



## SPECIALTY BEVERAGE DISPENSER

### NITROPRO MINI 2290

# Installation, Service and Decommissioning Manual



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# SAFETY INSTRUCTIONS

## READ AND FOLLOW ALL SAFETY INSTRUCTIONS

### Safety Overview

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

### Recognition

Recognize Safety Alerts
 <p>This is the safety alert symbol. When you see it in this manual or on the unit, be alert to the potential of personal injury or damage to the unit.</p>

### Different Types of Alerts

#### **DANGER:**

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

#### **WARNING:**

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

#### **CAUTION:**

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

### SAFETY TIPS

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

NOTE: The dispenser is not designed for a wash-down environment and **MUST NOT** be placed in an area where a water jet could be used.

## QUALIFIED SERVICE PERSONNEL

### **WARNING:**

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit.

ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

IF THE SUPPLY CORD IS DAMAGED, IT MUST BE REPLACED BY THE MANUFACTURER, ITS SERVICE AGENT OR SIMILARLY QUALIFIED PERSONS IN ORDER TO AVOID A HAZARD.

## SAFETY PRECAUTIONS

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

### **WARNING:**

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

FAILURE TO DISCONNECT THE POWER COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

### **CAUTION:**

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

DO NOT STORE EXPLOSIVE SUBSTANCES SUCH AS AEROSOL CANS WITH A FLAMMABLE PROPELLANT IN THIS APPLIANCE.

CHILDREN SHALL NOT PLAY WITH THE APPLIANCE.

CLEANING AND USER MAINTENANCE SHALL NOT BE MADE BY CHILDREN WITHOUT SUPERVISION.

## SHIPPING AND STORAGE

### **CAUTION:**

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

## MOUNTING ON A COUNTER

### **WARNING:**

When installing the unit on a counter top, the counter must be able to support a weight in excess of 185 lbs. (83.9 kg.) to insure adequate support for the unit.

FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

THE APPLIANCE HAS TO BE PLACED IN A HORIZONTAL POSITION



## R290 REFRIGERANT WARNINGS



**WARNING!** R290 Refrigerant used in this dispenser is flammable. Follow the Warnings listed below to avoid hazards.

**⚠ DANGER:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. Do Not Use Mechanical Devices To Defrost Refrigerator. Do Not Puncture Refrigerant Tubing.

**⚠ DANGER:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing.

**⚠ CAUTION:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. Consult Repair Manual/Owner's Guide Before Attempting To Install or Service This Product. All Safety Precautions Must be Followed.

**⚠ CAUTION:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. Dispose Of Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerant Used.

**⚠ CAUTION:**

Risk Of Fire Or Explosion Due To Puncture Of Refrigerant Tubing; Follow Handling Instructions Carefully. Flammable Refrigerant Used.

**⚠ WARNING:**

Do not use electrical appliances inside the food/ice storage compartments unless they are of the type recommended by the manufacturer.

**⚠ WARNING:**

To reduce flammability hazards the installation of this appliance must only be carried out by a suitably qualified person.

**⚠ WARNING:**

Any fluid circuits connected to the appliance shall safely release abnormal pressure. It shall not allow the release of flammable refrigerant into areas served by the other circuits if these do not comply with minimum room area limit.

The appliance is to be installed in accordance with the Safety Standard for Refrigeration Systems.

**⚠ WARNING:**

Appliances and their surroundings shall not attain excessive temperatures in normal use.

**⚠ WARNING:**

**Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.**

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

**⚠ WARNING:**

**Keep any required ventilation openings clear of obstruction.**

Notice that servicing shall be performed only as recommended by manufacturer.



## SPECIFICATIONS

Table 1

Line Voltage - V		115
Frequency - Hz		60
Phase		1
Max Current - A		5
Operating Ambient temperature - °F (°C)		50 - 90 (10 - 32)
Water Inlet Pressure - psi (Kpa)		40 - 65 (275.8 - 448.2)
Water Inlet Temperature - °F (°C)		40 - 90 (4 - 32)
Water Inlet Size - Inches (mm)		3/8" (95) SAE Male flare fitting on dispenser
Equipment Weight - Lbs (Kgs)	Dry	120 (54.4)
	Operating	185 (83.9)
Ice Bank Weight - Lbs (Kgs)		6 - 8 (2.7 - 3.6)
Clearance Requirement	Top - Inches (mm)	12 (348)
	Sides - Inches (mm)	4 (101.6)
	Back - Inches (mm)	4 (101.6)
Unit Dimensions	Height - Inches (mm)	34.05 (865), 30.05 (763) Without legs
	Width - Inches (mm)	10.44 (265)
	Depth - Inches (mm)	24.47 (621.5), 25.91 (658) at handles

## UNIT DIMENSIONS

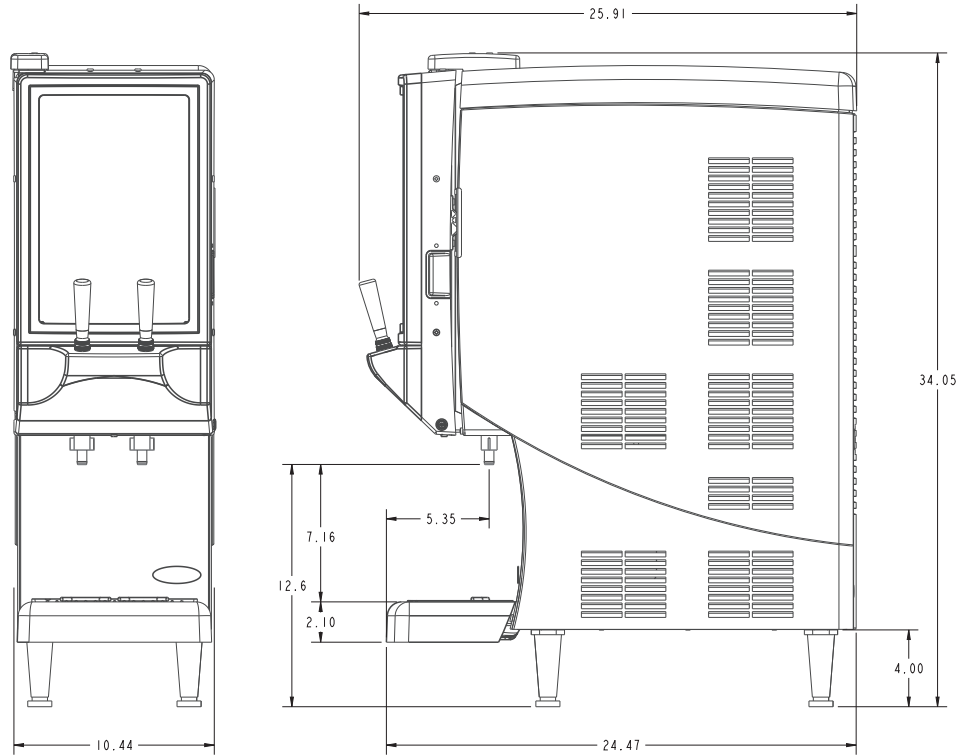


Figure 1

## RECEIVING

Each unit is completely tested and inspected before shipment. At the time of shipment, the carrier accepts the unit and any claim for damage must be made with the carrier.

Upon receiving the unit(s) from the carrier, inspect the carton for visible damage. If damage exists, have the carrier make a note on the bill of lading and file a claim with the carrier.

## UNPACKING

- Remove staples securing carton to pallet.
- Lift carton up and off of unit.
- Remove inserts and shipping bag.
- Open upper cabinet door and remove installation kit.
- Remove bolts securing unit to pallet.
- Lift unit off of pallet.
- Attach 4" length legs to the unit.

NOTE: Do not lay the unit on it's side or back. This may cause vital oils to drain from the compressor resulting in damage during start-up and consequently voiding the warranty.

**NAMEPLATE DATA**

Table 2

Models	VAC	Amps	Ph	Hz	Refrigerant			Test Pressure psi (kPa) (bar)	
					Oz	Grams	Type	High side	Low side
Nitropro Mini 2290	115	5	1	60	1.83	62	R-290	315 (2171.9) (21.7)	140 (965.3) (9.7)

**ICE BANK/PULL DOWN**

Weight 6-8 lbs. (2.7 - 3.6 kg.). Pull Down: 3 hours at 75°F (24°C)

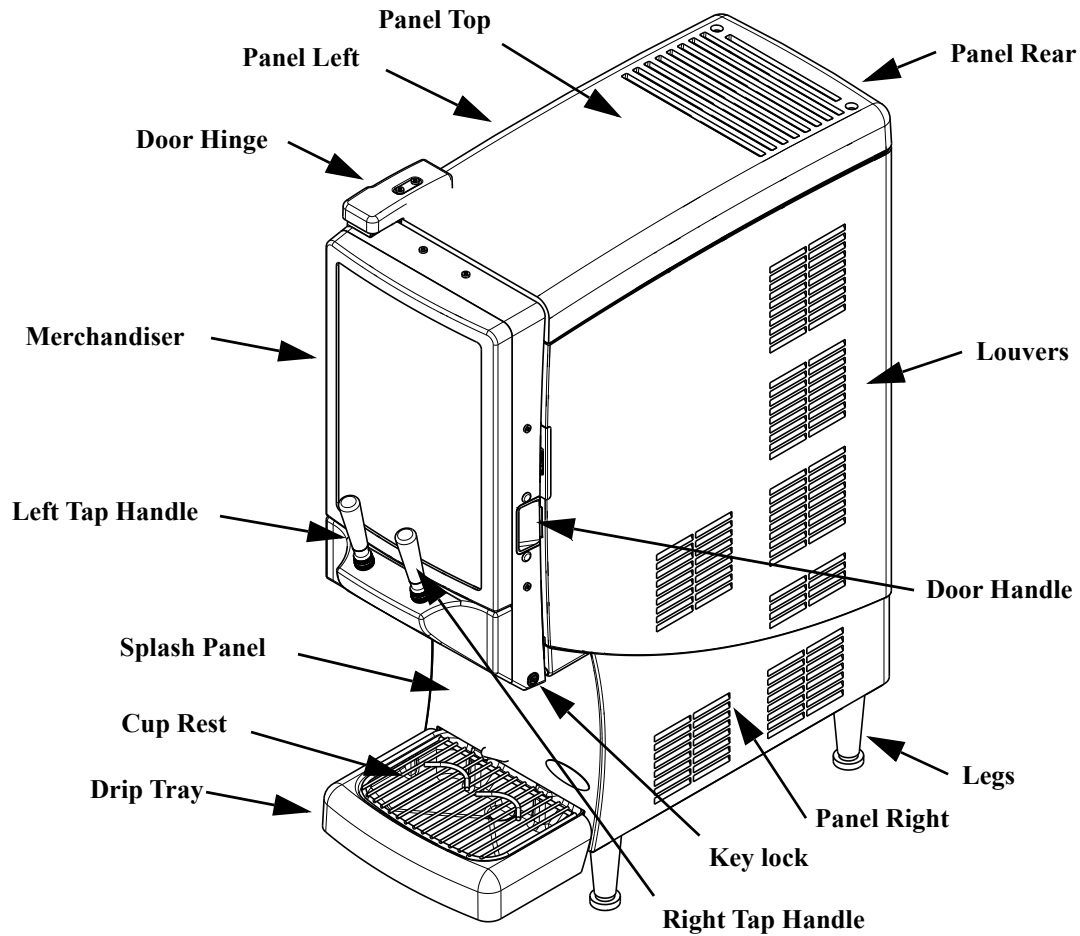


Figure 2

NOTE: Left Tap Handle - Dispenses Still Coffee.







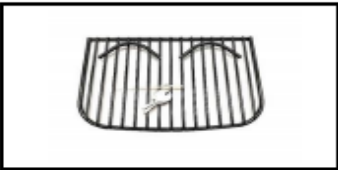





Right Tap Handle - Dispenses Nitro Coffee.

## INSTALLATION KIT

This unit comes with the following components to complete the installation setup.

- Manual
- Legs (4)
- Tube assembly
- BIB adapter
- Drip tray
- Cup rest
- Keys
- Power cord
- 3/8 FFL x 3/8 barbed elbow
- 3/8 Flare gasket

## NitroPro Mini Accessories List

Water Connection	 <p>77040900 - 3/8" Barb Fitting - 1 pc</p>	 <p>40897 - 3/8" Flare Gasket - 1 pc</p>	 <p>309852000 - #17.0 Oetiker Clamp - 5 pcs</p>
	 <p>49034 - 3/8" ID Tubing - 6 FT</p>		
Install	 <p>37958 - 4" Leveling Legs - 4 pc</p>	 <p>620049855 - Drip Tray Black - 1 pc</p>	 <p>620708562 - Cup Rest and Key - 1 pc</p>
	 <p>620069835 - BIB Door Cover - 1 pc</p>		
Connectors	 <p>620049959-001 - Power Cord - 1 pc</p>	 <p>620067410 - BIB Hose Assembly - 1 pc</p>	
Cleaning	 <p>620068460 - Cleaning Adapter - 1 pc</p>		
Manuals	 <p>548000106/NS - Installation Manual - 1 pc</p>		

## REQUIREMENTS

### COUNTER LOCATION

Select a location in a well ventilated area, close to a grounded electrical outlet. If possible do not place the unit close to hot and/or steaming machines.

### MINIMUM AIRFLOW CLEARANCE

The minimum airflow clearance is: 4" (10.16 cm) in back, 12" (30.48 cm) on top, 4" (10.16) at sides and open to the front.

### **IMPORTANT:**

Condenser air is drawn in from the bottom of the rear panel and discharged out the top of the rear panel & side panels. Failure to maintain clearance space will reduce capacity of the unit and cause premature compressor failure.

The Dispenser needs to be placed using 4" legs that are included.

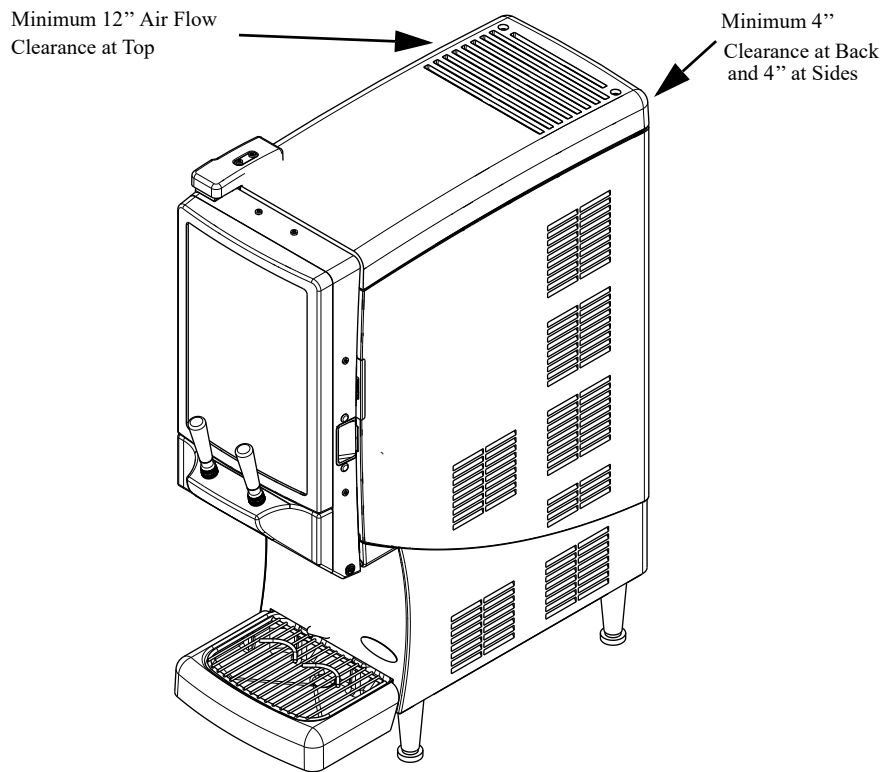


Figure 3

### **CAUTION:**

Ducts connected to an appliance shall not contain a POTENTIAL IGNITION SOURCE.

The indoor equipment and pipes shall be securely mounted and guarded such that accidental rupture of equipment cannot occur from such events as moving furniture or reconstruction activities.

For mechanical ventilation, the air extraction opening from room shall be located equal to or below the refrigerant release point.

For floor mounted units, it shall be as low as practicable. The air extraction openings shall be located in a sufficient distance from the air intake openings to prevent re-circulation to the space.

For mechanical ventilation as specified the lower edge of air extraction opening where air is exhausted from room shall not be more than 100 mm above the floor.

## CONNECTING THE WATER SUPPLY

NITROPRO MINI Dispenser is designed to dispense cold brew nitro coffee. It is very important that the incoming water line be dedicated for use by the dispenser only and does not have other machines connected which could cause a water surge, (i.e., a dishwasher, coffee maker, etc.).

### **⚠ IMPORTANT:**

The water supply should be consistent with proper water quality standards (neutral pH of 7.0 to 8.0), and should not be connected to a water softener. It is the installer's responsibility to ensure that all water connections to the dispenser are sized, installed with adequate backflow protection and maintained to comply with Federal, State, and Local Laws.

## PLUMBING AND WATER SUPPLY REQUIREMENTS

This dispenser must be connected to a COLD WATER system with operating pressure between 40 psi (275.8 kPa) (2.8 bar) minimum (dynamic) and 65 psi (448.2 kPa) (4.5 bar) maximum (static). This water source must be capable of producing a minimum flow rate of 3 fluid ounces (88.7 ml) per second. A shut off valve should be installed in the line before the dispenser. Install a regulator in the line when pressure is greater than 65 psi (620.5 kPa) to reduce it between 40 and 65 psi (dynamic). If water pressure is below 40 psi, a recommended water booster and regulator should be installed prior to the machine inlet.

### **⚠ WARNING:**

This equipment must be installed to comply with the International Plumbing Code of the International Code Council and the Food Code Manual of the Food and Drug Administration (FDA). For models installed outside the U.S.A., you must comply with the applicable Plumbing/Sanitation Code for your area.

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

1. Install the flared gasket P/N 40897 into the 3/8" swivel nut P/N 77040900. Figure (4a)
2. Secure the swivel nut onto the water inlet located at the rear of the dispenser. Secure the flexible supply tubing to the 3/8" barbed end with the supplied clamps. Figure (4b)



Figure (4a)

Water Inlet  
with Supply Tubing  
Connected



Figure (4b)

Figure 4



## ELECTRICAL REQUIREMENTS

### **CAUTION:**

Only trained and certified electrical technicians should replace the power cord or the unit should be returned to an Authorized Service Center for power cord replacement.” The replacement cord must meet all requirements of the original equipment manufacturer.

### **WARNING:**

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

1. A minimum of 15 amps electrical service is needed for 120VAC power supply. A minimum of 10 amps electrical service is needed for 230VAC power supply.
2. 6 ft. long (1.83 m) power cord with 3-prong plug is included with the dispenser. Export models are shipped with a European plug.

NOTE: When the power is supplied to the unit, the air compressor comes on and runs for 10-15 seconds initially.

## FILLING AND DRAINING THE ICE BATH

### FILLING THE ICE BATH

The ice bath holds approximately 1.62 gallons (6.13 liters) of water. The fill tube is located behind the front splash panel and capped with a red 0.5" plug.

1. Remove the splash panel.



Figure 5

2. Remove the 0.5" plug and attached the tube to the LEFT nozzle.

NOTE: Do not connect to the right nozzle as it will cause the gas to run continuously.



3. Ensure that the coffee BIB is disconnected inside the cabinet. With the tube attached to the left nozzle, close the door, replace the drip tray and pull the Left Tap Handle until the tank has filled and water trickles from the over flow.

NOTE: If the BIB is not disconnected from the cabinet, the ice bank will fill with product and will not work.



Figure 6

4. Once the ice bath is full, store the drain/fill tube vertically, back in its original location, with the 0.5" cap attached. The drain/fill tube can now be used as a "sight glass" to monitor the water level in the ice bath.



Figure 7

## DRAINING THE WATER BATH

When the unit is to be moved, relocated, or transported the water and ice in the ice bath need to be drained. Disconnect the power to the unit before draining the ice bath. This can be done by removing the splash panel as in step 1 above, pulling out the drain/fill tube and removing the red cap. Pointing the tube down into a drain or bucket will allow the ice bath to drain.

**NOTE:** After draining the water there may still be ice on the refrigeration evaporator inside the ice bath. This ice should be melted and the resulting water also drained. This may take several hours for the ice to completely melt.

### **WARNING:**

The ice bath needs to be completely drained before moving, relocating, or transporting the unit.

**FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

## PRIMING/FLUSHING WATER SYSTEM

Close the door and pull the Tap Handles for a few seconds. Repeat until a steady flow of water is observed from all dispense valves.

NOTE: Some splashing may occur during this purge cycle.

NOTE: Dispense motor switch should be in "ON position".

NOTE: When the power is supplied to the unit, the air compressor comes on and runs for 10-15 seconds initially.

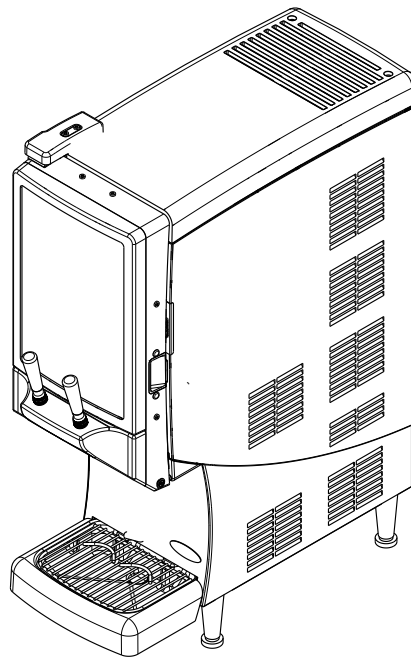


Figure 9

## RATIO SETTING PROCEDURE

NOTE: If concentrate is not properly thawed, it will adversely affect the amount of concentrate dispensed. Thawed product should be between 35°F/1.6°C to 40°F/4.4°C. Thawed product should have no ice particles remaining in the BIB.

### SUPPLIES

- 1 - Small 12 oz. cup (354.8 ml)
- 1 - Large 21 oz. cup (621.1 ml)
- 1 - Straw
- 1 - Thermometer
- 1 - Phillips head screw driver
- Paper Towels

### CHECKING/ADJUSTING THE RATIO SETTING

#### Operating the Controls – Dip Switch Settings:

1. The unit is setup to have ‘pre-configured’ ratios at options of 3:1, 4:1, 5:1 and 7:1. These ratios are chosen by setting the dip-switch to the corresponding number in the table below.
2. The dip-switches are accessed by removing the splash panel (see page 10 for removing splash panel in the ‘Filling the Ice Bath’ steps).
3. To set the dip switch position, use a small flat head screw driver to set the desired switch flipped ‘UP’ with all other switches ‘DOWN’.

