touchpad and Bastone versions

Installation and user manual Mirage

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Parts identification

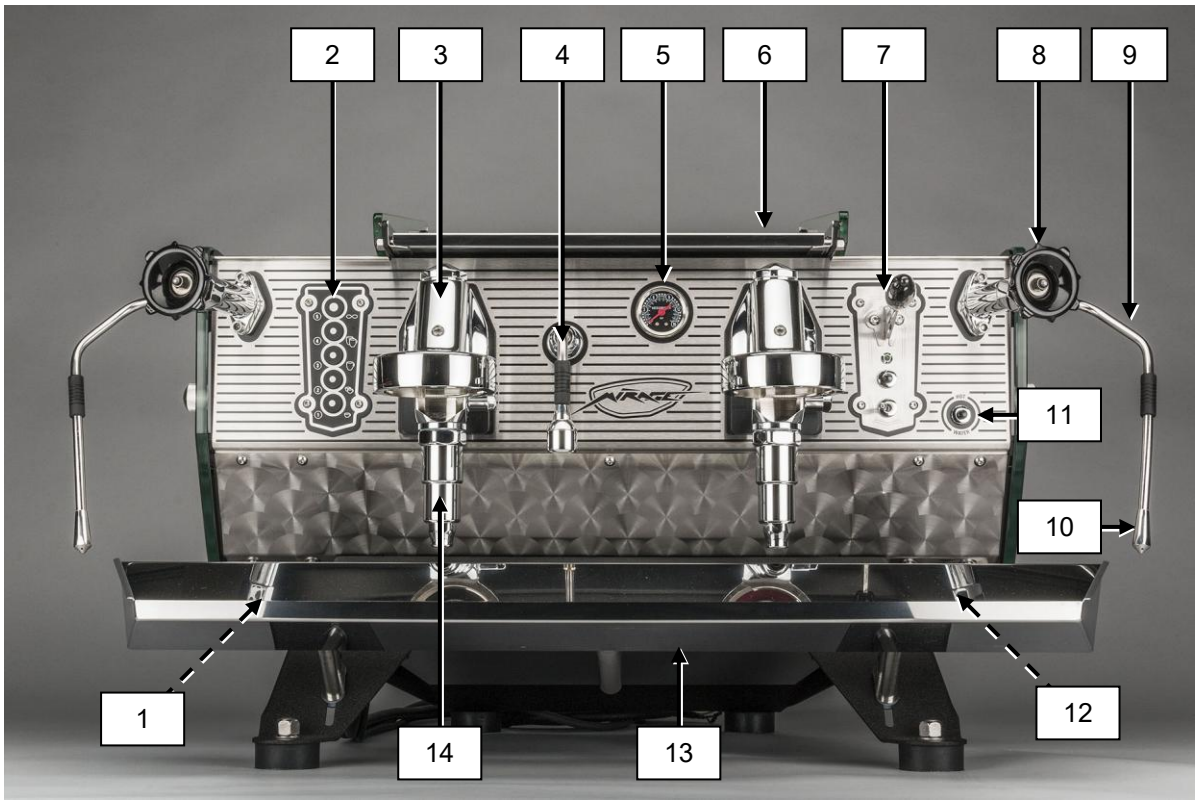


Figure W 1. Showing main operational parts of the Mirage Duette equipped with optional pre-infusion cylinders. Special show model with touchpad operation for the left group and Bastone operation for the right group. The Mirage Triplette is wider since it has an extra group in between the two groups shown here but its function is identical to a Duette.

1. Mains switch, heating element indicator light(s) and fuse(s) (not visible on photo)
2. Touchpad group 1
3. Group head 1
4. Hot water spout
5. Pump pressure gauge
6. Cup-warming tray
7. Bastone unit group 2
8. Steam valve
9. Steam wand
10. Steam tip
11. Hot water switch
12. Temperature controller (not visible on photo)
13. Drip tray
14. Progressive pre-infusion cylinder (optional)

Notice

Filled with water, a Mirage espresso machine has a large mass and produces heat. Space in the immediate surrounding should be available for coffee grinder, knock-box, tamper and other accessories. The pump and water treatment (not included) should be placed in the proximity of the machine. Water supply and discharge, as well as an AC socket with earth connection is needed. The location of your Mirage should account for these.

	Duette		Triplette	
Dimensions	cm	inch	cm	inch
Height	52	20.5	52	20.5
Depth	67	26.4	67	26.4
Width of body	73	28.7	92	36.2
Width including steam wands	91	35.8	110	43.3
Footprint	cm	inch	cm	inch
Depth	50	19.7	50	19.7
Width, operator side	55	21.7	74	29.1
Width, rear side	32	12.6	52	20.5
Max. power consumption	kW	Amp (230 VAC)	kW	Amp (230 VAC)
Single phase	3.6	15.7		N.A.
Three-phase	5.1	22.2	6.4	27.8
Single phase, high power	5.1	22.2	6.4	27.8
Volume capacity	litre	US	litre	US
Steam boiler	12.6	3.3 gals	18.8	4.9 gals
Heat exchanger (each)	0.45	15.2 fl oz	0.45	15.2 fl oz
Weight (appr.)	kg	pounds	kg	pounds
Machine empty	65	145	80	175
Machine filled	75	165	95	210
Pump with motor	5.3	12	5.3	12

Table W 1. List of main characteristics of the Mirage.

Water quality

Since water content in an espresso is more than 90%, the quality of your water supply is highly important for the taste of your coffee. While too much mineral content will hasten damaging lime scale build-up inside your Mirage, an absence of minerals will give your espresso a flat taste while also harming the boilers inside the machine. As a rule of thumb, the amount of total dissolved solids (TDS) in your water should be 100-150 mg/l (=ppm).

We recommend that you contact your water company for details about your water quality and have a water expert with knowledge of (local) water quality in espresso-machines help you to determine a suitable water-treatment system. Below some guiding principles.

Hard water treated with an ion exchange water softener only has calcium replaced, and so it is wise to further treat your water with an activated carbon or a carbon block water filter. These carbon filters also remove other impurities that affect taste, but, on their own, are not able to remove water hardness. Calcium and magnesium in the form of carbonates dissolved in water are the two most common minerals that make water "hard". It is recommended that water hardness is 2-4 German degrees (35-70 mg/l Ca/Mg carbonate). The water treatment system hooked up to your machine should establish these values.

The acidity (pH-value) of your water should be close to neutral (pH=7). A lower value (pH < 6.5) will make your espresso start to taste acidic and is corrosive to the metal parts in your machine. A higher value (pH > 7.5) results in bland tasting brews although it can also neutralise slightly acidic coffee grinds. You are advised to check the acidity of your water every once in a while.

