



PBD175 (SPIRE 3.0)

Service Manual



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This document contains the original instructions for the unit described.

CORNELIUS INC
101 Regency Drive
Glendale Heights, IL
Tel: + 1 800-238-3600

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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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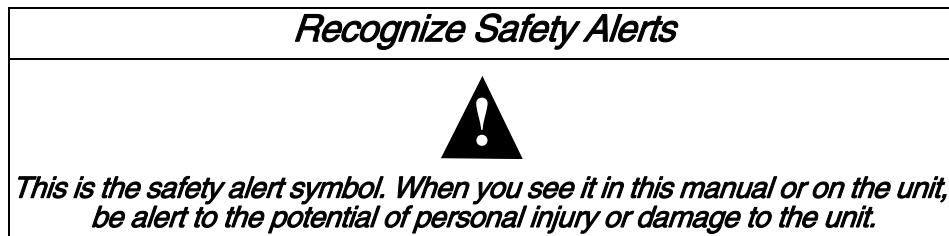
SAFETY INSTRUCTIONS

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**.

PEPSI PBD175 (SPIRE 3.0) USAGE

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.

DECOMMISSIONING AND/OR TRANSPORTING THE UNIT

Whenever the unit is going to be removed from service and/or transported, the unit must be sanitized and completely drained of all liquid.

CAUTION:

When transporting the unit it must be carefully tied down or stored in such a manner that the unit will not move during shipment.

INTRODUCTION

SERVICE MANUAL OVERVIEW

This manual is organized to allow the reader to scan quickly to the subject of interest along the left side of the pages and to read the detail about the subject or procedure on the right side of the page. The manual provides the detail needed for newcomers to the industry, while allowing experienced technicians to skip over the details and move quickly through the material.

This manual is designed as a guide for the trained technician in maintaining and servicing the Pepsi PBD175 (Spire 3.0) dispenser. It is not meant for employees operating the equipment.

WARNING:

Electrical Static Discharge (ESD) is possible when handling the electronics used in this dispenser. ESD can damage software and components. Always use a ground strap when handling circuit boards contained in this unit.

SYSTEM OVERVIEW

The PBD175 (Spire 3.0) dispenser uses touch screen technology to interface with users or service personnel. The control system is comprised of a touch screen display controlled by a computer mounted in the unit. The computer receives inputs from the Touch Screen and sends signals to the Valve Control board. The Valve Control board controls the unit's valves and lights. The computer also has a service menu that allows the technician to BRIX the unit, do unit cleaning and sanitization, remap valves and monitor communications to the display and Valve Control board. Power for the dispenser comes from the two internal power supplies mounted on the left side of the unit.

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)

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 1.

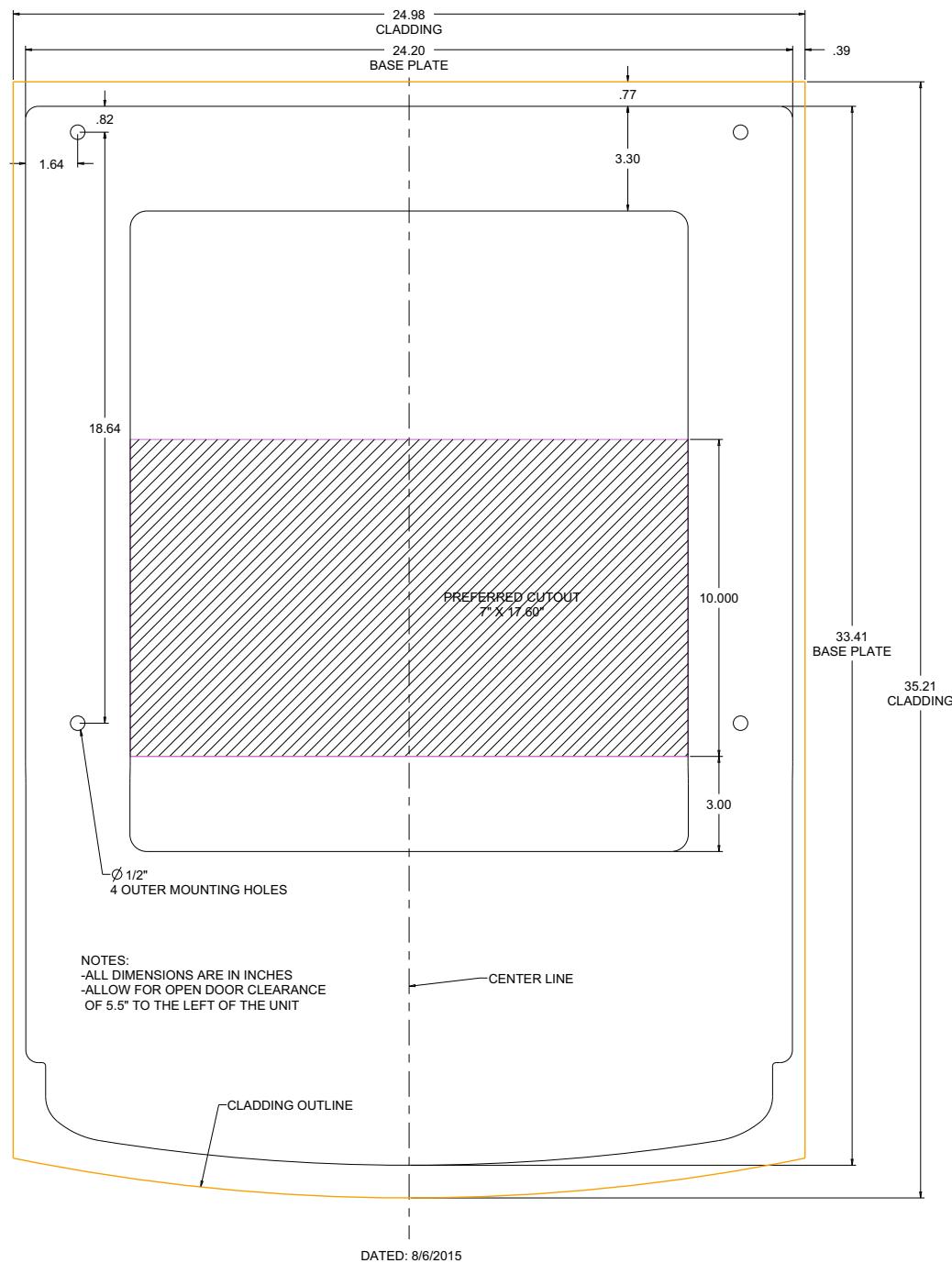


Figure 1.

CONTROL PANEL

A microprocessor based control system monitors and controls all of the major systems and components of the unit. This control system uses the front panel display to interface with the system, as shown in Figure 2.

The display is used by the operator to dispense drinks and by service technicians to access other screens for modifying operating characteristics or troubleshooting of the unit.

In addition to controlling the unit, the control system keeps track of the diagnostic information for use when adjusting and/or repairing the unit. It also communicates with the local network through the SEN Modem.

The control system allows the service technician to perform service, maintenance and repair functions on the unit. This is accomplished through the front panel display. The service screen with the basic service and maintenance functions is shown in Figure 3.



Figure 2.

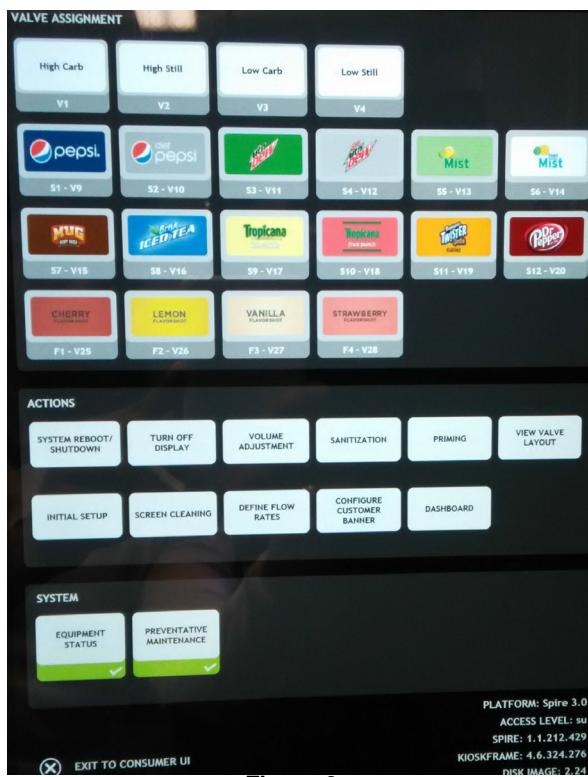


Figure 3.

SPIRE SUBSYSTEMS

The subsystems that make up the PBD175 (Spire 3.0) unit are shown in Figure 4:

- Computer
- Top Power Supply is 30V only
- Bottom Power Supply is a 12V/24V
- Valve Control Board (MFV)
- ADA (Americans with Disabilities Act) Console
- LX3 Board
- Powered USB Hub (located beneath the computer)
- Valve Assemblies

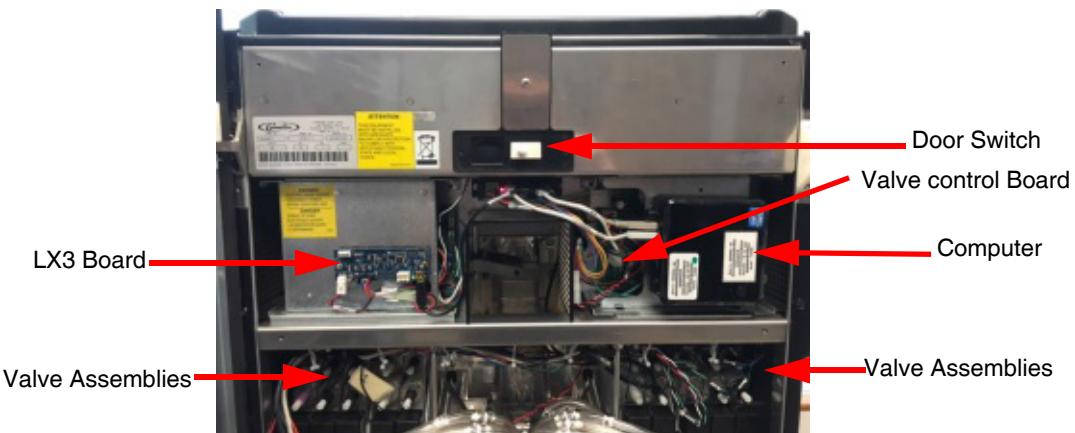


Figure 4.

Computer

The computer controls all functions of the PBD175 (Spire 3.0) unit. This includes the display, all dispense functions, setup and all external devices, such as the SEN modem.

The computer is shown in Figure 4. It has a power button and a LED on the front.

The computer is located in the top portion of the unit, behind the E-box cover shown in Figure 5.



Figure 5.

Valve Assemblies

The valves are located behind the display panel and control the flow of the syrup, water and flavor shots to the valve assembly. Image only applies to 16+8 unit. It also allows technicians to BRIX the unit. The valve assemblies are shown in Figure 6. The white valves are water valves, the black valves are syrup valves and the purple valves are the flavor shots.

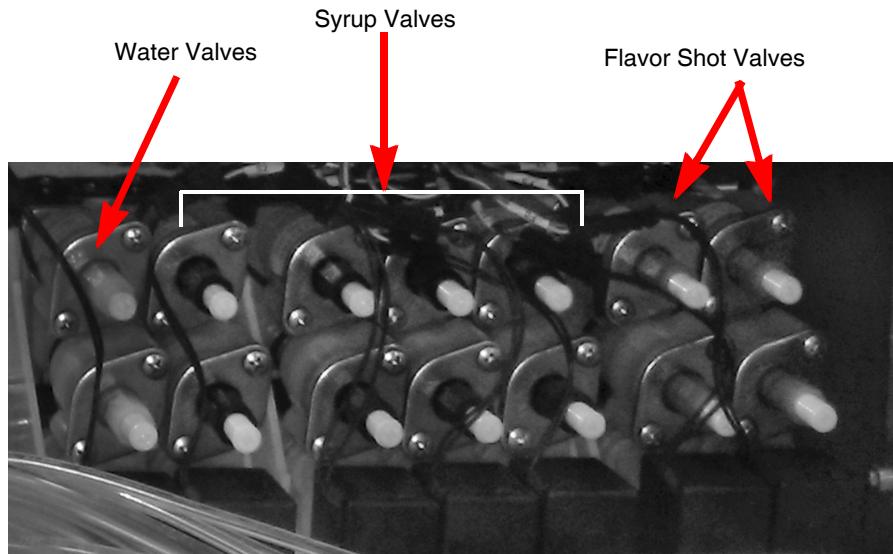


Figure 6.

LX3 Board

The LX3 board is located on the upper-left of the unit, as shown in Figure 7. It is mounted to the unit by two mounting nuts, shown in Figure 7. It receives both 12 and 24 V input voltage.

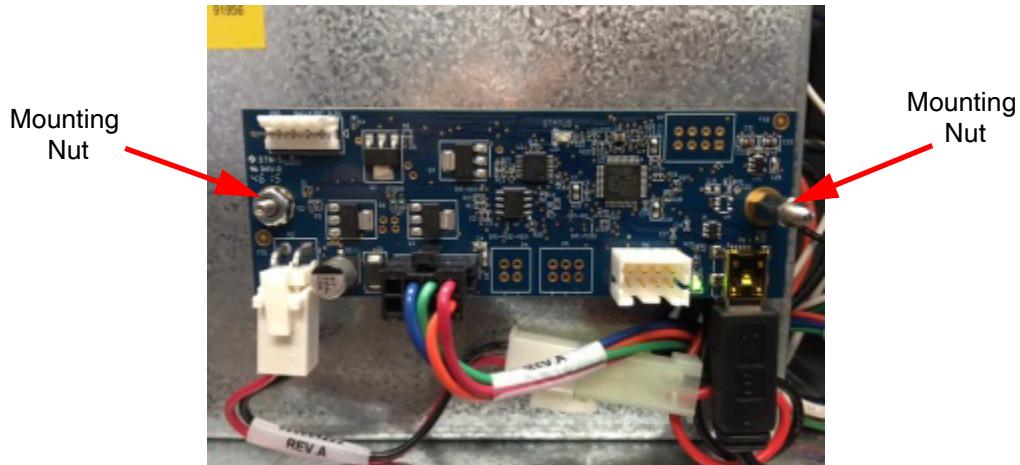


Figure 7.

Valve Control Board

The Valve Control board is located on the upper-right of the unit, as shown in Figure 8. It is mounted to the unit by four mounting tabs, shown in Figure 8. It contains both 12 and 30 V power.

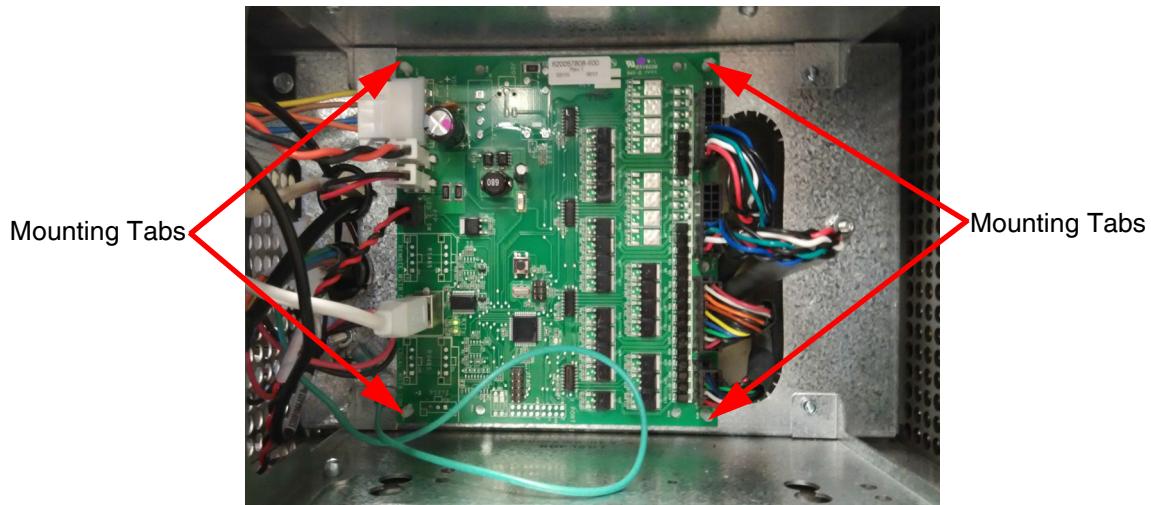


Figure 8.