NOTE: If multiple switches are up at the same time, it will go to a factory default setting and not target the desired ratio.

NOTE: The unit should come pre-configured at a factory setting of ‘5:1’ at dip-switch ‘position 3’

See photo below for an example of the dip-switch at ‘position 3’ for a target ‘5:1’ setting.

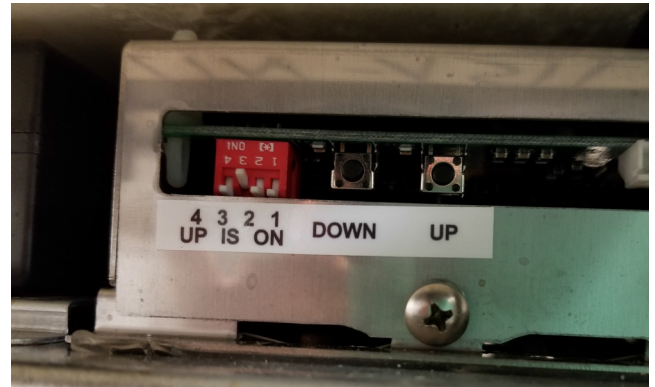


Figure 10

Table 3

Concentrate Target Ratio	Dip Switch Position
3:1	1
4:1	2
5:1	3
7:1	4

## Operating the Controls - Micro Adjustment Buttons

Directly to the right of the dip-switches are two micro-switch buttons marked 'DOWN' and 'UP'. These buttons adjust the motor speed down and up to adjust the ratio further. While the machine comes preset to 5:1, the default settings will have some variance due to coffee products used, water supply variance, and unit tolerances. These buttons can be used to calibrate the machine accurately to the desired ratio once installed.

### Using the Buttons

1. Pressing on the 'UP' micro-switch button will adjust the motor speed up, resulting in a lower ratio (i.e. higher TDS/Brix)
2. Pressing on the 'DOWN' micro-switch button will adjust the motor speed down, resulting in higher ratio (i.e. lower TDS/Brix).
3. Typically, pressing the button once will adjust the average TDS by a value of .02 to .08. The amount of change is dependent on the coffee product, and assumed a thoroughly mixed (homogenous) coffee concentrate.
4. Example: Upon installation of the machine, a TDS of 1.45 is measured at the dispense point. If the target TDS for the theoretical product is actually 1.6. The 'UP' button should be pressed to increase the TDS. The button may need to be pressed several times to reach the desired result.



## TDS MEASUREMENT GUIDE

### GENERAL GUIDELINES FOR TARGETING DESIRED TDS/RATIO

1. Set the dip-switch to the desired ratio target setting.
2. Shake the bag, prior to installing.
3. Dispense approximately 16oz of drink and discard. This is done to purge out any water or coffee from previous settings.
4. Draw an 8oz drink into a clean dry cup, and measure the temperature to confirm the drink is between 35 to 45°F.

NOTE: Drink temperature must be maintained to properly set the ratio of the unit.

5. Stir the sample thoroughly, and measure the TDS of the drink (Use any of the 3 options described below to measure the TDS / Ratio).
6. If the TDS matches the desired range of the product, not further adjustments are necessary. If the TDS is above/below required the desired setting, use the 'UP' or 'DOWN' Micro buttons as necessary to target the desired value.

NOTE: A 16oz drink should be dispensed to purge the previous setting before measuring again.

NOTE: It is recommended to make adjustments in 1-2 button pushes at a time to avoid 'overshooting' the target value.

7. Once the desired value is reached, the setup is complete and should be stable with standard maintenance of the equipment. The splash panel can be placed back on and no further work is needed.

NOTE: This value will not reset from cleaning mode or power loss.

NOTE: If a coffee concentrate flavor, manufacturer or ratio type is changed, then this process should be repeated. This process is not needed for changing BIBs of the same type of coffee concentrate.

There are 3 different methods that can be used to check/calibrate the ratio setting of the equipment.

1. Using a TDS Meter
2. Using a Brix Meter/Refractometer
3. Manually Checking Volume Ratio

For all 3 methods, first access the ratio control board by removing the splash panel (see Page 10 for removing splash panel in the 'Filling the Ice Bath' steps).

## OPTION 1: USING A TDS METER

### Additional Supplies

- Coffee TDS meter

A TDS meter measures the Total Dissolved Solids in a drink. In the case of coffee, it measures the level of extraction and can be used to ensure the right ratio of water to coffee concentrate is achieved. If the TDS target is known, a TDS meter will allow for a very simple process to measure and ensure properly calibration of the equipment.

1. Follow instructions for the TDS meter to ensure proper calibration and 'zero' set prior to starting this process.
2. Follow steps 1-5 in the 'General Guidelines for Targeting Desired TDS/Ratio' section (refer to page 15).
3. Using a straw, transfer a small sample of the finished drink to a clean cup for temperature compensation.
4. Let the small sample warm to room temperature before transferring to the TDS meter lens (refer to operating instructions specific to your coffee TDS meter for exact process).
5. Check TDS value... etc.
6. Adjust the unit settings and purge as noted in steps 6-7 in the 'General Guidelines for Targeting Desired TDS/Ratio' section (refer to page 15).

NOTE: This method measures TDS, so the 'UP' button will adjust TDS up, and the 'DOWN' button will adjust TDS down.

## OPTION 2: USING A BRUX REFRACTOMETER

### Additional Supplies

- Refractometer

A brix refractometer is used to measure the sugar content in aqueous solutions. This method may not apply to all coffee concentrates, but many concentrates have natural sugars that allow a brix refractometer to be used. In order to use this method, the target brix value must be known for the coffee concentrate.

1. Follow instructions for the brix refractometer to ensure proper calibration and 'zero' set prior to starting this process.
2. Follow steps 1-5 in the 'General Guidelines for Targeting Desired TDS/Ratio' section. (refer to page 15).
3. Using a straw, transfer a small sample of the finished drink to the brix refractometer meter lens (refer to operating instructions specific to your brix refractometer for exact process).
4. Check the brix value on the meter.
5. Adjust the unit settings and purge as noted in steps 6-7 in the 'General Guidelines for Targeting Desired TDS/Ratio' section (refer page 15).

NOTE: Since this method measures Brix, so the 'UP' button will adjust Brix up, and the 'DOWN' button will adjust Brix down.





## OPTION 3: MANUALLY CHECKING VOLUME RATIO

### Additional Supplies

- Weighing scale

Following steps explain measuring the water to coffee concentrate ratio using weight.

NOTE: Weight can be substituted by volume if weighing scale is not handy.

1. Follow steps 1-5 in the 'General Guidelines for Targeting Desired TDS/Ratio' section (refer to page 15).
2. Pull Left & Right Tap Handles for 10 seconds one after other to make sure coffee is dispensing.
3. Set 10 seconds timer.
4. Pull Left Tap Handle for 10 seconds to dispense the coffee and weigh the product dispensed.
5. Divide #4 by the total parts to get target coffee concentrate dispense weight.
6.
  - a) If the total dispense is 300 grams and desired ratio is 5:1 divide by 6 to get 50 grams concentrate target for a 10 second pour.
  - b) If the total dispense is 300 grams and desired ratio is 4:1 divide by 5 to get 60 grams concentrate target for a 10 second pour.
  - c) If the total dispense is 300 grams and desired ratio is 3:1 divide by 4 to get 75 grams concentrate target for a 10 second pour.
7. Turn off water to machine.
8. Pull Left Tap Handle for 5 seconds or until coffee is darker and only concentrate is dispensed.
9. Set 10 seconds timer and dispense concentrate by pulling the Left Tap Handle.
10.
  - a) If weight is greater than #6 target use 'DOWN' button on controller to slow the concentrate motor down.
  - b) If weight is less than #6 target use 'UP' button on controller to speed up the concentrate motor.
11. Set 10 seconds timer and dispense concentrate by pulling the Left Tap Handle until target value from #6 is within +/- 2 grams of target.
12. Turn water on to machine.
13. Pull Left Tap Handle for 10 seconds until coffee is dispensed.
14. Pull Right Tap Handle for 10 seconds until coffee is dispensed.



## CLEANING AND SANITIZING

### CLEAN SPLASH ZONES AND DISPENSE NOZZLES

1. On a daily basis, using a clean, damp cloth, clean the external cabinet and splash areas including the door gasket. Remove and wash the cup rest and drip tray using mild dish soap.
2. Remove the dispense nozzles by rotating each 90° and pulling down. Remove the mixing chambers by pulling straight forward. Wash using mild dish soap.

**IMPORTANT:** DO NOT wash nozzles or mixing chambers in a dish washer. This will distort the plastic and damage the o-rings. Additionally, do not soak them in sanitizing solution longer than 2 minutes.

### WEEKLY

Check concentrate to water TDS ratio (refer to the Checking/Adjusting the Ratio TDS Setting section, Page 13).

Sanitize the dispenser thoroughly (internally and exterior surfaces) by using one of the sanitizers listed.

For the cleaning process, have the following ready: Two, 1 gallon food grade buckets / containers, one white cleaning screw in adapter and approved Sanitizer.

### CLEANER PRODUCT

URNEX Clearly Cold - Cold Brew Equipment Cleaner.

Mix 0.50 oz. (20 ml) of clearly cold into 1 Gallons (3.78 liters) of water.

### SANITIZER PRODUCT

KAY-5® Sanitizer

Mix one 1 oz. (0.03 liters) packets of Kay-5® Sanitizer solution (or similar brand) in 0.75 gallons (2.83 liters) of tap water to insure 330 PPM of available chlorine.





**IMPORTANT:** Use tap water at 75-95°F (23.89-35°C). Water above this range breaks down the chlorine count and minimizes sanitation.

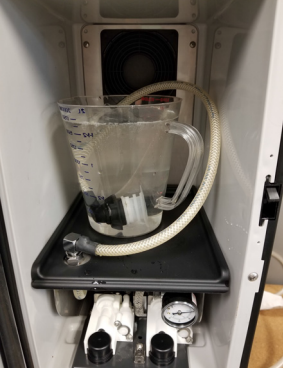



Before using the Nitropro Mini unit for product dispensing and on an ongoing basis, dispenser must be cleaned and sanitized.



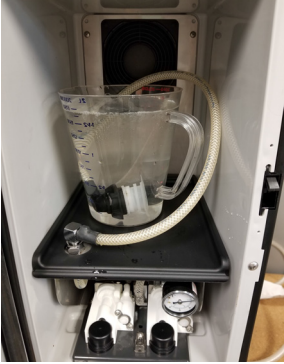

To clean and sanitize the unit, perform the procedure in below table.




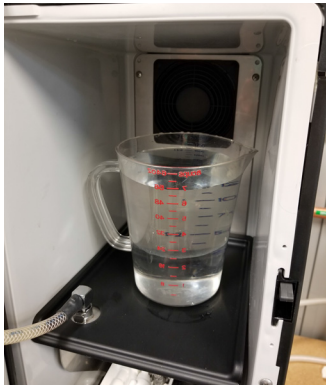
**NOTES:** It is recommended that the cleaning be performed weekly, but local codes and regulations must be followed for frequency of cleaning procedures.


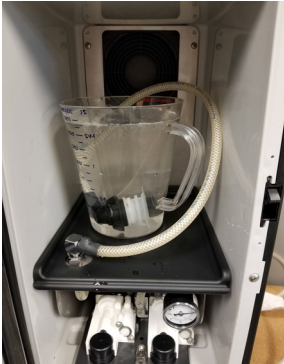


Table 4



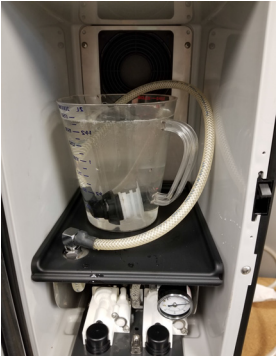
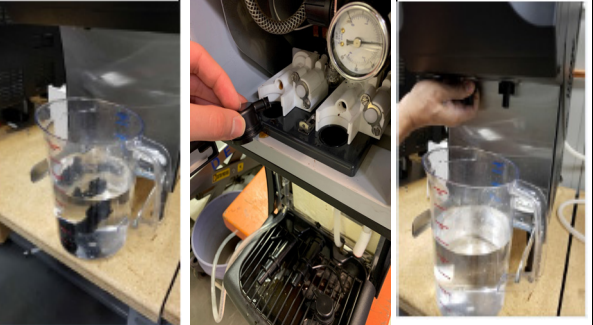
Step	Action	
1	Open the cabinet door (front door).	 <p data-bbox="1166 653 1258 678">Figure 11</p>
2	<p data-bbox="316 814 906 934">A. Disconnect the product output connector from the BIB (Bag in Box product) by turning the BLACK threaded connector counterclockwise and lifting on the outside of the BLACK connector</p> <p data-bbox="316 947 678 972">B. Remove the BIB from the unit</p>	 <p data-bbox="1166 1073 1258 1098">Figure 12</p>
3	Connect the white cleaning screw in adapter to the BLACK product output connector by turning the threaded connector clockwise.	 <p data-bbox="1166 1493 1258 1518">Figure 13</p>
4	Using a clean and empty food-grade container: Prepare approximately 0.5 gallons (1.9 liters) of warm water. Place the container of water inside the cabinet.	 <p data-bbox="1166 1955 1258 1980">Figure 14</p>

Step	Action	
5	Place the BLACK product output connector with the WHITE cleaning adapter inside the food-grade container so that the connector will stay at the bottom.	 <p data-bbox="1089 653 1187 680">Figure 15</p>
6	Set the dispense motor switch on the back of the door to "Clean Mode"	 <p data-bbox="1089 1083 1187 1110">Figure 16</p>
7	Remove drip tray, Place container below nozzles to capture product.	 <p data-bbox="1089 1545 1187 1572">Figure 17</p>
8	<p data-bbox="232 1623 808 1682">A. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of warm water.</p> <p data-bbox="232 1696 418 1724">B. Close the tap.</p> <p data-bbox="232 1738 808 1797">C. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of warm water.</p> <p data-bbox="232 1812 418 1839">D. Close the tap.</p> <p data-bbox="329 1854 824 1944">NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p data-bbox="1089 1955 1187 1982">Figure 18</p>



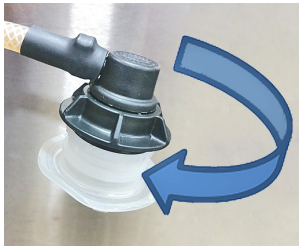
Step	Action	
9	<p>Remove the bucket of water from inside the cabinet and dispose of the remaining water.</p>	 <p>Figure 19</p>
10	<p>Using a clean and empty food-grade container: Prepare any of the listed cleaner solution from the “cleaner products” section above. Place the container of cleaner solution inside the cabinet storage area.</p> <p>NOTE: Mix thoroughly until all cleaner is dissolved in the solution.</p>	 <p>Figure 20</p>
11	<p>Place the BLACK product output connector with the WHITE cleaning adapter inside the food-grade container so that the connector will stay at the bottom.</p>	 <p>Figure 21</p>
12	<p>Remove drip tray, Place container below nozzles to capture product.</p>	 <p>Figure 22</p>





Step	Action	
13	<p>A. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of cleaner solution.</p> <p>B. Close the tap.</p> <p>C. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of cleaner solution.</p> <p>D. Close the tap.</p> <p>NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p style="text-align: center;">Figure 23</p>
14	<p>With the taps straight up (closed), allow cleaner solution to soak in the lines for 5 minutes.</p>	 <p style="text-align: center;">Figure 24</p>
15	<p>A. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of cleaner solution.</p> <p>B. Close the tap.</p> <p>C. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of cleaner solution.</p> <p>D. Close the tap.</p> <p>NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p style="text-align: center;">Figure 25</p>
16	<p>Remove the bucket of cleaner solution from inside the cabinet and dispose of the remaining cleaner solution.</p>	 <p style="text-align: center;">Figure 26</p>

Step	Action	
17	<p>Using a clean and empty food-grade container: Prepare any of the listed sanitizer solution from the “sanitizer products” section above. Place the container of sanitizer solution inside the cabinet storage area.</p> <p>NOTE: Mix thoroughly until all sanitizer is dissolved in the solution.</p>	 <p data-bbox="1166 646 1260 674">Figure 27</p>
18	<p>Place the BLACK product output connector with the WHITE cleaning adapter inside the food-grade container so that the connector will stay at the bottom.</p>	 <p data-bbox="1166 1092 1260 1119">Figure 28</p>
19	<p>Remove drip tray, Place container below nozzles to capture product.</p>	 <p data-bbox="1166 1535 1260 1562">Figure 29</p>
20	<p>A. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of sanitizer solution. B. Close the tap. C. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of sanitizer solution. D. Close the tap.</p> <p>NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p data-bbox="1166 1969 1260 1997">Figure 30</p>

Step	Action	
21	<p>With the taps straight up (closed), allow sanitizer solution to soak in the lines for 20 minutes.</p>	 <p style="text-align: center;">Figure 31</p>
22	<p>A. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of sanitizer solution.                      B. Close the tap.                      C. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of sanitizer solution.                      D. Close the tap.</p> <p style="text-align: center;">NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p style="text-align: center;">Figure 32</p>
23	<p>Remove the bucket of sanitizer solution from inside the cabinet and use it for cleaning the nozzle and mixing chamber.</p>	 <p style="text-align: center;">Figure 33</p>
24	<p>Remove Left and Right nozzles, along with both mixing chambers and place in sanitizer bucket for 2 minutes.</p>	 <p style="text-align: center;">Figure 34</p>



Step	Action	
25	<p>Replace both mixing chambers, Left, and Right nozzles.</p> <p>NOTE: Check that o-rings are on the mixing chamber and dispense nozzles.</p>	 <p>Figure 35</p>
26	<p>Final Rinse</p> <p>A. Using a clean and empty food-grade container: Prepare approximately 0.5 gallons (1.9 liters) of warm water. Place the container of water inside the cabinet.</p> <p>B. Place the BLACK product output connector with the WHITE cleaning adapter inside the food-grade container so that the connector will stay at the bottom.</p> <p>C. Open LEFT Tap Handle and dispense 0.25 gallons (0.95 liters) of warm water.</p> <p>D. Close the tap.</p> <p>E. Open RIGHT Tap Handle and dispense 0.25 gallons (0.95 liters) of warm water.</p> <p>F. Close the tap.</p> <p>NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p>Figure 36</p>
27	<p>Disconnect the WHITE cleaning adapter from the BLACK product output connector by turning the BLACK connector counterclockwise and lifting on the outside of the BLACK connector.</p>	 <p>Figure 37</p>

Step	Action	
28	<p>A. Remove bucket of water and obtain a product BIB.</p> <p>B. Place it in the cabinet, outlet port towards the base of the cabinet, and connect the BLACK product output connector by turning the threaded connector ring clockwise. Be sure the connector is screwed on completely.</p> <p>C. Close the cabinet door.</p>	 <p data-bbox="1089 642 1182 667">Figure 38</p>
29	<p>A. Open LEFT Tap Handle to pour 16Oz (until coffee comes out).</p> <p>B. Close the Tap.</p> <p>C. Open RIGHT Tap Handle to pour 8Oz (until coffee comes out).</p> <p>D. Close the tap.</p> <p>NOTE: Do not open both valves at the same time as dispensing may pulse or even stop.</p>	 <p data-bbox="1089 1083 1182 1108">Figure 39</p>
30	<p>Change the Dispense motor switch position to 'on' from clean mode.</p>	 <p data-bbox="1089 1503 1182 1528">Figure 40</p>
31	<p>The sanitizing procedure is complete.</p>	 <p data-bbox="1089 1938 1182 1963">Figure 41</p>

## CHANGING COFFEE TYPES

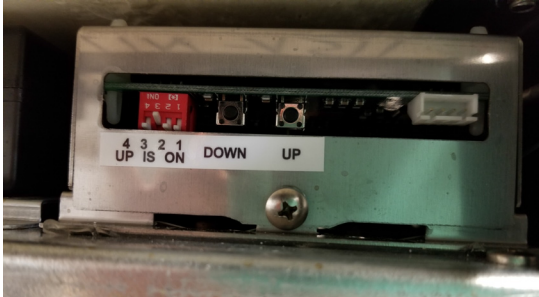

In some cases the type of coffee used in the Nitropro Mini unit may require an adjustment of the height of the foam head for proper presentation. If this adjustment is required, it should be performed by a manager or technician who is trained in the operation of the Nitropro Mini unit.

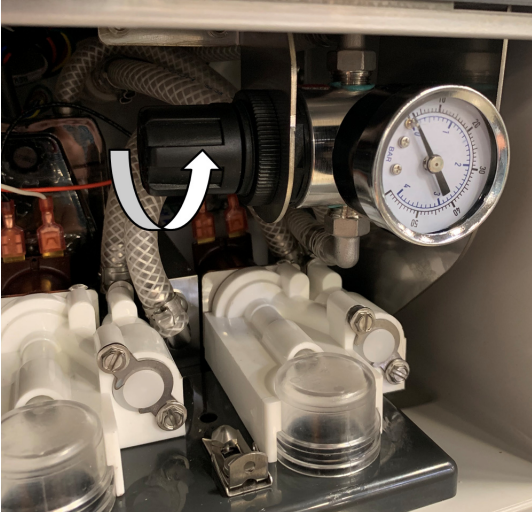

### UNIT FOAM HEAD HEIGHT ADJUSTMENT

**NOTE:** Follow all previous INSTALLATION and CLEANING/SANITATION section processes before continuing with this section.

