SYNESSO

Owner's Manual

TABLE OF CONTENTS

INTRODUCTION

Congratulations on the purchase of your Synesso™ espresso machine. Please read this Owner's Manual and retain it in a safe location for future reference. If you have any questions about your machine, please contact Synesso™ and our knowledgeable staff will assist you.

Factory Contact information:
Synesso™ Inc.
309 S. Cloverdale, Suite C41
Seattle, WA 98108
Tel: 206.764.0600
Fax: 206.764.0601
e-mail: info@synesso.com
Web: www.synesso.com

Please have your Serial Number available
BEFORE calling for service or technical support.
Thank you.
S/N: 309111162
The offsets for this machine are:
Zone 1: +1.8°F / Zone 2: +1.0°F / Zone 3: +1.6°F
Steam Tank: +11.0°F

Included in the package with this machine you will find the following:

- Thumb Drive containing the Owner's Manual and other technical documents
- Pump/Motor Combination + hoses (3/8" compression fittings on all hoses)
- 8' Flexible ¾" ID drain hose + hose clamp (attached)
- Fitting, 1/4" Pipe x 3/8" Compression
- Accessory Package: Portafilters (per customer specification), blind basket, Synesso™ 3 oz. (90ml) shot glass, JoeGlo™ cleaning kit, 58mm tamper, 4 rubber leg pads
- Electrical plugs are ONLY included on CSA Certified machines (Canada). For all other machines, the owner of the machine must purchase an appropriate plug end for their machine. Please see the installation instructions on page 7 for more information.

Serial Number
Your espresso machine has a unique serial number, located on the left inner frame of the machine, just under the drain tray on a serial plate. Please have this serial number available for reference when contacting the factory.

This owners manual applies to all Synesso models: Cyncra, Sabre and Hydra/Hybrid machines. The Cyncra is Synesso's manual machine, available in 2 and 3 group models. The Sabre is a volumetric machine, also available in 2 or 3 group models. Hydra machines have an individual pump and motor per group head and can accommodate 4-stage ramping on all groups. The Hydra-Hybrid is a combination of the manual and volumetric machines: customers can choose the number and configuration of group heads for their machine. For example, a 3 group Hybrid machine will have 3 pumps and motors (1 for each group head) and can have between 1 and 3 manual group heads and between 1 and 3 volumetric group heads.

SAFETY WARNINGS

IMPORTANT Information for Synesso™ Espresso Machines:

- DISCONNECT FROM POWER BEFORE SERVICING.
- Read the entire manual before operating this machine.
- Steam and condensation from the steam wand discharge is very hot and may cause burns.
- The steam wand tips and bases become hot during use: do not touch these surfaces.
- Cover the steam wand tip or submerge in a filled pitcher to safely divert the steam before opening the steam valve.
- Never remove the steam wand from the product that is being heated when the valve is open.
- Never remove the portafilter from the machine during the active brewing process.
- Keep water and moisture away from any electrical device or live power.
- Steam tank water is heated to 260°F (126°C); Use caution if tank is exposed.
- The brew groups deliver water as hot as 210°F (99°C). Avoid exposure to this water.
- The hot water mix valve can be adjusted to deliver water as hot as 212°F (100°C), which can cause severe burns: please use caution when activating this water source.

Safety Label Locations:

Synesso complies with UL regulations by posting the following labels on its machines:

Electrical box:

WARNING: Disconnect from power supply before servicing
AVERTISSEMENT: Couper l'alimentation avant l'entretien et le depannage.

Electrical cord:

The conductors of the power supply cord are marked "L1","L2" for the ungrounded ("hot") supply conductors and "G" for an equipment grounding lead.

Warning: Risk of Fire. Use UL Listed Grounding Type Plug rated for 220 Volts, _____ Amperes, _____Phase, #_____ Wire. Plug to be Selected and Installed only by Qualified Service Personnel.

Inside right edge of the frame under the drain tray:

This equipment is to be installed to comply with the applicable federal, state or local plumbing codes.

Materials information for Synesso machines:

- All stainless steel coming into contact with the water supply is 300 series
- All brass fittings are low lead per the CA360 specifications or better
- All electronic devices are lead free
- All gaskets are made from food-contact safe material

Test Information

- Brew (coffee) tanks are hydrostatically tested to 375 psi
- Steam tanks are hydrostatically tested to 75 psi
- The electrical system is subject to an electrical withstand test of: 1.20 kvac, at 5.00 mA, for 1 (one) second

INSTALLATION

To maintain the 1 year warranty, an authorized or certified espresso service representative must perform the installation of this espresso machine.

Site Preparation

The machine must be placed on a level horizontal surface that can be easily cleaned and is capable of sustaining a minimum of 300 lbs. of weight.

The surface depth should allow for a minimum clearance of 1” behind and 3” in front of the machine.

Make a 2 ½” round hole through the counter top, 4” from the back center of the machine. This should provide ample room for the hoses and electrical lines.

A 3/8” cold water supply line with a shut off valve is needed within 5’ of the machine, preferably located directly underneath the machine.

A proper water filtration or softening system must be installed on the incoming water supply. Water treatment systems will vary, and it is important to use a system designed to match the needs of your specific area. Most water filtration systems require periodic maintenance, including cartridge or filter replacement. This is vital to the proper functioning of the machine and the quality of the espresso served. Follow the instructions provided by your water treatment system for proper installation. Note: Improper water filtration can result in water damage inside the machine causing scale and corrosion. **DAMAGE CAUSED BY IMPROPER WATER TREATMENT WILL NOT BE COVERED BY THE MACHINE WARRANTY**. Please read the warranty section on page 31 in this manual for more detailed instructions.

There must be adequate room under the counter to locate the motor and pump. This should be within 5’ of the cold water supply line. The pump should be easily accessible for potential adjustments and should have proper ventilation and a minimum of 3” clearance on all sides. Dimensions of the pump and motor are: 6 ½” Height x 5 ½” Width x 9 ½” Depth.

