User manual
Spiritello
espresso machine

(Original instructions)

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CONTENTS

Intended use

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments;
- farm houses;
- by clients in hotels, motels and other residential type environments;
- bed and breakfast type environments.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

Safe operation

- The espresso machine has to be placed in a horizontal position on a sturdy and flat surface.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The mains electricity the appliance is connected to must include a residual-current-circuit-breaker of 3-30 mA.
- When connected to water mains, water pressure should be in the range 0.1-1.0 MPa. When mains pressure is higher than 0.5 MPa a suitable pressure reducer should be installed between water mains and the espresso machine for best performance of the machine.
- When needed, the new hose-sets supplied with the appliance are to be used. Old hose-sets should not be reused.
- The appliance may not be immersed in water or cleaned with the aid of a water jet.
- The appliance is not suited for outdoor use or for use inside a cabinet.
- 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.
  Whenever the machine and/or pump have suffered freezing conditions, ask a technician to start-up the appliance again.
- It is advised to install a leak prevention system when the appliances is directly connected to the water mains.
- Make sure that you do not spill water on the electric connector.
- Surfaces in contact with food should be cleaned with a moist (not wet) cloth.
- Cleaning and user maintenance shall not be made by children without supervision.
- Misuse of the machine can lead to serious injury.
- Be aware that parts of the machine will remain hot a long time after the machine has been turned OFF.

△ Hot surfaces!
Parts of the machine will be hot when the machine is turned ON.

- The metal groups are intended to radiate heat and can 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 130°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 130°C.

Designation

This manual applies to the Spiritello espresso machine manufactured by Kees van der Westen Espressonistic Works B.V..

Compliance

To comply with IEC 61000-3-11 the machine must be connected to a public distribution system having a nominal voltage of 230V line to neutral and a maximum system impedance (Z_{max}) of 0,15 Ω.

Water Quality

Be aware that bottled water often is "mineral water" which, due to increased mineral content, may not be suited to use in an espresso machine.

When water feed is from mains, 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 higher part of the SCA "core zone", see Figure 1, and have a pH of 7.0-7.5 (at 25°C).

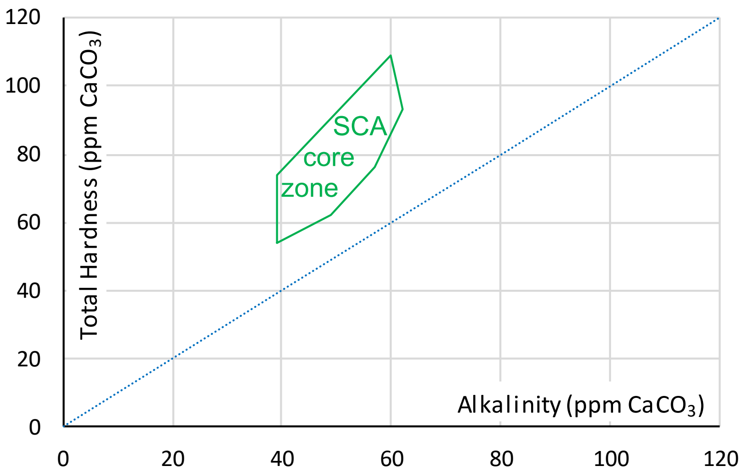


Figure 1. Alkalinity vs-Total Hardness graph showing the SCA "core zone" in green outline.

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	--
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			

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 within the core zone.

[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

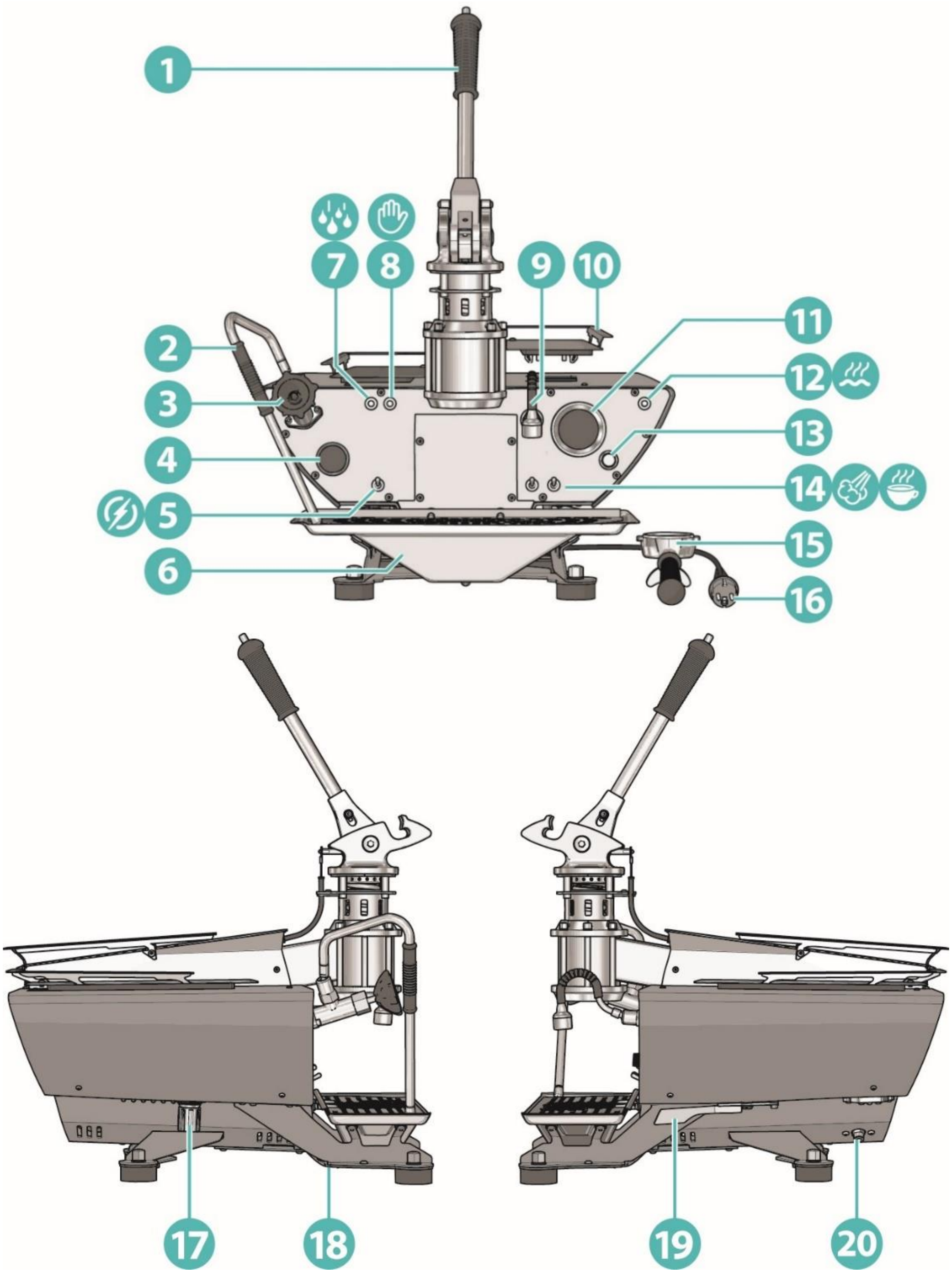


Figure 2. Showing the main operational parts of the Spiritello.

1. Group lever
2. Steam wand
3. Steam valve
4. Brew pressure gauge
5. Main power switch
6. Removable drip-tray
7. Flush button
8. Relief button
9. Hot water spout
10. Removable cup tray (water tank lid)
11. Display
12. Hot water button (mix-water)
13. Encoder knob
14. Heat switches steam and coffee
15. Filter holder
16. Power plug[1]
17. Pressure reducer
18. Drain connection
19. Side panel lever
20. Water mains connection

[1]The espresso machine comes with either an European Schuko power plug or without a power plug. See installation manual for more information.

Other manuals

For more information on how to prepare for the arrival of your Spiritello, go to the pre-installation guide. In that document you will find information regarding transport, necessary preparations for your countertop, water requirements, electrical requirements and unpacking instructions.

For more information on how to install the Spiritello, go the installation manual. In that document you will find more in-depth information on the water and electrical requirements, how to connect your machine to the electric mains and if desired, water mains and drain. Next to this there’s a step by step procedure to follow for the first use (fill the machine, heat-up, adjustment of mix-water).

Be aware that bottled water often is “mineral water” which, due to increased mineral content, may not be suited to use in an espresso machine.

Fill water tank

You can fill the tank by lifting the cup-tray from the right body panel and then pour water from a bottle or jug into the tank. It is advised to empty, rinse and re-fill the tank every day.

Water in the tank will get warm which enhances bacterial growth. Water used for espresso and steam will be heated to such temperature that possible organisms will not survive. A mixed water dispense will include water straight from the tank, which may contain organisms. It is advised to empty, rinse and re-fill the tank on a daily basis.

Remove water tank (see Figure 3)

1. Remove the cup tray of the right body panel.
2. Remove the body panel: push the lever just below the panel towards the centre of the machine (approx. 2 cm, 1”), the lower part of the panel shifts outwards
3. Then gently move the exterior side of the panel up and away from the machine. The body panel can now be laid aside.

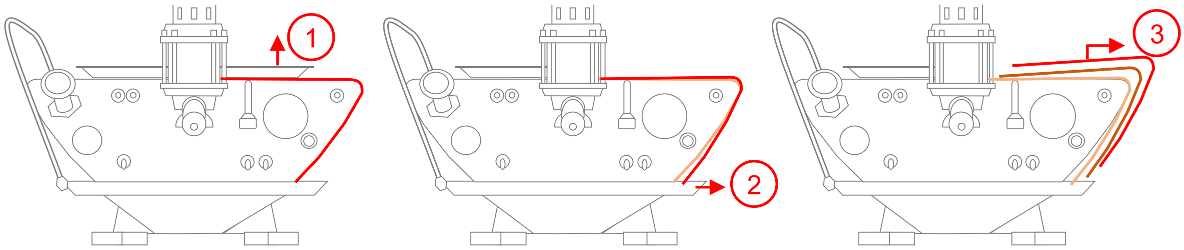


Figure 3. Remove the right hand side panel in 3 steps to be able to remove the tank from the machine.

4. Lift the tank out of the machine and remove the lid from the tank.
5. Wash and rinse the tank with fresh water, dry the outside, remount the lid and replace into the machine. Make sure the water outlet connects to the receptacle and push the tank firmly down.
6. Replace the side panel: hook upper section into position first, then push complete panel inwards.
7. Fill the tank but keep below the max-level (approx. 3.5 litres).

Operational features

MAIN switch

The main switch is located at the lower-left side of the machine and has 2 positions:

DOWN=OFF   Power to the controller is disconnected.

UP=ON   The machine is connected to the electric mains. With only main switch ON, the machine functions but the boilers will not heat. Power to the heating elements will remain disconnected as long as the heat switches (see below) are OFF.

Figure 4. Showing the MAIN, HEAT STEAM and HEAT COFFEE toggle switches.

HEAT STEAM switch and HEAT COFFEE switch

Heating power to the machine is split in two different circuits. Each circuit can be (dis-)connected individually. The heating element of the steam boiler consists of a lower and upper spiral.

Note!
The boilers will not heat up when the HEAT switches are in the OFF position.

1. The left HEAT switch powers the steam boiler heating element.
2. The right HEAT switch powers the group heating element.

