

VESUVIUS OWNERS MANUAL DRAFT COPY

VESUVIUS OWNERS MANUAL



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Introduction

Congratulations on the purchase of the world's first prosumer, computer controlled pressure profiling espresso machine, using an E61 group. The Vesuvius uses true pressure profiling via an FG304 gear pump and speed controllable brushless motor. Currently there is no other prosumer machine available with such advanced functions.

The pressure profiles and other functions can be set up in many ways, so many, that the owner's manual is just a starting point for your journey.

I hope you enjoy the Vesuvius!

Paolo Cortese (Designer)

Vesuvius Supplied Items.

- The Vesuvius Espresso machine
- Wooden Accessory Case
- 2 portafilter handles (with double and single baskets and blind filter basket)
- Small Accessories Bag (Various useful maintenance items)
- 4 Metal Feet, 2 small (front), 2 large (Rear)
- Drain hose
- Water supply hose
- Appropriate certifications, This manual and any additional notes

Product Safety Notice

This manual is an integral and essential part of the product and is to be delivered to the user. Carefully read all warnings as they provide important information required to install, use and maintain the Vesuvius.

Inspection and unpacking

After having removed the packaging, make certain that the Vesuvius is not damaged in any way. If you have any doubts, do not use the Vesuvius and contact a professionally qualified person or your dealer. Always keep all packaging including any plastic bags, internal packing screws, and rubber transit feet etc.). All packing materials should be kept out of reach of children and disposed of

responsibly in accordance with your country's recycling and disposal arrangements.

General Installation precautions

Before switching on the Vesuvius make certain that the rating indicated on the label matches the available power supply. The serial number and rating label is located behind the drip tray.

Installation should be in line with the standards and laws within the country where it is being installed, following any manufacturer's specific instructions and checks.

We recommend skilled personnel install the Vesuvius. The manufacturer cannot be held responsible for any damages incurred if the system is not electrically grounded, or by water leaks when connected to the rising main.

For electrical safety, this machine requires a ground or earth. If in any doubt contact a technically certified electrician who must check that the electrical outlet used has adequate capacity for the current draw of the machine and that it is properly grounded.

We do not recommend the use of extension leads, adaptors or any other equipment between the Vesuvius and the mains supply socket. If for any reason this type of equipment must be used, you should consult a qualified electrician. ***Different countries have different regulations for plumbed in machines. Before plumbing in the Vesuvius, you should consult with a qualified plumber and/or ensure all in country regulations are followed.***

Always ensure the portafilter is locked in correctly

Failure to do this can result in the portafilter coming undone, with the risk of scalding or breaking any cups below. Please lock to the 6:00 position or further for safe operation.



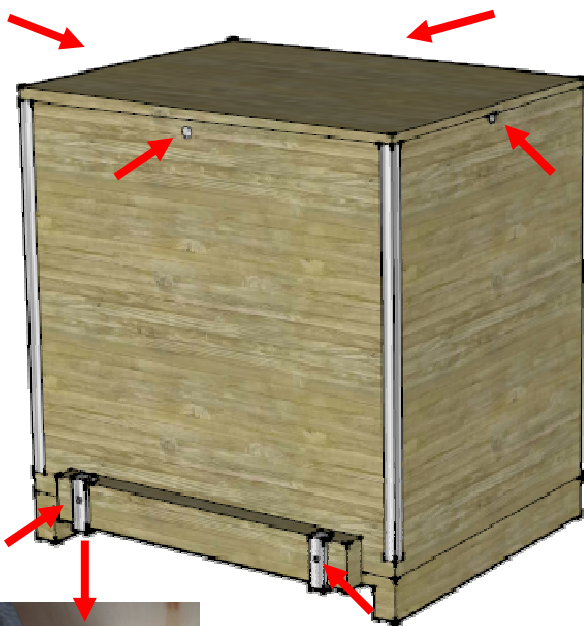
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Unpacking the Vesuvius

The Vesuvius comes in a special protective wooden case, this item has been designed to not only protect the Vesuvius, but when disassembled, folds flat to allow the Vesuvius to be repackaged for transportation at any time. To remove the Vesuvius from the case, the following unpacking procedure should be used.

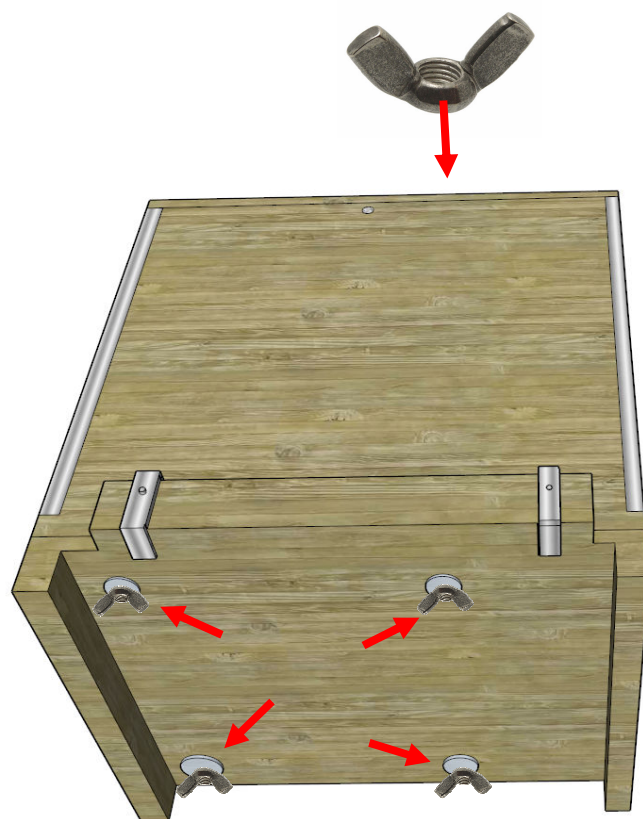
1. All 4 screws securing the lid should be removed. There are 1 on each side shown by the arrows, 4 in total. **Note: they are NOT on the top.**
2. The sides of the crate are secured by 4 metal clips, each held in place by a screw that should be removed.
3. Remove the clips



The sides of the case can now be lifted away from the base and the sides folded flat for storage.



The Vesuvius is secured to the base using rubber transit feet with bots on the bottom that protrude through the case and are secured with 4 wing nuts, these must be undone. .



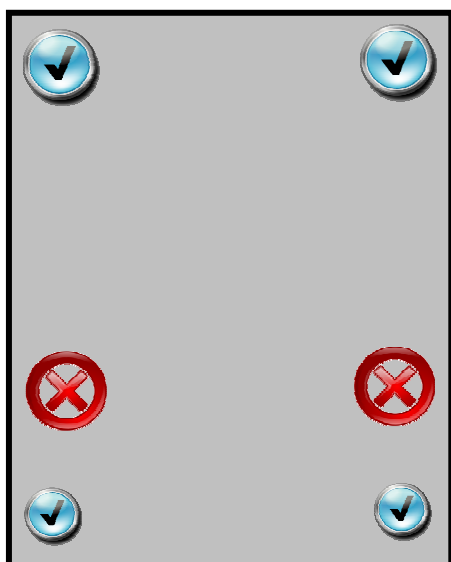
Once the wing nuts have been undone, the Vesuvius will lift away from the base and have 4 soft rubber transit feet attached. These should be removed.

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Attaching the feet

Remove the 4 transit feet and store in the accessory case. The Vesuvius comes supplied with 4 feet in the accessory case. 2 small and 2 large. The large are placed on the rear mounting holes and the 2 small ones are placed in the very front mounting holes. The extra holes near the middle are only used for 2 of the 4 transit feet.



To plumb the waste, use the flexible hose provided and remove the rubber stopper in the pipe at the rear of the drip tray. The mains water connection is underneath the Vesuvius towards the back.

The internal tank

The internal tank is accessed by opening the left side panel using the opening latch.



The Accessory Tray

The Vesuvius comes with a wooden accessory tray, all supplied accessories will be in this tray. It also functions to store screws clips and transit feet, should the Vesuvius ever need to be repacked into it's protective shipping case.

Mains Water Connection

The Vesuvius is supplied ready for a mains water connection or internal tanked operation. **The Vesuvius only uses the mains water connection to fill it's internal tank and the pump always draws from the internal tank. A pressure reducer is not required when plumbing in.** Use the flexible hose provided with the Vesuvius, connect it to a connection hose 3/8" male with a shut off valve. The use of a water softer or filtration system, is advised. The drip tray can be plumbed to the waste or left unplumbed.

