SPIRE 4.1

Installation Manual

Release Date: September 18, 2017
Publication Number: 620066826INS
Revision Date: December 18, 2017
Revision: B

Notice

The products, technical information, and instructions contained in this manual are subject to change without notice. These instructions are not intended to cover all details or variations of the equipment, nor to provide for every possible contingency in the installation, operation or maintenance of this equipment. This manual assumes that the person(s) working on the equipment have been trained and are skilled in working with electrical, plumbing, pneumatic, and mechanical equipment. It is assumed that appropriate safety precautions are taken and that all local safety and construction requirements are being met, in addition to the information contained in this manual.

This Product is warranted only as provided in Cornelius' Commercial Warranty applicable to this Product and is subject to all of the restrictions and limitations contained in the Commercial Warranty.

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Correct Disposal of this Product

RECYCLE

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

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.

SAFETY ALERT SYMBOL

This is the safety alert symbol. When you see this in the manual or on the unit, be alert to the potential of personal injury or damage to the unit.

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

- Keep safety signs in good condition and replace missing or damaged items.
- Learn how to operate the unit and how to use the controls.
- **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 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. The unit should be stored in a climate controlled area if long term storage is needed. Long term exposure to cold/hot conditions can permanently damage critical system components such as the computer and touchscreen.

CO_2 (Carbon Dioxide) Warning

⚠ DANGER	CO_2 displaces oxygen. Strict attention **MUST** be observed in the prevention of CO_2 gas leaks in the entire CO_2 and soft drink system. If a CO_2 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 CO_2 gas experience tremors which are followed rapidly by loss of consciousness and **DEATH.**

Mounting in or on a Counter

⚠ WARNING	While 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	• This unit is not designed for use in outdoor locations. • The appliance must be placed in a horizontal position. • The appliance is not suitable for installation in an area where a water jet would be used.

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

SPIRE 4.1 SYSTEM OVERVIEW

SPIRE 4.1: DESCRIPTION

Spire 4.1 solves your ice and beverage service needs in a sanitary, space saving, economical way. It is designed to manually fill with ice from any remote ice-making source. The unit includes the following components:

- Single, multi-brand dispensing valve
- Cold plate
- Internal carbonator tank
- External pump for carbonator

This dispenser dispenses cubes (up to 1-1/4 inch in size), cube-lets, and compressed (not flaked) ice and supplies beverages direct from the Bag-In-Box (BIB) syrup supply with no additional cooling. Figure 1. shows the dimensions of the Spire 4.1 unit.

SPIRE 4.1: SPECIFICATIONS

Model name	Spire 4.1
Total unit weight (empty)	Approximately 335 lb. (151.9 kg)
Ice storage	255 lb. (115.7 kg)
CO_2 operating pressure	75 psig (0.52 MPa) max Note: CO_2 pressure is regulated down to 75 psi by a supplied preset regulator.
Ambient operational temperature	65 to 95° F (18 to 35° C)
Maximum Storage Temperatures Note: Damage to components may occur if storage conditions exceed temperature limits.	-4°F (-20°C) to 122°F (50°C)
Maximum number of brands/flavors available	14/6
Electrical	120 V/1-phase/60 Hz 220 - 240 V/1-phase/50 Hz 15 A dedicated, protected circuit
Dimensions	42-9/16 in. (1.08 m) tall, to top of lid (Manual Fill Unit) 31-7/8 in. (0.81 m) wide 35-9/16 in. (0.90 m) deep
Noise Level	The unit emits acoustical noise with an A-weighted sound pressure level no greater than 75 dB, as measured in accordance with EN 60335-2-75

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SPIRE 4.1: PHYSICAL DIMENSIONS

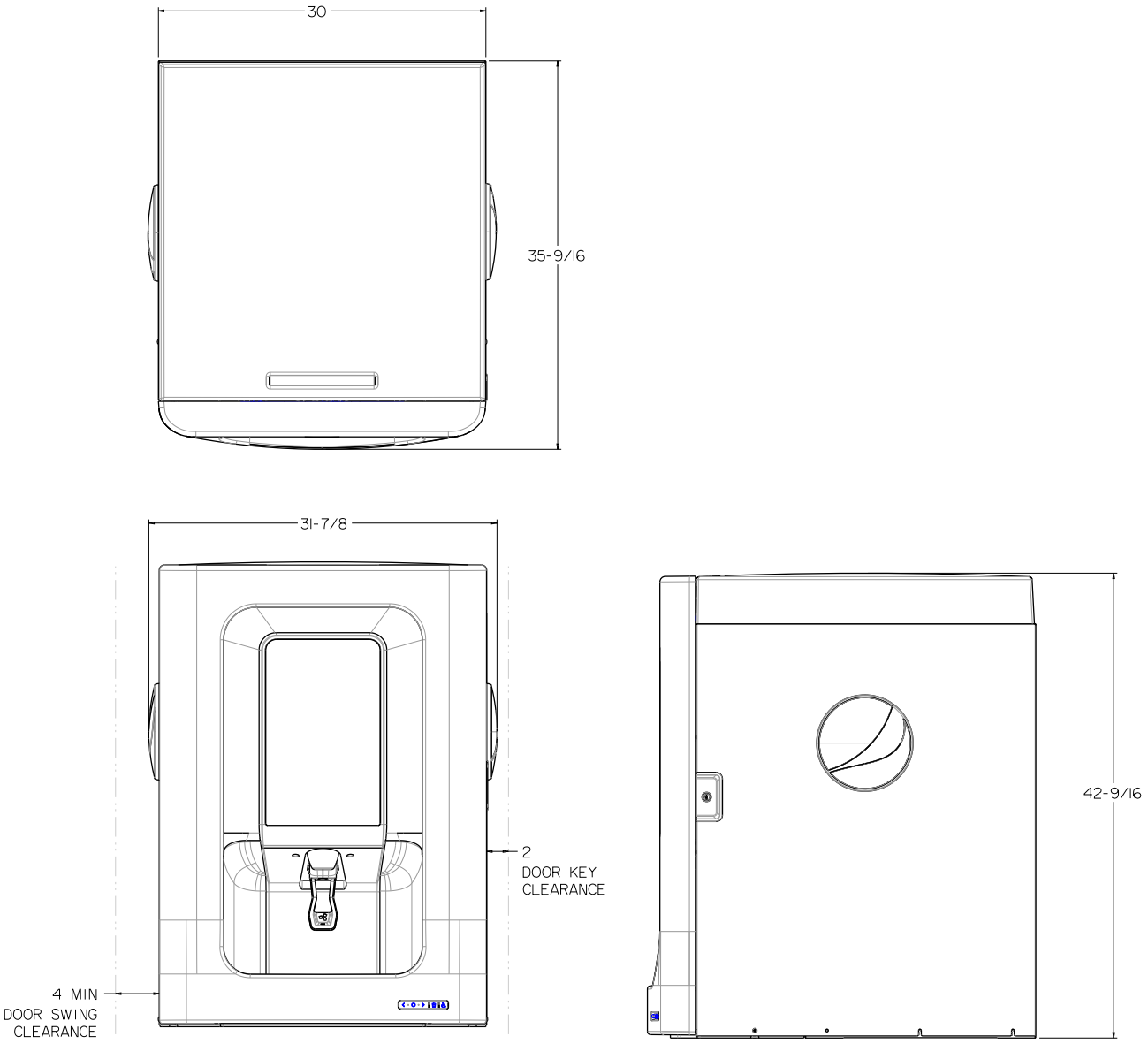

Figure 1. Spire 4.1 Physical Dimensions

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.
⚠ CAUTION	**Unit Temperature Stabilization** Allow the unit to stabilize within the ambient operational temperature range (see “Spire 4.1: Specifications” on page 8) for 30 minutes before plugging in and energizing to prevent damage to critical components.

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.

Unpacking the Unit Carton

Note the following when unpacking the carton:

1. Check for damage, even if it appears minor. If the carton is damaged, write “exterior carton damage-concealed damage possible” on the consignee copy of the freight invoice 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 yes, report immediately to the carrier.

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PREPARING THE COUNTER

To place the Spire 4.1 unit on a counter, the counter must be prepared by cutting a slot in the counter to accommodate the syrup lines and power cord connection to the unit.

MARKING AND CUTTING THE COUNTER - SPIRE 4.1

To mark and cut the counter, refer Figure 2.

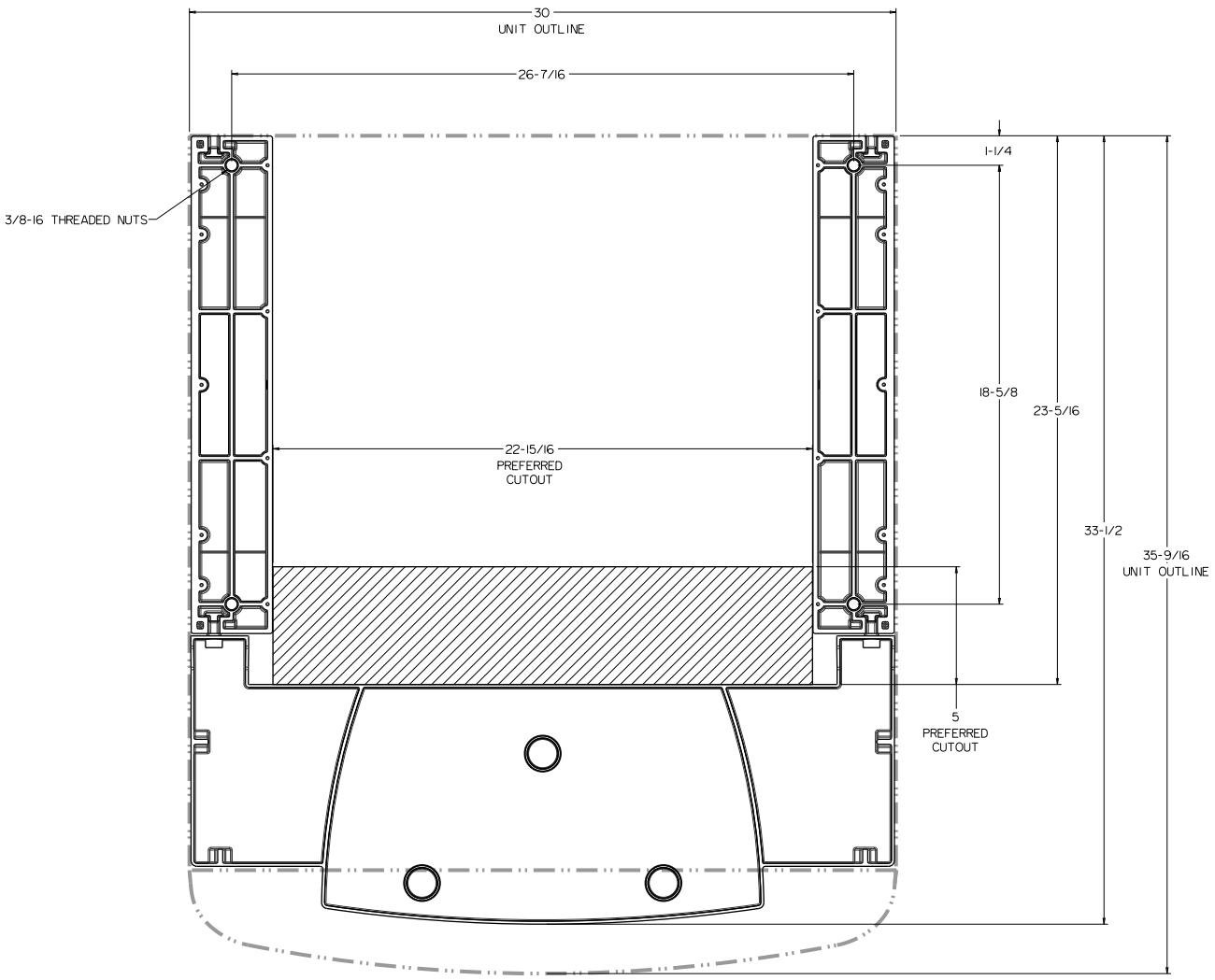

Figure 2.

