



User Manual

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Mavam Mach Two User Manual

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NOTE:

This manual is for the daily use of the machine. For detailed data, technical diagrams, installation, and troubleshooting please see the applicable document.

Safety Warnings

Safety Messages

IMPORTANT Information for the Mavam Undercounter Espresso Machine

- **DISCONNECT FROM ALL POWER SOURCES BEFORE SERVICING**
- Read the entire manual **BEFORE** operating this machine
- Steam and condensation from the steam wand discharge is **HOT** and may cause burns
- The steam wand tips become **HOT** during use, do not touch them - Use Caution!
- Always have the steam wand tip covered or inserted in the product to be steamed before turning steam on.
- Never remove the steam wand from the product that is being heated when the steam is on.
- Never remove the portafilter from the machine during the brewing process
- Keep water and moisture away from any electrical device or live power
- Steam tank water can be heated to 260°F (126°C), use caution around this
- The brew groups are heated to 200°F and deliver water as hot as 210°F (99°C) - Use Caution!
- Brew Group housings can be hot to the touch - Use Caution!
- Never put water on top of machine no water should be on cups so no water can leak inside machine

Brew Group



Warning Labels

ATTENTION! Wiring must conform to the current National Electric Code

CAUTION!

INSTALLER SUR UN CIRCUIT
COMPORTAINT UNE PROTECTION A
MAXIMUM D'INTENSIFE DE # A or
equivalent.

CAUTION!

TO BE INSTALLED WITH # A
MAXIMUM OVERCURRENT
PROTECTION- or equivalent

WARNING!

Wiring must conform to the current
National Electric Code ANSI/NFPA No.
70 or Canadian Electric Code Part 1,
CSA Standard C22.1, and local
building codes. Refer to wiring
diagram. See nameplate on boiler box
cover for minimum circuit ampacity and
maximum over-current protection size.

WARNING!

Electric Shock Hazard. Can cause
injury or death. Unit must be
grounded in accordance with
national and local codes.
Line voltage is present at all
components when unit is not in
operation on units with single-pole
contactors. Disconnect all remote
electric power supplies before
opening access panel. Unit may have
multiple power supplies.

SAFETY WARNING:

The risk of serious burns or other bodily injury is always increased when working on a hot espresso machine. MAVAM LLC, is not responsible for personal injury can occur when servicing or maintaining any

Operational Setting Limits

The machine will limit settings and operation to these ranges. They are not user adjustable.

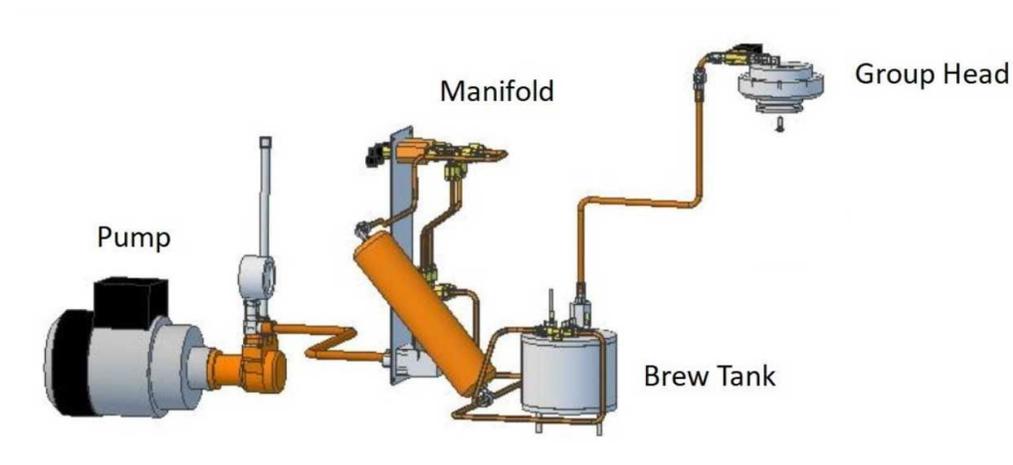
Steam Pressure	0.0 to 1.5 Bar
Brew and Group Temperature	85 to 110 C (185 to 230 F)
Pre-Infusion Time	0 to 360 seconds (6 minutes)
Brew Time	0 to 120 seconds (2 minutes)
Steam Time	0 to 120 seconds (2 minutes)
Water Time	0 to 30 seconds (½ minute)
Internal Boiler Unit Temperature	80 C (175 F)

Overview

Machine Description

The Mavam Mach 2 is a low profile commercial espresso machine. Depending on model there may be two, or three group heads, two steam wands and one hot water tap. The Mach 2 is all about temperature stability and has 3 points of heating per group. This allows for uninterrupted endless hot water from the first to last shot in a major rush.