FLUSH switch and RELIEF switch

Shortly pressing the <u>flush switch</u> starts water flowing to the group for a pre-set amount of time. Depending on how the machine is instructed, the pump may or may not be active during a flush. Flush duration can be adjusted (within a range) by the user. The flush switch has no function when the brew-lever is not in resting position. Flush duration can be adjusted in (SETTINGS – Machine – Flush Time = 0.5 .. 5.0 seconds)

Shortly pressing the <u>relief switch</u> will open the waste of the group such that a brew-in-progress quickly stops with the lever returning to resting position while remaining (water-) pressure is relieved into the drip tray. The relief switch has no function when the lever is in resting position.

Figure 5. Showing the FLUSH, RELIEF and MIX-WATER push-button switches.

MIX-WATER switch

Shortly pressing the <u>mix-water switch</u> will activate the hot- and cold- water valves inside the machine to dispense mix water during a pre-set amount of time. The dispense duration can be adjusted in (SETTINGS – Machine – Hot Water Time = 0.5 .. 5.0 seconds). Shortly pressing the switch again during a dispense will immediately stop the flow. When you press-hold the switch longer, the dispense continues until you release the switch.

> **Note!**
> Hot water can only be dispensed when the steam boiler is above 100°C as steam pressure is the means to push water out of the boiler. When the steam boiler is not at operational temperature yet, the mix-water temperature will be lower than your setting.

Pressure gauge

While brewing a real shot the coffee-bed becomes less permeable during wetting (pre-infusion stage) and pressure will rise until the set regulated-pressure is reached. The pressure gauge displays the pressure in the line that runs from group-valve to group-screen. This means that when a group is inactive or when no filter-holder is locked in, the pressure gauge will display 0 bar.

Figure 6. Showing brew-pressure gauge.

The gauge is also used to adjust the pump-pressure and pressure reducer settings.

Steaming

Before steaming milk it is necessary to open the valve for a short while to purge water from the steam wand and heat up the wand and valve. The purged 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 condensate.
Directly after steaming milk, flush the steam wand with a little steam and clean the tip of the steam wand with a damp cloth. For hygienic reasons, do not use this cloth for anything other than cleaning the steam tip.
Twist the valve-knob to open/close and adjust the steam flow. From fully open to fully closed is about ½ turn, there is no need to close the valve firmly.

The steam-tip is made from PEEK material to which milk will not stick easily. For better cleaning, unscrew the tip from the wand using the tool that came with the machine. Apply a little food-safe grease on the sealing O-ring when re-mounting the tip, use little torque.

Figure 7. Showing the steam valve, -wand and -tip.

Note!
It is advised not to decrease the steam power by lowering the steam boiler temperature. A lower boiler temperature will reduce the amount of steam that can be produced and the temperature of the mix-water dispensing.

Display and encoder

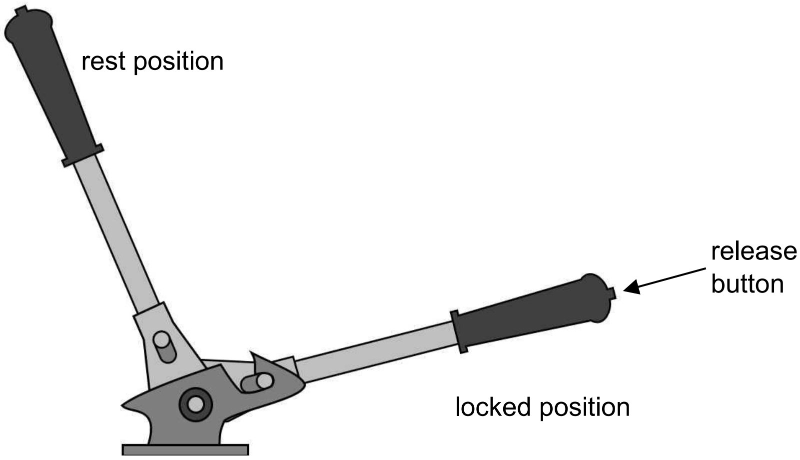
Figure 8. showing position of display and turn-push encoder.

The encoder, together with the display, lets you go through settings of the machine and change them (within factory-determined range) to your liking. In general pressing the encoder activates the chosen item on display or saves it after changing and turning the encoder leads you to the previous or next list-item or parameter value.

Tips!
A long-press on the encoder, until the text at the top of the display lights up, will take you back to a higher menu-level instantly such that you do not have to select the "back" option first.
When you pull the lever from rest position, the display immediately changes to the "brew dashboard", irrespective of what is shown just before pulling the lever.

When you want to re-set a parameter-value to factory setting: press-hold of the encoder for 3 seconds until the value changes.
When you want to re-set all parameter-values to factory settings and/or clear the heating schedule go to the Reset sub-menu.

Group-lever



Pulling the group-lever out of rest position will lift the piston inside the cylinder while compressing the spring. At maximum piston-lift, the lever will lock. When you press the release button, the lever gets unlocked and the spring will force the piston down and lever to return to rest position. Water inside the cylinder will be pushed out, either through the coffee-bed into a cup, or through the group valve when you activate the relief-switch.

A Bowden cable mechanism that is attached to the oval bracket at the top of the piston rod will manipulate two switches. One switch signals whether the piston is in its lower position or not, the other switch signals whether the piston in in the higher position or not.

Menu-structure

menu	sub-menu	parameter	parameter value-range	increment	factory set	unit
HOME	In HOME choose from menu-items available or short-press the home icon to get brew dashboard. Press-hold the encoder for 4 seconds to turn the display to a clock.					
	Dashboard	Shows vital machine information for brewing like boiler temperatures, heating mode, last shot duration (no scale in use) or next shot weight, tank state (OK, empty), AUTO-STOP mode (none, weight, pressure). Turning (anti-) clockwise changes next shot setting.				
	Clock	Shows present time, heating mode and next heating mode action.				
SETTINGS	Temperature	Coffee	80.0 .. 99.9	0.1	93.0	°C
		Steam	115 .. 130	1	130	
		Coffee ECO	50 .. 70	1	60	
		Steam ECO	60 .. 80	1	75	
		Coffee Offset	-5.0 .. 5.0	0.1	0.0	
	Machine	Auto Stop	No/Weight/Pressure		No	
		Hot Water Time	0.5 .. 5.0	0.1	1.5	sec
		Flush Time	0.5 .. 5.0	0.1	2.0	
		Fill Time	1.0 .. 5.0	0.1	3.0	
		Peak Power	Normal/Limited		Limited	
		Water Feed	Tank/Mains		Tank	
		Pump Active*	Always/Fill&Flush/ No Brew/Never		Always	
		Pump Delay*	0.0 .. 5.0	0.1	0.0	sec
	Date/Time	Year	2024 .. 3000	1	2024	
		Month	1 .. 12	1	1	
		Day	1 .. 31	1	1	
		Hour	00 .. 23	1	00	
		Minute	00 ..59	1	00	
	Display	Disp. Shot Time	20 .. 60	1	20	sec
		Dim After	5 .. 120	5	20	min
		Temp. Unit	°C/°F		°C	
		Brightness	20 .. 100	5	80	%
	Reset	Settings	Keep/Reset		Keep	
		Schedule	Keep/Reset		Keep	
SCHEDULE	Monday	action Mon 1	(e.g.: 07:30/ON)	A maximum of 6 HEATING-MODE actions per week-day can be programmed. It is possible to stack identical actions at consecutive moments.		
		action Mon 2	(e.g.: 09:00/ECO)			
		action Mon 3	(e.g.: 12:30/ON)			
		action Mon 4	(e.g.: 14:00/ECO)			
		action Mon 5	(e.g.: 19:15/ON)			
		action Mon 6	(e.g.: 22:00/OFF)			
	Tuesday	action Tue 1				
	...	...				
HEATING MODE			ON/ECO/OFF		ON	
SHOTS	Weight	Shot 1	10 .. 200	1	30	gr
		Shot 2			40	
		Shot 1 Offset	0.0 .. 5.0	0.1	0.5	
		Shot 2 Offset				
		Auto Tare	No/Yes		No	
		Stabilise Time*	1.0 .. 10.0	0.5	3.0	sec
	Pressure	Shot 1	1.0 .. 10.0	0.1	7.0	bar
		Shot 2			6.0	
SCALE		Reset and Scan		To connect to (new) scale		
PRESSURE				Shows pressure at last shot end		

* only shown when Water Feed = Mains   * only shown when Auto Tare = No

Sleep and wake-up screen

Home screen
(no Auto-stop, heating = ECO)

With encoder change shot
(stop by weight, heating = ON)

At stand-by, the display will show the home screen. In the left example above the present heating mode of the machine is ECO (heating symbol is green). When in the home screen, turning the encoder will change the size of the next shot and display that size (right), provided that the machine is set at Auto-stop (and in this case connected to scale).

Shot timer screens

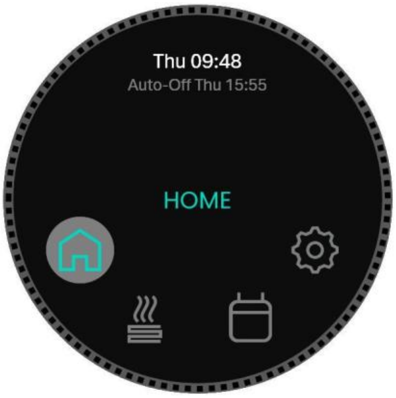
Shot time at 21 s
(no Auto-stop)

Shot time at 21 s
(Auto-stop by weight)

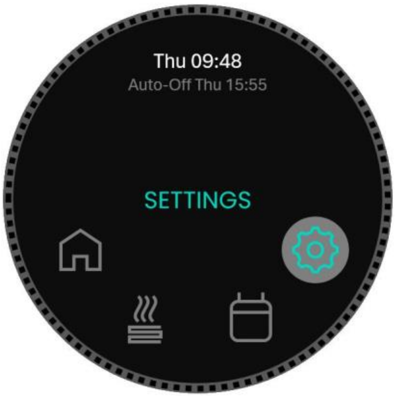
Shot time longer than 60 seconds

When you pull the lever, the display will change to the brew-window that shows shot time (in full seconds past, left screen). When scales are connected, weight (in grams) and instantaneous flowrate (in g/s) of the brew in progress is shown, and a bar growing to show the present vs the target weight (centre screen). When you overshoot 60 seconds in a shot, the hand on the dial will not pass 61 seconds although the timer will continue to count (right screen) until the shot ends.
A user-defined moment (in range 20 .. 60 seconds) after the lever has returned to resting position, the display will change to show temperature information and previous shot duration again (see top of page).

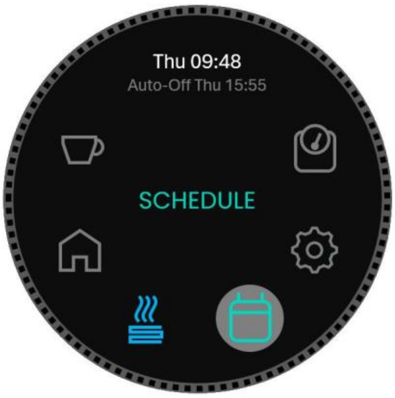
Main menu screens



HOME selected
(heating=ON, no Auto-stop)



SETTINGS selected
(heating=ON)



SCHEDULE selected
(heating=OFF, Auto-stop by weight)

With the encoder you can select sub-menus and items within the menu-structure and adjust parameter-values.

Sub menus SCALE or PRESSURE and SHOTS will only be shown when the machine is set to Auto-stop = weight or pressure.

