



**MARMON**  
Foodservice  
Technologies

**nitropro™ mini**  
Training Presentation





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A BERKSHIRE HATHAWAY COMPANY



## Installation

- Packaging and placement
- Connections
  - Water and electrical
- Start up
  - Fill water bath, ratio setting, gas pressure

## Cold Brew Talking Points

### Function of components

- Refrigeration system
- Water bath
  - Ice Bank control, Probe, Agitator / recirculator pump, heat exchanger and fan
- 24 Volt components
  - Power supply, peristaltic pump, Solenoids, control board, air compressor
- Mixing components
  - Mixing block, sparger, mixing chambers and nozzles

### Cleaning / Sanitizing

- Daily
- Weekly

### Preventive Maintenance

- Annually

# Training Outline



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# INSTALLATION - Packaging & Placement



- **Unit shipped bolted to skid with cardboard box enclosure:**
  - Shipping Dimensions **17”W x 30”L x 40”H**
  - Shipping Weight: **140lbs**
  - Operating Weight on counter: **185lbs**
- **Accessory box shipped inside cooling cabinet. Accessory Box includes:**
  - Installation/Operator Manuals
  - Legs (4)
  - Product delivery tube assembly
  - BIB cleaning adapter (Scholle 1910L)
  - Drip tray (Same as Quest)
  - Cup rest (Same as Quest)
  - Keys (for locking cabinet door)
  - Power cord (115V/60hz/5.0amps)
  - 3/8 FFL x 3/8 barbed elbow (for water supply)
  - 3/8 Flare gasket (for water supply)



# INSTALLATION - Packaging & Placement

## Location

- Remove the unit from the skid using a 9/16 ratcheting socket to remove the 4 retaining bolts.
- Legs can be found in the box located inside the NitroPro Mini cabinet
  - Do not place the unit on its side when installing the legs
  - Recommend installing the legs by pivoting the unit on the skid after removing the retaining bolts
- Place the NitroPro Mini unit on the counter before filling water bath to prevent spill over
- Allow 4" on each side and back and 12" for clearances. Unit pulls air in sides and discharges out the top
- Same base unit as Quest Elite 2 flavor



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# INSTALLATION - Packaging & Placement

## Merchandiser

- The unit comes with the generic graphic installed but can be replaced by a custom graphic
- Easy-to-remove the merchandiser by pulling on the top outer frame/bezel. It is held in place by 2 pins on the top frame.
- The graphic slides upward to remove from clear plastic sleeve.
- Graphic Specs
  - Entire Area: 8.763" x 12.927"
  - Visible Area: 8.5" x 12.5"
  - Graphic Thickness: .03



# INSTALLATION - Packaging & Placement

## Tap Handles

- Units ship with standard black tap handles shown on this slide.
- Tap handles contain a 3/8" – 16 thread.
- Customers can source any tap handles available on the market with these specs.
- Larger handles may limit visibility of the merchandiser and also accidentally activate dispense switch with out pulling handle due to weight.



# INSTALLATION - Water and Electrical

## INSTALL WATER SOURCE

- Supplied with the unit is a 3/8 flare x 3/8 barb swivel elbow fitting. Attach the fitting to the rear of the unit using the provided plastic washer
- Incoming water pressure must be between 35 - 90psi. If water pressure is outside this range the water inlet solenoid will not open. Optimal pressure is 65psi
  - if below 35psi, a water booster will be required
    - Cornelius part number 620068154
  - if above 90psi a water regulator will be required
    - Cornelius part number 620055952



# INSTALLATION - Water and Electrical

## Electrical Power Up



- Use the power supply cord shipped in accessory box
- The 115 volt input to unit is then routed to a 24VDC output power pack located inside the unit
- When unit is plugged in the cabinet interior fan (115vac) will come on and runs continuously
- The water bath agitator motor 115vac will run continuously
- The unit has an on board air compressor (24vdc) that will run approximately 5 seconds to initially pressurize the system



## Fill Water Bath

- Remove the drip tray and splash panel
- Pull out the looped tubing and remove red end cap
- Slide tubing over only the left nozzle
- Pull the left handle and allow dispensed water to fill bath
  - dispensing has a 1 minute limit. release handle and pull again to continue
- Using right side nozzle will cause on board air compressor to unnecessarily run
- **CAUTION: DO NOT HAVE COFFEE PRODUCT CONNECTED AT THIS POINT OR UNIT WILL CONTAMINATE WATER BATH WITH COFFEE PRODUCT**



