

# MVP & MVP HYDRA

## OWNERS MANUAL VERSION 2018.1

Last Revision: October 2018



**3 Group MVP**

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# INTRODUCTION

**These are original instructions.** 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 Contract Information:

Synesso™ Inc.  
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Seattle, WA 98108 - USA  
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E-mail: info@synesso.com  
Web: www.synesso.com  
Twitter: @SynessoFactory  
Instagram: Synesso\_factory

Please WRITE your Serial Number & Offset Information here. This can be found on the 2nd & 3rd Menu Levels of the Display Controller. Have this available BEFORE calling for service or technical support.

S/N: \_\_\_\_\_

The offsets for this machine are:

BG1: \_\_\_\_\_ °F / BG2: \_\_\_\_\_ °F / BG3: \_\_\_\_\_ °F

Steam Tank: \_\_\_\_\_ °F

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

- Thumb Drive containing the Owner's Manual, MVP Series Video and other technical documents
- Pump/Motor Combination + hoses (3/8" compression fittings on all hoses)
- 8' Flexible 3/4" ID drain hose + hose clamp (attached)
- Fitting, 1/4" male NPT x 90° x 3/8" Compression (if not CE/C-Tick)
- Accessory Package: Portafilters (per customer specification), blind basket, Synesso™ 3 oz. (90ml) shot glass, JoeGlo™ cleaning kit, 58.4mm 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 starting on page 8 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. The number can also be read on the display during start-up. Please have this serial number available for reference when contacting the factory.

This manual applies to Synesso™ models: MVP and MVP Hydra machines. The MVP machines can be configured to operate any group head as manual, manual with a program and full volumetric with a program that includes adjustable total water volume. The MVP Hydra machines have an individual pump and motor per group head and come standard with Bypass hardware and a Pressure Regulator for 4 Stage Pressure Ramping.

# 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 are 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) or more; Use caution near steam tank.
- 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:	<p><b>WARNING:</b> Disconnect from power supply before servicing</p> <p><b>AVERTISSEMENT:</b> Couper l'alimentation avant l'entretien et le dépannage.</p>	California only:	<p><b>CALIFORNIA PROPOSITION 65 WARNING</b></p> <p><b>WARNING:</b> This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law require this warning to be given to customers in the State of California)</p>
Electrical	<p>The conductors of the power supply cord are marked "L1", "L2" for the ungrounded ("hot") supply conductors and "G" for an equipment grounding lead.</p>		<p><b>Warning: Risk of Fire.</b> Use UL Listed Grounding Type Plug rate for 220 Volts, _____ Amperes, _____ Phase, # _____ Wire. Plug to be Selected and Installed only by Qualified Service Personnel.</p>
Under drain tray	<p><b>This equipment is to be installed to comply with the applicable federal, state or local plumbing codes.</b></p>		

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 pressure tested to 75 psi
- The electrical system is subject to an electrical withstand test of:
  - 1.20 kvac, at 5.00 mA, for 1 second

# BREW & STEAM TANK SAFETY

## Safety Precautions:

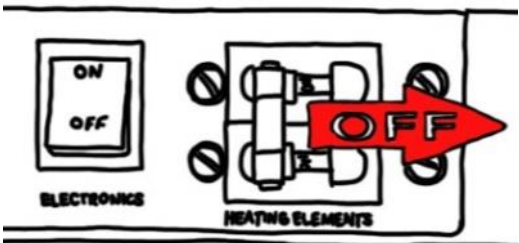
Espresso machines have numerous potential hazards, and it is of paramount importance to Synesso™ that people servicing our machines take all necessary precautions to ensure their personal safety. When working on the machine's boilers (unless otherwise instructed in the directions):

- Turn the machine off and shut off the incoming water supply.
- Depressurize the boilers as shown below.

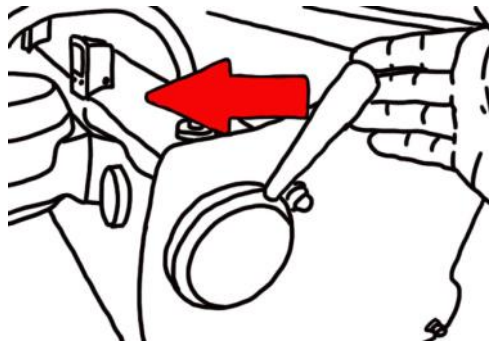
When working on any electrical wiring (unless checking voltage or amperage readings or otherwise instructed in the directions) ensure that the machine is switched off at the electrical box and the machine is unplugged.

## Depressurizing the Steam Tank:

1. Turn off the element circuit breaker located under the machine



2. Open the steam valve by moving the steam actuator lever forward

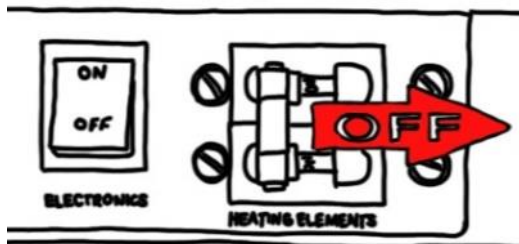


3. The steam tank is depressurized when the steam gauge reads zero. Note: the steam gauge is rated @ 0-60 psi



## Depressurizing the Brew Tanks:

1. Turn off the element circuit breaker located under the machine.  
2. Also turn off the water supply to the machine.



3. In the second level menu, change the brew valves from "Normal" to "ON" this will bleed the pressure.



Normal to On

4. The brew tanks are depressurized once the pressure gauge reads zero. Note – the brew gauges are rated at 0-300 psi



## START UP SCREEN



When cycling the power on, this screen is shown momentarily. It displays your software version and your serial number.

Understanding the information displayed in the serial number. i.e.: 301142030

3 - is the number of groups on this machine (this is a 3 group machine)

01 - is the month it was built (Jan is 01)

14 - is the year it was built (14 is the year 2014) & 2030 is the machine sequence number

## RECOMMENDED TOOLS & SUPPLIES

### **Tools and recommended items required to fully diagnose, service and maintain Synesso espresso machines.**

- Multi Meter – reads volts, amps and ohms (The Fluke T5-600 is recommended)
- Heat Shrink Gun or Torch
- Vacuum with a Hose
- Compressed Air
- Descaler – Citric Acid
- Flashlight
- Box Knife
- Thread Sealant – Red and Blue Loctite
- Food Grade Grease (Super Lube) 1.8600
- Tube Bender for 1/4", 5/16", and 3/8" Tube
- Flare Tool - 45°
- Tube Cutter
- Brass Bristle Wire Brush
- 3/8" Drive Socket Wrench with 7/16", 1/2" and 9/16" "Deep Sockets"
- Hammer Medium Size Ball Peen
- Wire Stripper / Crimper
- Small Punch and Chisel
- Small Files – Round and Triangular
- Picks – Straight and Curved, an Ice Pick is great for replacing portafilter gaskets
- Dies: 1/8" NPT, 1/4" NPT, and 1/8" BSPP
- Taps: 8-32, 10 - 32, 3/8 – 16, and M6 x 1 bottoming Tap
- Allen Wrenches: 3/32", 1/8", 9/64", 5/32, 3/16", 1/4" (steam valve seat)
- Wrenches: 2x11/32, 1/4, 5/16, 3/8, 2x7/16, 1/2, 2x9/16, 5/8, 11/16, 3/4, 12mm & 17mm
- Adjustable wrenches: Medium size 1 1/4" opening and Small for tight spots
- Pliers: Channel Lock, Standard pliers and Side Cutters
- Philips Head Screwdrivers: #2 short, #2 long and #1
- Flat Head Screwdrivers: #2 short, #2 medium length, #1 medium, #0 medium
- A large flat head screwdriver (or small flat nail puller) to use as a pry bar or wedge.
- Pen and paper

# WARRANTY & WATER STANDARDS

## Limited 2 Year Plus 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 24 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.

