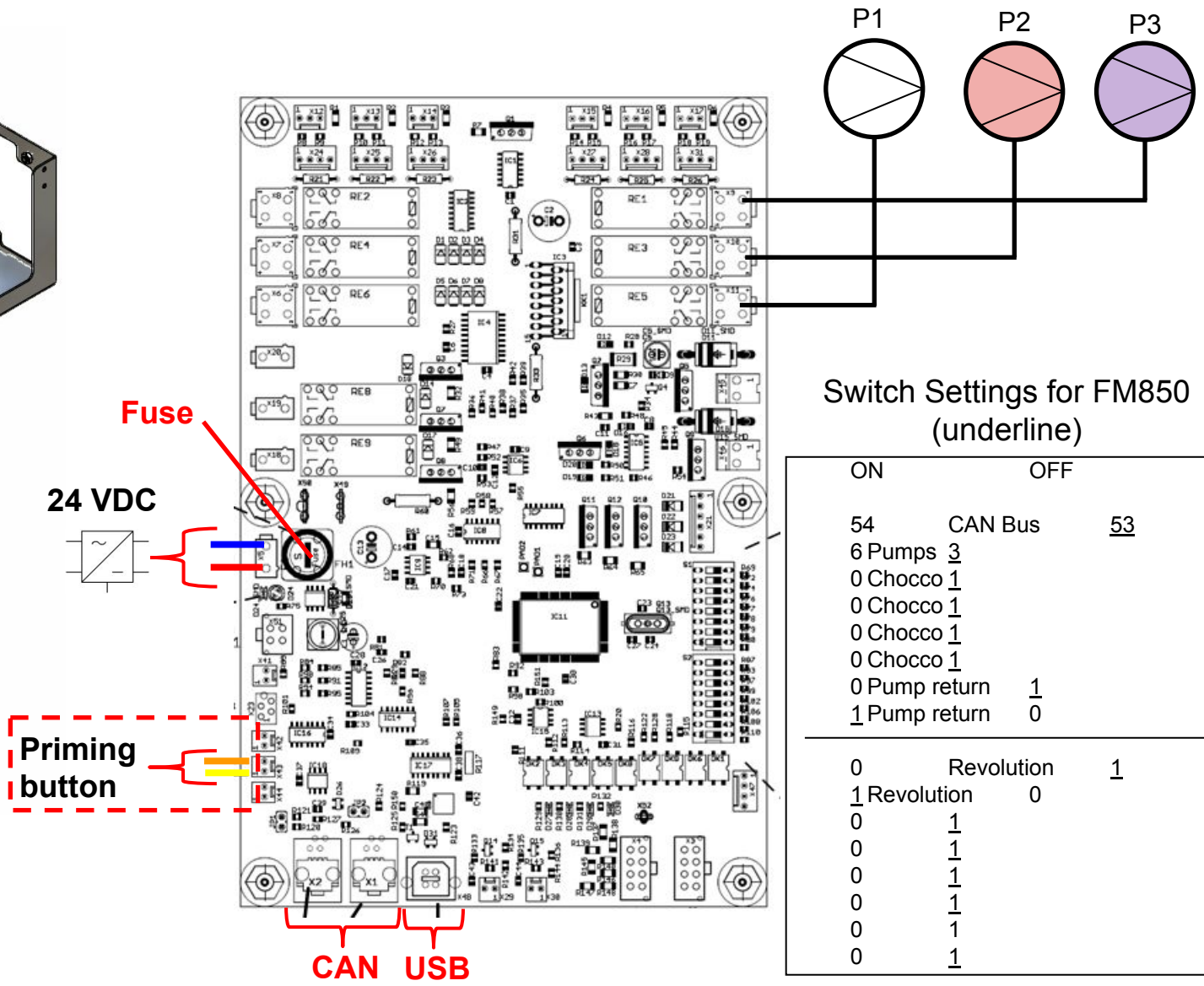
Technical construction
Flavour Station / electrical part





Switch Settings for FM850 (underline)

ON		OFF
54	CAN Bus	53
6 Pumps	3	
0 Chocco	1	
0 Chocco	1	
0 Chocco	1	
0 Chocco	1	
0 Pump return	1	
1 Pump return	0	
0	Revolution	1
1 Revolution	0	
0	1	
0	1	
0	1	
0	1	
0	1	
0	1	

