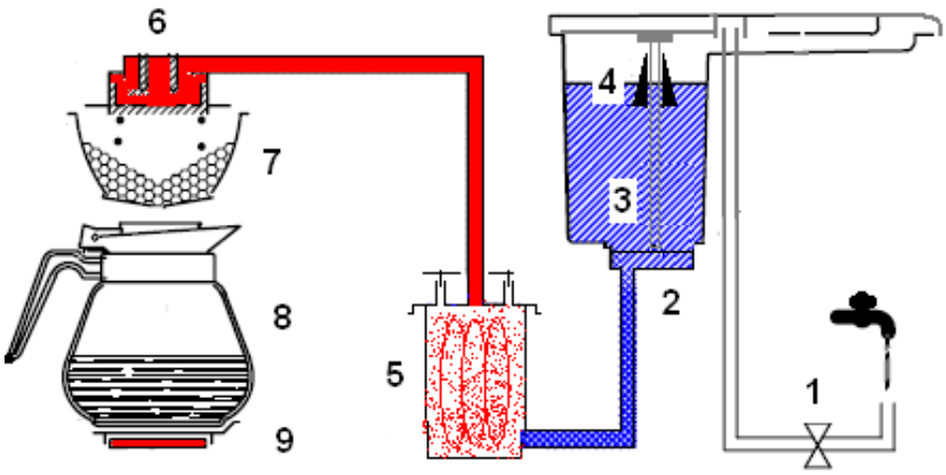
1. OPERATING PRINCIPLE MATIC



1.1 General operation

Cold water is evaporated using a throughflow element and distributed over the filter basket, which is filled with coffee, via the spray head. The coffee is collected in a glass jug and kept at temperature by a PTC element.

1.2 Water dosage system.

1.2.1 First use (calibration)

On the first use of a Matic Snelfilter there is only the selection of a whole jug.

There are 2 reasons for this:

- Every quick filter appliance must always be flushed before first use.
- This appliance is fitted with a linear float. For good dosing accuracy it is important that this float system is calibrated once.

Flushing/calibration:

- Press the ON/OFF pushbutton.
- Machine emits an audible signal and the illumination light goes on for one second.
- The ON/OFF pushbutton and the $^1/_1$ whole jug pushbutton stay lit.
- The lower warming plate is switched on.
- Press the $^1/_1$ pushbutton.
- A signal sounds and the pushbutton for a whole jug starts flashing.
- The appliance starts a coffee–setting cycle for approx. 1.6 litres of water.
- Immediately after evaporating 1.6 litres of water the coffee ready signal sounds (3 short acoustic signals).
- The pushbutton for a whole jug stops flashing.
- The ON/OFF, $^1/_4$, $^1/_2$ and $^1/_1$ pushbuttons light.
- The appliance is now ready for use.

Please note:

– At the end of the calibration process there is no drip time.

1.2.2 Initialisation

- Press the ON/OFF pushbutton.
- Machine emits an audible signal and the illumination light goes on for one second.
- The machine is ready for use.

1.2.3 Filling

The quick filter works on the basis of the throughflow principle. The throughflow system consists of the following main components:

1. Magnetic valve
2. Cold water reservoir
3. Linear float (shaft)
4. Linear float (float)
5. Throughflow element
6. Spray head with electrodes
7. Filter basket
8. Jug
9. PTC element

When the machine is switched on for the first time, the cold water reservoir will be empty and the linear float at the lowermost position.

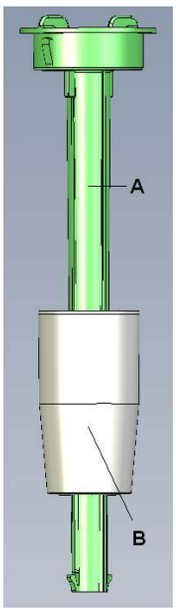
- When a full jug is selected, the magnetic valve is opened and the cold water reservoir is filled at a speed of 2 litres per minute.
- The water in the cold water reservoir flows to the throughflow boiler.