Remove the tank and wash in warm soapy water before first use. Ensure all tubes are replaced in the tank. The longer of the 2 tubes must reach all the way to the bottom of the tank (this is the pump inlet), make sure the small particulate filter is in place. The shorter tube is the vent tube from the safety release valve and need not reach the base of the tank. Routing the safety pressure release vent valve to the water tank, protects both you and the electronics if a fault causes any high pressure venting of steam from the safety valve.

Electronic selection -Tanked or mains plumbed

There is a switch under the Vesuvius at the rear, after connecting to the water main, this needs to be switched on...the switch will light when in the on position.

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Operation with Internal Tank

If operating with the internal tank, ensure the mains water/tank switch underneath is off (not lit). Access and clean the internal tank as described in the mains water connection section. The only difference is the tank must be manually filled with water. We recommend decalcified water, or water suitably treated for espresso machines.

Even if the switch is accidentally placed in the mains plumbed position (illuminated), when running tanked. The Vesuvius will still work perfectly normally and not leak water, because a blanking cap is fitted to the mains inlet pipe. This needs to be removed if running plumbed.

Preparing the Vesuvius for operation

The Vesuvius has been correctly installed as per the previous guidance and is ready to be filled for the very first time. You can think of this process as bringing your Vesuvius to life. Be watchful during this time for anything abnormal and to ensure everything is working correctly. The portafilter should not be locked into the group yet.

Filling the Vesuvius for the first time

There are 2 boilers in the Vesuvius, the Service Boiler (Steam & Hot water) and the Brew boiler, for coffee brew water only. The Service boiler has a water level probe and will not switch on it's heating element until the water level reaches the probe. The brew boiler does not have this probe and does not know whether the water level is low or not. This makes some simple precautions important during the first time fill.

Usually the brew boiler will be full of water from factory testing, but if for any reason it has been emptied prior to shipping the following procedure is advised,

1. Open the side panel and observe the water level in the tank.
2. Switch on the Vesuvius at the mains and once the firmware has loaded, turn the Vesuvius on from the front panel. Within a few moments, the pump may start to run
3. **Lift the brew lever, always do this!**

4. the water level in the tank should fall and within a short time water should flow from the group within 90s. Lower the lever when water exits the group.
5. If the pump continues to run, **you should open the steam valve to aid the filling of the service boiler (only open this once the brew boiler is full, see 4 above)**. The level of water in the tank should continue to drop when the pump is running and the service boiler will stop filling automatically.

If water does not appear from the group within 90s and the tank level is not going down when the pump runs, check for a blockage, kinked pipe, or other obvious problem. Wait approximately 1 minute and try again.

If the service boiler continues to fill with the lever down, again check the level of water in the tank is reducing. If not, switch the Vesuvius off, check for a kinked hose or other blockage. Then switch on and try again.

If the service boiler is filling, the water level is dropping in the tank, **but the pump does not stop filling due to a fault**. You will notice water exiting from the steam wand (if open), this is a warning to switch the Vesuvius off.. Please contact your dealer for advice.

Flushing the Vesuvius before using

Although the Vesuvius is tested at the factory, we always advise you flush before first use. This removes any stale water and manufacturing residues from the Vesuvius. We recommend the following procedure.

1. Lift the lever and draw 1 litre through the group in 200ml amounts pausing for 15 seconds each time.
2. Switch on the steam boiler, under the eco option in the main menu (see page 10). Once the steam boiler has come up to temperature. Switch the steam boiler off, **then switch the Vesuvius off** and with a jug under the hot water tap, open the hot water tap and drain as much water off as possible. The pump should not run during this process. Switch the Vesuvius on, allow the service boiler to refill and repeat this process.

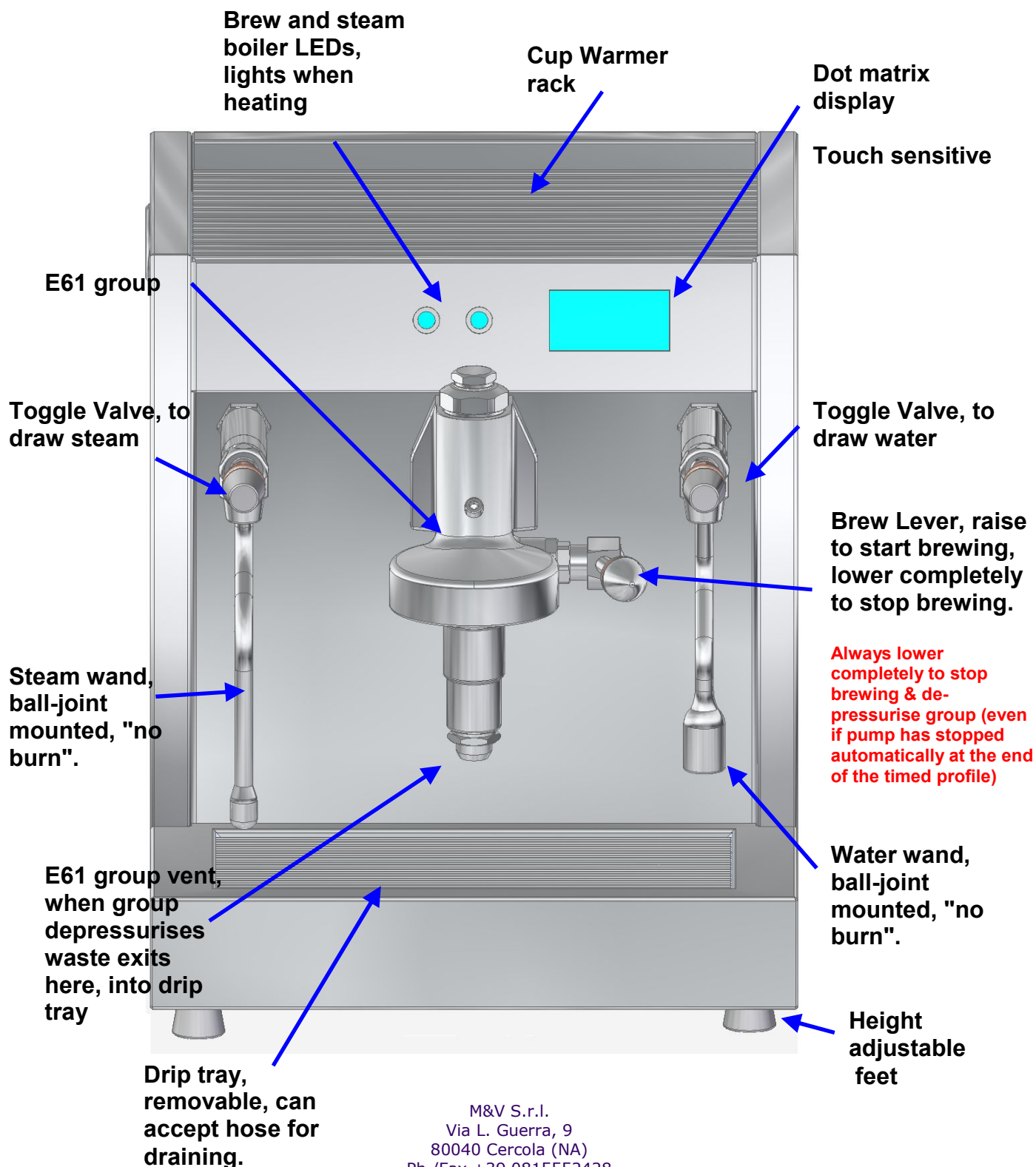
These procedures will remove any stale water and residues. Any "new machine" taste, will correct itself in a week or so.