## Fill Water Bath (cont)



- Continue to fill water bath until water starts to dribble out black overflow tube in the front bottom center of bath
- It will be normal for water to dribble out for a few hours while unit produces a ice bank in bath
- While filling you will hear the agitator motor prop come in contact with the water then quite down
- 3 minutes after the water reaches the ice bank probe the refrigeration compressor and condenser fan will come on
- Initially the cabinet takes 30 to 45 minutes to chill down



## Verify Ratio and Pressure settings

- While the splash panel is removed, verify that only the #3 dip switch is flipped upward
  - factory setting for 5:1 ratio
- From the factory the gas regulator inside the cabinet is preset to 28 to 30psi
- The regulator can be adjusted up or down in 1 psi increments for desired infused drink from the right side dispense



## Connecting Coffee Product

- Use the BIB hose assembly supplied in the accessory kit
- The BIB connector is a Scholle 1910L
- Cabinet is 460 cubic inch and can fit two half gallon BIB's or a single one gallon BIB
- Unit is designed and plumbed to only dispense one flavor
- Unit is fixed so left only dispenses plain Cold Brew and right side is Nitro Cold Brew
- When connecting Scholle connector to BIB hand tighten only
- Before connecting a new BIB it is recommended to shake BIB to mix any settled sediment
- Coffee concentrate BIB should be thoroughly thawed before use





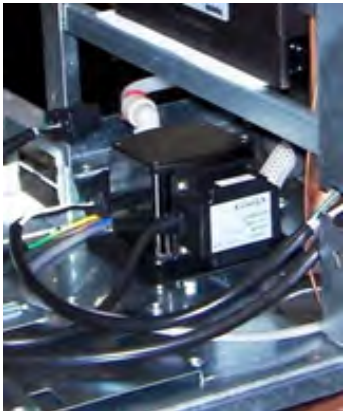
# COLD BREW UNIT TALKING POINTS

- Cold brew coffee TDS (total dissolved solids) is in a range of 1.6 to 2.0
- The nitrogen content in atmosphere is approximate 78%
- Nitrogen generators and tanks provide 95 - 99% pure nitrogen
- Nitrogen does not absorb into the water it attaches to the coffee particles in the drink
- A good Infused drink cascades in the cup for 90 to 120 seconds in a 16 oz cup
- Foam height after cascading can vary depending on preference, 3/8 to 1/2 inch is typical
- Nitrogen gives drink creamy sweet taste with out sugar
- The NitroPro Mini unit uses room air (78% nitrogen) to inject into the drink
- Cascading occurs when the nitrogen escapes upward as the coffee particles settle
- The difference between AIR and pure NITROGEN infused into the beverage is virtually indistinguishable. Taste/texture/cascade same as a nitrogen generator or tank
- Cold brew coffee traditionally is made by placing coffee grounds in cloth sack and soaking in cool water for 15 to 20 hours. Ice coffee is hot coffee brewed extra strong and poured over ice with ice melting to mix drink
- Nitrogen infuses good at approximately 1 to 2 psi above dynamic pressure
- Our unit has a fixed flowrate and pressure of water (29psi at 1oz/sec) with precisely metered concentrate based on target ratio via variable speed peristaltic pump



## Refrigeration

- Refrigeration is a water bath/ ice bank system. (8 lbs ice bank)
- The system is controlled by a solid state Ice bank control.
- Cabinet is cooled by circulating the cold water from the bath into a cabinet heat exchanger and circulating the cold air with an internal cabinet fan
- The agitator motor and recirculator pump are one in the same
- Cabinet temperature is consistent ~39 to 41 degrees F
- There are no temperature adjustments on either the water or cabinet

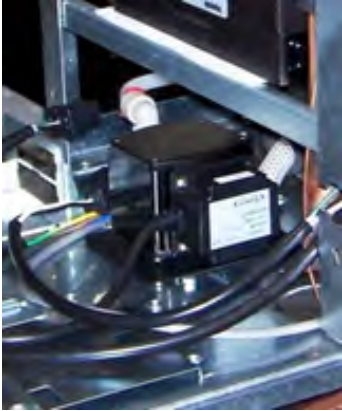


## Water Bath Ice Bank Control and Probe



- Control is 115vac input
- Sends power out to agitator/recirculator pump continuously when control is powered up.
- Probe is made up of 3 pins. Control is measuring continuity between center and one outside pin and center and other outside pin
- Control measures every 30 seconds
  - If both readings are infinite (no water around probe), no power to compressor
  - If both readings are equal in ohm value (water around both probes), compressor on
  - If one reading high ohm value (ice on 1 of 3 pins), other reading low ohm, compressor off
- Water is conductive due to mineral content, do not fill bath with RO water or distilled.
- When water freezes mineral content stays in liquid water and ice is clear and no/low mineral
- Compressor on delay and compressor off delay approximately 3 minutes

## Agitator / Recirculate Pump



- The Agitator motor and recirculator pump are one in the same component
- The motor is 115vac and when unit is plugged in it comes on
- It receives the 115vac every time the Ice Bank Control is powered up and runs continuously with or without water in the bath
- It is the same part that has been used in our Quest juice units for 20 years
- Pump pulls the chilled water from the ice bath and circulates it thru the heat exchanger in the cabinet and back to the ice bath.