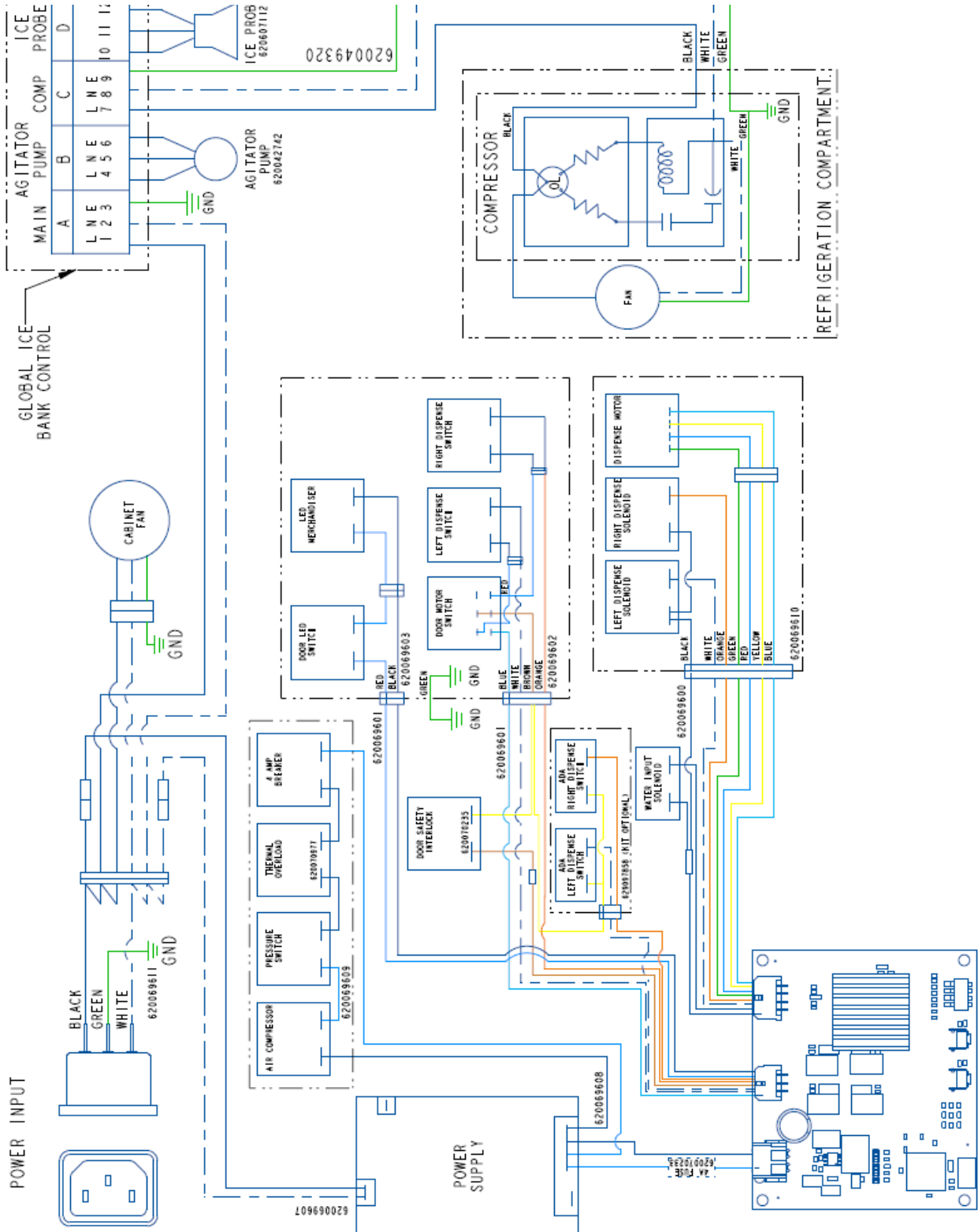
Once the equipment has been installed, cleaned, and sanitized, perform the procedure refer below Table to adjust the foam head height on the Nitropro Mini unit.

Table 5

Step	Action	
1	<p>Inside the cabinet, ensure dispense motor switch is at "ON position".</p> <p>Dip switch on the PCB behind the splash panel is set as per product requirement.</p>	 <p>Figure 42</p>
2	<p>Locate the secondary Nitrogen regulator behind the pump deck door inside the cabinet.</p> <p>Adjust only the regulator shown.</p>	 <p>Figure 43</p>

Step	Action	
3	<p>REDUCED FOAM HIGHT adjustment:</p> <ul style="list-style-type: none"> <li>A. Pull out regulator control knob to unlock for adjustments.</li> <li>B. Adjust the regulator control knob slightly (approximately 1/8th of a turn) to the LEFT (counter-clockwise). Only very fine adjustments are required. This reduces the amount of Nitrogen injected.</li> <li>C. Push regulator control knob in to lock set pressure.</li> <li>D. Open the RIGHT Tap Handle and dispense about 8 oz. of product to drain the line of product at the previous foam setting. Then dispense 12 oz. of product and confirm the foam head height. Repeat and dispense another 12 oz. to confirm setting.</li> <li>E. Repeat step A if a further reduction of foam head height is required.</li> </ul>	 <p style="text-align: center;">Figure 44</p>
4	<p>INCREASED FOAM HIGHT adjustment:</p> <ul style="list-style-type: none"> <li>A. Pull out regulator control knob to unlock for adjustments.</li> <li>B. Adjust the regulator control knob slightly (approximately 1/8th of a turn) to the RIGHT (clockwise). Only very fine adjustments are required. This increases the amount of Nitrogen injected</li> <li>C. Push regulator control knob in to lock set pressure</li> <li>D. Open the RIGHT Tap Handle and dispense about 8 oz. of product to drain the line of product at the previous foam setting. Then dispense 12 oz. of product and confirm the foam head height. Repeat and dispense another 12 oz. to confirm setting.</li> <li>E. Repeat step A if a further increase of foam head height is required</li> </ul>	 <p style="text-align: center;">Figure 45</p>
5	Reinstall the regulator access cover.	Figure 46

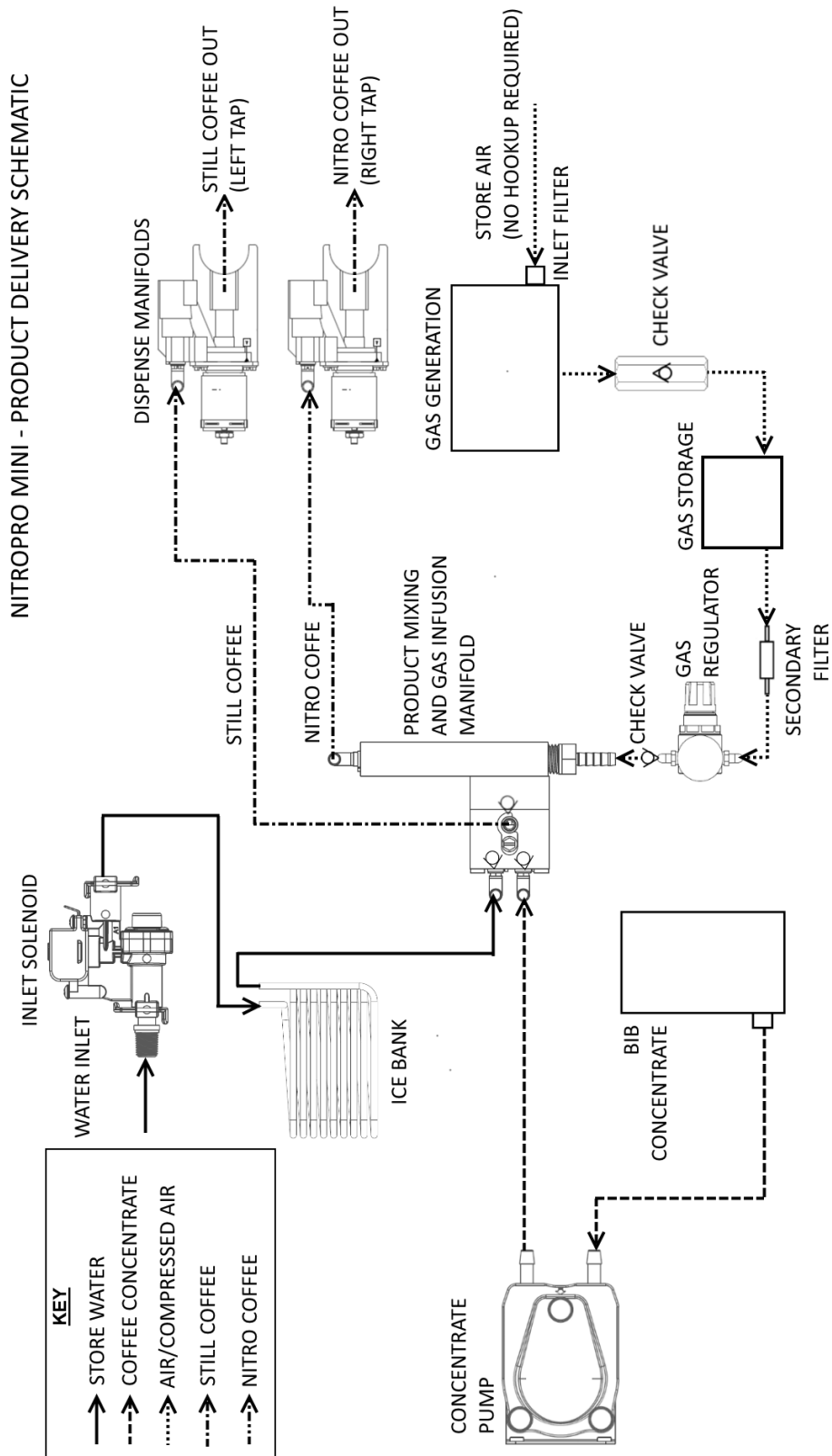
# SYSTEM ELECTRICAL DIAGRAM



P/N: 620073755 REV A

Figure 47

# SYSTEM PLUMBING SCHEMATIC





# **NITROPRO MINI 2290 SERVICE PROCEDURES**

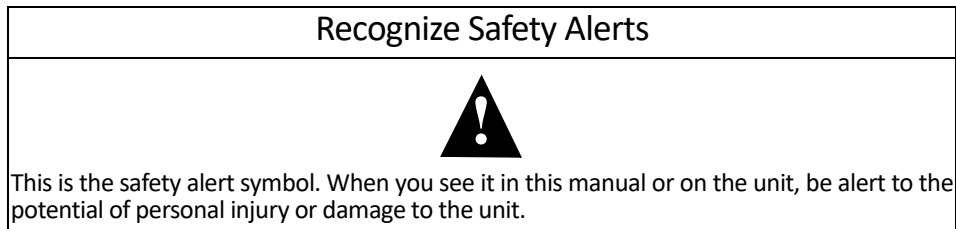
# SAFETY INSTRUCTIONS

## READ AND FOLLOW ALL SAFETY INSTRUCTIONS

### Safety Overview

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

### Recognition



### Different Types of Alerts

#### **DANGER:**

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

#### **WARNING:**

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

#### **CAUTION:**

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

### SAFETY TIPS

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

NOTE: The dispenser is not designed for a wash-down environment and **MUST NOT** be placed in an area where a water jet could be used.





## QUALIFIED SERVICE PERSONNEL

### **WARNING:**

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit.

ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

IF THE SUPPLY CORD IS DAMAGED, IT MUST BE REPLACED BY THE MANUFACTURER, ITS SERVICE AGENT OR SIMILARLY QUALIFIED PERSONS IN ORDER TO AVOID A HAZARD.

## SAFETY PRECAUTIONS

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

### **WARNING:**

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

FAILURE TO DISCONNECT THE POWER COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

### **CAUTION:**

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

DO NOT STORE EXPLOSIVE SUBSTANCES SUCH AS AEROSOL CANS WITH A FLAMMABLE PROPELLANT IN THIS APPLIANCE.

CHILDREN SHALL NOT PLAY WITH THE APPLIANCE.

CLEANING AND USER MAINTENANCE SHALL NOT BE MADE BY CHILDREN WITHOUT SUPERVISION.

## SHIPPING AND STORAGE

### **CAUTION:**

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

## MOUNTING ON A COUNTER

### **WARNING:**

When installing the unit on a counter top, the counter must be able to support a weight in excess of 185 lbs. (83.9 kg.) to insure adequate support for the unit.

FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

THE APPLIANCE HAS TO BE PLACED IN A HORIZONTAL POSITION

## R290 REFRIGERANT WARNINGS



**WARNING!** R290 Refrigerant used in this dispenser is flammable. Follow the Warnings listed below to avoid hazards.

### **DANGER:**

Risk Of Fire or Explosion. Flammable Refrigerant Used. Do Not Use Mechanical Devices To Defrost Refrigerator. Do Not Puncture Refrigerant Tubing.

### **DANGER:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing.

### **CAUTION:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. Consult Repair Manual/Owner's Guide Before Attempting To Install or Service This Product. All Safety Precautions Must be Followed.

### **CAUTION:**

Risk Of Fire Or Explosion. Flammable Refrigerant Used. Dispose Of Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerant Used.

### **CAUTION:**

Risk Of Fire Or Explosion Due To Puncture Of Refrigerant Tubing; Follow Handling Instructions Carefully. Flammable Refrigerant Used.

### **WARNING:**

Do not use electrical appliances inside the food/ice storage compartments unless they are of the type recommended by the manufacturer.

### **WARNING:**

To reduce flammability hazards the installation of this appliance must only be carried out by a suitably qualified person.

### **WARNING:**

Any fluid circuits connected to the appliance shall safely release abnormal pressure. It shall not allow the release of flammable refrigerant into areas served by the other circuits if these do not comply with minimum room area limit.

The appliance is to be installed in accordance with the Safety Standard for Refrigeration Systems.

### **WARNING:**

Appliances and their surroundings shall not attain excessive temperatures in normal use.

### **WARNING:**

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn. Be aware that refrigerants may not contain an odor.

### **WARNING:**

Keep any required ventilation openings clear of obstruction.

Notice that servicing shall be performed only as recommended by manufacturer.



## 2.0 OVERVIEW AND REQUIRED TOOLS

### 2.1 NITROPRO FUNCTIONS & SPECIFICATIONS

The Nitropro Mini dispenses still or air-injected, chilled Nitro coffee at the pull of a tap handle. Opening a tap automatically engages the product mixing pump (as well as the air pump for the injected-coffee selection). The dispensing unit requires facility electrical and water inputs; Nitro infusion gas is generated within the unit.

- Coffee syrup from a product container is automatically mixed with water at the selected ratio (with mix ratios user-selectable via a DIP switch on the main control PCB)
- Nitro coffee is created via its dispensing circuit including a gas-infusion (air-injection) manifold prior to the tap (dispensing) valve
- Metering of the product concentrate is performed by a servo-driven, peristaltic pump
- Water inlet rate is fixed and controlled by an inlet solenoid valve assembly that also provides pressure limiting and flow control
- Chilling of the product cabinet and mix water is performed by an automatically-controlled ice bank at the base of the enclosure.

Table 2-1 - Electrical Specifications

Models	VAC	Amps	Ph	Hz
Nitropro Mini	115	5	1	60

Table 2-2 - Refrigerant Type

Refrigerant		
Oz	Grams	Type
1.83	52	R-290

Table 2-3 - Refrigeration Nameplate Values

Pressure psi (kPa) [bar]	
High side	Low side
315 (2171.9) (21.7)	140 (965.3) (9.7)

Table 2-4 - Water Requirements

Water Supply Pressure	40 psig (275.8 kPa) Min. 65 psig (448.2 kPa) Max. (if >65 psi, install external pressure regulator, set @ 65 psi)
Water Supply Flow Rate	3 fl. oz. (88.7 ml) per second, minimum
Water Temperature	40 - 90° F. (4.4 - 32.2° C)
Water Inlet Size	3/8 in. (0.95 cm) SAE male flare fitting on dispenser

Table 2-5 - General | Dimensions | Weight

Unit Height	34.05 in. (86.5 cm)
Unit Width	10.44 in. (26.5 cm)
Unit Depth	24.47 in. (62.2 cm)
Clearance Requirements	Back: 4" (10.16 cm) Top: 12" (30.48 cm) Sides: 4" (10.16 cm)
Unit Weight (Dry)	120 lbs (54.4 kg)
Operating Weight	185 lbs (84.0 kg)
Ambient Operating Temperature	50 to 90 °F (10 to 32 °C)

Table 2-6 - Ice Bank Specifications

Ice Bank Capacity	7-8 lbs. (3.2-3.6 kg.)
Temp. Pull Down Time	3 hours at 75 °F (24 °C)

## 2.2 KEY COMPONENTS

The Nitropro Mini consists of these main controls and components (refer to Figs. 2-1 and 2.2).

### Dispensing Taps (Still & Nitro Coffee)

Allow coffee dispensing. Pulling of tap handle triggers switch that activates outlet solenoid valve (in dispense manifold); also turns on water inlet solenoid valve and concentrate pump to initiate flow.

### Ice Bank (Water Reservoir and Refrig. Unit)

Water/ice-filled reservoir for chiller lines.

Includes controller to manage refrigeration compressor, bath agitator, circulation pump and temperature/ice sensor.

### Air Compressor & Storage Chamber

Provides air to the gas-infusion manifold.

Stores compressed air to support high drink volumes. The compressor is independent and is activated by the storage-chamber pressure switch. Storage outlet routes to a pressure regulator prior to entering the infusion manifold.

### Concentrate Pump

Meters input of coffee product from BIB

(Bag In Box) to mixing manifold. Peristaltic pump, servo-motor driven.

### Product-Mixing & Gas-Infusion Manifold

Interconnected plastic blocks with check valves and a mixing chamber for mixing, air-injecting and routing of coffee concentrate, water and air to the dispense manifolds. Three check valves control flow routing by preventing backflow.

### Dispense Manifolds

Tap-handle activated, outlet solenoid valve.

Outlet valve allows product dispensing.

### Water-Inlet Solenoid Valve/Regulator

Solenoid valve allows water inlet.

Regulator limits inlet pressure & flow rate.

### System Controller Board (Main PCB)

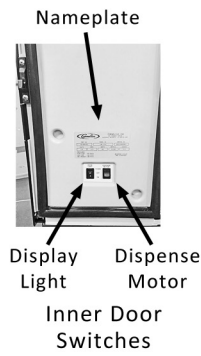
Manages system events and device interactions. Includes adjustable DIP switch for concentrate-pump ratio selection. Also includes PCB switches for fine-tuning the ratio selection.

### 24Vdc Power Supply

Provides power to Main PCB and the air compressor.



Figure 2-1 - Front LED-Backed Merchandiser Removal



Dispensing Tap Handles

Drip Tray

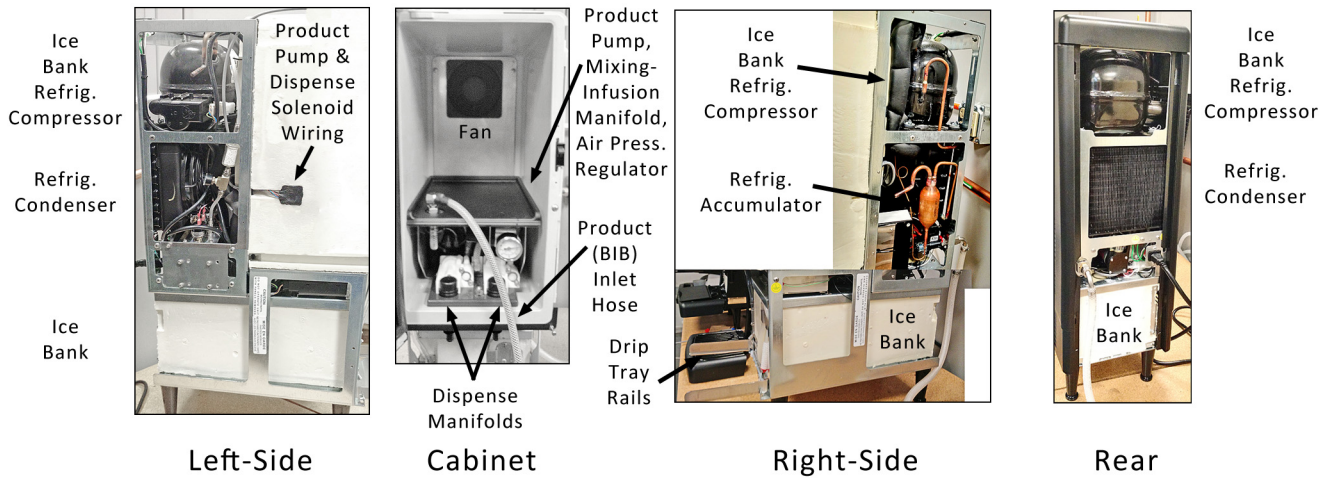
Front Controls

Water Inlet Solenoid Valve

Water Inlet

Power Input

Rear Panel Inputs



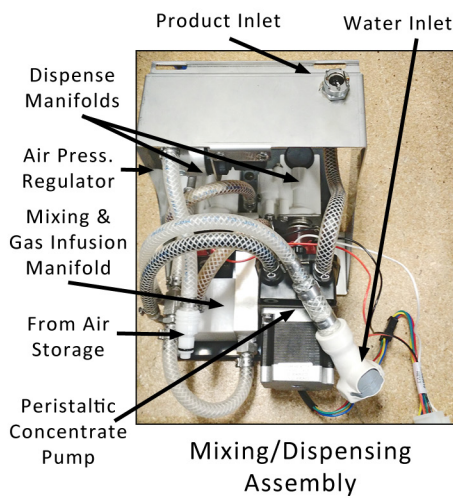
Left-Side

Cabinet

Right-Side

Rear

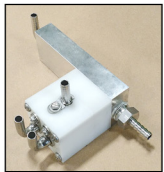
SYSTEM COMPONENTS



Mixing/Dispensing Assembly



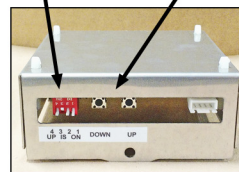
Peristaltic Pump



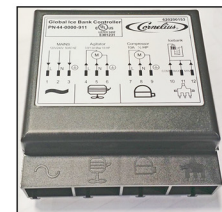
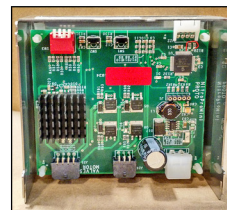
Mixing & Air Infusion Manifold

Mix Ratio Select

Ratio Tuning Buttons



System Main Control PCB



Ice Bank Controller (Bath Agitator & Refrigeration Control)

Mixing/Dispensing Assembly & System Controllers

Figure 2-2 - Main Components



## 2.3 REQUIRED TOOLS

These tools are required for conducting the various procedures in this manual. You may find it helpful to review the Troubleshooting and Component Replacement sections to determine what additional tools you might prefer to include.

