Version

A3.1

COCA-COLA FREESTYLE

DRAFT Gandalf Technical Manual for Alpha 3.1

Document History

Date	Version	Author	Comments
July 7, 2014	First Draft Alpha 3	KaTrina Love	Based on Alpha 3 Dispenser
July 28, 2014	Second Draft Alpha 3.1	KaTrina Love	Based on Alpha 3 Dispenser

Table of Contents

Chapter 1

Introduction

The Gandalf Dispenser is a tabletop, fully self-contained, mechanically refrigerated beverage dispenser with internal carbonator control. This chapter provides information about the Gandalf Dispenser and the theory behind how we make the beverages.

This manual assumes that you are a service technician who maintains and services the Gandalf Dispenser at customer locations.

Theory of Operation

The Gandalf Dispenser is a beverage dispensing unit that utilizes the use of a Smart Carbonator to deliver chilled beverages (both carbonated and non-carbonated) without the need for external ice. The Smart Carbonator builds an ice bank within the dispenser that keeps the beverages delivered within cooling specifications. The machine contains six Core Ingredient pumps and four Flavor pumps.

The six Core Ingredient Pumps allow for the use of twelve 1 Liter cartridges and the four Flavor pumps allow for the use of four 150mL cartridges. A water line with a recommended 80 PSI pressure output is required to be attached to the dispenser to provide still water, which will get converted into carbonated water within the Smart Carbonator for the delivery of carbonated beverages.

For the Core Ingredient cartridges, the sweetener is included in the mix within the cartridge pouch. The system requires installation of an external CO2 bottle to pressurize the system.

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Navigation

A Human Machine Interface (HMI) located on the front of the dispenser is what you use to interact with and navigate the system.

GLOBAL NAVIGATION ICONS

Global Navigation Icons appear at the bottom of the screens.

DONE: Returns you to the Status screen

UTILITIES: Displays a sub-navigation menu with a selection of guided activities and utilities

POUR: Returns you to the Consumer Pour screen

SUBSYSTEMS: Displays a sub-navigation menu with a selection of troubleshooting pages

MANUALS: Takes you to the library of instruction materials. **Currently unavailable**

LOGS: Takes you to the Logs screen. **Currently unavailable**

SETTINGS: Takes you to the Settings screen.

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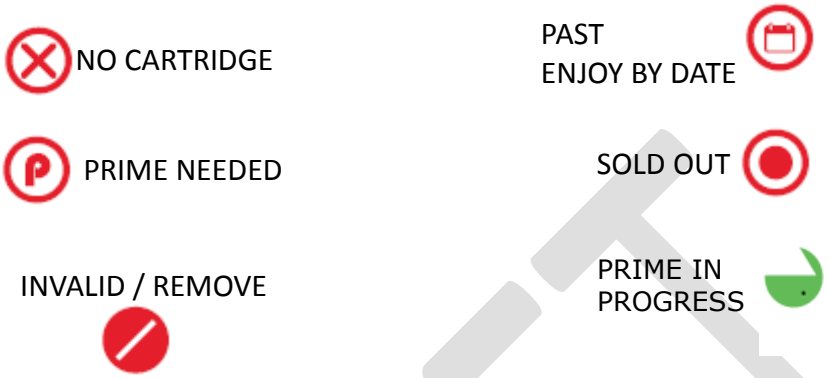
INGREDIENT STATUS ICONS

The ingredient status icons are located on the left side of the ingredients list. They provide the status of the cartridges in the syrup tower.



Consumer User Interface

The Consumer User Interface (CUI) contains screens that the consumer and customer can view and navigate. These screens enable the customer to change ingredients, flush lines, prime, and pour drinks.

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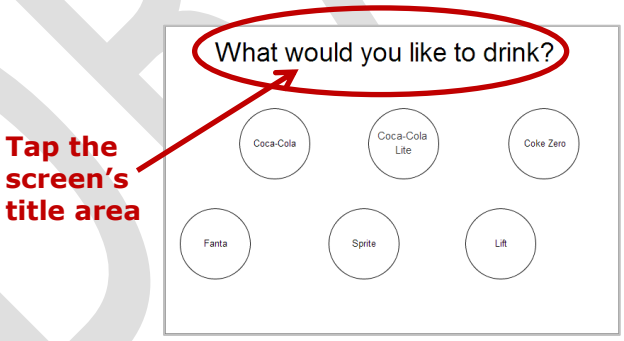
Non-Consumer User Interface

The Non-Consumer User Interface (NCUI) is just for the service technicians. From here you can access the screens necessary for you to troubleshoot and service the dispenser: Ingredients, Diagnostics, and Settings. Make sure that you always have a cup under the nozzle when the system starts and while doing any NCUI tasks.

ACCESSING THE NCUI

Use the following steps to access the NCUI screen.

Step	Action
1	Access the CUI Home screen (What Would You Like to Drink?). 
2	Tap on the right ¾ of the screen. 
3	Tap on the left ¼ of the screen.
4	Tap on the ½ of the screen.
	RESULT: The NCUI screen is displayed.

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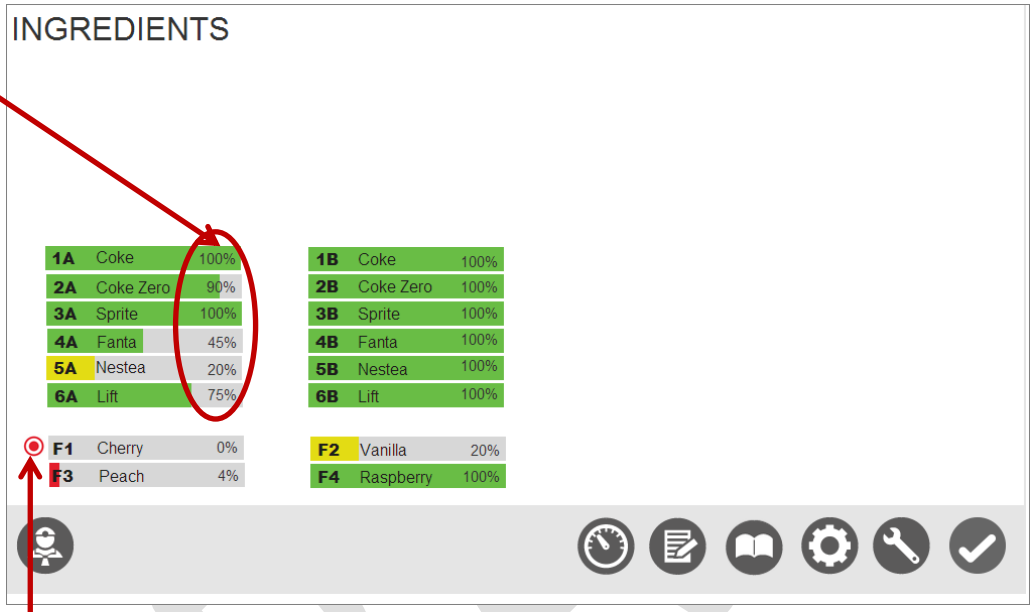
Ingredients Screen

INGREDIENTS SCREEN

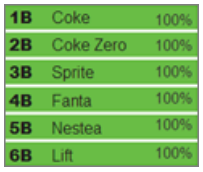
The Ingredients screen shows the health and status of the Brand and Flavor cartridges: Volume percentage, slot label, ingredient, and any statuses (sold out, prime needed, no status).

Fuel gauge shows the volume of ingredient left in cartridge. It is shown here in percentage and by color codes.



Ingredient icons display here too:

- sold out
- no cartridge
- prime needed



Green means that 21% and above remains in the cartridge.

Yellow means that 20 % to 6% remains in the cartridge.

Red means that 5% to 1% remains in the cartridge.

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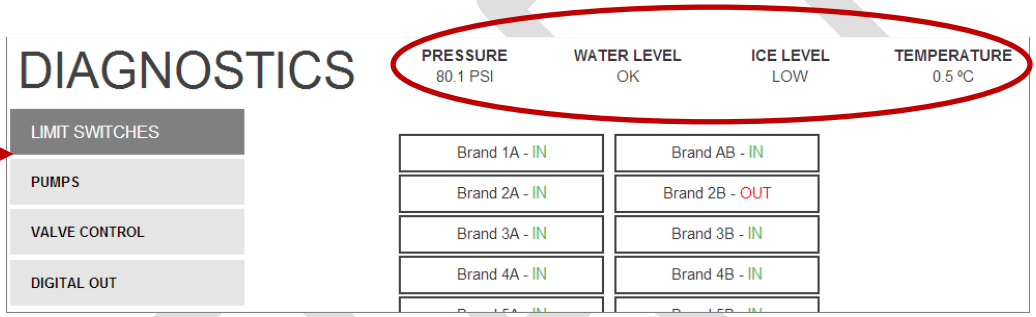
Diagnostics Screens

The Diagnostics screen has side navigation that provides access to information about Limit Switches, Pumps, Valve Control, and Digital Out. The pressure level, water level, and temperature display across the top of each Diagnostics screen.

- The PRESSURE and TEMPERATURE information refresh every second.
- The WATER LEVEL is either OK or LOW.
- The ICE LEVEL is either HIGH or LOW.



Side Navigation

ACCESSING THE DIAGNOSTICS SCREEN

Use the following steps to get to the Diagnostics screen.

Step	Action	
1	**If you are at the . . .**	**Then . . .**
	Main screen	Press drink would like.
	Crew Serve screen	Press the wrench icon.
2	Click the icon.	
3	Select DIAGNOSTICS from the submenu.	

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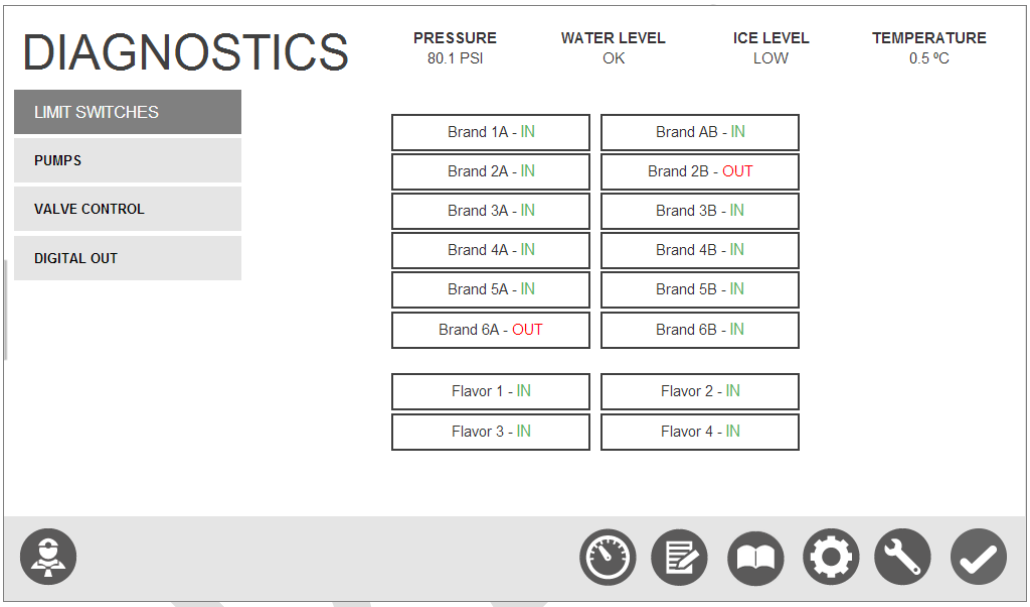
LIMIT SWITCHES DIAGNOSTICS SCREEN

The Limit Switches screen gives you the cartridge status using a magnet strip. The Magnet gives Gandalf the ability to know when a cartridge is removed and inserted. The statuses are:

- IN means that there is a cartridge in the slot.
- OUT means that there is not a cartridge in the slot.



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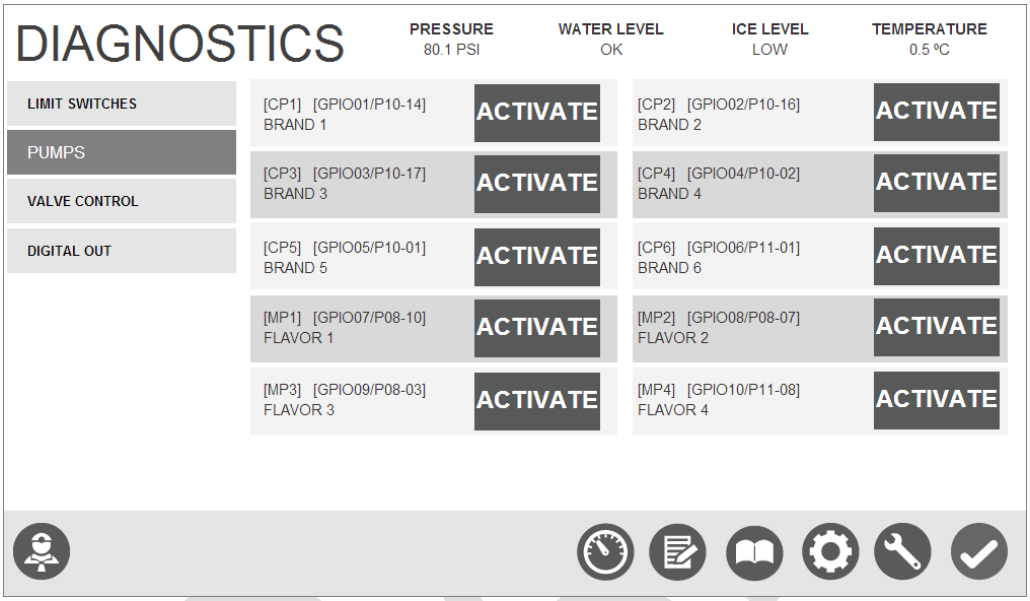
PUMPS DIAGNOSTICS SCREEN

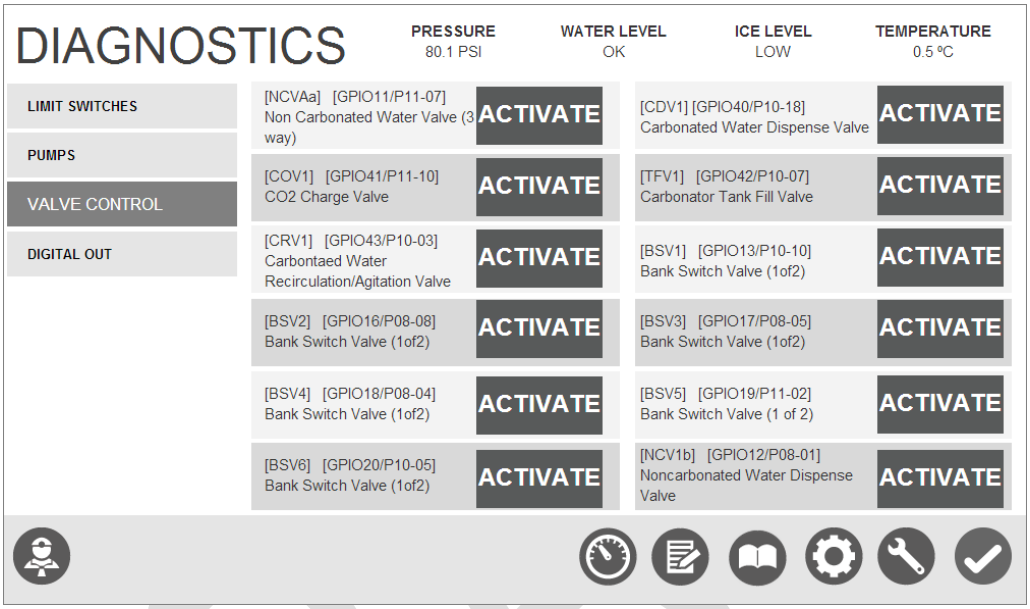
The Pumps screen shows the brand and flavor pumps. Use this screen to troubleshoot the pumps, pressing ACTIVATE to verify power to the pump and if liquid flows. Pressing ACTIVATE turns on that pump for one second. If you activate, you must reinitialize the system.



VALVE CONTROL DIAGNOSTICS SCREEN

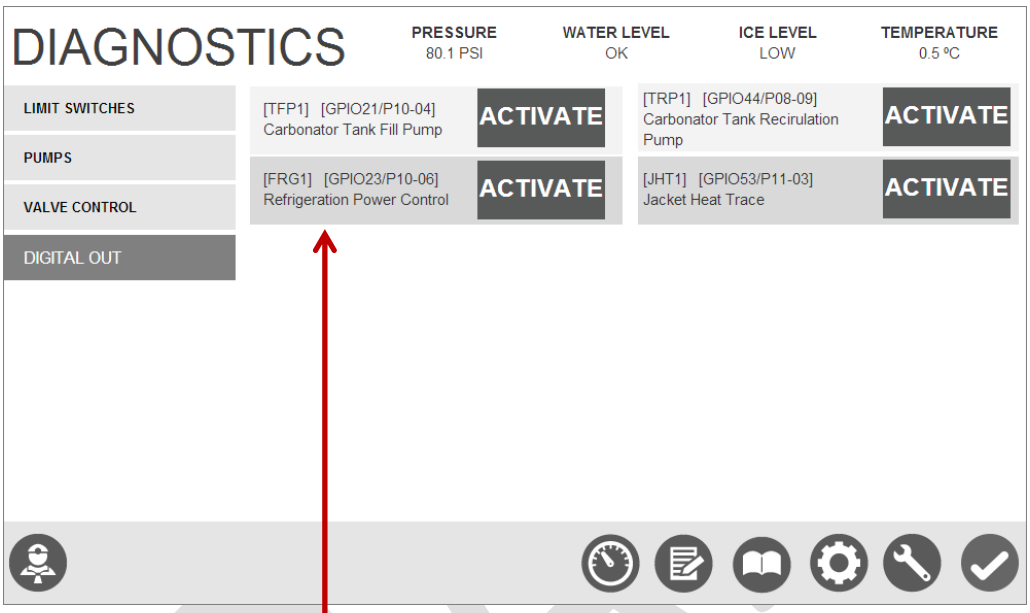
The Valve Control screen provides descriptions about each valve in the dispenser.

Pressing ACTIVATE turns on that valve for one second. If you activate, you must reinitialize the system.



DIGITAL OUT DIAGNOSTICS SCREEN

The Digital Out screen shows the digital outputs of the AC items in the system. From here you can turn items on and off in the smart carbonator and refrigeration systems.



TFP1, TRP1, & FRG1 all make sounds when you activate them. JHT1 makes no sound

CAUTION: **After activating FRG1, you must wait 2 minutes before activating again. You will destroy the fuse if you consistently turn the compressor on and off!**

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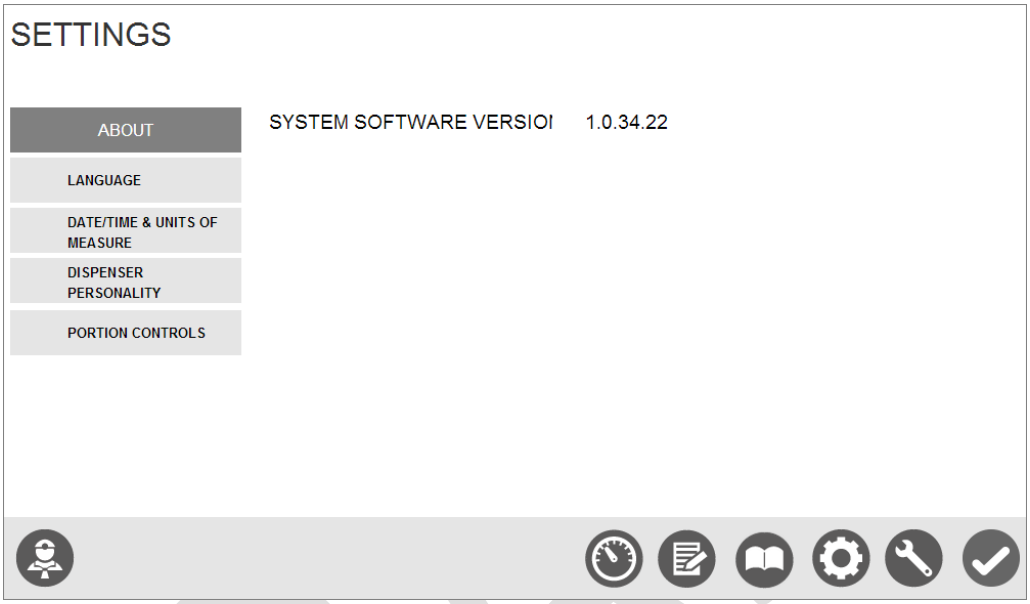
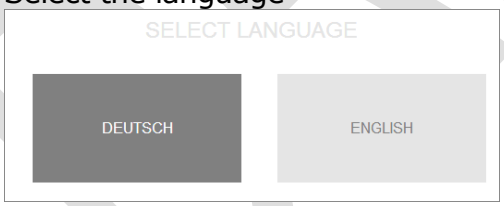
Settings Screen

On the Settings screen you can set the basic personality of the dispenser.

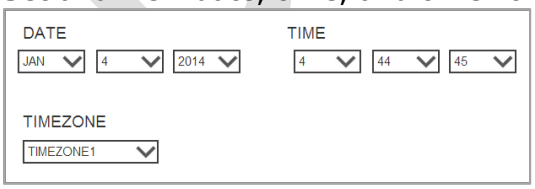


Using the side navigation on the Settings screens you can:

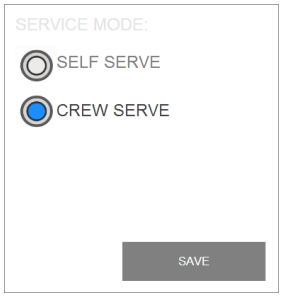
- Find out the version of software on the system
- Select the language



- Set and view date, time, and time zone information



- Select if you want the dispenser to operate in Crew Serve or Self Serve



- Set the amount of beverage that pours for small, medium, and large drinks

Setting up the Dispenser

SETTING UP THE GANDALF DISPENSER

The dispenser is installed one time at the customer location. This process includes loading the appropriate software and getting the dispenser ready for the customer to use.

Prerequisites

This section gives the specifications necessary to house and operate the dispenser.

MATERIALS

In performing many of the tasks in this manual, you will need the following materials:

- A cup under the nozzle when the system starts and while doing any NCUI tasks
- Cross Screw Driver
- Allen Wrench
- T10 Torqx

EXTERNAL CONNECTIONS

The following external connections are required:

- Water connection
- Power connection
- Tabletop mount
- Mechanical refrigeration system
- Carbonation temperature control

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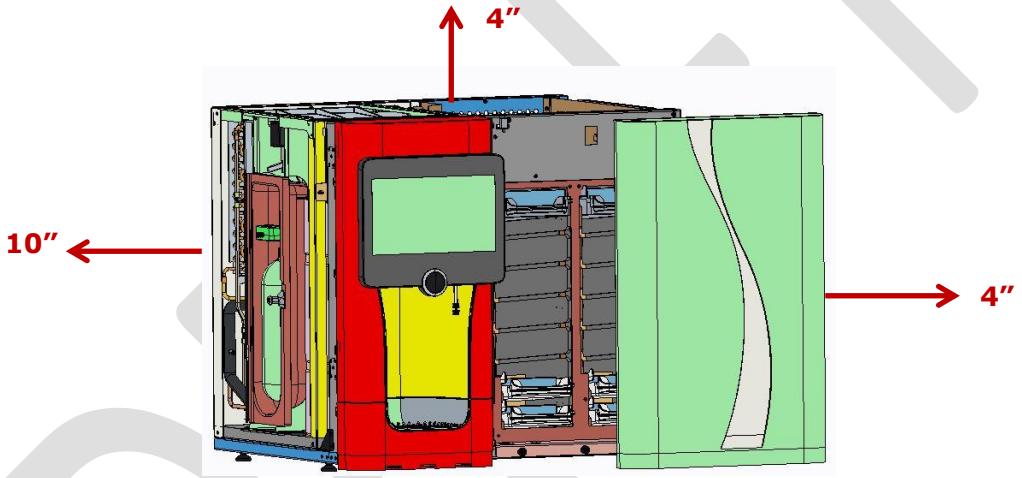
DIMENSIONS

The tabletop space for the dispenser must accommodate the following dimensions:

- 590 mm (23.23) tall
- 550 mm (21.65) wide
- 580 mm (22.83) deep

You need at least 46 inches vertically to be able to remove the Shroud (cladding) up and off the dispenser.

