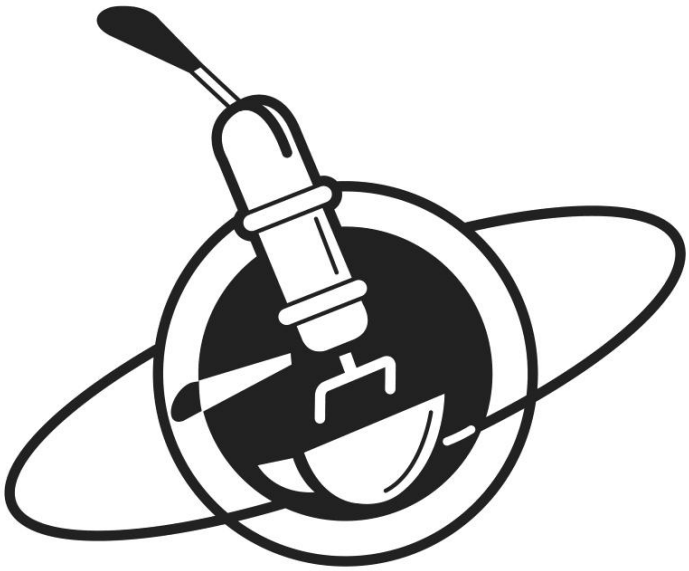

keesvanderwesten.com

Speedster

# USER and MAINTENANCE MANUAL

February 2012

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## Parts identification

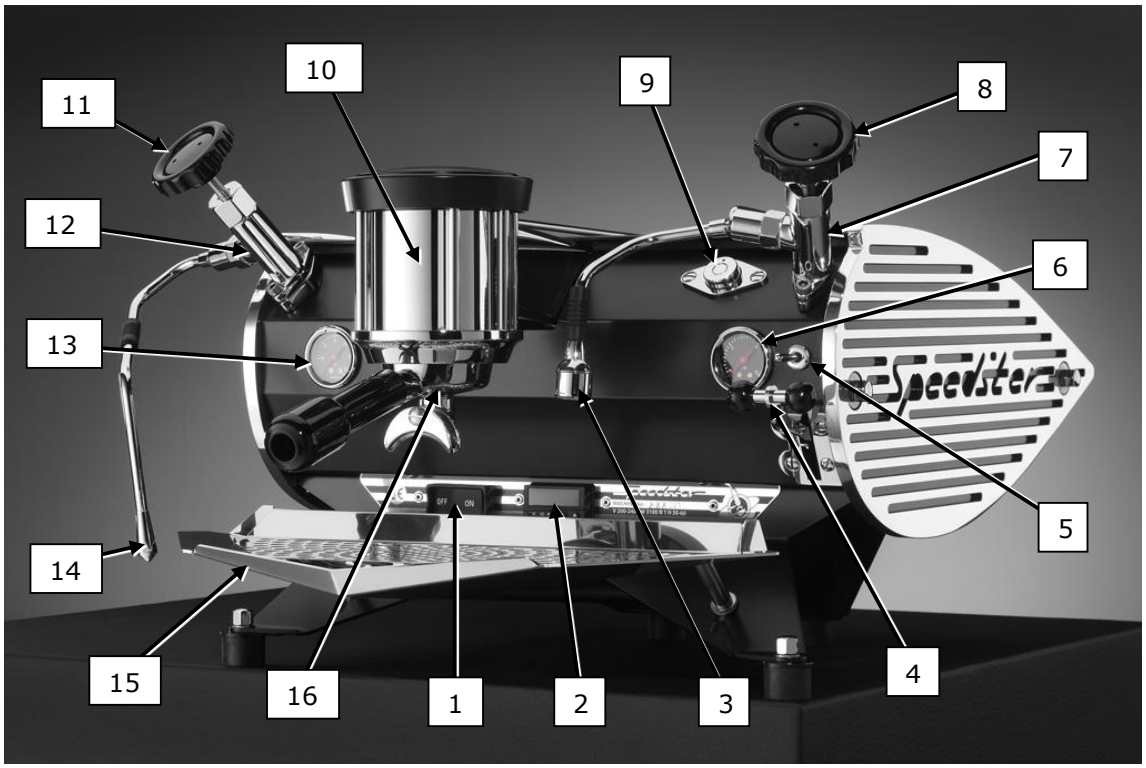


*Figure 1. Showing main operational parts of the Speedster*

1. Main switch
2. PID with coffee boiler temperature display
3. Hot water spout
4. 3-way brewing lever
5. 3-way hot water toggle switch
6. Coffee boiler pressure gauge
7. Hot water valve
8. Hot water valve knob (no operational function)
9. Visible end of progressive pre-infusion piston
10. Group head
11. Steam valve knob
12. Steam valve
13. Steam boiler pressure gauge
14. Steam tip
15. Drip tray
16. Filter holder

## Welcome

Thank you for ordering a Speedster espresso machine from Kees van der Westen Espressonistic Works B.V. The Speedster is a professional one group machine which is hand built and individually tested at our shop in Waalre, the Netherlands.

Standard shipment includes an external water pump with electrical motor, water softener, 3 high pressure water supply lines and several accessories. The frame, body and both boilers are made from high grade stainless steel (group and boiler: grade 316L).

The Speedster functions according to the so-called double boiler system in which there are separate boilers for both coffee water and for steam/hot water supply. This system allows for very accurate temperature stability of espresso and steam/hot water, also with large quantities over long periods. The coffee boiler is equipped with a PID[1]-regulator which is a very user friendly device ensuring near perfect temperature stability.

An in-house developed pre-infusion system is incorporated within the Speedster. A "soft-start" mechanism (progressive pre-infusion cylinder) absorbs pump pressure such that it increases gradually to 3 Bar which ensures pre-wetting and swelling of the coffee grinds before extraction starts. The 3-way group operation lever with positions "off", "pre-infusion" and "pump active" gives the barista total control over the pre-infusion phase by increasing the pre-infusion time as desired. The combination of these techniques guarantees that the delicate coffee flavours can fully develop and conveyed to the cup during extraction which results in more taste and aroma.

Both the steam boiler and the coffee boiler are equipped with an individual electronic safety shut-down system which interrupts the power to the heating elements. An expansion valve in the coffee water system is adjusted to 10-12 Bar at our workshop and a safety valve of 3 Bar in the steam boiler ensure that the pressures in the Speedster cannot exceed safety values.

## Notice

Filled with water, the Speedster espresso machine has a mass of approximately 45 kg (100 lbs), produces heat and measures approximately 50x60x40 cm (width x depth x height; 20x24x16 inch). To properly operate the Speedster a sturdy platform with a fully horizontal surface is essential while space is needed above and to the sides of the machine for coffee grinder, knock-box, tamper and other accessories. The pump and water softener should be placed in the proximity of the machine and water supply and discharge, as well as an AC socket with earth connection (minimum rating 3100 Watt = 13.5 Amp at 230 Volt) is needed for installation (see also "Technical specifications – Electricity"). The location of your Speedster should account for these.

[1] PID: Proportional Integral Derivative; a very fast and precisely responding electronic feedback system.

## 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 Speedster, 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).

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 3-4 German degrees (50-70 mg/l Ca/Mg carbonate). When properly regenerated, the water softener supplied with your machine will establish these values. Hard water treated with an ion exchange water softener has sodium added, and so it is wise to further treat your water with an activated carbon or a carbon block water filter. These kinds of filters also remove other impurities that affect taste, but, on their own, are not able to remove water hardness.

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).

# 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.

**Warning!**

The valves at both sides of the group are not designed to lift the machine. Lifting the machine by these may cause the frame to bend which results in unrepairable damage.

# Installation

***Parts needed, included in shipment***

- Machine
- Water softener, height 40 cm (16 inch), diameter 19 cm (8 inch), taps protrude 7 cm (3 inch)
- Brass fitting
- 2 high pressure hoses, each 1.5 m (5 ft)
- 1 high pressure hose, 0.5 m (20 inch)
- Pump with motor, 29x14x19 cm (length x width x height; 12x6x8 inch)
- Discharge hose with stainless steel clamp

***Tools needed***

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

## Connect water supply

1. Tighten the special brass fitting to the washing machine tap with a 30 mm or adjustable spanner. Apply a few windings of Teflon tape on the tap first to eliminate leakage.
2. Use a 20 mm spanner to attach one end of a long high pressure hose to the fitting on the tap. A gasket is not needed, the ball-shaped brass end will seal upon tightening. Use a 30 mm spanner on the brass fitting to refrain it from tightening further.
3. Attach the other end of the high pressure hose to the upper tap on the water softener (see figure 2). Tighten with a 20 mm spanner while securing the tap with a 19 mm spanner. Do not use excessive force.

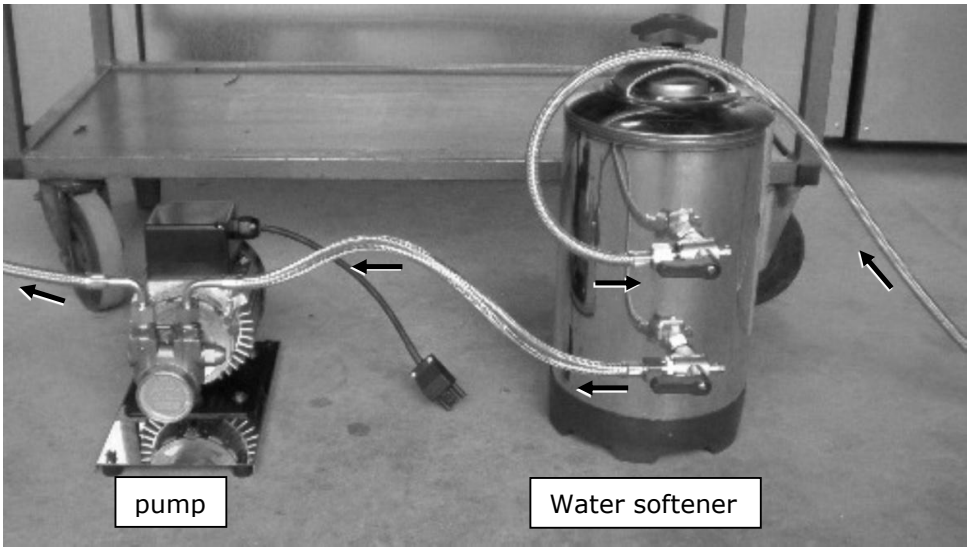


*Figure 2. Water softener on right is connected to the pump on the left. Water flow is according to arrows. Both handles on water softener are in "9 'o clock" position. Washing machine tap is right of figure, Speedster will be to left of figure.*

4. Attach the short high pressure hose to the lower tap on the water softener. Tighten with a 20 mm spanner while securing the tap with a 19 mm spanner.
5. Attach the other end of the short high pressure hose to the inlet of the pump. **Beware!** The inlet of the pump is marked with an arrow pointing down, towards the pump-housing (see figure 3). Tighten with 20 mm spanner.
6. Attach the second long high pressure hose to the outlet of the pump. **Beware!** The outlet of the pump is marked with an arrow pointing upwards, away from the pump-housing (see figure 3). Tighten with a 20 mm spanner.

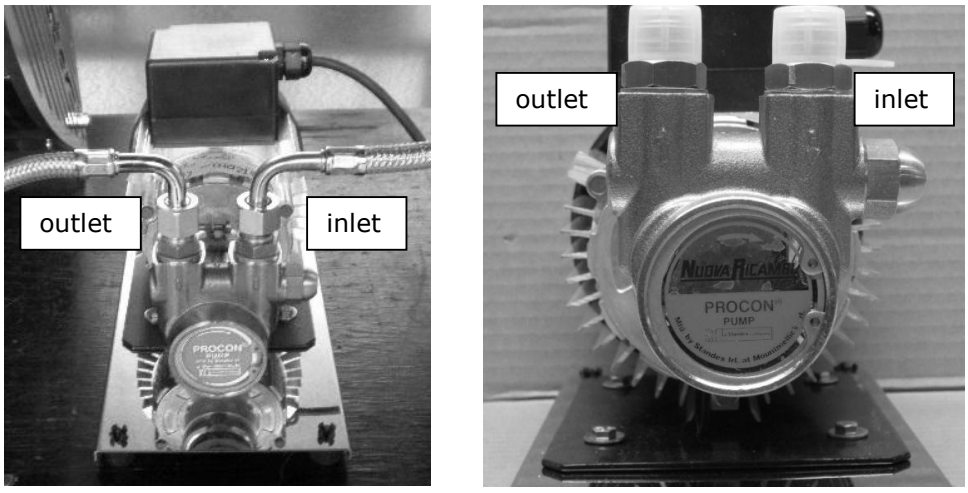


*Figure 3. Pump with inlet and outlet shown.*

7. Make sure that both handles of the taps on the water softener are in a horizontal "9 'o clock" position as shown in figure 2. Place the loose end of the high pressure hose in the bucket and open the washing machine tap such that water runs through the water softener into the bucket. The water can be brownish-yellow at

first; this is from the resin in the water softener and is harmless. Flush until the water runs clear.

8. Close the washing machine tap and connect the loose end of the high pressure hose to the water connection on the bottom of the Speedster with a 20 mm spanner. The Speedster may be tilted in such a way that it rests on the two hind-legs and the back of the machine, see figure 4.

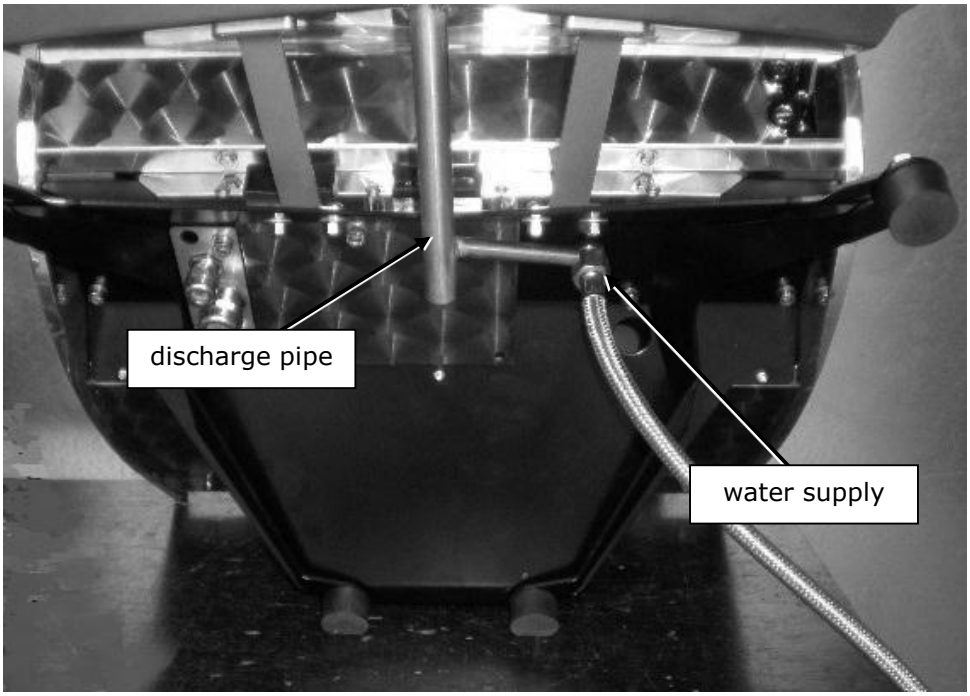


*Figure 4. Speedster is tilted on its back, water supply is connected. Discharge pipe is indicated.*

9. Re-open the washing machine tap and check the earlier made connections for leakage. Tighten when needed but do not use excessive force. In the meantime, the front (coffee) boiler will fill with water.