### |Hand Tools

---

Wrenches - SAE Open-end or Combination  
(1/4" through 7/8")

Wrenches - Adjustable  
(2" x 6"- 8" Length, Crescent)

Nut Driver Set - SAE

Pliers - Adjustable  
Channel-Lock/Knipex-style

Pliers - Needlenose

Flat Screwdriver 3/16"

Phillips Screwdrivers  
#2 & #0 (6" Length)  
#2 Stubby or Flex-shaft

Diagonal Cutting Pliers

Pick Set - Dental Type

Magnetic Pickup Wand

Cleaning Brushes  
Bristle and Wire

Air Pressure Gauge  
Capable of 100 psi (689 kPa) with high-pressure hose and 1/4" push-connect fitting

Hose-Clamp Crimping/Cutting Tool  
Oetiker HIP 2800 Es

### Electrical Tools

---

Multimeter - Digital VOM  
1000V/10A ac/dc, milliohm to megohm, millivolt, auto-ranging,  $\pm 2.5\%$  +1 digit accuracy

Temperature Meter & Probe  
 $\pm 2.5\%$  +1 digit accuracy

Cordless Drill or Screwdriver  
With Screwdriver Bits / Nut Drivers

Flashlight

Portable Vacuum Cleaner - With hose and crevice tool

### Supplies

---

O-Ring Lubricant/Sealant Food-Grade Silicone  
Dow Corning Molykote 111 or equiv.

Solvent - Nonflammable

Teflon Thread-sealing Tape

Lint-free Cloth Rags

### 3.0 SYSTEM OPERATION

This section describes how the Nitropro Mini dispenser operates. By grasping the details of the operating process for still and Nitro coffee dispensing, you will have the knowledge to detect many of the common malfunctions.

#### 3.1 FACILITY SUPPLIES

Electrical: Depending on model and application, the unit operates from either 115Vac or 230Vac that enters the unit through a back-panel cord socket, as shown in Fig 3-1. Input AC power is supplied to the ice bank controller (which manages the refrigeration compressor and the ice-bath agitator motor). AC power is also routed to the 24Vdc power supply which provides power to the Main PCB and the air pump. The Main PCB then provides 24V power to the remainder of the DC components.

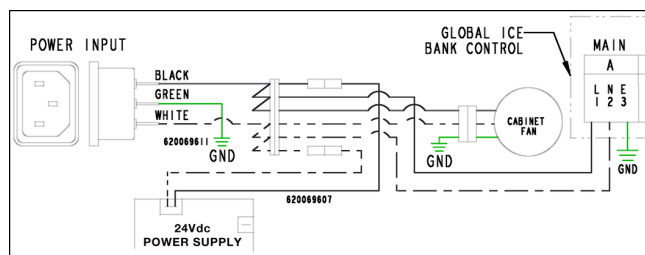


Figure 3-1 - Power Input

Water: Store water enters the unit through a rear inlet solenoid valve within the pressure range indicated in Table 2-4 above. The inlet solenoid valve activates when a dispensing tap is pulled. The inlet solenoid assembly also provides input pressure control [29 psi (200 kPa) - fixed] and flow-rate limiting within the range of 1 to 1.25 fluid ounces (29.6 to 37 ml) per second. Inlet water is first routed to the ice bank for chilling and then is supplied to the mixing-infusion manifold.

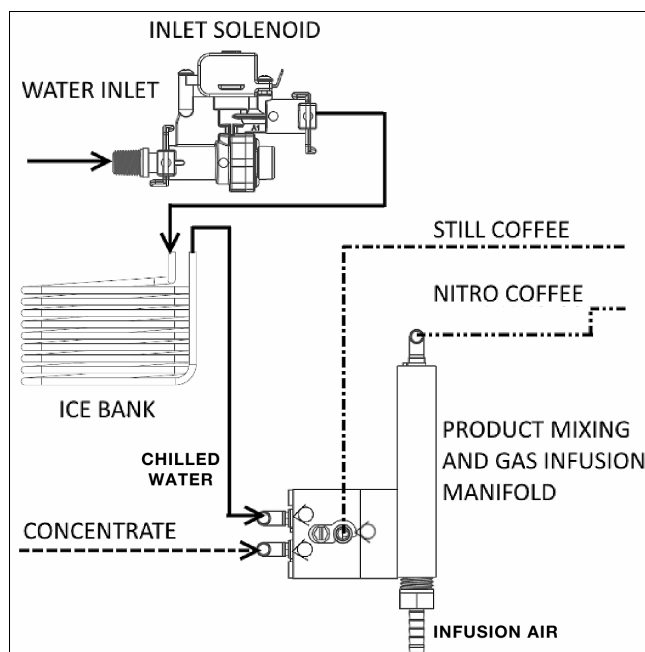
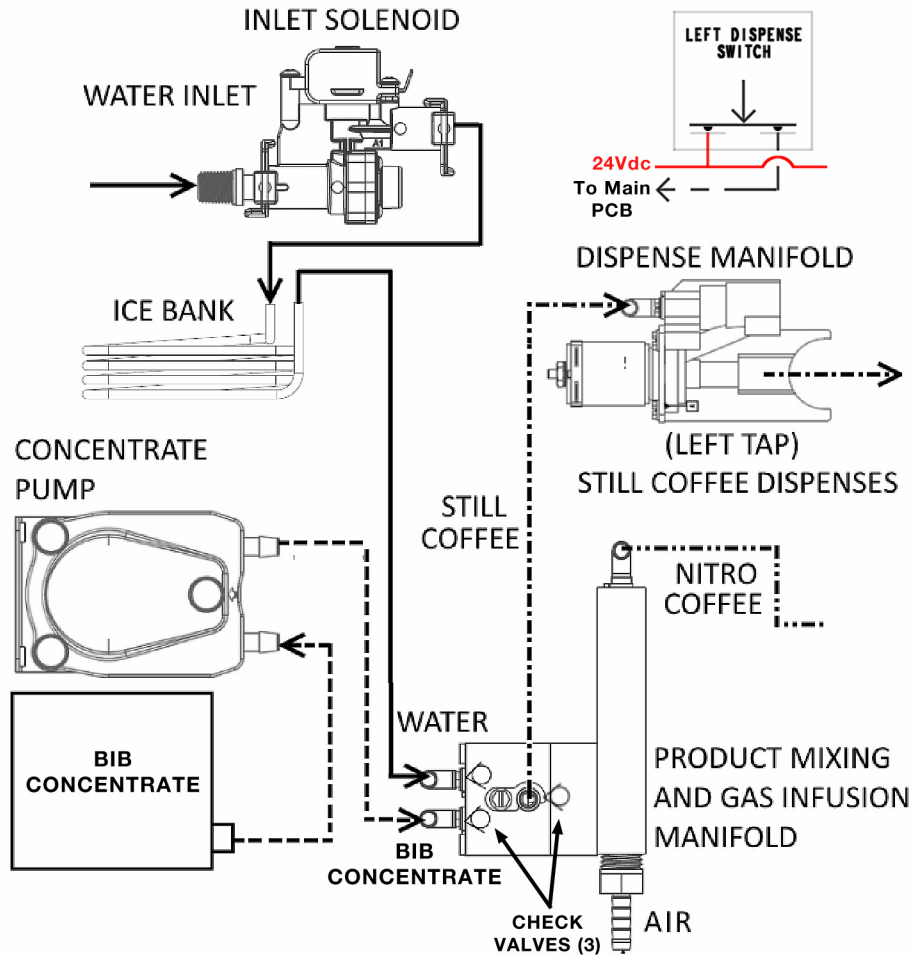


Figure 3-2 - Water Input



### 3.2 OPERATING PROCESSES

#### Left Tap Handle - Still Coffee Dispensing



1. Left tap handle is pulled.
2. Left Dispense switch is depressed, activating (via Main PCB):
  - A. Dispense Manifold Solenoid Valve (allows front dispensing)
  - B. Concentrate Pump (delivers coffee concentrate to Mixing Manifold)
  - C. Inlet Solenoid (delivers water to Mixing Manifold)

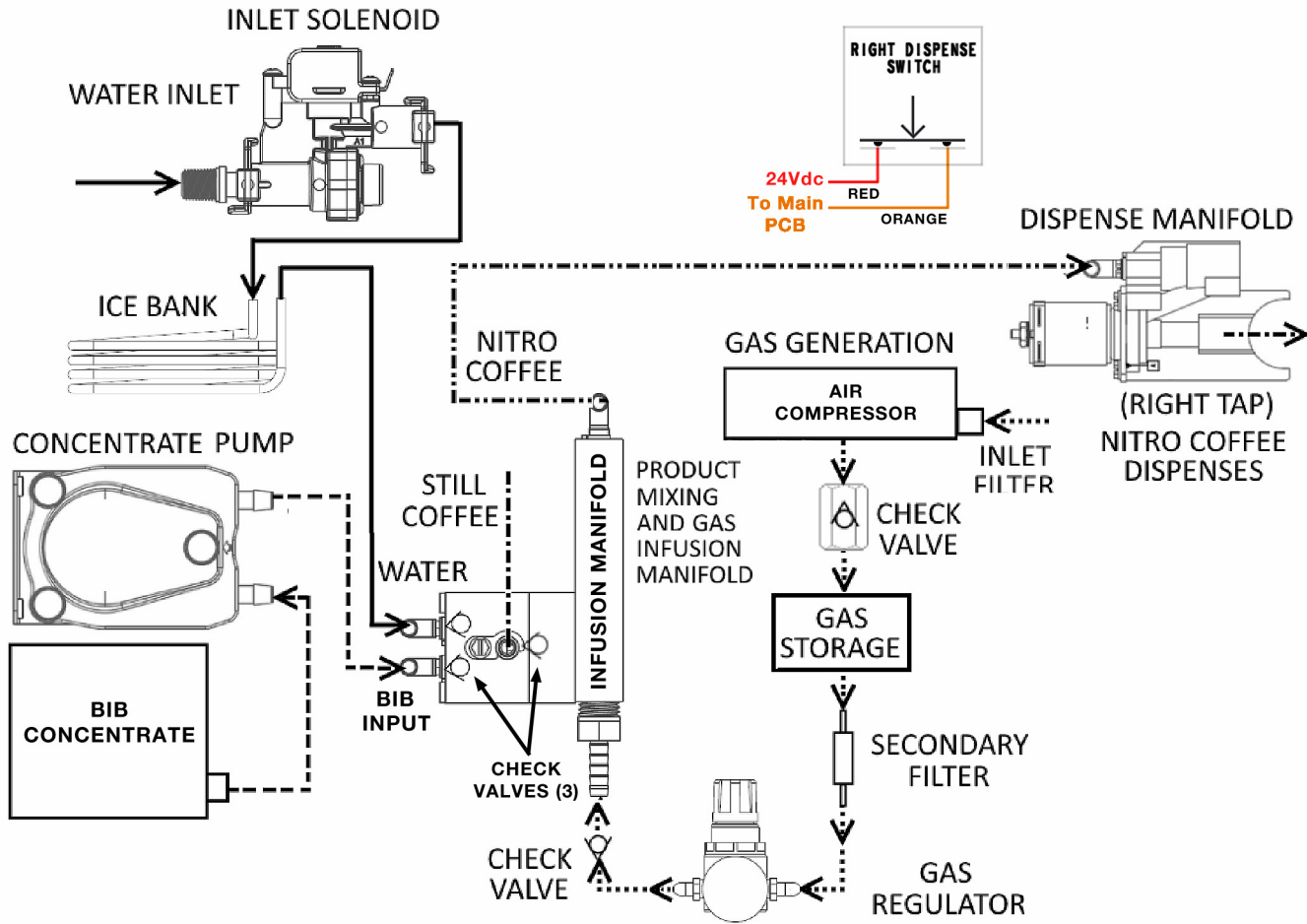
**Action:** Water and coffee concentrate combine in the mixing manifold and then flow to the dispense manifold and into the serving cup.

**Note:** There is no flow in the Nitro-coffee circuit and infusion manifold since its dispense valve is closed. The low-pressure path is to the still-coffee dispense manifold in which the dispense solenoid valve is open.

Figure 3-3 - Still Coffee Dispense Process

### 3.2 OPERATING PROCESSES

#### Right Tap Handle - Nitro Coffee Dispensing



1. Right tap handle is pulled.
2. Right Dispense switch is depressed, activating (via Main PCB):
  - A. Dispense Manifold Solenoid Valve (allows front dispensing)
  - B. Concentrate Pump (delivers coffee concentrate to Mixing Manifold)
  - C. Inlet Solenoid (delivers water to Mixing Manifold)

**Action:** Water and coffee concentrate combine in the mixing manifold, are then infused with air in the gas infusion manifold and then flow to the Nitro dispense manifold and into the serving cup.

**Note:** There is no flow in the still-coffee circuit since its dispense valve is closed. The low-pressure path is to the Nitro-coffee dispense manifold in which the dispense solenoid valve is open.

Figure 3-4 - Nitro Coffee Dispense Process

### 3.3 COMPONENT FUNCTIONS

#### 3.3.1 Tap Handles

The dispensing tap handles (Fig.3-5), when pulled, activate microswitches (Fig. 3-6) that signal the Main PCB to activate specific components, as de-scribed previously in section 3.2.

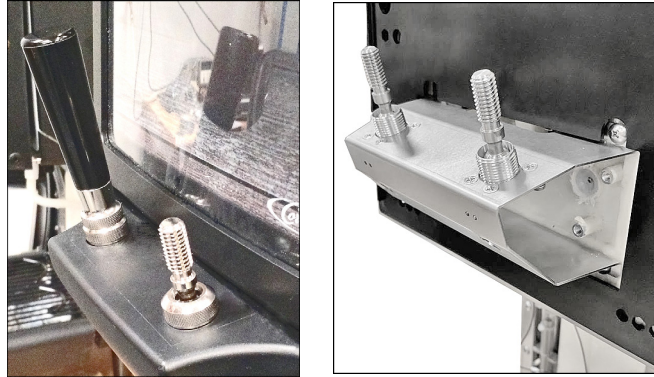


Figure 3-5 - Tap Handles / Microswitch Assemblies

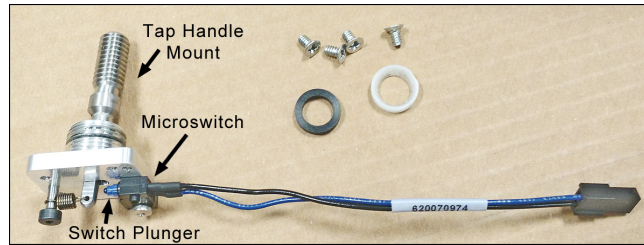


Figure 3-6 - Microswitch Assembly

### 3.3.2 Coffee Concentrate Pump

This pump (Fig.3-7) draws coffee concentrate from the chilled Bag In Box (BIB) and meters it to the mixing manifold at a specific, user-selected ratio to the input water (which is supplied at a fixed pressure and flow rate).

Mixing ratios are adjusted by changing the DIP switch settings on the Main PCB mounted beneath the cabinet, as shown in Figure 3-8. Adjustment of these settings changes the speed of the peristaltic pump to provide more or less concentrate per unit time.

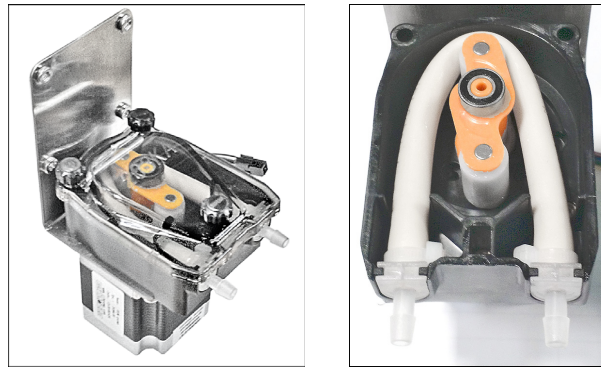


Figure 3-7 - Concentrate Pump

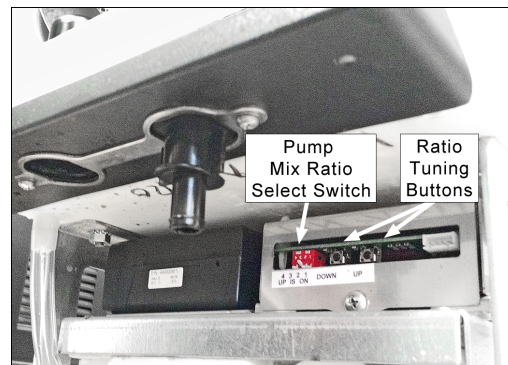


Figure 3-8 - Ratio Select Switch & Tuning Buttons

The selectable ratios provide, from one gallon of concentrate, the coffee yields shown in Table 3-1. (NOTE: Select one ratio - one switch ON.)

Table 3-1 - Concentrate Pump Ratios

Ratio	Main PCB Switch Setting	Concentrate Gallons	Coffee Yield Gallons
3:1	Switch 1 ON	1	4
4:1	Switch 2 ON	1	5
5:1	Switch 3 ON	1	6
7:1	Switch 4 ON	1	8

Ratio Tuning Buttons: One press of a button changes the pump motor speed by 5 RPMs (or by 0.02 - 0.08 of the average TDS value).

The peristaltic pump is driven by a 24V DC servo motor. A maintenance kit for the pump includes a replacement pump hose with nipple ends.

### 3.3.3 Water Inlet Solenoid

This device controls the water input to the mixing manifold. It also limits input pressure to 29 psi (200 kPa) and limits the water flow rate within the range of 1 to 1.25 fluid ounces (29.6 to 37 ml) per second.

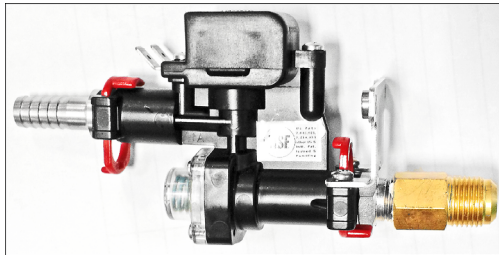


Figure 3-9 - Water Inlet Solenoid

### 3.3.4 Air Compressor & Storage

The 24Vdc air compressor provides air to the mixing-infusion manifold to produce Nitro coffee. It operates independently so that stored air is always available when the Nitro-coffee tap is activated. The pressure switch stops compressor operation when a storage-chamber pressure of 80 psi (552 kPa) is detected. The pressure-relief valve activates at 95 psi (655 kPa) in the event of pump-motor runaway.

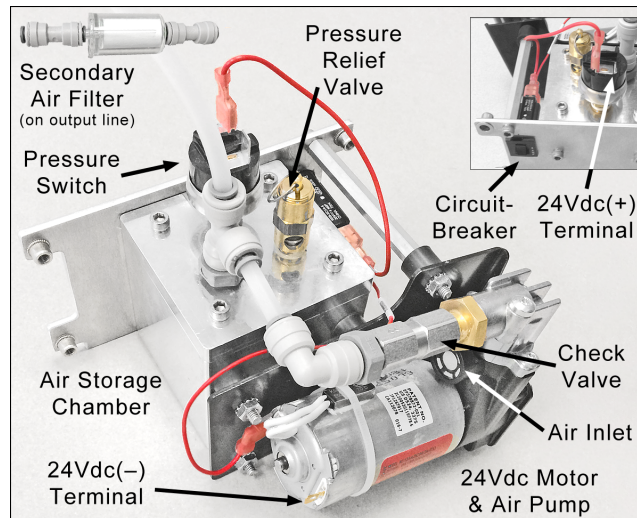


Figure 3-10 - Air Compressor and Air Storage

### 3.3.5 Mixing-Infusion Manifold & Check Valves

The mixing manifold has two halves and is connected to the air-infusion manifold. Three check valves prevent reverse flow in the supply lines and chambers. The assembled check valves snap into place in the manifold.

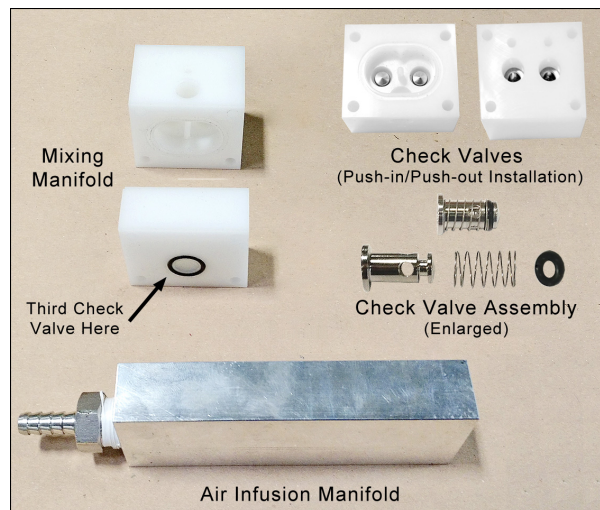
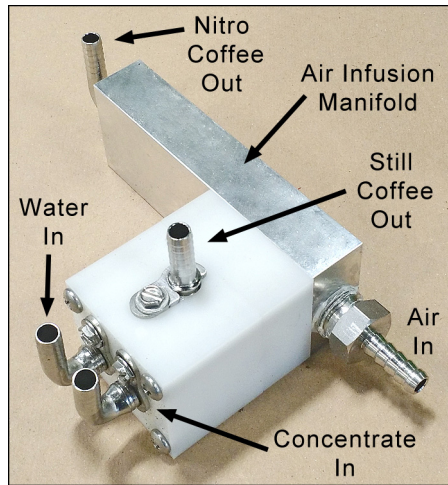


Figure 3-11 - Mixing-Infusion Manifold & Check Valves

### 3.3.6 Dispense Manifold

There is a dispense manifold for each coffee type. It receives the mixed coffee and dispenses it through a solenoid valve that is electrically activated by the tap handle. During operation (when open) the solenoid plunger, to which a valve seat is attached, retracts to allow flow through the valve orifice (Fig. 3-12).

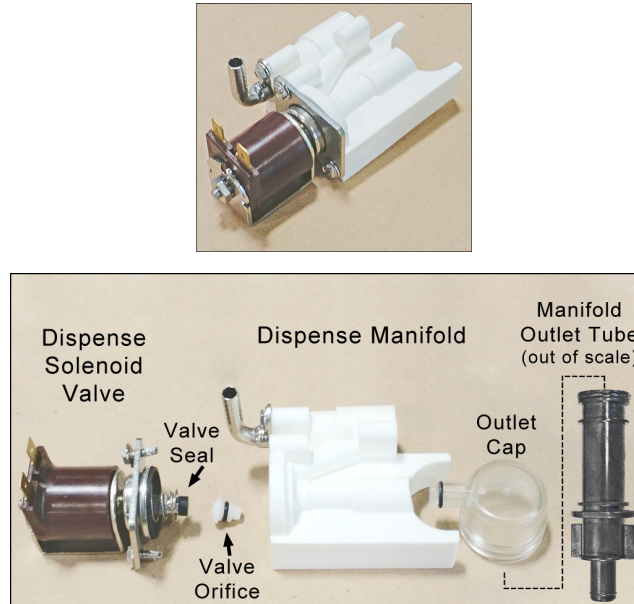


Figure 3-12 - Dispense Manifold Assembly

### 3.3.7 Power Supply (24Vdc)

This unit provides DC power for the air compressor and the Main PCB.