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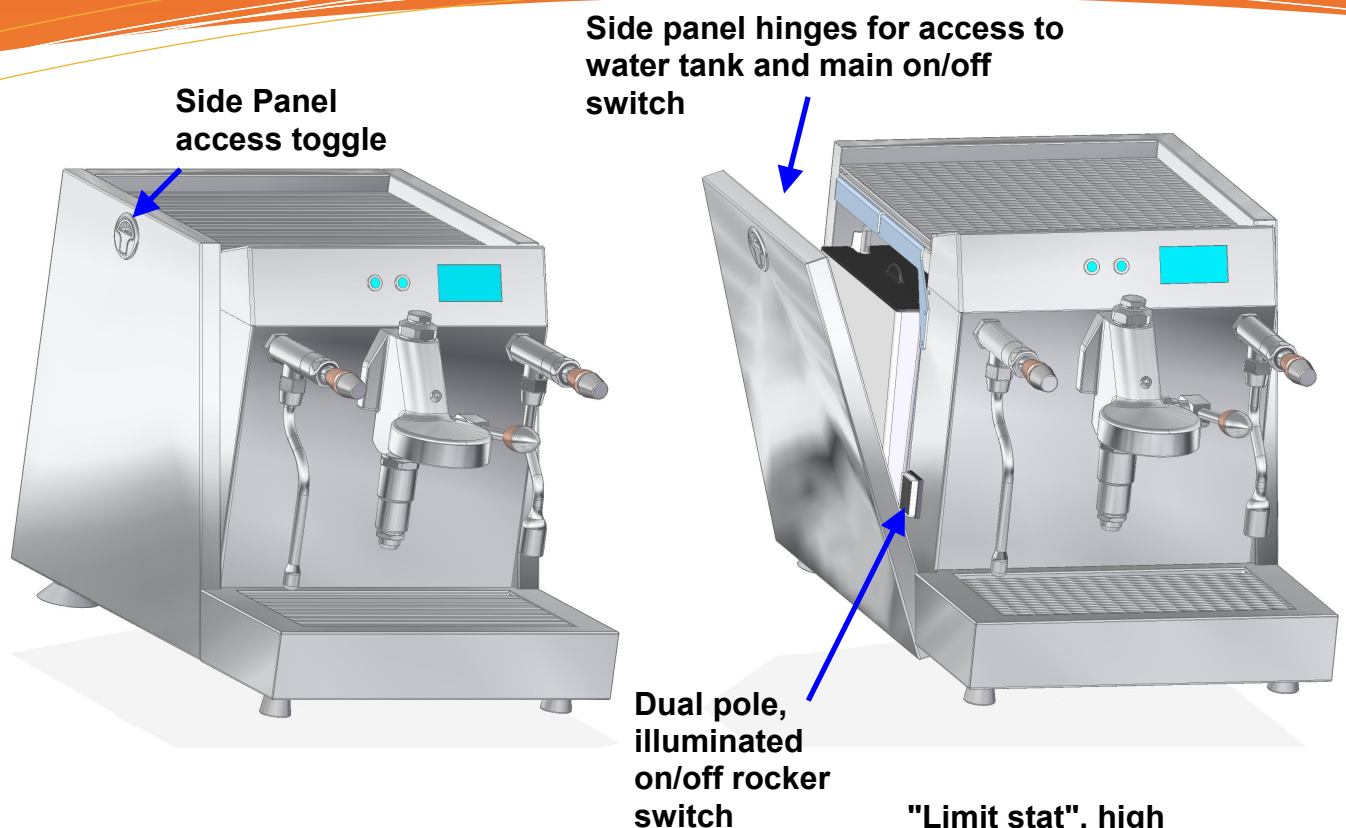
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Description of the major controls of the Vesuvius

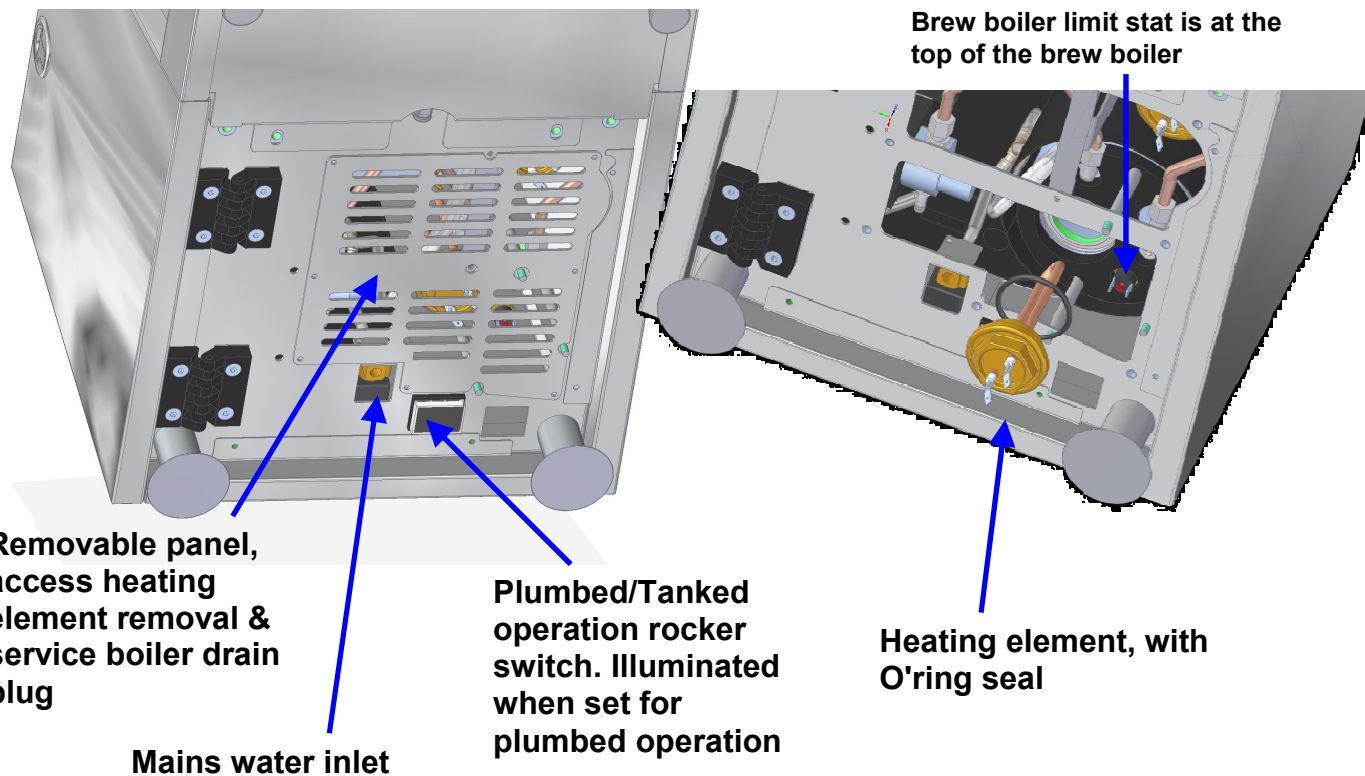


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"Limit stat", high temperature resettable breaker (service boiler).



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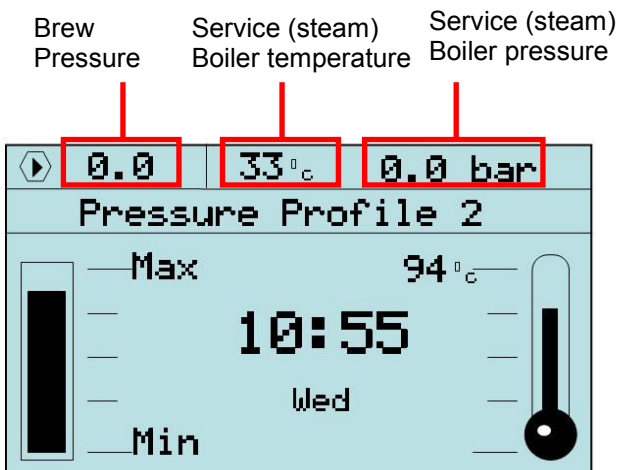
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Understanding the display & programming functions

The Vesuvius dot matrix display is capacitive sensing and **only has to be touched to elicit a response, no pressure is necessary**. The display may appear not to respond, because some functions have a programmed delay. In these cases the area should simply be touched for the appropriate time e.g. entering the advanced menu has a 10s delay, to reprogram a profile has a 5s delay.



The display above shows the Vesuvius on standby. Touching the area marked with a red circle, switches the Vesuvius on and the "home screen" is shown (below).



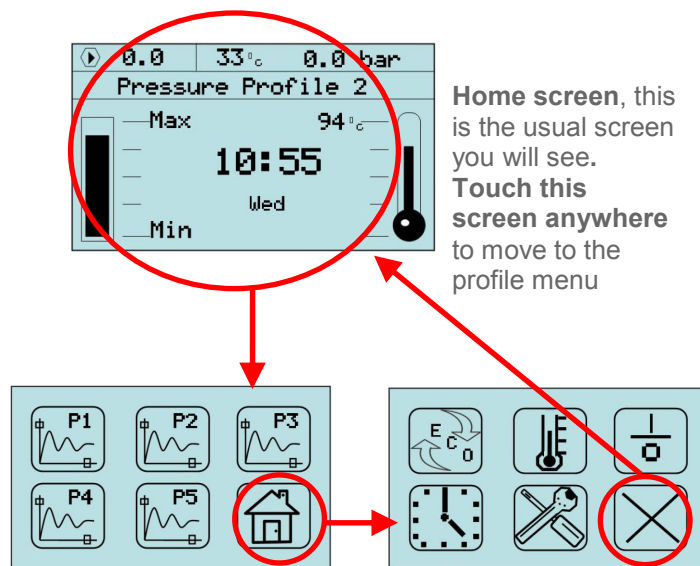
Home Screen

The display is split into 3 Horizontal zones. The top zone shows brew pressure (when brew lever activated), Steam boiler temperature and pressure.