## 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 4) and tighten the hose clamp.
2. Insert the other end of the discharge hose into the sewer or a discharge container.

> **Beware!** 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 Speedster back on its feet.

## Connect electrics

**Beware!**

The Speedster has a maximum power consumption of 3100 Watts from your AC-outlet. This occurs when all three heating elements and the pump are active simultaneously. At 230 Volts this is equivalent to approximately 13.5 Amps. We therefore recommend that the machine has its own power circuit breaker.

1. The thinner electrical cord attached to the Speedster is the pump cable and has a special type of connector. Attach the pump cable to the pump motor using the special connectors.
2. Attach the other cable to a 230 VAC earthed power outlet.
3. Make sure that the Speedster rests on its feet. Turn the main switch on the machine to "ON". The main switch is mounted on the model tag on the front of the machine (see figure 1, item 1).

The machine will now fill both boilers (when the front boiler is not already filled). Put the 3-way brewing lever on the right hand side of the machine (figure 1, item 4) in the lowest position ("pump on") until water without air leaves the group. This procedure expels all air from the coffee boiler.

The display of the PID temperature regulator in the centre of the model tag (see figure 1, item 2) will not show any value until a minimum water level in the steam boiler is reached.
When the temperature in the steam 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 steam boiler.

# Using the machine

## Brewing espresso

The 3-way brewing lever on the right hand side of the machine (see figure 1, item 4) operates the group valve and the pump. The lever can be fixed in 2 slots and thus has three operating positions:

1. Lever in upper (resting) position: Group valve is closed and pump is off. Water cannot flow from the coffee boiler to the coffee bed.
2. Lever in middle position: Group valve is open but pump is off. In this position (hot) water under line pressure can reach the coffee grounds which will wet and swell. This process is called pre-infusion. You may adjust the timespan of pre-infusion to your liking.
3. Lever in lower position: Group valve is open and pump is activated. The water pressure on the coffee bed will increase to 9 Bar.

Switching off is easily accomplished by a short down-right tap on the left hand ball on the lever. The lever will return to its resting position and the remaining pressure in the coffee filter will be discharged.

When you switch from resting position directly to the lower position, the primary increasing pressure is absorbed by a piston and spring within the so-called "progressive pre-infusion cylinder" up to approximately 3 Bar. As soon as the piston reaches its ultimate position, the full pump pressure of 9 Bar is applied to the coffee bed. You can easily check the functioning of the progressive pre-infusion as the guiding rod of the piston will protrude through an opening in the front panel of the machine just left of the hot water tap (see figure 1, item 9).

The extraction can be further manipulated by switching the lever from lower to middle position near the end of the extraction phase. Water pressure will then decrease fairly quick to approximately 3 Bar but remains at that level.

The progressive pre-infusion cylinder has the extra advantage that clean water in the cylinder is pushed through the group valve into the discharge after each extraction, thus rinsing the valve.

**Note**
Filling of the steam/hot water boiler is disengaged during brewing (brewing lever in middle or lower position) in order to prevent differences in extraction pressure.

## Hot water

A three-way toggle switch, located on the right hand side between the brewing lever and the hot water spout, controls the hot-water distribution (see figure 1, item 5). The tap knob itself (see figure 1, item 8) is purely visual and has no operational function.

When the switch is pushed downwards the machine will automatically mix a small amount of cold water with hot water from the steam boiler. The main advantage is that the result is a steady, non-sputtering, flow of hot water. The addition of cold water has as extra advantage that less water from the steam boiler is used for the same amount of liquid thus diminishing the load on the steam boilers heating element.

When the switch is pulled upwards no cold water is mixed with hot water from the steam boiler. In this position near-boiling water with some steam may leave the spout.

The steam boiler will re-fill automatically, also activating the pump. A flow restrictor with an opening of 0.6 mm diameter regulates the inflow such that the heating element can warm the incoming water as efficiently as possible.

However, the boiler will not fill when a shot is pulled as not to disturb the process of espresso extraction by a fluctuating water pressure.

## Steam

The left valve is the steam valve (see figure 1, item 12). Turning the steam valve knob (figure 1, item 11) counter-clockwise will open the valve. 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 condensed steam from the last use and new condensation from steam coming in contact with the cold tubing, valve and wand. Position the tip of the steam wand over the drip tray when purging the condensation.

**Warning!**

The steam valve is a spring loaded valve with the spring actually keeping the valve closed. Use no force to close the steam valve since this will wear down the rubber 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 close to fully open is about ¼ turn.

## Set boiler temperatures

The factory settings of the coffee boiler temperature and steam boiler temperature are 93 and 135 degrees Centigrade (°C) respectively. The 135 °C is approximately equivalent to 2.4 Bar steam pressure.

### Coffee boiler

The display of the PID-regulator of the coffee boiler is located on the front panel of the machine in between the on/off switch and the model tag (see figure 5).

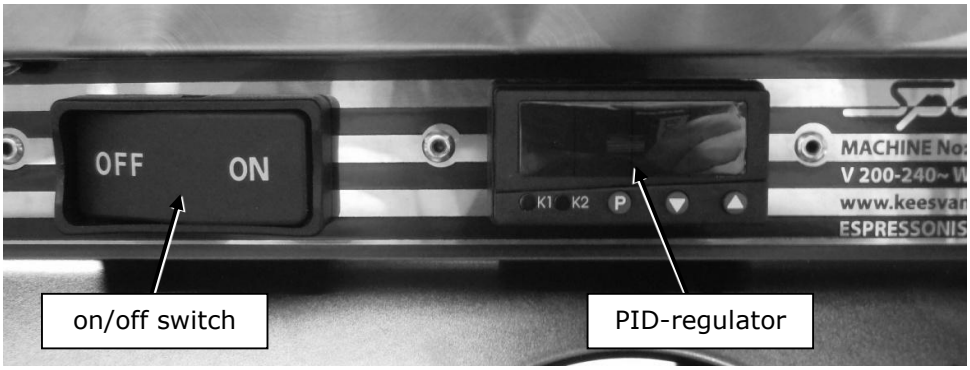


*Figure 5. Showing on/off switch and PID-regulator.*

#### *Procedure to change the coffee boiler temperature*

1. Press the P key on the PID shortly. The display will alternating show "SP" (set point) and the currently set temperature value.

2. Press the key with arrow up (^) to increase the temperature, press the key with arrow down (v) to decrease the temperature.
3. When you have set the temperature as desired refrain from touching any key; after a few seconds the regulator will return to its normal operation and will bring the boiler to its newly set temperature (mind you, cooling down to a lower set temperature will take longer than heating up the coffee boiler).

**Note!**
The temperature of the coffee water is measured by a probe in the coffee boiler. The temperature reading on the PID is thus the temperature within the boiler. The temperature of the water that leaves the group at the group screen on top of the coffee bed will be 2.5 to 3 degrees lower. You may account for this when fine-tuning the temperature setting on the PID.

***Procedure to adjust temperature offset***

1. Press the [P] key on the PID shortly. The display will alternating show "SP" (set point) and the currently set temperature value.
2. Press the [P] key for more than 2 seconds. The display will alternating show "AL" and the currently set value (1.0).
3. Press the [P] key several times shortly until "Y .0" is displayed, alternating with its set value (0).
4. Press the [P] key for more than 2 seconds. The display will alternating show "C111" and the currently set value (001).
5. Press the [P] key several times shortly until "OFFS" is displayed, alternating with the currently set value (0.0).
6. With the arrow keys you may set the offset value.
   When you adjust to -2.5, the display will show the boiler temperature minus 2.5 degrees Centigrade, That is approximately the temperature difference between the coffee boiler temperature and the group screen.
7. Press the [P] key to confirm the newly set value.
8. When all keys remain untouched for approximately 10 seconds, the PID will return to its operating state.

See "PID-parameter settings" for original factory settings of all parameters.

**Steam boiler**
The electronic temperature regulator of the steam boiler is positioned in the back of the machine on the left hand side (see figure 6).

**Warning!**

Parts of the interior of the machine will have a temperature (nearly) as high as the set temperature of the steam boiler. Take the necessary precautions.

***Procedure to set the temperature in the steam boiler***

1. Remove the left hand side panel from the machine, a 13 mm spanner is needed for the nuts.
2. Press the [P] key on the regulator until "AL1" appears on the display (it will alternate with the set value of AL1).
3. Press the [P] key again, the display will now read "AL2", alternating with the set value for AL2.

4. Change the temperature by pressing one of the arrowed keys. The newly set value appears in the display.
5. Press the P key twice to enforce the newly set temperature.

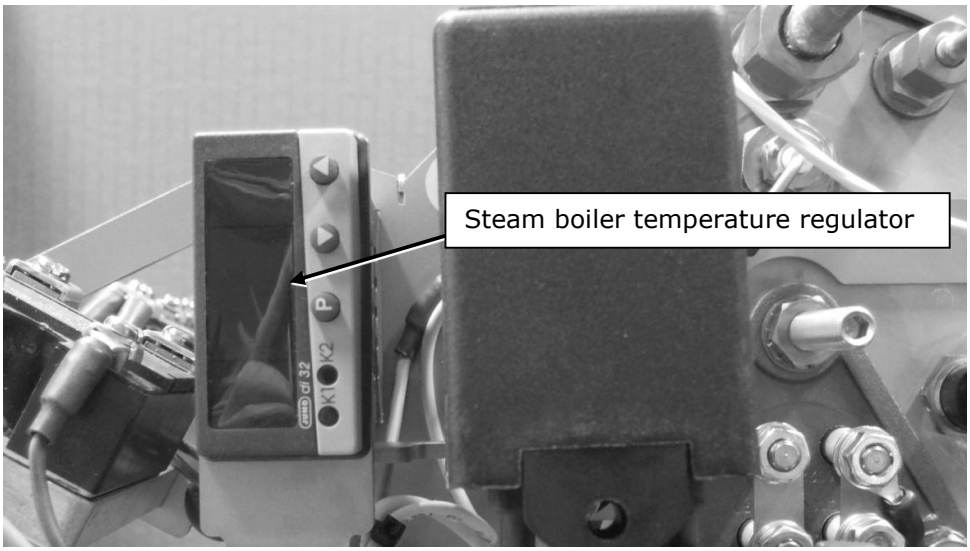


*Figure 6. Showing steam boiler temperature regulator.*

## Adjust pump pressure

The right hand side pressure gauge displays the pressure in the coffee boiler. The minimum value is the pressure of the incoming tap water (as in other water taps in your house). Factory setting of the maximum pressure in the boiler is 11-13 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, with the group valve "open" and the pump activated, the pressure is supposed to increase up to 9 Bar (factory setting). The pump pressure can be adjusted by turning the set screw on the right hand side of the brass pump housing (see figure 7).

***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 the group by slotting the brewing lever in its lower position.
3. Observe the right hand 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.

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

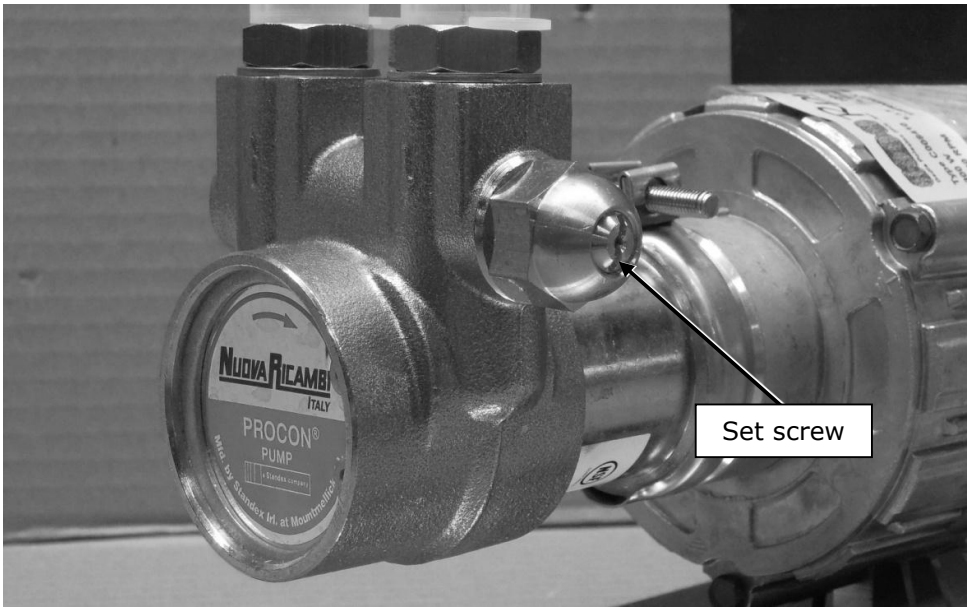


*Figure 7. Showing the set screw on the pump to change pump pressure.*

**Notes**
Do not set the pump pressure with a blind filter in the filter holder. When a blind filter is used water in the system is trapped between a one-way valve and the blind filter. Therefore, the coffee boiler pressure will not drop when the set screw is turned counter-clockwise.

When pump pressure exceeds approximately 12 Bar, the expansion valve will open. Increasing the pump pressure further will not result in higher coffee boiler pressure.

Do not set the operational pressure above 9 Bar since this will reduce the life-span of valves, etc. in your Speedster dramatically.

# Cleaning the machine

## Remove filter basket

***Materials needed***

1. Wide screw driver (or back end of teaspoon)

***Procedure***

1. Remove the filter holder.
2. Pry the filter basket (e.g. with a teaspoon) from the filter holder (see figure 8).
3. When remounting the filter basket, make sure the spring snaps into the basket.

*Figure 8. Pry filter basket from filter holder with e.g. tea spoon.*

## 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 plastic handle will corrode in this solution and should thus be kept out of the solution.

**Beware!**

Never clean the filter holder in a dish washer as dish washer detergent will ruin it.