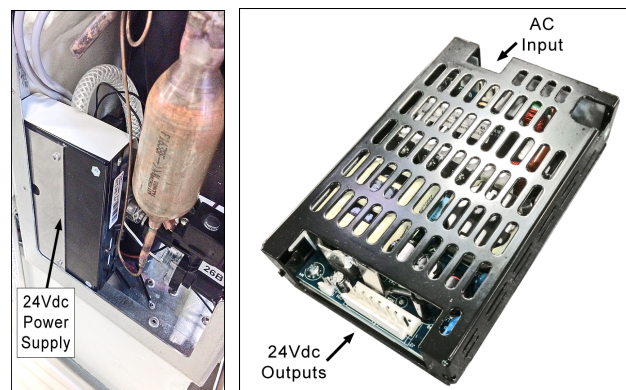


Figure 3-13 - 24Vdc Power Supply

### 3.3.8 Mixing-Dispensing Assembly

This removable assembly performs the mixing, air-injection and dispensing functions of the unit. It consists of the components identified in Figure 3-14. The air-pressure regulator allows user adjustment of the air-infusion pressure for Nitro coffee. The assembly is mounted in the chilled cabinet.

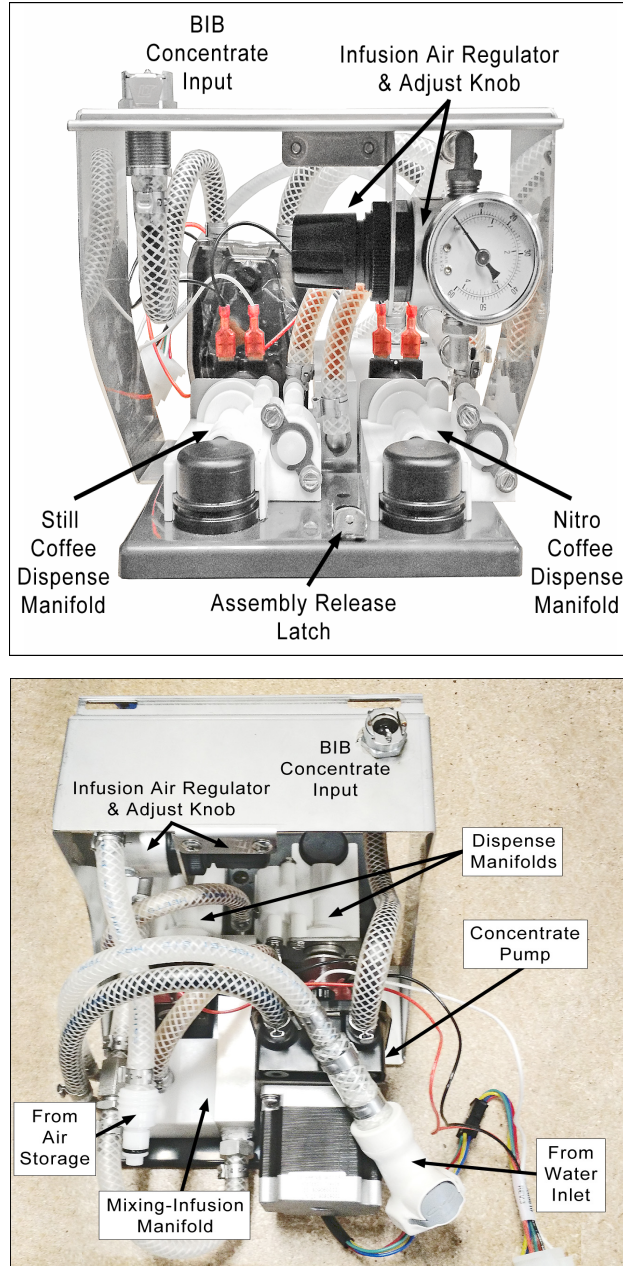


Figure 3-14 - Mixing-Dispensing Assembly



### 3.3.9 Ice Bank Chilling System

In the base of the unit resides the insulated ice bank assembly. It is comprised of a refrigeration unit (in the rear of the enclosure), a water/ice reservoir, an agitator/circulation pump to control ice formation and circulate cooling water, an ice sensor and a control module. The control module manages the refrigeration system and the agitator based on feedback from the ice sensor. Water from the inlet solenoid is routed through a stainless steel coil in the ice bank for chilling. As well, cooling lines from the circulation pump are routed into the product cabinet where a fan circulates chilled air.

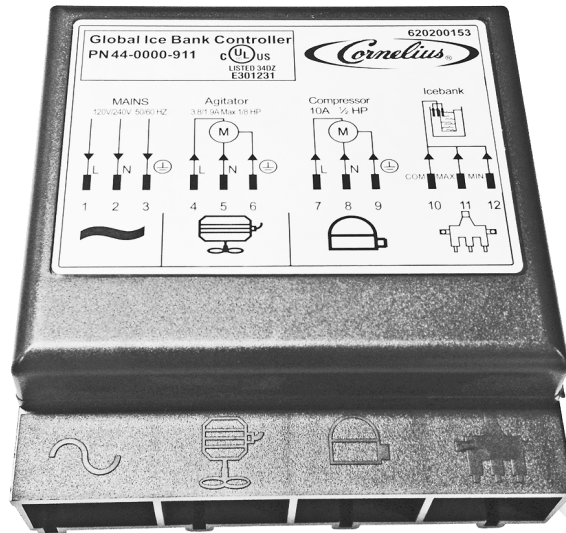
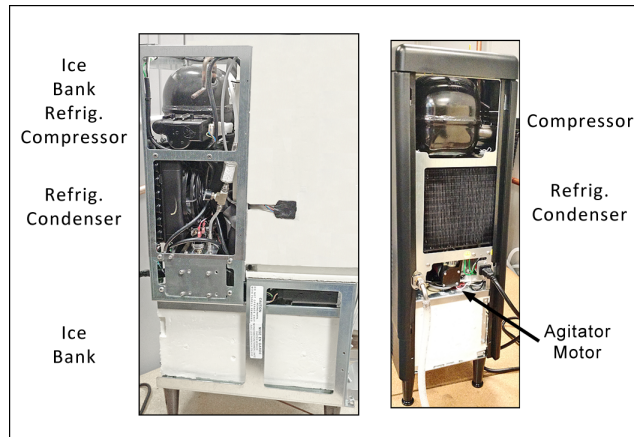


Figure 3-15 - Ice Bank and Controller Module

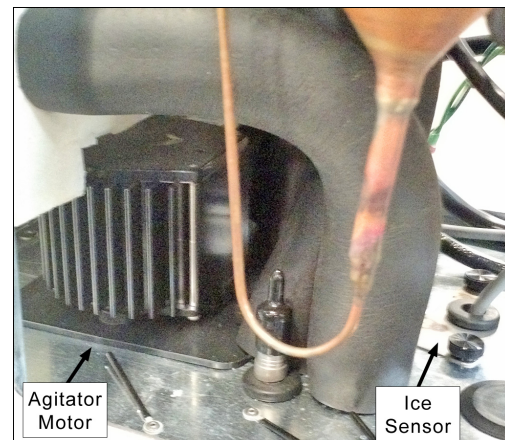
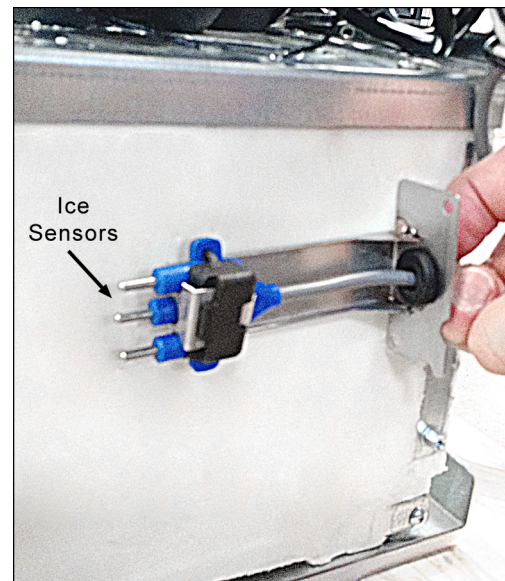
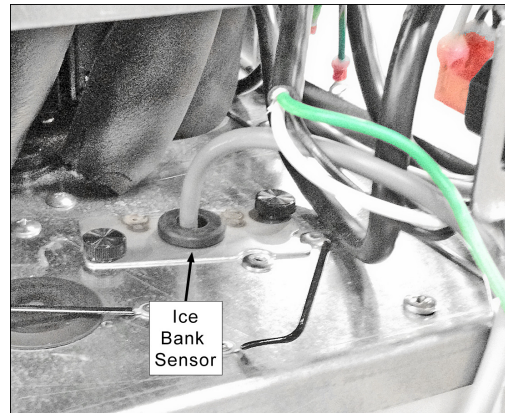


Figure 3-16 - Ice Bank Sensor & Agitator Motor

### 3.3.10 Front-Door Control Switches

These two switches control the merchandiser LED backlight on the front of the door and the dispensing circuit, as indicated below.



Figure 3-17 - Front Door Switches

**Door Light:** On/Off switch turns LED backlight on or off.

**Dispense Motor:** A 3-position switch for normal operation (ON), system shutoff (OFF) and for performing sanitizing procedures (CLEAN). In CLEAN mode, this switch sets the concentrate pump to the water/cleaning-agent mixing ratio (5:1). When the switch is returned to the ON position, the mixing ratio returns to that selected on the pump mix-ratio switch bank (Fig. 3-8).

## 4.0 PREVENTATIVE MAINTENANCE

### 4.1 OVERVIEW

Perform the procedures in this section at the intervals indicated to ensure consistent, safe and clean operation of the unit. These are provided in addition to the routine cleaning and sanitizing procedures included in the Installation & Operation manual.

### 4.2 MAINTENANCE SCHEDULE

Table 4-1 - Maintenance Schedule

Procedure	Section	Interval (Months)
Refrig. condenser & cabinet fan cleaning	4.3.1	12
Ice bank level check	4.3.2	12
Concentrate pump mix ratio verification	4.3.3	12
Components visual inspection	4.3.4	12
Concentrate-pump hose replacement	4.3.5	12

### 4.3 ANNUAL MAINTENANCE

#### 4.3.1 Refrigeration Condenser & Cabinet Fan Cleaning

To ensure optimal cooling efficiency, clean the fan blades and grilles of any collected dust and debris. (The use of compressed or canned air to clean the refrigeration condenser fan blades is adequate.)

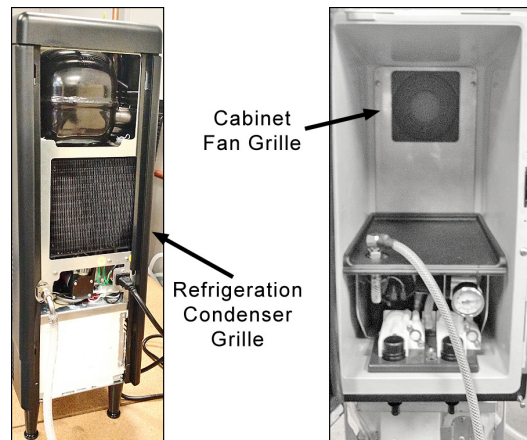


Figure 4-1 - Fans

#### 4.3.2 Ice Bank Level Check

The water level in the ice bank may require periodic topping off to ensure optimal operation. Check and refill it as indicated below.

The fill tube is located behind the front splash panel and is capped with a red plug.

The small, black, overflow tube, connected to an internal standpipe, will emit water during manual refill when the water level reaches the full mark.

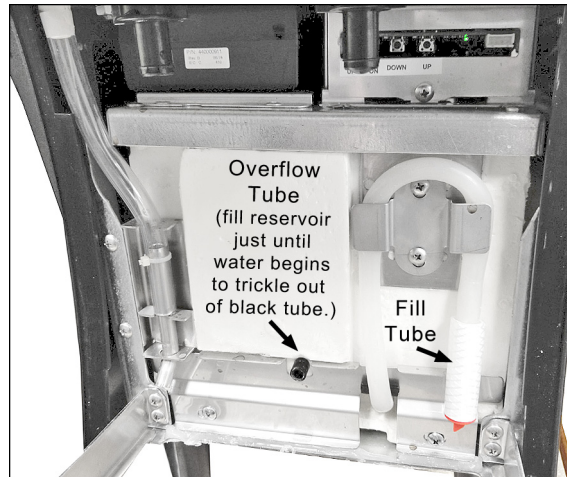


Figure 4-2 - Ice Bank Fill & Overflow Tubes

NOTE: When the fill tube is in its stored position (as shown in Fig. 4-2) it also serves as a 'sight glass' indicating the bank water level.

- 1) Remove the drip tray and splash panel to reveal the front of the ice bank.
- 2) Observe the fill tube and the water level in it. If the water level is below the top of the tube arc, add water to the ice bank.
- 3) Add filtered store water through the fill tube after extending it from its storage position and removing the red cap. Add water until a trickle runs out of the black overflow tube.
- 4) Cap the fill tube and return it to its storage position.

### 4.3.3 Product Pump Mix-Ratio Verification

It is important to ensure consistency in the dispensed coffee, thus the coffee-concentrate/water mixing ratios must be verified. Since the ratios are selected via the Main PCB DIP switch setting, and may sometimes require adjustment using the tuning buttons, a routine check of the ratios is essential. Follow the applicable procedure below to verify/adjust each of the four mixing ratios.

Table 4-2 - Mix Ratio Main PCB Switch Settings

Ratio	Main PCB Switch Setting	Concentrate Gallons	Coffee Yield Gallons
3:1	Switch 1 ON	1	4
4:1	Switch 2 ON	1	5
5:1	Switch 3 ON	1	6
7:1	Switch 4 ON	1	8

1) Set the DIP switch for a ratio (Fig. 4-3).

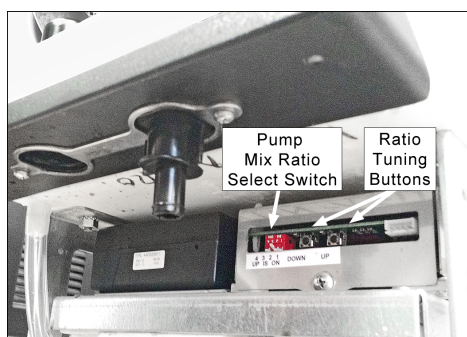


Figure 4-3 - Ratio Select Switch & Tuning Buttons

2) Prior to installing, shake the concentrate BIB.

NOTE: If concentrate is not properly thawed, it will adversely affect the amount of concentrate dispensed. Thawed concentrate should be between 35 °F (1.6 °C) to 40 °F (4.4 °C) and have no ice particles remaining in it.

3) Dispense approximately 16 oz. of drink and discard. This is done to purge any water or coffee dispensed using the previous settings.

4) Draw an 8 oz. drink into a clean dry cup, and measure the temperature to confirm the drink is between 35 to 45°F.

NOTE: Drink temperature must be maintained to properly set the ratio of the unit.

5) Stir the sample thoroughly, and measure the TDS of the drink (refer to the TDS measuring procedures in section 4.3.3.1).

6) If the TDS matches the desired range of the product, no further adjustments are necessary.

If the TDS is above/below required value, use the 'UP' or 'DOWN' Ratio Tuning buttons as necessary to achieve the desired value. (One press of a tuning button changes the pump motor speed by 5 RPMs; or by 0.02 - 0.08 of the average TDS value.)

NOTE: Dispense a 16 oz. drink to purge the previous setting before measuring again.

NOTE: Make adjustments in 1-2 button pushes to avoid overshooting the target value.

7) Once the desired value is reached, the setup is complete and should be stable with standard maintenance of the equipment.

8) Perform the previous steps for the remaining three ratios to verify/adjust them.

NOTE: The adjusted ratio settings will not be reset by Clean mode or power loss.

NOTE: If a coffee concentrate flavor, manufacturer or ratio type is changed, repeat this process to set the ratio accurately. Conducting this process is not necessary when changing BIBs of the same type of coffee concentrate.



#### 4.3.3.1 Measuring TDS (Total Dissolved Solids)

There are three methods that may be used to check/calibrate the ratio setting of the equipment.

1. Using a TDS Meter
2. Using a Brix Meter/Refractometer
3. Manually Checking Volume Ratio

For each method, access the mix-ratio control switches (Fig. 4-3) by removing the splash panel. NOTE: Only one ratio select switch is allowed to be On, with all others Off.

##### Option 1: Using A TDS Meter

A TDS meter measures the Total Dissolved Solids in a drink. For coffee, it measures the level of extraction and can be used to ensure that the correct mix ratio is achieved. If the TDS target is known, a TDS meter allows for a simple process to measure and ensure proper calibration.

- 1) Follow instructions for the TDS meter to ensure proper calibration and zero setting prior to starting this process.
- 2) Follow steps 1-5 in section 4.3.3 previously.
- 3) Using a straw, transfer a small sample of the finished drink to the TDS meter lens.
- 4) Check the TDS value on the meter.
- 5) Adjust the unit ratio setting with the tuning buttons and purge the system by dispensing a 16 oz. drink after each adjustment.

NOTE: Since this method measures TDS, the 'UP' tuning button will adjust TDS up, and the 'DOWN' button will adjust TDS down.

##### Option 2: Using a BRIX Refractometer

A Brix refractometer is used to measure the sugar content in aqueous solutions. This method may not apply to all coffee concentrates, but many concentrates have natural sugars that allow a Brix refractometer to be used. In order to use this method, the target Brix value must be known for the coffee concentrate.

- 1) Follow instructions for the Brix refractometer to ensure proper calibration and zero setting prior to starting this process.
- 2) Follow steps 1-5 in section 4.3.3 previously.
- 3) Using a straw, transfer a small sample of the finished drink to the Brix refractometer meter lens.
- 4) Check the Brix value on the meter.
- 5) Adjust the unit ratio setting with the tuning buttons and purge the system by dispensing a 16 oz. drink after each adjustment.

NOTE: Since this method measures Brix, the 'UP' tuning button will adjust Brix up, and the 'DOWN' button will adjust Brix down.



### Option 3: Manually Checking Volume Ratio

#### Additional Supplies

- Weighing scale

Following steps explain measuring the water-to- coffee-concentrate ratio using weight.

NOTE: Weight can be substituted by volume if a weighing scale is not handy.

- 1) Follow steps 1-5 in section 4.3.3 previously.
- 2) Pull the Left & Right Tap Handles for 10 seconds one after the other to make sure coffee is dispensing.
- 3) Set 10 seconds timer.
- 4) Pull the Left Tap Handle for 10 seconds to dispense the coffee and weigh the product dispensed.
- 5) Divide #4 by the total parts to get the target coffee concentrate dispense weight.
- 6) a) If the total dispense is 300 grams and desired ratio is 5:1, divide by 6 to get 50 grams concentrate target for a 10 second pour.  
b) If the total dispense is 300 grams and desired ratio is 4:1, divide by 5 to get 60 grams concentrate target for a 10 second pour.  
c) If the total dispense is 300 grams and desired ratio is 3:1, divide by 4 to get 75 grams concentrate target for a 10 second pour.
- 7) Turn off water to the unit.
- 8) Pull the Left Tap Handle for 5 seconds or until coffee is darker and only concentrate is dispensed.
- 9) Set 10 seconds timer and dispense concentrate by pulling the Left Tap Handle.
- 10) a) If weight is greater than #6 target, use the 'DOWN' button on controller to slow the concentrate motor down.  
b) If weight is less than #6 target, use the 'UP' button on controller to speed up the concentrate motor.
- 11) Set 10 seconds timer and dispense concentrate by pulling the Left Tap Handle until target value from #6 is within +/- 2 grams of target.
- 12) Turn water on to unit.
- 13) Pull the Left Tap Handle for 10 seconds until coffee is dispensed.
- 14) Pull the Right Tap Handle for 10 seconds until coffee is dispensed.



#### 4.3.4 Components Visual Inspection

Check the condition of each system component for the following conditions and replace per the instructions in section 6.0 if any are observed.

Air/Water Hoses: Cracking, bulging, leaking.

Hose Connectors: Cracking, leaking, worn or distorted o-rings or seals.

Ice Bank & Inlet Solenoid Spring Housing (Fig. 3-9): Water Discoloration, Contamination, Sediment. (Attempt drain and flush before replacing component.)

Main PCB (Fig. 2-2): Corrosion or signs of overheated components.

Dispense Manifolds (Fig. 3-12): Check o-rings on top portion of dispensing tubes and on the dispensing tube, outlet-cap nipple that inserts into the manifold. If the manifold drips, check the solenoid valve plunger seal and o-ring on the orifice insert (Fig. 4-4). Replace as the manifold assembly as required.

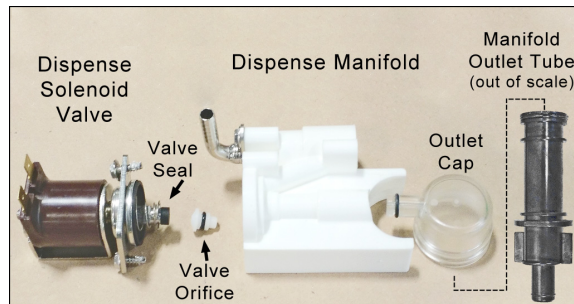


Figure 4-4 - Dispense Manifold Assembly

Cabinet Fan (Fig. 4-1): Verify operation.

Refrigeration System (Fig. 4-1): Verify adequate airflow through condenser coil. Clean as needed.