Main menu-HOME

A short-press on the encoder when HOME is selected will change the display to the “home screen” that shows boiler temperatures and previous shot time. Turning the encoder changes the chosen shot, provided that these are programmed and accessible:

Shot without Auto-stop

Shot with Auto-stop = weight

Shot with Auto-stop = pressure

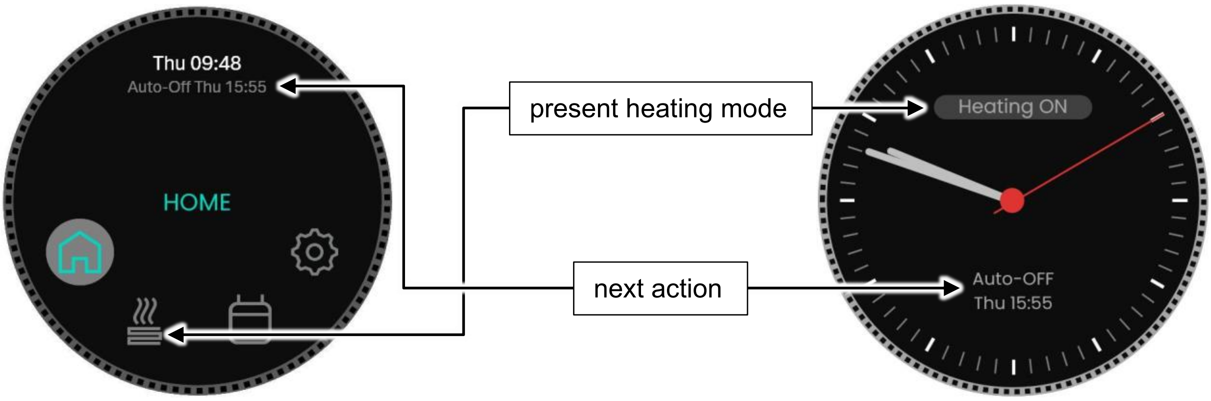
Icon bar

The bar with icons shows information about the machine. A faintly visible grey colour of an icon indicates “standard” setting. A combination of coloured icons is possible.

All is normal display: Auto-stop = none, heating mode is set to ON
Auto-stop = pressure
Auto-stop = weight, scale is connected
Auto-stop = weight, connection to scale is lost
Water tank is empty
Heating mode is set to ECO
Heating mode is set to OFF
General warning, the top of the display will give extra information

CLOCK

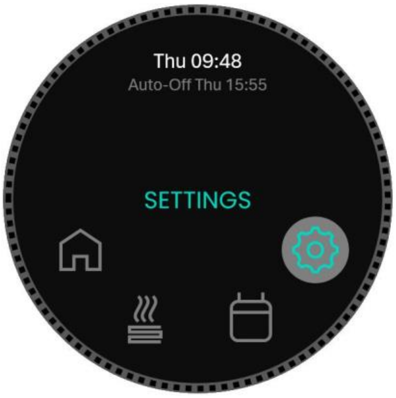
When in the MENU screen you press-hold the encoder for more than 4 seconds, the display changes to a clock. The clock screen shows information about heating mode and next scheduled (heating mode) action.



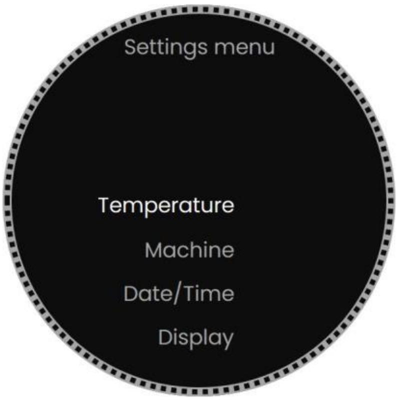
MENU screen *clock*

The screen will dim after the set amount of time and return to the HOME screen when you short-press the encoder.

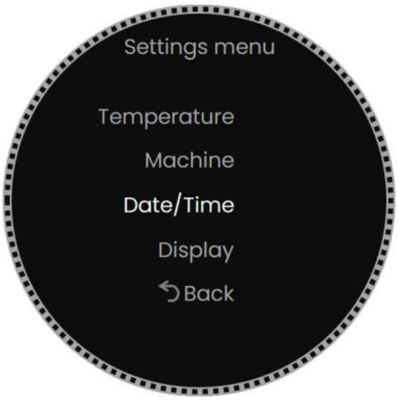
Main menu-SETTINGS



Settings selected

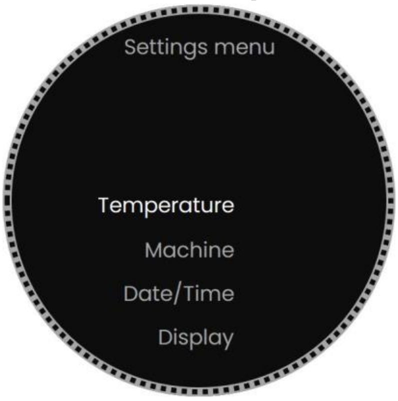


Temperature selected

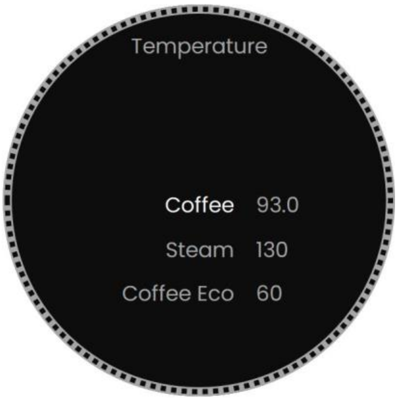


Date/Time selected

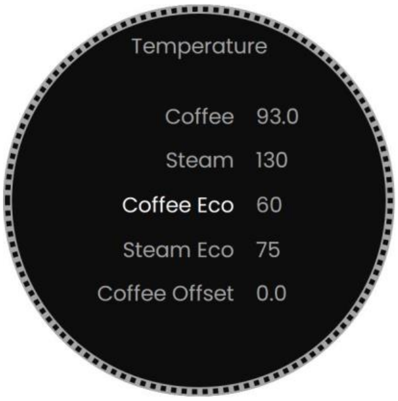
sub-menu Temperature



Temperature selected



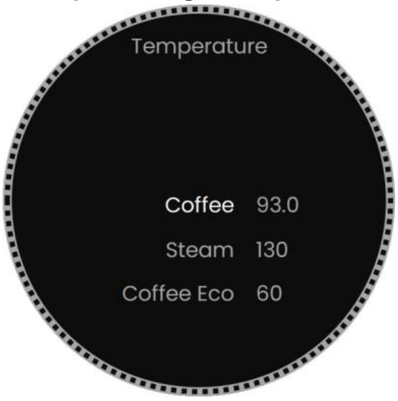
Coffee selected



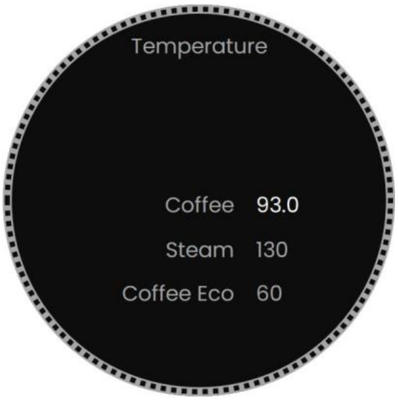
Coffee Eco selected

The display will show the sum of the “Coffee Offset” value and the measured value in the coffee boiler. Example: when the measured value is 93.4°C and the Coffee Offset is -2.2, the temperature value displayed will be 91.2°C.

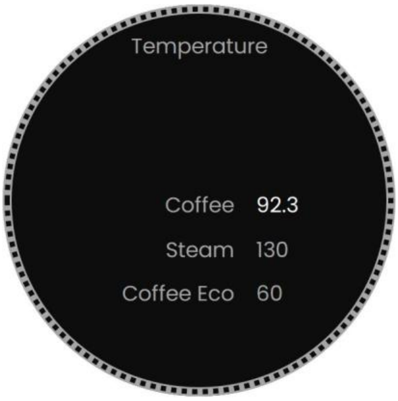
Example change Temperature Coffee



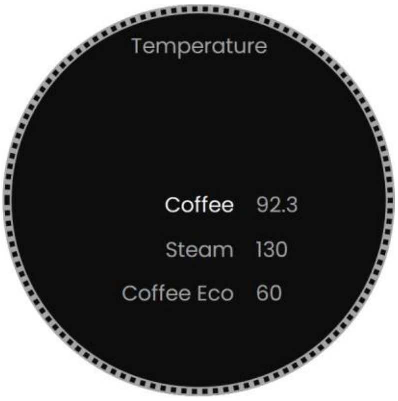
Coffee selected *press*

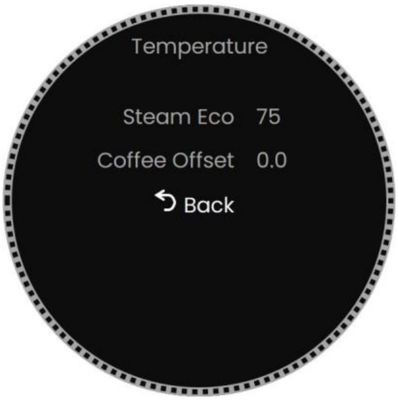


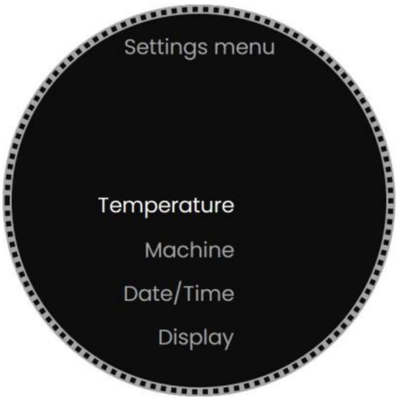
93.0 selected *turn*



92.3 constructed *press*

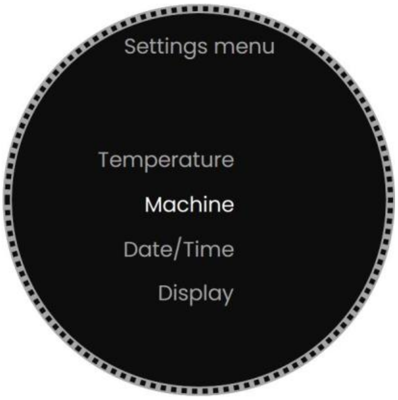




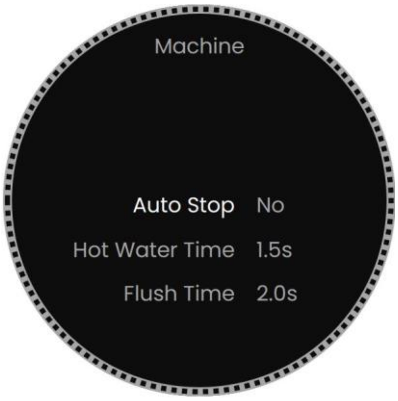


↳ *Coffee selected* turn *Back selected* press *Coffee changed*

sub-menu Machine



Machine selected press



↳ *Auto Stop selected* turn *Peak Power selected* turn *Back selected**

parameter	range	factory	incr.	unit	remark
Auto-stop	No, Weight, Pressure	No			see below
Hot Water Time	0.5 .. 5.0	1.5	0.1	sec	
Flush Time	0.5 .. 5.0	2.0	0.1	sec	
Fill Time	1.0 .. 5.0	3.0	0.1	sec	
Peak Power	Normal/Limited	Normal			
Water Feed	Tank/Mains	Tank			
Pump Active	Always/Fill & Flush/ No Brew/Never	Always			Only shown when "Water Feed" = mains
Pump Delay	0.0 .. 5.0	0.0	0.1	sec	

NB: When you use the Acaia Lunar, firmware of the scale should be 1.0.017 or higher:

https://help.acaia.co/hc/en-us/articles/207391486-How-to-Update-your-Acaia-Product-s-Firmware

Auto-stop: In standard setting you can manually end a shot by pressing the relief button. When the machine is connected to scales (Acaia Lunar), the shot-end can be based on increasing weight data from the scale. When you select pressure, the shot-end can be based on the (decreasing) pressure reading of the internal pressure sensor.