Agitator/Carbonator Control Board

The Agitator/Carbonator Control Board is located behind the 30 VDC and 12/24VDC power supplies. It supplies function to the agitator motor, carb pump motor, off-cycle agitation settings, agitator motor heater, ice dispense switch and safety switches. It receives both 24V and 115V input voltage.

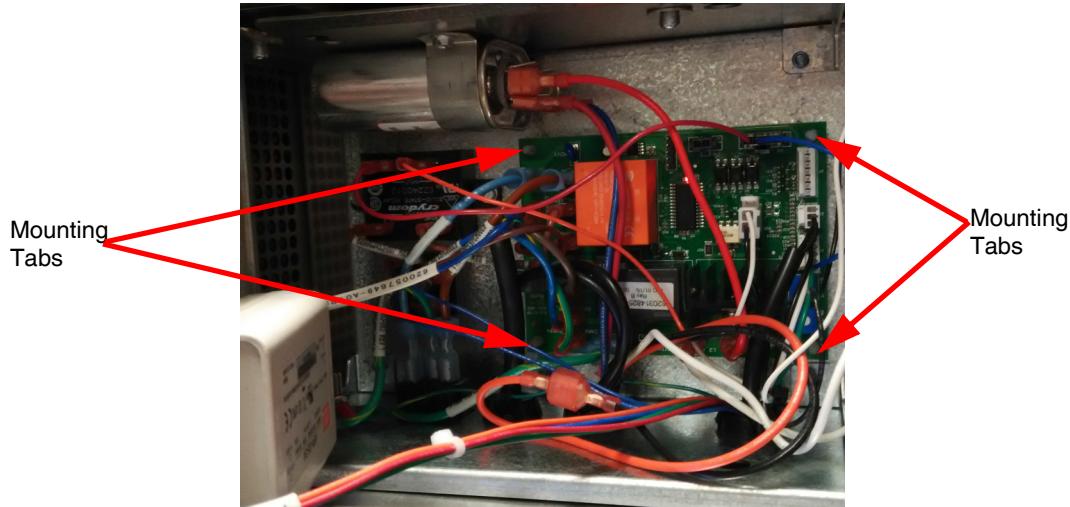


Figure 9.

ADA Console

The ADA console controls the display screen and acts like a mouse to navigate the front panel display menu. The ADA console sends its output to the computer through a USB interface. It is located at the bottom, right side of unit front, as shown Figure 10.

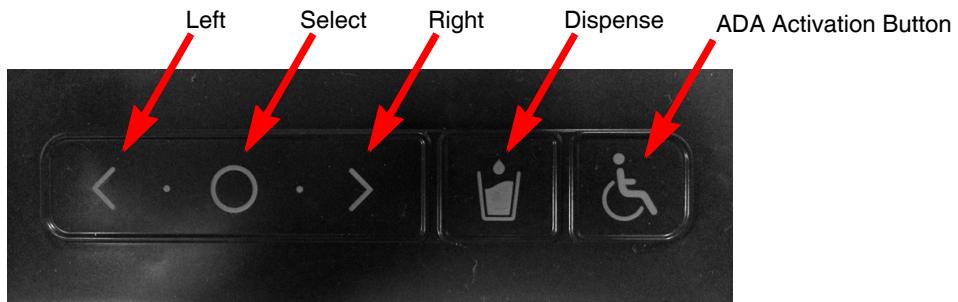


Figure 10.

OPERATION

STARTING THE UNIT

To start the unit, plug the power cord into the appropriate, protected wall outlet. Open the front panel display by grasping it on the right side and to open the unit's door by grasping the grab handle. Machine (dispenser door) is configurable as RH or LH hinge. By pressing the door switch, the front panel display will illuminate and display the user screen, shown in Figure 2 on page 5. If the unit does not power up when plugged in, press the NUC power button to turn it ON.

 **CAUTION:**

If the supply cord is damaged, it must be replaced by a cord available from Cornelius Inc.

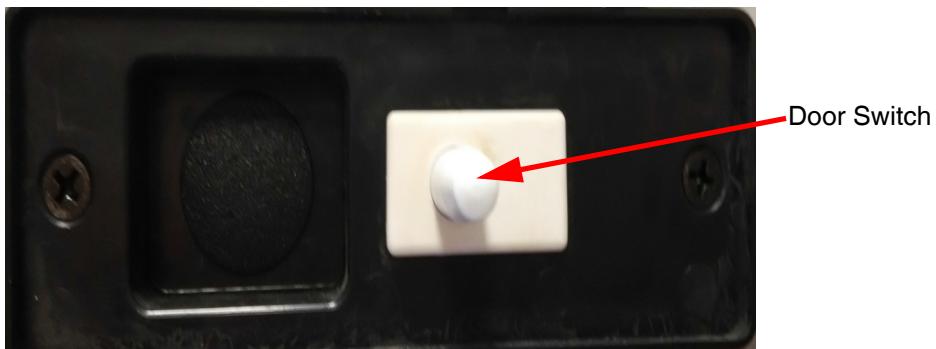


Figure 11.

ICEMAKER CAPABILITY

The PBD175 (Spire 3.0) has a built-in icemaker adapter to accept a maximum 30" wide X 24" deep icemaker footprint. The dispenser is supplied and shipped with needed parts for this icemaker installation. Any ice maker smaller than these dimensions may require an additional kit for proper icemaker 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 icemaker harvest issues. Failure to install this sensor may result in equipment damage or ice dispensing issues.

PREVENTATIVE MAINTENANCE

**WARNING:**

Shutdown unit via the proper software shutdown procedure. When the computer has fully turned off, unplug the unit from the wall outlet.

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

**CAUTION:**

Do not use metal scrapers, sharp objects or abrasives on the ice storage hopper, top cover or exterior surfaces, as damage to the unit may result. Do not use solvents or other cleaning agents as they may attack the material resulting in damage to the unit.

- **Soap solution** – Use a mixture of mild detergent and warm (100° F) potable water.
- **Sanitizing Solution** – Dissolve 1 packet [1 oz. (29.6 ml)] of Stera Sheen Green Label (or KAY-5 Sanitizer/Cleaner) into 2-1/2 gallons (3.79 l) of warm [80-100° F (26.7-37.8° C)] potable water to ensure 100 ppm of chlorine.

CLEANING THE PBD175 (SPIRE 3.0)

Daily Cleaning

**WARNING:**

Do not use abrasive cleansers.

Remove the cup pedestal from the ice slide, as shown in Figure 12, and clean them with warm soapy water, rinse them with clean water and allow them to air dry.

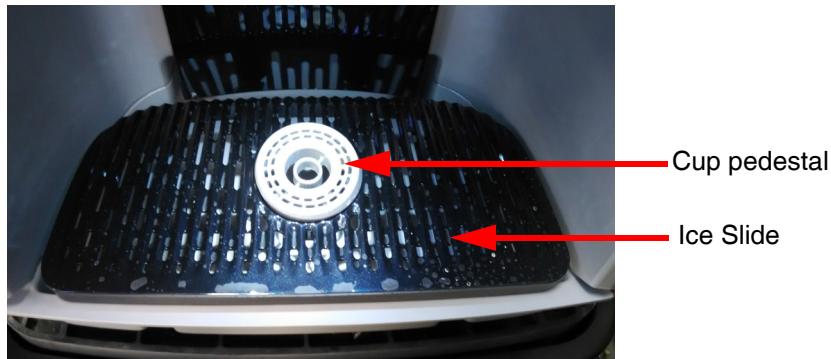


Figure 12.

Wipe down the display screen and the exterior of the unit with warm soapy water. Then rinse with clean water and wipe with a clean soft cloth.

Remove the nozzle and separate it components, as shown in Figure 13 and Figure 14. Wash them in warm soapy water, rinse in clean warm water and allow to air dry.

Wipe down the bottom of the dispensing valve with a clean damp cloth.



Figure 13.



Figure 14.

Spray the nozzle and diffuser inside and outside with approved sanitizing solution, reinstall the diffuser and nozzle on the valve and allow them to air dry.

Pour warm, soapy water down the drains to keep them clean and flowing properly and reinstall the cup rest into the drip tray.

Daily Maintenance

- 1 Check the temperature, smell and taste of the product.
- 2 Check ice in the bin.
- 3 Check the water pressure coming to the unit monitoring the pressure gauges on the back room package.
- 4 Check the carbonation of the drinks.
- 5 Check the level of the CO₂ supply to the system.
- 6 Check the date on all of the BIBs.

MONTHLY CLEANING

NOTE: Perform all the daily procedures in addition to the monthly cleaning procedures.

⚠ 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.

Sanitizing Syrup Lines and the BIB System

Table 1.

Step	Action
1	Remove all the quick disconnects from all the BIB containers.
2	Fill a suitable pail with soap solution.
3	Submerge all disconnects into the soap solution and then clean them using a nylon bristle brush. (Do not use a wire brush) . Rinse them with clean water.
4	Using the same soap solution, perform Steps 7 through 11. It is not necessary to allow the soap solution to remain in the lines for 15 minutes.
5	Rinse all components using clean water.

Table 1.

Step	Action
6	Empty the plastic pail and prepare approximately five gallons of sanitizing solution. See sanitizing solution instructions on page 11.
7	Submerge the BIB disconnects in the sanitizing solution.
8	Sanitizing fittings must be attached to each BIB disconnect. If these fittings are not available, the fittings from empty BIB bags can be cut from the bags and used. These fittings open the disconnect so the sanitizing solution can be drawn through the disconnect.
9	Place all the BIB disconnects into the pail of sanitizing solution.
10	Select and press the syrup or water icon to be cleaned. Refer to Table 2 on page 14. NOTE: Water will also be dispensed in this mode when dispensing any brand or flavor.
11	Enter the priming mode to prime up to five valves at a time.
12	Remove the nozzle components, clean in a soap solution, rinse and replace. Refer to Figure 13 and Figure 14.

ENTERING SERVICE MODE

Service Screen

The unit contains a service mode that is accessed through the front panel display. This allows service personnel to set up the unit or service it.

To shut down the computer through the service screen, perform the procedure in Table 2.

Table 2.

Step	Action
1	Enter the service menu by using your finger to draw two large "P"s on the front panel display (Figure 15), one right after the other. Do not lift your finger while drawing the letter "P".
2	After the two "P"s have been accepted, the PIN number screen is displayed, as shown in Figure 16 . Enter the correct PIN number.
3	When the PIN number is entered, the next screen shown in Figure 16 is displayed.
4	When the Service button is pressed in Figure 17, the screen shown in Figure 18 is displayed. This displays the service menus allowing the technician to map valves, prime valves and shutdown the computer, as well as other service related functions.



Figure 15.

Start at the bottom and around the P



Figure 16.

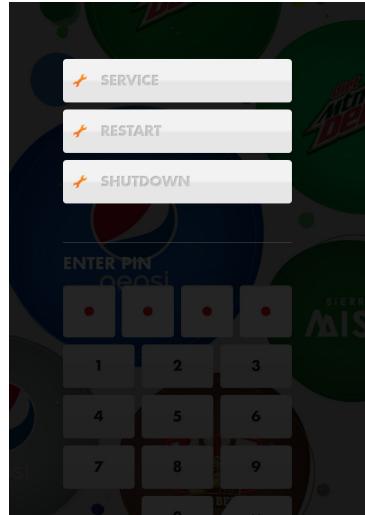


Figure 17.

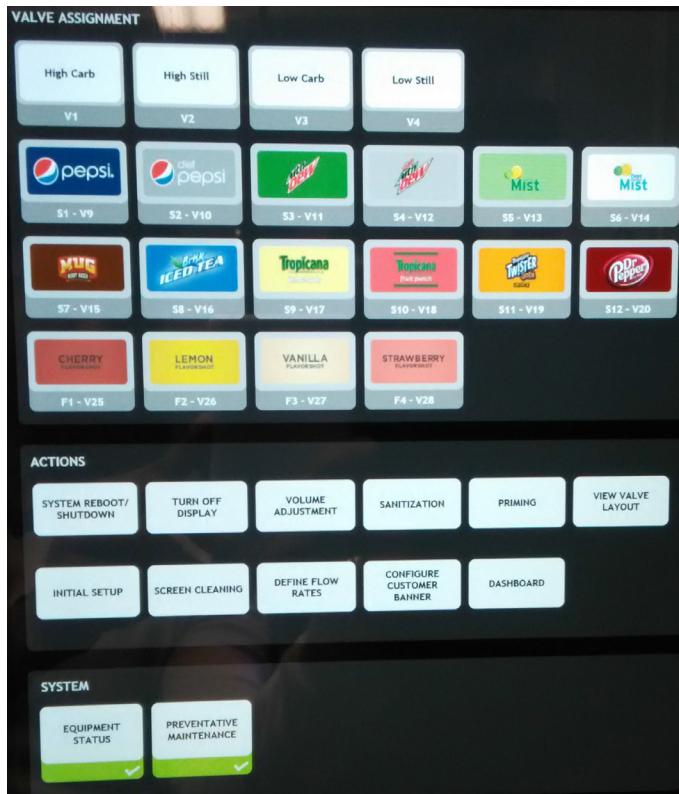


Figure 18.

NUC Power Button

To shut down the computer using the computer power button, perform the procedure in Table 3.

Table 3.

Step	Action
1	Open the unit door.
2	To shut down the computer, press and release the exposed NUC power button, as shown in Figure 19. This operation provides the same function as a software shutdown. ⚠ WARNING: Holding the NUC power button for 5 seconds is an unsafe, hard shutdown. This is not advised during normal operation.
3	To reboot the computer, press the NUC power button for 1 second. The blue light illuminates and the display goes through the boot up routine. At the end of the routine, the main user screen is displayed. Wait 15 seconds after the main user screen is displayed for communications to be completed to the Valve Control board.

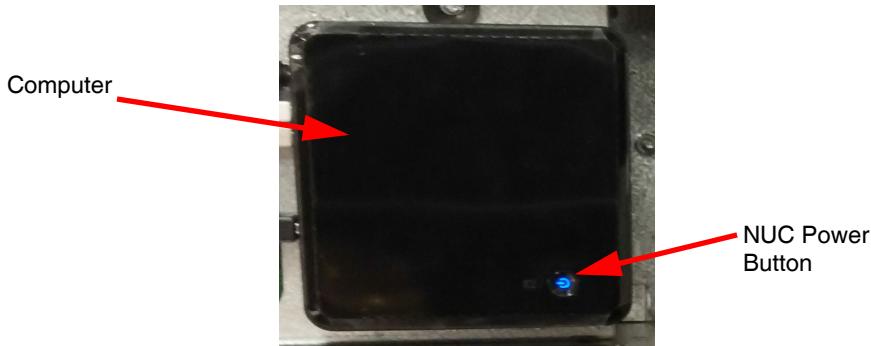


Figure 19.

Sold Out Syrups

This feature can be used to lock a brand or flavor from dispensing. One possible use is to lock a leaking valve that needs to be replaced. The screen is shown in Figure 20.