## 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.

**Beware!**

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.

## Body

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.

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

Activate the group (without filter holder placed) 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.

## Back flush group

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 intensively used several times per day. 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)
- Wide screw driver (or back end of teaspoon)

***Procedure***

1. Remove the filter holder, activate the pump (lever in lower position) and flush the group for approximately 5 seconds.
2. Clean the group screen and rubber group seal with the plastic group brush.
3. Pry the filter basket (e.g. with a teaspoon) from the filter holder (see figure 8) and replace it with the blind filter.
4. Scoop 1 teaspoon of coffee dissolving powder in the blind filter and place the filter holder in the group.
5. Activate the pump until full 9 Bar pressure is reached (lever in lower position for approximately 5 seconds) and shut off the pump (lever in upper position).
6. Wait for approximately 3 seconds (the pre-infusion cylinder should have time to empty) then activate the pump again for approximately 5 seconds.
7. Repeat the last step 9 times (wait 3 seconds, activate pump 5 seconds).
8. Remove the filter holder from the group, clean the blind filter by flushing it under the tap, activate the pump for approximately 5 seconds to remove possible powder from the group screen.
9. Repeat step 6 (3 seconds pump "off", 5 seconds pump "on") 4 times but remove the filter holder and pour out remaining liquids between each flush.

> **Note!**
> Removing the filter holder is essential to prevent remnants of cleaning powder to settle between the plunger and housing of the 3-way group valve.

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

# Maintenance

Below is the recommended maintenance scheme followed by a description of how the individual maintenance items should be carried out. Up to one year, the maintenance is easy and does not require any technical knowledge. However, checking and replacing parts inside the machine should be done with care and requires some technical skills.

## Recommended maintenance scheme

***Daily (depending on use,** see description in previous section**)***

- Clean filter holder
- Clean steam wand
- Backflush group

***Weekly***

- Clean group dispersion plate
- Clean group screen
- Clean filter holder

***Every 3 months***

- Re-generate water softener
- Check pump pressure
- Check and replace if necessary:
  rubber group seal
  group screen
  filter basket
  filter holder clip

***Every 6 months***

- Replace rubber group seal
- Check anti-vacuum valve for leakage
- Check safety-valve on hot water/steam boiler for leakage
- Check expansion valve on heat-exchanger system
- Check O-ring and spring in progressive pre-infusion cylinder, grease O-ring and piston shaft

***Every 12 months***

- Replace:
  group screen
  filter basket
  filter holder clip
- Replace anti-vacuum valve
- Grease steam wand ball and check play between nut and ball of steam wand;
  replace nut if necessary
- Check restrictor in group on scale build-up

***Every 2 years***

- Rebuild steam valve
- Clean probes, level and safety

***Every 5 years:***

- Replace all solenoid valves

## Replace group seal

The group seal is made out of rubber and will harden in time. We advise to replace the group seal at least every 6 months or more often when needed.

***Materials needed***

- Wide flat screw driver (or back end of a fork or spoon)
- Replacement rubber group seal

***Procedure***

1. Pry the group screen gently from the group using a wide screw driver as lever under bayonet-ring and against the side of the group screen (see figure 9a). Pry left and right for even distribution of force. The screen will fall out together with the rubber group seal.
2. Remove the rubber group seal from the group screen.
3. One side of the rubber group seal has a somewhat more rounded surface. When replacing the rubber group seal, 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 9b).
4. Remove the filter basket from the filter holder. Place group screen with rubber group seal on the filter holder and insert into group, pushing upwards. Turn filter holder in bayonet, then remove filter holder.
5. Insert the filter basket to the filter holder. Turn into the group to finish pressing the rubber group seal into the group.

*Figure 9a (left). Pry left and right with screwdriver to remove group screen and rubber group seal.*
*Figure 9b (right). Mount group screen with empty filter holder and group ring not pushed all the way on the group screen.*

## Clean group dispersion plate.

The group dispersion plate ensures more uniform wetting of the coffee bed. When dirty, the wetting will become less uniform.

***Materials needed***

- Wide flat screw driver (or back end of a fork or spoon)
- Screw driver no.2

***procedure***

1. Remove group screen with rubber group seal.
2. Turn out 2 screws holding black POM dispersion plate (see figure 10).
3. Pull down black dispersion plate.

4. Clean all.
   **Beware**! Do not scrub the POM dispersion plate as it will scratch easily.
5. Re-install.

*Figure 10. Shows dispersion plate mounted with 2 screws (left) and dispersion plate removed from group (right).*

## Regenerate water softener

All tap water contains dissolved elements, one of which is calcium carbonate. While an increase in temperature normally leads to better dissolution of elements, precipitation of calcium carbonate (scale) is favoured by high temperatures. Scale in your machine will inevitably lead to costly repairs and may eventually cause your machine to break down. To avoid the precipitation of calcium carbonate from the tap water in your Speedster, a water softener is included in your shipment to capture the calcium carbonate before it reaches your machine. We urge you to never use your Speedster without a properly functioning water softener.

Calcium carbonate is taken out of your tap water and stored in the water softener (also called: ion exchanger) which will decrease its proper functioning. By regenerating the water softener the calcium carbonate is expelled from the water softener thus restoring its proper functioning. For assurance, the water softener delivered to you was regenerated in our shop before shipment.

How quickly the functioning of your water softener decreases depends mainly on the quality of your tap water and the amount of use. We advise you to regenerate your water softener at least every 3 months, more often is never wrong.

**Warning!**

During regeneration the water supply to your machine is cut off, therefore you must shut down your machine before regenerating the water softener.

***Materials needed***

- PVC-hose (included in your shipment)
- Bucket
- Coarse grained regeneration salt (e.g. Broxomatic); 1,0 kg

***Procedure***

1. Shut down your Speedster.
2. Turn the water softener such that the valves are facing you with both handles in the "9 'o clock" position (see figure 2).
3. Cut the PVC hose in two, one section should be approximately 50 cm (18 in) long.
4. Attach one end of the short section to the slender spout (right hand side) of the upper valve and dangle the other end in the bucket.
5. Turn the upper valve clockwise into the "3 'o clock" position. Inflow of water to the water softener is now cut off and excess pressure is released into the bucket.
6. Turn the black knob on top of the water softener a few times counter clock wise such that the lid can be removed, remove the lid.
7. Pour 1,0 kg of Broxomatic (or other coarse grained regeneration salt) into the water softener.
8. Use caution as the rim of the water softener is sharp! Wipe the inside of the water softener where the rubber ring of the lid will be clean with your finger.
9. Put the lid back in its place and tighten it by turning the knob, use only little force.
10. Attach one end of the long section of PVC hose to the slender spout of the lower valve and place the other end in the discharge.
11. Turn the lower valve clockwise into the "3 'o clock" position.
12. Turn the upper valve counter clock wise into the "9 'o clock" position.
13. Water will now slowly run through the water softener (regulated by a restrictor in the spout of the lower valve). The salt will dissolve and attach itself to the resin in the water softener thus substituting the precipitated calcium carbonate particles which in turn will be discharged.
14. We advise you to shake your water softener up and down during regeneration to ensure that the salt solution penetrates in all parts of the resin bed.
15. The regeneration process is complete when the discharged water no longer tastes salty, this will take 30-45 minutes.

**Note**
The water tastes salty because salt not used to replace calcium carbonate is expelled from the water softener. If it takes very long (more than 90 minutes) for the water to taste fresh, regeneration was not necessary yet.

16. When the salty taste is gone, turn the lower valve back to the "9 'o clock" position, remove the PVC hoses and turn your Speedster "on".

**Notes**
Do not use descaling solution (or e.g. vinegar), as you would with a consumer coffee brewing apparatus, because it might damage your Speedster. The aggressive agent may corrode metal and sealing materials of the machine from the inside.

Our commercial machines, which are used in bars and restaurants and thus produce up to hundreds (and even a thousand) of beverages per day, do not show noticeable scaling for years provided that the water softener of these machines is regenerated as often as needed.

# Maintenance inside the Speedster

**Warning!**

To avoid hazardous situations it is of the utmost importance that repairs are only performed by the manufacturer or another professional when the power cord, pump cord or other electric parts of your Speedster gets damaged or should be replaced for other reasons.

**We strongly recommend to only have well-experienced espresso machine technicians to perform the tasks described further on in this manual. Kees van der Westen Espressonistic Works B.V. cannot be held responsible for any damage caused by non-trained people working on our machines.**

## Remove body panels

Most parts within the machine that need regular maintenance can be accessed by removing either left, right and/or upper body panel. Since the upper body panel is enclosed between the side panels, the upper body panel should not be removed with the side panels still attached. Removing only the upper body panel will result in scratching the side panels and possible bending of the upper body panel.

**Warning!**

Parts of the interior of the machine will have a temperature (nearly) as high as the set temperature of the steam boiler.

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

**Take the necessary precautions when one or more body panels are removed**.

***Tools needed***

- Spanner 13 mm
- Allen key 3 mm

***Procedure side panels***

1. Unscrew the 2 nuts on the side panel with a 13 mm spanner (see figure 11).
2. Carefully pull side panel away from the machine.
3. When re-mounting the side panels, don't forget the rubber and stainless steel ring under the nuts.

***Procedure upper body panel***

1. Make sure that both side panels are removed.
2. Use a 3 mm Allen key to remove 3 (earlier machines) or 5 (newer machines) bolts The remaining bolts on the body panel should not be loosened (see figure 12).

3. Lift back side of panel up then pull panel a little to the front.
4. When re-mounting, make sure that the upper body panel hooks onto the front of the machine. Do not over-tighten the Allen bolts.
5. Re-mount side panels.

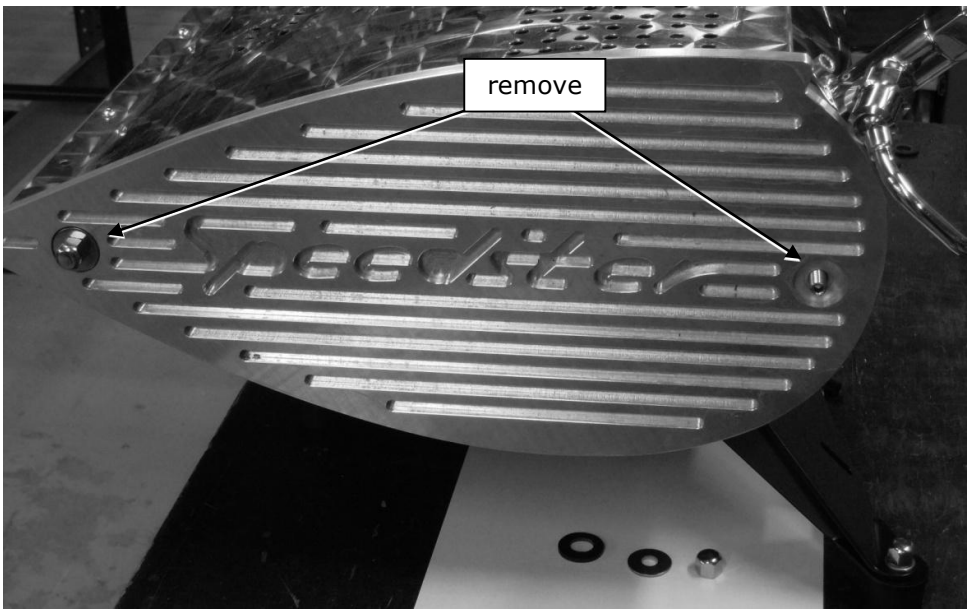


*Figure 11. To remove side panel loosen the 2 nuts with a 13 mm spanner. Note: the side panel shown in the picture is not polished.*

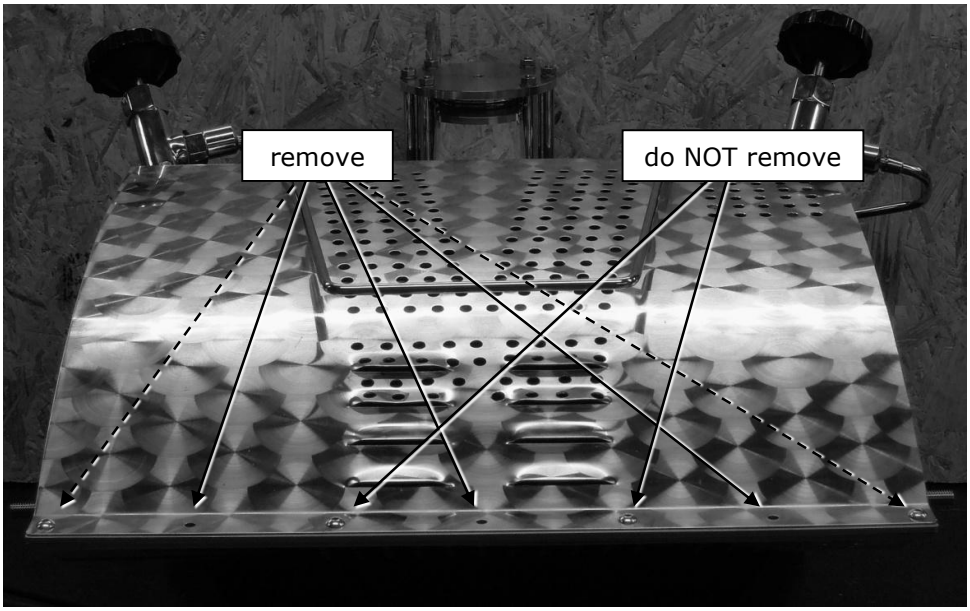


*Figure 12. Showing which bolts should be removed to lift upper body panel. During 2012 the upper body panel will be attached with 5 bolts.*

## Replace anti-vacuum valve

The anti-vacuum valve could malfunction when the machine is turned off regularly. It is advised to replace the anti-vacuum valve every year.
Some sputter and hiss inside the drain pipe at the back of the drip tray is normal when the machine is warming up from cold when the water reaches boiling temperature and a little steam is released through the anti-vacuum valve into the discharge.
A malfunction of the anti-vacuum valve is recognised by a continuous hissing sound combined with the lack of pressure and temperature building up while the heater in the steam/hot water boiler is engaged continuously and the boiler is filled automatically once in a while. (However, a malfunctioning safety valve leads to similar symptoms.)

***Materials needed***

- Spanner 13 mm, 16 mm, 17 mm
- Allen key 3 mm
- Replacement anti-vacuum valve

***Procedure***

1. Turn Speedster "off".
2. Open the steam valve, this will relieve the pressure in the hot water/steam boiler.
3. Remove left and right side panels first, then upper body panel.
4. Pull the black silicone (drain-) hose from the anti-vacuum valve (see figure 13).
5. Unscrew with a 16 mm spanner the brass nut underneath the sub-frame on which the anti-vacuum valve is mounted. Retain the valve with a 17 mm spanner.
6. Replace the anti-vacuum valve, do not tighten the brass nut with a lot of force.
7. Put the silicone hose on the valve.
8. Close the steam valve and turn the Speedster "on".
9. Check the anti-vacuum valve for leakage. If necessary, tighten nut a little more.
10. Mount upper body panel first, then both side panels.