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. Perform the following steps to sanitize the ice bin:

1. Open the display door and remove the cover from the ice bin.

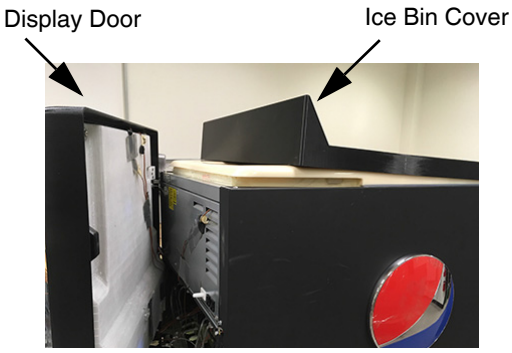

Figure 3

2. Remove the agitator retaining screw. To do this, turn the thumbscrew counterclockwise, then lift the agitator cover off the 2-piece agitator assembly

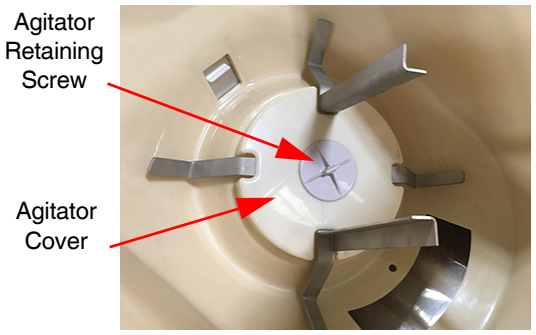

Figure 4

3. Remove the 2-piece agitator assembly from the bin.

   To do this, lift the first (top) piece of the 2-piece agitator assembly from the bin, then lift the second (bottom) piece out of the bin.

   Result: See Figure 6.

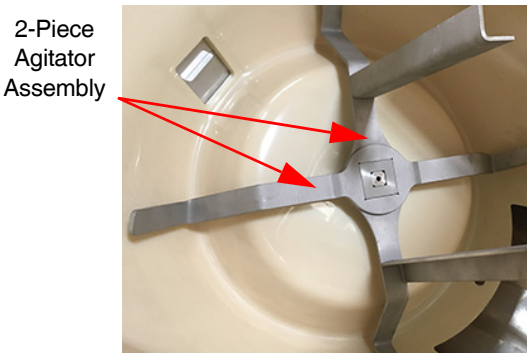

Figure 5

4. With the 2-piece agitator removed from the bin, clean the interior of the bin, top cover and agitator assembly.

   Note: Use a soap solution with a nylon bristle brush, sponge or cloth to clean the interior of the bin, top cover and agitator assembly.

   Then, thoroughly rinse the bin, cover and agitator surfaces with clean potable water.

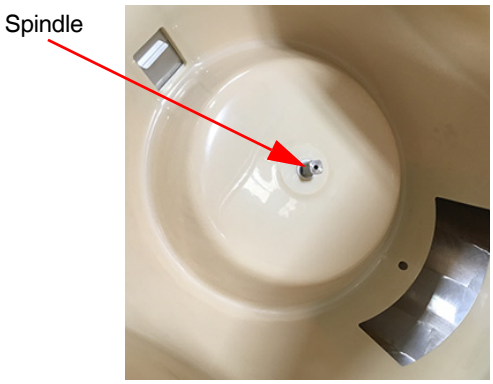

Figure 6

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5. Place the bottom agitator over the spindle as shown in Figure 7.

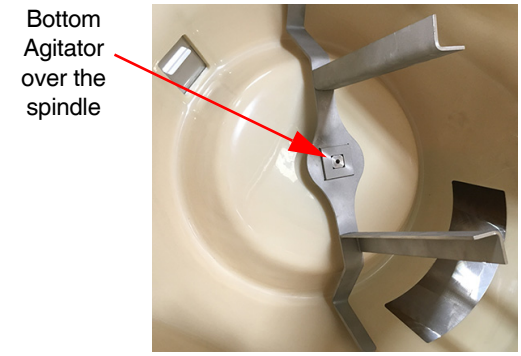

Figure 7

6. Then, place the top agitator in place over the bottom agitator making sure the two agitator components are seated properly as shown in Figure 8.

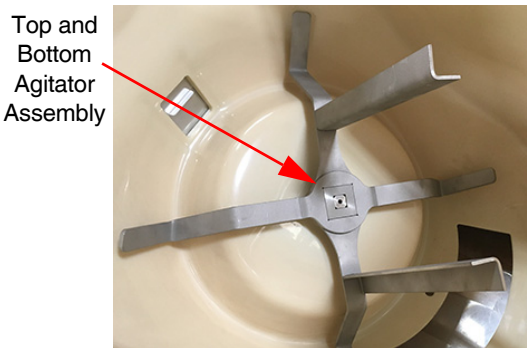

Figure 8

7. Finally, with the 2-piece agitator assembly seated properly, place the agitator cover over the 2-piece assembly and secure it with the agitator retaining screw. Make sure that the agitator retaining screw is tight as shown in Figure 9.

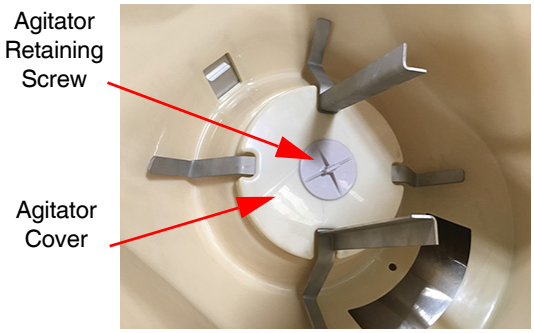

Figure 9

8. Using a mechanical spray bottle filled with sanitizing solution, spray the entire interior of the ice bin and agitator assembly with the sanitizing solution and allow it to air dry.
9. Replace the ice bin cover and make sure it remains in place during the rest of the installation
10. Close the display door.

POSITIONING THE SPIRE DISPENSER ON THE COUNTER

⚠ WARNING	The Spire 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.**
⚠ CAUTION	**Important:** Before taking the unit off the pallet or whenever moving the unit, gather all electrical cables and tubing from under the unit and position them appropriately to protect them from damage when moving the unit.

Review all information here first, then perform the following steps to place the Spire unit in position on the counter:

1. Locate the indoor placement of the dispenser. The dispenser can be placed directly on the counter top or it can be placed on the counter top using the optional Anti-Tip Kit (sold separately).

   Counter Mounting

   For direct mounting of the dispenser to a level counter top (without legs), openings must be cut into the counter. To do this, locate the desired position for the unit, then mark openings on the counter using dimensions provided in Figure 2.

   After direct counter top mounting, the unit must be sealed to the counter. Apply a continuous bead of NSF International (NSF) silicone sealant (Dow 732 or equal) approximately 1/4-inch around the outside of the unit. All excess sealant must be wiped away immediately.

   Counter Mounting with Optional Anti-Tip Kit

   Follow kit instructions for proper installation.

   ⚠ **WARNING**

   Failure to install the Anti-Tip Kit properly could result in a hazardous situation which, if not avoided, could result in serious injury, death, or equipment damage.

   NOTE: The dispenser MUST be place in a horizontal, level position and product and supply lines must be flexible enough to permit shifting the position of the dispenser (when cleaning the area beneath the dispenser, etc...).

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

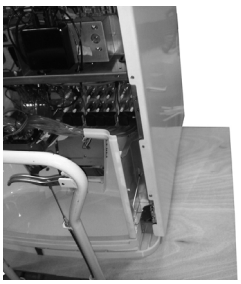

Figure 10

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

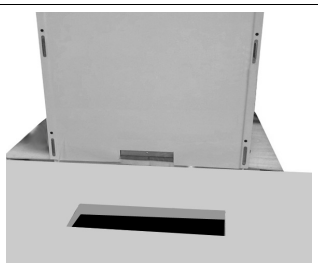

Figure 11

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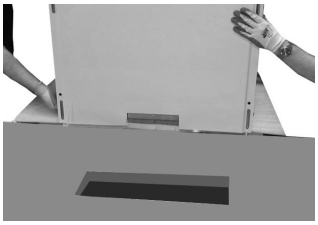
4. Carefully slide the unit off of the fountain lift and onto the counter. NOTE: Make sure the unit is securely placed on the counter, but leave open space in the counter cut-out for routing cables and tubing through the counter top.	 Figure 12
5. Gather cables and tubing from the unit that will require under-counter connections and route them through an open space in the counter-top.	
6. Finally, position the unit so that the drip tray sub-base is lined up in front of the cutout and is centered appropriately over the cutout in the counter to ensure it is stable.	

ICE MAKER MOUNTING

For proper ice maker and dispenser function, review the following before mounting an ice maker.

- When using the optional Spire Ice Maker Adapter Kit, refer to the installation instructions for that kit.
- An Ice level sensor (bin stat) should be installed at least 2" below hopper top. (Refer to the installation instructions for the Ice maker).
- Ice bridge thickness is adjusted per Ice Maker manufacturer's specification. (Refer to the installation instructions for the Ice maker).
- Make sure agitator board off-cycle timer settings are set properly for ice type. (See "Off-Cycle Agitator Settings" on page 35).
- Make sure Ice flow from the dispenser ice chute is sufficient for ice type. (See "Ice Chute Restrictor Adjustment" on page 36).
- Note that if chew-able ice is used, additional parts and components must be ordered from Cornelius.

CONNECTING THE UNIT

REMOVING THE ENCLAVE

The Enclave provides access to service lines to support installing and servicing water, CO_2, syrup and drain lines.

Read all steps first, then, perform the following steps to remove and replace the Enclave.

1. Open the display door.

   Note: The Enclave is a 3-sided component surrounding the bottom, inside of the dispenser.

   Before removing the Enclave, **remove the ice lever and cup locater tray**.