The next Zone shows what pressure profile is being used and this is a sideways scrolling display.

The third zone has a tank water level indicator, **which actually only shows full and empty**. The time and day of the week and on the right the brew boiler temperature next to a thermometer graphic.

Main Vesuvius Screens



Profile menu for viewing and changing profiles. Touch the "House" Icon to move to the main menu

Main menu for accessing most commonly used settings. Touch the "X" icon to move to the home screen

Remember this triangle to move from one menu to another, after a few tries it becomes easy to use.

Tip: It helps if you think about accessing the "main menu" as, two touches in the right hand lower corner of the screen

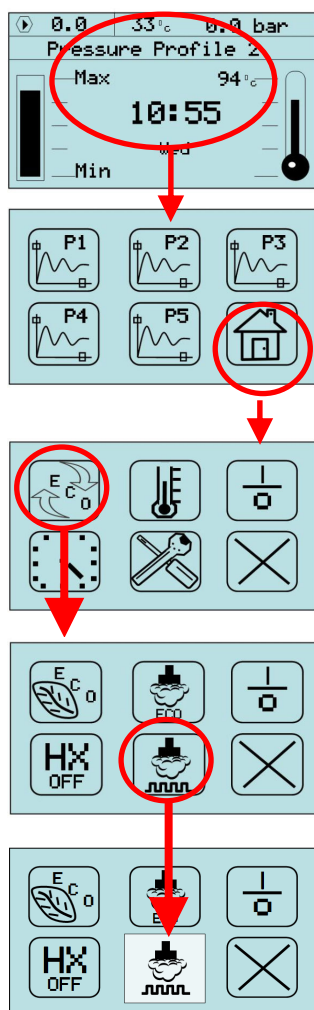
Note: Profile settings, as well as all other menu settings are maintained even if the machine is unplugged via a battery powered backup system

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Turning the Service (Steam) boiler on or off

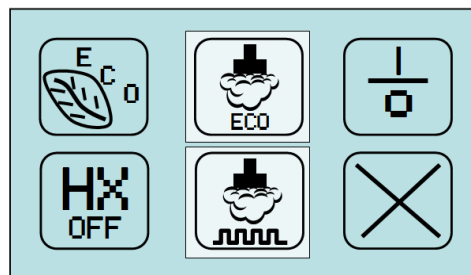
The service boiler provides both steam and hot water. The steam and hot water wands operate only when it is switched on. To switch the service boiler on, enter the ECO menu by the following sequence



Steam is switched on when the steam button is touched and highlighted, as shown above

Note: The steam on/off function is independent of ECO mode. So Eco Steam might be highlighted, but if the steam function is not switched on, the steam boiler will not heat and it **will not enter ECO Steam mode, as "Eco Steam function" only operates when the steam boiler is on.**

Eco Mode + Eco Steam can be left enabled to **work automatically (as shown below) whenever you switch the steam boiler on (fast access main menu screen)**. You can leave Eco mode enabled in the advanced menu, only needing to access it if you want to change the number of minutes before the Vesuvius enters Eco mode ("Time Economy" function page 12 and 20).



Hot Water Tip

Eco steam mode can be very useful for hot water production. If you set ECO mode to maintain the service boiler temperature at 60 or 70C and you want to use the Vesuvius for hot water, say for tea, or just want a nice smooth flow. The best way is to start drawing water as soon as the service boiler reaches a little above 100C and some pressure is shown.

This allows you to get an absolutely smooth flow of water exiting the tap and it's a little cooler for tea.

This technique keeps your service boiler at an economical 60C, but within a couple of minutes, sufficient pressure is available to draw water. Unlike other machines, ECO Steam mode makes this a practical proposition, because you don't need a long wait for hot water (as you would get if you switched the steam boiler on/off to achieve this result).

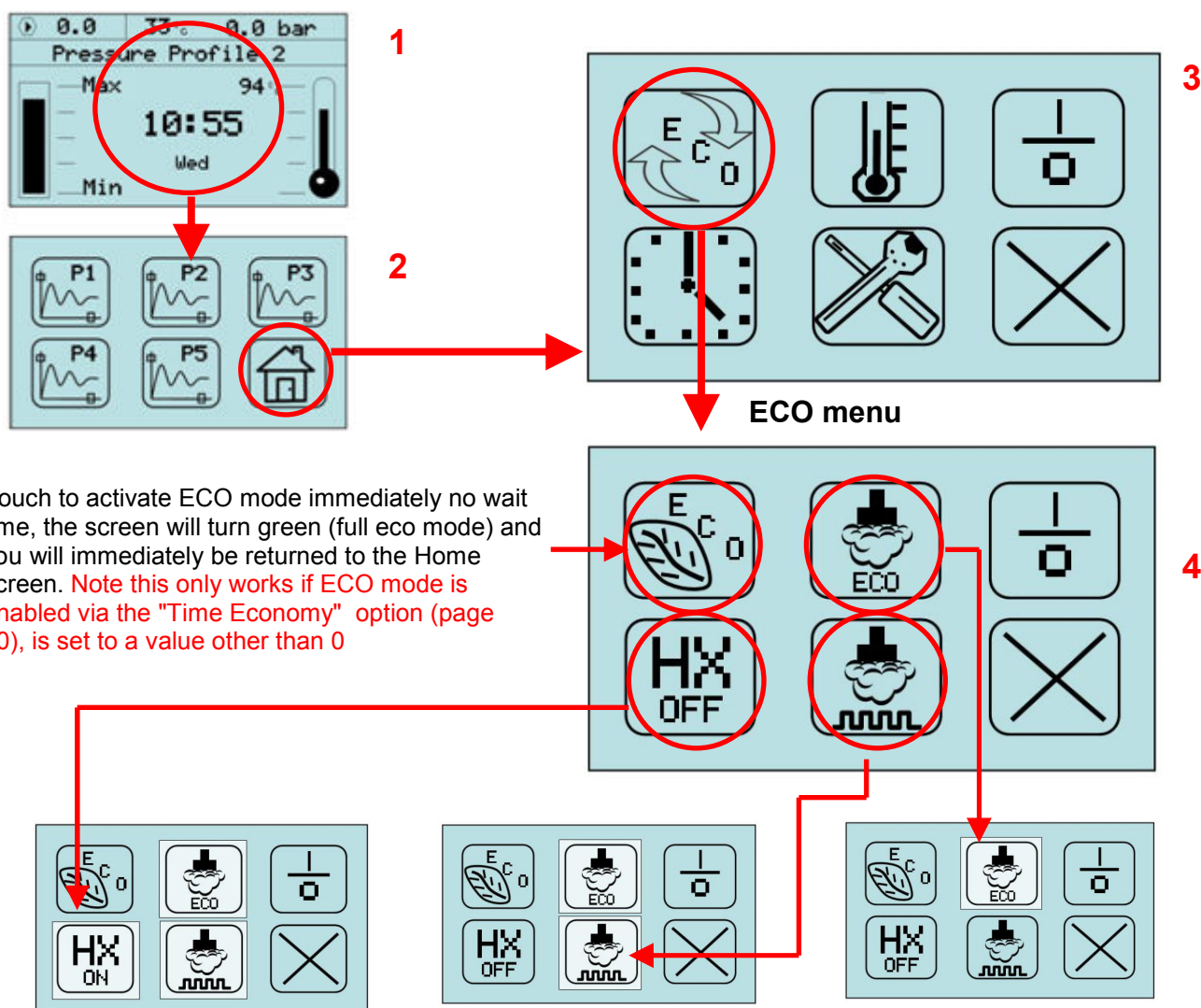
e.g. by the time you have prepared that espresso, you can produce the Americano with water that has reached a few degrees above boiling, no steamy splutter.