Chlorine should not be present in your water since it has a highly corrosive effect on all metal parts (copper, brass and even stainless steel) inside your machine and makes your espresso smell and taste awful. Chlorine treated water should therefore not be used in your machine unless chlorine is removed from the water after the chlorine treatment (e.g. by use of an activated carbon or a carbon block water filter).

Water Quality Parameter	Target	Acceptable range
Odor	Clean/Fresh, odor free	
Color	Clear	
Chlorine	0 mg/l	
TDS	150 mg/l	75-250 mg/l
Calcium Hardness	51 to 68 mg/l	17 to 85 mg/l
Total Alkalinity	40 mg/l	at or near mg/l
pH	7.0	6.5 to 7.5
Sodium	10 mg/l	at or near 10 mg/l

Table W 2. Water properties for optimum taste. Source: SCAA Technical Standards Committee, 2009.

Any installed water treatment system should take the above into account and also prevent coarse particles and aggressive components to enter the machine. We do not favour the use of de-scaling agents in our machines and therefore recommend that the function of the water treatment system is checked regularly. Not only changes in Alkalinity and Hardness of water, but also temperature have dramatic effects on scale deposits and/or aggressiveness of water on the machine thus no single water is optimal for both steam- and coffee boiler. We favour scale deposit over corrosion and advice the use of the higher hardness value shown in the table below. Flushing the steam boiler will help to reduce scale deposit in the steam boiler. Drawing lots of hot water reduces the scale-forming induced by steaming due to removal of pure water.

°C	Alkalinity (mg/l)											
↓	33	37	40	43	47	50	53	57	60	63	67	70
90	342	250	202	166	130	110	93	77	67	59	51	46
95	280	205	166	136	106	90	77	63	55	49	42	38
115	130	95	77	63	49	42	37	31	27	24	21	19
120	108	79	63	52	41	36	31	26	23	21	18	16
125	89	65	53	43	35	30	26	22	20	18	15	14
130	75	55	44	37	30	26	22	19	17	15	13	12

Table W 3. Maximum non-scaling Hardness (mg/l) by temperature and Alkalinity. With an Alkalinity of 50, ideal hardness would be about 100 mg/l for the coffee boiler (90-95 degrees) and about 30 mg/l for the steam boiler (125 degrees). We advise to use 100 mg/l hardness at 50 mg/l Alkalinity. Source: Jim Schulman's Insanely Long Water FAQ.

For comprehensive information about water in espresso machines we refer to: *Jim Schulman's Insanely Long Water FAQ, Originally Posted on alt.coffee.*

Note on this manual

Work on the Mirage manual (touchpad version) is a continuing process. Photographs in the manual are taken in the shop from machines being built or from parts available, they range from 2012 to 2015. For that reason, body panels and/or parts from the machines on display may be missing and parts in the machine you bought some time ago may not look identical to the parts shown in the manual. Over time, sections are added and/or improved, sometimes as result of readers making comments. If you have suggestions for improvements, do not hesitate to send them to: support@keesvanderwesten.com.

Precaution

Installation of and maintenance on the Mirage should be done by a qualified technician. Parts of the machine can reach a temperature of close to 130 °C (266 °F). The steam/hot water boiler contains water and pressurised steam of 125 °C at 1.4 Bar overpressure (258 °F at 20 PSI), temperature and pressure in the coffee system reaches up to 96 °C at 12 Bar overpressure (205 °F at 175 PSI).

Danger

We cannot be held responsible for damage and/or injuries resulting from actions performed on our machines by non-qualified personnel.

Parts included in standard shipment

- Mirage espresso machine
- Water pump with electric motor
- Two high-pressure water supply hoses, each 1.5 m (5 ft)
- Discharge hose, inner diameter 20 mm (0.8 inch) with stainless steel hose clamp
- Filter holder 2-cups with filter basket: Duette 2x; Triplette 3x
- Filter holder 1-cup with filter basket.
- Stainless steel “Kees van der Westen” tamper; compliant with VST specifications
- Jar with cleaning powder
- Group brush
- 2 shot glasses
- USB flash drive with comprehensive, user and maintenance manual
- Kit with consumable parts to facilitate service and routine maintenance, composition depends on whoever is responsible for installation and maintenance

Unpack

Tools needed

- Phillips screw driver no. 2

Procedure

1. Remove the lid of the crate.
2. Remove the side panels.
3. Lift the machine by its legs (not by the steam valves).

Installation

Parts needed, included in shipment

- Machine
- 2 high pressure hoses, 1.5 m (5 ft)
- Pump with motor, 29x14x19 cm (length x width x height; 12x6x8 inch)
- Discharge hose 2.0 m (6.6 ft) with stainless steel clamp

Parts needed, not included in shipment

- Water treatment system with installation materials

Tools needed

- Spanner 18, 19, 20, 22 mm
- Spanner 30 mm or adjustable spanner
- Teflon tape
- Screw driver
- Sharp knife
- Side cutter
- Bucket

Connect water supply

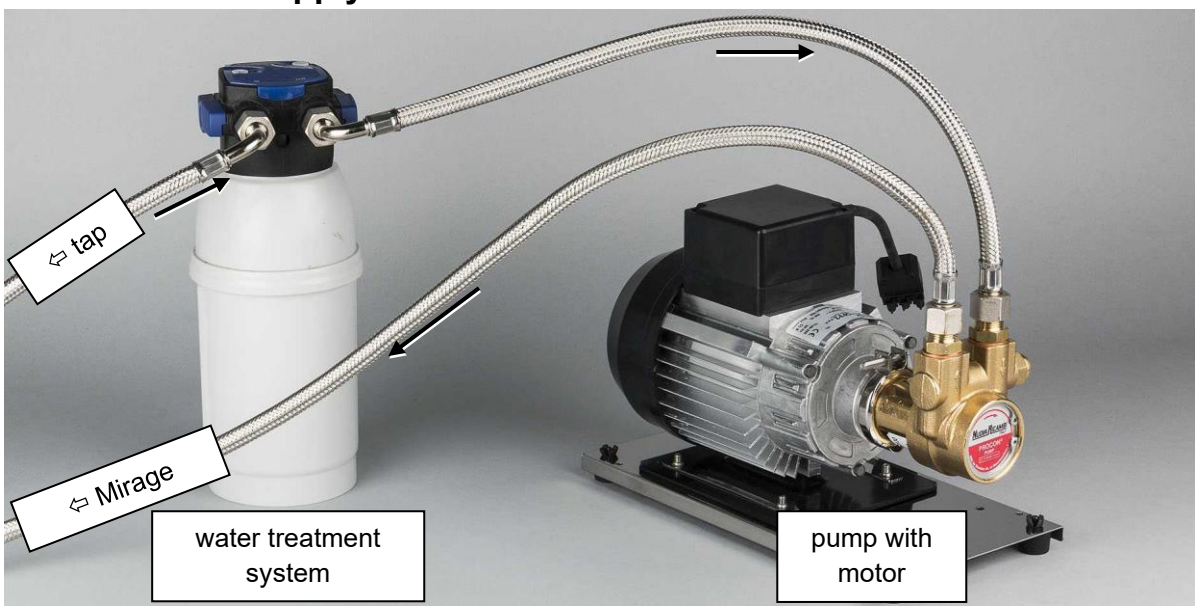


Figure I 1. Water treatment system (not included) on left is connected to the pump on the right. Water flow is according to arrows. Tap and Mirage will be to left of figure.