## The 2 Year Plus Warranty\* will cover all non-wearing parts including:

- Universal Brew Tank
- Steam Tank
- Marathon Motor
- Fluid-o-Tech Pump

## In addition to the standard 2 Year Plus Warranty\*, Synesso will cover the following items under a Limited 5 year Warranty:

- Group Head Assemblies
- Steam Valve Actuator
- Machine Body
- Machine Frame
- Sight Glass
- Heating Elements
- Wire Harness
- Flow Meters

## Wearing parts not included in the 2 Year Plus Warranty\* are:

- Portafilter Gaskets
- Portafilter Baskets
- Portafilter Springs
- Group Diffuser Screens
- Steam Valve Seals
- O-Rings or Seals

**\*To obtain the 2 Year &/or 5 Year Plus Warranty, the annual Preventative Maintenance Guide and checklist must be completed by a qualified Synesso Technician. After twelve months from the original date of shipment, the completed checklist must be emailed to the Synesso Technical Support Department. [ Tech@Synesso.com ] Checklists must be received before the thirteenth month from the original date of shipment in order to be valid.**

**See page 9 for the Annual Preventative Maintenance Checklist.**

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	6.5 pH to 7.5 pH
Chloride	5-15 ppm – any Chlorides can be corrosive and harmful
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 stainless steel tanks. Use of either system is highly 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 \*\*.

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.



## Annual Warranty Checklist

- Replace portafilter gaskets**
  - 8.4mm = 1.3440 (standard size)
  - 9.0mm = 1.3430 (for older handles with worn ears)
- Replace group diffuser screens**
  - Synesso reinforced screen 1.3292
- Inspect portafilter baskets for wear or damage. Replace if necessary**
  - 14 gram basket=1.7000
  - 18 gram basket=1.7090
  - 21 gram basket=1.7170
- Rebuild or replace steam valves. Clean and lubricate wand pivot ball and pusher face**
  - Rebuild kit = 1.7320
  - Complete valve = 1.4501
  - Remove and clean steam tips
- Remove side and splash panels, inspect tanks, copper tubes, and all fittings for leaks**
- Inspect and replace all ruby flow restrictors and brew valves**
  - Ruby jet replacement kit = 1.3191
  - Brew valve = 1.2460
- Inspect brew valve drain manifold. Replace worn or cracked drain hose**
  - Drain manifold black hose= 1.3261
- Check flow rate at each brew group. 2 oz water in 6-8 seconds**
- Test consistency and accuracy of volumetrics across all groups**
- Check that expansion valve does not leak at 9bar. 11-12 bar is the factory standard setting**
  - Expansion valve = 1.4070
- Check line, bypass, and pump pressures**
- Replace steam tank vacuum breaker**
  - Vacuum breaker = 1.4265
- Inspect steam tank pressure relief valve (dark spots may indicate leaking). Replace if signs of leaking.**
  - Pressure relief valve = 1.4102
- Depressurize steam and brew systems, check that gauges return to zero. Replace if not accurate.**
  - 0-60psi steam gauge = 1.4083
  - 0-300psi brew gauge = 1.3373
- Remove and inspect level probes. Clean scale build up if necessary**
  - Upper level probe (fill probe) = 1.4111
  - Lower (safety) probe = 1.4112
- Inspect sight glass and drain valve for leaks. Rebuild if signs of leaking**
  - Sight glass repair kit= 1.5880 – current sight glass
  - 1<sup>st</sup> Gen sight glass needs additional 1.5280 o-ring
- Inspect drain hose for clogs or leaks**
- Check element gaskets for signs of leaking, tighten if needed**
- Test handheld controller for proper operation. All buttons react as normal**
- Test steam tank element set points. Cycle each loop of element**

# WARRANTY & WATER STANDARDS

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## INSTALLATION & WORK STATION

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

Site Preparation - See Diagram p.9 . 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.

The counter top requires a depth of 28", which provides a minimum clearance of 1" behind and 3" in front of the machine.

The height of the surface can vary to suit the operator.

Make a 2 ½" minimum diameter hole through the counter top located 4" from the rear and 7" from the right side of the machine. The hoses, drain tube, and electrical lines will all pass through this hole.

A 3/8" min. diameter cold water supply line from the filter with a shut off valve is required within 5' of the machine. The valve should be easily accessed for machine service.

The machine supply hose and pump fittings are 3/8" tube compression fittings.