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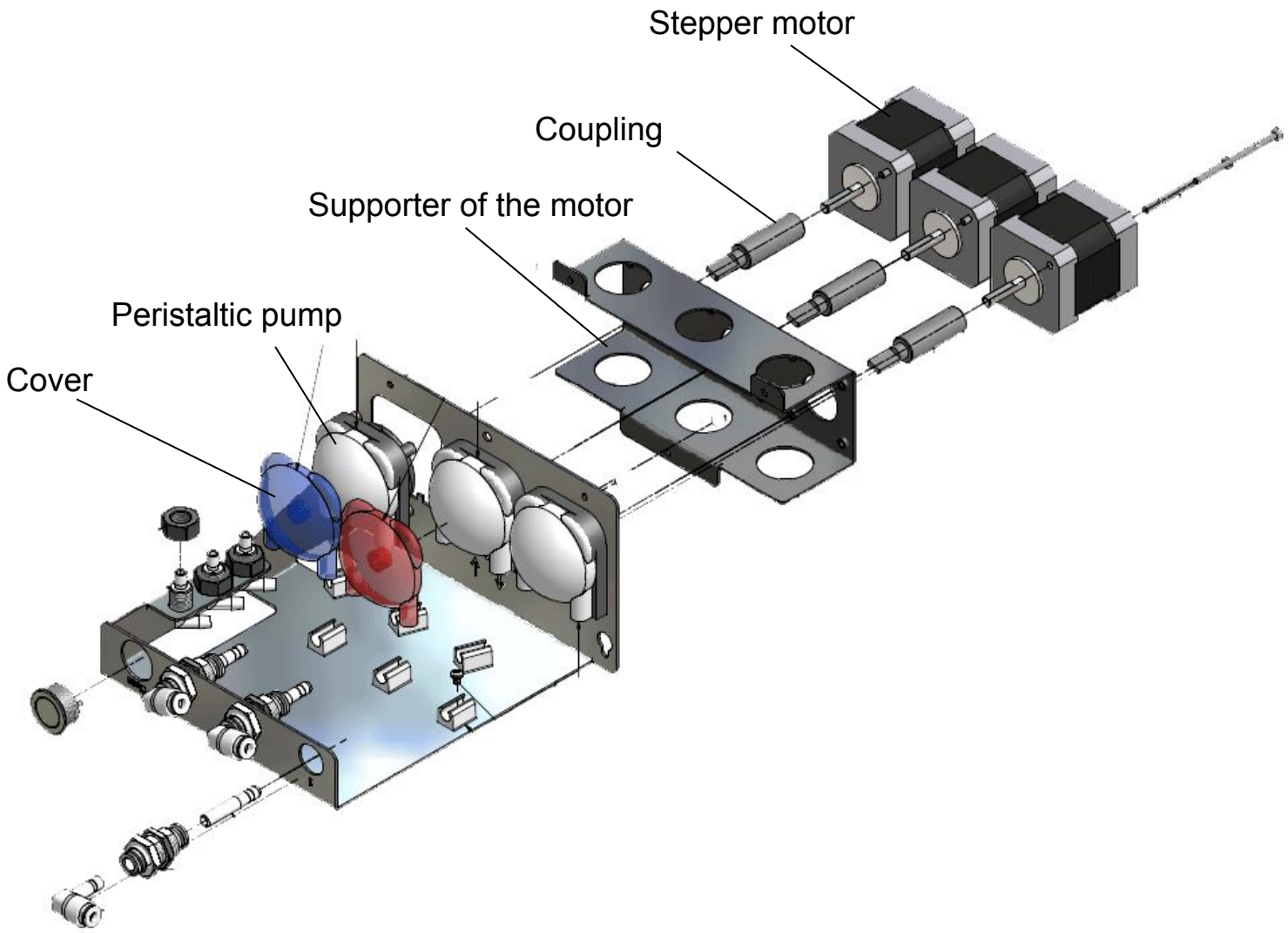
Technical construction
Flavour Station / mechanical part



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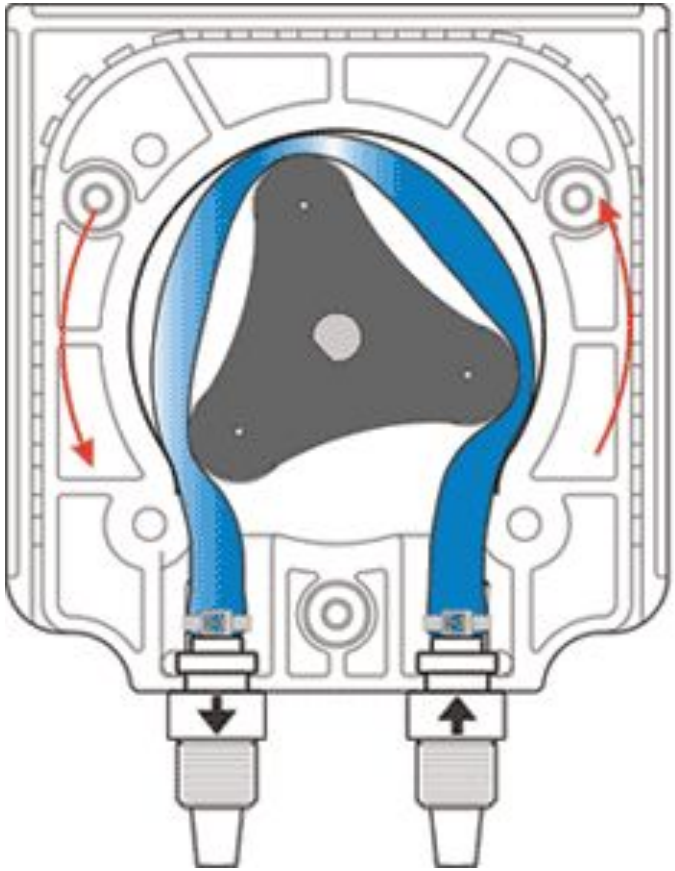
Technical construction
Flavour Station / Function of the pump



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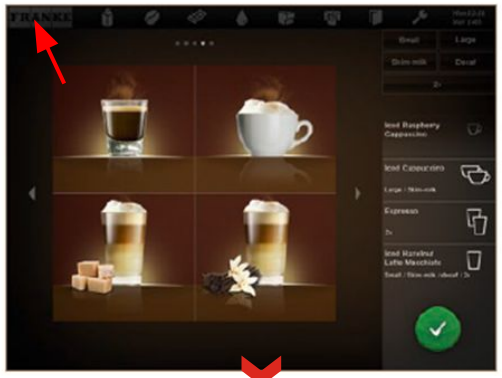
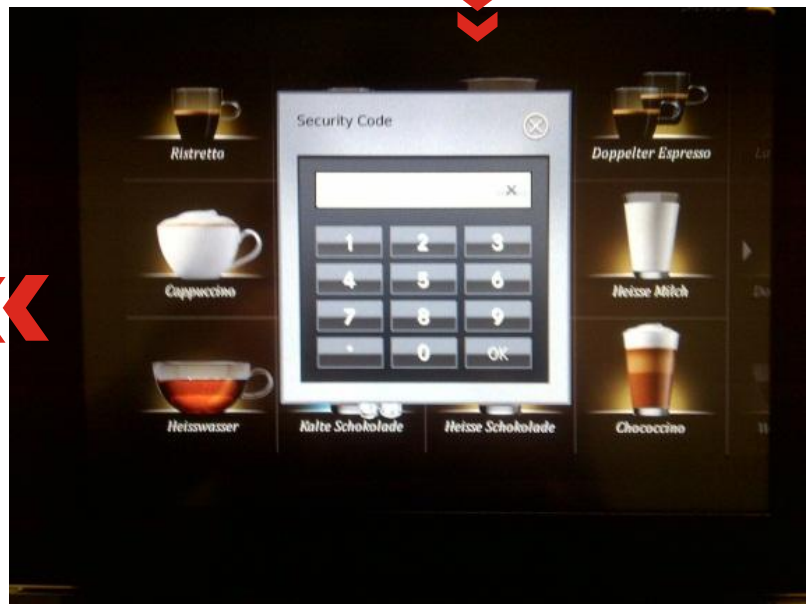
Operating

