
BUNN®

Technical Training

Ultra-2 HP CFV



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Ultra™ 1 & 2 Gourmet Ice System

Note: Bullet points will only list changes to the Ultra LAF with CF valve when compared to the ULTRA LAF with Ratio Brix Pump.

Ultra Liquid Auto Fill with constant flow valve transformation includes:

- Revised water and syrup pressure requirement.
- Depth dimension change.
- Extended motor covers to include additional components.
- Addition of syrup constant flow valve with orifice.
- Addition of syrup pressure switch.
- Addition of water constant flow valve.
- Addition of water flow adjuster.
- Revision of external pump method (CO2 Supply & CO2 Pump)
- Inlet syrup and water line connections relocated to each motor cover.
- Sanitize procedure instruction revised to follow supplied CO2 pump system.
- Additional step to remove motor cover mounting brackets during a PM process.

Unit Objectives

Given a realistic scenario in which the learner has access to the machine's internal components, the learner will be able to recognize and explain the composition and functions of the CF valve accessory and syrup CO₂ pump system.

The learner will be able to identify and explain the internal components of the CFV system.

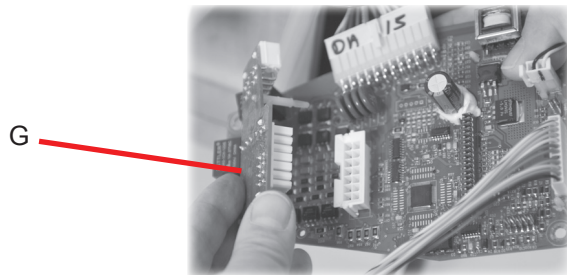
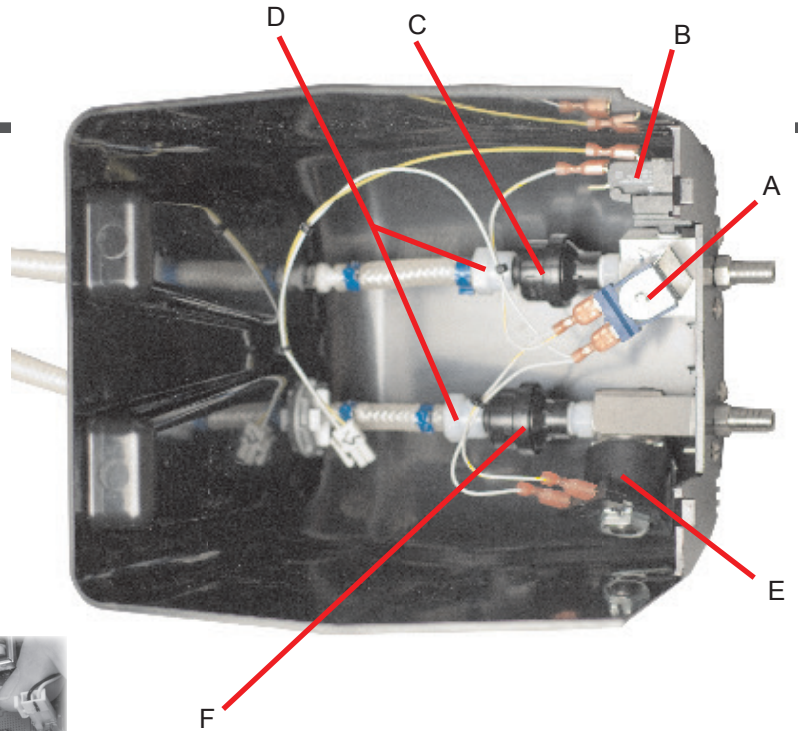
The learner will be able to identify and explain the external components of the CFV system.

The learner will be able to identify and explain the system function and operation of the:

- Auger Refill On
- CF Valve
- CO₂ Syrup Bag-in-Box Pump

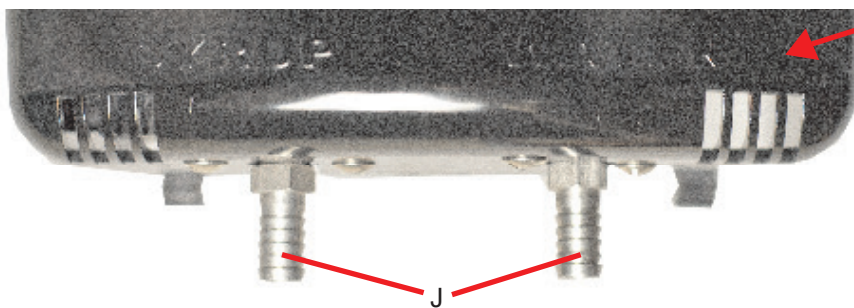
Internal Overview

- A. 120 VAC Syrup Solenoid Valve
- B. Pressure Switch
- C. Syrup Constant Flow Valve with .035 Orifice
- D. Adapter Fitting
- E. 120 VAC Water Solenoid Valve
- F. Water Constant Flow Valve with .035 Orifice
- G. Auto-fill Circuit Board for Ultra-2



External Overview

- H. Water Screw Adjustment Valve/Fitting
- I. 1/4 Flex Hopper Fill Tubes
- J. 3/8 Stainless Syrup and Water Inlet Fitting
- K. CO2 Tank with Pressure regulator (Picture not Illustrated)
- L. CO2 Bag-in-Box Pump (Picture not Illustrated)

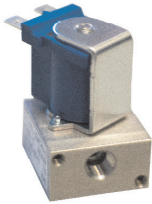


Component Differences Review

120 VAC Syrup Solenoid Valve

When the solenoid is energized with 120VAC, the valve coil generates a magnetic field which will pull the steel plunger with a rubber seal tip away from the internal housing and allows the syrup to flow past the solenoid. Once the valve coil is de-energized, the compressed spring in the internal housing will push the steel plunger back into its original closed position.