You need 4 inches of space between dispenser and anything else at the rear and on the right side. You need 10” of space on the left side where in order to change the CO2 bottle.



DISTANCE

So that the unit does not interfere with power cord strain relief or plumbing connections, make sure there is a minimum distance of 105 mm from surfaces behind the dispenser and 105 mm of vertical surface.

ACCESSIBILITY

The CO2 tank must be accessible from the left side of the dispenser. It is replaceable.

You need at least 46 inches vertically to be able to remove the Shroud (cladding) up and off the dispenser.

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Initial Set Up

This section provides instructions for the first time a dispenser is set up. Several processes occur to set up the dispenser:

- Commissioning
- Initialization
- Assigning ingredients
- Calibration

Overview

First time installation is automated. The system performs its own installation using the software. Navigate through the set up screens and ensure that no alerts or errors occur. The system provides a progress bar at the top of each Dispenser Setup screen.

COMMISSION

Commissioning occurs one time on a new dispenser system. During commissioning:

- **The outer jacket of the dispenser fills with water**. Gandalf is self-cooling. The water in the outer jacket keeps the plain and CO2 water cool.

- **A CO2 purge occurs on the line**, where, the system sends CO2 through the line to purge it. You know this is happening because the system pours what's in the line out. Make sure a cup is there to catch liquid. There is no feedback from the screen; however, you will hear a hissing sound and see some discharge.

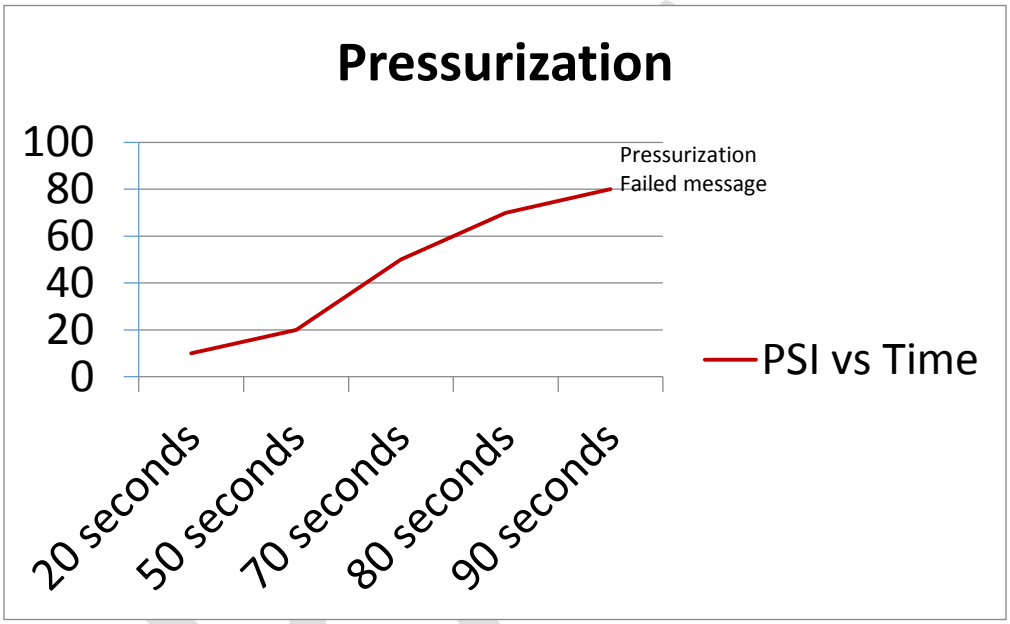
After commissioning, the system automatically begins the initialization process.

INITIALIZATION

Initialization establishes the dispenser's appropriate parameters. During initialization, the following actions occur in the dispenser:

- **System cools** to 33 degrees Fahrenheit to begin building an ice barrier around the tank, which keeps the beverages cool.

- **Pressurization** to 80 PSI. The system has 90 seconds to reach 80 PSI. If the system does not reach 80 PSI within 90 seconds, a Pressurization Failed message displays.



- **Inner water tank fills**. It has two minutes to fill; otherwise, a Water Fill Fails message displays.

- **Water recirculation**. This does not occur if the tank does not fill. If the system does not reach 32 degrees within two hours, water recirculation stops.

This installation process usually takes 60 minutes, but it has a total of two hours to cool.

Initialization occurs each time the system is turned off and on and when the dispenser goes into error mode.

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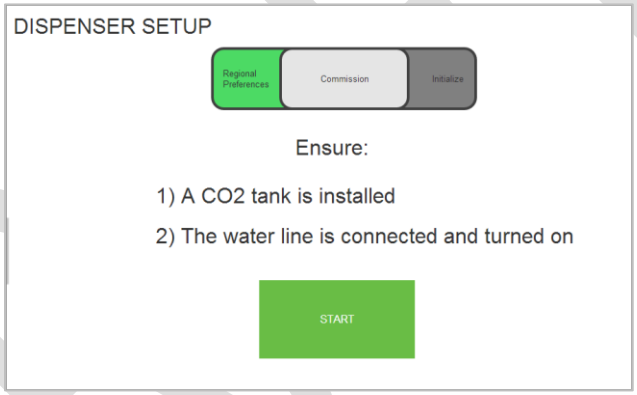
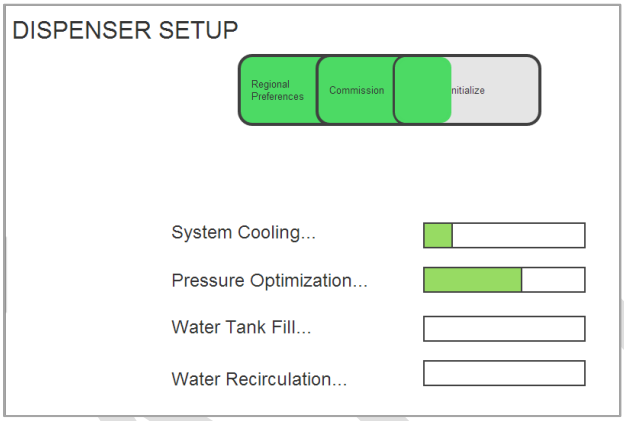
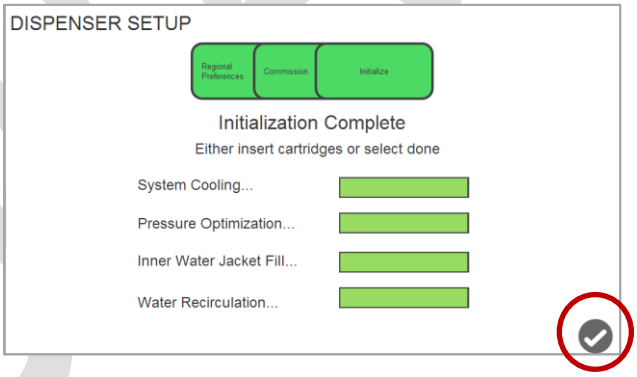
SETTING UP THE DISPENSER

Use the following steps to set up the dispenser.

Step	Action
1	Plug the dispenser into the power outlet.
2	Connect the waterline to the dispenser, and turn on the water supply.
3	Unlock the CO2 door, and put the CO2 canister in place.
3	Open the right door, and power on the dispenser.
4	At the Dispenser Setup screen, select Deutsch, and click the forward arrow ⏩. **RESULT**: Commissioning begins as indicated in the progress bar at the top of the screen.
5	Put a cup underneath the nozzle.
6	Click Start. 

Step	Action
	RESULT: CO2 purging begins and the outer jacket fills with water. Initialization occurs next (the system cools, pressure is optimized, the water tank fills, and water recirculates). 
7	Ensure that initialization starts.
8	When the Initialization complete screen appears, click the check mark. 
9	Assign ingredients.

Before You Assign Ingredients

After the dispenser commissions and initializes, you must tell it what brand and flavor cartridge you insert into each slot. This section provides the information you must know BEFORE you assign ingredients.

INITIAL PRIME

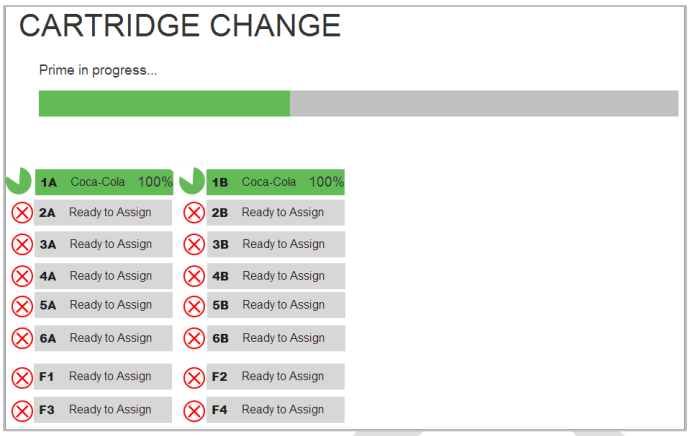
Priming is the process of purging air out of the line. After this initial prime, the customer does not have to prime again unless they change the Brand of the ingredient in the slots. If they change the same ingredients (Coke for Coke), priming is not necessary. But if they want to put Coke Zero in the Coke slot, priming is required.

You can only prime when the slot is in Ready to Assign or Assigned states. You can only prime after the line is flushed.

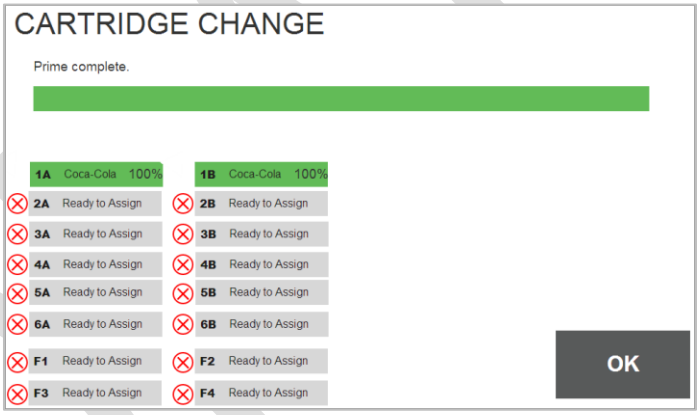
The system primes sequentially, from top to bottom and does not allow you to insert different Brands into the corresponding slots A and B. There are two ways to prime:

- Batch prime: This is the preferred and quicker was for your initial prime. You assign all of the ingredients, and then click prime.
- Individual slot prime: You can prime each slot individually, assigning ingredients to the slot and then clicking prime. Go to the next slot, assign and then prime.

Priming times out after two seconds. As the system primes, a status bar displays at the top of the screen and the Prime in Progress  icon displays next to the slots that are currently priming.



When priming is finished, the status bar at the top of the page says Prime complete, the Prime in Progress icon is removed, the slot label is totally green, the fuel gauge shows 100%, and the Brand name appears on the label.



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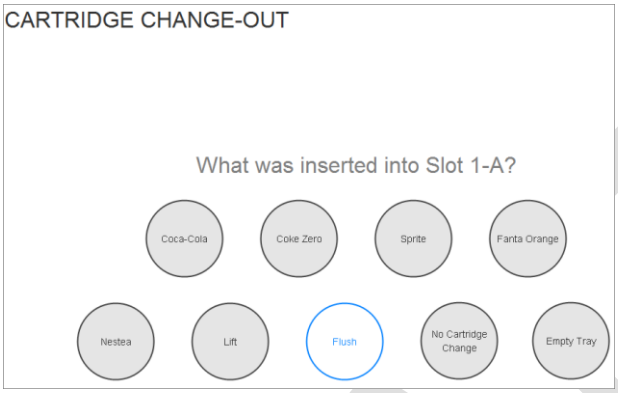
Assigning Ingredients for the First Time

The Gandalf Dispenser can detect when and where you remove a cartridge from its slot, but you must tell the dispenser what Brand or Flavor you put in the slot.



This process of telling the dispenser what type of Brand and Flavor you insert into each slot is called assigning ingredients.

INGREDIENT STATUSES

The following table contains statuses that slots on the dispenser can have. These statuses display on the slot of the ingredient map, letting you know which slots are available for assigning and which are not.

Status/Identity	Description
Ready to Assign	The slot was flushed and is ready to be assigned. This state occurs after user flushes the line and removes the cartridge tray from the dispenser slot.
Flushing Cartridge	The system confirms that a flushing cartridge was inserted into a slot.
Assigned Ingredient	Confirms that the slot was primed and a brand or flavor was assigned to the slot.

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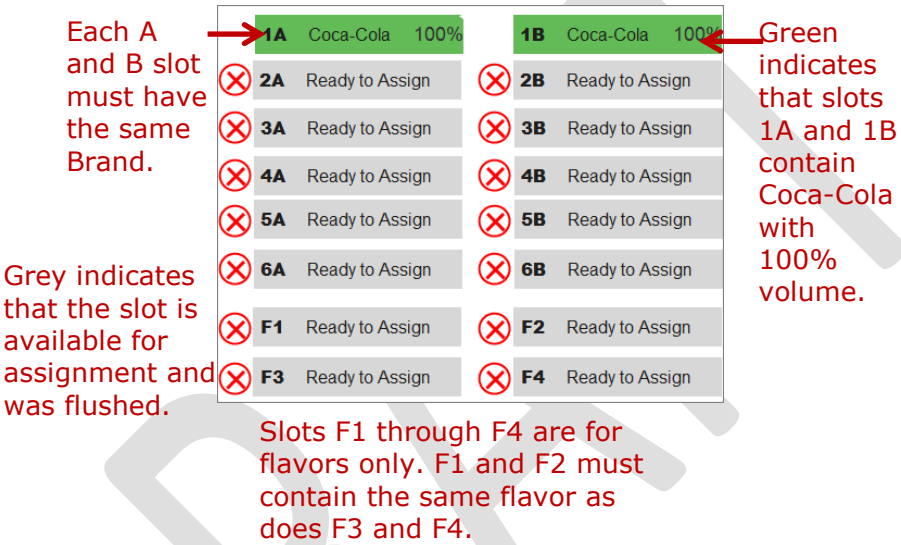
ASSIGNMENT RULES

There are 16 slots within the dispenser. 1A through 6B are dedicated to the Brands (Coke, Sprite etc.) only. F1 through F4 are reserved for Flavors (cherry) only. You cannot insert Brands into the Flavor slots and vice versa. Gandalf can carry up to six different Brands and four different flavors.

The A and B Brand slots share the same pumps; therefore, they must contain the same ingredient. They must be assigned the same ingredient, primed at the same time, and flushed at the same time.

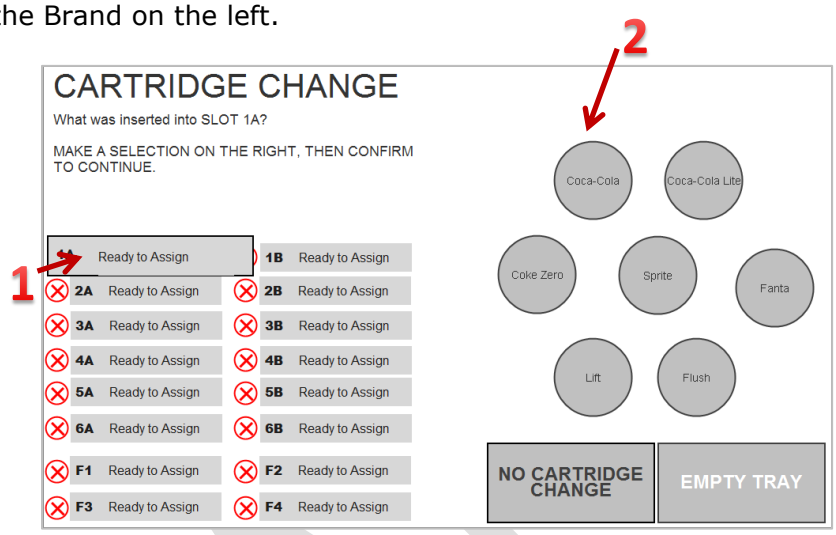
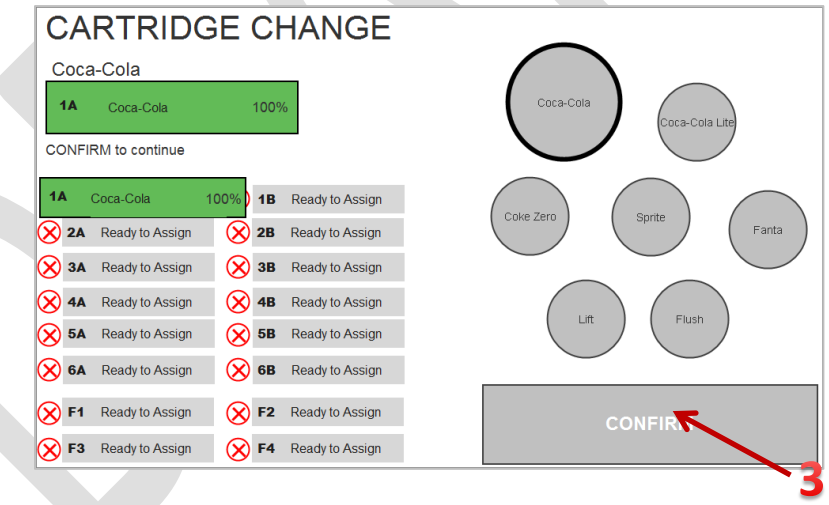


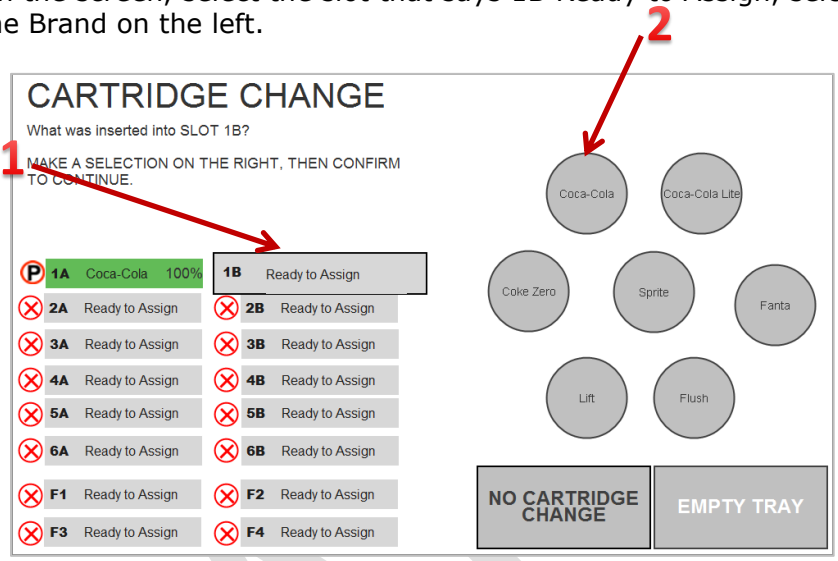
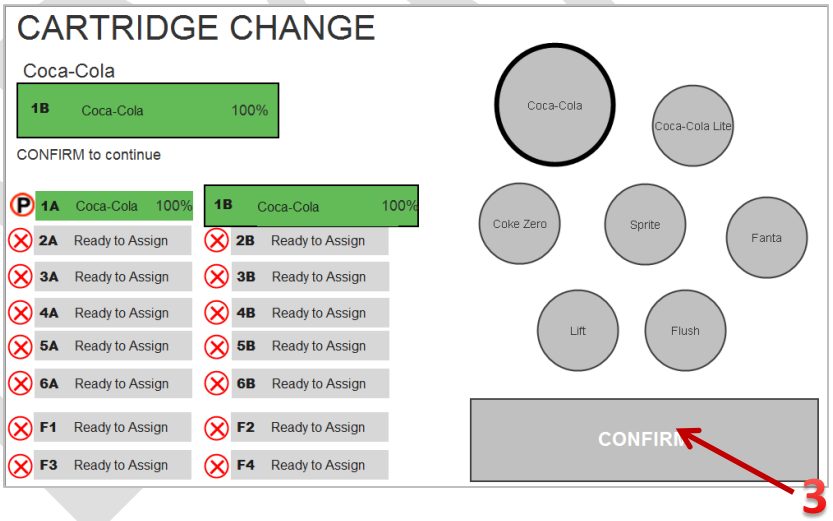
This image shows how the cartridges must correspond on the dispenser. The left side of the syrup tower is side A. The right side is side B. Coke Zero is in slot 1A and 1B, and so on.

ASSIGNING INGREDIENTS FOR THE FIRST TIME

Before you attempt these steps, review the Assignment Rules section. Use the following instructions to assign ingredients to slots for the first time after commission and initialization are complete.
CAUTION: Be careful removing and inserting the cartridge trays.

Step	Action
1	Facing the front of the dispenser, pull the 1A cartridge tray out, and put the Brand cartridge into the tray.
2	Push the cartridge into the slot. RESULT: The Cartridge Change screen displays.

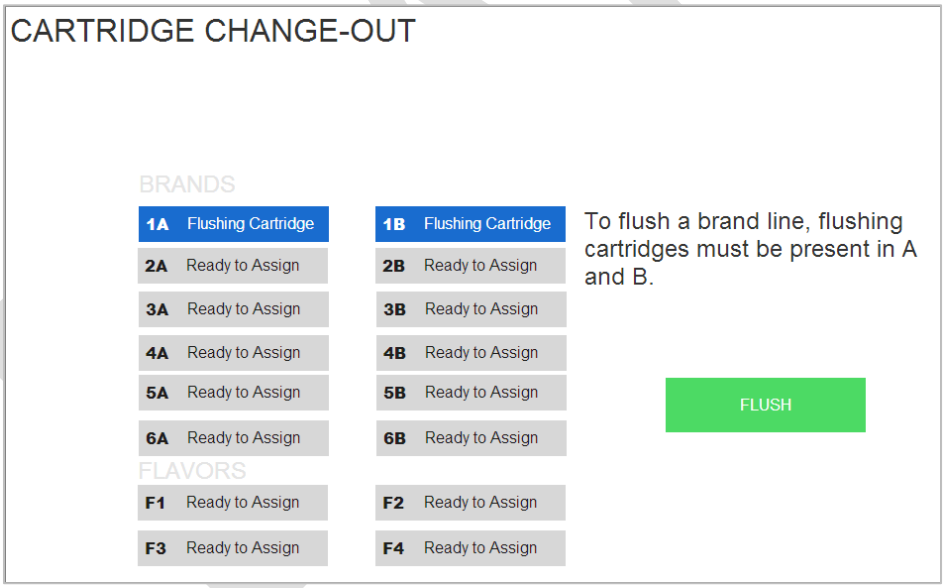
Step	Action
3	On the screen, select the slot that says 1A Ready to Assign, select the Brand on the left. 
3	Click Confirm.  RESULT: A screen displays prompting you to PRIME. **Do not click Prime**. We will do a batch prime after we assign all slots. Proceed to the next step.
4	Facing the front of the dispenser, pull the 1B cartridge tray out, and put the same Brand into the tray as 1A.
5	Push the cartridge into the slot. RESULT: The Cartridge Change screen displays.

