

PBD175 (SPIRE 3.0)

Installation Manual



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Contact Information:

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This document contains the original instructions for the unit described.

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Correct Disposal of this Product



This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.



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SAFETY INSTRUCTIONS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

Safety Overview

- Read and follow **ALL SAFETY INSTRUCTIONS** in this manual and any warning/caution labels on the unit (decals, labels or laminated cards).
- Read and understand ALL applicable OSHA (Occupational Safety and Health Administration) safety regulations before operating this unit.

Recognition



DIFFERENT TYPES OF ALERTS



DANGER:

Indicates an immediate hazardous situation which if not avoided **WILL** result in serious injury, death or equipment damage.



WARNING:

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in serious injury, death, or equipment damage.



CAUTION:

Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury or equipment damage.

SAFETY TIPS

- Carefully read and follow all safety messages in this manual and safety signs on the unit.
- Keep safety signs in good condition and replace missing or damaged items.
- Learn how to operate the unit and how to use the controls properly.
- **Do not** let anyone operate the unit without proper training. This appliance is **not** intended for use by very young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.
- Keep your unit in proper working condition and do not allow unauthorized modifications to the unit.

QUALIFIED SERVICE PERSONNEL



WARNING:

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. **ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

SAFETY PRECAUTIONS

This unit has been specifically designed to provide protection against personal injury. To ensure continued protection observe the following:

WARNING:

Disconnect power to the unit before servicing following all lock out/tag out procedures established by the user. Verify all of the power is off to the unit before any work is performed.

Failure to disconnect the power could result in serious injury, death or equipment damage.

CAUTION:

Always be sure to keep area around the unit clean and free of clutter. Failure to keep this area clean may result in injury or equipment damage.

SHIPPING AND STORAGE

CAUTION:

Before shipping, storing, or relocating the unit, the unit must be sanitized and all sanitizing solution must be drained from the system. A freezing ambient environment will cause residual sanitizing solution or water remaining inside the unit to freeze resulting in damage to internal components.

CO₂ (CARBON DIOXIDE) WARNING

DANGER:

CO₂ displaces oxygen. Strict attention **MUST** be observed in the prevention of CO₂ gas leaks in the entire CO₂ and soft drink system. If a CO₂ gas leak is suspected, particularly in a small area, **IMMEDIATELY** ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentrations of CO₂ gas experience tremors which are followed rapidly by loss of consciousness and **DEATH**.

MOUNTING IN OR ON A COUNTER

WARNING:

When installing the unit in or on a counter top, the counter must be able to support a weight in excess of 1,000 lbs. to insure adequate support for the unit. **FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

UNIT LOCATION

CAUTION:

Appliance is not suitable for installation in an area where a water jet could be used.

CAUTION:

The appliance must be placed in a horizontal position.

CAUTION:

This unit is not designed for use in outdoor locations.

MACHINE USAGE

**CAUTION:**

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

**CAUTION:**

Children should be supervised to ensure that they do not play with the appliance.

NOISE LEVEL

This unit emits acoustical noise with an A-weighted sound pressure level no greater than 75dB, as measured in accordance with EN 60335-2-75.

INTRODUCTION

DESCRIPTION

The PBD175 (Spire 3.0) solves your ice and beverage service needs in a sanitary, space saving and economical way. Designed to be manually filled with ice from any remote ice-making source, this dispenser dispenses cubes (up to 1-1/4 inch in size), cubelets, and compressed (not flaked) ice. In addition, the unit includes a single, multi-brand dispensing valve, a cold plate, an internal carbonator tank and an external pump for the carbonator. It is designed to supply beverages direct from syrup tanks with no additional cooling required. Figure 1 shows the dimensions of the PBD175 (Spire 3.0) unit.

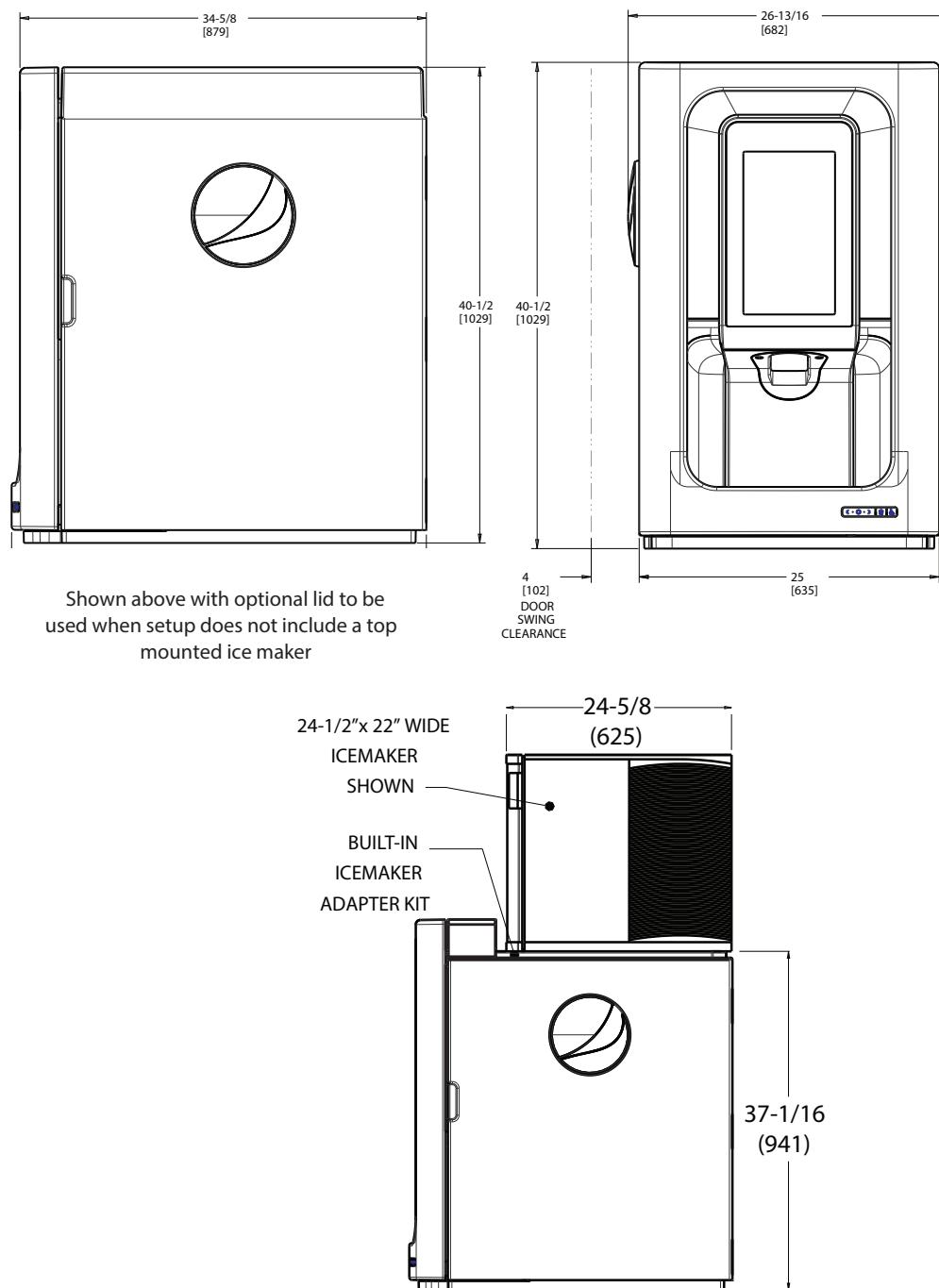
SPECIFICATIONS

Model Description:	PBD175 (Spire 3.0)
Total Unit Weight, empty	260 lb. (117.9 kg)
Ice Storage:	175 lb. (79.4 kg)
Maximum Number of Brands/Flavors Available:	12/4
Built-in Cold Plate:	Yes
Internal Cold Carbonation	Yes
Electrical:	115 V/1Ph/60 Hz 220-240 V/1Ph/50/60Hz 15 Amp dedicated, protected circuit
Dimensions:	40-1/2 in. (1.03 m) tall, to top of lid (Manual Fill Unit) 26-13/16 in. (0.68 m) wide 34-5/8 in. (0.87 m) deep
CO ₂ Operating Pressure	75-psig (0.52 MPa) max
Ambient Operational Temperature	65 to 95° F. (18.3 to 35° C.)
Maximum Inlet Pressure	125 PSI (862 KPa)

ICEMAKER CAPABILITY

The PBD175 (Spire 3.0) has a built-in ice maker adapter to accept a maximum 22" wide X 24" deep ice maker footprint. The dispenser is supplied and shipped with needed parts for this ice maker installation. Any ice maker smaller than these dimensions may require an additional kit for proper ice maker installation. Contact your Cornelius Sales Representative for additional information.

NOTE: Icemaker needs to be equipped with a low level ice sensor (bin stat) to prevent hopper overfilling or ice maker harvest issues. Failure to install this sensor may result in equipment damage or ice dispensing issues.



SPIRE 3.0 HAS A BUILT-IN ICEMAKER ADAPTER
THE ADAPTER IS DESIGNED FOR 22" WIDE ICEMAKERS.
SMALLER FOOTPRINT ICEMAKERS WILL REQUIRE ADDITIONAL PARTS.

Figure 1.

CRITICAL COMPONENT STORAGE TEMPERATURES

Component	Storage Temperature range
NUC	-4°F – 158°F (-20°C – 70°C)
USB Hub	-4°F – 185°F (-20°C – 85°C)
MFV PCBA	-22°F – 176°F (-30°C – 80°C)
Agitator PCBA	-22°F – 176°F (-30°C – 80°C)
LX3 PCBA	-4°F – 158°F (-20°C – 70°C)
30 VDC Power Supply	-40°F – 185°F (-40°C – 85°C)
12/24 VDC Power Supply	-4°F – 185°F (-20°C – 85°C)
19 VDC Power Supply	-4°F – 176°F (-20°C – 80°C)
ADA	32°F – 122°F (0°C – 50°C)

DELIVERY, INSPECTION & UNPACKING

⚠️ WARNING:

It is the responsibility of the installer to ensure that the water supply to the dispensing equipment is provided with protection back flow by an air gap as defined in ANSI A 112.1.2-1979; or an approved vacuum breaker or other such method as proved effective by test and must comply with all federal, state and local codes.

Failure to comply could result in serious injury, death or damage to the equipment.

Water pipe connections and fixtures directly connected to a potable water supply shall be sized, installed and maintained according to Federal, State and Local laws.