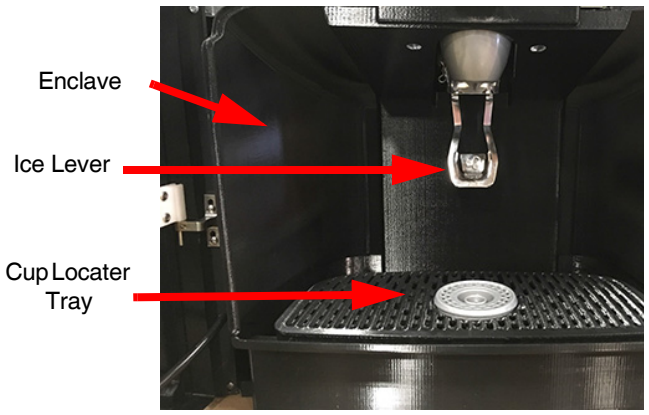


Figure 13

2. Locate the three (3) Enclave tabs securing the Enclave to the three (3) tab holders on the unit.

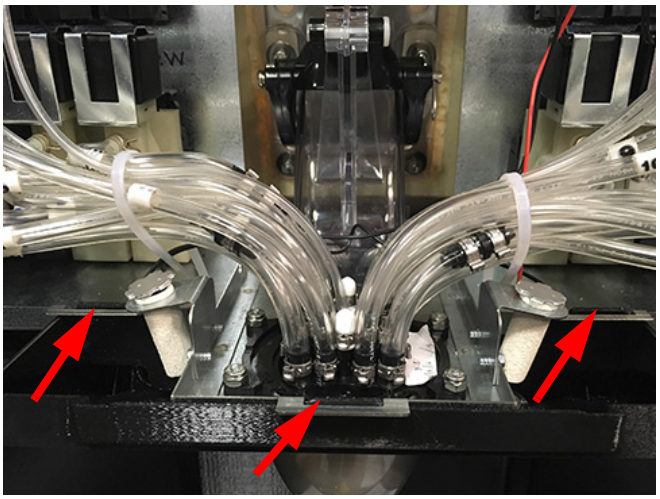


Figure 14

3. Release the Enclave tabs from the tab holders.

   To do this, press down on each Enclave tab, move it forward away from the metal tab holder. Do this so that all three (3) tabs are released from the tab holders.

   Result: Each Enclave tab is released from its tab holder to provide removal of the Enclave from the unit.

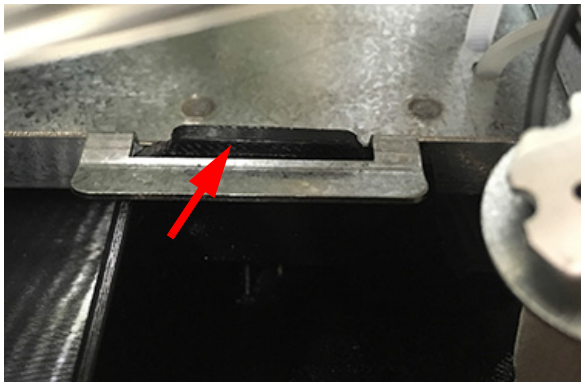


Figure 15

4. With each Enclave tab released from a tab holders, guide the Enclave forward and out of the unit. Place it in a safe place.

   Result: The Enclave is removed from the unit and the service lines are exposed to support installation and service activities.

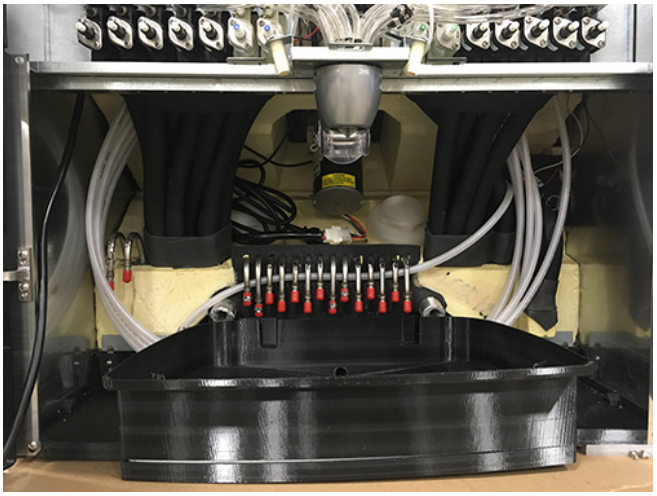


Figure 16

Replacing the Enclave

Read all steps first, then, perform the following steps to replace the Enclave. Note that you should not replace the Enclave until after all supply lines and drain lines are established and no leaks are detected.

1. Before replacing the Enclave, make sure all lines and drains are connected properly and no leaks are detected.

2. To replace the Enclave, the drain pan must be in position. Place the drain pan into the unit as shown in Figure 17.

   The drain pan is installed in the unit.

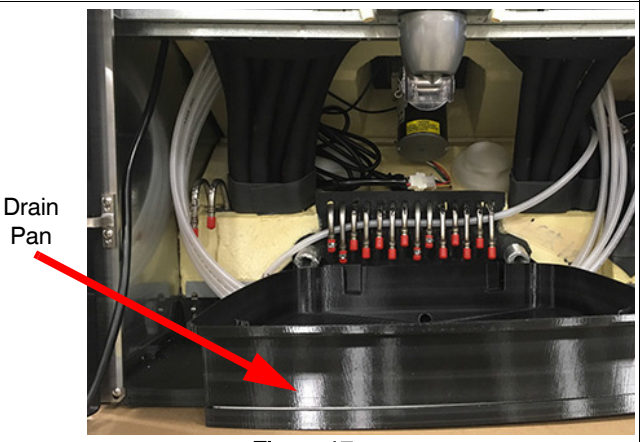


Figure 17

3. With the drain pan in place, tilt the top of the Enclave unit toward the inside of the unit and position the left and right sides of the Enclave on top of the left and right sides of the drain pan, respectively.

   Then, press the top of the Enclave tabs down and back toward the tab holders until the tabs click into place.

   Result: The Enclave is installed in the unit.

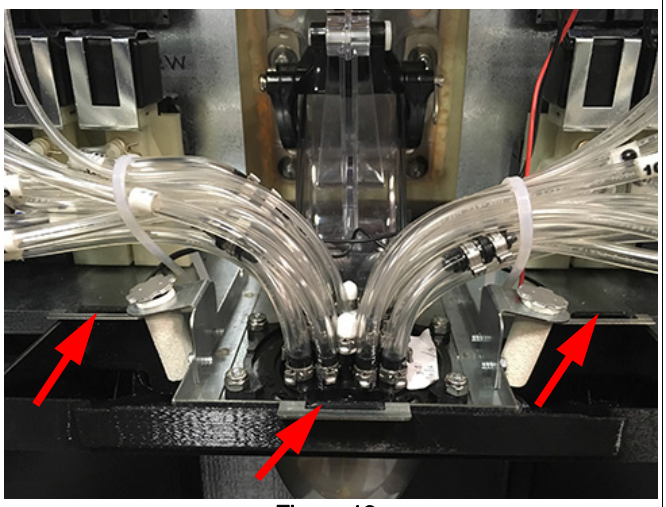


Figure 18

INSTALLING WATER, CO_2 AND SYRUP LINES

Once the unit is located in its final position on the counter, the unit must be plumbed by connecting the supply lines (water, CO_2 and syrup lines). Perform the procedure below to plumb the unit.

1. Locate the water and syrup input tubes.

The lines are marked as follows:

- S1 through S14 /F1-F6 for syrups
- CW for carbonated water
- W for Plain water
- F1 through F6 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 19

CAUTION

- Do not install water pressure regulator on the plain water inlet between the back room package and the unit
- 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.
- The maximum water pressure can be no more than 65 psi (0.45 MPa), etc.]. If necessary, 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 still water supply.
- Incoming plain water inlet supply line pressure to the pump MUST remain a minimum of 10 psi (0.07 MPa) BELOW the carbonated CO_2 operating pressure. [Example: Carbonator CO_2 operating pressure is 75 psi (0.52 MPa).

IMPORTANT

- Make sure the unit is not plugged into the AC power source.
- If water exceeds maximum pressure specifications, a water pressure regulator kit must be installed in the plain water inlet supply line.

2. Connect the beverage system product tubes to the python coming from the back room package, depending on the unit being installed.
3. **Turn the carbonator pump power switch to the OFF position.** The power switch for the carbonator pump is usually located on an electrical junction box as part of the carbonator pump deck assembly.
4. Connect the inlet water line to the carbonator pump and connect the outlet port on the carbonator pump to the Spire unit using 3/8” (0.95 cm) food-grade tubing.

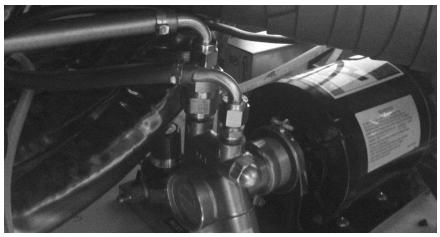


Figure 20

5. Route the power cord used for providing power to the carbonator pump (located behind the Enclave of the Spire unit) to the carbonator pump deck assembly. The Spire unit provides power to the carbonator pump.
6. With the **carbonator pump power switch in the OFF position**, connect the power cord from the Spire unit to the power junction box supplying power to the carbonator pump. Leave the power switch OFF.

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Installing the Drain

After installing the syrup, water and CO_2 lines, the drain lines must be installed.

Perform the following steps to install the drain line:

1. Pull the drain tube stub from the storage space in the bottom of the unit and route it through the cut-out in the counter.

2. Connect the drain tube stub from the unit to the drain tube on the drain pan.

   Note: Route the drain tube to an open drain with the end of the tube above the “flood” level of the drain. Use the tubing, fittings, clamps, and insulation provided with the dispenser to assemble the drain. The completed drain line must pitch continuously downward and contain no “traps” or improper drainage will result.

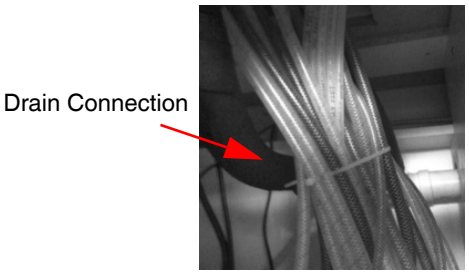

Figure 21

3. Figure 22 shows the drain tube on the drain pan.

   IMPORTANT: Make sure the drain tube is fully insulated to prevent condensation and connect the drain tube to the drain pan with a hose clamp but DO NOT over-tighten the clamp. Tighten to maximum of approximately 16 in/lbs torque.

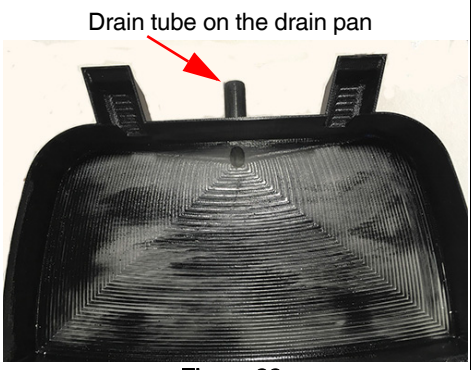

Figure 22

NOTE: After the ice bin has been sanitized, and after the supply lines and drain line is installed, it is recommended that the ice bin be filled with ice. This is because the cold plate must be chilled for a minimum of 30 minutes before brixing is performed. See “Filling the Ice Bin (Manual)” on page 19.

Filling the Ice Bin (Manual)

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.