Step	Action
6	On the screen, select the slot that says 1B Ready to Assign, select the Brand on the left. 
7	Click Confirm.  RESULT: A screen displays prompting you to PRIME. **Do not click Prime**. We will do a batch prime after we assign all slots. Proceed to step 8.
8	Repeat steps 1, 2, and 3 to assign all Brand (1A-6B) slots. NOTE: You must have the same ingredient in slot A and B.
9	Continue to assign ingredients to the Flavor (F1-F4) slots.

Step	Action
10	Ensure that all of the slots on the screen are green and assigned a brand. There will also be a Prime Needed icon next to each slot.
11	On the dispenser, put a cup underneath the nozzle.
12	On the screen, click Prime. NOTE: Prime in progress displays at the top of the screen during priming.
13	Click OK when the Prime complete message displays.
14	Calibrate the pumps using the instructions in the next section.

Flushing

Flushing is the process of cleaning the line. It is necessary to flush a line when you want to change the type of Brand or Flavor in a given slot. To flush, you insert Flushing Cartridges into the slots instead of identical Brand cartridges.



The system prompts you to flush when you attempt to change Brands or Flavors without flushing. It also prompts you to flush both lines.

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FLUSH NEEDED
To change brands: Remove ingredient cartridge from slot 1-A and insert flushing cartridge

Example Scenario: The Sprite brand is in slots 3A and 3B. You want to change slots 3A and 3B from Sprite to Coke. Because the Brands are different, you must flush the line to clean the Sprite out so that the Coke dispenses authentically.

After the line is flushed, the slot goes into Ready to Assign status, where you can assign an ingredient to the slot. You must flush both slot A and B simultaneously.

CALIBRATION

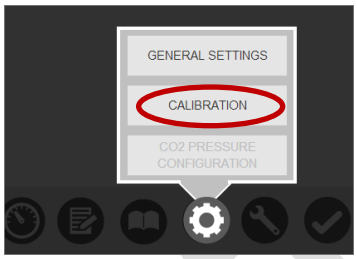
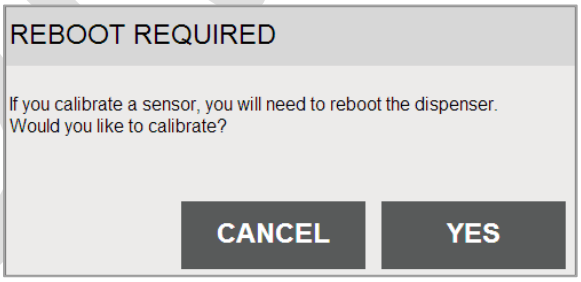
Calibration is the process of the dispenser determining the correct pressure, temperature, and amount of liquid to pour. You must calibrate at operating temperature; therefore, always calibrate the sensors (pressure then temperature) BEFORE you calibrate the pumps.

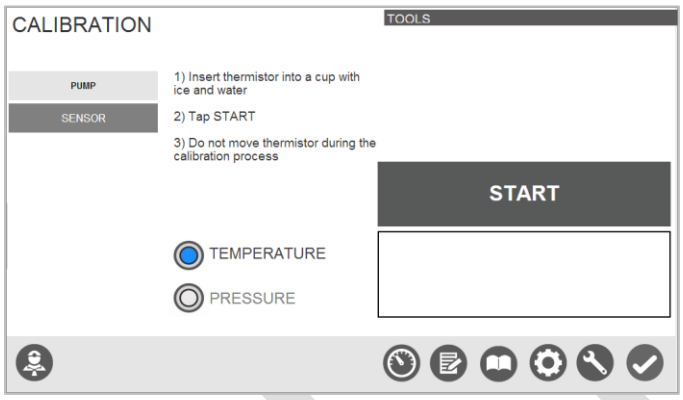
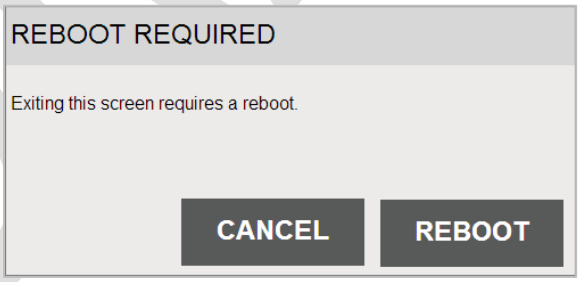
Calibrating the Sensors

CALIBRATING TEMPERATURE

Use the following steps to calibrate temperature.
Tools: None
Materials: Cup of ice water, Thermometer

Step	Action
1	Access the NCUI.
2	Select the Settings icon.

Step	Action
3	Select Calibration. 
4	Select Sensor from the Calibration UI screen. 
	RESULT: A REBOOT REQUIRED message is displayed. 
5	Select Yes to continue with calibration. RESULT: The Sensor Calibration screen is displayed.

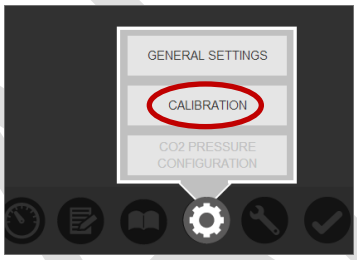
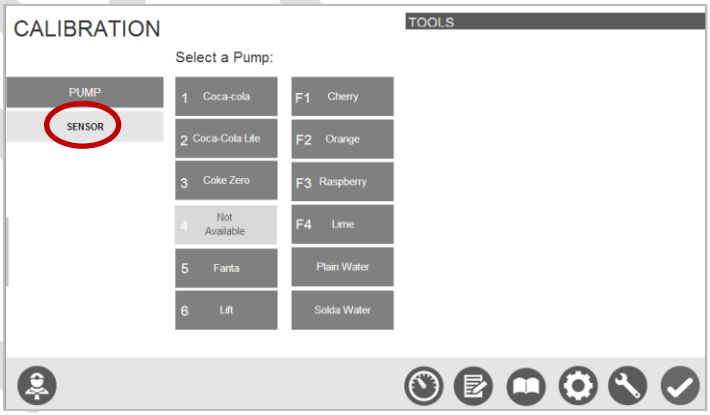
Step	Action
5	Select Temperature. 
6	Get a cup of ice water, and insert a thermometer into the cup to ensure that the ice water is 33 degrees Fahrenheit.
7	Remove the thermistor from the thermal well.
8	Put the thermistor into the cup of ice water for 20 seconds before going to the next step.
9	Select Start after 20 seconds. RESULT: Calibration begins.
10	After calibration is complete, put the thermistor back into the thermal well.
11	Select any navigation menu item. RESULT: The system prompts you to reboot the system. 
12	Select Reboot.
13	Verify that the system reboots into the Initialization screen and passes system cooling at 33 degrees Fahrenheit (+/- 1F).

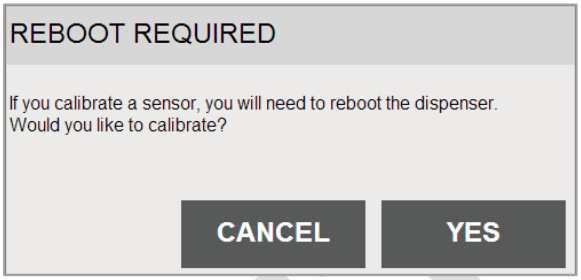
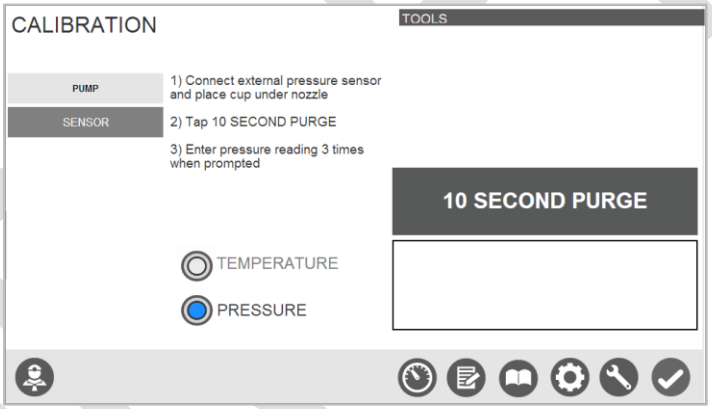
freestyle

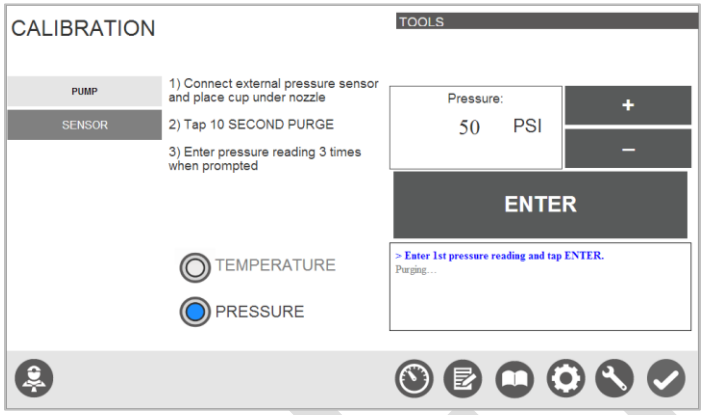
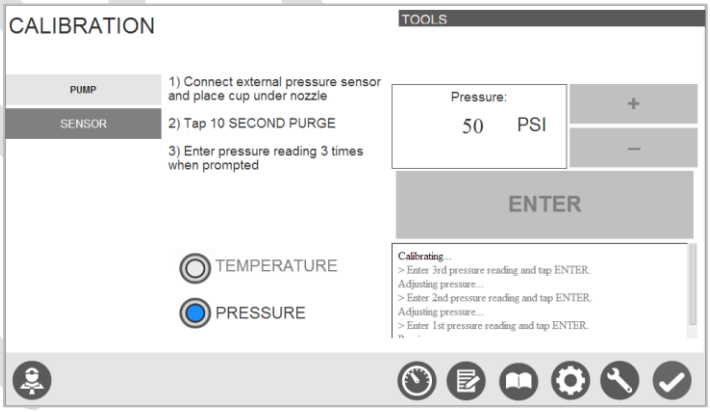
CALIBRATING PRESSURE

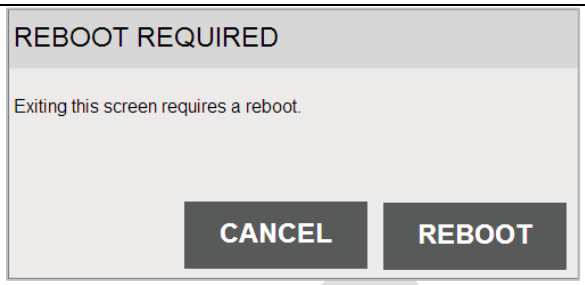
Use the following steps to calibrate pressure.

Tools: None
Materials: External pressure sensor

Step	Action
1	Access the NCUI.
2	Select the Settings icon. 
3	Select Calibration. 
4	Select Sensor from the Calibration UI screen. 

Step	Action
	RESULT: A REBOOT REQUIRED message is displayed. 
5	Select Yes to continue with calibration. RESULT: The Sensor Calibration screen is displayed.
5	Select Pressure. 
6	Attach an external pressure sensor and validate that it gives a pressure reading.
7	Select 10 Second Purge. RESULT: The 10 Second Purge begins and completes. The system prompts you to enter the pressure reading.

Step	Action
8	Enter the first pressure reading on the sensor, and press Enter.  RESULT: The system adjusts the pressure and begins the second purge.
9	Enter the second pressure reading using the + and – buttons, and click Enter. RESULT: The system adjusts the pressure and begins the third purge.
10	Enter the third pressure reading and click press Enter. RESULT: Calibration begins and completes. 
11	Remove the external pressure sensor.
11	Select any navigation menu item. RESULT: The system prompts you to reboot the system.

Step	Action
	
12	Select Reboot.
13	Verify that the system reboots into the Initialization screen and passes the pressure optimization.
14	Go to the NCUI.
15	Select Subsystem icon>Diagnostics.
16	Verify that the pressure reading is accurate (approx. 80 PSI).

Coca-Cola freestyle

Calibrating the Pumps

Pump calibration entails dialing in the flow rate to make sure that the pumps are pumping the right amount of Brand and Flavor, Carbonated and Plain water at the correct rate when dispensing.

This is an iterative process of starting a pump, measuring the amount the pump pours, entering the amount poured, and repeating this process until the pump pours the correct amount of liquid:

- Brands have a 15 ML pour
- Flavors have a 5ML pour

Plain and Carbonated water have a 250ML pour

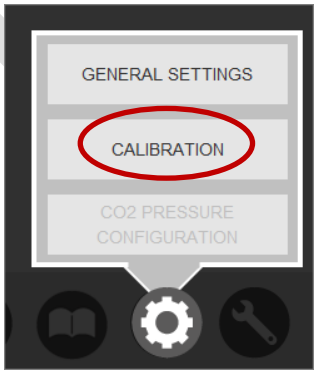
Calibrating the Carbonated and Plain water is a manual process, which we explain in the next section.

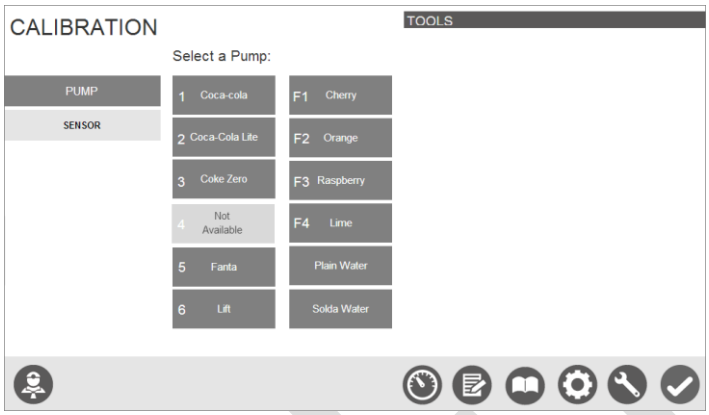
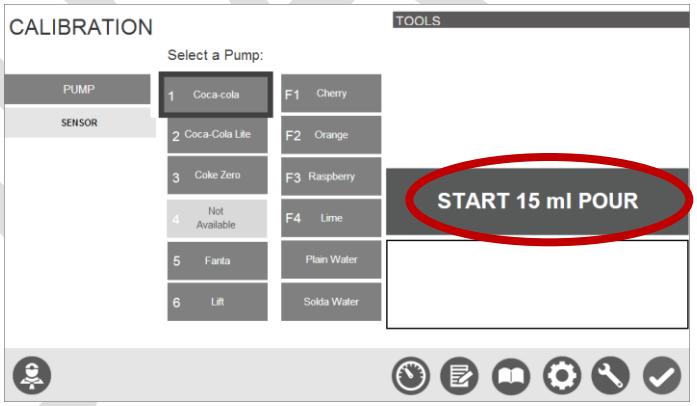
CALIBRATING THE PUMPS

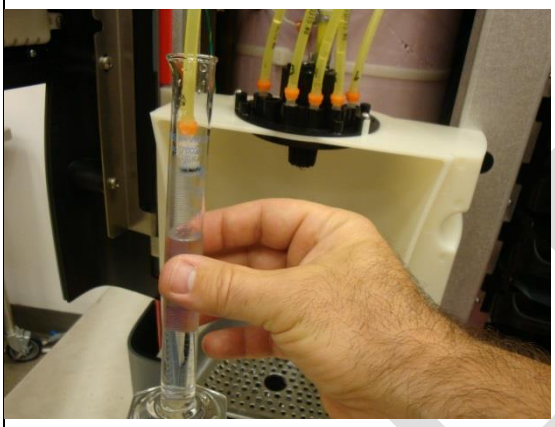
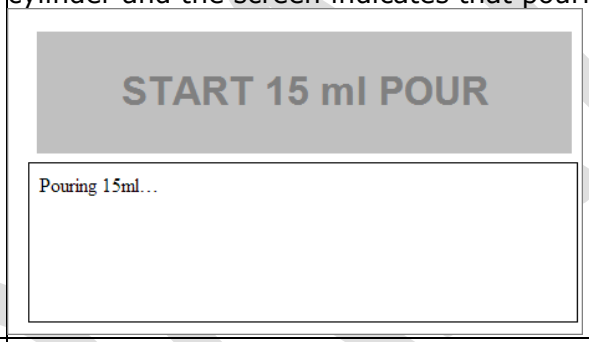
CAUTIION: Always calibrate the sensors (pressure then temperature) BEFORE you calibrate the pumps.

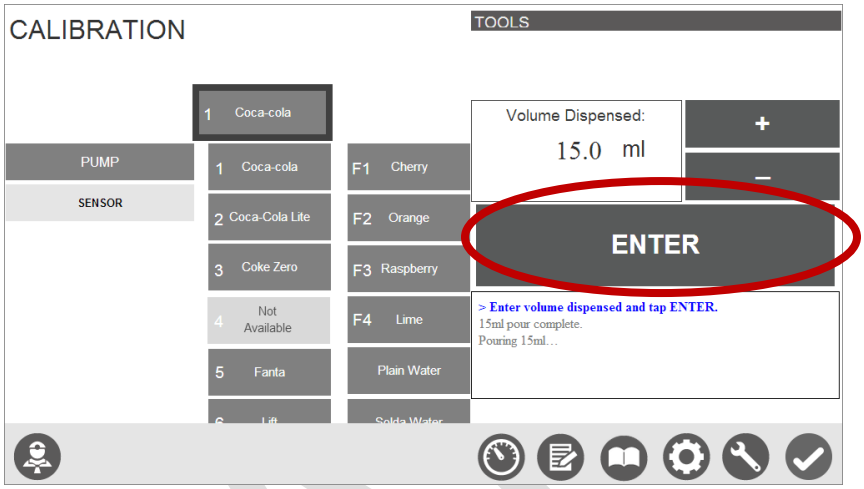
This is a first time dispenser set up, so you must calibrate all pumps. Calibrate each pump individually.

Tools: Graduated Cylinder, T10 Torqx

Step	Action
1	Face the dispenser, and put a cup under the nozzle.
2	On the screen, click the Subsystems icon, and select Calibration. 

Step	Action
	RESULT: The Calibration screen displays. 
4	Press PUMP.
5	Select the Brand (1-6) or Flavor (F1-F4) pump that you want to calibrate.
	RESULT: The system presents a button for you to begin pouring. In these instructions, we calibrate the Coca-Cola Brand.
6	Click START 15ml POUR. 
7	At the dispenser, identify the line the syrup is coming out of, and remove that line from the nozzle using the T10 Torqx.

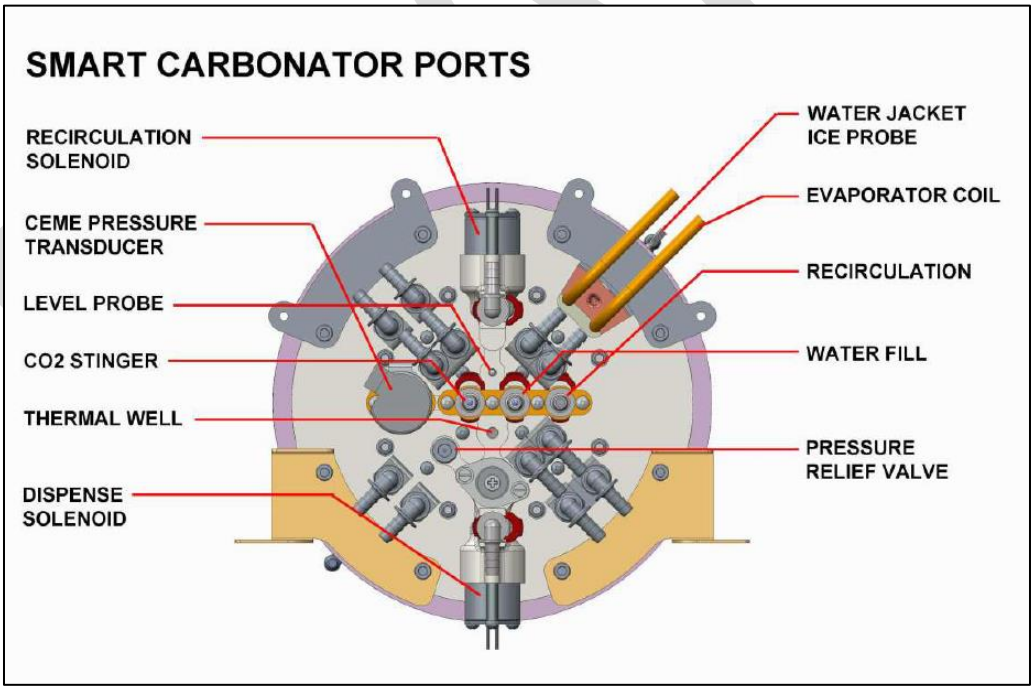
Step	Action
8	Put the line inside of the graduated cylinder. 
	RESULT: The dispenser pours the Coca-Cola into the graduated cylinder and the screen indicates that pouring occurs. 
9	Look closely at the cylinder and determine how much poured.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>10</td><td>Touch the screen to enter the amount the dispenser pours into the graduated cylinder. Use the + and – signs to increase or decrease the amounts. Click Enter.
 
</td></tr>
<tr><td>11</td><td>
<table>
<tr><th>If the . . .</th><th>Then . . .</th></tr>
<tr><td>Poured amount is lower or higher than specified amount (15ML for our Brand example)</td><td>Keep pouring and pressing the + or – sign on the screen to input measured pour amount until you get a 15ml pour in the cylinder</td></tr>
<tr><td>Poured amount is exactly the specified amount (15ML for our Brand example)</td><td>Go to the next pump you want to calibrate</td></tr>
</table>
</td></tr>
</table>

Smart Carbonator

MAINTAINING THE SMART CARBONATOR COMPONENTS

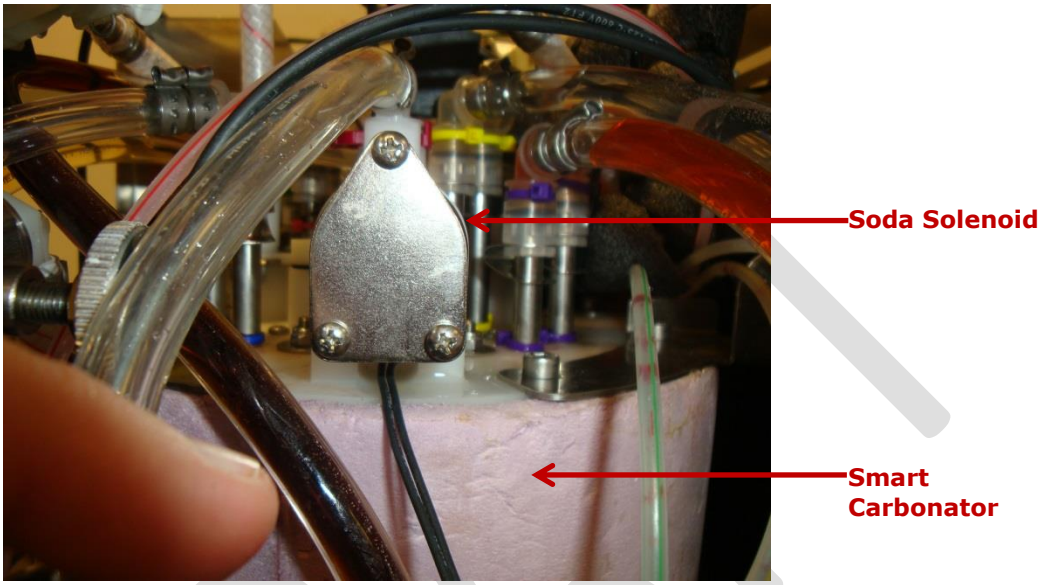
The Smart Carbonator makes the soda water and it chills plain water and soda water for all beverages. It consists of the needle valve, recirculation pump, Soda Dispense solenoid, level probe, and plain water dispense solenoid. The following image provides a topical view of the smart carbonator ports.