Hot Water Time: duration of a mix-water dispense.

Flush Time: duration of a flush.

Fill time: the machine will start filling the boiler when level drops below operational level, provided that a brew in progress does not require water. Filling will continue for a moment after the operational level has been reached in order to diminish multiple start-stop for filling. When machine is at water mains pressure, the continued filling may be set a little longer than when the machine fills with pump active.

Peak Power: Factory setting is “standard”. At setting “Limited” the 2nd heating spiral in the steam boiler will not get power when the coffee boiler heating is active, this reduces peak power consumption with 450W. Steam boiler heat-up from cold will take longer but once the machine is heated up, the user may not notice any difference in machine performance.

Water Feed: when you connect your machine to mains water supply you need to change the water-feed setting and turn the 3-way tap inside the machine to “Mains”.

Pump Active: when connected to mains you can choose to not use the pump for certain activities.

1. Always: the pump is active during all activities; this is the only available setting when the machine is set to Water-feed = Tank.
2. Fill &Flush: the pump will be active while filling the steam boiler or flushing the group. It is not active for mix-water and filling the group-cylinder.
3. No Brew: the pump will not be active while filling the group-cylinder.
4. Never: the pump is never active, reducing sound produced by the machine. This setting is only possible when mains pressure is higher than 2.5 bar (needed to fill the steam boiler and add cold water to get mix water). Filling of the group cylinder can be done at even lower pressure (with pressure reducer) to prolong pre-infusion stage.

When you change to setting 2, 3 or 4 you may have to adjust the mix-water temperature.

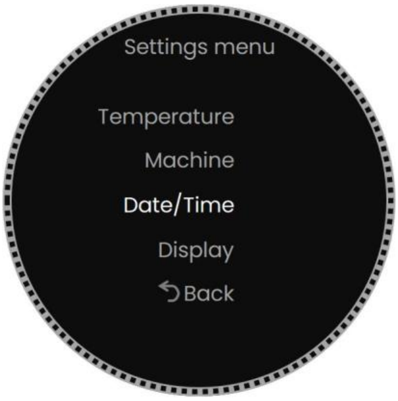
Pump Delay: When connected to water mains with low pressure, the pump may cavitate at instant start. This unwanted cavitation can be counter-acted by the pump-delay making that water starts to flow through the pump first before it activates. The option is not present when the machine is set to Water-feed = Tank.

For information on how to update the Acaia Lunar firmware:

https://help.acaia.co/hc/en-us/articles/207391486-How-to-Update-your-Acaia-Product-s-Firmware

sub-menu Date/Time

In Date/Time you set the present date and time which are needed to make the Auto ON-ECO-OFF programming function properly.



Date/Time selected *press* *Year selected* *turn* *Minutes selected* *press*

↳ *23 selected* *turn* *change to 24*

Press to confirm 24, turn to “Back”, press to leave the sub-menu.

sub menu Display

Display selected *press* *Disp. Shot Time selected* *turn* *Brightness selected*

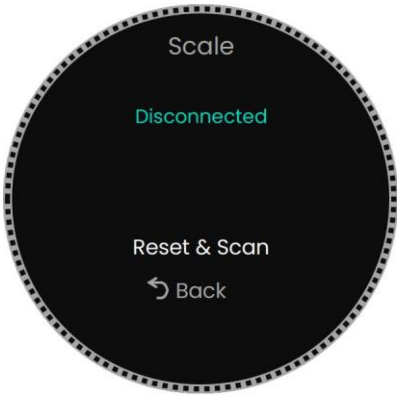
parameter	range	factory	incr.	unit	
Disp. Shot time	20 .. 60	20	1	sec	
Dim After	5 .. 120	20	5	min	
Temp. Unit	°C, °F	°C			
Brightness	20 .. 100	80	5	%	

Disp. Shot Time: The display changes to shot timer when pulling a shot. With this parameter you can set how long it takes before the display changes to “home screen” with temperatures.
Dim After: Duration after which the displays dims.
Temp. Unit: Display in Celsius or Fahrenheit.
Brightness: Contrast between font and background.

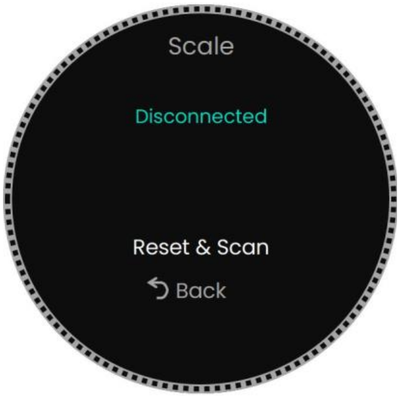
Auto-Stop

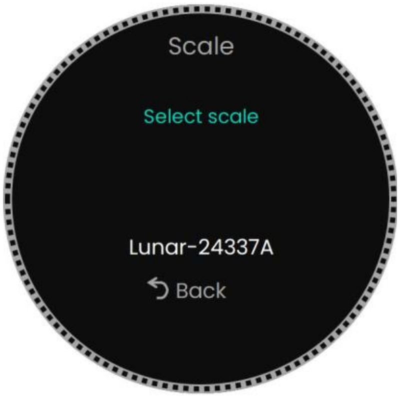
Auto-stop by weight
The machine can get information from a scale (Acaia Lunar) to stop a brew at a pre-determined weight. In order to make use of this option you first need to set the machine to Auto-stop = weight and then pair the scale to the Spiritello.

Pair scale



SCALE selected *press* *forget scale and scan* *turn* *may happen* *press*





↳ *try again* *press* *choose scale found* *press* *scale connected*

When pairing is successful, the scale logo in the dashboard screen will be light grey, when the connection to the scale is lost, the icon will change to red.

 Auto-stop = weight, scale is connected

 Auto-stop = weight, connection to scale is lost

SHOT 1 and 2 (using scale)
In SHOT 1 and SHOT 2 you can adjust when the shot should be ended automatically. When scales are paired with the machine, a brew-in-progress can auto-stop by weight (grams).

The weight and offset of 2 different shots can be set in SHOTS

scale SHOTS selected *press, turn* *Shot 2 selected* *turn* *Auto Tare selected*

(only) When "Auto Tare" = No, the parameter "Stabilise Time" is shown and can be adjusted.

With "Auto Tare" = Yes, the machine will order the scale to tare when you pull the lever. When you prefer to Tare the scale yourself, choose "Auto Tare" = No. After pulling the lever you have a moment to Tare the scale manually before the weight information is passed from scale to machine. That moment is called "Stabilise Time".

Scaled shot with target 40g in progress.

When the scale properly communicates with the machine (scale symbol is light grey), the machine will signal the scale a brew is started when the lower piston-switch is manipulated. When Auto Tare active, this signal will make that the scale tares (weight to 0 gr). During the brew the scale forwards the increasing weight in the cup to the machine's controller which predicts when the brew should stop to end up at the correct weight. Some latent flow depends on coffee-bed preparation, filter-holder used, etc., and cannot be predicted by the controller but must be set manually with the offset parameter.

In a lever-machine, the maximum shot-weight is determined by the displaced volume of the cylinder (approx. 60 ml). The maximum volume/weight in the cup can be increased by waiting until some brew has already collected in the cup before taking the lever out of locked position.

When connection is lost, the scales symbol turns red. The brew will stop when (1) the lever-system manipulates the lower switch or (2) when the relief-switch is manipulated.

Notes!

Motion of the machine during a brew can disturb accurate taring and weight propagation.

When, with a lever machine, you set the weight higher than can be achieved by the content of the cylinder (60 ml), the shot will also stop when the lever is in its upwards/resting position. This is when the lever system manipulates the lower switch (again).

Auto-stop by pressure
The machine has a sensor that measures water-pressure on the coffee-bed during a brew. Since spring compression is related to spring force and piston displacement, stopping a brew in progress when the brew-pressure falls below a programmed value can also be used to automatically stop a brew. Because the pre-compression of the spring can be changed there is no single relation between volume displaced and brew-pressure. In effect it means that when you change the pre-compression of the spring, you also have to change the auto-stop pressure when you want to get the same amount of brew at the auto-stop.

After you have set the machine to Auto-stop = pressure in the sub-menu Machine, the gauge symbol will be shown in the Main menu and in light-grey in the icon-bar of the dashboard.

PRESSURE selected

showing last shot-end

pressure SHOTS selected

SHOT 1 and 2 (using pressure sensor)

Stop pressure selected

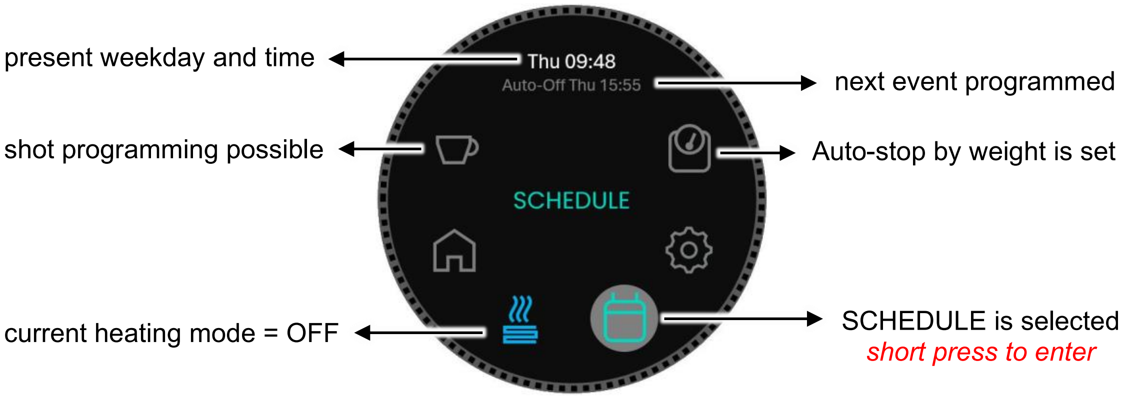
dashboard with pressure shot in progress

When the conditions at moment of releasing the lever are identical, the volume (and thus weight) in the cup will be identical as well. Provided that coffee-bed preparation has not changed, you need to release the lever at identical condition as well. We advise to choose an appropriate time after start to do so. This duration should be long enough to completely soak the coffee-bed and fill the cylinder and thus depends on coffee-bed properties and pressure regulator-setting. A good starting duration would be 7 resp. 12 seconds (high resp. low pressure regulator setting).

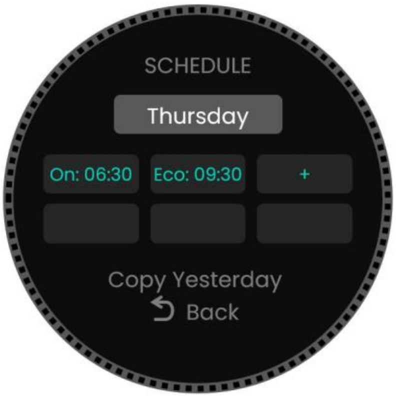
Main menu-SCHEDULE

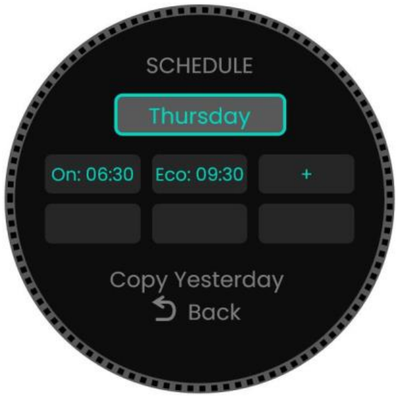
In the SCHEDULE menu, the auto ON-ECO-OFF actions can be programmed with a maximum of 6 actions per weekday. When you enter the menu it will be on the weekday of that moment.