DELIVERY AND INSPECTION

NOTE: Cornelius is not responsible for damaged freight. If damage is found, you must save all packaging material and contact the freight carrier. Failure to contact the carrier within 48 hours of receipt may void your claim.

Moving the Unit

The box containing the unit should be moved using a manual forklift.

Unboxing the Unit

The following steps should be performed to open the shipping carton when it is in position to be lifted and installed on the counter.

1. Inspect the carton and note any damage, even if it appears minor. If the carton is damaged, note on the consignee copy of the freight invoice "exterior carton damage-concealed damage possible" and contact the freight company immediately.
2. Remove and inspect the motor assembly from the top compartment of the carton.
3. Inspect the unit and determine if there is any internal shipping damage, if so, report it immediately to the carrier.

PREPARING THE COUNTER

In order to place the PBD175 (Spire 3.0) unit on a counter, the counter must be prepared by cutting an opening in the counter to accommodate the syrup lines and power cord connection to the unit.

MARKING AND CUTTING THE COUNTER

To mark and cut the counter, refer to Figure 2.

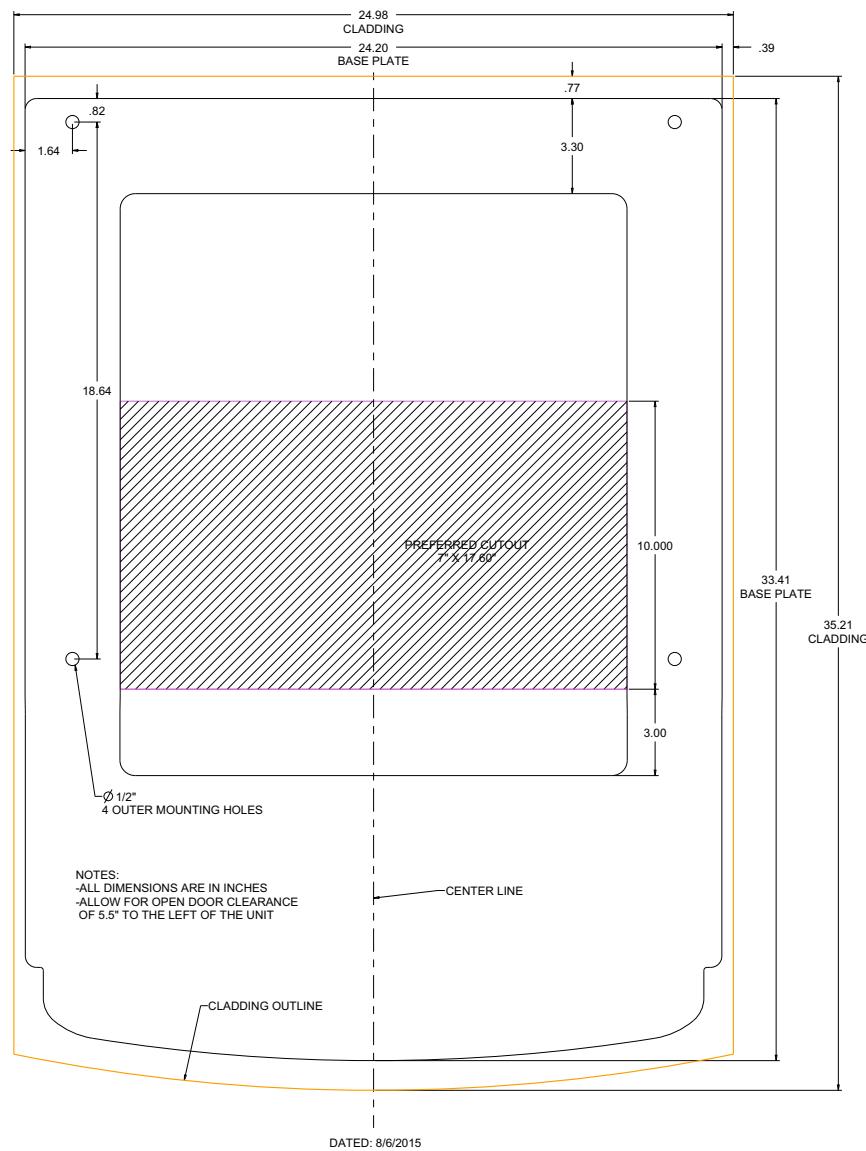


Figure 2.

SANITIZING THE ICE BIN

It is easier to sanitize the ice bin before placing the unit on the counter. This procedure can be performed after positioning the unit on the counter, if desired.

To sanitize the ice bin, perform the procedure below.

1. Open the display door.



2. Remove the cover from the ice bin.



3. Remove the agitator assembly.



4. Use a nylon bristle brush, sponge or cloth to clean the interior of the bin and soap solution for the top cover and agitator assembly. Thoroughly rinse the bin, cover and agitator surfaces with clean potable water.



5. Reassemble the agitator assembly. Take special care to tighten the thumbscrew.

6. Use a mechanical spray bottle filled with sanitizing solution to spray the entire interior of the ice bin and agitator assembly. Allow them to air dry.
7. Replace the ice bin cover and make sure it remains in place during the rest of the installation.
8. Close the display door.

POSITIONING THE UNIT ON THE COUNTER

⚠️ WARNING:

The PBD175 (Spire 3.0) unit is very heavy and extreme care should be taken when moving or lifting the unit. Do not attempt to lift the unit manually.

Failure to comply could result in serious injury, death or damage to the equipment.

To place the PBD175 (Spire 3.0) unit in position on the counter, perform the procedure below.

1. Move the fork lift with the unit to the front edge of the counter where it will be installed.



Figure 7.

2. Carefully jack up the fork lift so that the bottom of the unit is flush or slightly above the level of the counter.



Figure 8.

3. Carefully slide off the unit of the fork lift and onto the counter.

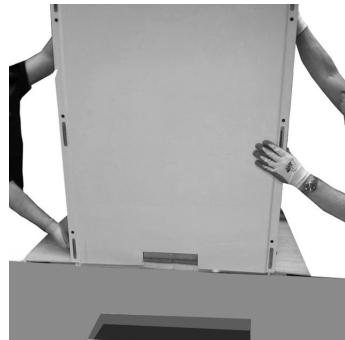


Figure 9.

4. Position the unit 2-1/2 in. from the back of the counter, over the rectangular cutout in the counter.
5. Remove the beverage tubes and pump deck power cord from their storage space in the bottom of the unit and route them through the slot in the counter.
6. Apply a continuous bead of NSF 51 approved silicone sealant (Dow 732 or equal) approximately 1/4-inch around the outer periphery of the unit. All excess sealant must be wiped away immediately.

NOTE: Perform step 6 only after completing the plumbing installation. Refer step 2 under section "Connecting the Unit" on page 15" for plumbing instructions.

ICE MAKER MOUNTING

NOTE: For proper ice maker and dispenser function, it is necessary to make sure that following are checked.

- Ice level sensor (bin stat) is installed at least 2" below hopper top (Refer to Ice maker Installation manual).
- Ice bridge thickness is adjusted per Ice Maker manufacturer's specification (Refer to Ice maker Installation manual).
- Agitator board off-cycle timer settings are set properly for ice type (See "Off-Cycle Agitator Settings" on page 24).
- Ice flow from dispenser ice chute is sufficient for ice type (See "Ice Chute Restrictor Adjustment" on page 24).

1. Make sure top of unit is clean and free of dirt, grime, and debris.



Figure 10.

2. Loosely mount ice maker bracket to back of dispenser with (3) 1/4-20 bolts.



Figure 11.

4. Make sure ice maker is centered on unit and equal distances on each side.



Figure 12.

5. Locate on the rear of the ice maker a good place to secure the supplied ice maker bracket to with #8 self-tapping screws.

⚠️ IMPORTANT:

Be sure to screw into sheet metal, not to screw into refrigeration componentry behind the sheet metal.



Figure 13.

6. Lift ice maker bracket as shown until either slots or holes in bracket are within area chosen to screw into. Tighten the (3) 1/4-20 bolts



Figure 14.

7. Use #8 self-tapping screws to screw into the ice maker as shown in Figure 15. Use a minimum of (2) screws to safely secure ice maker to dispenser. Any hole or slot in bracket can be used.



Figure 15.

8. Seal ice maker all around using 100% silicone.

NOTE: If ice maker has swinging front door, do not apply silicone to the door.



Figure 16.

9. Complete installation of ice maker electrical and plumbing connections. Be sure to follow and abide by any local or state codes.



Figure 17.

10. Install manual fill lid as shown Figure 17.



Figure 18.

11. Screw (2) #8-32 truss head screws into the upper frame front, one each side. Do not fully seat screws.

12. Place Filler panel on top (make rubber bumpers are installed on the 4 holes on Filler panel) and place keyslot into the #8-32 screws as shown in Figure 19.



Figure 19.

13. Tighten screws down to secure the filler panel.



Figure 20.

14. Close the door and check for fit and function.

CONNECTING THE UNIT

INSTALLING WATER, CO₂ AND SYRUP LINES

Once the unit is located in its final position on the counter, the unit must be plumbed. Perform the procedure below to plumb the unit.

1. Locate the water and syrup input tubes. The lines are marked S1 through S12 /F1-F4 for syrups, CW for carbonated water, W for plain water and F1 through F4 for flavor shot lines.

NOTE: If lines are to be cut, mark the line numbers above the cut with a marker. Make sure that syrup lines and flavor lines are not mixed.

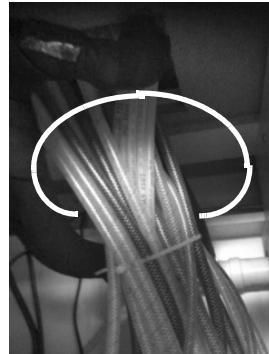


Figure 21.

2. Connect the beverage system product tubes to the python coming from the back room package, depending on the unit being installed.
3. Connect the inlet water to the pump and the pump outlet to the PBD175 (Spire 3.0) unit using 3/8" (0.95 cm) food-grade tubing.



CAUTION:

Do not install a water pressure regulator on the plain water inlet between the back room package and the unit.



IMPORTANT:

Make sure the unit is not plugged into the AC power source.



CAUTION:

Check the minimum flow rate and the maximum pressure of the plain water inlet supply line. Minimum flow rate must be at least 125 Gal/Hr (0.47 cubic m/hr). If flow rate is less than 125 Gal/Hr (0.47 cubic m hr), starving of the carbonator water pump occurs. Starving causes the carbonator water pump to overheat.