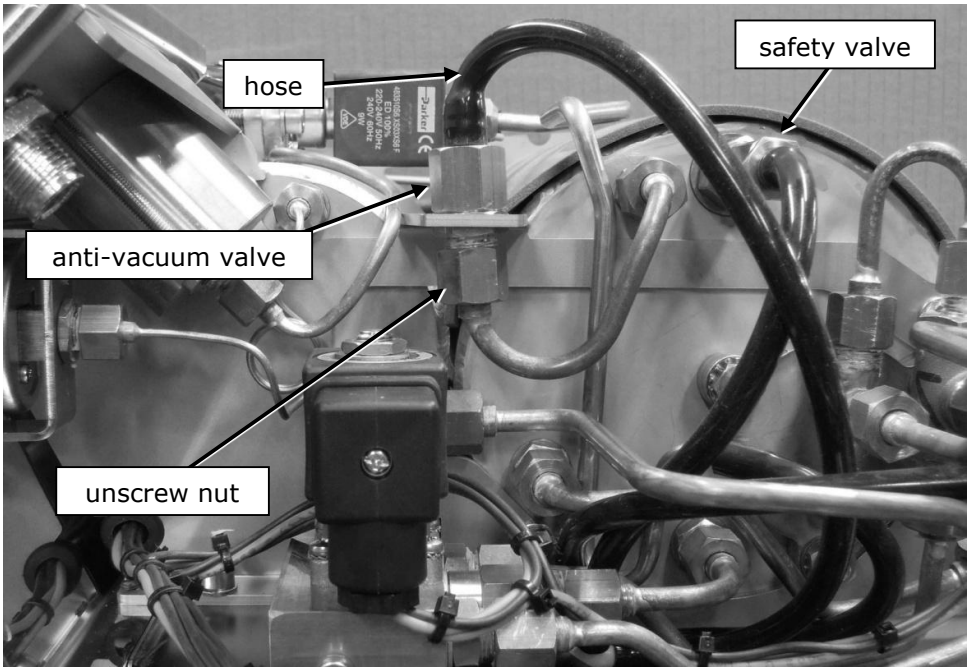


*Figure 13. Showing anti-vacuum valve and nut to unscrew for replacement. Also showing position of safety valve.*

## Grease wands and check play between nut and ball

The ball shaped end of the steam and hot water wands is in direct contact with the conical nut and should therefore be lubricated. If not lubricated, the steel ball will erode the brass nut and eventually the wand will "pop out" of the nut.
When opened, you may just as well grease the plunger in the valve.

***Materials needed***

- Spanner, 22 mm
- Heat resistant, food safe, silicon grease
- Loctite

***Procedure***

1. Make sure that valve is closed and valve temperature is such that it can be firmly gripped.
2. Turn conical valve nut with spanner 22 mm counter-clockwise to remove. Beware that a spring inside the valve pushes a plunger against the ball end of the wand. A Teflon sealing ring will probably remain on the valve.
3. Clean the threads on the valve, do not damage the Teflon ring.
4. When removed, slide the nut a little over the wand towards the tip. A (red) silicone ring inside will be pushed out of the nut.

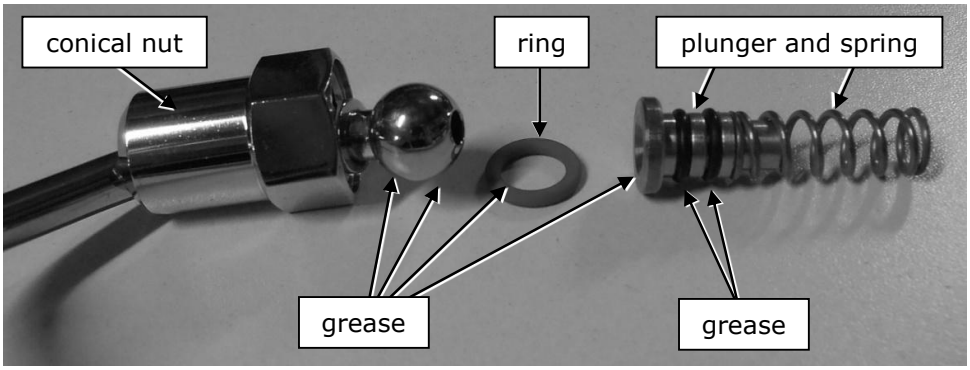


*Figure 14. Steam or hot water wand end with plunger removed. Grease parts as indicated.*

5. Apply a (very) small amount of grease to both sides of the ball end of the wand, the silicone ring, the rounded end of, and the two rubber rings on, the brass plunger in the valve.
6. Slide the spring and plunger back into the valve.
7. Slide the nut back over the wand, insert the red silicone ring.
8. Screw the nut a few turns onto the valve.
9. Apply 2 drops of Loctite to the threads of the valve. Tighten nut with spanner, do not use excessive force.

## Check jet in group on scale build-up

Even when you keep your water softener in excellent condition, a minor amount of scale will still be deposited on the inside of your Speedster. Most ducts within the machine have such dimensions that a little scale will not influence the brewing process. However, the flow restrictor, or jet, within the group head has an opening with a diameter of 0.6 mm[2] and is thus most affected by any scale build up. When new, the flow (with filter holder removed) is 135 ml (+/- 20 ml) in 10 seconds. When this drops to less than 90 ml in 10 seconds your machine needs attention.

**Note!**
Opening the group head should be done with extreme care as not to damage any parts. First, make sure that the decrease in flow is not due to a malfunction of the pump or expansion valve.

### Clean jet in group head

***Materials needed***

- Spanner 11 mm
- Allen key 3 mm
- Small screwdriver (no. 1)

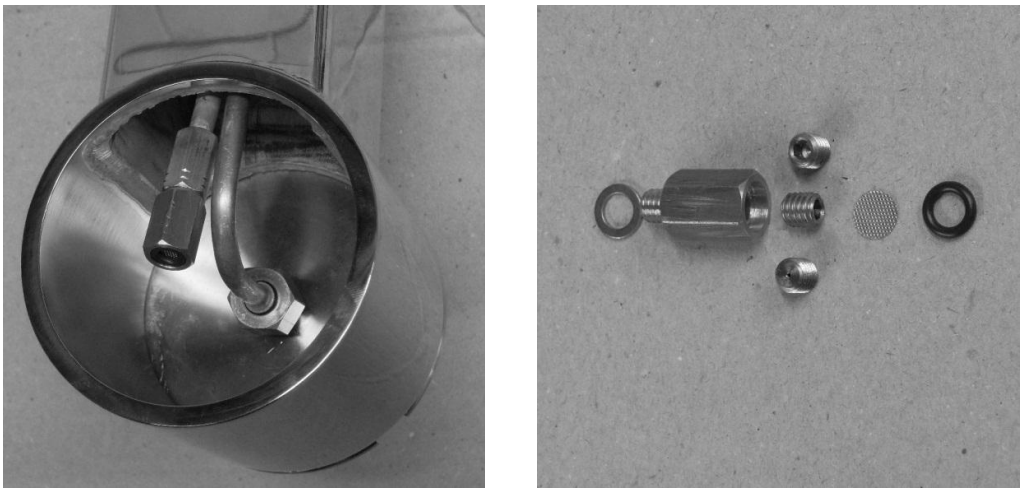

*Figure 15. Showing the jet housing and jet within the group head (left) and an isolated and exploded view of the jet housing. 3 jets are shown, the middle one is "in position", the others show inside and outside of the jet. To avoid damage, do not remove the jet housing from the group.*

***Procedure***

1. Disconnect the pump motor (unplug special connector).
2. Close main tap of water supply.
3. Make sure that machine is switched "on".
4. Put brewing lever in middle position, this will relieve the water pressure in the coffee boiler and group.
5. Put brewing lever back in upper position.

[2] The coffee water injection system contains 2 jets with 0.6 and 1.5 mm diameter openings respectively. Normally, the 0.6 mm jet is mounted in the group head.

6. Switch machine "off".
7. Unscrew the plastic cap from the group head.
8. Remove the 6 nuts on the rim of the group head with a 10 mm spanner.
   It is possible that the nut does not come loose from the tie-rod such that the tie-rod will be unscrewed from the group ring. In this case, do not try to remove the nut from the rod.
   Water will run from the group into the drip tray as soon as the group bayonet ring is loosened. The group and group neck contain about 1 litre of water, the drip tray will not be able to discharge such a large quantity of water at once.
9. Lift the top group head plate from the group head.

> **Beware**! The bayonet group ring (with tie rods) will drop when the top group head plate is lifted off.

10. With the jet housing still attached inside the group, remove the rubber ring from the jet housing with a small screw driver, do not damage the ring.
11. Use a needle or pin to remove the filter screen from the jet housing.
12. use a 3 mm Allen key to remove the jet from its housing. Retain the jet housing with a 11 mm spanner. See figure 15.
13. Clean the jet (if possible use a 0.6 mm drill-bit).
14. Remount the jet, do not over-tighten.
15. Remount the filter screen and rubber ring in the jet housing.
16. When remounting the bayonet group ring and top group head plate, make sure that the rubber sealing ring on the top group head plate does not get jammed.
17. Remount the 6 nuts on the top.

> **Beware**! Do not over-tighten the nuts. The bottom -bayonet- group ring is made from brass; the threads in this ring wear out easily.

18. Open water mains.
19. Connect pump motor.
20. Switch machine "on".
21. Check for leakage, first with brewing lever in middle position (line pressure; up to 3 Bar), then in lower position (pump engaged; 9 Bar).
22. When leakage occurs, check if sealing ring in top group head plate is positioned correctly.
23. Replace the plastic cap on group.

## Safety valve on steam boiler

When the safety valve on the steam/hot water boiler is malfunctioning it will open at a (much) lower than operating pressure (2.4-2.5 Bar). When this occurs, The safety valve has to be replaced

A malfunction of the safety valve is recognised by a continuous hissing sound combined with the lack of pressure and temperature building up while the heater in the steam/hot water boiler is engaged continuously and the boiler is filled automatically once in a while. (However, a malfunctioning anti-vacuum valve leads to similar symptoms.)

### Check safety valve

***Materials needed***

- Spanner 13 mm

***Procedure***

1. Remove right hand side panel.
2. Pull black silicone drain hose from safety valve (see figure 13).
3. Check for leakage, the hose should be dry and should not show evidence for leakage (detrital build-up) on the inside.
4. If necessary, replace safety valve (see below).
5. Remount hose.
6. Mount right side panel.

### Replace safety valve

***Materials needed***

- Spanner 13 mm, 15 mm, (ring) 18 mm
- Allen key 3 mm
- Replacement safety valve
- Loctite or Teflon tape

***Procedure***

1. Turn main switch of your Speedster to "off".
2. Open the steam valve to let off steam, this will relieve the excess pressure in the steam/hot water boiler.
3. In the meantime, remove left and right side panels first, then remove upper body panel.
4. Pull black silicone drain hose from the safety valve (see figure 13).
5. When pressure in boiler has dropped, remove the safety valve from the fitting in the boiler with a 15 mm spanner, retain the fitting with a 18 mm (ring) spanner. **Note**. The valve is mounted with Loctite to ensure sealing, you may need a little extra torque to loosen it.
6. Clean inside threads of the fitting as well as possible.
7. Apply a few drops of Loctite or a few windings of Teflon tape to the threads of the replacement safety valve and mount in fitting on boiler.
8. Turn machine "on", wait until pressure has built up.
9. Check valve and sealing for leakage.
10. Remount hose.
11. Mount upper body panel first, then both side panels.

## Expansion valve on heat-exchanger system

The coffee water heating system consists of a heat-exchanger inside the steam boiler and the coffee boiler with group. This entire system is filled with water only, no steam, no air. At the entrance of the coffee water system a one-way valve, or check valve, is installed to prevent hot water being pushed back into the fresh water lines.
When water is heated it will expand. As there is no room for the expanded water (no air pockets, no way out) pressure will build up. The right hand pressure gauge indicates the pressure in the coffee water heating system.
To keep this pressure within safety limits, an expansion valve is part of the system. The expansion valve will release drops of water when pressure exceeds the set value. The released water is directed into the discharge.
As soon as the brewing lever is moved to its middle (pre-infusion) position (group valve open, no pump activated) the pressure will drop immediately to incoming line pressure. When the lever is moved to the lower position the pump will be activated. The pump now pressurises the entire coffee water system.

The expansion valve and one-way valve is a combined part in the Speedster (see figure 16). The vertical part is the one-way valve, the horizontal part is the expansion valve.

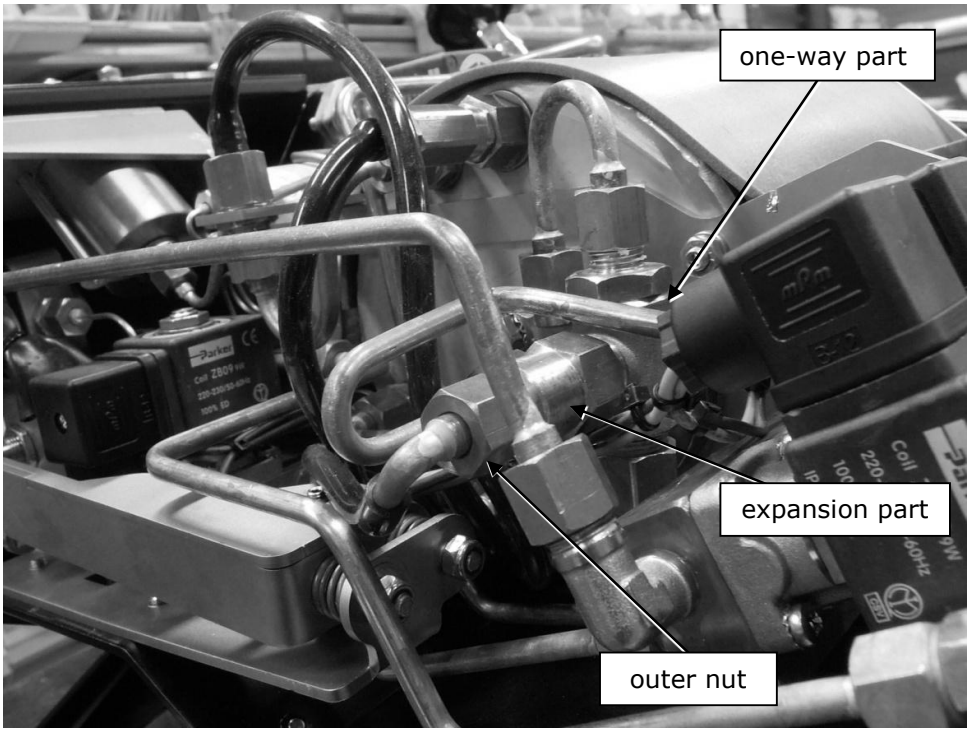


*Figure 16. Showing combined expansion valve and one-way valve. Flow direction within the one-way valve is upwards.*

Easiest is to work with the machine heating up from cold. This will give a long trajectory of heating up and thus expanding of water in the coffee water system such that a proper adjustment can be made.
When the machine is at idle (boiler water already warm) the heating element is only engaged for short bursts every once in a while and the water within the coffee water system does not expand, at least not enough for a proper adjustment.