1. Use a 20 mm spanner to attach one end of a long high pressure hose to the tap. A gasket is not needed, the ball-shaped brass end will seal upon tightening. Inside thread on high pressure hose is 3/8"BSPP (parallel threads; also called G 3/8”).
2. Attach the other end of the high pressure hose to the ingoing side on a suitable water treatment system (see Figure I 1). Tighten with a 20 mm spanner. Do not use excessive force.
3. Attach the short high pressure hose to the outgoing side on the water treatment system. Tighten with a 20 mm spanner.

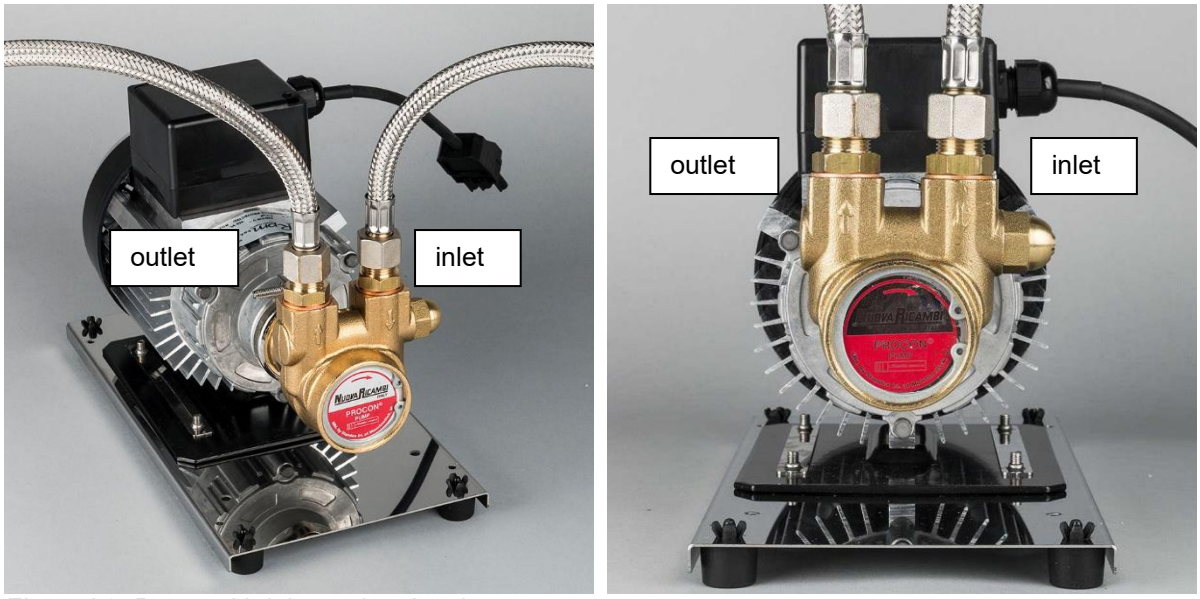


Figure I 2. Pump with inlet and outlet shown.

1. Attach the other end of the short high pressure hose to the inlet of the pump.
2. **Beware!** The inlet of the pump is marked with an arrow pointing down, towards the pump-housing (see Figure I 2). Tighten with 20 mm spanner.
3. Attach the second long high pressure hose to the outlet of the pump.

4. **Beware!** The outlet of the pump is marked with an arrow pointing upwards, away from the pump-housing (see Figure I 2). Tighten with a 20 mm spanner.
5. Hold the loose end of the high pressure hose in a bucket and open the tap slowly. Flush the water treatment system according to manufacturer's instruction. Then flush the pump for a minute (the pump-motor does not have to run). Check if the water does not have a strange colour or smell. Close the tap, connect the hose to the fitting at the bottom of the Mirage with a 20 mm spanner. The Mirage may be tilted in such a way that it rests on the two hind-legs and the back of the machine, or use (wooden) blocks under the feet (see Figure I 3).

> **Note!**
> Use a permanent marker to write the expiry date on the water treatment cartridge and replace the cartridge as advised by the manufacturer but at least every 12 months, even when the capacity is not exceeded yet.

6. Open the tap and check the earlier made connections for leakage. Tighten when needed but do not use excessive force. In the meantime, the coffee system will start to fill with water.

