Viper

Pocket Guide

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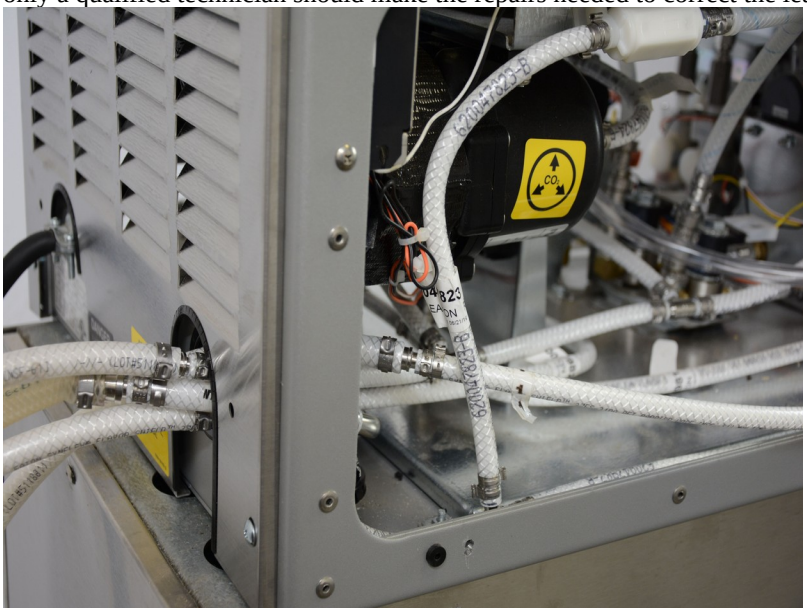
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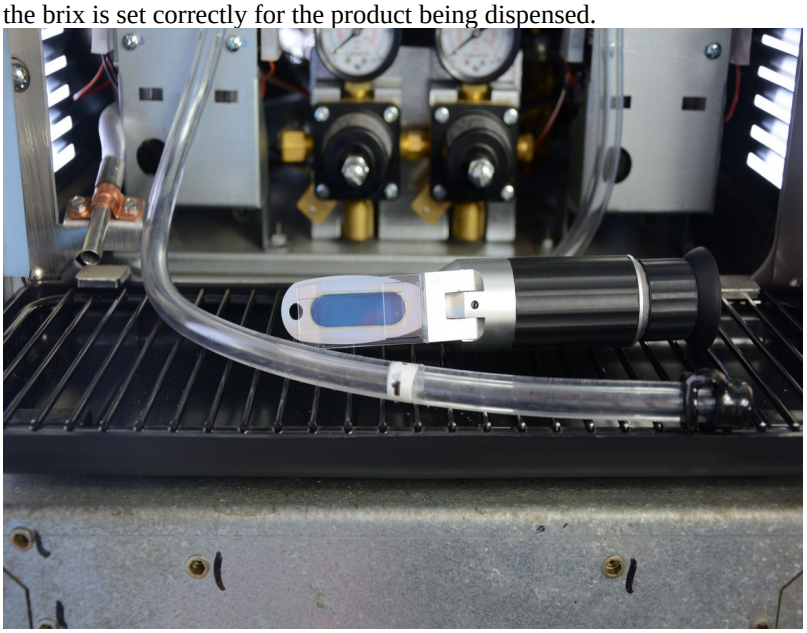
Cleaning and Maintenance

Annual

1. Check for Leaks
While doing a scheduled annual PM on the Viper unit preform a general inspection of the CO2, water and Syrup lines for signs of leaking. Also inspect in and around the Viper unit for any indications of leaking. If a leak is found, only a qualified technician should make the repairs needed to correct the leak.



2. Check Product Brix
Annually or when changing syrup types, the brix for each barrel should be checked using a refractometer to ensure the brix is set correctly for the product being dispensed.



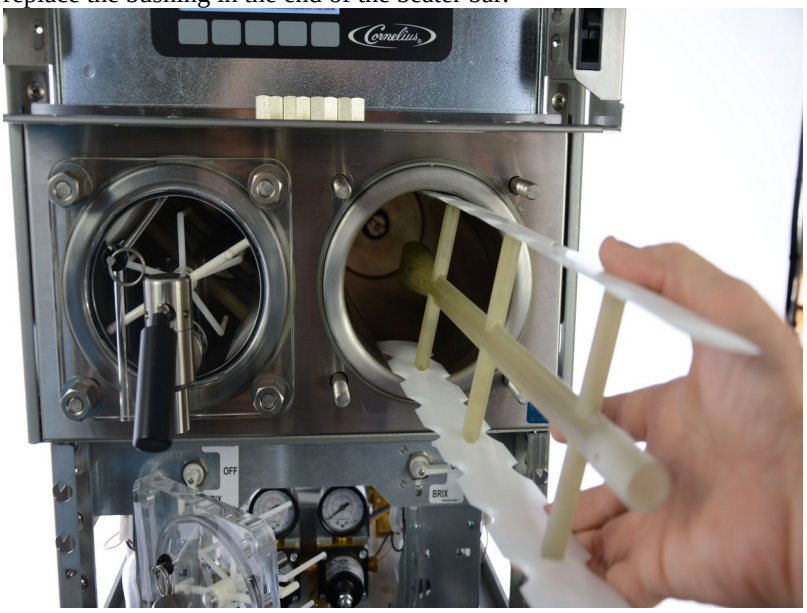
3. Sanitize Unit
The syrup system is to be sanitized annually by a qualified service technician following the sanitizer manufacturer's recommendations to ensure 100PPM of available chorine. The step-by-step procedure is detailed in the Viper Owner’s manual provided with the Viper or can be found at the listed link.

https://www.cornelius.com/resources/



4. Check or Rotate Scraper Blades

Scraper blades should be inspected for wear annually. The scraper blades can be reversed to get extended life depending on the wear pattern. If there is significant wear on the scraper blades or they have already been reversed, the scraper blades should be replaced. When reversing or replacing the scraper blades it is also recommended to replace the bushing in the end of the beater bar.



5. Clean Condenser Coil

The refrigeration system condenser should be inspected and cleaned annually for any collection of dust and debris the metal mesh air filter may not have captured. The condenser coil is best cleaned by the use of a vacuum. The use of compressor air or arousal sprays can leave the unit and the surrounding area of the Viper contaminated.



6. Replace Freeze Barrel Rear Seal
The rear seal for each barrel can be replaced from the front of machine. The use of a small screw or a hook to grab and pull the seal out of its housing is recommended. Care should be taken not to scratch or damage the drive shaft adaptor's ceramic surface. When installing the new seal, lubricate the seals inside diameter only. Barrel seals should be replaced every 12 months during a scheduled PM.



Bi Annual

1. Check Clock Setting
Every 6 months when changing to or from daylight savings time it is recommended to check the clock setting to confirm the Viper clock is set correctly. To set the clock go to the Installation segment in this guide and select "Control Panel System Setup" and then "Clock Setup".



2. Check Water Filter
Every 6 months or if water pressure in the system is low the water filter should be inspected. Depending on the quality of the water supply and the style of water filter installed, the cartridge(s) may need to be replaced at a sooner interval.

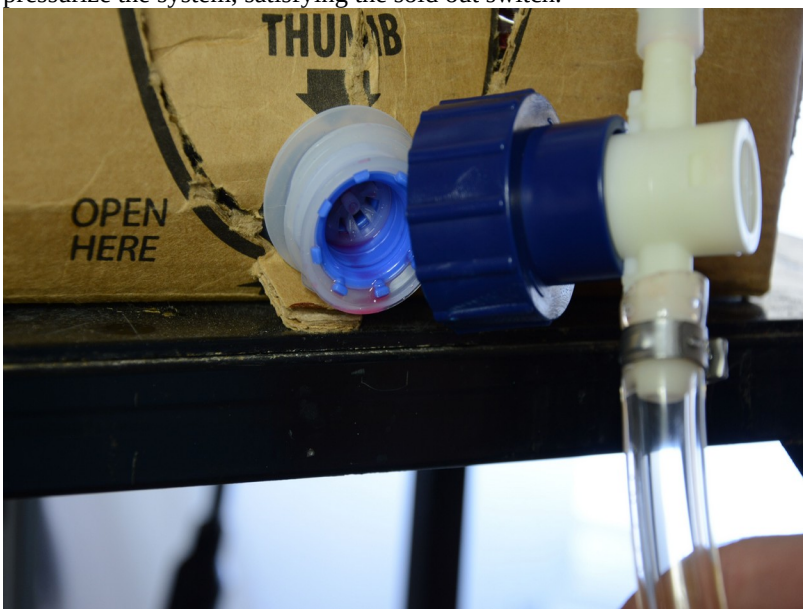


3. Clean BIB Connectors
Remove the BIB connectors from the BIB containers, and submerge them in a soapy water solution. Using a nylon brush (not a wire brush) clean connectors. Afterwards rinse with clean, potable water and reconnect.



4. Check Syrup Sold out Switches

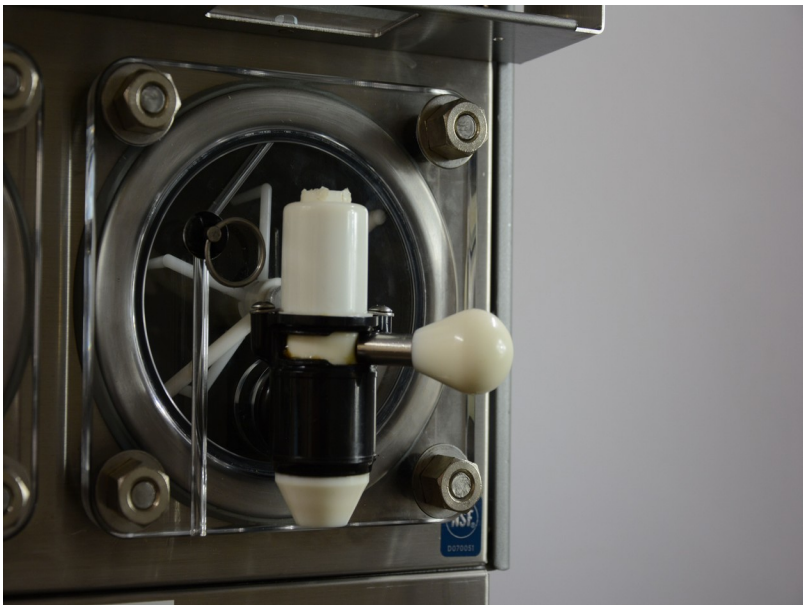
The syrup sold out switches should be checked for proper operation by individually disconnecting each syrup BIB connector and dispensing a drink to trigger that barrels sold out switch. When the switch is tripped the indicator light on the front of the merchandiser will illuminate. Reconnecting the BIB connector will allow syrup to again flow and pressurize the system, satisfying the sold out switch.



5. Servicing Motorman Valve

The Viper unit, if equipped with the Motorman style dispensing valves with caged O-ring, should be serviced (lubricated) every 6 months or more frequently if the valve lever gets tight to operate. Caged O-rings should be replaced every 12 months.

