



Speedster

Installation and user manual

Speedster Espresso machine Model 2020

230Vac, standard (3100W; 13.5A) and Low-Amp (2200W; 9.6A) versions

(Original instructions)

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Warning!

The Speedster is made for 220-240Vac power supply (50 or 60 Hz). Make sure that the power demands (see identity tag on front of machine) matches the local power supply before connecting the Speedster to the mains power. We cannot be held responsible for damages resulting from connecting the machine to incompatible mains power.

Warning!

The machine is meant to be connected to the water mains. To prevent possible water damage we advise to install a water-spill detection system that closes the water supply in case a leak occurs.



Designation

This manual applies to the Speedster espresso machine manufactured by Kees van der Westen Espressonistic Works B.V. A separate rotational pump with electric motor is part of the appliance.

Precaution

Hot surfaces!

Parts of the machine will be hot when the machine is turned ON.

- The metal cup tray heats up by way of radiation of the boilers inside the machine and can reach temperatures up to 75°C.
- The metal group is intended to radiate heat and can possibly reach a temperature of up to 99°C.

Hot water and/or steam!

When the machine is heated up, hot water and steam can escape from various parts of the machine upon manipulation of a corresponding interface (valve, switch, touch-button, ...).

- Activating the group will lead to water being dispensed with a temperature of up to 99°C.
- Activation of the hot water dispense can lead to steam escaping with temperatures up to 135°C as well.
- Activating the mix-water dispense can lead to overheated water (steam) being dispensed when the cold-water addition is not set correctly.
- Opening the steam tap will start steam escaping from the steam wand-tips, the steam can reach temperatures up to 135°C.

Safe operation

- The espresso machine has to be placed in a horizontal position on a sturdy and flat surface.
- If the supply cord or pump cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The new hose-sets supplied with the appliance are to be used. Old hose-sets should not be reused.
- Intended use of the appliance is restricted to well-trained personnel only.
- The appliance must be installed in locations where it can be overseen by trained personnel.
- The appliance may not be left unattended when there is the possibility that children and/or vulnerable people can reach the machine.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- The mains electricity the appliance is connected to must include a residual-current-circuit-breaker of 30 mA.
- The appliance may not be cleaned with the aid of a water jet.
- The appliance is not suited for outdoor use.
- Ambient temperature for correct operation of the appliance is 10-30°C (50-86°F).
- If ambient temperature falls below 5°C (41°F), keep the machine at ECO or ON to prevent freezing of water inside the machine.

Note that the external rotational pump should be kept above freezing point of water as well.

Whenever the machine and/or pump have suffered freezing conditions, ask a technician to start-up the appliance again.



Water Quality

Have a water treatment system installed and its function checked regularly. The treatment system should at least have a carbon block that not only traps drug-remnants, Chlorine and organic compounds but also prevents rigid particles >30 µm to enter the pump. Optimally, the water fed into the espresso machine would fall in the SCA “core zone”, see Figure 1, and have a pH of 7.0-7.5 (at 25°C).

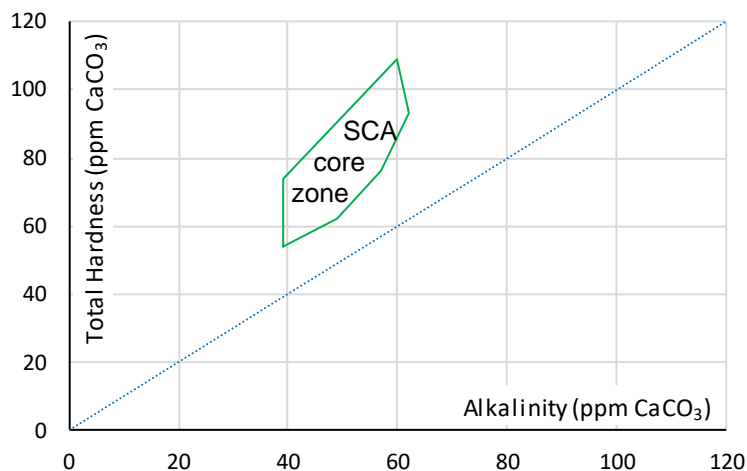


Figure 1. Alkalinity vs-Total Hardness graph showing the SCA “core zone” in green outline.

Besides the Alkalinity and Total Hardness requirements, the water should have the following properties:

Parameter	Target	Acceptable range	unit
Total Hardness	72	50-175#	ppm
Total Alkalinity	40*#	40-75#	ppm
pH	7.0*	6.5-7.5*, 6.5-8.0#	--
Electrical conductivity		< 3 times Alkalinity (in ppm)#	µS/cm ¹
Total Dissolved Solids	150*	75-250*	ppm ¹
Calcium Hardness	51-68*	17-85*	ppm
Sodium	10*	at or near 10*	ppm
Sulphate	30	0-50	ppm
Chloride	0	0-30	ppm
Silica	0	0-5	ppm
Odour and colour	clean*, fresh*, odour free*, clear*		
Taste influencing organic compounds*#	not present		
Chlorine#, Hypochlorite#, Chloramines#			
Iron#, Lead#, Manganese			

* SCAA Technical Standards Committee, 2009: water properties for optimum taste.

Values from “The SCAE water Chart” (2015?).

Table 1. Showing parameter values for water meant to brew coffee with.

Water with properties that lie within the SCA “core zone” and has correct pH combines technical aspects enabling a safe operation and sensory aspects yielding a high quality brew, provided the other parameters are met as well. High brew-ratio's, as for espresso, shift the optimum of total hardness and alkalinity towards higher values.

¹ The conversion from electrical conductivity to TDS depends heavily on the water composition and temperature, yielding results that can vary significantly. Additionally, even if the estimated TDS value is accurate, it does not contain any information about what the TDS is actually made up of.



Parts identification

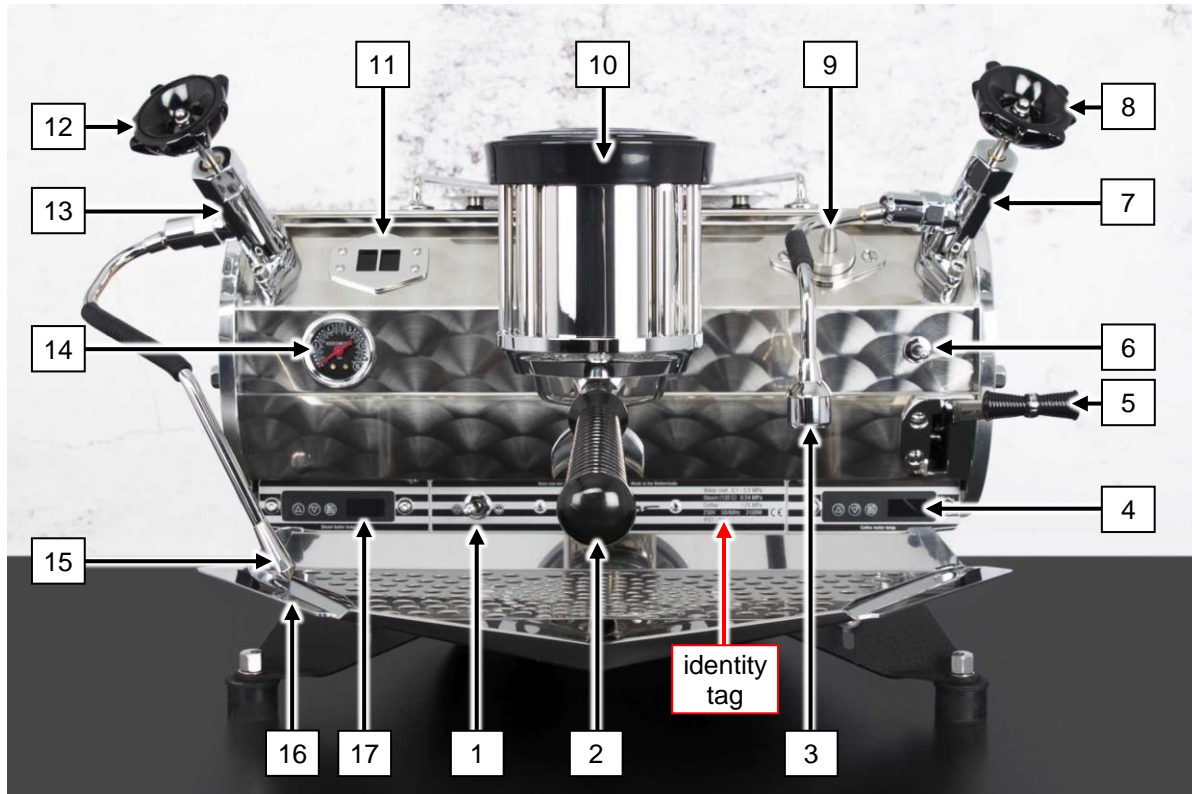


Figure 2. Showing the main operational parts of the Speedster.