When warm, the pressure needed for checking and adjustments can be supplied by the pump.

**Note**
The group valve has a rating of 15 Bar. This means it will be pushed open when pressure exceeds 15 bar. The group valve thus acts as a second safety, should the expansion valve fail to open.

### Check expansion valve

***Materials needed***

- Spanner 13 mm, 16 mm, 21 mm
- Allen key 5 mm
- Wide screwdriver
- Towel or sponge

***Procedure when machine is cold***

1. Turn the machine "on".
2. Be sure the coffee water system is completely filled: water should excite immediately from the group when the brew lever is moved downwards.
3. Remove both left and right side panels and upper body panel. (When the outer nut of the expansion valve is not too tight, there is no need to retain the expansion valve such that the left side and upper body panels do not have to be removed.)
4. Turn outer nut loose from expansion valve with 16 mm spanner. Retain expansion valve with 21 mm spanner. Let drain hose with short copper tube and nut dangle to side.
5. Check on right hand pressure gauge at what pressure the expansion valve starts to drip. Have a towel ready to pick up the spills.
6. If opening pressure is lower than 12 Bar, use a 5 mm Allen key to turn the set screw inside the expansion valve clockwise (see figure 17).
   If expansion valve does not start dripping when 12 Bar is reached, turn set screw counter-clockwise until it does.
   When the valve cannot be closed at 12 Bar, the sealing disk inside has to be replaced (see below).

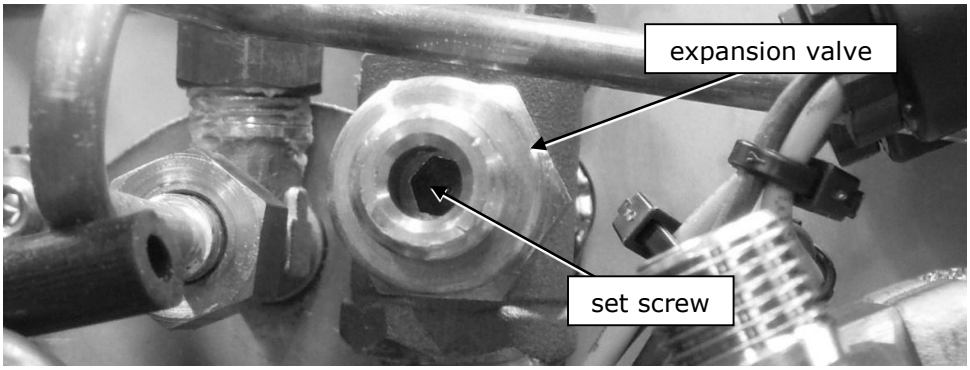


*Figure 17. Showing detail of expansion valve and hexagonal opening in set screw. Drain hose is removed from valve.*

7. Re-mount drain hose to expansion valve. Wiggle the tube a little when fastening the nut, do not over-tighten the nut.
8. Re-mount upper body panel (if removed), then side panel(s).

***Procedure when machine is warm/hot***
***Extra material needed*** blind filter

1. (Make sure machine is switched "on".)
2. Remove both left and right side panels and upper body panel. (When the outer nut of the expansion valve is not too tight, there is no need to retain the expansion valve such that the left side and upper body panels do not have to be removed.)
3. Unscrew outer nut from expansion valve with a 16 mm spanner. Retain expansion valve with 21 mm spanner. Let drain hose with short copper tube and nut dangle to side.
4. Turn the set screw inside the expansion valve with Allen key 5 mm clockwise to increase the opening pressure of the valve.
5. Replace filter basket in filter holder by blind filter.
6. Mount filter holder in group.
7. Activate pump (brewing lever in lower position).
8. Check pump pressure in coffee boiler on (right) pressure gauge.
9. Increase pump pressure to 12 Bar by turning the set screw on the pump clockwise. It is possible that the expansion valve starts to leak water, in that case, replace the sealing disk in the valve (see below).

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

10. Turn set screw inside the expansion valve counter-clockwise until the valve starts to drip. Have a towel ready to pick up the spills.
11. De-activate pump (lever in upper position), wait for 3 seconds and watch pressure drop on gauge.
12. Turn set screw on pump anti-clockwise to reduce pump pressure.
13. Activate pump and increase pump pressure slowly until expansion valve starts to drip. If necessary, adjust pressure at which expansion valve starts to drip.
14. De-activate pump (lever in upper position).
15. Re-mount the hose to expansion valve. Wiggle the tube a little when fastening the nut, do not over-tighten the nut.
16. Re-mount upper body panel (if removed), then side panel(s).
17. Set pump pressure back to 9 Bar (use ground coffee in filter basket; see section "adjust pump pressure".)

**Replace sealing disk in expansion valve**

***Materials needed***

- Spanner 16 mm, 21 mm, adjustable
- Allen key 5 mm
- Small screw driver
- Replacement (Viton) sealing disk
- Loctite or Teflon tape
- Heat resistant, food safe, silicon grease

***Procedure***

1. Close water mains to machine.
2. Put brewing lever in middle position to depressurise the coffee water system.
3. Turn machine "off" and brewing lever in upper position.
4. Remove left and right side panels first and then upper body panel.
5. Unscrew outer nut from expansion valve with a 16 mm spanner. Retain expansion valve with 21 mm spanner. Let drain hose with short copper tube and nut dangle to side.
6. Remove outer part of expansion valve with 21 mm spanner. Retain expansion valve with suitable spanner since outer part of expansion valve is sealed with Loctite. Inside you will find a set screw, spring and plunger, the sealing disk is mounted in the plunger (see figure 18).

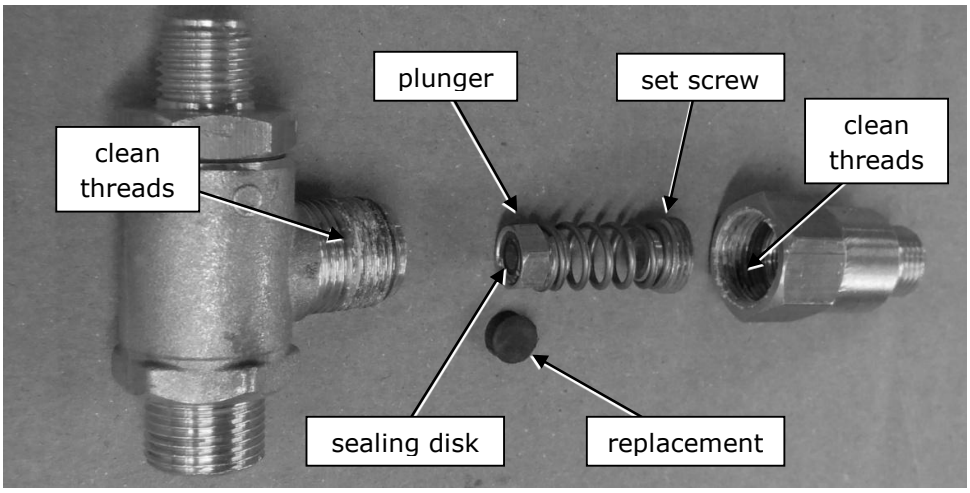


*Figure 18. Exploded view of expansion valve showing plunger, spring set screw, and replacement sealing disk. There is no need to remove the expansion valve from the machine when replacing the disk.*

7. Clean threads on expansion valve and inside the outer part.
8. Carefully remove sealing disk from plunger with small screw driver, do not damage the plunger.
9. Put a little silicon grease on both plunger and sealing disk.
10. Mount sealing disk back on plunger, make sure that you push out possible air between plunger and disk.
11. Mount plunger and spring back into the expansion valve (disk inwards).
12. Apply a few drops of Loctite to the threads of the expansion valve (or a few windings of Teflon tape).
13. Screw outer part back on the expansion valve, retain the valve with a suitable spanner.
14. Adjust opening pressure of expansion valve (see previous paragraph).
15. Re-mount the hose to expansion valve. Wiggle the tube a little when fastening the nut, do not over-tighten the nut.
16. Re-mount upper body panel first, then side panels.
17. Open water mains to machine.

## Rebuild valves

When properly maintained, the steam and hot water valves have a very long life-span. Since temperatures in these valves rise up to 135 °C (275 F), the (rubber, Teflon and silicon) sealing parts inside wear out a bit quicker than in your house-hold taps.

***Materials needed***

- Allen key 5 mm
- Adjustable spanner
- Spanner 10 mm, 20 mm, 22 mm
- Rag
- Heat resistant, food safe, silicon grease
- Replacement rings and disks (for both valves: 4x rubber ring in valve, 1x rubber disk in valve, 1x Teflon ring in valve, 2x silicon ring in wand, 2x Teflon ring in wand, 4x rubber ring on wand-plunger)

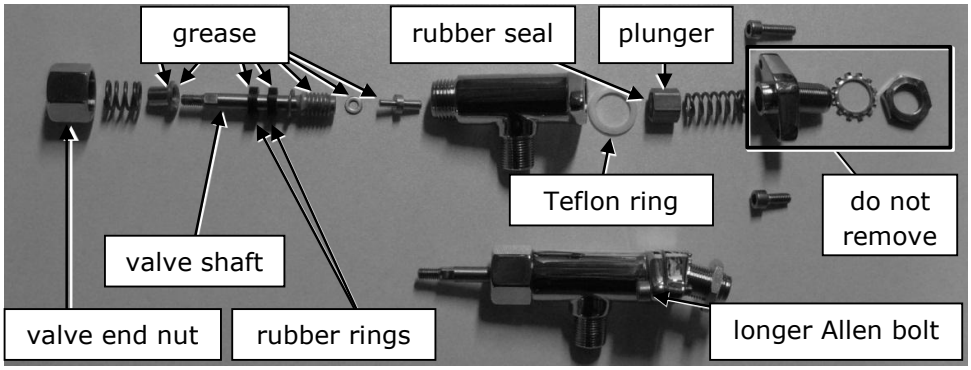


*Figure 19. Exploded view of steam valve and assembly. The base of the valve will remain attached to the Speedster. Note position of longer Allen bolt on top side of assembled valve. On the machine, the longer bolt is in the lower position. The rubber sealing rings are not removed from the valve shaft.*

***Procedure steam valve***

1. Turn machine "off".
2. Open steam valve until no more steam escapes the machine. This is to release pressure from hot water/steam boiler, keep valve open.
3. Remove steam wand: twist off conical nut with spanner 22 mm (see figure 14).
4. Twist off cap in the centre of the steam valve knob, then remove nut with 10 mm spanner (retain knob when loosening nut), remove knob.
5. Put rag over valve end nut to protect chrome, loosen with adjustable spanner, do not remove the nut completely at this moment.
6. Remove the two Allen bolts (5 mm), a spring will push the valve from its base (the base of the valve will remain on the Speedster). Be careful not to lose any parts. The Teflon ring will probably remain in the valve, pry out gently.
7. Now remove valve end nut.
8. Use valve knob to remove shaft from valve.

| **Beware**! These threads are counter-clockwise. |
|---|

9. Replace Teflon ring, rubber sealing rings on shaft (2x) and rubber seal on plunger.
10. Be generous with grease on rubber sealing rings and other parts and threads on shaft.

11. Re-assemble valve and remount on machine, note position of longer Allen bolt. On the machine the longer Allen bolt is the bottom one.
12. Remount valve knob and cap on valve shaft. Close valve.
13. Replace the 2 rubber rings on the plunger and silicon ring (use grease; see figure 14), and Teflon ring in conical nut of steam wand.
14. Remount steam wand with a drop of Loctite.
15. Switch machine "on".
16. When machine is heated up, use valve and check for leakage.

***Procedure hot water valve***

Although the twist-knob on the water valve has no function, the interior parts of the valve get warm and must be serviced. The hot water valve contains fewer parts (see figure 20, compare to figure 19). Since there is no plunger, it is not necessary to remove the valve from the machine.

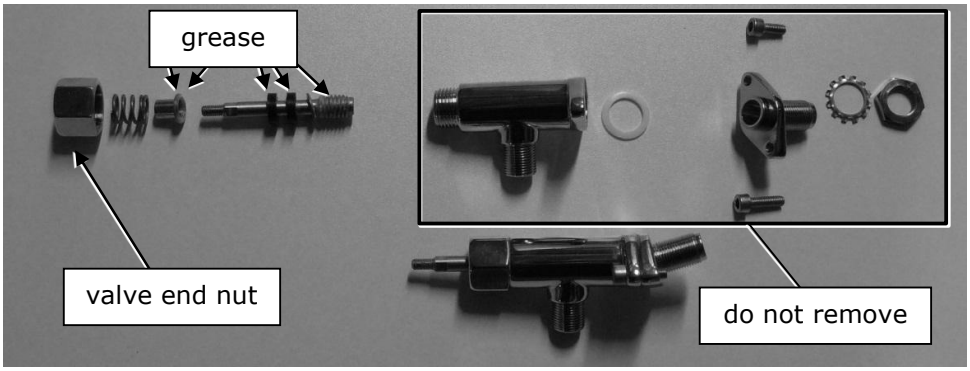


*Figure 20. Exploded view of hot water valve and assembly. The valve itself will remain on the machine. The rubber sealing rings are not removed from the valve shaft.*

1. Turn machine "off".
2. Open steam valve until no more steam escapes the machine. This is to release pressure from hot water/steam boiler, keep valve open.
3. Remove hot water wand with spanner 22 mm.
4. Twist off cap in the centre of the hot water valve knob, then remove nut with 10 mm spanner (retain knob when loosening nut), remove knob.
5. Put rag over valve end nut to protect chrome, loosen with adjustable spanner and remove.
6. Use valve knob to remove front rod from valve.

| **Beware**! These threads are counter-clockwise. |
|---|

7. Replace rubber sealing rings on valve shaft (2x). Be generous with grease on rubber sealing rings and shaft threads.
8. Remount valve shaft in valve,
9. Remount valve end nut, valve knob and cap on valve.
10. Replace the 2 rubber rings on the plunger and silicon ring (use grease; see figure 14), and Teflon ring in conical nut of hot water wand.
11. Remount hot water wand with a drop of Loctite.
12. Close steam valve, switch machine "on".
13. When machine is heated up, use valve and check for leakage.