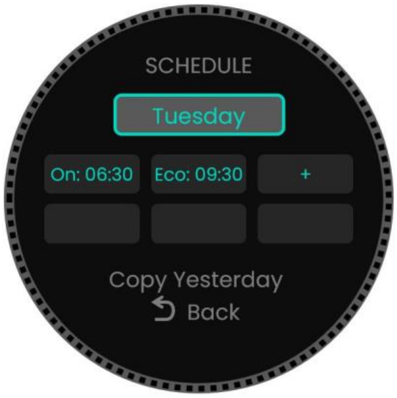
In the next example it is Thursday-morning 9:48AM, heating mode = OFF and the machine is set as Auto-stop = weight. You want to adjust the action on Tuesday “change to ECO” from 13:30 to 14:30.



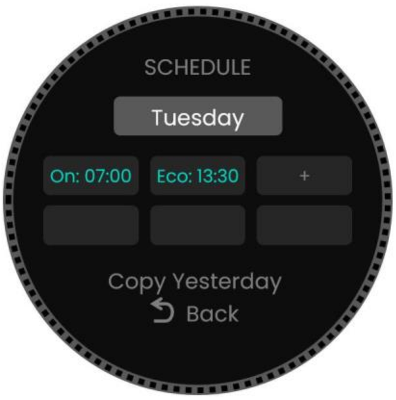
When you have selected a parameter and short-press the encoder, you can adjust the value of that parameter by turning the encoder. You press again to save the new value and then turn to go to the next parameter.

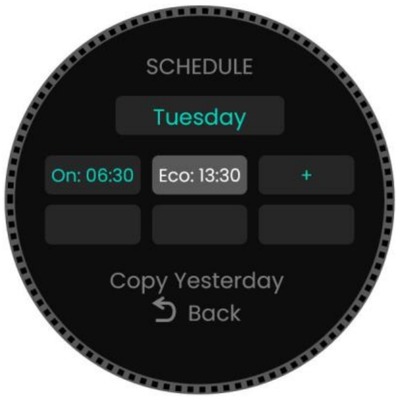


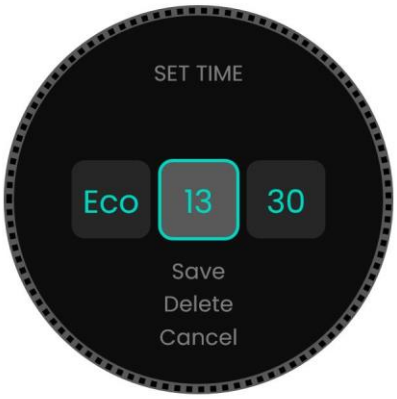




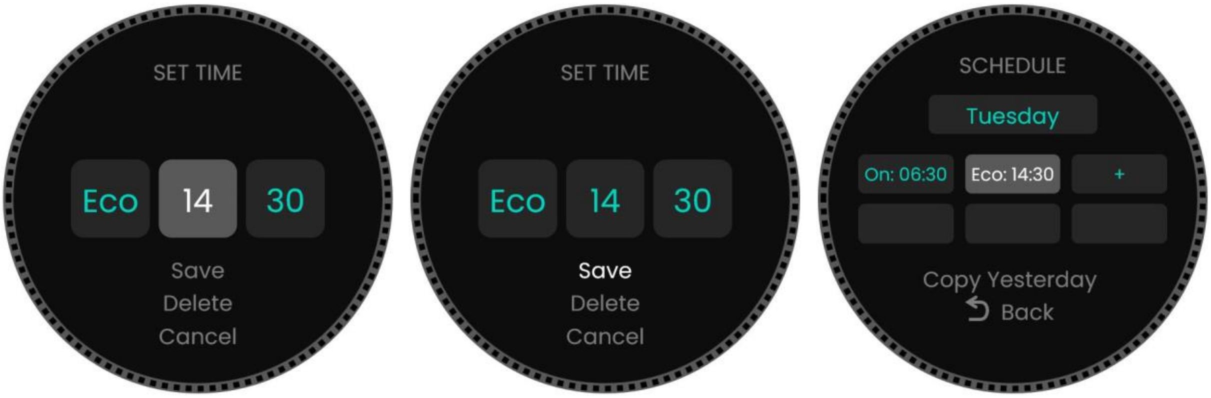
↳ *Thursday selected* *press* *Thursday adjustable* *turn* *adjust to Tuesday* *press*
(shown are still Thursday times)







↳ *Tuesday selected* *turn* *action 2 selected* *press-turn-press* *13 adjustable* *turn-*
now shown are Tuesday times *turn to skip “Eco”*

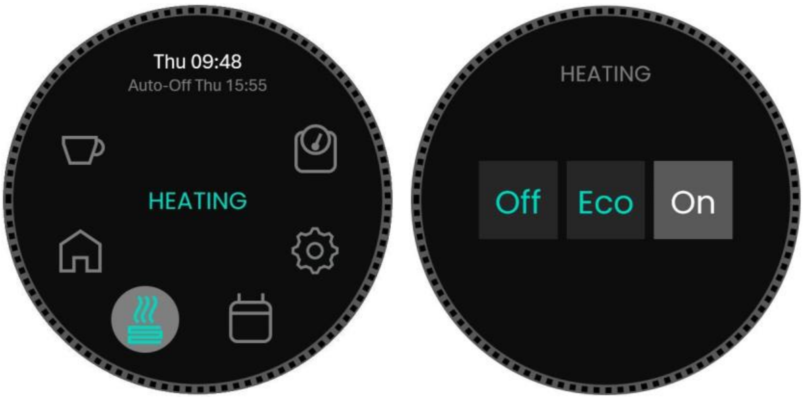


press *14 selected* *turn* *save selected* *press* *action 2 Tuesday adjusted*

Changing heating mode, times and adding/deleting actions follow a similar procedure.

Main menu-HEATING

Changing HEATING Mode from ON to ECO or OFF and vice versa is either programmed with the schedule-option but can immediately be enforced using the encoder. Shortly press the encoder to get into the MAIN MENU, select “HEATING”. Shortly press again to get into the sub-menu “heating”. Turn the encoder to change the desired mode and shortly press again to confirm your choice.



Select HEATING *press, turn* *On active* *press to confirm the (new) heating mode.*

At Heat ON, boiler temperatures are (factory set) at 93.0°C (199°F) for coffee and 130°C (266°F) for steam. 130°C is equivalent to approximately 1.7 bar steam overpressure.

At Heat ECO, boiler temperatures reduce to 60°C (140°F) for coffee and 75°C (167°F) for steam. At this lower temperature setting up to 70% power is saved while the boilers will still have a short heat-up time (approx. 6.5 minutes).
It is possible to increase the coffee-boiler ECO temperature to brewing temperature (max.99°C). The ECO-temperature of the steam boiler cannot be increased higher than 80°C. Pre-heating of brew water in the heat exchanger will be reduced such that brew-temperature stability is reduced and steaming/hot water are not functional but you will still be able to instantly pull a single shot at perfect temperature.

At HEAT OFF, heating to the boilers is discontinued. The boilers will cool down to room temperature. Heating up from room temperature to operational temperature takes approx. 14 minutes.

WARNINGS

Water problems

Tank Level low

during brew

at lever release

during flush/water dispense

When you run the machine from water tank there must always be enough water in the tank to finish a brew that has been started. That is why the tank-low warning will be shown even though there is still some water left (approx. 0.3 Liter; see droplet icon on left screen).

When water runs out before the cylinder is completely filled, the lever can possibly return to resting position with dangerously high speed. The display will show a warning when this situation is recognised (centre screen).

Filling of the cylinder will not be complete when the lever is pulled when there is no water feed into the cylinder (tank is empty) or when you (perhaps accidently) press the relief button while pulling the lever out of resting position.

Other dispenses than a started brew (mix-water, flush) will be stopped when TANK-LOW is detected and a warning is shown (right screen).

Steam boiler operational level lost

When water level in the steam boiler drops below operational level, the machine will automatically start to top-up the boiler when possible and stop a moment after the operational level is reached again. Filling of the boiler requires that water is pushed in at significantly higher pressure than the steam pressure inside the boiler. When you run the machine from water mains you can thus disable the pump only when water mains pressure is at least 2.5 bar.

When the tank gets low while the machine is filling the steam boiler, filling and other dispenses than a “shot in progress” will stop.

When a fill action takes longer than 2 minutes, the machine will go into stand-by mode: all operational functions will be suspended until the machine has been turned OFF and ON again with the main switch. This will occur at first fill-up and may occur when water mains pressure is too low to fill the boiler without pump or there is a malfunction in the fill valve and/or pump.

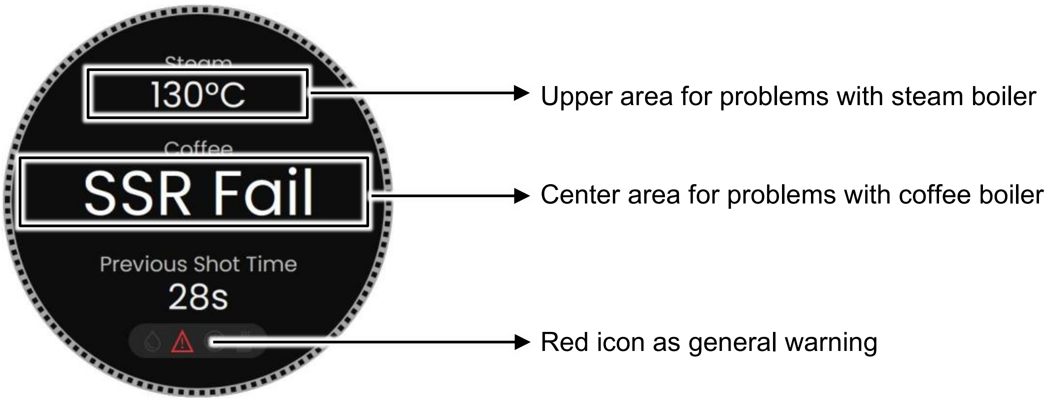
Steam boiler fill will not start when (1) mix water dispense or (2) flush is in progress or (3) tank is low.

Filling will stop when:

1. a brew is started
2. mix water dispense is activated
3. flush is activated
4. water tank level gets low (when the machine is running from the tank)
5. filling takes longer than 2 minutes

Steam boiler safety level lost
When for some reason (malfunctioning fill-system) the steam boiler level drops below safety level, the machine will disable all heating while other functions remain possible.

Electric problems
The display can warn for various electric problems. The position and text displayed provides extra information.



Coffee boiler SSR failing

The upper area can display problems with the steam boiler:

1. Heater 1 Fail upper steam boiler spiral has short circuit (too high power)
2. Heater 2 Fail lower steam boiler spiral has short circuit (too high power)
3. SSR 1 fail upper steam boiler spiral SSR no longer disconnects
4. SSR 2 fail lower steam boiler spiral SSR no longer disconnects
5. Sensor Fail steam boiler temperature sensor has closed or open circuit

The centre area can display problems with the coffee boiler:

6. Heater Fail coffee boiler spiral has short circuit (too high power)
7. SSR fail coffee boiler spiral SSR no longer disconnects
8. Sensor Fail coffee boiler temperature sensor has closed or open circuit

Heating signal to the corresponding solid state relay will be disabled when one of the above warnings appear. Have the machine checked and repaired by a technician.