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



Dimensions and characteristics

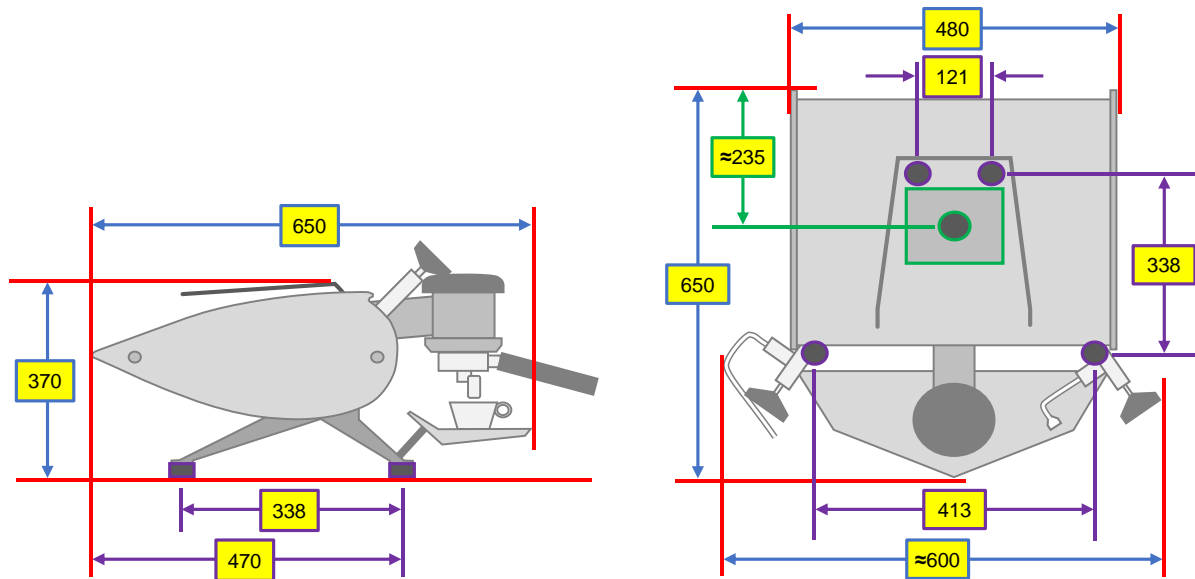


Figure 3. Side view (left) and top view (right) of the Speedster. Also shown the rubber feet ($\varnothing=30$ mm, in purple) and optimal position (green circle $\varnothing\geq 42$ mm) and near optimal location (green square 125x110mm) of counter-top feed-through.

Dimensions				
Height (top of cup rail)		370 mm		
Depth drip-tray to back		650 mm		
Width of machine body		480 mm		
Width including tap and steam wand		appr. 600 mm		
Footprint				
Depth (centre of feet)		338 mm		
Width (centre of feet)	front	413 mm		
	back	121 mm		
Peak power consumption at 230Vac		Watt	Amp	
Standard		3100	13.5	
Low-Amp		2200	9.6	
Volume capacity		litre	gal / floz (US)	
Steam boiler		3.5	0.9 gal	
Water in steam boiler		2.0	0.5 gal	
Heat exchanger		0.12	4 floz	
Coffee boiler		2.1	0.6 gal	
Weight	empty		filled	
	kg	pound	kg	pound
Espresso machine	40	88	45	100
Pump assembly	5	11	N.A.	
Shipping crate	75	165		

Table 2. General data for the Speedster. Shown are theoretical dimensions, actual values can deviate +/- 5 mm.



Water supply

Rated pressure: 0.1-0.5 MPa (1-5 bar)
 Rated flow: minimum 4 litre/minute

The water supply should be able to deliver a minimum amount of 4 litres per minute in the range 0.1-0.5 MPa (1-5 bar). The machine and accompanying rotary vane pump must be connected with the supplied new set of high-pressure hoses (two hoses, each 1.5 meter long), old hose-sets should not be re-used. The distance between water treatment system and pump and the distance between pump and machine cannot be greater than 1.5 meter unless there is appropriate material available to increase these distances.

Notes

Not included in the shipment are supplies to make the connection between the water-tap and the water treatment system.
 National rules/regulations may apply when the appliance is connected to the water mains.

Water treatment system

The water treatment system should also be able to deliver a minimum amount of 4 litres per minute and should at least have a carbon block that not only traps drug-remnants, Chlorine and organic compounds but also prevents rigid particles >30 µm to enter the pump.

If the resulting water does not fall into the SCA “core-zone” (see Figure 1) have additional treatment installed.

Notes

Flush the water treatment system according to the manufacturers instruction before connecting it to the pump-inlet.
 Make sure that the functioning of the water treatment system will be checked on a regular basis.

Waste/drain

The appliance has a drain hose attached to the drip tray. This semi-flexible hose has an external diameter of 20 mm (inner diameter: 15 mm). The hose must slope downwards all the way from machine to waste to prevent clogging. The waste at the location should have a minimum inside diameter of 20 mm to accommodate for the hose and incorporate a water-lock to prevent smelly odours.

Machine location

The machine is only to be installed in locations where it can be overseen by trained personnel. Areas where a water-jet could be used are not suitable as location for the machine.

Surface

The countertop must be sturdy enough to easily support the machines' weight (when filled: up to 50kg) plus extra equipment (one or two coffee-grinders, tableware, ...). The surface should have a height of 95-100 cm and be smooth, flat and horizontal.

It is advised to think about the location of holes in the countertop where the water and waste hoses and electric cables should pass before the machine is installed.

Pump location

There should be nearby space for the electric motor with rotary vane pump. The pump-assembly should not be able to touch the walls of the cabinet it is located in to prevent noise. Further noise reduction can be achieved by placing the assembly on a 2-4cm thick rubber-foam sheet with dimensions: 16x30cm (not supplied with machine). The pump will be electrically connected to the espresso machine with an approximately 2 m long cable with plug.

Areas where a water-jet could be used are not suitable as location for the pump-assembly.

Make sure there is air-flow possible near the motor to prevent overheating.



Electric mains

Rated voltage: ~230V, 50/60Hz

Rated power: standard: 13.5 Amp, low peak power: 9.6 Amp (see Table 3 for details).

Peak power	version	standard		low peak power	
		Watt	Ampere	Watt	Ampere
Coffee boiler heating power		900	3.9	900	3.9
Steam boiler heating power		1800	7.8	1800	7.8
Max. combined heating power		2700	11.7	1800	7.8
Max. total peak power		3100	13.5	2200	9.6

Table 3. Showing peak power in the different phases for different machine versions.

Single-phase machine

The machine is meant to be connected to P-N-E (single Phase + Neutral + Earth) or 2P-E (split Phase + Earth) power mains, see Figure 4. Note that the 2P-E configuration does NOT make use of the neutral wire of the electric mains. For peak power, see Table 3. The tension between the phase and neutral (P-N-E power) or the tension between the two phases (2P-E power) should be 220-240Vac.