Coca-Cola freestyle

Soda Solenoid

The soda solenoid regulates the flow rate of soda water. It is located on top of the Smart Carbonator.

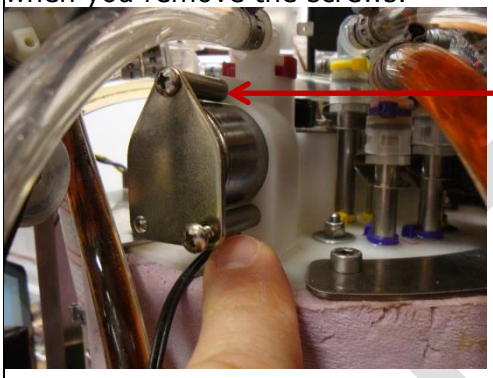


REPLACING THE SODA DISPENSE SOLENOID

Tools: Cross Screw Driver
Materials: New Soda Solenoid

Use these steps to remove and replace the Soda Solenoid.

Step	Action
1	Depressurize the Smart Carbonator.
2	Disconnect the harness.

Step	Action
3	Using the Cross Screw Driver, remove the three Cross screws that secure the soda solenoid. CAUTION: Each screw has a standoff, so do not drop the standoff when you remove the screws. 
4	Remove the old Solenoid.
5	Insert the new Solenoid.
6	Use the Cross Screw Drive to screw the three Cross screws to secure the soda solenoid. Take care with the standoffs.

Coca-Cola freestyle

Cooling System

The cooling system is part of the Smart Carbonator SC). It is the CO2 refrigerant cooling system. The evaporator is inside the SC. The cooling system includes the compressor, condenser, evaporator, and the cap tube. If there is a problem here, or if any of these components fail, you will replace the Refrigeration Deck.

Servicing the Smart Carbonator

REMOVING THE SMART CARBONATOR COOLING SYSTEM

Tools: Cross Screw Driver
Materials: Cooling deck, Smart Carbonator

Use the following steps to remove the Smart Carbonator/Cooling System.

Step	Action
1	Shut the water off.
2	Remove the cladding.
3	Disconnect the plain water from the inlet water solenoid, which is located on the right side of the cabinet.
4	Disconnect the carb water from the inlet water solenoid, which is located on the right side of the cabinet.
5	Remove the nozzle from the nozzle body.
6	Remove the CO2 bottle.
7	Remove the CO2 housing.
8	Disconnect the soda water solenoid by disconnecting the harness from the soda water solenoid.
9	Disconnect the wire harness for the water/soda water solenoid.
10	Disconnect the wire harness for the condenser fan.
11	Disconnect the wire harness for the circulating pump.
12	Disconnect the wire harness for the temperature probe.
13	Disconnect the wire harness for the water solenoid.
14	Disconnect the wire harness for the tank heater.
15	Disconnect the wire harness for the CO2 solenoid.
16	Remove the tank ground wire using the 516 driver.
17	Disconnect all syrup inlets by pushing the tab up and simultaneously sliding the fitting up and off. There are six syrup inlets located at the top of the tank.
18	Using your thumbs or Cross Screw Driver, remove the two bottom thumb screws from the bottom of the frame.

Step	Action
19	Carefully slide the existing smart carb/cooling assembly off the dispenser. CAUTION: Guide the nozzle and tubing out of the cabinet taking care not to damage the nozzle or tubing.

INSTALLING A SMART CARBONATOR COOLING SYSTEM

After you remove the existing cooling system, you must install the new one. Use the following instructions to install the new cooling system.

Step	Action
1	Remove the existing smart carbonator/cooling system from the dispenser.
2	Slide the new smart carb/cooling assembly on to the dispenser.
3	Route the nozzle and tubing through the chassis to the nozzle housing, and slide the new cooling deck onto the dispenser.
4	Line up the locator pin on the new smart carb/cooling deck with the locator pin on the chassis.
5	Line up the bolt and screw holes.
6	Put the two screws back to mount the new smart carb/cooling assembly back on to the dispenser.
7	Reconnect all of the harnesses.
8	Connect the syrup inlets.
9	Reconnect the soda water solenoid.
10	Put the CO2 bottle back into the CO2 housing, and then reinstall the CO2 housing.
11	Reconnect the carb water and the plain water inlets.
12	Reinstall the nozzle to the nozzle body.
13	Turn the water on.

REPLACING THE RECIRCULATION PUMP

The Recirculation Pump circulates the soda water to ensure that the cooling system is building an even ice bank. Recirculation is continuous. The pump runs for 60 seconds and shuts off for 15 seconds. The Recirculation Pump is located at the top of the smart carbonator. Instructions for Replacing the Recirculation Pump are in Chapter 8 Pump Module.

Coca-Cola freestyle

The Level Probe

The Level Probe turns on the water pump to produce carbonated water.

REPLACING THE LEVEL PROBE

Tools: Needle Nose Pliers
Materials: New Level Probe

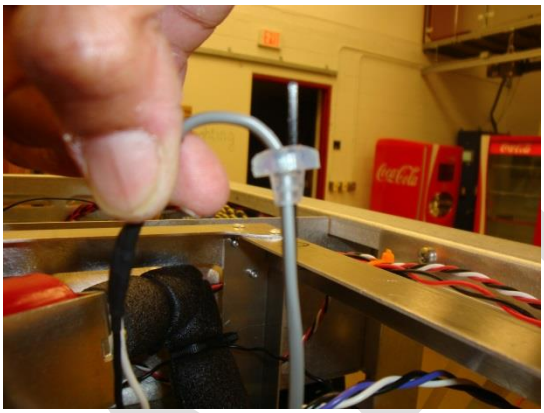
Use the following steps to remove a failed Level Probe and to install a new one.

Step	Action
1	Disconnect the wiring harness from the top of the probe.
2	Loosen the set screw.
3	Use the Pliers to pull the old probe up.
4	Insert the new probe.
5	Tighten the set screws.
6	Reconnect the wiring harness to the top of the new probe.

Coca-Cola freestyle

Thermistor

The Thermistor is the feedback to the software on the internal temperature of the Smart Carbonator. It is located on top of the Smart Carbonator.



REPLACING THE THERMISTOR

Tools: Needle Nose Pliers
Materials: New Thermistor

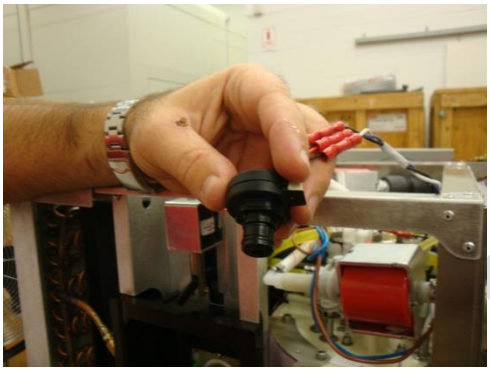
Use the following steps to remove a failed Thermistor and to install a new one.

Step	Action
1	Disconnect the wiring harness. It is plugged into the IOM board in position carb tmp/pres sense.
2	Grab the Thermistor guide and pull it out.
3	Insert the new Thermistor.
4	Reconnect the wiring harness to the IOM board.

Coca-Cola freestyle

Pressure Transducer

The Pressure Transducer senses the pressure inside the Smart Carbonator tank, letting us know if we have CO2 or not. It is located on top of the Smart Carbonator.

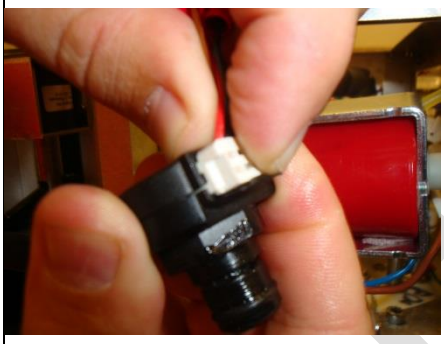


REPLACING THE PRESSURE TRANSDUCOR

Tools: Flat Screw Driver
Materials: New Pressure Transducer

Use the following steps to remove a failed or leaking Pressure Transducer and to install a new one.

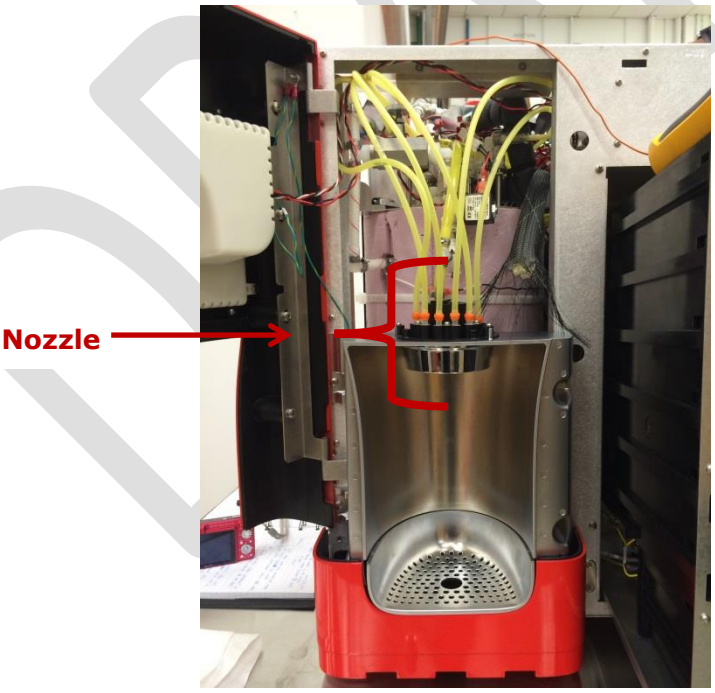
Step	Action
1	Using the Flat Screw Driver, unlock the failed Pressure Transducer by sliding the lock towards the front of the dispenser.
2	Grasp the Pressure Transducer and pull straight up to bring it out of the dispenser.

Step	Action
3	Disconnect the wiring harness from the Pressure Transducer. Push down on the black tab and pull the white wiring harness straight out. 
4	Connect the new Pressure Transducer to the wiring harness.
5	Slide the Pressure Transducer into its slot on top of the Smart Carbonator and lock it.

Dispense Nozzle

REPAIRING THE DISPENSE NOZZLE MODULE

This chapter provides information about the dispense nozzle, which includes the nozzle body, inner nozzle body, beauty ring, and the nozzle tip. The dispense nozzle is the point where the flavor, brands, and water meet and are then poured. It is located in the front of the dispenser behind the right door.



Coca-Cola freestyle

Nozzle

The instructions in this section assume that you removed the cladding from the Gandalf Dispenser. If not, refer to Removing the Cladding.

REPLACING OR CLEANING THE NOZZLE TIP

Remove the nozzle tip from the nozzle anytime you need to clean or replace the nozzle tip. The nozzle tip is inside of the nozzle. You can remove the nozzle tip without removing the nozzle.

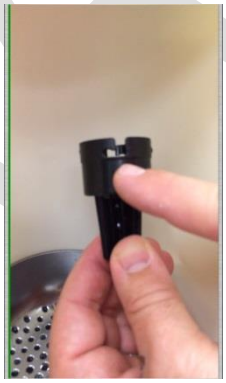
The nozzle tip is inside of the nozzle. In this image, the nozzle tip is pulled out. Normally the tip is not visible.

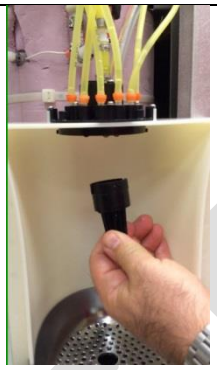
Nozzle Tip

Coca-Cola freestyle

Tools: Clean fingers
Materials: New Nozzle tip, Clean towel/rag

Use the following steps to remove the Nozzle Tip.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Reach underneath the nozzle, and locate the nozzle tip.
  </td></tr>
<tr><td>2</td><td>Turn the nozzle tip to the left, and pull straight down.
  </td></tr>
<tr><td>3</td><td>Your next step depends on whether you want to replace or clean the nozzle tip:
<table><tr><th>If you want to . . .</th><th>Then . . .</th></tr><tr><td>Replace the nozzle tip</td><td>Proceed to the next step</td></tr><tr><td>Clean the nozzle tip</td><td>Use a clean towel/rag to wipe the nozzle tip, and proceed to the next step.</td></tr></table></td></tr>
</table>

Step	Action
	
4	Reinstall the cleaned or new nozzle tip by inserting the nozzle tip into the nozzle and turning it to the right until it clicks into place.

Coca-Cola freestyle

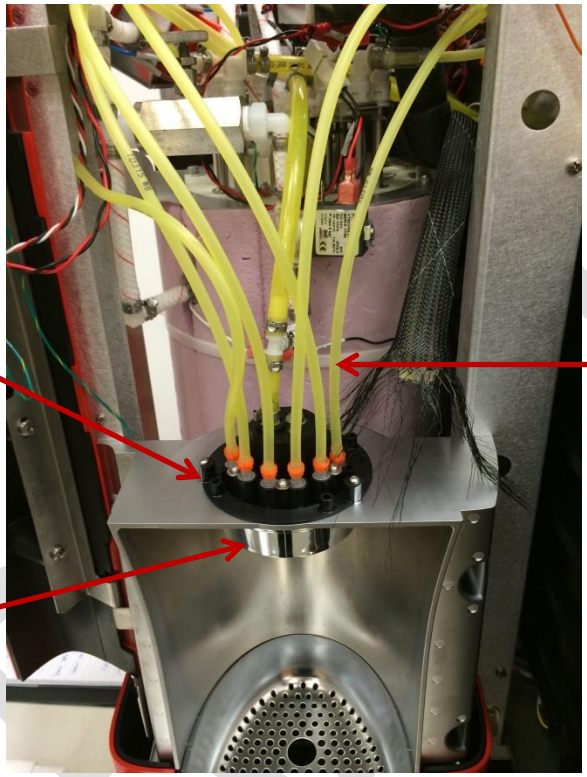
Replacing the Nozzle

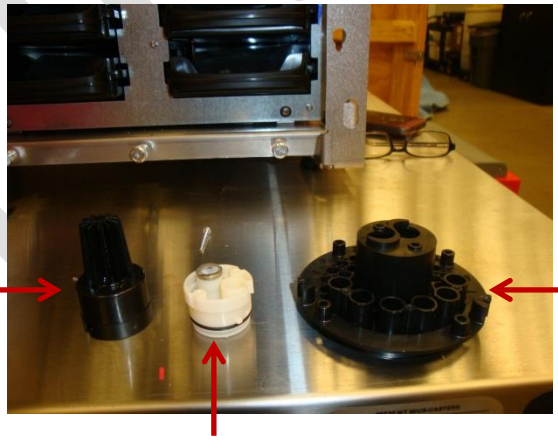
REMOVING THE NOZZLE FROM THE DISPENSER

The nozzle resides above the nozzle body. The Brand and Flavor lines and the water/soda inlet connect to the nozzle.

Nozzle

Standing in front of the dispenser, the nozzle is on the left side, next to the Syrup Tower. It has several tubes running into it that enable the beverage to reach the cup.





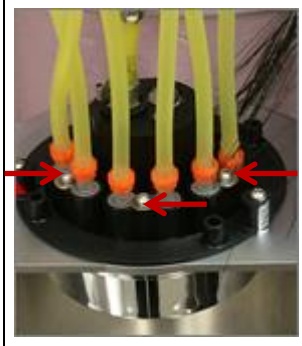
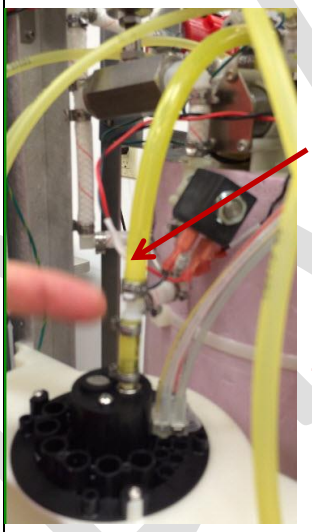
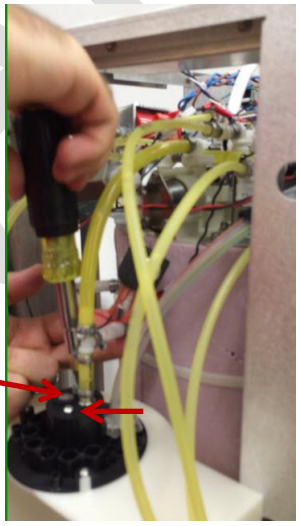
Coca-Cola freestyle

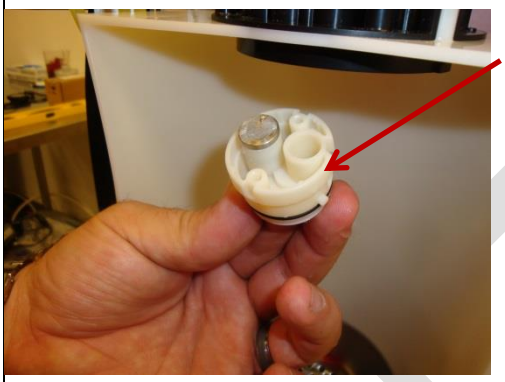
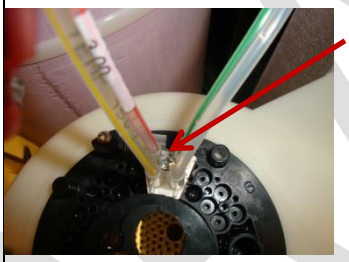
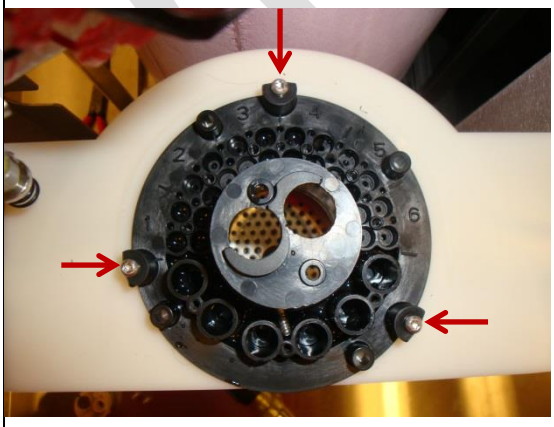
Tools: T10 Torqx, #1 Cross Screw Driver
Materials: None

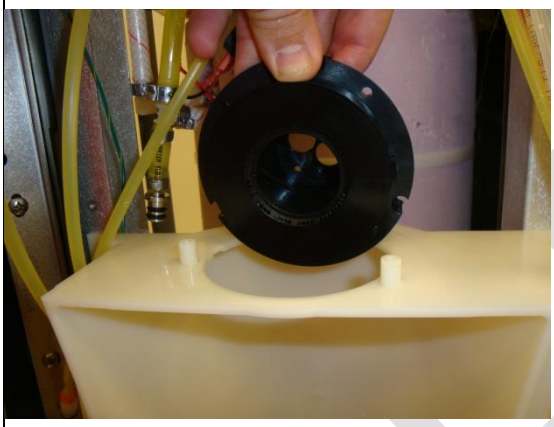
NOTE: When removing screws, make sure you put the screws in a safe place. Some of the screws have washers as well.

Use the following steps to remove and replace the Brand lines, Flavor lines, water/soda inlet, or the nozzle on the Gandalf Dispenser.

Step	Action
1	Open the left door of the dispenser.
2	Remove the Beauty Ring. 
3	Remove the Nozzle Tip. 

Step	Action
4	Remove the six Brand lines off of the nozzle: Use a T10 Torqx to remove the three screws and their washers, and then pull the lines straight up.  
5	Using a Cross Screw Driver, remove the Soda/Water Line Inlet: Remove the two screws, twist the line to the left, and lift it straight out.  

Step	Action
6	Reach underneath the nozzle and remove the inner nozzle body. The screws you removed in the previous step loosened it.  **Inner Nozzle Body**
7	Remove the Flavor QTA lines from the nozzle: Use a #1 Cross Screw Driver to remove the screw in the center of the QTA, and pull the lines up. NOTE: This is a long screw.  **Remove this screw** 
8	Using the T10 Torqx, remove the three screws holding the nozzle on the dispenser.  **Remove these screws**

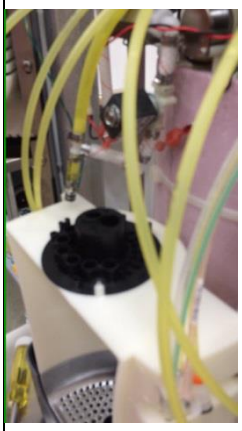
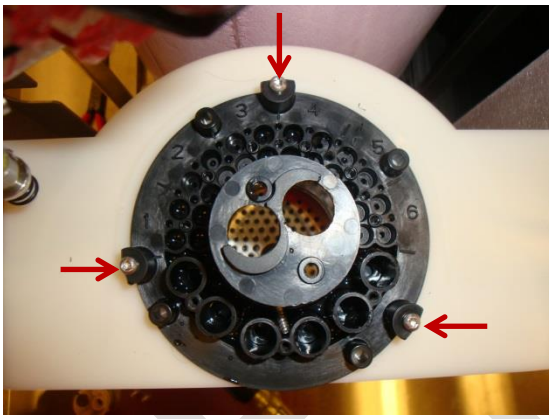
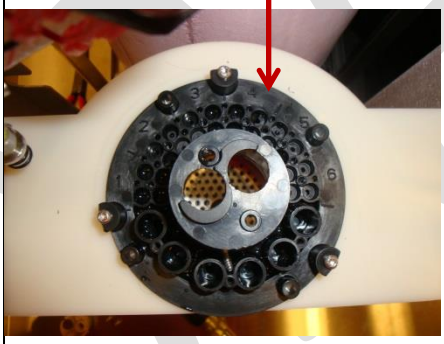
Step	Action
9	Remove the nozzle from the dispenser. 