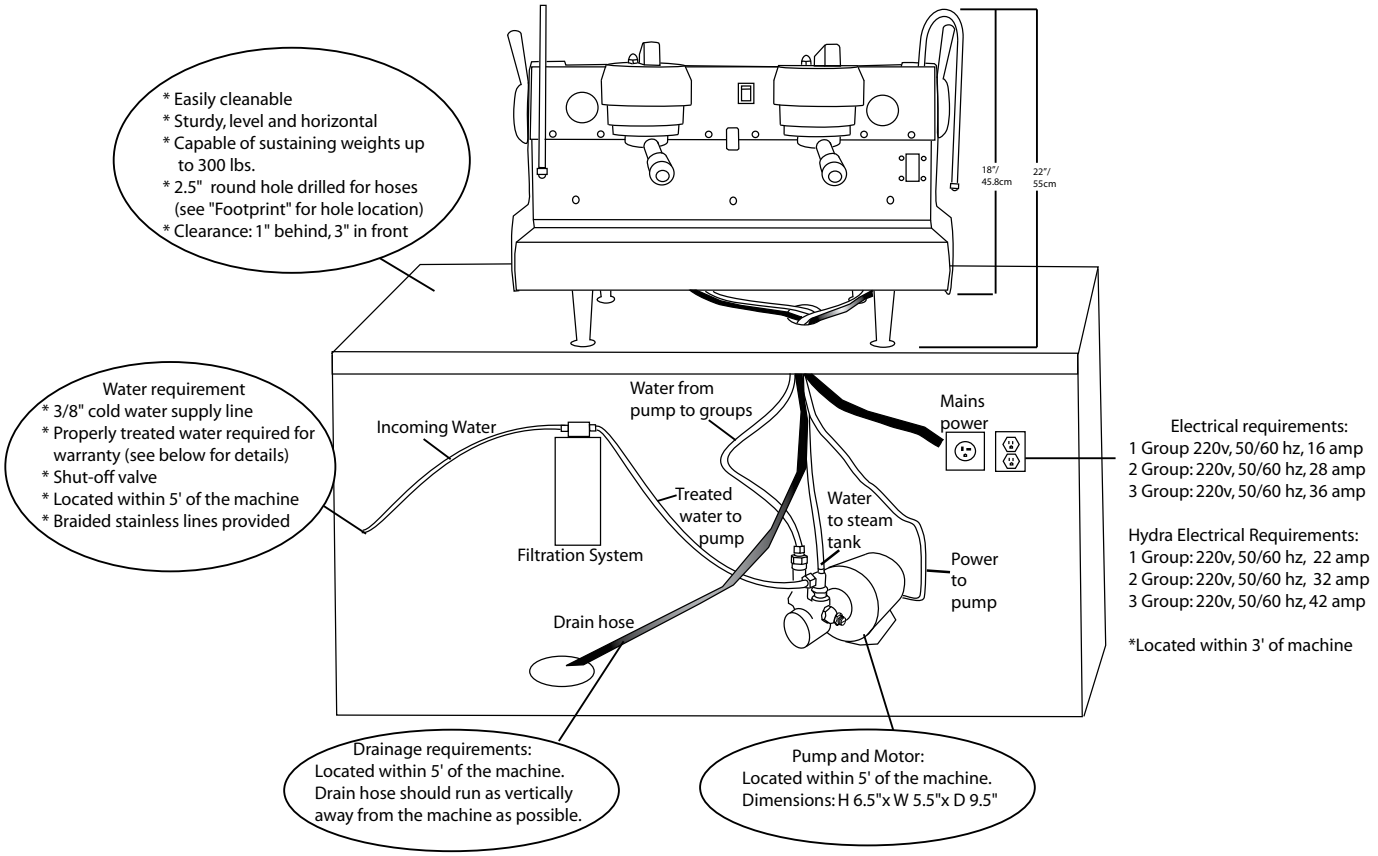
A floor drain or sink should be readily available. The best location is directly under the installation site of the machine. The drain hose should descend steeply for proper drainage.

An electrical receptacle and matching plug, rated at the proper voltage and amperage is required within 3’ of the location of the machine. Plug ends are not included with the machine. Below are the recommended cord plug ends for the Synesso machines:

- 1 Group, 220 V – UL-listed 20 amp
- 2 Group, 220 V – UL-listed 30 amp
- 3 Group, 220 V – UL-listed 50 amp

SYNESSO

INSTALLATION DIAGRAM



Water Requirements

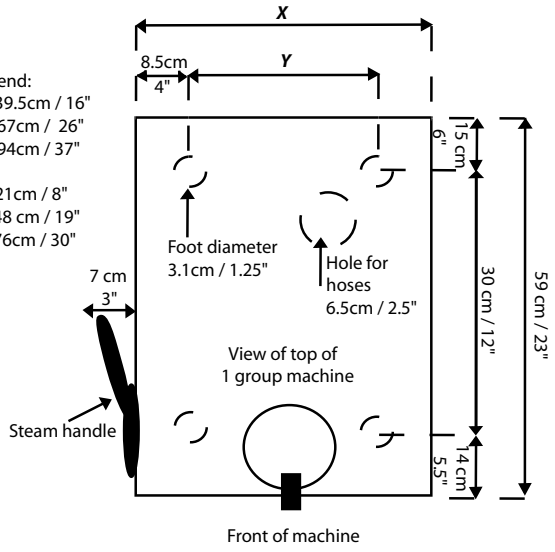
Proper water filtration and regular filter changes are a requirement to keep your factory warranty valid and your machine functioning properly. It is highly recommended that you contact a professional water filtration specialist in your area and have your water tested to determine the proper filtration system. It is important to note that many municipalities change their water sources throughout the year, so periodic water tests may be necessary.

Water Standards to keep your warranty valid:
Total Dissolved Solids (TDS) 30 to 200 ppm (parts per million)
Total Hardness - in ppm Less than 85 ppm
Total Hardness - in grains 3 to 5 grains (divide ppm by 17.1 to get grains)
pH 6 pH to 8 pH
Chloride 0 ppm - any Chlorides can be corrosive and harmful
Total Alkalinity Less than 100 ppm
Chlorine 0 ppm
Iron 0 ppm

MACHINE FOOTPRINT

Legend:
X: 1 group: 39.5cm / 16"
2 group: 67cm / 26"
3 group: 94cm / 37"

Y: 1 group: 21cm / 8"
2 group: 48 cm / 19"
3 group: 76cm / 30"



PLUMBING INSTRUCTIONS

This equipment must be installed to comply with the applicable federal, state or local plumbing codes. WATER TREATMENT IS REQUIRED TO PRESERVE THE FULL MACHINE WARRANTY. Please insure that the incoming water to the machine complies with the warranty requirements listed on page 30 of this manual.

Connect the provided stainless steel braided hose from the pump to the connection from the filtered, cold water line. Fittings on the hoses are 3/8” compression-type fittings*; thread sealant or Teflon tape is not necessary. Make connections snug, but do not over tighten.

The ¾” inside diameter clear vinyl hose connects the outlet fitting of the drain box to the drain (located on the right hand rear corner of the machine). Run this hose to the floor drain or floor sink and maintain an air gap between the hose and the drain.

Turn incoming water ON and check for leaks.

NOTE: Synesso machines require a minimum of 35 PSI (2.5 bar) of line pressure to have the auto-fill system for the steam tank function properly. Please ensure that the incoming water meets this requirement or contact Synesso for alternative methods of boosting water pressure.

*Please note: Synesso sells a “Euro-hose” adaptor hose and fitting (part numbers 1.0510 hose; 1.5000 fitting) which converts from a 3/8” tube fitting to a pipe fitting, suitable for most non-US plumbing). Please refer to the picture below to identify the differences between the standard and Euro-styles fittings and hoses.