Individualise your machine

Mix-water temperature

Mix water temperature depends on:

1. steam boiler temperature (and thus steam pressure)
2. cold water pressure (water mains or pump-pressure)
3. cold-water temperature
4. orifice of cold water addition

Although steam boiler temperature and pump-pressure can be adjusted, they are supposed to be rather constant once the machine has been set-up. Cold water temperature can change for example by season (water mains temperature) or amount of time the machine has been ON (water tank temperature). The fill/mix-block inside the machine has an adjusting-screw to adjust the orifice of the cold-water addition. The screw can be accessed using a slender screw-driver without removing the left hand side panel (see Figure 9, left).

- Remove the left cup tray.
- Use a slender screw driver to change the amount of cold water addition and thus mix-water temperature.

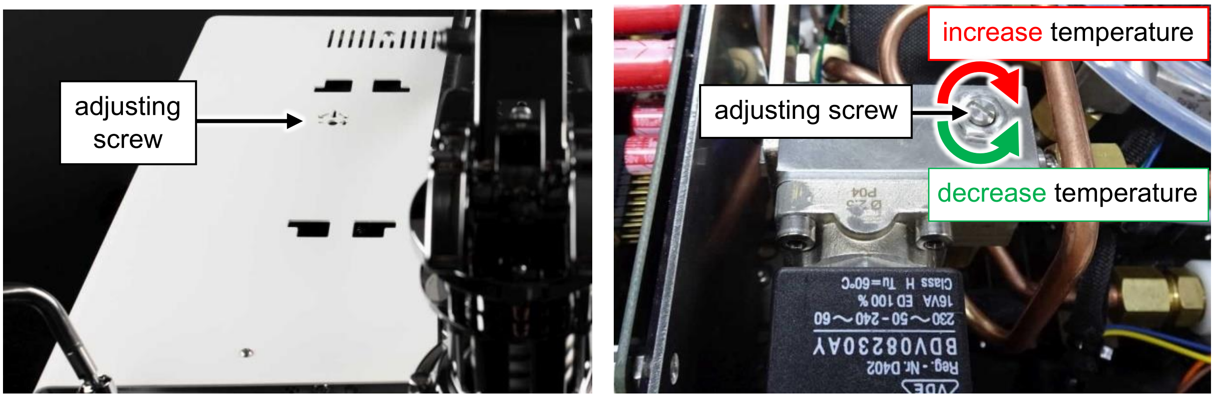


Figure 9. Adjusting mix-water temperature. Right photo (taken from side with panel removed) shows the adjusting screw on the fill/mix-block that can be accessed without removing the side panel.

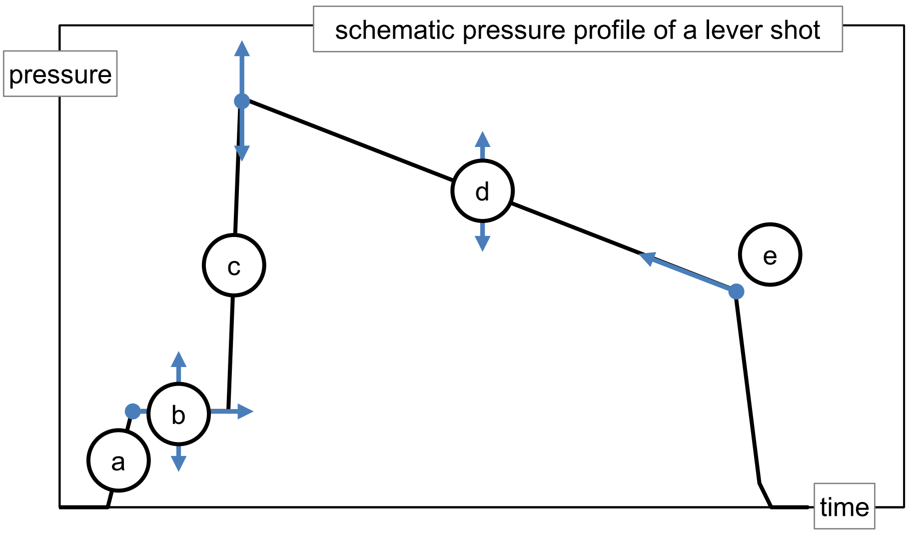
Personalised brewing

Factory setting of the machine will be with pump pressure at approx. 6 bar, pressure reducer at 4 bar, minimum pre-tension of the spring and no automated brew-stop. This will make a good start for your first shots.

A spring operated lever machine is considered to be rather forgiving. On top, with the Spiritello you are able to dive deep into pre-infusion, infusion and extraction parameters to optimize the brew to your taste and choice of roast and ground beans.

Where most lever machines use either water-mains pressure or steam boiler pressure to lead water onto the coffee bed, with the Spiritello you can adjust this to your own preference.

- Advised pressure reducer adjustment is from just over 2 bar to 4 bar. The pressure can be set lower than 2 bar, but we urge you not to use such low setting without understanding possible side-effects and how to counter these (or live with them).
- Allowed pump pressure is between 4 and 8 bar, it should be set 1-4 bar higher than the pressure reducer setting. Factory setting is 6 bar. (PS: pump pressure adjustment requires specific tools and equipment and should be done by a technician.)
- Initial spring length can be adjusted by approx. 15 mm, leading to a change in spring pre-tension and related pressure trajectory during extraction.



The graph above shows a schematic pressure profile of a shot with the Spiritello lever machine.

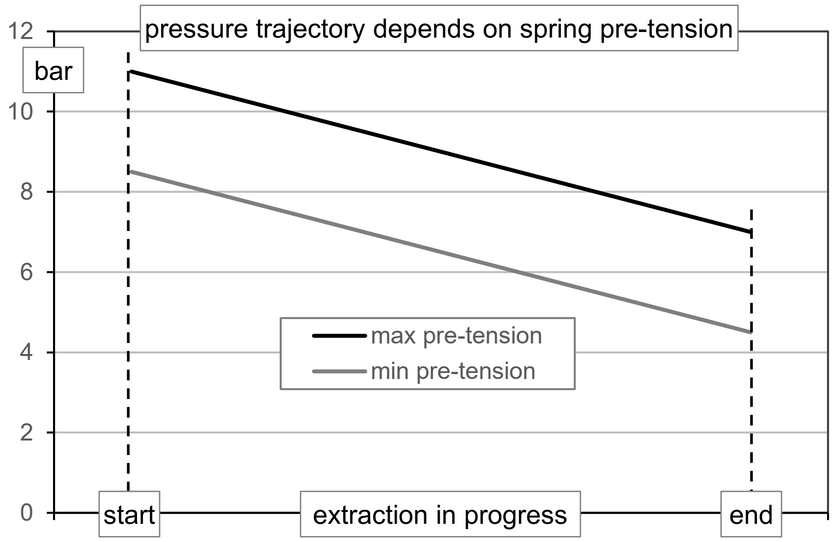
a. pressure increase during wetting of the ground coffee
b. fixed pressure during pre-infusion (height depends on reducer setting and duration upon amount of time that lever remains in locked position)
c. quick pressure increase when taking the lever out of locking position (maximum depends on spring pre-tension setting)
d. declining pressure trajectory during extraction (height depends on pre-tension setting)
e. pressure release after brew has finished (can depend on relief or active Auto-stop)

With the pressure reducer setting you can adjust sections “a” and “b”. With higher setting “a” will be steeper and “b” will be higher.

With low pressure reducer setting the coffee grinds get more time to soak before the first brew leaves the filter-holder. However, you should be aware that too low pre-infusion pressure may soak and swell the top of the puck so much that water will not penetrate all the way through the puck.

Keeping the lever in locked position increases the time-span of section “b” during which the coffee-bed is under pressure reducer setting. Keeping the lever in locked position also allows for shots with higher total volume than only the content of the cylinder (maximum approx. 60 ml).

With the spring pre-tension setting you can adjust section “d” up (increase pre-tension) or down (decrease pre-tension).



Brew pressure with the adjusting disk in highest position (spring at minimum pre-tension) will start at approx. 8.5 bar and end at approx. 4.5 bar. With the disk at lowest position (spring at maximum pre-tension) the start will be at approx. 11 bar and end at approx. 7 bar.

Notes!

A very low pressure reducer setting (or water mains pressure) can lead to a gurgling noise at the onset of a brew (pre-infusion stage) but does not have an effect on brew-temperature.

Without flush just prior to starting a brew we recommend that the pressure reducer is set to a value above 2.0 bar and steam boiler temperature is set at a maximum of 130°C (266°F).

With very low pressure reducer setting and high steam boiler temperature, water in the heat exchanger may start to boil as soon as water is allowed to flow to the coffee-bed (when you pull the lever). This can be countered with a flush just prior to starting a brew (to reduce temperature inside the heat exchanger).

Similarly, when the machine is connected to water mains and pressure reducer setting is below 2.0 bar, the pump may start to cavitate at the start of a brew. Using a pump-delay duration of a few seconds can counter this unwanted behaviour.

Pressure reducer setting
Factory setting of the pressure reducer is approx. 4 bar. This pressure is chosen as starting position for brewing but you can adjust the setting to change pre-infusion pressure. The adjustment must be done with a (used) coffee-puck in the filter-holder.

procedure

1. Pull the lever into locking position. Water will flow into the cylinder and onto the coffee-bed that will provide back-pressure.
2. Watch the pressure on the pressure gauge.
3. The pressure reducer setting is reached when the pressure on the gauge no longer changes.
4. See Figure 10: Unlock the adjuster (pull the knob down) and adjust the setting to your liking by turning the knob.
5. Lock the adjuster when done (push the knob up).

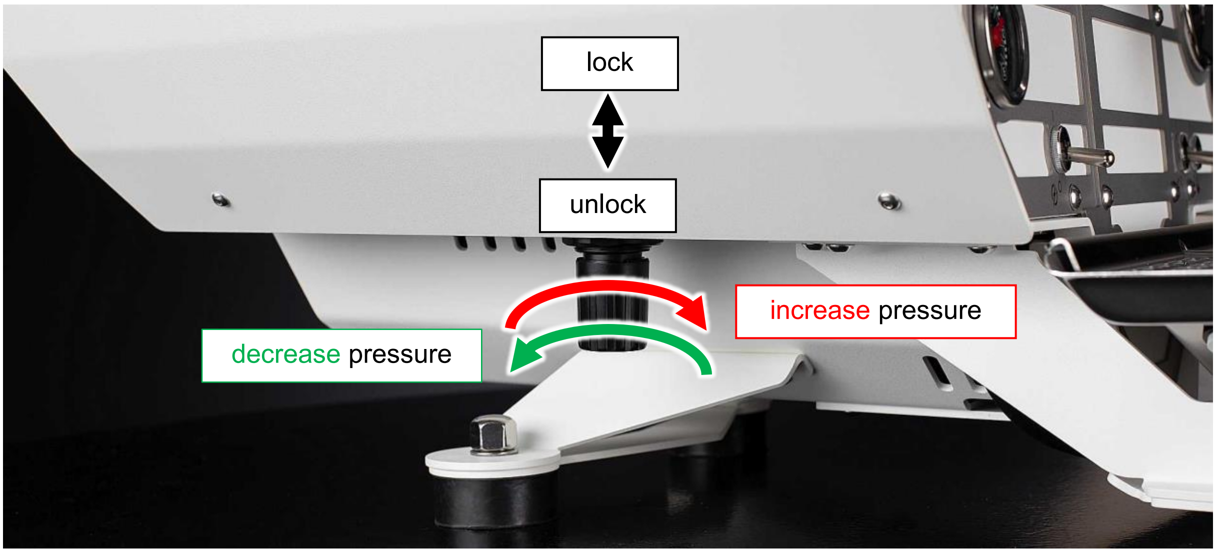


Figure 10. Showing the pressure reducer adjusting knob.