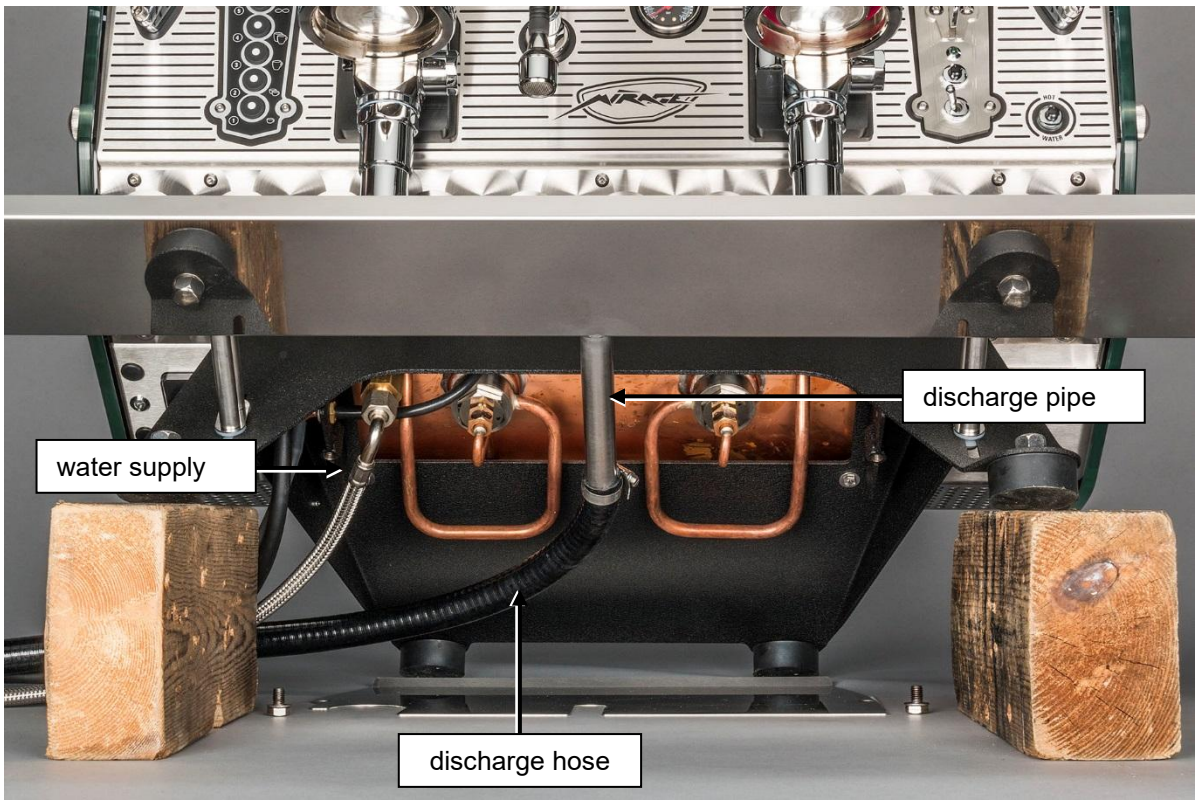


Figure I 3. Mirage Duette tilted backwards by use of 2 wooden blocks and bottom panel removed to show high pressure water supply and discharge hose pushed on discharge pipe. Blocks have dimensions HxWxD = 15x5x20 cm; 6x2x8 inch.

Connect water discharge

1. Position the stainless steel hose clamp on one end of the discharge hose. Slide the end of the hose over the discharge-pipe of the drip tray (see Figure I 3) and tighten the hose clamp.
2. Insert the other end of the discharge hose into the sewer or a discharge container.

> △ **Caution!** To prevent sedimentation of smudge, the discharge hose should slope down to your sewer or discharge container over the entire length of the hose.

3. When necessary, cut the discharge hose to desired length (cut the inforcement with side cutters).
4. Put the Mirage back on its feet.

Connect electrics

> ☠ **Danger !**
>
> Depending on model and type, the Mirage has a maximum power consumption of 3600-6500 Watts from your AC-outlet. This occurs when all heating elements and the pump are active simultaneously. At 230 Volts this is equivalent to approximately 15.7-27.8 Amps. We therefore strongly recommend that the machine has its own power circuit breaker(s).

1. The thinner electrical cord attached to the Mirage is the pump cable. Connect the pump-cable inside the box on top of the pump (see Table I 1 for colour coding).
2. Attach the other cable to a 230 VAC earthed power outlet (one phase or three phases, depending on model and type, see Table I 1 for colour coding). When your machine was ordered without mains connector, have an electrician connect your Mirage to the electric power mains.
3. If you tilted the machine, make sure that the Mirage rests on its feet before filling the machine with water.

function	mains cable			pump cable
	3-phase	1-phase		
		EU	USA	
earth	green/yellow	green/yellow	green	green/yellow
neutral	blue	blue	white	blue
phase(s)	brown black grey	brown	black	brown

Table I 1. Colour coding of leads in electric cables.

First Use

Filling the machine with water from empty

Check whether water is actually reaching the machine, the pressure gauge of the pump-pressure should display approximately 3 Bar (the water mains pressure).

Turn the mains switch on the machine to “1”. The mains switch is mounted on the bottom left hand side of the machine (see Figure W 1, item 1).The machine will wait for approximately 3 seconds before engaging the pump and starting to fill the boiler. Since the fill valve and pump will not be active for more than 2 minutes continuously, the security breaker will shut down the machine and LED’s on the touchpads or Bastone levers will start flashing. Turn the mains switch to “0” and then to “2”. The machine will restart filling and within the next 2 minutes the heating element will be switched on when the security level is reached. The heating element indicator light(s) will be lit when the heating element is engaged. Since the operating level will still not be reached yet, the machine will shut down again after 2 minutes, with LED’s flashing. Turn the mains switch to “0” and again back to “2”. You have to repeat this procedure again until the pump stops and the LED’s do not start flashing. The boiler is now filled to operational level, the element indicator light(s) will be on and the water in the boiler will heat up.

Check if the machine is leaking.

Expel air from heat exchangers

You now have to expel all air from the heat exchangers. If present, remove the filter holder(s) from the group(s). Activate the groups: shortly press the upper button on each touchpad (or shortly press the program button of a Bastone unit) and let each group run until only water leaves the group. Press the button again to deactivate the group. While the machine heats up, let each group run for approximately 10 seconds to expel any remaining air pockets.

Check if the machine is leaking.

Heating up

When the temperature in the boiler reaches boiling point, some steam will escape through the anti-vacuum valve which makes a hissing or sputtering sound inside the machine. This will stop when the valve is shut by the increasing pressure inside the boiler. After the anti-vacuum valve is closed, pressure will build up inside the boiler. The pressure increase will stop when the set operational temperature is reached and the heating element indicator light(s) will go off.

Check if the machine is leaking.

Note! As the steam boiler temperature is controlled with a temperature sensor, a pressure gauge for the steam boiler is not needed to (indirectly) check the temperature.

Adjust pump pressure

The pressure gauge displays the pressure of the incoming cold water directly after entering the machine. The minimum value is the pressure of the water mains (as on other water taps in your establishment).
Factory setting of the maximum pressure in the coffee system is 12 Bar. Above this value an expansion valve on the machine will open thus bleeding excessive pressure until the maximum value

is no longer exceeded (this occurs when water with a lower temperature than the set value enters the coffee boiler, heats up and thus expands).

While brewing espresso, the group valve is “open”, the pump engaged and return pressure being generated by the coffee bed, the pressure gauge is supposed to increase during pre-infusion until it stabilises at 9 Bar (factory setting). As the water pump is a “pressure multiplier”, the outgoing pressure is related to the water mains pressure and must be adjusted to local water mains pressure before use. Adjusting is done by turning the set screw on the right hand side of the brass pump housing (see Figure I 4) and should only be done when actually brewing coffee (not with a blind filter).

Tools needed

- Screw driver

Procedure to adjust the pump pressure:

1. Place a filter with ground coffee in the filter holder (this may be used coffee).
2. Activate a group by pressing the upper button on one of the touchpads or the program button of a Bastone unit.
3. Observe the pressure gauge to check how the pressure evolves.
4. To increase the pump pressure turn the screw in the pump housing clockwise. Turn the screw counter-clockwise to decrease the pump pressure.

△ **Caution!** The set screw is made from brass and is easily deformed. To avoid damage use a screw driver that snugly fits the slot.