Standard style

Euro-hose style

ELECTRICAL INSTRUCTIONS

After you make sure your receptacle and circuit are properly rated (see the installation diagram on page 8) for your model, install a matching plug on the power cord. See page 7 for plug specifications.

Synesso provides wiring options based upon customer's preference. Listed below are the power cord wires for plug installation:

North American Wire Configuration		Outside of North America Wire Configuration	
Green	Ground	Green and Yellow	Ground (Earth)
White	110v Line 1	Brown	220v
Black	110v Line 2	Blue	Neutral

Tightly connect the wires into the plug end as directed. Make sure that the On/Off electronics switch (red rocker switch on the electrical box) and the heating element breaker are in the OFF (0) position, then plug the power cord into the receptacle.

IMPORTANT - The machine operates best if the line voltage is 220-240v. If the voltage on the receptacle used is less than 210 Volts, the machine requires more time to heat up and recover from heavy use.

Synesso recommends installing an In-Line Buck-Boost transformer to increase voltage below 210v to optimize machine functioning. Buck-boost transformers come in different sizes. Please choose the appropriate one for your machine.

- 1 and 2 Group 220 Volt Machines require a 1.0 KVA transformer
- 3 Group 220 Volt Machines require a 1.5 KVA transformer.

SPECIAL ELECTRICAL INFORMATION FOR EMC-COMPLIANT MACHINES

(C-TICK FOR AUSTRALIA AND NEW ZEALAND, CE FOR EUROPE AND OTHER LOCATIONS)

To comply with EMC (Electromagnetic Compatibility) regulations, Synesso is required to install a capacitor in the electronics box across the main power IN. **To avoid an electric shock from the charge held in the capacitor, unplug the cord, taking care to NOT touch the metal prongs on the plug end. Turn the electronics ON/OFF red rocker switch to the ON position and wait a few seconds until the red switch "goes dark." At that point, the electrical charge has dissipated.**

OPERATION

Start-Up Instructions

1. To fill the machine, connect the water lines, set the drain hose and turn the water ON.
2. Switch the red electronics On/Off switch to ON. This activates the machine's water auto-fill feature for the steam tank and the electronics, but NOT the heating elements.
3. The water level sight glass for the steam tank is located on the right side of the machine. As the tank fills, the water level will rise in the sight glass and will automatically stop when the preset level is reached.
4. Bleed the group heads of air:
   Manual machines: Turn each group head handle left into the BREW position, (see pictures below) allow the group to run until there is a steady flow of water. Return the group head to the OFF position.
   Volumetric machines: Activate the pitcher button on the right side of the keypad. Once the water flows in a steady stream, press the pitcher button again to stop the water.
5. Wait until the steam tank has stopped filling and that the level in the sight glass reads at least ½ full and then turn the heating element breaker to the ON or (1) position. All the elements inside the machine (brew and steam) are now activated. It takes roughly 30 minutes to heat the machine up to operating temperature.
6. To adjust the pump pressure, activate the pump by turning the brew group to the BREW position. On volumetric machines, activate the pump with the pitcher button.
7. Locate and read the pump pressure / brew gauge on the right hand side
8. Set the pump pressure to 9 Bar:
   Locate the pump adjusting screw on the right side of the brass pump housing.
   Loosen the lock nut and turn screw with a screwdriver
   - Clockwise to INCREASE pressure
   - Counterclockwise to DECREASE pressure

   Once the desired pressure is reached, retighten the lock nut.
9. Please allow at least 30 minutes of "warm up" time before using your Synesso espresso machine to brew shots or steam milk. The steam gauge (the left hand gauge) should read a minimum of 1.1 Bar.

Off

Preinfusion

Brew

OPERATION

Bean Grinding

1. For best results, use fresh coffee.
2. Understand the properties of the coffee roasts you have chosen. Generally, light roasts brew at hotter temperatures than dark roasts. Your roaster might be able to suggest an ideal brewing temperature for their product.
3. Ground coffee should be brewed within a few minutes of grinding.
4. Fill the portafilter basket just above level and wipe off the excess.
5. Press straight down evenly on top of the grounds with the tamper.
6. Use firm pressure and twist slightly to insure a level surface.
7. Insert the portafilter into the group head and push the handle to the right to ensure a tight seal.

Espresso Brewing

1. Single, double and bottomless portafilters are available through Synesso. The single portafilter can only be used to brew a single shot of espresso. The double or bottomless can be used to brew 1 double or 2 single shots of espresso. These portafilters should be kept warm by keeping them engaged in the brew group before using.
2. Filter basket size: a single is 7 grams, a double is 14 grams, triples are 18 and 21 grams.
3. In order to brew a satisfactory shot of espresso, the grind, the dose and tamp of the beans must be correct. This is critical to the quality of the shot.
4. Fill the portafilter basket with ground espresso. Using the supplied tamper, press firmly, packing the grounds into the portafilter basket. Make sure the top of the coffee is level.
5. Engage the portafilter into the brew group that has the correct temperature setting for this espresso roast and pull firmly to the right to set the seal.
6. Turn the brew group clockwise to the PRE or center position allowing line pressure to pre-infuse the coffee until a drip shows at the spout. Turn clockwise again to BREW, thus engaging the pump to create pressure to brew.
7. If the coffee is ground, dosed and tamped to the proper consistency, it should take about 22 to 27 seconds to brew a 2 oz. double shot.

Milk Steaming

1. The steam wands are used to both heat and expand the milk into tight-bubbled foam.
2. Pour fresh cold milk into a steaming pitcher. Fill the pitcher halfway for optimal foam production. Generally smaller pitchers are recommended for proper foaming. Use only the milk quantity needed: it's recommended that unused milk be discarded.
3. Insert the tip of the steam wand deep into the milk pitcher. This will prevent milk from overflowing once the steam is turned on.
4. Open the steam valve fully by pulling the handle towards you. Total travel is only a few inches.
5. Place one hand on the side of the steam pitcher to feel the rising temperature of the milk.

OPERATION

6. As the milk agitates and heats, lower the pitcher to keep the tip of the steam wand closer to the surface, but still beneath the surface. If an adequate amount of foam has been attained prior to reaching the desired temperature, raise the pitcher to lower the tip of the wand deeper into the milk. This will continue the heating process and minimize further foaming. Do not touch the steam wand to the bottom of the milk pitcher; this can create an inaccurate temperature measurement.
7. Heat milk to approximately 150F to 170F (65°C to 76°C). If you are using your hand to help determine the temperature, it will feel about as hot as you can stand without burning yourself. Milk thermometers are also an excellent way to determine the temperature of the milk. Caution: Do not overheat the milk and scald it. Scalded milk should not be used.
8. Wipe off and purge the steam wand immediately after each use.
9. Synesso steam wands are made with a proprietary double-walled process that helps to keep the outer wall cooler. The tip and the base of the wand can heat to very high temperatures and caution must be used. The double wall process also makes wiping and cleaning the steam wand much easier.