Switch over to the Maintenance level by tipping on the Franke logo in the upper left-hand corner of the monitor and then entering the PIN code.
Select the Service Menu. The PIN code for the maintenance level is comprised of: (Day + Month) * Year * (Hour + Minute).
Use the date and time information on the operator panel (upper right corner).
Example: 28.09.2012; 11:36
PIN code: **37*2012*47**
If a user is currently still logged on, tip twice on the Franke logo.
You can then authenticate yourself with a new user right.





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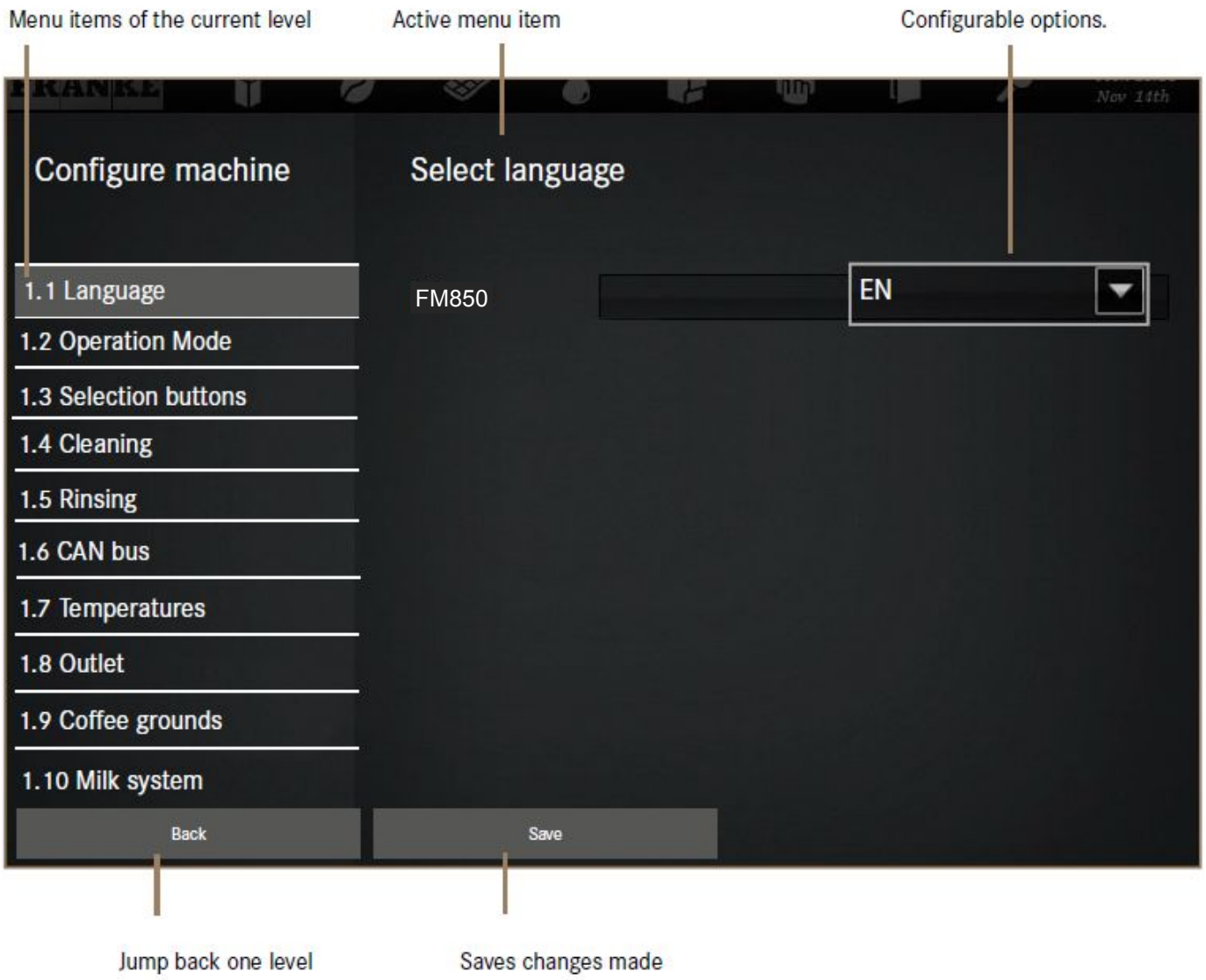
Operating
Operator panel construction



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Operating
Input methods

Tip on the switch to switch over to Yes/No or On/Off. The visible value is activated.

Drag on the scale in order to set parameters. The framed value is activated.

Tip on arrow to display selection and to select option.

Tip on keyboard to enter text or numbers.