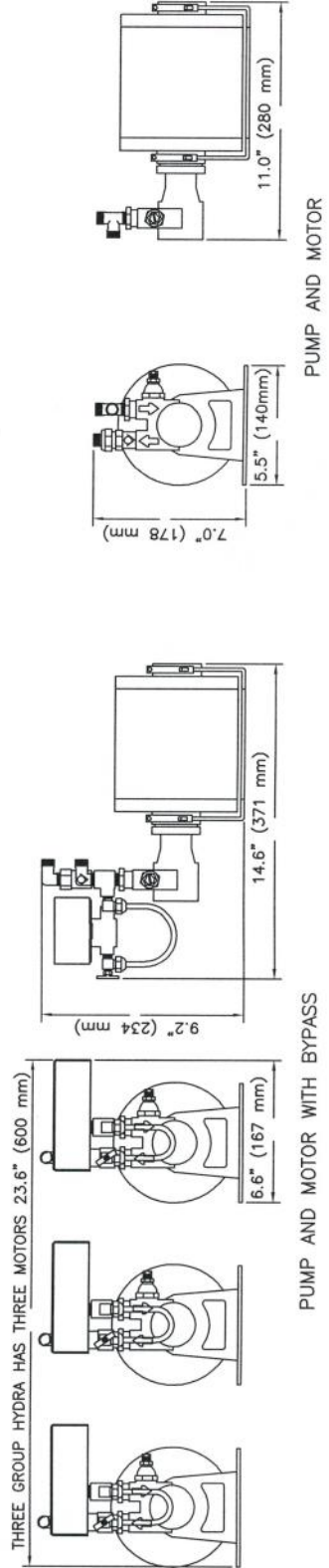
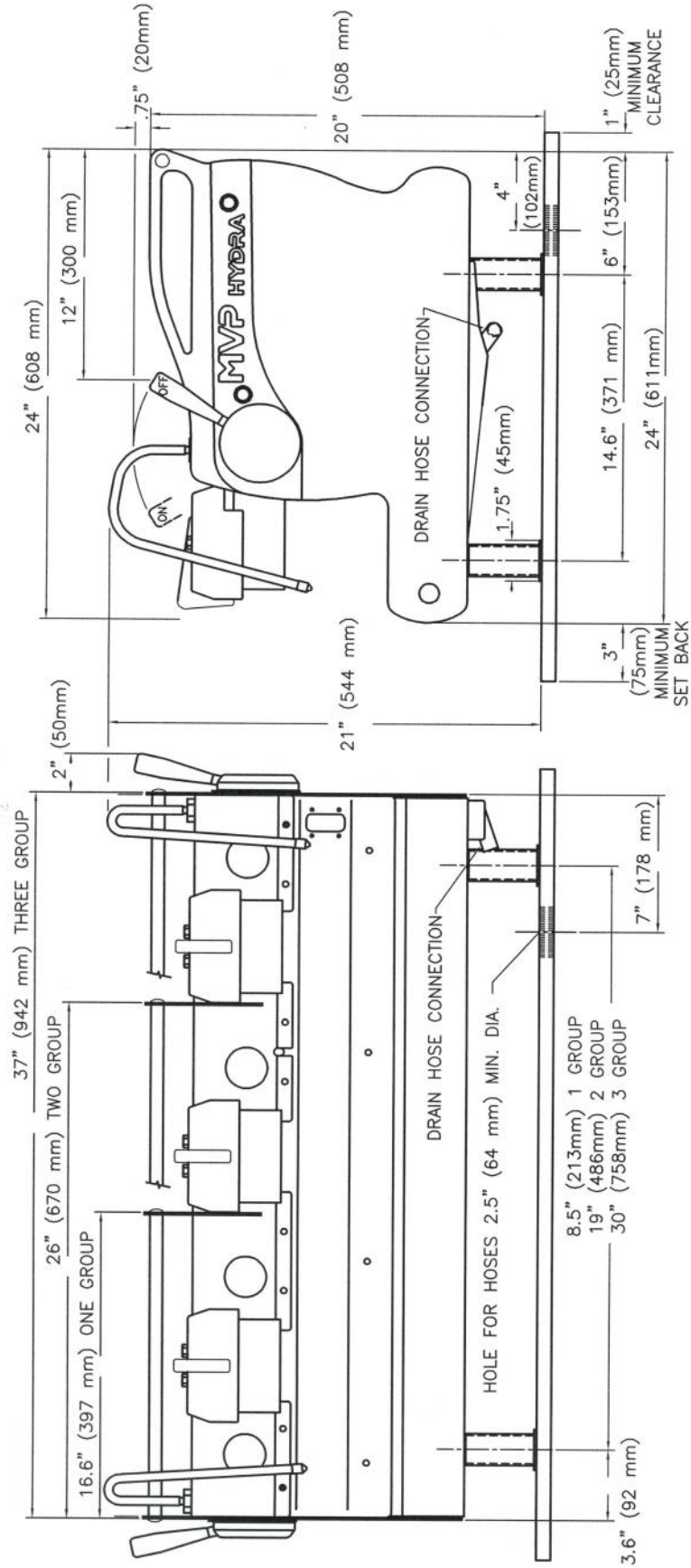
A proper water filtration or softening system must be installed on the incoming water supply. Water treatment requirements will vary, and it is important to use a system designed to match the needs of your specific area. Water filtration systems require periodic maintenance, including cartridge or filter replacement. Proper filtration and service is vital to the function 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 severe damage to the machine including scale deposits and corrosion. **DAMAGE CAUSED BY IMPROPER WATER TREATMENT WILL NOT BE COVERED BY THE MACHINE WARRANTY.** See page 7.

There must be adequate room under the counter to locate each motor and pump. The pumps must be easily accessible for adjustment and motors must have a minimum of 3" clearance on all sides for air flow.

A floor drain or sink must be available. The best location is directly under the machine. The 3/4" drain hose should descend as vertically as possible for optimal drainage. An air gap is required between the end of the drain hose and the highest water position of a clogged drain. This is to prevent the possibility of drain water backing up into the machine.

# INSTALLATION & WORK STATION



## MVP & MVP Hydra - 2 Piece Side Panels



This side panel is shown with the trim plates removed, to display the way the lower panel interlocks with the upper panel.

When removing the Lower Side Panel from the espresso machine:

- Loosen the 2 side panel mounting bolts , but do not remove.
- Remove the Thumb Screw from the drain tray
- Push the panel to the back of the machine while lifting slightly up

This allows the user easy access to the drain box & allows the technician easy access to all water control valves on the water inlet (right) side and to the level probes and thermal switches on the left side.

For the technician to access the steam valve, the Upper Panel must be removed.

When removing the Upper Panel from the espresso machine:

- Remove the 2 side panel mounting bolts completely.
- Each bolt is threaded into a plate fastener inside the frame. **Be careful not to lose the fasteners.**
- The Safari Rack is suspended by, but not threaded onto, short bolts on each side panel. **\*The Safari Rack needs to be supported while removing the Upper Panel.**
- **When reinstalling the side panel, always tighten both bolts to ensure proper grounding and steam valve function.**

# PLUMBING REQUIREMENTS

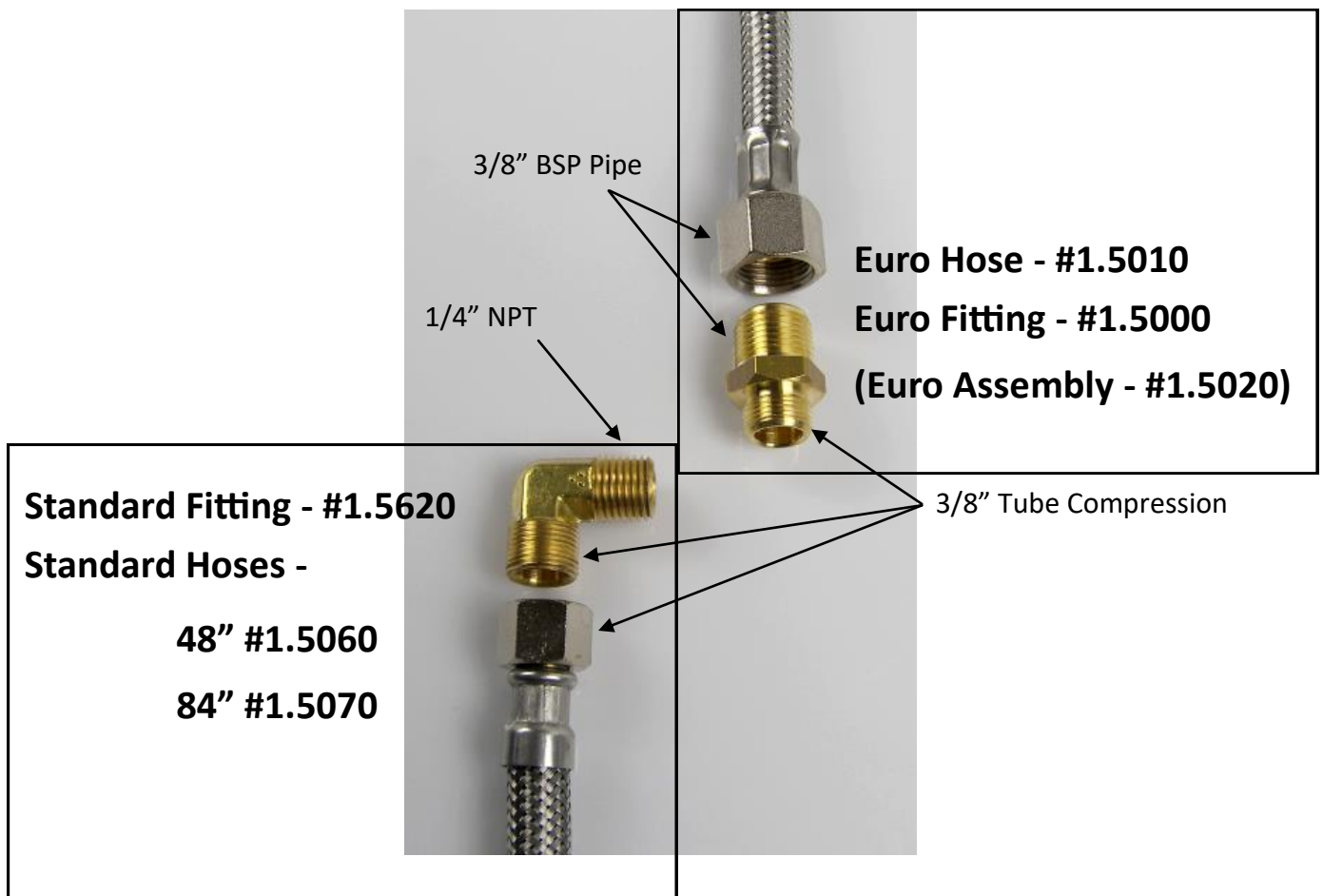
This equipment must be installed to comply with the applicable federal, state or local plumbing codes. WATER TREATMENT IS REQUIRED TO PRESERVE THE FULL MACHINE WARRANTY. Please ensure that the incoming water complies with the warranty requirements listed on page 7.