Note: Whole Milk, 2%, 1%, Non-Fat, Soy Milk, Rice Milk and other milk type products may require a different technique to foam properly. In general, the higher the fat content, the easier it is to achieve consistent foam.

CLEANING

Proper and regularly scheduled cleaning and maintenance procedures are CRITICAL for trouble-free and optimum quality performance from your espresso machine.

Back-Flushing

On the current generation of Synesso machines, back-flushing can be programmed for Auto-Flush activation. For Auto-Flush activation, please refer to the programming section of this manual, page 22. To activate either Auto-Flush or manual back-flushing:

1. Replace the filter basket with the provided blind filter basket (a single solid basket without holes) in one of the portafilters.
2. Engage the portafilter in one of the brew groups, turn the head to the BREW position and leave it there for 10 seconds. Repeat several times (in Auto-Flush, the machine will turn the group head on and off automatically; for manual back-flushing, the operator must manually turn the group on for 10 seconds, then off for 10 seconds). This procedure should be performed on EACH brew group daily. This process forces water through the inlet tube and drain system.
3. When using an approved espresso industry detergent during back-flushing, follow the manufacturer's instructions. It is extremely important to thoroughly rinse the blind filter basket and repeat back flushing several times with clean water to clear the system of any detergent residue.

General machine cleaning

1. Clean the surface of the machine using a soft damp cloth. Avoid using abrasive cleaners or cleansing pads. Take extra care on the mirror finish stainless steel surfaces. A "micro-fiber" towel is recommended for the mirrored surfaces to avoid scratches.
2. Make sure the steam wands and tips are free of milk build-up. It is always best to clean the steam wand and tip after each use. Approved espresso industry cleaners can be used to dissolve milk build-up.
3. The drip tray, drip tray grates, and portafilters should be removed and cleaned every day. If you clean the portafilters in the dishwasher, first remove the filter baskets and insert springs before placing all items in the dishwasher.

MAINTENANCE SCHEDULE

Daily

1. Back-flush each brew group a few times without detergent, and at least once with an espresso industry approved detergent (usually this occurs during the final cleaning of the night, or after a busy period).
2. Wipe down the entire machine with a soft cloth.
3. Remove portafilters, baskets and springs, drip tray and grates and clean thoroughly. These items are all dishwasher safe.
4. Slowly pour a pitcher of hot water down the drain to clear grounds debris and prevent blockage.

Weekly

1. Soak portafilters and the removed filter baskets in an approved espresso industry detergent and water solution overnight. Rinse thoroughly before reassembling and using your portafilters.
2. Carefully remove screens from each brew group using a short handled screwdriver and soak overnight in a similar solution as the portafilters.
3. Rinse screens thoroughly before installing and using. **Make sure you install the screens before brewing any shots of espresso. Failure to do so may plug the drain lines with coffee grounds.**

Monthly

1. Check your water filtration system and make sure the cartridges and filters are changed as needed. In areas of high mineral content, hard water, high particulate count or in very busy locations, the filtration systems will need to be checked more often.

Quarterly

1. **Change** portafilter gaskets and closely **inspect** diffuser screens and filter baskets, If these items are showing wear, please replace them as soon as possible. Change these items if they show damage or overuse.
2. Briefly inspect the machine for leaks or potential issues. Contact Synesso or your local distributor or service agent to order parts and/or request service.

Synesso recommends that you contact your distributor or service agent for periodic maintenance. The frequency of maintenance visits will depend on a variety of factors including how much use the machine receives, but at least one preventative maintenance visit a year is recommended.

TROUBLESHOOTING

This is a troubleshooting guide for some of the common, easily fixable issues that operators might encounter when using their machine. For more detailed assistance with technical issues, contact your distributor or local service agent.

The machine may be reset by powering off for 10 seconds.

Brewing problems

The shot is pouring too slowly:

- Tamp pressure was too firm
- Too much coffee is in the basket
- The grind is too fine
- Diffusion screens are clogged; clean or replace
- Pump pressure is too low. Ensure that it is set between 8-9.5 bar
- Brew jet is clogged; when operating properly, 60ml should flow out within 8 seconds

The shot is pouring too quickly:

- Tamp pressure is too light
- Not enough coffee in the basket
- Grind is too coarse
- Portafilter baskets are worn or cracked; replace
- Brew temperature is too cold

Crema is thin with large bubbles and tastes astringent:

- Coffee is old
- Grinder burrs are dull
- Brew temperature may be set too low

Diffuser screen is loose:

- This is most likely caused by over filling the portafilter basket with coffee. This causes the expanding coffee puck to push against the diffuser and bend the screen-to-screw contact point away from the screw.

No pump pressure when water flows from the group:

- Check position of group head: ensure that it is in the brew position.

The pump comes on, gauge reads full pressure, but no water comes out:

- Diffuser screen/screw, or brew jet is clogged (can be caused by soap residue not fully flushed after cleaning).
- The water filter is clogged and needs changing
- Brew solenoid has failed

Brew Gauge

Brew Pressure gauge needle value changes often:

- This is normal. The lowest number (usually 3-5 bar) reflects the incoming line pressure. When brewing the needle reflects brew pressure (8.5-9 bar). When the brew tanks heat, the water expands and the expansion valve relieves the pressure and rises to 11 or 12 Bar.

TROUBLESHOOTING

Brew Pressure is Low:
- Check pump to make sure pressure is properly set
- Water supply hose to the pump is kinked
- Water filter is plugged. Check and replace if necessary

Pump Motor Runs; No Brew Pressure:
- Failed pump, needs to be replaced
- Brew Solenoid is stuck (can be caused by soap residue not fully flushed after cleaning).
- Brew Solenoid has failed
- The line between the pump and the water supply has collapsed or is kinked
- Hose to the pump is kinked
- Water filter is plugged. Check and replace if necessary
- Water supply is inadequate

Readout for Brew Water Temperature Varies by a Few Degrees:
- The control must “see” the increment just above the set point before it sends a signal to turn off the heating element. This will allow the electronics to show a reading just above the set point. The energy from the heating element and the tube for the preheated incoming water are within 1” or 25mm from the location of the temperature sensing probe in the coffee tank. The water pick up tube for brew water is at the top of the brew group and is in the most temperature stable water in the tank. Meaning, the readout can show a temperature of a few degrees above your set point but your brew water is actually at the set point.
- Steam Pressure is set too high; Synesso recommends a setting of 1.3 bar. The steam pressure can be set above 2.0 Bar but there can be undesirable side effects in the brewing process. A small amount of water is preheated in the steam tank for brewing. If the temperature in the steam tank is set very high then this could allow for the preheated brew water to be too hot and cause some erratic brew temperature spikes. There are ways to make this work if it is absolutely necessary to have a very hot steam tank; contact Synesso for more information.

Electronics

All zones read LOW:
- Check to make sure the element breaker is ON (element switch is to the left). Zones will read low until the temperature in that zone reaches 175° F. Please allow 20-30 minutes to heat up initially.