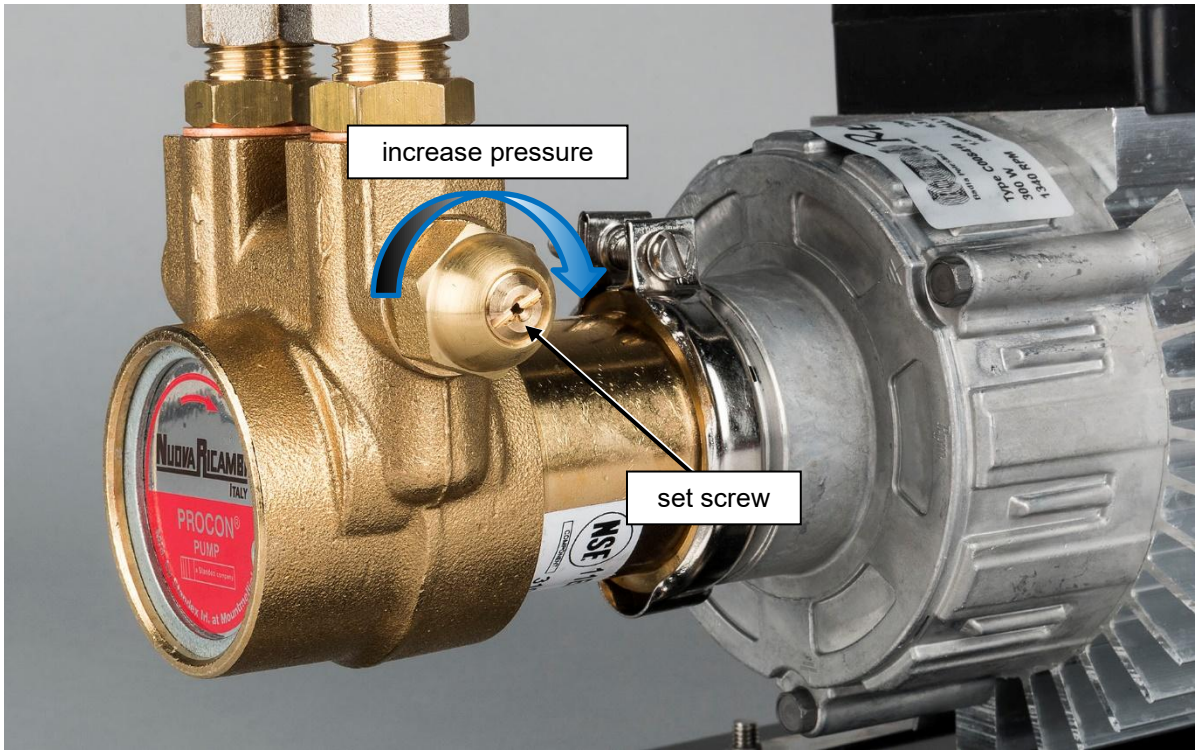


Figure I 4. Showing the set screw on the pump to change pump pressure.

Using the machine

Mains switch

The mains switch (see Figure U 1 and Figure U 2) is located at the left hand bottom side of the machine and has 3 positions:

0. All power to the machine is disconnected.
1. The machine is connected to the power, but power to the heating elements is disconnected. The machine functions but there is no heat and thus neither hot water nor steam pressure. Flow from the hot water spout is cold and less than normal as there is no steam pressure (yet).
2. Machine and heating elements are connected to the power.

Indicator light(s) and fuses

The green indicator light(s) just left of the mains switch tells if power is fed onto the heating element. In a normal Duette there is just one indicator, in a Duette high power or Triplette, there are 3 indicator lights.





Figure U 1 (left). Showing the mains switch of a Duette with its 3 positions: “0”, “1” and “2”. Indicator light is lit meaning that heating element is "on".
Figure U 2 (right). Mains switch of a (prototype) Triplette with 3 indicator lights and 3 fuses. Mains switch of a Duette high power is identical.

Touchpad

Each group is operated by a touchpad and each touchpad has 5 buttons with corresponding LED’s inside the buttons (see Table U 1). The left hand side touchpad is also used to start the automatic back-flush program.

On/off and programming

The upper button (white circle) is an on/off group switch with programming function.
Press this button shortly to open the group valve and activate the pump, the LED next to the button will light up. Press it again shortly to deactivate the pump and close the group valve, the LED will go off.

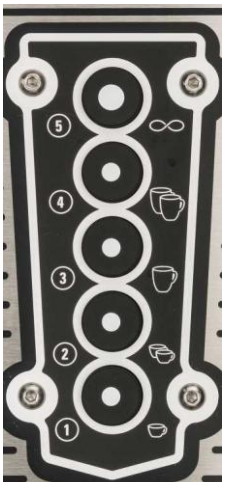
TOUCHPAD	normal operation	special functions left pad	special function all pads
	on / off continuous	program hot water dose #	program doses 1-4 #
	dose 1	clean ⊙	
	dose 2		
	dose 3		
	dose 4		
	press shortly to start	⊙ keep button pressed while switching machine on	# keep button pressed until top LED lights up

Table U 1. Listing the functions of the 5-button touchpads.

Pre-set volumes
The lower 4 buttons are used to start a pre-set volume (dose) of a brew. When pressed shortly, the brew starts and automatically stops when the pre-set volume has passed the water meter. If any button on that touchpad is pressed shortly during a (not yet finished) brew, the brew is stopped.. Each volume can be programmed individually.

Programming
Volume programming should be done as if you are actually pulling a shot: with tamped ground coffee in the portafilter. If you are keen on a short flush just prior to locking in the portafilter then also include a short flush when programming. As the last programmed volume is stored in memory, the volume of the flush is overwritten by the actual brew. Make sure that there is less than 8 seconds between the end of the flush and the start of the volume to be programmed.

Keep the upper button pressed for 6 seconds (until the LED lights up) to enter the programming mode of the selected touchpad. You may now program any one of the lower 4 buttons. Press the selected button shortly to activate the group, the LED next to the selected button will light up (the upper LED will also remain lit). When the desired volume for the selected button is reached, press the button shortly again[1]. Both LED's will go off and the programmed volume for that button is stored in the memory of the Mirage. This way, you may program 8 different volume doses in a Duette, and 12 different doses in a Triplette.

When water flows through a coffee system, the flow meter in that group sends pulses to the controller. The controller actually stores the amount of pulses from the flow meter between activation and de-activation of the group.

During the programming phase of a group, all other groups, even hot water, remain disabled.