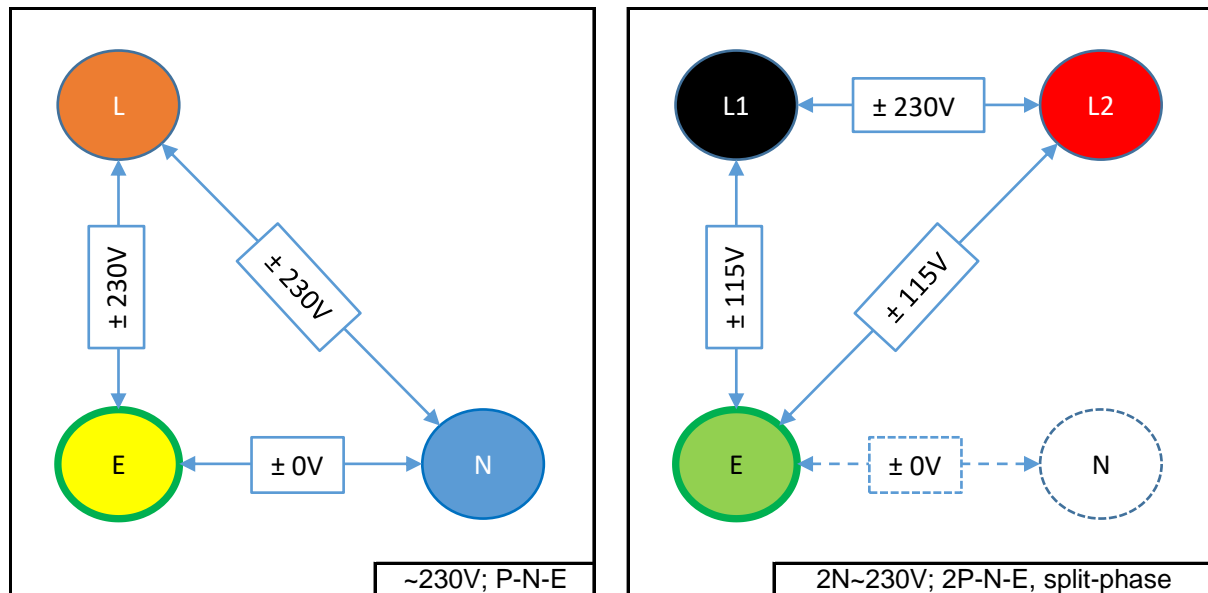


Figure 4. At left P-N-E, at right 2P-N-E. The machine can make use of P1 and P2 plus E (without N) of the right electric mains configuration. Peak current is 13.5A or 9.6A, depending on version ordered.

Standard / low peak power conversion

The machine will be delivered from factory in the version ordered. The accompanying peak power consumption will be stated on the identity tag of the machine.

Conversion to low peak power requires an extra part. This part and instruction for the conversion can be obtained via: support@keesvanderwesten.com; include machine serial number in your email.

Note

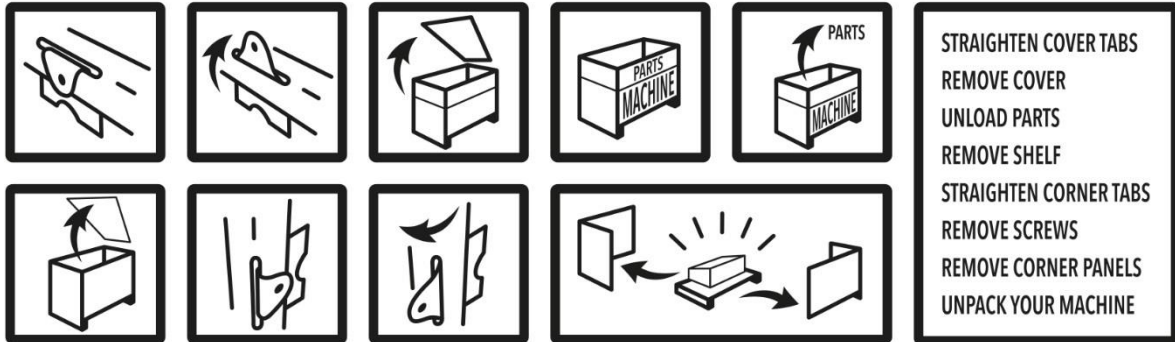
National rules/regulations may apply when the appliance is connected to the electric mains.



INSTALLATION

Unpack

1. Straighten the tabs that fixate the lid to the wooden crate, then remove the lid.
2. Unpack only the loose materials inside the crate.
3. Remove the shelf from the crate.
4. Straighten the tabs on the two diagonally ribs of the crate.
5. Undo the screws that hold the sides of the crate to the bottom.
6. Remove the sides of the crate from the bottom.



7. Check if all accessories are present.
8. Remove packing material from machine.
9. Check the machine for transport damage.
10. Get adequate help to lift the machine from the bottom of the crate onto the countertop.

Warnings!

Grip the machine by the legs when lifting it (onto the countertop).

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. Although sturdy, the brew lever might bend when lateral force is applied. A bent brew lever may lead to malfunction of the lever.

Parts included in standard shipment

Accessories

- Stainless steel filter holder, 2-cup spout
- Stainless steel filter holder, 1-cup spout
- 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)
- Discharge hose, inner diameter 15 mm (0.6 in)
- Stainless steel hose clamp for discharge hose
- KVDW Stainless steel tamper
- Blind filter
- Jar with cleaning powder
- Group brush
- Group screen extractor
- Boiler drain hose with adapter
- 2 KVDW shot glasses

Spare parts

- there is a Barista Kit included with the machine to facilitate first routine maintenance



Installation

⚠ Caution!

Installation of and maintenance on the Speedster should be done by a qualified technician. Parts of the machine can reach a temperature of close to 135 °C (275 °F). The steam/hot water boiler contains water and pressurised steam of 135 °C at 2.2 bar overpressure (275 °F at 33 PSI), temperature and pressure in the coffee system reaches up to 100 °C at 12.5 bar overpressure (212 °F at 181 PSI).

💀 Danger

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

💀 Danger

If the supply cord or the pump connection cord is damaged it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA.

Note

Use the new hoses supplied with the machine. Do not re-use old (high pressure) hoses.

Parts needed, included in shipment

- Machine
- 2 high pressure hoses, 1.5 m (5 ft) each
- 1 push-in adapter (mounted already on one high pressure hose)
- Pump with motor, 29x14x19 cm (length x width x height; 12x6x8 inch)
- Discharge hose with stainless steel clamp

Tools needed

- Spanner 20-22, 30 (or adjustable) mm
- Allen key 4 mm
- Screw driver
- Sharp knife and side cutter
- Bucket

Extras needed (not in shipment)

- suitable water treatment system
- extra hose to connect tap to treatment system



Connect water supply

Rated pressure: 0.1-0.5 MPa (1-5 bar)
Rated flow: minimum 4 litre/minute

1. Attach a suitable water treatment system to the water tap.
2. Flush the water treatment system according to manufacturer's instruction.
3. Attach the high pressure hose without push-in fitting to the outgoing side on the water treatment system. Tighten with a 20 mm spanner.
4. Attach the other end of the 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 9). Tighten with 20 mm spanner.
5. Attach the high pressure hose with push-in fitting 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 9). Tighten with a 20 mm spanner.

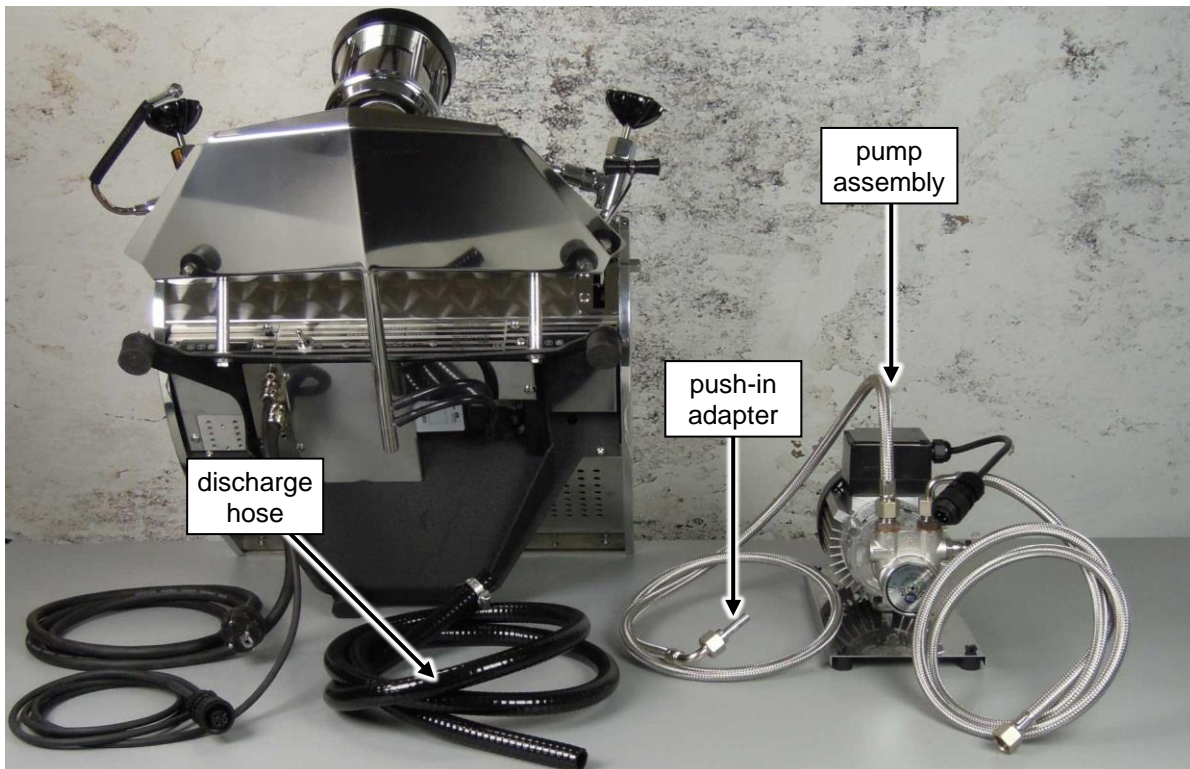


Figure 5. Speedster tilted on back for access to water supply and discharge.