Steam Wand

Drip at the Steam Wand Tip:
- Steam valve seal is worn. Replace by installing steam valve rebuilt kit.
- Steam valve is filled with milk residue. Disassemble steam valve and clean.

TROUBLESHOOTING

Wand is Hard to Move or Sticky:

- Remove wand at the nut, clean and lubricate moving parts with food grade grease

Steam

Sudden loss of steam pressure:

- Commonly caused from drawing large amounts of hot water while steaming milk. Allow the machine time to recover pressure. Check temperature settings on Steam 1 and 2 to make sure they are high enough for your application. Watch the steam gauge when the pressure drops; allow the heating elements to heat the incoming cold water. When it reads above 1.2 bar, hot water and steam may be dispensed again.
- Check the programming keypad to make sure all set points, especially steam zone settings, are close to their set points.
- Check the element breaker on the electronics box to make sure the heating elements are ON (element switch is to the left).

Steam Tank is overfilling:

- Water is too soft; this occasionally happens with reverse osmosis water filtration systems. The water level (auto fill) probe needs to sense mineral content in order to work.
- Debris caught in the water control valve or worn out valve.
- Calcium deposits on the fill probe are preventing the probe from detecting the water level.

Steam Valve Stem Seals Leak:

- Replace O-rings. Purchase Rebuild Kit

The Sight Glass shows over- or under filled steam tank

- Machine is not level. Check to make sure the surface that holds the machine is level. Slightly adjust leg height to level the machine.
- Water level is too high; use the hot water spout to drain water from the steam tank. Continue releasing hot water until the autofill system activates. Once autofill stops, recheck the water level.
- Debris is stuck in the water control fill valve.

MACHINE OPTIONS

The following options are available on Synesso machines. If you have one or more of these options, please follow the instructions below. With the exception of the cash valve and in-line pressure regulator, these options are not available as after-market parts and must be installed during the manufacturing process.

LED Shot Timers

Synesso offers LED shot timers which display how long water has flowed through the group head. The timer is located above its associated group head and the timer starts when the brew valve is opened. The time of the last shot is displayed until the next shot is started, at which point the timer resets to 0 and starts counting again.

PRESSURE REGULATION DEVICES

Pump Bypass Systems (*Required for 4-stage Pressure Ramping)

Pump bypass systems are valves attached to the pump output which allow for pressure adjustment during the shot. Please see programming on Page 22 for information on how to set and control the pump bypass systems if this option is present on your machine.

In-line Pressure Regulator (*Required for 4-stage Pressure Ramping)

This regulator is a device installed on the incoming water line before the pump. It reduces high incoming water pressure to a desirable level (around 50psi). This device is useful in high fluctuation areas where there is variable water use throughout the day (ie. hotels, apartment buildings). This is easily adjusted by watching the brew gauge while in the pre-infuse position, then turning the handle on the valve clockwise to increase pressure and counter-clockwise to decrease pressure.

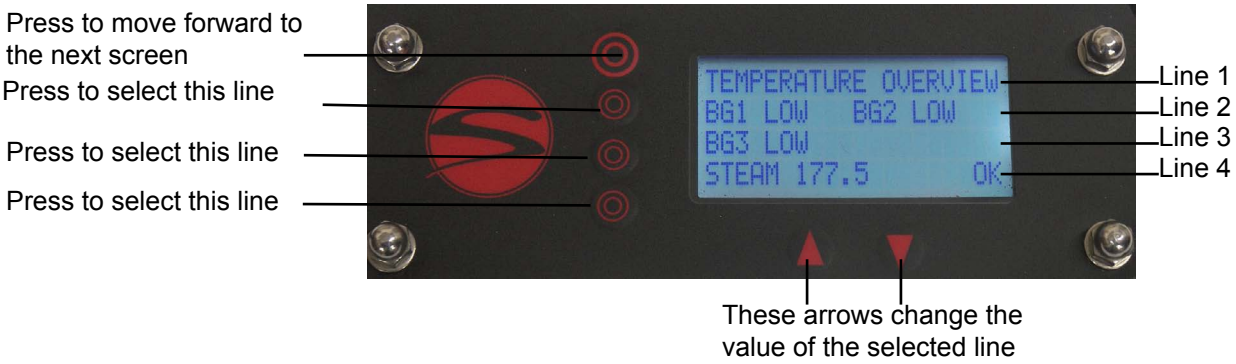
Cash Valve

A cash valve is an option for single pump/motor, multi-group machines. It is installed on the pump head and functions as a larger pressure adjustment tool, similar in function to the standard hex nut adjuster on the pump head. It can accommodate and control greater variance in water fluctuation than the standard pump adjuster, and is a good tool for situations in which large water fluctuations are seen. Adjust the pump pressure above 10 bar using the adjustable hex nut; then adjust the cash valve to your desired pressure (approximately 9 bar).

PROGRAMMING

This programming manual applies to all Synesso machines after serial number 203111051. These machines have a hand held (wired) keypad, pictured below, to allow the user to comfortably view and change the machine settings. The machine must be on and at operating temperature to adjust the settings. There are 3 levels of programming: this manual only addresses the primary level which covers all the settings that the end user needs to access. Service technicians will have access to additional levels of programming for troubleshooting and resetting the programming.

This is the first screen of the display: Temperature Overview



Line 1 indicates the screen title, in this case **Temperature Overview**.
Line 2 indicates the operable brew group(s) and the associated temperature(s).
Line 3 indicates the operations of brew groups 3 and 4, if applicable.
Line 4 indicates the steam tank temperature to the left and error codes (if any) to the right.

On Line 2 of this Temperature Overview display screen, brew group 1, represented as BG1, is reading 'LOW'. This indicates that BG1 is below the temperature probe's ***set range*** of measurement (170F-270F / 76.6C-132.2C). If the BG1 heating element is on (element breaker in the left position) for longer than 15 minutes, and the indicator continues to read 'LOW', refer to the error indicator on line 4. Check Error Log Codes on page 26 if needed.

The lowest ***programmable*** temperature is 180F (82.2C) and the highest ***programmable*** temperature is 220F (104.4C). The factory set temperature is 203F (95C). To change brew groups' factory set temperatures, refer to page 21.

The steam tank reading on line 4 will normally read the factory default setting of 250F(121.1C). To change this temperature, see page 23.

The [OK] on the right hand side of line 4 is indicating that there are no errors being detected by the control system. If, in place of the [OK] you find an error code (EX: AABB##), refer to the Error Log codes on page 26.

To cycle to the next display screen in the menu level, the 'BG 1 Temperature Control' screen in this case, press the button to the left of line 1.

PROGRAMMING

This is the second screen of the display: **BG1 Temperature Control**

Line 1 of the BG1 Temperature Control screen indicates the current temperature being recorded by the first position brew group's temperature probe, LOW in this example. Once this temperature reaches the set point, it will continuously cycle up and down by small increments as the electronics balance the temperature.
Line 2 is indicating the set point of 203.0F (95.0C).
Line 3 indicates the length of time that the stage 1 timer (timed preinfusion) will run.
Line 4 indicates the length of time that the stage 2 timer will run. This option will ONLY be available on machines that are equipped with pump bypass systems. See page 22 for more information.