#### 4.3.5 Concentrate-Pump Hose Replacement

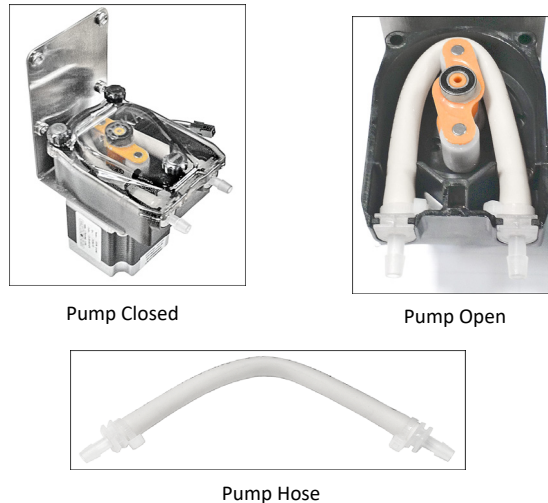


Figure 4-5 - Concentrate Pump & Overhaul Kit

Over time, the concentrate-pump internal hose can become less pliable and the rotor and top bearing significantly worn. To prevent a disruptive failure, install a new pump hose annually as described below.

- 1) Inside the cabinet, disconnect the water and air lines at the back of the chamber.
- 2) Pull each tap to relieve line pressure.
- 3) Shut off power to the Nitropro unit.
- 4) In the cabinet, unplug the wiring connector from the mixing-dispensing assembly and remove the assembly. Place it on the countertop (Fig. 4-6).

5) Disconnect the two hoses from the pump, note or mark their locations for reassembly.

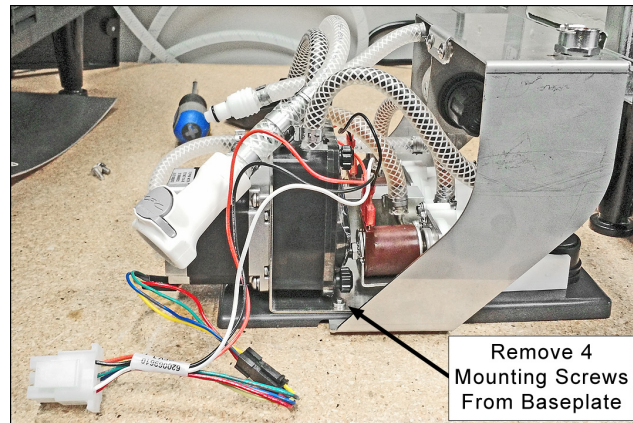


Figure 4-6 - Mixing-Dispensing Assembly Removed

- 6) Remove the four screws securing the pump bracket to the assembly baseplate (access from underneath).
- 7) Open the pump cover by removing the three thumbscrews.
- 8) Lift out the pump rotor and bearing. Slide out the two pump-hose nipples from the pump housing.
- 9) Clean the pump-hose chamber as required.
- 10) Install the new pump hose. When installing it, orient the rotor as shown in the upper photos of Fig. 4-5 so that only one point on the hose must be compressed.
- 11) Reinstall the pump cover.
- 12) Install the pump on the baseplate and reconnect the hoses.
- 13) Reinstall the mixing-dispensing assembly into the cabinet, making sure to reconnect the plumbing and electrical connectors.
- 14) Confirm pump operation by dispensing both product types until air is purged from the lines.



## 5.0 TROUBLESHOOTING

### 5.1 SYSTEMS-LEVEL TROUBLESHOOTING

Malfunction	Possible Causes	Corrective Action
Unit will not operate	<ul style="list-style-type: none"> <li>A. No power to unit due to tripped circuit breaker</li> <li>B. Loose or broken wiring connection to 24Vdc power supply</li> </ul>	<ul style="list-style-type: none"> <li>A. Reset facility circuit breaker. Confirm that breaker is correct size &amp; no other equipment is operating on the same circuit. Also confirm that supply voltage is within <math>\pm 10\%</math> of name plate specification</li> <li>B. Repair connection, confirm 24Vdc output. Replace power supply as required.</li> </ul>
No Cooling	<ul style="list-style-type: none"> <li>A. Line voltage not within nameplate specs. causing compressor overload trip</li> <li>B. No water in water ice bath or water level very low, exposing ice bank sensing probe</li> <li>C. Malfunctioning ice-bank controller or sensing probe</li> <li>D. Cabinet fan inoperative resulting in warm concentrate (water continues to cool)</li> <li>E. Compressor short cycles on overload</li> <li>F. Compressor starts, hums, trips overload</li> <li>G. Defective compressor overload or start capacitor</li> <li>H. Compressor starts but does not switch off of motor-start winding</li> <li>I. Refrigerant leak</li> </ul>	<ul style="list-style-type: none"> <li>A. Contact an electrician</li> <li>B. Fill ice bath to proper water level (see section 4.3.2)</li> <li>C. Replace</li> <li>D. Replace</li> <li>E. Shut off, determine cause</li> <li>F. Seized or shorted compressor, replace</li> <li>G. Test &amp; replace</li> <li>H. Relay or compressor is defective. Test &amp; replace faulty item</li> <li>I. Repair leak, evacuate &amp; recharge system</li> </ul>
Merchandiser LED back-lighting panel not working	<ul style="list-style-type: none"> <li>A. Door switch is off</li> <li>B. Harness not connected</li> <li>C. No power to Main PCB control board or board has failed</li> </ul>	<ul style="list-style-type: none"> <li>A. Turn on Door Light switch inside door</li> <li>B. Remove LED panel, check harness connections</li> <li>C. Measure power input to Main PCB. Replace fuse or board if necessary (see Fig. 6-1)</li> </ul>

## 5.2 DRINK-QUALITY TROUBLESHOOTING

Malfunction	Possible Causes	Corrective Action
Dispensed coffee is too weak	<ul style="list-style-type: none"> <li>A. Incorrect ratio DIP switch selected for product ratio being used</li> <li>B. Brix adjustment needs to be made</li> <li>C. Concentrate hose or pump-motor malfunction</li> </ul>	<ul style="list-style-type: none"> <li>A. Confirm product ratio and select appropriate ratio DIP switch</li> <li>B. Using the ratio-tuning buttons located behind the splash panel, press the UP button to increase pump speed and recheck Brix measurement</li> <li>C. Verify BIB connection and harness connection to concentrate pump</li> </ul>
Dispensed coffee is too strong	<ul style="list-style-type: none"> <li>A. Incorrect ratio DIP switch selected for product ratio being used</li> <li>B. Brix adjustment needs to be made</li> <li>C. Water pressure too low</li> </ul>	<ul style="list-style-type: none"> <li>A. Confirm product ratio and select appropriate DIP switch</li> <li>B. Using the ratio-tuning buttons located behind the splash panel, press the DOWN button to decrease pump speed and recheck Brix measurement</li> <li>C. Verify water supply to unit is in range</li> </ul>
Excessive foam in Nitro coffee	<ul style="list-style-type: none"> <li>A. Air regulator in cabinet not set properly</li> <li>B. Regulator not holding set point. Pressure reading is drifting upwards</li> <li>C. Air-storage pressure-switch malfunction (causing high pressure)</li> </ul>	<ul style="list-style-type: none"> <li>A. Pull regulator knob outward turn CW for more air or CCW for less air injection</li> <li>B. Bleed off all pressure and reset regulator. If after setting pressure the gauge reading continues to drift upward, replace the regulator</li> <li>C. Inside cabinet, connect pressure gauge to air outlet quick disconnect (see Sec. 5.1). Gauge should read 75 to 85 psi (517 to 586 kPa). If reading is outside of range, replace pressure switch</li> </ul>
Warm drinks	<ul style="list-style-type: none"> <li>A. Environment around dispenser too warm</li> <li>B. Excessive demand on dispenser</li> <li>C. Dirty condenser coil</li> <li>D. Inoperative condenser fan</li> <li>E. Defective ice bank control module</li> <li>F. Refrigerant low due to leak in system</li> <li>G. Defective ice probe</li> </ul>	<ul style="list-style-type: none"> <li>A. Relocate dispenser</li> <li>B. Add a water pre-cooler or a second dispenser to divide usage load</li> <li>C. Clean condenser coil</li> <li>D. Replace condenser fan motor</li> <li>E. Test &amp; replace if necessary</li> <li>F. Repair leak and recharge system</li> <li>G. Check and replace as necessary</li> </ul>
Concentrate is warm, water is cold	<ul style="list-style-type: none"> <li>A. Cabinet fan malfunction</li> <li>B. Product box too close to fan</li> <li>C. Agitator motor/pump malfunction or output is restricted</li> <li>D. Loss of refrigerant charge due to leak in system</li> </ul>	<ul style="list-style-type: none"> <li>A. Check/replace fan</li> <li>B. Move product box away from fan</li> <li>C. Check/replace agitator motor, check water lines &amp; flow</li> <li>D. Repair leak, recharge system</li> </ul>



### 5.3 COMPRESSED AIR & INFUSION TROUBLESHOOTING

Malfunction	Possible Causes	Corrective Action
No gas infusion on right side tap (no foam in Nitro coffee)	<ul style="list-style-type: none"> <li>A. Infusion air regulator in cabinet is not set properly</li> <li>B. The air compressor did not activate or is cycling on/off</li> <li>C. Sparger (infusion manifold) clogged, dirty</li> <li>D. Stuck check valve</li> </ul>	<ul style="list-style-type: none"> <li>A. Pull regulator knob outward, turn CW for more air injection or CCW for less</li> <li>B. See air compressor symptoms</li> <li>C. Perform the weekly sanitize/cleaning procedure (per Install-Operator manual)</li> <li>D. Flush out, same as C above.</li> </ul>
Air compressor not turning on	<ul style="list-style-type: none"> <li>A. Malfunctioning pressure switch</li> <li>B. Malfunctioning 24 Vdc power supply</li> <li>C. No voltage to air compressor</li> <li>D. Malfunctioning air compressor</li> </ul>	<ul style="list-style-type: none"> <li>A. Check pressure switch for continuity with zero pressure in system. If circuit is open, replace switch</li> <li>B. Confirm output voltage is 24VDC at power supply. Replace as required</li> <li>C. Measure for 24VDC at compressor, inspect wire connections, power supply</li> <li>D. If air compressor is receiving 24 Vdc, replace it</li> </ul>
Air compressor cycling on/off too frequently	<ul style="list-style-type: none"> <li>A. Leak in the compressed air circuit</li> <li>B. Air-storage relief valve not fully seating</li> <li>C. Pressure switch malfunction</li> </ul>	<ul style="list-style-type: none"> <li>A. Leak check circuit starting at compressor through to air regulator in cabinet. Repair or replace defective component</li> <li>B. Pull relief valve ring and purge any possible debris. If it continues to leak, replace relief valve</li> <li>C. Check pressure switch per Sec. 5.1.</li> </ul>
Air compressor runs continuously	<ul style="list-style-type: none"> <li>A. Leak in the compressed air circuit</li> <li>B. Malfunctioning pressure switch</li> <li>C. Air-storage relief valve not fully seating due to obstruction</li> <li>D. Air-storage relief valve worn out</li> </ul>	<ul style="list-style-type: none"> <li>A. Leak check circuit starting at compressor through to air regulator in cabinet. Repair or replace defective component</li> <li>B. Check pressure switch for continuity with zero pressure in system. If circuit is open, replace switch</li> <li>C. Pull relief valve ring and purge any possible debris. If it continues to leak, replace relief valve</li> <li>D. Hold down relief valve stem and allow air compressor to cycle &amp; shut off at 80 psi. Release stem and if it still leaks, replace the relief valve</li> </ul>

## 5.4 DISPENSING-FUNCTION TROUBLESHOOTING

Malfunction	Possible Causes	Corrective Action
Nothing dispenses when tap handle is pulled (refrigeration is operating)	<ul style="list-style-type: none"> <li>A. Door inner Dispense Motor switch is off</li> <li>B. Mixing-Dispensing assembly wiring harness is disconnected</li> <li>C. Door interlock switch is open</li> <li>D. Tap microswitch is not activating</li> <li>E. Dispense solenoid valve or water inlet solenoid not opening</li> <li>F. Clogged orifice at dispense manifold valve or in dispense-tube cap</li> <li>G. No output from 24 Vdc power supply</li> <li>H. No power to Main PCB or board has failed</li> </ul>	<ul style="list-style-type: none"> <li>A. Turn on Dispense Motor switch</li> <li>B. Connect harness in cabinet-wall socket</li> <li>C. Door must be closed to allow dispensing. Check interlock switch operation &amp; replace if necessary</li> <li>D. Remove tap handle and inspect lever for damage, verify switch operation, replace as required (see section 6.10)</li> <li>E. Verify 24 Vdc at both solenoids when dispense switches are activated</li> <li>F. Perform the weekly sanitize/cleaning procedure in Install-Operator manual</li> <li>G. Confirm power supply output voltage is a steady 24 Vdc</li> <li>H. Measure 24 Vdc input to board. Replace fuse or board if necessary (see Fig. 6-1)</li> </ul>
No water dispensed, concentrate only	<ul style="list-style-type: none"> <li>A. Water line inside cabinet is disconnected from mixing-dispensing assembly</li> <li>B. No water to dispenser, supply is off</li> <li>C. Water inlet solenoid (at the rear of unit) is clogged, binding or defective</li> <li>D. Freeze-up of water coil in ice bank</li> </ul>	<ul style="list-style-type: none"> <li>A. Reconnect water quick-disconnect</li> <li>B. Restore water supply</li> <li>C. Confirm 24 Vdc is present at solenoid during dispensing; confirm solenoid coil is not open-circuited; replace as required</li> <li>D. Unplug dispenser &amp; allow ice bank to thaw for 2-4 hrs. Verify operation of agitator motor &amp; ice bank control; replace components as required</li> </ul>
No concentrate dispensed, water only	<ul style="list-style-type: none"> <li>A. BIB hose end not fully engaged into connector on mixing-dispensing assembly platform in cabinet</li> <li>B. Concentrate too cold, not properly thawed</li> <li>C. Malfunctioning pump motor</li> <li>D. No power to Main PCB or board failed</li> </ul>	<ul style="list-style-type: none"> <li>A. Check connector o-rings, fully insert BIB hose end into connector</li> <li>B. Concentrate should be 35 to 40 °F (1.7 to 4.5 °C) with no ice prior to loading</li> <li>C. Verify BIB hose connection and wiring harness connection to pump</li> <li>D. Measure 24 Vdc power input to board. Replace fuse or board if necessary (see Fig. 6-1)</li> </ul>
Unit continues to dispense after tap handle is released or dispenses without operator action	<ul style="list-style-type: none"> <li>A. Dispense lever or dispense microswitch is stuck in ON position</li> </ul>	<ul style="list-style-type: none"> <li>A. Remove tap lever shroud (sec. 6.10) and inspect dispense switch and wiring harness</li> </ul>
Product continuously drips from dispense tube in OFF mode	<ul style="list-style-type: none"> <li>A. Water inlet solenoid at rear of unit or dispense manifold solenoid valve is not shutting off completely</li> </ul>	<ul style="list-style-type: none"> <li>A. Flush/clean solenoid(s), replace parts as necessary (see sections 6.4.3 &amp; 6.6)</li> </ul>
Pulsing effect in coffee stream while dispensing	<ul style="list-style-type: none"> <li>A. Facility water pressure low, below 30 psi</li> <li>B. Water inlet solenoid binding or pressure-control components are malfunctioning</li> <li>C. Concentrate pump malfunctioning</li> </ul>	<ul style="list-style-type: none"> <li>A. Correct water supply pressure to ensure constant 40-65 psi (275.8-448.2 Kpa) is being provided to unit</li> <li>B. Clean and/or replace as necessary</li> <li>C. Verify operation, replace as necessary</li> </ul>

## 5.5 AIR-COMPRESSOR PRESSURE VERIFICATION

This procedure is a measurement of the air pressure in the air storage chamber to determine if the air pump is working properly and shutting off when the pressure is approximately 80 psi (552 kPa).

- 1) Shut off power to the Nitropro unit.
- 2) Inside the cabinet, disconnect the dispense-assembly air line from the back wall air inlet. Connect a 100 psi (689 kPa) air pressure gauge with a quick-connect fitting to the Air Inlet line (Figure 5-1).

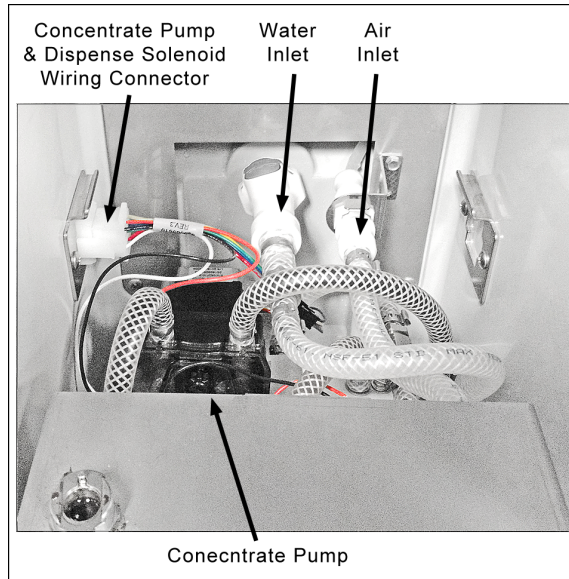


Figure 5-1 - Air Inlet Line

- 3) Apply power to the unit.
- 4) Dispense a Nitro coffee drink or two to trigger air-compressor operation.
- 5) Observe the pressure gauge.
- 6) The compressor should stop running at a reading of 75 to 85 psi (517 to 586 kPa). If the pressure is out of range, check for leaks and check/replace the storage-chamber pressure switch.

## 6.0 COMPONENT REPLACEMENT

This section provides instructions or guidelines on replacing the various Nitropro Mini components.

### 6.1 SAFETY PRECAUTIONS

#### **WARNING:**

Disconnect power to the unit before servicing or replacing electrical components. Follow all lock out/tag out procedures established by the user. Verify all power is disconnected from the unit before performing any work. Failure to comply could result in serious injury, death or damage to the equipment.

#### **CAUTION:**

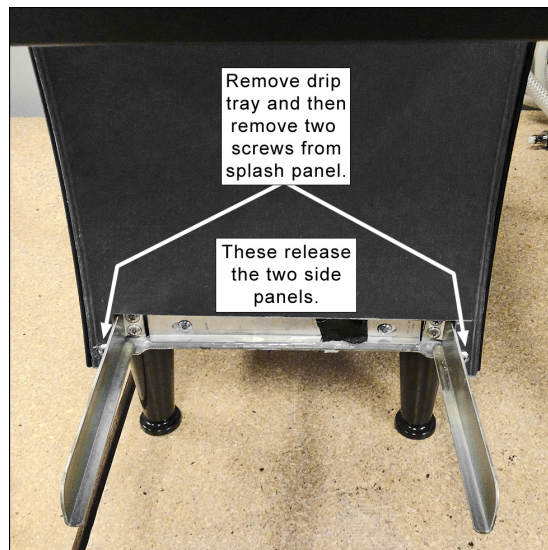
When replacing or testing electronic components, be sure to wear a static strap connected to chassis ground. This protects the electronic components from any static discharge while working on the unit. (This specifically applies to handling of a new Main PCB or an Ice-Bank Controller module.)

### 6.2 ACCESS PANEL REMOVAL

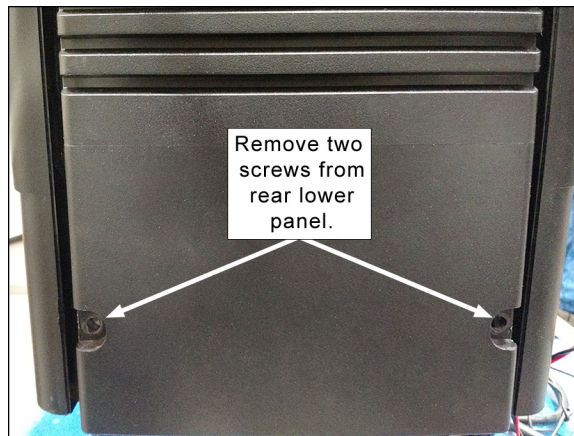
Follow the steps in the photos below to remove the access panels in the required order.

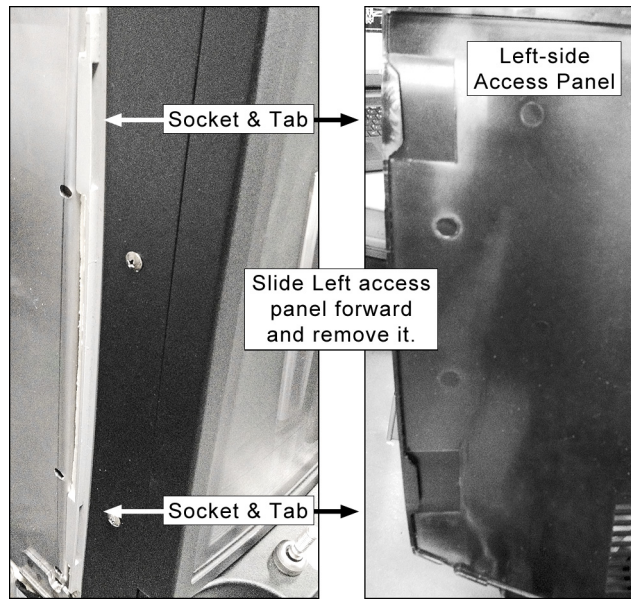


NOTE: Use the hinge cover to collect the panel screws removed.









### 6.3 MAIN PCB

- 1) Shut off power to the Nitropro Mini and unplug its power cord from the wall receptacle.
- 2) Remove the drip tray and splash plate.
- 3) Remove the Phillips screw securing the metal housing of the Main PCB (Fig. 6-1).
- 4) Withdraw the Main PCB from the unit and unplug its three wiring connectors.
- 5) Replace and secure new PC board/mounting plate assembly in the unit with the supplied screw.
6. Setup the mix-ratio select switches by following the procedure in the install manual or section 4.3.3 of this manual.
7. Apply power to the unit and confirm that the green, heartbeat LED on the PCB is blinking, indicating that the board is functioning properly.

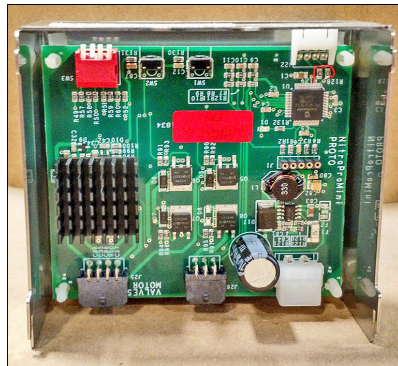
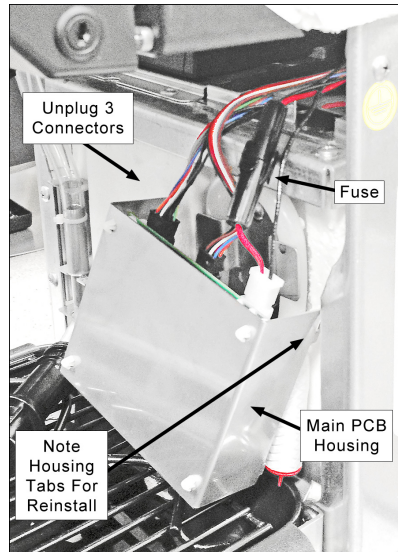


Figure 6-1 - Main PCB Housing Removed

## 6.4 MIXING-DISPENSING ASSEMBLY COMPONENTS

This assembly contains multiple components that typically must be unfastened from the baseplate (underside mounting screws) or from the upper brackets employing through-hole mounting.