6. Hold the loose end of the high pressure hose in a bucket and open the tap slowly. Flush the pump for a minute (the pump-motor does not have to run). Check if the water from the treatment system does not have a strange colour or smell.
7. The machine may be tilted in such a way that it rests on the two hind-legs and the back of the machine, or use (wooden) blocks under the feet; see Figure 5. Close the tap and push the push-in adapter to the water-inlet at the bottom of the Speedster, see Figure 7. Pull the fitting to assure that it is correctly mounted. (It should not be possible to pull the fitting out without simultaneously pushing the lock inwards).

Note

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

8. Open the 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 start to fill with water.



INSTALLATION

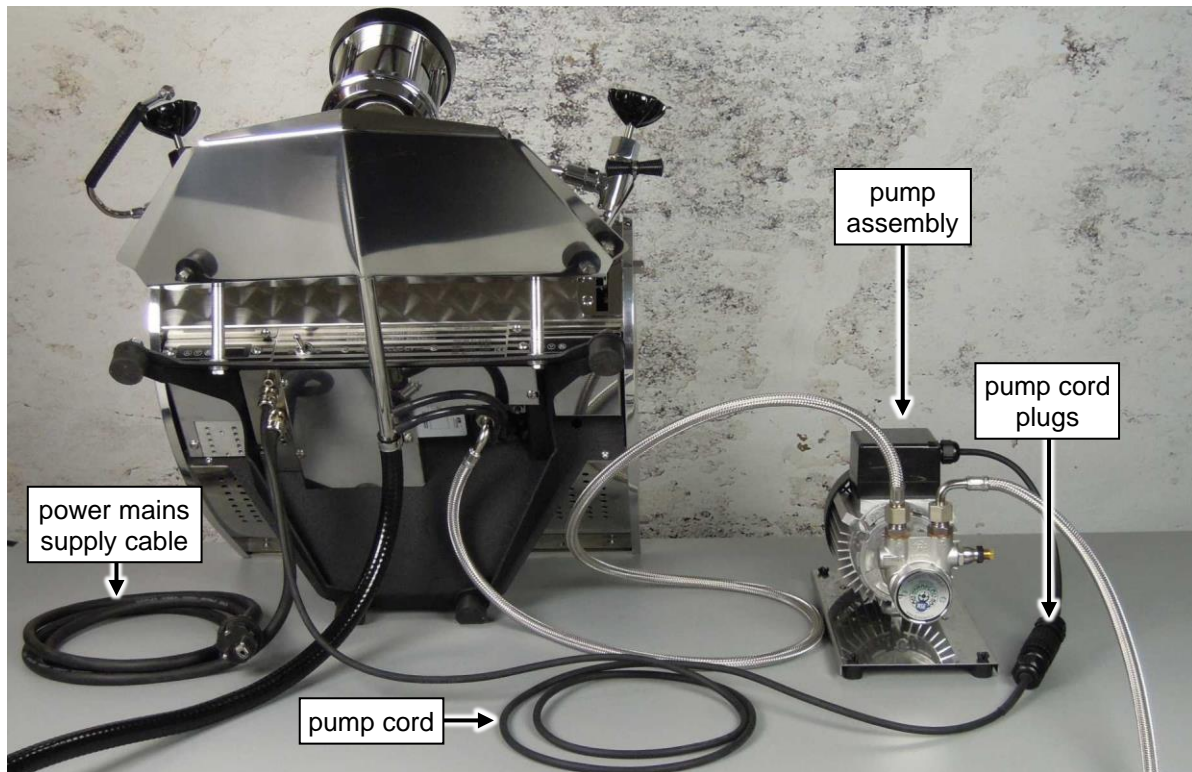


Figure 6. Water supply, discharge hose and pump motor are connected.

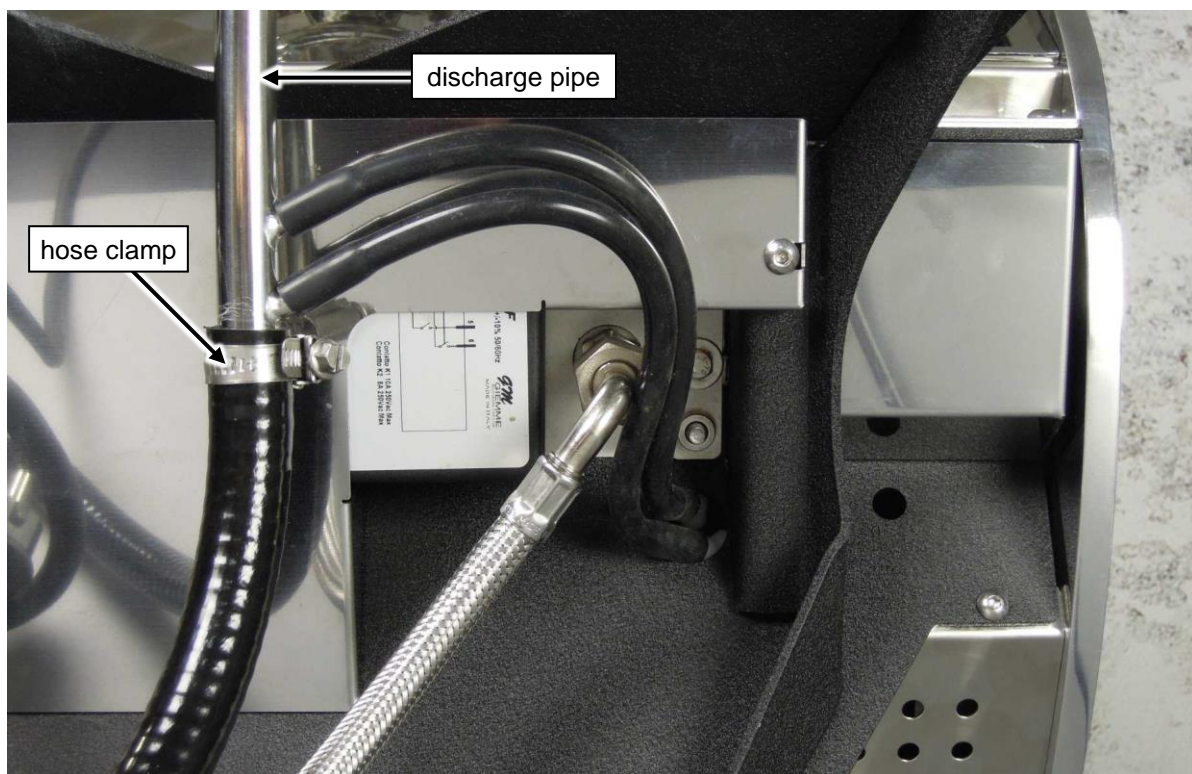


Figure 7. discharge hose is clamped to discharge pipe and water supply is pushed into the machine.

Notes

Use the new hoses supplied with the machine. Do not re-use old (high pressure) hoses.
National rules/regulations may apply when the appliance is connected to the water mains.



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 7) 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, see *Figure 8*.

3. When necessary, cut the discharge hose to desired length.
4. Put the Speedster back on its feet.
5. Check for leaks in the connections just made.