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Programming
Service Menu

Service Menu

Menu item	Task
0 Commissioning	Configuring and calibrating the coffee machine
1 Configure machine	Setting the behavior of the coffee machine
2 Set drinks	Configuring drinks, creating new ones or clearing ones from the product portfolio
3 Date and time	Configure date, time and timers
4 Counters	Displaying and resetting counter readings
5 Test functions	Checking individual components and processes, e.g. during troubleshooting.
6 Access rights	Assigning access rights and/or PIN codes for the various configuration menus
7 Decommissioning	Emptying the system with the help of software
8 Updating the software	Updating the software

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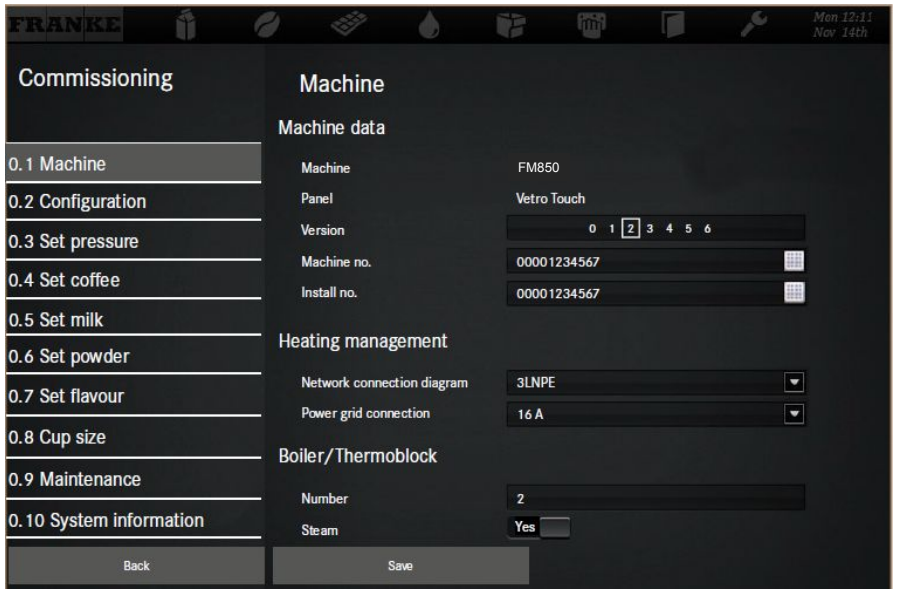
Programming
Commissioning

0 Commissioning

Menu item	Description
0.1 Machine	Enter machine data (taken from type plate)
0.2 Configuration	Configure the coffee machine. Enter equipment requirements. The other menus are limited on the basis of this configuration
0.3 Set pressure	Set pump pressure
0.4 Set coffee	Calibrate water quantity, set grind coarseness and calibrate grinders
0.5 Set milk	Calibrate cleaning water for the milk system and set foam qualities for each milk type
0.6 Set powder	Calibrate water quantity and powder quantity per powder dosing unit
0.7 Set flavour	Calibrate syrup quantity
0.8 Cup sizes	Set cup sizes and scaling factors
0.9 Maintenance	Leave maintenance interval and service number
0.10 System information	All software versions at a glance



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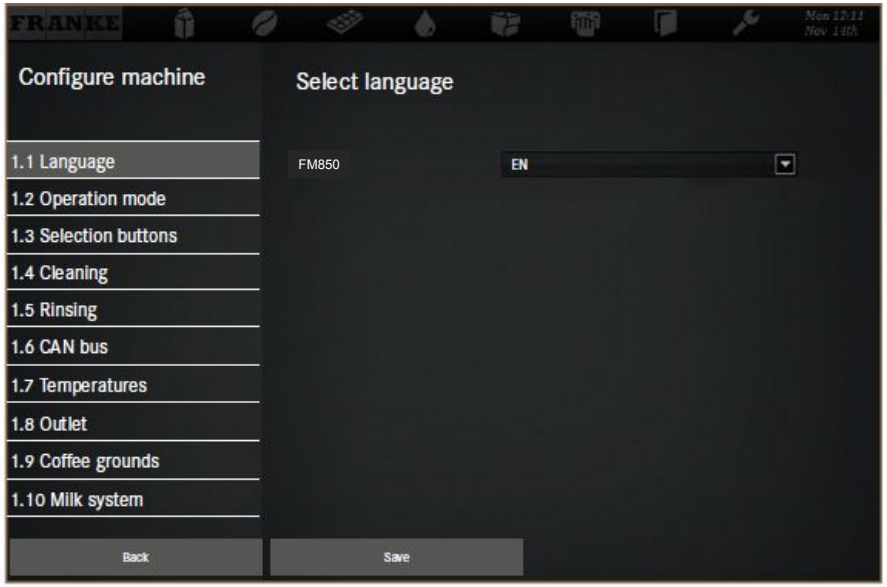
Programming
Configure machine

1 Configure machine

Menu item	Description
1.1 Language	Select desired language from list
1.2 Operation mode	Define desired operation mode for the coffee machine
1.3 Selection buttons	8 selection buttons can be assigned various functions in accordance with customer preference
1.4 Cleaning	Set cleaning parameters
1.5 Rinsing	Set rinsing behavior
1.6 CAN bus	Define CAN IDs for coffee machine and add-on units
1.7 Temperatures	Set temperatures for coffee and hot water/steam and temperature level
1.8 Outlet	Set the outlet height and the outlet delay
1.9 Coffee grounds	Set coffee ground chute option, quantity of cakes in the grounds container and press-out time
1.10 Milk system	Configure monitoring of milk system
1.11 Flavour	Activate Flavour Station and define syrup types
1.12 Accounting	Set accounting parameters
1.13 Sensors	Set cup monitoring
1.14 Edge lighting	Set the behavior of the edge lighting
1.15 Decaf	Permit utilization of decaffeinated coffee