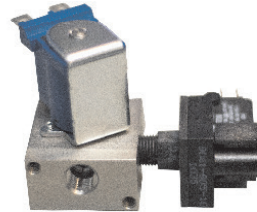
Note: The syrup valve housing inlet and outlet holes are not marked on the base. The side with two screw mounting holes is the syrup inlet and the direct opposite side (180°) is the syrup outlet.



Inlet



Outlet



Pressure
Switch Port

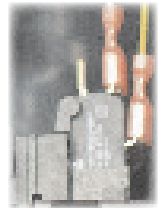
120 VAC Water Solenoid Valve

When the solenoid is energized with 120VAC, the valve coil generates a magnetic field which will pull the steel plunger with a rubber seal tip away from the internal housing and allows the water to flow past the solenoid. Once the valve coil is de-energized, the compressed spring in the internal housing will push the steel plunger back into its original closed position.



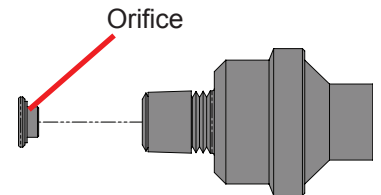
Pressure Switch

The pressure switch is mounted to the syrup valve base and is a type of switch that makes electrical contact when a certain set pressure has been reached on its inputs. The switch is designed to make electrical contact when pressure reaches 30 psi and will lose contact when pressure is below 21 psi. The switch is wired normally in an open position. The syrup pressure switch detects when there is not enough psi present and will shut off the electrical supply going to the 120VAC syrup and water solenoid valves. This will prevent incorrect dispense ratios into product hoppers.



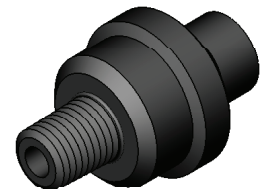
Syrup Constant Flow Valve with Orifice

The syrup constant flow valve (CF Valve) is a device that is constructed with an internal spring that is designed to open at a continuous fluid or air pressure. The pressure is evenly balanced within the valve body and keeps the valve in an open position while the product flow is being controlled by a flow orifice located on the outlet side of the CF valve. The hole size in the flow orifice on the product side sets a constant product flow rate. Anytime the source pump pressure drops below 21 psi, the pressure switch will de-energize the syrup and water solenoid valves first and once the syrup line reaches a point of 12 psi, the CF valve's internal spring will retract and close off the flow path internally within the CF valve.



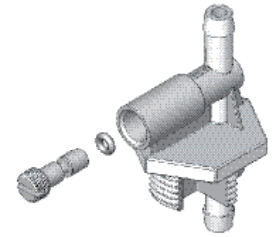
Water Constant Flow Valve

The water constant flow valve (CF Valve) is a device that is constructed with an internal spring that is designed to open at a continuous fluid or air pressure. The water CF valve has a water screw adjustment valve that is used to increase or decrease water flow. The pressure is evenly balanced within the valve body and keeps the valve in an open position. Anytime the source pump pressure drops below 21 psi, the pressure switch will de-energize the syrup and water solenoid valves first and once the water line reaches a point of 12 psi, the CF valve's internal spring will retract and close off the flow path internally within the CF valve. Unlike the syrup CF valve, the water CF valve does not have a flow orifice.



Water Screw Adjustment Valve/Fitting

The water screw adjustment valve is used to set the product mix ratio, but only as long as the incoming water pressure is between 30-80 psi. Rotate the adjustment screw with a standard medium or small blade screwdriver. Turning the screw clockwise will decrease the water flow and counter-clockwise will increase water flow.



Note: If water source is not within the specification of water pressure requirement(s), a water booster pump will need to be installed and adjusted to maintain the 30 to 80 psi requirement.

CO2 Tank with Pressure Regulator

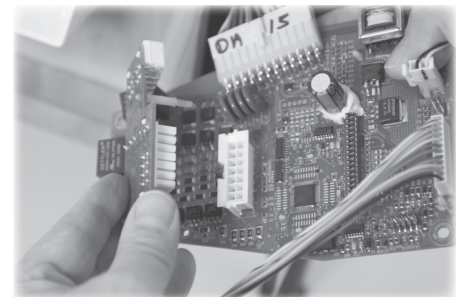
Alternate source used in conjunction with syrup CO2 pumps to move bag-in-box syrup product. Several factors are involved when setting the actual pressure because of product viscosities, length and positioning of lines (vertical or horizontal). Optimal psi range is 40-80. A typical set point is 65 psi.

CO2 Syrup Pump

See CO2 Operated Bag-in-Box Pump brochure for technical product data.

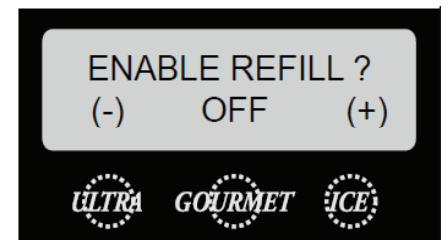
Auto-Fill Circuit Board (Ultra-2 Only)

The auto-fill circuit board attaches to the back side of the main control board. The attached auto-fill board will show additional features and service menus when scrolling through programming menus. The additional menus relate to the operation of the “Auger Refill On” system.