Follow the listed link for a video on the PM of the Motorman Valve
www.cornelius.com/ViperVideos



Daily

1. Clean External Surfaces
On a daily basis, clean all external surfaces with a mild soap solution and rinse with clean water. Dry all external surfaces with a clean soft cloth.
Follow the listed link for a video on Cleaning the Unit
https://www.youtube.com/watch?v=OEMSx4e9p_E



2. Drip Tray
Remove the cup rest and drip tray (if applicable) and wash with warm soapy water. Rinse with clean water and dry thoroughly and replace.



3. Check Syrup Supply
The Viper unit is equipped with an out of syrup indicator light on the front of the unit. This should be checked daily and if illuminated the appropriate BIB of syrup in backroom replaced with a new BIB.



4. Check CO2 Supply
On a daily basis if not using a bulk tank CO2 supply, check the level of the backroom CO2 supply cylinder. Make sure the CO2 cylinder regulator gauge indicator is not in the shaded “change CO2 cylinder” part of the dial. If it is in the shaded area, the cylinder is almost empty and must be replaced.



Monthly

1. Clean Condenser Air Filter

The condenser air filter is located behind the merchandiser and should be cleaned at least once a month. To clean the filter first remove by grasping the two tabs and sliding straight out. Wash the filter with clean water and shake out the excess water before reinstalling.

Follow the listed link and click on Cleaning the Unit for a video on cleaning the air filter

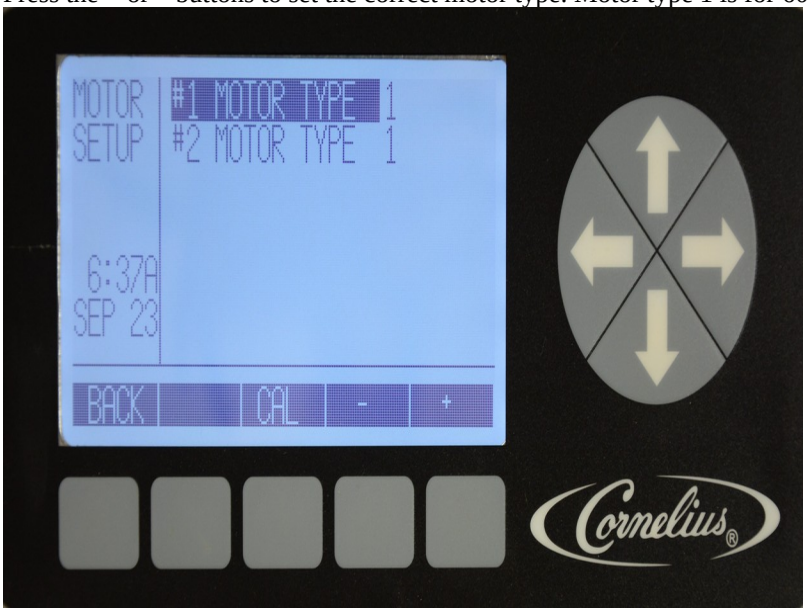
https://youtu.be/OEMSx4e9p_E?t=59



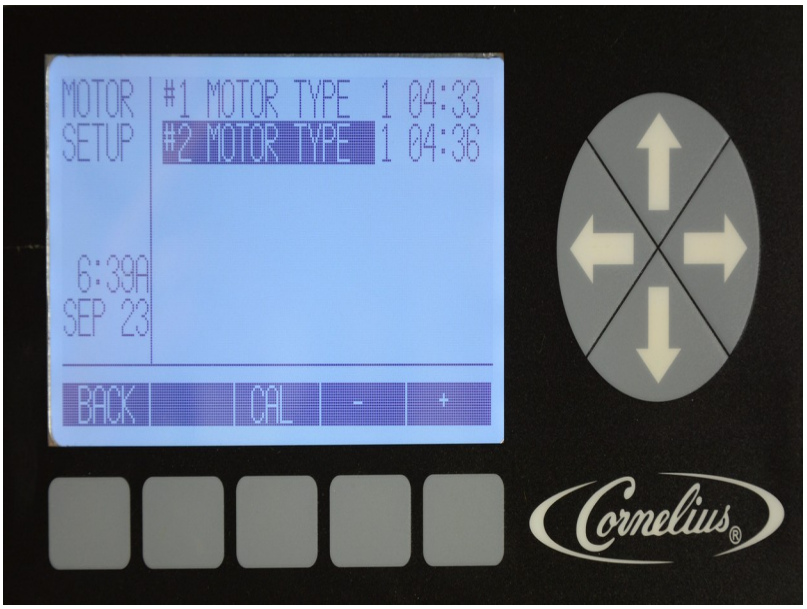
Installation

Calibrating Motors

1. Selection of Motor Type
The Viper has two motor types to select from, 50hz or 60hz and is set at the factory based on the model unit built. From the maintenance menu, select MOTOR SETUP using the up and down arrows, highlight the desired motor. Press the + or – buttons to set the correct motor type. Motor type 1 is for 60hz and motor type 2 is for 50hz units.



2. Calibrating Motors
Calibration of the beater motors establishes a baseline for the motor assembly. This allows the system to determine proper viscosity settings for the new motor. It is VERY IMPORTANT that calibration is performed when the product in the barrel is in a 100% liquid state. There can be no ice in the barrel or on the beater bar. Press the CAL button in the Motor Setup menu to start the calibration process. The calibration cycle continues for five (5) minutes to allow the gearbox to stabilize at temperature and ensure correct calibration.
Note: Never Calibrate a motor while product is frozen. You can calibrate all motors at the same time during installation, or PM.



Commissioning the Unit

1. Pressurize Water System
It is important to prime the water pump prior to engaging Co2. Failure to do so may result in premature pump failure.
To pressurize and prime the water on the Viper, turn on the water supply and check the system for leaks. Next turn the three-way valve to the brix position (down), remove the cap at the end of the sample tube and place the tube in a bucket. Manually lift up on the water valve coil plunger to purge air from the system and prime with water until you have a steady flow. Return the three-way valve to the off position when done. Repeat this for each of the water valves.



2. Pressurizing Syrup System
To pressurize and prime the syrup system on the Viper, slowly engage the secondary Co2 regulator for the FCB BIBs to 75psi and check the system for leaks. Next turn the three-way valve to the brix position (down), and remove the cap at the end of the sample tube and place the tube in a bucket. Manually lift up (slowly) on the syrup valve coil

plunger to purge air from the system and prime with syrup until you have a steady flow (it is normal to have a burst of air before syrup). Return the three-way valve to the off position when done. Repeat this for each of the syrup valves.
Note: It is recommended to flush the sample tube with water after priming with syrup.



3. BIB Connector Style
There are two variations of BIB connectors. The threaded screw-on type and the push-pull (QCD) type connector. Both style connectors are designed to close off syrup connection when disconnected.

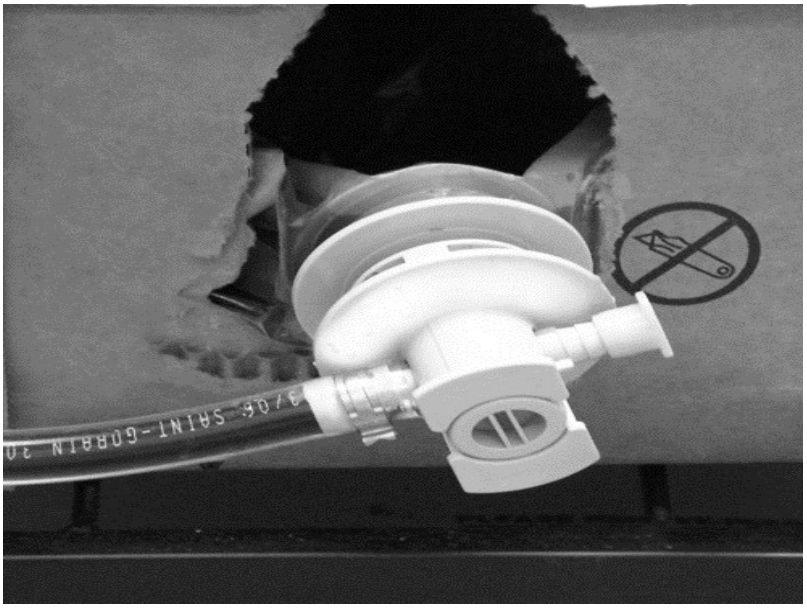


4. BIB Connect Screw On
Screw the connector clockwise until it is fully seated onto the bag connector. Screw the connector counterclockwise to remove. A spring-loaded poppet assembly will keep the BIB and connector from leaking when removed.
Note: the BIB connector should be cleaned every time a BIB is changed. This will allow for easy connection and removal.



5. BIB Connect Push-Pull

Install the QCD connector onto the BIB connector by slipping it onto the connector and pushing the syrup hose and stub in toward the box to engage. Push in on the outer connector tab and pull the syrup hose and stub out to unlock the connector from the BIB. Pull the connector sideways to disengage the line from the bag connector.
Note: the BIB connector should be cleaned every time a BIB is changed. This will allow for easy connection and removal.



6. Pressurizing CO2 System

To pressurize the Viper's CO2 system, open the CO2 supply valve slowly and allow system to pressurize, check for leaks. Slowly adjust the dedicated secondary Co2 regulator for the Viper to 75psi. Check the Vipers internal Co2 regulators to ensure proper Co2 settings. The Co2 regulators behind the splash panel affect the overrun and should be set to 36-38psi to achieve 100% overrun.



7. Expansion Tank CO2 Pressure

The expansion tank regulator regulates Co2 pressure to the expansion tanks and is preset at the factory to 30psi. It is located on the right side of the Viper for two and three flavors and the left side of the Viper for four flavors. Do not change or adjust this setting with pressure in the barrels. If the regulator needs to be reset to 30psig, depressurize all barrels, backseat the regulator to 0psi and slowly engage to 30psi.

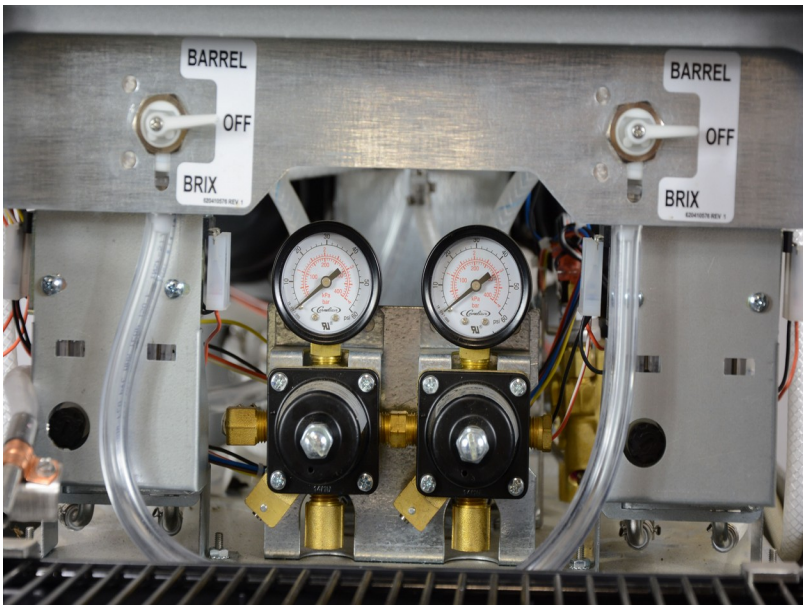
Note: The expansion tank regulator will read ~32-33psi with the product in the barrels.