Water Path



Description of terms

The following terms are used throughout this manual and other Mavam publications. While not a full list these are the most used and common terms.

Group Head: Metal receptacle attached to the underside of the top of the Group Assembly that holds the portafilter.

Portafilter: Mates with the Group Head and holds the basket containing ground coffee. A handle is attached to the portafilter so the barista may insert and remove the portafilter. There are many styles and configurations of portafilters.

Blind Basket: A cup that is installed in the portafilter without holes. This is used for cleaning the Group Head.

Steam Wands: Metal tubes shaped like an “L”. Steam is piped from the steam boiler and exits at the Steam Wand tip.

Hot Water Jet: Metal tube shaped like an “L”. Hot water is piped from the steam boiler and exits at the Hot Water Diffuser tip. Hot water wand is only designed for cleaning and rinsing of cups and coffee preparation tools.

Drain Tray: Removable metal screen below the Group Heads. Water drains through this screen to the drain attached to the base of the frame.

Operation Controls: Actuators and button(s) that control a function of the machine. Each actuator may have more than one function depending on the mode selected.

Group Display: OLED display mounted on the front of the machine. This displays group temperature, mode of operation, and brew times for pre-infusion and brew cycles, menu functions and adjusting the flow meters

Pump: AC motor with pump and pressure regulator attached. These are external to the unit.

Operation

Controls

Power Control

Power Switch: Power for the entire machine is controlled by the switch on the front left side of the face. *Caution: while this removes power from the unit line power is still supplied to the machine.*

Temperature Controller: This is the main controller for temperature of all elements, steam pressure, fill, and internal sensing referred to as “BCU (Boiler Unit Controller)” for the remainder of the manual. Note: For operation of the BCU refer to the manual titled “BOILER UNIT CONTROLLER USE AND SETUP”.

User Interface

There are two main components of the User Interface used for operation, actuators, and UI display. Display is discussed in detail in the section “UI DISPLAY”.

Actuators



Actuator

Placement c on User Interface

UI Actuators control all the functions of the UI. They consist of an actuator, (the part you push), and an illuminated ring that indicates mode of operation.

General

Preinfusion and Brew controls are activated by paddles wrapped around the group heads. The Steam is activated by slap / push in style switches located on the upper side panels of the machine. The hot water is activated via a piezo touch activated switch. These actuators control all functions of the machine (Pre-Infusion, Brew, Steam, and Water) the display screen will show all functions of the machine. S for Steam, W for Hot Water Tap, Pre Infusion turns on the left display timer and Brew or full pressure turns on the right display timer.

There is a short delay, ($\frac{1}{4}$ second), required between pushes. Pushing the actuator faster than this will not register a new push.

The Mach 2 Uses a screen saver to protect the OLED display screen. In this state the MAVAM coffee drop will appear. Press the group activation levers to open the home page.

Each actuator has two uses, regular operation, and menu (setting options for that group). Uses of the actuator are detailed in the “Functions” section.

Startup

On power up the group OLED will display the version number in the upper data window. Please note this information for reference later on. Some operations are different depending on software version. These are noted in instructions as “After, (or before) Version X.X...” for example.

Functions

Pre-Infusion and Brew are two phases of the coffee extraction cycle. Pre-Infusion introduces hot water to the coffee puck at a low pressure to saturate the coffee and let it bloom. Once the coffee has had a chance to bloom the Brew cycle is started. Hot water under pressure is forced through the coffee to produce espresso. Mavam gives the barista complete control over the time, flow, pressure, and temperature the coffee is extracted at.

Pre-Infusion

Low water flow restricted to 2 bar 30 psi. This is can be run manually or set to a desired time in Auto mode. The Left paddle turns on and off the Pre-Infusion phase of the brew cycle. This is also used to ramp down or finish the shot in low flow mode.