Model Ultra-1 control boards were developed at a later date and will already have the auto-fill capability. The auto-fill board is not needed on the Ultra-1, but the wiring harness identified as Q in the LAF instruction sheet will need to be added in order for the “Auger Refill On” system to operate on Ultra-1 models that are not designed for auto-filling.

The “Enable Refill” menu found in programming will need to be turned on to activate the refill automation when “Auger Refill On” is selected from the auger switch.



System Functions and Operation

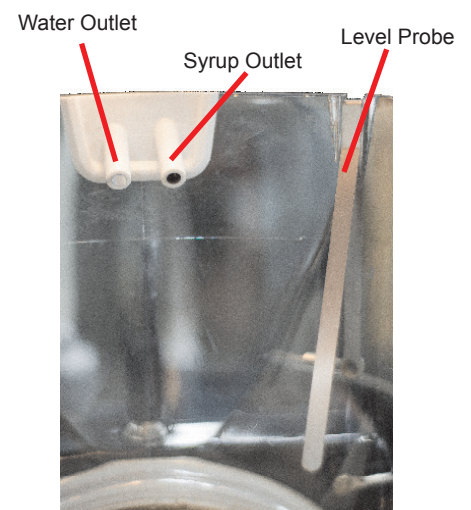
Auger Refill On System

The system maintains the level of product in the ULTRA hoppers with the use of a level probe. Anytime the hopper drops below the level probe, the system will automatically energize the corresponding syrup and water valve to refill the hopper with product until it touches the level probe.

The refill system has a time limit and will display a “Refill Fault” message when time has elapsed without satisfying the level probe. Once the set refill time has elapsed without satisfying the level probe, the left or right hopper refill fault will appear on the Ultra LCD screen and the hopper hood lights start flashing as a visual indicator to alert the user of a fault message. The LCD screen will prompt the user to press the “Ultra” switch to clear faults.

Example A: Bag-in-Box is empty and needs replacement.

Example B: Hopper level probe is not installed on the hopper after a cleaning procedure.



Constant Flow Valve System

The CFV system consists of:

- External source to pump syrup
- Inlet water pressure requirement 30 - 80 psi
- Syrup pressure requirement 40 - 80 psi
- Syrup constant flow valve with orifice
- Water constant flow valve
- Water flow adjuster valve
- Electric syrup solenoid valve
- Pressure switch/syrup
- Electric water solenoid valve
- Refill circuit board or circuit
- Hopper level probe

The activation of the refill circuit starts with selecting the “Auger Refill On” mode from the auger On/Off switch on the user panel. Once the mode has been enabled, CBA monitors the condition of the hopper level probe and will activate the corresponding components to allow product to flow into the hopper when needed. A CO₂ syrup pump that is connected to a CO₂ tank will pump the syrup under an operating pressure of 40 - 80 psi. The pressure requirement plays an important role in the CFV system designed to assure product ratio delivery.

The syrup and water electric solenoid valve will energize to allow fluid to pass through the valves and into the constant flow valves. The constant flow valves are designed to open under a set pressure and will allow fluids to pass on through. The syrup constant flow valve has an orifice mounted on the outlet side of the CF valve, which sets the product flow rate as constant while the water side has a water screw adjustment valve that can be used to increase or decrease water flow coming into the hopper.

The regulated syrup and water lines connected to the hoppers simultaneously fill the receiving hopper until product touches the level probe and will shut-off. If the “Delay Refill” option is enabled, the product will be dosed in increments until it reaches the level probe.

The fill system incorporates another component called a pressure switch that is mounted on the syrup electric solenoid valve base. The purpose of the switch is to de-energize the syrup and water valves in the event of a pressure drop below a set psi point mandated by the pressure switch to prevent inaccurate delivery of ratio product into the hopper.

The external pump method consists of:

- CO₂ supply with pressure regulator
- CO₂ syrup Bag-in-Box pump
- Syrup pressure requirement 40-80 psi
- Product with B.I.B. connector
- Stainless steel fittings
- Flex hose and oetiker clamps

CO₂ Syrup Bag-in-Box Pump Operation

The CO₂ supply with recommended psi connects to the CO₂ pump. When the refill circuit is activated to fill the hopper with product, the electric syrup and water valves open. The opening of the syrup valve will activate the CO₂ pump. Generally, CO₂ pumps have an internal shut-off that stops the pump from operating when high vacuum builds up on the inlet side, which is how the pump indicates that the Bag-in-Box is empty and needs to be replaced. If the product in the hopper is below the level probe when a new Bag-in-Box is connected, the pump will automatically resume operation until product touches the level probe. The placement of CO₂ pump and supply needs to be in a well ventilated area or a hose will need to be connected to the pump gas discharge fitting and routed to an open area/ atmosphere.

UNIT 2 INSTALLATION & SETUP



Unit Objectives

Given a new machine, all the necessary tools and safety equipment, the learner will be able to install the ULTRA CFV without error.

The learner will be able to install a CF valve kit onto an existing Ultra-2 machine with zero errors.

The learner will be able to setup, prime and calibrate the product to mix ratio successfully.

The learner will be able to identify and explain the fill system and CO2 pump system.

The learner will be able to properly sanitize the external pump system and Ultra hoppers.

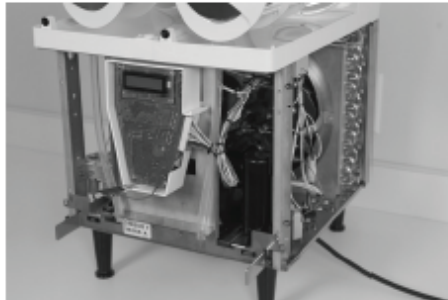
These instructions are for installing the Liquid Autofill Kits on Autofill ready ULTRA-1 and ULTRA-2 cold drink dispensers.