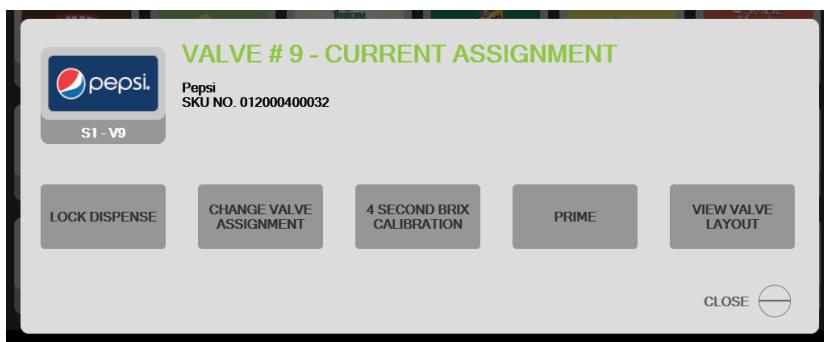


Figure 20.

Mapping the Valves

This feature allows the technician to change the brand or flavor that is displayed on the user interface screen. Possible uses would be a brand or flavor change on a circuit, or during installation a wrong flavor was connected to a valve.

The valves in the dispenser may be mapped to allow any brand shown on the touch screen to be directed to any valve. The only acceptations are the carbonated water and the four plain water valves, since the flow controls are special for these two valves. Before brixing the unit, the technician should validate that the plumbed brand lines from the python are correctly connected to the labeled brands on the user display screen. Enter Service mode, shown in "Entering Service Mode" on page 14. Refer to "Mapping the Diagram" on Figure 104. This chart can also be found in the Service mode menu on the dispenser.

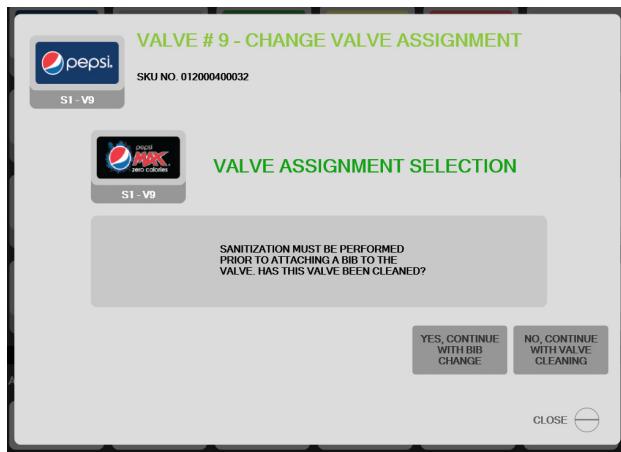
To map the valves, perform the procedure in Table 4.

Table 4.

Step	Action
1	To enter Service Mode, refer to "Entering Service Mode" on page 14.
2	Press the valve in the Valve Assignment area of the screen to reassign a flavor.
3	The Change Valve Assignment screen is displayed, as shown in Figure 21.
4	Pick the new assignment in the Change Valve Assignment screen. The dispenser prompts if the lines have been purged, as shown in Figure 22.
5	Press "Yes continue with BIB change" or "No, continue with valve cleaning."
6	Repeat Step 2 thru 5 until all valves are properly assigned.
7	When finished press Close and then press Close.

Table 4.

Step	Action
8	For reference of valve layout vs brand press View Valve Layout button on the Current Assignment screen, shown in Figure 20. The screen shown in Figure 23 is displayed and shows the valve number vs brand or flavor in the orientation that the valves are in the machine.


Figure 21.

Figure 22.

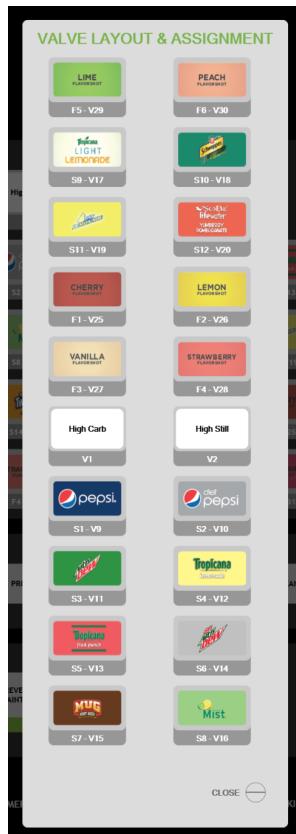


Figure 23.

Valve Assignment Options

When a brand or flavor is selected, a second screen is displayed, as shown in Figure 24, providing the technician with several options.

NOTE: This option only allows one selection at a time. When dispensing a syrup or flavor no water will be dispensed. If water is selected no syrup will be dispensed.

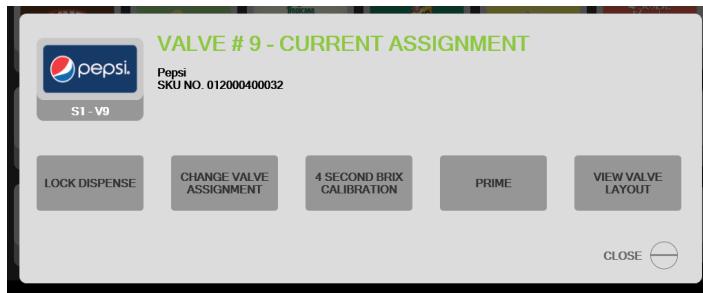


Figure 24.

4 Second BRIX Calibration

This selection dispenses a 4 second pour. Possible uses are to check the syrup volumes for brixing or to check that the valve is dispensing the proper syrup. This function also exists in the priming menu, but in that screen it allows multiple selections.

Sanitization

This selection graphically prompts the technician through the sanitization cycle. This feature includes timing functions that will not let the user continue until after the sanitization step has been completed. The screens are shown in Figure 25.



Figure 25.

Priming

This selection opens the selected valve for an unlimited time, allowing the technician to purge the line. This feature allows the technician to purge the lines during install or when changing out a brand or flavor.

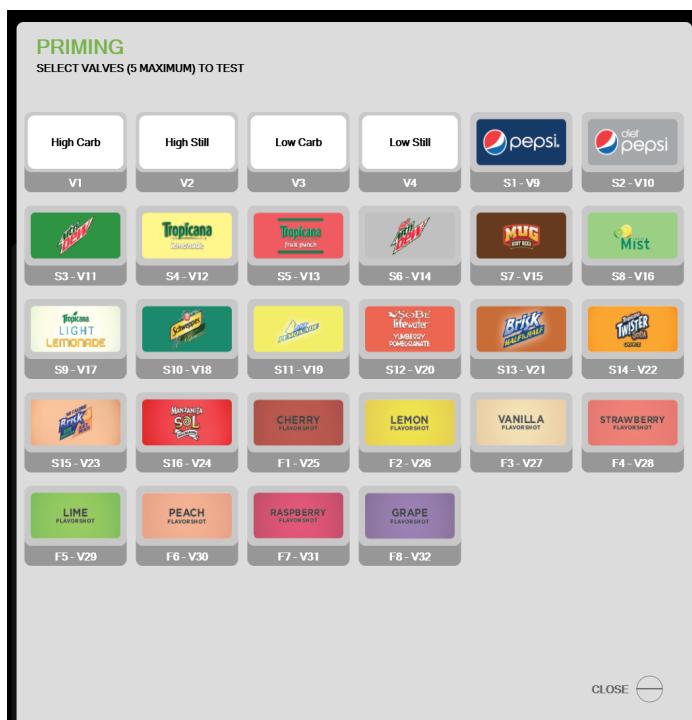


Figure 26.

View Layout

This selection shows the mapped valves as to how they will appear in the user screen. The valve selected is highlighted.

ACTIONS OPTIONS

This series of selections is used to navigate different options available to the service technician.

System Reboot Shutdown

This selection does a “soft” shutdown of the computer. Use this selection or the green button behind the display to reboot the computer to avoid creating corrupted files in the computer.

Display Power

This selection is used to turn off power to the display. The power is shut off at the “Valve Board” through the computer.

Volume Adjustment

This function is not used.

Sanitization

This selection is used to enter into the “Automatic Sanitization” menu. See details in the "Valve Assignment Options" on page 18.

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 BRIX.

NOTE: Lines must also be purged prior to Brixing.

To BRIX the unit, perform the procedure below.

1. Enter Service mode, as described in "Entering Service Mode" on page 14.

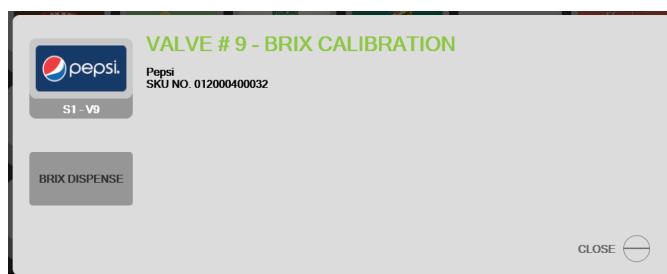
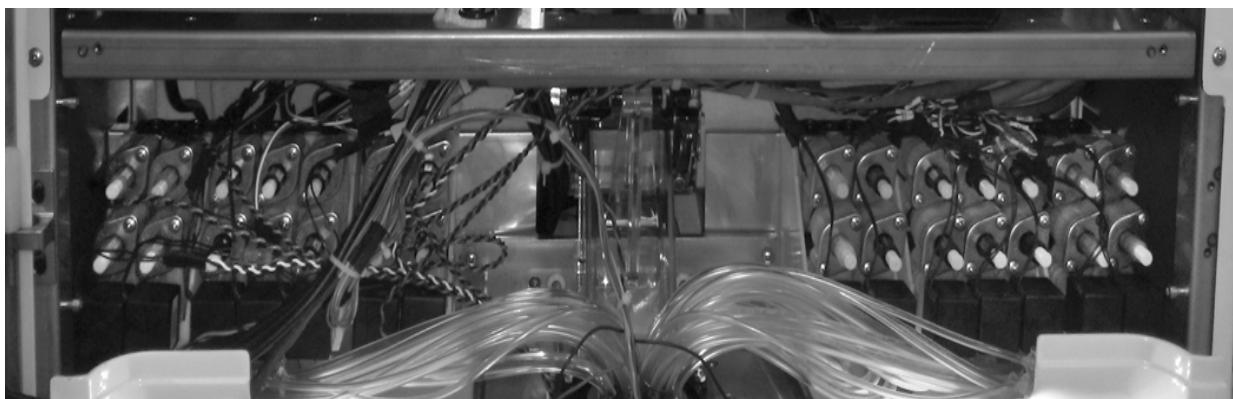


Figure 27.

2. Press the brand or flavor to be brixed. The BRIX screen, shown in Figure 27. is displayed.
3. Hold the BRIX cup under the valve and press the “BRIX Dispense” icon.
4. Adjust the carbonated water flow to the desired rate [such as 2 to 3 Oz. (59 to 88.5 ml) per second]. Refer to Figure 28 for valve locations. High carbonation set to 210 ml / 4 seconds and low carbonation set to 90 ml / 4 seconds. High plain set to 210 ml / 4 seconds and low Plain set to 90 ml / 4 seconds.
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.
6. Set the syrup flow adjustment valve to get the desired ratio. Set flavor shots to dispense 12 ml / 4 seconds.
7. Set syrup volumes to 60 ml (for 5:1 Syrups).
8. Set the flavor shot setting as shown in Table 5.

Table 5.

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

**Figure 28.**

DEFINE INPUT FLOW RATES

The technician has the ability to input the flow rates for water, carbonated water, and flavor shots. Figure 29 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 30.



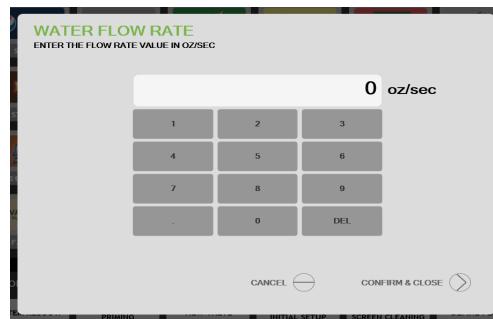
SELECT A RATE TO CONFIGURE

WATER 2.50 oz/sec

CARB WATER 2.50 oz/sec

FLAVOR SHOT 0.10 oz/sec

CLOSE

Figure 29.

WATER FLOW RATE
ENTER THE FLOW RATE VALUE IN OZ/SEC

0 oz/sec

1	2	3
4	5	6
7	8	9
.	0	DEL

CANCEL CONFIRM & CLOSE PRIMING INITIAL SETUP SCREEN CLEANING

Figure 30.

SYSTEMS OPTIONS

This series of selections allow the technician to access diagnostics screens that give information as to the status of the different components and systems of the machine. If the icon is highlighted GREEN then all of the systems in the group are functioning properly. If the Icon is highlighted RED, then one of the selections has an error and should be addressed.

EQUIPMENT STATUS

SEN Connections

Monitors the software applications that operate the dispenser.

System

This selection monitors vital temperatures of the computer. These include the CPU & SSD temperatures and fan speed. If the icon is red check the system fans to make sure they are operating.

Valve Controller

Validates communication between the computer and valve board.

ADA Controller

Validates communication between the computer and ADA board.

Touch Controller

Validates communication between the computer and display.

PREVENTATIVE MAINTENANCE

This selection is a reminder to the technician that a designated amount of time has expired and these systems should be checked. The display is shown in Figure 31. If they are highlighted RED the technician should check the component highlighted and clear the alarm when completed. They include:

- Water Filter
- Lines & Valve Sanitation
- Power Supply Fan Clean
- Computer Fan Clean

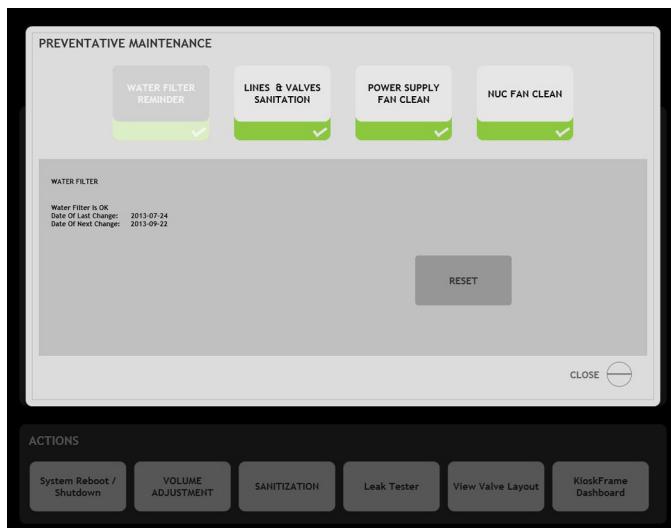


Figure 31.

COMPONENT REPLACEMENT

REMOVING THE CLADDING

To remove the cladding, perform the procedure below.

1. Open the door by grasping it on the right side and swinging it open.



Figure 32.

2. Remove the 4 screws from the latch side of the unit.

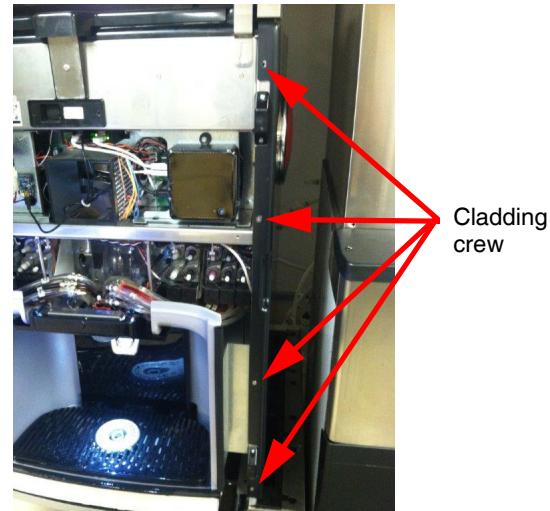


Figure 33.