Perform the following steps to fill the ice bin.

1. Open the display door.

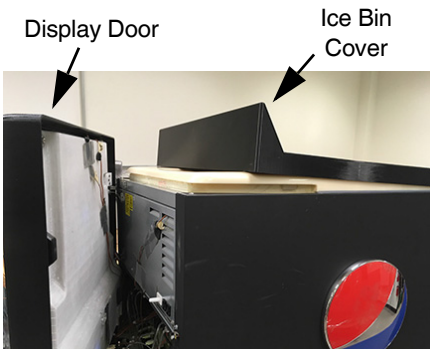

Figure 23

2. Remove the cover from the ice bin. See Figure 23.
3. Fill the bin with ice. (255 lb. MAX).

   ⚠ **Important: Do not over-fill the ice bin.**
4. Replace the ice bin cover. See Figure 23.
5. Close the door. See Figure 23.
6. After loading ice into the bin, wait 30 minutes to allow the cold plate to chill the syrups to the proper operating temperature.

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: 35 psi

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INITIAL SETUP

Plug the cord into the carb deck, and then plug the carb deck into the protected AC wall outlet.

CAUTION	• Before connecting the CO_2 regulator assembly to a CO_2 cylinder, turn the regulator adjusting screw to the left (counterclockwise) until all tension is relieved from the adjusting screw spring. • 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 CO_2 REGULATOR SETUP

Perform the following steps to setup the water supply and the CO2 supplied to the unit.

1. If necessary, remove the Enclave.

   To do this, see “Removing the Enclave” on page 15.

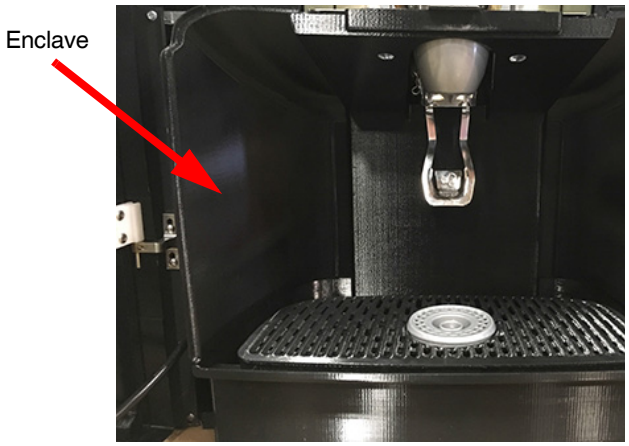

Figure 24

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

3. To displace the air from the carbonator tank, open the carbonator tank relief valve until water flows into the drip tray.

   On the Spire 4.1 unit, the carbonator tank relief valve is located to the right of the agitator motor on the far right side of the unit. To open the valve, pull on the valve ring.

   Once water flows into the drip tray and air in the tank is displaced, push on the relief valve to close the valve.

Figure 25

4. Locate the CO_2 supply and turn (counterclockwise) the CO_2 cylinder valve slightly-open to allow the lines to **slowly fill with CO_2 gas**, then gradually turn the valve open to fully to back-seat the valve.

   Note: Back-seating the valve prevents leakage around the valve shaft). **The carbonator CO_2 regulator is fixed at a normal 75 psi.**

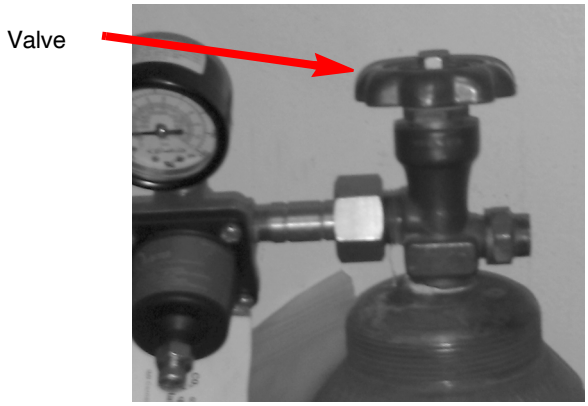

Figure 26

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

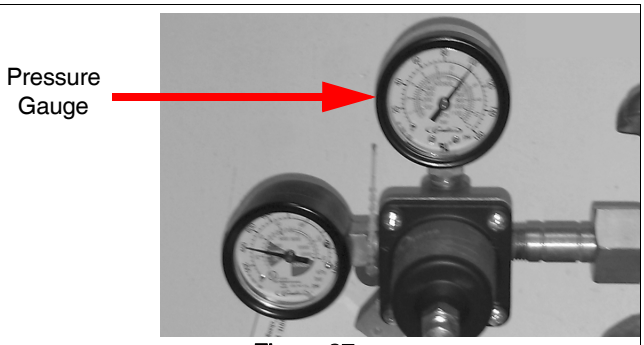

Figure 27

6. Plug the Spire unit into an AC power source. This supplies power to the Spire unit.

   NOTE: After AC power is supplied to the Spire unit, power is also supplied to the carbonator pump deck assembly as long as the dedicated power cord from the Spire unit was routed and connected to the electrical junction box or other connection providing power to the pump.

7. Once power is supplied to the carbonator pump, turn the carbonator pump power switch to the ON position and check for leaks in the system.

8. Next, replace the Enclave. To do this, see “Replacing the Enclave” on page 16.

9. Enter Service Mode and perform the Initial Setup procedure.

   To do this, see “Service Mode - Initial Setup” on page 23.

   IMPORTANT: Once the unit is powered ON, the Initial Setup procedure must be completed within 15 minutes.

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Accessing The Service Menu and Service Mode

The unit provides a service mode feature to allow service personnel access to a set of service menu items used to setup and service the dispenser.

Perform the following steps to access the **Service Menu** and place the unit in **Service Mode**:

1. From the display screen, access the **ENTER PIN** screen.

   Note: The initial display screen, before setup, appears as shown in Figure 28, but the unit will show the "**Touch to Start**" screen after setup.

   To access the **ENTER PIN** screen, place your finger near the bottom of the touch-sensitive screen and **draw a letter "P" symbol (shown in red) twice, one right after the other**.

   Result: The **ENTER PIN** screen appears.

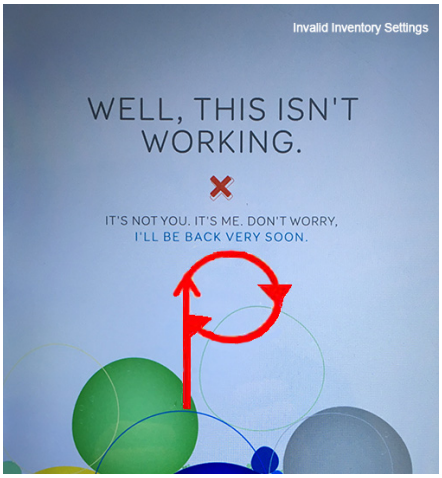

Figure 28 Display screen

2. From the **ENTER PIN** screen, enter the appropriate PIN code to access the Service screen.

   Result: The **Service Menu** screen appears.

Figure 29 ENTER PIN screen

The **Service Menu** screen displays the following three menu item buttons as described below:

- **Service** button - use this button to enter **Service Mode**
- **Restart** button - use this button to restart the unit
- **Shutdown** button - use this button to shutdown the unit

3. Press the **Service** button to place the unit in **Service Mode**.

   Result: The unit enters service mode and displays **Initial Setup** screens or the **Service** screen.

Figure 30 Service Menu

Service Mode - Initial Setup or Service Screen

The **Service** button from the **Service Menu** puts the unit in **Service Mode**. The unit will display one of two different screens depending upon whether or not Initial Setup was previously performed on the unit.

- **Initial Setup:** If initial configuration parameters need to be provided to the unit, after entering a PIN and selecting the Service button, the **EDIT SPIRE FIRST TIME SETUP SETTINGS** screens appear to process through Initial Setup. See "Service Mode - Initial Setup" on page 23.
- **Service Screen:** If initial configuration parameters have previously been provided for the unit, after entering a PIN and selecting the Service button, the **SERVICE** screens appear to support service activity after initial setup. Note that the Service screen does provide an Initial Setup button to access and change initial configuration parameters for the unit after initial setup. See "Service Mode - Service Screen" on page 24.

SERVICE MODE - INITIAL SETUP

The initial setup process establishes various configuration parameters for the unit. Review the following, and all steps in the process, before performing Initial Setup.

- After entering a PIN on the Enter PIN screen to put the unit in Service Mode, if configuration parameters need to be provided to the unit, the **EDIT SPIRE FIRST TIME SETUP SETTINGS** screens appear to prompt the user through an Initial Setup process.
- If configuration parameters have already been provided to the unit, after entering a PIN and selecting the Service button, the **SERVICE** screens appear to support service activity after initial setup. See “Service Mode - Service Screen” on page 24.

Note: The screens shown here may be slightly different on your unit depending on the software version installed.

Perform the following steps to complete an Initial Setup

1. Enter Service Mode. See “Accessing The Service Menu and Service Mode” on page 22.

   Result: If configuration parameters need to be provided to the unit, the **Edit Spire First Time Setup Settings - “Machine Status”** screen displays as shown in Figure 31 below. **Go to step 2**.

   If configuration parameters have already been provided to the unit, the Service screen appears. See “Service Mode - Service Screen” on page 24.

2. From the **Machine Status** screen, with the status of all parameters is reporting as “True”, press **Continue**.

   Result: The **Unit Type** screen displays with a list of unit types.

   Note: If the status of any parameter is “False”, see the section on Troubleshooting.

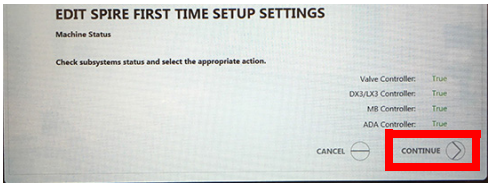

Figure 31

3. Select the appropriate **Unit Type** for the unit being setup (see Figure 32), then press **Continue**.

   Result: The **Equipment Serial Number** screen displays.

Figure 32

4. On the **Equipment Serial Number** screen, enter the appropriate serial number, then press **Continue**.

   Result: The **Unit Location** screen displays.

5. From the **Unit Location** screen, select the appropriate Unit Location, then select “**Start Registration**”.

   Result: The **Registration Status** screen displays until registration is complete, then the **Registration Review** screen displays.

   Note: If the **Modem Connectivity** screen displays, follow the **Action Steps** shown on the screen. If connectivity is not possible, select “**Retry**” until the “Registration Error” screen displays, then press **Finished**.

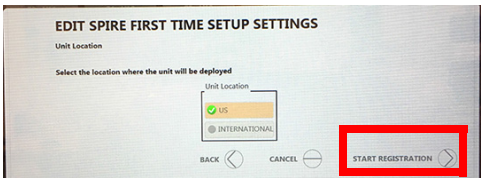

Figure 33

6. From the **Registration Review** screen, press **Finished**.

   Result: The **Reboot** screen displays.

7. From the Reboot screen, select **Reboot**, then select **Confirm Reboot**.

   Result: The unit will reboot.