KIT CONTENTS	ULT-2	ULT-1	
A. 37567.0000	1*	-	Circuit Board, ULTRA 2 Auto-Fill
B. 37962.0001	1*	-	Wire Harness, AF Kit
C. 36329.0000	2	2	Tie, Cable-Nylon BLK 4.04"
D. 43120.xxxx	2	1	Cover Assy, Motor LAF-BLK
E. 38055.0003	2*	1	Probe Assy, LAF
F. 34362.0003	4*	2	Bushing .156" ID x .490" OD x .12" Flg
G. 00973.0000	4*	2	Nut, KEPS #6-32
H. 43131.0000	2	1	Bracket, Motor Cover Support
I. 43145.0000	2	1	Bracket, Motor Cover Mounting
J. 00970.0000	8	4	Nut, KEPS #8-32
K. 02308.0000	4	2	Screw, Pan Head, Slotted w/serr. #8-32 x .38"
L. 38129.0017	4	2	Hose, Braided .25 ID x 11.0" Lg
M. 21275.0006	8	4	Clamp .406/.504" Dia.
N. 01317.0000	4	2	Screw, Truss Head, Slotted #8-32 x .50"
O. 44194.0000	-	1	Wire Harness (<u>Not</u> Auto-fill Ready)
P. 44195.0000	-	1	Wire Harness (Auto-fill Ready)

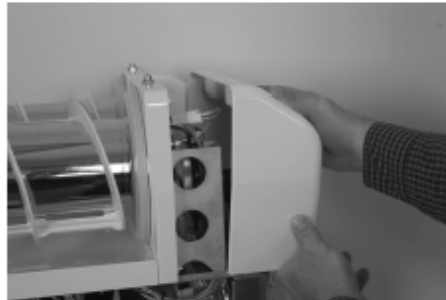
* Not included in all kits.

INSTRUCTIONS

1. Unplug machine from power source before removing any panels.
2. Drain both hoppers and clean the machine if needed before proceeding.



3. Remove hoppers, drip tray, both side panels and front panel.



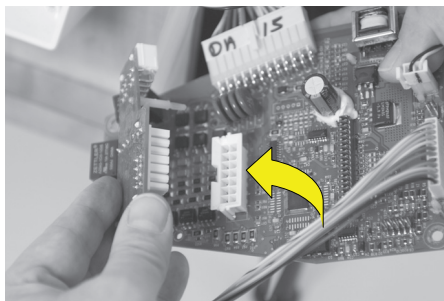
4. Remove both motor covers and locate .50" round knock out in top right area of plastic drum mount. Discard screws.



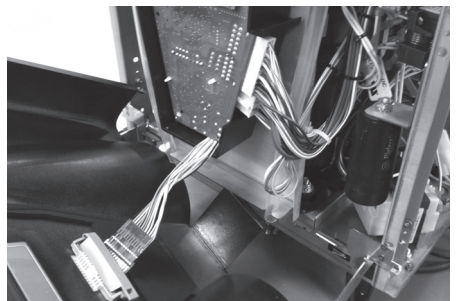
5. With a standard screwdriver and a hammer, punch out the hole needed for the level probe. Repeat this step for all barrels.



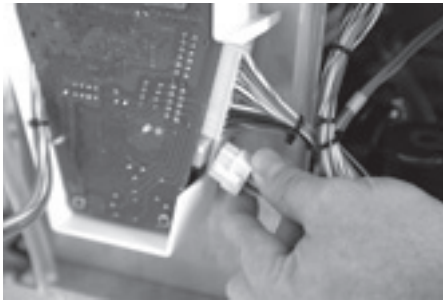
6. Remove 4 screws holding in the main circuit board.
On ULTRA-1 Models, proceed to Step 12.



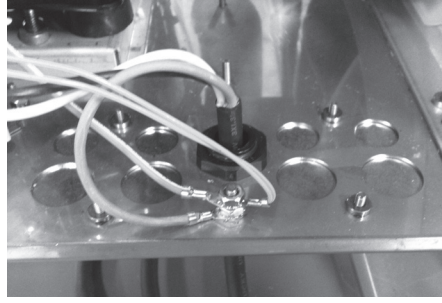
7. Connect Auto Fill board to J-12 on the main board. Be sure to snap the plastic stand off's completely into the main board.



8. Reinstall the main board into the machine using the original mounting screws.



9. Plug wire harness (B) into Auto Fill board connector and route wires in front of drain tube and back into the machine.

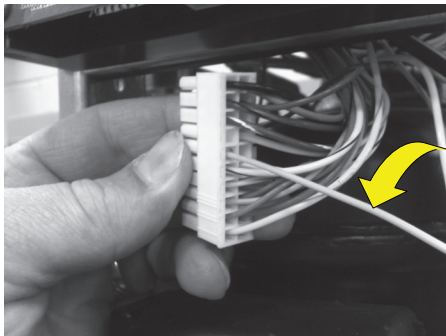


10. Remove top nut off of grounding stud in the base of the machine, add on the green grounding wire from the new harness and reinstall the nut onto the stud. Make sure that all the other grounding wires remain on the ground stud.

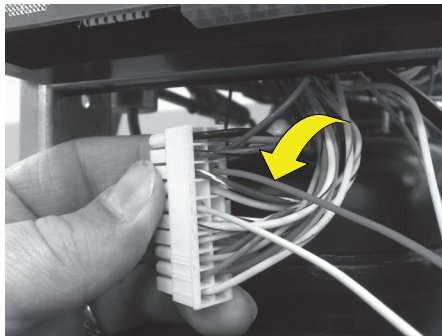


11. Route Pink and Tan wires up to level probes. To ease wire harness installation, remove both auger motors. Note: valve connection wire colors – right is red and white, left is blue and white.