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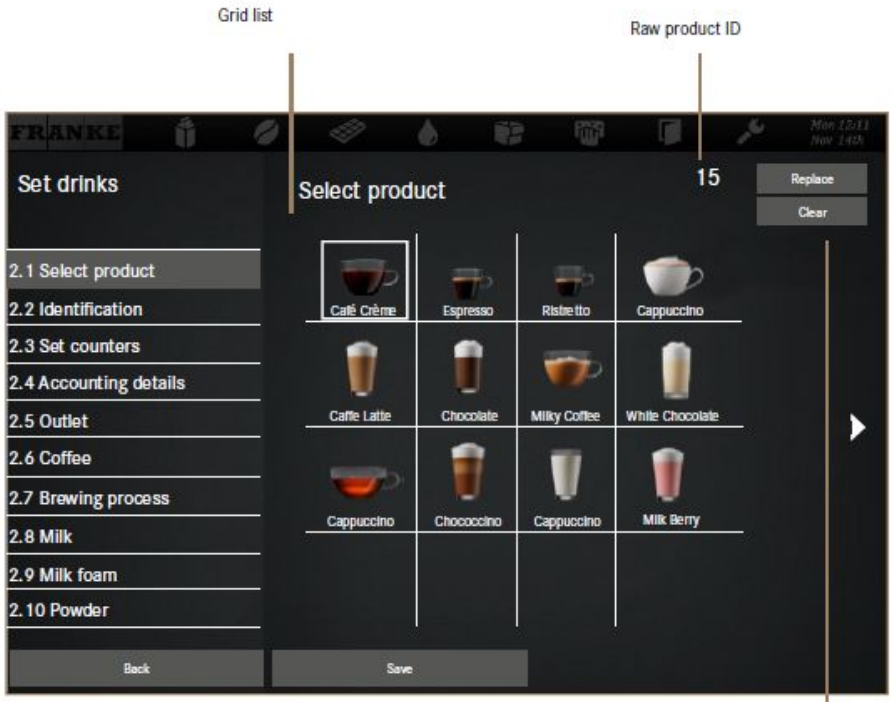
Programming
Set Drinks

2 Set Drinks

Menu item	Description
2.1 Select product	Select drink or create new one
2.2 Identification	Name drink and activate advertising image
2.3 Set counters	Set counters
2.4 Accounting details	Set accounting details for the drink
2.5 Outlet	Configuring outlet height for the selected drink
2.6 Coffee	Configuring parameters for coffee
2.7 Brewing process	Configuring brewing process
2.8 Milk	Set milk
2.9 Milk foam	Setting milk foam
2.10 Powder	Set powder
2.11 Flavour	Set flavour
2.12 Water Quantity Tea	Configuring water quantity for tea
2.13 Steam/Autosteam	Configuring Autosteam options
2.14 External resource	Integrate external resources
2.15 Product sequence	Define drink production sequence
2.16 Cup size	Scale product



- Replace – replace available product.
- Create new (appears when an empty box has been selected) – defines a new drink on the basis of a raw product.
- Clear – delete available product.

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Programming
Date and Time

3 Date and Time

Menu item	Description
3.1 On/Off machine	Configuring automatic on and off switching of coffee machine
3.2 Date and Time	Set date, time and change between Daylight Savings Time and Standard Time
3.3 Timer 1 – 4	Setting timers 1 – 4

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Programming
Test functions

5 Test functions

Menu item	Description
5.2 Brewing unit	Brewing unit test functions
5.3 Outlet	Outlet test functions
5.4 Flowmeter Coffee	Flowmeter coffee test functions
5.5 Milk system/pump	Milk system/pump test functions
5.6 Heaters	Heaters test functions
5.9 Outputs separately	Test functions of all outputs
5.10 Inputs separately	Test functions of all inputs

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Programming
Access rights

6 Access rights

Menu item	Description
6.2 Settings	Define PIN code for My Settings
6.3 Settings (B)	Define PIN code for My Settings (B)
6.4 Settings (C)	Define PIN code for My Settings (C)
6.5 Maintenance	Define PIN code for the Maintenance Menu
6.6 Key (secured) Products	Define PIN code for key (secured) products
6.7 On/Off Machine	Define PIN code for switching the coffee machine On and Off

Menu item	PIN code Default values
6.2 Settings	1111
6.3 Settings (B)	2222
6.4 Settings (C)	3333
6.5 Maintenance	7777
6.6 Key (secured) Products	8888
6.7 On/Off Machine	9999

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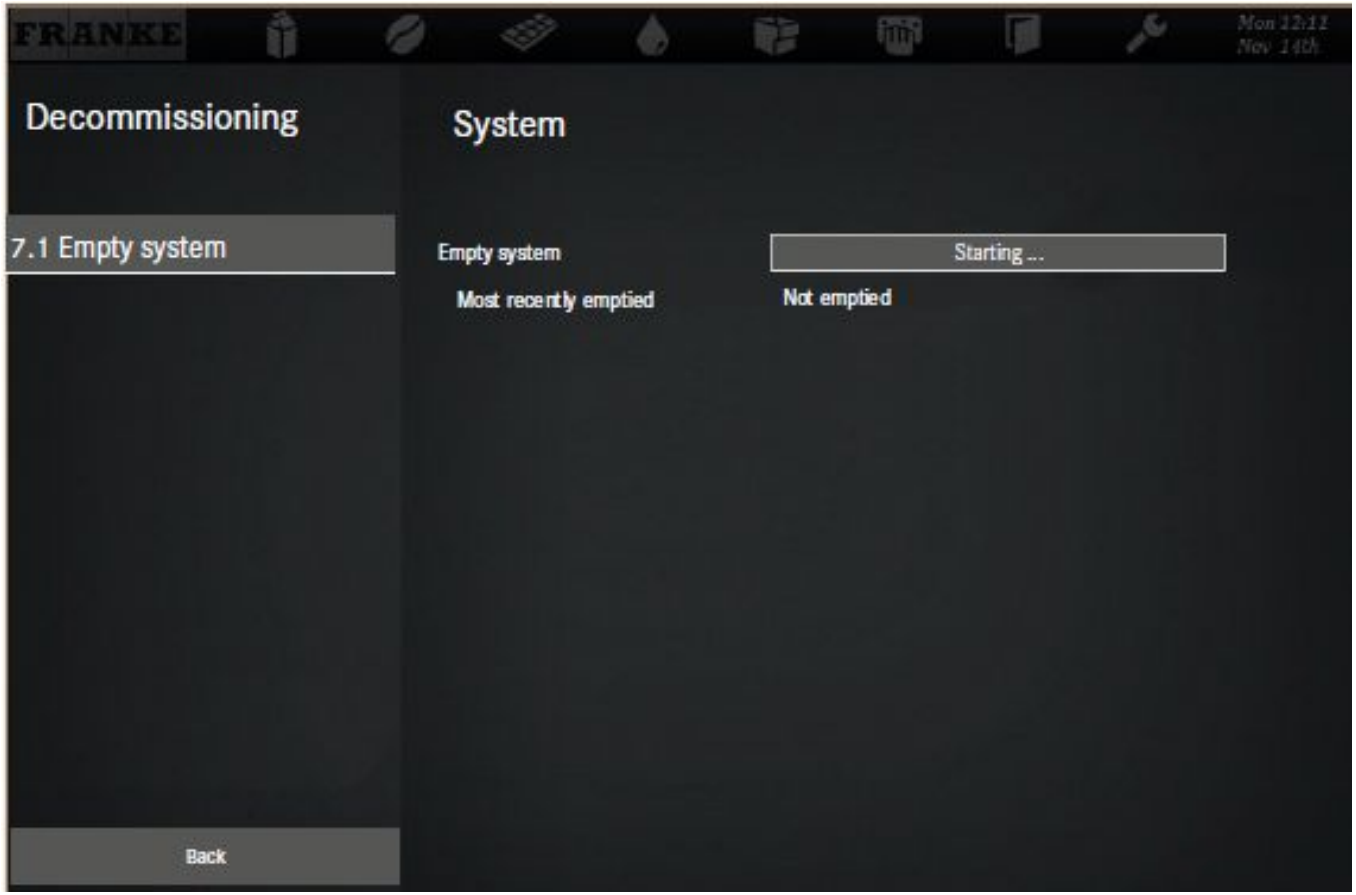
Programming
Decommissioning