8. Complete the **SEN Activation form** (PDF). See your representative for details.

SERVICE MODE - SERVICE SCREEN

After Initial Setup, the **Service** button on the **Service Menu** will display the Service screen as described below and shown in Figure 34

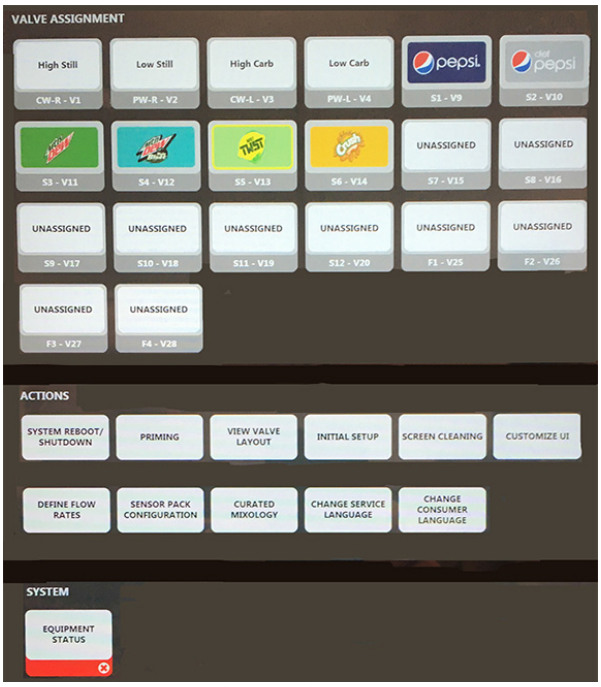

Figure 34 Service Screen Interface

The Service screen contains icons categorized in the three sections, described below. Note that screens for your unit may be slightly different than screens shown in example figures provided here.

The **Valve Assignment** section:

- **High Carb, High Still, Low Carb**, **Low Still:** Used to access service for these valves.
- **Brand and Unassigned**: Various icon buttons map valves in the unit to water, syrup, or flavor shot products. See “Mapping the Valves” on page 25.

The **Actions** section:

- **System Reboot/Shutdown**: Provides access to reboot or shutdown the system gracefully.
- **Priming**: Used to Prime up to five valves (manual or Brix).
- **View Valve Layout**: Used to show how assigned valves map to the actual hardware when observing a Spire unit.
- **Initial Setup**: Provides access to initial setup parameters.
- **Screen Cleaning**: Used to disable the touch-sensitive screen, for a 30 second interval, to allow for cleaning of the screen.
- **Customize UI**: Used to change some of the user interface settings.
- **Defines Flow Rates**: Used to set flow rates for waters, syrups, and flavor shots.
- **Sensor Pack Calibration**: Future feature currently not utilized.
- **Curated Mixology**: Used enable or disable flavor mixes.
- **Change Service Language**: Used to change the language on the Service User Interface.
- **Change Consumer Language**: Used to change the language on the Consumer User Interface.

The **System** section:

- **Equipment Status**: Provides information about the SEN Connection, System, Valve Controller, ADA Controller, and the touch controller.

MAPPING THE VALVES

Mapping the valves is the process where icons on the display screen are assigned to the valves associated with plumbed lines matching a brand or product to be dispensed.

To simplify the mapping process, make sure each plumbed line is labeled appropriately to represent the brand or product for each valve.

Use steps in the following example to map display screen icons to the appropriate valves for a brand or product to be dispensed. Note that screens for your unit may be slightly different than screens shown in example figures provided here:

1. Place the unit in **Service Mode** and access the **Service** screen. See “Accessing The Service Menu and Service Mode” on page 22 and “Service Mode - Initial Setup or Service Screen” on page 22.

   Result: The **Service** screen appears.

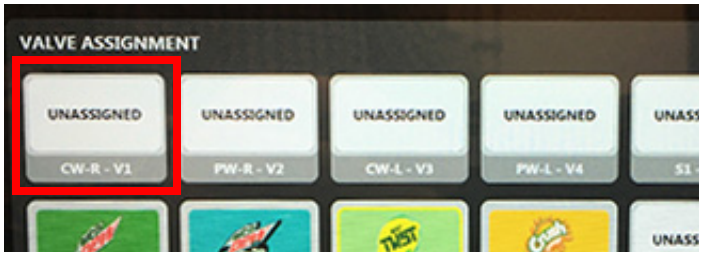

Figure 35

2. From the **Service** screen, in the Valve Assignment section, select the **UNASSIGNED CW-R-V1** icon. See Figure 35.

   Result: A **Valve Assignment** screen appears for the selected valve. See Figure 36.

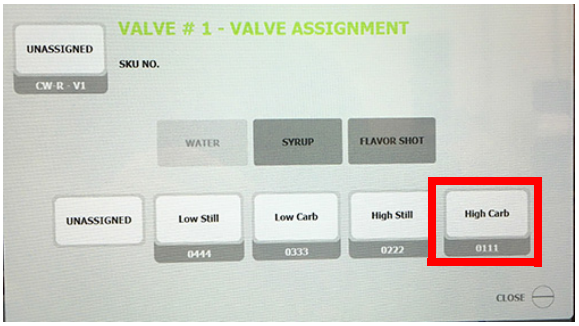

Figure 36

3. From the **Valve Assignment** screen (Figure 36), select **High Carb.**

   Result: The **Current Assignment** screen for the valve appears. See Figure 37.

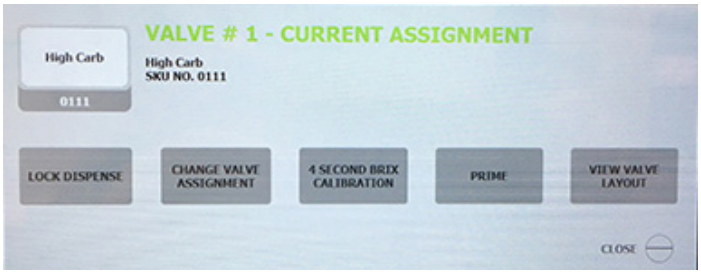

Figure 37

4. From the **Current Assignment** screen, select **Close**.

   Result: The Valve Assignment section of the Service screen shows the **High Carb** icon assigned to the **CW-R-V1** valve. See Figure 38.

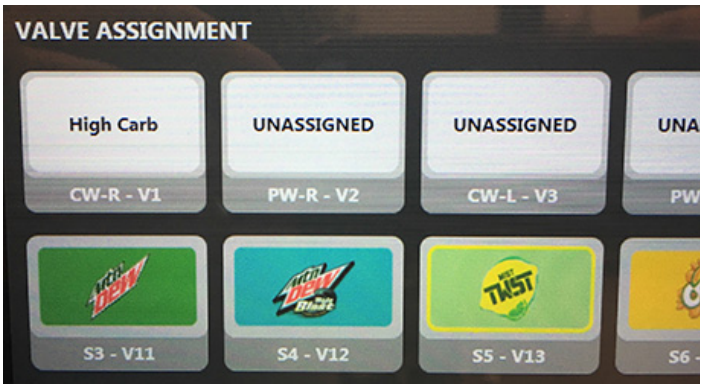

Figure 38

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5. Repeat steps 1 through 4 to assign (map) the following valves:
   - Map PW-R-V2 to High Still
   - Map CW-L-V3 to Low Carb
   - Map PW-L-V4 to Low Still

   Result: Valves 1 through 4 are assigned (mapped) to High Carb, High Still, Low Carb, Low Still, respectively as in Figure 39.

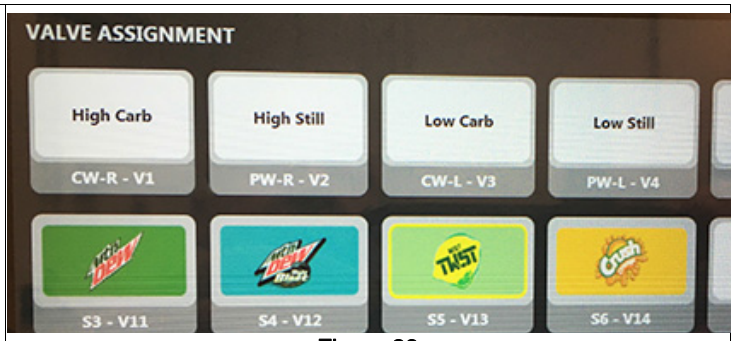


Figure 39

6. After valves 1 through 4 are assigned (mapped) to High Carb, High Still, Low Carb, Low Still icons, assign other Unassigned icons to valves associated with a brand or product, as necessary.

   The following shows a mapping scheme for assigning brand icons to valves:

   - **CW & PW** - Map these icons to **High Carb, High Still, Low Carb, Low Still** valves.
   - **S# through S##** - Map these icons to **Brands** for valves associated with plumbed lines matching a brand or product to be dispensed.
   - **Map F# through F##** - Map these icons to **Flavor Shots**, for valves associated the plumbed lines matching a flavor shot to be dispensed.

   To do this, follow the same basic process shown above in steps 1 through 4.

CHANGING VALVE ASSIGNMENTS

After establishing valve assignments to map brand icons to valves, changes can be made to map a brand icons to different valves associated with a different brand or product to be dispensed.

To change the valve assignment for a brand or product icon, perform the following steps:

1. Place the unit in **Service Mode** and access the **Service Screen**. See “Accessing The Service Menu and Service Mode” on page 22 and “Service Mode - Initial Setup or Service Screen” on page 22.

   Result: The **Service Screen** appears as in Figure 40.

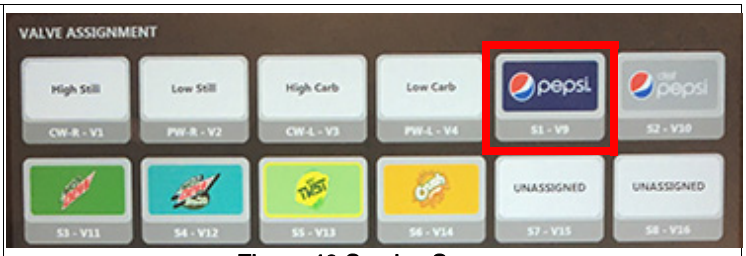


Figure 40 Service Screen

2. From the **Service Screen**, in the Valve Assignment section, select an icon to be changed, for example **Pepsi**.

   Result: The **Current Assignment** screen shows the S1-V9 valve associated with the Pepsi brand. See Figure 41.

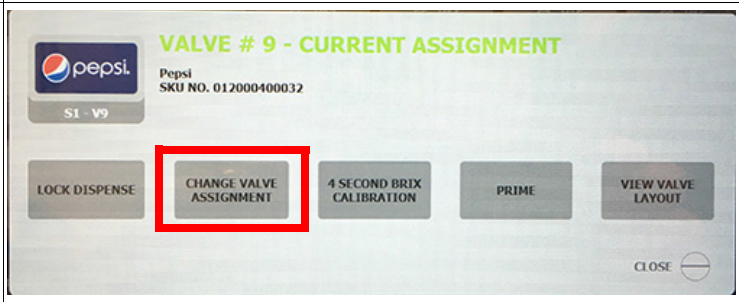


Figure 41

3. From the **Current Assignment** screen, select the **Change Valve Assignment** button.

   Result: The **Change Valve Assignment** screen is displayed. See Figure 42.