## Clean probes, level and safety

Two probes are mounted in the hot water/steam boiler. The lower probe checks the water safety level. Power to the heating elements in the Speedster (both hot water/ steam boiler and coffee boiler) is disconnected when water level is lower than this probe. The upper probe checks the water level in the hot water/steam boiler for normal operation; when water level is below the probe, the boiler will start filling with the pump engaged, provided that no shot is being pulled. The boiler stops filling when water level reaches the probe.
Precipitation on the probes will act as (electrical) insulation, thus inhibiting proper functioning of the probes.

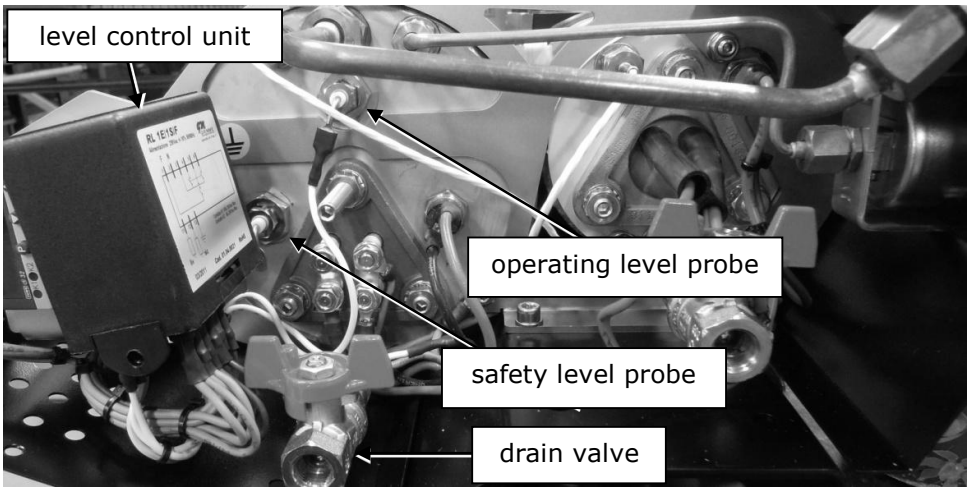


*Figure 21. Showing safety level (lower) and operating level (upper) probes. The element cover has been removed.*

***Materials needed***

- Spanner 13 mm, 17 mm, 19 mm
- Adjustable spanner
- Allen key 2.5 mm, 3 mm
- Drain hose with fitting (included in shipment)
- Bucket
- Flat screwdriver no.2
- Loctite or Teflon tape

***Procedure***

1. Close water mains.
2. Switch power "off", unplug machine from AC outlet.
3. Open steam valve until no more steam escapes the machine. This is to release pressure from hot water/steam boiler, keep valve open.
4. Remove both side panels and upper body panel.
5. Drain water from hot water/steam boiler: remove plug (or cap in older model) from the hot water/steam boiler drain valve with a 17 mm spanner (see figure 21). Insert the fitting of the drain hose in the open end of the drain valve, dangle the other end in the bucket. Open drain valve on steam/hot water boiler until water stops running. Close drain valve, remove drain hose and fitting, replace plug.
6. Remove the element cover with spanner 13 mm.

7. Remove the electric multi-connector from the steam boiler temperature controller.
8. Remove the screw underneath the level control unit, dangle aside (do not pull the electrical wiring from the unit).
9. Remove the bracket under level control unit with Allen key 2.5 mm, leave temperature controller in bracket, lay aside.
10. Pull electrical connections from probes.

> **Beware!**
>
> Unscrew the outer fittings (large nuts). The inner nut holds a Teflon sealing which, once tightened, cannot be removed from the outer fitting without damaging it. Furthermore, the operating level probe is also bent on the inserted end, it cannot be pulled through the Teflon sealing.
>
> Since there is not enough space to handle a spanner as you normally would, you have to use an unconventional approach.

11. Put a 19 mm spanner perpendicular on the outer fitting of the probe. With an adjustable spanner on the 19 mm spanner, twist the fitting from the boiler (see figure 22).

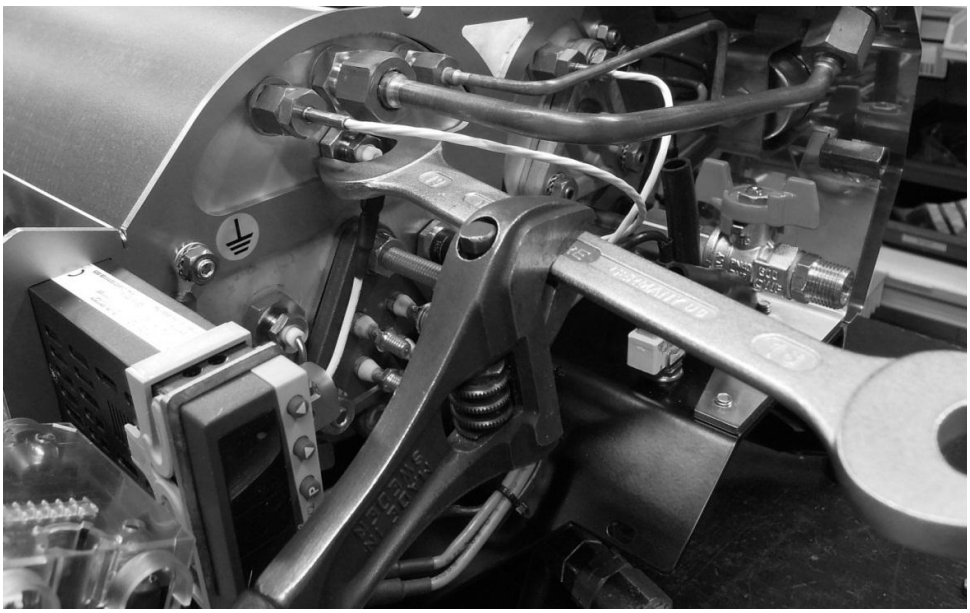

*Figure 22. Showing unconventional approach to remove operating level probe. The level control unit is dangling down (not visible), the bracket with steam boiler temperature controller is still mounted.*

12. Clean the metal end of the probes with a well-used plastic scrub pad (see figure 23). Scale and dirt adheres better on a rough surface: try not to scratch the probes.
13. Clean the threads on the probes and boiler.
14. Apply a drop of Loctite, or a few windings of Teflon tape, on the threads and remount the probes. Use the same technique as when removing. Turn the probes in position: the bent flat ends of the probes should point downwards.

15. Connect the electrical connections to the probes: orange is safety level (lower), white is operating level (upper).

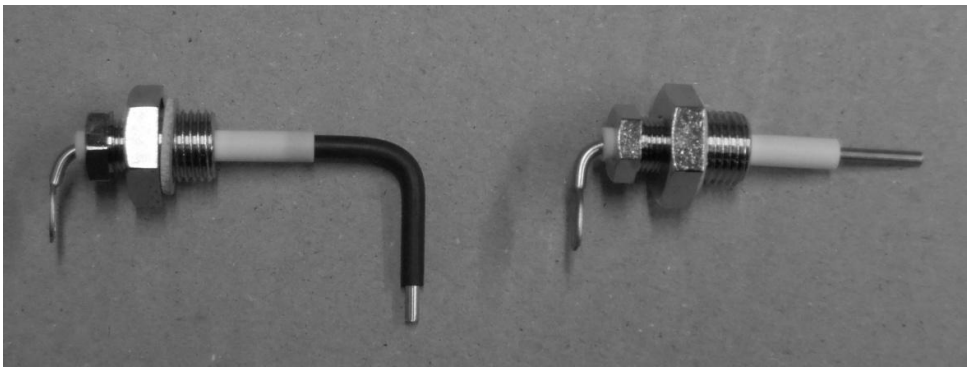

*Figure 23. Showing operating level (left) and safety level (right) probes.*

16. Remount the bracket with temperature controller, plug in electric multi connector.
17. Remount level control unit and element cover. Make sure that the probe wires are not jammed under the element cover.
18. Open water mains.
19. Plug machine into AC outlet.
20. Switch Speedster "on", the boiler will start to fill automatically.
21. Check for proper operation (no power to heating element until safety level is reached; boiler stops filling when operation level is reached; leakage).
22. Remount upper body panel first, then side panels.

## Check O-ring and spring in progressive pre-infusion cylinder

A progressive pre-infusion cylinder is incorporated in your Speedster to guarantee a gradual pressure build-up prior to extraction thus allowing for pre-wetting and swelling of the coffee grounds. At the start of the brewing cycle, the cylinder fills with water until the piston reaches its maximum position. A rubber O-ring around the piston ensures that no pressure is lost in the cylinder. After extraction, when the brewing lever is in the upper position and the group valve is open, the spring pushes the piston back thus expelling water from the piston. The expelled water flows through the 3-way group valve into the drain and thus cleans the valve after each extraction.
Over time, the rubber O-ring may harden and crack and the spring could break. When the O-ring is cracked, water may drip from the visible end of the progressive pre-infusion cylinder.

***Materials needed***

- Spanner 13 mm
- Allen key 3 mm
- Screwdriver no.2, small
- Retaining ring pliers
- Heat resistant, food safe, silicon grease
- Loctite or Teflon tape

***Procedure***

1. Switch machine "off".
2. Remove side panels and upper body panel.

3. Remove the copper tube from the back-side of the pre-infusion cylinder with a 13 mm spanner.
4. Remove the tube leading to the coffee boiler pressure gauge from the boiler with a spanner 13 mm. retain the fitting with a 14 mm spanner. Bend the copper tube a little downwards.
5. Remove the fitting of the pressure tube from the boiler. This will give you enough space to remove the progressive pre-infusion cylinder.
6. Remove the 2 mounting screws on the front of the machine to detach the cylinder from the frame, take the cylinder out of the machine (see figure 24).
7. Remove the retaining ring on the front of the cylinder (see figure 25).
8. Remove the O-ring from the piston (e.g. with a small screwdriver, do not scratch the piston).
9. Inspect rubber O-ring and spring on piston, replace when necessary.
10. Clean cylinder and piston, do not scratch the inner surface of the cylinder.
11. Grease the groove in the piston, replace the rubber O-ring and put some grease on the O-ring itself. Put a little grease on the piston shaft.
12. Re-assemble the progressive pre-infusion cylinder.
13. Remount the cylinder in the machine and the copper tube on the cylinder.
14. Remount the fitting of the pressure gauge tube on the boiler with a drop of Loctite or a few windings of Teflon tape
15. Remount the tube from the pressure gauge.
16. Switch machine "on".
17. Check for proper operation: use blind filter and make sure that progressive pre-infusion cylinder moves out when brewing lever is (in middle or) lower position, and returns when brewing lever is in upper position.
18. Check for leakage.
19. Remount upper body panel first, then side panels.

*Figure 24. Progressive pre-infusion cylinder isolated from machine, the mounting parts that hold the cylinder to the machine are also shown. (In fact, the retaining ring that holds the upper end of the cap is not mounted, for that reason, the piston end is not flush with the outside)*

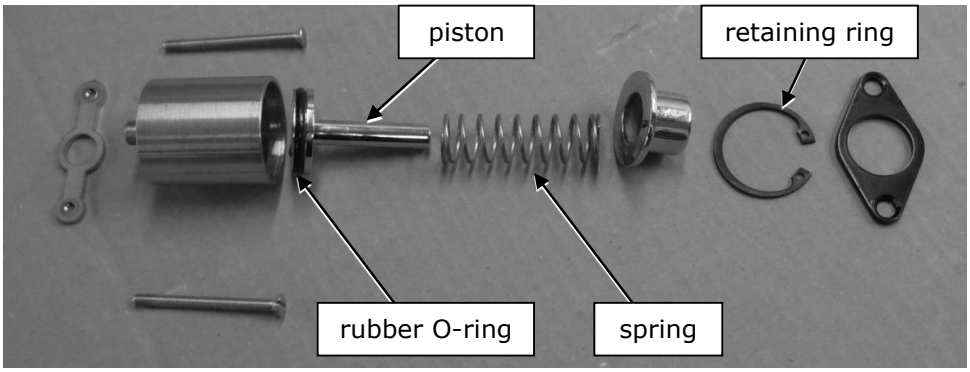


*Figure 25 . Exploded view of progressive pre-infusion cylinder.*

## Replace all solenoid valves

To be sure that the solenoid valves inside your Speedster keep operating properly, it is advised that you replace them every 5 years. The electrical coil outside, and spring and rubber sealing inside, the valve are prone to wear and tear.

***Materials needed***

- Allen key 3 mm
- Spanner 13 mm, 14 mm, (24 mm)
- Phillips screw driver no.1, no.2
- Replacement flange valves (3x brass, 1x stainless steel or )
- Replacement locking washer M4, 16x (or 12x)

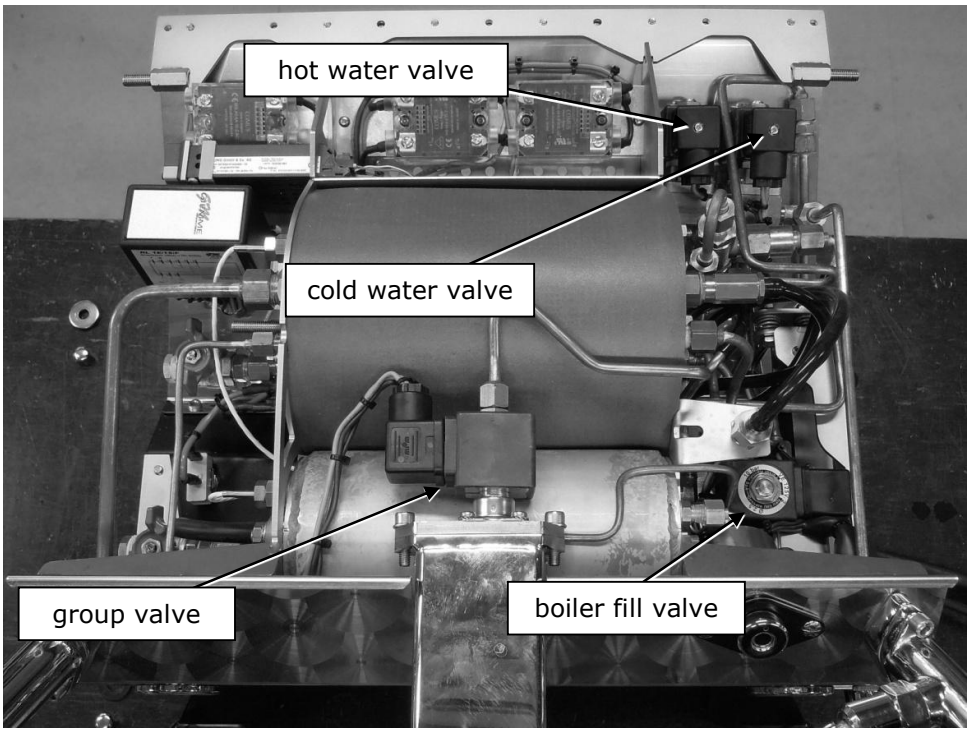


*Figure 26. Showing the Speedster from above with side and upper panels removed. Location of solenoid valves as indicated. Note that group valve is stainless steel 3-way flange valve; older machines (before serial number 148****) have different 3-way group valves.*

***Procedure for flange valves***

1. Close water mains.
2. Remove filter holder.
3. Relieve pressure from coffee boiler by shifting brewing lever to middle position until water stops flowing from group.
4. Relieve pressure from hot water/steam boiler by opening steam valve until steam flow stops.
5. Switch machine "off".
6. Remove both side panels and upper body panel.
7. Remove screw from electrical plug with Phillips screw driver no. 1 (see figure 27). (Turn the group valve coil and plug such that you can reach the screw, if necessary loosen the flat nut on top of the coil a little with spanner 14 mm.)

