

# Zia 6000 and 8000 series

## Technical manual

Model: Zia 6000 and Zia 8000  
Machine type: 9CND...

Revision 1.0, English  
Reference: 5DTCNP20



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**de JONG DUKE**

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## Preface

This technical manual is valid for the machine supplied by the manufacturer, including the options installed by the manufacturer. The manufacturer accepts no liability for any damage resulting from incorrect or improper use of the machine, or resulting from modifications that have not been authorized by the manufacturer.

This manual gives instructions for the operation and maintenance of the machine. Moreover, it gives solutions to simple malfunctions that may occur. The instructions in some paragraphs are meant only for persons who are trained in the operation and maintenance of the machine.

Always use original parts from the manufacturer when the machine needs to be repaired.

Carefully read this technical manual before you operate and/or repair the machine.

Keep this manual in a safe place for possible later reference.

Only properly trained personnel may carry out repairs, install the machines or transport the machines.

This manual cannot be regarded as a replacement for training and instruction, but must be seen as an addition to the training, and as a reference work.

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# **1 Safety**

## **1.1 Safe use**

- Before using your coffee machine, please read the safety instructions and all of the information in this manual first and keep it for future reference.
- Be careful! This machine serves hot drinks. Don't reach beneath the dispensing nozzles and hot water spout after selection and during dispensing.
- This appliance can be used by children aged 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and they understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- The machine may only be in locations where it can be overseen by trained personnel.

## **1.2 Safety risks**

The most important safety risks during maintenance of this machine:

- Moving parts inside the machine, beware of trapped fingers if the service key is placed when the door is open.
- Beware of hot parts and hot liquid inside the machine, even after the power is disconnected.

## **1.3 Installation**

- Installation, transportation and adjustment of the machine should only be carried out by properly trained service personnel.
- Check the appliance for transport damage. Do not connect a damaged machine.
- The machine is not suitable for outdoor use.
- Do not install the machine in an area where a water jet or similar device could be used.
- Place the machine on a level surface in a hygienic dry room, with a temperature between 5°C and 35°C. (40°F - 95°F)
- Do not use an extension cord.
- Only hose-sets according to IEC 61770 may be used for the connection to the water supply.

## **1.4 Maintenance**

- Regular cleaning according to the user manual is needed to ensure hygienic operation.

- The appliance shall not be cleaned by a water jet.
- Do not use water in or near the machine unless the instructions explicitly give direction to do so.
- Do not use aggressive cleaning products or abrasives to clean (parts of) the machine.

### **1.5 Extended down time**

- If the machine will not be used for a longer period of time (for example during the holidays) it is recommended to switch off the water supply and the electricity. The main on/off switch (see picture in chapter 2.3, point 2) is located at the inside of the machine.
- In areas where the temperature can fall below freezing, the boilers must be emptied. (see chapter 7.25)

## 2 Description of the machine

### 2.1 General

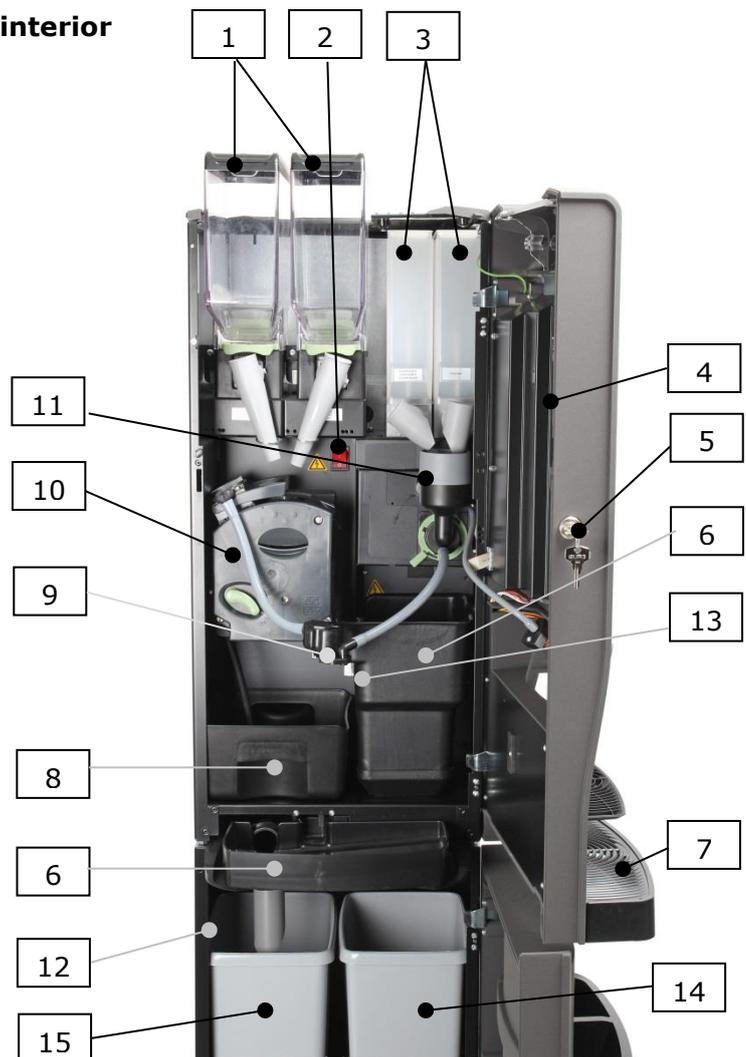
The machine is a compact semi-automatic machine for the preparation and vending of hot and optional cold drinks.

### 2.2 The front of the machine

The machine can be operated by using the touch panel on the door. By touching one of the selection images on the screen, a product choice can be made. Before pressing start, first a cup must be placed under the correct dispense nozzle.

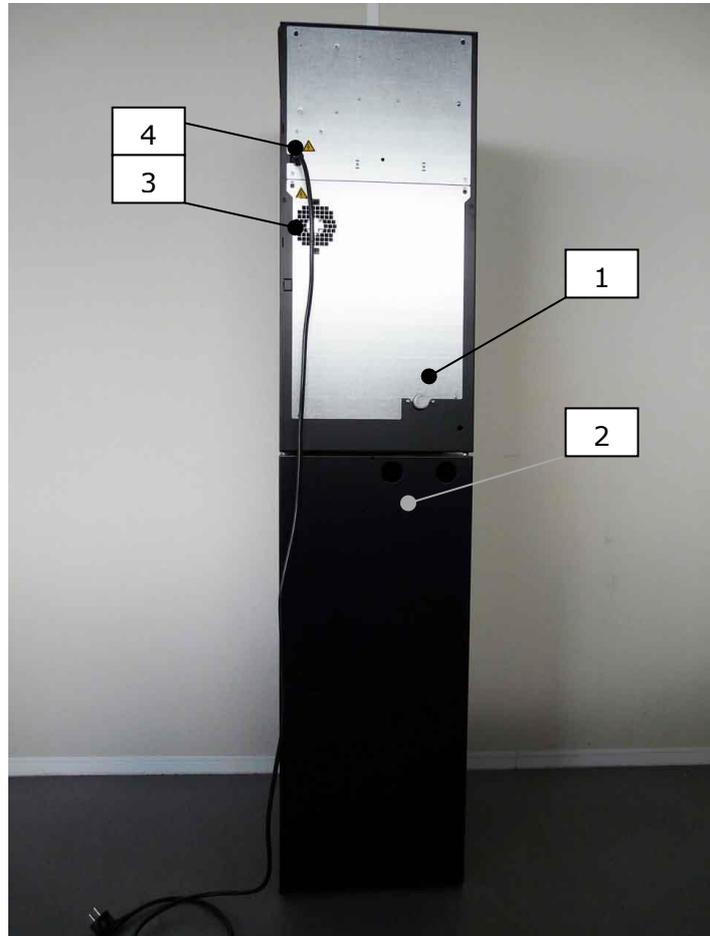
### 2.3 Overview of the machine interior

1. Bean canisters
2. On/off switch
3. Instant canisters
4. Door switch
5. Door lock
6. Waste guide (or Waste bucket)
7. External drip tray
8. Internal drip tray.
9. Dispensing nozzles
10. CoEx<sup>®</sup> brewer system
11. Mixing system
12. Base cabinet (Option)
- 13 Waste bucket sensor
- 14 Waste (residue) bucket in base cabinet. (Option)
- 15 Waste (liquid) bucket in base cabinet. (Option)



## 2.4 Backside of the machine

- 1 Water connection
- 2 Holes for water filter in base cabinet. (optional)
- 3 Fan
- 4 Power cord



### 3 Options and accessories

The machine can be extended with several options. Some options can interfere or exclude other options.

#### 3.1 Base cabinet

Part number 9OKNK1140 is a base cabinet with condimental trays.

Part number 9OKNK1110 is a base cabinet with closed front.

Dimensions base cabinet:

Height: 850 mm / 33.5 inch

Width: 360 mm / 14.2 inch

Depth: 510 mm / 20.0 inch



#### 3.2 Cup dispenser on front

A Cup dispenser can be mounted on the front of the base cabinet instead of an ingredient tray.

Part number 9BEB008 for cups 70mm diameter

Part number 9BEB010 for cups 80mm diameter



#### 3.3 Cup dispenser on right hand side

Part number 9BEB007 for cups 70mm diameter

Part number 9BEB009 for cups 80mm diameter



#### 3.4 Table between machine and cabinet

A table can be mounted in-between the base cabinet and machine

Part number 9ETA003 table for 70mm cups

Part number 9ETA005 wide table for 70mm cups

Part number 9ETA007 table for 80mm cups

NOTE:

The drain from the drip tray to a bucket in the base cabinet is not possible in combination with this option.



### 3.5 Cold water unit in base cabinet

A cold water unit for chilled water or a unit for carbonated and chilled water can be installed in the base cabinet.

Part number 9VKS019 chiller for chilled water.

Part number 9VKS017 chiller for chilled and carbonated water.



### 3.6 Waste guide

The machine can be extended with a waste guide to the base cabinet.

Part number 5KAF085

If this waste guide is installed, the error and warning messages based on number of cycles needs to be switched off (Set to not available) in the service menu.

(see chapter 7.16, error settings)

In this case the wires on the waste bucket sensor needs to be electrical disconnected.



### 3.7 Drip tray drain.

The water from the drip tray can be drained to a large bucket in the base cabinet. This drain is only available in combination with a base cabinet.

An extra sensor can be installed in the base cabinet for detecting a full bucket.

Part number 9AOV011



### 3.8 Fresh milk system.

It is possible to provide the machine with a fresh milk system.

This must be done in the factory, it is not possible to build a fresh milk system in an existing machine.

For information, contact the manufacturer: [support@dejongduke.nl](mailto:support@dejongduke.nl)

### 3.9 Payment systems

#### A Coin validator in a side unit.

A coin validator/acceptor communicating via the MDB protocol can be connected to the control board.



#### B Change giver in a side unit.

A coin change giver, communicating via the MDB protocol, can be connected to the control board.



#### C Card reader in a side unit.

A card reader or key payment system, communicating via the MDB protocol, can be connected to the control board.

### 3.10 Mechanical consumption counter

A total product counter can be installed in the door and is connected to the control board.

Part number 5ETL010



### 3.11 Pump set

The Machine can work in combination with a pump set.

Part number of the 230V pump set complete: 9VIL018



## 4 Technical data

### 4.1 Type plate

The type plate is mounted at the inside of the machine, at the top left.

The type plate shows:

- Manufacturer
- Serial number
- Type/model specification
- Power connection
- Date of production
- Water connection

### 4.2 Technical specifications

Dimensions:

Width 360 mm / 14.2 inch

Depth 510 mm / 20.1 inch

Height :

- Standard machine: 795 mm / 31.3 inch
- With bean canister: 875 mm / 34.5 inch
- With increased bean canister: 1025 mm / 40.4 inch

Weight (empty): ±50 kg / 110 lbs

Electrical connection possibilities:

- 120 VAC, 60 Hz, 1.3 kW
- 220-240 VAC, 50-60 Hz, 2.9 kW
- 220-240 VAC, 50-60 Hz, 1.5-1.8 kW (limited power setting)

Water line pressure:

- Minimum 100 kPa (1 bar)
- Maximum 600 kPa (6 bar)
- Rated pressure: Water boiler 1.1 MPa (11 bar)/160 psi  
Steam boiler 0.5 mPa (5 bar)/ 72 psi

Capacity waste bucket:

About 180 coffee consumptions.

Noise level:

- Standby: 0 dB(A).
- During delivering beverages using whole beans: < 63 dB(A).

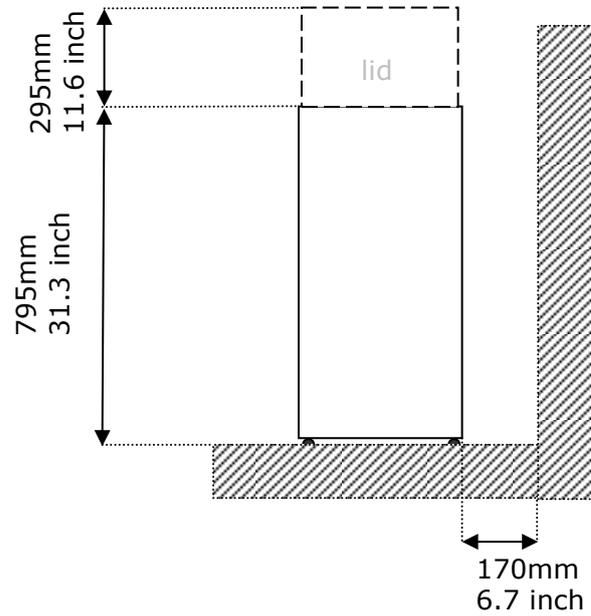
Ambient temperature:

- Storage 5 - 50°C (40 - 120°F)
- Operating 5 - 35°C (40 - 95°F)

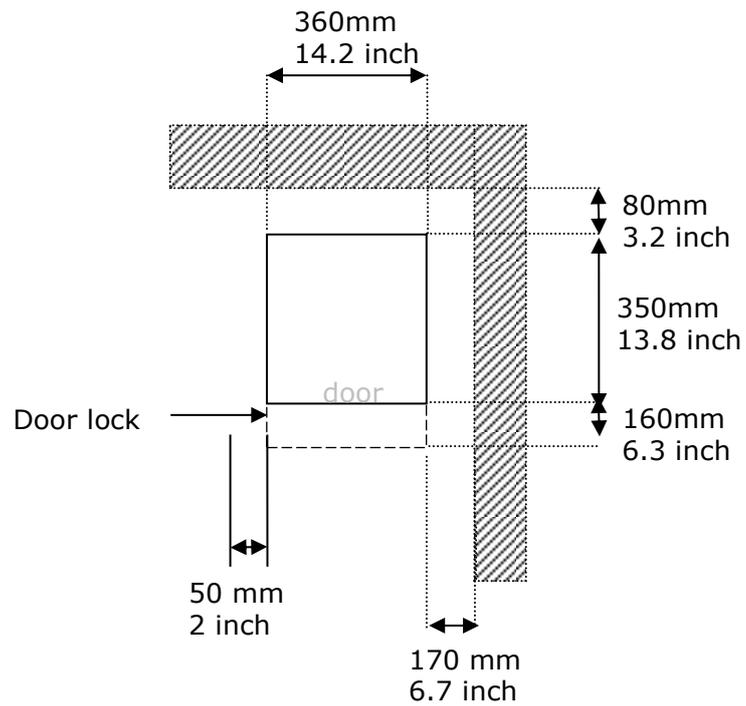
### 4.3 Dimensions of the machine

The machine can be extended with several options.  
In the pictures below are the dimensions for a standard sized machine.

#### Front view



#### Top view



#### **4.4 Water specifications**

Water line pressure: See chapter 4.2

The water flow rate from the mains should be minimal 2,5 liter per minute.

For an optimal operating of the coffee machine and an optimal coffee quality, the water should be conform the following specifications:

- Hardness: 6-8 °dH (German hardness) or 11-14 °fH (French hardness)

- pH value: Minimal 6.5  
Maximal 8.0

- Conductance: about 100µS (micron Siemens) @ 20° C (68° F)

A water filter can be used if the water quality is not conform our specification.

The incoming water temperature may not be above 30°C. (86°F)

#### **4.5 Machine configurations and variations**

The machine can be equipped in different canister and product variations. The specification number is always printed on the type plate. See the product information sheets for detailed information.

[www.dejongduke.nl](http://www.dejongduke.nl)

#### **4.6 Norms and standards**

The machine bears the CE marking and complies with the following directives/regulations:

- 2006/42/EC Directive on machinery
- 2006/95/EC Low voltage directive
- 2004/108/EC Directive EMC
- (EG) 1935/2004 Regulation on food contact materials
- 98/83/EG Directive on the quality of water
- 2011/65/EU Directive ROHS

The machine complies with the following standards:

- IEC 60335-1 Safety of household and similar appliances
- IEC 60335-2-75 Particular requirements for dispensing appliances and vending machines
- EN 61000-6-3 Radiated and conducted immunity up to 1 GHz
- EN 61000-6-1 Radiated and conducted immunity up to 2.7 GHz
- EN 61000-4-2 ESD
- EN 61000-4-3 HF immunity
- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 CDN/clamp injection
- EN 61000-4-8 Power Magnetic field
- EN 61000-4-11 Dips and voltage fluctuations
- EN 61000-3-2 Harmonic currents
- EN 61000-3-3 Flicker

## 5 Function of the components

In the next paragraphs you find a detailed description of the several parts and components in the machine.

Understanding of the function of the different components is essential for maintaining the machines.

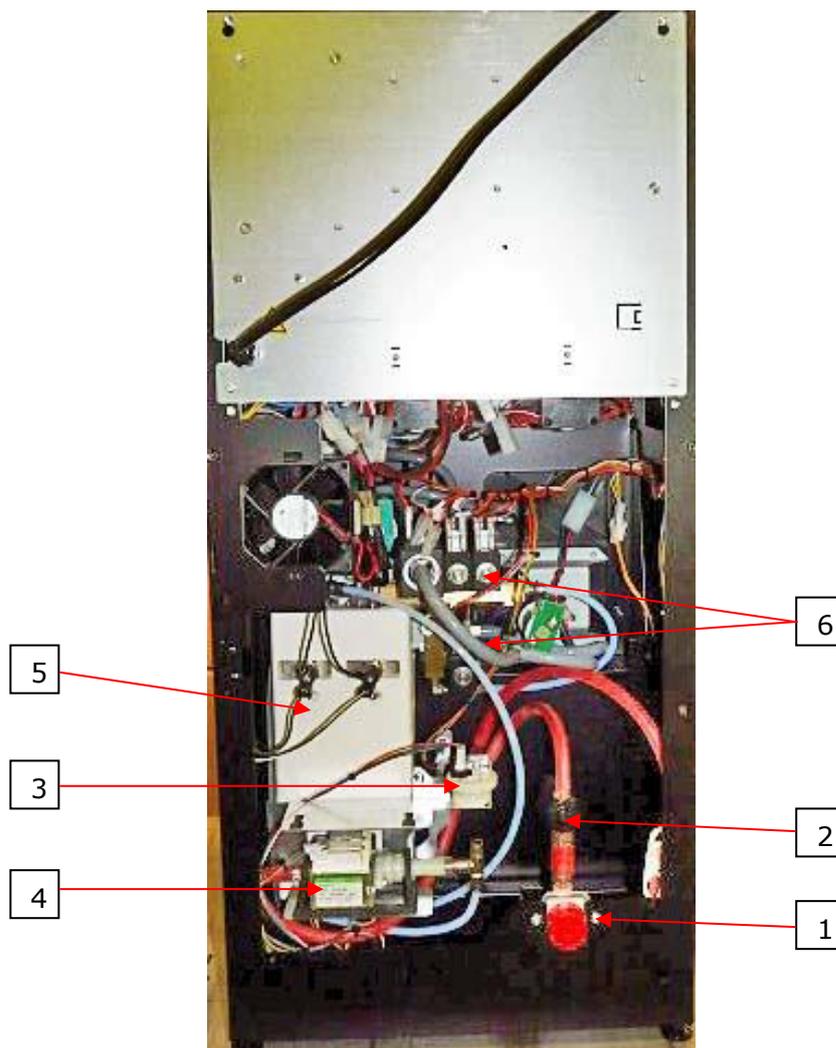
### 5.1 Hot water system

The water system is positioned at the back side of the machine and accessible from the back.

If water and power are connected and the door is closed the water system start filling the boilers automatically.