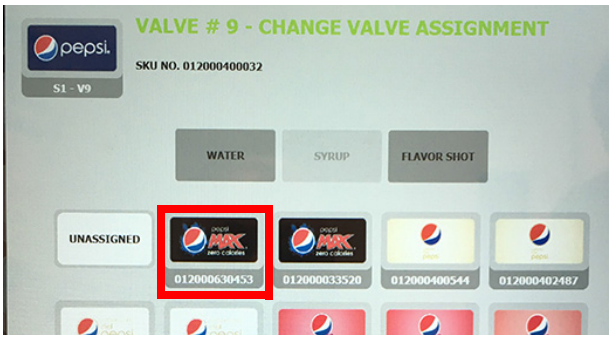


Figure 42

4. From the **Change Valve Assignment** screen, **select one of the brand option icons** available for assignment. (Pepsi MAX is shown in Figure 42). Then, press the **Close** button.

   Result: The **Service Screen** shows the new selected brand (Pepsi MAX in this example) for the valve assignment. See Figure 43.

   Note: if there are numerous syrups from which to choose, a scroll-bar may be used to select the brand option.

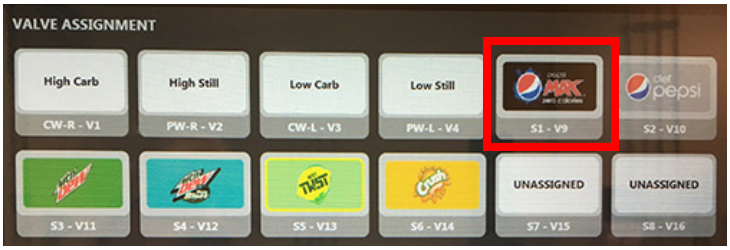


Figure 43

5. The valve assignment is complete. To close the Service Screen, select **Exit to Customer UI** in the bottom left corner of the Service screen.

PRIMING LINES

Priming a line can be done individually or up to five (5) lines can be purged simultaneously. Read all the information and activity steps before priming the lines.

To prime an individual line, see “Priming Individual Lines” on page 28.

To prime multiple lines simultaneously, see “Priming Multiple Lines” on page 29.

Priming Individual Lines

Priming a line can be done from each Current Valve Assignment screen. Read the following tips and all steps before priming the lines:

- When using the Priming function button from a Current Valve Assignment screen for CW valves, let priming run until carb water is observed. This may take several cycles of the carb pump.
- When using the Priming function button from a Current Valve Assignment screen for PW valves, let priming run until a steady stream of plain water is observed and all air has been removed.
- Screens for your unit may be slightly different than screens shown in example figures provided here.

Perform the following steps to prime an individual line:

1. Place the unit in Service Mode and access the Service Screen. See “Accessing The Service Menu and Service Mode” on page 23 and “Service Mode - Initial Setup or Service Screen” on page 23.

2. From the **Service Screen**, in the Valve Assignment section, select the icon for High Carb (CW-R-V1).

   Result: The **Current Assignment** screen for the valve appears. See Figure 44.

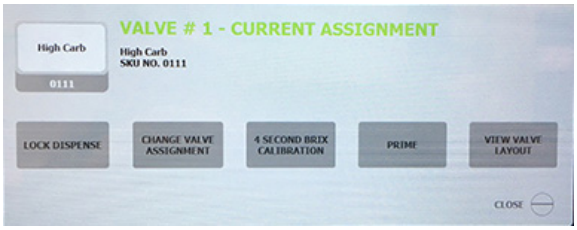


Figure 44

3. From the **Current Assignment** screen for the selected valve, select the **Prime** button to start the Priming function.

   Result: The **Prime Valve** screen displays for the High Carb valve. See Figure 45.

   Note: To set the amount of time for a line to be purged, use the **Start Timed Prime** button. Then, use the Stop Prime Dispense button stop the flow.

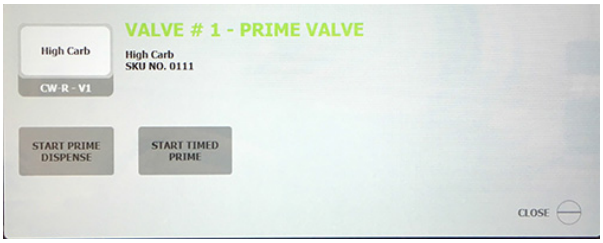


Figure 45

4. From the **Prime Valve** screen, select the **Start Prime Dispense** button to start the Priming function.

   Result: A **Priming icon** appears over the High Carb icon, the **Stop Prime Dispense** button appears, and **flow begins from the selected valve**. See example in Figure 46.

Figure 46

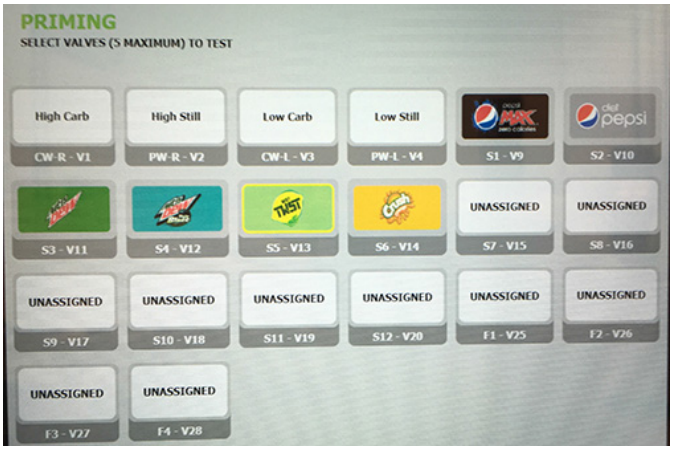
5. Make sure the correct water is being dispensed (Carb or Plain depending on the valve selected). Then, press the **Stop Prime Dispense** button. Result: The flow stops and the **Current Assignment** screen for the valve appears.
6. To prime any other remaining lines, repeat steps 1-5 as necessary. Otherwise press **Close** on the Current Assignment screen to return to the Service Screen.

Priming Multiple Lines

Use the Priming button in the Actions section of the Service Screen to prime up to 5 valve lines simultaneously.

Review all steps before priming multiple lines. Note that screens for your unit may be slightly different than screens shown in example figures provided here.

To Prime multiple lines, perform the following steps:

1. From the Actions section of the Service Screen, select the **Priming** button. Result: The **Priming** screen appears.	 **Figure 47**
2. From the **Priming** screen, **select up to 5 valves to be primed** by pressing each icon (up to 5) for each valve line to be primed. Result: Valve icons are highlighted as **Selected.** Also, the Brix Dispense, Start, and Clear buttons appear. See Figure 48. NOTE: Use the **Clear** button to clear the selection and start the selection process over.	 **Figure 48**

3. With the valve icons identified as **Selected**, start the prime function. To do this, press the **Start** button.

   Result: The prime function starts for the valve lines selected and the **Stop** button appears at the bottom of the screen.

4. To stop the prime function, press the **Stop** button.

   Result: The prime function stops and the Priming screen is displayed. See Figure 49.

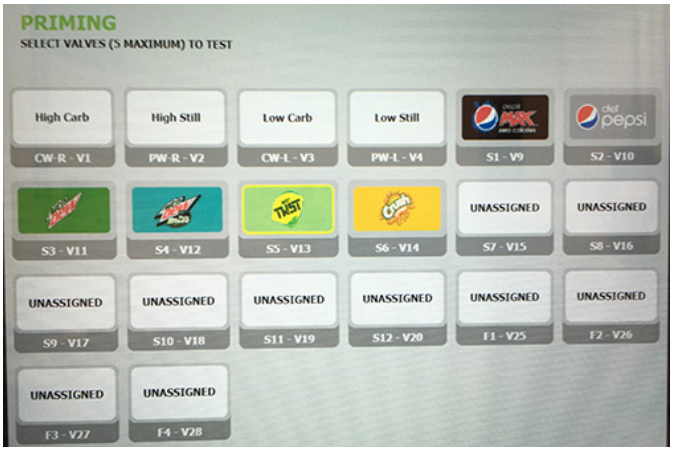


Figure 49

5. When the priming function is complete, move on to adjust the water to syrup ratio (brix). See “Adjust Water to Syrup Ratio (BRIX)” on page 31.

   Otherwise, close the **Priming** screen. To do this, select **Close** (bottom right corner of the screen) and the **Service Screen** will appear.

ADJUST WATER TO SYRUP RATIO (BRIX)

The BRIX process adjusts the water to syrup ratio for a brand or flavor. Read all and steps before conducting the procedure.

- Lines must be purged prior to brixing.
- Water and syrup must be cold before checking ratios.
- During the brixing process, occasionally agitate ice in the bin to ensure that the cold plate is at temperature.
- Start the brixing ratio adjustment process with the most viscous Flavor first.
- Screens for your unit may be slightly different than screens shown in example figures provided here.

To BRIX the unit, perform the procedure below.

1. Enter **Service Mode** and access the **Service Screen**. See “Accessing The Service Menu and Service Mode” on page 22.

2. From the **Service Screen**, in the Actions section, select the **Priming** icon.

   Result: The **Priming** screen is displayed.

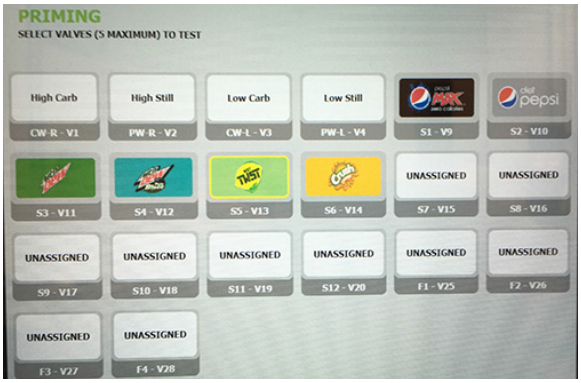


Figure 50

3. From the **Priming** screen, select a brand or flavor icon.

   Note: It is best to start the brixing process with the most viscous Flavor first.

   Result: The **Current Assignment** screen for the selected valve is displayed. See Figure 51.

   Note: Before continuing, it may be useful to view the valve layout for the unit. The Current Assignment screens provide access to **View Valve Layout**. See “Viewing Valve Layout” on page 33.

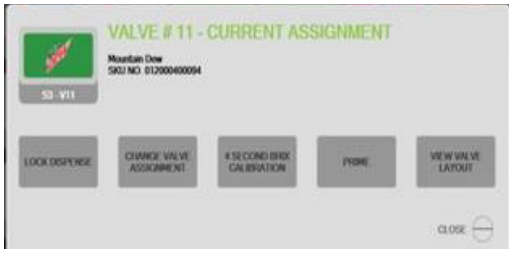


Figure 51

4. From the **Current Assignment** screen for the selected valve, select the **4 Second Brix Calibration** button.

   Result: The **BRIX Calibration** screen for the selected valve is displayed.