1 Take into account that each solenoid valve in the Mirage cannot be open for longer than 2 minutes continuously.

Left hand rules
Attention: All touchpads will automatically copy the adjustments made on the left hand touchpad. If you want different volumes on each group, start by programming the left hand touchpad, then program the other touchpad(s).

Hot water distribution
The left hand touchpad also governs the hot water timer. Programming is similar to dosing the coffee buttons. Keep the top button on the left hand touchpad pressed until the top LED lights up. Push the hot water button (see Figure W 1) shortly to start water flow. Push again shortly when the desired amount of hot water is reached. Wait until the LED is off to leave programming mode. The controller actually stores the amount of seconds between activation and de-activation of the hot water distribution.

Back flush program / cleaning program
The back flush program pressurises and de-pressurises all groups simultaneously 8 times in a row and is used to quickly rinse the group heads. To start the back flush program:

1. Turn the mains switch to "0".
2. Press the 2nd button from the top on the left touchpad down, keep pressed
3. Turn the mains switch to "1" or "2",
4. When the program starts, release the button.

When the program is finished, the machine will return to normal operation.

Bastone Unit

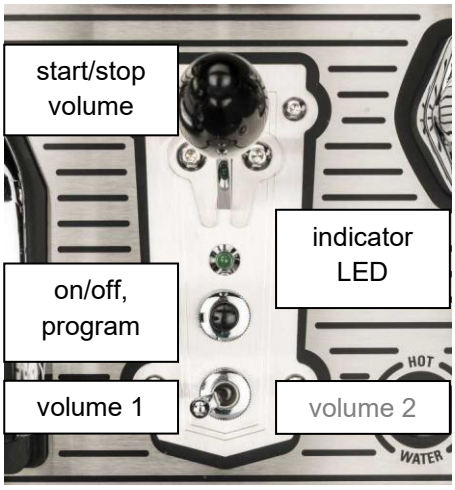


Figure U 3. Functions of a Bastone unit of a Mirage. The toggle switch is in the left position, when the Bastone is pressed shortly, the brew will automatically stop after pre-set volume 1 has passed the flow meter.

The Bastone units (see Figure U 3) have a functionality similar as a touchpad, but with 2 instead of 4 pre-set volumes. Looks of the Bastone is more spectacular than the touchpad and "manual override" in stopping the brew process is easier.

Bastone (brew lever)
The Bastone is used to start a pre-set volume (dose) of a brew. When pressed shortly, the brew starts (indicator LED is lit during brew) and automatically stops when the pre-set volume has passed the water meter. If the Bastone is pressed shortly during a (not yet finished) brew, the brew is stopped. By changing the position of the toggle switch, two different brew-volumes can be started.

Note! Barista's that want "total" manual control using the brew lever may choose to set one of the pre-set volumes very high such that the brew must be stopped by tapping the lever again when the brew is finished.

On/off and programming
The push button on a Bastone unit has two functions:

1. Press shortly to start a brew, press again shortly to stop (LED is lit during brew);
2. Keep button pressed for 6 seconds to enter programming mode (until LED lights up).

Volume programming should be done as if you are actually pulling a shot: with tamped ground coffee in the portafilter. If you are keen on a short flush just prior to locking in the portafilter then also include a short flush when programming. As the last programmed volume is stored in memory, the volume of the flush is overwritten by the actual brew. Make sure that there is less than 8 seconds between the end of the flush and the start of the volume to be programmed.

Keep the push button pressed for 6 seconds (until the LED lights up) to enter the programming mode of the selected Bastone unit. You may now program either position of the toggle switch. Press the Bastone shortly down to activate the group, the LED will light up. When the desired volume for the selected switch position is reached, press the Bastone shortly again[2]. The LED will go off and the programmed volume is stored in the memory of the Mirage. This way, you may program 4 different volume doses in a Duette, and 6 different doses in a Triplette.

Toggle switch
The toggle switch underneath the Bastone has two positions and governs which pre-set volume of a brew is chosen. Thus two pre-set brew volumes can be started with the Bastone.

Hot water distribution
The left hand Bastone unit is used to set the timer of the hot water. Keep the push button pressed until the LED lights up. Push the hot water button (see Figure W 1) shortly to start water flow. Push again shortly when the desired amount of hot water is reached. Wait until the LED is off to leave programming mode. The controller actually stores the amount of seconds between activation and de-activation of the hot water distribution.

Back flush program / cleaning program
The back flush program pressurises and de-pressurises all groups simultaneously 8 times in a row and is used to quickly rinse the group heads. To start the back flush program:

1. Make sure that the toggle switch on the left hand Bastone unit is in left position.
2. Turn the mains switch to "0".
3. Press the left Bastone down, keep pressed
4. Turn the mains switch to "1" or "2",
5. When the program starts, release the Bastone.

When the program is finished, the machine will return to normal operation.

2 Take into account that each solenoid valve in the Mirage cannot be open for longer than 2 minutes continuously.

Brewing coffee

Twist a filter holder with coffee grinds in the bayonet of the group. Place cup(s) under the spout(s) of the filter holder and press the appropriate button on the touchpad or Bastone shortly. When the pre-set volume of water is reached, the group is de-activated and the corresponding LED turns off.

You may always de-activate the group before the pre-set volume is reached: just press any button on the appropriate touchpad or the Bastone lever again to stop the brewing process.
The interrupted brewing phase is not stored in the memory which means that pressing the same touchpad-button or Bastone again will start a new pre-set volume brew.

Note! While using pre-set volumes the amount of "brew in the cup" may vary slightly as the water meter registers the amount of incoming water instead of outflowing brew. Initial pressure in the coffee system and water take-up by the coffee particles can vary slightly from brew to brew causing deviations in brewed volume.

Dispense hot water

Place a cup under the hot water spout and press the hot water push button shortly (see Figure W 1). The flow will stop when the pre-set time has elapsed, or when the push button is pressed shortly again, whatever comes first. An interrupted dispensing is not stored in the memory, pressing the hot water push button again will start the timer at 0.

Steaming

The Mirage has two steam wands with twist knob valves (see Figure W 1). These valves are spring loaded with the spring actually keeping the valve closed. Use no force to close the steam valve since this will wear down the Viton and silicone parts within the valve. Fasten just until no more steam is leaving the tip, at that point the valve is closed. Total travel of the knob from closed to fully open is about ¼ turn even though the knob can be turned further.

Before steaming milk it is necessary to open the valve for a short while to purge the water from the steam wand. This water is condensate from steam coming in contact with the cold valve and wand. Position the tip of the steam wand over the drip tray when purging the condensation.

Directly after steaming milk, purge the wand from milk remnants and clean the tip of the steam wand with a damp cloth or wet paper towel. Do not use this cloth for anything else than cleaning the steam tip. Purging is necessary because milk remnants in the steam tip and wand might otherwise slowly creep all the way upwards into the manual valve by capillary rise.