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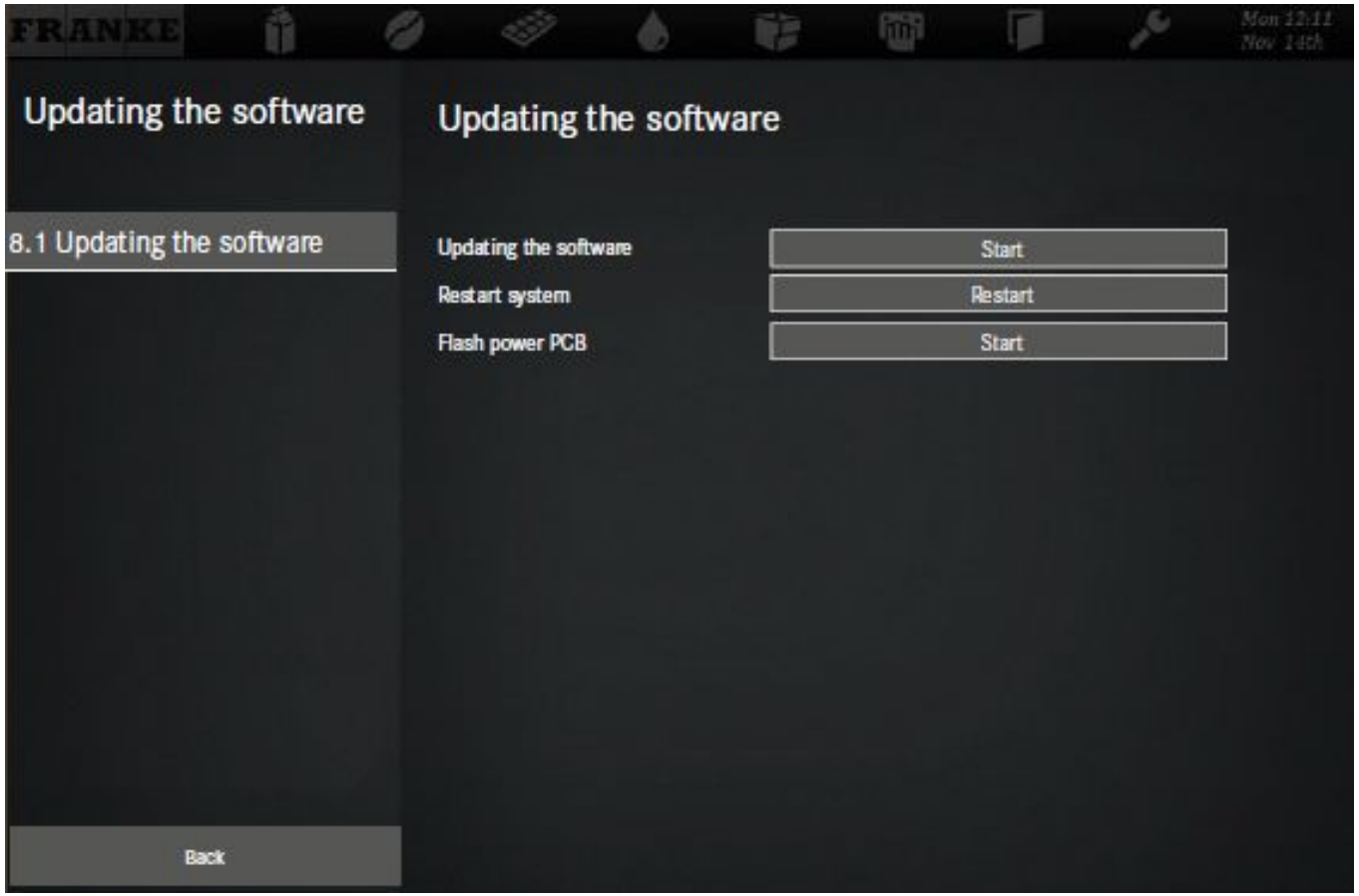
Programming
Updating the software