3. Remove the four screws from the hinge side of the unit.



Figure 34.

4. Pivot the side cladding away from the unit and slide back slightly to remove from rear tab and remove from the unit.
5. To replace the cladding, reverse the procedure.

REPLACING THE DISPLAY

To replace the touch screen display, perform the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Loosen the four mounting screws holding the rear door panel to the door frame and lift the panel up and off the mounting screws.



Figure 35.

5. Unplug the power, USB and HDMI cables from the rear of the touch screen panel.

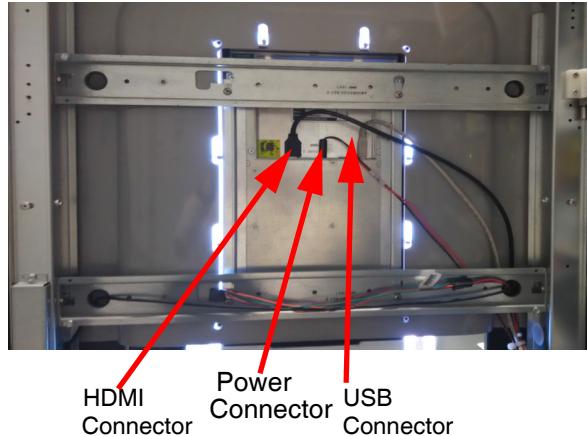


Figure 36.

6. Loosen (Do NOT remove) the four screws holding the display to the door frame.

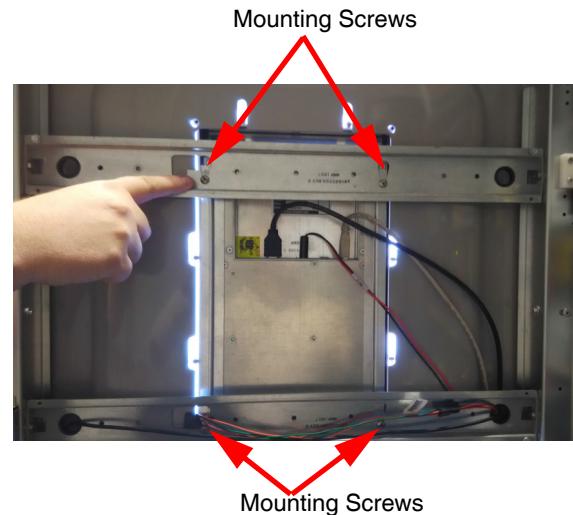


Figure 37.

7. Remove the cable connection.

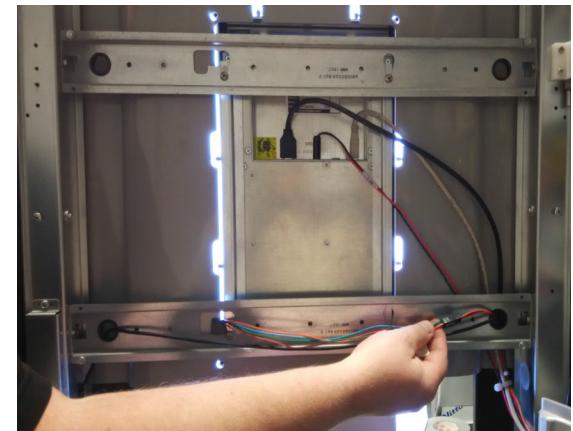


Figure 38.

8. Close the door and lift the display up and forward to remove it from the unit.

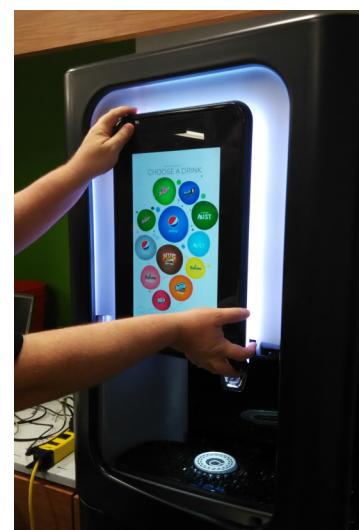


Figure 39.

9. Close the door and reattach the display to the door of the unit by positioning the four mounting screws into the slots in the door frame.

10. Tighten the four screws that hold the display to the door frame.

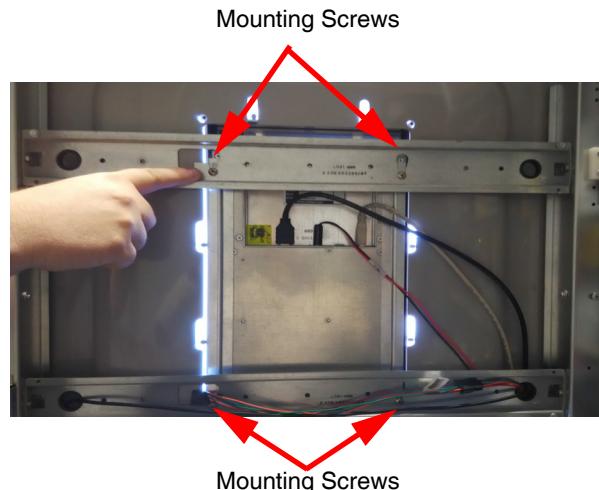


Figure 40.

11. Reinstall the four screws that secure the display to the inner door.
12. Remove the tape and reconnect the RCA plugs, USB and HDMI cables to the rear of the display, as mentioned in Step 5 of "Replacing the Display" on page 24.
13. Replace the rear door panel.
14. Plug the power cord back into the wall receptacle and resume normal operation.

REPLACING VALVES

If a valve is damaged, perform the procedure below to replace the valve.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Enter the service screen and activate the leak testing function.
4. Activate the valves to be removed and press start to depressurize them.
5. Open the door.

6. Push the backblock fittings up to close the syrup and water supplies. Also remove 4 outer screws securing the perimeter of the screen

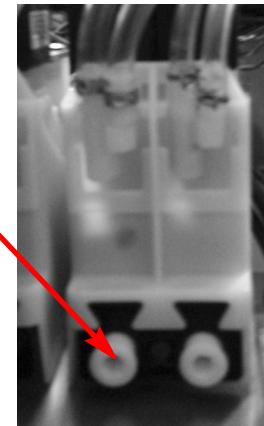


Figure 41.

7. Disconnect the tubing from the valve by squeezing the wire tubing clamps and disconnecting the tubing.

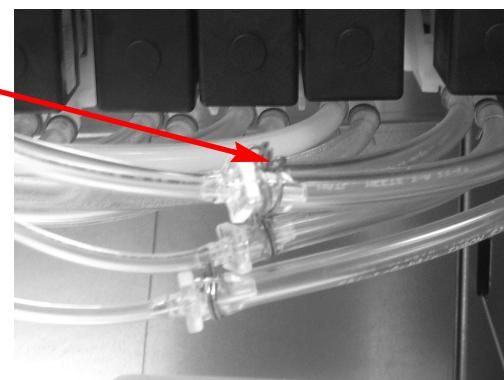
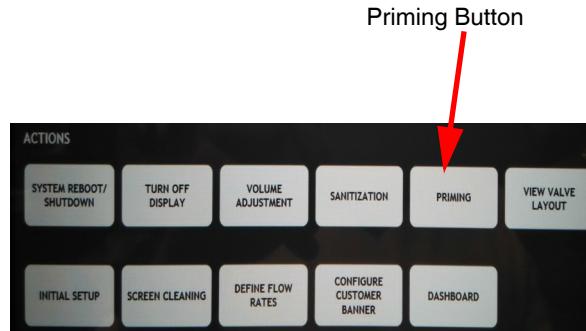


Figure 42.

8. Lift the valve assembly and pull it out of the unit.
9. Lubricate the O-Rings with food-safe lubricant on the new valve assembly before installing it in the unit.
10. Slide the new valve assembly into the front of the unit.
11. Push the valve block down into position.
12. Reconnect the product output lines.
13. Open the backblock to allow syrup and water flow.
14. Plug the power cord back into the wall receptacle.
15. When the unit is ready, go into the service mode, as described in "Entering Service Mode" on page 14.

16. For valves or back blocks that have been replaced, enter priming mode and start the carb water priming to run water until circuits that were serviced are observed (typically several cycles of the carb 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 them until all the air has been removed, then continue with balance.



17. Press the Priming button on the service screen and follow the procedure to sanitize and BRIX the new valves.

Figure 43.

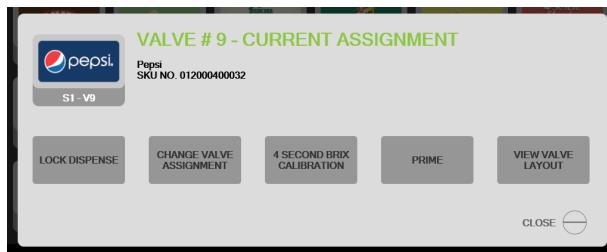


Figure 44.

18. Selecting Priming on the BIB popup allows the technician to prime only one valve at a time.



Figure 45.

20. Perform the procedure in "4 Second BRIX Calibration" on page 18.
 21. Perform the procedure in "Priming" on page 19.
 22. Resume normal operation.

REPLACING THE BACKBLOCK

To replace a damaged backblock, perform the procedure below.

1. Disconnect the CO₂ supply from the unit.
2. Bleed off syrup pressure using prime dispense for all valves that need to be replaced
3. Lubricate Valve inlet O-Rings with food safe lubricant.
4. Perform Step 1 through Step 9 on page 27.
5. Reconnect the CO₂ supply to the unit.

6. Remove the mounting screws holding the backblock to the panel.

Mounting Screws Mounting Screws

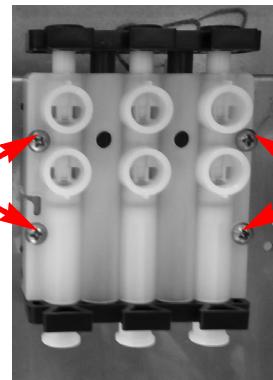


Figure 46.

7. Replace the backblock.
8. Reinstall the new backblock and perform Step 9 through Step 22 on page 28.

COMPUTER INFORMATION AND SERVICE

WARNING:

The computer is powered by 19 VDC. Any other voltage may cause operational issues or damage to the computer. The computer controls all of the functions of the dispenser. Blank screens or valves not operating could be a symptom of a computer problem. Before replacing the computer validate the following diagnostics.

Computer Diagnostics

To diagnose computer malfunctions, perform the procedure below.

1. Open the door, with the dispenser running,
2. Visually inspect the computer for loose cables and verify that all the cables are connected.

3. Verify that the LED on the computer is illuminated. If the light is on, this means there is power to the computer.



Figure 47.

4. If the light is not illuminated, verify that power is on to the unit..
5. If the light still does not illuminate, remove electrical box cover from the computer and with a volt meter set to DC voltage and validate that 19 Vdc is being supplied. Convertor not E-box supply.
6. If there is no voltage present at the plug or it is low, replace the power supply. Check input voltage, if input voltage is correct, replace the computer as described in "Replacing the Computer" on page 30.

Replacing the Computer

To replace the computer, perform the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Remove the E-box cover by removing the two mounting screws and sliding the panel down to disengage the tabs on the top of the panel.



Figure 48.

5. Disconnect all the connections from the top of the computer.

6. Remove screw retaining computer prior to sliding. Slide the computer to the right to disengage the screws on the back of the computer from the keyhole slots on the mounting bracket.



Figure 49.

7. Replace the computer with a new unit.
8. Reconnect the connectors on the top of the computer.
9. Replace the E-box cover and close the door.
10. After plugging in, refer "Starting the Unit" on page 10 to resume normal operation.

VALVE CONTROL BOARD INFORMATION AND SERVICE

The Valve Control board uses a USB communication cable from the computer to cycle the beverage valves and control the down lights. The board is supplied by a 30/12 VDC connector from the power supply and is capable of supplying power to 28 valves {when PBD175 (Spire 3.0) is completely featured}.

Valve Control Board Diagnostics

To diagnose Valve Control board malfunctions, perform the procedure below.

1. With the dispenser running, open the door.

2. Remove the E-box cover by removing the two mounting screws and sliding the panel down to disengage the tabs on the top of the panel.



Figure 50.

3. Visually inspect the Valve Control board for any signs of loose connections.

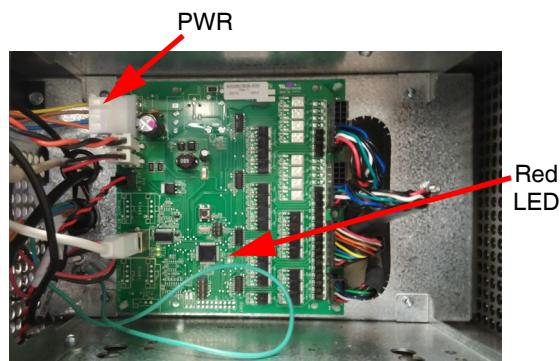


Figure 51.

4. Verify that the red LED on the board is illuminated.
5. If power is present and the red LED is not illuminated, replace the board.
6. Visually check the communications LEDs located above the USB input to the board. There are two LEDs that flash in sequence. Both LEDs should be flashing at 1 second intervals
7. If the LEDs are not flashing, check the USB cable at the computer and relay board ends. If signs of water encroachment are visible at the USB port clean the USB connectors and or replace both the cable and the board.

If only one LED is flashing, the lights are sporadic or not flashing, clean the USB connectors or replace both the cable and board.

If any burning or discoloration appears on the board, replace it.

8. If all of the valves are properly mapped and more than one valve is operating sporadically, replace the Valve Control board, as described in "Replacing the Valve Control Board" on page 32.

Replacing the Valve Control Board

To replace the Valve Control board, perform the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Remove the E-box cover by removing the two mounting screws and sliding the panel down to disengage the tabs on the top of the panel.



Figure 52.

5. Unplug the 30/12VDC PWR, USB and the four valve connectors at the right side of the board.
6. LED down light.
7. Ensure that key switch connector is in the horizontal or "ON" position".

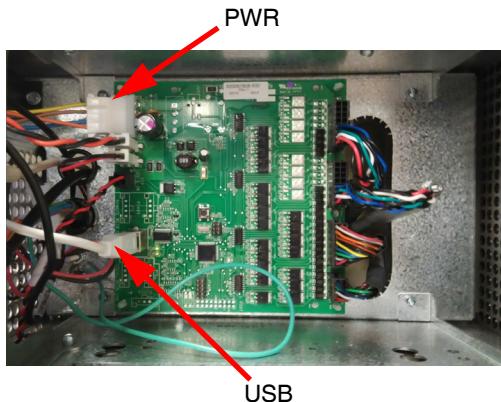


Figure 53.

8. Using a needle nose pliers, pinch the four standoffs to release the board.

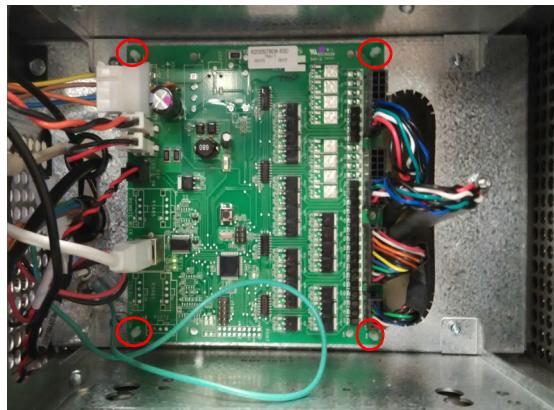


Figure 54.

9. Replace the Valve Control board and press the new board onto the four standoffs.
10. Reconnect all of the connectors to the board from step 5-7.
11. Replace the E-box cover and install the two screws holding the cover.
12. Reconnect the power cord in the wall receptacle and resume normal operation.