8. Freeze Barrel CO2 Pressure

Behind the splash panel is a bank of secondary CO2 regulators, one for each freeze barrel. The pressure for each barrel is set to 36-38 PSIG at the factory to achieve ~100% overrun. The pressure setting may need to be readjusted for syrup being used and the product desired.

Note: Do not make adjustments to these Co2 regulators while the barrels are pressurized. To adjust, empty the barrel, backseat the gauge to 0psi and slowly engage to the desired setting.



Connections

1. Water Supply Volume
The Viper water supply inlet is equipped with a 1/2” barbed fitting. Water supply lines are required to be ½ ID tubing along with appropriate sized connections. Two and three flavor Vipers require 100 GPH while four flavor Vipers require 150 GPH. As a general rule, if you can fill a 5 gallon bucket in 3 minutes you have enough water flow to be at 2.5 GPM. The incoming water flow should maintain a minimum of 65 psig dynamic pressure. If water pressure it low, the use of a water booster should be used. You must install a 50psi-65psi WPR prior to the Viper water inlet.



2. Water Supply filtration
The use of a pre filter to remove large sediment followed by carbon filters to remove taste and odor is recommended. DO NOT SUPPLY THE VIPER WITH SOFT OR DESCALED (RO) WATER, AS IT WILL PREVENT PROPER CARBONATION.



3. CO2 Supply

There are two CO2 delivery systems available, a high pressure cylinder or a low pressure bulk tank. A high pressure cylinder requires a primary regulator. A low pressure bulk system will have a regulator as part of the bulk tank. Either CO2 systems output regulator should be set to supply between 90psi to 120psi to the Co2 secondary regulators. The Viper is shipped with two secondary Co2 regulators; one that is dedicated to the viper and one that is dedicated to the FCB BIB pumps, both are set at 75 ±1 psig. All Co2 tubing is required to be 3/8" I.D. Also secondary regulators should be easily accessible and within 6 feet of the Viper and BIB rack. Do not turn on the CO2 supply until the commissioning of the Viper is performed.

CO2 to the unit must have two 75psi regulators - one for the BIBs and another for the unit. These regulators should both be initially set to "0" and gradually turned up to 75psi after the CO2 has been turned on.

Not doing this will push 110psi of CO2 into the 75psi regulator, then into the 30psi regulator potentially causing the expansion tanks to fail. The unit is made to gradually turn on the CO2

Note: Label the secondary Co2 regulators as Viper and FCB BIB for identification purposes.



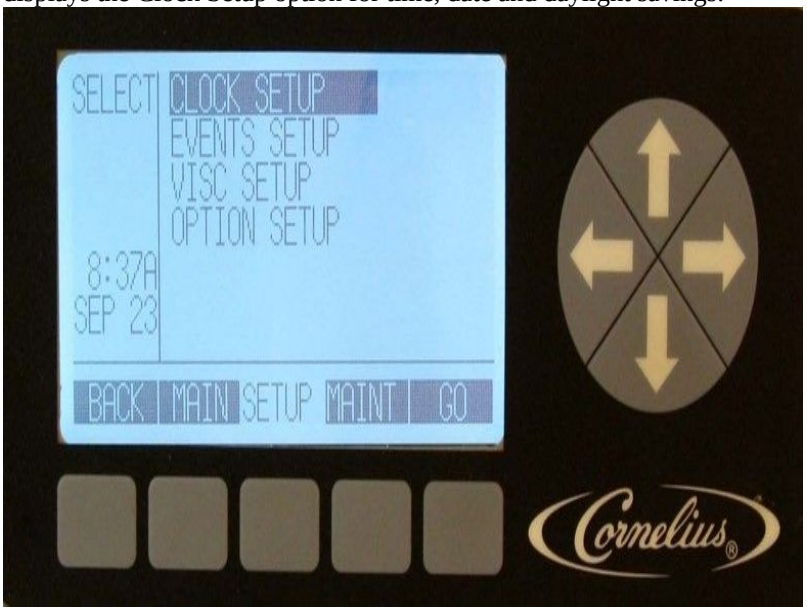
4. Syrup Supply

The Viper syrup supply inlets are equipped with a 3/8” barbed fitting. The use of 3/8ID tubing with appropriate sized connections for the syrup lines from the backroom BIB rack assembly to the Viper is required. Do not turn on the syrup supply until the commissioning of the unit.

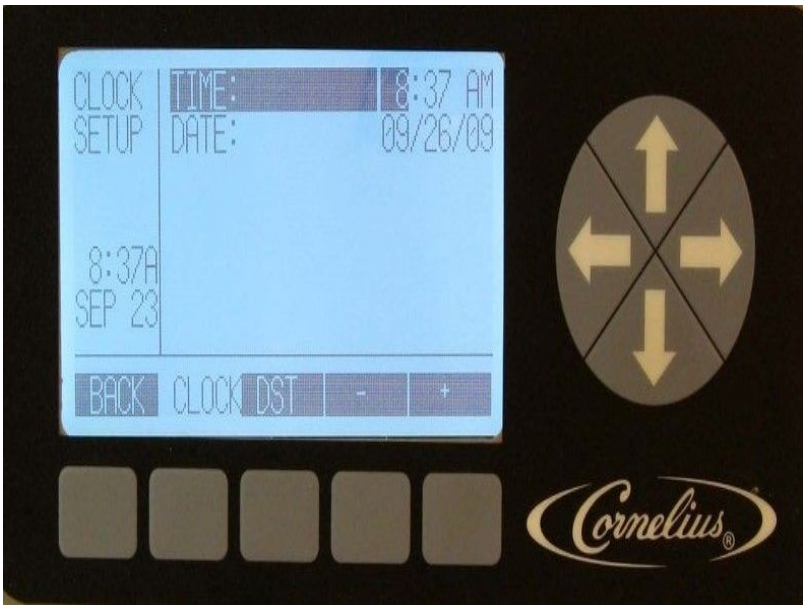


Clock Setup

1. Clock Setup
Using the up or down arrows highlight the CLOCK SETUP field from the SETUP menu and press GO. This displays the Clock Setup option for time, date and daylight savings.

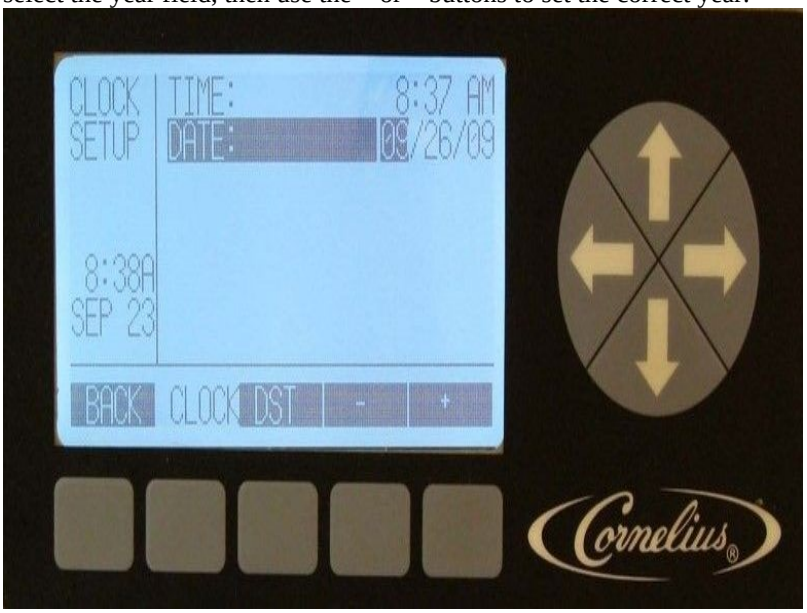


2. Set Current Time
To set the time, use the up and down arrows on the control panel to highlight the TIME option on the screen. Use the left and right arrows to select the hour field, then use the + or - buttons to set the hour. Use the left and right arrows to select the minute field, then use the + or - buttons to set the minutes. If the 12 hour clock format is selected, use the left and right arrows to select the AM/PM field and use the + button to set the AM/PM setting.



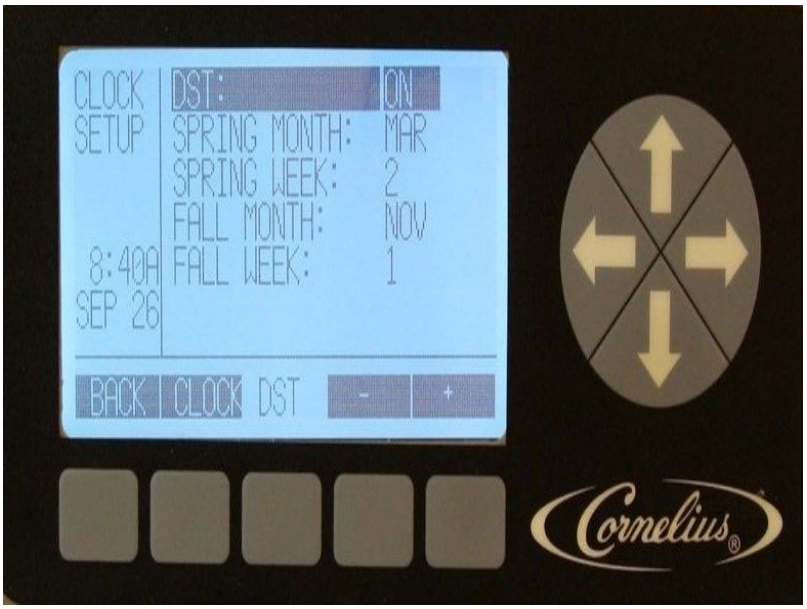
3. Set Current Date

To set the date, use the up and down arrows on the control panel to highlight the DATE option on the screen. Use the left and right arrows to select the month field, then use the + or - buttons to select the month. Use the left and right arrows to select the day field, then use the + or - buttons to set the day. Use the left and right arrows to select the year field, then use the + or – buttons to set the correct year.



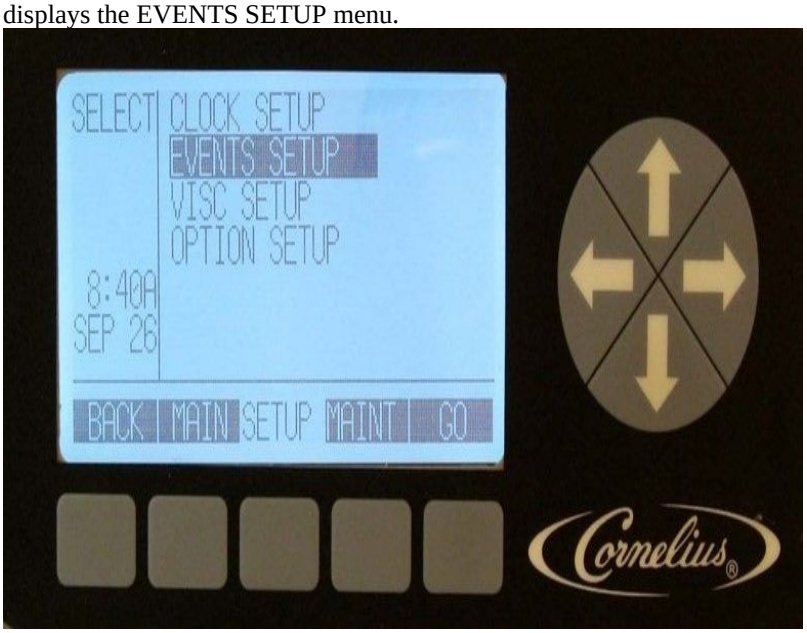
4. Selecting Daylight Savings

You can enable and set Daylight Savings once the time and date are set, this will automatically adjust the time when DST occurs. Press the DST button while in the CLOCK SETUP menu to display the Daylight Savings Time menu. Highlight the DST option and use the + button to turn on daylight savings time. Use the up or down arrows to select SPRING MONTH, then use the + or – buttons to set the correct month. Use the up or down arrows to select SPRING WEEK, then use the + or - buttons to set the correct week. The choices are 1, 2, 3 or L. Repeat the same process for FALL WEEK.