Using the provided stainless steel braided hose, connect the pump to the shutoff valve on the filtered cold water line. Fittings on the hoses and pumps are 3/8" tube compression. Thread sealant or Teflon tape is not necessary. Make connections snug, but do not over tighten.

Turn incoming water ON and check for leaks.

Synesso™ machines require a minimum of 50 PSI (3.5 bar) of line pressure at 30gal (120L) per hour to have the auto-fill system, for the steam tank functioning properly. Please ensure that the incoming water meets this requirement or contact Synesso™ for alternative methods of boosting water pressure.

NOTE: Synesso™ sells a "Euro-hose" adaptor hose and fitting (part number is 1.5020) 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-style fittings and hoses.



# ELECTRICAL REQUIREMENTS

All Synesso™ machines are rated to operate on 220v / 60 Hz or 230v / 50 Hz frequency, single phase. Machines will operate between 208v and 240v.

Listed amp ratings are all measured at 220v. Incorrect voltage can cause malfunction or damage to the machine. **Plug or means of isolation must be easily accessible.**

An electrical socket and matching plug, rated at the proper voltage and amperage are required within three feet of the machine. Plug ends are NOT included with the machine unless required by CSA or other certification.

Model	Cord Plug Rating (UL Listed)	Machine Max Amp Draw	Machine Max Watts
2 Group MVP	30 amp	28 amp , 220v / 60 Hz	5956 Watts, 230v / 50 Hz
3 Group MVP	50 amp	36 amp , 220v / 60 Hz	7742Watts, 230v / 50 Hz
1 Group MVP Hydra	20 amp	16 amp , 220v / 60 Hz	3141 Watts, 230v / 50 Hz
2 Group MVP Hydra	30 amp	30 amp , 220v / 60 Hz	6219Watts, 230v / 50 Hz
3 Group MVP Hydra	50 amp	40 amp , 220v / 60 Hz	8259Watts, 230v / 50 Hz

North American Wire Color		Worldwide Wire Color	
Green	Ground	Green and Yellow	Ground (Earth)
White	110v Line 1	Brown	230v
Black	110v Line 2	Blue	Neutral

Attach the plug end per manufacturer's instructions.

Make sure that the red electronics switch and the heating element breaker on the front of the electrical box are in the OFF position, then plug the power cord into the receptacle.

OPTIONAL: If recovery time is slow, install an In-Line Buck-Boost transformer to increase voltage below 208v to optimize machine recovery time. Buck-boost transformers come in different sizes. Please choose the appropriate one for your machine if required. 1 and 2 Group Machines require a 1.0 KVA transformer, 3 Group Machines require a 1.5 KVA transformer.

## SPECIAL ELECTRICAL INFORMATION FOR EMC-COMPLIANT MACHINES

(C-TICK FOR AUSTRALIA, 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 or isolate the machine with the electronics ON/OFF red rocker switch in the ON position.**

# MVP HYDRA PACKAGE REQUIREMENTS & INSTALLATION

## MVP 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. See table on page 12.

Each pump motor has a distinct color association, which is indicated throughout the machine by colored wires and zip ties. The colors are as follows:

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

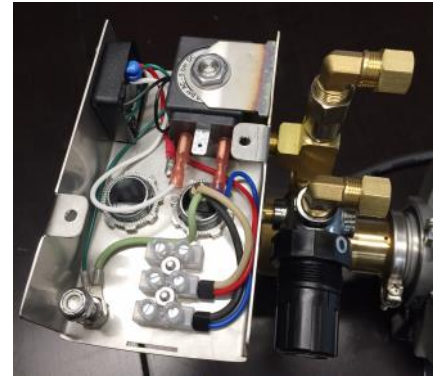
Wherever these colors are seen, it is critical for proper machine function that they are matched up correctly (grey to grey, etc.) for both electrical and plumbing systems.

### Plumbing:

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

## Pressure Regulator Plumbing & Bypass Box Wiring:

Manifold for MVP Hydra



Pump cord installation: Insert the color coded pump cable into the opening of the matching bypass box and attach the wires to the terminal: green wires stacked on the ground bolt, white to white/red, black to black/blue, connect the bullet connectors.

Pressure regulator: Used to achieve the stage 1 low pressure pre-infusion. It is set and tested at 50 psi in the Synesso™ factory. This pressure setting can be lowered if desired, but 50psi is the maximum output pressure. To adjust the pressure regulator, pull black knob out and turn clockwise to increase pressures. Turn counter-clockwise to decrease pressure. Push knob back in to lock setting.

# START UP

## Start-Up Instructions

1. To fill the machine, connect the water lines, connect 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:
  - Hold each brew group handle left until the corresponding display reads M: shift each group head handle left momentarily, (see pictures below) allow the group to run until there is a steady flow of water. Shift each group head right to turn off.
5. Wait until the steam tank has stopped filling and the level in the sight glass reads at least  $\frac{1}{2}$  full. Turn the heating element breaker to the ON or (1) position. All the heating elements (brew and steam) are now activated.
6. To adjust the pump pressure, activate the pump by shifting the brew group handle momentarily left two times on MVP and three times on MVP Hydra.
7. Locate and read the pump pressure / brew gauge located to the right of the rightmost group on MVPs and to the right of each group on MVP Hydras.
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 the 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.