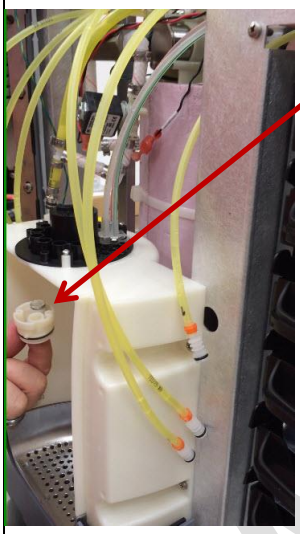
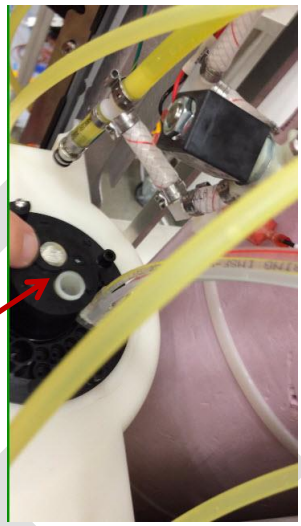
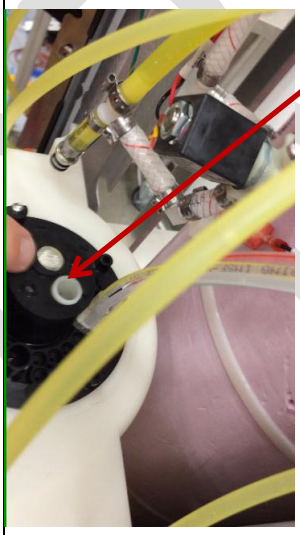
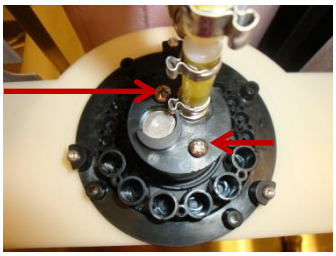
INSTALLING A NOZZLE

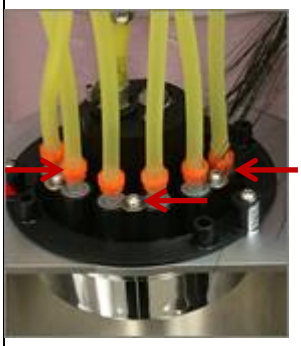
Tools: CROSS Screw Driver, T10 Torqx
Materials: New Nozzle

These instructions assume that you removed the nozzle from the dispenser. If you have not, read the Removing the Nozzle from the Dispenser section that precedes this one.

Step	Action
1	Remove the old Nozzle from the dispenser. 

Step	Action
2	Using the T10 Torqx, screw the new Nozzle into the dispenser. There are three screws.  
3	Using the #1 Cross Screw Driver, connect the Flavor lines to the #4 slot in the back of the Nozzle. Push the Flavor QTA into the #4 slot and then screw the long screw in the middle of the Flavor QTA.   CAUTION: Do not over tighten. You might strip the screw.

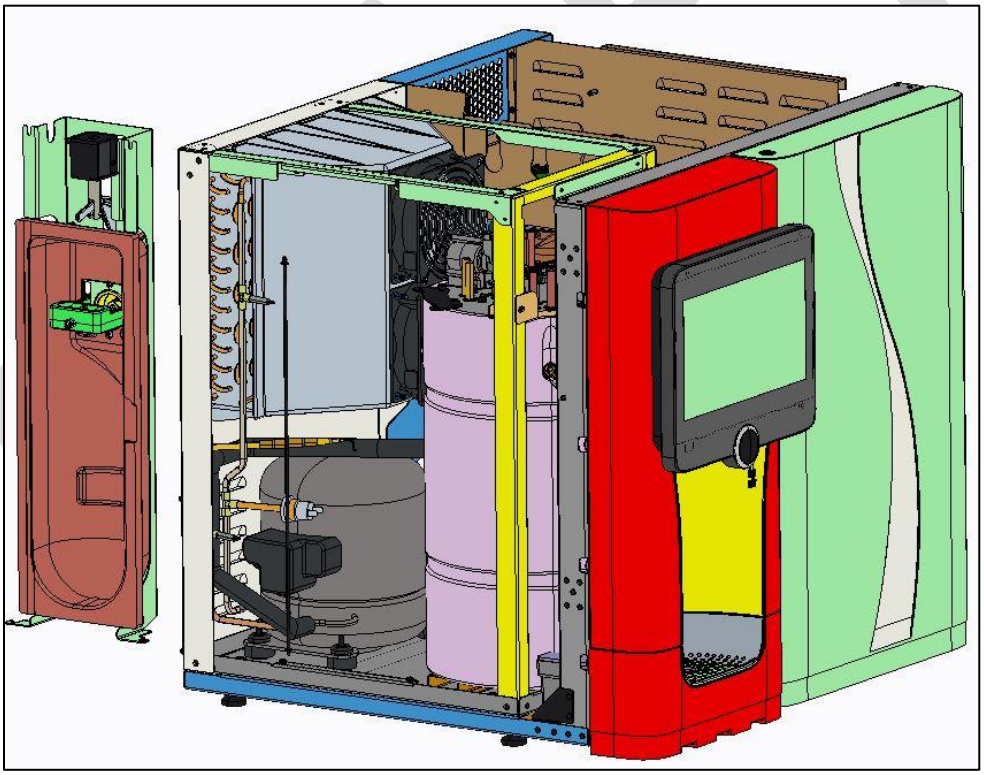
Step	Action
4	Insert the Inner Nozzle Body into the underside of the Nozzle.  Push the Inner Nozzle Body up into the nozzle, turning it to the left to snap into place. There is a built in locking mechanism to lock the Inner Nozzle Body into the Nozzle. 
5	Hold the Inner Nozzle Body on the underside of the nozzle as you push the Water/Soda Line Inlet into the nozzle and then screw it down.  Put the Water/ Soda Inlet here. Screw these screws into the Nozzle to secure the Water/Soda Line Inlet and the Inner Nozzle Body into the dispenser. 

Step	Action
6	Screw the Nozzle into the dispenser and then push the Brand Lines into their perspective slots on the Nozzle.  **Screw these in.** NOTE: You might need to lubricate the O-Rings of the Brand Lines before you insert them into the Nozzle. 
7	Insert the Beauty Ring.
8	Close the left door on the dispenser.

CO2 Delivery System

MAINTAINING THE CO2 DELIVERY SYSTEM

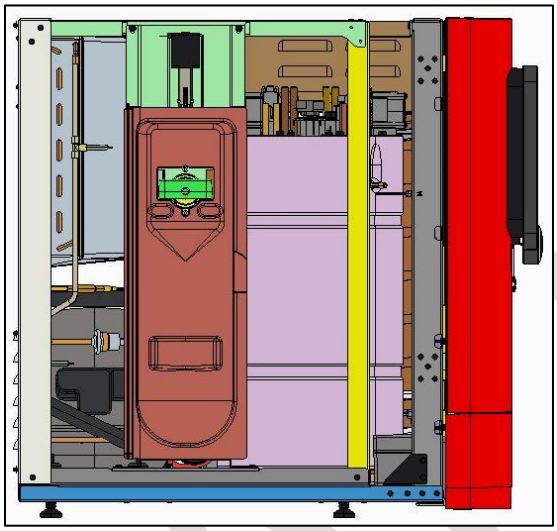
The CO2 Delivery System contains the CO2 bottle, the flow meter, and the CO2 Dispense Solenoid. It allows CO2 into the Smart Carbonator tank to make soda water.



freestyle

CO2 Solenoid

The CO2 Solenoid allows bursts of CO2 pressure into the Smart Carbonator tank to maintain 80 PSI.

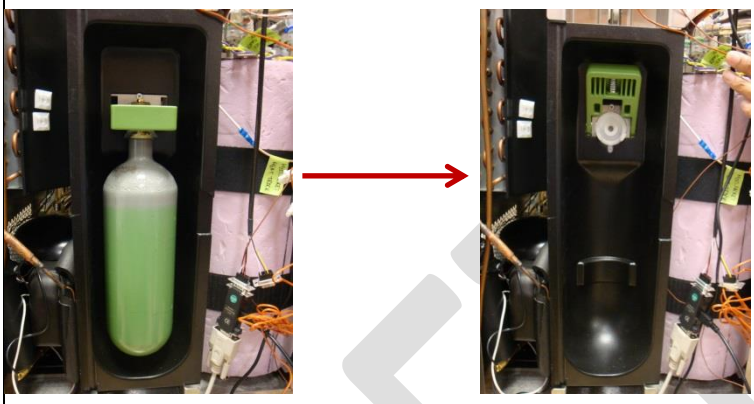
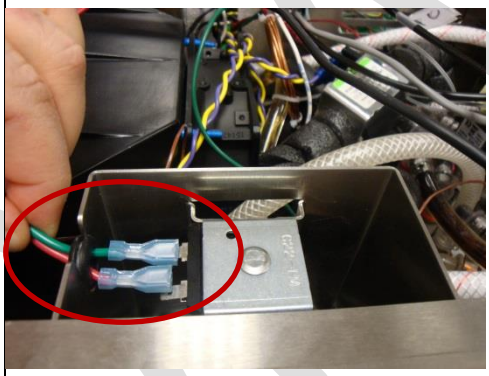


REPLACING THE CO2 SOLENOID

Tools: Cross Screw Driver, 5 32nd Allen Wrench
Materials: New CO2 Solenoid

Use the following steps to remove, install, repair, and replace the CO2 Solenoid.

Step	Action
1	Remove the cladding.

Step	Action
2	Remove the CO2 bottle. 
3	Remove the CO2 inlet line from the top of the Smart Carbonator tank. Unlock it by pushing the slide lock to the front and pulling it straight up.
3	Disconnect the wiring harness from the solenoid. 
4	Loosen the two screws on the top of the assembly.
5	Loosen the two screws that secure the bottom of the assembly.
6	Slide the bottom of the assembly out and then pull down. RESULT: The entire assembly comes off.
7	Turn the assembly over so that the back of it is exposed.
8	Remove the two screws holding the solenoid in place.
	Turn the assembly back to the front, and pull the solenoid towards you.
9	Insert the new CO2 solenoid.
10	Use the two screws to hold the solenoid in place.
11	Tighten the screws on the top and bottom of the assembly.
12	Slide the assembly in top first.

Step	Action
13	Connect the wiring harness.
14	Put the CO2 inlet line into the top of the Smart Carbonator tank.
15	Put the CO2 bottle back into the CO2 assembly.

Syrup Tower

MAINTAINING AND REPARING THE SYRUP TOWER COMPONENTS

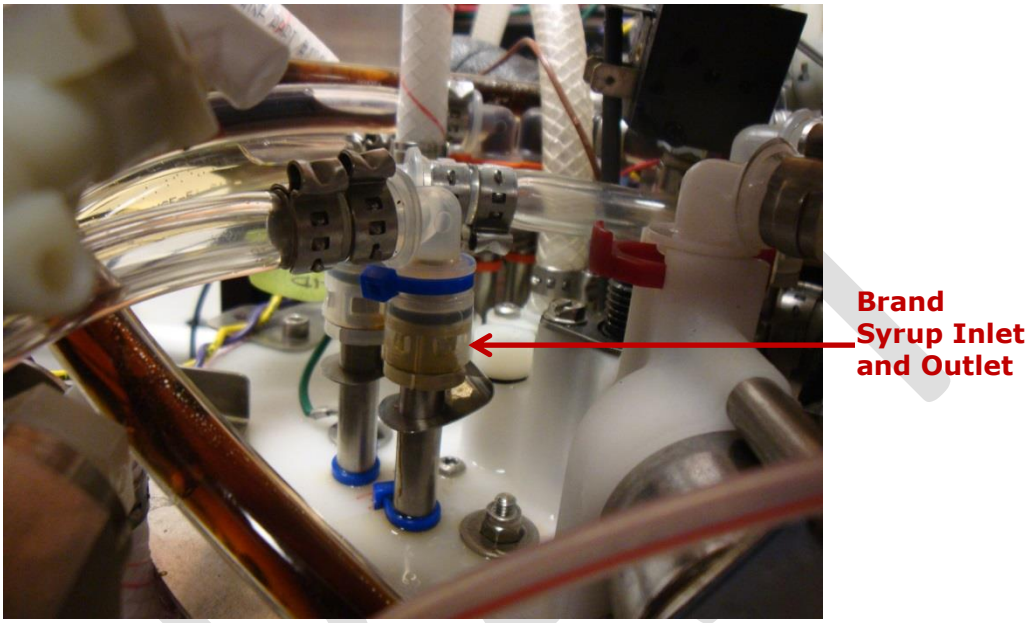
The Syrup Tower houses the slots that hold the Brand and Flavor cartridges. Fluid lines go from the pumps into the back of the Syrup Tower. The Syrup Tower includes the Brand and Flavor Fitments, Bag selectors, Cartridge Trays, and the Mag Read. Information about the Brand and Flavor Pumps is in the Pump Chapter.

The following image shows the pump manifold removed.

Coca-Cola freestyle

Brand Syrup Inlet/Outlet

The Brand Syrup Inlet/Outlet takes the brand syrup and moves it through the Smart Carbonator to be chilled for dispensing.



Pump Module

REPLACING THE COMPONENTS OF THE PUMP MODULE

The following graphic shows the Syrup Tower Pump Manifold removed. You can see the Brand and Flavor pumps in the back of the tower.

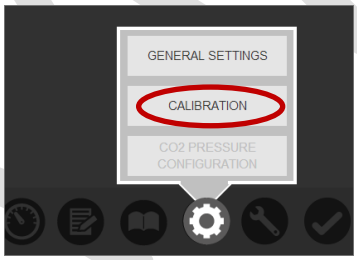
Calibration is the process of the dispenser determining the correct pressure, temperature, and amount of liquid to pour. You must calibrate at operating temperature; therefore, always calibrate the sensors (pressure then temperature) BEFORE you calibrate the pumps.

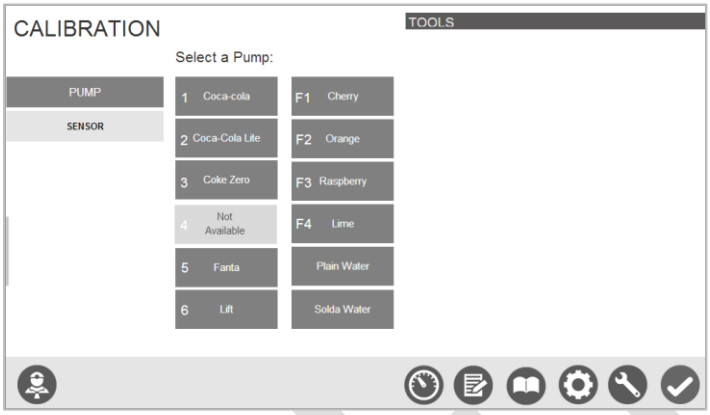
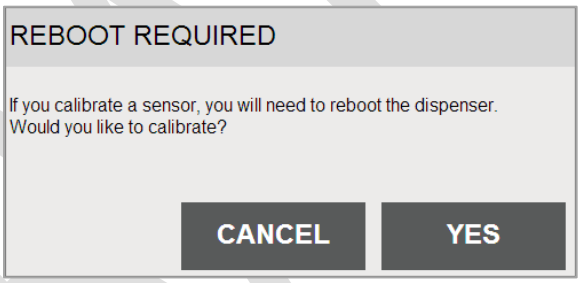
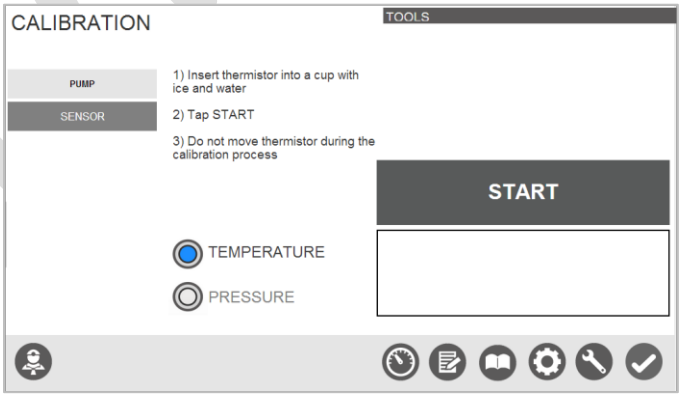
Calibrating the Sensors

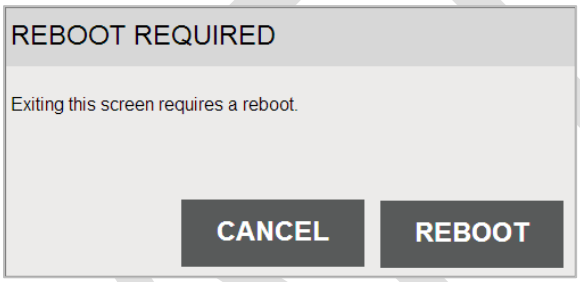
CALIBRATING TEMPERATURE

Always calibrate the sensors (pressure then temperature) BEFORE you calibrate the pumps. Use the following steps to calibrate temperature.

Tools: None
Materials: Cup of ice water, Thermometer

Step	Action
1	Access the NCUI.
2	Select the Settings icon.
3	Select Calibration. 

Step	Action
4	Select Sensor from the Calibration UI screen. 
	RESULT: A REBOOT REQUIRED message is displayed. 
5	Select Yes to continue with calibration. RESULT: The Sensor Calibration screen is displayed.
5	Select Temperature. 

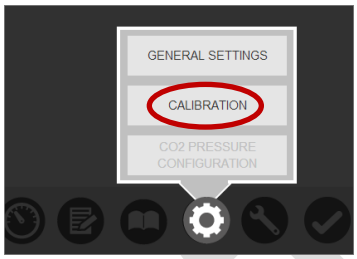
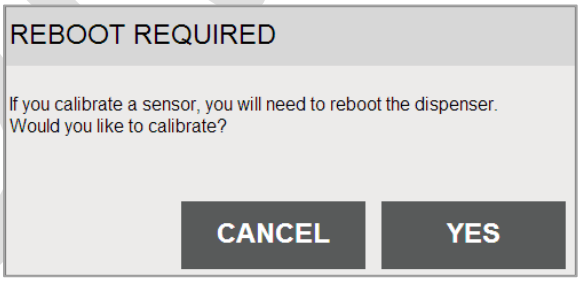
Step	Action
6	Get a cup of ice water, and insert a thermometer into the cup to ensure that the ice water is 33 degrees Fahrenheit.
7	Remove the thermistor from the thermal well.
8	Put the thermistor into the cup of ice water for 20 seconds.
9	Select Start after 20 seconds. RESULT: Calibration begins.
10	After calibration is complete, put the thermistor back into the thermal well.
11	Select any navigation menu item. RESULT: The system prompts you to reboot the system. 
12	Select Reboot.
13	Verify that the system reboots into the Initialization screen and passes system cooling at 33 degrees Fahrenheit (+/- 1F).

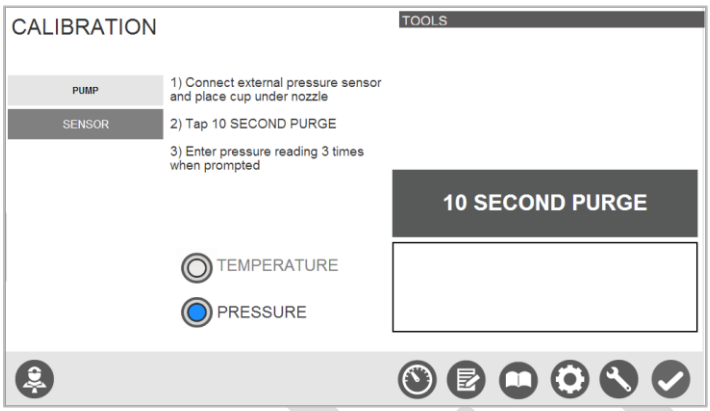
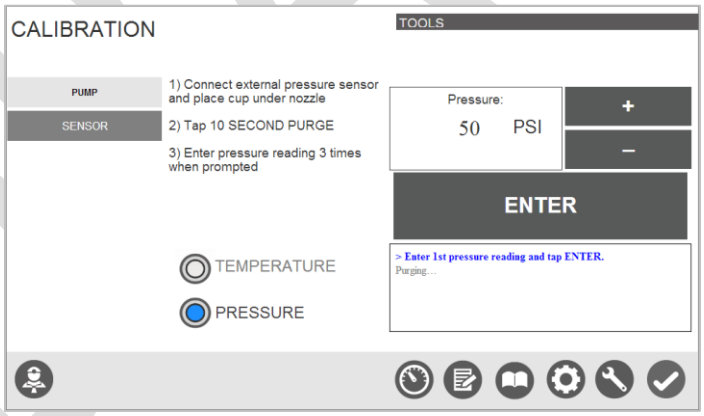
CALIBRATING PRESSURE

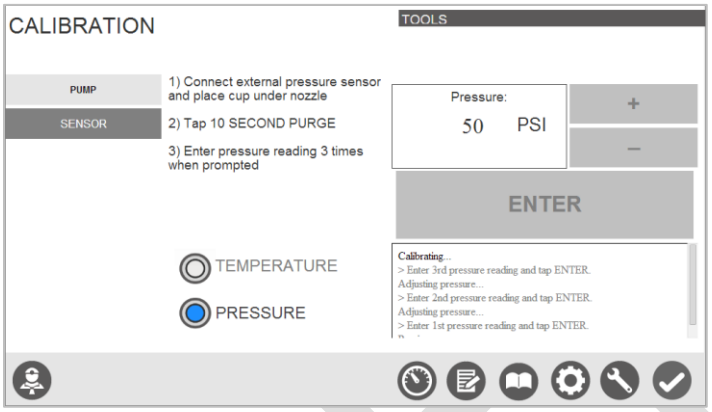
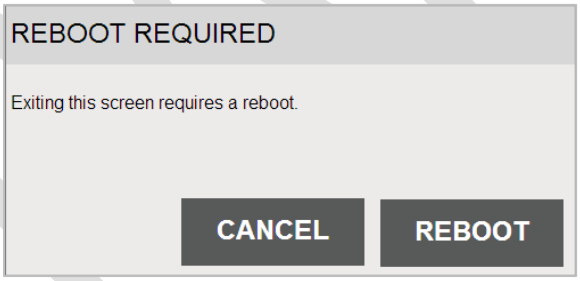
Use the following steps to calibrate pressure.

Tools: None
Materials: External pressure sensor

Step	Action
1	Access the NCUI.
2	Select the Settings icon. 

Step	Action
3	Select Calibration. 
4	Select Sensor from the Calibration UI screen. 
	RESULT: A REBOOT REQUIRED message is displayed. 
5	Select Yes to continue with calibration. RESULT: The Sensor Calibration screen is displayed.

Step	Action
5	Select Pressure. 
6	Attach an external pressure sensor and validate that it gives a pressure reading.
7	Select 10 Second Purge. RESULT: The 10 Second Purge begins and completes. The system prompts you to enter the pressure reading.
8	Enter the first pressure reading on the sensor, and press Enter.  RESULT: The system adjusts the pressure and begins the second purge.
9	Enter the second pressure reading using the + and – buttons, and click Enter. RESULT: The system adjusts the pressure and begins the third purge.

Step	Action
10	Enter the third pressure reading and click press Enter. RESULT: Calibration begins and completes. 
11	Remove the external pressure sensor.
11	Select any navigation menu item. RESULT: The system prompts you to reboot the system. 
12	Select Reboot.
13	Verify that the system reboots into the Initialization screen and passes the pressure optimization.
14	Go to the NCUI.
15	Select Subsystem icon>Diagnostics.
16	Verify that the pressure reading is accurate (approx. 80 PSI).

Coca-Cola freestyle

Calibrating the Pumps

Pump calibration entails dialing in the flow rate to make sure that the pumps are pumping the right amount of Brand and Flavor, Carbonated and Plain water at the correct rate when dispensing.

This is an iterative process of starting a pump, measuring the amount the pump pours, entering the amount poured, and repeating this process until the pump pours the correct amount of liquid:

- Brands have a 15 ML pour
- Flavors have a 5ML pour
- Plain and Carbonated water have a 250ML pour

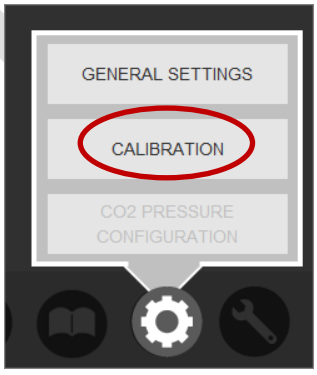
Calibrating the Carbonated and Plain water is a manual process, which we explain in the next section.