Maximum time allowed is 360 seconds (6 minutes). Pre-Infusion will shut off after this time.

Menu: Selects one of two options or increments a setting (counts up).

Can also trigger Auto 1 when in Auto Mode

NOTE: Holding down paddle actuator will change in increments of 10s after counting three.

Brew

Turns on Brew valve and Pump Motor. In manual mode once desired preinfusion is reached pressing the brew actuator turns on Full pressure or the pump of the specific group. The pump can be adjusted to any extraction pressure from 3-12 Bars

Maximum time allowed is 120 seconds (2 minutes). Brew will shut off after this time.

Activates Auto 2 in Auto mode

Menu: Selects one of two options or decrements a setting (counts down).

NOTE: Holding down paddle actuator will in decrement in 10s after counting three.

Steam:

Regular: Turns on and off the Steam Wand. Maximum time allowed is 120 seconds (2 minutes). Steam will shut off after this time.

Menu: Used as Enter key.

Hot Water

Regular: Turns on and off the Hot Water Jet. Maximum time allowed is 5 sec. Hot Water will shut off after this time.

Menu: Used as alternate Enter key in three group machines.

Group Head Cleaning

Cleaning is performed everyday. The machine comes with a 3mm wrench. Remove the screen and diffuser plate with the 3mm wrench and clean with a dry towel.

Reinsert diffusers and screen. Making sure the flat side of the diffuser mounts to the flat side of the group head.

Find the Blank / Backflush disk that can with the machine. Insert this into the portafilter. Add a teaspoon of espresso machine cleaner to the backflush cup.

Insert the portafilter with the cleaner into the group head. Each group head must be cleaned separately. If you choose to do this manually you should run the group 10 times on full pressure or right button for 2-3 seconds then shutting off. The blank disk will force the cleaner through the 3 way valve cleaning any leftover coffee in the system. After 10 cycles remove the portafilter clean out any extra cleaner and perform the same task with just water. This will remove any left over build up or cleaner inside the valve. Failure to do this can lead to cleaner stuck inside the valve possible no water out of the group.

We do have an automatic function that will do the 10 cycles for you. Please see below for instructions.

This is a special function usually performed at the end of the day. The clean cycle will run ten cycles of five seconds Brew phase and five seconds off. The UI display will show "AUTO CYCLE" in the top data window with the total cycles on the right of the bottom data window and cycles completed in the left of the bottom data window. After each cycle the top data window will display "CYCLES TOTAL" and a total of completed cycles. The following steps describe how to access this function

1. Enter Menu Mode
2. Using the Paddle actuators, and versions below 3.0, push and hold BOTH the Pre-Infusion and Brew actuators down until "HLD FOR MENU" shows in the top data display. Continue holding until "CLEAN? NO" is shown in the top data display.
3. When "CLEAN? NO" is shown use the Pre-Infusion actuator to change to "CLEAN? YES". Press the Steam or Water actuator to start the clean cycle. If you do not want to perform the clean function leave at "NO" and press the Steam or Water actuator to move to the next menu function. Pressing the Brew actuator will change "YES" to "NO".
4. Pressing either Pre-Infusion or Brew actuator at any time will cancel the clean cycle.
5. When completed, or stopped, the UI will return to Idle mode.

Clean Cycle running

Clean Cycle running, Display between cycles



Manual and Automatic Modes

There are three modes used for the brew cycle, Manual, Timed Automatic and Flow meter Automatic . Current mode is shown in the upper left corner of the display in the upper data window. “MAN” = Manual, “AUTO” = Automatic.

Note: In adherence to our philosophy of total user control you may change the mode “on the fly” for each shot if desired. For example, if in Automatic, you may want to pull a different shot. You can change to Manual when starting the shot and have full control of shot.

Manual Mode

This mode gives the barista complete control over the brew cycle. Once a portafilter is inserted and ready for use the user may initiate the brew cycle by starting Pre-Infusion or go directly to Brew. With this full control you can run the machine anyway you like. Long preinfusion, full pressure to low pressure. Just full pressure. Just low pressure.Low then full pressure etc. For example: User starts the Pre-Infusion phase and after the desired time has elapsed starts the Brew phase. Pressing the Brew actuator will finish the cycle, pressing the Pre-Infusion actuator will change the brew cycle to the low pressure Pre-Infusion phase.