As an option, foot operated solenoid valves can be installed on either one or both steam valves for efficient steaming. Since the steam valves on the front of the machine remain intact, the flow can still be regulated by the twist knobs. Do not close the steam valve entirely when this option is installed, activating the solenoid valve while the steam valve is closed will not lead to steam delivery.

Coffee comes first

Operation of the group takes priority over filling up the steam boiler in order to not disturb the brewing pressure. Whenever a coffee cycle is activated during filling up of the boiler, the fill valve will be closed until all coffee cycles are ended.

This means that when you use the Mirage such that at any time at least one of the groups is active, the steam boiler will never be filled up. When you also distribute hot water and/or (a lot of) steam, the water level in the steam boiler will eventually drop below the minimum security level and the machine will shut down completely with all LED’s flashing. When this occurs, you have to turn the mains switch to “0” and then back to “2” to start filling the machine. You probably have to repeat the switching off and on again and again to reach operational water level and, of course, have to wait until all the cold water is heated up before you can use the Mirage again.

Adjust steam boiler temperature

Factory setting of the steam boiler temperature is 124 or 125 °C (255, 257 °F) and is controlled by an electronic thermostat (see Figure U 4) with temperature sensor.

Although the steam boiler temperature can be easily adjusted, a change in steam boiler temperature does not one-on-one relate to a change in brew temperature. Therefore the steam boiler temperature should only be adjusted with subsequent checking/adjusting the brew temperature. This should be done by a technician and is explained in the maintenance manual.

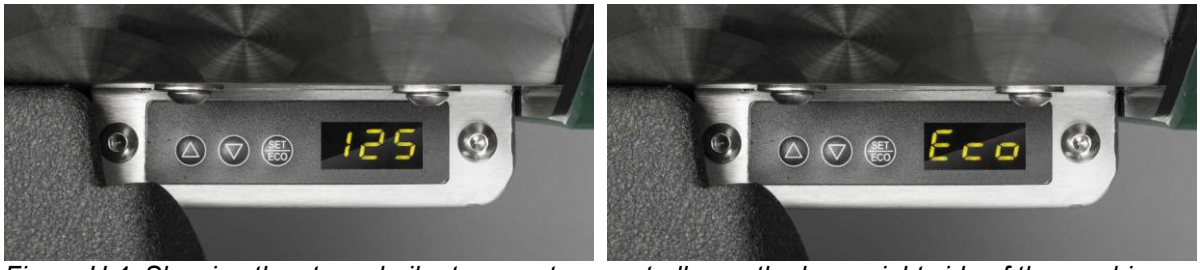


Figure U 4. Showing the steam boiler temperature controller on the lower right side of the machine. Left: temperature in boiler is 125 degrees and heating is "off" - no indicating dot is lit between the 2 left digits. Right: Steam boiler is set at "Eco" temperature (factory set at 70 degrees).

Saturated steam pressure at 124 °C is about 1.25 bar (overpressure), at 125 °C it is about 1.33 bar. This pressure is high enough for powerful and long-lasting frothing of milk.

The steam boiler set temperature can be easily changed back and forth to the so-called "Eco" temperature of 70 °C (158 °F). This is advantageous when the machine is not used for a longer period of time (over the weekend), while maintaining a reasonable short heating-up time of 20-25 minutes.

procedure

Change from operational temperature to "Eco" temperature and back.

1. Press and hold the "SET/ECO" button until the display reads "Eco" (this takes about 6 seconds). to change back:
2. Press and hold again until the display reads a temperature value (this takes about 6 seconds), or Switch the mains power "off" and "on".

The operational temperature of the steam boiler can be set in the range: 0-132 °C (32-270 °F).

To **increase/decrease** the set temperature:

1. Press and keep pressed the "SET/ECO" button, the display will show the set temperature.
2. Before 6 seconds have passed, press the "△" or "▽" button shortly, the display will show the adjusted set temperature.
3. Release all buttons to store the new set temperature.

Daily to weekly routine

Clean exterior

The outside of the machine can be cleaned with window cleaner in a hand spray flask in combination with a soft, often washed, cotton cloth. When the machine is turned “on” it will be warm and you have to work swiftly to prevent stripes: spray and immediately rub. To remove difficult stains without scratching the surface of the stainless steel panels use silver polish and a soft cotton cloth.

Lift the drip tray grill from the machine and clean it with washing up liquid and a sponge.

Activate the groups (without filter holder locked in) or let the hot water tap run for a moment and use a brush to push remains into the drain.

To prevent clogging of the drain hose pour, as often as needed (with regular use once every 2 days), one teaspoon of coffee dissolving powder into the drain and flush it with some hot water down the drain.

Remove filter basket

Materials needed

- group screen extractor (included in shipment, or wide screw driver, teaspoon)

Procedure

1. Remove the filter holder.
2. Pry the filter basket with the extractor from the filter holder (see Figure U 5).
3. When remounting the basket, make sure the spring snaps into the basket’s ridge.



Figure U 5. Pry filter basket from filter holder with the extractor.

Clean filter holder

Remove the filter basket from the filter holder and clean it with a little washing up liquid and plastic scouring pad. Place the metal part of the filter holder for 10 minutes in a solution of 1 tablespoon of coffee dissolving powder in hot water. The bakelite handle will slowly disintegrate in this solution and should thus be kept out of the solution.

△ **Caution!** Never clean the filter holder in a dish washer as the detergent will ruin it.

Clean steam wand

Milk easily sticks to the hot surface of the steam wand and tip and eventually leaves baked on remains. Therefore, the steam wand and tip should be cleaned with a damp cloth directly after each use. Do not use this cloth for anything else than the steam wand.

Notes!
Immediately after steaming milk you should flush the steam wand with a little steam. This will prohibit milk creeping into the pipe, and even into the valve house, through the so called capillary rise. Flushing also prevents the 4 holes in the tip to clog. In the event that clogging occurs, place the end of the steam wand and tip for several minutes in a glass of hot water. The remains will soften and can be wiped off easily. NEVER scrape, grind or cut the steam wand or tip since it leads to avoidable damage.

Back flush a single group

How to start the cleaning program for all groups simultaneously: see page 15 (touchpad) or page 16 (Bastone).

Back flushing cleans the group and conduits from coffee residue which influences the taste of the extraction since fresh (hot) water is transported to the coffee bed through these parts. It is advised to back flush the group at least once a day and when the Mirage is intensively used several times per day.
Described below is the procedure for an individual group in which the other group(s) remain(s) operational.