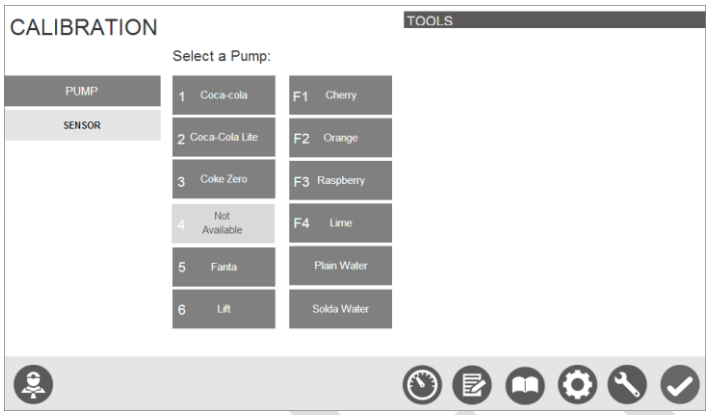
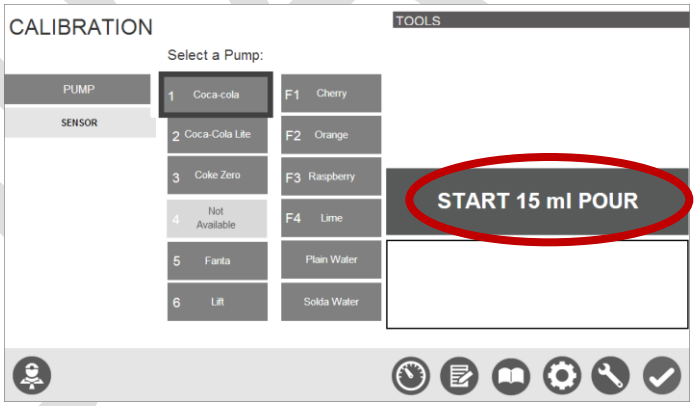
CAUTION: Always calibrate the sensors (pressure then temperature) BEFORE you calibrate the pumps.

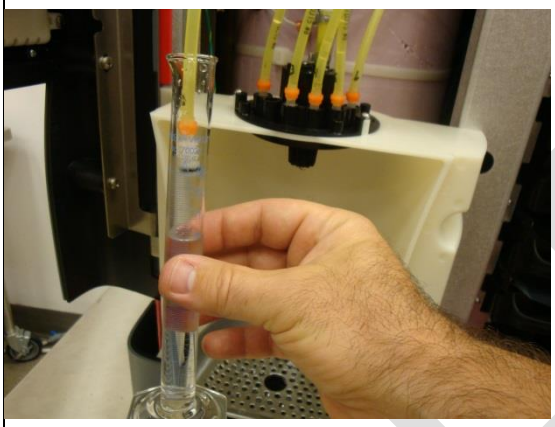
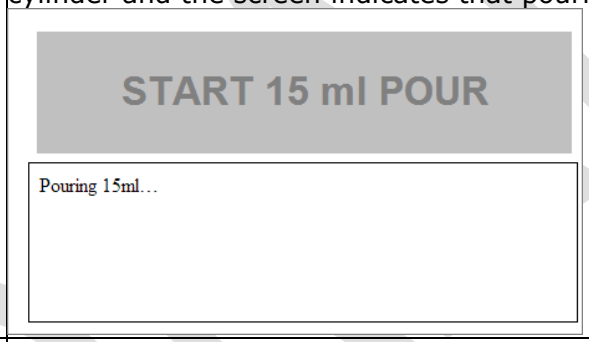
CALIBRATING THE PUMPS

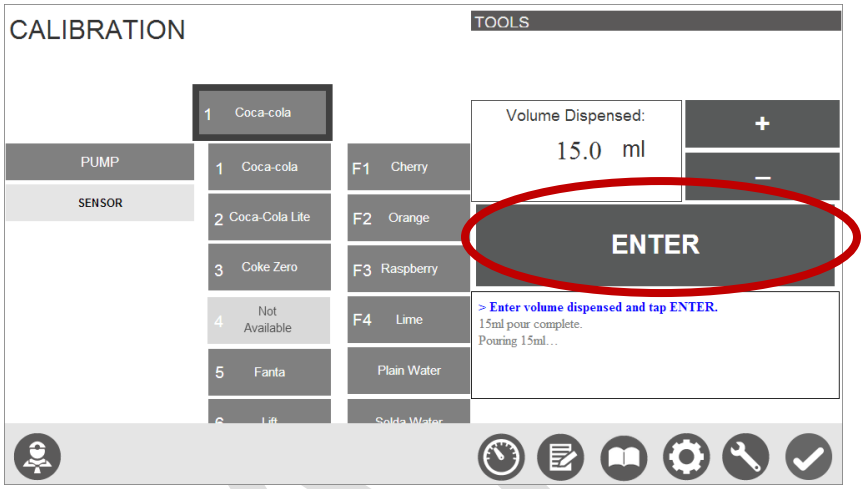
This is a first time dispenser set up, so you must calibrate all pumps. Calibrate each pump individually.

Tools: Graduated Cylinder, T10 Torqx

Step	Action
1	Face the dispenser, and put a cup under the nozzle.
2	On the screen, click the Subsystems icon, and select Calibration. 

Step	Action
	RESULT: The Calibration screen displays. 
4	Press PUMP.
5	Select the Brand (1-6) or Flavor (F1-F4) pump that you want to calibrate.
	RESULT: The system presents a button for you to begin pouring. In these instructions, we calibrate the Coca-Cola Brand.
6	Click START 15ml POUR. 
7	At the dispenser, identify the line the syrup is coming out of, and remove that line from the nozzle using the T10 Torqx.

Step	Action
8	Put the line inside of the graduated cylinder. 
	RESULT: The dispenser pours the Coca-Cola into the graduated cylinder and the screen indicates that pouring occurs. 
9	Look closely at the cylinder and determine how much poured.

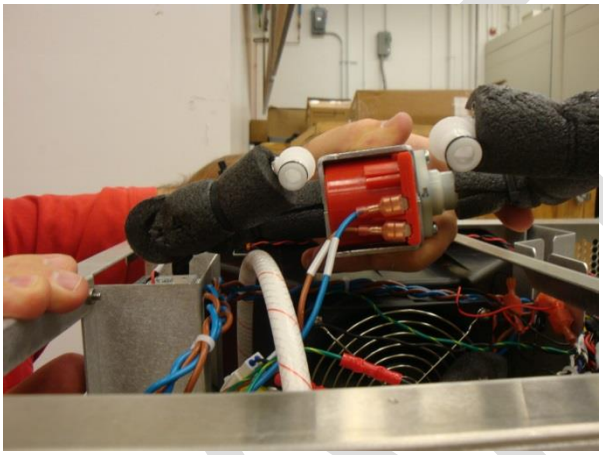
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>10</td><td>Touch the screen to enter the amount the dispenser pours into the graduated cylinder. Use the + and – signs to increase or decrease the amounts. Click Enter.
 
</td></tr>
<tr><td>11</td><td>
<table>
<tr><th>If the . . .</th><th>Then . . .</th></tr>
<tr><td>Poured amount is lower or higher than specified amount (15ML for our Brand example)</td><td>Keep pouring and pressing the + or – sign on the screen to input measured pour amount until you get a 15ml pour in the cylinder</td></tr>
<tr><td>Poured amount is exactly the specified amount (15ML for our Brand example)</td><td>Go to the next pump you want to calibrate</td></tr>
</table>
</td></tr>
</table>

Coca-Cola freestyle

Recirculation Pump

The Recirculation Pump circulates the soda water to ensure that the cooling system is building an even ice bank. Recirculation is continuous. The pump runs for 60 seconds and shuts off for 15 seconds.

The Recirculation Pump is located at the top of the smart carbonator.

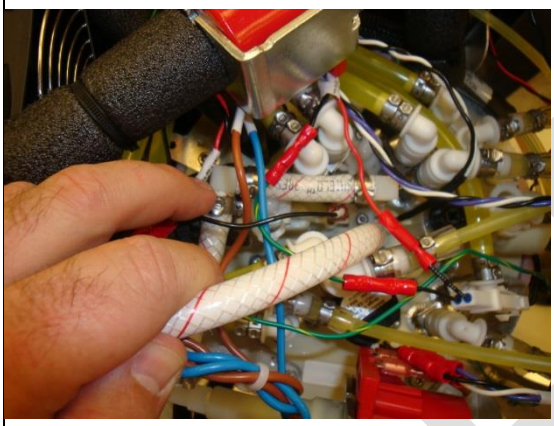


REPLACING THE RECIRCULATION PUMP

Tools: Clean fingers
Materials: New Recirculation Pump

Use the following steps to replace the Recirculation Pump.

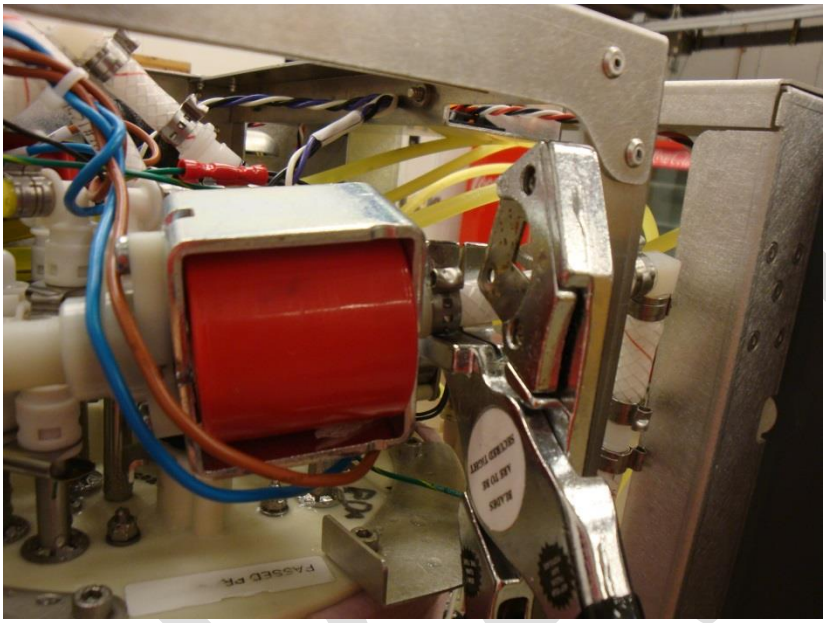
Step	Action
1	Release the quick connect on each side of the pump.
2	Remove the two Brand lines in order to reach the pump.

Step	Action
3	Push the tab and slide it up and then disconnect the wiring harness. 
4	Pull the entire Recirculation Pump assembly out of the dispenser.
5	Connect the wiring harness to the new Recirculation Pump.
6	Push the pump into its slot on top of the Smart Carb tank.
7	Lock it in by pushing one lever to the left and push the other to the rear of the dispenser.
8	Reconnect the Brand lines.

Coca-Cola freestyle

Replacing the Water Pump

The Water Pump moves plain water from the pump, through the lines, to the smart carbonator. It is located on the left side of the dispenser on top of the smart carbonator.



REMOVING THE WATER PUMP

Tools: Clean fingers, Tubing cutter, Crimper
Materials: Clamp

These instructions assume that you have access to the right side of the dispenser. Use the following steps to remove the Water Pump.

Step	Action
1	Remove the shroud.
2	Disconnect the quick connect (slide the quick connect forward to disconnect and back to reconnect).
3	Remove the line from the top of the tank.
4	Cut the white tubing that is in the front of pump.
5	Disconnect wiring harness.
6	Remove the pump.

Tools: Clean fingers, Tubing cutter, Crimper
Materials: Clamp, Water replacement pump

These instructions assume that you have access to the right side of the dispenser. Use the following steps to install the Water Pump.

Step	Action
1	Removing the Water Pump.
2	Insert the new pump.
3	Connect the wiring harness to the new pump.
4	Reach around the back of the pump and press the pump slide lock to open the pump housing.
5	Put the pump into the pump housing.
6	Release the pump, and slide lock to lock the pump in place.

freestyle

Replacing the Brand Syrup Pump

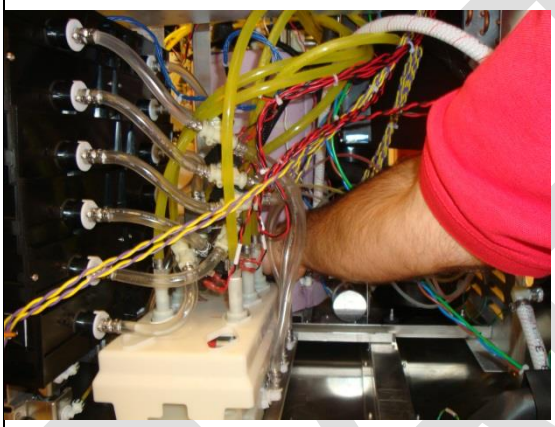
The Brand Syrup Pumps move syrup out of the pouch through the two-way valve into and out of the pump, into the heat exchanger and then to the nozzle. There are six Brand Syrup pumps located in the back of the dispenser behind the syrup tower.

REPLACING A BRAND SYRUP PUMP

Tools: Clean fingers, Tubing cutter, Cross screw, T 10 Torqx
Materials: New Pump

These instructions assume that you have access to the right side of the dispenser. There are six syrup pumps, and any of them can fail. Use the following steps to replace a Brand Pump.

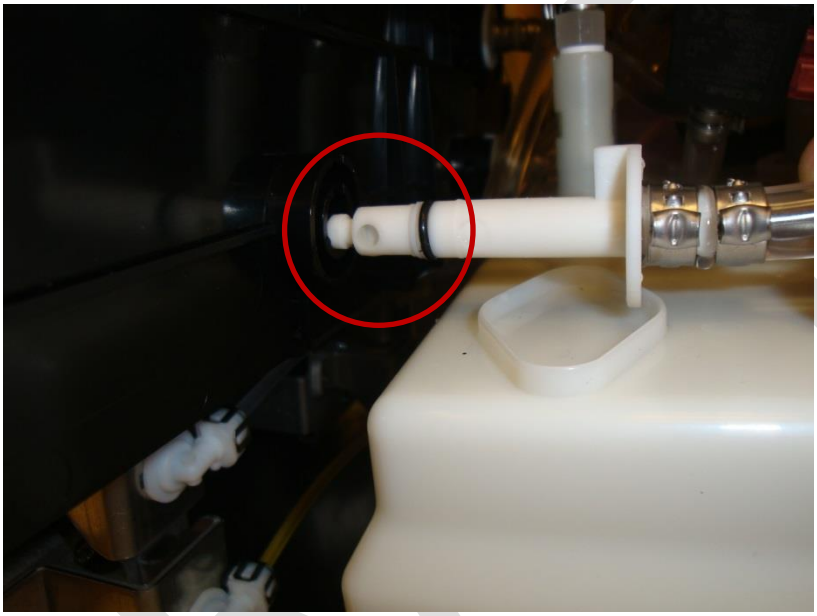
Step	Action
1	Remove the shroud.
2	Open the right door (syrup door).
3	Unscrew the thumb screws at the bottom of the tower.
4	Pull the syrup tower out. Be careful not to pull the tower completely out of the dispenser. Once you feel some resistance, stop. CAUTION: Do not damage the wiring harness, which is attached to the syrup tower.

Step	Action
5	Remove the cartridges from 6A and 6B.
6	Go to the back of the dispenser.
7	Use the T 10 Torqx to remove the Outlet fitting on the right and left side. It will be very hard to do it on the left side.
8	Four screws hold the cover over the brand pumps. Remove the four screws using the Cross Screw Driver. To remove screws from the left side is a blind operation. You have to feel where the screw is with your hand and then unscrew it. 
9	Lift the failed pump off of the power strip.
10	Disconnect the syrup inlet from the top of the smart carb tank.
11	Connect the new pump to the syrup inlet that is at the top of the smart carb tank.
12	Push the pump back down on the power strip.
13	Put cover back on.
14	Go to front of the syrup tower and reinsert the syrup cartridges that you removed.
15	Push the Syrup Tower back in to the dispenser.
16	Screw the thumb screws back in.

Coca-Cola freestyle

Replacing the Cartridge Selector

The Gandalf Dispenser has two cartridges for the Brand syrup: side A and side B. When side A is empty, the system automatically switches to its counterpart on side B. The Cartridge Selector lets the dispenser know when to switch to side B to pull the syrup. The Cartridge Selector is located in the back of the syrup tower.



REMOVING THE CARTRIDGE SELECTOR

Tools: Clean Fingers
Materials: New Cartridge Selector

Use the following steps to remove the failed cartridge selector.

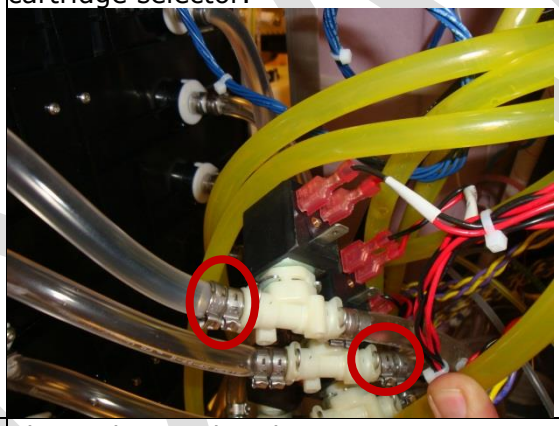
Step	Action
1	Remove the shroud, and open the (right) door to the syrup tower.
2	Stand in front of the syrup tower, locate, and remove the cartridges that you want to remove.
3	Loosen the three thumb screws located at the bottom of the syrup tower.
4	Slide the syrup tower out. CAUTION: Be careful removing the syrup tray.
5	Go to the right side of the dispenser, and locate the cartridge selector you want to remove.
6	Remove the silver clip from the top of the cartridge selector.

Step	Action
7	Pull the cartridge selector straight out.
8	Disconnect the syrup outlet from the cartridge selector by pulling the retaining clip up and out.
9	Cut the tubing that connects to the A side.

INSTALLING THE NEW CARTRIDGE SELECTOR

Tools: Clean Fingers
Materials: Replacement cartridge selector, Clamper

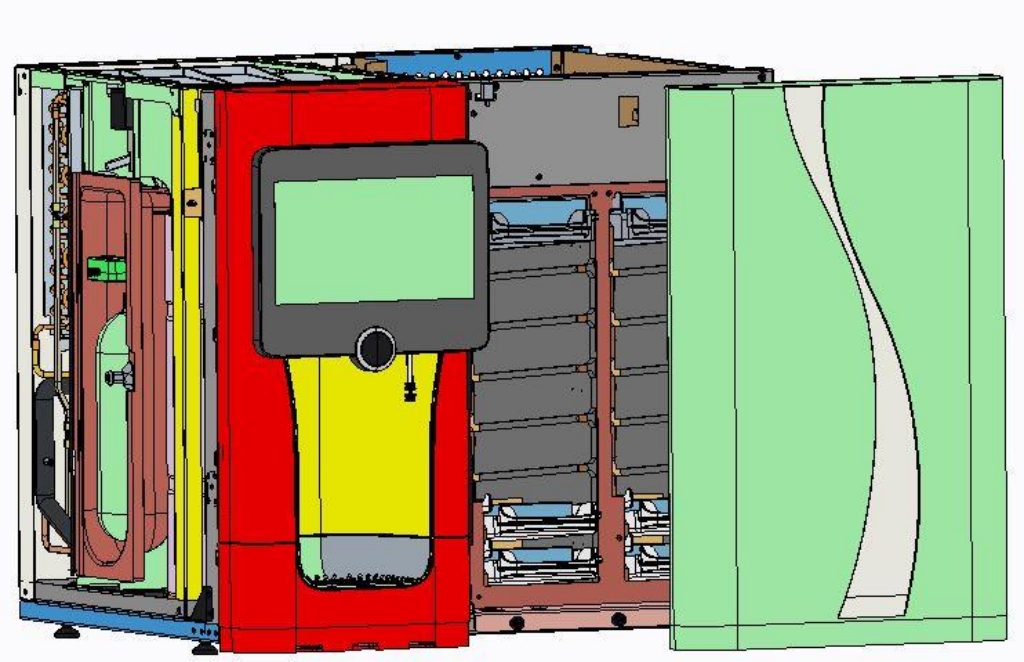
Follow the steps in Removing the Cartridge Selector before attempting these steps. Use the following steps to install a new cartridge selector.

Step	Action
1	Removing the Cartridge Selector from the back of the syrup tower.
2	Insert the new cartridge selector.
3	Connect the silver retaining clips at the top and base of the cartridge selector. 
4	Clamp the A side tubing.
5	Use your fingers to insert the three screws at the bottom of the syrup tower that secure the tower to the dispenser.
6	Slide the syrup tower back into the dispenser.
7	Close the syrup tower door, and cover the dispenser with the shroud.

Doors and Door Lock

Maintaining the Doors and Door Lock

The dispenser doors close to protect the interior of the dispenser. You will remove the doors to make repairs.



REPLACING THE RIGHT DOOR

Use the following steps to remove the right door on the dispenser. This door needs to come all of the way off of the dispenser so that you can fully get to the dispenser.

Tools: Cross Screw Driver
Materials: Replacement right door

Step	Action
1	Remove the Shroud.
2	Unlock the right door. The lock is on top of the door.
3	Using a Cross Screw driver, loosen the two screws securing the door to the dispenser. Do not remove the screws. 
4	Lift the door up and slide it out of the hinge.

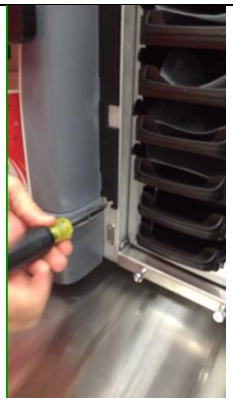
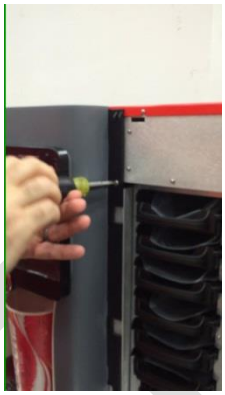
Step	Action
	
5	Slide the new door on to the hinge.
6	Tighten the screws.
7	Put the Shroud back on.

OPENING THE LEFT DOOR

If you need to repair the nozzle, syrup lines, or get to items on top of the Smart Carbonator, you must open the left door of the dispenser. Use the following steps to open the Left Door of the dispenser.