Note: When Brew phase is started the elapsed time will continue to count up in the Brew phase window of the display.

Automatic Mode

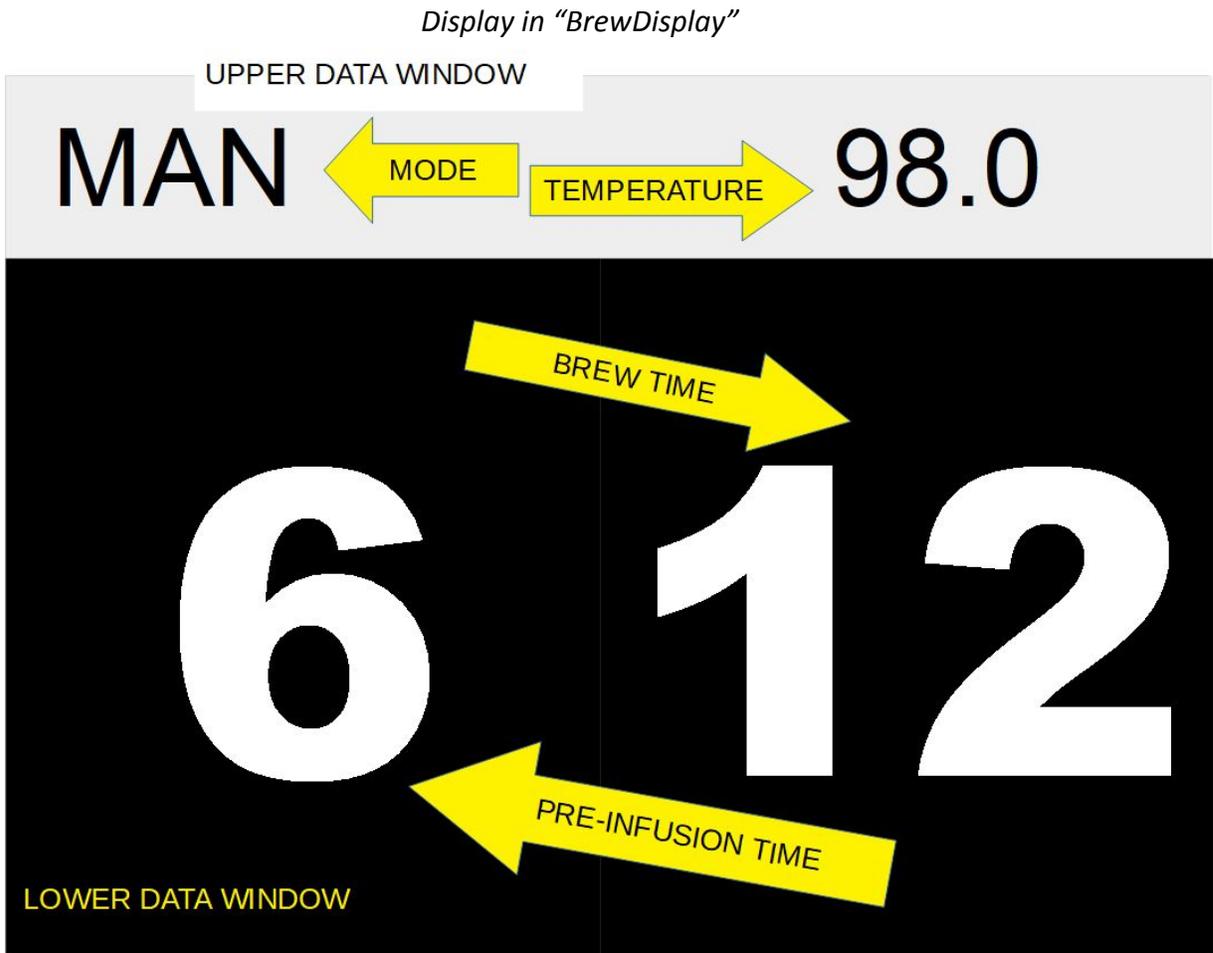
There are two ways to control the brew cycle automatically. There is no one correct way to control a brew cycle. We offer the user two methods so you can determine which one suits your preferred method.