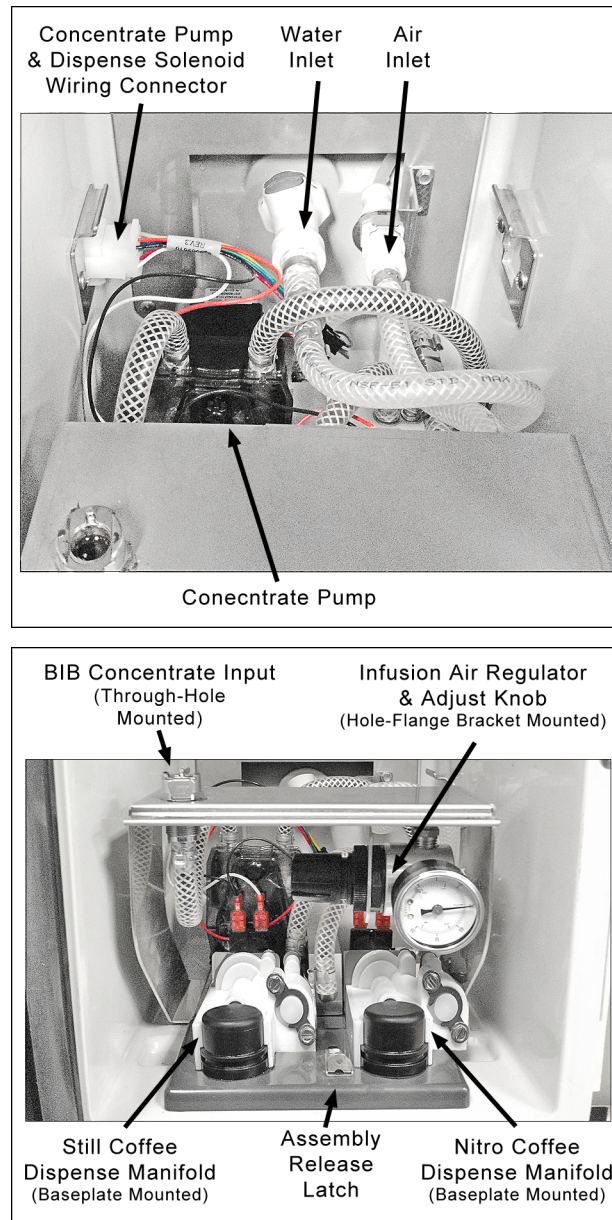


Figure 6-2 - Mixing-Dispensing Assembly in Cabinet

### Assembly Removal from Cabinet

- 1) In the cabinet, disconnect the air/water supply lines and the wiring connector.
- 2) Pull the assembly release latch (Fig. 6-2) forward and then lift the assembly out of the cabinet and place it on a bench or countertop.

3) Replace components by following the appropriate instructions below.

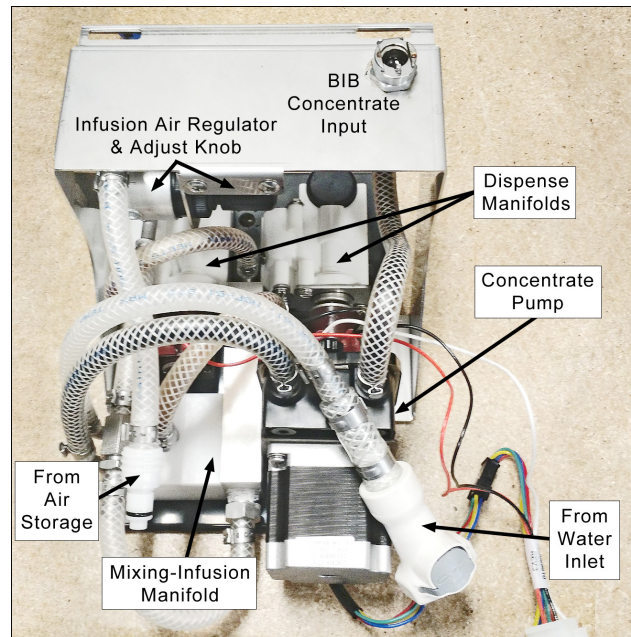


Figure 6-3 - Mixing-Dispensing Assembly in Cabinet

#### 6.4.1 Air Pressure Regulator

- 1) Unscrew the black, threaded ring under the regulator adjustment knob and the bracket. Withdraw the regulator from its mounting bracket to access the air hoses.
- 2) Unfasten the air hoses, noting or marking their locations. Remove the regulator.
- 3) On the old regulator, turn its adjustment knob clockwise and count the turns until it stops.
- 4) On the new regulator, turn its adjustment knob clockwise until it stops (closed). Then open it the number of turns counted in step 3.
- 5) Connect the new regulator to the air hoses.
- 6) Reinstall the regulator in reverse order.
- 7) Confirm operation and adjust as required.

#### 6.4.2 Mixing - Infusion Manifold

- 1) On the underside of the assembly baseplate, remove the screws securing the mixing-infusion manifolds (Fig. 6-3).
- 2) Use tape and a marker to label the five hoses.
- 3) Loosen the C-plate retainer screws where the four hoses connect to the manifold (Fig. 6-4).
- 4) Move a retainer plate aside and rotate the hose fitting back and forth while withdrawing it from the manifold. Remove the four fittings. Check/replace their o-rings as needed.
- 5) Carefully remove the threaded, hose-nipple fitting from the infuser manifold by first removing the hose clamp using side cutters or the recommended Oetiker HIP 2800 Es crimping/cutting tool (see Fig. 6-5). Cut the clamp open.

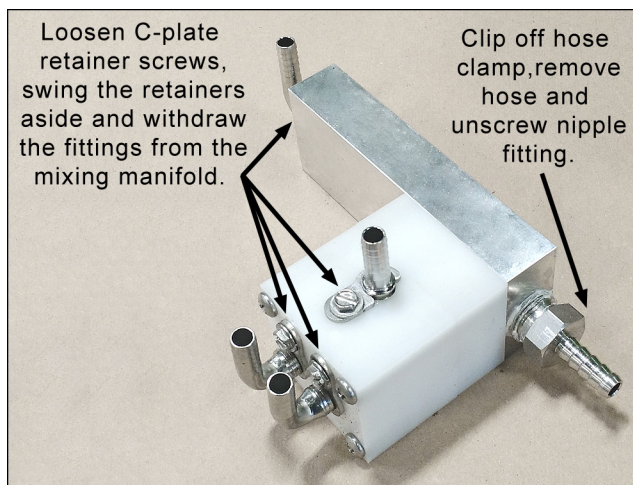


Figure 6-4 - Mixing Manifold Hose Fittings Removal

#### **⚠ CAUTION:**

Be careful to avoid damaging the tubing when removing the hose clamp.

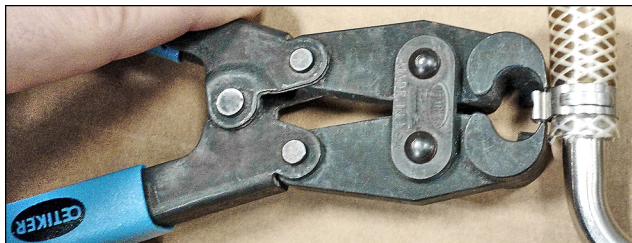


Figure 6-5 - Hose Clamp Removal (Oetiker Tool)

- 6) Remove the hose and unscrew the threaded, hose-nipple fitting. Clean off the Teflon tape and apply new tape (or use an NSF 61 pipe-sealing dope, such as T Plus 2 by Rector Seal).
- 7) Remove the mixing-infusion manifold and place the new one in the mixing-dispensing assembly.
- 8) Reinstall the hoses in reverse order. When tightening the threaded, hose-nipple fitting in the infuser manifold, tighten it finger tight and then rotate it 2 to 3 turns to prevent leakage. Use the Oetiker crimping tool to install the hose clamp on the hose-nipple fitting.
- 9) Secure the manifold assembly to the baseplate by reinstalling the underside screws.
- 10) Reinstall the mixing-dispensing assembly in the cabinet, operate the dispenser and check all the manifold hose connections for leaks.

### 6.4.3 Dispense Manifold

- 1) Remove the assembly-underside screws that secure the manifold (Fig. 6-6) to the baseplate.
- 2) Unplug the two solenoid wires and disconnect the hose from its port.
- 3) Remove the dispense manifold and replace it by following the previous steps in reverse order.

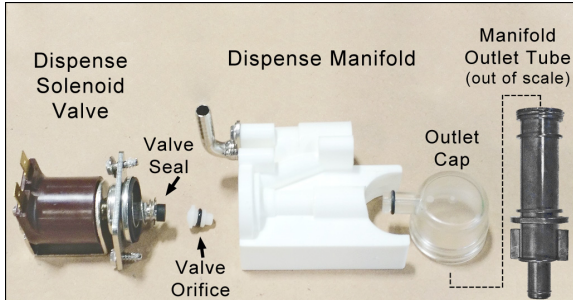


Figure 6-6 - Dispense Manifold Assembly

### 6.4.4 Concentrate-Pump

Refer to section 4.3.5 Concentrate-Pump Hose Replacement for pump removal instructions.

## 6.5 AIR COMPRESSOR REMOVAL

The air compressor (Fig. 6-7) is located in the left rear of the enclosure and is mounted on a carrier plate to allow removal.

- 1) Shut off the power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the top, back, and left access panels from the dispenser.
- 3) With power off, pull the relief valve ring to depressurize the air storage chamber.
- 4) Disconnect the air line from the storage chamber top cover.
- 5) Remove the 4 screws indicated in Figure 6-7.
- 6) Remove the compressor partially from the enclosure and disconnect the black ground wire from the motor and the red wire from the 4 amp breaker terminal.
- 7) At this point you may service the compressor by replacing the pressure switch, relief valve, check valve, motor/compressor assembly or the storage chamber gasket. Otherwise, transfer the plumbing components necessary to the new compressor and install them in reverse order.

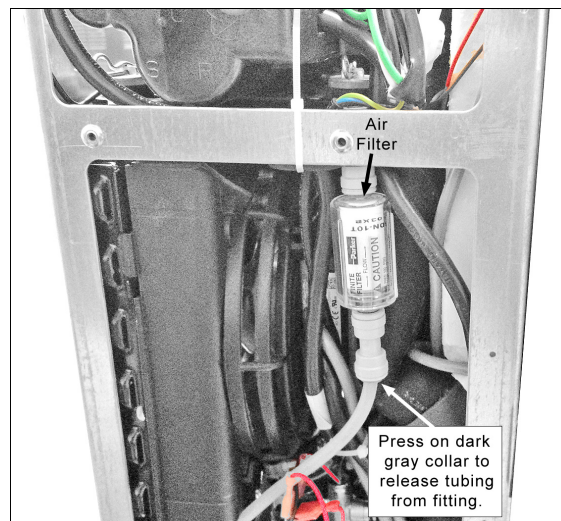
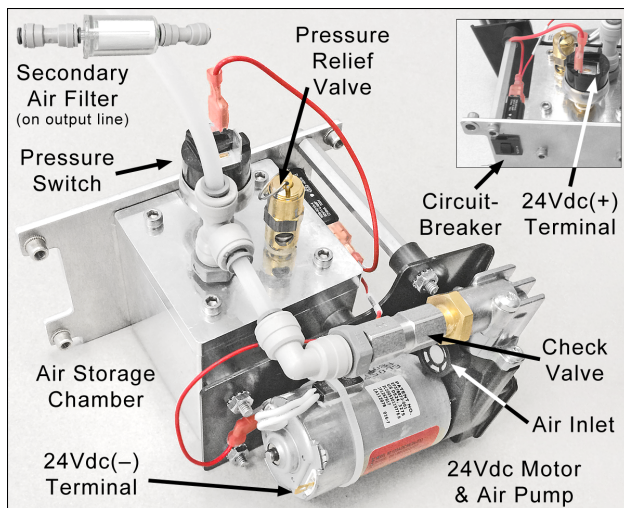
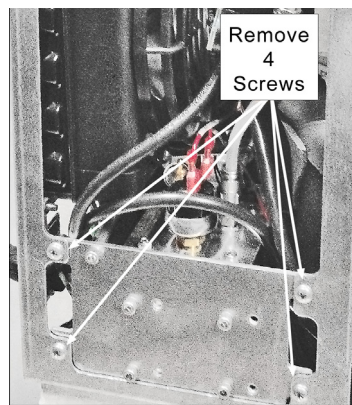


Figure 6-7 - Air Compressor and Storage Chamber

### 6.5.1 Compressor Air Filter Replacement

- 1) Perform steps 1 -3 shown above in section 6.5.
- 2) Note the orientation of the air filter (Fig. 6-7).
- 3) Disconnect the air filter from the air line by pressing on the dark gray ring on the hose side of each connector while withdrawing the hose.
- 4) Install the new air filter by firmly pressing the air hose into each filter-connector end.



## 6.6 WATER INLET SOLENOID

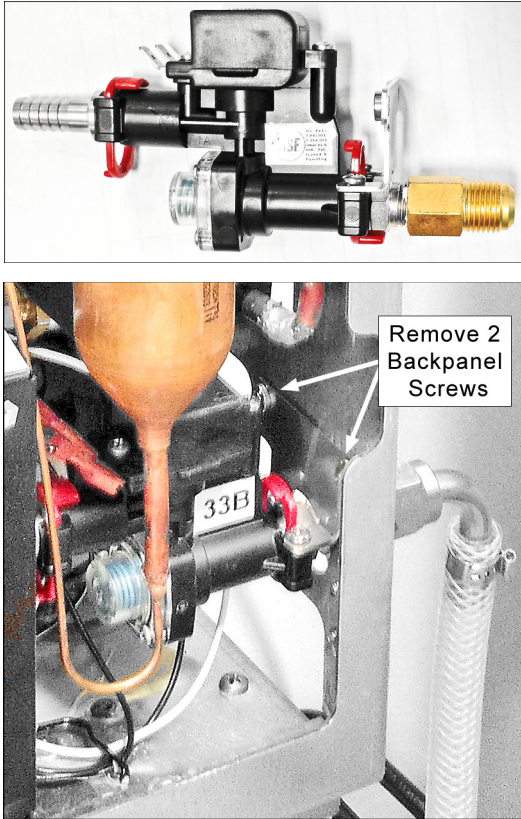


Figure 6-8 - Water Inlet Solenoid & Mounting

- 1) Shut off the water supply to the unit and then dispense a still coffee (left tap handle) drink to relief any water pressure in the lines.
- 2) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 3) Remove the enclosure top panel and then the right-side and rear access panels from the dispenser.
- 4) Disconnect the water-supply hose from the inlet solenoid.
- 5) Remove the two back-panel, Phillips screws securing the inlet solenoid bracket.
- 6) Partially remove the inlet solenoid and then remove the dispenser water-inlet hose from it.
- 7) Connect the dispenser water hose to the replacement solenoid.
- 8) Reinstall the solenoid in reverse order.

## 6.7 POWER SUPPLY (24VDC)

- 1) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the enclosure top panel and then the right-side access panel from the dispenser.
- 3) Disconnect the AC wiring from the top of the power supply (Fig. 6-9).
- 4) Remove the screws securing the power supply to the enclosure rail.
- 5) Remove the power supply partially from the enclosure and disconnect the DC wiring from the bottom terminals. Then remove it entirely.
- 6) Install the new power supply in reverse order.

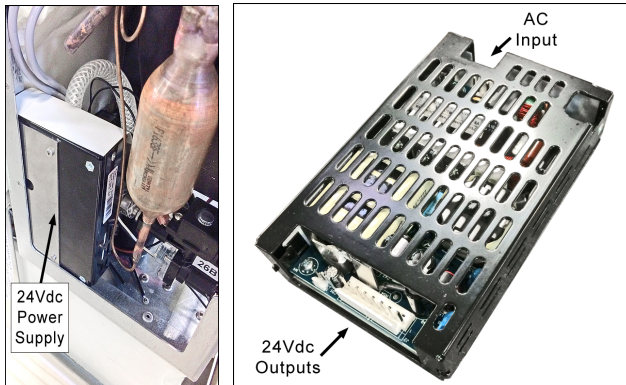


Figure 6-9 - 24Vdc Power Supply & Mounting

## 6.8 MERCHANDISER LED BACK-LIGHTING PANEL

This panel is mounted to the cabinet door behind the merchandiser window. Its control module can be accessed by removing the light panel.



Figure 6-10 - Merchandiser LED Backlight Removal

- 1) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the merchandiser window by pulling firmly on the frame molding surrounding it, at the top, as shown in Figure 6-10.
- 3) Remove the corner screws securing the light panel to the cabinet door.
- 4) Disconnect the wiring at the back of the panel.
- 5) Connect the new panel wiring and reinstall the light panel in reverse order.

## 6.9 ICE BANK

The Ice Bank consists of multiple components that are replaceable. They include:

- 1) Ice Sensor Probe
- 2) Agitator/Pump Motor & Bath Impeller
- 3) Electronic Control Module
- 4) Refrigeration Components

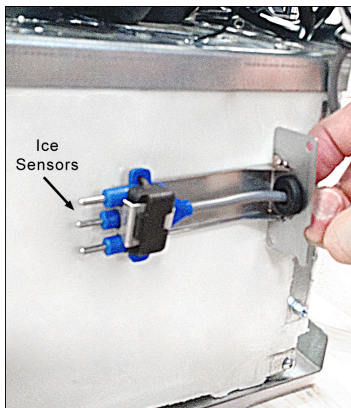
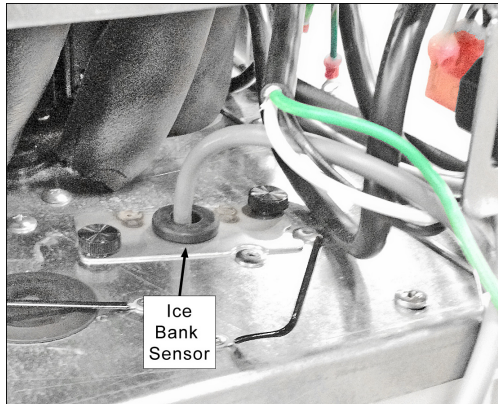


Figure 6-11 - Ice Sensor Probe

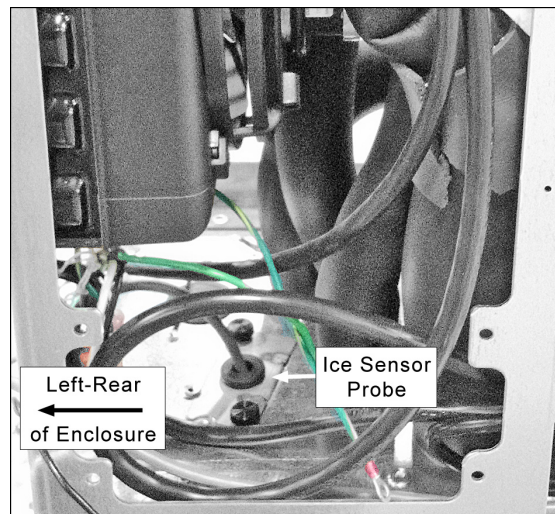
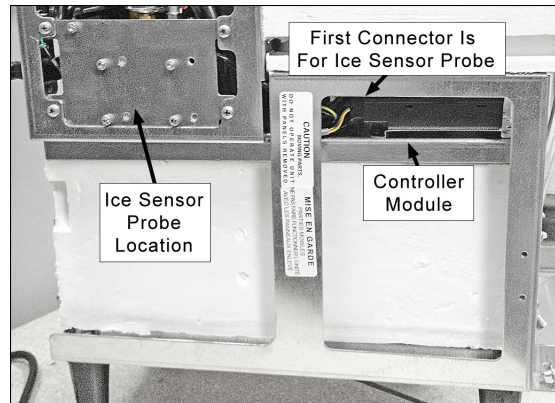


Figure 6-12 - Ice Sensor & Control Module Locations

### 6.9.1 Ice Sensor Probe

- 1) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the enclosure top panel and then the left-side and rear access panels from the enclosure.

NOTE: The ice sensor is located at the left-rear of the enclosure (Fig. 6-12) and sensor removal may be performed from the enclosure rear.

It is recommended, for easier sensor-cable routing and plugging/unplugging from the control module, to remove the air compressor unit for improved access.

- 3) Unplug the sensor cable from the ice-bank controller module.
- 4) Remove the two black thumbscrews securing the ice sensor probe and then lift the sensor out of the ice bank. Note its orientation.
- 5) Install the new sensor in the ice bank. Route its cable to the controller module and plug it in.

### 6.9.2 Agitator Motor

The agitator motor is located centrally on the ice bank cover plate (Fig. 6-13). Obtain the most convenient access by removing the air compressor. Remove the thumbscrew shown to unfasten the agitator motor from its mounting.