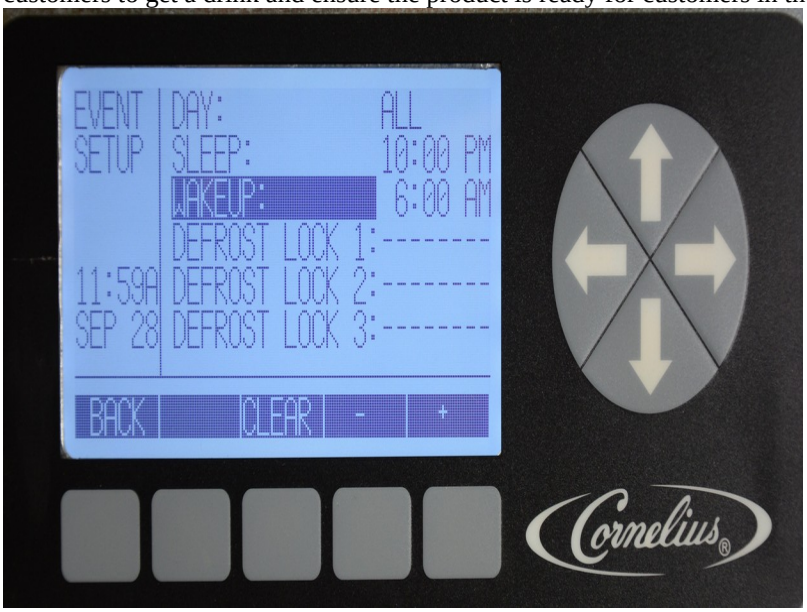
Event Setup

1. Event Setup
Using the up or down arrows, highlight the EVENTS SETUP field from the SETUP menu and press GO. This displays the EVENTS SETUP menu.

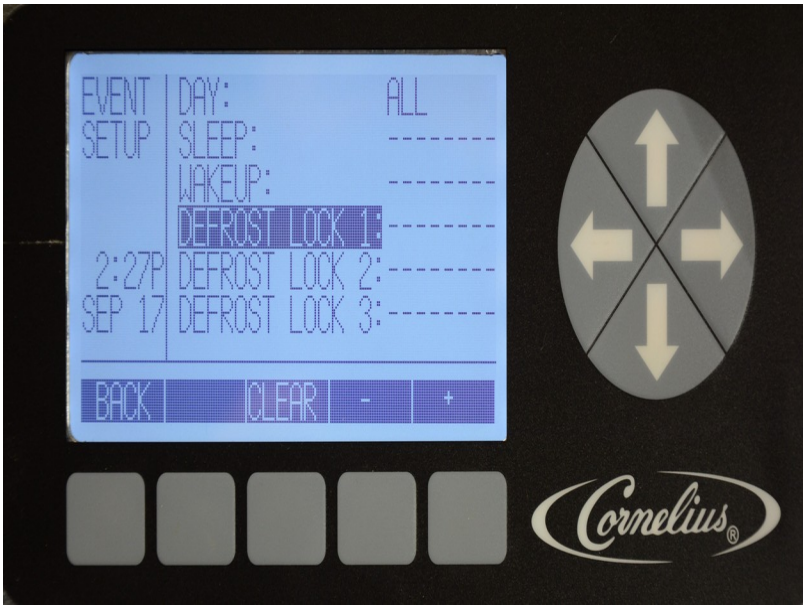


2. Set Sleep and Wake Up
If the store closes at night, we recommend you program the Viper to go to sleep at closing and then wake up one hour prior to store opening. During normal operation there is no need to power down the Viper, it should remain plugged in and powered up unless service or other needs require it to be powered down.
It is recommended to leave the Viper unit run continuously but you can set the Viper to go to sleep and wake up. To do so, highlight EVENTS SET UP in the select MENU and press the GO button. Use the up or down arrows to highlight DAY, then use the + or - buttons to set the desired day or all days. To set sleep use the up or down arrows to highlight SLEEP, then use the left and right arrows to select the hour field and the minute field. To set wake, use

the up and down arrows to highlight WAKEUP and repeat steps. If the 12-hour clock option is selected, use the left and right arrows to select the AM/PM field. Then use the + or - buttons to set AM or PM.
Note: Setting a specific day will override any settings set for the week. If setting sleep and wake, it is recommended to set the sleep time 1 hr after closing and to set the wake for 1 hr prior to opening. This allows last minute customers to get a drink and ensure the product is ready for customers in the morning.



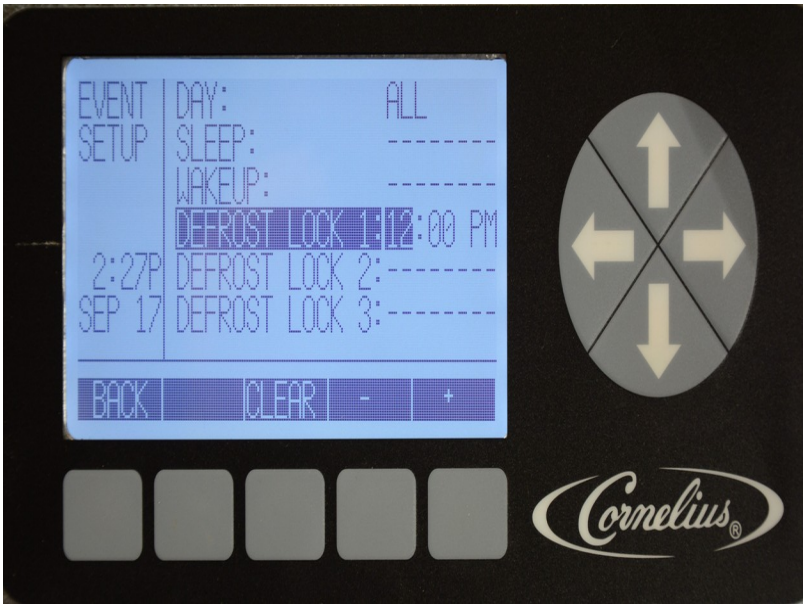
3. Set Defrost Lock Out
When looking at the Event set up, the viper has an auto defrost cycle built into its programming. If not, enough product has been dispensed from a particular barrel after a 3 hour period, it will initiate a defrost cycle to ensure the product stays fresh.
Defrost lockout prevents the Viper from automatically defrosting during set times and is typically enabled if the Viper or a specific barrel is constantly in defrost during peak times. The defrost lockout affects all barrels at the same time and can be programmed to have 3 - three hour defrost lockout time slots. They can be individual or sequential for a maximum of 9 hours per day. Sequential defrost lockouts should be overlapped by 15 minutes to prevent Intelligent Defrost© from engaging.
Caution: Three consecutive defrost lock outs can cause barrel errors



4. Set Defrost Lock Out

The Viper defrost lockouts can be set for individual days or all days to lockout the automatic defrost cycle. To set the defrost lock out times, highlight EVENTS SETUP in the select menu and press the GO button. To activate the defrost lockouts use the up or down arrows to highlight DAY, then use the + and - buttons to set the desired day or all days. To set specific lockout times, use the up or down arrows to highlight DEFROST LOCK 1, then use the left or right arrows to select the hour field and use the + and - buttons to set the desired hour. Next, use the left and right arrows to select the minute field, then use the + and - buttons to set the desired minute (in 15 min increments). If the 12 hour clock option is selected, use the left and right arrows to select the AM/PM field and the + button to set the AM/PM field.

Caution: Three consecutive defrost lock outs can cause barrel errors

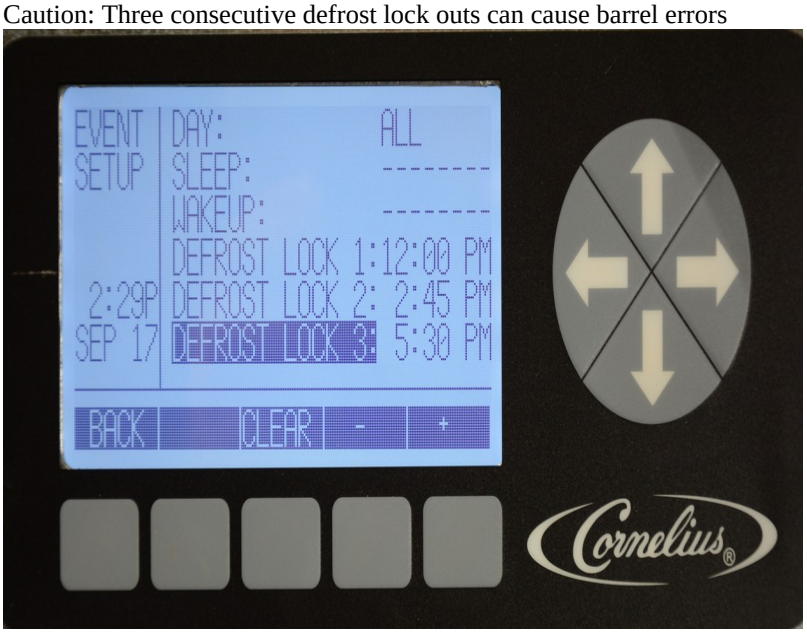


5. Set Defrost Lock Out

Note: Defrost lockouts are not set during manufacturing. Do not set the defrost lockout unless the times are mandated by the account based off peak times.

Example of 15 min overlapping if setting consecutive lockouts. 12:00pm-2:45pm, 2:45pm- 5:30pm, and 5:30pm-8:15pm.