Spring pre-tension

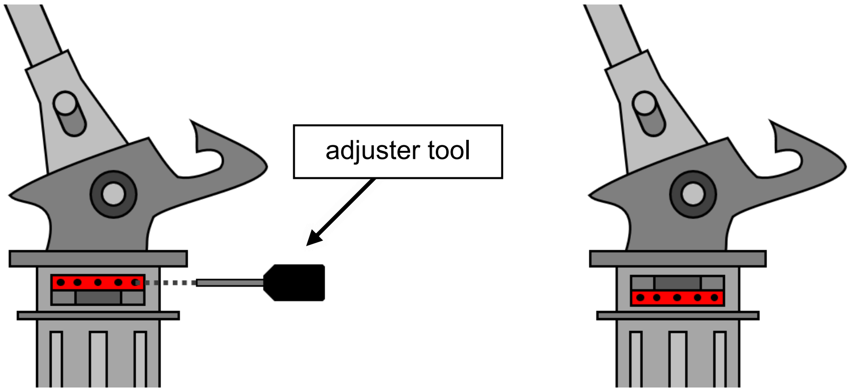


Figure 11. Left: adjuster-disk in upper position. Right: adjuster-disk in lower position.

Within limits, you can change the pressure trajectory of a brew by changing the spring pre-tension. Insert the tool in a slot of the adjuster-disk to turn the disk up or down. With adjuster-disk in higher position (left) the trajectory will be lower than with adjuster-disk in lower position (right, see Figure 11).

Some settings explained

Pump-pressure

Factory setting of the pump pressure is 6 bar. This setting must be higher than the maximum pressure reducer setting (4 bar) and lower than 10 bar to prevent possible cavitation in the pump.

To change the pump pressure the left side panel must be removed. This should be done by a technician.

Pump delay

We found that pressure reducer setting below 2 bar in combination with water mains feed can cause cavitation within the pump at the start of a brew. This can be countered by having water flowing through the pump before the pump is activated. For this reason the menu has the option to set a pump-delay duration up to a few seconds. This parameter only functions at brew and with water feed set to mains, the duration can be adjusted in SETTINGS – Machine – Pump Delay

Why switch to ECO …

1. A not-used machine kept at ECO (60-70 Watt) consumes about 30-40% of the energy of a not-used machine kept at operational temperature (160-180 Watt).

Heat loss of the machine is related to the square of the temperature difference between the machine and its environment. Of course some extra energy is needed to heat up from ECO to operational temperature. Switching to ECO will therefore lead to a maximum of 60-70% energy reduction, depending on how long the machine will be at ECO before turning ON again.

… and not to OFF?

2. A lot of parts in the machine suffer from temperature variations, the more so when these variations are large.
3. Heating up from ECO (approx. 6.5 minutes) is faster than heating up from room temperature (about 14 minutes).

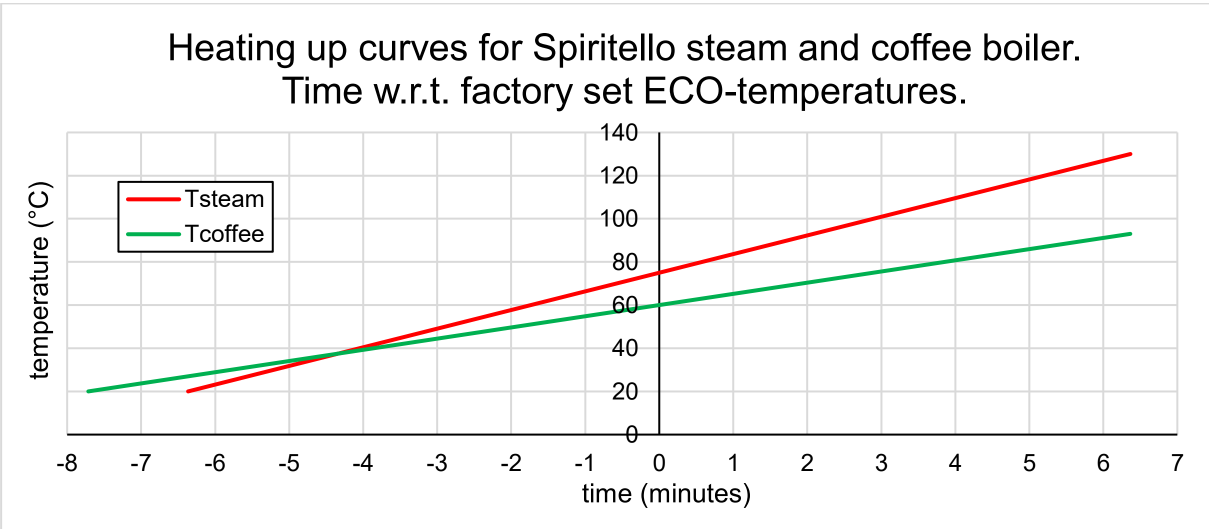


Figure 12. Graph showing typical heat-up duration normalised at ECO-temperatures. From ECO to operational temperatures takes approx. 6.5 minutes for both coffee and steam. From 20°C to operational takes 14 (coffee) and 13 (steam) minutes resp..

Note!
The temperature sensor of the steam-boiler is placed above the water-level for quick response to steam withdrawal. At temperatures below 110 °C (230 °F) the sensor will not quickly register a change in (water) temperature. For that reason, the steam-boiler temperature may be up to 6 °C higher than the ECO-setpoint at the moment you switch from ECO to operational mode.

Machine cool-down
As the steam boiler is isolated, the temperature in the steam boiler will drop very slowly when heating is turned off and the machine is otherwise untouched. It will take nearly 2.5 hrs to cool down to its ECO temperature of 75°C. The coffee boiler, which is not isolated, will cool down faster and will reach ECO temperature (60°C) after 1.5 hrs.

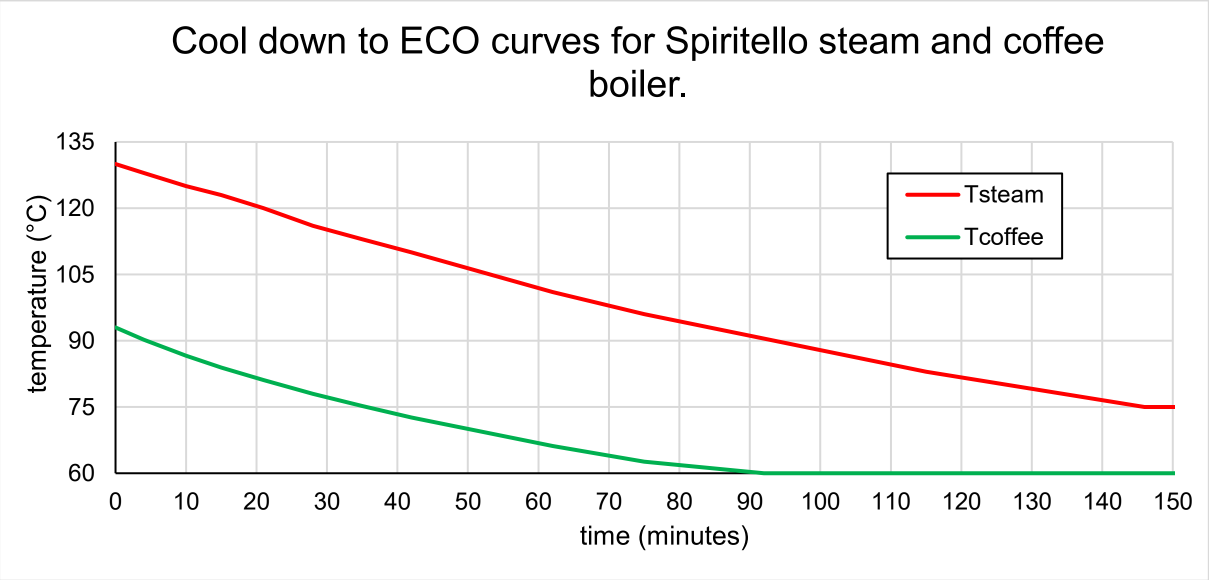


Figure 13. Graph showing typical cool-down of the boilers when the machine is turned to "ECO" when it is at operational temperature.

If it is needed to cool down the machine quickly, switch the heating circuits to OFF and (1) dispense mix water (2) open the steam tap until no more steam escapes from the tip and (3) flush the group several times to have cold water running via the heat exchanger towards the group. These actions will cool down water in the steam boiler to 100°C but be aware that there will be some latent heat within the stainless steel of the boiler heat exchanger and group.

Regular maintenance

Cleaning

Use hot water from the machine
Even the best treated water will lead to scale deposition in the steam boiler when the steam boiler is predominantly used to steam milk. If the hot water-tap on the espresso machine is hardly ever used get into the habit of doing your daily clean-up up with mix-water drawn from the espresso-machine instead of from another hot-water supply.

Clean body
Resistant smudges on high gloss metal panels may be removed with silver polish and a soft cloth (these surfaces scratch easily, even copper polish may leave marks). Other materials can be cleaned with window cleaner in a hand spray flask in combination with a soft, clean, cotton cloth. When the material is warm you have to work swiftly to prevent stripes: spray and immediately rub.

1. Clean steam wand and filter holder.
2. Back-flush the group.
3. Lift the drip tray grill from the machine and clean it with washing up liquid and a sponge. Empty and clean the drip tray.

> **△ Danger!**
> Individual parts can be very hot when maintenance is performed on a machine that has not cooled down sufficiently.

Clean steam wand
Milk easily bakes to the hot inner and outer surfaces of the metal steam wand. Therefore, the steam wand should be cleaned with a damp cloth <u>directly after each use</u>. Do not use this cloth for anything else than the steam wand.

As the PEEK material of the steam tip is heat neutral, milk does not easily bake onto its surface. However, you should ascertain that as little milk as possible remains in and on the tip after use:

> **Note!**
> Immediately after steaming milk you must purge the steam wand with a little steam. This will prohibit milk creeping into the pipe, and even into the valve house, through so-called capillary rise.
> Purging also prevents clogging of the 4 holes in the tip. 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 damage.

Remove filter basket

Materials needed
- Group screen extractor (included in shipment, or back end of teaspoon)

Procedure
1. Remove the filter holder from the group and pry the filter basket out (see Figure 14).
2. When remounting the filter basket, make sure the spring remains in the groove of the filter holder and grabs the basket.

Figure 14. Pry filter basket from filter holder with the group screen extractor.

Clean filter holder

Remove the filter basket from the filter holder and clean the filter basket with a little washing up liquid and plastic scouring pad or firm brush. Soak the metal part of the filter holder for 10 minutes in a solution of 1 tablespoon of coffee dissolving powder in 0.5 litre hot water. The plastic handle will eventually disintegrate in this solution and should thus be kept out of the solution.

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

Back flush group
Back flushing cleans the group and conduits from coffee residue that may influence 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 more often when the machine is intensively used.

Back flush procedure

Materials needed
- Plastic group brush (included in shipment)
- Blind filter (looks like a filter basket but has no holes, included in shipment)
- Coffee dissolving powder (included in shipment)
- Group screen extractor (included in shipment, or back end of teaspoon)

Procedure
1. Remove the filter holder and flush the group.
2. Clean the group screen and group seal with the plastic group brush. Flush again when done.
3. Pry the filter basket (e.g. with the group screen extractor) from the filter holder (see Figure 14) and replace it with the blind filter.
4. Scoop 1 teaspoon of coffee dissolving powder in the blind filter and lock the filter holder in the group.
5. Pull the lever into locked position and wait for pressure on the gauge to stabilise.
6. Then take the lever out of locked position, it will move up a little but will not return to resting position. Pull the lever successively 5 times into locking position and then take out of locking position. You will see the pressure increase and decrease on the gauge.
7. Unlock lever and press relief to flush the water-with dissolving powder through the waste of the group-valve into the drain.
8. Remove the filter holder from the group, clean the blind filter by flushing it under the tap.
9. Lock filter holder in group again, successively lock-unlock the lever 5 times again, relief and then remove filter holder and pour out remaining liquids.
10. Repeat step 9 twice.
11. Pry the blind filter from the filter holder and replace the filter basket.
12. Pull a first espresso and throw away.