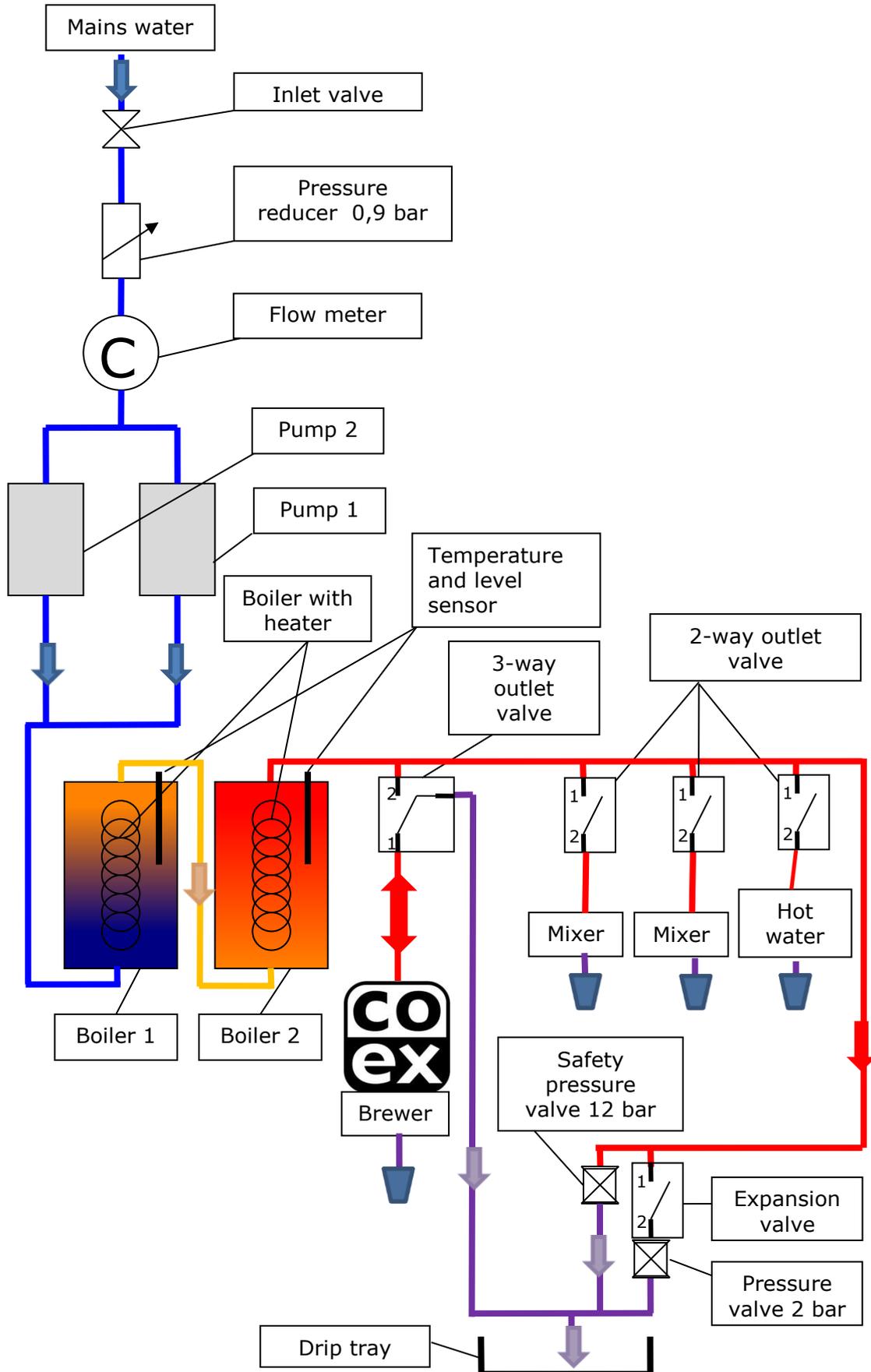
The water system consists out of the following main components:

1. Inlet valve
2. Pressure reducer
3. Flow meter
4. Vibration pump(s)
5. Boilers
6. Valves (outlet valves and pressure valves)



## 5.2 Schematic diagram of the water system

(standard 9CND machine, 2 mixers)



### 5.3 Inlet valve

The inlet valve is controlled by the level sensor in the boiler and is switched on during a dispense of hot water to the brewer or mixer. The inlet valve is a 24V DC valve. The inlet valve contains a backflow protection. This backflow protection is preventing that water is flowing back into the water supply.

Electrical connections/wire colors:

Number	Wire color	function
1	Orange	Common (+24V)
2	Orange-green	Output (0)

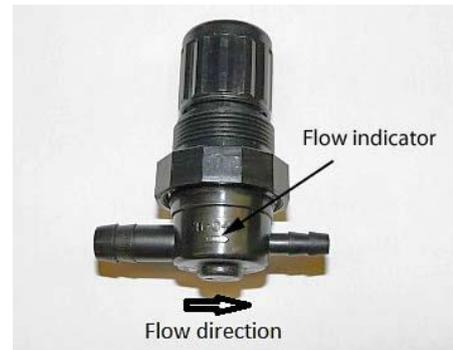


### 5.4 Pressure reducer

The pressure reducer reduces the water pressure to a stable pressure independent from the inlet pressure from the mains water supply. The required inlet pressure from the water supply is between 1,0 and 6 bar. The pressure reducer is adjusted to an outlet pressure of about 0,8 - 0,9 bar during an espresso cycle.

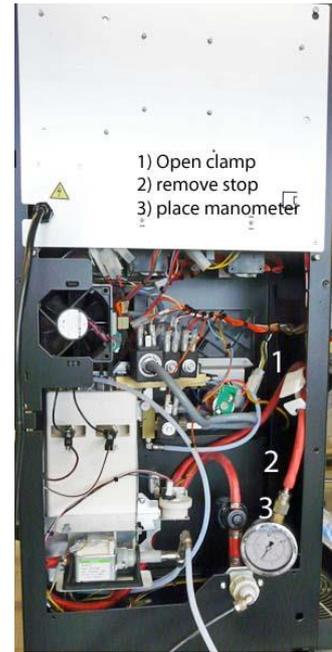
The input and output tube to the reducer must be connected in the right direction, the reducer works incorrectly in the reversed mode. There is an arrow on the side of the reducer indicating the correct water flow direction.

The reducer contains a backflow protection. This backflow protection prevents the possibility that water from the machine is flowing back into the main water supply.

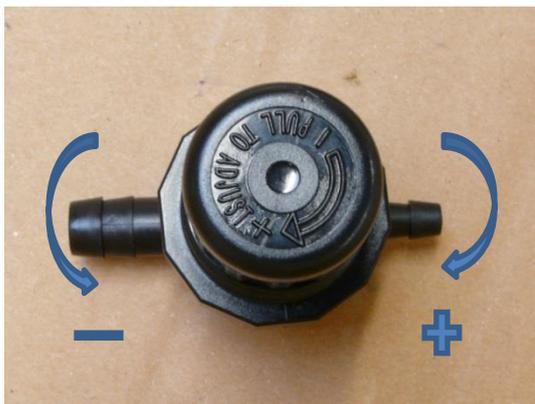


**Procedure to adjust the pressure reducer:**

1. Remove the lower back plate from the machine.
2. Remove the tube clamp and stop. (see picture)
3. Connect the manometer to the tube.
4. Pull out the knob to unlock the reducer.
5. Select an (double) espresso. Adjust the reducer by turning the knob during the pump cycle of the espresso selection. The manometer must show 0,8 - 0,9 bar during an espresso cycle.
6. Lock the reducer by pushing the knob down towards it's own housing.
7. Disconnect the manometer and replace the tube clamp and stop in the tube.
8. Replace the back plate on the machine.
9. Ready



Part number pressure reducer: 4MVL010



Looking from above: Turning clockwise = increase output pressure  
Turning counter clockwise = decrease output pressure

## 5.5 Water flow meter/water counter

The water flow meter measures the quantity of the water flowing through the hot water pressure system.

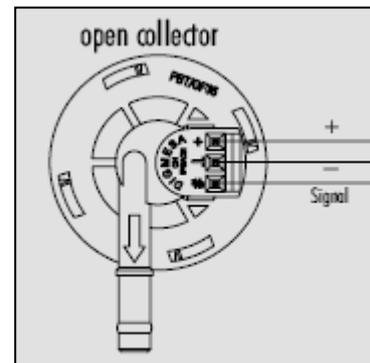
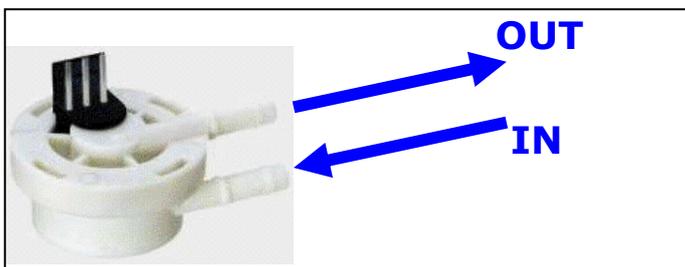
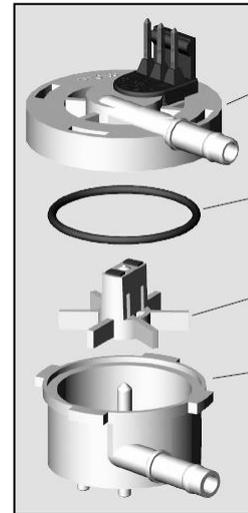
Three functions are based on the water flow meter:

1. The water dosages for the consumptions are based on quantity of the pulses generated by the flow meter.
2. During the start up procedure it is detected if water is flowing into the system. If not, the machine will stop working and show the error messages "start-up problem" and "no water connected"
3. The amount of heating of the boiler is, besides the measurement with the temperature probe, also based on the quantity of incoming water.

The water flow meter is built in between the pressure reducer and the pumps. It is a small turbine which produces electrical pulses. Each 360° rotation produces 2 pulses in the sensor (Hall element). The pulses are detected by the control system.

The tube to the water flow meter must be connected in the right position; the flow meter cannot detect water in the reverse mode. There is a small arrow on the water flow meter which shows the right direction.

The water flow meter is a 1.8 mm type.  
Each pulse is about 0.8 ml of water.



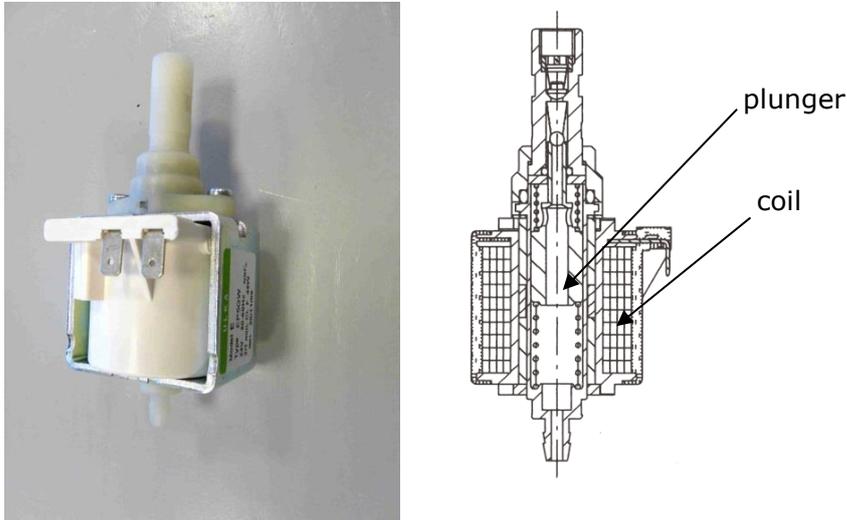
Electrical connections/wire colors:

Number	Wire color	function
1	Red-white	Common (+)
2	Green-purple	Null (0)
3	Blue-black	Signal to the IO board

## 5.6 Pump

The pumps are generating the pressure and flow of the water.  
The pumps increase the pressure to the required brewing pressure (1.5 till 10 bar).

The pump is a vibration pump. The plunger vibrates up and down, therewith a pressure can be build-up.

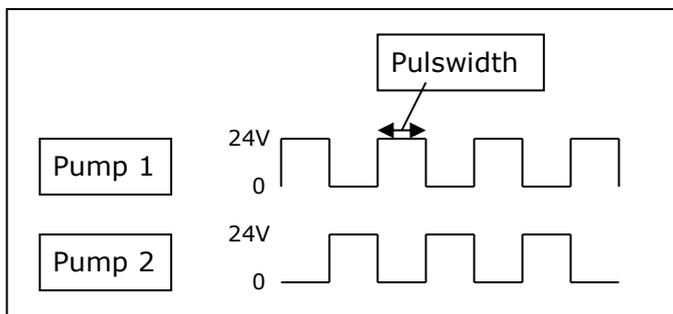


The pump is a 24VAC pump, the electrical signal to the pump is a 24DC block pulse.

The pressure can be adjusted by the electrical signal (pulse-width) to the pump. A longer pulse gives a higher pressure because the plunger is lifted higher. The maximum pulse width is 20. This figure can be set in the service program, individual for every consumption.

Because of the high frequency of the pulses this electronic signal cannot be measured with an ordinary volt meter.

The pulses for the two pumps runs out of phase so a stable high pressure is offered to brew an espresso.



Electrical connections/wire colors:

Pump 1:

Number	Wire color	function
1	Grey-Blue	Common (+24V)
2	Yellow-Brown	Output (0)

Pump 2:

Number	Wire color	function
1	Black-Pink	Common (+24V)
2	Orange-White	Output (0)

Machines with one or two pumps:

- The Fresh brew version without a bean hopper (Zia 6000) has just 1 pump and is brewing coffee on a low 1-4 bar pressure.
  - The B2C espresso machine has 2 pumps, parallel connected and can brew espresso on 8-10 Bar or coffee on a low pressure 1-4 bar.
- The variation in pressure generates an excellent coffee or espresso flavor.



2 pumps system (Zia 8000 series)



1 pump system (Zia 6000 series)

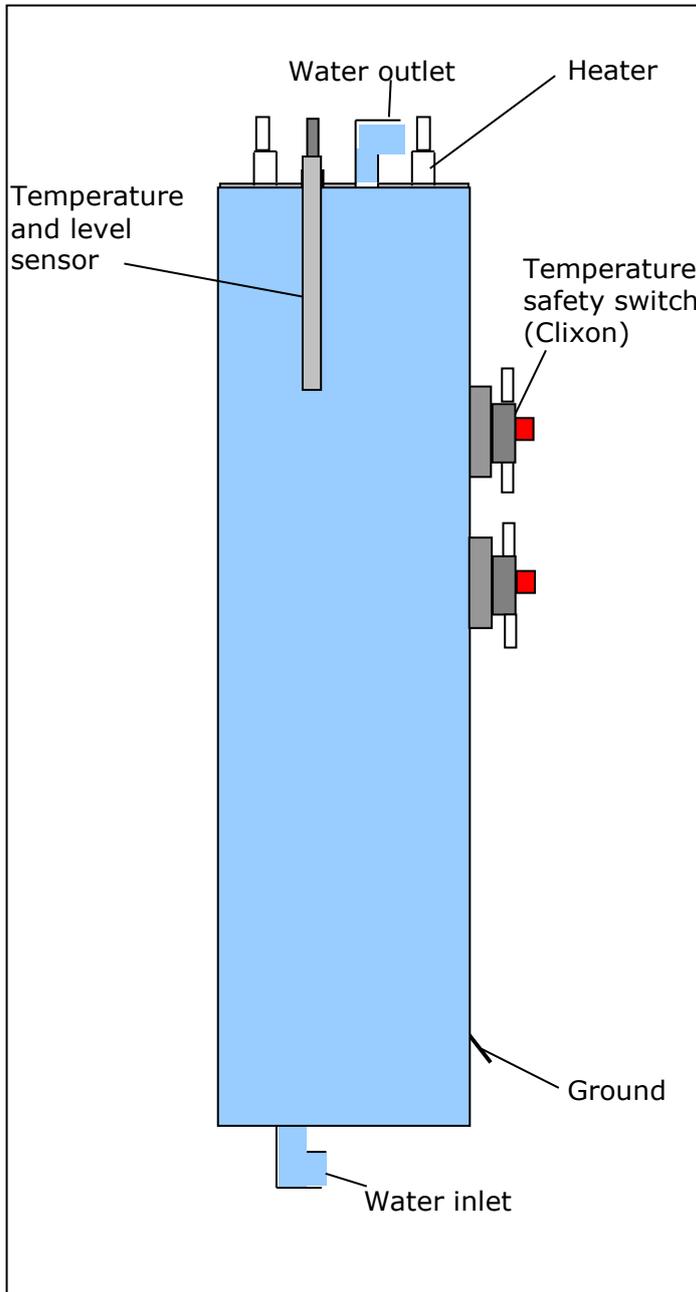
Part number pump: 4EMT027

## 5.7 Boiler

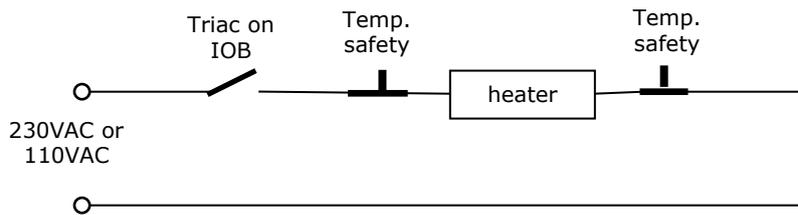
The hot water is prepared in the boilers. The machine is equipped with two boilers, made out of stainless steel.

The boilers are connected in serial; water from boiler 1 flows into boiler 2 and from boiler 2 through outlet valves out of the hot water system.

The water inlet is in the bottom of the boiler, the outlet at the top.



Electrical boiler connections:

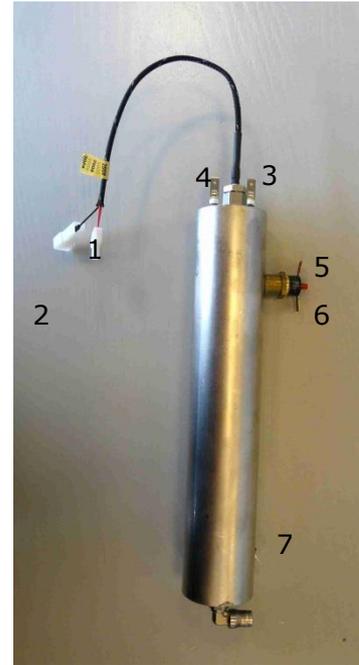


Connections boiler 1

number	Wire color	function
1	Green-Purple	Temperature common
1	Pink	Temperature
2	Dark-red /Black	Level detection
3	Black	Heater phase
4	Blue	Heater neutral
5	Black	Temperature safety
6	Brown	Temperature safety
7	Yellow/grey	Earth boiler housing

Connections boiler 2

number	Wire color	function
1	Green-purple	Temperature common
1	White-pink	Temperature
2	Brown-black	Level detection
3	Black	Heater phase
4	Blue-white	Heater neutral
5	Black	Temperature safety
6	Brown-white	Temperature safety
7	Yellow/grey	Earth boiler housing



Heater:

The boiler has a 1,4 KW/240VAC heater or a 1,1KW/110VAC. The volume in the boiler is 0,36 liter.

The boiler and heater are made of stainless steel. The heater is welded in the top of the boiler.

The winding resistance of the heater is:

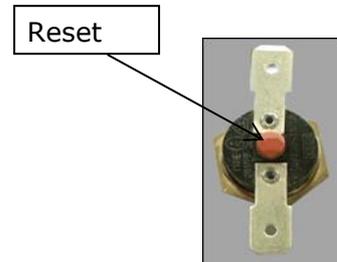
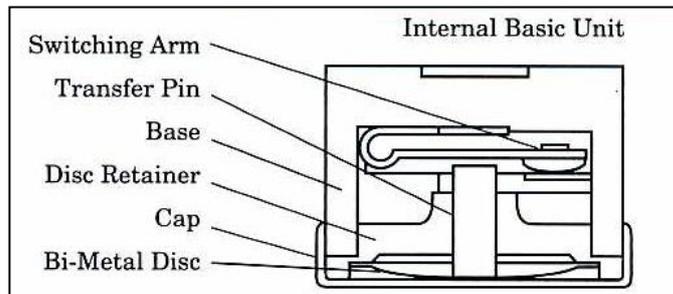
Heater	resistance
1400W 240VAC	39 - 40Ω
1100W 120VAC	12 - 13Ω

The heater is controlled by the control system. This is based on a combination of detected temperature by the temperature sensor and the amount of incoming water by the flow meter.

### Temperature safety / clixon:

The temperature safety switch is positioned on the side of the boiler. In the housing is a bi-metal disk which switch if the device gets too hot. This safety protects the heater against overheating if the control system does not switch off the heater.

The temperature safety (normally closed contact) switches off at a temperature of 110°C +/- 5°C. The safety switches the current to the heater directly off if the boiler is overheating. The clixon is resettable after cooling down by pressing the pin by hand.



### Temperature/Level sensor:

The sensor in the boiler is a combined level and temperature probe. The sensor is isolated from the boiler housing with a plastic isolation clamped with two nuts around the stainless steel sensor housing.

If replacement is needed the sensor needs to be replaced complete, including nuts.

### **Temperature:**

The temperature is detected by a thermistor mounted in the stainless steel housing. The control system is controlling the temperature in the boiler based on the resistance of the thermistor.

### Resistance of the thermistor:

Resistance	Temperature
6.5 kΩ	95°C
100 kΩ	25°C
126.7 kΩ	20°C

The temperature is adjustable in the settings of the control system. The optimal temperature setting is 90°C in boiler 1 and 92 °C in boiler 2. If no consumptions are made, the temperature in boiler 2 will automatically raise in about 25 minutes to 98°. Herewith the first consumption with a cold brewer is brewed with incoming water on a higher temperature, compensating the colder brewer.

The control system contains some safeties and warnings based on the detected value of the temperature sensor.

A too high temperature, too low temperature, shortcut or disconnected sensor is detected by the control system.

- Disconnected temp. sensor is generated if the resistance is above 350 kΩ.
- Shortcut temp. sensor is generated if the resistance is below 1 kΩ

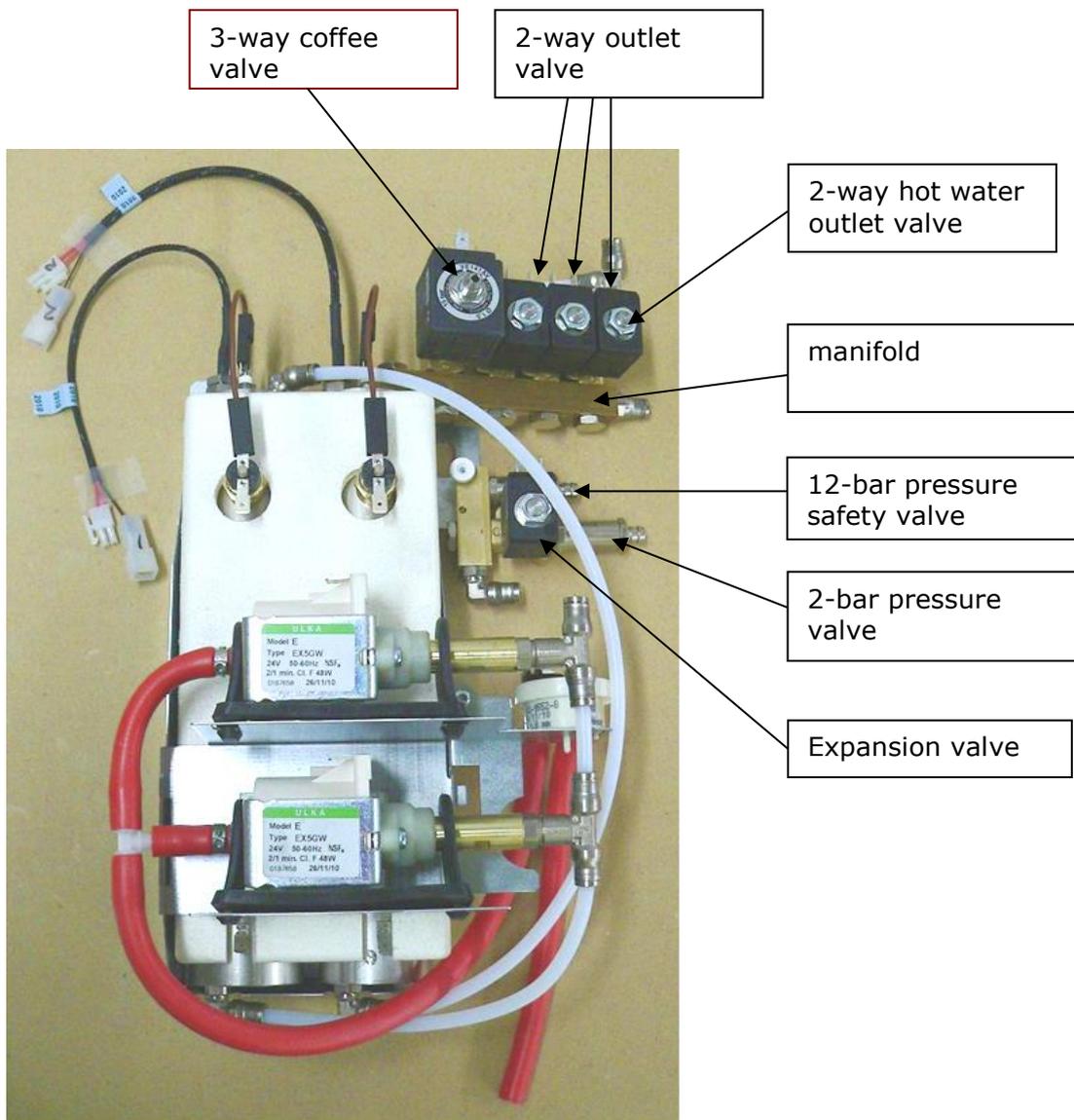


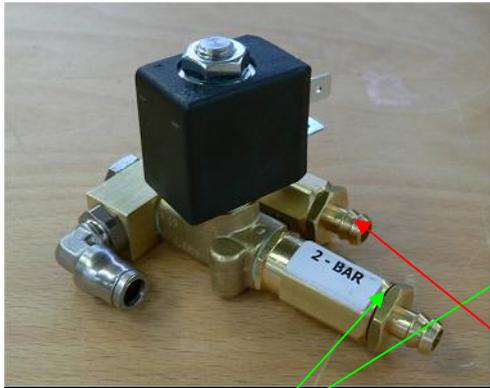
**Level:**

The level in the boiler is detected by the stainless steel housing of the sensor. The boiler is connected to ground. On the housing is a positive signal from the control system. If the sensor is in the water, current is able to pass through the water. The control system is detecting the water level because of this current.