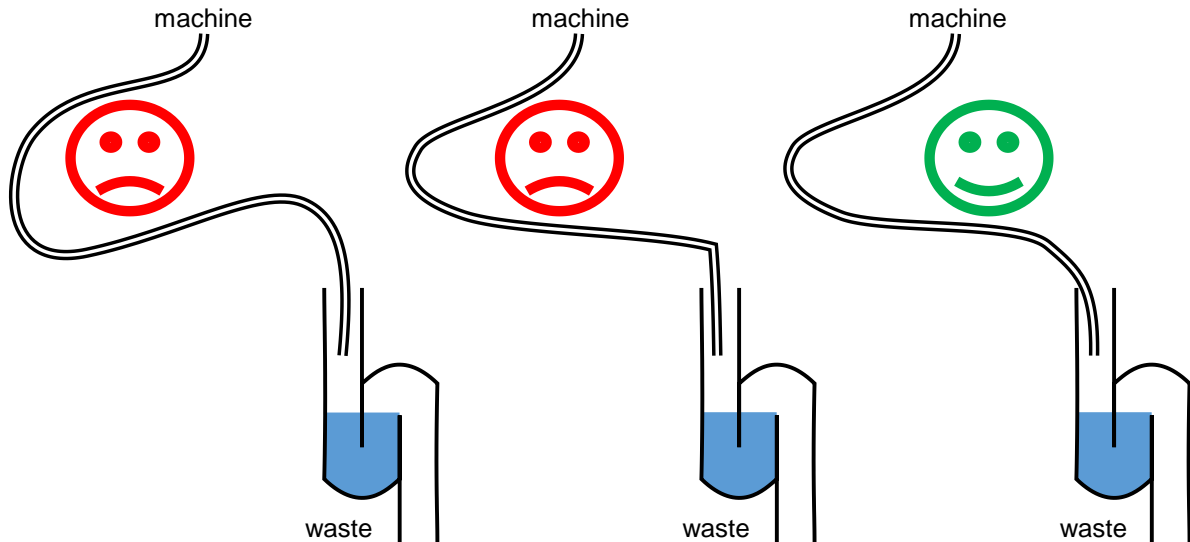


Figure 8. Showing wrong and correct drain hose trajectories.



Connect to mains power and switch on

Rated voltage: ~230Vac, 50/60Hz

Rated power: standard: 13.5 Amp, low peak power: 9.6 Amp (see Table 3 for details).

Danger

If the supply cord or the pump connection cord is damaged it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA.

Warning!

Make sure that the power demands (see identity tag on front of machine) matches the local power supply before connecting the Speedster to the mains power. We cannot be held responsible for damages resulting from connecting the machine to incompatible mains power.

1. Make sure that the mains switch is in the "OFF"-position. The mains switch is mounted on the identity tag on the front of the machine (see Figure 2, item 1).
2. The thinner electrical cable attached to the Speedster is the pump cord (see Figure 6) and has a special type of plug. Connect the pump cord to the pump motor and secure the plug, see Figure 7.
3. Attach the other cable to a 230 Vac earthed power outlet. If your Speedster came without a mains plug, it is advised to attach the blue wire to the neutral in your power outlet. (Although there is no difference in operational aspect, this makes it easier to check the electrics in case of a malfunction.)
4. Make sure that the Speedster rests on its feet.
5. Put the 3-way brewing lever on the right hand side of the machine (Figure 2, item 4) in the lowest position (Figure 10 "pump active").
6. Turn the mains switch on the machine to "ON", the coffee boiler filling is continued.
7. Wait until water without air leaves the group head. This procedure expels all air from the coffee boiler. A separate bleeding procedure is not needed.
8. After this move the brewing lever in its high "OFF" position. The machine will now automatically fill the steam boiler.

The displays of both temperature regulators (see Figure 2, items 2 & 17) will not show any value until a minimum water level in the steam boiler is reached. Only when this safety level is reached, the temperature controller displays will light up and the boilers will start to warm up. Filling procedure will continue till it reaches the maximum (operational) level.

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 and may produce some steam escaping from the drip-tray. This will stop when the anti-vacuum valve is shut by the increasing pressure inside the steam boiler.

Note

National rules/regulations may apply when the appliance is connected to the electric mains.



Adjust pump pressure

The pressure gauge displays the actual brew pressure (the water pressure on the coffee bed). The minimum value when the machine is at rest is 0. Factory setting of the maximum pressure in the boiler is 11.5-12.5 bar. Above this value the expansion valve in the coffee circuit will open, thus bleeding 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 only when back pressure is present (coffee puck or blind filter). The pressure generated by the pump depends slightly on the line pressure of the building. The pump pressure can be adjusted by turning the set-screw on the side of the pump housing (see Figure 9).

Note

When pump pressure exceeds approximately 12 bar, the expansion valve will open. Increasing the pump pressure further will not result in higher brew pressure.

Tools needed

- Spanner 10mm (or large screw driver), 14 mm

Procedure to adjust the pump pressure

1. Lock a filter-holder with normally prepared coffee-bed in the group.
As soon as the brew lever is activated water will flow onto the coffee bed and the gauge indicates true brew pressure (which is practically zero at the early stage of pre-infusion).
2. Activate the group by slotting the brewing lever in its lower (pump active) position.
3. Observe the pressure gauge to check how the pressure evolves, wait until pressure stabilises.
4. Undo the lock-nut a few turns. To increase the pump pressure turn the set-screw in the pump housing clockwise. Turn it counter-clockwise to decrease the pump pressure.

Beware!

To prevent ruining the threads, the plastic lock nut on the set-screw should not be tightened with much torque.

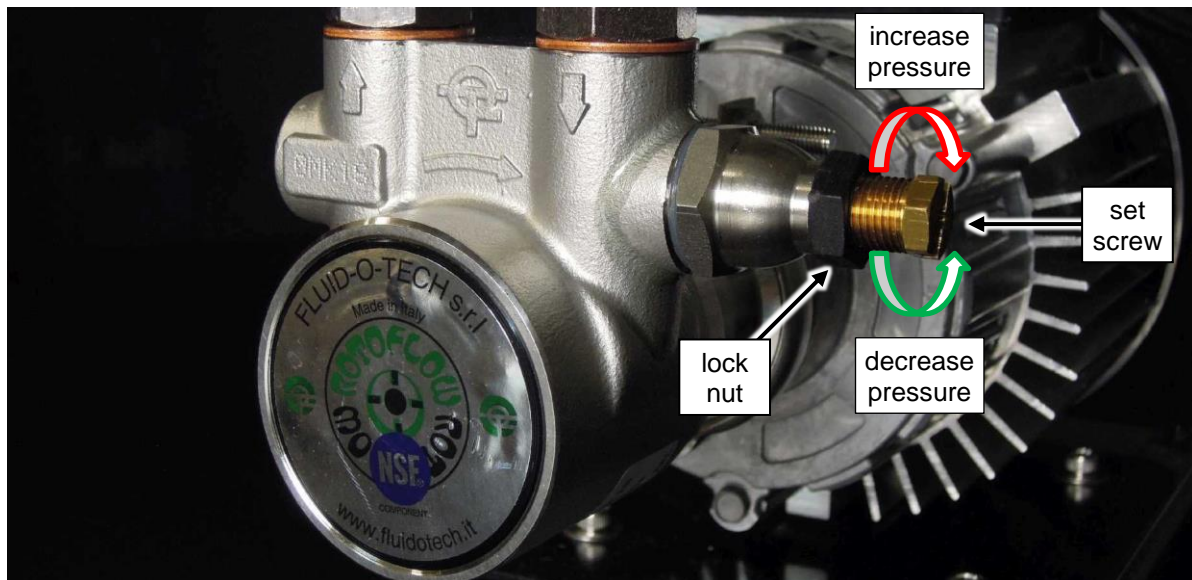


Figure 9. Showing the set screw on the pump to change pump pressure.

Note

Do not fine-adjust 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, pressure in the coffee system will not drop when pump pressure is reduced.



Using the machine

Brewing espresso

The 3-way brewing lever on the right hand side of the machine (see Figure 10) operates the group valve and the pump. The lever can be fixed in 2 slots and thus has three operating positions:

1. OFF. Lever in upper (resting) position. Group is inactive (valve is closed and pump is off). Water cannot flow from the coffee boiler to the coffee bed.
2. PRE-INFUSION. Lever in middle position. Group valve is open but pump is off. In this position (hot) water under line pressure can reach the coffee grinds and flow into the pre-infusion cylinder upon which the grinds will wet and swell. This process is called manual pre-infusion. You may adjust the timespan of pre-infusion to your liking.
3. PUMP ACTIVE. Lever in lower position. Group valve is open and pump is activated. The water pressure on the coffee bed will increase to 9 bar (or other pump-setting).