1. TIME MODE “ChronoMass”: In this mode the brew cycle, pre-infusion and brew, is controlled using time. The pre-infusion and brew phase are controlled by the user set times.
2. FLOW MODE: In this mode the brew cycle is controlled by a flow meter, precisely measuring the mass of water being sent through the coffee. The user enters the “pulse count” in the menu to determine the precise amount of water to use. Pre-infusion is still controlled using time in flow mode.

Using Time or Flow mode is determined in the menu. When selecting Brew Time if you want to use Flow mode you must set Brew Time to ZERO (0). If set to anything else the setting for Flow mode will be bypassed.

Automatic settings are shown in the lower data window when idle, A1 and A2. Settings are shown as three numbers separated by a forward slash "A1:20/30/0 A2:15/0/300". The first number is the Pre-Infusion time, the second is Brew time and the third is pulses. Pressing the Pre-Infusion actuator will start A1, pressing the Brew actuator will start A2 (*if in Automatic mode*). When started the cycle will run for the pre-set time and stop. The program will be shown in the upper data window when running, "AUTO:1", if running A1, "AUTO:2", if running A2. The cycle may be stopped anytime by pressing the current phase actuator. For example, if in Pre-Infusion phase, pressing the Pre-Infusion actuator will cancel the cycle.

UI Display



There is one display per group. Located to the right and left of the groups. When not in use a screen saver will turn on with an espresso drip. This is to protect our OLED screen



Display Modes

There are three modes of display Screen Saver, Brew Display, and Menu Display. Screen Saver mode is displayed when Menu mode is not being used.

Brew Display

Information on the screen is dependant on what phase of operation is active and mode of operation. (X) refers to illustration on next page. The different phases are:

Idle: Group not in use, Steam and / or Water may be in use. (1), (2), (3)

Pre-Infusion: Pre-Infusion phase of the brew cycle in use. (4)

Brew: Brew phase of brew cycle in use (5)

Post Brew: Pre-Infusion and Brew phase finished. (6)

Menu: Changing group options. See *“Using the Menu Functions”*

Modes of operation are Manual, and Automatic.

Data Table

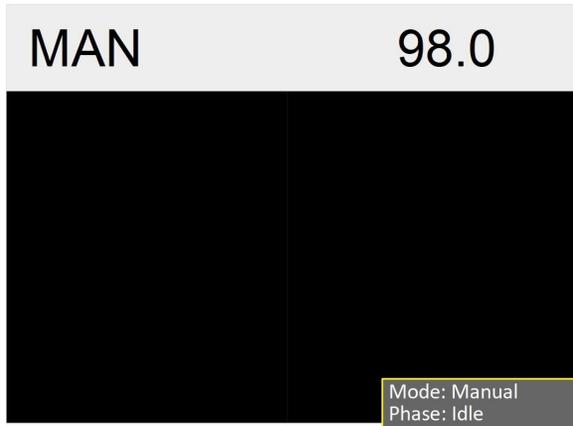
Table of data shown in different phases and modes.

Phase	Mode	Steam, Water ON	Group Temperature	Pre-Infusion Time	Brew Time	Auto Settings
Idle	M, A	M,A	M, A	X	X	A
Pre-Infusion	M, A	X	M,A	M,A	M,A	X
Brew	M,A	X	M,A	M,A	M,A	X
Post Brew	M,A	M,A	M,A	M,A	M,A	X
Menu	S	S	S	S	S	S

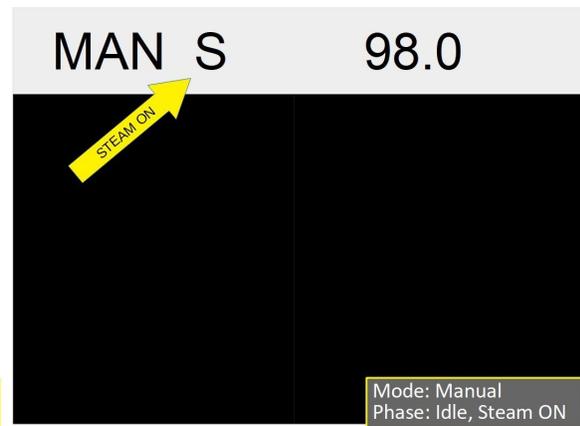
M = Shown in Manual Mode, A = Shown in Automatic Mode, X = Not Displayed, S = Special use