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Main Menu Screen

All the commonly used settings are here, entering this screen is done via the "profile menu" screen. The red circle denotes a "touch" zone action. The X icon takes you back to the "Home screen"



Touch to activate ECO mode immediately no wait time, the screen will turn green (full eco mode) and you will immediately be returned to the Home screen. **Note this only works if ECO mode is enabled via the "Time Economy" option (page 20), is set to a value other than 0**

Brew water preheat, enabled/disabled. If using high steam temperatures above 127C, **OFF** prevents any possibility of brew water overheating. **Highlighted when ON**

Enabling, greatly increases capacity for a busy session and recommended if running **"Eco steam mode"**

Steam boiler on/off, highlighted when ON

Recommend, steam boiler is either off, or set to eco steam mode with a temperature of 60C

"Eco Steam mode"

only affects steam boiler (recommended).

Highlighted when ON

If OFF (not highlighted), eco mode affects both steam and brew boilers (not recommended for home use)

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Eco Mode Explained

Eco mode, reduces power consumption and temperatures inside the Vesuvius for longer component life. It does this by selectively reducing the temperature of the brew and/or steam boilers, based on the Eco time set ("**Time Economy**" function in the advanced menu).

The Internal Eco timer starts counting down to 0 when there are no operations of the touch screen, or anything causing the pump to run. Once it reaches 0, Eco mode is triggered. The Vesuvius immediately exits ECO mode, if the brew lever is lifted, or the display screen is touched, if not yet in Eco mode, then the Eco countdown timer is reset.

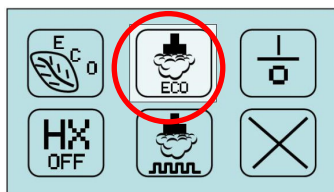
ECO mode only operates if the "Time Economy" option on page 20 is set to a number of minutes greater than 0. This option is accessed via the advanced menu.

Eco mode reduces the temperature of the brew+steam or steam boiler only, by the value set in the advanced menu option "Economy DT". If a value of 80 is set, boiler temperatures will be reduced by a value of 80C from their set point. Values larger than 80 cannot be set.

If full ECO mode and not just the steam boiler (eco Steam) is selected, with a typical "Economy DT" of 67 the brew boiler might reduce from 94C, to a brew temperature of 27C. this would mean the boiler is effectively switched off. **Economy mode is of very little use on a brew boiler (home environment), as the group would cool down and require significant time to warm up again.**

In full eco mode (both boilers) ONLY, the display switches to green when it enters ECO mode. In steam ECO mode this does not happen.

We recommend the ECO setting is restricted to operate on the Steam boiler only. Touch to highlight "Eco Steam" as below. The full Eco mode was a commercial function we decided to retain on the main-board firmware



If the steam (service) boiler is set to 127 **and in the advanced menu, "Economy DT" is set to 67**, with an Economy time ("Time Economy" value) of 4. After 4 minutes of inactivity, the steam boiler temperature will reduce to 60C.

By setting the steam boiler to run this way, you can walk away after steaming, knowing that the temperature will automatically reduce after 4 minutes. This keeps the Vesuvius cooler and gives a very rapid warm up to full steaming temperature. 60C provides optimum energy efficiency and a warm up time reduced by 50%. **This allows the boiler to be ready for steaming in approximately 3 minutes instead of 6 minutes.**

The Steam boiler will come out of ECO mode, when the brew lever is lifted, the pump runs, or the display is touched.

There is a further economy setting in the advanced menu called. "Time to off". This setting will switch the Vesuvius to standby in whatever number of minutes has been set (max value 999), after the Vesuvius enters economy mode. This can be useful in a number of circumstances.

If you don't use the daily on/off timers and want the Vesuvius to switch off if it's not being used

Or

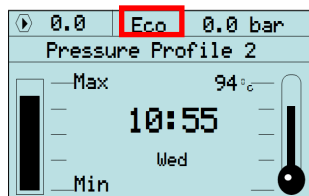
You wish the Vesuvius to be on before you get up and go to work, but your work pattern varies. You can for example, set the Vesuvius to come on at 7am with no off time and on again at 7pm and off at 11pm. You then might set a "Time to off" of 2 hours

If you are in all day and using the Vesuvius it will stay on. If you have to suddenly leave for a meeting, the Vesuvius will switch off after 2 hours and then switch on again in the evening at 7pm.

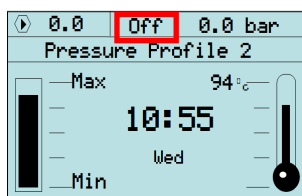
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Eco Mode Explained (cont.)



If Eco mode is active and only the steam boiler selected. The home screen will show



If the steam boiler is switched off in the ECO menu, the display will show "Off" instead of steam temperature.

Note: Vesuvius will not enter ECO mode, when the "Eco Steam function" is selected unless the steam boiler is on, see page 10.

Tip: When in Eco steam mode, a touch on the Eco (leaf) symbol will immediately put you in ECO mode and take you back to the home screen.

The tip above is for the times when you want to brew a coffee and not necessarily steam milk. Once you have finished, you may decide to put the Vesuvius straight back into Eco mode. Again if it helps think of this fairly quick procedure as:

- 2 touches on the lower left corner of the display, followed by 2 touches on the top left corner of the display.

It's a little difficult to understand why it works until you try it and see the options you need are positioned directly "underneath" each other on the various screens. When the Home screen is shown, you will see the word ECO on the display instead of a temperature.

This also works for full Eco mode (both boilers), but in this case the display will turn Green.

Brew Water Preheat - HX on/off function

Some (not all) dual boiler machines have the ability to preheat the brew water. They do this by using the heat of the Service Boiler (steam boiler) to heat the incoming water to the brew boiler. This can be by a copper pipe spiral on the outside of the service boiler, or by an Heat Exchange (HX) within the

service boiler (steam boiler). Both these methods are always on if the service boiler is on. They take no account of the incoming water temperature, the environmental temperature and can overheat a brew boiler in certain circumstances. On some machines this forces limits on how hot the service boiler can be. It is also possible for heat to be lost into the service boiler under certain circumstances on some machines..

Switching off the preheat allows you prevent brew water being preheated in these special circumstances above. **Even when preheat is on, if no shot is being pulled, there is a mechanical separation of the plumbing between the brew boiler and service boiler.**

When preheat is enabled the preheat function is activated (and the mechanical separation removed) the moment a shot is pulled on the Vesuvius.

Running with preheat disabled usually only affects "capacity", the number of back to back shots you can pull and unless you are very busy making coffee, you generally won't notice much difference.

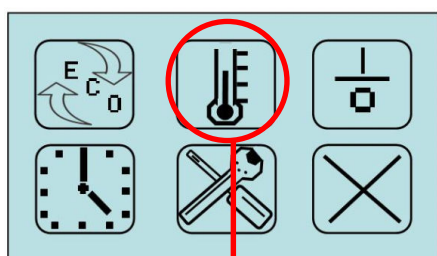
Enabling preheat may be beneficial in certain circumstances

- If ECO steam mode is enabled then the steam boiler is likely to be at a lower temperature than the brew water when the shot is made.
- The steam boiler is being run at lower temperatures
- The Vesuvius is in a very cold environment
- Your really busy making a lot of coffees

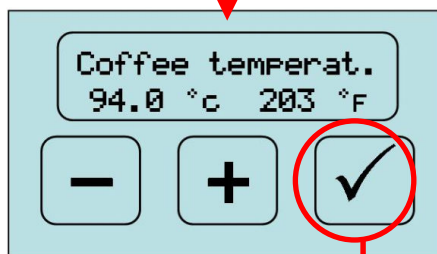
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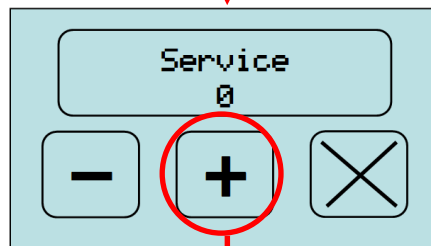
Main menu screen (cont)



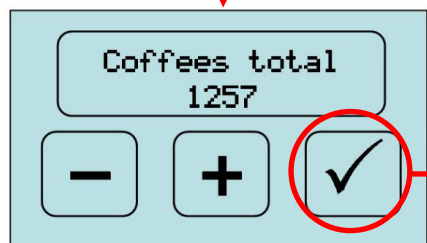
Touch to set coffee temperature



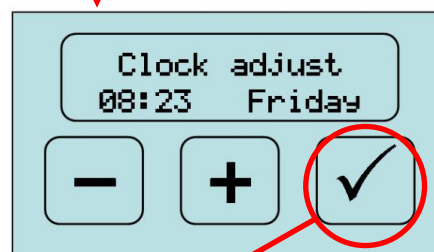
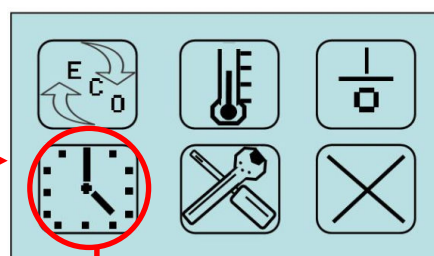
Touch to access service menu