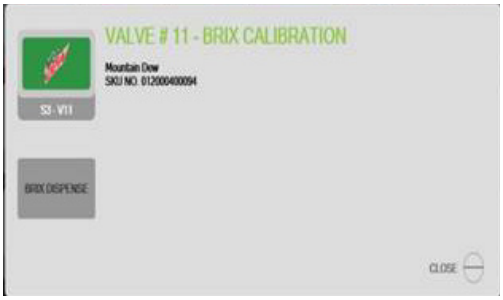


Figure 52

5. Place a **BRIX cup** under the dispenser.

   Note that a 100ml graduated cylinder can be used for syrups and flavor shots or a ratio cup can be used for water adjustments.

6. From the **BRIX Calibration** screen, select **BRIX Dispense**.

   Result: The brixing process starts and a **Calibrating** icon appears on the BRIX Calibration screen.

Figure 53

7. During the brixing process, you may need to adjust the flow of the valve selected. To adjust the flow of a valve, do the following:

   To increase the flow of a valve, turn the valve clockwise.

   To decrease the flow of a valve, turn the valve adjusting screw counterclockwise. See Figure 54 below.

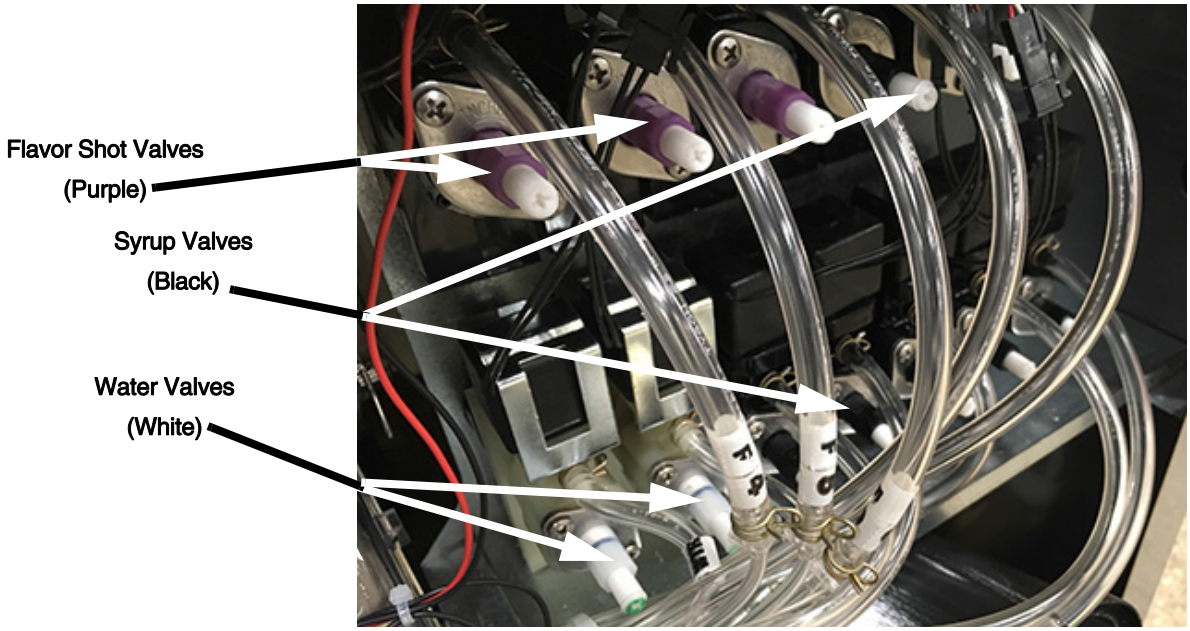


Figure 54

Note the following while making adjustments:

- Turn the flow adjustment valve 1/4 of a turn at a time and recheck the flow. To increase the reading, turn the knob clockwise.
- Set High carb to 210 ml / 4 seconds and low carb set to 90 ml / 4 seconds.
- Set syrup flow adjustment valve to get the desired ratio. Set flavor shots to dispense 12 ml / 4 seconds.
- Test the valve and make adjustments until a consistent ratio is delivered three consecutive times.

VIEWING VALVE LAYOUT

To support service operations, the unit can provide a view of the valve layout and assignments. Note that screens for your unit may be slightly different than screens shown in example figures provided here.

Perform the following steps to view the valve layout.

1. Enter **Service Mode** and access the **Service Screen** interface. See described in “Accessing The Service Menu and Service Mode” on page 22.
2. From the **Service Screen**, in the Actions section, select the **View Valve Layout** icon.
   Result: The **Valve Layout and Assignment Screen** is displayed, see Figure 55.
   Note: The “Left” bank of valves is on your left as you open the door while facing the unit, see Figure 90.

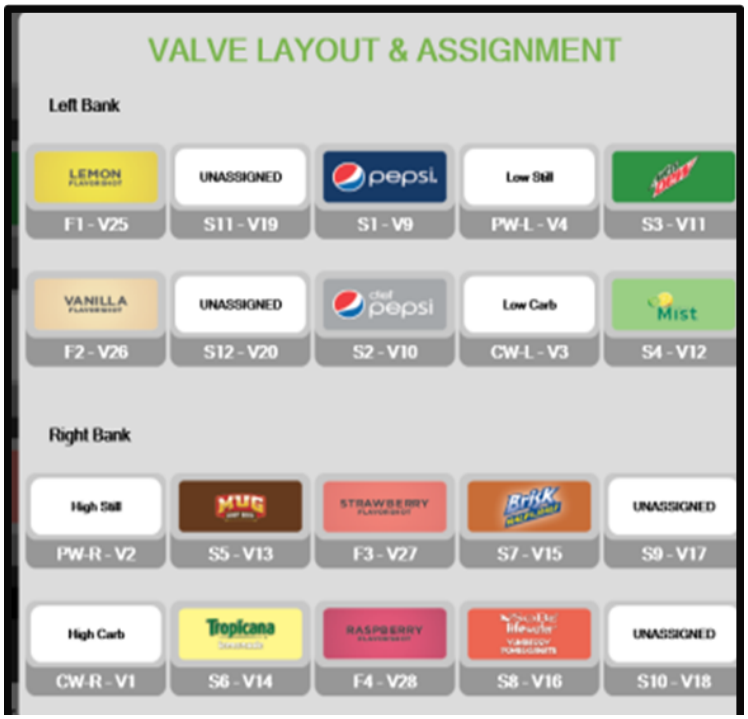
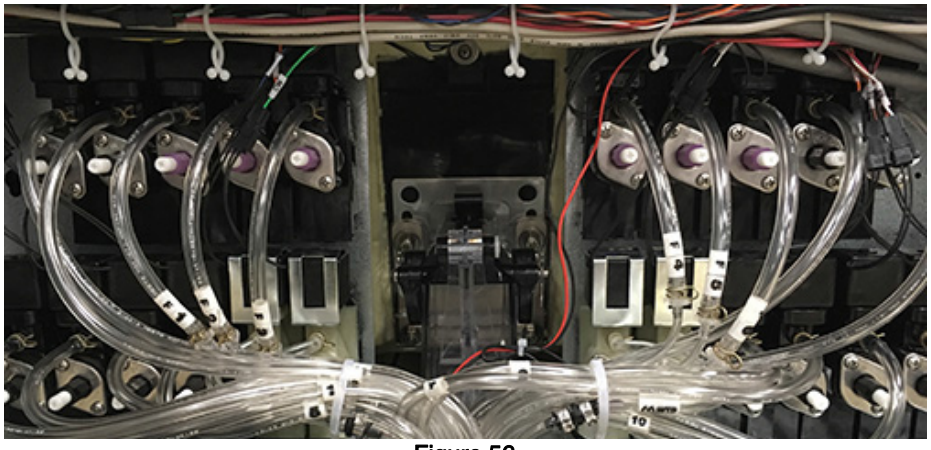


Figure 55

Left Bank



Right Bank

Figure 56

VIEWING DEFINED FLOW RATES

Perform the following steps to view the defined flow rates.

1. Enter **Service Mode** and access the **Service Screen**. See “Accessing The Service Menu and Service Mode” on page 22.

2. From the **Service Screen**, in the **Actions** section, select the **Define Flow Rates** icon.

   Result: The **Define Flow Rate** screen is displayed.

Figure 57

3. Close the **Define Flow Rates** screen. To do this, select the **Close** button on the lower-right corner of the screen.

   Result: The **Service Screen** is displayed.

4. Close the **Service Screen**. To do this, select **Exit to Consumer UI** in the lower-left corner of the Service Screen.

   Result: The unit returns to the customer display.

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.

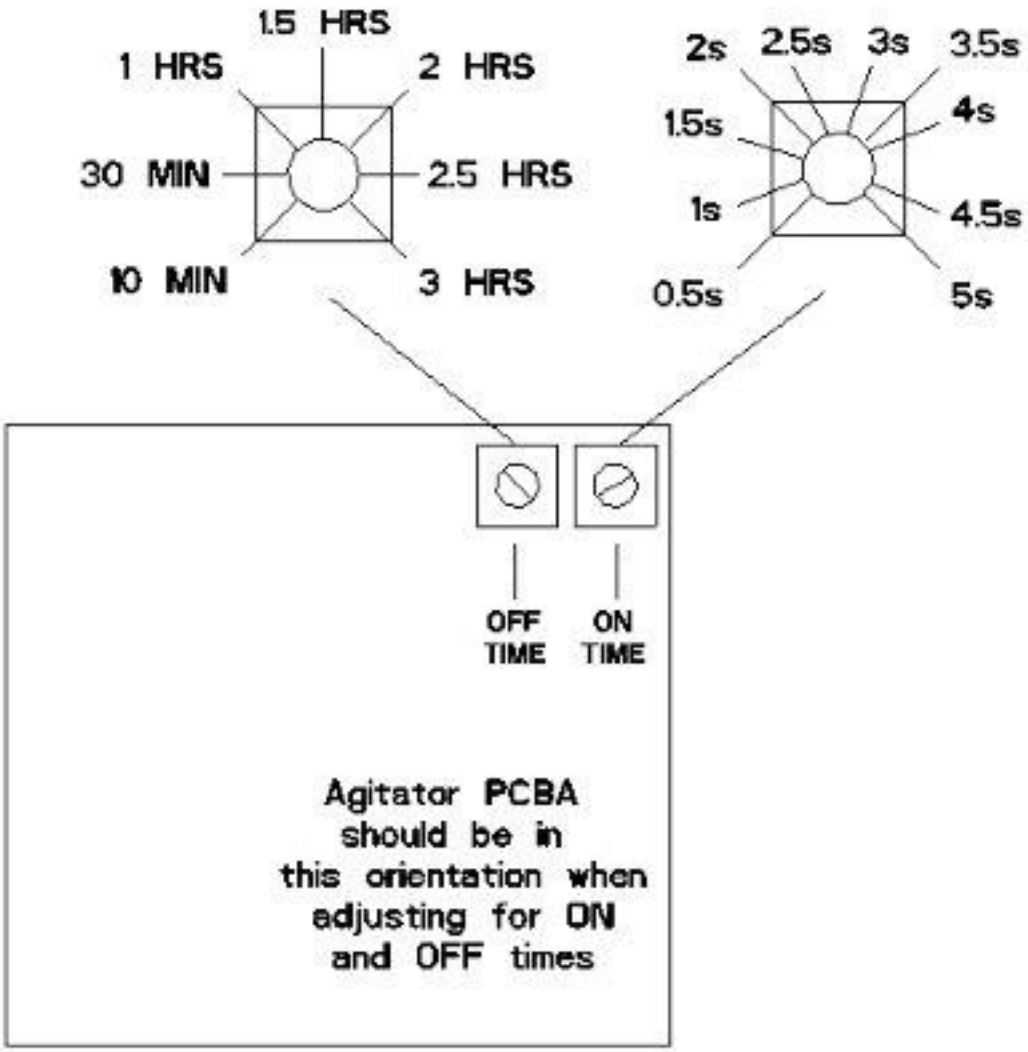


Figure 58

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 an ice deflector kit (p/n 629097086) for use of soft/chunk-let ice. Contact your local Cornelius Sales Representative or Customer Service for more details.