CAUTION:

Incoming plain water inlet supply line pressure to the pump MUST remain a minimum of 10 psi (0.07 MPa) BELOW the carbonated CO₂ operating pressure. [Example: Carbonator CO₂ operating pressure is 75 psi (0.52 MPa), then the maximum water pressure can not be more than 65 psi (0.45 MPa), etc.]. Add a 65 psi regulator to the soda water line. Water over pressure (higher than CO₂) can cause carbonator flooding, malfunction, and leakage through the carbonator relief valve. Do not add a regulator to the plain water supply.

4. Locate the carbonator pump assembly and connect the power cord from the PBD175 (Spire 3.0) unit to the pump. The cord is connected to the unit's electrical box and has an electrical connector on the end that plugs into a receptacle in the junction box at the carbonator pump assembly of the carbonation pump deck below the unit.
5. Turn on the water supply and assure pump deck switch is ON.



Figure 22.

INSTALLING THE DRAIN

After installing the syrup, water and CO₂ lines, the drain lines must be installed. To install the drain line, perform the procedure below.

1. Make sure drain tube is clean and free of damage.

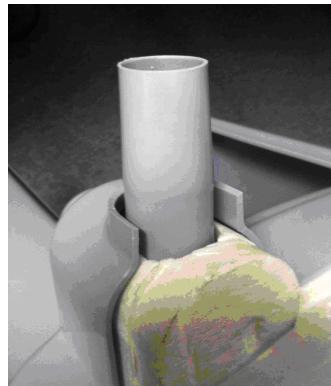


Figure 23.

2. Push supplied drain hose until it touches the foam.

⚠️ IMPORTANT:

Do not cut or remove any foam.



Figure 24.

3. With supplied clamp, position as shown in Figure 25 and tighten to approx. 16 in/Lbs. Over tightening will cause the drain fitting to deform and leak.



Figure 25.



Figure 26.

4. Look into drain fitting to confirm no deformation has occurred.

⚠️ IMPORTANT:

Cover any exposed clamps and drain line with insulation and insulation tape. Failure to do so can lead to condensation.



Figure 27.

5. This step may require a 2nd person for help. Route drain tube thru the unit and down thru the counter top opening to the floor drain, careful not to place excessive side or down pressure into drain fitting (this pressure or load may lead into fitting to drip tray part failure). The drain tubing, when applicable, has a minimum horizontal slope of $\frac{1}{4}$ " per foot for proper drainage. Failure to do so will result in poor drip tray draining.

⚠️ IMPORTANT:

Be sure to comply with any local, city & state plumbing codes.

6. Once Enclave is in the correct position, secure enclave to its mounting brackets.

ENCLAVE RE-INSTALL WORK INSTRUCTIONS

This document is to aid in Spire 3.0 Enclave removal and re-installation. Procedures not covered in this document can be found in Spire 3.0 Operators or Service manuals. Only trained and certified technicians familiar with the Spire family of Dispensers should service this unit.

⚠️ IMPORTANT:

Before removing the enclave, ensure the unit is of correct fit and operation while opening and closing the door. Note any abnormalities that may affect door operation. Verify and service any parts that may affect door closure first before attempting this procedure.

1. Open the Door, remove the Ice Slide and Splash Panel by disengaging the magnetic contact with the static panel mounting bracket, by pulling the ice lever forward. Carefully remove Splash Panel.



Figure 28.



Figure 29.

2. Mark location of Enclave screws as shown in Figure 30 to help reference re-installation and proper Enclave placement.



Figure 30.

3. Loosen the Enclave screws QTY (4), (2) each side using a screw driver, carefully remove the enclave and set it aside.



Figure 31.



Figure 32.

4. Once the connections are complete, stow the lines towards the back of the unit. Be sure to dress the lines in a clean manner taking notice of where lines should run to not interfere with the enclave when installed.



This is an example of POOR installation.
Beverage lines, cords and drain lines should
be routed to allow enclave installation
an easy path.

Figure 33.

5. Install drip tray drain tube on enclave as described in "Installing the Drain" on page 16.

⚠️ IMPORTANT:

Do not overtighten clamp (Tighten to approx. 16 in/Lbs torque max). Make sure drain tube is fully insulated to prevent condensation.

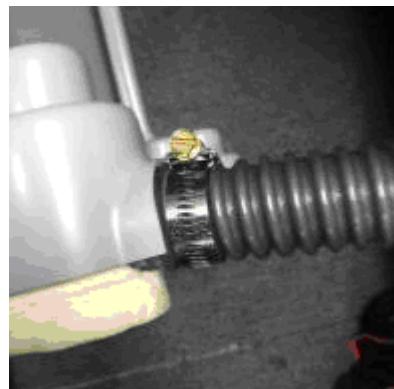


Figure 34.

6. Carefully Install the Enclave by sliding it back till the screws match with the marked location on the side of the enclave bracket (approx center of the slot). Make sure plumbing lines and drain tube are not in the way, providing resistance on Enclave. If so, re-arrange plumbing and drains lines accordingly.
 - Make sure main drain line is pitched properly per local, city or state codes.
 - Make sure cold plate drain funnels are firmly installed in enclave holes and are in a vertical position.



Figure 35.



Figure 36.

7. Push the Enclave back and down, tighten the lower Enclave screw at the mark location with a screw driver, stop when screw has seated to prevent overtightening and damage to plastic mounting parts.

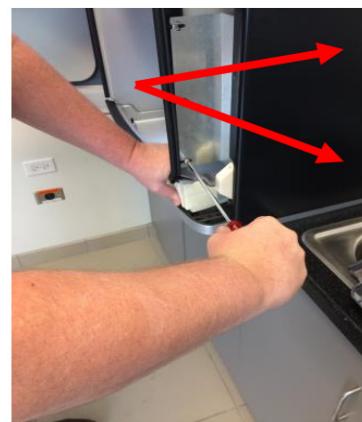


Figure 37.

8. Check Door closure to verify that when the door is closing it is not 'grabbing' or rubbing gasket on Enclave.



Figure 38.

9. If the door has difficulty in closing, loosen the 2 lower screws again and push the enclave further back, re-tighten screws.

NOTE: Enclave depth is limited when it touches the cold plate foam base (See in Figure 28). If Door still does not close properly, there is something else not aligned.

⚠️ IMPORTANT:

Do not attempt to modify enclave.



Figure 39.

10. Once door closes properly, tighten the remaining Enclave screws, verify door closure again. If OK, re-install the Splash Panel by ensuring the ridges on the back of the splash panel clip over the edge of the enclave. Pull the ice lever forward and push the panel back till the magnets contact the static panel mounting bracket.



Figure 40.



Figure 41.

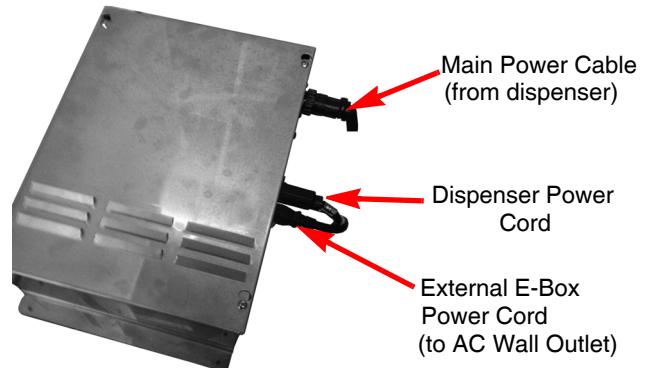
11. Verify function of the unit.

CONNECTING THE E-Box

Mount the E-box in a convenient location under the counter. Make sure that it is close enough to the dispenser so that the power cord reaches the dispenser power connector.

To connect the E-box, perform the procedure described below.

NOTE: All of the cords are polarized and are designed to be installed only one way. This is to prevent installation errors.



1. Plug the unit power cord into the E-box.

Figure 42.

2. Attach the main power cable into the E-box.
3. Plug the carbonator motor plug into the carbonator deck E-box.

INITIAL SETUP

**CAUTION:**

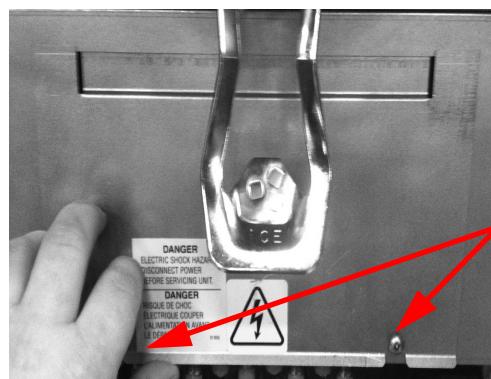
Before connecting the CO₂ regulator assembly to a CO₂ cylinder, turn the regulator adjusting screw to the left (counterclockwise) until all tension is relieved from the adjusting screw spring.

**CAUTION:**

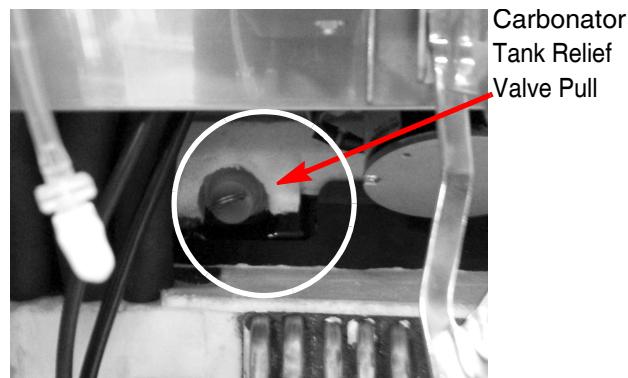
Never operate the carbonator pump with the water inlet supply line shutoff (valve closed). "Dry running" the water pump will burn out the pump. A pump damaged in this manner is not covered by warranty.

WATER SUPPLY AND CO₂ REGULATOR

1. Turn on the main water supply valve to flood the unit.



2. Remove the access panel by removing the two mounting screws holding the access panel.



3. Open the relief valve on the carbonator to flood the tank by pulling the valve pull, located at the lower right side of the front of the unit, until water flows from relief valve.

4. Replace the access panel.

5. Open (counterclockwise) the CO₂ cylinder valve slightly to allow the lines to slowly fill with gas, then open the valve fully to back-seat the valve (Back-seating the valve prevents leakage around the valve shaft).

NOTE:The carbonator CO₂ regulator is fixed at a nominal 75 psi.