ADA CONTROL BOARD INFORMATION AND SERVICE

The ADA feature is located in the front of the drip tray and controlled through a USB connector from the ADA board to the computer. The ADA feature is a capacitance touch control board activated by an object changing the capacitance field and sending a signal to the computer.

ADA Control Board Diagnostics

Before replacing the drip tray or the ADA board it is possible to determine if the board is faulty by plugging the USB output into a computer. The control board acts like a mouse and will move a cursor on a screen. If the cursor moves appropriately, the board is not the problem.

Replacing the ADA Control Board

If it is determined that the ADA control board is not functioning properly, replace it by performing the procedure below.

1. Open door and remove ADA service cover by pulling/removing the 4 panel clips (save the panel clips).



Figure 55.

2. Unplug ADA power harness and unscrew the 2 mounting screws (new screws come with kit).

3. Carefully pull board assembly out.

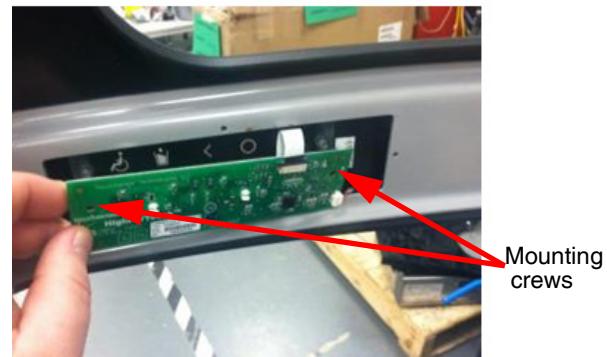
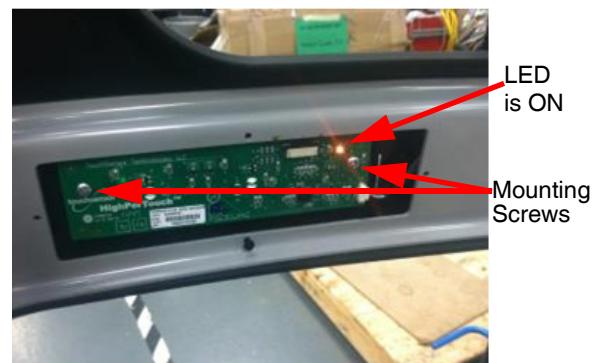


Figure 56.

4. Now you're ready to re-install the new board. To prevent static damage to the board, ESD protection (ESD wrist strap) is recommended or at a minimum, touch dispenser frame to discharge any static charge before touching the new board.
5. Clean the back side of bezel, notice the recess where the icons are at. Then carefully slide, board assembly into, up and forward. The key is to touch sensor board sit into the bezel recess mentioned earlier. Refer Figure 57 and Figure 58.

**Figure 57.****Figure 58.**

6. If done correctly, board assembly mounting holes will align with screw posts and board will appear flush and not bulging outward.
7. Re-install the 2 mounting screw and plug ADA power harness back into its connector.

**Figure 59.**

8. Once the power harness has been installed, the board LED should be on.

**Figure 60.**

9. Test for function, make sure all buttons work and function properly. When verified and complete, re-install ADA service cover with panel clips.

LED SPOT LIGHT ASSEMBLY

The LED Spot light consists of two LED lamps located on either side of the nozzle. These LED lights are controlled by a 12 VDC output from the Valve Control Board.

Replacing the LED Spot Light Assembly

If it is determined that the LED Spot Light Assembly is not functioning properly, replace it by performing the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Remove the LED spot lights from their mounts.

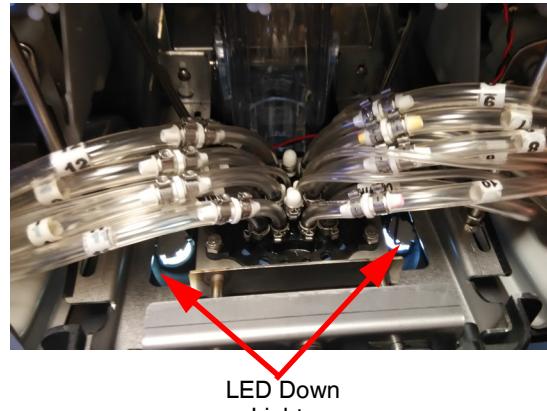


Figure 61.

5. Unplug the LED spot light assembly connector from the Valve Control board and free it from the wire loom.

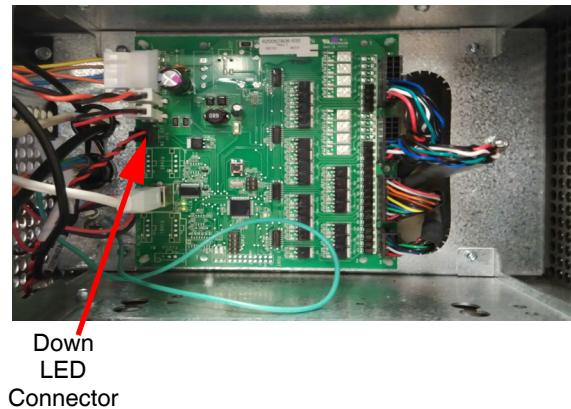


Figure 62.

6. Pull the two LED assemblies and remove them from the unit.
7. Replace the LED spot light assembly with a new unit.
8. Route the connector back up to the Valve Control board and plug it in.
9. Reconnect the power cord in the wall receptacle and resume normal operation.

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 63.



Figure 64.

9. Mark location of Enclave screws as shown in Figure 65 to help reference re-installation and proper Enclave placement.



Figure 65.

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



Figure 66.



Figure 67.

11. 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.

12. Install drip tray drain tube on enclave as shown in Figure 69.

**IMPORTANT:**

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

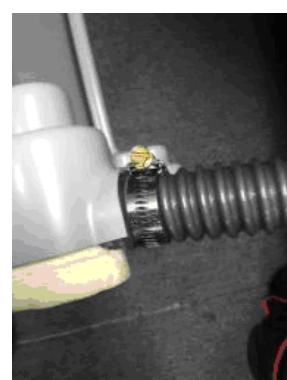


Figure 69.

13. 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 70.



Figure 71.

14. 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.

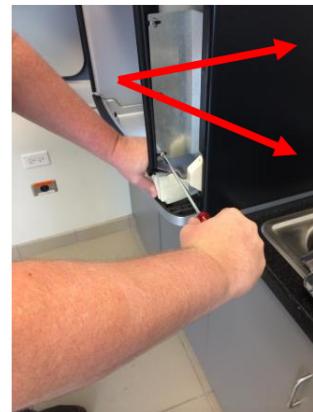


Figure 72.

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



Figure 73.

16. 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 74). If Door still does not close properly, there is something else not aligned.



IMPORTANT:

Do not attempt to modify enclave.



Figure 74.

17. 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 75.



Figure 76.

18. Verify function of the unit.

Replacing the Carbonator Sensor

If it is determined that the carbonator sensor is not functioning properly, replace it by performing the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Remove the ice slide. Pull the backsplash forward from the top and lift the ice dispense lever to remove the backsplash from the unit.



Figure 77.

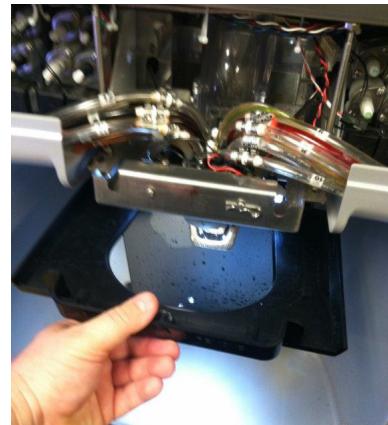


Figure 78

4. Remove the enclave by loosening the 4 mounting screws (2 on each side) and removing it from the front of the unit.

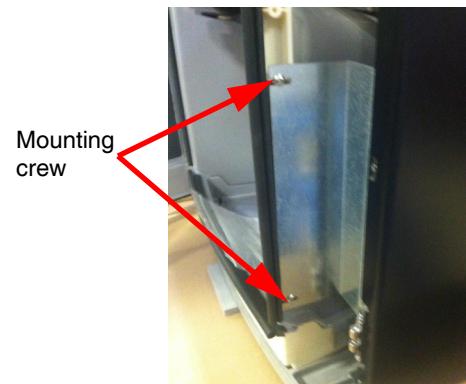


Figure 79.

5. Remove drain from enclave.
6. Remove lower access panel.
7. Turn off carb pump, refer to purge steps to clarify. Turn off water go to prime high and low carb until all water is out and CO₂ is coming out turn off CO₂ pull relief valve.

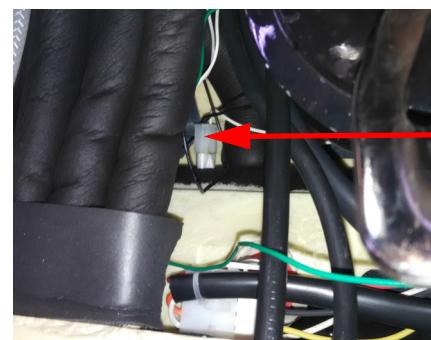


Figure 80.

9. Disconnect the lead from the damaged probe and unscrew the probe.
10. Screw in the new sensor and reconnect the connector. Probe connector goes only in one way.
11. Need to reconnect the drain to enclave.
12. Reconnect the backsplash and the ice slide.
13. Reconnect the power cord in the wall receptacle and resume normal operation. Refer to startup procedure to fill and purge tank.

Replacing the Ice Bin Agitator

If the ice bin agitator is damaged, perform the procedure below to replace it.

NOTE: Sanitize after replacement is complete.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Remove the ice bin cover.



Figure 81.

5. Loosen the agitator thumbscrew and remove the agitator assembly.



Figure 82.

6. Replace the agitator assembly and tighten the agitator thumbscrew. Make sure the thumbscrew is tight.

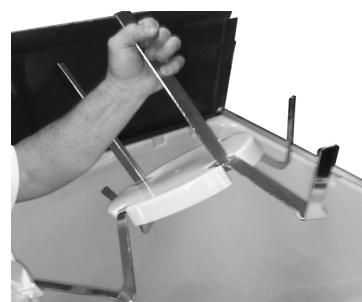


Figure 83.

7. Reassemble the front and top of the ice bin.
8. Replace the ice bin cover.

9. Close the door.
10. Reconnect the power cord in the wall receptacle and resume normal operation.

Replacing the Agitator Timer Board

If the agitator timer board is malfunctioning, perform the procedure below.

1. Shut down the unit using the service menu on the display.
2. Unplug the power cord from the wall receptacle.
3. Open the door.

4. Remove the E-box cover by removing the two mounting screws and sliding the panel down to disengage the tabs on the top of the panel.



Figure 84.

5. Remove the two screws that mount the power supply panel to the unit and swing the panel down to expose the agitator timer board.

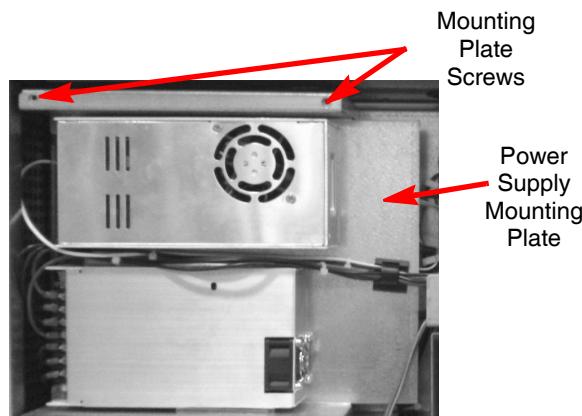


Figure 85.

6. Carefully remove and mark all the connectors.

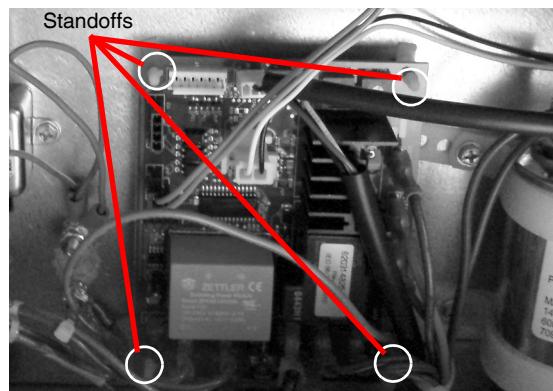


Figure 86.

7. Using a needle nose pliers, pinch the four standoffs to release the board.
8. Replace the Agitator Timer board and press the new board onto the four standoffs.
9. Reconnect all of the connectors to the board.

10. Swing the power supply panel up and install the two screws holding the panel.
11. Reconnect the power cord in the wall receptacle and resume normal operation.

Replacing the Agitator Motor

1. Unplug from power and allow several minutes for gearbox heater to cool.

2. Remove the 4 screws with a 1/4" socket to separate the agitator motor from the gear box.

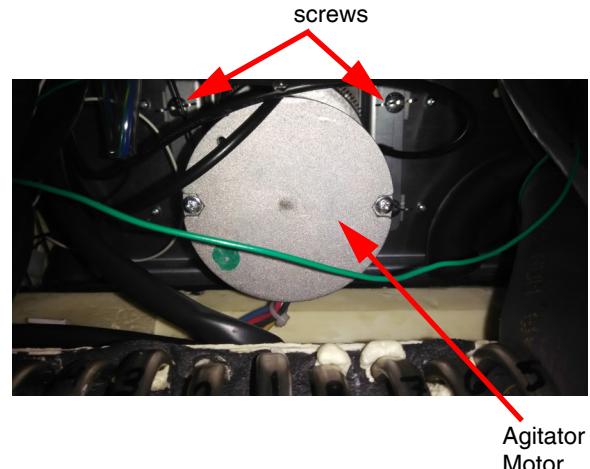


Figure 87.

3. Remove the agitator motor.

4. Install the new agitator motor and replace the screws removed in step 1 with a 1/4" socket.



Figure 88.

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.

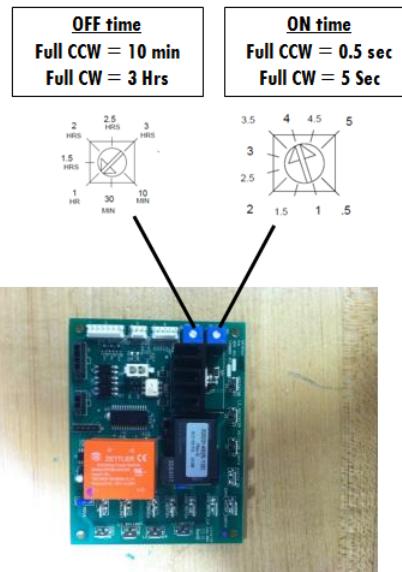


Figure 89.

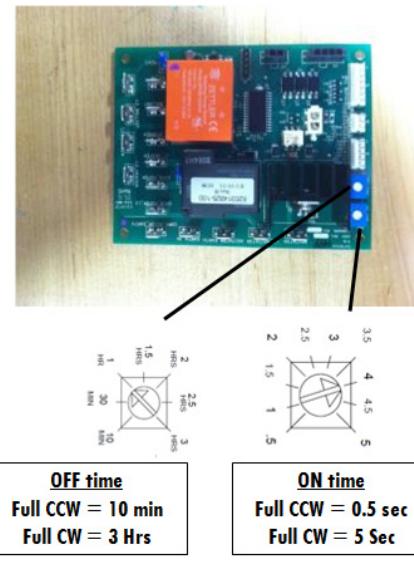


Figure 90.

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.