8. Remove flat nut retaining coil to valve with spanner 14 mm, remove coil.
9. Remove 4 screws that hold flange valve to base with Phillips screw driver no. 2.
10. Replace flange valve. When mounting, make sure that the new valve has both rubber seals and that you position the openings in the flange over the openings in the manifold. Use new locking washers on flange screws.
11. Replace coil with correct side up and electrical connectors in the proper position. When mounting, tighten the flat nut on top just enough to hold the coil in position. Too much strain on the coil-tube will separate it from the valve.
12. Remount electrical plug, note position of plug (see figure 26).
13. Open water mains.
14. Switch machine "on".
15. Check for proper functioning.
16. Remount upper body and side panels.

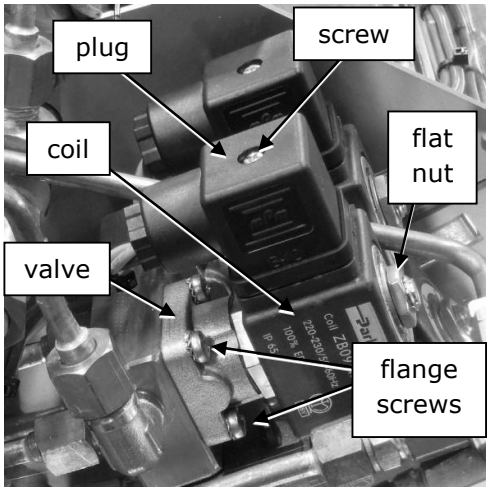


*Figure 27. Detail of (2-way) flange valves on hot water manifold.*

***Procedure for old model group valve (before serial number 148****)***

1. Remove coil from group valve (see above: actions 1-8).
2. Unscrew valve from group with spanner 24 mm.
3. Make sure that the plunger and spring are removed as well.
4. Replace plunger, spring and valve. Put a little silicon grease on sealing ring between valve and group.
5. Replace coil, do not over-tighten flat nut.
6. Remount plug.
7. Open water mains, switch machine "on", check for proper functioning.
8. Remount body panels.

## Adjust brewing lever

When too much lateral force is exerted on it, the brewing lever may bend and thus not function properly. After straightening the lever, it is possible that you have to adjust the position of the lever mechanism for correct functioning of the switches.

***Materials needed***

- Spanner 13 mm, 10 mm
- Allen key 5 mm, 2.5 mm

***Procedure to align lever***

1. Switch machine "off".
2. Remove both side panels and upper body panel.
3. Make sure that the lever is straight; the part protruding from the front of the machine should be parallel to the back end of the lever. The lever is most likely to bend where it passes through the front panel.
4. With the lever in the middle position (pre-infusion, pump off) the wheel on the upper switch should protrude halfway over the lever thickness at the point where it touches the lever (see figure 28).

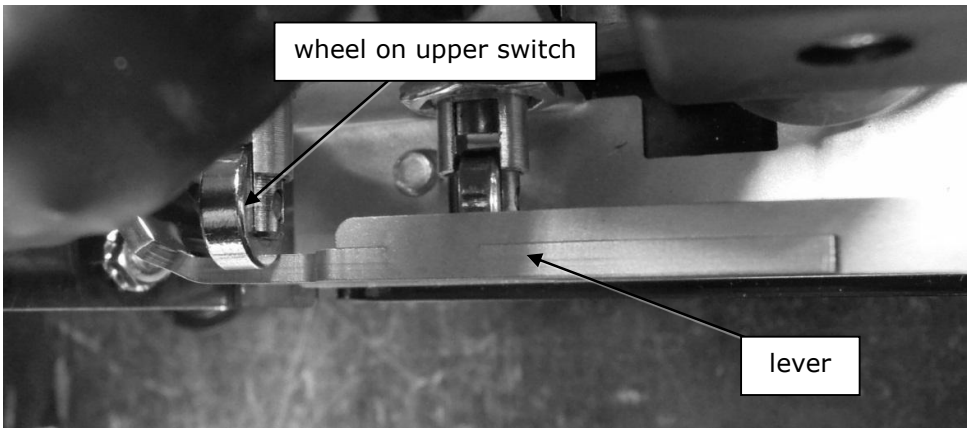


*Figure 28. With the brewing lever in the middle position, the wheel of the upper switch should protrude halfway over the thickness of the lever material.*

5. When adjustments are necessary, loosen the two Allen bolts underneath the frame (see figure 29).
6. Position the bottom bracket of the lever mechanism parallel to the side of the frame with the wheel of the upper switch halfway over the lever thickness.
7. Tighten the two Allen bolts underneath the frame, re-check the position of the lever mechanism (wheel position and parallel alignment with frame).
8. Switch machine "on".
9. Check lever for proper operation.
10. Remount upper body panel first, then side panels.

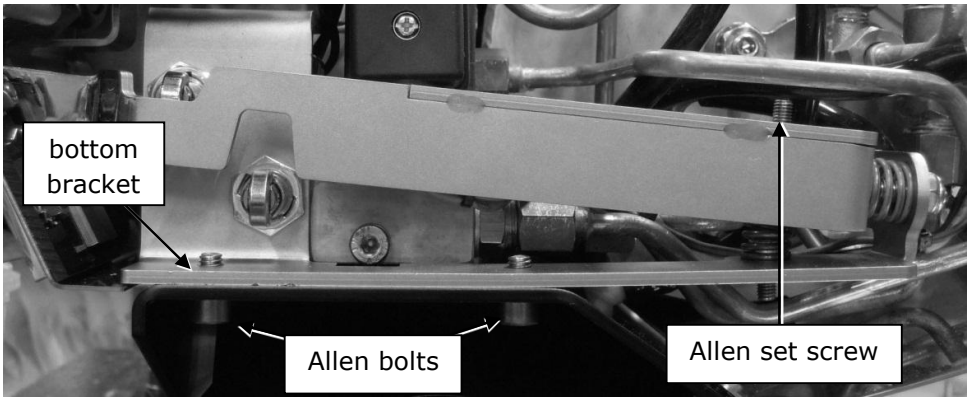


*Figure 29. Showing the brewing lever mechanism. Adjustment of the lever w.r.t. the switches can be made by loosening the lower 2 Allen bolts underneath the frame.*

**Notes**
The force required to press the lever down can be adjusted with the Allen set screw (2.5 mm) on top of the lever mechanism.
The two self-locking nuts at the back of the lever mechanism adjust the force by which the lever is pressed horizontally against the slotted front guiding plate (and the amount by which the lever protrudes from the front of the machine). Be sure the front of the lever is pulled ever so lightly against the most outward (right hand) side of the slot in the guiding plate.

## Drain all water when freezing is possible

Because boiler freeze-up will lead to the need of replacing the affected boiler your Speedster should never be in a freezing environment unless all water is drained from it. Cargo bays in ships and planes are normally not temperature controlled and cannot be trusted to remain above freezing at all times.

***Materials needed***

- Spanner 13 mm, 17 mm
- Allen key 3 mm, 5 mm
- Drain-hose with fitting that snugly fits in drain valve (included in shipment)
- Bucket
- Towel and/or sponge
- Loctite or Teflon tape

***Procedure***

***Steam/hot water boiler***

1. Turn main switch of your Speedster to "off".
2. Shut off water supply to your machine.
3. Unplug the pump from your Speedster.
4. Fully open steam valve.
5. Remove left and right side panels.
6. Wait until all pressure is released from the steam/hot water boiler (the large boiler in the back of the machine).
7. Remove plug (or cap in older model) from the steam/hot water boiler drain valve with a 17 mm spanner (see figure 30).

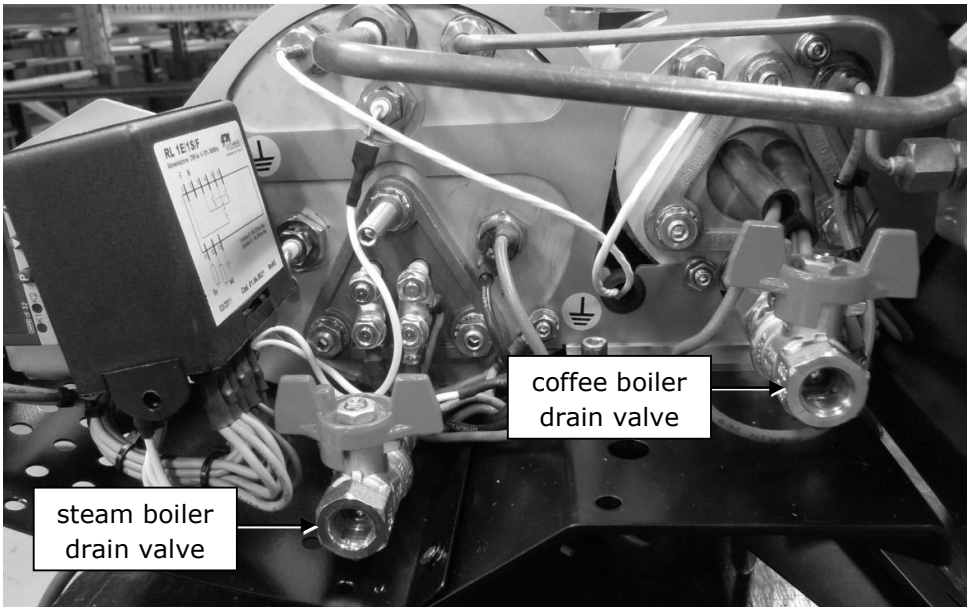


*Figure 30. Showing steam boiler drain valve on the left and coffee boiler drain valve on the right. Plugs (or caps) have already been removed. Element cover is also removed which is, however, not recommended for draining.*

8. Insert the fitting of the drain hose in the open end of the drain valve, dangle the other end in the bucket.
9. Open drain valve on steam/hot water boiler.
10. When water flow stops, tilt the Speedster by lifting the right side to drain remaining water from the steam/hot water boiler until flow stops.
11. Close steam valve.
12. Close drain valve and remove drain hose from the steam/hot water boiler.
13. Put a little silicone grease on the plug and replace on drain valve, use only little force to tighten (a spanner is not really necessary).

***Coffee boiler***

14. Remove plug (or cap in older model) from the coffee boiler drain valve with a 17 mm spanner (see figure 30).
15. Insert the fitting of the drain hose in the open end of the drain valve, dangle the other end in the bucket.
16. Open drain valve.
    Hardly any water will flow from the coffee boiler since it is completely filled and no air can flow into the boiler yet.
17. Turn main switch "on". (Since no water is present in the steam/hot water boiler the heating elements will not be activated when the machine is turned on.)
18. Make sure that the filter holder is removed from the group. Activate group valve by positioning the brewing lever in the middle position. (This will open the group valve thus letting air into the coffee boiler which will now start to drain.)
19. When water flow stops, tilt the Speedster by lifting the right side to drain remaining water from the coffee boiler until flow stops.
20. De-activate group valve (brewing lever in upper position).
21. Switch machine "off", unplug the Speedster from the 230 VAC.
22. Keep drain valve open and hose attached.

***Heat exchanger***

23. Remove the Allen bolt on the heat exchanger with Allen key 5 mm (see figure 31). This bolt is sealed with Loctite and my need some torque to loosen.

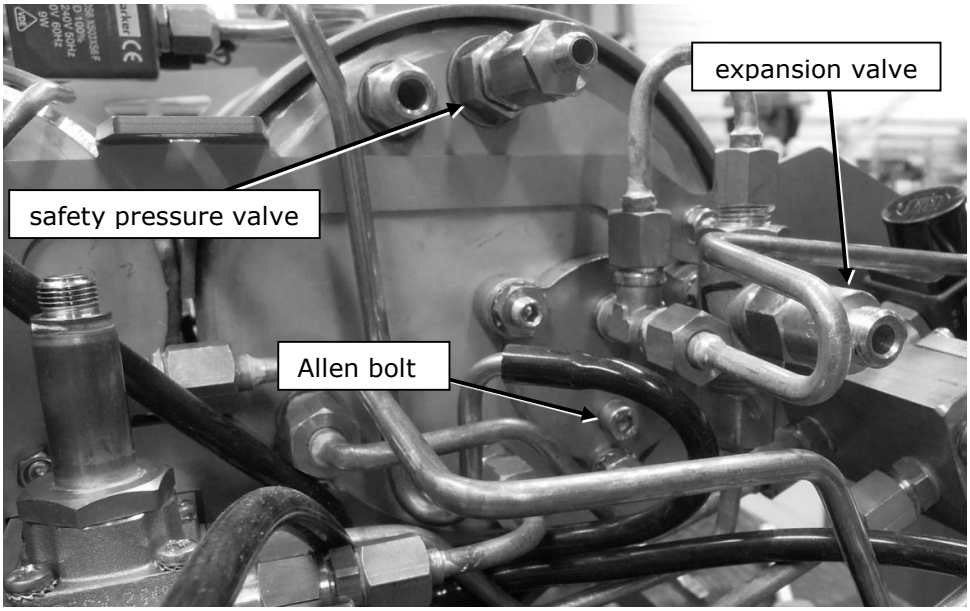


*Figure 31. Showing Allen bolt to remove for draining heat exchanger. Some parts in the machine were removed for clarity. Also shown are the steam boiler safety pressure valve and the heat exchanger system expansion valve (drain hoses are not mounted).*

24. A little water may flow from the opening. Have a towel or sponge ready to remove the spills, make sure that no water flows onto the electrical wiring/parts in the machine.
25. Tilt the Speedster by lifting the left side, keep machine tilted.
26. In order to drain the heat exchanger, blow air into the "drain hose" on the coffee boiler, water will flow from the opening.
27. When flow is stopped, stop blowing.
28. Set machine back in horizontal position.
29. Replace Allen bolt. Use Loctite or a few windings of Teflon tape to ensure sealing.
30. Close drain valve and remove drain hose from coffee boiler.
31. Put a little silicone grease on the plug and replace on drain valve, use only little force to tighten (a spanner is not really necessary).
32. Replace upper body panel first, then both side panels.