Center Position - At Rest



Shift Left - Start or Advance  
Hold Left - changes M to MP to VP



Shift Right - Off or  
Select Brew Program



## MVP HYDRA BYPASS SETUP



**Pump Bypass:** With the brew group in M mode, turn the associated brew group actuator momentarily to the left. Adjust the regulator to control pre-infuse pressure. Turn left twice in a row and adjust the pump pressure (typically 9 bar.) Finally, turn left once more and adjust bypass pressure using the pin valve at the pump. Adjust to taste (factory setting is 7 bar.)

The pre-infusion time and ramp up, or bypass, time are set on the Temperature Control screen of the display by following the directions on pages 20-21. Press the button next to the line to be adjusted and use the up and down arrows to adjust the set time.



With these settings in place, you can taste the effects of pressure ramping applied to each shot. The shot begins with pre-infusion. Low pressure water saturates the puck, swelling it to reduce channeling. After the pre-infuse time has elapsed, ramp up (bypass) begins. The bypass system creates a slow rise in water pressure by partially diverting water away from the brew group. After the ramp up time ends, the bypass closes and a brew pressure (9 bar) stage begins. Ramp down returns to bypass pressure. When in M or MP mode, the operator enters ramp down by moving the group top actuator momentarily to the left. Volumetric groups can be programmed to automatically begin ramp down at a set percentage of the shot as described on page 20.

## MVP & MVP HYDRA INTRODUCTION

The MVP Hydra is a machine model with a pump and motor for each group head. The MVP Hydra has internal plumbing and wiring to accommodate separate and distinct pressures in each brew group. In contrast, an MVP has a single pump and motor for the entire machine. Having individual pumps and motors allows the operator to control brewing pressure at each group head, and each brew group functions independently without affecting the pressure at the other groups.

MVP Hydra groups can function in Manual mode (M) with full manual control, in Manual Program mode (MP) with timed pre-infusion and pressure ramp up, or in Volumetric Program mode (VP) with programmed pressure ramping. Any group head can be changed on the fly to any configuration at any time.

### Last Shot Brewed:

The MVP and MVP Hydra have a storage feature where the last brewing function is stored in a temporary memory. This applies to any brewing function. If you quickly purge a screen, this will be stored as the last shot brewed. If you manually brew an espresso that is perfect, this is the last shot brewed. The following functions do not change the memory of the last shot brewed:

- Turning on save mode (hold any brew group handle right for 2.5 seconds)
- Shifting thru the 6 available programs (momentary presses of the brew group handle to the right)
- Saving (momentarily pressing the brew group handle left from within save mode)
- Saving again to additional program locations, on the same, or different groups
- Exiting save mode (hold any brew group handle right for 2.5 seconds)
- Shifting between programs M, MP, VP, by holding the handle on the desired brew group left

When a running group is stopped, the parameters are stored. After shot parameters are saved they can be viewed and altered on the hand held controller. Any alterations are saved as new shot parameters.

# OPERATION

## Prepare a Portafilter

1. For best results, use fresh coffee. Ground coffee should be brewed as soon as possible after grinding.
2. Select the correct spout and basket configuration. Single, double and bottomless portafilters are available through Synesso™. The single spout portafilter is used with a single (7g) basket to brew a single shot. The double spouted or bottomless portafilters can be used with double (14g) or triple (18g or 21g) baskets to brew triple, double, or 2 single shots of espresso.
3. Fill the portafilter basket just above level and wipe off the excess.
4. Press straight down evenly on top of the grounds with the tamper.

NOTE: When not in use, keep the portafilter engaged in the group head to keep it warm.

## Espresso Brewing

1. Grind a dose of coffee appropriate to the basket you will be using.
2. Dispense into the portafilter basket.
3. Level the mound and compress using a tamper. (A tamper is supplied with the machine.)
4. 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.



Hold handle LEFT to change the Operation Mode from M (Manual) to MP (Manual Program) to VP (Volumetric Program).

### M - Manual

5. Pre-infuse the coffee puck by momentarily shifting the brew group left. This allows line pressure to saturate the puck.
6. When a drip shows at the spout (or on the basket if bottomless,) momentarily shift the brew group left again to advance the process. Repeat to continue advancing thru the brewing process until complete.
7. You can end the shot by momentarily shifting the group cap right at any time while brewing.

*If brewing in manual program mode continue to step 8 (Manual Program)*

### MP - Manual Program

8. Manual Program allows a time to be set for pre-infusion (and also for ramp up on MVP Hydra models.) At the completion of the set time the next stage begins automatically. If "0" is selected for the amount of time then the stage will be skipped.
9. When the process has advanced to full pressure brew (9 bar) the operator shifts to the next brew stage

# OPERATION

manually or ends the brewing process manually.

## VP - Volumetric Program

5. Select a program to run by momentarily shifting the corresponding group head right, this will shift through the programs displayed on the shot timer. There are six to choose from. Some may be turned off, and therefore not displayed.
6. Check the program on the hand held controller. Press the down arrow to move to the corresponding group. The program number and pressure times are displayed on the first screen, and the percentage of shot brewed and total water count on the next screen. See pages 20 - 21.
7. The shot will automatically end once the set total water count has been registered.

## Brew Pressure Graph



Pre-infuse Bar

Ramp Up Bar

Brew Pressure Bar

Ramp Down Bar

## Display Functions



Shift LEFT to SAVE to Program 1

SAVE Lockout is ON

Steam Tank, Low Water Level or Low Flow Error

5 Minute Time Out Error or Low Flow Error



6 programs available per group. Only the selected program displays when in use.



MVP Brew Pressure Graph.

# OPERATION

## Milk Steaming

1. Fill the pitcher halfway with fresh, cold milk. Smaller pitchers are recommended for drink sizes less than 10 oz. steamed, unused milk should be discarded.
2. Condensation can collect inside the wand. Activate the steam handle to blow the wand clear before steaming milk.
3. Insert the tip of the steam wand deep into the milk pitcher. This will prevent milk from splashing once the steam is turned on.
4. Open the steam valve by pulling the handle towards you.
5. Place one hand on the side of the steam pitcher to feel the rising temperature of the milk.
6. As the milk agitates and heats, lower the pitcher to keep the tip of the steam wand closer to the surface. Allow the steam jets to push some air beneath the surface, then 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. Remove the wand from the milk, purge with steam, and wipe clean immediately after each use.

**NOTE:** Although Synesso™ steam wands are made with a proprietary double-walled process that helps to keep the outer wall cooler, the tip and base can become very hot and caution must be used.

**NOTE:** Whole Milk, 2%, 1%, Non-Fat, Soy Milk, Rice Milk and other milk type products may require different techniques to foam properly. In general, the higher the fat content, the easier it is to steam.

# PROGRAMMING

This programming section applies to all MVP Synesso™ machines. MVP machines have a hand held (wired) controller, pictured below, to allow the user to comfortably view and change the machine settings.

**To change settings on these screens, first press the line button on the left side of the display associated with the setting you wish to change. The value will flash once selected. Press the up or down buttons until the desired value is displayed. Press the line button again to confirm the change. The value will stop flashing. Use this procedure to change any variables in the controller menus.**



The top line of every screen indicates the title. In this case, Temperature Overview.

**You can return to this screen at any time by pressing the home button at the top right of the controller.** The machine will also return to this screen automatically after a short time.