Caution: Three consecutive defrost lock outs can cause barrel errors



Initializing Software

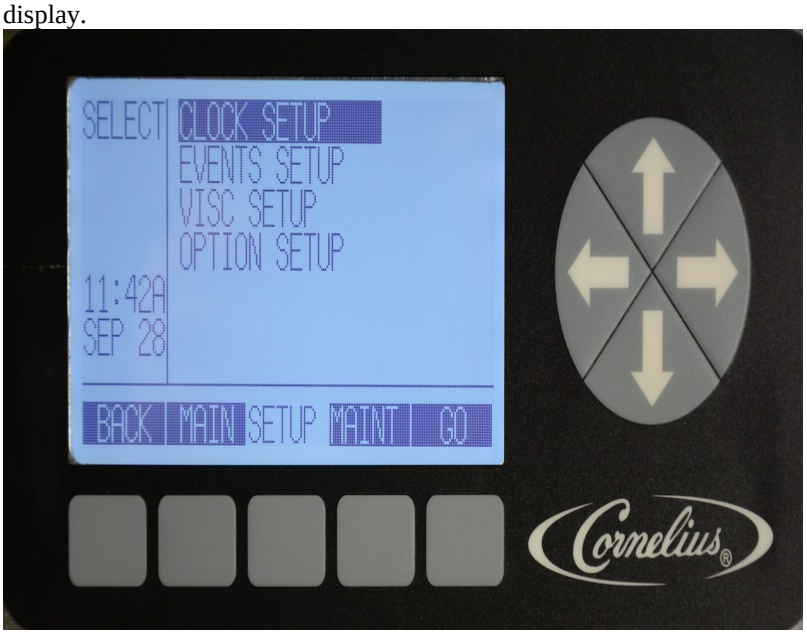
1. Initializing Software

The Viper has no on/off power switch, powering up the unit is done by plugging the power cord into the wall outlet or BNB. Located behind the merchandiser is the control panel with a LCD display. The LCD display provides a visual readout for status and is utilized to change programming parameters. The software runs a system verification as the Viper powers up, this takes approximately 30 seconds. If all is ok, PASS is momentarily displayed and the LCD display shows the Barrel Status menu, this is the home screen for the system.



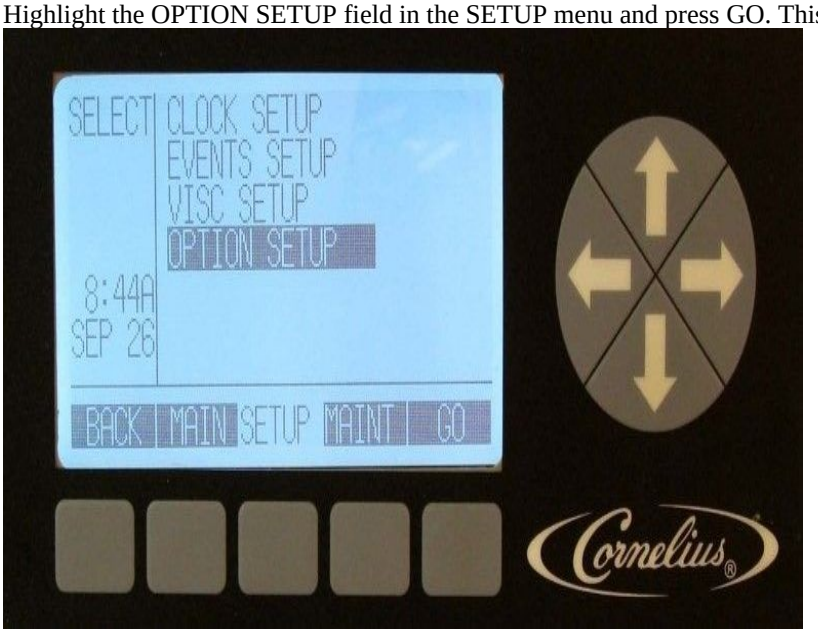
2. Initial Options Setup

It is important to enter and verify parameters in SETUP during installation. To access the SETUP menu, press the MENU button on the Barrel Status menu, this displays the MAIN menu. Then press the SETUP button to display the SETUP menu. Use the up and down arrows on the control panel to navigate between the various choices on the display.

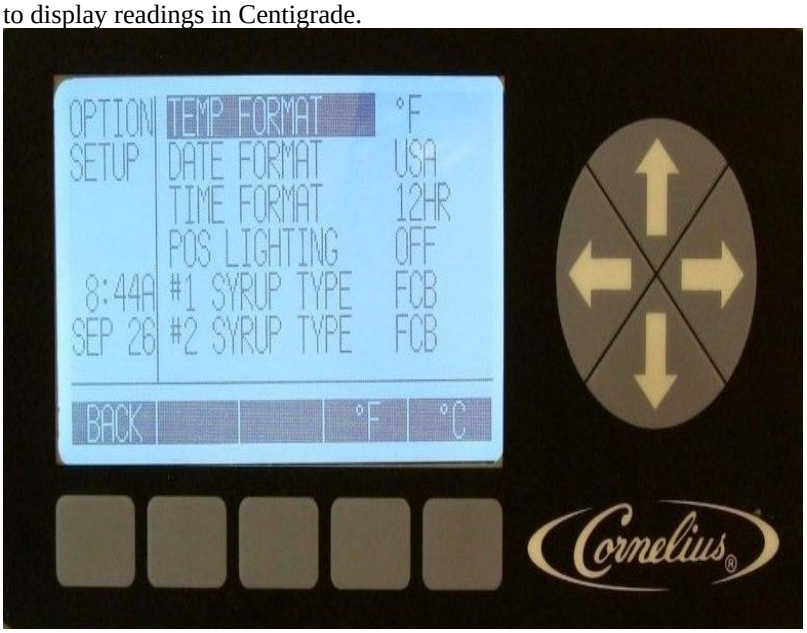


Options Setup

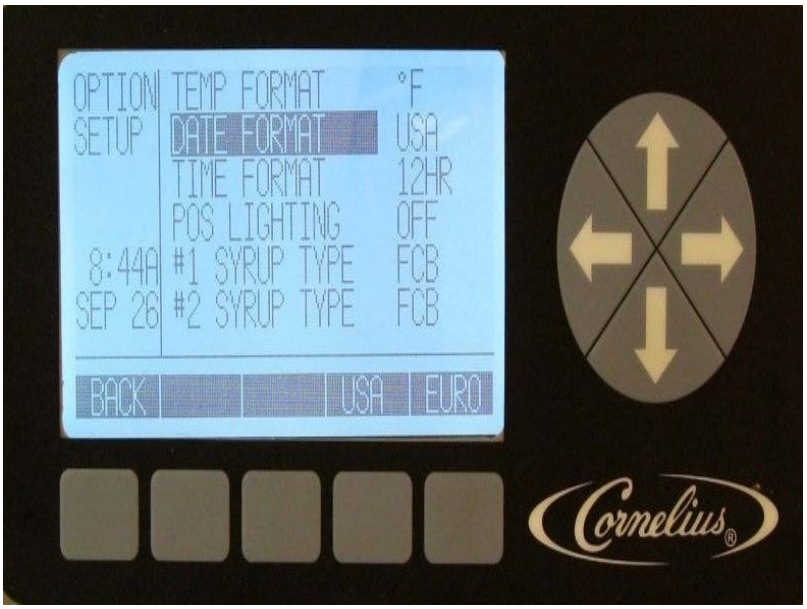
1. Options Setup
Highlight the OPTION SETUP field in the SETUP menu and press GO. This displays the OPTION SETUP menu.



2. Set Temp Format
The temperature format displayed by the Viper may be set to either Centigrade or Fahrenheit. In the Options set up menu highlight TEMP FORMAT and press the °F button to display readings in Fahrenheit and press the °C button to display readings in Centigrade.

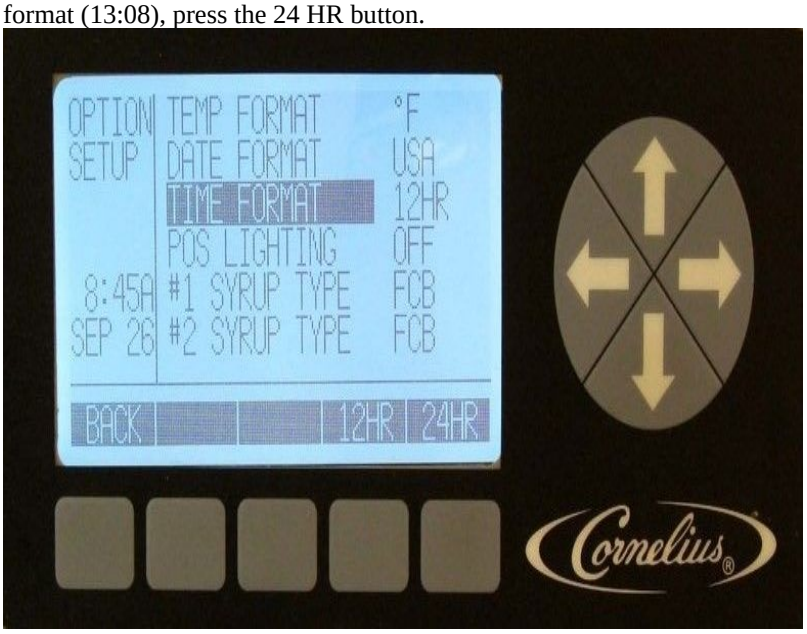


3. Setting Date Format
The date format displayed by the Viper may be set to either United States or European. In the options set up menu highlight DATE FORMAT and press USA button to display the date in mm/dd/yy format or press EURO to display the date in dd/mm/yy format.



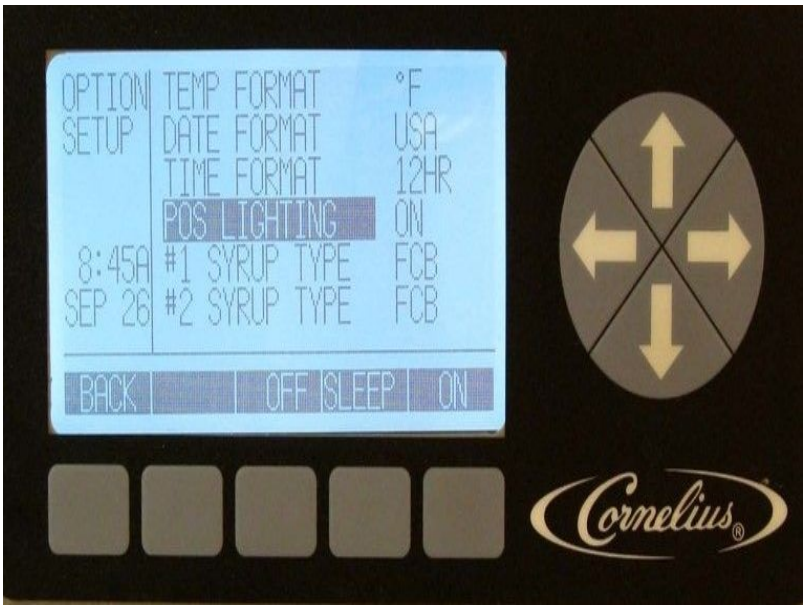
4. Set Time Format

Time format can be displayed in either 12 or 24 hour format. In the options set up menu, highlight TIME FORMAT. To display the clock settings in 12 hour format (1:08 P), press the 12 HR button. To display settings in 24 hour format (13:08), press the 24 HR button.