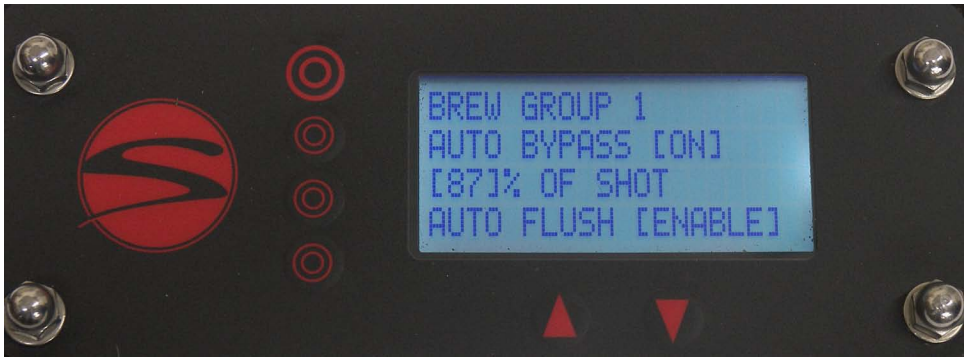
To change the temperature set point, press the button for **line 2**. The current temperature setting (203.0F) will begin to flash. To alter the temperature, press the '▲' or '▼' buttons until the desired temperature is reached. Press the button to the left of line 2 to confirm the temperature point. The number will stop flashing.

Line 3 indicates the amount of Stage 1 or "Line Pressure Pre-infuse" time that will elapse before the pump is initiated. Line pressure can be altered with either a pressure regulator or a boost pump.
To change the Stage 1 time, press the button associated with line 3. The current time will begin to flash. To alter the time on the indicator, press the '▲' or '▼' buttons until the desired time is reached. Note, setting the Stage 1 timer to 00 will automatically set the Stage 2 timer, if present, to 00). Once the desired time is reached, press the line 3 button to save the Stage 1 time. The number will stop flashing. If a time is set for Stage 1, the user will be able to activate the timed preinfusion program by moving the group head handle all the way to the left into the brew position. The brew valve will open and the pump will turn on after the designated number of seconds for Stage 1 time have elapsed.

Line 4 indicates the amount of time that the pump bypass (if present) will operate. Stage 2 time begins once the Stage 1 time has finished. Operating the bypass while the pump is running, as occurs in Stage 2, allows a settable, reduced pressure point between line pressure and pump pressure. To change the Stage 2 time, press the button for line 3. The current set time will begin to flash. To alter the time on the indicator, press the '▲' or '▼' buttons until the desired time is reached. Once the desired time is reached, press the button associated with line 4 to confirm the Stage 2 time. The number will stop flashing.

To cycle to the next display screen in the menu level, press the button next to line 1.

PROGRAMMING



This is the third screen of the display: **BG1 Auto-Bypass and Auto-Flush**

Line 1 indicates the brew group to be adjusted.
Line 2 indicates whether the automatic bypass is currently [ON] or [OFF]. **This feature is only available on volumetric machines with bypass hardware installed.**
Line 3 indicates the percentage of the shot that will be completed before the bypass turns on. **This option only appears when the 'Auto Bypass' indicator on line 2 is set to [ON].**
Line 4 indicates the option to do an automatic back-flush.

To program Auto Bypass, press the button associated with line 2. The indicator ([ON] in this case) will begin to flash. Use the '▲' '▼' buttons to select [ON] or [OFF]. Press the line 2 button again to confirm the selection. If the Auto Bypass on line 2 is set to [OFF], nothing will be displayed on line 3.

To set the percentage level on the bypass, press the button associated with line 3. The percentage indicator will begin to flash, showing it is ready to be adjusted. Use the '▲' '▼' buttons to select the desired percentage, followed by the line 3 button once again to confirm the selection. The bypass will now turn on after the selected percentage of the shot is completed.

The **Auto Flush** can be activated by pressing the button associated with line 4.

Volumetric: If the machine has volumetric capabilities, the indicator lights on the button pad of the brew group selected will all light up. Place the portafilter used for back-flushing into the selected brew group and press any button on the lit pad. The machine will now back flush 10 seconds on, followed by 10 seconds off for 5 cycles. While cycling, the button pad lights will go into chase mode to let you know it is currently engaged in the Auto-Flush process. Once the Auto-Flush is completed, remove the portafilter and thoroughly clean the diffuser screen. The machine is now ready for use.

Manual: If the machine does not have volumetric capabilities place the portafilter used for back-flushing into the selected brew group and turn the actuator to the on position. The machine will now back flush 10 seconds on, followed by 10 seconds off for 5 cycles. Once the Auto-Flush is completed, turn off the brew group to allow it to reset, remove the portafilter and thoroughly clean the diffuser screen. The machine is now ready for use.

The Auto-Flush can be interrupted mid-cycle by pressing any button on the selected brew groups button pad (with a volumetric machine) or by turning the brew group actuator to the off position (on a manual machine). Interrupting the program will cancel the auto-flush process, turning the indicator on the control panel back to [Enable], and resetting the program.

PROGRAMMING

(**NOTE:** Options for adjustments to brew groups 2, 3, and 4, if applicable, will appear on the following screens of the control panel interface. Adjustments for 'Temperature Control' as well as 'Optional Features' on these brew groups will be the same as the instructions for brew group 1. These screens are omitted from this manual for simplicity.)

Line 1 The **Steam Tank Temperature Control** screen indicates the current temperature being recorded by the steam tanks temperature probe, 216.9F in this example. Once this temperature reaches the set point, the digital display will continuously cycle up and down by small increments as the electronics balance the temperature.

Line 2 is indicating the factory set point of 250.0F (121.1C). The adjustable set range for the steam tank is between 170F and 270F (76.6C and 132.2C).

Line 3 and 4 are indicating that loops 1 and 2 of the elements are activated.

To change the temperature set point, press the button next to line 2. The current set temperature (250.0F), will begin to flash. To adjust the temperature settings, press the '▲' or '▼' buttons until the desired temperature is reached. Press the button next to line 2 to confirm the new temperature point.

To turn off loop 1 or 2 of the element, press the button associated with the appropriate line. The indicator reading [Active] will begin to flash. Press either the '▲' or '▼' button to select [off], followed by the line 3 or 4 button accordingly, to confirm the selection.

Turning off either loop 1 or 2 of the element can be used as a troubleshooting procedure and is not a recommended method of energy conservation.

To cycle to the next display screen in the menu level, press the button next to line 1.

PROGRAMMING

Line 1 indicates that you are on the **Hot Water Tap** control screen.