Lines 2,3,and 4 may contain information or settings, many of which can be changed by the operator. This screen provides the current temperatures for each brew group along with the steam tank. The most recent error will also be shown in the lower right corner. No settings can be changed on this screen.

In some circumstances, numeric temperatures will not be shown. If a tank is reading 'LOW', this indicates that tank is below the temperature probe's effective range of measurement (170F-270F / 76.6C-132.2C). Readings above the effective range will show as 'HIGH'.

The programmable temperature range for a brew group is from 180F (82.2C) up to 220F (104.4C). The factory set temperature is 203F (95C). To change brew group set temperatures, refer to page 20.

The steam tank is set by the factory to a default setting of 250F (121.1C). To change this temperature, see page 21.

The [OK] on the right hand side of line 4 is indicating that there have been no errors detected by the control system. If, in place of the [OK] you find an error code (EX: STLW01), refer to the Error Log codes on page 23.

To cycle to the next display screen, press the down arrow button. (You may press the up arrow instead to travel back to the previous screen.)

# PROGRAMMING

## Factory Settings:

The factory settings for your machine are as follows:

Brew Group Temperature	203°F
Steam Tank Temperature	250°F
Brew Mode	M (Manual)
Right-Hold Save Lockout	Locked
Enabled Programs	1 & 2 Enabled (3-6 Disabled)
Temperature Units	Fahrenheit

### Program 1:

Pre-Infusion	4 seconds
Ramp Up	2 seconds
Ramp Down	92%
Total Water Count	280

### Program 2:

Pre-Infusion	4 seconds
Ramp Up	2 seconds
Ramp Down	92%
Total Water Count	380

## Menu Level 1: Group 1, Program 1



Line 1 of the first brew group control screen indicates the current temperature of the brew tank as measured by its probe. Once this temperature reaches the set point, it will continuously cycle up and down by small increments as the electronics balance the temperature. This line also indicates the active program (PRG1 in this case). Changing the active program will update the settings on lines below.

Line 2 is indicating the set point of 202.0F (94.4C).

Line 3 indicates the length of time pre-infusion is set for in the current program. When starting a shot in MP or VP mode, pre-infusion will allow line pressure water to soak the puck for as long as indicated before moving on to the next brew phase. Setting the pre-infusion time down to 0.0 seconds will skip the pre-infusion phase in MP and VP modes. One step lower than 0.0 is the "MAN" setting, which will require the operator to exit the pre-infusion phase manually in MP mode, and will skip pre-infusion in VP mode.

Line 4 indicates the length time set for the ramp-up phase in the current program. This option will ONLY be visible on MVP Hydra models. Ramp-up time begins once the pre-infusion stage has finished.

To cycle to the next display screen, press the down button.

# PROGRAMMING



Line 1 indicates the brew group and program associated with the settings below.

Line 2 shows the percent of the total water count at which the machine will ramp the shot pressure down. Lowered pressure near the end of the shot will change the extraction rate and alter the flavor of the shot.

Line 3 and 4 show the total water count associated with the current program. As indicated, there are about 4.5 'counts' per milliliter dispensed by the machine. Some of this dispensed water is absorbed and retained by the coffee puck, but generally, if you add 9 counts, you should receive 2 additional mL of water.

To cycle to the next display screen, press the down button.

## Menu Level 1: Steam Tank



Line 1 shows the current reading of the steam tank temperature probe (250.7F 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 set point of 250.0F (121.1C). The adjustable set range for the steam tank is between 200F and 265F (93.3C and 129.4C).

Line 3 and 4 are indicating that the independent loops 1 and 2 of the heating element are active.

NOTE: 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, press the down button.

# PROGRAMMING

## Menu Level 1: Hot Water Tap



Line 1 indicates that you are on the hot water tap control screen.

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

Line 3 gives the option of setting the hot water time on line 2 by activating the tap and letting the water flow, then shutting it off. The machine will store the duration of this pour as the new dispense time.

To cycle to the next display screen, press the down button.

## Menu Level 1: Auto Backflush



Auto backflush can be activated by pressing the line button associated with the group you want to flush. Set the value to “ready”, then place a portafilter equipped with a blind basket into the selected brew group. Shift left on the group head. The selected group will run the brew valve and motor for 10 seconds, followed by 10 seconds off. This will repeat 5 times. The shot timer will count up to 10 to let you know when it is running. Upon completion, the timer will read 10. Remove the portafilter and thoroughly clean the diffuser screen.

If you have used soap or other cleanser during the backflush, run the backflush process a second time with no soap or chemicals to rinse the internal tubing and brew valve. Failure to rinse after a soap backflush can leave soap residue in the brew valve affecting taste and/or machine behavior.

Any number of brew groups can use the auto backflush feature at the same time. The auto backflush can be interrupted mid-cycle by shifting to the left, or right, or by turning the setting on the controller back to “off”.

To cycle back to the temperature overview screen, press the down button.



# PROGRAMMING

## Menu Level 1: Brew System Error Codes



In an effort to prevent damage to machines and to help operators troubleshoot issues, Synesso™ has engineered several safeguards into the programming. By understanding these codes, operators can remedy issues more quickly. The most recent error can be found on the temperature overview screen at the lower right corner.

<b>BR - Brew System Codes</b>	<b>GROUP 1</b>	<b>GROUP 2</b>	<b>GROUP 3</b>	<b>CODE DESCRIPTION</b>
BV - Brew valve	BRBV01	BRBV02	BRBV03	Brew Valve has been on for 5 consecutive minutes
OT - Over Temp	BROT01	BROT02	BROT03	Over Temperature (220°F)
UT - Under Temp	BRUT01	BRUT02	BRUT03	Group reads < 180°F for 1 minute while reheating
BP - Bypass Valve	BRBP01	BRBP02	BRBP03	Bypass Valve has been held on for 5 consecutive minutes
<b>ST - Steam System Codes</b>				
LOW H2O				Low level probe not in contact with water (audible alarm)
LW - Low Water Probe	STLW00	N/A	N/A	Indicates past LOW H2O warning
FP - Fill Probe	STFP00	N/A	N/A	Fill Probe is not in contact with water for 1 minute
FV - Fill Valve	STFV00	N/A	N/A	Fill Valve has been on for 5 consecutive minutes.
OT - Over Temp	STOT00	N/A	N/A	Over Temperature (270°F)
<b>VM - Volumetric System Codes</b>				
UF - Unexpected Flow	VMUF01	VMUF02	VMUF03	Unexpected flow detected while group is off

# PROGRAMMING

There are 3 levels of menus a technician can access through the wired controller:

Menu level 1 described on pages 19-23 contain settings relevant to the day-to-day operation of the machine.

Menu level 2 may be reached from level 1 and contains settings relevant to technicians and machine owners.

**To access menu level 2, first press the home button to return to the temperature overview screen. Next, press and hold the home button. Press and release the 4th line button, then release the home button.**

## Menu Level 2: Lockout



This is the first screen of the 2nd level of menus, the right hold save lockout screen.

Line 3 can prevent the accidental use of save mode. When this setting is “locked”, holding right on the group heads will not enter save mode, instead the shot timers will blink a red error light at the operator.

To cycle to the next display screen, press the down button.