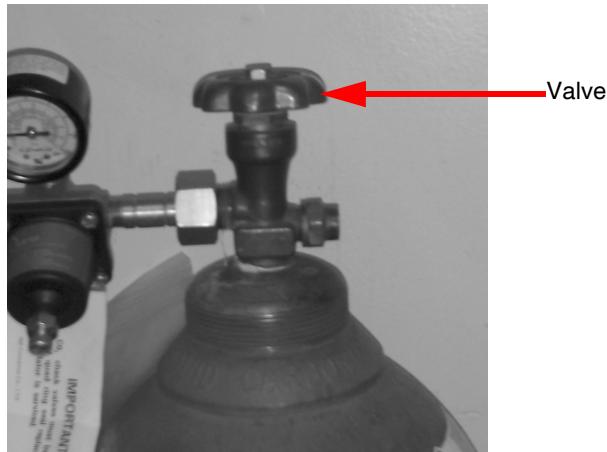


Figure 45.

6. Verify that the pressure gauge on the cylinder reads over 110 PSI.

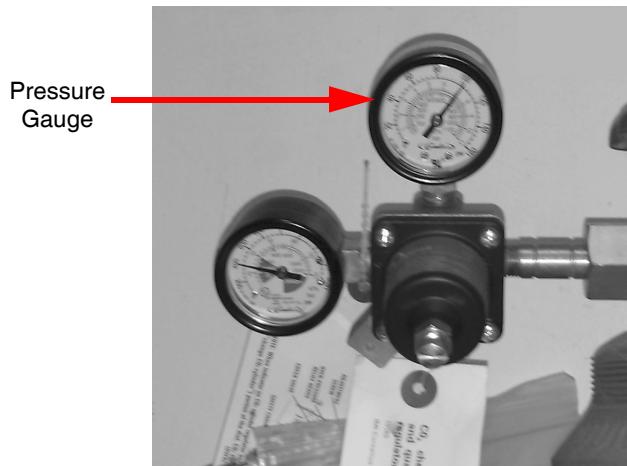


Figure 46.

7. The power cord is attached with a zip tie to the bottom of the unit, cut the tie and plug the unit into a devoted 15Amp grounded 115VAC power supply and the touch screen should startup.

OFF-CYCLE AGITATOR SETTINGS

It is important to correctly set the ON/OFF times for off-cycle ice agitation to prevent ice dispense and storage issues. The default factory timer settings are set at 4 seconds ON / 1 hour OFF. It may be necessary to adjust these times based on ice type and quality used with this dispenser.

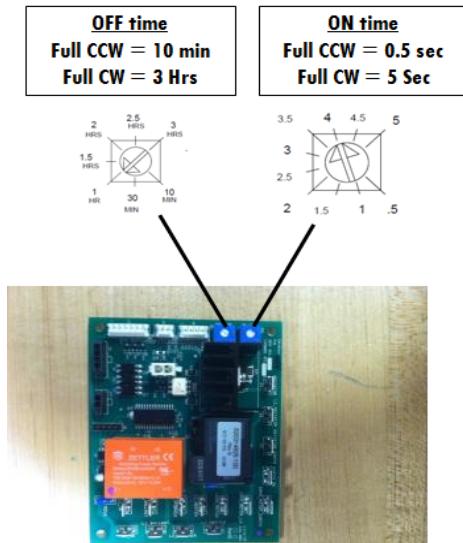


Figure 47.

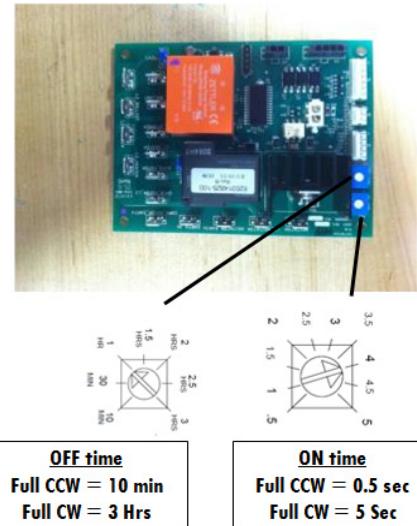


Figure 48.

ICE CHUTE RESTRICTOR ADJUSTMENT

To adjust ice flow rate out of the ice chute, it may be necessary to increase or decrease flow rate based on customer use and/or ice type. The default factory ice opening is 1.5".

Softer ice types should require the restrictor to be opened completely to prevent ice storage or 'balling' issues.

It may be necessary to order a soft ice slide kit for use of soft/chunklet ice. Contact your local Cornelius Sales Representative or Customer Service for more details.

- A. Remove ice chute cover
- B. Loosen the 4 nuts
- C. Push restrictor plate up for more flow, down for less flow
- D. Tighten and torque nuts in a crisscross pattern to the specified torque value.
 - ED models – torque to approx. 12 in/Lbs
 - IDC models – torque to approx. 32 in/Lbs



IMPORTANT:

Failure to torque nuts properly may result in a poor gasket seal/ water leakage. Be sure to torque nuts properly.

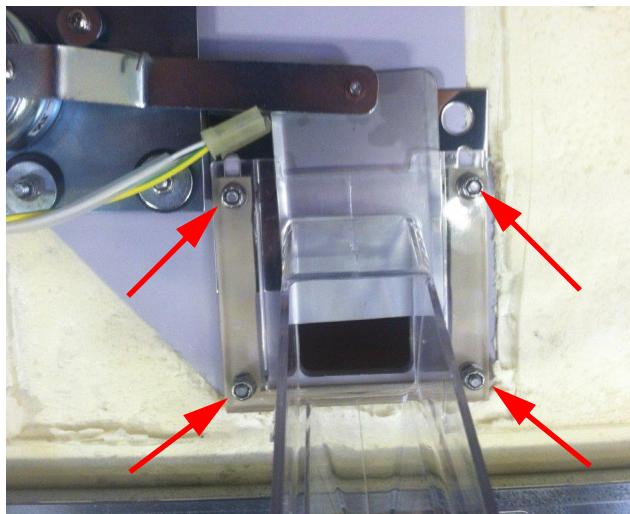


Figure 49.

FILLING (MANUAL FILL UNIT ONLY)

For an Ice Maker equipped unit, refer to the ice maker manufacturer's manual to begin filling the ice hopper with ice.

CAUTION:

- The dispenser cannot be used with crushed or flaked ice.
- Use of bagged ice which has frozen into large chunks can void warranty.
- The dispenser agitator is not designed to be an ice crusher.
- Use of large chunks of ice which jam up inside the bin will cause failure of the agitator motor and damage to the bin.
- If bagged ice is used, it must be carefully and completely broken into small, cube-sized pieces and left to "temper" or warm up for a minimum of 20 minutes at room temperature before loading it into the ice bin.

To sanitize and fill the bin, perform the procedure below.

1. Open the display door.

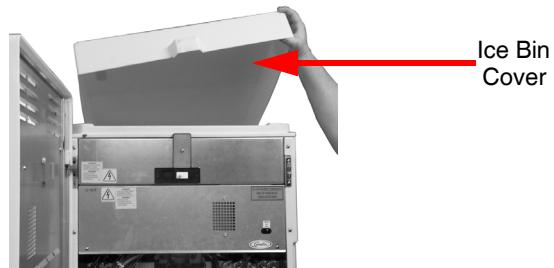


Figure 50.

2. Remove the cover from the ice bin.

IMPORTANT:

Do not overfill hopper.

3. Fill the bin with ice(175 lb. maximum).

4. Replace the ice bin cover.

5. Close the door.
6. After loading the ice into the bin, wait 30 minutes to allow the cold plate to chill the syrups to the proper operating temperature.
7. Plug the external E-box power cord into a protected AC wall outlet. Once this cord is plugged into a wall outlet, the dispenser and external EBOX are energized. The NUC Power button needs to be pressed to turn on the dispenser.



Figure 51.

START SYRUP FLOW

Start the syrup pumps and adjust them to the following pressures:

- Sugar Syrups: 65-75 psi (depending on syrup viscosity)
- Diet Syrups: 45 psi (depending on syrup viscosity)
- Flavor Shots: 45 psi

ENTERING SERVICE MODE

The unit contains a hidden section that allows service personnel a set of tools to setup the dispenser. To enter this mode perform the following steps.

1. Enter the Service menu by drawing two “P”s on the screen with your finger, one after another, starting from the bottom, as shown in Figure 52. The PIN screen should appear. Do not lift your finger while drawing the “P”.
2. “Enter Pin” number. The next screen should appear.
3. Press the “SERVICE” button. This displays the menus allowing the technician to assign valves, prime and set the ratio of the valves.
4. If the unit does not power up when plugged in, press the NUC power button to turn it ON.



Figure 52.



Figure 53.

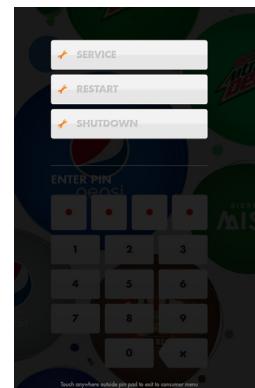


Figure 54.

INITIAL SETUP

When the unit is first installed, the technician's first visit to the Service Mode prompts for an Initial Setup. The technician can also alter any of the setup fields in the future by selecting the Initial Setup action. The following screens are used for the initial setup. The only difference between the first setup and any subsequent setup is the presence of a Cancel button in the screen. The first popup window in this process verifies the status of all subsystems (Valve Controller, System Inventory, and MB Controller). The technician can progress through the setup process by selecting Continue after each step.

1. Enter SERVICE Mode, as described in the "Entering Service Mode" on page 26.
2. The Initial Setup Screen shown in Figure 55 A is displayed.
3. If all the conditions on the lower right side of the screen are "True", press continue. If the conditions are false, refer to the "Troubleshooting" on page 39.
4. Select Spire 3.0 for Unit Type from the screen shown in Figure 55 B. Once unit type has been selected the screen advances to Figure 56 A, now the unit location can be selected.

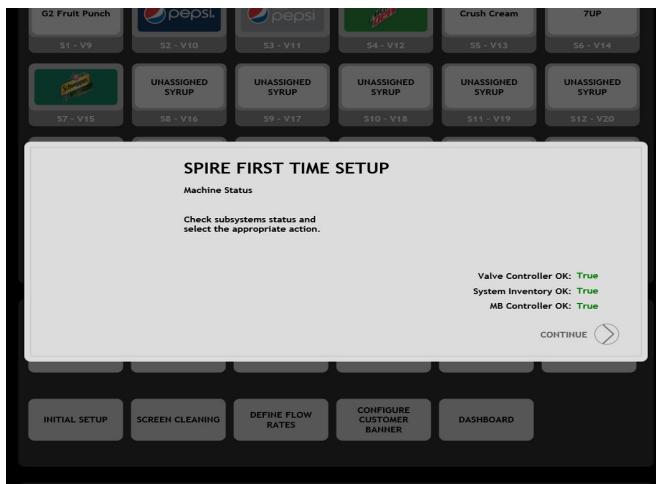


Figure 55 A.