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

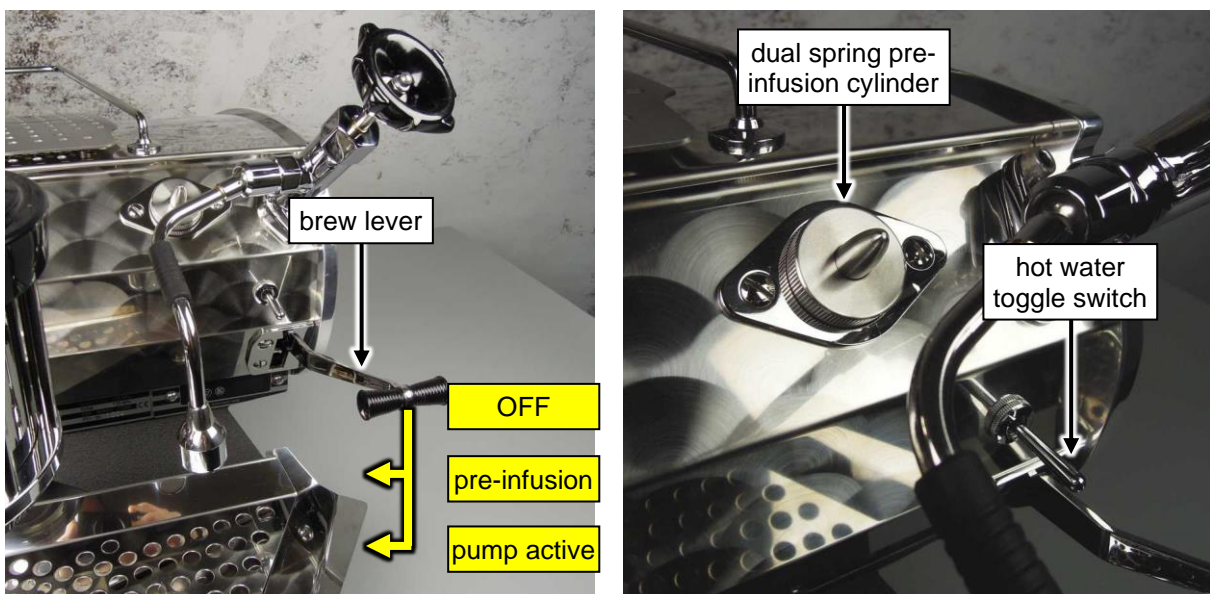


Figure 10. Brew lever with lever positions, progressive pre-infusion cylinder and hot water toggle switch.

When you switch from resting position directly to the lower-left position, the primary increasing pressure is still absorbed by a piston and spring within the so-called "pre-infusion cylinder" up to approximately 3.5 bar. Only when 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 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 10).

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 to line pressure (approximately 3 bar) but remains at that level until the brew is stopped (lever in upper position).

The 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 brew pressure differences during extraction.



Shot timer

When the group valve is active (open) for longer than 0.1 second, a timer first re-sets to zero and then starts to count. The display (see Figure 11) will show the seconds passed since the valve was opened. It does not distinct between pump active or inactive. The shot timer may help you to determine the optimum coffee-bed preparation to reach a perfect espresso (25-35 seconds).

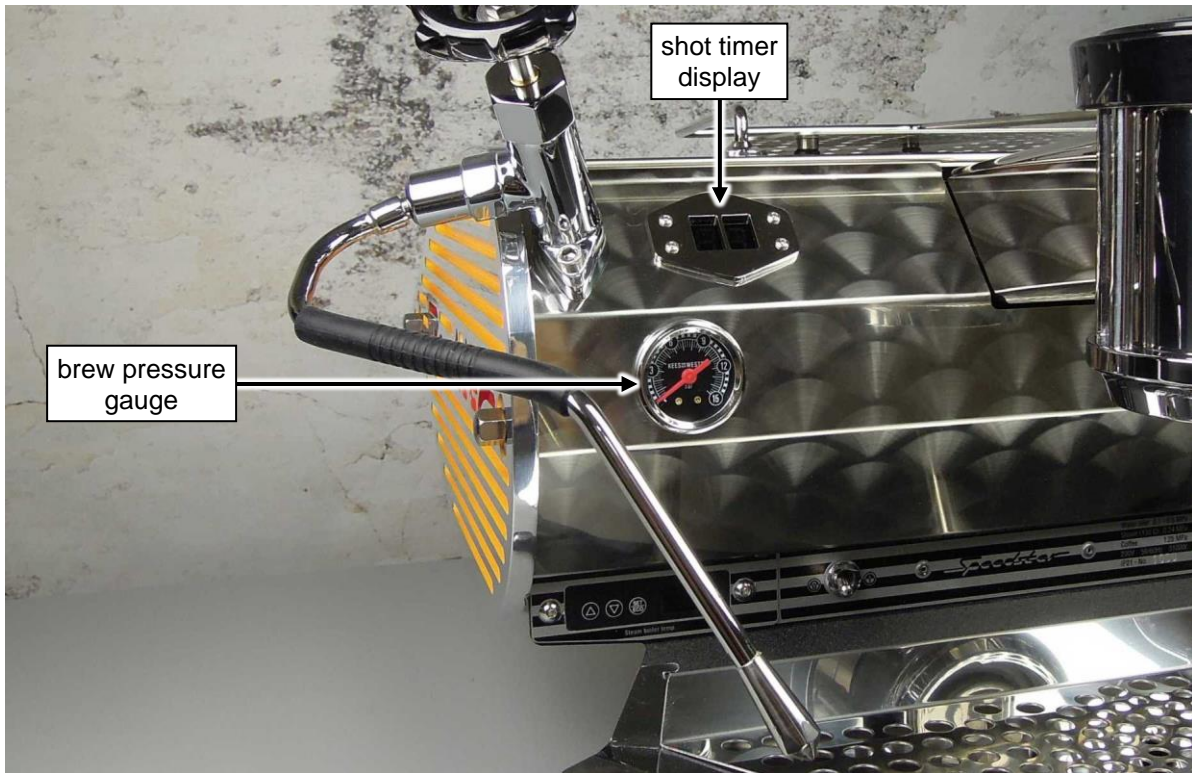


Figure 11. The shot timer display and (brew) pressure gauge.

Pressure gauge

The pressure gauge (see Figure 11) shows the water pressure in the tube running from group valve to coffee-bed. This means that when the group is inactive (open connection between coffee-bed and drain) the pressure gauge will display 0 bar. When brewing a shot the coffee-bed becomes less permeable after wetting (pre-infusion stage) and pressure will rise until line- or pump pressure is reached (ideally 9 bar).

If 9 bar pressure is not reached during a normal brew, either the pump pressure is set too low, or the coffee-bed was not able to produce enough counter pressure (not enough coffee grinds, coffee grinds too coarse, channelling in coffee-bed during extraction, ...), or the gauge is malfunctioning.

If the pressure gauge does not display 0 bar when the group is inactive, it is likely that the gauge is malfunctioning: call in a technician.

Checking opening pressure of expansion valve

You can check the opening pressure of the expansion valve of a group by first having a long flush (about 20 seconds) then quickly locking in a blind filter and activating the group again. After filling of the pre-infusion cylinder pressure will quickly rise to pump pressure and then the expansion of heating up the inflow of cold water will slowly increase the pressure inside the coffee system above pump-pressure. The gauge should reach a maximum value between 11 bar and 13 bar and then remain near constant. If the pressure rises above 13 bar, the expansion valve should be replaced. If the pressure does not rise above pump-pressure, the expansion valve may need replacement or the one-way valve in the coffee-circuit may be malfunctioning: call in a technician.



Hot water

A three-way toggle switch, located on the right hand side between the brew lever and the hot water valve, controls the hot-water distribution (see Figure 10 and Figure 12). The valve knob itself is purely visual and has no operational function.