## Menu Level 2: Programs

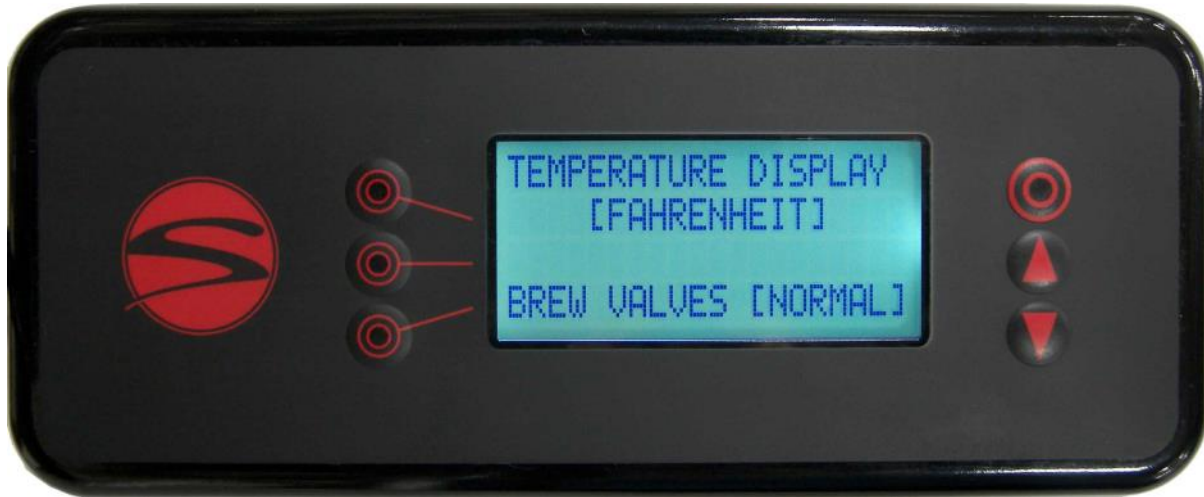


On this screen, you can activate or deactivate program storage positions 2 through 6. Program #1 cannot be deactivated. Shifting right while not brewing a shot will cycle through any program save locations currently active in numerical order. (1->2->5->1... as shown.) This setting is applied to all groups.

To cycle to the next display screen, press the down button.

# PROGRAMMING

## Menu Level 2: Temperature (F or C)



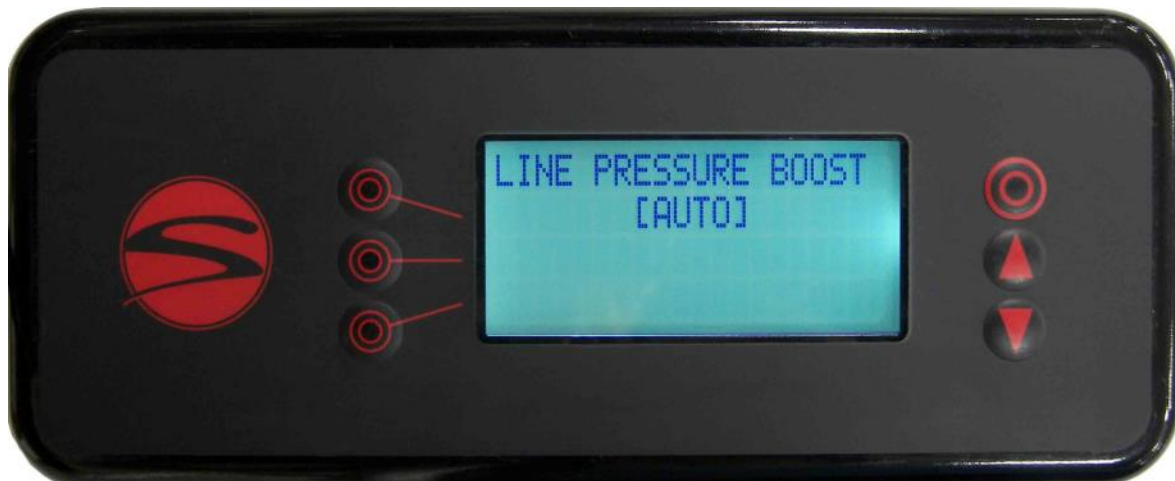
This is the temperature display screen.

Line 2 indicates the Temperature scale that you are currently in (Fahrenheit or Celsius).

Line 4 indicates the operation status of the machine's brew valves.

Setting the brew valve function to [ON] will activate the brew valves, allowing the pressure to be bled from the brew tanks. Once the pressure has dropped, turn the brew valve setting back to [NORMAL] and attach the appropriate drain hose to the brew group's drain tube. Turn the brew valve setting back [ON] once the drain hoses are securely attached. This will allow the water in the brew groups to fully drain in approximately 5 minutes. When the brew groups are finished draining, set the Brew Valve indicator back to the [NORMAL] setting. If the draining process takes longer than 5 minutes, the machine's safety programming will automatically turn the brew Valve indicator to the [NORMAL] setting while exiting back to the temperature overview screen. If more time is needed, return to the Temperature Display screen and set the Brew Valve display back to the [ON] position to finish the procedure. Once finished with the draining procedures, make sure the Brew Valve indicator is set back to the [NORMAL] position. To cycle to the next display screen, press the down button.

## Menu Level 2: Line Pressure Boost



# PROGRAMMING

## Menu Level 2: Line Pressure Boost

If the machine has an optional line pressure boost pump installed, you will see this menu screen, otherwise it will not be shown.

“AUTO” is the setting on line 2 for normal operation. In “AUTO” mode, whenever a brew valve or water control valve is activated, the power board will also trigger a pump relay to run a line pressure generating pump and motor package. If this is set to “OFF”, the line boost motor will not activate. The “ON” setting will run the boost motor constantly. This is factory set to “OFF” to protect the boost pump from running without water.

To cycle to the next display screen, press the down arrow

## Menu Level 2: Brew Offset



Line 2 indicates the measured water temperature at the selected brew group’s temperature probe.

Line 3 indicates the temperature adjustment made at the Synesso™ factory, in order to match the measured temperature with the temperature desired inside the puck.

The Synesso™ testing method is as follows:

Using a bottomless portafilter, dose out 16-18 grams of coffee into a 14 gram basket with a thermal probe inserted 1/8th of an inch from the surface and in the middle of the puck, packing and tamping the grounds in the basket as usual.

The thermal probe is then wired to a FLUKE thermometer to relay the actual temperature of the water flowing through the puck while pouring a 25 second, 2 ounce shot. This process is repeated a minimum of 3 times per brew group in order to get the most accurate readings. The difference between the measured puck temperature and the raw tank temperature becomes the brew offset

This offset should not be altered without thoroughly testing the puck temperature, as mentioned above.

To cycle to the next display screen, press the down button.

# PROGRAMMING

## Menu Level 2: Steam Offset



Line 2 indicates the measured steam temperature at the steam tank temperature probe.

Line 3 is the offset used to calibrate the steam tank temperature and pressure so that when the steam tank is set at 250f, there is 1.3bar pressure on the gauge.