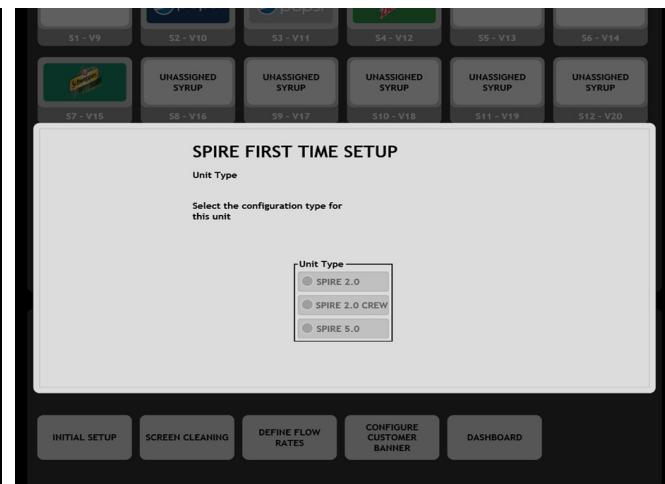


Figure 55 B.

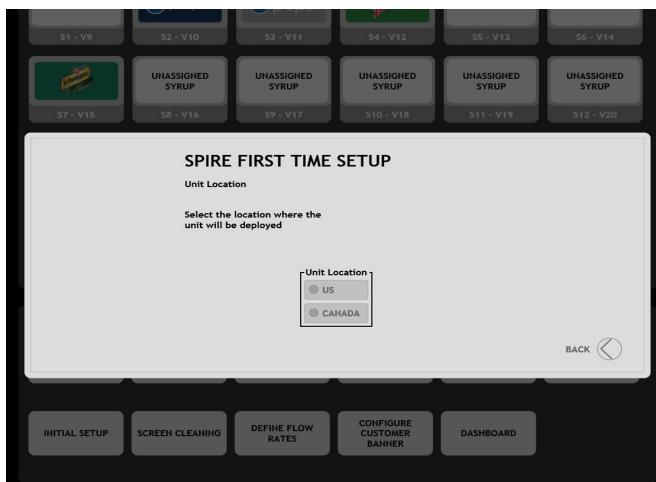


Figure 56 A.

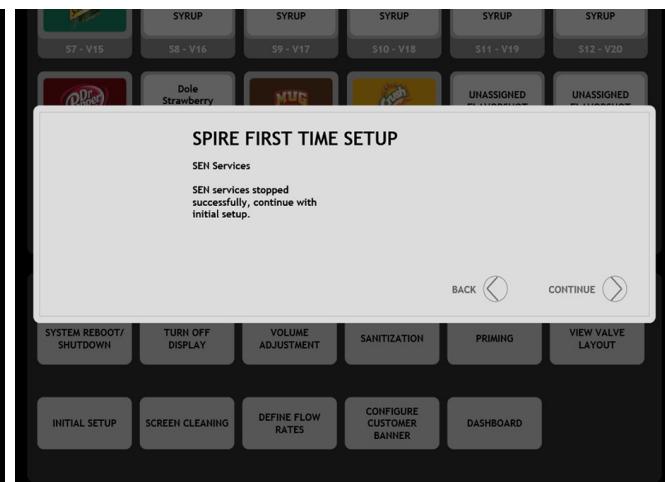


Figure 56 B.

5. Once a location has been chosen the screen advances to the "SEN services stopped" continue and this will prompt to entering SEN information, shown in Figure 56 B.

6. Selecting Continue on the SEN Services screen displays the Kiosk Name Setup screen, shown in Figure 57 A. Enter the Kiosk Name in the text box and press Enter, this displays the Kiosk ID screen, shown in Figure 57 B.

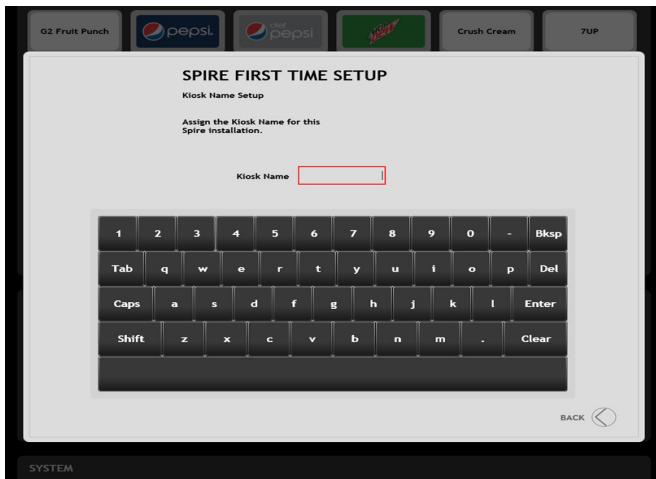


Figure 57 A.

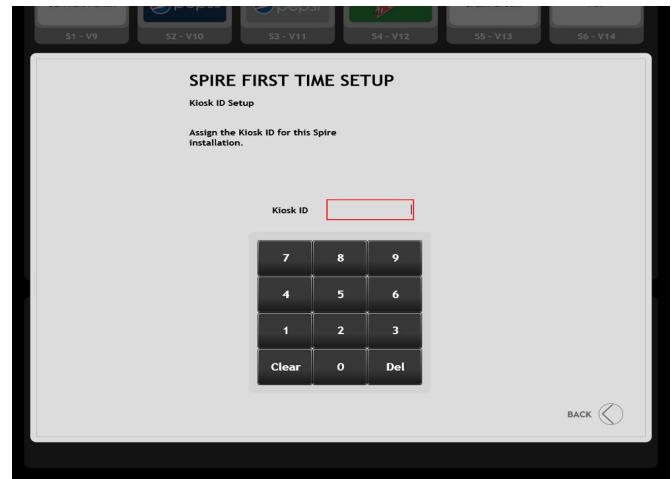


Figure 57 B.

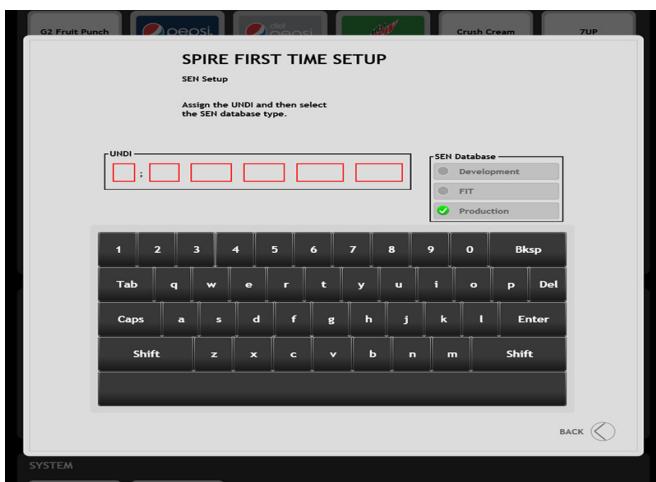


Figure 58 A.

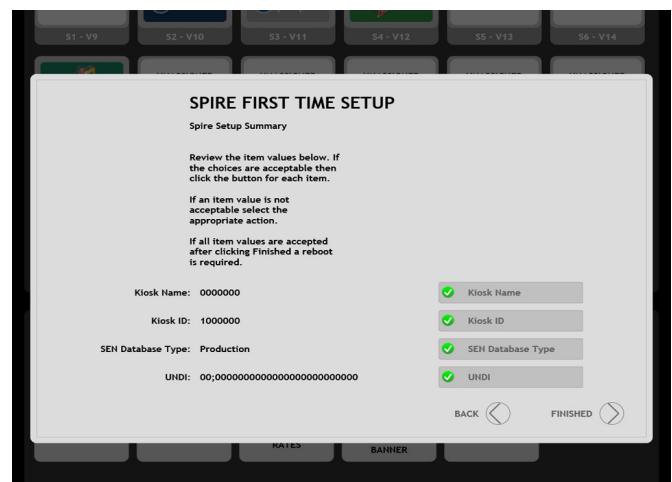


Figure 58 B.

7. Enter UNDI number and select production for SEN database type shown in Figure 58 A. Press enter to get the spire set up summary screen shown in Figure 58 B. This spire set up summary screen shows the Kiosk Name, ID, SEN Database Type and UNDI. Selecting each of the fields verifies the proper selections and green circles with check marks are displayed. If the information on the screen is correct, select Finished.

8. When the Finished button is pressed on the Spire Setup Summary screen, the Reboot screen shown in Figure 59 A is displayed. Select the Reboot button to display the Reboot Confirm screen shown in Figure 59 B. Press the Confirm Reboot button to reboot the unit.

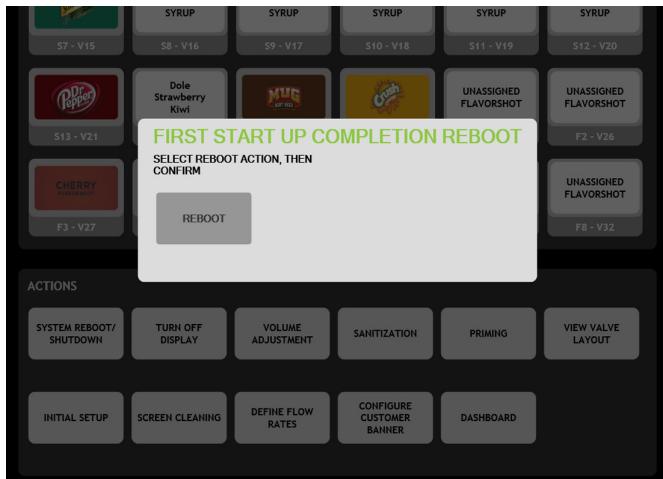


Figure 59 A.

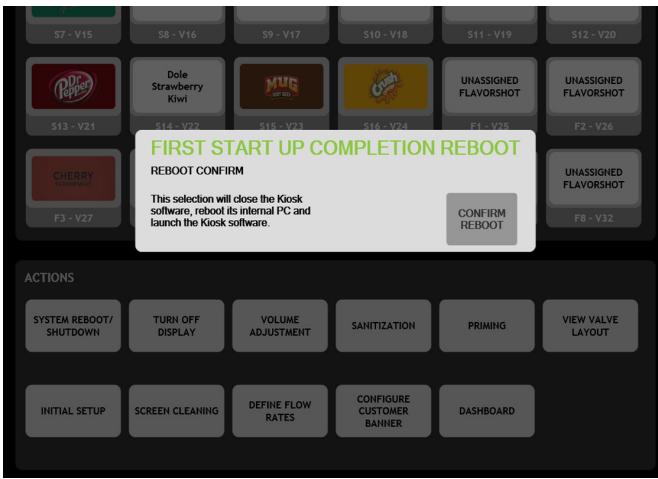


Figure 59 B.