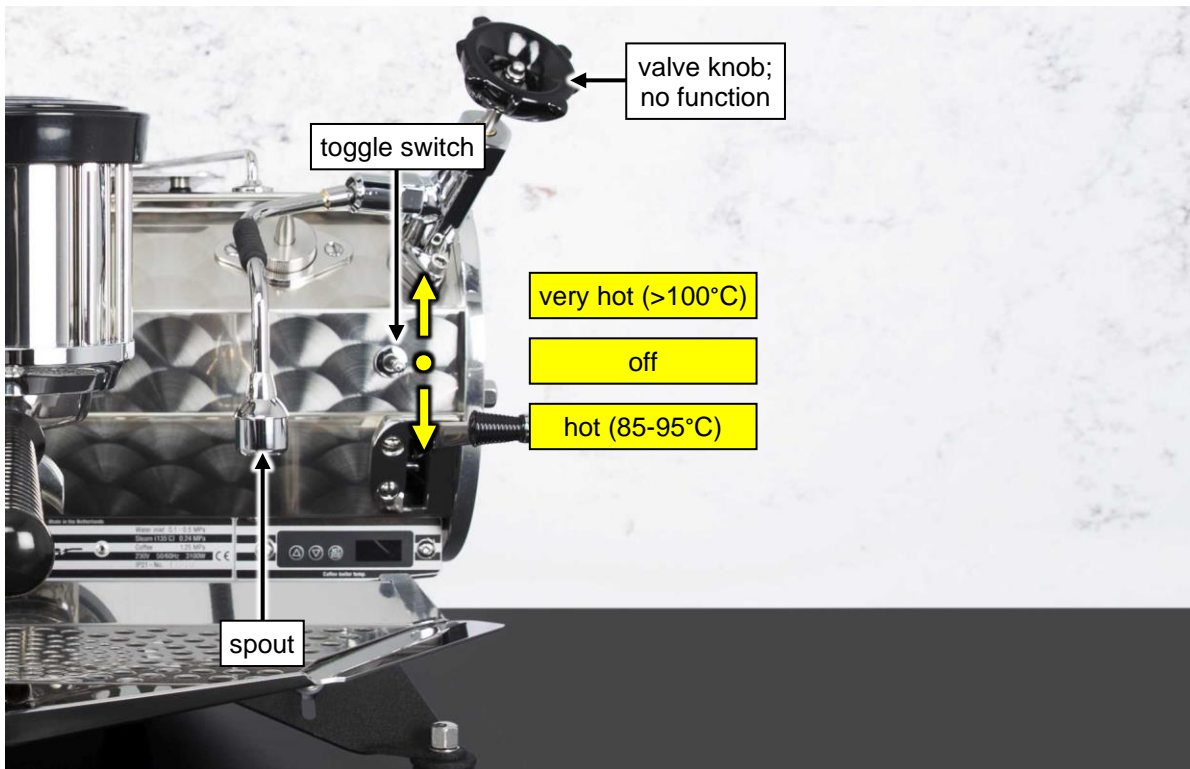


Figure 12. Hot water: toggle switch, valve knob and hot water spout.

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 an extra advantage that less water from the steam boiler is used for the same amount of liquid thus diminishing the load on the steam boiler 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 leaves 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.

Although the boiler will not fill when a shot is pulled as not to disturb the process of espresso extraction by a fluctuating water pressure it is possible to draw (mix-) water from the tap while brewing. When drawing mix-water while brewing, brew pressure will decrease a little as water can also flow to the hot water spout. It is up to the barista to make the decision if such small pressure drop is acceptable or that hot water dispensing should wait for the brew to finish.

Adjust mix-water temperature

The temperature of the mix-water depends on steam boiler temperature and thus steam pressure and the amount and temperature of cold water added. The amount of cold water added depends on pump pressure and the cold-water orifice size. With a set-screw the orifice size can be adjusted to obtain the wanted mix-water temperature. Factory setting of the mix-water temperature is 90-95°C and is based on 135°C steam boiler temperature (2.2 bar steam pressure), 9 bar pump-pressure and appr. 15°C tap water temperature. The set-screw can be reached and adjusted via an opening in the lower body panel, see Figure 13. Counter-clockwise adjustment will decrease the temperature, clockwise will increase the temperature of the mix-water.



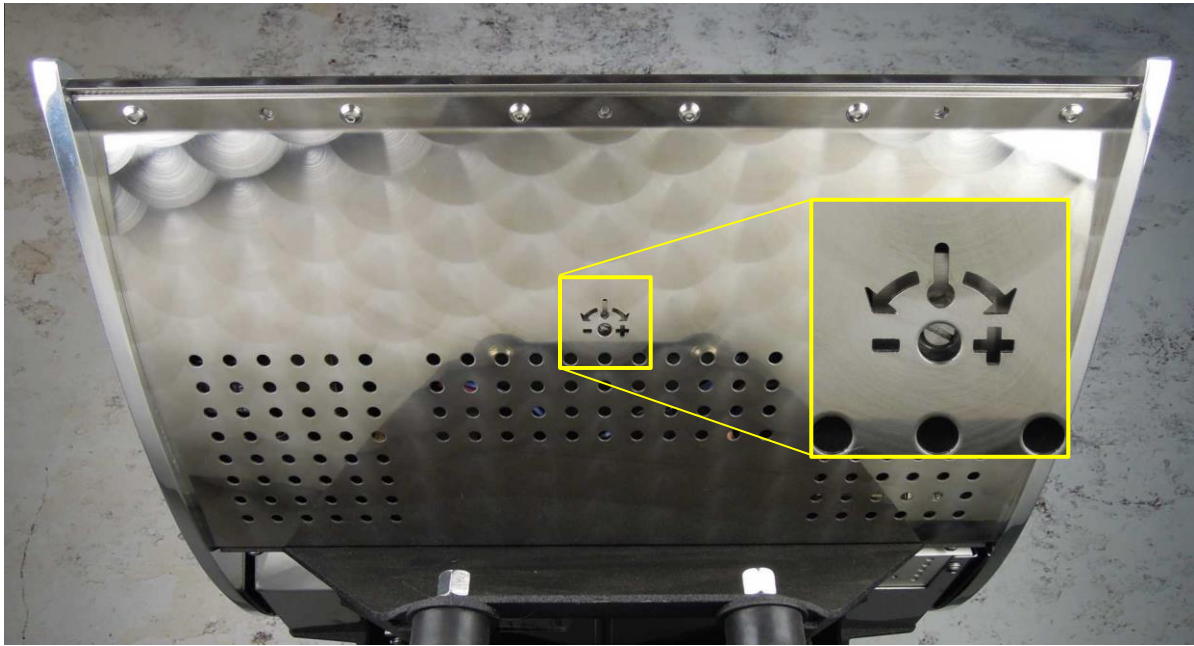


Figure 13. Showing how to adjust the mix-water temperature.

tools needed

- small screw driver with short handle
- (very) quick response thermometer

procedure

1. Have the machine at operation for at least 30 minutes with the steam valve used for at least 30 seconds continuously.
2. Dispense approximately 150 ml mix-water (to heat up pipes etc.) and discard.
3. Dispense approximately 150 ml in a plastic cup (to heat up cup) set aside.
4. Wait for the steam boiler to be topped-up again and heated up (the indicator dot on the temperature display goes OFF).
5. Discard water from heated cup and immediately dispense approximately 150 ml new mix-water in the pre-heated cup.
6. Measure the water temperature.
7. If water temperature is too low, turn set screw counter-clockwise (and vice versa).
8. Repeat the temperature check after adjustment.

If you do not have a quick-response thermometer, turn the set screw clockwise until the dispensed water just starts to sputter (indicating boiling water), then screw counter-clockwise for ¼ turn.



Steam

The left valve is the steam valve (see Figure 14). Turning the steam valve knob 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 condensate 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.

Foot operated steam valve

The 2020 version of the Speedster can optionally be equipped with a foot operated steam valve. A floor pedal activates a momentary air-switch in the machine that in turn activates a solenoid valve. The solenoid valve will be either closed or fully open, steam power can then be adjusted by turning the valve knob.

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 Viton and silicone parts within the valve. Turn clockwise 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 $\frac{1}{4}$ turn, opening further does not have any effect.

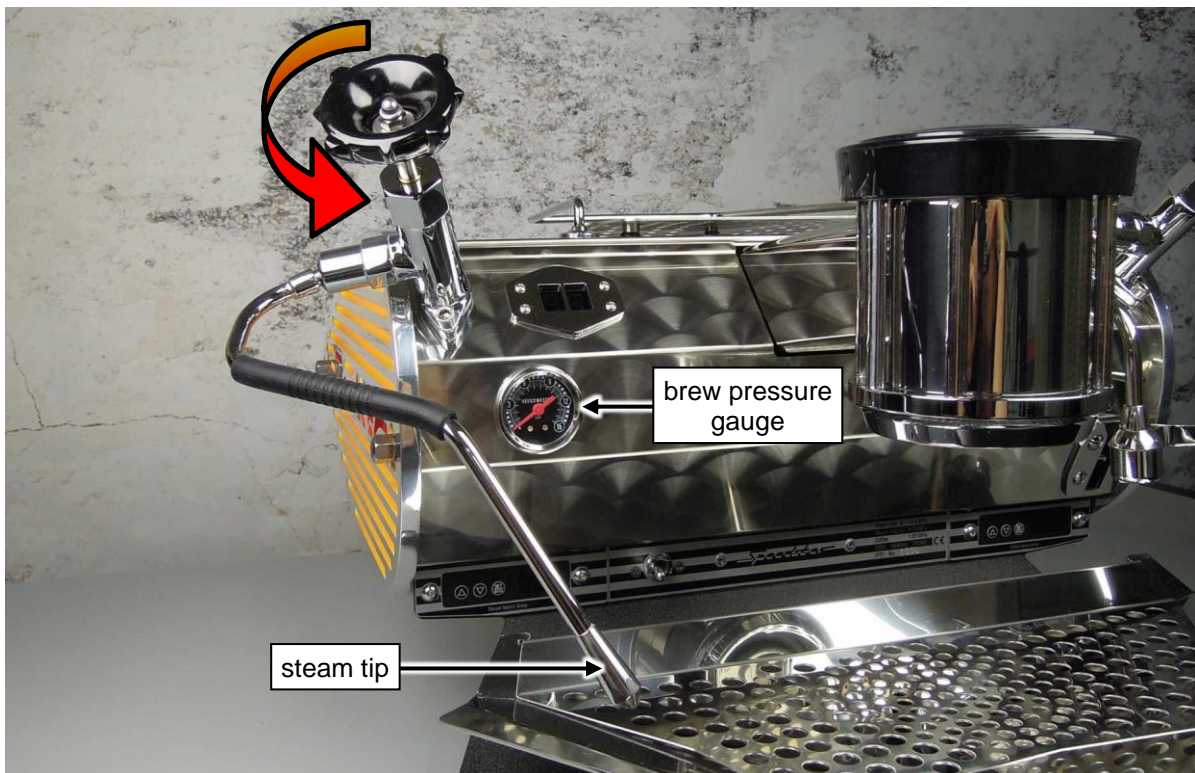


Figure 14. Turn steam valve anti-clockwise to open.