For ULTRA-1 Models not Auto-fill ready:



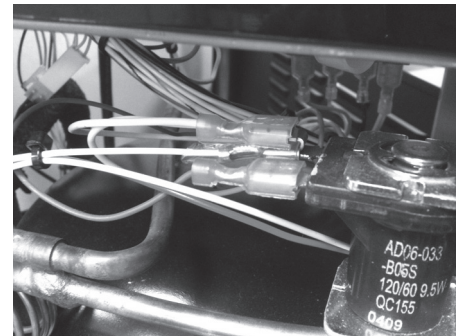
12. Disconnect main wiring harness from circuit board. Insert pink wire from Harness (Q) into terminal #6.



13. Insert red wire from Harness (Q) into terminal #18.

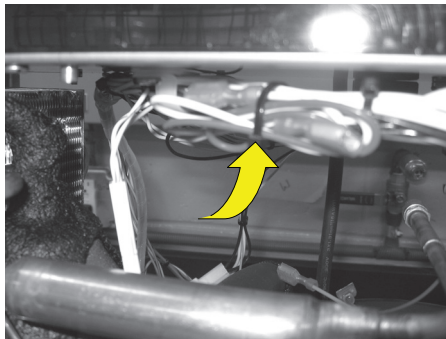
NOTE: The pin terminal must be oriented correctly to be inserted fully. After inserting these connections, pull lightly on the wires to insure they do not come out.

- Route new harness back into machine along with the main harness.

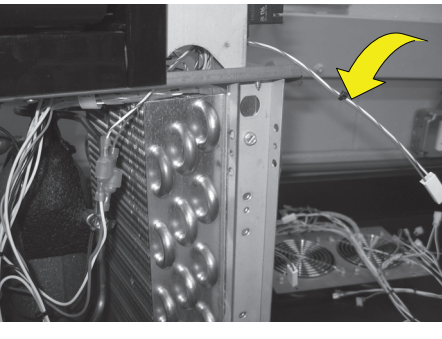


14. Locate white wire on new harness with piggy-back style spade connection. Remove white wire from refrigerant valve and connect piggy-back connector from new harness onto refrigerant valve. Reconnect white wire from main harness onto the new piggy-back connector. Route remaining portion of new harness toward the back of the machine.

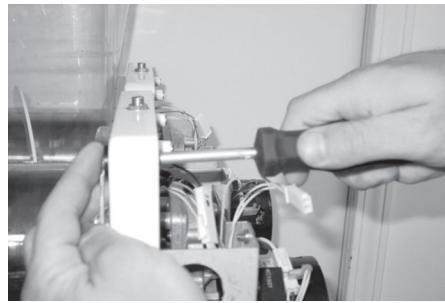
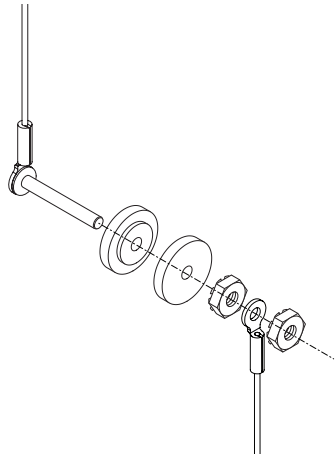
For ULTRA-1 Models that are Auto-fill ready:



15. Locate unused white and red auto-fill valve wire connections tied in a bundle on the main wiring harness. Carefully cut wire tie to free the bundle.



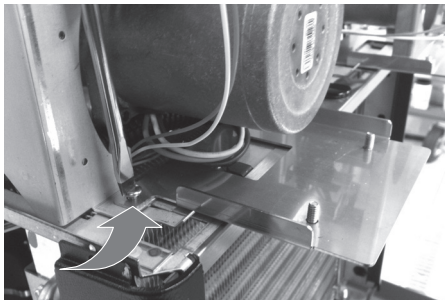
16. Connect white and red wires from the new harness (R) to white and red wires respectively on the main harness. Route the new harness toward the back of the machine.



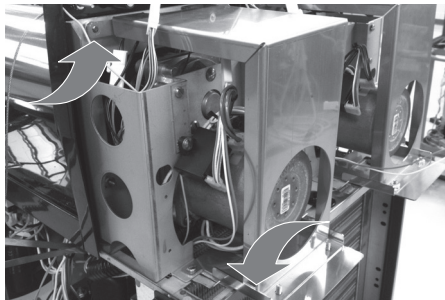
17. Install level probe assembly into hole and secure with nuts provided (G).



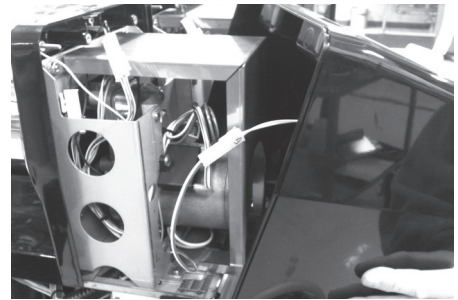
18. Position wire and connector away from metal bracket as shown. Attach using nuts provided. Pink is the right probe and Tan is the left probe. Reinstall motors using original screws.