Note! The cleaning (back flush) program activated by the touchpad is best performed at the end of the day and is very useful as there is no need to repeatedly engage-disengage each group individually. You should run the program twice: first with cleaning powder, then rinse the blind filter baskets and run the program again without cleaning powder. In this second run you quickly empty a blind filter in between pressurising of the groups, when the groups have depressurised you do the same with the next group, etc.

A blind filter is a filter basket without perforations in the bottom.

Materials needed

- Plastic group brush (included in shipment)
- Blind filter (included in shipment)
- Coffee dissolving powder (included in shipment)
- Group screen extractor (included in shipment, or back end of teaspoon)

Procedure

1. Remove the filter holder from the group to be back-flushed.
2. Activate the pump (upper button on touchpad or program button of Bastone unit) and flush the group for approximately 5 seconds.
3. Clean the group screen and Arinca group seal with the plastic group brush.
4. Pry the filter basket (e.g. with a teaspoon) from the filter holder (see Figure U 5) and replace it with the blind filter.
5. Scoop 1 teaspoon of coffee dissolving powder in the blind filter and place the filter holder in the group.
6. Activate the group until full 9 Bar pressure is reached and then de-activate the group.
7. Wait for approximately 3 seconds (if present: the pre-infusion cylinder should have time to empty) then activate the group again for approximately 5 seconds.

8. Repeat the last step 8 times (wait 3 seconds, activate group 5 seconds; the repetition is automated if you start the cleaning program).
9. Remove the filter holder from the group, clean the blind filter by flushing it under the tap, activate the group for approximately 5 seconds to remove possible powder from the group screen.
10. Repeat step 7 (3 seconds pump “off”, 5 seconds pump “on”) 4 times but remove the filter holder and pour out remaining liquids between each flush (again, the repetition can be achieved using the cleaning program).

△ **Warning!** Finishing the back flush routine without cleaning powder is essential to prevent remnants of cleaning powder to settle between the plunger and housing of the 3-way group valve.

11. Pry the blind filter from the filter holder and replace the filter basket.

Clean group screen, check and replace group seal

The group screen helps to disperse the incoming hot water onto the coffee bed and also prevents coffee grinds to enter the group. The group seal is made out of material that will harden in time. We advise to replace the group seal every 3 months.

Materials needed

- Group screen extractor (or wide flat screw driver or back end of a fork or spoon)
- Plastic brush (included in shipment)
- Coffee dissolving powder
- Replacement group seal (when necessary)

Procedure

1. Pry the group screen gently from the group using the group screen extractor under bayonet-ring and against the side of the group screen (see Figure U 6). Pry left and right for even distribution of force. The screen will fall out together with the group seal.




Figure U 6 (left). Pry left and right with group screen extractor to remove group screen and ring.
Figure U 7 (right). Mount group screen with empty filter holder and group ring not pushed all the way over the group screen.

2. Remove the group seal from the group screen.
3. Clean the group screen with plastic brush. When necessary, put in a solution of coffee dissolving powder and warm water. Rinse under streaming water.
4. Check the group seal for cracks and/or hardening, replace if necessary.

5. One side of the group seal has a somewhat more rounded surface. When replacing the group seal on the group screen, make sure the rounded side of the ring is inserted into the group (facing upwards). Push the group seal not all the way to the end of the group screen (see Figure U 7).
6. Remove the filter basket from the filter holder. Place group screen with group seal on the filter holder and insert into group, pushing upwards. Turn filter holder in bayonet, then remove filter holder.
7. Insert the filter basket to the filter holder, the spring should snap into the filter basket. Turn into the group to finish pressing the group seal into the group.

Clean group dispersion plate

The group dispersion plate ensures more uniform wetting of the coffee bed. When dirty, the wetting will become less uniform and an acidic espresso taste will develop.

Materials needed

- Wide flat short screw driver
- Wide screw driver
- Plastic brush (included in shipment)
- Coffee dissolving powder (included in shipment)

procedure

1. Remove group screen with group seal (see previous item).
2. Turn out brass dispersion plate with screwdriver or narrow coin (see Figure U 8).
3. Clean dispersion plate with plastic brush. When necessary, put dispersion plate in a solution of coffee dissolving powder and warm water for about 5 minutes. Rinse under streaming water

⚠ **caution!** Do not scrub the brass dispersion plate with an metal brush or new Scotch-pad as it will scratch easily and dirt adheres more easily on a scratched surface.

4. When re-installing, do not over-tighten the group dispersion plate.
5. Remount group screen and group seal (see previous section).



Figure U 8. Remove dispersion plate from group head.

Recommended maintenance scheme

Daily (see user manual)

- Clean filter holder
- Clean steam wand
- Back flush group

Weekly (see user manual)

- Clean group screen
- Clean group dispersion plate

Monthly (see user manual)

- Check the function of your water treatment system (when you have an ion-exchange water softener installed: re-generate)
- Check pump pressure
- Check and replace if necessary:
  - group seal
  - group screen
  - filter basket
  - filter holder clip

Every 3 months (call in a qualified technician)

- Replace group seal
- Grease steam wand ball and check play between nut and ball of steam wand; replace nut if necessary
- Check temperature at group head. When temperature is not correct, check restrictors/needle valve on scale build-up
- Check anti-vacuum valve for leakage
- Check safety-valve on steam boiler for leakage
- Check operation of expansion valve on heat-exchanger system
- Check operation of progressive pre-infusion cylinder (if so equipped)

Every 6 months (call in a qualified technician)

- Grease O-ring and check spring in progressive pre-infusion cylinder (if so equipped)
- Check restrictor in mix-block on scale build-up
- Check tube from mix-block to hot water outlet on scale build-up

Every 12 months (call in a qualified technician)

- Rebuild steam valves
- Clean probes, level and safety
- Replace O-ring and check spring in progressive pre-infusion cylinder (if so equipped)
- Replace:
  - group screen
  - filter basket
  - filter holder clip
- Replace anti-vacuum valve

Every 2 years (call in a qualified technician)

- Replace pressostat

Every 5 years (call in a qualified technician)

- Replace all solenoid valves

Maintenance

△ Warning!

Maintenance on the Mirage should be done by a qualified technician. Parts of the machine can reach a temperature of close to 125 °C. The steam/hot water boiler contains water and pressurised steam of 125 °C at 1.35 Bar overpressure (257 °F at 19.6 PSI), temperature and pressure in the coffee system may reach up to 96 °C at 12 Bar overpressure (205 °F at 175 PSI).

When servicing the machine it is sometimes necessary to keep the Mirage connected to the AC power outlet and the machine switched “on”. In both cases there is a possibility that you touch a live wire.

☠ Danger

We cannot be held responsible for damage and/or injuries resulting from actions performed on our machines by non-qualified personnel.

Maintenance Record

Date	Task	Comments

Date	Task	Comments

Contact information

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