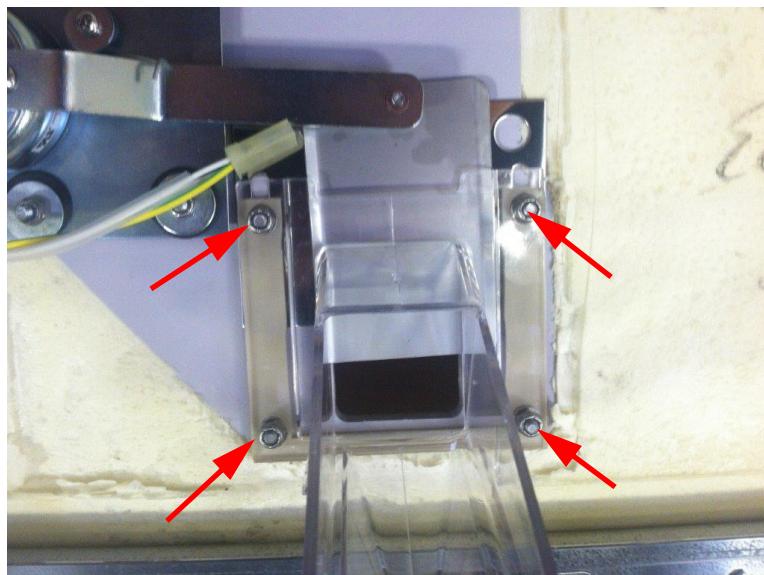


Figure 91.

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 44).
 - Ice flow from dispenser ice chute is sufficient for ice type (See "Ice Chute Restrictor Adjustment" on page 44).
1. Make sure top of unit is clean and free of dirt, grime, and debris.

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

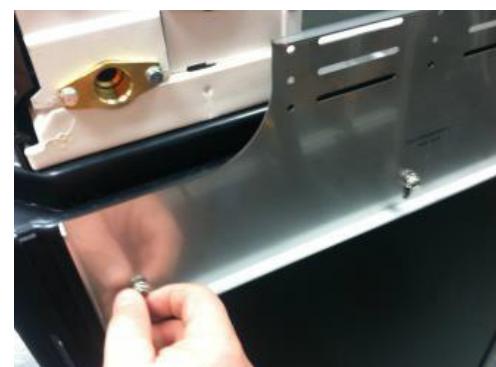


Figure 92.

3. Place ice maker on top of unit and push until rear of ice maker is flush with bracket OR ice maker rear is flush with rear of the dispenser



Figure 93.

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



Figure 94.

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, be sure to check and not to screw into refrigeration componentry behind the sheet metal.



Figure 95.

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 96.

7. Now using the #8 self-tapping screws, screw into the ice maker as shown. A minimum of (2) screws are needed to safely secure ice maker to dispenser. Any hole or slot in bracket can be used.



Figure 97.

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

NOTE: If ice maker has swinging front door, do not use silicone on door.



Figure 98.

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



Figure 99.

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



Figure 100.

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 101.



Figure 101.

13. Tighten screws down to secure filler panel.



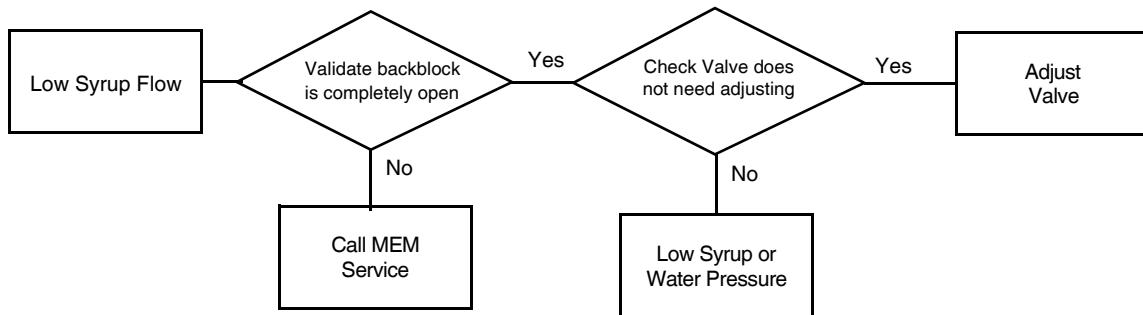
Figure 102.