Line 2 indicates the settable amount of time that the hot water tap will run before shutting off.

Line 3 gives the option of setting the hot water dispersion time by activating the tap and letting the water flow, then shutting it off. The machine will retain the duration of this pour and dispense for the same length of time when the hot water switch is activated.

To change the 'Hot Water Tap' time by tenths of a second, press the button associated with line 2. Use the '▲' '▼' buttons to select the desired time, followed by the line 2 button once again to confirm the selection. The hot water tap will now dispense hot water for the allotted amount of time.

By selecting the **line 3** 'Program Time' you may set the desired time by placing the cup size you wish to fill under the hot water tap, press the hot water button on the top of the machine, let it reach the desired level and then press the hot water button again. This will automatically set the amount of water just dispensed as the 'Program Time', and the actual time in seconds will appear on line 2.

To cycle to the next display screen in the menu level, press the button next to line 1.

PROGRAMMING

Line 1 of the **Serial Number Display** indicates the software revision number (Ex: v1.04)

Lines 3 and 4 on the display will indicate the serial number given to this machine.

This screen will show when starting up the machine. Please have this number available if you contact technical support to aid in more rapidly identifying your machine.

PROGRAMMING

Error codes are displayed here

In an effort to prevent damage to machines and to help operators troubleshoot issues, Synesso has engineered several safeguards into the programming. These codes will help users identify operational issues with the machine, as well as automatically prevent greater problems from occurring. By understanding these codes, operators can remedy issues more quickly.

Error code key

Error codes are in this format: AABB##
AA = system code
BB = subsystem code
= group or section experiencing the issue

BR – Brew System Codes
BV – Brew Valve open time-out (valve has been held open for 5 minutes)
01 through 04 – groups 1-4
OT – Over-temperature (over 220F)
UT – Under-temperature (under 180F for 1 minute while group is trying to heat)
PR – Pump relay is on and timed out (relay coil has been on for 5 minutes)
BP – Bypass valve open time-out (valve has been held open for 5 minutes)

ST – Steam system Codes
LW – Low water probe is dry, meaning it is not in contact with water (an audible alarm will also sound)
FP – Fill probe is dry (water is not touching it) for 1 min (an audible alarm will also sound)
FV – Fill valve open time-out (valve has been held open for 5 minutes)
OT – Over temperature (over 270F)

VM – Volumetric system
UF – Unexpected flow while group is off (leaking or filling)

Example:
After manual back flush, group 2 was not returned to the Off position. After 5 minutes, the machine will register a **BRBV02** and a **BRPR02** error; which translate to “Brew System, Brew Valve Group 2” and “Brew System, Pump Relay is timed out, Group 2” errors. At this time the machine will automatically shut off both the brew valve and the pump relay to ensure they will not be damaged. They will remain off until the group is returned to the off (far right) position, which allows the group to return to normal operation.

SABRE PROGRAMMING

This section contains instructions for programming the volumetric dosing on Sabre machines and on Hybrid machines with Sabre group heads. Basic machine programming is contained in the previous section.

To enter programming mode, press and hold any 2 shot buttons. After 3 seconds, the indicators for each button will illuminate. At this point, you can press the continuous flow (or pitcher) button on one or more groups to ***exclude*** that specific group from programming. This will turn off the upper indicators on the deselected group. A red indicator will remain lit on the deselected group's continuous flow button. Pressing this button again will exit the programming mode. If a group has been deselected in error, you must exit and reenter programming mode to reselect the group for programming.

While in programming mode, press any shot button with a lit indicator to begin a shot. As the shot flows, the indicator at each button receiving a program will blink. Once the desired volume has been reached, press the same shot button a second time to end the shot. The indicator light(s) will turn off. You may now program another button or exit the programming mode. If an error has been made, you may reprogram a button without leaving programming mode. Pressing a previously programmed button overrides the original program.

To exit the programming mode, press any continuous flow button on a deactivated group. As noted above, pressing a continuous flow button on an active group will deactivate it. When you exit programming mode, all lit indicators will turn off.

Notes:

- The continuous flow / pitcher button, does not receive a program. During normal operation, pressing the pitcher button will stop a currently flowing shot, or start a continuous flow of water from the group.
- Any stage 1 or 2 times (see Programming, page 21) set up prior to entering programming mode will be active during programming. This does not affect the total volume of water dispensed.
- Shot timers, if present, are not active during volumetric programming. The timers return to normal function once the machine leaves programming mode.

SABRE PROGRAMMING

Auto-volumetric bypass:

- When turned on, this feature engages the low pressure bypass valve at a set percent of the brewed shot. For example, when set at 80%, the bypass will engage once the flowmeter has determined that 80% of the shot has been dispensed. This will increase the shot time, but not the total shot volume. The machine must be equipped with pump motor bypasses as mentioned on Page 19. Pump bypass programming is covered in the basic programming steps on Page 22.

Errors:

- If a shot button is pressed but flow is not detected by the flow meters, the two indicators on the pitcher button will light and flash. If the inadequate flow persists for another 30 seconds, the brew valve will close, cancelling the shot. The indicators will continue to flash until the low flow error has been acknowledged by pressing the pitcher button. Once the error is acknowledged, the group returns to normal operation mode. The most common reason for this error will be grind/tamp mistakes, but in rare cases, the incoming water may be restricted. If this error occurs frequently, please check the incoming water lines.

HYDRA / HYBRID

The Hydra is essentially a machine with an individual pump and motor per group head. For example, on a 2 group machine, the machine would come with 2 pump and motor combinations, complete with 2 sets of electrical and plumbing for the 2 motor/pump combinations. This allows the operator to set a separate brewing pressure per group head, and each group functions independently without affecting the other groups.

Hydras can be built as fully manual machines (multiple manual group heads) or fully volumetric (all group heads have programmable keypads), or a mixture of group heads to match your requirements. Hydras with mixed group head configurations are referred to as Hybrids.

Hydra Installation requirements:

Electrical:
The Hydra package has a slightly greater amp draw than the single pump machines; please note the max amp draws and plan your electrical installation accordingly:

- 1 group: 20 amp
- 2 group: 30 amp
- 3 group: 40 amp

Each pump motor has a distinct color code, which is indicated throughout the machine by colored zip ties. The colors are unique to their specific group and will indicate which group they belong to throughout the machine.