Line 4 of this display screen is showing a 5 second delay. The fill probe will wait this long before turning the steam tank fill valve on or off. Add time here if the machine is in an unstable installation such as a food truck or catering cart. There is no need to drop this time below 5 seconds.

To cycle to the next display screen, press the down button.

## Menu Level 2: System Clock



This is the system clock screen.

Line 2 allows the operator to set the local time in a 24 hour format.

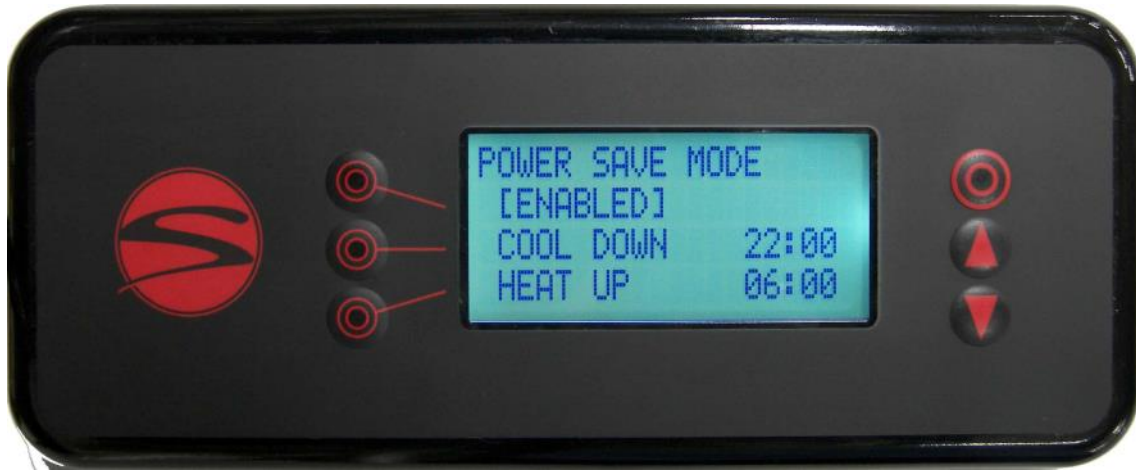
Line 3 and 4 allow the operator to set the current date.

The date and time are used for both the error log and the power saving mode. A small battery on the power board should keep the clock and calendar running if the machine loses power, but it will need to be replaced eventually. Refer to the markings on the battery for replacement info.

To cycle to the next display screen, press the down button.

# PROGRAMMING

## Menu Level 2: Power Save Mode - Enabled



Line 2 of the Power Save Mode in this example is indicating the timers are [ENABLED], making adjustments to lines 3 and 4 available. If line 2 reads [DISABLED], no further settings will be available on this screen.

## Menu Level 2: Power Save Mode - Disabled



Line 3 indicates the settable time at which your power save mode will start, cooling the machine to lower heat levels overnight.

Line 4 indicates the settable time at which your power save mode will end, heating the machine back up to the set points.

Enabling the power save mode will drop the temperature in the brew groups to 180F (82.2C) and the steam tank to 220F (104.4C) when it is active. This will help conserve energy while preventing maintenance issues that occur when machines are turned off and on repeatedly.

While power save mode is active, there is a note on the display which states that the operator can exit power save mode at any time by pressing any button on the wired controller.

To cycle to the next display screen, press the down button.

# PROGRAMMING

## Menu Level 2: Error Log



Line 1 of the error log screen shows how many errors the machine has recorded, up to the 35 most recent errors, and which of these you are currently viewing. This example is showing the second of two errors.

Line 2 indicates the error code. If the error log is clear, this line will simply read 'NO ERRORS' as shown below.



Line 3 indicates the date and time that the last error has occurred. If no error has occurred, this line will be blank.

Line 4 gives the option to scroll through or clear the error log. To view older errors, press the 4th line button once, which will make [SCROLL] flash. Use the up and down buttons to change the viewed error. Press the 4th line button again and [CLEAR] will begin flashing instead of [SCROLL]. Press the 4th line button again to deselect both options.

## Menu Level 2: Error Log



To clear the Error Log, press the 4th line button 2 times so that [CLEAR] is flashing. Press an arrow button to select clear. The 4th line will ask you to confirm clearing the error log as shown below.

Change the flashing [NO] to [YES] to immediately clear the log. Press the 4th line button with [NO] still flashing to exit without clearing the log.

See page 23 for descriptions of the error codes you may see.

To cycle to the next display screen, press the down button.

## Menu Level 2: Return to Operations



This is the last screen in the second level of menus.

Pressing the 3rd line button will take you back to the temperature overview screen in the 1st level of menus.

**Access to the 3rd level of menus is only available from this screen.**

Menu level 3 contains machine configuration settings which do not change over the life of the machine. Technicians will need to access this level only if some major modification has been preformed, or if the main electronics board has been replaced.

**To access menu level 3, press and hold the home button. Press and release the 4th line button, then release the home button.**



# MAINTENANCE

## DAILY MAINTENANCE

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

### **Backflushing**

This process forces water through the inlet tube and drain system. This should be performed on EACH brew group daily.

To Backflush:

1. Replace the filter basket with the 'blind' basket, which has no filter holes.
2. Engage the portafilter, then follow the instructions on page 22 to use the auto backflush function.
3. When using an approved espresso industry detergent during backflushing, follow the manufacturer's instructions. It is extremely important to thoroughly rinse the blind filter basket and repeat backflushing several times with clean water to clear the system of any detergent residue. Failure to rinse can cause valve problems and bad flavor.

**NOTE: NEVER** remove the screen and screw when backflushing. Remove and clean them after backflushing is complete. Do not forget to reinstall.

### **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 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. Tips can be removed to soak.
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 springs before washing.

# MAINTENANCE

## MAINTENANCE SCHEDULE

### Daily

1. Backflush each brew group without detergent throughout the day.
2. Backflush with an espresso industry approved detergent during the final cleaning of the night (or after a busy period), and then again without detergent to rinse.
3. Wipe down the entire machine with a soft cloth.
4. Remove portafilters, baskets and springs, drip tray and grates and clean thoroughly. These items are all dishwasher safe.
5. 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 required. During this yearly service, all body panels must be removed and all connections both electrical and hydraulic must be inspected. Small problems can become large if not caught early.

# TROUBLESHOOTING GUIDE

This is a troubleshooting guide for some of the common 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 which brew stage the group is in (shot timer pressure graph shows three bars for pump pressure.)
  - In M mode, it takes several shifts left to reach full pump pressure (2 for MVP, 3 for MVP Hydra.)
  - In MP or VP mode, pre infusion and/or ramp up time may be set to run too long.
- Pump relay may have failed

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

# TROUBLESHOOTING

- Diffuser screen/screw, or jet is clogged
- Soap residue not fully flushed after cleaning has glued the valve closed (tap the valve body gently).
- Brew solenoid has been sealed shut by dried soap or 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 at 11 or 12 Bar.

### 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, and may fluctuate due to the heat from the element or heat exchanger, but your brew water is actually at the set point.

## **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.

# TROUBLESHOOTING

## 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.

### 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 1.1 bar, hot water and steam may be dispensed again.
- Check the wired controller to make sure all temperatures, especially in the steam tank, 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 a minimum mineral content in order to detect water.
- 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.