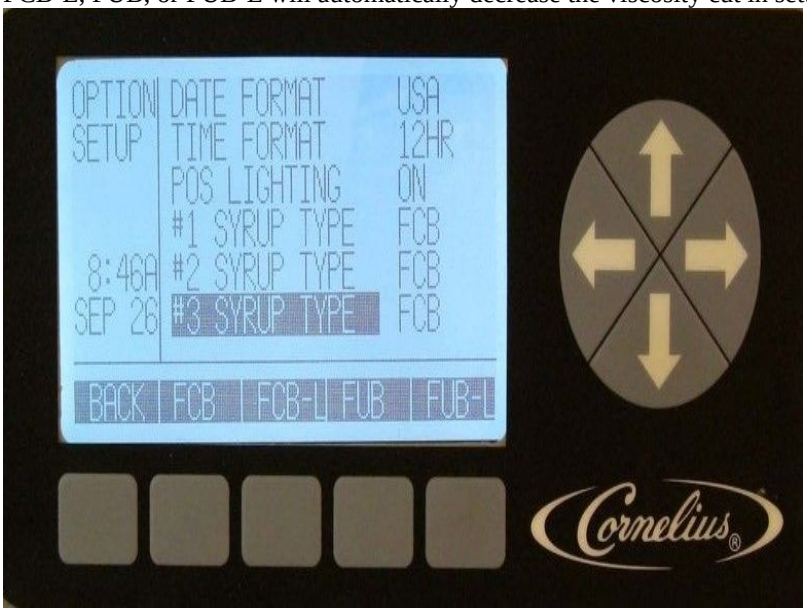


5. Select POS Lighting

POS (point of sale) lighting can be turned on or off. In the options set up menu highlight POS LIGHTING. To turn off the POS lighting press the OFF button. To turn the POS on press ON. To turn the POS on and off with the sleep settings, press SLEEP.

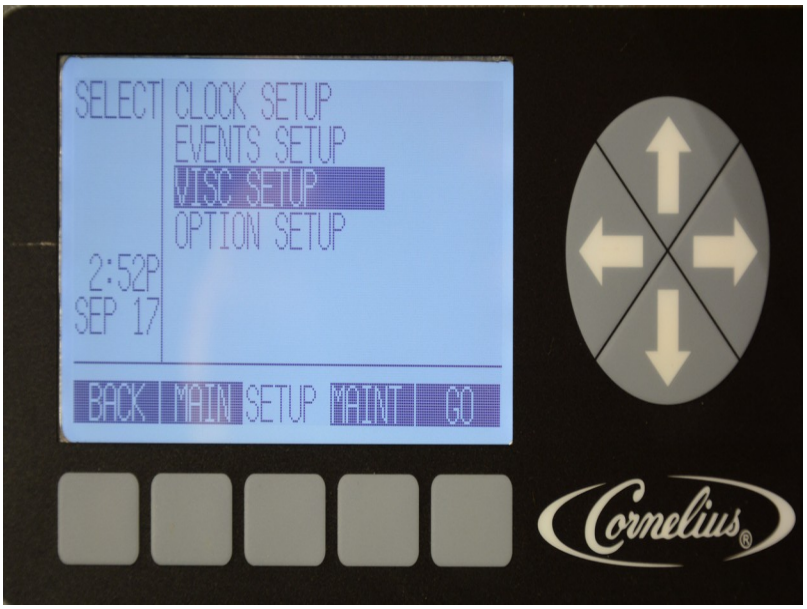


6. Select Type of Syrup
To set the syrup type, highlight Syrup Type in the OPTION SETUP menu and press the GO button. In the OPTION SETUP menu, highlight the individual barrels and select the desired syrup type by pressing the appropriate button. FCB is for Frozen Carbonated Beverage, FCB-L is for Frozen Carbonated Beverages - Light (diet), FUB is for Frozen Non-Carbonated Beverages, and FUB-L is for Frozen Non-Carbonated Beverages - Light (diet). Selecting FCB-L, FUB, or FUB-L will automatically decrease the viscosity cut in setting by 10 points.



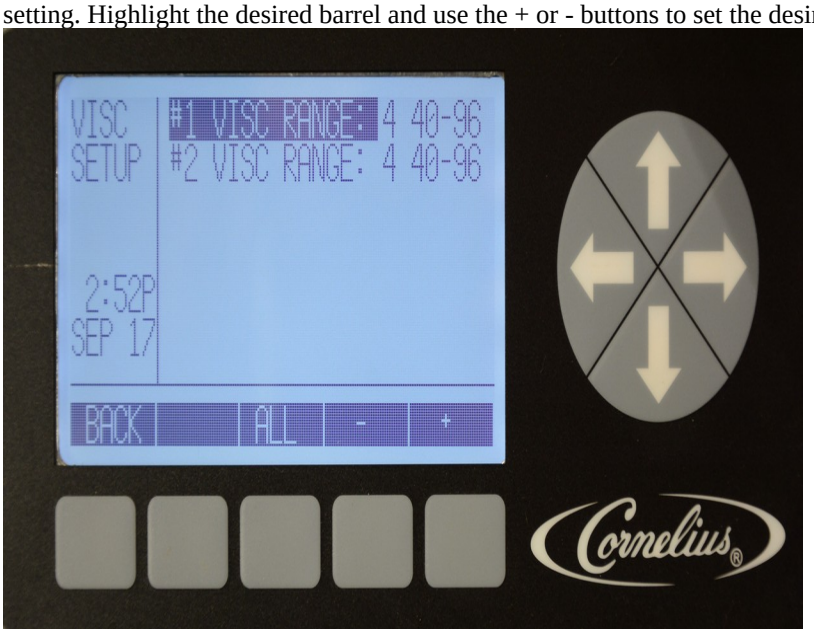
Viscosity Setting

1. Select Viscosity Setting
To enter the viscosity setting, highlight VISC ETUP in the SETUP menu and press the GO button. The viscosity setting controls how thick the product is by controlling the refrigeration cut in and cut out to maintain proper product viscosity.



2. Viscosity Programming

The viscosity range is 1-9: 1 being the least frozen and 9 being the most frozen, with 4 being the default factory setting. Highlight the desired barrel and use the + or - buttons to set the desired range.



3. Viscosity Example

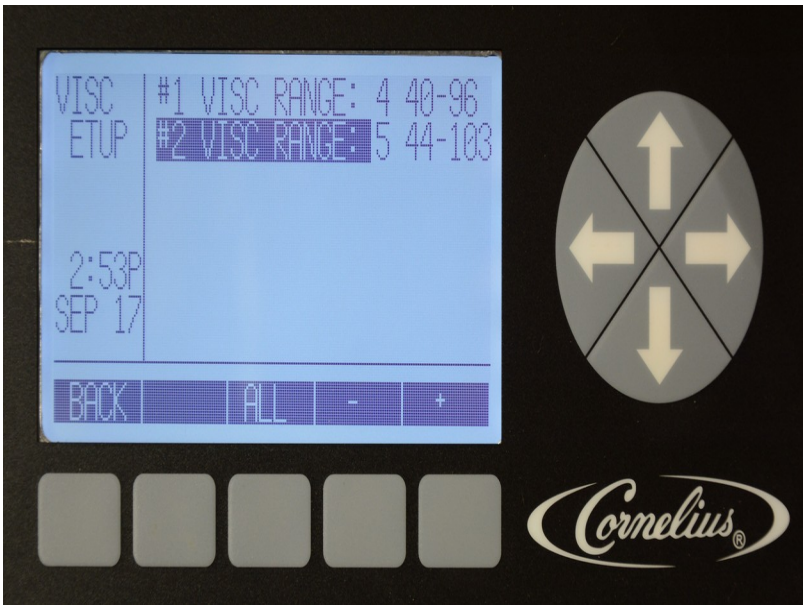
If you increase the viscosity, let the compressor cycle multiple times before making changes. This allows the change to take effect. If you need to decrease viscosity, defrost the barrel, adjust the viscosity and freeze down again.

Factory recommended settings:

FCB syrup w/ foaming Agent use range #4

FCB syrup w/o foaming Agent use range #4

FUB syrup use range #3



Electrical

1. Power Cord
All Viper units come pre wired with a power cord from the factory and will require a dedicated 230 Vac, 60Hz, single-phase circuit. A two flavor Viper is equipped with a NEMA L-620P plug and will require a 20 amp dedicated circuit with an L-620R receptacle. Three and four flavor Vipers are equipped with a NEMA L-630P plug and will require a 30 amp dedicated circuit with an L-630R receptacle. The Vipers recommended operating voltage range is 215 volts to 245 volts. If the incoming voltage to the unit is lower than 200 VAC you will receive a LOW VOLTAGE EROR, if the incoming voltage is above 260VAC you will receive a HIGH VOLTAGE ERROR and the Viper will shut down displaying an error message.



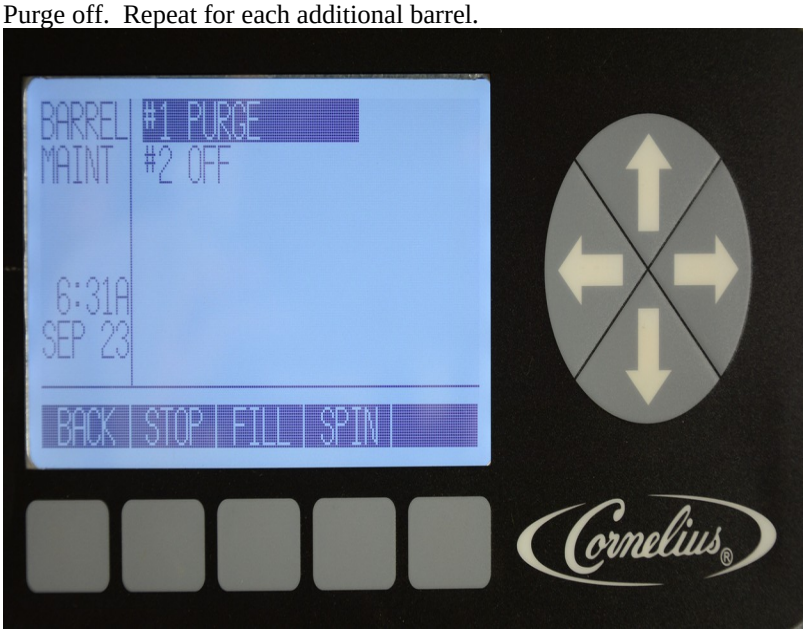
2. Buck-N-Boost Transformer
If the supply voltage at the wall outlet is under 215VAC, it is recommended that the Viper be installed with the Buck and Boost transformer (pn 620067479) to ensure that proper operating voltage is maintained when the refrigeration system and barrel motors are all running.

A Buck-N-Boost Transformer gives you the ability to increase or decrease the incoming supply voltage by 16 or 32Vac depending on the incoming supply voltage. The Buck and Boost transformer is only supplied with three and four flavor Vipers and is pre-wired to increase in the incoming line voltage by 16Vac. The BNB plugs directly into the wall and the Viper plugs directly into the BNB.
Note: Check your wall voltage and BNB output voltage to determine BNB wiring configuration. This will avoid any potential voltage issues.