## Heat Exchanger and Fan

- Heat exchanger is located behind the back metal panel inside cabinet
- As the chilled water is circulated the heat exchanger will condensate
- Moisture from heat exchanger drips to bottom of cabinet and drains out front left side behind splash panel
- Cabinet fan is wired direct to incoming power and not supplied thru the Ice Bank Control
- Unit does not have a thermostat to adjust
- Cabinet temperature stays at approximately 39F to 41F



## Power Supply

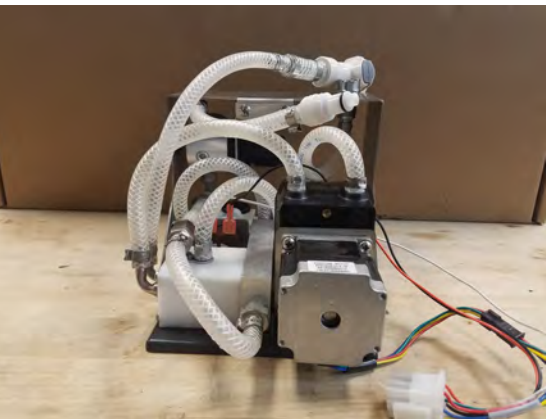


- The power supply receives incoming line voltage and converts to 24 VDC output
- The same power supply could be used in a 115vac unit or 208-230vac application. The 24VDC output is the same
- The power supply is located in the right rear compartment of the refrigeration platform
- If unit is to be moved or transported the water in ice bath needs to be drained
  - moving of the unit may cause water to splash out and contaminate the power supply
- Power supply is for all solenoids, air compressor, peristaltic pump, dispense control board and merchandiser



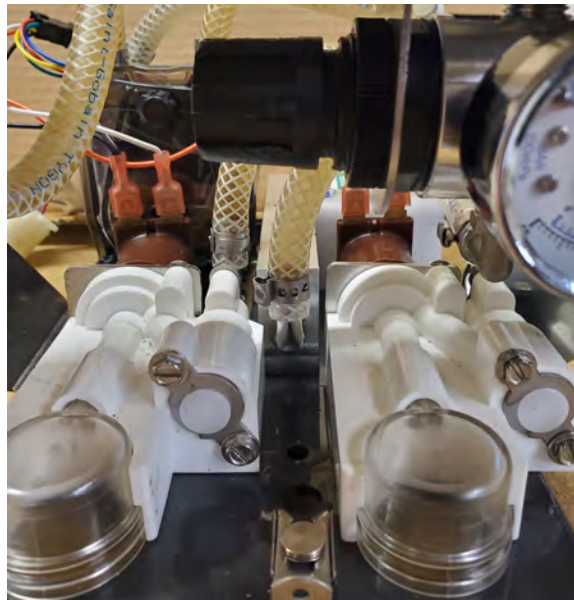
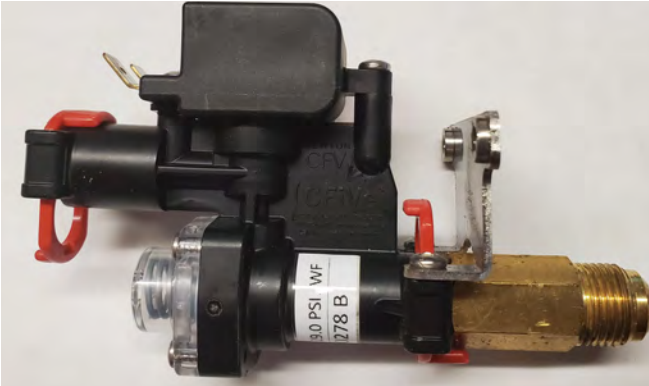
## Peristaltic Pump

- Concentrate pump is a DC stepper motor
- Lowering the voltage to the motor slows the pumping rpm's and pumps less
- Increasing the voltage to the motor speeds up the pumping rpm's and pumps more
- With the control board changes can be made up or down in motor speed
- Pump is mounted on platform in cabinet
- Pump tubing should be replaced annually