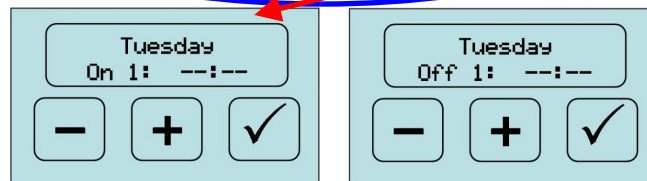
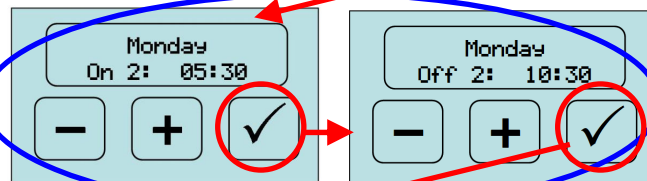
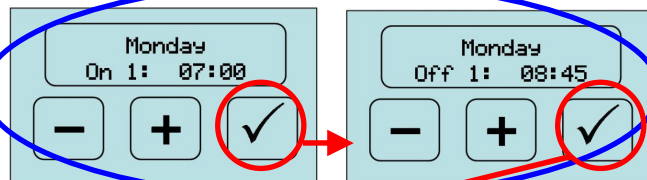
Does nothing, touch + to continue



This actually shows E61 group lever operations



Touch +/- to change time and day



The Vesuvius has an internal On/Off timer, with 2 on/off times each day, 7 days per week. It can be ready in the morning, off during the day and back on again when you return from work.

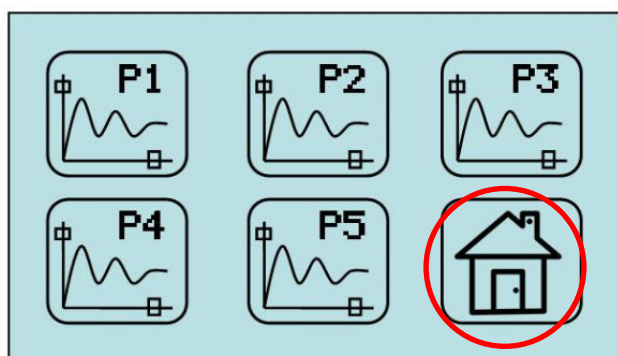
If a timer has no value, it is ignored, in the example above the machine will not switch on or off for the first of Tuesday's timer settings

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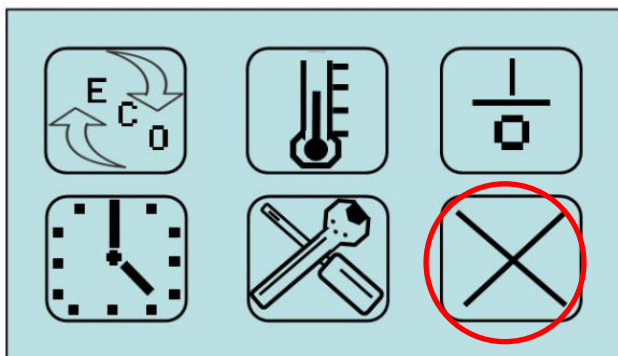
The profile screen

The Vesuvius has 5 programmable pressure profiles, each with up to 7 phases. Touching the "home screen" anywhere when the Vesuvius is not in stand by, brings up the profile screen below.

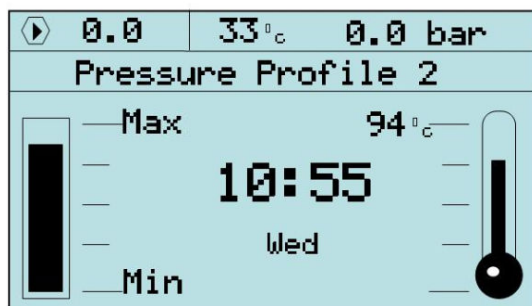


This screen shows the 5 profiles available and a home icon. To program or view a profile, simply touch one of the 5 profile icons for 5 seconds.

Touching the house icon returns you to the "main menu" screen below.

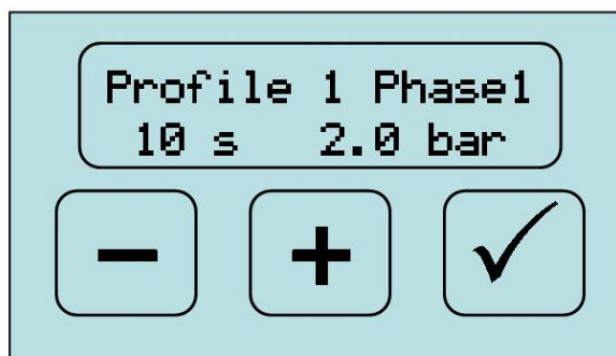


Touching the "X" icon returns you to the "home screen".

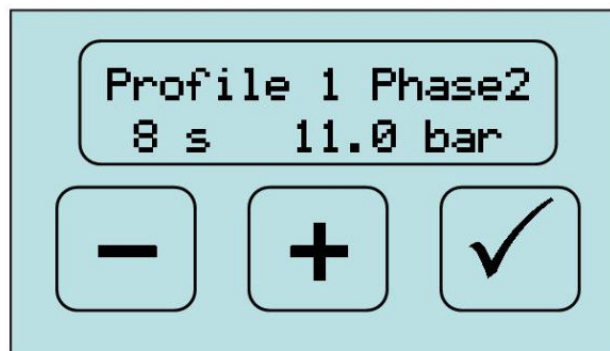


Programming/examining pressure profiles

The profiling system is very easy to use and can achieve results as simple or complex as you care to program. After you touch and hold a profile icon (P1) for 5 seconds, you will enter this screen.



This screen tells us that for the 1st phase (of the 7 phases available), the Vesuvius will deliver a pressure of 2.0 bar for 10s. A global Pump acceleration parameter (page 20) affects how quickly the pump responds and will affect the speed at which any programmed pressure is reached.



- Touching the - or + icon will increase or decrease the seconds, touching the "tick" icon will, store the value in memory and move you to the pressure value.
- The - or + icon will increase or decrease pressure settings. touching the "tick" icon saves the settings and displays the next phase. The procedure is repeated to program the next phase.
- If no changes are desired, simply touch the "tick" icon twice to move to the next phase.

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Programming/examining pressure profiles (cont.)

Not all phases have to be used, enter a 0 time and that phase will not be used. The screens that follow show the rest of this example profile. **Phase 7 is unused shown by a value of 0 seconds.** It is not necessary to put 0.0 bar as well.

Profile 1 Phase3		
7 s 9.0 bar		
-	+	✓

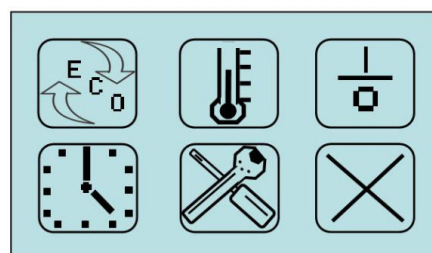
Profile 1 Phase4		
5 s 8.0 bar		
-	+	✓

Profile 1 Phase5		
6 s 6.0 bar		
-	+	✓

Profile 1 Phase6		
3 s 4.0 bar		
-	+	✓

Profile 1 Phase7		
0 s 0.0 bar		
-	+	✓

One useful tip, if just a small change is desired, after touching the "Tick" Icon to save the value, raising and lowering the brew lever returns you to the Main menu screen.



Profile advice

The Vesuvius has advanced pressure profiling capabilities but everyone's taste is different, so some suggestions to get you started below **assuming a pump acceleration value of 400 (factory setting)**. Always remember, although you have 7 phases for each profile, you don't have to use them all.

Phase 1 Preinfusion times for the first low pressure phase

You can choose to move straight to maximum pressure, but the Vesuvius benefits from a preinfusion phase. **Note: the preinfusion chamber within the E61 group has been disabled, as it's operation interferes with pressure profiling.**

Preinfusion, times shorter than 3 seconds will be ineffective as this will mainly be lost in filling the inactive preinfusion chamber in the E61 group and the space above the coffee puck. The filling of the redundant E61 preinfusion chamber also makes a pre-flush unnecessary prior to pulling a shot.