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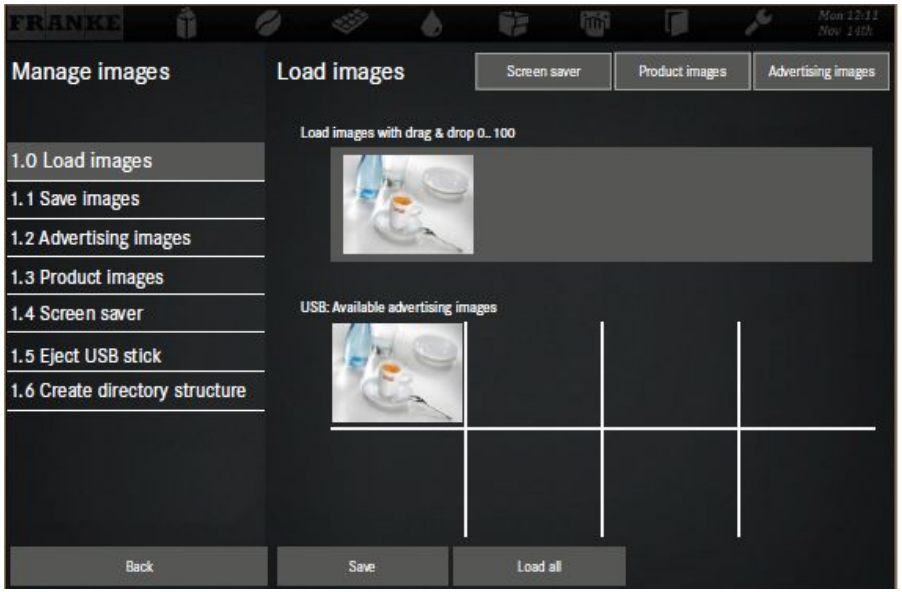
Programming
Individualization and data transfer

Individualization and data transfer

Menu item	Description
1 Manage images	Load, save and manage images
2 Modify depiction	Define depiction in the operation modes, screen savers, etc. and activate drinks
3 Backing up/loading data	Back up settings and data on USB stick and load on machine
4 Import FPC	Import the Franke Product Catalogue
5 Eject USB stick	Eject the connected USB stick



	Screen saver	Product images	Advertising images
Image size (Width x Height)	800 x 600 px	430 x 274 px	800 x 600 px
Data format	PNG with 24 bit	PNG with 24-bit and 8-bit alpha channel as required	PNG with 24 bit
Orientation	-	Centered on vertical axis	-
Memory folder on USB stick	Drive:\QML-Files\rc\custom\screensavers	Drive:\QML-Files\rc\custom\drinks	Drive:\QML-Files\rc\custom\images

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Programming
Modify depiction

2 Modify depiction

Menu item	Description
2.0 Activate Drinks	Activate and deactivate the programmed drinks
2.1 Image Carousel	Select images for the Image Carousel, remove images from the Image Carousel, activate and deactivate the Image Carousel
2.2 Screen saver	Select Franke images for the screen saver, remove Franke images from the screen saver
2.3 My Screen Saver	Select own images for the screen saver, remove own images from the screen saver
2.4 Menu Cards	Select images for the menu cards, remove images from the menu cards, activate and deactivate menu cards
2.5 Advertising images	Add and remove Franke advertising images that are displayed during drink dispensing
2.6 My Advertising Images	Add and remove your own advertising images that are displayed during drink dispensing
2.7 Sort Quick Select	Adjust the alignment of the drinks on the monitor
2.8 Sort Cash Register	Adjust the alignment of the drinks on the monitor
2.9 My Product Images	Assign images to the products

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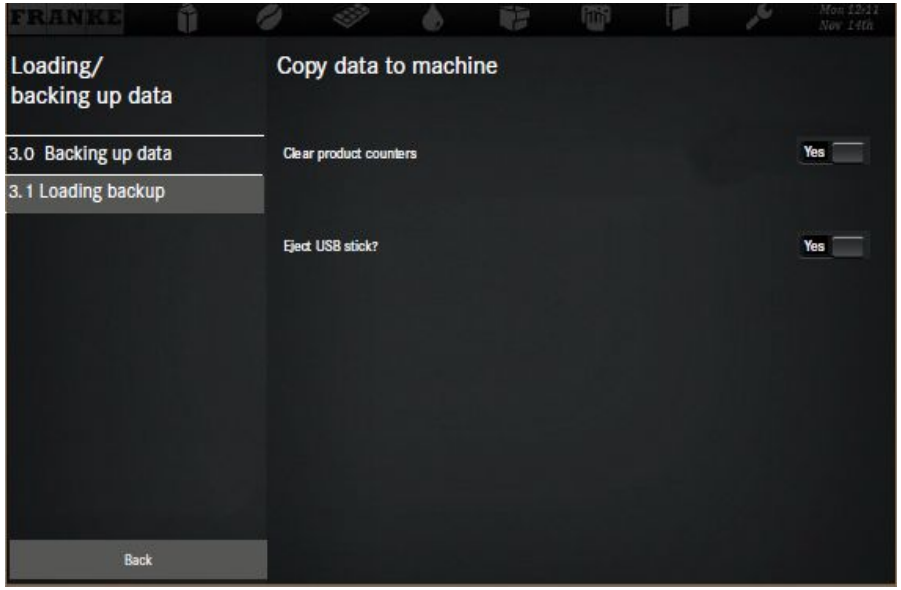
Programming
Backing up/loading

3 Backing up/loading data

Menu item	Description
3.0 Backing up data	Exporting data and settings
3.1 Loading backup	Load saved settings and data on machine

All setting in the menu «0 Commmissioning» is **NOT** included in the confugration back up.