A. Remove ice chute cover
B. Loosen the 4 nuts
C. For more flow, push the restrictor plate up, for less flow, push the restrictor plate up
D. Tighten and torque the nuts in a criss-cross pattern to a torque of 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.**

Four (4) Hex Nuts Adjust the Ice Chute

Two (2) hex nuts on top

Two (2) hex nuts on bottom (not shown)

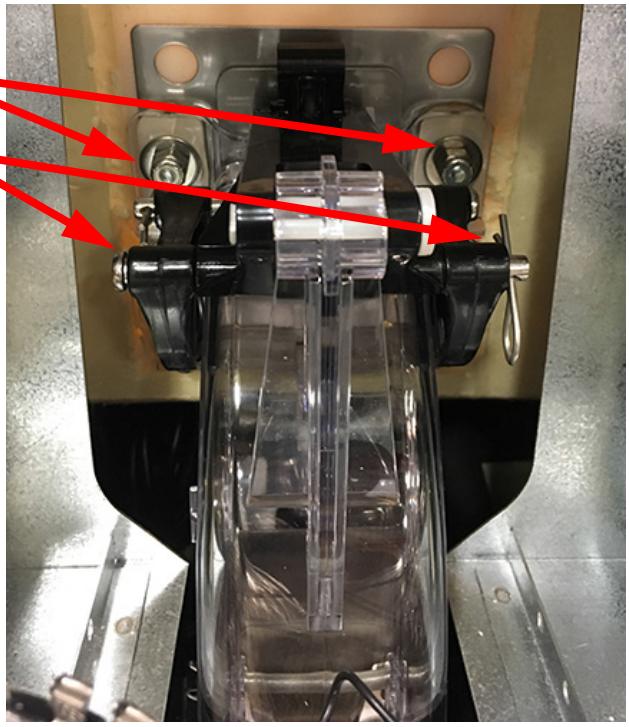


Figure 59

DIAGRAMS

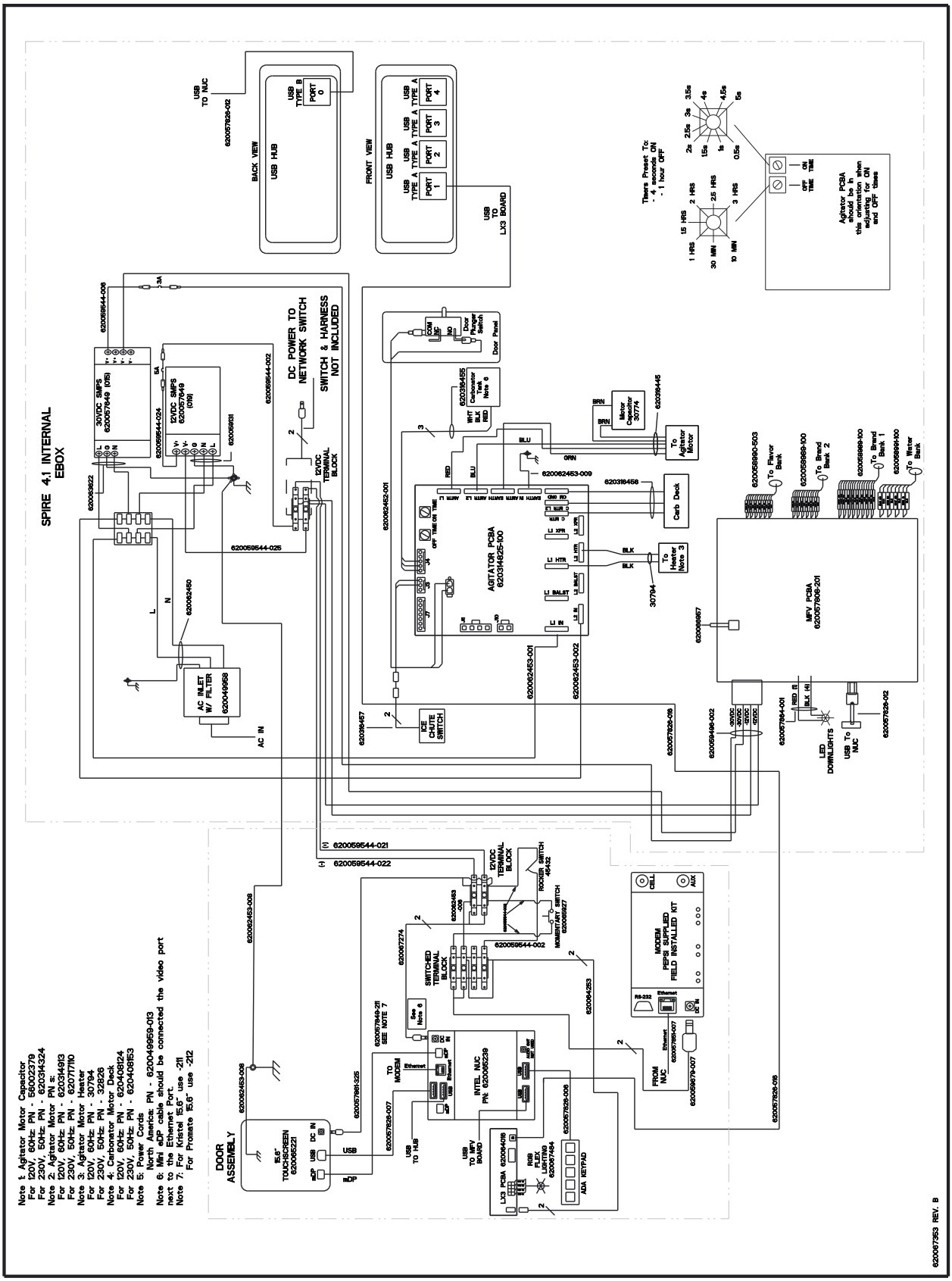


Figure 60

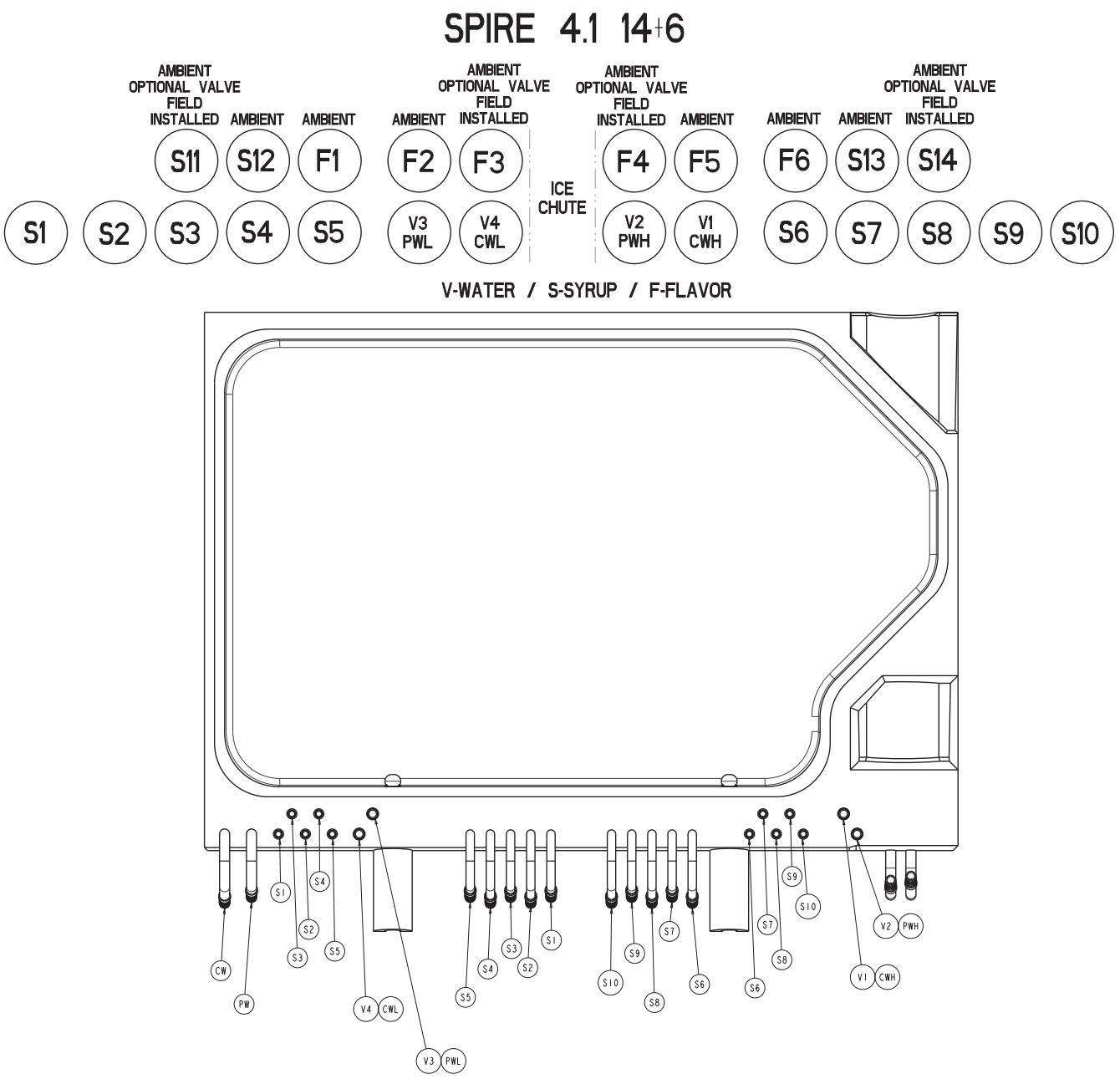


Figure 61

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 CO_2 system, stop dispensing, shut off the CO_2 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 ns not turn ot 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 of replace 2-wire harness
	Bad connection at main control board, J3, pins 2 &3	Repair connection or replace 2-wire harness
	Door switch defective	Replace door switch.
Ice dispenses continu-ously	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 dis-pense	No 30V DC to valves	Restore 30V DC to valves
	No CO_2 pressure	Restore CO_2 pressure

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. Spurts 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 timeout.	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 timeout 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 timeout. 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 probe	Replace liquid level probe

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.	- 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.**	Check the harness connections of the red signal wire at both ends: 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.

Publication Number: 620066826INS

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