Screen Examples

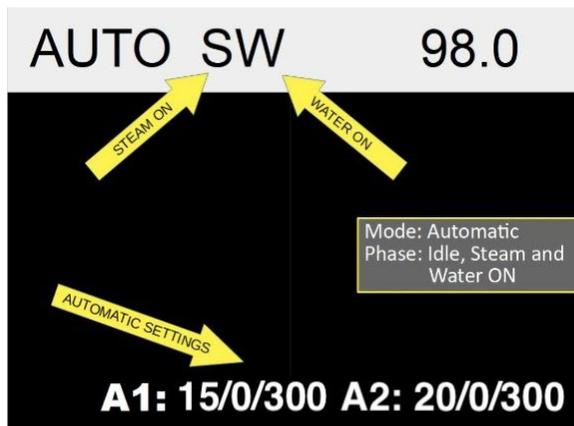
(1) Idle Screen



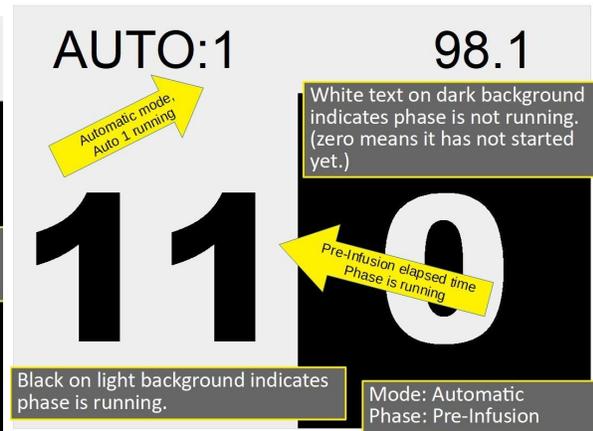
(2) Idle Screen, Steam ON



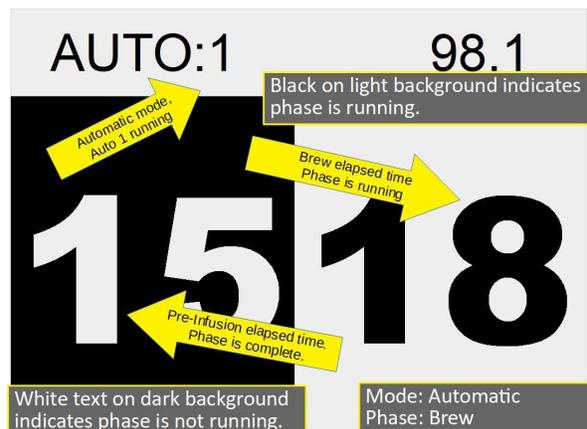
(3) Idle, Steam and Water ON



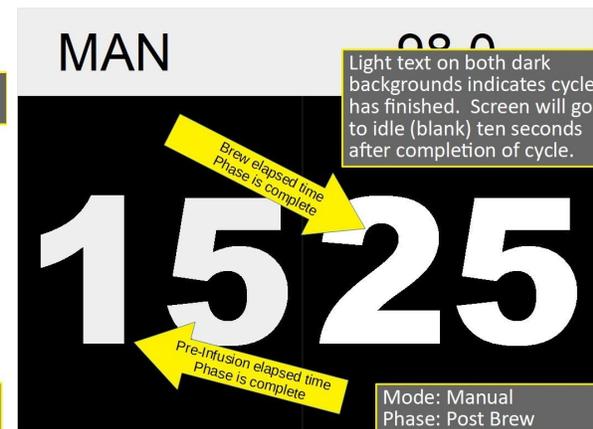
(4) Pre-Infusion phase



(5) Brew phase



(6) Post Brew phase



Menu functions and screens are covered in “USER INTERFACE MENU INSTRUCTIONS”

USER INTERFACE MENU INSTRUCTIONS

Menu Overview

Menu functions allow the user to set or change the operating parameters of the User Interface. Features available in the menu are listed in order with the *Parameter* in italics and options available in parenthesis (). Default option shown in brackets [].