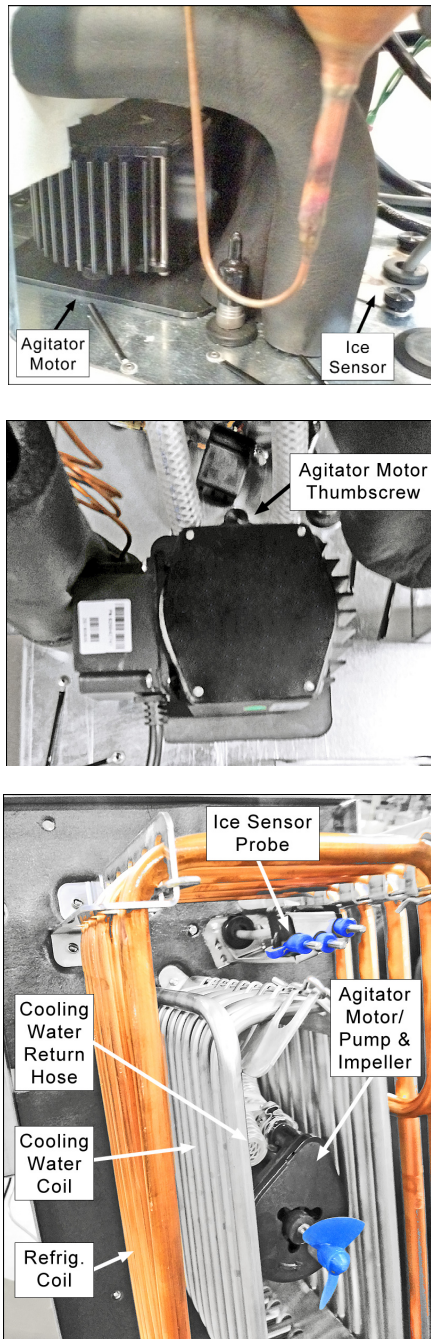


Figure 6-13 - Agitator Motor Location & Underside

- 1) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the enclosure top panel and then the left-side and rear access panels.
- 3) Remove the air compressor from the left side of the enclosure (refer to section 6.5).

4) Unplug the agitator-motor wiring plug from the ice bank controller module socket (Fig. 6-14).

NOTE: You can obtain access to the controller wiring sockets by removing the splash shield and the Main PCB housing refer to section 6.3).

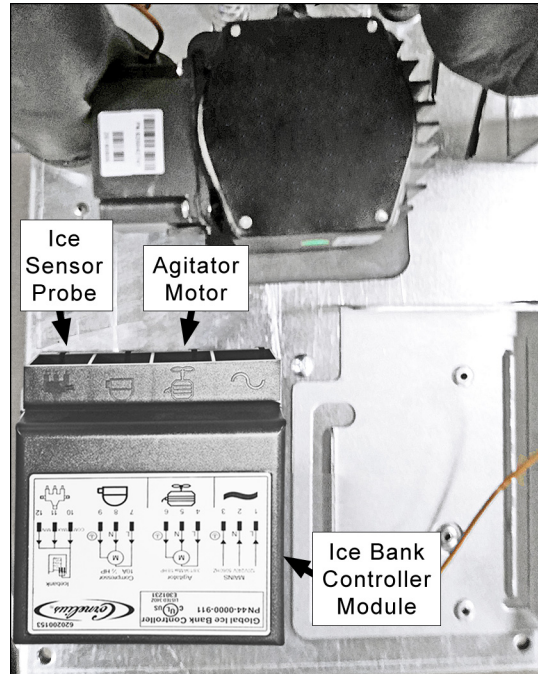


Figure 6-14 - Agitator Wiring Socket on Controller Module

5) Loosen the thumbscrew at the base of the agitator motor (Fig. 6-13).

6) Lift and angle the motor assembly to withdraw it from the ice bank.

7) Install the replacement motor in reverse order.

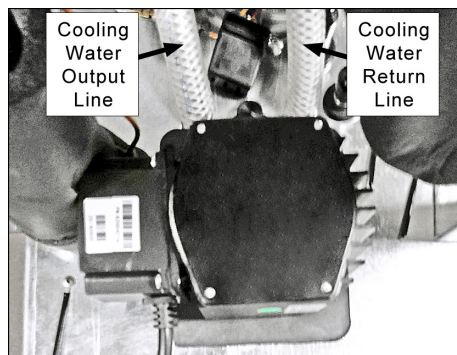


Figure 6-15 - Agitator Pump Hose Orientations

### 6.9.3 Ice Bank Controller

- 1) Shut off power to the dispenser and unplug the power cord from the wall receptacle.
- 2) Remove the enclosure top panel and then the left-side access panel.
- 3) Remove the drip tray, splash panel and the Main PCB housing (refer to section 6.3).
- 4) Unplug the four wiring connectors from the ice bank controller module (Fig. 6-16).

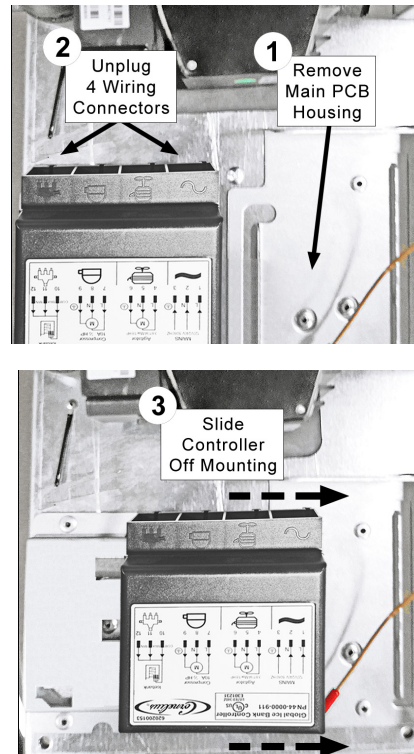


Figure 6-16 - Ice Bank Controller Module Removal

- 5) Slide the controller to the right, off its mounting and remove the controller.
- 6) Install the replacement controller in the reverse manner.

#### 6.9.4 Refrigeration Components

### **⚠ WARNING:**

Only trained and certified refrigeration technicians should service the Nitropro Mini refrigeration system components. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

ALL REFRIGERATION SERVICE PROCEDURES MUST CONFORM TO LOCAL CODES, ENVIRONMENTAL AND PROFESSIONAL-PRACTICE STANDARDS.

Ensure that the refrigerant charge is captured by appropriate equipment before the system is opened for the servicing of pressurized components.

NOTE: It may be helpful to the refrigeration technician to review the dispenser-particular guidance in the following Troubleshooting tables and specific Malfunctions of section 5.0 Troubleshooting.

Table 5-1: No cooling

Table 5-2: Warm drinks; Concentrate is warm, water is cold

Additionally, refrigeration information in section 2.1 Nitropro Functions & Specifications should be helpful:

Table 2-2 - Refrigerant Type

## 6.10 TAP MICROSWITCHES

Each tap handle activates a microswitch connected to the Main PCB. The microswitches are mounted on the base plates of the tap handle assemblies. Access is achieved by removing the tap-handles and the mounting rings that secure each mechanical activator assembly.

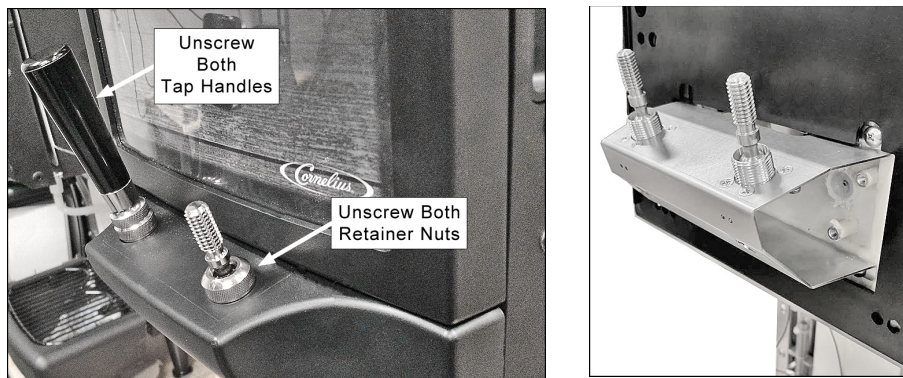


Figure 6-17 - Tap Handle/Microswitch Mounting

- 1) Shut off power to the dispenser and unplug the power cord from wall receptacle.
- 2) Carefully unscrew each tap handle from its activator-pin assembly (Fig. 6-17).
- 3) Unscrew and remove each retainer ring as shown.
- 4) Carefully lift the surrounding plastic housing off of the tap-handle mounts to expose the microswitch assemblies.



5) Remove the 4 screws securing each tap-handle switch assembly to the metal bracket and disconnect the wiring leads (Fig. 6-18).

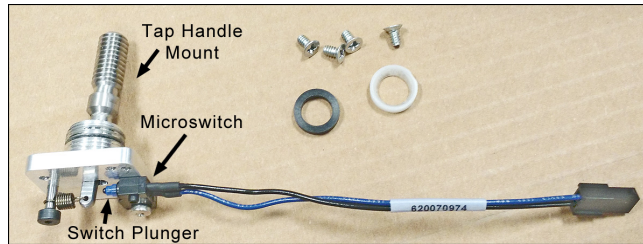


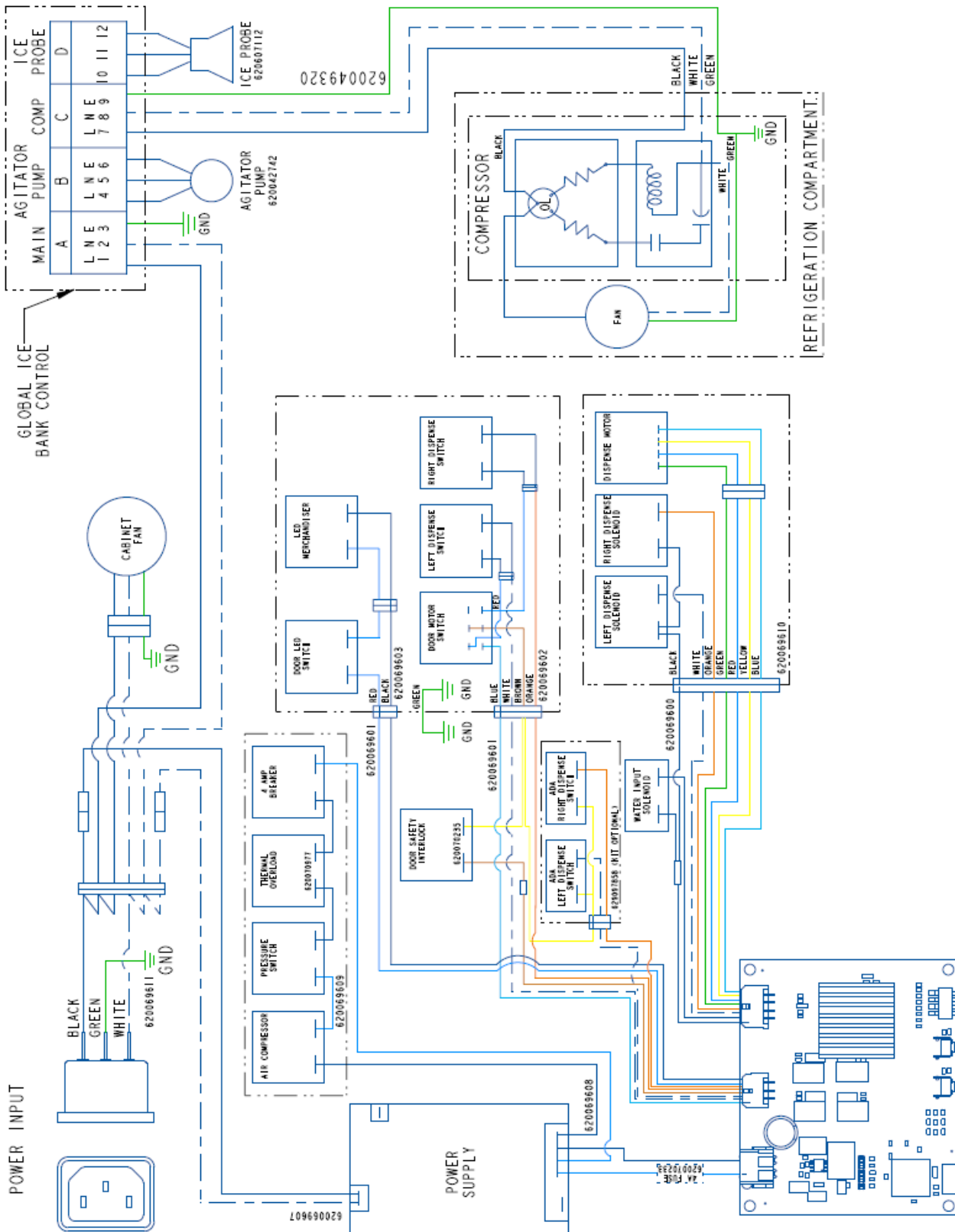
Figure 6-18 - Tap Handle Microswitch Assembly

6) Remove the switch assembly and install the new one. Mount the assembly on the support bracket and reconnect the wiring leads.

7) Reinstall the plastic cover over the tap-handle switch mountings and secure with the threaded retainer rings. Reinstall the tap handles.

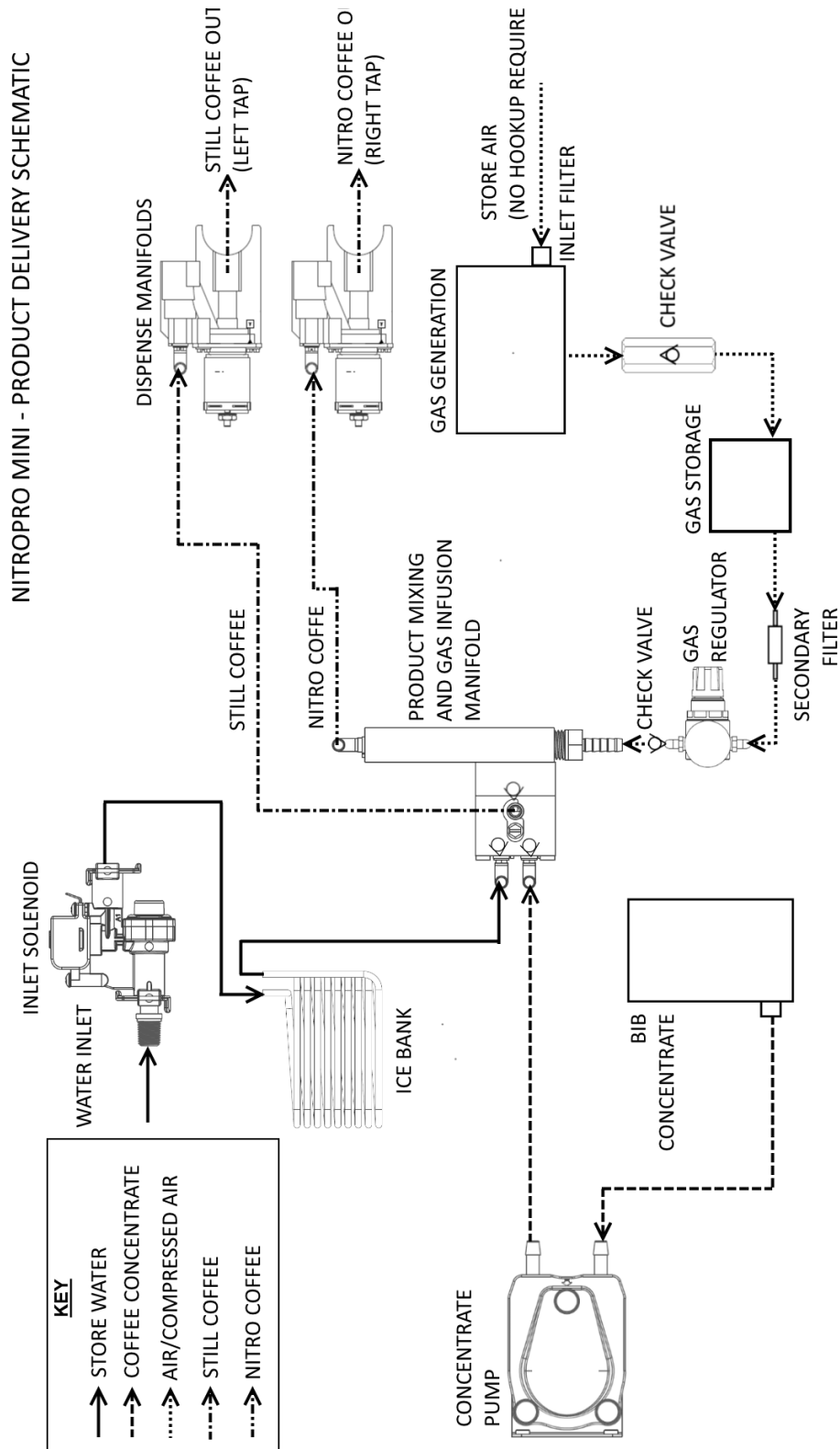
8) Verify operation of the taps.

# APPENDIX A - ELECTRICAL DIAGRAM



P/N: 620073755 REV A

## APPENDIX B - PLUMBING SCHEMATIC





## CORNELIUS STANDARD SERVICE CALL GUIDE

The parts warranty referenced in the Certificate of Warranty in this manual applies to the replacement of the defective part. Cornelius Inc. will not accept parts warranty claims for water leaks applicable to the installation, clogged drains, adjustments of any kind including regulators, pumps, thermostats, ratio, or brix settings, stratification issues, preventative maintenance, sanitizing, etc. Cornelius Inc. will consider only actual service time on the equipment. Charges for mileage, holiday pay, night charges, and overtime will not be considered. All parts claim that are fare, reasonable, and within the terms of the warranty and allotted repair times will be paid in U.S. Dollars.

Any questions regarding the warranty procedures can be directed to our Customer Service group at 800-238-3600.

ITEM #	PAGE #	DESCRIPTION	MAX HOURS

\*Recovery and pump down require at least two hours depending on contamination and is not included in the allotted repair time shown above.



# **NITROPRO MINI 2290 DECOMMISSIONING PROCEDURES**

## DECOMMISSIONING PROCESS

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. **It is essential that electrical power is available for recovery-equipment use before the procedure is commenced.**

### Decommissioning Procedure

- 1) Become familiar with the equipment and its operation.
- 2) Isolate the system electrically by disconnecting all AC power sources.
- 3) Before beginning the procedure, ensure that:
  - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  - All personal protective equipment is available and being used correctly;
  - The recovery process is supervised at all times by a competent person;
  - Recovery equipment and cylinders conform to the appropriate standards.
- 4) Pump down the refrigerant system, if possible. NOTE: If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

#### CAUTION:

**Do not overfill cylinders (no more than 80% volume liquid charge).  
Do not exceed the maximum working pressure of the cylinder, even temporarily.**

#### CAUTION:

**When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.**

#### CAUTION:

**Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.**

#### CAUTION:

**DO NOT switch recovery system on/off near the source of flammable refrigerant that may be leaking out or may leak out during recovery-system line connection/disconnection.**

### Recovery Requirements and Guidelines

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.



**NOTE: For appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved; then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.**

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Competence of service personnel Information of procedures additional to usual information for refrigerating appliance installation, repair, maintenance and decommission procedures is required when an appliance with FLAMMABLE REFRIGERANTS is affected. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. The achieved competence should be documented by a certificate.

5) Label the equipment as indicated below:

#### **Labeling**

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

#### **Decommissioning**

If safety is affected when the equipment is taken out of service, the REFRIGERANT CHARGE shall be removed before decommissioning.

Ensure sufficient ventilation at the equipment location.

Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.

Discharge capacitors in a way that won't cause any spark, using a Supco CapDis tool.

Remove the refrigerant. If recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.

When FLAMMABLE REFRIGERANTS are used:

- A) Evacuate the refrigerant circuit.
- B) Purge the refrigerant circuit with oxygen-free nitrogen for 5 min.
- C) Evacuate again.
- D) Fill with nitrogen up to atmospheric pressure.
- E) Put a label on the equipment that the refrigerant is removed.

#### **Information On Correct Working Procedures**

##### **Commissioning**

Ensure that floor area is sufficient for REFRIGERANT CHARGE or that the ventilation duct is assembled in a correct manner.

Connect pipes and carry out a leak test before charging with refrigerant.

Check safety equipment before putting into service.

##### **Maintenance**

Portable equipment shall be repaired outside or in a workshop specially equipped for servicing units with FLAMMABLE REFRIGERANTS.

Ensure sufficient ventilation at repair place.



Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.

Discharge capacitors in a way that won't cause any spark, using a Supco CapDis tool. (The standard procedure to short circuit the capacitor terminals usually creates sparks.)

Reassemble sealed enclosures accurately. If seals are worn, replace them.

Check safety equipment before putting into service.

**Repair**

Portable equipment shall be repaired outside or in a workshop specially equipped for servicing units with FLAMMABLE REFRIGERANTS.

Ensure sufficient ventilation at the repair place.

Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.

Discharge capacitors in a way that won't cause any spark, using a Supco CapDis tool.

When BRAZING is required, the following procedures shall be carried out in the order indicated:

- A) Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
- B) Evacuate the refrigerant circuit.
- C) Purge the refrigerant circuit with oxygen-free nitrogen for 5 min. (not required for A2L refrigerants)
- D) Evacuate again (not required for A2L REFRIGERANTS).
- E) Remove parts to be replaced by cutting, not by flame.
- F) Purge the braze point with nitrogen during the brazing procedure at the pressure indicated below.
- G) Carry out a leak test before charging with refrigerant at the pressure indicated below.

Model	Low Side Pressure psig (kPa) (bar)	High Side Pressure psig (kPa) (bar)
<b>Nitropro Mini 2290</b>	140 (965.3) (9.7)	315 (2171.9) (21.7)

**NOTES:**

Reassemble sealed enclosures accurately. If seals are worn, replace them.

Check safety equipment before putting into service.

When BRAZING is required, the following procedures shall be carried out in the following order:

Ensure sufficient ventilation in the work area.

- A) Make sure the power to the unit is turned Off.
- B) Safely remove the refrigerant following local and national regulations. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
- C) Purge the refrigerant circuit with oxygen free nitrogen.
- D) Evacuate the refrigerant circuit.
- E) Purge the refrigerant circuit with oxygen-free nitrogen for 5 min.
- F) Evacuate again.
- G) Remove parts to be replaced by cutting or brazing.
- H) Purge the braze point with nitrogen during the brazing procedure required for repair.
- I) Carry out a leak test before charging with refrigerant.





When FLAMMABLE REFRIGERANTS are used:

- A) Evacuate the refrigerant circuit.
- B) Purge the refrigerant circuit with oxygen free nitrogen.
- C) Evacuate again.
- D) Cut out the compressor and drain the oil.

## **Disposal**

Ensure sufficient ventilation in the work area.

Remove the refrigerant.

Where controlled, refrigerant-recovery is required, follow all local regulatory guidelines and requirements.

Where refrigerant recovery is not required by local/national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. A designated person should oversee this process to ensure safety. Take special care that drained refrigerant will not drift back into the building during the draining process.

When FLAMMABLE REFRIGERANTS are used:

- A) Evacuate the refrigerant circuit.
- B) Purge the refrigerant circuit with oxygen-free nitrogen for 5 min.
- C) Evacuate again.
- D) Cut out the compressor and drain the oil.