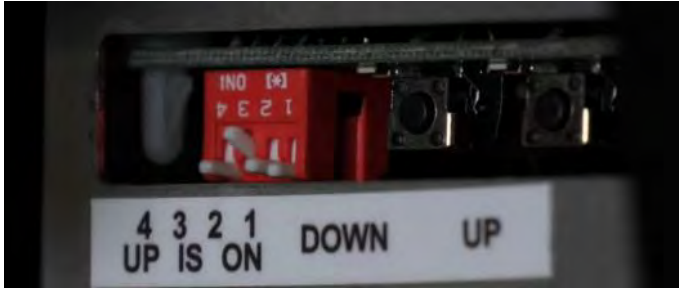
## Valves

- The main water inlet valve solenoid coil is 24vdc
  - controlled by the main control board
- The rear main water inlet valve has three functions in the unit
  - controls incoming water for unit by opening and closing
  - regulates the incoming water pressure down to 29psi output
  - regulates the throughput water flow rate at a fixed 1 ounce per second
- The working pressure range for main input water valve is 35 to 90psi
- Located on the pump platform inside cabinet is are two solenoid assemblies that open to allow mixed product into mixing chamber / nozzles
  - coils are 24vdc
  - control board only allows a single one to open
  - controlled by main control board
- solenoids assemblies on pump platform have no flow controls.



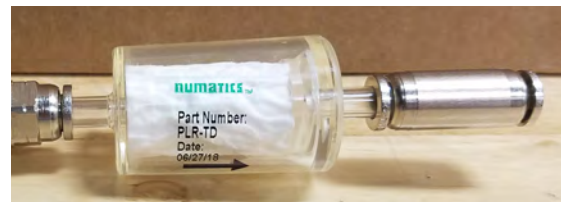
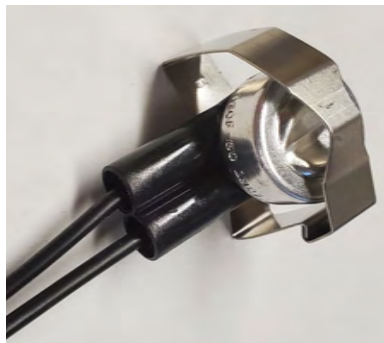
## Main Control Board

- The main control board is supplied with 24vdc from power supply
- When board is functioning properly a green LED will be flashing on board
- The control board has a block of 4 dip switches for selection of pump ratio's. Dip switches are labeled left to right 4, 3, 2, 1. Switch up is in ON position
  - 4 = 7 to 1 ratio
  - 3 = 5 to 1 ratio (factory setting)
  - 2 = 4 to 1 ratio
  - 1 = 3 to 1 ratio
- If multiple switches selected control defaults to left most switch
- Black buttons labeled down/up allow for micro adjustments of 5 rpm's in pump speed
- On average (5) clicks of a micro adjustment will result in a full ratio change