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

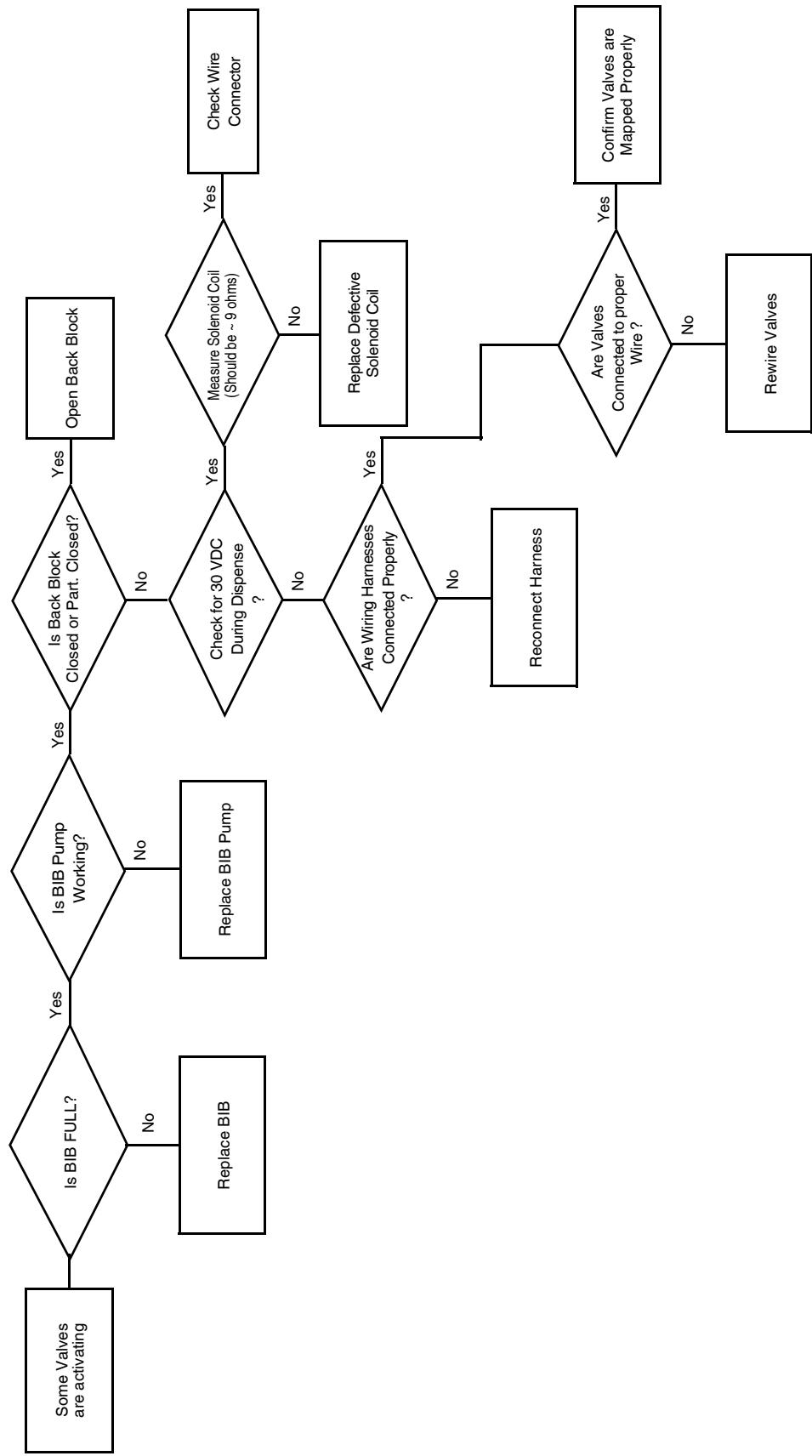
TROUBLESHOOTING

TROUBLESHOOTING VALVES

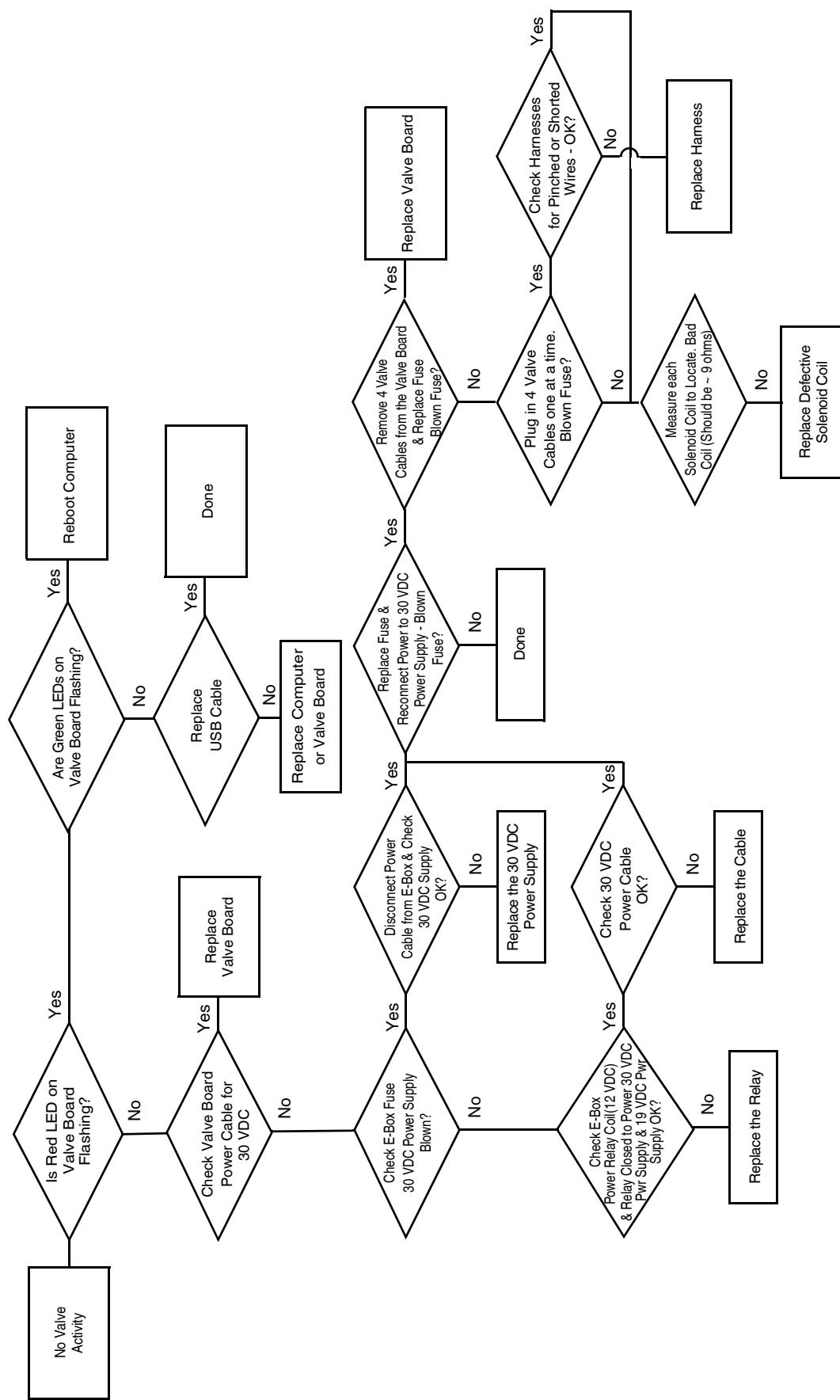
Low Syrup Flow



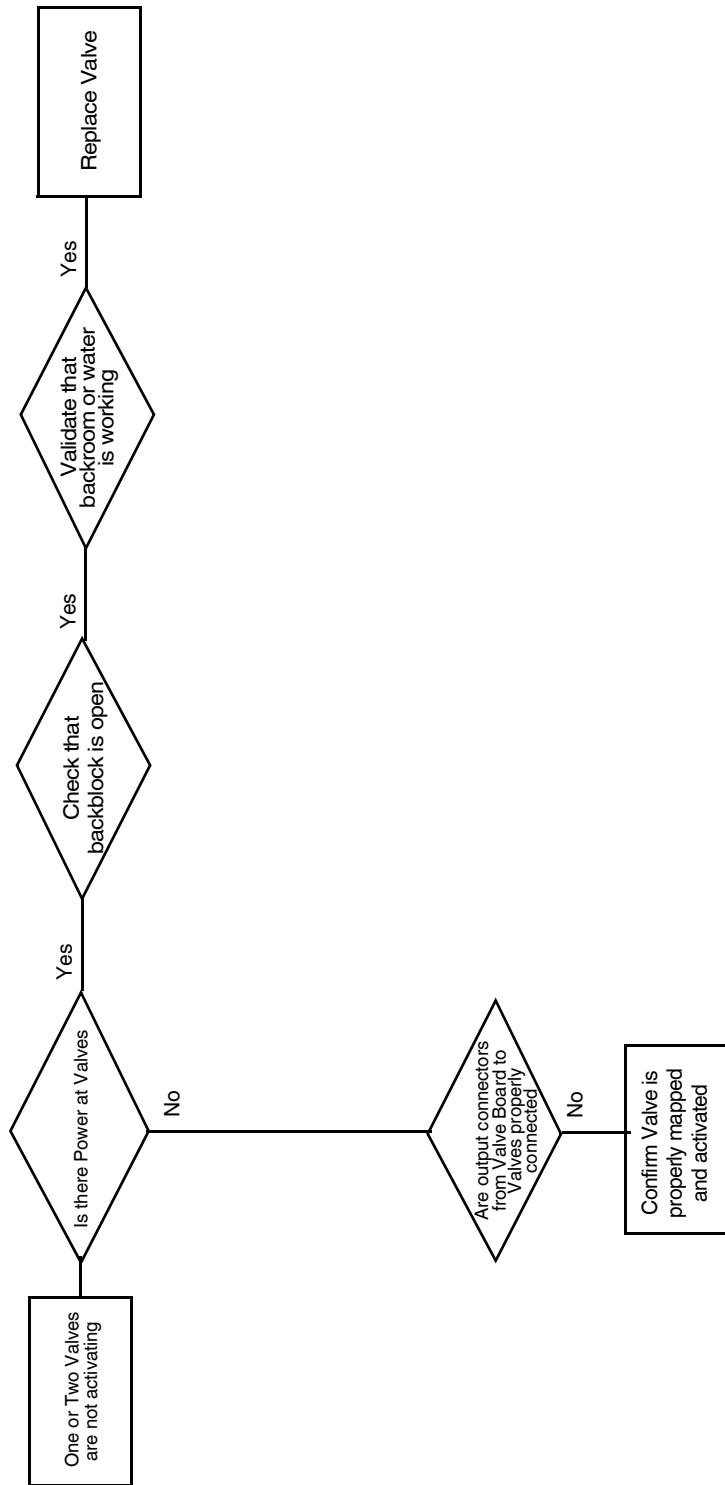
Some Valves are Activating



No Valve Activity

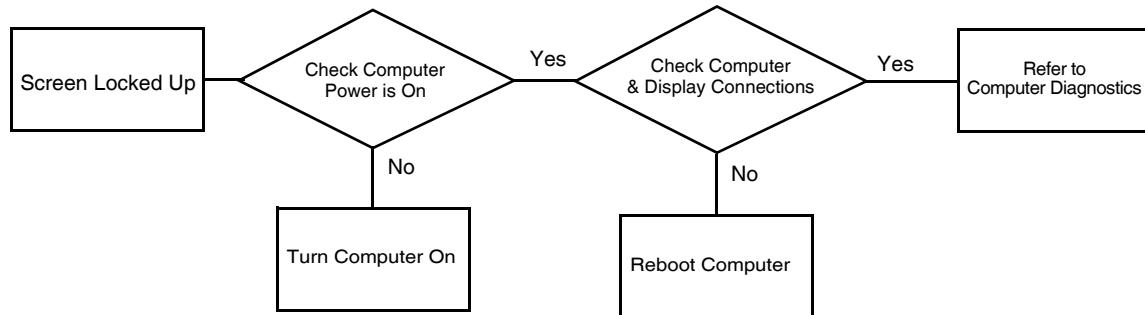


One or Two Valves are Activating

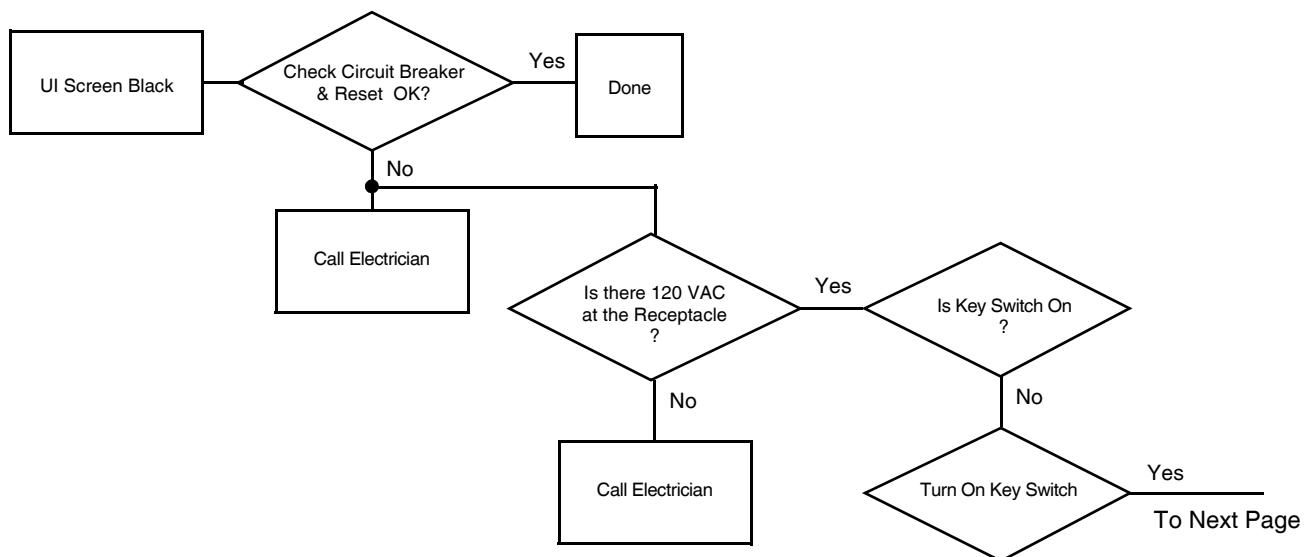


TROUBLESHOOTING THE DISPLAY

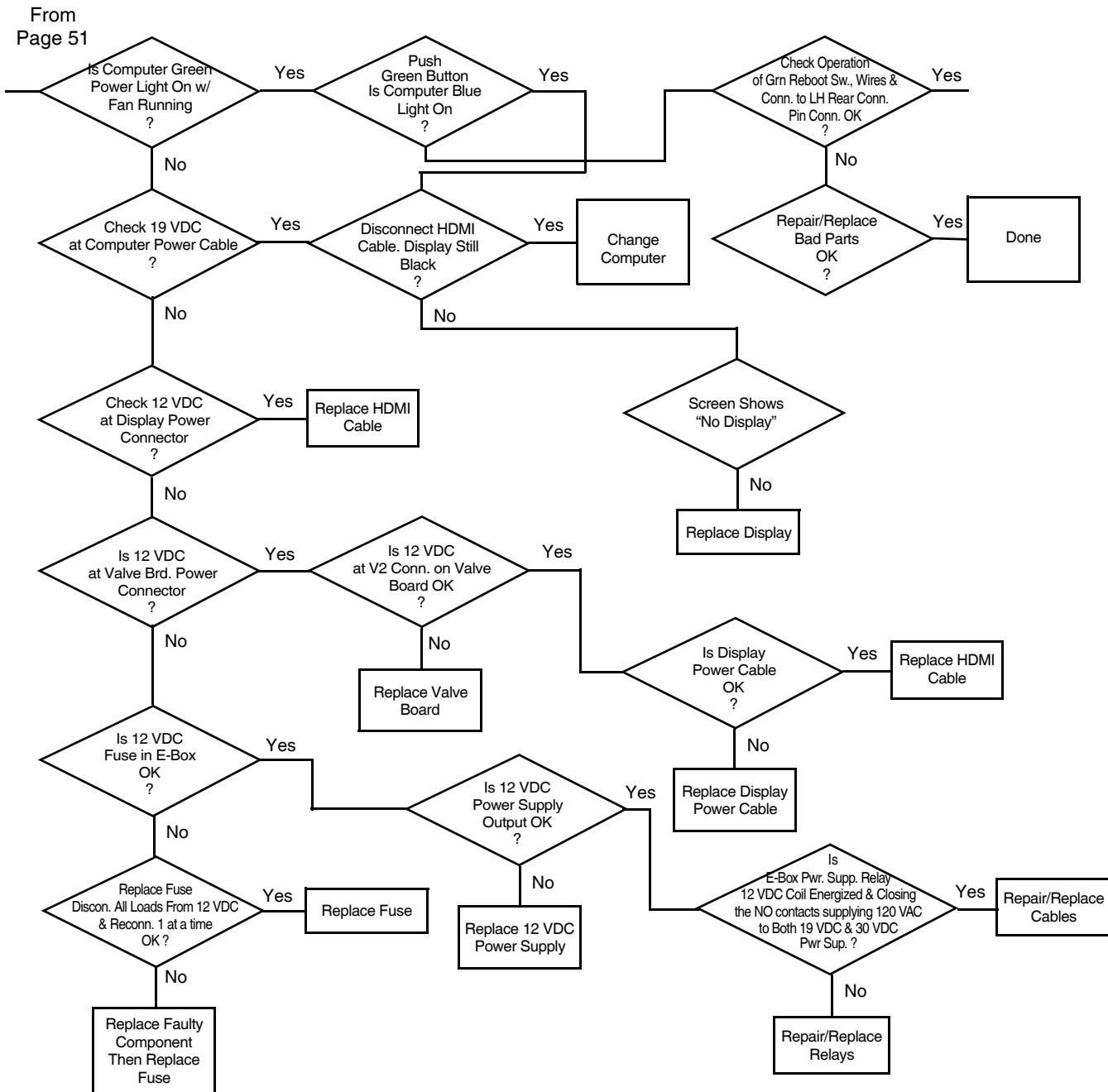
Screen Locked Up



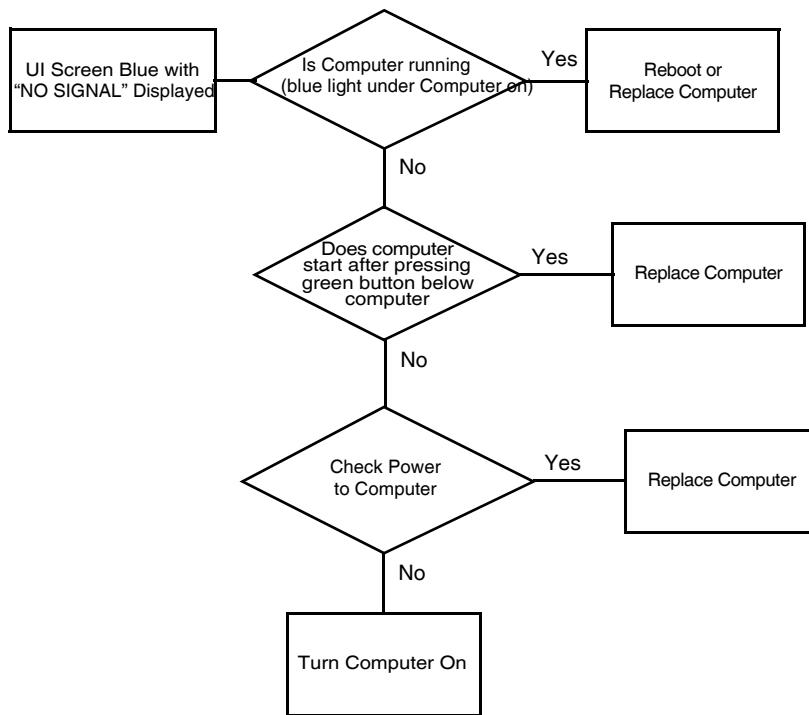
UI Screen Black



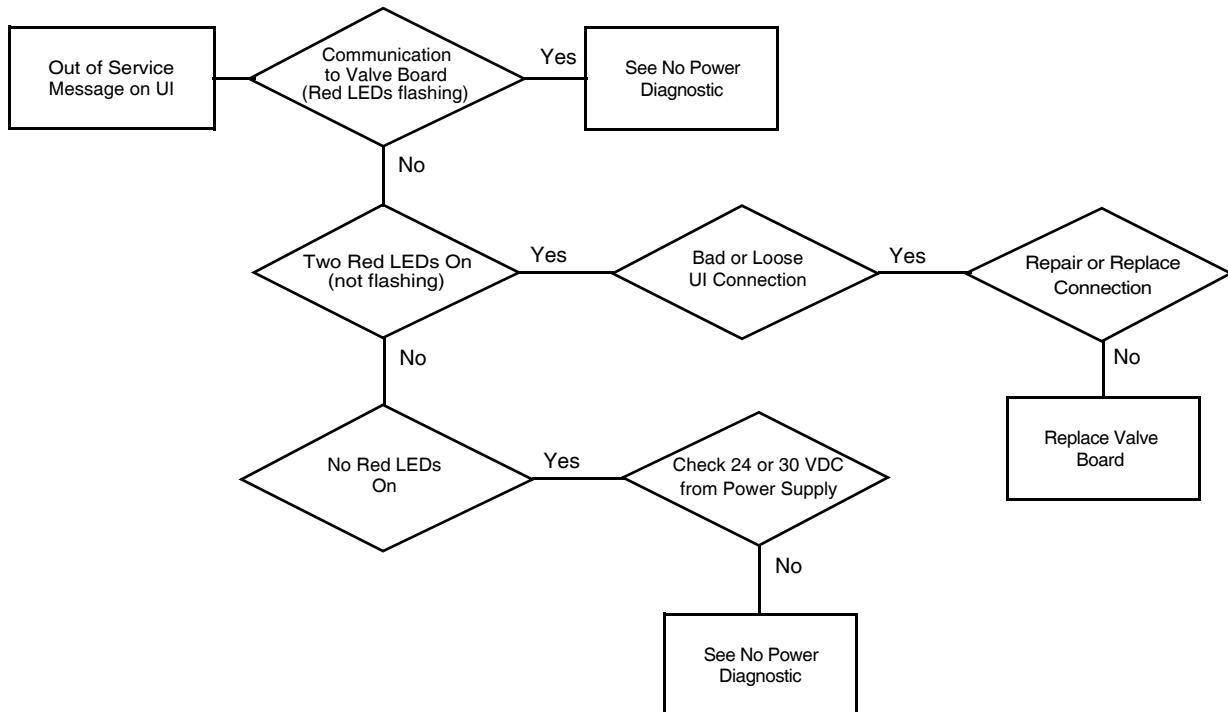
UI Screen Black (Continued)