Change boiler temperatures

The factory settings of the coffee boiler and steam boiler temperature controllers are 93 and 135 degrees Centigrade (°C) respectively (200 and 275 °F). Saturated steam overpressure at 135 °C is approximately equivalent to 2.2 bar.

The controllers are locked to prohibit unintended changes but allow, within limits, for changes in operational temperature. If you want to make other adjustments, see section "PID-parameter settings" in the Maintenance Manual ("technical information" section) to unlock the controller.

Coffee boiler

The display of the PID-regulator of the coffee boiler is located on the right side of the front panel of the machine (see Figure 15).



Figure 15. Showing both controllers and ON/OFF switch.

Procedure to change the coffee boiler temperature

1. Press-hold the SET/ECO button on the PID. The display will show the currently set operational temperature value.

Note!

When you press-hold the SET/ECO button for 6 seconds or longer, the controller changes to ECO-mode (a lower temperature setting) and the display will read "Eco". Press-hold the button again for 6 seconds to change it back to operational temperature.

2. **Within 6 seconds**, (with SET/ECO pressed) press the button with arrow up (△) to increase the temperature, press the button with arrow down (▽) to decrease the temperature.
3. When you have set the temperature as desired release the SET/ECO button; the controller 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 leaving the group at the group screen on top of the coffee bed will be 1.5-2.5 degrees Centigrade lower, depending on environmental conditions. You may account for this when fine-tuning the temperature setting on the PID. The procedure is described in the technical manual (available upon request as pdf-file).

Steam boiler

The steam boiler controller is in fact a device identical to the coffee boiler controller, but with different parameter settings such that it functions as a very precise thermostat. Changing the operational (steam boiler) temperature is the same as for the coffee boiler controller.



Cleaning the machine

Remove filter basket

Materials needed

- Group screen extractor

Procedure

1. Remove the filter holder.
2. Pry the filter basket with the pointed end of the extractor from the filter holder (see Figure 16).
3. When remounting the filter basket, make sure the spring snaps into the basket.



Figure 16. Pry filter basket from filter holder with the group screen extractor.

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 handle material may corrode in this solution and should thus be kept out of the solution.

Beware!

Do not clean the filter holder in a dish washer as coffee remnants will not be cleared completely. Furthermore, the plastic handle may get damaged by dish washer detergent.

Steam wand

Milk easily sticks to the hot surface of the steam wand and tip and will leave 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, by means of 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.



Clean exterior

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

Lift the drip tray grill from the machine and clean it with washing up liquid and a sponge. Activate the group (without filter holder locked in) or let the hot water tap run for a moment and use a brush to push remains into the drain.

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

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.

NB: a blind filter is a filter basket without perforations in the bottom.

Materials needed

- Plastic group brush (included in shipment)
- Blind filter (included in shipment)
- Coffee dissolving powder (included in shipment)
- Group screen extractor (included in shipment)

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 from the filter holder (see Figure 16) 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 10 seconds) and shut off the group (lever in upper position).
6. Wait for approximately 5 seconds (the pre-infusion cylinder should have time to empty) then activate the pump again for approximately 10 seconds.
7. Repeat the last step 9 times (wait 5 seconds, activate pump 10 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 (5 seconds group "OFF", 10 seconds "pump active") 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.



Replace group seal

Most group seals are made out of rubber-like material that will harden in time and thus over time need increasing force to properly seal. We advise to replace such group seals at least every 6 months or more often when needed.

Our machines have group seals that do not harden quickly. The Arinca group-ring seals with little force but will wear more rapidly when a lot of pressure is applied to it. Our advice is to use one finger only to lock-in the portafilter. That way group seal will last very long.

Materials needed

- Group screen extractor
- Replacement group seal

Procedure

1. Pry the group screen gently from the group using the group screen extractor as lever under bayonet-ring and in the ridge on the side of the group screen (see Figure 17). Pry left and right for even distribution of force. The screen will fall out together with the rubber group seal. Be sure to place the extractor in the ridge of the screen only.
2. Remove the group seal from the group screen.
3. One side of the 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 17).



Figure 17. Left: Gently pry left and right with group screen extractor to remove group screen and group seal.

Right: Mount group screen with empty filter holder and group ring not pushed all the way on the group screen.

4. Remove the filter basket from the filter holder. Place group screen with group seal on the filter holder and insert into group, pushing upwards. Turn filter holder in bayonet, then remove filter holder.
5. Insert the filter basket to the filter holder. Turn into the group to finish pressing the group seal into the group.



Clean group dispersion plate

The group dispersion plate ensures more uniform wetting of the coffee bed. When dirty, the wetting will become less uniform. The new PEEK material used for the dispersion set has a very long life-span when cleaned periodically.

Materials needed

- Group screen extractor
- Screw driver no.2

procedure

1. Remove group screen together with group seal.
2. Turn out 2 screws holding dispersion plate (see Figure 18).
3. Pull down black dispersion plate.
4. Clean all.

Beware! Do not scrub the dispersion plate as it may leave scratches in the material.

5. Re-install.



Figure 18. Shows dispersion plate mounted with 2 screws (left) and dispersion plate removed from group (right). Photos taken from bare coffee-boiler laying on its back.



Maintenance

Below is the recommended maintenance scheme. Up to one year, the maintenance is easy and does not require any technical knowledge. However, checking, adjusting and/or replacing parts inside the machine should be done with care and requires some technical skills.

Recommended maintenance scheme

Daily (depending on use, see user manual)

- Clean filter holder
- Clean steam wand
- Backflush group

Weekly (see user manual)

- Clean group screen
- Clean filter holder

Every 3 months (see user and/or technical manual)

- Clean group dispersion plate
- Check water treatment system (or re-generate water softener)
- Check pump pressure
- Check and replace if necessary:
 - group seal
 - group screen
 - filter basket
 - filter holder clip

Every 6 months (see technical manual)

all 3-month maintenance plus ...

- Grease steam wand ball and check play between ball-joint nut and ball of steam wand
- Check and replace if necessary:
 - anti-vacuum valve for leakage
 - safety-valve on hot water/steam boiler for leakage
 - operation of expansion valve on heat-exchanger system
 - O-ring and springs in pre-infusion cylinder, grease O-ring and piston shaft

Every 12 months (see technical manual)

all 6-month maintenance plus ...

- Replace:
 - water treatment system filter cartridge (or more often)
 - group screen
 - filter basket
 - filter holder clip
- Replace anti-vacuum valve
- Rebuild steam valve
- Clean probes, level and safety

Every 5 years (see technical manual)

all 12-month maintenance plus ...

- Replace all solenoid valves

When ordering parts or asking (technical) questions, please forward the machine number in question. The machine number is found on the identity tag located at the front of the machine.



Maintenance Records

[illegible]

Contact information

Kees van der Westen Espressonistic Works B.V.

Van Elderenlaan 6

5581WJ WAALRE

The Netherlands

Telephone +31 40 2223433
Keep machine number at hand

Email for technical questions
support@keesvanderwesten.com
Forward machine number

Website www.keesvanderwesten.com

Ordering replacement parts

See <http://www.keesvanderwesten.com/assets/speedster-parts-list.pdf> for the spare parts list.
(to be sure to download the latest version, clear browser memory first)

Order parts directly via
spareparts@keesvanderwesten.com
Forward machine number

The machine number is found on the identity tag located at the front of the machine.