Tools: Cross Screw Driver
Materials: None

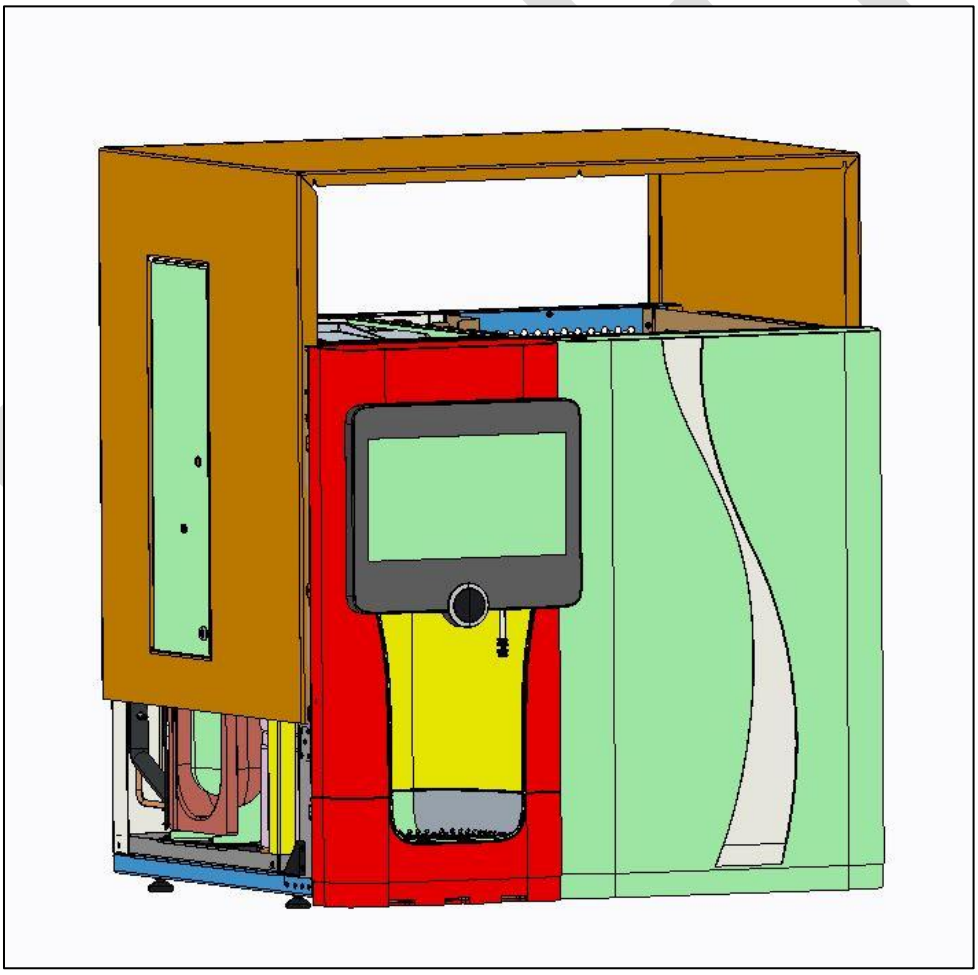
Step	Action
1	Remove the Shroud.
2	Open the left door.
3	Using the Cross Screw Driver, remove the screw at the bottom of the dispenser and then remove the screw at the top of the dispenser.

Step	Action
	 **Remove bottom screw first** 
4	Pull the door open.

Shroud (Cladding)

MAINTAINING THE SHROUD COMPONENTS

The shroud covers the top and two sides of the dispenser.



Coca-Cola freestyle

Removing the Cladding

There are screws all around the cladding, connecting it to the dispenser. You need 46 inches vertically to safely remove the cladding.

Tools: #1 Cross Screw Driver
Materials: None

Use the following steps to remove the cladding.

Step	Action
1	Make sure that both the left and right doors are closed.
2	Using the #1 Cross Screw Driver loosen all of the screws around the front of the dispenser.
3	Go to the back of the dispenser and loosen all of the screws around the back of the dispenser.
4	Pull the cladding out, away from the dispenser on both sides. 

Step	Action
5	Standing in front of the dispenser, pull the cladding up and off of the dispenser. 

Coca-Cola freestyle

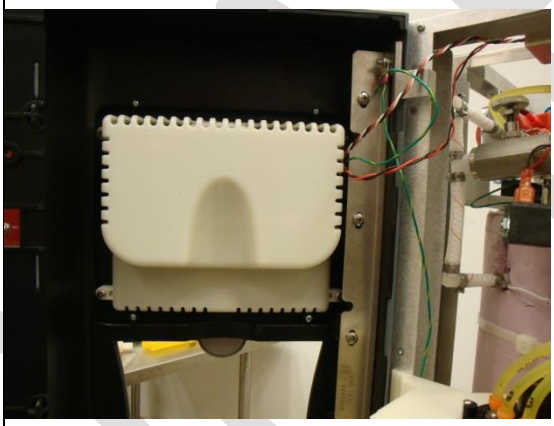
HMI/CDM

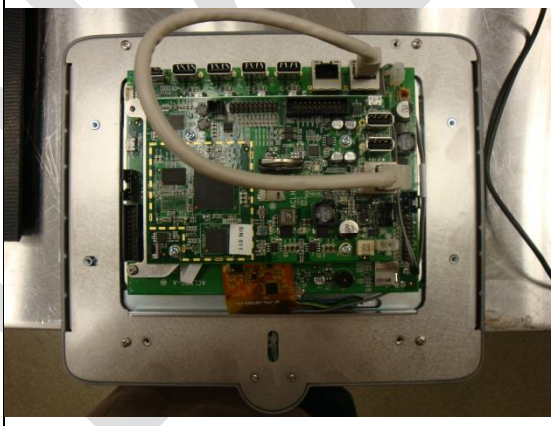
The HMI/CDM is located inside the left door. The HMI is the screen on the front of the dispenser. The CDM is the board behind the HMI.

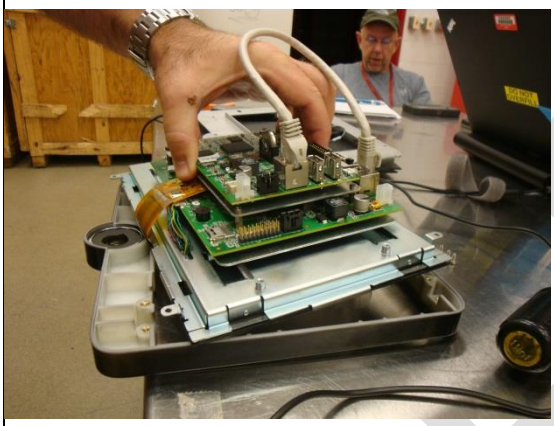
REPLACING THE HMI/CDM

Tools: Cross Screw Driver, #1 Cross Screw Driver
Materials: New HMI/CDM

Use the following steps to replace an HMI/CDM.

Step	Action
1	Open the left door that houses the Nozzle body, and locate the screws at the bottom of the door.
2	Using the Cross Screw Driver, remove the two bottom screws, and place them somewhere safe. Result: The cover of the HMI/CDM is visible. 
3	Remove the cover by unscrewing the top two screws, carefully supporting the UIM with one hand as you remove the screws.
4	Take the cover off of the door (remove from the left door). Result: The CDM is visible.

Step	Action
	Remove the harness and ground wire (green and white): 28.5vdc out goes in the upper right connector. There are two red and two black wires on that connector. The bottom right has two wires. 
5	Remove the four screws, bottom two first, that secure the HMI. CAUTION: Hold the HMI with one hand as you do this or the HMI will fall out and get damaged.
6	Carefully lay the HMI/CDM down with the CDM facing you. 
7	Remove the four #1 screws using the #1 Cross Screw driver.
8	Remove the harness that holds the bracket, and then remove the bracket (has the push-to-our on it).

Step	Action
9	Remove the four screws to get the HMI/CDM out of the case that holds it. 
10	Lift the entire old HMI/CDM up.
11	Put the new HMI/CDM inside the bracket.
12	Put the HMI/CDI back in its case, and screw in the four screws.
13	Put it back in the harness, and screw in the four #1 screws.
14	Reconnect the harness and ground wire (green and white): 28.5vdc out goes in the upper right connector. There are two red and two black wires on that connector. The bottom right has two wires.
15	Put the cover on the HMI/CDI.
16	Close the left door.

Coca-Cola freestyle

Push-to-Pour Switch

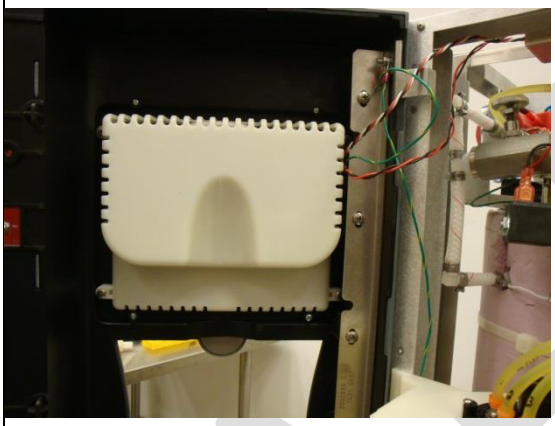
The Push-to-Pour is the mechanism that consumers push to get the dispenser to pour. It is located on the front of the dispenser on the left door.

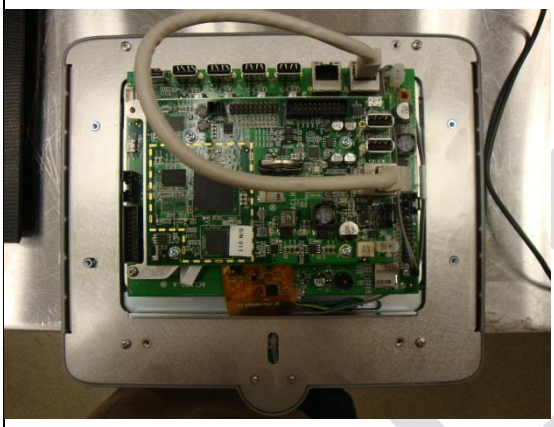
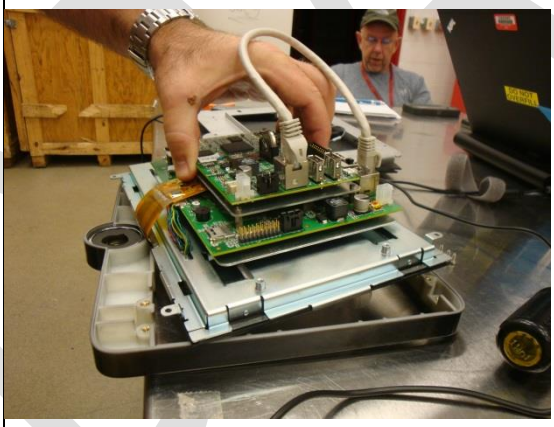
REPLACING THE PUSH-TO-POUR SWITCH

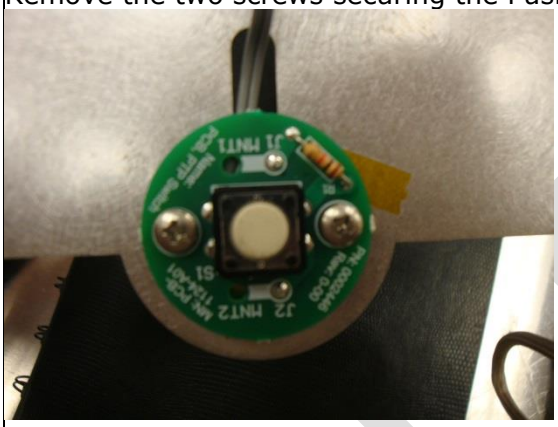
Tools: Cross Screw Driver, #1 Cross Screw Driver
Materials: Push-to-Pour switch

Use the following steps to replace the Push-to-Pour unit on the dispenser.

Step	Action
1	Open the left door that houses the Nozzle body, and locate the screws at the bottom of the door.

Step	Action
2	Using the Cross Screw Driver, remove the two bottom screws, and place them somewhere safe. Result: The cover of the HMI/CDM is visible. 
3	Remove the cover by unscrewing the top two screws, carefully supporting the UIM with one hand as you remove the screws.
4	Take the cover off of the door (remove from the left door). Result: The CDM is visible.
	Remove the harness and ground wire (green and white): 28.5vdc out goes in the upper right connector. There are two red and two black wires on that connector. The bottom right has two wires. 
5	Remove the four screws, bottom two first that secure the HMI. CAUTION: Hold the HMI with one hand as you do this or the HMI will fall out and get damaged. (When installing, put the top two screws in first, and then the bottom two screws.)

Step	Action
6	Carefully lay the HMI/CDM down with the CDM facing you. 
7	Remove the four #1 screws using the #1 Cross Screw driver.
8	Remove the harness that holds the bracket, and then remove the bracket, which has the Push-to-Pour on it.
9	Remove the four screws to get the HMI/CDM out of the case that holds it. 
10	Locate the circle at the bottom of the bracket.

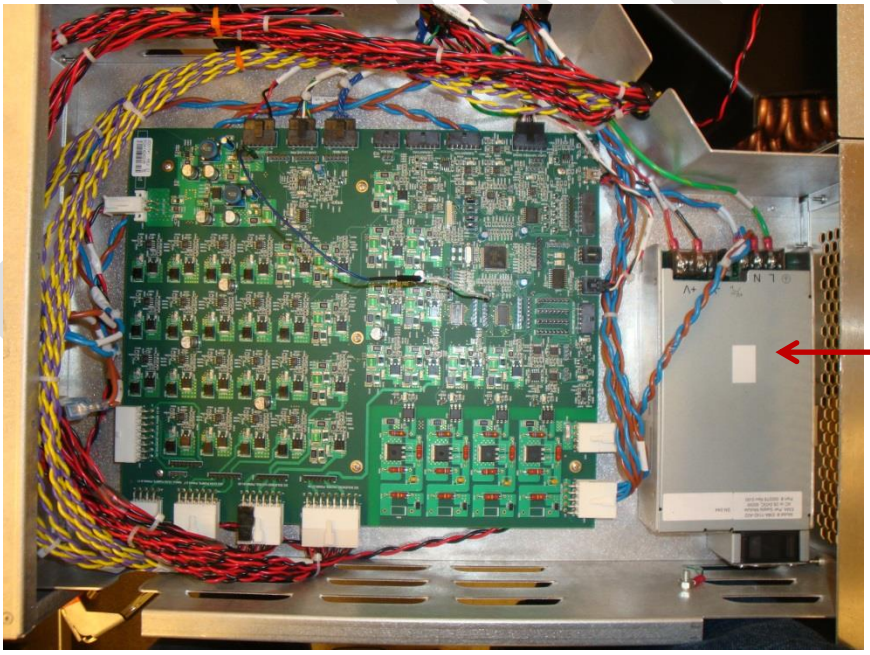
Step	Action
11	Remove the two screws securing the Push-to-Pour to the bracket. 
12	Put the HMI/CDI back in its case, and screw in the four screws.
	Remove the old Push-to-Pour and insert the new one.
	Screw the Push-to-Pour back into the bracket.
13	Put the HMI/CDI back in the harness, and screw in the four #1 screws.
14	Reconnect the harness and ground wire (green and white): 28.5vdc out goes in the upper right connector. There are two red and two black wires on that connector. The bottom right has two wires.
15	Put the cover on the HMI/CDI.
16	Close the left door.

Power Supply

REPAIRING THE POWER SUPPLY AND ITS COMPONENTS

The components of the power supply module that you might service includes the power supply, main power switch, main power filter, and the Power Breaker.

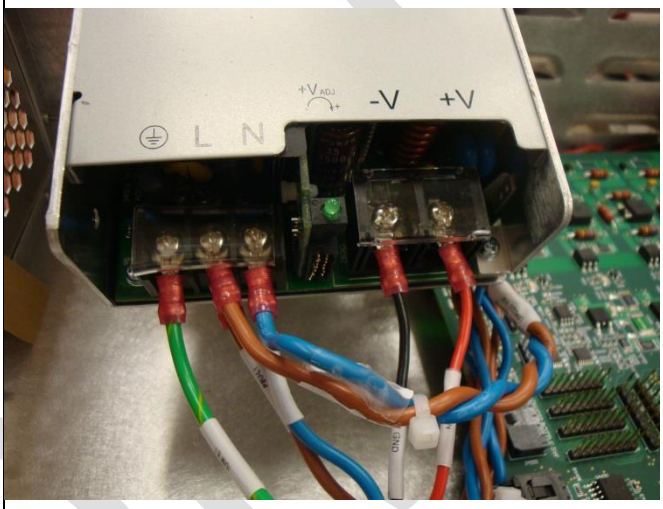
Power Supply



This is an aerial view of the top of the dispenser with the cladding removed. Towards the very back is the Power Supply.

Tools: #1 Cross Screw Driver
Materials: New Power Supply

Use the following steps to remove a failed Power Supply and to install a new one.

Step	Action
1	Unplug the dispenser.
2	Remove the Shroud.
3	Open the right door (Syrup Tower door) of the dispenser, and pull the Syrup Tower out as far as safely possible.
4	Use the #1 Cross Screw Driver to remove the two screws that secure the Power Supply to the dispenser. 
5	Disconnect all wires from the Power Supply.
6	Remove the failed Power Supply, and put the new Power Supply in.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>7</td><td>Reconnect the wires to the new Power Supply:
<table>
<tr><th>Terminal</th><th>Wire</th><th>Color</th></tr>
<tr><td>Ground</td><td>IOM E1</td><td>Green with a yellow stripe</td></tr>
<tr><td>L</td><td>AC INPUT</td><td>Brown</td></tr>
<tr><td>L</td><td>PSU-L1</td><td>Brown</td></tr>
<tr><td>N</td><td>AC INPUT</td><td>Blue</td></tr>
<tr><td>N</td><td>AC INPUT</td><td>Blue</td></tr>
<tr><td>-V</td><td>GND</td><td>Black</td></tr>
<tr><td>+V</td><td>28.5vdc n</td><td>Red</td></tr>
</table>

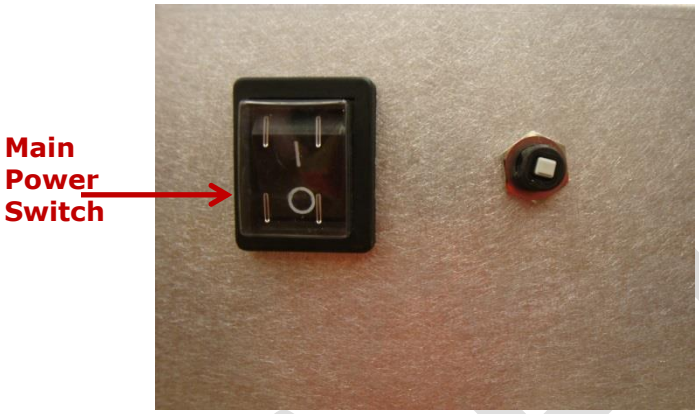
</td></tr>
</table>

Coca-Cola freestyle

Main Power Switch

REPLACING THE MAIN POWER SWITCH

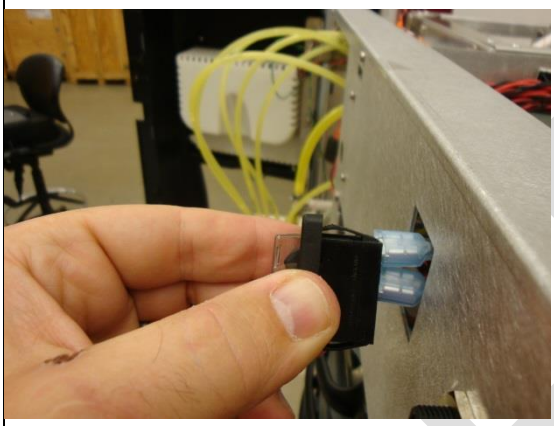
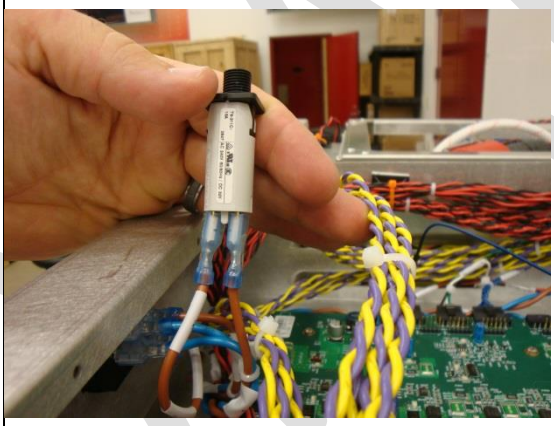
The Power Switch is located in the front of the dispenser above the Syrup Tower.



Tools: Clean hands
Materials: New switch

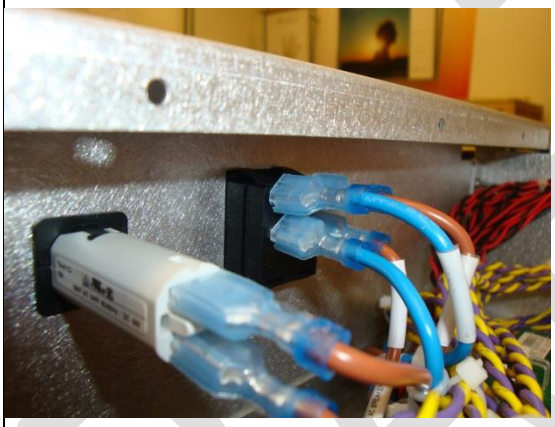
Use the following steps to remove the old power switch and install a new one.

Step	Action
1	Disconnect incoming power.
2	Open the syrup tower door. RESULT: The Power Switch is located at the top of the syrup tower.

Step	Action
3	Compress the tabs on the top and the bottom, and pull the switch out of the dispenser. 
4	Disconnect the wire harness. 
5	Place the new switch into the bracket.

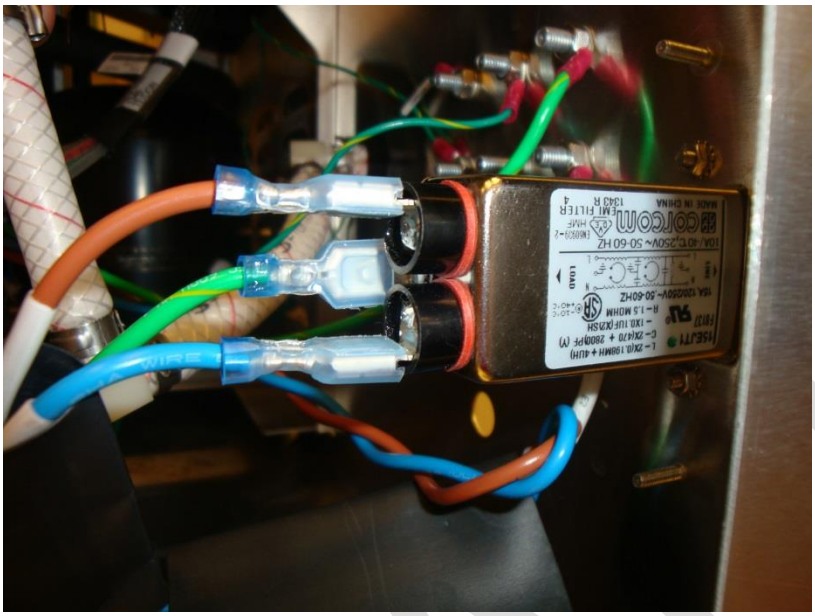
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>6</td><td>Connect the wire harness to the new switch:

<table>
<tr><th>Terminal</th><th>Wire</th><th>Color</th></tr>
<tr><td>5B</td><td>S1</td><td>Blue</td></tr>
<tr><td>4B</td><td>L2</td><td>Blue</td></tr>
<tr><td>1A</td><td>L1</td><td>Brown</td></tr>
<tr><td>2A</td><td>S1</td><td>Brown</td></tr>
</table>

  </td></tr>
<tr><td>7</td><td>Push the Power Switch back into place.</td></tr>
<tr><td>8</td><td>Close the syrup tower door.</td></tr>
</table>

Coca-Cola freestyle

Main Power Filter

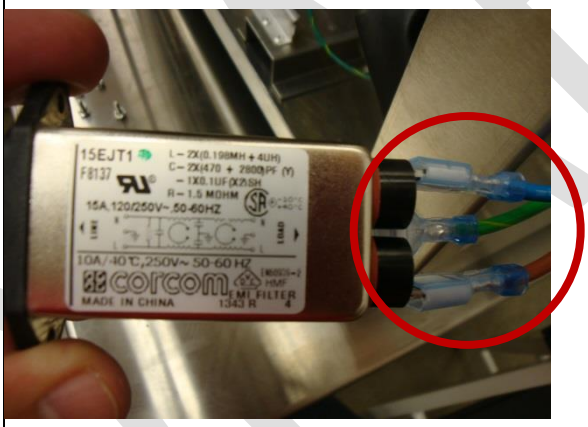


REPLACING THE MAIN POWER FILTER

Tools: #1 Cross Screw Driver
Materials: New Main Power Filter

Use the following steps to remove the old power filter and install a new one.