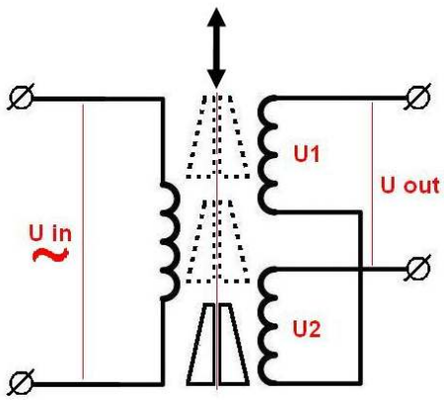
- When the position of the linear float has reached the preset value the magnetic valve switches off.

1.2.3.1 Quick filter level measurement with connection to the water supply

A so–called linear float is used to determine the right amount of water. This float (see the figure below) consists of a:

A. Float pin with 3 positioning coils (static part)
B. Movable float containing a metal core (dynamic part).





By applying an alternating current to the centre coil (**U in**) an output voltage (**U out**) is created between the two outer coils. This output voltage depends on the position of the float. See the schematic above.

Because the float moves with water level in the cold water reservoir, the software is able to convert this output voltage into an amount of water.

The adjoining schematics show the output voltage in the situation in which the float is in the lower, middle, and upper position respectively. In fact, the float can be anywhere between the top and bottom position

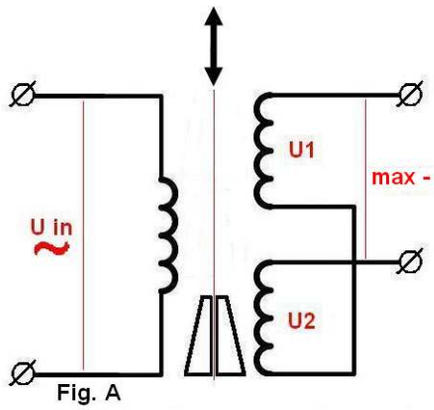


Fig. A

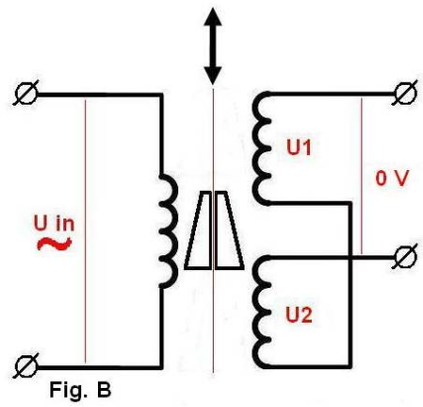


Fig. B

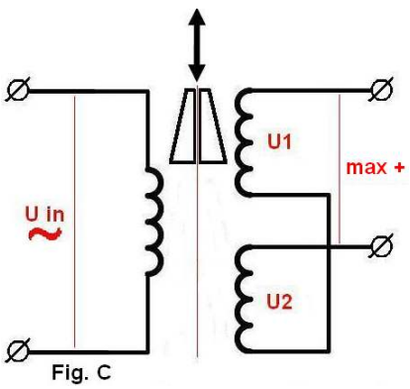


Fig. C

1.2.4 Heating

The water in the throughflow element is evaporated via the spray head to the filter basket. The element switches off when the linear float in the cold water reservoir is back in its lowermost position again. After the element has been switched off, the light in the switch will be lit continuously. 70 Sec. then the light in the switch switches off and a signal sounds 3 times.

1.2.5 Extraction

The water in the filter basket drains through the coffee and the filter paper. A filter basket spring on the bottom of the filter basket prevents the filter paper sticking to the bottom and the coffee not being able to flow to the outlet.

1.2.6 Descaling indication

Depending on the use and water hardness, in the course of time scale forms in the spray head. The more scale accumulates here, the slower the water flows out of the spray basin. If the electrodes in the spray head still make contact with the water 12 seconds after the heating has been switched off, the descaling lamp starts flashing. If the machine is descaled, the level of the water lowers fast enough again in the spray basin and the descaling lamp will no longer flash.

1.3 Temperature holding system

The warming plate consists of an aluminium part with a PTC element (Positive Temperature Coefficient) underneath it. This PTC element is constructed from a number of ceramic beads. The electrical resistance of these beads is determined by the surface temperature. Depending on the temperature in de coffee jug on the warming plate, less or more power is fed through the PTC element. In this way the coffee stays at the right holding temperature regardless of the quantity.