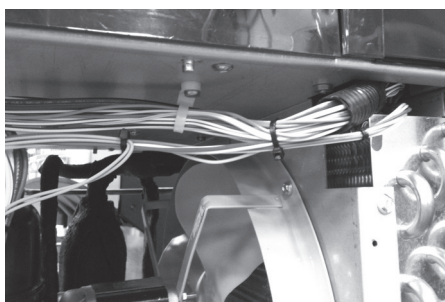
19. Remove the two lower motor bracket screws and align new bracket in place. Attach with new screws (K) provided.



20. Install larger metal bracket as shown. Route light connection wires above plastic boss to keep from being pinched under the new mounting bracket. Route torque sensor wires away to keep from being pinched under metal mounting bracket. Secure with 4 nuts (J) provided.



21. Connect harness to each new motor cover assembly with Auto Fill, then mount motor cover to machine with new screws (N) provided. Hint: Align the motor cover in at the top, then snap the bottom in place.



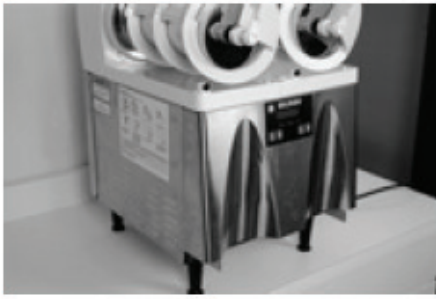
22. Using supplied cable tie (C), attach the new harness to the main harness to keep away from the condenser fan.

Plumbing & Water Pressure Requirements

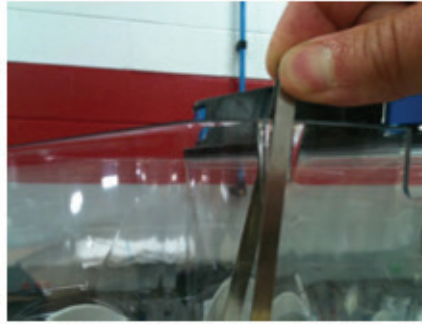
- Supply water pressure requirement is 30 - 80 PSI.
- Syrup supply is to be 40 - 80 PSI.



23. Connect syrup supply lines from BIB system. Connect water lines from source. NOTE: Connection points for these are marked on the rear of the motor cover.



24. Reinstall front and side panels.



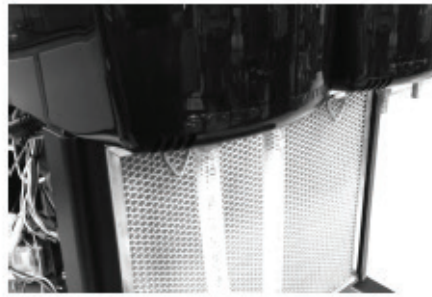
25. Install hoppers onto machine and slide probes onto hoppers into slots provided.



26. Route the tubes from the motor cover together and connect to hopper fitting.



27. Slide hopper fitting into place in the slot on the hopper.

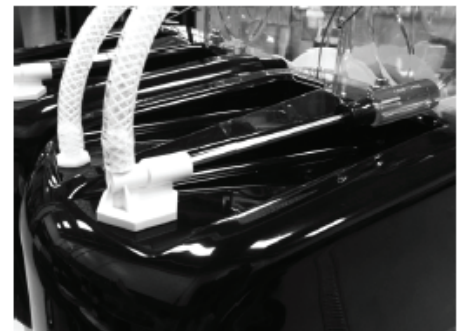


28. Install customer supplied pump system. Turn on pump system and water supply. Check all tubing connections for leaks.

Set up and calibration:

29. Apply power to machine and turn on water and syrup supply. Refer to the Programming section of this manual in the Refill Threshold section to check refill for proper operation.
30. At the threshold screen, with no product in the hopper, confirm the number on the left (top) of the screen is around 250. The number on the right of the screen is factory set to 155. The factory set point should not need any adjustment.
31. After confirming that both hoppers are reading about 250 for the threshold, proceed to the next screen to test the refill circuit.
32. At the test refill screen, select yes.
33. The Activate Valve screen will allow you to test the pumping and refill circuit. Press and hold the ULTRA button to activate the left refill system. Confirm that the left side is filling when the ULTRA button is pressed. Release the ULTRA button to stop the filling process. Repeat this process for the right side by pressing the ICE button to test. Check for leaks at the hoses while pumping system is running.
34. Run each side until water and product are flowing freely.
35. Take a sample from each side (directly from the tubes going into the hopper) to check for proper brix ratio.
36. Make adjustments to the brix/ratio by turning the screw/valve adjuster on the water side at the top of the motor cover (at right). Turning the screw clockwise will decrease the water flow. Counter-clockwise will increase the water flow. The flow rate on the syrup side is not adjustable.
37. Once the testing is complete, exit the programming menu.
38. The auto fill feature can be turned on by pressing the auger button for each side until the display reads "AUGER REFILL ON".