## Maintenance Records

| Date | Task | Comments |
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# Technical information

## Dimensions

| | | |
|---|---|---|
| Width of body | 47 cm | 19 in |
| Width including steam pipe and hot water spout | 50 cm | 20 in |
| Height of body | 31 cm | 12 in |
| Height including valves | 37 cm | 15 in |
| Depth from front feet to back of body | 53 cm | 21 in |
| Total Depth including drip tray | 65 cm | 26 in |
| Width of front feet | 44 cm | 17 in |
| Width of back feet | 18 cm | 7 in |
| Depth between front and back feet | 37 cm | 15 in |
| Depth between back feet and back of body | 12 cm | 5 in |
| Depth between front feet and front drip tray | 13 cm | 5 in |
| Feet diameter | 2 cm | 1 in |

## Boiler capacity

| | |
|---|---|
| Steam boiler | 3.5 litre |
| Coffee boiler including group | 2.1 litre |

## Electricity[3]

| | | |
|---|---|---|
| Power consumption heating element steam boiler | 1800 Watt | |
| Power consumption heating element coffee boiler | 900 Watt | |
| Total power consumption (pump activated) | 3100 Watt | |
| Maximum total current | 13.5 Amp | |
| Voltage | 230 Volt | 50 Hz |

## Weight

| | |
|---|---|
| Speedster solo and empty | 35 kg |
| As shipped in crate | 82 kg |

[3] The Speedster can be ordered in a low total power consumption type especially for the single phase 115 VAC, 60 Hz market. The steam boiler heating element power consumption in this machine is interrupted when power is needed by the coffee boiler heating element. Where the maximum power consumption of the elements is 1600 and 800 Watt resp., the maximum total power consumption with pump (330 Watt) activated is 1930 Watt (17.0 Amp; 115 VAC, 60 Hz).

## PID-parameter settings

The controller may be locked such that you can only change the operating temperature (Sp, set at 93.0 °C) and/or a few other parameter values.

**Unlocking** the controller is done by pressing [P] and [v] simultaneously for about 5 seconds. The display will read "COdE" alternating with the value "001" or "011". With the [v] key you change the value into "000", the controller is now unlocked, press [P] to confirm and return to operating temperature.

**Locking** is done similarly, change the value for "COdE" back to "001" with the [^] key.

To gain access to the parameter settings in the PID, press the [P] key shortly such that the display reads "Sp" alternating with the set coffee boiler temperature value (originally: "93.0"). Press the [P] key again but now hold for approximately 2 seconds until the display reads "AL", then release the [P] key. The display will now alternatingly show "AL" and "1.0".
Pressing the [P] key shortly will scroll you through the different parameters, pressing the up and down arrow keys ([^] and [v] resp.) will change the value of the parameter on display at that time.
Pressing the [P] key will store the (newly) set value and simultaneously scroll to the next parameter.
When parameter "Y .0" is shown in the display, you may enter a "deeper" level of the PID by pressing and holding the [P] key until the display shows "C111".
Leaving all buttons untouched for more than approximately 10 seconds will return the PID to normal operation in which the set value of the boiler temperature is shown (not alternating).

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P | Sp | 93.0 |
| P > 2s | AL | 1.0 |
| P | Pb.1 | 5.5 |
| P | dt | 15 |
| P | rt | 75 |
| P | CY 1 | 2.5 |
| P | HYS.1 | 1.0 |
| P | Y .0 | 0 |
| P | Y .1 | 100 |
| P | Y .2 | -100 |
| P | dF | 1.0 |
| P | Return to: Sp | |

or ->

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | C111 | 001 |
| P | C112 | 1 |
| P | C113 | 20 |
| P | C114 | 6 |
| P | C115 | 0 |
| P | C116 | 0 |
| P | C117 | 0 |
| P | C118 | 0 |
| P | C120 | 0 |
| P | SPL | 80.0 |
| P | SPH | 99.0 |
| P | OFFS | 0.0 |
| P | HYSt | 1.0 |
| P | Return to: AL | |

*Table 1. Shows scrolling sequence of PID and factory value settings of the individual parameters (in degrees Celsius). Highlighted are the parameters and values to change when switching to degrees Fahrenheit: change value for "Sp" last.*

**From °C to °F**

When changing a PID programmed in degrees Centigrade to display in Fahrenheit, you have to change the parameter values of setpoint (Sp), lower and upper "safety" temperature (SPL and SPH resp.) and process display (C112). The complete list of parameters and set values for display in degrees Fahrenheit is given in Table 2.

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P | Sp | 200.0 |
| P > 2s | AL | 1.0 |
| P | Pb.1 | 5.5 |
| P | dt | 15 |
| P | rt | 75 |
| P | CY 1 | 2.5 |
| P | HYS.1 | 1.0 |
| P | Y .0 | 0 |
| P | Y .1 | 100 |
| P | Y .2 | -100 |
| P | dF | 1.0 |
| P | Return to: Sp | |

or ->

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | C111 | 001 |
| P | C112 | 4 |
| P | C113 | 20 |
| P | C114 | 6 |
| P | C115 | 0 |
| P | C116 | 0 |
| P | C117 | 0 |
| P | C118 | 0 |
| P | C120 | 0 |
| P | SPL | 176.0 |
| P | SPH | 210.0 |
| P | OFFS | 0.0 |
| P | HYSt | 1.0 |
| P | Return to: AL | |

*Table 2. Shows scrolling sequence of PID and factory value settings of the individual parameters (in °F). Highlighted are the values to change when switching to degrees Celsius: change value for "SP" last.*

**Note!**
The PID will stop functioning when you enter a setpoint (Sp) above the upper security temperature level (SPH) and leave the programming phase without changing the upper security temperature level. For this reason, when you change from Centigrade to Fahrenheit, change the value for SP **after** you have changed the values for SPL and SPH.

**Resetting the PID**

When your PID does not respond to unlocking or programming you may reset the PID to the JUMO manufacturer settings by first switching the Speedster "off". Then, while pressing both the [P] and [∧] keys on the PID simultaneously, switch the Speedster "on".

**Note!**
When the PID is reset, all parameter values will return to JUMO manufacturer setting which means that you have to re-enter all Speedster settings by hand, also the settings in the sub-menu that can be entered when the display shows "Y. 0".

For more information on the PID we refer to the operating instructions of the JUMO iTRON B 70.2040 which were included in your shipment.

## Steam/hot water boiler temperature controller

The controller can process 2 sensors, "AL1" is not used in the Speedster (value for °C and °F: 127.2), "AL2" is connected to the sensor in the steam/hot water boiler.
The factory set value of "AL1" is 127.2 (both °C and °F).
The factory set value of "AL2" is 135 °C (or 275 °F).
The factory set value of "dF" is 0.1 (both °C and °F).

The controller is locked such that you can only change the operating temperature (AL2) and the filter time constant (dF).

**Unlocking** the controller is done by pressing [P] and [v] simultaneously for about 5 seconds. The display will read "COdE" alternating with the value "001". With the [v] key you change the value into "000", the controller is now unlocked, press [P] to confirm and return to operating temperature.

**Locking** is done similarly, change the value for "COdE" back to "001" with the [v] key.

Now you may enter a "deeper" level in the controller, which is essential when you want to change from degrees Celsius to degrees Fahrenheit or vice versa.

When parameter "dF" is shown in the display, you enter a "deeper" level of the controller by pressing and holding the [P] key until the display shows "C111". Table 3 shows the scrolling sequence and factory value settings of the individual parameters in degrees Celsius.
Leaving all buttons untouched for more than approximately 20 seconds will return the controller to normal operation in which the set value of the boiler temperature is shown (not alternating).

Table 3 lists the parameter values set for your Speedster with display in degrees Celsius.

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | AL 1 | 127.2 |
| P | AL 2 | 135.0 |
| P | dF | 0.1 |
| P | Return to: Sp | |

or ->

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | C111 | 001 |
| P | C112 | 1 |
| P | C113 | 8 |
| P | C114 | 8 |
| P | C115 | 0 |
| P | C116 | 0 |
| P | C117 | 0 |
| P | C118 | 0 |
| P | C120 | 0 |
| P | OFFS | 0.0 |
| P | HYS1 | 0.3 |
| P | HYS2 | 0.3 |
| | t1 | 0 |
| | t2 | 0 |
| | ALLO | 0.0 |
| | ALHI | 140.0 |
| | tr | 4 |
| P | Return to: AL 1 | |

*Table 3. Shows scrolling sequence of steam boiler controller and Speedster value settings of the individual parameters (in degrees Celsius). Highlighted are the values to change when switching to degrees Fahrenheit.*

Table 4 lists the parameter values set for your Speedster with display in degrees Fahrenheit.

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | AL 1 | 127.2 |
| P | AL 2 | 275.5 |
| P | dF | 0.1 |
| P | Return to: Sp | |

or ->

| press | alternating display | |
|---|---|---|
| | parameter | value |
| P > 2s | C111 | 001 |
| P | C112 | 4 |
| P | C113 | 8 |
| P | C114 | 8 |
| P | C115 | 0 |
| P | C116 | 0 |
| P | C117 | 0 |
| P | C118 | 0 |
| P | C120 | 0 |
| P | OFFS | 0.0 |
| P | HYS1 | 0.3 |
| P | HYS2 | 0.3 |
| | t1 | 0 |
| | t2 | 0 |
| | ALLO | 0.0 |
| | ALHI | 284.0 |
| | tr | 4 |
| P | Return to: AL 1 | |

*Table 4. Shows scrolling sequence of steam boiler controller and Speedster value settings of the individual parameters (in degrees Fahrenheit). Highlighted are the values to change when switching to degrees Celsius.*

**Note!**
The controller will stop functioning when you enter a setpoint (AL 2) above the upper security temperature level (ALHI) and leave the programming phase without changing the upper security temperature level. For this reason, when you change from Centigrade to Fahrenheit, change the value for AL 2 **after** you have changed the value for ALHI.

**Resetting the controller**
When your controller does not respond to unlocking or programming you may reset the controller to the JUMO manufacturer settings by first switching the Speedster "off". Then, while pressing both the P and ∧ keys on the controller simultaneously, switch the Speedster "on".

**Note!**
When the controller is reset, all parameter values will return to the JUMO manufacturer setting which means that you have to re-enter all Speedster settings by hand, also the settings in the sub-menu that can be entered when the display shows "dF".

For more information on the steam/hot water temperature controller we refer to the operating instructions of the JUMO di 32 B 701530 which were included in your shipment.

## Exchanging jets for different infusion

The Speedster coffee water system contains 2 restrictors (or jets): one inside the group head (see figure 15), the other in the tube that leads from the heat exchanger to the coffee boiler (see figure 32). Standard, a jet with 0.6 mm diameter is mounted in the group head and a 1.5 mm jet is mounted in the tube, the only function of the latter is to protect the threads in the tubes' connector.

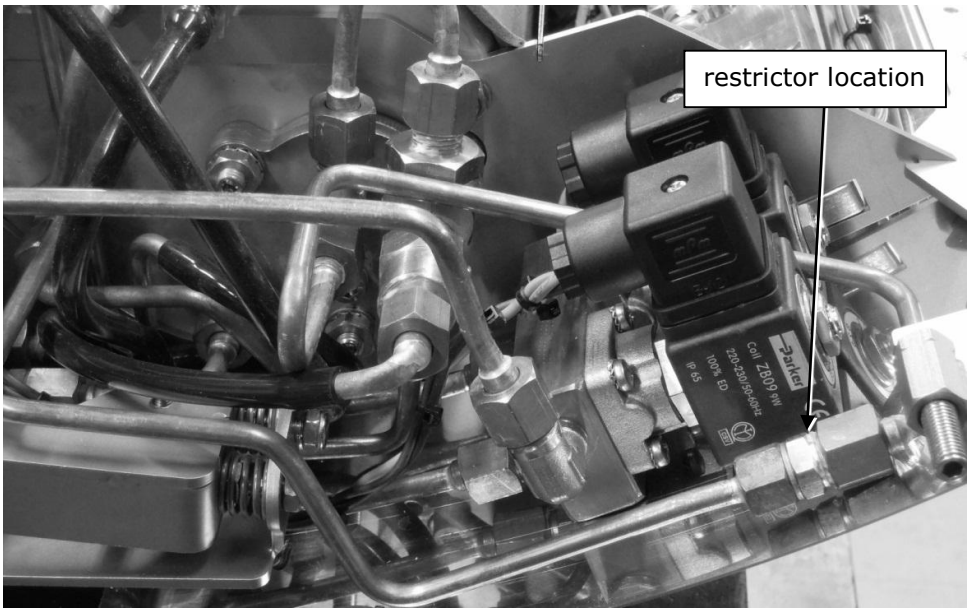


*Figure 32. Shows location of restrictor in tube from heat exchanger to coffee boiler.*

When the two jets are swapped, the infusion changes dramatically. Once the group valve is activated (brewing lever in middle position), the pressure inside the coffee boiler (up to 12 Bar) will soak the coffee grounds rapidly while pressure is also released into the pre-infusion cylinder. Since the 0.6 mm jet restricts the flow towards the coffee boiler, the pressure on the grounds reduces to practically zero before increasing only gradually to line pressure (or pump pressure when pump is activated).

## Parts included in standard shipment

- Filter holder 2-cups, with Teflon coating
- Filter holder 1-cup, with Teflon coating
- Water pump with electric motor
- Two high-pressure water supply hoses, each 1.5 m (5 ft)
- One high pressure water supply hose, 0.5 m (20 in)
- Brass connector for water supply to washing machine tap
- Discharge hose, inner diameter 16 mm (0.64 in)
- Stainless steel hose clamp for discharge hose
- Water softener, 6 l (with PVC hose for regeneration)
- Aluminium tamp-support
- Stainless steel tamper
- Blind filter
- Jar with cleaning powder
- Group brush
- Extra group screen
- Extra rubber group seal
- Drain hose
- Speedster T-shirt

# Contact information

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***Ordering replacement parts***
Check our website if the webshop is already up and running.
If not: contact us via the information given above.