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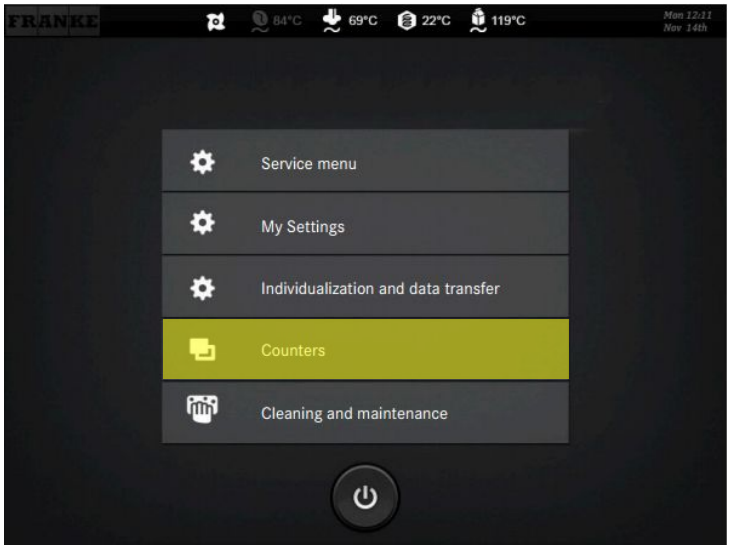
Programming
Counters

4 Counters

Menu item	Description
4.1 Machine total	Counter for products with coffee and milk (excluding purely milk and powder products and products with syrup)
4.2 Cycles	Cycles counter
4.3 Water filter	Counter for the service life of the water filter
4.4 Grinders/dosing units	Counters for grinders and powder dosing units
4.5 Cleanings	Counter for cleanings performed
4.6 Coffee products	Counter for all products with a coffee split
4.7 Milk products	Counter for all products with a milk split
4.8 Water products	Counter for all cold and hot water products
4.9 Powder products	Counter for all products with a powder split, independent of the powder type
4.10 Flavour products	Counter for all products with a flavour split, regardless of the number of flavour types.
4.12 All products	Counters for for every product set
4.13 Maintenance	Counter for maintenance
4.13 Events	Counter for milestone events (commissioning, replacement of components, updates)



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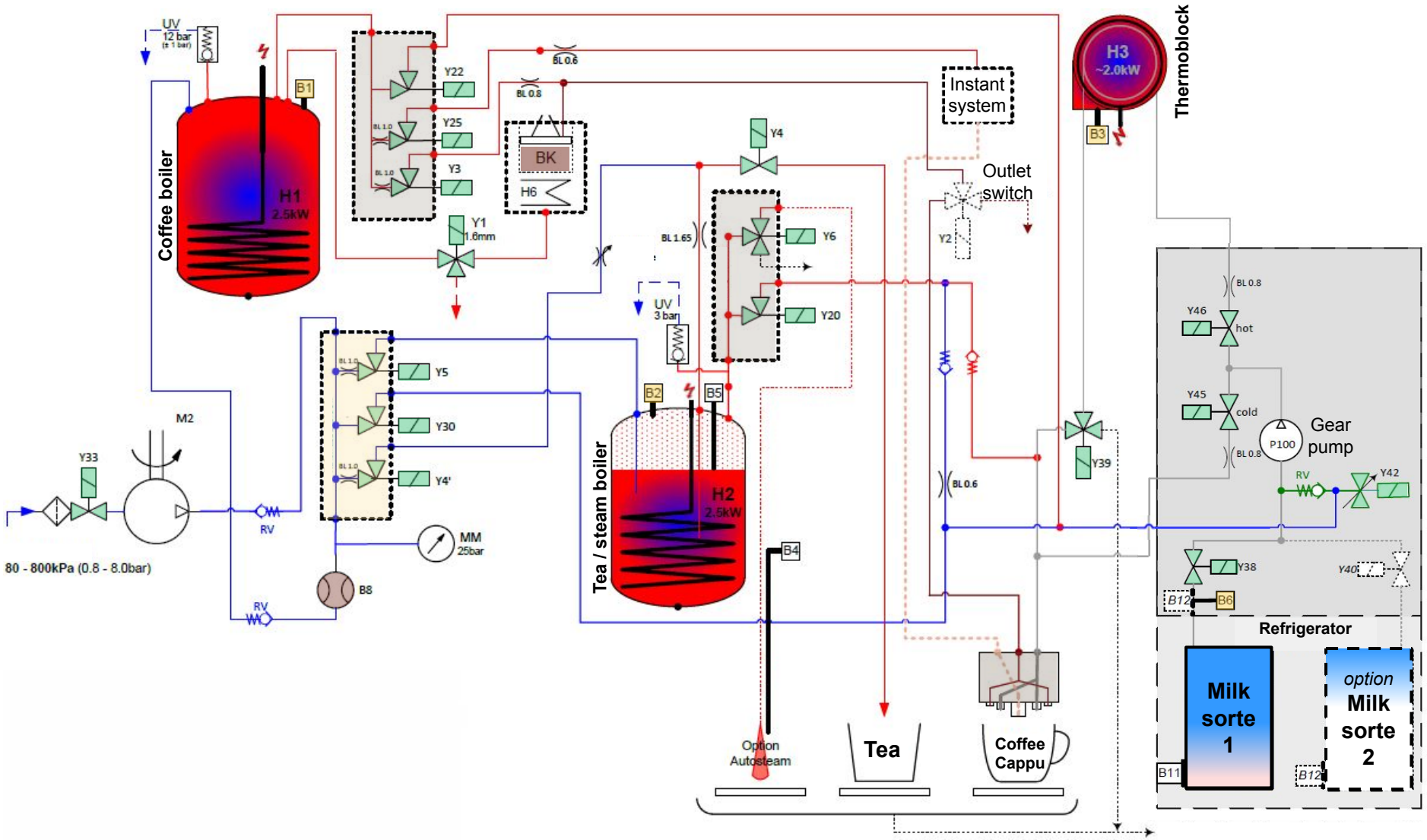
Water flow circuit diagram

Back



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- Commissioning
- Product adjustment
- Troubleshooting
- Cleaning

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THANK YOU FOR YOUR ATTENTION

COFFEE
SYSTEMS

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