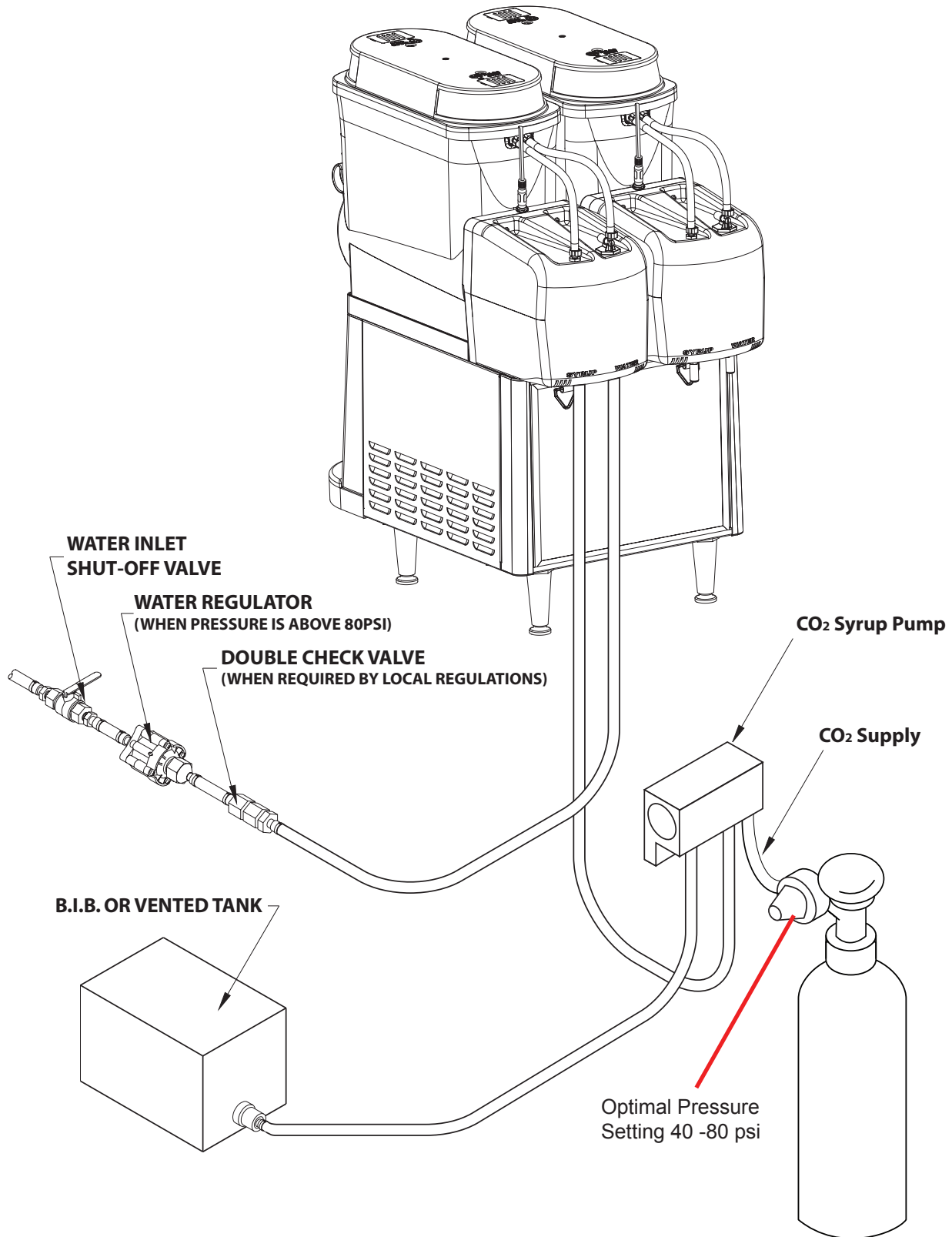
NOTE: Some models also include a "Delay Refill" option. This feature is used to dose in small amounts of new product while delaying between doses. This can help the already frozen product from becoming deluted and not ready to serve. These delay and fill times are to be determined and set based on each application as desired by the end user.



Setup

Pressure Requirements

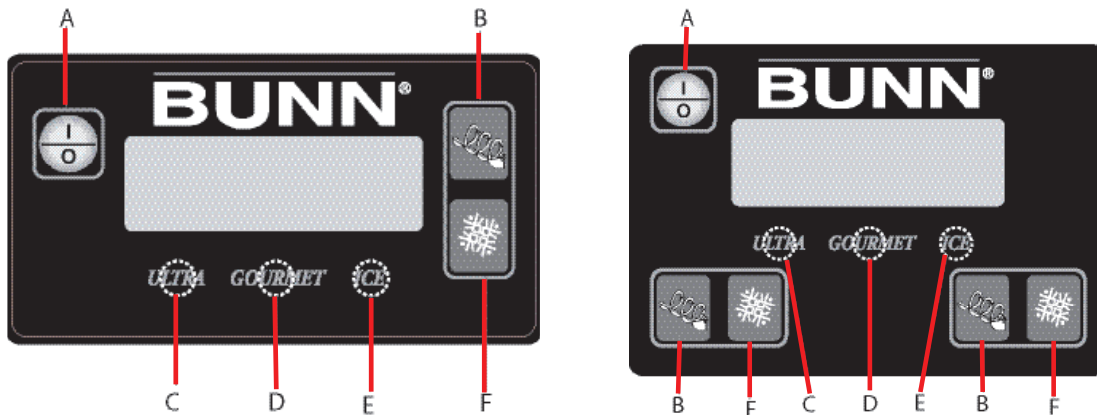
- Incoming water pressure must be 30 - 80 psi
- Syrup supply pressure must be 40 - 80 psi



User Interface

Using the menu-driven display on the front of the dispenser, the operator has the ability to operate, alter or modify various parameters such as beverage consistency and set day/night “On/Off” times. The operator is also prompted to check a variety of periodic service functions or even a step-by-step cleaning routine.

Operating Controls



(A) Main Power Switch

This switch is the On/Off toggle switch that powers up the dispenser and the LCD display. The switch is also used as a back up switch in menu mode.

(B) Auger Switch

Press and release the On/Off switch to start the auger motor and to turn on Autofill when applicable.

(C) Ultra Switch

When prompted by a selection from the menu to answer yes or no, the “Ultra” switch is used to answer “No” or (-) minus.