## On Board Air Compressor Assembly

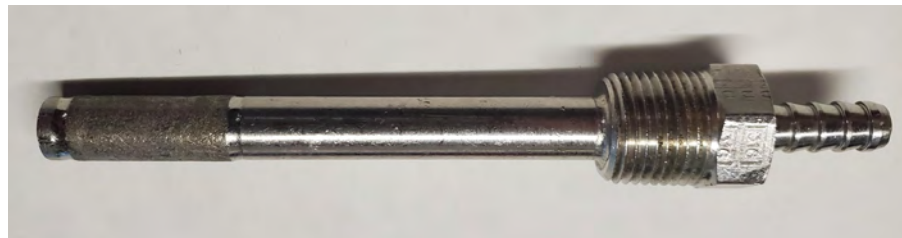
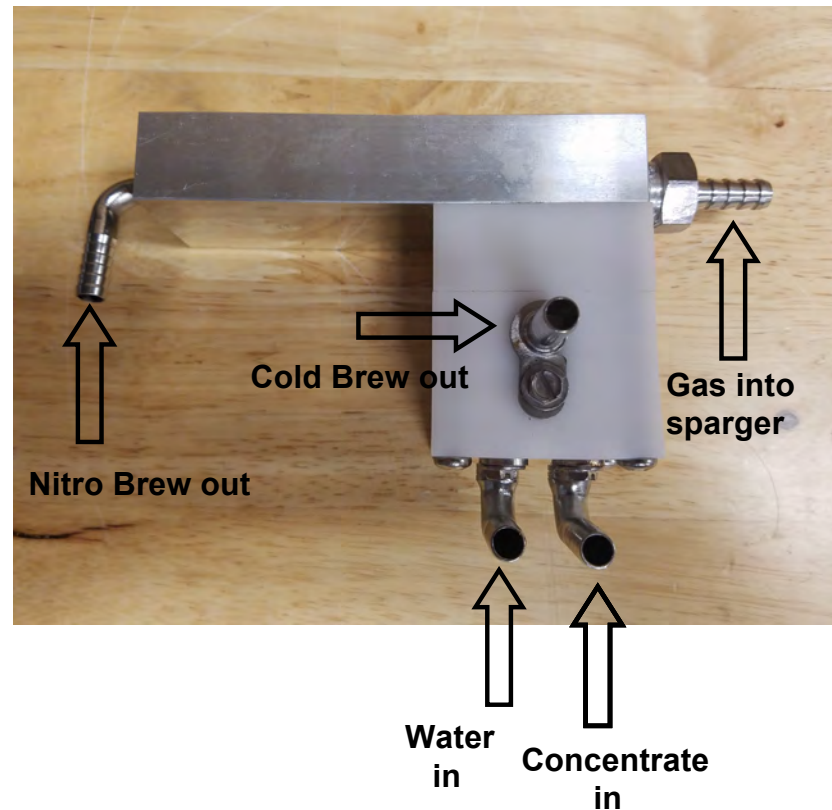
- Air compressor and air box assembly are one assembly from factory
- Air compressor is 24vdc supplied direct from 24vdc power supply
- manufacture rated duty cycle is 1 minute on / 20 minutes off
- When continuously dispensing nitro-infused beverages under normal operation, the compressor will operate at a 5% duty cycle or less, approximately 1 time every ~30oz dispensed. And cycle on 2 to 3 seconds
- Air inlet disk filter for compressor is 5 microns
- Air compressor discharge line has a in line air filter at 1 micron filtration
- Air chamber is 7.2 cubic inches
- Relief valve unseats at 95psi
- Air chamber pressure switch cycles at 60 to 80psi, controls compressor on/off
- Air compressor exterior shell thermal overload cut out is 70C (auto reset)
- Thermal safety (auto reset) located on compressor discharge line, cut out 160F -cut in 110F
- In line 24vdc to air compressor is a 4 amp breaker that is manual reset





## MIXING BLOCK

- Factory term used at factory for gas injector is called referenced as a sparger
- The tip of the sparger is like a stone in a fish tank
- Sparger is all stainless steel and mesh tip is 2 microns
- The dynamic pressure as the mixed coffee passes along side the sparger tip is 27psi (2 psi pressure drop from main water inlet valve)
- The mixing block has internal check valves to keep water and coffee concentrate flowing in correct direction with no back flow
- The mixing block itself is a service part and internal check valve are not serviceable
- The sparger can be removed for cleaning or replacement if needed
- The left or right side solenoid is activated to allow mixed coffee to flow from the mixing block into the mixing chamber and nozzle for dispensing





## Miscellaneous components

- Dispense switch's are spring loaded micro switch that sends a open or closed signal to main control board to activate dispensing components
- Micro switch assembly (less handle) is a complete assembly, switch not sold separate
- Merchandiser illumination is a one piece LED panel (nomenclature - Light Engine)
- Inside cabinet door switch's
  - left one turns merchandiser on/off
  - right one is 3 way switch
    - Up - clean mode, pump runs at fixed 5 to 1 ratio no matter CB dip switch
    - Middle - off, dispense lock out
    - Down - normal dispense
- Rotate nozzle  $\frac{1}{4}$  turn to unlock Pull down to remove
- Push the nozzle up until it stops and rotate it  $\frac{1}{4}$  turn to lock. The nozzle is locked when the wings are parallel to the front panel



# Maintenance Required



**Kay – 5 Sanitizer**

Cleaning Type	Time Consumed	Requirements
<b>Daily</b>	3-5 minutes	Wipe down exterior surfaces including door gasket. Wash nozzle/mixing chamber with dish soap.
<b>Weekly</b>	- 30 minutes total time w/ letting cleaner/product soak in unit. - Approx. 10 minutes of hands-on labor time.	Daily requirements plus... - Flushing with cleaner. - Flushing with Sanitizer
<b>Preventive Maintenance (12mo.)</b>	Approx. 1 hour total performed by service technician.	1. replace pump tubing 2. replace in line 1 micron filter 3. top of water in water bath 4. clean refrigeration condenser



**Clearly Cold Cleaner**

- Clearly Cold– recommended weekly cleaner
- Kay-5 sanitizer or equivalent for weekly sanitation
- Weekly cleaning BIB adapter shipped with unit