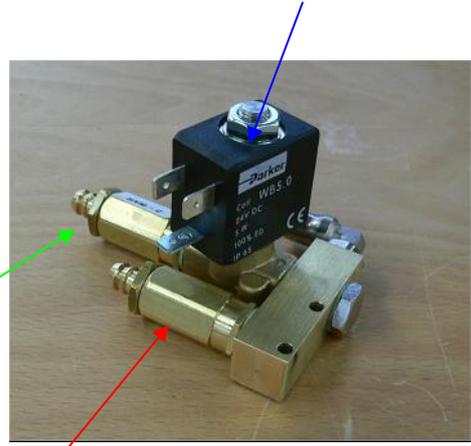
**5.8 Position of valves in the hot water system**

The manifold with valves is connected straight on the boiler with a bolt. This connection is needed to keep the manifold with valves warm if the machine is not used for a while.

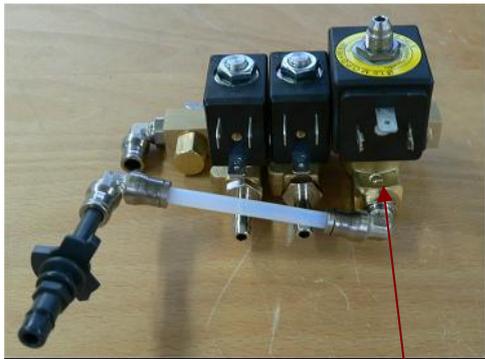




2-bar pressure valve



12-bar pressure safety valve



3-way coffee valve



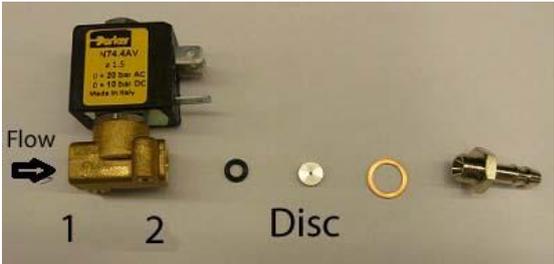
Hot water valve

2-way outlet valve



The two way hot water outlet valve is equipped with a special disc between valve and hose nozzle. This disc has a very small hole (0.7mm) in the middle. All the water must flow through this very small hole, causing the air in the water to dissolve. If this disc is not fitted, tea made with hot water will have a foam layer and will not look appealing.

- Part numbers:
- 2 way valve: 4EMV031
  - O-ring: 4ROR015
  - disc: 5MVL176
  - copper ring: 4BPR039
  - Hose nozzle G1/8": 4MPF044



Mounting sequence: as shown in picture.

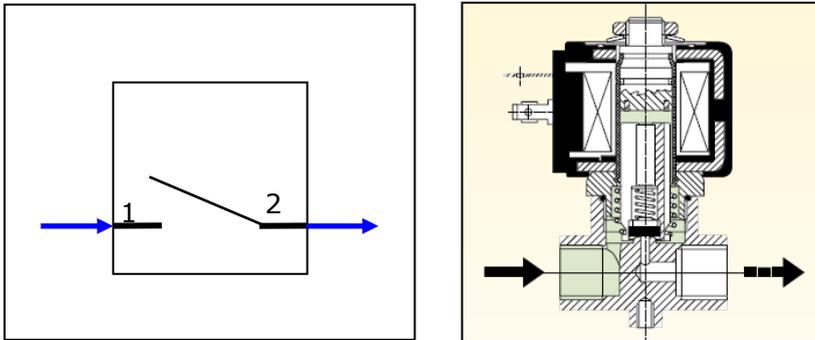
## 5.9 2-way valve / outlet valve

The two way valve is the outlet from the hot water system to a component. The moveable plunger has an integral seat which, when the solenoid coil is energized, moves off the valve (direct operated) orifice opening the valve. When the coil is de-energized, a return spring repositions the plunger in the original closing position on the valve, thus cutting off the flow of the fluid. The valve is controlled by 24VDC from the IO-board.

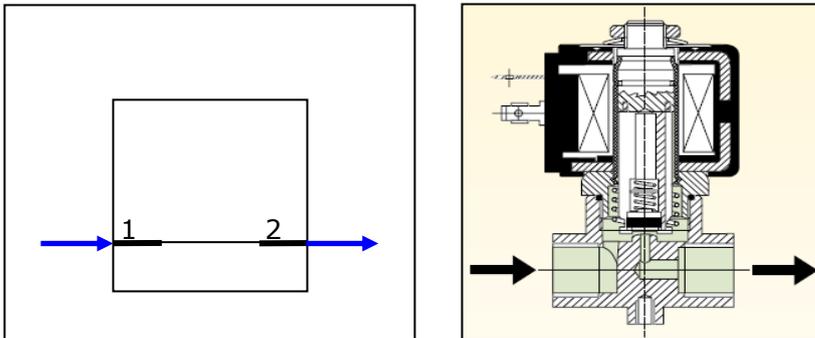
Water connections:

Number	Function	Description
1	Input	Connected to manifold
2	Output	Connected to component (Mixing system, hot water or 2-bar valve)

Water flow in valve if coil de-energized: (no flow)

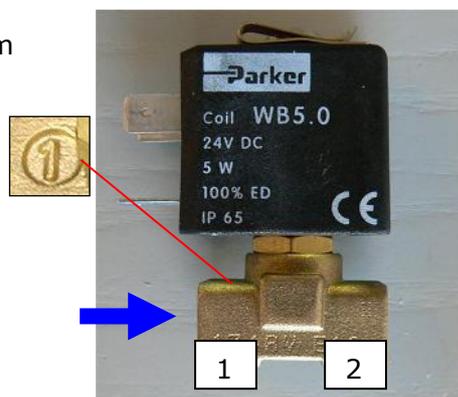


Water flow in valve if coil is energized:



The water connections on the valve are identified by numbers:

The water flow MUST BE from number 1 to number 2!



### 5.10 3-way valve / brewer valve

The three way valve is the outlet from the hot water system to the CoEx<sup>®</sup> Brewer (coffee valve) and has a channel from the brewer into the drip tray. Herewith the coffee residue can flow back from the brewer into the waste bucket.

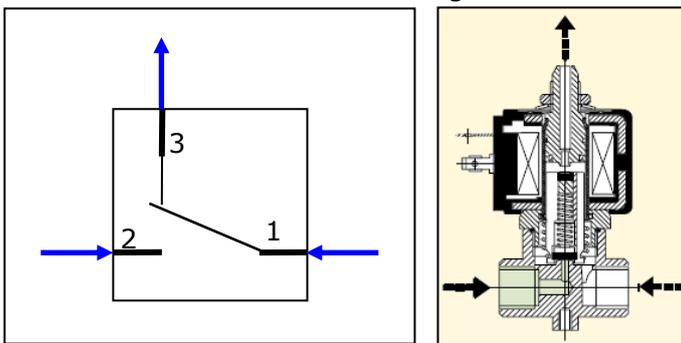
The function of the valve is based on a spring together with the system pressure which is pressing the plunger on the valve-seat.

The valve is controlled by 24VDC

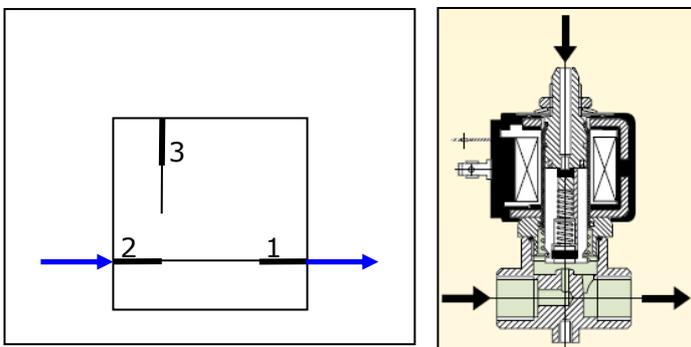
Water connections:

Number	Function	Description
1	Output	Connected to brewer
2	input	Connected to manifold
3	Drain	Drain to drip tray

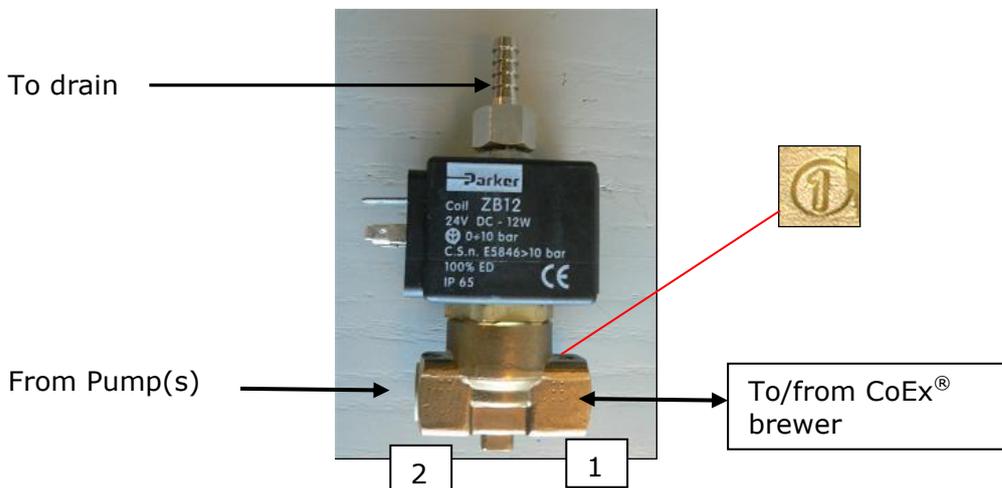
Water flow in valve if coil de-energized:



Water flow in valve if coil energized position:



The water connections on the valve are identified by numbers.:



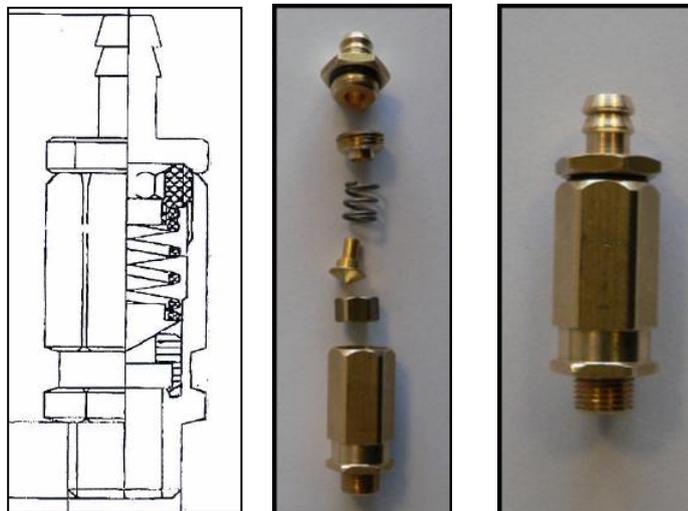
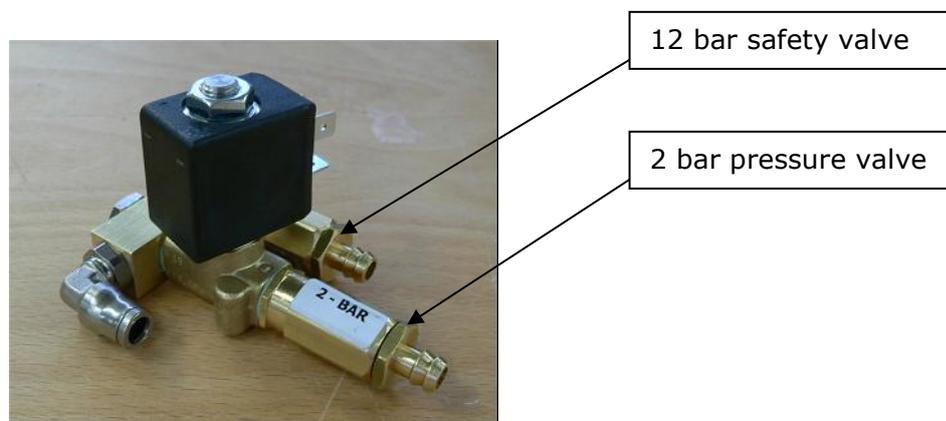
### 5.11 Pressure valve 2 bar

The 2 bar pressure valve is a mechanical pressure valve. This valve automatic opens if 2 bar pressure is reached.

This pressure valve can be switched off electronically by the 2-way expansion valve, in front of this 2 bar valve. The 2-way expansion valve is switched off during a vend cycle. If the system is in 'standby', the expansion valve is switched on (open) if the heaters are switched on, so the maximum pressure in the system during standby is 2 bar.

### 5.12 Safety pressure valve 12 bar

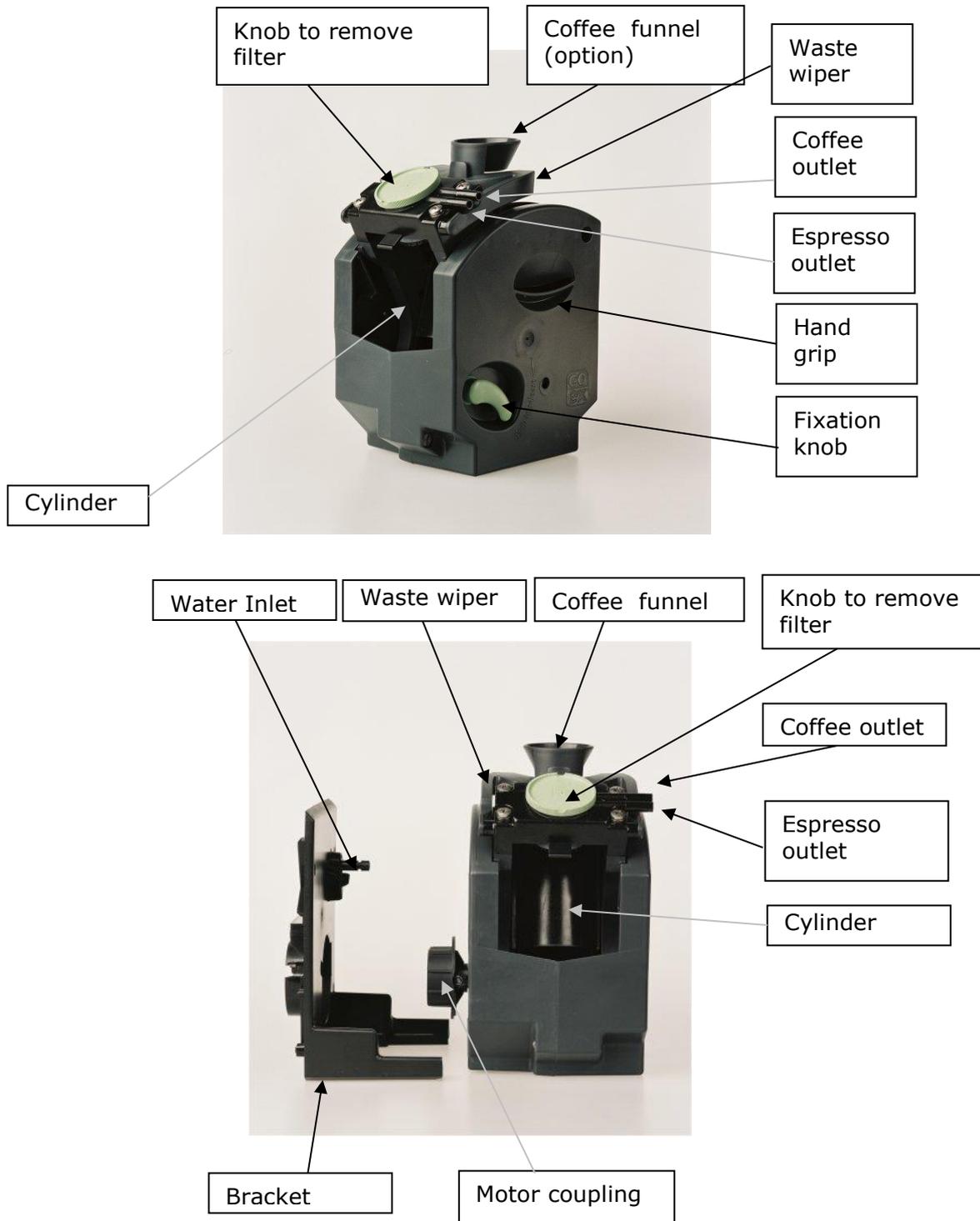
The 12 bar pressure valve is a mechanical pressure valve, in open line with the water system after the pumps. The valve automatically opens if 12 bar pressure is reached. Therefore the maximum pressure in the system can never be above 12 bar if this valve is functioning correctly.



Do not adjust the pressure valves in case of malfunction. They are specially set to 2 or 12 bar, and cannot be set correctly without special tools and knowledge. In case of malfunction replace for a new one.

### 5.13 CoEx® brewing system

The combined coffee and espresso brewer. The brewer is one of the most important parts in the machine. The quality of the coffee depends very much on the condition of the brewer. It is very important to keep the unit clean, also for a good functionality.

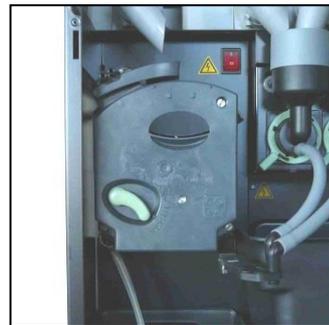
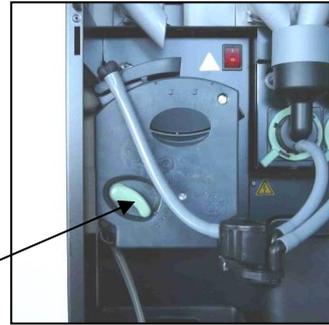


## 5.14 Removal of the CoEx® brewer

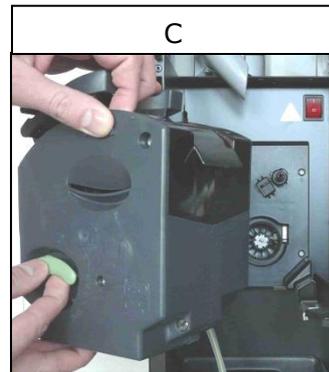
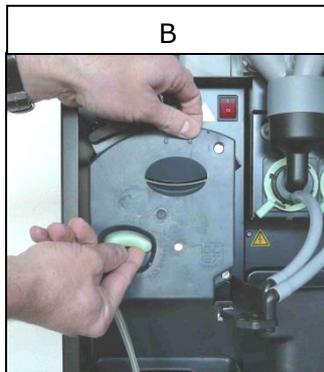
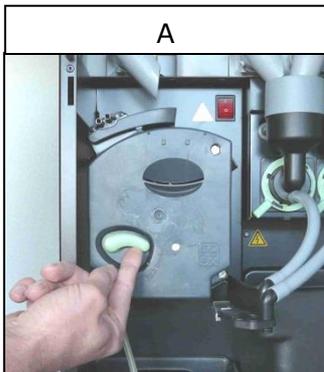
Removal of the brewer is necessary for performing maintenance.  
Carry out the following procedure for removal of the brewer:

Open the door of the machine.

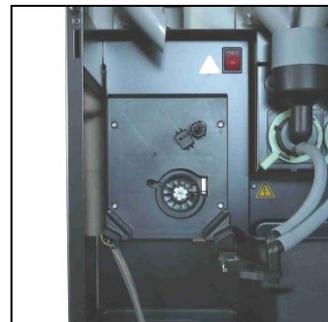
Remove the outlet tube from the brewer.



Push the green handle upwards and pull the brewer out off the machine at the same time.

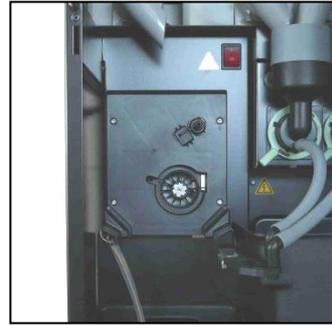


Ready.



### 5.15 Install the brewer

Carry out the following procedure to replace the brewer:



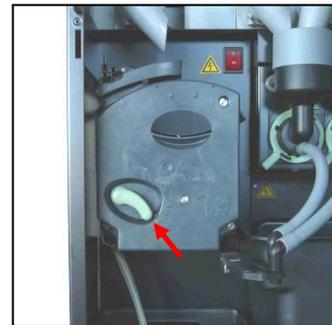
Place the brewer in the bracket.