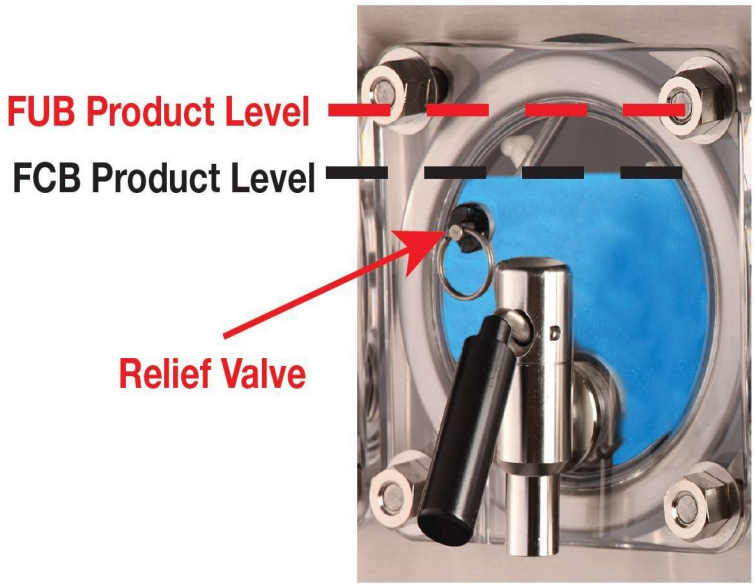
Filling the Barrels

1. Purging Barrels of Air
Before filling the barrel with product you must purge the barrel of air. To fill the Barrel with CO2 select MAINT, then BARREL MAINT, highlight the barrel being filed and then select PURGE. Let the barrel fill with CO2 and bleed air through the pressure relief valve located on the faceplate, repeat three times. Once completed turn the Purge off. Repeat for each additional barrel.



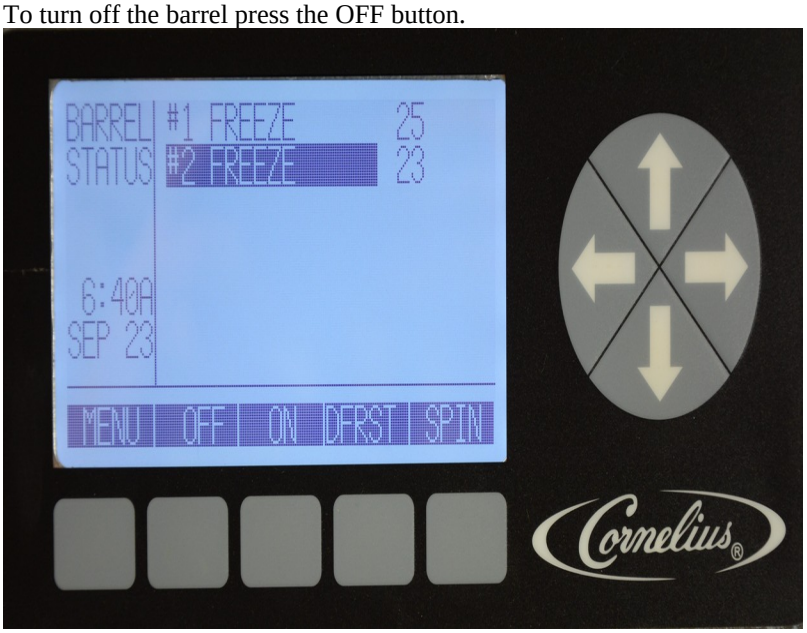
2. Filling Barrels with Product

Once the product has been brixed and barrels purged of air, it is time to fill the barrels with product. Go to MAINT, Barrel Maintenance, and use the up or down arrows to highlight the desired barrel. Pressing the FILL button starts the fill process for the barrel. The product will start to fill the barrel until the barrel fill switch reaches 28psi and stops filling. Lightly and slowly pull the relief valve ring on the faceplate to release gas pressure and the barrel will start to fill with product until 28psi is reached inside the barrel again. Repeat this process until the barrel is filled to the proper level, ~3/4" below the top of the barrel for FCB and ~1/2" below the top of the barrel for FUB. Once the product reaches the proper level, press the OFF button to stop the barrel filling process.
Note: Only fill one barrel at a time. This is only for setup and will fill automatically as needed in normal operation.



Freeze Product in Barrels

1. Initial Freeze Down
In the BARREL STATUS menu, highlight the desired barrel and press the ON button to start freezing the product. To turn off the barrel press the OFF button.



2. Quality of Drinks

A good quality drink does not collapse in the cup after dispense, draws easily through a straw, and has no air gaps. Also it is uniform and consistent with no syrup draining to the bottom of the cup.



Remote Condenser

1. Procedure

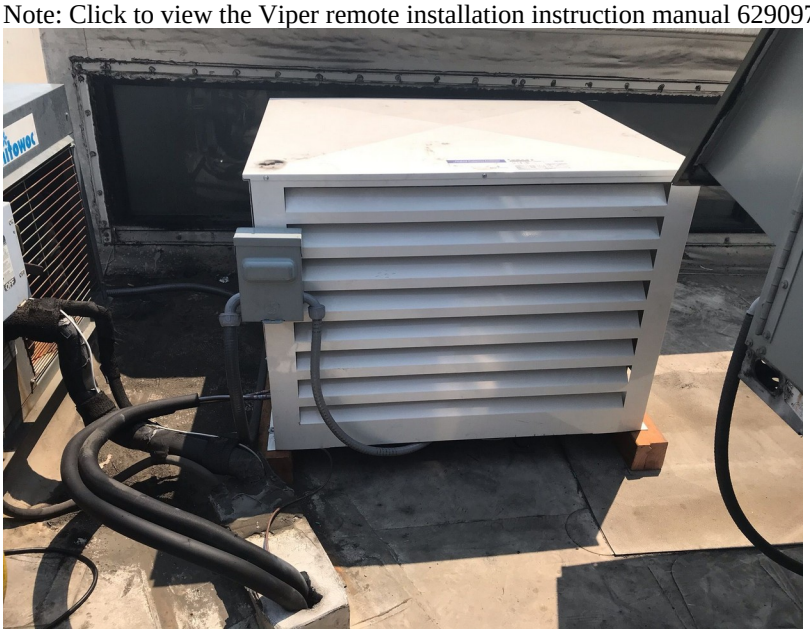
Installation of the remote condenser will require proper refrigeration line routing, a separate individual electrical service for the remote condenser and low voltage signal wiring between the remote condenser and the Viper unit. Also required will be the use of the calculation formula and chart found in the installation manual to determine the proper refrigeration charge for the system. The charge is based on the Rise, Drop and Run lengths of the line set. Note: Click to view the Viper remote installation instruction manual 629097916INS for complete details.



2. Components

For the proper installation of a Viper Remote unit, four items will need to be ordered from Marmon Foodservice Technologies. The items are the Viper remote version unit, mating remote condenser, installation kit and the refrigeration line set. Additional items that will need to be sourced locally include mounting hardware for the

condenser, construction material for roof penetration, brazing supplies/tools, electrical wiring/conduit & connectors and the required amount of 404a refrigerant for the remote model Viper (3 or 4 flavor) being installed.
Note: Click to view the Viper remote installation instruction manual 629097916INS for complete details.



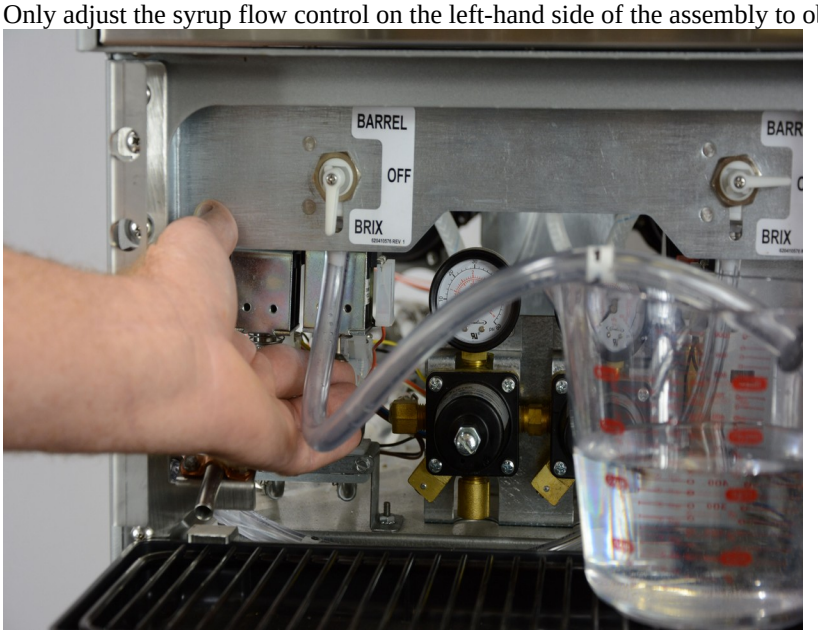
3. Location
Select the best available location, protecting the remote condenser from extremes of dirt, dust and sun. Also meet all applicable building codes using methods and practices to local building codes to mount and secure the remote condenser.
Note: Click to view the Viper remote installation instruction manual 629097916INS for complete details.



Setting Brix

1. Water Flowrate for Brix
Always check for proper flow rate at the water valve prior to brixing the unit, especially when installing the unit or replacing the water valve. The water valve must be set/adjusted to 16-17 oz in 10 seconds – these valves may not be preset and must be checked on every install.

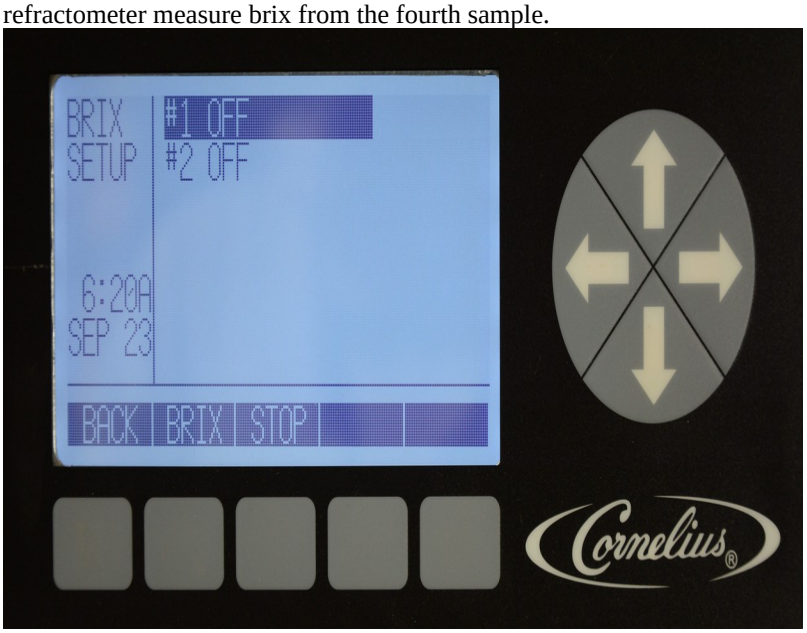
The water flowrate for each of the Vipers barrels is preset at the factory to 1.6 – 1.7 ounces/second. DO NOT ADJUST UNLESS DIRECTED BY A CORNELIUS REPRESENTATIVE. You can confirm the flowrate by manually engaging the water solenoid and capturing the flow rate in 10 seconds, you should achieve 16-17oz/10 sec. Only adjust the syrup flow control on the left-hand side of the assembly to obtain the proper brix.



2. Taking a Brix Sample

Checking the Brix determines the amount of sugar in the product. The higher the brix the more sugar, the lower the brix the less sugar.