ENTERING THE SECONDARY USER INTERFACE

The display shown in Figure 60 is the screen displayed for the secondary user interface. It is accessed from the SERVICE mode or by entering the correct PIN at the Consumer user interface. The user interface consists of three sections:

1. Valve Assignment Section
2. Actions
3. System

The Valve Assignment Section controls the following:

- Valves in the system are mapped to water, syrup, or flavor shot products.
- Priming steps for individual BIBs and water.
- Lock/unlock a valve to prevent/allow pours from Consumer UI.

The Actions Section controls the following:

- Reboot/shutdown the system gracefully.
- Priming up to five valves (manual or Brix).
- View Valve Layout shows how the assigned valves map to the actual hardware when observing a Spire unit.
- Initial Setup allows the technician to change certain parameters from the original setup.
- Screen Cleaning disables touch for a 30 second interval to allow for cleaning.
- Defines Flow Rates for waters, syrups, and flavor shots.

The System Section controls the following:

- Equipment Status provides information about the SEN Connection, System, Valve Controller, ADA Controller, and the touch controller.
- Preventative Maintenance provides statuses on the Water Filter, Sanitization, Power Supply Fan, and NUC Fan.

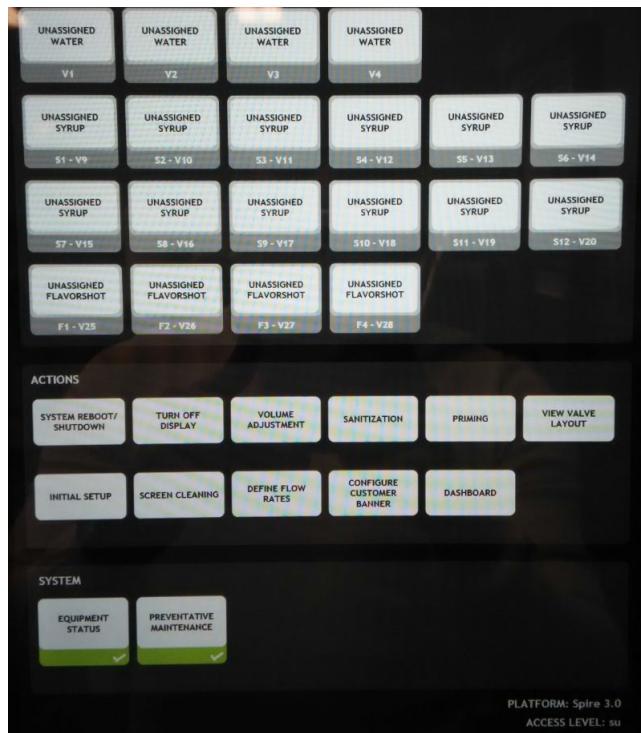


Figure 60.

MAPPING THE VALVES

The valves in the PBD175 (Spire 3.0) dispenser can be mapped to any brand shown on the touch screen, except the carbonated water and plain water valves. Before brixing the unit, make sure the plumbed brand lines from the python are correctly connected to the labeled brands on the user display screen.

1. Enter SERVICE Mode. Shown in ““Entering Service Mode” on page 26.
2. Press the “unassigned valve” icon to assign a flavor, in the display in Figure 60. The BIB popup screen is displayed, as shown in Figure 61. The technician can assign any brand as well as can swap to another brand and lock it to prevent the consumer from pouring any liquid. The technician can also perform a 4-second Brix Calibration or prime the valve.

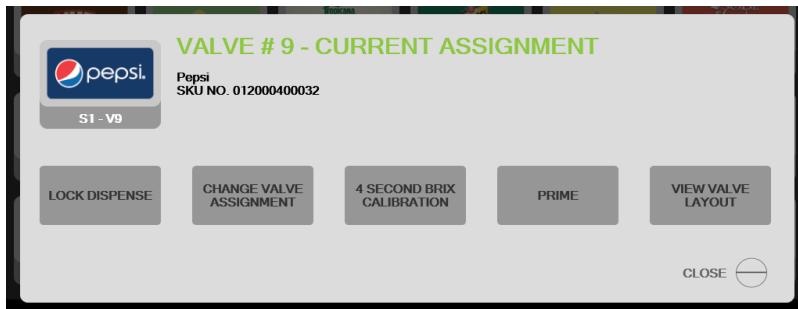


Figure 61.

3. Press “CHANGE VALVE ASSIGNMENT” to assign the new flavor. The screen shown in Figure 62 allows the technician to change the assignment of the valve that was selected by choosing a valid unassigned product.



Figure 62.

4. Figure 63 shows what it would look like when a technician changes the assignment of the first valve to any other unassigned product. The interface asks the technician whether or not the valve has been sanitized. The technician can select “Yes, continue with BIB change”, which assumes that the sanitization process has been completed. If the technician has not sanitized the valve, select “No, continue with valve cleaning” displays Figure 64, listing the steps for sanitization.



Figure 63.

The sanitization process is performed in four steps: Pre-Rinse, Sanitize, Soak, and Post-Rinse. The image below illustrates how to sanitize the valve.



Figure 64.

PRIMING

Selecting Priming from the action section is different from the priming button mentioned previously. This selection allows for the technician to prime up to 5 valves at the same time. As the carbonator tank was "flooded" during install select High Carb & Low Carb then press START and let the carbonator pump cycle several times or until a good flow of carbonated water is observed.



Figure 65.

1. You can save time by selecting 5 valves simultaneously. After the Brix Dispense prime has been completed/terminated, the valves that were selected prior to priming will stay selected. If the technician stops a manual prime, the valves that were selected prior to priming will be deselected. The technician also has the option to manually deselect selected valves by selecting the Clear button.

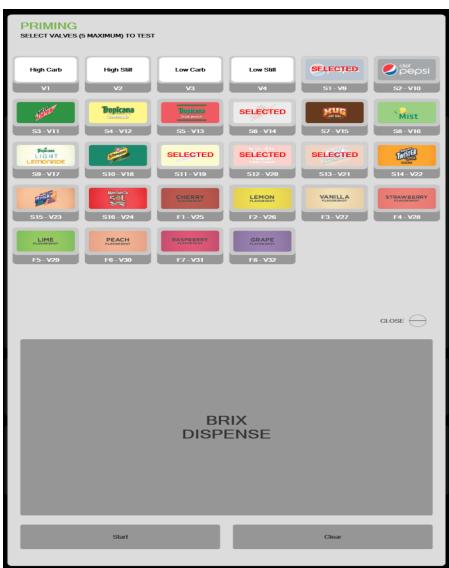


Figure 66.

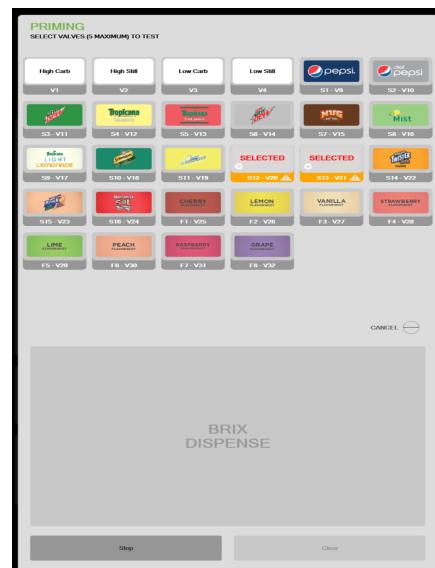


Figure 67.

Priming Lines

Priming is also available through the Priming button function. This allows up to five valves at a time to be done. Priming may also be done through the individual valve icons, one at a time. When the plain and carbonated water being primed, cycle the pump motor several times or until carbonated water is observed.

1. Turn on CO₂ supply, set BIB pump pressures to 65 psi sugar syrups, 45 psi diet syrup & 45 psi flavor shots
2. Check for CO₂ leak.
3. Enter priming mode and start carbonated water priming to run water until carbonated water is observed (typically several cycles of the carbonation pump). Then start the plain water and let it flow until a steady stream is observed and all air has been removed. Select up to 5 syrups to simultaneously and run until all air has been removed, then continue with balance. SERVICE Mode, as described in the "Entering Service Mode" on page 26.
4. Press the Prime function, shown in Figure 68. Selecting Priming on the BIB popup allows the technician to prime only one valve at a time. When priming the valve, the technician can choose to Start Prime Dispense, which primes the valve until the technician selects Stop Prime Dispense, shown in Figure 69.

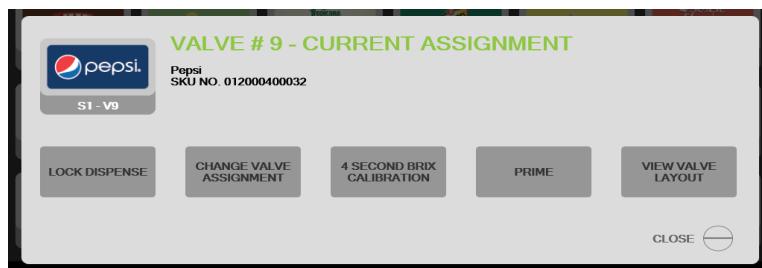


Figure 68.



Figure 69.

The technician can also choose to Start Timed Prime, which primes the particular valve for a set amount of time or until the user selects Stop Timed Prime, as shown in Figure 70.



Figure 70.

5. Repeat Step 3 until all lines are purged. When doing carbonated water, make sure carbonator is purged.

ADJUST WATER TO SYRUP RATIO (BRIX)

NOTE: During the brixing process, agitate the ice in the bin occasionally to ensure that the cold plate is at temperature.

Water and syrup must be cold before checking ratios.

NOTE: Lines must be purged prior to brixing.

To set ratios to the unit, perform the procedure below.