1. *CLEAN?* [NO], (YES) Selects auto clean cycle if yes.
2. [*CELSIUS*], (*FAHRENHEIT*) Selects temperature unit.
3. *OFFSET* [0.0] Sets a hardware offset for the temperature display. *NOTE:* only set this if you are sure you know the the calibrated temperature of the group. This is set at the factory and normally does not need to be changed.
4. [*MANUAL*], (*AUTOMATIC*) Changes mode between Manual and Automatic.
5. *AUTO PI NO:1* [0], (0 to 360) Sets the Pre-Infusion time for Automatic one.
6. *AUTO BR NO:1* [0], (0 to 120) Sets the Brew time for Automatic one. *NOTE Set to ZERO (0) if you want to use the flow option.*
7. *FLOW:* Select one of the options, ZERO, LAST, or HOLD
 - 7.1. ZERO: Sets the flow count to zero.
 - 7.2. LAST: Sets the flow count to the last brew cycle count. This is very useful to “dial in” a setting. For example, use manual mode to pull shots until you get the settings you want. Once a good shot is pulled enter the menu and select this to set the flow count to the last shot you pulled. You can fine tune this in the next step.
 - 7.3. HOLD: This enters the setting from the one in memory.
8. *SET FLOW:* Use pre-infusion and brew paddles to change the flow count up or down to fine tune it.
9. *AUTO PI NO:2* [0], (0 to 360) Sets the Pre-Infusion time for Automatic two.
10. *AUTO BR NO:2* [0], (0 to 120) Sets the Brew time for Automatic two.
11. See steps 7 and 8 to setup auto no 2.
12. *EXITING MENU* End of menu, returns to Idle.

If there is no activity for thirty (30) seconds the menu function will exit and return to Idle. The Steam AND / OR Water Actuator is used as an Enter button. On three group machines the Water actuator is used for the center User Interface Enter button. For ease of display the Steam Actuator is shown in all illustrations.

Entering the Menu

Press and release BOTH Pre-Infusion and Brew actuators at the same time. “PSH FOR MENU” will show in the top data display. Press and release BOTH Pre-Infusion and Brew actuators again, (this has to be done within two seconds of the first part). If done within two seconds “CLEAN? NO” will show in the top data window. If “PSH FOR MENU” is not displayed and one of the brew phases are started just press BOTH again, the phase will be cancelled when the “PSH FOR MENU” is displayed.

NOTE: Timing is important for this operation, it may take a few tries to “get” it, no harm is done to the machine if multiple tries are needed.

Entering the Menu Press Both Actuators at the Same time and release. Then press both again and release



Menu Item 1, Selecting Auto Clean Cycle

When “CLEAN? NO” is shown use the Pre-Infusion actuator to change to “CLEAN? YES”. Press the Steam or Water actuator to start the clean cycle. If you do not want to perform the clean function leave at “NO” and press the Steam or Water actuator to move to the next menu.

Menu item 1. Auto Clean Cycle.



Example screens when Auto Clean has been selected and run

Auto Clean Running



Auto Clean between cycles



Menu Item 2, Selecting Temperature Units

You may select the temperature units to be either Celsius, or Fahrenheit. Press the Pre-Infusion actuator for Fahrenheit or Brew for Celsius. Upper data window will display selection.

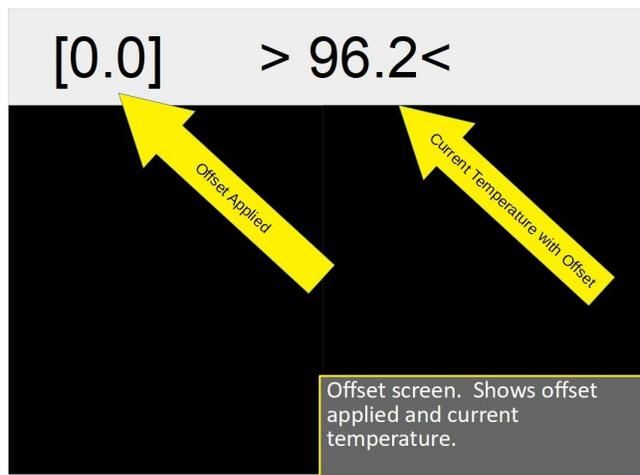
Menu Item 2, Selecting Temperature Units