Step	Action
1	Remove the power cable from the dispenser. 

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>2</td><td>Remove the shroud.</td></tr>
<tr><td>3</td><td>Go to the lower, back area of the dispenser, and locate the main power filter.</td></tr>
<tr><td>4</td><td>Unscrew the thumb screws and slide the Syrup Tower out.</td></tr>
<tr><td>5</td><td>Disconnect the three wire connectors from the main power filter.</td></tr>
<tr><td>6</td><td>Remove the power filter. It is secured with two #1Cross screws on the outside and nuts on the inside. Simultaneously hold the nut and remove the screw.</td></tr>
<tr><td>7</td><td>Insert the new main power filter.</td></tr>
<tr><td>8</td><td>Connect the three wire connectors to the new main power filter.
<table>
<tr><th>Terminal</th><th>Wire</th><th>Color</th></tr>
<tr><td>L</td><td>L1</td><td>Brown</td></tr>
<tr><td>N</td><td>L2</td><td>Blue</td></tr>
<tr><td>Ground</td><td>E2</td><td>Green with yellow stripes</td></tr>
</table>

</td></tr>
<tr><td>9</td><td>Use the #1 Cross Screw driver to put the screws back into the main power filter mount. Hold the nut on the inside while you screw the screw on the outside.</td></tr>
<tr><td>10</td><td>Carefully push the Syrup Tower back into the dispenser, and tighten the thumb screws.</td></tr>
<tr><td>11</td><td>Close both dispenser doors, and lock the syrup tower door.</td></tr>
<tr><td>12</td><td>Put Shroud back on.</td></tr>
</table>

Coca-Cola freestyle

Power Breaker

The Power Breaker is located at the front of the dispenser on the right door.

REPLACING POWER BREAKER

Tools: Clean, dry hands, Adjustable Wrench
Materials: New Power Breaker
NOTE: When this breaker is tripped, the center small white button protrudes.

Use the following steps to replace the Power Breaker.

Step	Action
1	Remove the shroud.
2	Go to the front of the dispenser.
3	Use the adjustable wrench to remove the retaining nut.
4	Pull the breaker out and up from the inside of the dispenser
5	Disconnect the CB1 Brown and S1 Brown wires from the breaker.
6	Insert the new Power breaker.
7	Connect the CB1 Brown and S1 Brown wire connectors to the new power breaker.
8	Use the adjustable wrench to put the retaining nut on.
9	Cover the dispenser with the shroud.

Alerts, Errors, and Logs

ALERTS AND ERRORS

Alerts and errors can occur in three situations:

- During installation
- In normal operation mode
- NCUI/Status screen

In this section, we provide cause, effect, and rules for each alert and error.

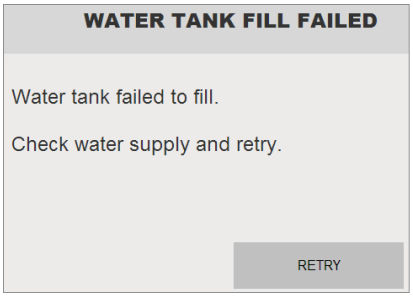
Installation Alerts and Errors

There are four errors that you might encounter during installation:

- Water fill fails
- Water fill fails last attempt
- Pressure optimization failed
- High temperature error

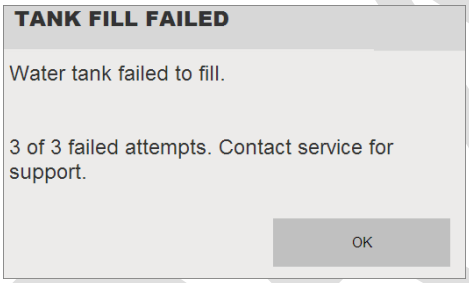
WATER TANK FILL FAILED ERROR

This error occurs during the initialization stage of installation when the water tank does not properly fill. You have three attempts to correct this error.



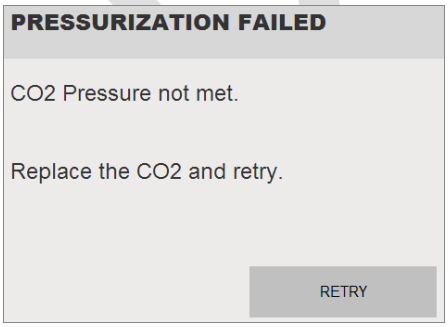
WATER FILL FAILS LAST ATTEMPT ERROR

This error occurs during installation after three failed attempts at refilling the tank.



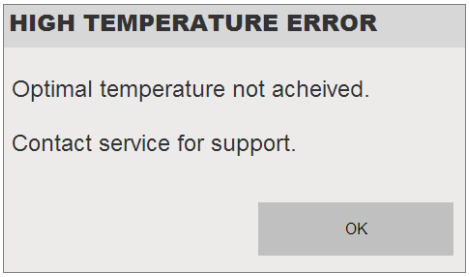
CO2 PRESSURE FAILS ERROR

This error occurs during installation when the pressure does not reach 80 DPSI within 90 seconds. You can retry five more times.



HIGH TEMPERATURE ERROR

This error occurs during installation when the system does not cool within two hours during initialization.



Normal Operation Mode Alerts and Errors

The customer sees the following alerts that eventually turn into Errors if not successfully rectified.

INSUFFICIENT WATER SUPPLY ALERT

This alert occurs during re-initialization when the water tank does not properly refill after the customer has three unsuccessful attempts or retries. It is then logged as an Insufficient Water Supply error.

INADEQUATE PRESSURE ALERT

This alert occurs when the CO2 pressure goes below 80 DPSI for more than 30 seconds. The customer can have the dispenser try five more times. After five retries, this alert becomes an error.

HIGH TEMPERATURE ALERT

This alert occurs when the temperature in the tank exceeds 39 degrees Fahrenheit for more than 15 minutes. When the system presents this error, dispensing stops and no can pour anything. All icons are greyed and inaccessible until the dispenser reaches the correct temperature.

SOLD OUT ALERT

This alert displays when an ingredient cartridge is empty. The customer just replaces the old cartridge with a new one.

Coca-Cola freestyle

NCUI / Status Screen Errors

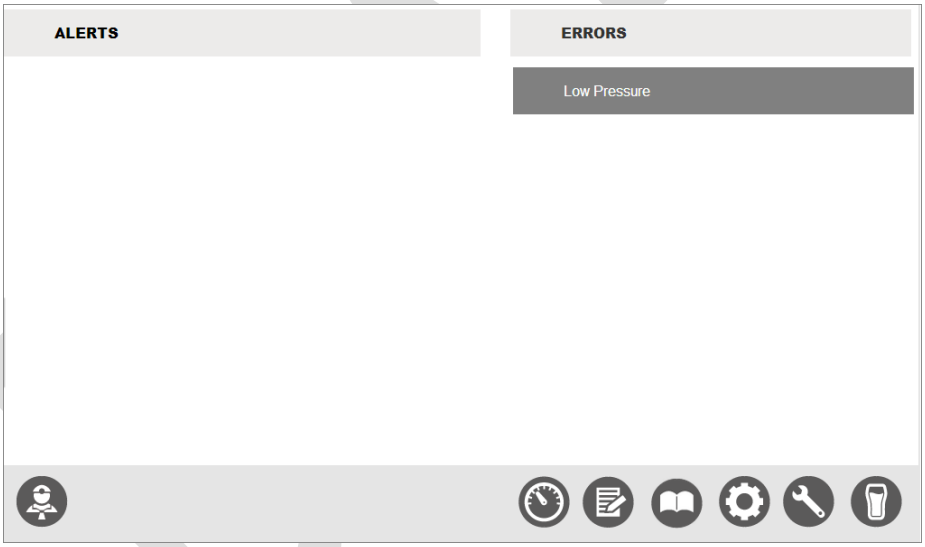
The Status screen displays all Errors. If there are multiple errors, they display under the Errors column in sequential order. They do not list; instead, after you fix an error, the next one appears.

ACCESSING THE STATUS SCREEN

To access the status screen,

Step	Action	
	If you are at the . . .	**Then . . .**
1	Main screen	Press drink would like.
	Crew Serve screen	Press the wrench icon.

The Status screen displays with any issues listed under the Errors column. The customer cannot address errors.



HIGH TEMPERATURE ERROR

This error occurs when the system does not cool within two hours during initialization. In normal operation mode, the system displays this error when the system reaches 39 degrees or above for more than 15 minutes.

LOW PRESSURE ERROR

This error occurs after five failed retries to get adequate pressure. This usually means that the CO2 is low or empty. Replace the CO2.

INSUFFICIENT WATER SUPPLY ERROR

This error occurs after three failed retries to properly refill the water tank.

Logs

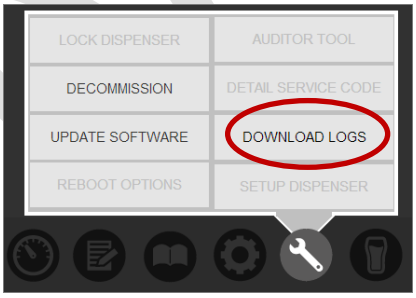
There are two types of log files, Alarm Logs and Event Logs. The Alarm Logs include the alerts and errors discussed in the beginning of the chapter. The Event Logs provide consumption data and information about product inventory.

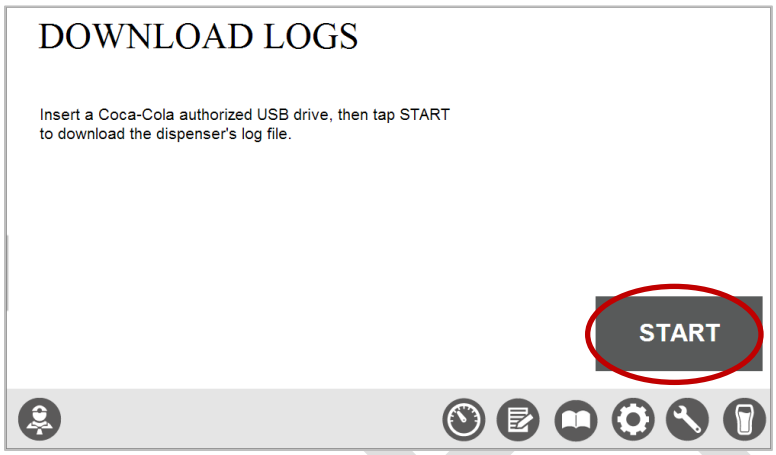
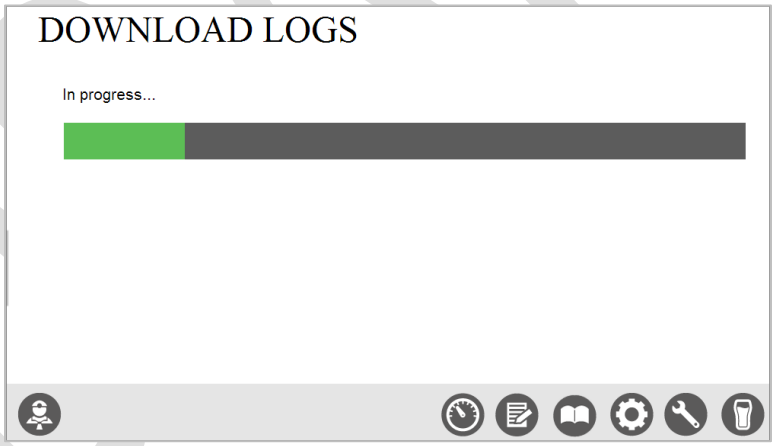
Download the logs every two weeks to receive reports about alerts and events. The business uses these logs to glean they type of volume occurs on the dispenser. Service uses these logs to monitor the health of the dispenser.

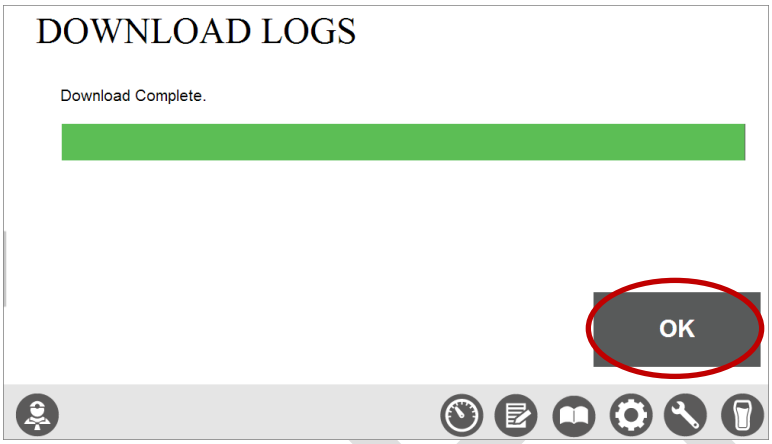
DOWNLOADING LOGS

Use the following steps to download logs.

Materials: USB drive

Step	Action
1	Go to the NCUI.
2	Select the Utilities icon.
3	From the Utilities menu, select Download Logs. 
4	Insert the USB drive into the USB port located on the HMI.

Step	Action
5	On the Download Logs screen, select START. 
	RESULT: A progress bar shows the progress of the download and when the download completes. 

Step	Action
6	Select OK on the Download Complete message. 
7	Remove the USB drive.
8	Insert the USB drive into a computer.
9	Open the files and verify that the logs were properly captured.

Troubleshooting

TROUBLESHOOTING

The chart on the following page provides troubleshooting information. You can map the symptom to the component and get an assessment of the issue and actions to take to rectify the issue.

1	Component / Symptom	Brand Pump (8) 28.5 VDC	Cartridge Switch Valve (6) 28.5 VDC	Flavor Pump (4) 28.5 VDC	CO2 Charge Solenoid 28.5 VDC	Carbonator Tank Fill Valve 28.5 VDC	Recirculation Valve 115 VAC	Soda Water Dispense Valve 28.5 VDC	Non-Carb 3-way Valve 28.5 VDC	Non-Carb Dispense Valve 28.5 VDC	Carb Tank Heater	Condenser Fan 28.5 VDC	Compressor 115 VAC	Carbonator Tank Fill Pump 28.5 VDC	UIM/HMI	Recirculation Pump 115 VAC	ACTION
2	Brand Sold-out Cartridge is full	X	X														Confirm package is full. Reset fuel Gauge
3	No Water					X	X		X	X	X			X		X	Confirm voltage/water supply
4	No Soda				X	X	X	X						X		X	Confirm voltage
5	Screen Unresponsive														X		Disconnect and reconnect the harnesses
6	No Flavor (orange, cherry...etc.)			X													Confirm voltage
7	Off Taste (weak)																Calibrate the system
8	Off Taste (strong)																Calibrate the system
9	Off Taste (warm/flat)										X	X	X				Confirm voltage
10	Water Leak																Visual inspection
11	Syrup Leak																Visual inspection
12	CO2 leak				X												Inspect CO2 circuit for leaks
13	Cartridge Door Won't Open																Clean pivots...
14	Nozzle Door Won't Open																Clean pivots...
15	Drip Tray Missing/Damaged																Replace
16	Scratched Doors/Cladding																Replace
17	Noisy																Inspect screws for cladding, doors...etc.

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1	Component / Symptom	Brand Pump (8) 28.5 VDC	Cartridge Switch Valve (6) 28.5 VDC	Flavor Pump (4) 28.5 VDC	CO2 Charge Solenoid 28.5 VDC	Carbonator Tank Fill Valve 28.5 VDC	Recirculation Valve 115 VAC	Soda Water Dispense Valve 28.5 VDC	Non-Carb 3-way Valve 28.5 VDC	Non-Carb Dispense Valve 28.5 VDC	Carb Tank Heater	Condenser Fan 28.5 VDC	Compressor 115 VAC	Carbonator Tank Fill Pump 28.5 VDC	UIM/HMI	Recirculation Pump 115 VAC	ACTION
11	Syrup Leak																Visual inspection
12	CO2 leak				X												Inspect CO2 circuit for leaks
13	Cartridge Door Won't Open																Clean pivots...
14	Nozzle Door Won't Open																Clean pivots...
15	Drip Tray Missing/Damaged																Replace
16	Scratched Doors/Cladding																Replace
17	Noisy																Inspect screws for cladding, doors...etc.
18	Screen Dark														X		Disconnect and reconnect the harnesses
19	Drain Clogged																Clean/Clear
20	Insufficient Water Supply Alert					X			X					X			Check water supply valve
21	Insufficient Water Supply Error					X			X					X			Check water supply valve
22	Inadequate Pressure Alert				X												Change/Confirm full CO2 bottle
23	Inadequate Pressure Error				X												Change/Confirm full CO2 bottle
24	High Temperature Alert										X	X					Confirm compressor voltage
25	High Temperature Error										X	X					Confirm compressor voltage
26	Sold Out Alert	X	X														Change Cartridge

Maintenance

MAINTENANCE TASKS

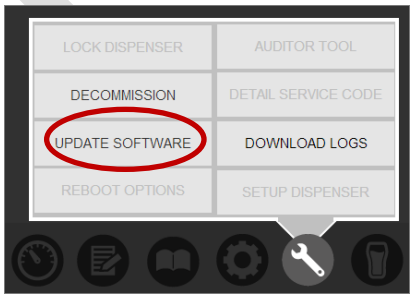
This chapter provides instructions for tasks that you perform to keep the dispenser running appropriately.

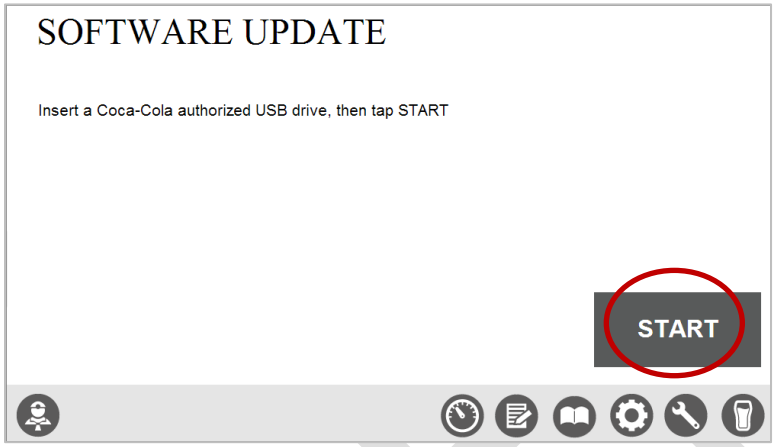
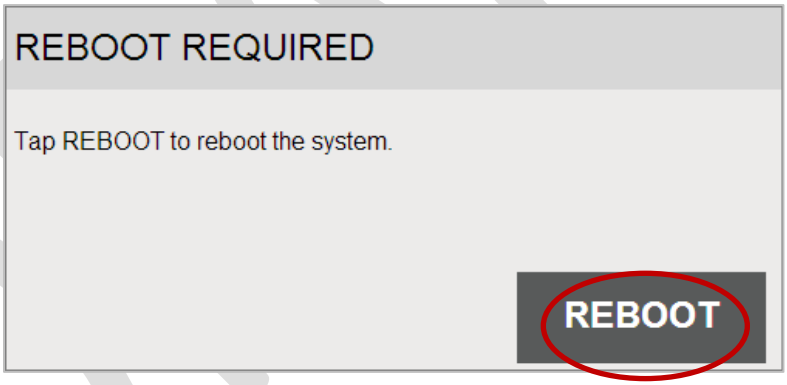
Software Updates

Coca-Cola Freestyle will inform the bottler when an upgrade is available. It takes approximately 18 minutes to upgrade the software from end-to-end, which includes the HMI/CDM prior to the reboot and the IOM after the reboot.

UPDATING THE DISPENSER SOFTWARE

Use the following steps to update the software on the dispenser.

Step	Action
1	On the HMI, go to the NCUI.
2	Select the Utilities icon.
3	Select UPDATE SOFTWARE. 
4	Insert USB drive into the USB port located on the HMI.
5	Wait 3 ½ minutes for the START button to become active.

Step	Action
6	On the SOFTWARE UPDATE screen, select START.  RESULT: A progress bar shows the progress of the update.
7	After the upgrade completes, reboot the system. 

Step	Action
	RESULT: It takes some time for the system to cycle through the upgrade and come back online. When the system is back online, the following screen is displayed. 
8	After the system comes back online, perform a pour to validate that the upgrade was successful.

freestyle

Sanitization

Perform these instructions once per year.

SANITIZING THE CIRCUIT

Use the following steps to sanitize.

Step	Action
1	Prepare your approved sanitizer per the directions on the packaging.
2	Fill the Sanitizer/Flushing cartridges with sanitizer fluid.
3	Remove the cartridge or cartridges from the cartridge slots, and replace them with the Sanitizer/Flushing cartridges.
4	On the screen, select Flush from the Ingredient subsystem. NOTE: When you insert the Sanitizer/Flushing cartridge the system automatically switches to the Ingredient screen.
5	Continue to press Flush until the circuit runs clear. NOTE: For the Sprite brand, you must feel the stream of fluid. It feels watery and slick when sanitizer is present.
6	Allow the sanitizer to stand in the circuit per the sanitizer's directions after the circuit is clear.
7	Fill the Sanitizer/Flushing cartridge with water to flush the circuit of the sanitizer.
8	Replace the Sanitizer/Flushing cartridges with the syrup cartridges.
9	Select the appropriate brand from the list and prime as needed.

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Ratio

The ratio task is a test to ensure that the dispenser is calibrated properly.

Produkt	Ratio*)		Getränk				
	Sirup/ Wasser	Abw. Ratio	°Brix	Abw. °Brix	CO2 Vol. **)	Abw. [Vol.]	Temperatur
Coca-Cola	1 : 5,50	±0,30	10,9	±0,50	3,40	*-0,30*	≤5°C
Coca-Cola light	1 : 5,50	±0,30	-	-	3,30	*-0,30*	≤5°C
Fanta Orange	1 : 4,40	±0,20	9,2	±0,50	2,70	*-0,30*	≤5°C
Coke Zero	1 : 5,50	±0,30	-	-	3,30	*-0,30*	≤5°C
Sprite	1 : 4,40	±0,20	9,5	±0,50	3,40	*-0,30*	≤5°C
Mezzo Mix	1 : 4,40	±0,20	10,9	±0,50	3,40	*-0,30*	≤5°C

PERFORMING A RATIO TEST

Perform the following steps when you are on-site for an off taste or an audit of the dispenser.

Step	Action
1	Switch the dispenser to CREW SERVE.
2	Open the nozzle door to access the syrup lines at the top of the nozzle.
3	Remove the screw that secures the syrup line to the nozzle body. 

Step	Action
4	Insert the line into the syrup chamber on your ratio cup. 
5	Position the water chamber under the nozzle tip. 
6	On the screen, select L or 600ml pour.