1. Enter SERVICE MODE. As described in "Entering Service Mode" on page 26.
2. Select PRIME from ACTION icon.
3. Place water chamber of ratio cup under the dispensing nozzle.
4. Adjust water flows first:
 - Select High Carb and press BRIX DISPENSE button, this will dispense Carb Water for 4 seconds. Set flow rate to dispense 210ml or 7 oz.
 - Select High plain and press BRIX DISPENSE button, this will dispense plain Water for 4 seconds. Set flow rate to dispense 210ml or 7 oz.
 - Select Low Carb and press BRIX DISPENSE button, this will dispense Carb Water for 4 seconds. Set flow rate to dispense 90ml or 3 oz.
 - Select Low plain and press BRIX DISPENSE button, this will dispense plain Water for 4 seconds. Set flow rate to dispense 90ml or 3 oz.
5. Turn the flow adjustment valve a 1/4 of a turn at a time and recheck the flow. To increase the flow, turn the knob clockwise. Set syrup after water.

6. Press the brand or flavor to be brixed. The BRIX screen, shown in Figure 71 is displayed.

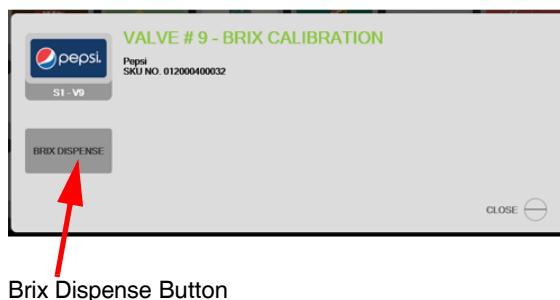


Figure 71.

7. Hold the BRIX cup under the valve and press "BRIX Dispense" icon.
8. Set syrup flow adjustment valve to get the desired ratio. Set flavor shots to dispense 12 ml / 4 seconds
9. Set syrup volumes to 60 ml (for 5:1 ratio syrups).
10. Set the flavor shot setting as shown in Table 1.

Table 1.

Valve	Flow Rate
High Carb	210 ml
High Plain	210 ml
Low Carb	90 ml
Low Plain	90 ml
Syrup	60 ml (5:1)
Flavor Shot	12 ml

Same as opposite side.

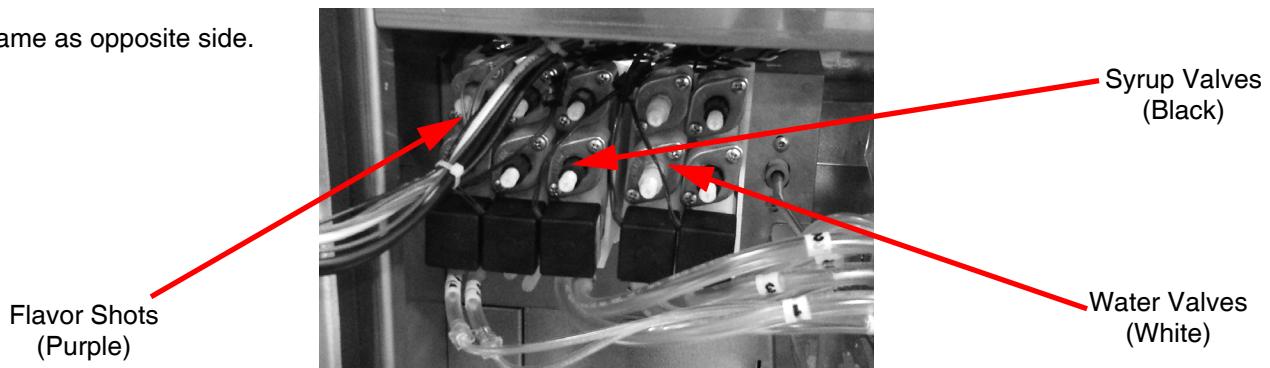


Figure 72.

DEFINE INPUT FLOW RATES

When syrup line runs are being extensive and high viscosity syrups are unable to provide enough syrup the Installer can use "Define Input Flow Rates" to assure SEN data is accurate. If there is a question about a long run the furthest unit should be tested with the most viscous (thick) syrup, if volume of syrup is low, first turn up CO₂ pressure to BIB pumps. If volume is still low then the technician should calculate the flow rate of water to be set for proper ratio. Once calculated, water flow rates can be modified for SEN info.

NOTE: This has no affect on operation of the unit, it is for DATA only.

The technician has the ability to input the flow rates for water, carbonated water, and flavor shots. Figure 73 displays the default values for each of the three liquids. After selecting a liquid, the technician can change the associated value to another valid value, as shown in Figure 74.

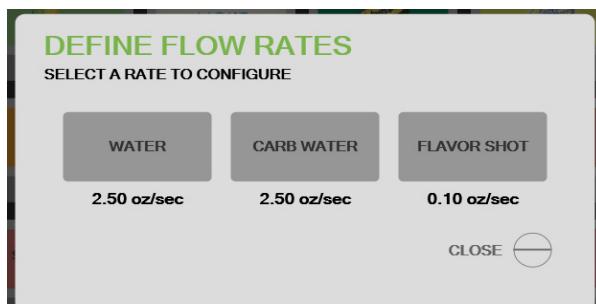


Figure 73.

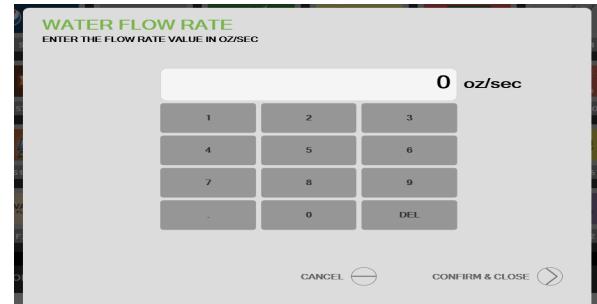


Figure 74.

DIAGRAMS

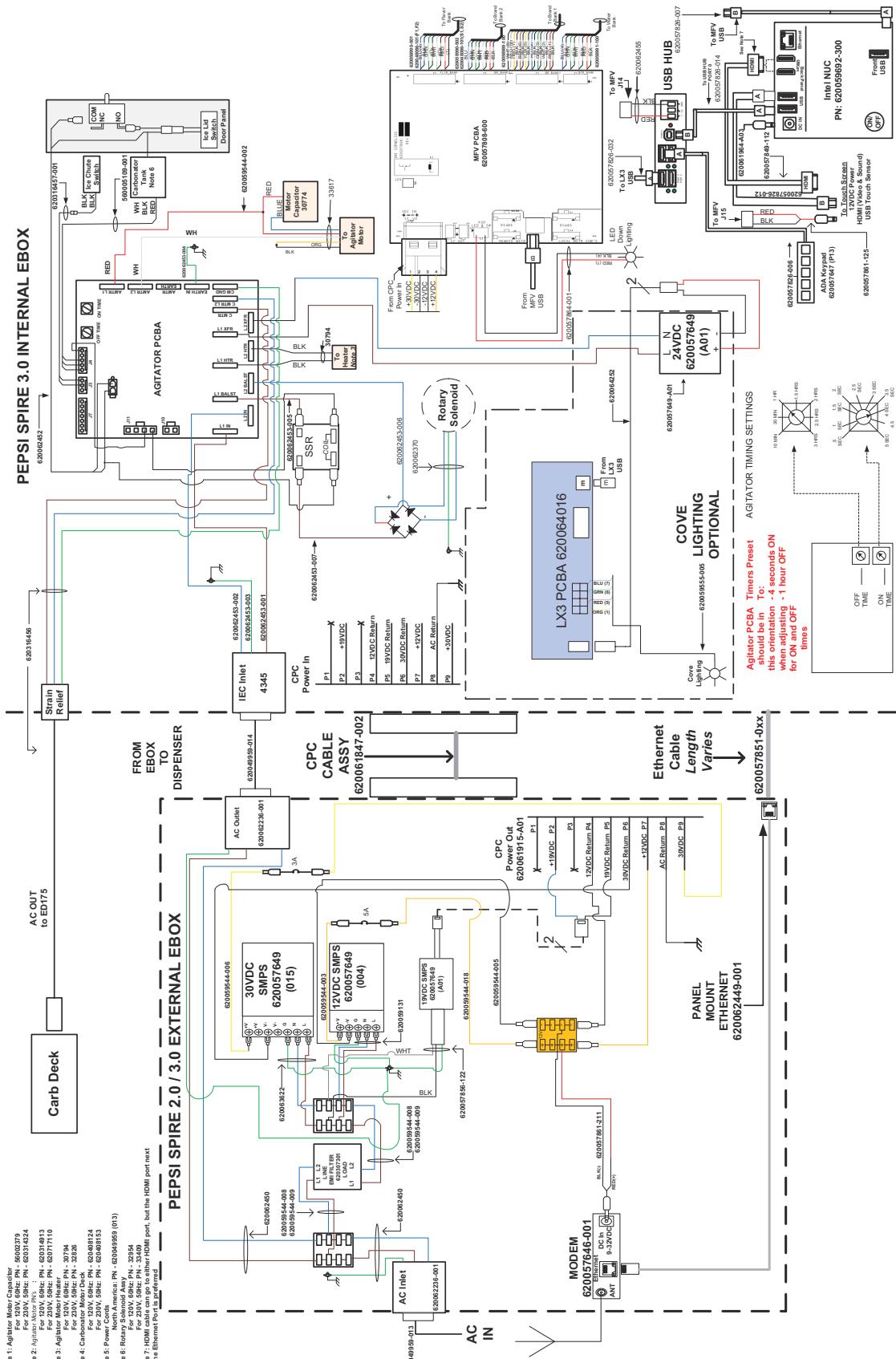


Figure 75.