UI Screen Blue with “NO SIGNAL” Displayed

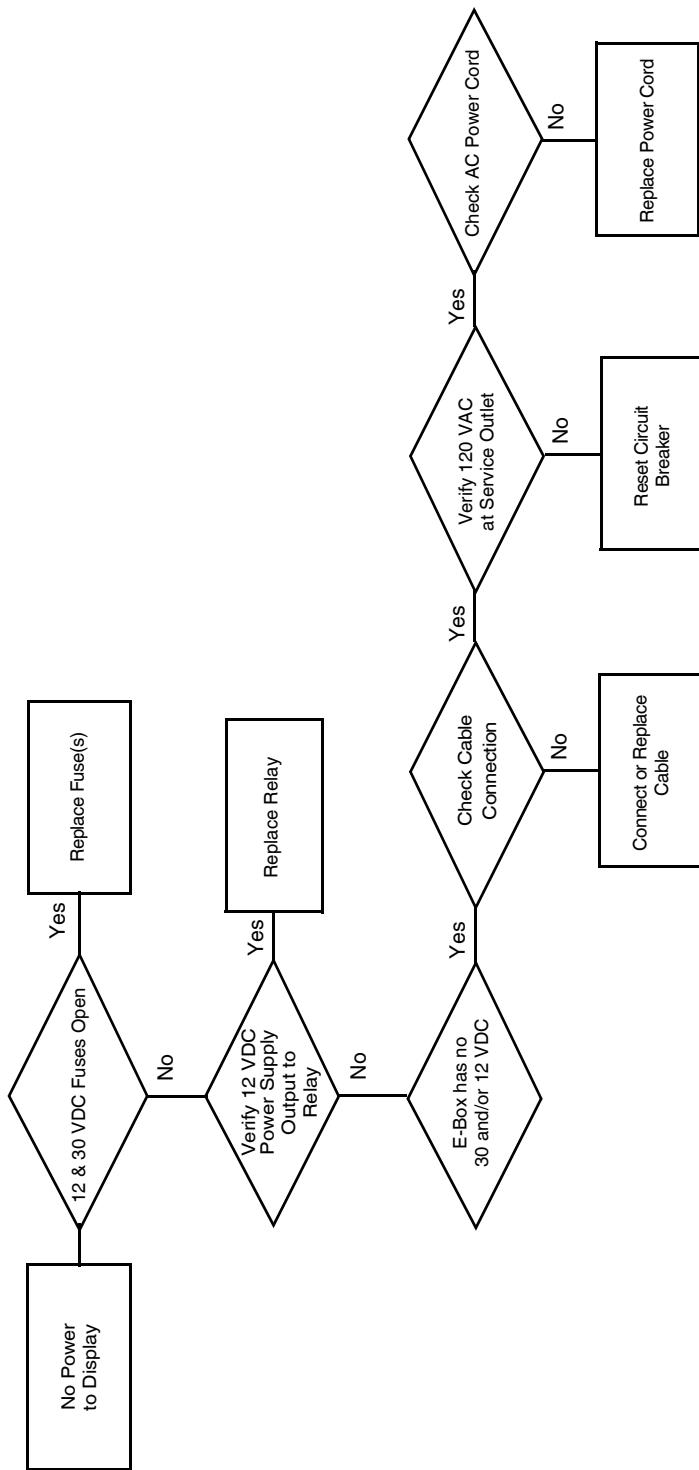


Out of Service Message on UI

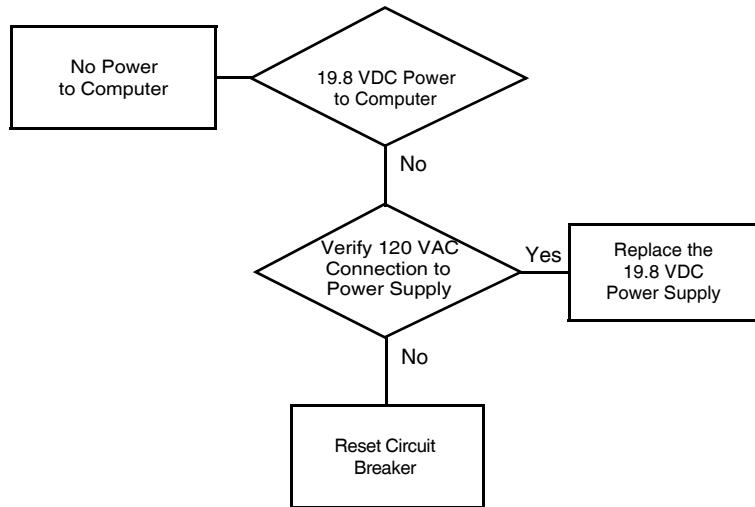


TROUBLESHOOTING POWER SUPPLY PROBLEMS

No Power to Display

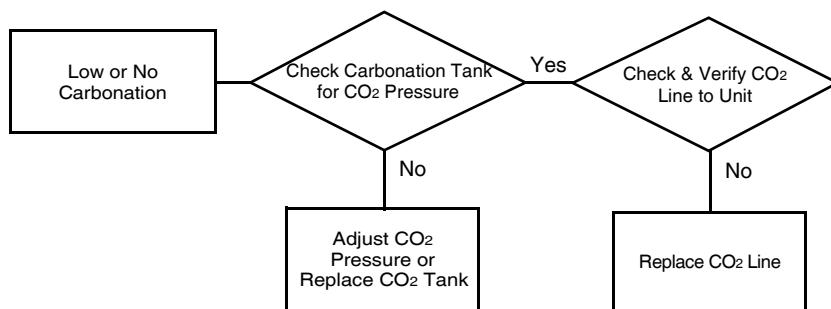


No Power to Computer

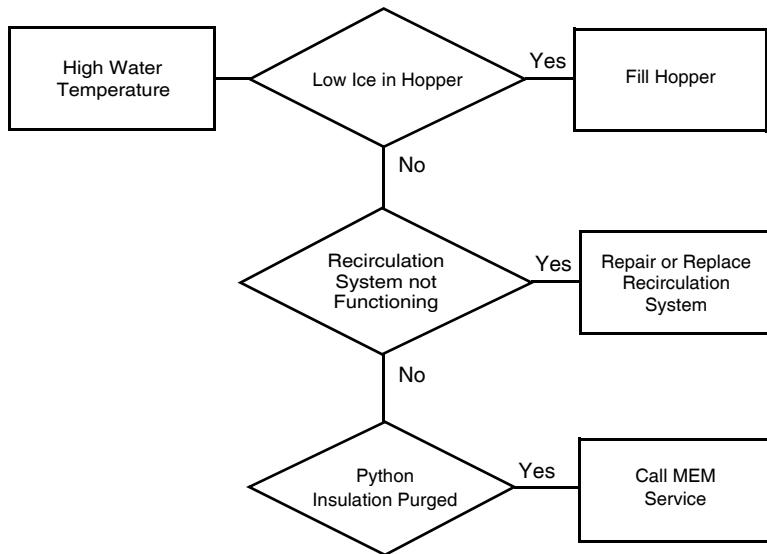


TROUBLESHOOTING DRINK QUALITY

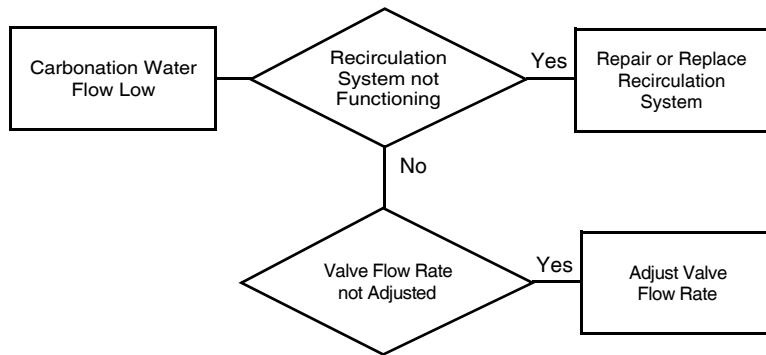
Low or No Carbonation



High Water Temperature

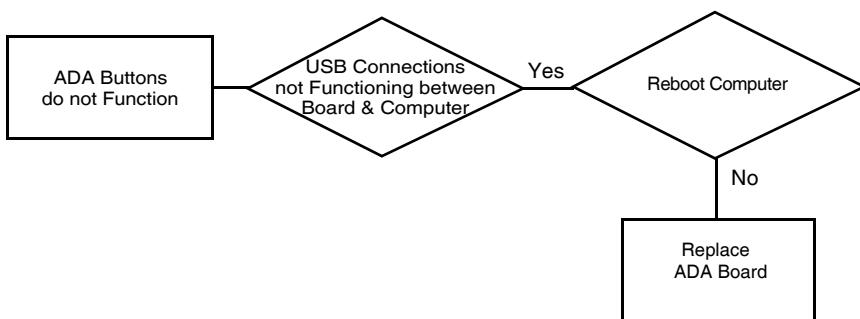


Carbonation Water Flow Low



TROUBLESHOOTING THE ADA CONSOLE

ADA Buttons do not Function



WIRING DIAGRAMS

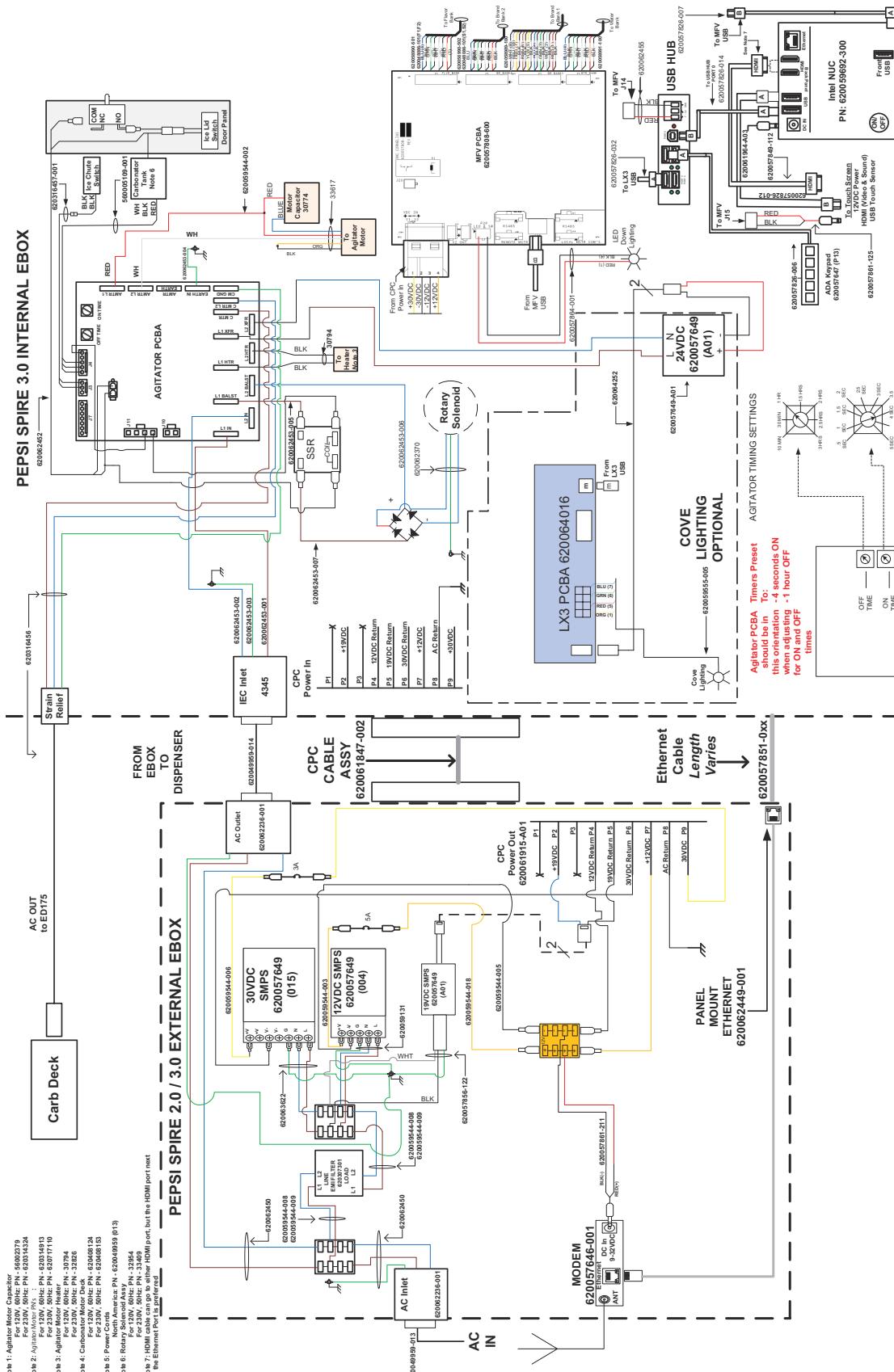


Figure 103. 12-4 Wiring Diagram

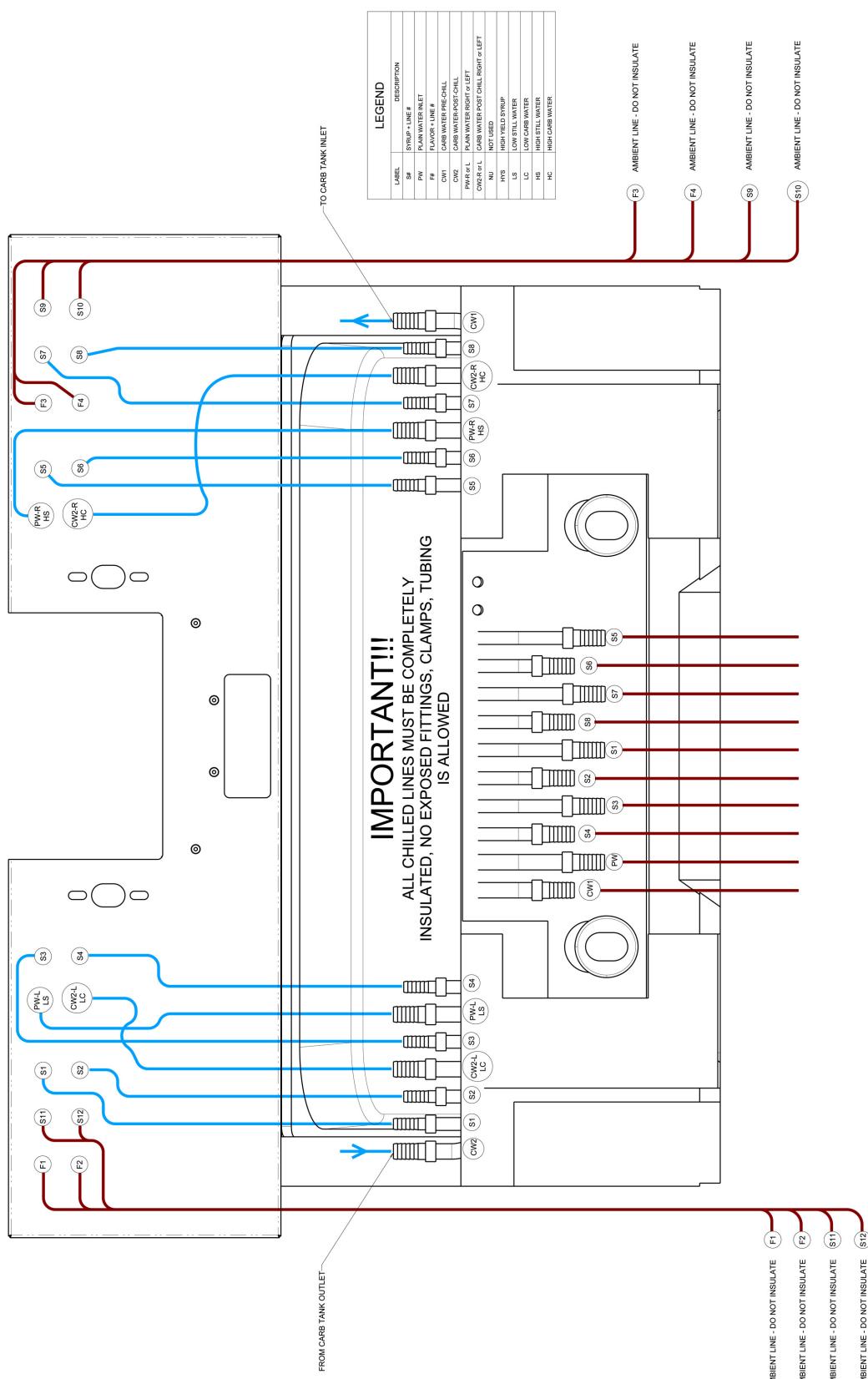


Figure 104.

VALVE BOARD DIAGRAM

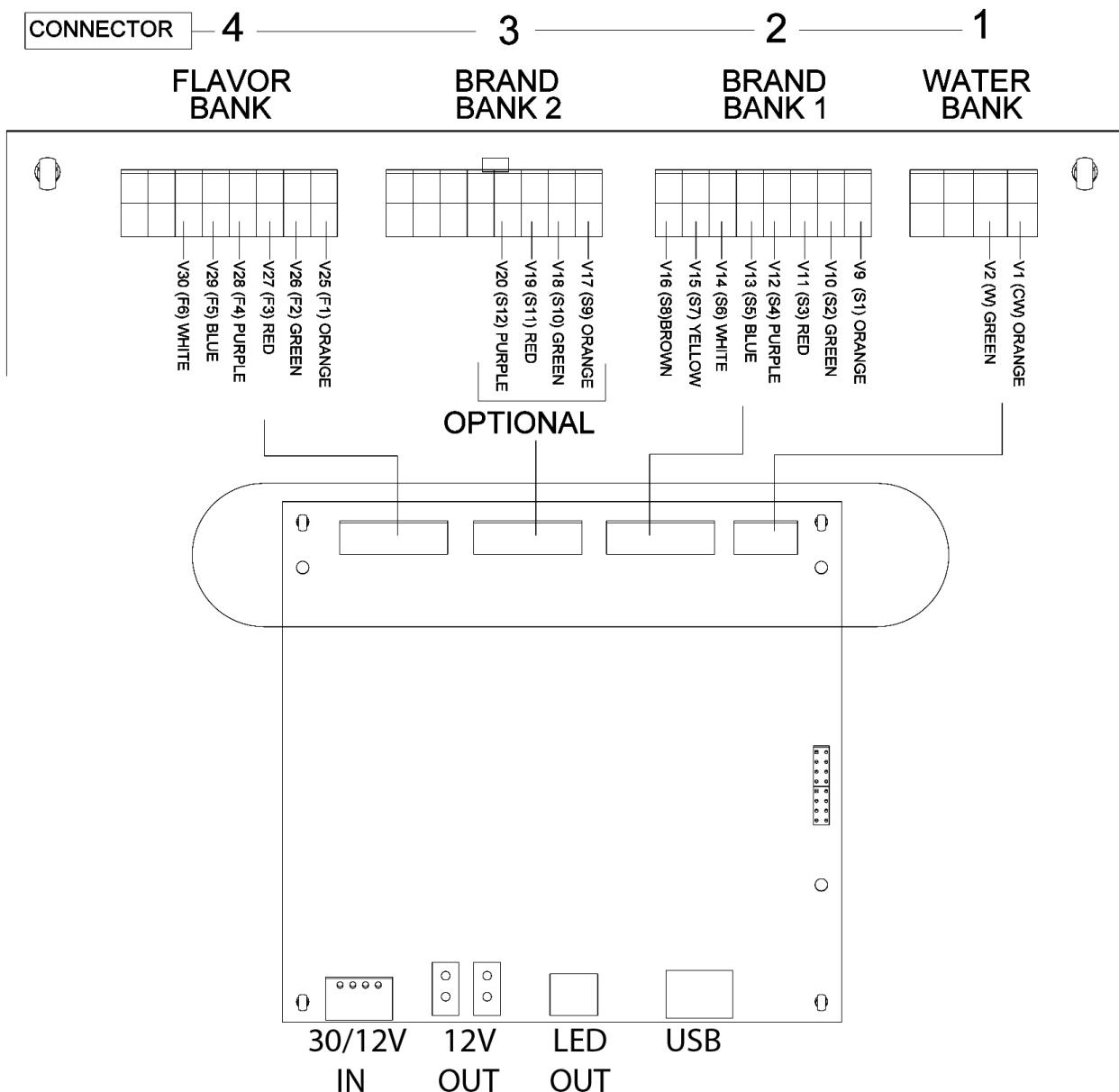


Figure 105.





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