The colors are as follows:

- Group 1: Grey
- Group 2: Purple
- Group 3: Brown
- Group 4: Orange
- Water inlet for the steam tank: Pink

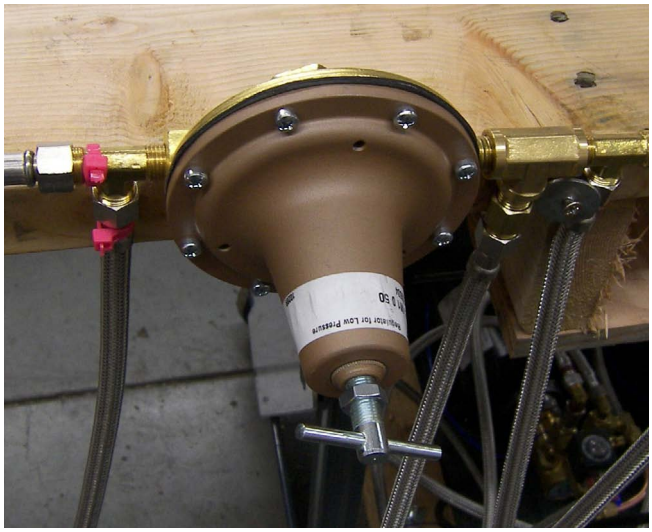
Wherever these colors are seen, they indicate which group they belong to. It is critical for proper functioning that the colors are matched up correctly (grey to grey, etc.) for both electrical and plumbing.

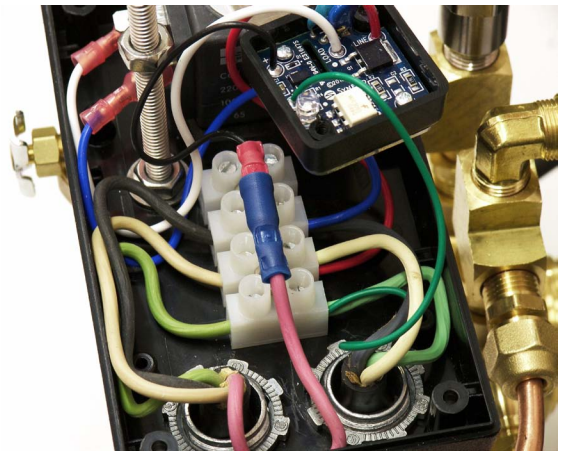
Plumbing:
Hydra packages require one incoming water source like single pump machines. The water passes through a manifold and is distributed to the appropriate hoses. Once again, follow the color coding for proper installation of the plumbing hoses.

Options:
The Hydra has optional features which can be installed at the time of manufacture. These options include LED Shot Timers for any or all groups and 4-Stage Pressure Ramping, which requires the addition of bypass motors and an in-line pressure regulator. Please see Page 19 for more information about these options.

Hydra Bypass Installation and Setup

The Hydra has the capability of achieving Four Stage Pressure Ramping by coordinating the use of mechanical function as well as electrical control.





Pump Installation: Insert the color coded pump cable into the opening of the appropriate bypass box and attach the wires to the terminal as shown in the picture above: Green to green, white to white/red, black to black/blue, red to small black.

Pressure regulator: Used to achieve the stage 1 low pressure pre-infuse, it is set and tested at 50 psi in the Synesso factory. This pressure setting is only a guideline and can be altered if desired. If you wish to adjust the pressure regulator, this can be done by first loosening the nut on the threaded post. Then turning the post clockwise to increase pressure, or counter-clockwise to decrease pressure.

Pump Bypass: Once the Pressure Regulator has been set to a stable flow, the bypass may be set. This is done by turning the associated brew group to position 2, then back to position 1. The butterfly valve on the pump may then be adjusted until the brew gauge indicates the desired setting. All bypasses are set between 7 1/2 - 8 bar at the factory.

The Stage 1, Pre-infuse time and Stage 2, Bypass time may now be set on the Temperature Control screen of the display by following the directions on page 21. It is suggested that the Stage 1 pre-infuse time be set to 7 seconds initially and that the Stage 2 Bypass time be set to 3 seconds. These times are viewed as good starting points and should be adjusted according to personal preference.

Once these components are in place and set you will be able to see the effects of four stage pressure ramping applied to each shot. Turn the group top actuator to position 2, to initiate the Stage 1 pre-infuse timer. In this stage low pressure water will slowly saturate the coffee puck, helping to prevent channeling. After the set time has elapsed the pre-infuse time will end and the stage 2 bypass will begin. In this stage the bypass will help create a slow rise in water pressure by preventing the pump from running at it's full, set capacity. After the bypass time has ended the pump will run up to stage 3, full pressure (9 bar). This will achieve full extraction. Stage 4 is determined by the operator and is achieved by moving the group top actuator back to brew position 1. This activates the bypass once again in order to decrease the water pressure, creating a slow ramp down from full pressure, helping to maximize the shots full potential before turning the group off.

WARRANTY

Limited One-Year Non Wearing Parts Warranty

Synesso, Inc and/or your Distributor warrants to the original purchaser that Synesso espresso machines are free from defects in materials and workmanship under normal use and service for the period commencing upon the date of shipping and continuing for 12 months from the original date of shipment. Synesso will make a good faith effort for prompt correction or other adjustment with respect to any non-wearing part that proves to be defective within the limited warranty period. This Limited Warranty is conditional upon proper use of the machine by the purchaser.

This Limited Warranty does not cover defects or damage resulting from: accident, misuse, abuse, shipping damage, neglect, unusual physical, electrical or electromechanical stress, unauthorized customer modifications or improper water filtration.

Proper water filtration and regular filter changes are a requirement to keep your factory warranty valid and your machine functioning properly. It is highly recommended that you contact a professional water filtration specialist in your area and have your water tested to determine the proper filtration system. It is important to note that many municipalities change their water sources throughout the year, so additional water tests may become necessary.

Water Standards to keep your warranty valid:

Total Dissolved Solids (TDS)	30 to 200 ppm (parts per million)
Total Hardness - in ppm	Less than 85 ppm
Total Hardness – in grains	3 to 5 grains (divide ppm by 17.1 to get grains)
pH	6 pH to 8 pH
Chloride	0 ppm – any Chloride can be corrosive and damage the boilers
Total Alkalinity	Less than 100 ppm
Chlorine	0 ppm
Iron	0 ppm

In Synesso's experience, Everpure Claris and Cirqua formulator systems can produce a result that can damage the Synesso boilers. Use of either of these systems is discouraged, and will void the water-related parts of the machine warranty.

Any part which is determined to be defective in materials or workmanship should be returned to Synesso or to an authorized service location, shipping costs prepaid, as Synesso designates. Synesso may repair or replace the product or part with new or factory refurbished equipment at Synesso's sole discretion. If the product or part is determined to be defective and in compliance with the Limited Warranty conditions, the replacement part or product will be returned to the purchaser with shipping prepaid **.

WARRANTY

Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from area to area. While Synesso attempts to assure that its products comply with such codes, it cannot guarantee compliance and cannot be responsible for how the product is used or installed.

Synesso's liability is limited to the purchase price of the product and shall not be held liable for damages that extend beyond the product itself. Synesso's liability of consequential, incidental damages, indirect or direct damages for personal injury, inability to properly use this product, loss of business profits or interruption to business is expressly disclaimed.

** Regarding equipment sold or residing outside the United States: purchaser maybe required to pay for the shipping and associated costs for warranty parts, repairs and services. Please contact your local distributor to resolve the issue regionally, if possible.