Preinfusion times of 6 - 14 seconds have given good results. With better grinders, even longer times may be of benefit. Preinfusion pressures can be anything you want, but not lower than 2 bar, testing has mainly been with 2 bar preinfusion pressures. Early testing did not show any benefits with pressure lower than 2 bar due to low flow rates from the pump.

One of the reasons the Vesuvius always supplies the pump from it's internal tank, is to allow preinfusion pressures lower than mains line pressure (usually much higher than 2 bar).

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Profile Advice (cont)

Phase 2 and beyond - The maximum or rising pressure phases

You can reach maximum brew pressure any way you want. A rise in stages from 2 bar to 5 bar and from 5 bar to 10 bar, or a single rise to 10 bar. It is up to you to experiment.

You may want higher pump acceleration and a faster response, moderating the pressure rise by having two rising stages. Or you may keep the acceleration at the factory settings and use 1 stage for a very soft and gentle rise to full pressure. We have had good results with a single rise to maximum pressure, but a 2 phase rise may not give benefits for some coffees/temperatures.

We do not recommend using pressures over 11.5 bar, as the results do not seem to improve beyond this point. The E61 group has a maximum limit of pressure based on the Vent release valve spring tension. For most E61 groups this is around 12.5-13 bar.

Note: the Vesuvius high pressure PTFE tubing and fittings are rated for 25 bar pressure, well beyond the capabilities of the pump.

Later phases after maximum pressure

Normally during the extraction process, the pour starts to blonde and often it loses integrity. We feel high pressure continually applied causes this and progressively lowering the pressure as the pour progresses will result in a better sweeter, more rounded shot with improved body. This is probably the reason for the good shots that many spring lever machines produce, but we have a level of repeatable control, well beyond that of any lever machine.

How much you lower the pressure and how fast, is influenced by your taste, coffee used and grinder you have. It's good to experiment and share information with other owners.

How the Vesuvius Controls pressure

The Vesuvius uses a pressure transducer, commercial valve system and PID algorithm to control pump pressure. Although not perfect, it is

better than a simple on off control, which would be unable to manage rapidly changing pressures.

You may notice brew pressures can overshoot the set point sometimes, this mainly happens with increasing pressures. High pump accelerations increase this tendency as do different coffees and grinds. **As dynamic pressures approach the static pressure potential in the system, pressure changes happen very rapidly.** The PID system reacts very fast, but has a finite reaction time. If PID settings are made very aggressive to damp this response it can cause hunting lower down the pressure ranges as the pressure falls.

These pressure overshoots are brief and have a minimal effect on the shot, as it's mainly static pressure showing rather than dynamic pressure. The higher the pressures you ramp to e.g. 11 or 12 bar, or the faster the pump acceleration, the more you might notice this.

You can fine tune the pump PID settings further, but we recommend using the factory settings until you become familiar with the machines operation.

Grinders.

The Vesuvius is not a cheap machine and it requires a good grinder. To get the most benefit from this advanced machine, we recommend a grinder costing from approximately 25-50% of the machines value. To give a real world example, **a grinder such as the Mazzer Super Jolly or similar class grinder would be the absolute minimum required** and better results will be obtained with more expensive grinders.

The Vesuvius is able to use a grind much finer than standard espresso machines and less expensive grinders tend not to grind as well at the finer settings.

Coffee

To do the Vesuvius any justice at all, coffee must be fresh. You should know the roast date of the coffee and only use quality coffee from good roasters. Ideally the coffee should rest for at least 5 days from the roast date before being used, often even longer. Use the time recommended by your roaster for resting any specific coffee before use.

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Vesuvius Specifications

Weight	approx 24kg
Dimensions	415H x 368W x 510D
Brew boiler	0.8l - 1000W AISI 316L low corrosion stainless steel 2mm thick (8mm end plates).
Steam boiler	1.5l - 1400W AISI 316L low corrosion stainless steel 2mm thick (8mm end plates).
Max Pressure	12.5 bar E61 brew group limitation
Total Power Draw max	2.5Kw, detachable mains cord, 1500W with brew boiler priority & sequential heating selected. Eco modes to reduce power consumption.
Pump & Motor	FG304 gear pump motor unit, brushless, 24V DC (4mm steel gears)
Water Tank Level Sensing	Capacitive (no magnets, sprung platforms or floats)
Water tank Capacity	2.9l to brim, normal fill 2.7 litres
Drip tray capacity	1.7l (can be drained)
Insulation	Both boilers
Useful Hot water draw	1000ml +/- 200 ml (dead draw with Vesuvius switched off is 910ml)
Low Voltage Transformer	24V 110W, commercial unit.
Low water alarm	Visual only
Feet	Metal, height adjustable
Steam and hot water wands	Ball joint no burn. Steam on left, water on right
Portafilters	2, 1 single and 1 double spout
Filter baskets	1 single, 1 double, 1 blind
Plumbed or tanked operation	Pipes and drain hoses supplied, drip tray has drain facility. Electronic switch to change from mains to plumbed
Pressure Profiling	5 profiles, each with up to 7 stages. Battery backup of stored profiles and all system settings.
Brew Boiler Isolation and selectable preheat	The brew boiler is always mechanically isolated from the steam boiler HX unit, the water path only opens when brewing begins and closes when brewing finishes. Preheat of brew water can be switched on or off as desired, even if the steam boiler is on.
PID control	Independent PID algorithms for brew boiler, steam boiler & pump
Timer	7 day timer, with up to 2 on/off times each day.
Wooden accessory case	Containing various small spares, feet, 2 portafilters single & double basket, blind filter, all hoses required for plumbing.
Pressure profiling	5 profiles can be saved each with up to 7 stages.
Last shot protection	The Vesuvius will always complete the last shot, even if water is low

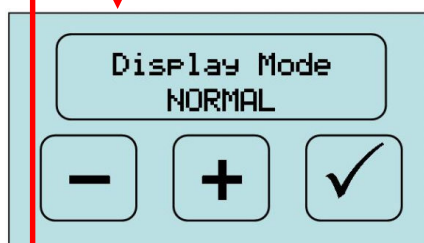
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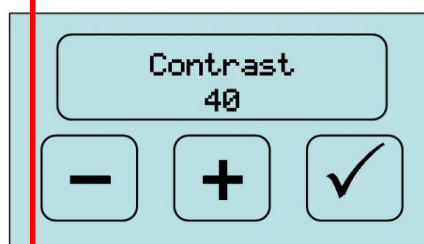
The Advanced Menu

This is a menu you will not use very often, It allows customisation of Vesuvius functions. All parameters are changed in the same way as the other menus.

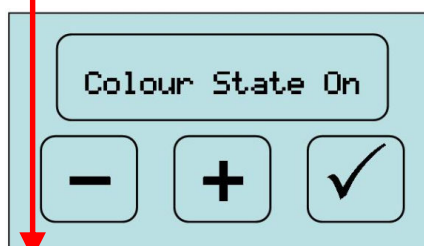
To enter the advanced menu touch the screen at the point indicated for 10 seconds. The options are shown in the order they appear



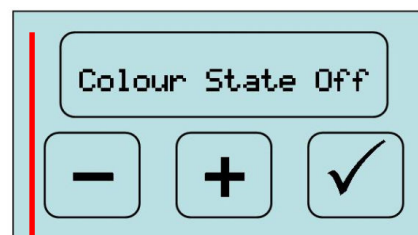
Set this to your preference, can be normal or reversed



Increase or decrease to improve visibility for particular display setting



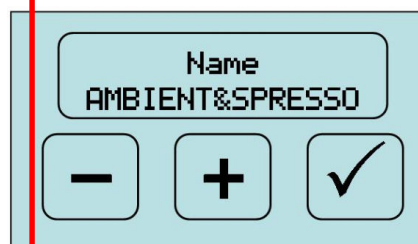
What colour you wish the display to be when the machine is on



What colour you wish the display to be when the machine is on standby



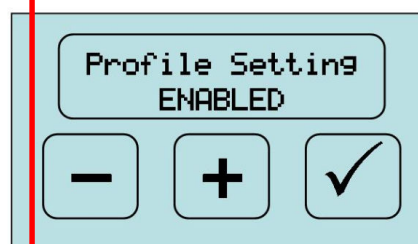
Select your Language. Spanish, French, German, Italian, English



Your dealer name, if input. One long press of "tick", moves to next screen



Your dealer phone number, if input. One long press of "tick", moves to next screen



Always leave enabled, if you wish to be able to view & change profiles

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PWM kP kI kD
10.5 0.24 90.0

− + ✓

Pump PID settings for controlling pressure, **recommend using these revised values until factory settings are updated**