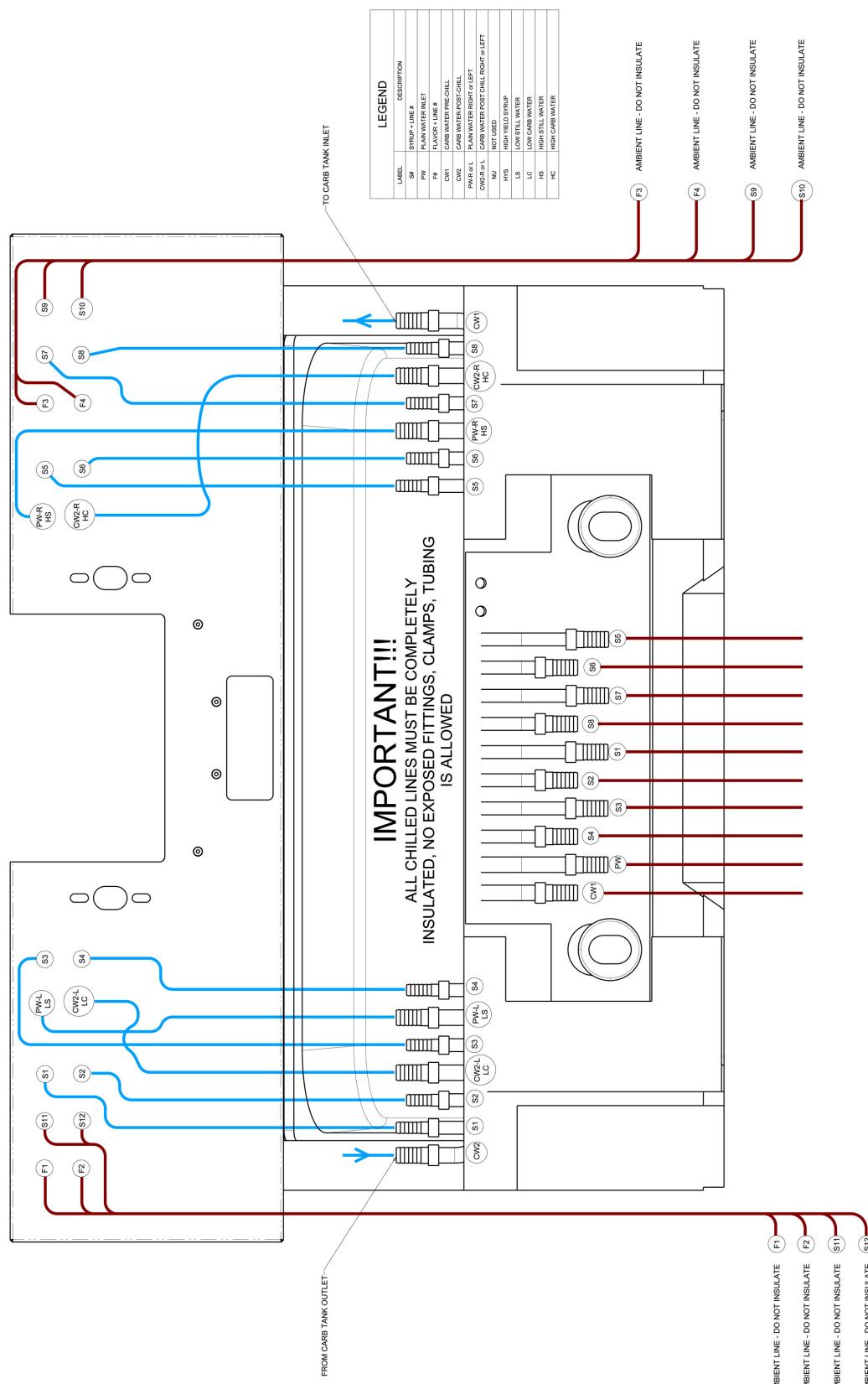


Figure 76.

TROUBLESHOOTING

NOTE: Refer to the electrical and flow diagrams located inside of the E-Box cover for troubleshooting.

⚠ CAUTION:

Only qualified personnel should service internal components or electrical wiring.

⚠ WARNING:

If repairs are to be made to a product system, remove quick disconnects from the applicable product tank, then relieve the system pressure before proceeding. If repairs are to be made to the CO₂ system, stop dispensing, shut off the CO₂ supply, then relieve the system pressure before proceeding. If repairs are to be made to the refrigeration system, make sure electrical power is disconnected from the unit.

Should your unit fail to operate properly, check that there is power to the unit and that the bin contains ice. If the unit does not dispense, check the following chart under the appropriate symptoms to aid in locating the defect.

Dispenser Troubleshooting		
Symptom	Cause	Remedy
Blown fuse or circuit breaker	Short circuit in electrical wiring	Repair Wiring
	Inoperable agitator motor (shorted motor)	Replace gear motor
Agitator does not turn	No power	Restore power or plug in unit
	Improperly installed upper ice chute assembly (Reed switch is not being activated)	Check the upper ice chute assembly for proper assembly and operation
	Inoperable reed switches	Replace defective reed switch
	Electrical board driver circuit is defective	Replace main control board
	Gear motor has open circuit	Replace gear motor
	Reed switch is not activated Improper assembly of upper ice chute to lower chute.	Check to make sure tongue of upper chute engages into the back of the lower chute, ensure upper chute engages outside the lower chute, and snap front of chute into place.
	Broken wire in the 2-wire harness leading to the reed switch	Repair or replace 2-wire harness
	Bad connection at main control board, J3, pins 2 &3	Repair connection or replace 2-wire harness
	Manual fill lid improperly seated.	Check to make sure lid is properly installed.
	Door switch defective	Replace door switch.
Ice dispenses continuously	Ice gate mechanism is stuck in open position	Inspect gasket for proper position. Examine gate plate to see if it slides freely behind the lower ice chute.
	Stuck or bent ice lever (does not allow gate to close and open reed switch)	Examine ice dispense lever to see if it is bent.
Slushy ice or water in bin	Blocked drains in cold plate	Remove access covers in cold plate cover & inspect/clean drains
	Poor ice quality due to water quality or ice maker problems	Correct water quality or repair ice maker
Beverage does not dispense	No 24VAC to valves	Restore 24 VAC to valves
	No CO ₂ pressure	Restore CO ₂ pressure
	Key switch in OFF position	Turn key switch ON

Beverage is too sweet	Valve brix requires adjustment	Adjust valve brix
	Carbonator is not operating	Repair carbonator
	No CO ₂ in carbonator	Restore CO ₂ pressure in carbonator
	City water pressure supply low or inconsistent	Booster pump must be used if dynamic water pressure drops below 40 psig.
Unit will not dispense carbonated drinks. Dispenses syrup only.	CO ₂ pressure in carbonator tank is too high.	Check CO ₂ pressure regulator setting. 75 psig recommended. Relieve pressure from carbonator tank.
	Water valve will not open	Check electrical connection to water valve. Check resistance of coil (should be 9 ohms). Check for voltage at coil when brand button is depressed.
Unit will not dispense carbonated drinks. Spouts CO ₂ and syrup only.	Carbonator tank is empty, because tank was emptied while power was applied to unit. 5 minute time-out of carbonator pump/motor occurred, and carbonator pump is locked off.	Unplug the unit and reconnect the unit. Main control board will reset, ice agitation will occur, and carbonator tank will refill to normal level.
	Note that this can occur while the water filter system is serviced or water supply is shutoff. If drinks are drawn from the dispenser while water pressure is shutoff, the carbonator pump starts and runs continuously, then shuts off on the 5 minute time out.	1) low water pressure switch deactivates carbonator pump, 2) after 5 minutes reset and retry carbonator pump. If water supply is restored, the 5 minute time out will not occur. Repeat reset a second time, but on a third time, then lockout carbonator pump, which will generate a service call.
Carbonated drinks are flat (low on carbonation)	CO ₂ is out	Replace CO ₂
	Carbonator tank is 100% filled because the city water pressure exceeds the carbonator tank CO ₂ pressure regulator setting.	CO ₂ setting for the carbonator tank is 75 psig, max water pressure is 60 psig. If necessary, install a water pressure regulating valve.
Low water pressure	Could be caused by excessively long runs (over 40 ft.) of 3/8" water supply line.	Increase line size to 1/2"
	Low water pressure	Add water pressure booster pump
	Plugged water filter.	Change water filter
	Water booster bladder has burst	Replace water booster tank/bladder
No Syrup or Watered down drink dispensed	Syrup supply is empty	Replace BIB
	BIB pump not working	Replace BIB pump
	No CO ₂ or compressed air supply to BIB pump, or not enough pressure	Check CO ₂ pressure regulator setting. 65 psig recommended. Replace CO ₂ tank or fix compressor.

Carbonator Troubleshooting

Symptom	Cause	Remedy
Carbonator pump does not start to fill tank	Power cord for the carbonator pump motor is not connected.	Carbonator pump is powered off the main control board inside the electrical box of the unit. Check that the umbilical cord is connected from the unit to the pump motor terminal box.
Power cord is connected but carbonator pump does not run.	Carbonator pump motor is disabled.	Check the enable/disable switch on the carbonator pump terminal box and enable it, if necessary.
	Probes were dry, unit was powered up, water was not turned on, and carbonator did not fill.	This results in a 5 minute time out. Unplugging the unit and plugging it in will reset the unit and start the carbonator pump.
	Water service was interrupted for more than 5 minutes.	Unplugging the unit and plugging it in will reset the unit and start the carbonator pump.
Carbonator pump is short cycling with every drink drawn	Lower liquid level probe reads "dry" while upper probe reads "wet"	Check color of leads going to probes. Black should go to bottom probe and white to top probe. Reverse if incorrect.

Carbonator tank overfills, overflows through relief valve, and pump shuts off after 5 minutes.	Poor electrical connections between carbonator tank and main control board	Check connections at carbonator tank and at connector J4 on the main control board.
	Broken wires between carbonator tank and main control board	Replace wire harness
	Defective liquid level probes	Replace both liquid level probes

Contact your local syrup or beverage equipment distributor for additional information and troubleshooting of beverage system.

DIAGNOSTICS GUIDE FOR AGITATOR TIMER BOARD

State	Observed State of Red LED	Sensor Input	Control Response	Service Remedy
0	Flash rate 3 seconds	Both probes read "wet"	Standby mode. Pump = OFF	No service required
1	Flash rate 1/2 second	Pump is OFF and HIGH probe reads "dry" and LOW probe reads "wet"	Waiting for level to drop below LOW probe. Pump = OFF	No service required
2	Flash rate 1/2 second	Both HIGH and LOW probes read "dry"	Normal mode. Pump = ON	No service required
3	Flash rate 1/2 second	Entered when HIGH probe does not detect liquid, and LOW probe does detect liquid, and pump is ON	Normal mode. Pump = ON	No service required
4	Flash rate 1 second	Entered when HIGH probe reads "wet" and LOW probe reads "dry"	This is an error condition.	<ul style="list-style-type: none"> - Check electrical connections at the carbonator tank, and at connector J4 on the main control board - Black wire should be connected to the LOW probe and also to Pin 4 of Connector J4 - Reverse the connections if incorrect - Replace harness if necessary
5	ON continuously, but "flickers" every 3 seconds	Poor signal connection to the carbonator tank. May result in short cycling of the carbonator pump.	Able to continue to function but carbonator pump short-cycles. Pump will come on each time a drink is drawn. This situation should be corrected.	<p>Check the harness connections of the red signal wire at both ends:</p> <ol style="list-style-type: none"> 1) at the carbonator ring terminal and 2) at Pin 5 of the J4 connector at the main control board
6	ON continuously	Entered when pump has run continuously for 5 minutes	This is an error condition.	Unplug the unit and plug it back in. This will reset the unit's main control board and restart the carbonator pump.



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