1.4 Operating system

1.4.1 Keyboard

The keyboard is located behind the control panel at the front of the machine. On this keyboard are the illuminated pushbuttons, seven–segment display and indicator lamps. The programmable settings are stored in the keyboard. When this circuit board is replaced, the customer–specific settings will be lost.

1.4.2 Main board

The main board is located at the rear inside the machine and is fitted with various electronics for controlling the machine. The supply for the keyboard is controlled from the main board.

1.5 Hardware protections

The machine is equipped with a number of hardware protections. These protections ensure that no dangerous situations can occur in the appliance.

1.5.1 Overflow protection

This protection is located in the cold water reservoir and ensures that, if the water becomes too high, excess water is passed through an overflow hose at the bottom of the machine.

1.5.2 Back–flow protection

The water coming from the magnetic valve sprays against the cover of the cold water reservoir and then flows into the cold water reservoir. This construction prevents water being able to flow back from the system to the water supply if the water pressure drops.

1.5.3 Boiling–dry protection

The boiling–dry protection consists of two thermal protections (klixons) on the cover of the throughflow boiler. These protections are connected in series with the element supply cables. If, as the result of a fault, the throughflow boiler is not switched off, the cover will become warmer than 100°C. One klixon interrupts one supply element cable if the temperature of the cover rises above 110°C and thus prevents the element boiling dry. This klixon reset automatically when the cover has cooled down enough. The second klixon interrupts the other supply cable if the temperature on the cover rises above 140°C. This klixon must be reset manually.

1.6 Software protection

The software continually monitors all the inputs and outputs of the machine throughout the whole process. If situations arise that are not allowed, the software intervenes. This intervention results in the machine being switched off and an error message being displayed in the seven–segment display.

1.6.1 Error codes

Error 6 – Filling process takes too long:

If the magnetic valve is on for longer than 120 seconds, it is switched off and E6 appears on the display.

Error 11 – Coffee–setting process takes too long:

If no drop in the linear float is measured during the coffee–setting process, the element is switched off and E11 appears in the display

Error 12 – Communication problem between the control and the linear float:

If no communication is possible between the control and the linear float, the machine switches off and E12 appears in the display

1.7 Programming

1.7.1 Setting the water quantity

- Switch the machine off.
- Simultaneously press the $^1/_4$ pushbutton and the $^1/_1$ pushbutton for 5 seconds.
- A signal sounds and the text “P1” appears on the display for 3 seconds, followed by the set value in litres (16=1.6 litres).
- The $^1/_4$ and $^1/_1$ pushbuttons start flashing and the ON/OFF pushbutton lights.
- Press the $^1/_4$ pushbutton for less water or the $^1/_1$ pushbutton for more water. For each step the change is 100 cc.
- The new value set is shown on the display. The value can be set between 1.0 and 2.4 litres.
- Store the new value by pressing the ON/OFF pushbutton or wait 20 seconds to not store the set value

1.7.2 Reading out the number of litres used

- Switch the machine off.
- Simultaneously press the $^1/_4$ and the $^1/_2$ pushbuttons for 5 seconds.
- A signal sounds and on the display the text “to” is displayed for 3 seconds. Then the number of litres used scrolls past. For example, 850 litres gives a flashing 8 first, then a 5 and finally a 0.
- Then the machine switches back to normal operating mode.

Please note:

– The maximum quantity that can be displayed is 65535 litres.

1.8 Using the machine

- Press the ON/OFF pushbutton to switch the machine on.
- Press the $^1/_4$, $^1/_2$ or $^1/_1$ pushbutton to start the coffee–making process.
- A signal sounds and the magnetic valve opens.
- When the linear float indicates that the water is at the right level, the magnetic valve switches off and the element switches on.
- The water is evaporated via the spray head to the filter basket.
- When the linear float is at the lowermost position, the cold water reservoir is empty and the element switches off.
- 75 Seconds after the element has been switched off, a signal sounds 3 times and the illumination of the $^1/_4$, $^1/_2$ or $^1/_1$ goes out.
- The machine has finished the coffee–setting process.

When the float has reached the lowest level, this process is repeated until the container is full or the required quantity has been reached.