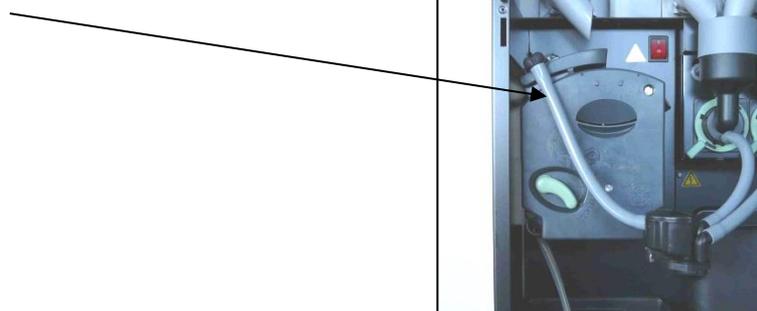
Push the brewer firmly in the machine till you hear "click" and the green handle is turned downwards in its home position.



**Make sure that the green handle is in the down position. When the brewer isn't installed correctly, the brewer can jump out of the fitting during a cycle.**



Replace the tube.

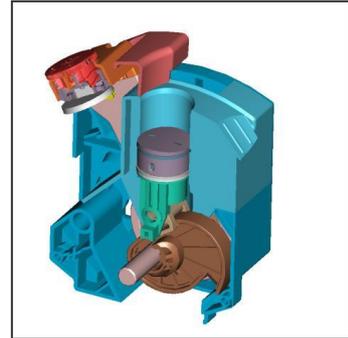


Check the function of the brewer by making a test drink. Place a cup under the outlet.

## 5.16 Brewer cycle

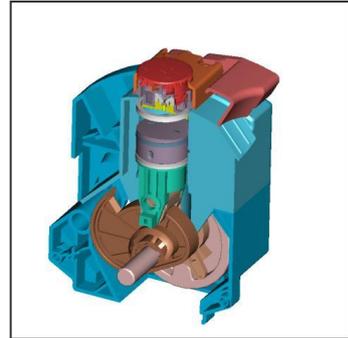
### Home position / Start position

After dosing the coffee the brewer start running. The motor runs clockwise till closed position.



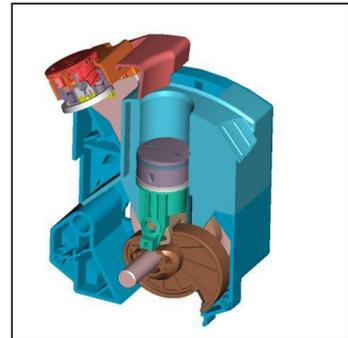
### Closed position

The dosed coffee is pressed together between the upper and lower piston.  
After pressing the coffee together the water is dosed through the piston, into the coffee cake and flows through the filter screen out into the top and outlet of the brewer.  
The pressure from the piston on the coffee cake is regulated by the adjustable current of the motor.



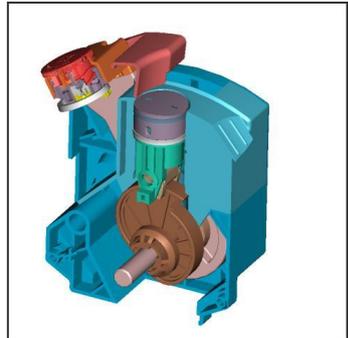
### Open position

If enough water is dosed the brewer runs counter clockwise to the open position.



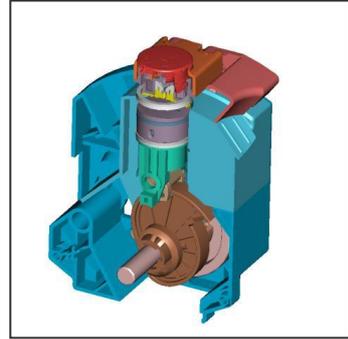
### Waste wipe

The brewer runs through, herewith the lower piston moves to the top position. Now the brewer starts running clockwise and the coffee cake is swiped from the piston into the waste bucket.



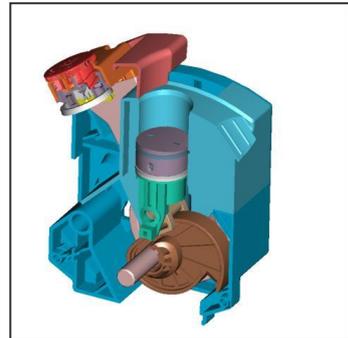
### Back to home

After swiping the coffee cake away, the brewer runs in the clock wise direction to the home position.



### Start/home position

The brewer is ready for a new cycle.



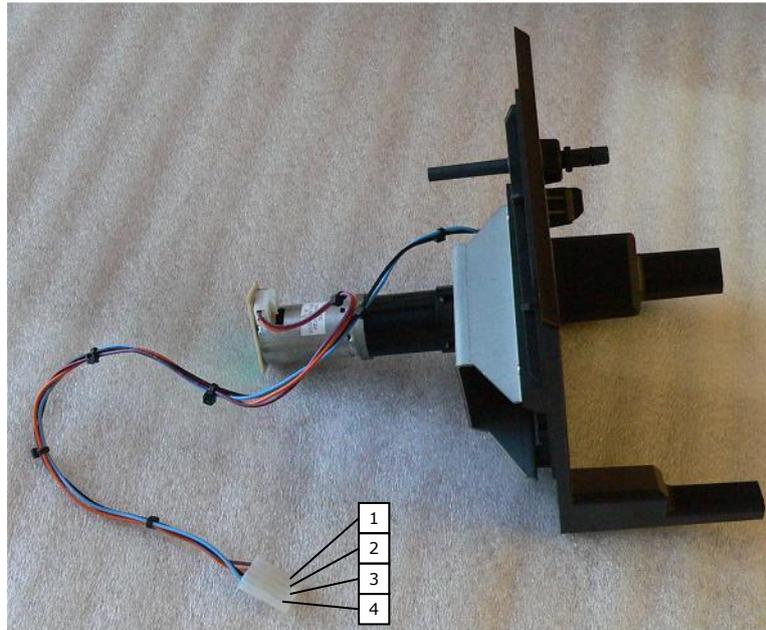
### 5.17 Brewer motor and micro switch

The brewer motor and micro switch are mounted on a bracket.

Specifications brewer motor:

- 24Vdc.
- No load: Speed 32 rpm, 0,10 A  $\pm$  0,05A
- Normal load: speed 25 rpm, 0,45A, 1,5 Nm.
- Stall: 1,8A  $\pm$  10%.

The motor is controlled in two directions, clockwise and counter clockwise. The position of the brewer is controlled by the micro switch and timers in the control system.

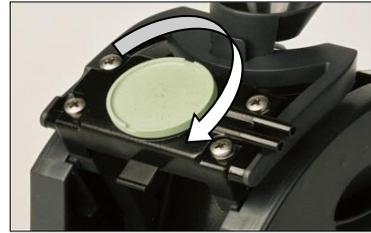


Electrical connections:

Number	Wire color (motor loom)	Wire color main loom)	function
1	Purple-red	Grey	Motor
2	Orange	Grey-white	Motor
3	Black	Purple-green (2x)	Micro switch
4	Blue	Grey-black	Micro switch

## 5.18 Upper piston

The upper piston is mounted in the top of the CoEx<sup>®</sup> brewer.



This upper piston is removable with the fixation knob on the top of the brewer.

To remove: Turn the knob clockwise

To fit on brewer: First place the complete upper piston in the right position, then turn the knob counter clockwise.

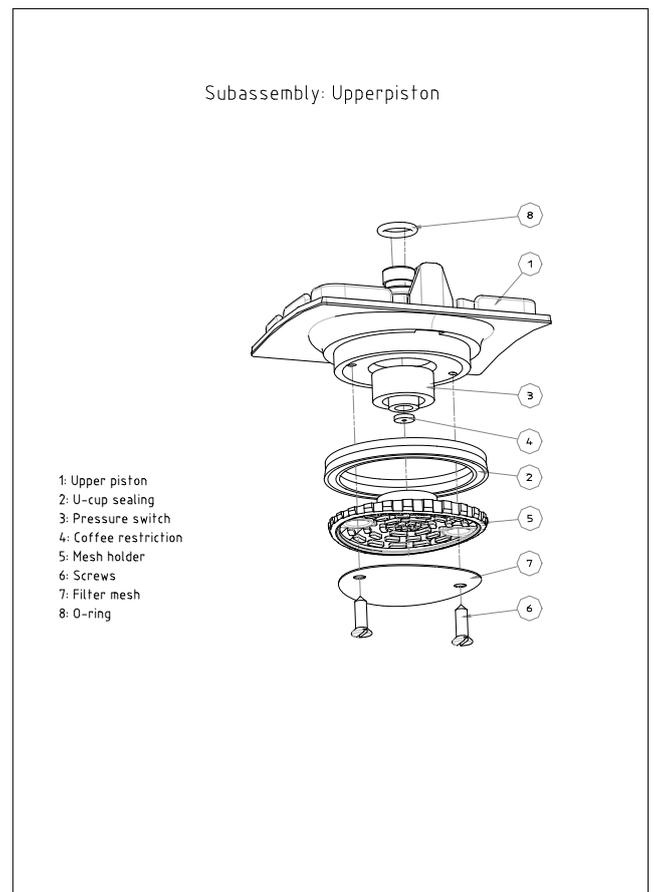


After replacing, check if the upper piston is correct fitted. If not correct replaced, the brewer will stall during dispense.

The upper piston contains the filter, restrictions and pressure switch. This part switches mechanical to the coffee or espresso outlet.



Upper piston.



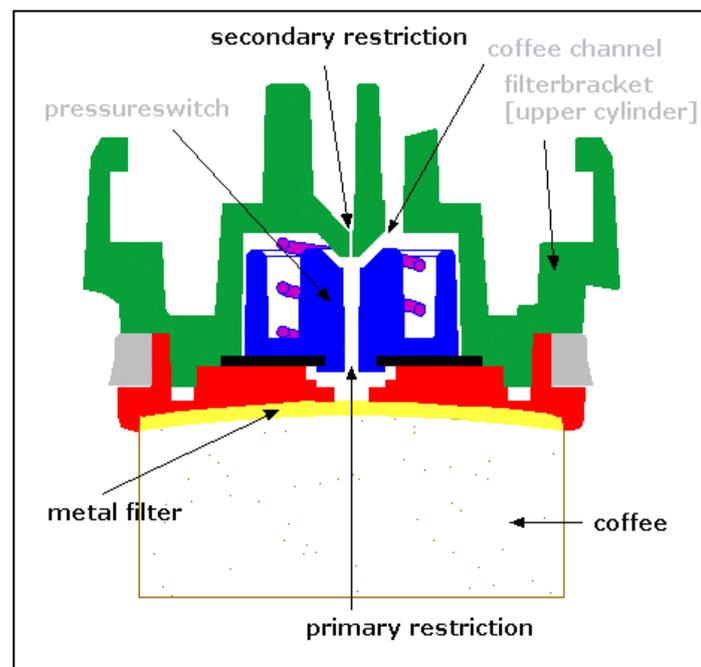
## 5.19 Controlling coffee/espresso pressure switch

With the unique patented system the CoEx<sup>®</sup>-brewer can make Coffee and espresso consumptions in one brewing system. The pressure for coffee and espresso is different, coffee is made with 3 - 4 bar pressure, espresso with 9 bar pressure.

The volume of a consumption is easily changeable in the software settings in the machine.

The duration time that the water is in contact with the coffee powder is a very important factor in the performance of the brewer and is about the same for coffee and espresso. The optimal water-coffee contact time is 15 - 25 seconds

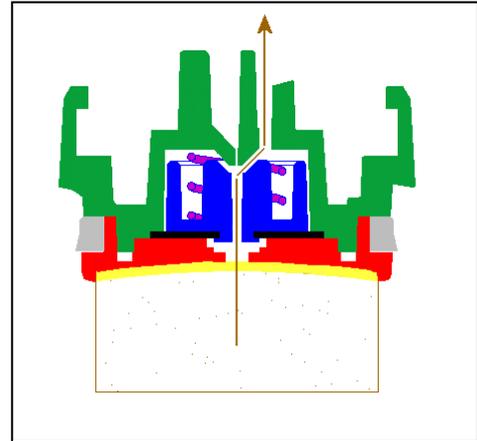
To achieve this value a restriction in the system must be used. By the combination of a higher pressure, lower volume and an equal coffee contact time the flow for espresso must be much smaller than the flow for coffee. In the following figures the solution for making these two beverages in one system is shown.



Coffee cycle:

When coffee is chosen, the start flow is relative low and will not activate the pressure switch. (Spring is strong enough to keep pressure switch in coffee position)

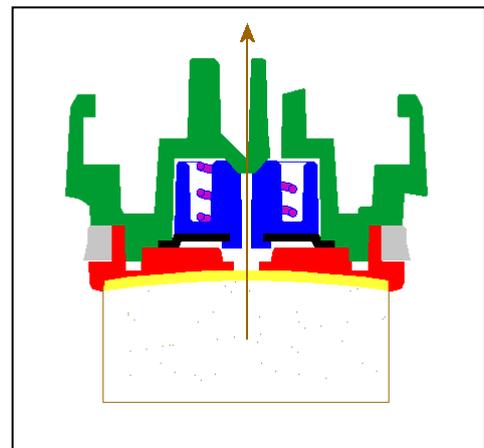
The coffee passes the primary restriction and can then flow through the large coffee channel.



Espresso cycle:

When espresso is chosen, at first the flow is high and will activate the pressure switch. (Spring is not strong enough to keep pressure switch in Coffee position)

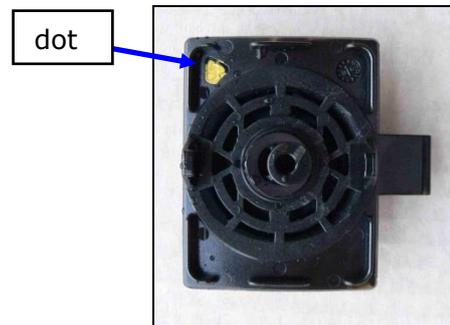
The coffee channel is closed and the espresso is forced through the secondary restriction, reducing the flow and increasing the pressure to 9 bar.



This different pressure between coffee and espresso is only used in the B2C espresso machines. (Zia 8000)

The CoEx<sup>®</sup> machines used as paperless fresh brew has no spring to switch between coffee or espresso pressure. (Zia 6000)

The upper piston is marked with a colored dot:



Machine type	Dot Color	Hole sizes	Part number
B2C espresso	Yellow	1,5mm/0,3mm	6ZBR057
Paperless fresh brew	White	0,5mm	6ZBR091

## 5.20 Seals

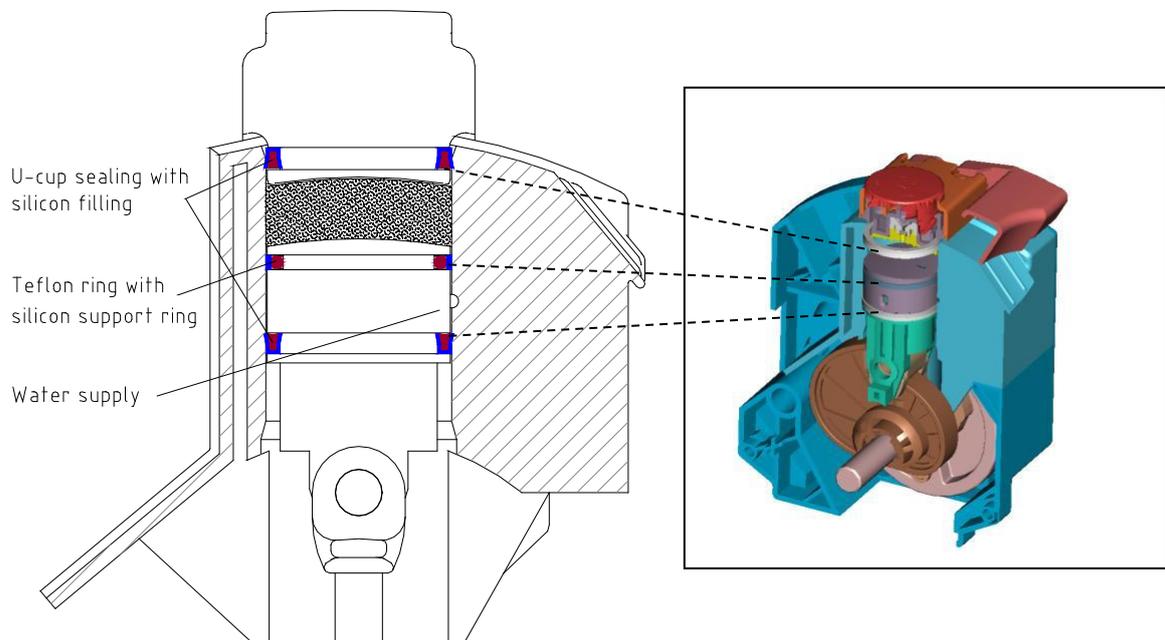
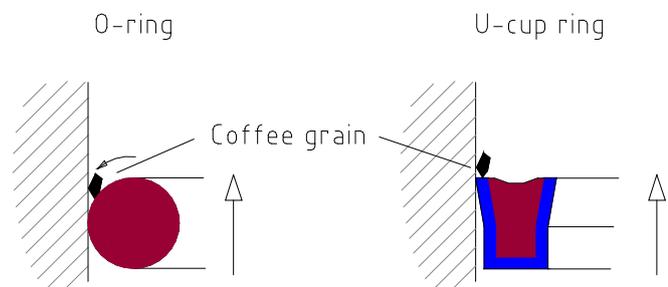
The brewer contains two pistons, the upper piston and lower piston. There are three sealing responsible for the sealing of the pressure room: Two in the lower piston and one in the upper piston. Hot water enters the cylinder (through the lower piston) between the two sealing rings in the piston.

The mix of water and coffee powder will be filtered by the mesh in the upper piston and then leave the cylinder.

The sealing in the upper piston and the lower sealing in the piston have to resist the pressure of the hot water during the brewing process (10 bars). As distinct from the most competitors this brewer is not equipped with o-ring sealing, rings which seems an important malfunction factor. In the following figure the impact of a coffee grain between the o-ring and the cylinder is shown. The grain will stuck which will result in twisting of the ring and grooves in the cylinder.

The shape of the selected u-cup ring avoids the grains scratching the cylinder.

The sealing consists of a Teflon u-shaped ring filled with silicon. Disadvantages of this ring are the higher cost price and the fact that the piston must be divided into a lower piston and a piston head to fix it. The upper sealing in the piston doesn't have to resist the high pressure but is only a scraper.



Two different U-cup rings are used in the brewer: The U-Cup ring in the upper piston has a blue color. The U-cup ring in the lower piston has a red color.

## 5.21 Replace seals in lower piston

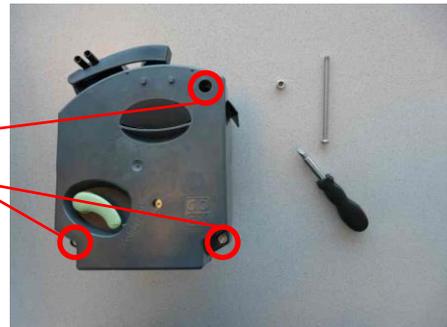
1. Needed tool: Screw driver



2. Unscrew the bolt in top of the brewer and loosen the two other bolts 2 turns.

remove

Loosen 2 turns



3. Remove waste wiper.



4. Push left and right housing sideward and pull the cylinder with piston out of the brewer.



5. Replace parts and install in reversed order



## 5.22 Mixer

The mixer consists of a mixer motor, to which a mixer blade and a mixer house are connected.

The mixer is controlled by the control board and ensures a correct mixing of the ingredients and the water.

Furthermore, the mixer whips air in de consumptions and forms a crème layer. This will grade up the taste and the appearance of the consumption.



Motor specification: 24VDC, 14.000 RPM.

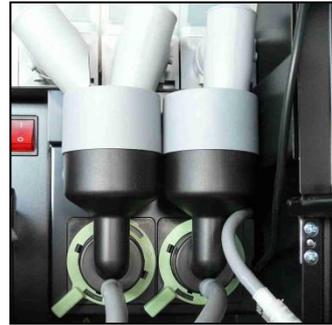
In case of a blockage, a safety is actuated on the IO board and the message "mixer blocked" is shown in the screen.

A restricted inlet diameter of the mixer house is used to create a nice flow in the mixer bowl. The used black mixer house is a special made house with inlet diameter for the pressure water system as used in the Zia 6000 an 8000 series.



## Disassembling the mixing system:

1. Remove outlet pipes from the ingredient canisters.



2. Turn the bayonet catch counter clockwise (approx. 10°).



3. Remove the mixer house by pulling it towards you.



5. Pull the mixer blade towards you.



6. Turn the base plate further counterclockwise and pull it towards you.



7. Ready



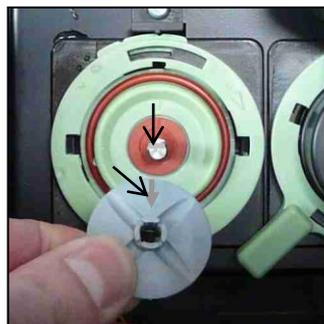
**Assembling the mixing system:**



1. Install the base plate.



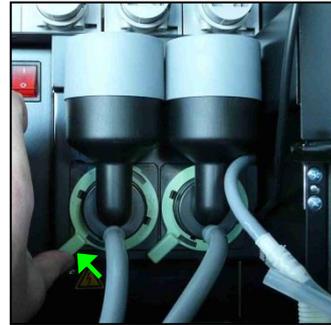
2. Install the mixer blade.  
Be sure that the arrow on the blade is at the flat side of the shaft.



3. Install the mixer house.

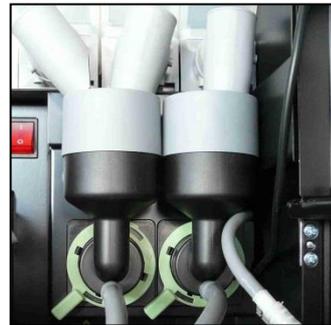


4. Turn the bayonet catch clockwise.



5. Install the outlet pipes on the ingredient canisters.

6. Ready.



## 5.23 Grinder

The grinder can be built in the door or on the base plate next to the other ingredient canisters.