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

Clean group screen, check and replace group seal
The group screen helps to evenly disperse the incoming hot water onto the coffee bed and also prevents coffee grinds entering the group.
The black group seal may become less flexible eventually. We advise to check the group seal regularly and replace when needed.

Materials needed
- Group screen extractor (included in shipment, or back end of a fork or spoon)
- Plastic brush (included in shipment)
- Coffee dissolving powder (included in shipment)
- Replacement group seal (when necessary)

Procedure
1. Pry the group screen gently from the group using the screen extractor levered under the bayonet-ring. Place the pointed edge of the tool in the rim of the group screen (see Figure 15 a), do not puncture the group screen. Pry left and right, the screen will fall out together with the group seal.
2. Remove the group seal from the group screen.
3. Soak the metal group screen in a solution of coffee dissolving powder and warm water for about 5 minutes. Rinse under streaming water.
4. Check the group seal for cracks and/or hardening, replace if necessary.
5. One side of the group seal has a somewhat more rounded surface. When replacing the group seal on the group screen, make sure the rounded side of the ring is inserted into the group (facing upwards, see Figure 15 b).
6. Place the group screen with group seal on the filter holder and insert into group, pushing upwards. It is necessary that you remove the filter-basket from the filter-holder first.
7. Turn the filter holder in the bayonet lock to firmly press the group seal into the group.

Figure 15 a,b (left). Pry left and right with screen extractor to remove group screen and group seal. Figure 15 c (right). Mount group screen with filter holder and group ring. Inset shows schematic cross section of group ring with rounded surface upwards.

Clean group dispersion plate

The group dispersion set ensures uniform wetting of the coffee bed. When dirty, the wetting will become less uniform. As the dispersion plate and base are made of plastic material which is heat neutral, no oils and fats will bake on easily and plate and base will remain clean for quite long.

Materials needed

- Short screw driver no.2 (“stubby”)
- Group screen extractor (included in shipment, or back end of a fork or spoon)
- Plastic brush (included in shipment, or toothbrush)
- Coffee dissolving powder (included in shipment)

Procedure

1. Remove the group screen and group seal (see previous item).
2. Remove the two bolts from the plastic dispersion plate with a short screwdriver (see Figure 16), the dispersion plate will fall out. Be careful with these screws, they have specific length to match the thickness of the dispersion plate.

> **△ Caution!**
> The dispersion base remains in the group bottom. With the bolts removed, the connection between the dispersion base and group bottom is fragile.

3. Clean the dispersion plate with a plastic brush. When necessary, put the dispersion plate in a solution of coffee dissolving powder and warm water for about 5 minutes. Rinse under streaming water.

> **△ Caution!**
> Do not scrub the dispersion plate with a metal brush or Scotch-pad as it will scratch easily and dirt adheres more easily on a scratched surface.

4. When re-installing, tighten the bolts that hold the group dispersion plate with little torque.
5. Remount the group screen and group seal (see previous section).

Figure 16. Dispersion set mounted in group head. Remove the 2 screws. The dispersion plate will fall out. The dispersion base remains in the group.

Replace dispersion base and plate
The dispersion base and plate are sold as a set only (with new screws) as both parts deteriorate simultaneously. The protrusion on the dispersion base is fragile and may break off when not properly treated.

Materials needed

- Short screw driver no.2 (“stubby”)
- Group screen extractor (included in shipment, or back end of a fork or spoon)
- Plastic brush (included in shipment, or toothbrush)
- Coffee dissolving powder (included in shipment)
- Replacement for dispersion set.
- 2 long M5 bolts

Procedure

1. Remove the group dispersion plate (see previous item).
2. Gently pull the dispersion base from the group bottom, pull as perpendicular as possible. Do not twist the dispersion base.

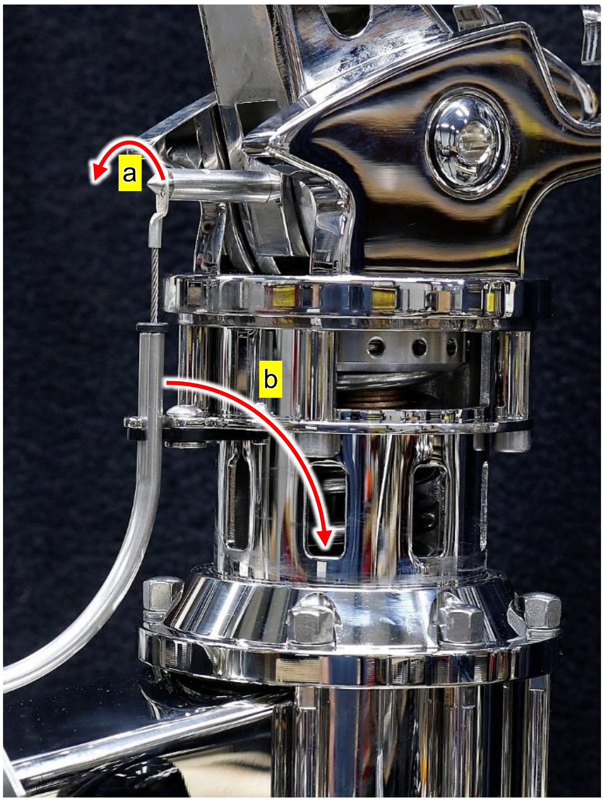
TIPs!
The dispersion base does not come off from the group bottom easily. Use two long M5 bolts to get a grip on the base (see Figure 17a,b).
If the protrusion breaks from the base and remains in the group head, pull out with needle nose pliers or twist in a (wood) screw and pull the screw with protrusion from the group bottom.

3. Mount the new base (with new O-ring) and plate with the new screws, discard the old screws.
4. Remount the group screen and seal (see previous item).

Figure 17. How to remove the dispersion base. After removing the bolts turn the dispersion a little. When possible, use 2 longer bolts M5 to get grip onto the dispersion base, when no longer bolts are available, use the bolts you just removed.

Grease and replace V-ring on piston

When the lever shows stick-slip motion when returning to rest position it is time to lubricate or replace the V-ring on the piston. While performing the procedure it is not necessary to let the machine cool-down first.



NB: Machines built after 101150725 (July 2025) do not have a green ring on the lower piston part.

materials needed

- Allen key 4mm, 3mm
- food-safe grease
- (new V-ring)
- soft cloth on a stick and paper towel

procedure

1. Switch the machine OFF, remove portafilter from group.
2. Unhook the switch-cable from the back of the group (a), turn metal tube aside (b).
3. Use 4mm Allen key to undo the 4 bolts that hold the group-head to the machine (c).
4. Pull the group-head with piston straight up and out of the cylinder.

5. With a clean soft cloth on a stick clean the inside of the cylinder from coffee-residue that has found its way into the cylinder.
6. Use paper towel to wipe V-ring on piston clean.
7. When you want to replace the V-ring:
    a. Undo the Allen screw underneath the PEEK piston part (d).
    b. Pull the bottom piston part from the assembly.
    c. Replace the V-ring (note correct position!! Open end should face downwards).
    d. Re-attach the lower piston part with flanged Allen screw.
8. Apply a little food-safe grease to the outside of the V-ring.
9. Lower the group-head with piston back into the cylinder.
10. Remount the group head with the 4 Allen bolts and re-attach the switch cable.
    a. When connected to water mains: turn water supply ON.
11. Turn machine ON.

Descaling

Descaling of (parts of) the machine is restricted to persons having knowledge and practical experience of the appliance, in particular as far as safety and hygiene are concerned.

It is recommended not to descale the machine as a whole. In general for professional espresso machines: only individual parts taken from the machine should be de-scaled and then re-mounted.

Check machine condition, report malfunctions

It will help the service technician solving problems if some information about the machine is known before a house-call is scheduled. This information should include:

1. serial number of the machine
2. a well-defined description of the malfunction

Check pressure gauge

No pressure: when not brewing, the needle of the pressure gauge should be in “resting position” (indicating close to 0 bar).

Note!
There is no need to replace a faulty gauge immediately. The gauge gives feed-back on, but has no active part in, the brew-process. A machine remains fully operational with a faulty gauge as long as it does not leak. Have a faulty gauge replaced during the next scheduled service.

Opening pressure of expansion valve

You can check the opening pressure of the expansion valve by pulling a shot with a blind filter locked in and then very gently force the lever up during that shot to increase “brew pressure”. Pressure will increase to opening pressure of the expansion valve when you slowly force the lever up and then remain (nearly) constant. The gauge should reach a maximum value between 11.0 bar and 13.0 bar. When you push too quickly, the pressure may rise well above this value.

Notes!

- The display can also show a pressure value (set Auto-stop to pressure), but the sensor inside will not accurately forward pressures above 10.5 bar. The sensor can therefore only be used to check if the opening pressure of the expansion valve is too low.
- If the pressure rises above 13.5 bar, the expansion valve opens at too high pressure or you have pushed too quickly.
- If the pressure does not rise over 10.5 bar it is likely that the expansion valve opens at too low pressure.

When the above is encountered, have a technician solve the problem as soon as possible.

Recommended maintenance and service scheme

Daily maintenance

- Clean steam wand (see page 34)
- Back flush groups (see page 36)
- Clean filter holder (see page 35)
- Clean drip tray

Weekly maintenance

- Clean group screen (see page 37)
- Clean group dispersion plate (see page 37)

Monthly maintenance

- Check and replace if necessary:
  - filter basket (see page 35)
  - filter holder clip (see page 35)
  - group seal (see page 37)
  - group screen (see page 37)
- Grease V-ring when needed (see page 40)
- Check the functioning of your water treatment system

Service is restricted to trained persons having technical knowledge and experience of the appliance, in particular as far as safety and hygiene are concerned.

6 month service

monthly maintenance PLUS:

- Check anti-vacuum valve for leakage
- Check safety-valve on steam boiler for leakage
- Check opening pressure of expansion valve
- Grease steam wand ball with food-safe grease and check play between nut and ball of steam wand; replace O-ring and/or nut when necessary
- Check pump pressure; adjust when necessary
- Check dispersion plate and base; replace when necessary

12 month service

bi-annual service PLUS:

- Check injection line for scale buildup; replace when necessary
- Check tube from mix-block to hot water outlet for scale build-up; replace when necessary
- Clean level probe and safety probe
- Replace:
  - group screen
  - filter basket
  - filter holder clip
- Replace anti-vacuum valve
- Renew water treatment filter cartridge

5 year service

yearly service PLUS:

- Replace all solenoid valves
- Replace pump

For service procedures, we refer to the technical manual.

Service Record

(machine number: ___________________ , installation date:___________________________________)

Date	Technician	Task	Comments

△ Warning!

Service is restricted to persons having knowledge and practical experience of the appliance, in particular as far as safety and hygiene are concerned. Parts of the machine can reach a temperature close to 130 °C (266 °F). The steam/hot water boiler contains water and pressurised steam of 125 °C at 1.35 Bar overpressure (257 °F at 20 PSI), temperature and pressure in the coffee system may reach up to 96 °C at 12 Bar overpressure (205 °F at 175 PSI).

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

☠ Danger

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

Any qualified technician working on the machine is urged to thoroughly read the latest edition of the “Technical manual” which can be obtained via:

support@keesvanderwesten.com

When seeking contact with the e-mail address above, please forward the model and serial number of the machine in question. This can be found inside the machine, next to the water tank (remove the right hand side body panel).

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Please supply machine details (model and serial number) and full contact information when ordering.