PWM Max Accel.
400

− + ✓

Pump acceleration, speed of response to change. Values above 700 have no effect. **Changing value may require change to pump PID settings**

Buzzer
DISABLED

− + ✓

There is no Buzzer

ProbeSensitivity
MID

− + ✓

Service boiler autofill probe.. affects fill level, **leave on Mid.** Low allows higher boiler water level, High is less

Sequent. Heating
DISABLED

− + ✓

Both boilers heat at once or brew boiler priority, if enabled. Reduces max power consumption to 1500W approx

Service Cycles
0000

− + ✓

Does nothing important

Temperature
°C

− + ✓

Set to display temperatures in C or F. Note F temps omit decimal values and always round down

Boiler Temperat.
127.0 °C 260 °F

− + ✓

Service (steam) boiler temperature. **I recommend a setting of 127 or 128 (factory use 130)**

kP kI kD
8.0 0.15 10.0

− + ✓

PID settings for steam boiler

PID setting
2.0 °C 35 °F

− + ✓

Temperature range around set point where PID operates. We want only a small range for service boiler

Economy DT
67.0 °C 152 °F

− + ✓

The delta value for economy. E.g. this will drop any boiler temperature by 67C

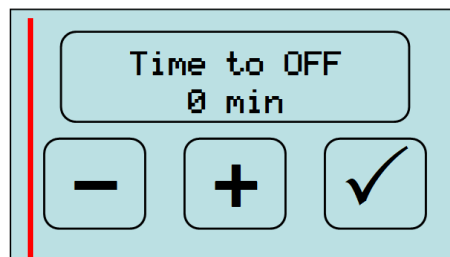
Time Economy
15 min

− + ✓

How many minutes before machine enters economy mode, if not used. **0 to disable. I also recommend using 4 or 5 minutes**

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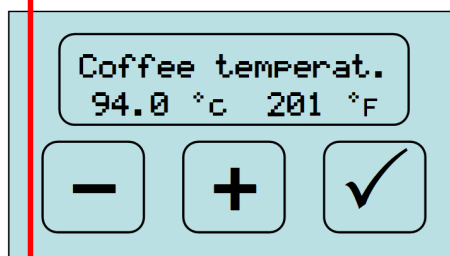
Time to OFF
0 min

− + ✓

How many minutes (max 999) after machine enters economy mode, before it switches to standby(if not used). **0 to disable**

Note: The programmers did make one error when calculating F values that were deltas.

e.g. In both "PID Setting" screens and "Economy DT" They should have deducted 32 from the F values and they didn't, they just showed a change in temp of 67C as 152F when in fact it should be 120F



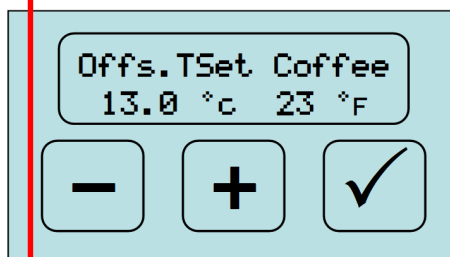
Coffee temperatur.
94.0 °C 201 °F

− + ✓

Set the temperature of the brew boiler (also accessible from main menu). I personally use 93C or 94 most of the time.

The one delta that is correct and gives the mathematically correct F value is the Offs.Tset Coffee

This is being corrected for USA machines (and all future Europe machines) . It has absolutely no effect on the machines operation because all values are calculated in C internally.

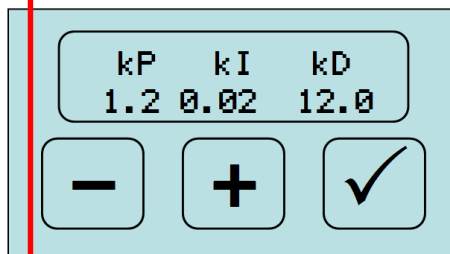


Offs.Tset Coffee
13.0 °C 23 °F

− + ✓

Allows for the drop in temperature of water as it passes from the brew boiler to the coffee. E.g. Brew Boiler water at 107 c, but 94 c is displayed

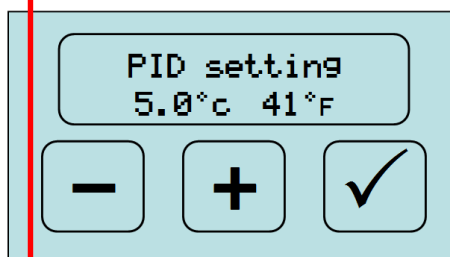
Also any displayed temperature values for brew temperature and steam boiler temperature are correct as these are not deltas, but actual values



kP kI kD
1.2 0.02 12.0

− + ✓

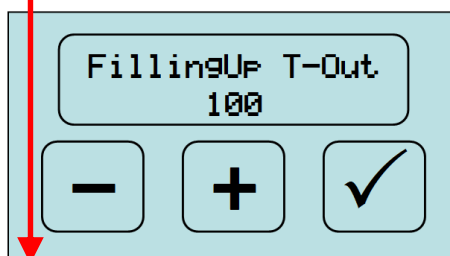
Revised recommended PID Values for Brew Boiler.



PID setting
5.0 °C 41 °F

− + ✓

Temperature range around set point where PID operates. We want a larger range for the brew boiler. Your machine may be set to 7C, I recommend you change this to 5C



FillingUp T-Out
100

− + ✓

This value is the number of seconds the machine will wait before

1. Closing the mains water solenoid, preventing flooding if a fault develops on a plumbed machine
2. Showing the red fill tank screen, when the water level is low
3. The length of time the pump will run when auto-filling the steam boiler

If you often walk away from the machine and miss the red low water warning on the display, you can reduce this value to 100 seconds.

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Maintenance

Service the Vesuvius on an annual basis, please refer to your authorised dealer for advice.

Maintenance operations that you can perform are:

- Changing the group gasket every 6-9 months, or as required.
- Washing the internal Water tank, weekly
- Removal and cleaning of shower screen
- backflushing with detergent (lubricate group afterwards)
- Check for leaks (weekly)
- Replace a heating element (with dealer guidance)

The Vesuvius should only be cleaned with non abrasive cleaners and a soft micro-fibre (recommended), cloth

In the event of any abnormal operation or problem with the display or main computer:

Switch the Vesuvius off and unplug it. Plug in and switch on again. If this does not fix the fault, check all the settings in the advanced menu, in case the main board firmware has been accidentally returned to the board manufacturers settings.

If a boiler fails to heat, the Vesuvius has 2 resettable limit stats:

Unplug your Vesuvius, remove either upper or lower access panel to reset the relevant limit stat, by pressing the little red button in the centre. The brew boiler has this on the top, the steam boiler has one located underneath. If the problem recurs, contact your dealer for advice.

Abnormal sounds or leaks:

Contact your dealer for advice. Sometimes the repair may be very simple, e.g. a leaking high pressure PTFE pipe joint, and the dealer can talk you through quickly fixing it. At other times it may be more serious and require the Vesuvius to be returned for repair

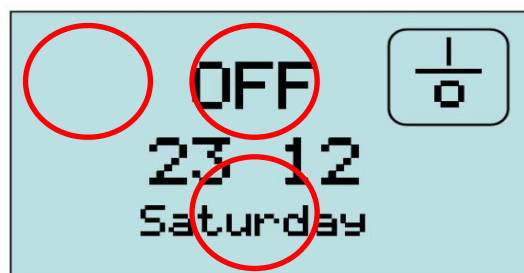
Descaling.

Although descaling can be successfully performed at home, it is beyond the scope of this manual and we recommend only suitable filtered or treated water is used. Please contact your dealer for advice.

Main Board Firmware - Manufacturer Reset

In the unlikely event of you having to perform a reset of the main board firmware, please use the following procedure. **Note this will revert the board to the board manufacturer settings, not factory settings**

Switch the power off at the wall socket. Then power the Vesuvius on and Touch the red zones above simultaneously until a reset message appears on screen.



PID values Explained

Although we recommend you don't change the values in the guide. With experience small changes may benefit the operation of your specific machine.

The P gain stands for Proportional - it will try to quickly restore the set point value. Too low, and response is sluggish, too high can cause overshoots.

The I gain stands for Integral - measures change over time and will add more to the proportional gain the longer we are not at the set point. Usually only small values of I are needed, try reducing it if overshoots/oscillations occur, or increasing I, if the set point is not reached.

The D gain stands for Derivative - Measures change over speed. It will reduce the effects of P and I more, the faster the set point is approached. It acts as a damping factor. Low values of D can cause overshoots, high values of D can make response sluggish.