In the grinder the coffee beans are ground through two metal blades to fine ground coffee.

These two blades in the grinder are mounted horizontally. The upper blade in the grinder is a fixed blade and the lower blade is rotating, driven by a motor of 24VDC.



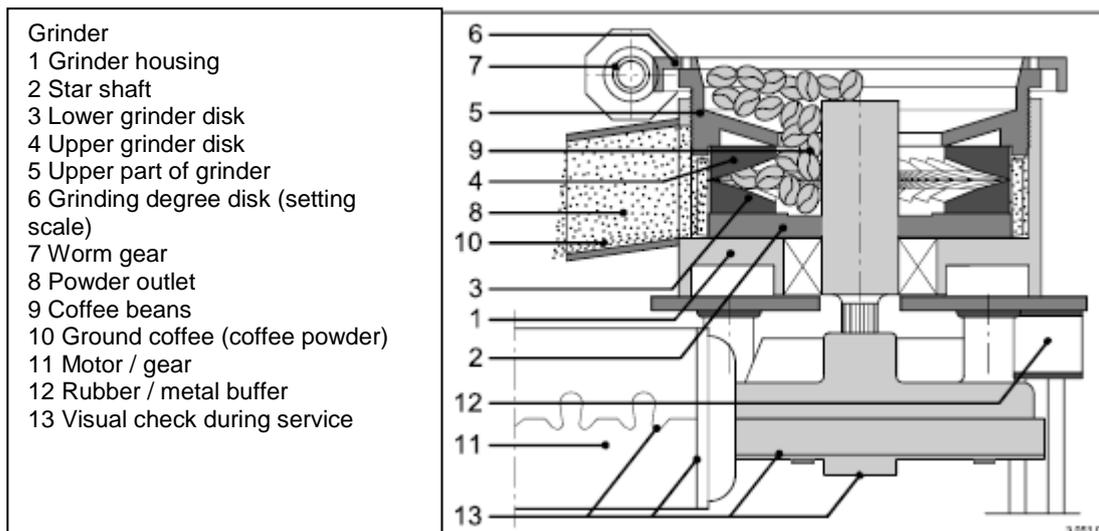
Grinder on canister plate



grinder in door

By adjusting the upper grinder blade axially, the air gap between the two grinder blades can be set very accurately. This air gap defines the grain size of the ground coffee, what is known as the grinding degree.

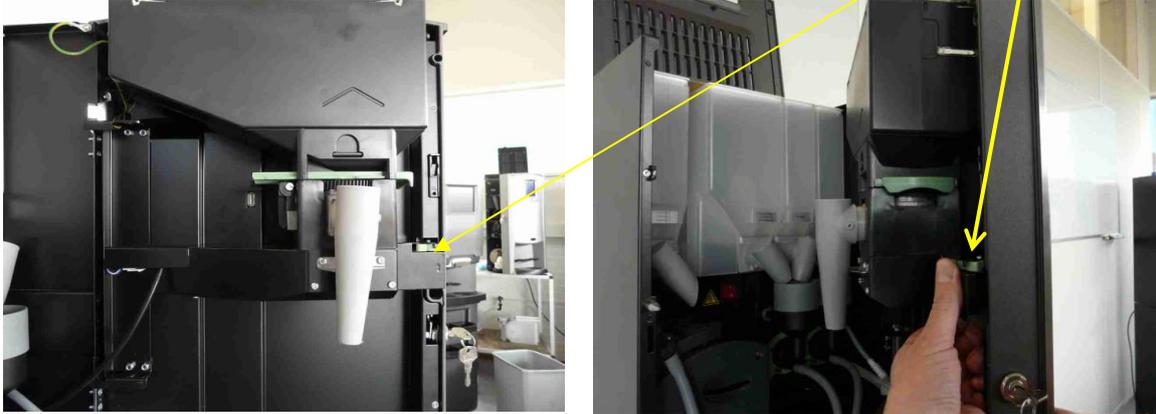
The grinding degree setting is made manually on a worm gear. The powder (ground coffee) is discharged into the powder outlet through four cams attached evenly around the circumference of the star shaft.



## 5.24 Grinder in door

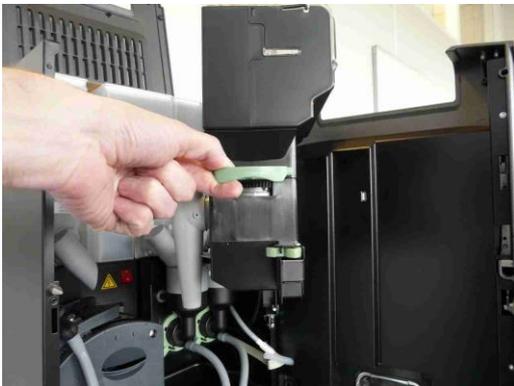
The grinder is mounted in a housing fixed with hinges in the cabinet. By opening the door the grinder will rotate automatically and stay in the door.

The grinder can be moved above the brewer for making a test drink with coffee from the grinder. In this case, unlock the grinder door with the green locking handle and rotate the grinder above the brewer.



## 5.25 Removing bean canister and grinder.

- Pull at the green lever of the bean canister to close the canister.
- Lift the canister upwards and place it on a table.
- Pull the grinder upwards and lift it out the 4 position pins. (the motor stays inside the machine)



**Remove grinder:**



## 5.26 Grinding adjustment.

For the adjustment of the grinder you can adjust the grinder blades inside the machine without disassembling the grinder. The machine will give a finer grinding by turning the screw counter clockwise and a coarse grained coffee by turning the knob clockwise.



After adjusting the grinder, first take two consumptions, to get rid of the old coffee in the grinder chute. After these two consumptions, check the new grinder setting with taking a test consumption, checking cr me layer, taste etc.

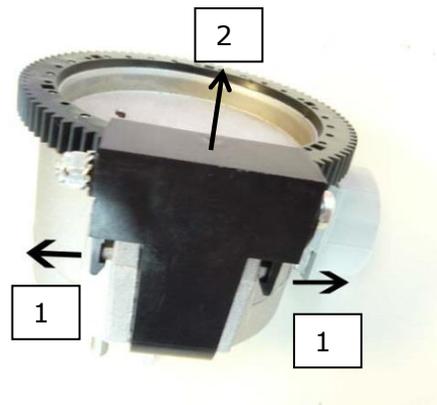
### 5.27 Default grinder setting

The grinder is default set as described below:

1. Remove the upper part of the grinder from the machine by pulling it upwards.



2. Remove the black adjustment worm-wheel by pulling the 2 pins outwards (1) and at the same time lifting this wheel upwards. (2)

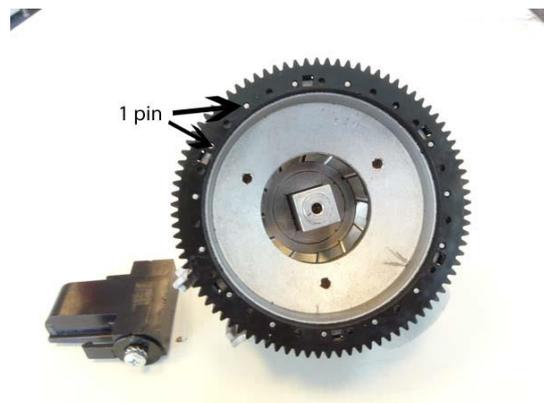


3. Remove the upper grinder knife together with the black gear ring by rotating it counter clockwise.
4. Be sure there are no beans left on the knives and in the grinder housing. Clean the knives.



5. Replace the upper knife and turn it gently as far as possible clockwise, just till the two knives hit each other.

6. Mark the position of the upper knife compared to a fixed point of the housing. Turn the upper-knife 2½ steps (1 step is one pin position) counter clockwise.



7. Replace the black adjusting worm-wheel

8. Replace the grinder back in the black housing.

9. Test the result by taking consumptions.  
Fine adjustments can be done by rotating the adjusting worm-wheel.  
(see chapter 5.26, grinding adjustment.)

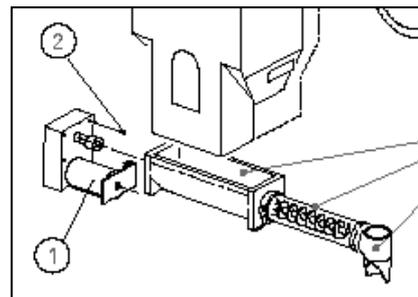


### 5.28 Ingredient canisters

The canisters can have a metal auger or plastic auger.  
The metal auger is used for instant coffee, instant tea and leaf tea.  
The plastic auger is used for the other ingredients.  
Special augers are available for special ingredients or low gram throws.



All canisters are driven by a 24VDC 120RPM motor.



## 6 Electronic hardware

Hardware MoVeC ICEQ  
(Modular Vending Controller for Intelligent Connected Equipment)

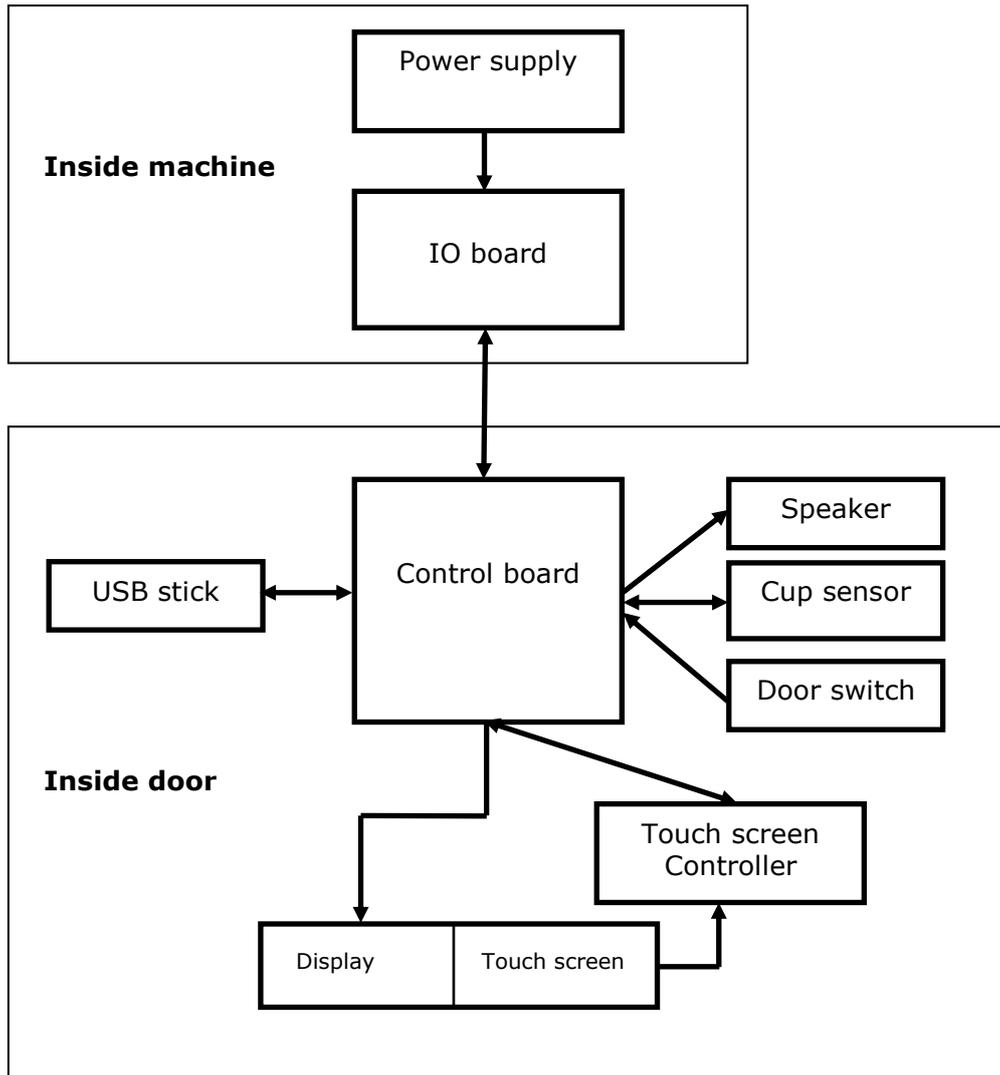
The electrical system consists of the following main components:

Power supply board

IO board

Control board

Display board with touch screen



## 6.1 Power supply

The power supply is located at the back plate of the machine behind the ingredient canisters.

The mains voltage is connected to the power supply board.

For over voltage protection, the power supply has been equipped with a fuse.



The heating elements are directly connected to the mains, via the On/off switch and the IO board. (see chapter 6.8, schematic 1)

The 5EPR078, a 120Watt power supply.

Connections on the power supply:

T1. Input 230V AC  
T2. Output 24V DC  
Fuse: 4A, 250V 5x20mm, slow. (T)

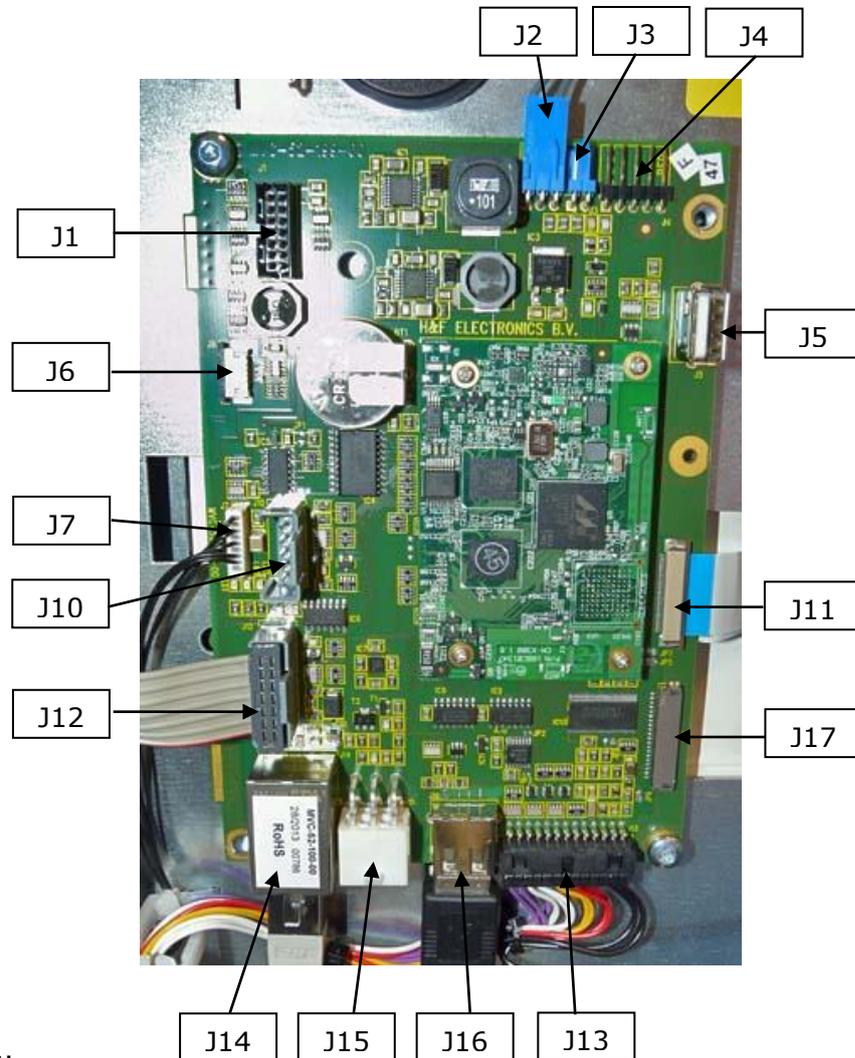
For the US:

Part number: 5EPR128  
T1. Input 115V AC  
T2. Output 24V DC  
Fuse: 4A, 250V 5x20mm, slow (T)



## 6.2 Control board

The control board is located at the inside of the door. The control board controls the operation of various components. The signals are sent to the IO board. On the control board you also find the connections for other PCB's and payment systems. The operating system, counters and settings are saved on the control board.



### Connections:

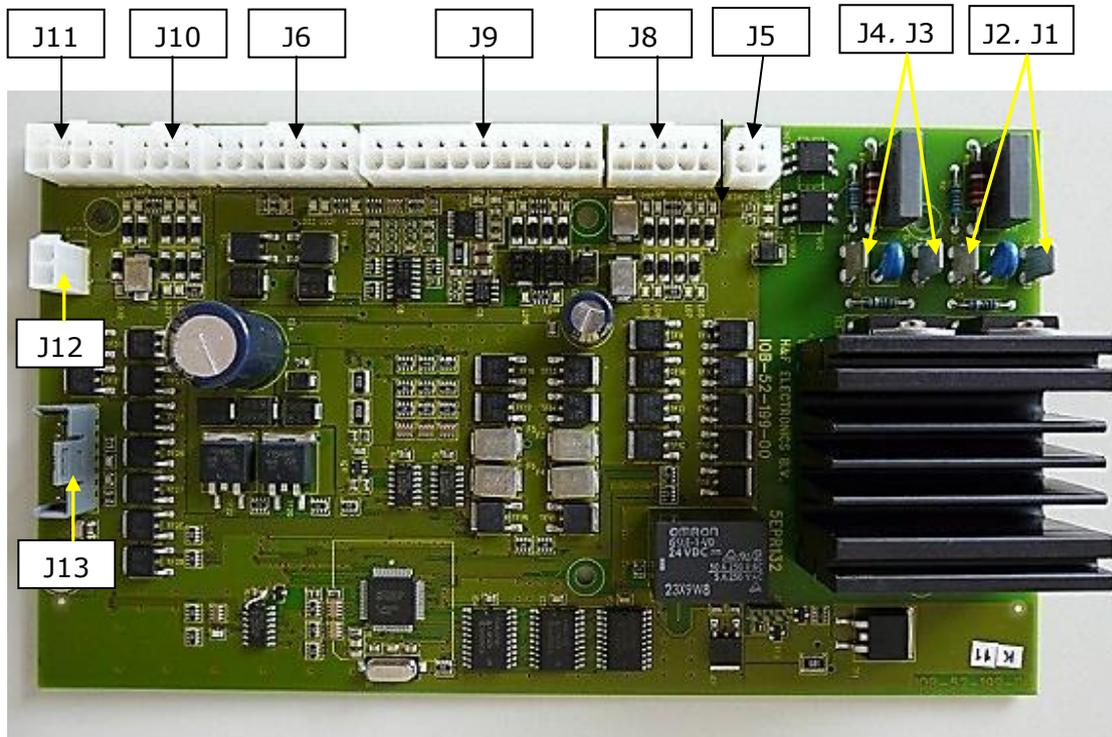
- J1 IRDA Board
- J2 Speaker
- J3 mechanical counter
- J4 USB
- J5 USB
- J6 Touch screen
- J7 backlight
- J10 Extension
- J11 Display TTL
- J12 IO board
- J13 cable loom door (cup sensors, door switch, leds)
- J14 Network connection
- J15 MDB payment system
- J16 USB
- J17 Display LVDS

Part number control board: 5EPR140

### 6.3 I/O board

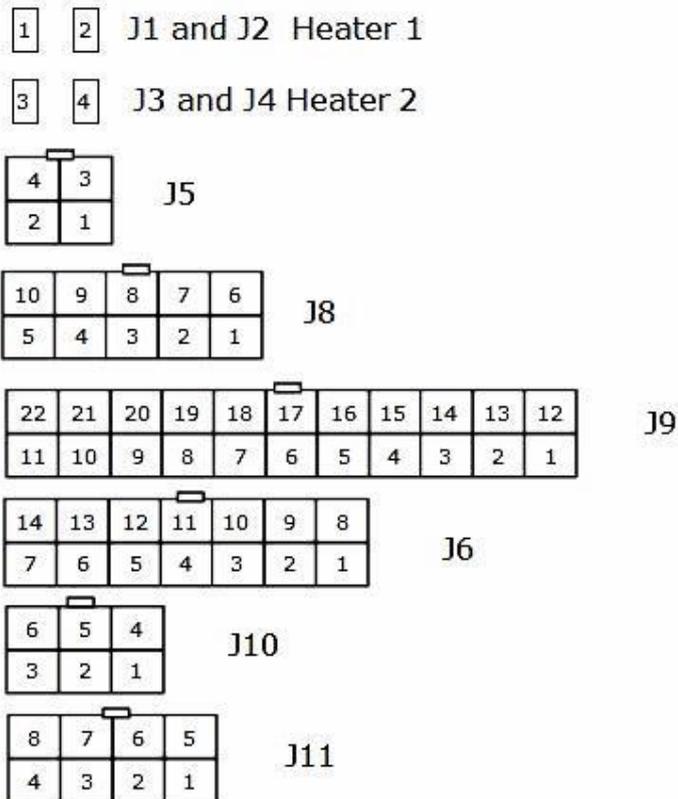
The IO board is controlled by the control board. The I/O board controls the mechanical components such as dosing motors, boiler(s), brewer motor, mixers and valves.