(D) Gourmet switch

Press and hold this switch for 5 seconds to access the Menu Function Index. This switch is also used as “Next” to scroll through the functions.

(E) ICE switch

When prompted by a selection from the menu to answer yes or no, the “ICE” switch is used to answer “Yes” or (+) plus.

(F) ICE/OFF/CHILL

When prompted by a selection from the menu to answer yes or no, the “Ice” switch.

Priming Instructions

- Step 1. Apply power to machine and turn on water and syrup supply.
- Step 2. At the threshold screen, with no product in the hopper, confirm the number on the left (top) of the screen is around 250. The number on the right of the screen is factory set to 155. The factory set point should not need any adjustment.
- Step 3. After confirming that both hoppers are reading about 250 for the threshold, proceed to the next screen to test the refill circuit.
- Step 4. At the test refill screen, select yes.
- Step 5. The Activate Valve screen will allow you to test the pumping and refill circuit. Press and hold the ULTRA button to activate the left refill system. Confirm that the left side is filling when the ULTRA button is pressed. Release the ULTRA button to stop the filling process. Repeat this process for the right side by pressing the ICE button to test. Check for leaks at the hoses while pumping system is running.
- Step 6. Run each side until water and product are flowing freely.

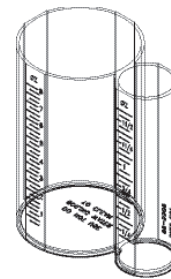
250 L REFILL 155
(-) THRESHOLD (+)

250 R REFILL 155
(-) THRESHOLD (+)

Calibration Instructions

Calibration tools required:

- Standard medium to small blade stub screwdriver.
- Ratio brix cup (PN: 33095.0000)



Brix Cup

Step 1. Enter programming by depressing the middle hidden “Gourmet” button for 5 seconds. Navigate to the “Test Refill” menu by depressing the “Gourmet” button and select yes.

TEST REFILL ?
NO YES

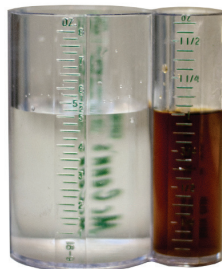
Step 2. Align and hold the brix cup under the product inlet nozzles attached to the hopper.



Step 3. Depress and hold the left or right button to activate product dispense. Allow enough time to fill the brix cup 3/4 full for ratio check.

ACTIVATE VALVE
LEFT DONE RIGHT

Step 4. Place the brix cup with sample on a level surface and compare the syrup and water for same height. If the ratio is not correct, make an adjustment to the brix/ratio by turning the water screw adjustment valve located on top of the motor cover until you reach the correct ratio.



Step 5. Once the ratio is calibrated, exit programming by depressing the “Gourmet” button until you pass the “Restore Factory Default” menu.

Step 6. The product is now calibrated and ready for the initial fill of the hoppers. The automatic fill feature can be turned on by selecting the “Auger Refill On” mode by depressing the auger button for each side.

Note: Some models also include a “Delay Refill” option. The feature is used to fill the hoppers in small increments until product touches the level probe. Between increments, there is a delay time that can be adjusted in programming. This can prevent the frozen product that is already in the hopper from becoming diluted and not ready to serve. The delay and fill times are to be determined and set based on each application as desired by the end user or supplier. Once the “Delay Refill” feature has been activated in programming, the feature will not operate until both hopper refill probes have been satisfied with product after the first initialization or plugging in of the machine.

DELAYED REFILL
(-) OFF (+)

DELAY TIME MINUTES
(-) 5 (+)

FILL TIME SECONDS
(-) 15 (+)

The BUNN Ultra utilizes the “Delay Refill” feature and is defaulted in the On position with default values of:

- 10 second fill time
- 7 minute delay time

Ultra 1 & 2 with CFV Sanitizing Instructions:

Step 1. Fill bucket with 4 gallons of 120 Degree F water and sanitizing solution to equal 100 ppm of available chlorine.

Note: some installations may require more sanitizer solution to fill the supply lines completely.

Step 2. Select “auger on” and set the cooling mode to “off” for each hopper being sanitized.

Step 3. Empty product from each hopper being sanitized.

Step 4. Pour one gallon of warm water into each hopper to rinse the remaining product, and then drain hopper(s).

Step 5. Disconnect concentrate line from the B-I-B and set so the sanitizer can flow freely through it. Place the connector in the bottom of the sanitizer solution bucket.

Step 6. Select “auger refill on” for each hopper being sanitized. Allow hoppers to fill until system reaches the fill probe. If a refill fault occurs, press the Ultra button to clear and continue filling. Repeat this process until the product line runs clear.

Note: You may need to drain the hopper again and allow filling until the product line runs clear, indicating sanitizer has completely filled the lines. If the delay refill system is activated, you may also need to turn the auger off, then back to “auger refill on” to fill the hopper without the delay.

Step 7. Once full, allow sanitizer to sit in the hopper(s) for 10 minutes.

Step 8. Select “auger off” for each hopper being sanitized. Drain the sanitizer from the hopper(s).

Step 9. Remove the B-I-B connector(s) from the sanitizer bucket and reconnect to the product B-I-B(s).

Step 10. Refer to the Recommended Cleaning instructions in the ULTRA technical training manual or Installation and Operating manual and follow the steps to remove, clean and sanitize the hopper(s), lid(s) and other dispense parts.

Step 11. Select “auger refill on” for each hopper being sanitized and allow to run until product starts flowing into the hopper(s).

Step 12. Select “auger off” for each hopper being sanitized, then drain hopper(s).

Step 13. The dispenser is now ready to be turned on and filled for use.