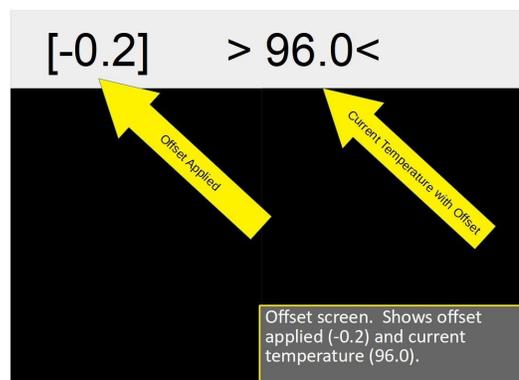
Menu Item 3, Offset

This is used to calibrate the temperature sensor. Calibration is done at the factory using highly accurate temperature measurement tools. You should only undertake this operation if you have a full understanding of this function. Offset and current temperature are displayed in the

upper data window. Offset is in brackets “[0.0]” (Zero offset applied). Current temperature is between arrows “> 96.2<”. The offset is added or subtracted from the temperature sensor input. To set the offset you must know the measured temperature coming out of the brew head during a brew cycle. Usually a test instrument such as a Scace temperature and pressure monitor is used. Using the screen



example to the left offset is [0.0] and temperature reads 96.2. Using a test instrument temperature has been measured to be 96.0, Offset is changed to [-0.2]. This is subtracted from the sensor input and displayed temperature is now 96.0 (screen at right).



Menu item 3, Offset



When changing the offset use the Pre-Infusion and Brew actuators to increase or decrease the offset until the displayed temperature matches the measured temperature.

Menu Item 4, Manual / Automatic

Change modes between Manual and Automatic. Mode is displayed in the upper data window. Pressing the Pre-Infusion actuator changes mode to Automatic, pressing the Brew actuator changes to Manual. Pressing Steam or Water applies the selection.

Menu Item 4, Manual / Automatic



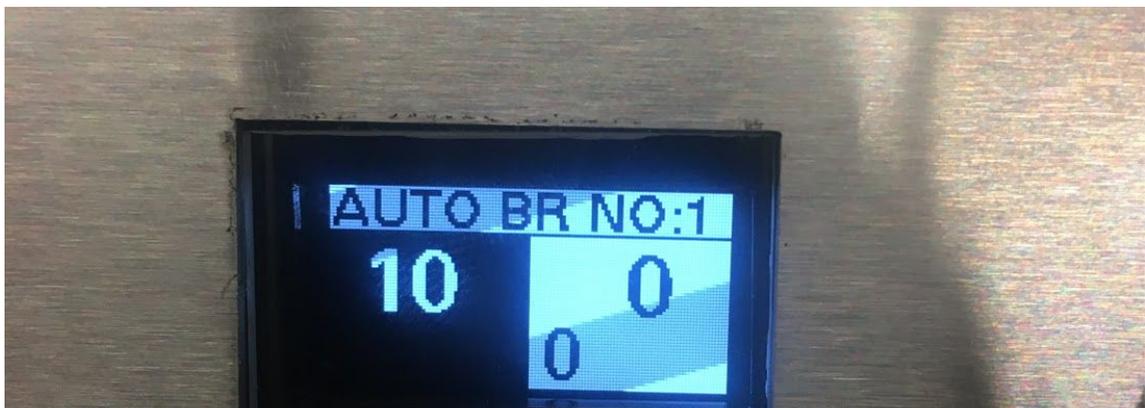
Menu Item 5, Setting Automatic Pre-Infusion Time:1

This is the first of four Automatic time settings. It is useful to set these even if you are not using Automatic mode. The ability to change “on the fly” lets these routines be used if desired. Setting the time to zero “0” will skip the Pre-Infusion phase for that brew cycle. Once set to the desired time Enter will save the setting and move to Item 6.



Menu Item 6, Setting Automatic Brew Time:1

This is the second of four Automatic time settings. Setting the time to zero “0” will skip the Brew phase for that brew cycle. Once set to the desired time Enter will save the setting and move to Item 7.



Menu Item 7, 8, Setting Automatic Pre-Infusion and Brew Time:2

This is the third and fourth of four Automatic time settings. Function is the same as 5 and 6 above except this sets Automatic 2. When finished with Item 8, pressing Enter will exit the menu and return to the Idle screen.

NOTE: After no activity for thirty seconds the Menu will exit and return to the Idle screen. If you have entered a setting or do not wish to record that setting just let the menu sit idle and it will exit not saving that setting.



User Manual