Part number: 5EPR132, 27 outputs and 2 heater outputs



- J1,J2 Switching wires heater 1
- J3,J4 Switching wires heater 2
- J5 24Vdc input
- J6 In and outputs
- J8 Outputs
- J9 In and outputs
- J10 Outputs
- J11 In and outputs
- J12 Input potential-free contact
- J13 Control board

## 6.4 Connectors on the IO board

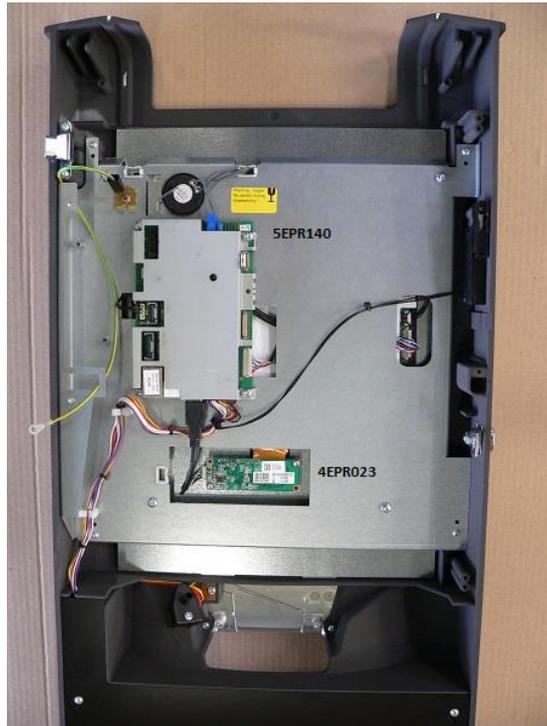


Connector	Component	Wiring color
J 1	Heating element 1	Blue
J 2	Heating element 1	Blue
J 3	Heating element 2	Blue/white
J 4	Heating element 2	Blue/white
J5-1	+24V DC supply	Red
J5-2	+24V DC supply	Red
J5-3	-	Black
J5-4	-	Black
J8-1	+24VDC (common)	Orange
J8-2	Valve brew/mix 1	Purple/white
J8-3	Ingredient motor 3	Blue/White
J8-4	Ingredient motor 4	White
J8-5	Brew/mix 1	Purple/Red
J8-6	Valve brew/mix 3	Orange/Brown
J8-7	Chilled water inlet valve	Black/Orange
J8-8	Ingredient motor 5	Blue/Green
J8-9	Ingredient motor 6	Purple/Black
J8-10	Mixer 2	Blue/purple

J9-1	+24V DC (common)	Orange
J9-2	Ingredient motor 1 coffee or grinder	Purple
J9-3	Ingredient motor 2 coffee or grinder	Brown/Red
J9-4	Brewer motor +	Gray/White
J9-5	Brewer motor -	Gray
J9-6	Brewer micro	Gray/Black
J9-7	Paper switch	Empty
J9-8	Common sensors	Green/Purple
J9-9	Drip tray detect	Black/Yellow
J9-10	Drip tray full detection	Yellow
J9-11	Drip tray common	Green/White
J9-12	Inlet valve open boiler	Red/Green
J9-13	Fan	Black/White
J9-14	Coffee valve	Yellow/White
J9-15	Valve hot water	Red/Blue
J9-16	Micro waste bucket	Yellow/Orange
J9-17	Tea brewer micro	Brown/Gray
J9-18	-	
J9-19	Temp 1 common	Green/Purple
J9-20	Temperature 1	Pink
J9-21	Level detection 1	Red/Black
J9-22	Level detection 1 common	Yellow/Grey
J6-1	+24 volt DC (common)	Orange
J6-2	Pump 1 (common)	Gray/Blue
J6-3	Pump 2 (common)	Black/Pink
J6-4	Flow meter supply	Red/White
J6-5	Flow meter signal	Black/Blue
J6-6	Flow meter common	Green/Purple
J6-7	Level 2	Brown/Black
J6-8	Expansion valve	Blue/Yellow
J6-9	Pump 1	Yellow/Brown
J6-10	Pump 2	Orange/White
J6-11	-	
J6-12	Temperature 2	Pink/White
J6-13	Temp 2 common	Green/Purple
J6-14	Level 2 common	Yellow/Grey
J10-1	+24 V DC (common)	Orange
J10-2	Output 23 Spare	Green/Red
J10-3	Output 24 spare	Green/Gray
J10-4	Carbonated water valve	Brown/Blue
J10-5	Output 26 Spare	Empty
J10-6	Brew/mix 4	Empty
J11-1	+24 V DC (common)	Orange
J11-2	Outlet arm	Purple/Yellow
J11-3	Micro switch cup splitter	Empty
J11-4	Micro switch outlet arm	Empty
J11-5	Cup splitter	Green/Pink
J11-6	Cup column mover	Orange/Blue
J11-7	Cups micro switch	Empty
J11-8	Common sensors	Empty

## 6.5 LVDS Display and touch screen.

Part numbers:  
Display LVDS: 4EPR022  
Touch screen: 6CSS053  
Control board: 5EPR140  
PCT controller: 4EPR023



PCT controller 4EPR023



## 6.6 Speaker

Part number: 4ELP001



## 6.7 Cup sensor

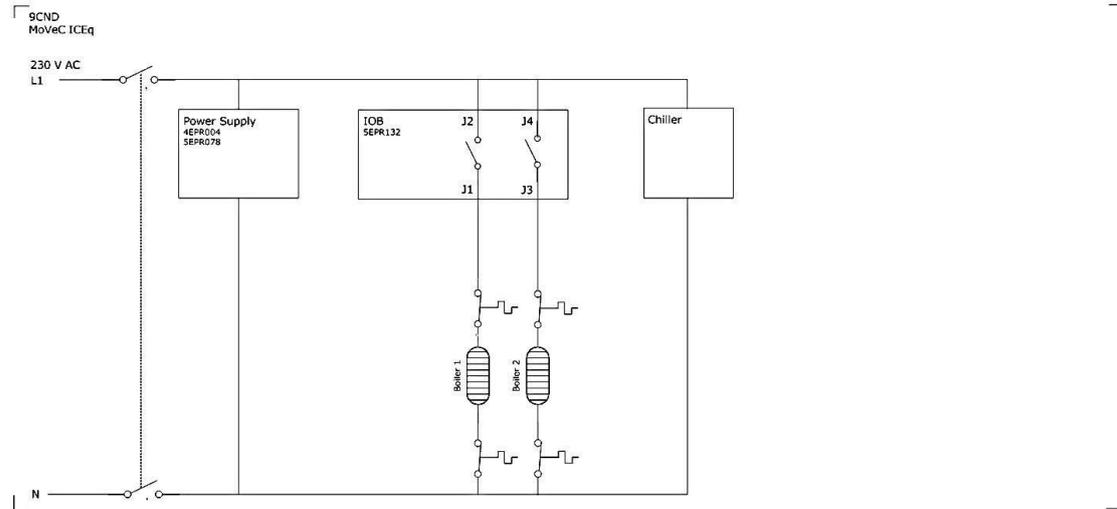
The cup sensor sense a cup on the cup stand. Maximum two cup sensors can be connected in the machine. One for the right outlet and one for the center outlet. A cup must be placed on the correct position on the cup stand before the start button is green and the cycle can start.

The sensitivity of the sensor is adjustable, see chapter 7.6, cup sensor settings.

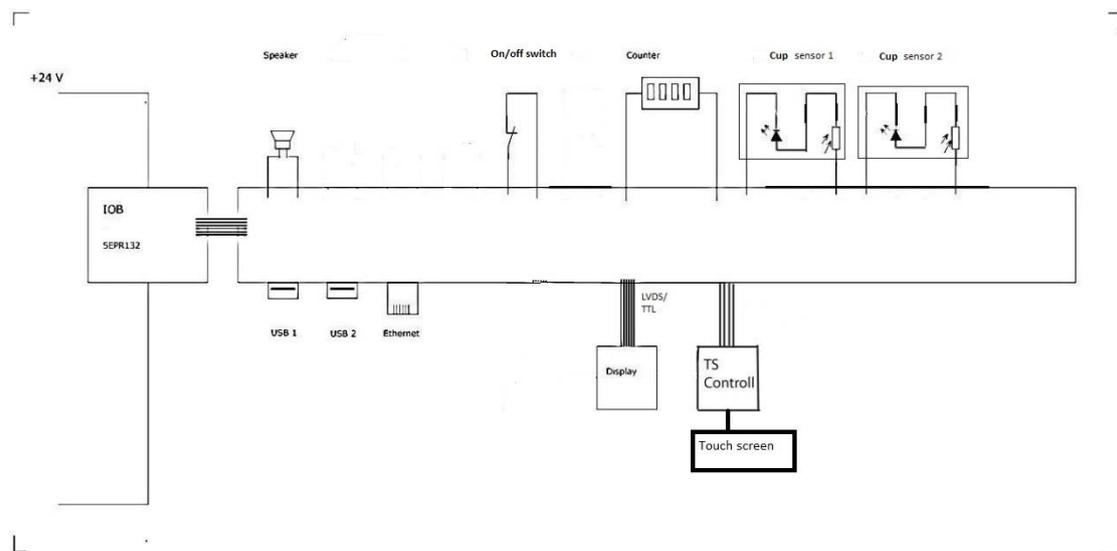


## 6.8 Electrical schematics

### Electrical Diagram - MoVeC ICEQ - 9CND: 230Vac

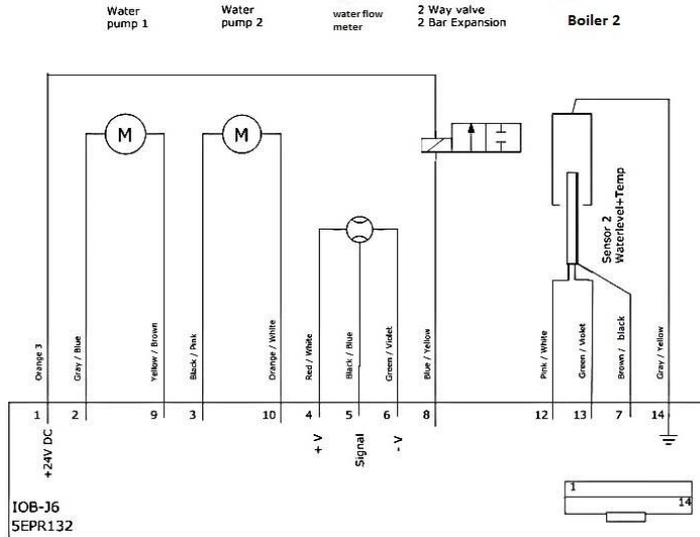


### Electrical Diagram - MoVeC ICEQ – Controller board - Zia



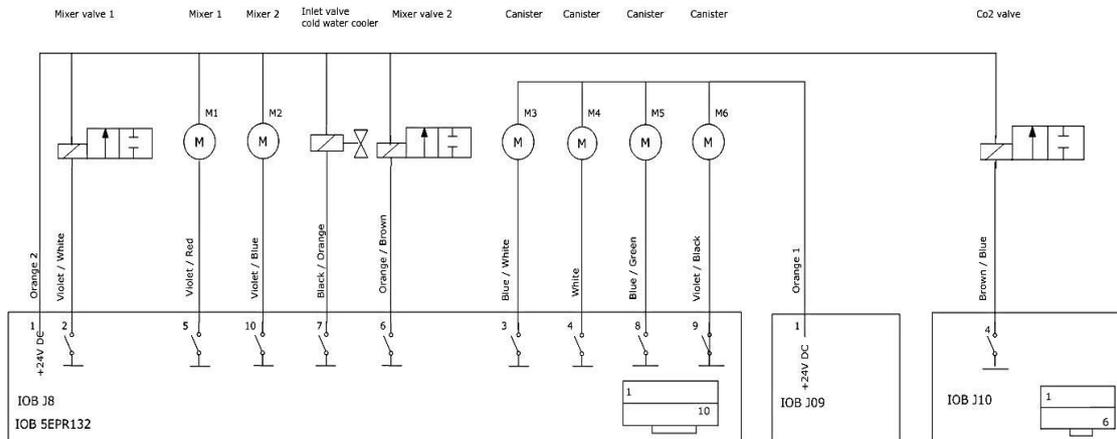
## Electrical Diagram - MoVeC ICEQ - 9CND: IOB connector J6

9CND  
MoVeC ICEq

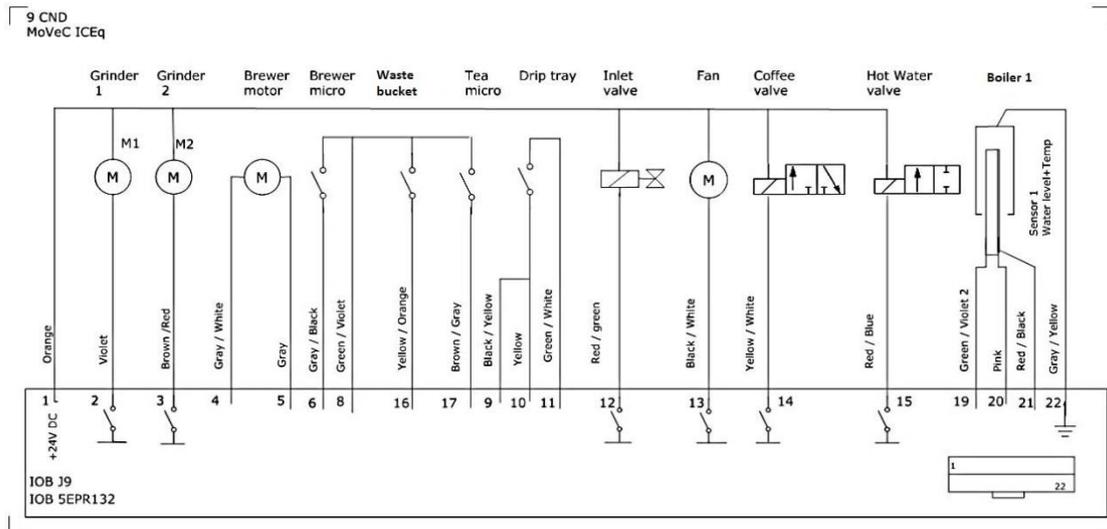


## Electrical Diagram - MoVeC ICEQ - 9CND: IOB connector J8, J9 en J10

9 CND  
MoVeC ICEq



## Electrical Diagram - MoVeC ICEQ - 9CND: IOB connector J9



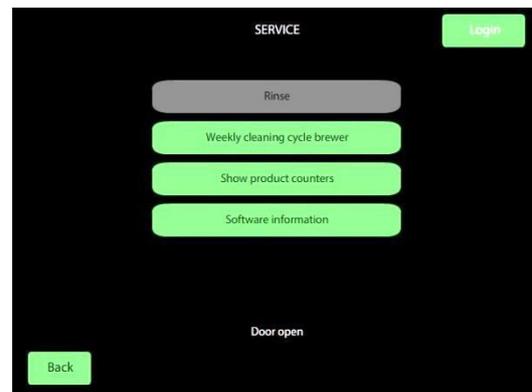
## 7 Service and programming

### Mode without password

After opening the door the service mode is shown in the screen.

This screen gives the options:

- Rinse (grey in picture)
- Weekly cleaning cycle brewer
- Show product counters
- Software information



Only buttons in light green color work.

Buttons who require a part of the machine to work will be in grey and will not function as long as the service key is not placed.

The rinse cycle (grey in example picture) will only work if the service key is inserted in the door.

(This key is in the machine for safety reasons. Conform CE no component may run after opening the door, unless a safety key is placed)

### 7.1 Inserting safety key

Insert the safety key and turn this key a quarter turn clockwise:



Inserting the service key gives electrical power to components.

Be aware of the following:



- Possible moving parts inside the machine, beware of trapped fingers if the service key is placed when the door is open.
- Beware of hot parts and hot liquid inside the machine, even after the power is disconnected.

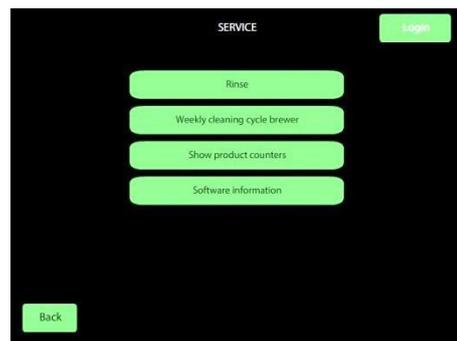


## 7.2 Functions without password

Inserting of the safety key makes the rinse functions available for use. (button color changes from grey to green)

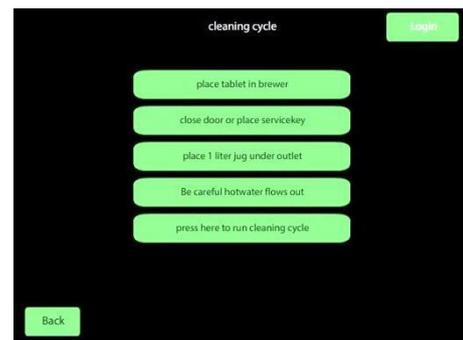
### Rinse:

The rinse cycle needs to be done daily. A jug or bin needs to be installed under the outlet nozzles before starting the rinse cycle. Pressing the rinse button will start a rinse cycle for mixers and brewer directly.



### Weekly cleaning cycle:

The weekly cleaning cycle needs to be done weekly. Pressing the weekly cleaning button will show a new screen with instructions. Follow the instructions and finish the whole procedure to reset the cleaning counter. If this cleaning cycle is not completed, an error message will appear: "cleaning error". See chapter 7.16 for clearing this message.



### Show product counters

Pressing free counters shows all the individual counters, free vend. Pressing paid counters shows all the individual counters, paid vend.



## Software information

This screen shows all types of software and hardware information about the machine.

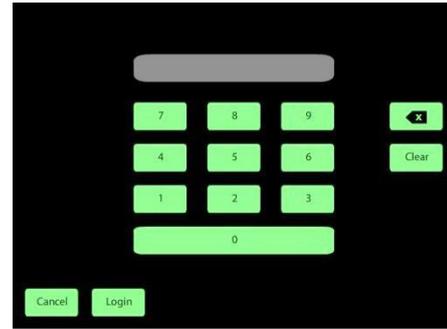


### 7.3 Service mode with password access

After opening the door the first level service screen is shown.

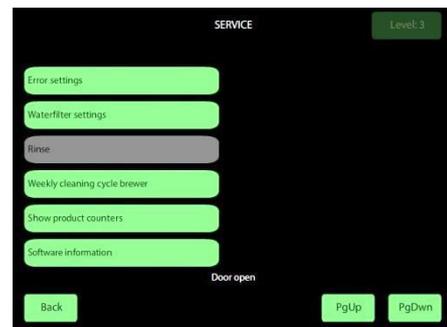
Press the **login** button right at the top, a new screen as shown here will pop up.

Enter the technician password and then press the login button left under.



#### The available service menu items:

- Recipe settings
- Boiler temperature
- Cup sensor
- Select language
- Payment settings
- Software configurations
- Load permissions
- Clock/time settings
- Jug settings
- Images
- Test outputs
- show error log
- Error settings
- Water filter settings
- Rinse
- Weekly cleaning cycle brewer
- Show product counters
- Software information
- Show EVA-DTS
- Change serial number
- Fan turn off delay
- Empty boiler



## 7.4 Recipe settings

### - Water/ingredient settings.

The water and ingredient dosage and other timings can be adjusted per available recipe. (see chapter 7.4.2 and 7.4.3 for detailed explanation)

### - Strength control %.

The max strength difference from the medium dosage can be set. The medium dosage is the set dosage in the recipe settings of each individual consumption.

Example:

For coffee and tea (this are main products) 5 strength steps are possible.

If the main product strength is set to 10%:  
Every step means 5% more or less product.  
With this setting max 10% more or 10% less product from the average dosage is possible.

For milk (creamer) and sugar 3 strength steps are available.

If the strength% is set to 30:  
Every step means 30% more or less product.

### - Milk/Sugar available.

The milk or sugar option can be switched off. If switched off, the milk/sugar selection will disappear from the user menu.

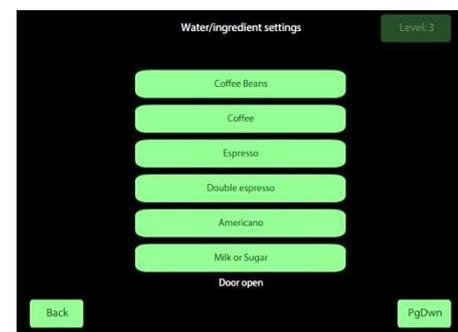
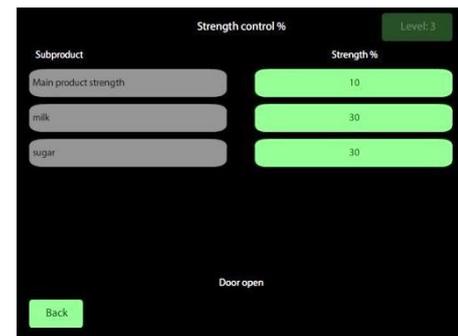
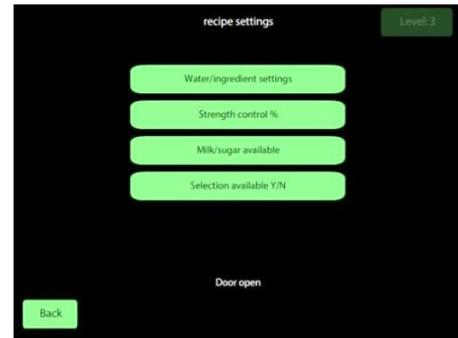
### - Selection available.

Every recipe can be available or not. If not available is selected the selection is not available in the user menu screen.

#### 7.4.1 Water/ingredient settings

All available recipes are shown in the water/ingredient settings menu.

Select the recipe you want to change.



### 7.4.2 EXAMPLE: (Fresh brew) Coffee recipe in a bean to cup machine

Coffee = The settings for the ingredient fresh brew coffee.

Press coffee, this gives a new screen:

Delay = 0.0 means: Coffee is immediately dosed in the brewer, no delay.

Duration = 2.5 means: The auger in the coffee canister rotates for 2.5 seconds, giving a certain amount of coffee in the brewer.

Speed = 100 means: The auger rotates 100% (= full speed. )

In "Sub high pressure" is it possible to set the amount of water dosed in high pressure mode to give a nice cr me layer on top of the coffee. Press sub high pressure to see the water amount for this part of the recipe.

Water amount (in main recipe) = the basis amount of water.



The water amount in the pressure boilers is adjusted in pulses generated from the flow meter. 1 pulse  $\approx$  0,8 ml

Water amount 100 = about 80ml

This coffee selection in this example exist out of 140(main recipe) + 40 (sub high pressure) = 180 pluses =  $180 \times 0,8 \approx 144\text{ml}$ .

With the test button this recipe is dispensed in the service mode.



If there is also milk and sugar possible, the water amounts of milk and sugar are also added to the main recipe water amount if a black coffee is chosen.

#### Change a recipe setting:

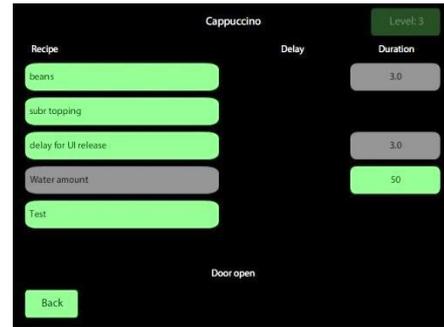
1. Select the setting you want to change by pressing the green button.
2. Enter the new value.
3. Press "Save" left under in the screen to save the new setting.



### 7.4.3 EXAMPLE: Cappuccino recipe in a bean to cup machine

Beans = the duration time the grinder grinds beans.

3.0 means a duration of 3 seconds for the grinder.



Subr topping = the recipe for topping in the cappuccino.

- 1. Topping

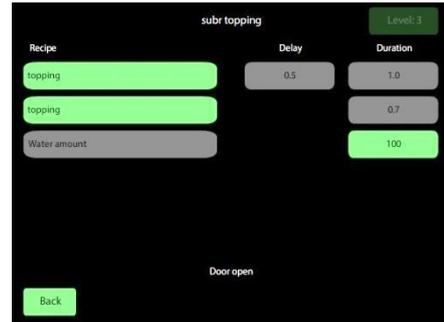
0.5 in the first column means a delay of 0.5 (so first there is water in the mixing bowl)

1.0 in the second column means a duration of 1.0 seconds for the milk powder motor.

- 2. topping

0.7 in the second column means a second topping powder dosage of 0.7 seconds after a fixed, not visible delay. (Normally this delay is 0.5 seconds)

- Water amount = 100: The amount of water dosed through the topping mixer. 100 = 100 pulses.



Delay for UI release: Delay time at the end of the consumption, to delay the moment the machine is available for the next consumption. (also the "beep" at the end of a selection is delayed)

Water amount = the amount of water dosed through the brewer.



If there is also sugar possible, the water amount of sugar is also added to the main recipe water amount if a black coffee is chosen.

#### Change a recipe setting:

1. Select the setting you want to change by pressing the green button.
2. Enter the new value.
3. Press "Save" to save the new setting.



#### 7.4.4 Sub product milk and sugar

The sub products milk and sugar have their own water and product settings.



In this example:

Delay = delay start dispensing product after start recipe = 0,5 sec.

Duration = duration auger rotates, dispensing product = 0,7 sec.

Speed = % of possible speed the auger rotates = 100%



#### 7.5 Boiler temperature

Temperature setting gives the possibility to change the desired boiler temperature.

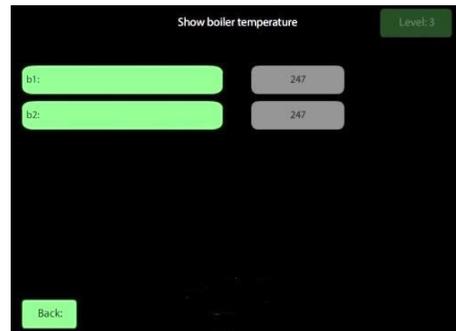
The default settings:

Boiler 1: 90 = 90°C (194°F)

Boiler 2: 92 = 92°C (197°F)



Show boiler temperature will show the actual temperature of the boilers in degrees Celsius or degrees Fahrenheit.



Boiler 2 is default set to 92°C (197°F).

This value increases slowly automatically to 98°C (207°F) in about 20 minutes idle, to compensate a cold brewing system.

As soon as a consumption is taken, the temperature setting decreases to the default 92°C.

After the consumption is taken, the sequence of slowly increasing the boiler temperature in boiler 2 is starting again.

## 7.6 Cup sensor

### Show cup sensor signal:

The signal of both sensors can be read individually.

This way the visibility of a cup can be tested also.

### Cup sensor setting:

The sensitivity of the cup sensor is adjustable. The value can be adjusted between 0 and 4000. The value 0 means switched off. In this case the machine works like there is no sensor.

A higher value means less sensitive. So for detecting a transparent or dark colored cup the value must be set low.

The default value is 100. This is the optimal value and gives the best detection for the most cup types.

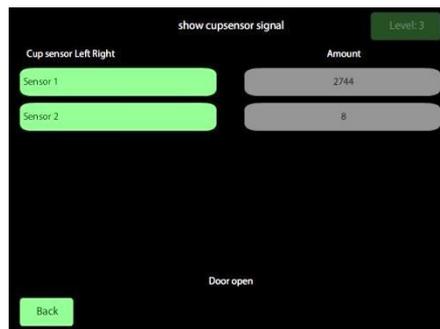
If there are two cup sensors in the machine, both are individual adjustable.

Sensor 1 = Middle sensor.

Sensor 2 = Right hand side sensor



Black cups or clear glass cups are not detectable, we advise to switch off the sensors if black cups or clear glass cups are used.



## 7.7 Language

Select the required active language.

Depending on the configuration setup, a language selection is available.

This chosen language is the default language for the user screen and the service program.

DJD is the default English factory language.



## 7.8 Payment settings

With the payment settings menu the product prices and the functions of the payment system can be set.

### - Consumption prices:

To adjust the price for all available consumptions. For each individual consumption type, 2 prices are available: Pricelist 1 and pricelist 2.

### - Free/paid vend

To set the machine in free vend or paid mode.

### - Active price list

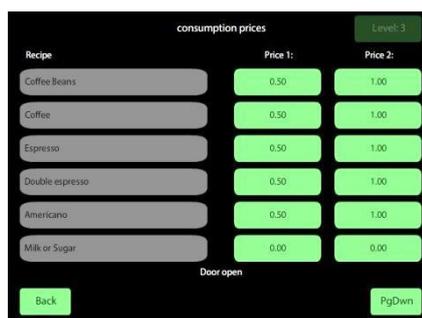
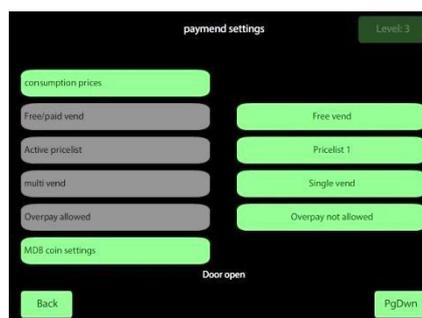
Activate the required price list.

### - Multi vend

A payment system can run in multi vend or single vend.

Multi vend means you can select more than 1 consumptions after each other. Your change or card will be returned after pressing the return button on change giver or card reader.

Single vend means you always receive your change or card direct after dispensing the consumption.



### Overpay allowed

- Overpay allowed means that it is allowed to insert more money as the highest consumption price.

Overpay not allowed means that it is not possible to insert more money as the highest consumption price.

### - MDB coin settings

The coin settings are adjustable in the software if they are set in the configuration file loaded in the machine.

### - MDB bill settings

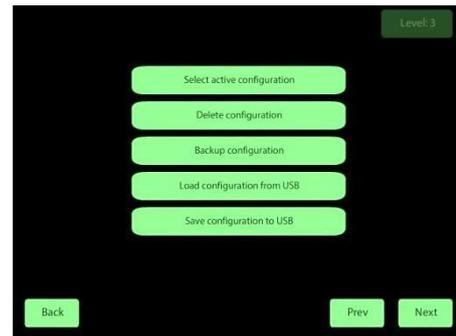
The bill settings are adjustable in the software if they are set in the configuration file loaded in the machine.



In clock/time settings (see chapter 7.11) it is possible to automatically choose between pricelists and free or paid for a certain period of time.

## 7.9 Software configurations

- **select active configuration:**  
Select the configuration file with which the machine have to work.  
 The configuration file which is currently active is in grey color, all other inactive files are in green.
- **Delete configuration:**  
Delete a configuration file.
- **Backup configuration:**  
This makes a copy of the active configuration with all settings. This saved file can be found back in the menu: "Select active configuration".  
The back-up file name exists of the original name added with an extension year, month, day and time:  
Example:  
Original file name: 8124a00.mvq  
Backup file name:  
8124a00\_1401121430.mvq  
14 = year 2014  
01 = month 01 (January)  
12 = day 12  
1430 = time 14.30
- **Load configuration from USB:**  
Standard Device 0 is available (only if a USB stick is placed)  
 It is possible to explore the maps in the stick to find the needed configuration file.  
The new loaded file from the stick is selected as active configuration automatically.
- **Save configuration to USB**  
This will save the current active file to the USB stick.



## 7.10 Load permissions

In this menu the permissions, e.g. to show images on the screen of the machine, can be loaded from an USB stick,

It is possible to explore the maps on the stick to find the needed permission file.

If the coffee machine is not configured for images, the standby images and distributing images option can be enabled on the DJD coffee machine using the following procedure.

### Load Permissions Summary:

- Check if the correct software is installed on the coffee machine.
  - MoVec ICEQ           Version: 3.40       or higher.
  - Flash file            Version: 1.7        or higher.
  - DJD software ID      Version: 4.0        or higher.
- Collect coffee machine information: (visible in software information, chapter 7.2)
  - Machine serial number
  - CM-X300 serial number
- Send coffee machine information to manufacturer.
- Receive the permission key file from manufacturer
- Load the permission key on coffee machine.

#### Note:

- A permission key can be generated for **one** coffee machine or for **multiple** coffee machines.

A detailed explanation how to do this can be found in chapter 8.3: How to get and load a permission key

## 7.11 Clock/time settings

### - Screen saver (delay) time

This is a delay time in minutes after the last consumption.

After this delay, the standby image will appear. If the time is set to 0, the standby image(s) will never show-up in the screen.

### - Set correct time

The actual date and time can be set in this menu. The correct date and time is also important for the correct timestamps in e.g. scheduler actions and EVA-DTS messages.

### - Select time zone

Select the correct time zone to enable automatic daylight saving settings and network time protocol. (NTP)

### - change scheduler actions

The following automatically actions can be set:

- Energy safe
- machine blocked.
- Switch to free vend
- Use other pricelist
- Machine off

### **Energy safe:**

With the energy safe settings, the machine can be switched to an energy safe mode during a period of time. During this action the boiler temperature drops to 65 °C.

After pressing a selection key, the machine will first heat to the normal temperature, before the machine is ready to give consumptions.

If the machine is not used for an hour the machine will go back to the energy safe mode.

### **Machine blocked:**

During this set time, the keys on the front panel are blocked and not visible for the user. No consumptions can be chosen. The boiler(s) stay hot.

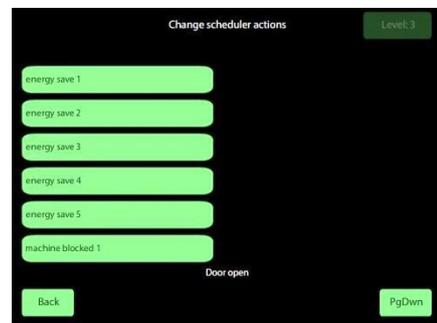
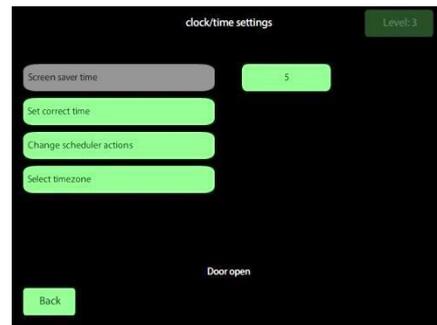
(The service mode is still working)

### **Switch to free vend.**

A machine in pay mode can be switched to free vend during the set time.

### **Use other pricelist.**

In the set time the machine will switch to the other price list.



### Machine off:

The machine is switched off during the set time. The display is completely black. The elements are switched off. During this time the machine can only be activated in the service mode.



### Setting the times in the scheduler:

The scheduler has a start time for hour, minute and day.

On the second page of each scheduled action (press PgDwn), the associated stop times must be set. (depending of the type of action)

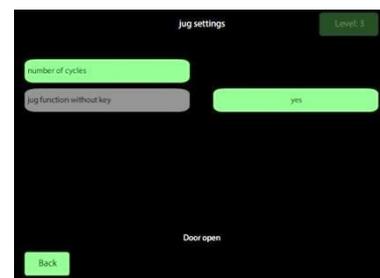


- Optional the date, month or year can be set as well. (if not used, set to 0)
- Set all the values to 0 to switch off an action in the machine.
- The value set in day, month and year must be 0 if the action is daily required. In this case only the hour (and eventually minute) must have a value greater than 0

## 7.12 Jug settings

### Number of cycles:

- Preset 1 is used for the number of cycles in the 1 JUG selection.
- Preset 2 is used for the number of cycles in the 1/2 JUG selection.
- Preset 3 is not used.



### Jug function without key.

If this is set to YES, a jug key selection button is available for the user in the main screen. If set to NO, this jug button is not visible.



## 7.13 Images

- Logo = A customer specific logo, visible in the user screen.
- Standby = an image, visible while the machine is not used. Also called screensaver.
- Distributing = an image, shown during dispense of a consumption.

Images needs to have the following file format:

.png  
.jpg  
.gif

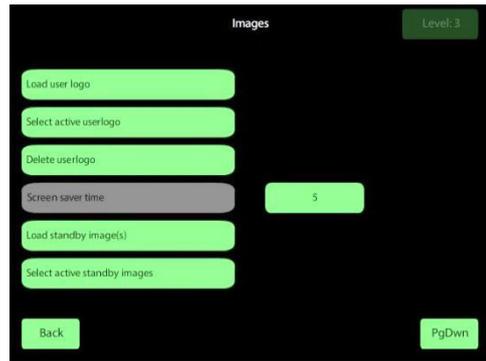
Wide x height

- Logo: 175 x 60 pixels (landscape)
- Standby: 640 x 480 pixels (landscape)
- Distributing: 600 x 350 pixels (landscape)

The maximum number of loaded images depends on the file size of the images and the available flash memory inside the machine.

The images need to have the correct pixel size for the best result.

Please note that the machine does not auto scale the images.



Possibilities:

### - Load user logo.

A user logo (or several user logo's) can be loaded via an USB stick or via "connect me".

### - Select active user logo

A logo can be selected, if more then 1 logo is available in the system memory. The logo in grey is active. Only 1 logo can be shown at the same time.



### - Delete user logo

Delete a logo from the system memory.

### - Screen saver time

See chapter 7.11 for explanation.

### - Load standby image(s)

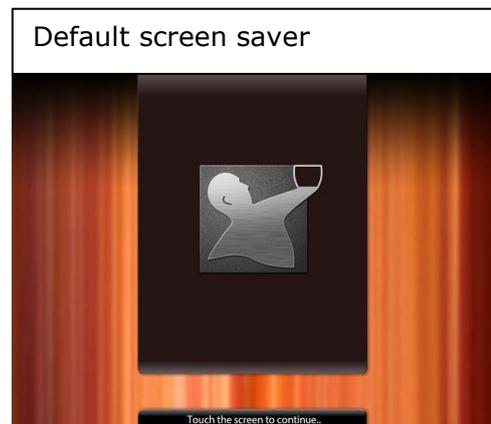
The files can be loaded via a USB stick or via "connect me".

### - Select active standby images

An image can be selected, if more then 1 is available. More then one image can be selected.

### - Set delay standby images.

The delay **between** the consecutive images can be set in seconds.



- **Delete standby images**

Delete a standby image.

- **Load distributing images**

A distributing image can be loaded via an USB stick or via "connect me". Every individual image can be connected to all consumptions (General) or to individual consumptions.

- **Select active distributing images**

One or several image(s) can be selected, if more then 1 is available.

- **Set delay distributing images**

The delay between the consecutive images can be set in seconds.

- **Delete distributing images**

Delete a distributing image.

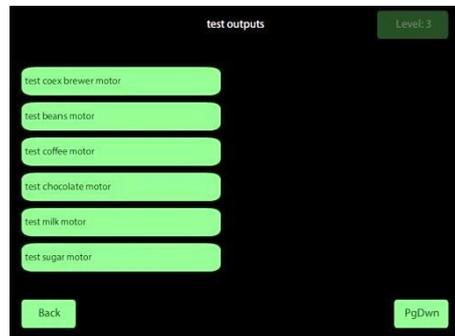
**7.14 Test outputs**

All outputs can be tested via the test output function.

Press the output you want to test and the output is activated for a few seconds.



The outputs can only be activated if the service key is placed in the door. Be aware of moving parts and hot liquid.



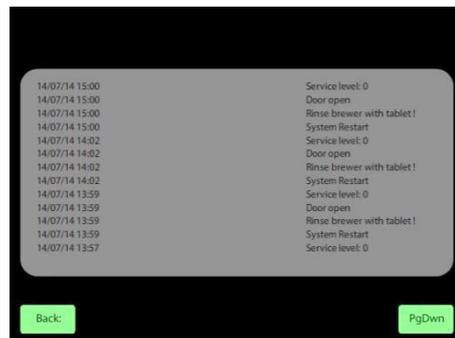
**7.15 Show error log**

Shows a log file of events, logged by the machine.

This are the EA fields of EVA-DTS.

The last 100 events are logged.

See chapter 7.22 for detailed information.



## 7.16 Error settings

This menu contains information and settings for the available warnings and errors.

Warning = message on display only.

Error = Message on display, machine (partly) out of order

### - Change error conditions.

The condition when a warning or error occurs can be adjusted with this function.

Possible settings:(depending of configuration)

- Waste bucket warning (residue cakes)
- Waste bucket error (residue cakes)
- Cleaning brewer warning (time in seconds)
- Cleaning brewer error (time in seconds)
- Water filter warning (consumptions)
- Water filter error (consumptions)

#### - Waste bucket warning

Indicates the number of cycles before the message "waste bucket full" is shown on the screen.

#### - Waste bucket error

Indicates the number of cycles before the message "Empty waste bucket" is shown on the screen. If this message is shown, the CoEx<sup>®</sup> brewer selections are blocked.

#### - Clean brewer warning

Indicates the time before the message "Rinse brewer with tablet" is shown on the screen. The time is indicated in seconds.

#### - Clean brewer error

Indicates the time before the message "Rinse brewer with tablet!" is shown on the screen. The time is indicated in seconds. If this message is shown, the CoEx<sup>®</sup> brewer selections are blocked.

#### - Water filter warning

This counter counts only the hot consumptions and rinse cycles.

Indicates the amount of consumptions going through the water filter, before the message "Replace waterfilter" is given on the screen.

#### - Water filter error

Indicates the amount of consumptions going through the water filter, before the message "Replace waterfilter!" is given on the screen.

In case of the "Replace waterfilter(!)" message, the machine keeps on working normally.

### - Read error counters

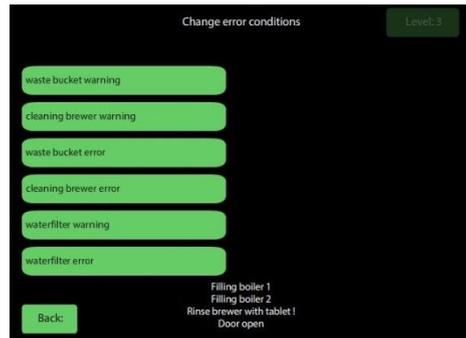
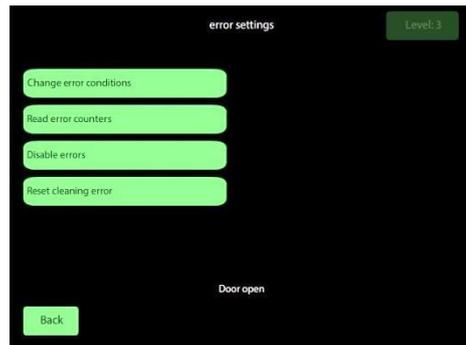
In this menu several counters can be read.

### - Disable errors

In this menu the warnings and errors can be enabled and disabled.



Both the waste bucket warning and waste bucket error needs here to be set to "not available" in case the waste is guided to a big bucket under the machine.



**- Reset cleaning error**

After pressing this button, the machine beeps, and the brewer cleaning message is cleared from the screen.



Be sure the brewer is clean, and no cleaning agent or cleaning powder is left in the brewer.

**7.17 Water filter settings**

**- No water filter installed.**

Selecting this button will switch off all messages for the water filter.

**- Water filter installed.**

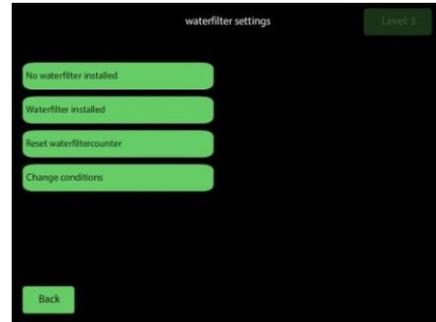
Selecting this button will activate the water filter counters. The warning and error show up after the set number of drink cycles is reached.

**- Reset water filter**

Selecting this button will reset the counter for the number of drink cycles to 0.



The service key needs to be installed to activate these settings!



**- Change conditions:**

After pressing this button, the same screen appears as after "change error conditions" in "error settings" in chapter 7.16

**7.18 Rinse**

See chapter 7.2, functions without password.

**7.19 Weakly cleaning cycle brewer**

See chapter 7.2, functions without password.

**7.20 Show product counters**

See chapter 7.2, functions without password.

**7.21 Software information**

See chapter 7.2, functions without password.



## 7.22 Show EVA-DTS

The available EVA DTS information:

	<b>Element name</b>
<b>ID100</b>	<b>Machine Identification</b>
ID101	Machine Serial Number
ID102	Machine Model Number
ID103	Machine Build Standard (operating system number)
<b>ID500</b>	<b>System Date / Time Report</b>
ID501	System Date
ID502	System Time
<b>DA100</b>	<b>Debit Card System Identification</b>
DA101	Debit Card System Serial Number
DA102	Debit Card System Model Number
DA103	Debit Card System Software Version
<b>DA200</b>	<b>Debit Card Vending Summary</b>
DA201	Value Of Card Sales Since Initialisation
DA202	Number Of Card Vends Since Initialisation
DA203	Value Of Card Sales Since Last Reset
DA204	Number Of Card Vends Since Last Reset
<b>DA400</b>	<b>Debit Card Output Summary</b>
DA401	Value Credited To Card Since Initialisation
DA402	Value Credited To Card Since Last Reset
<b>VA100</b>	<b>Vending Sales Summary - All Sources</b>
VA101	Value Of All Paid Sales Since Initialisation
VA102	Number Of All Paid Sales Since Initialisation
VA103	Value Of All Paid Sales Since Last Reset
VA104	Number Of All Paid Sales Since Last Reset
<b>VA200</b>	<b>Test Vend Summary</b>
VA201	Test Vend Value Of Sales Since Initialisation
VA202	Number Of Test Vends Since Initialisation
VA203	Test Vend Value Of Sales Since Last Reset
VA204	Number Of Test Vends Since Last Reset
<b>VA300</b>	<b>Free Vend Summary</b>
VA301	Free Vend Value Of Sales Since Initialisation
VA302	Number Of Free Vends Since Initialisation
VA303	Free Vend Value Of Sales Since Last Reset
VA304	Number Of Free Vends Since Last Reset
<b>CA100</b>	<b>Coin Mechanism Identification</b>
CA101	Coin Mechanism Serial Number
CA102	Coin Mechanism Model Number
CA103	Coin Mechanism Software Revision
<b>CA200</b>	<b>Cash Sales Vending Summary</b>
CA201	Value Of Cash Sales Since Initialization
CA202	Number Of Cash Vends Since Initialization
CA203	Value Of Cash Sales Since Last Reset
CA204	Number Of Cash Vends Since Last Reset
<b>CA300</b>	<b>Cash Input Summary</b>
CA301	Value Of Cash IN Since Last Reset
CA302	Value Of Cash To Cash Box Since Last Reset
CA303	Value Of Cash To Tubes Since Last Reset
CA305	Value Of Cash IN Since Initialization
CA306	Value Of Cash To Cash Box Since Initialization
CA307	Value Of Cash To Tubes Since Initialization
<b>CA400</b>	<b>Cash Output Summary</b>
CA401	Value Of Cash Dispensed Since Last Reset
CA402	Value Of Cash Manually Dispensed Since Last Reset
CA403	Value Of Cash Dispensed Since Initialization
CA404	Value Of Cash Manually Dispensed Since Initialization
<b>CA700</b>	<b>Cash Discounts</b>
CA701	Value Of Discounts Given (vend price - price paid = discount value) Since Last Reset
CA702	Value Of Discounts Given (vend price - price paid = discount value) Since Initialization
<b>CA800</b>	<b>Cash Overpay Summary</b>
CA801	Value Of Cash Overpay Since Last Reset
CA802	Value Of Cash Overpay Since Initialization

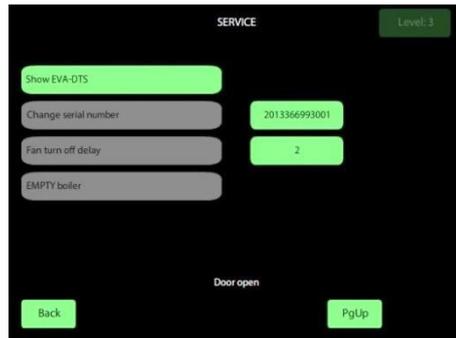
<b>CA1000</b>	<b>Manual Cash Filling Summary</b>
CA1001	Value Of Cash Filled Since Last Reset
CA1002	Value Of Cash Filled Since Initialization
<b>CA1500</b>	<b>Value of Tube Contents</b>
CA1501	Value of all coins stored in all tubes of the change giver
<b>TA200</b>	<b>Token Sales Summary</b>
TA201	Value of Vend Token Sales Since Initialization
TA202	Number of Vend Token Sales Since Initialization
TA203	Value of Vend Token Sales Since Last Reset
TA204	Number of Vend Token Sales Since Last Reset
TA205	Value of Value Token Sales Since Initialization
TA206	Number of Value Token Sales Since Initialization
TA207	Value of Value Token Sales Since Last Reset
TA208	Number of Value Token Sales Since Last Reset
<b>PA100</b>	<b>Product Identification</b>
PA101	Product Number
PA102	Product Price
PA103	Product Identification
	* Vended Cups = 999
<b>PA200</b>	<b>Sales Vends By Product</b>
PA201	Number Of Products Vended Since Initialization
PA202	Value Of Paid Product Sales Since Initialization
PA203	Number Of Products Vended Since Last Reset
PA204	Value of paid products sales since last reset
	* Vended Cups = 999
<b>PA400</b>	<b>Free Vends By Product</b>
PA401	Number Of Free Vends Since Initialization
PA402	Value Of Free Vends Since Initialization
PA403	Number Of Free Vends Since Last Reset
PA404	Value of free vends since last reset
	* Vended Cups = 999
<b>PP100</b>	<b>Pre-selections (additives, e.g. sweetener, creamer, etc.)</b>
PP101	Pre selection number
PP102	Pre selection price
PP103	Identification (e.g. Sugar Coffee; Creamer for Tea)
PP104	Incremental price for each step
PP105	Number of times this additive has been chosen Since Initialization
PP106	Value of this additive that has been chosen Since Initialization
PP107	Number of times this additive has been chosen Since Last Reset
PP108	Value of this additive that has been chosen Since Last Reset
<b>SA200</b>	<b>Ingredient counters (grams dispensed)</b>
SA201	Ingredient name
SA202	Quantity of dispensed ingredient Since Initialization (in grams)
SA203	Quantity of dispensed ingredient Since Last Reset (in grams)
<b>EA100</b>	<b>Event</b>
EA101	Event Identification
EA102	Date of Event Occurrence
EA103	Time of Event Occurrence
EA104	Duration of the Event (MM)
<b>EA300</b>	<b>Standard Interrogation Summary</b>
EA301	Number Of Reads Since Initialization
EA302	Date Of This Read Out
EA303	Time Of This Read Out
EA304	This Terminal / Interrogator Identification

### 7.23 Change the serial number

The machine serial number must be entered here.

The serial number of the machine is printed on the CE type plate of the machine.

The serial number is used if you use the EVA-DTS function to readout data from the machine and for "connect me" functions.



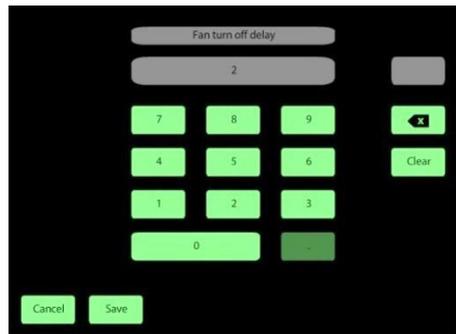
### 7.24 Fan turn off delay

The fan will run the set time after the last consumption.

Time is set in minutes.

If the time is set to 0, the fan stops immediately after the consumption is finished.

If the time is set to 99, the fan will run continuously.



## 7.25 Empty boiler



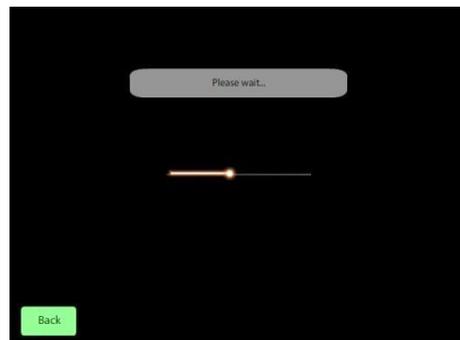
Take care, possible hot water comes out of the boilers.

In case the machine needs to be stored for a longer time, or needs to be transported (freezing weather, plane) the internal hoses and boilers needs to be emptied. The boilers are emptied due to gravity.

Procedure:

- Remove the power cord from the wall socket.
  - Remove the back cover plate from the machine.
  - Remove the stop from the metal elbow or T coupling right after the pump(s). (see picture)
  - Connect a 6 mm hose to the elbow.
  - Be sure the outlet of this hose is lower then the inlet valve of the machine.
- 
- Put the power cord back in the wall socket.
  - Go into the service program and select: Empty boiler
  - The pumps will run for a short time, the 3-way valve opens to ad air to the system and slowly all water runs out of the boiler and hoses.

Part number stop: 5MPF007  
6 mm hose: 4XSL035



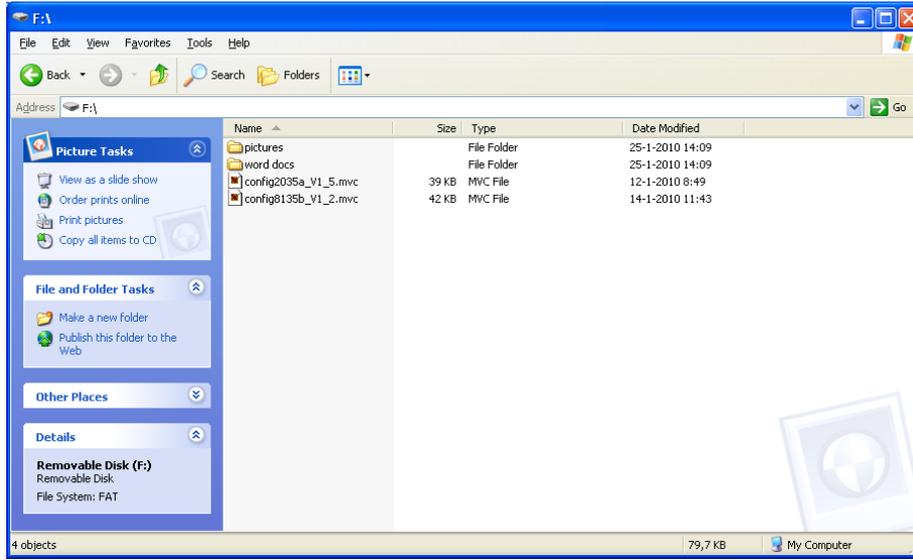
## 8 How to do

### 8.1 How to load a new configuration file from an USB stick?

The MoVeC files have the extension .mvq

1. Copy the new file to a USB stick.

Example files on USB:



2. Insert the USB stick in the USB port of the machine. (inside the door)
3. Wait for about half a minute, the machine must see the stick first.
4. Access the service mode on the machine and select the service menu: 7.9 Software configurations.
5. Select the option: Load configuration from USB
6. Select the available device. (most of the times: Device 0)
7. Select the needed configuration on the USB stick.  
The selected configuration is now loaded and automatically started.
8. Remove USB stick.
9. Ready.

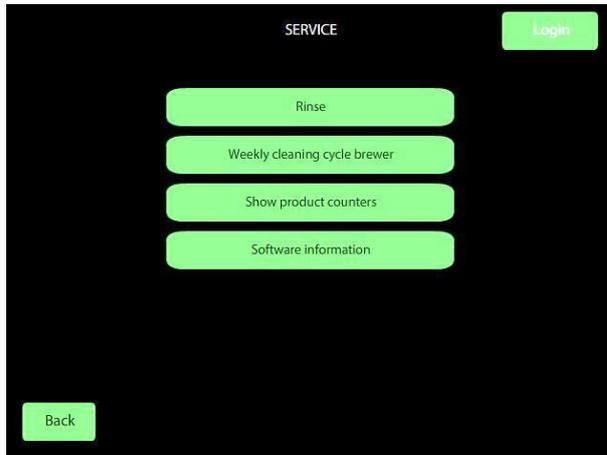
## **8.2 How to load a new flash(SWF) or MoVec ICEQ file from USB**

Upload the MoVeC ICEQ Linux and swf software to the machine:

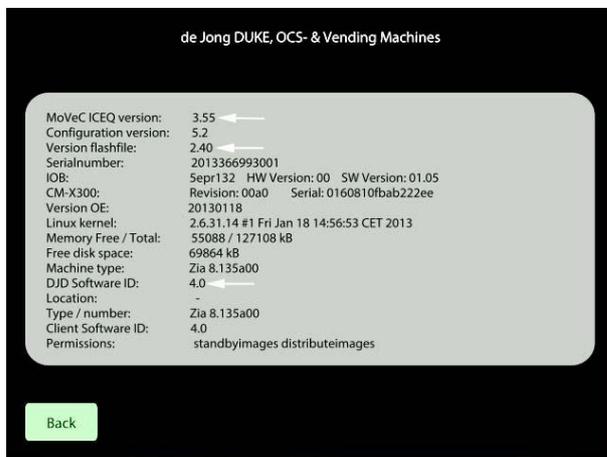
1. Copy the new files to a USB stick. The files must be placed in the root directory.
2. Insert the USB stick in the USB port of a working machine. (inside the door)
3. The machine will recognize the files and upload these automatically.  
The procedure takes max 60 seconds; the machine is blocked for this period.  
After these 60 seconds the machine will restart.  
After the restart the machine will automatically use the new files.
5. Remove USB stick.
6. Ready.

### 8.3 How to get and load a permission key

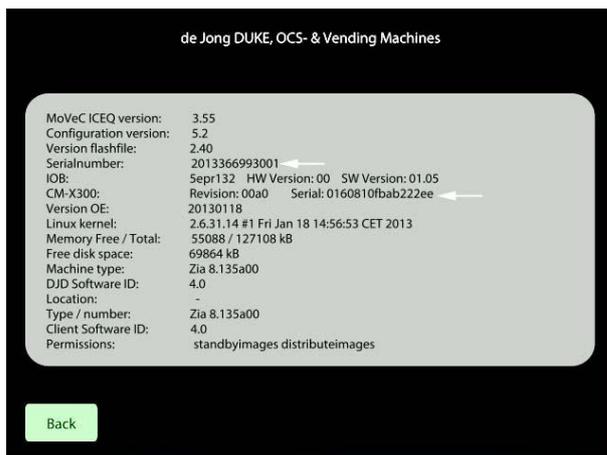
#### Collecting coffee machine information:



1. Open the front door of the machine.
2. The service menu is shown on the screen.
3. Select "Software information" button on the touchscreen.



4. Software information screen is shown.
5. Check if the correct software versions are installed:
  - MoVeC ICEQ version :3.40 or higher
  - Version flash file :1.7 or higher
  - DJD software ID :4.0 or higher



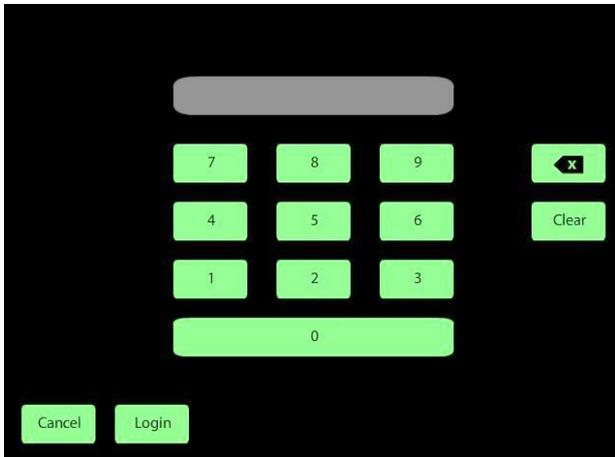
6. Within the software information screen, locate the line: CM-X300
7. **Write down the entire CM-X300 serial number.** The number is 16 characters long and case sensitive. Note: If the CM-X300 serial number is incorrect, the received permission key will not work.
8. Write also down the complete machine serial number. This machine serial number is 13 character long. (The machine serial number can also be found on the CE sticker inside the machine)



Send the CM-X300 serial number and the coffee machine serial number to the manufacturer. You need to receive back a key.mpf file from the manufacturer.

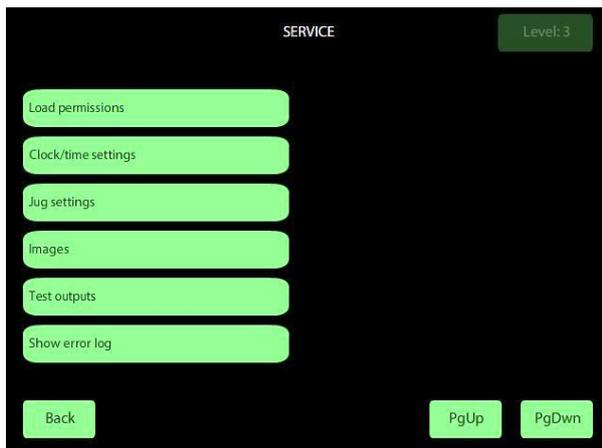
## Load the Permissions:

Follow the procedure below to load and activate the permission key on the DJD coffee machine(s).



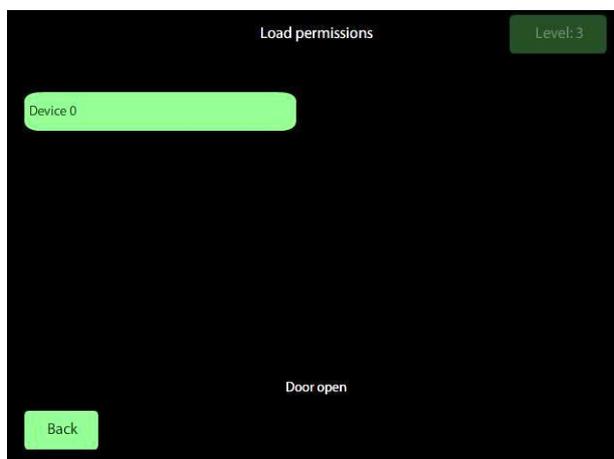
1. Connect a USB memory stick to a working PC.
2. Copy the received "Key.mpf" file to the USB memory stick:  
Place the Key.mpf file directly in the root directory of the USB stick for ease of uploading.
3. Open the front door of the coffee machine.
4. Place the prepared USB memory stick in the USB port at the inside of the front door. Wait for half a minute for recognizing the USB stick.
5. The service menu is shown on the display.
6. Select the "login" button.
7. Enter the code with the number buttons
8. Default code for service technicians is: 4444
9. Select the login button down left to enter the service menu.

## Load the Permissions:



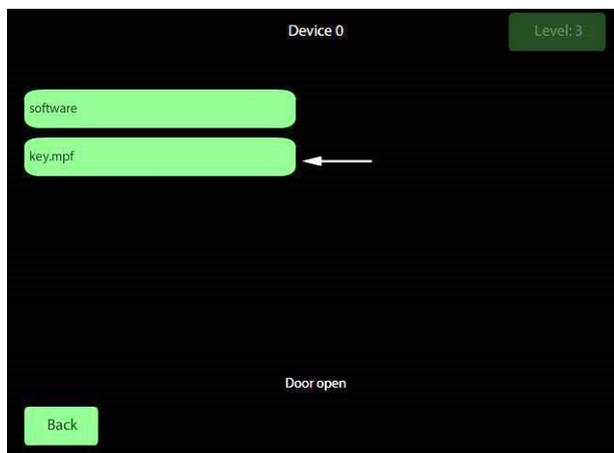
10. Select the "PgDwn" or "PgUp" button until the button "load permissions" appears.

11. Select the "load permissions" button.



12. Select the "device 0" button.

(device0 = USB Memory stick inside door)



13. Select the file "xxx\_key\_xx.mpf" button. (May need to browse based on saved location of key file.)

14. The file is loaded.

15. The beep indicates the key has been loaded correctly.

16. To finalize the activation, exit the service menu via the "back" button and remove the USB stick.

## Load the Permissions:



17. Close the door and select the “close door and press here to quit service” button to exit the service menu.

18. The coffee machine starts up again.



19. When the normal operation screen is displayed, the coffee machine is ready for normal use.

20. Log in to the service menu to set the distributing and standby images. (see chapter 7.13: Images.)

## 9 Warning, failure and error messages

### Brewer not in home position

The micro switch did not detect the brewer home position on the required moment.

- Check if the brewer is installed correctly. Remove and replace the brewer following the procedure.
- Check if the micro leveler is bend.
- Check if the motor shaft is broken.
- Check if the brewer is blocked and cannot run.

### Cleaning Error

The weekly CoEx® brewer cleaning cycle did not finish correctly.

- Run the cleaning cycle again and finish it correctly.

Note: It is possible to clear this message in the service program.

See chapter 7.16

### Clean the milk system

The daily cleaning cycle is required.

- Run the cleaning cycle and the message will disappear. The cleaning cycle reset the number of cycles.

### Communication error

Communication between control board and IO board is not correct.

- Check the cable between the boards on damage.
- A bad connection on control or IO board can generate this message.

### Door open

- Close the door or install the service key in the door to run the machine.

### Drip tray full

- Empty the drip tray in front of machine and under the brewer; make sure the probes are dry.

### Empty waste bucket / Waste bucket full

The number of cycles is reached to generate the message, waste bucket is full.

- Empty the waste bucket.  
This message and counter are reset by activating the micro switch behind the waste bucket for at least 3 seconds. (remove the waste bucket for at least 3 seconds.)

### Enough water?

The dispensed drink did not reach the adjusted amount of water (pulses measured by water flow meter) in time.

- If it concerns a drink from the brewer, the filter screens can be dirty. Run the weekly cleaning cycle with a cleaning tablet and clean the filter screens.
- Check the main water supply, inlet valve.
- Check the valve(s)
- Check pump(s).
- Check if the water flow meter is connected and working correctly.

#### Filling boiler 1/2

Open and close the machine door for restart, wait until boiler is filled.

If message continues:

- Check if main water is connected and available.
- Check if inlet valve and pumps works.
- Check water system in machine

#### Grinder 1/2 blocked

A too high current is detected on the output for the grinder.

- Grinder is blocked and needs to be cleaned. (hard particle is trapped between the grinder blades)

#### Heating boiler 1 / WAIT, Heating boiler 2

Wait until boiler is heated.

- If message is still shown after 10 minutes, check the clixon(s) and heating element.

#### Install drip tray

External drip tray is not detected.

- Install drip tray
- Check contacts on drip tray, clean contacts on drip tray and in machine. (can be dirty, corroded)

#### Install waste bucket

The micro switch behind the waste bucket does not detect the waste bucket.

- Install the waste bucket in the machine.

#### Mixer 1/2 blocked

A too high current is detected on the output of the mixer motor.

- Clean the mixing bowl, check the motor.
- Check recipes, no dry powder should drop in the mixing bowl.

#### No water connected

No water detected for more then 30 seconds.

- Open and close the machine door for restart.
- Check water supply from the mains
- Check inlet valve, pressure reducer and water flow meter.

#### Place cup in center / Place cup right

- Cup needs to be installed on the grid in the right position before the start button is available.

Note: The sensitivity of the sensor is adjustable.

#### Replace water filter

- The counter has reached the number of cycles, new filter needs to be installed and reset counter. Chapter 7.17

#### Rinse brewer with tablet

The weekly cleaning cycle is required, the number of cycles is detected.

- Run the cleaning cycle and the message will disappear. The cleaning cycle reset the number of cycles.

#### Shortcut temp. sensor 1 / 2

- A short cut is detected on the input of the temp. sensor.
- Temperature probe is broken, or a shortcut in wiring.

### Startup problem

The amount of pulses for the water flow meter during start-up is not reached in time.

- Open and close the machine door for restart.
- If message shows again, check the expansion valve, 2 bar valve, pumps, water inlet from mains and inlet valve.
- Check water flow meter.

### Temp. sensor 1 / 2 disconnected

- A too high resistance is detected on the input of the IO board.
- Temperature probe is broken, or wiring is loose.

### Temp. boiler 1 / 2 too high

A temperature of 10 degrees more as the adjusted temperature is detected.

- Check if heater is broken and keeps heating.
- Check temperature setting.
- Check temperature probe.
- Check wiring loose/bad contact.
- Check the boilers are correct connected, don't switch the wires for boiler one with boiler two.

### Water filter installed?

- In service mode the correct selection needs to be made.

### Water level 1 / 2 too low

No water level is detected by the level probe in the boiler.

- Check level sensor
- Check if wire from probe is connected to the cable loom.
- Check if the ground is connected to the boiler.
- Check if the boiler is leaking water due to leakage or wrong connected valve.