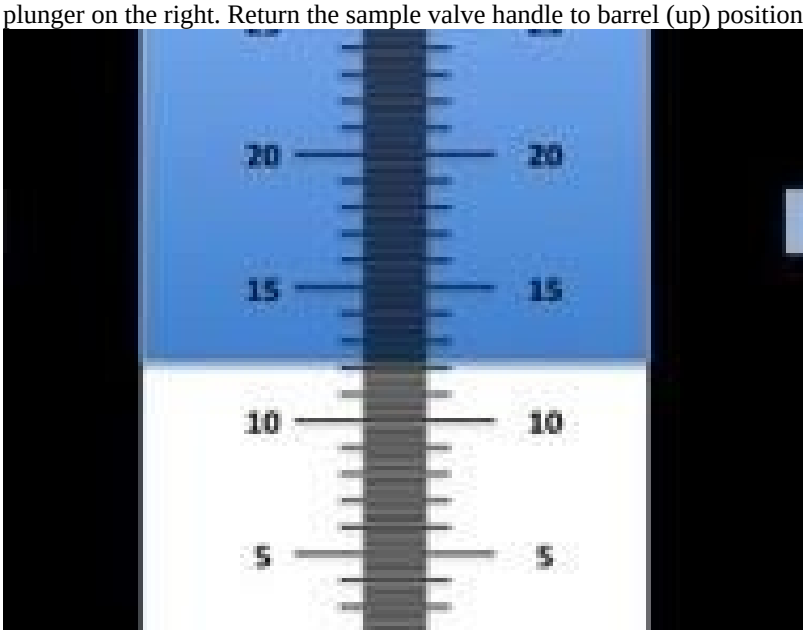
The BRIX SETUP menu is located in the MAINT menu. The Viper is programmed for a three-second dispense so that brix comparisons can be made between samples. Start by using the up and down arrows to highlight the barrel to be brixed. Next, turn the three-way valve down to brix position and remove the end cap of the sample tube. While holding the tube in a container press the brix button and collect and discard the first three samples. Then using a refractometer measure brix from the fourth sample.



3. Making Brix Adjustment

Industry-standard is 13.0 + or – 1.0. Cornelius likes to target 13.5-14.0. If the brix needs adjusting, the syrup should be adjusted to obtain the desired brix, never change the water flow control to adjust brix. Turning the syrup

knob clockwise will increase the brix reading and turning the syrup knob counter clockwise will lower the brix reading. After each adjustment, take and discard three samples taking the reading on the fourth sample. After the desired brix has been obtained, purge the sample tube with water by manually pressing up on the water solenoid plunger on the right. Return the sample valve handle to barrel (up) position when done.



Unit Location

1. Counter Installation

The counter must be capable of supporting a minimum of 500 pounds. The recommended clearance for airflow is 2 inches in the back and 12 inches on the top of the Viper. If both sides of the Viper have a clearance of 2”, then the Viper may be flush to the wall in the back.

If being placed into a cubby, recess or enclosed area, that area should have proper ventilation to remove hot air discharged from the viper and not allow it to circulate it back into the area/unit.

The hot air from the viper should NOT be able to recirculate back into the installation area as the refrigeration of the unit will not work properly.

Note: take proper precaution to avoid scratching the counter when sliding the Viper into place. A table lift capable of supporting 500+ lbs. is recommended.



2. Leg Installation

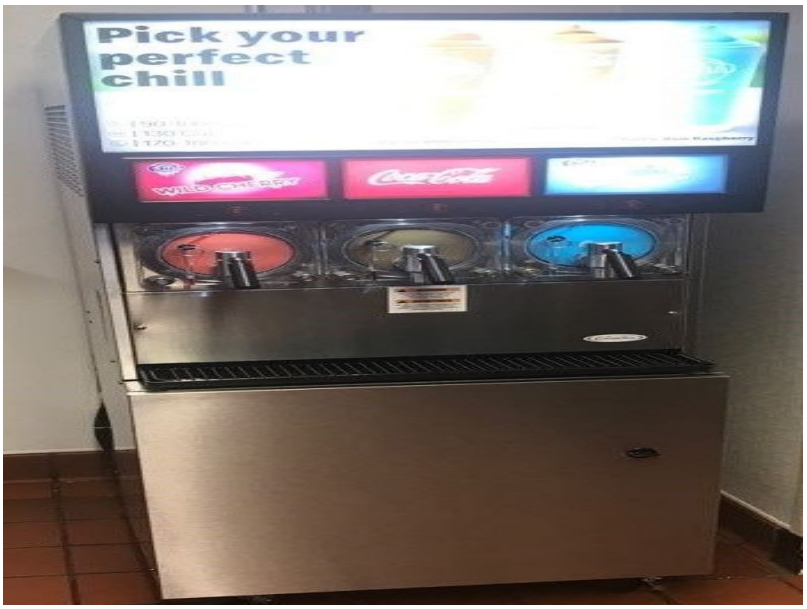
When a Viper is to be installed with legs, only use the leg kit provided from the factory. The use of any other legs may not be sufficient to support the weight of a Viper. Install the legs into the threaded holes provided in the bottom of the Viper. The legs can be adjusted from 2”-4”

Note: take proper precaution to avoid scratching the counter when sliding the Viper into place.



3. Cart Installation

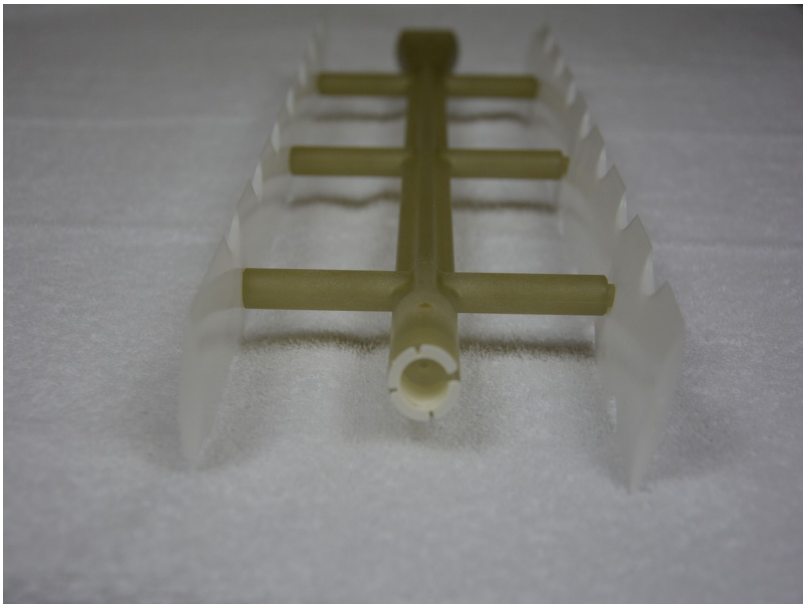
The Viper unit can be mounted on a mobile cart from the factory which allows movement of the Viper for service and cleaning. There are four captive nuts (3/8-16) as part of the Viper frame to secure unit to the cart. A 2 flavor cart is designed with movable front wheels that act as outriggers to provide further stability. Supply connections (CO2, water and Syrup) for the Viper can be routed up thru the openings in top of the cart and thru bottom of the Viper. Supply connections can also be routed through the back of the viper.



Operation

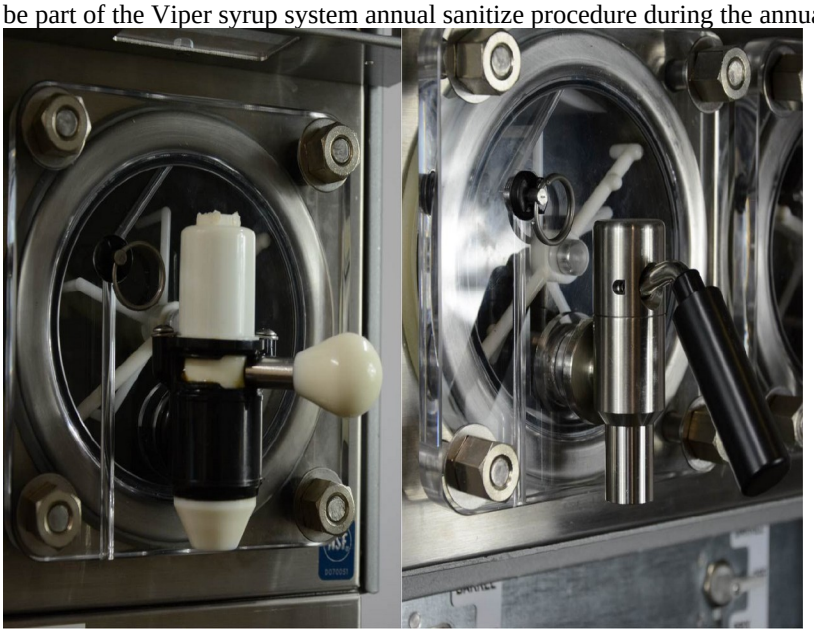
Barrel Components

1. Beater Bar – Scrapper Blades Bushing
The beater bar arms are indexed so blades only go on one way but scrapper blades are reversible so the opposite edge can then be used to get extra life from blades. The plastic bushing is for the interface between the faceplate beater bar stainless steel pin and the end of the beater bar. There is only a single style bushing and it is white when new. It may turn the color of the product which is normal and not to get confused that bushings come in different colors.



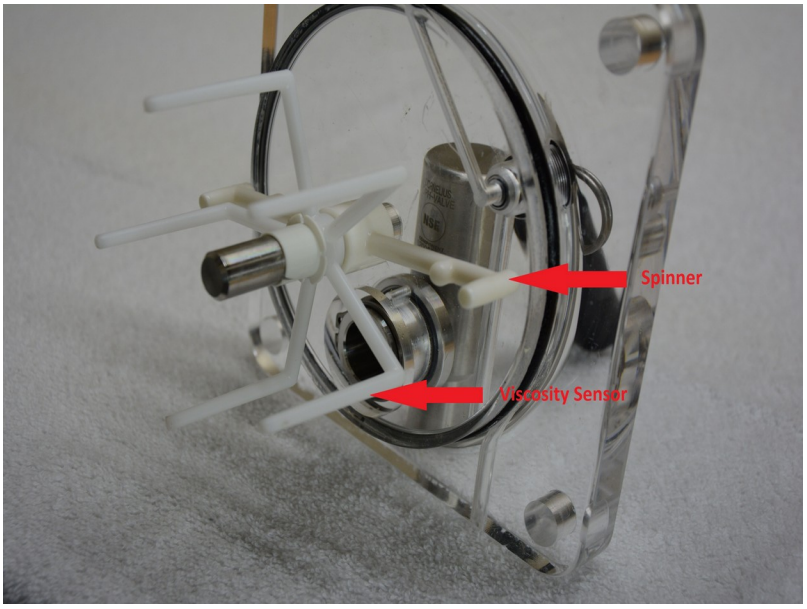
2. Dispensing Valves – Motorman and SPN
The Motorman dispense valve with a caged O-ring should be serviced and lubricated (Dow-Corning DC-111) every 6 months or more frequently if the valve lever gets tight to operate. And the caged O-ring should be replaced every

12 months. The SPH dispense valve does not require routine service and disassembly to lubricate. Both valves are to be part of the Viper syrup system annual sanitize procedure during the annual PM.



3. Spinner – Viscosity Sensor

The spinner keeps the inside of the face plate from product build up. The viscosity sensors' original purpose many years back in the V series FCB units was for sensing product thickness. Today it helps in the mixing of product near the front of the barrel.



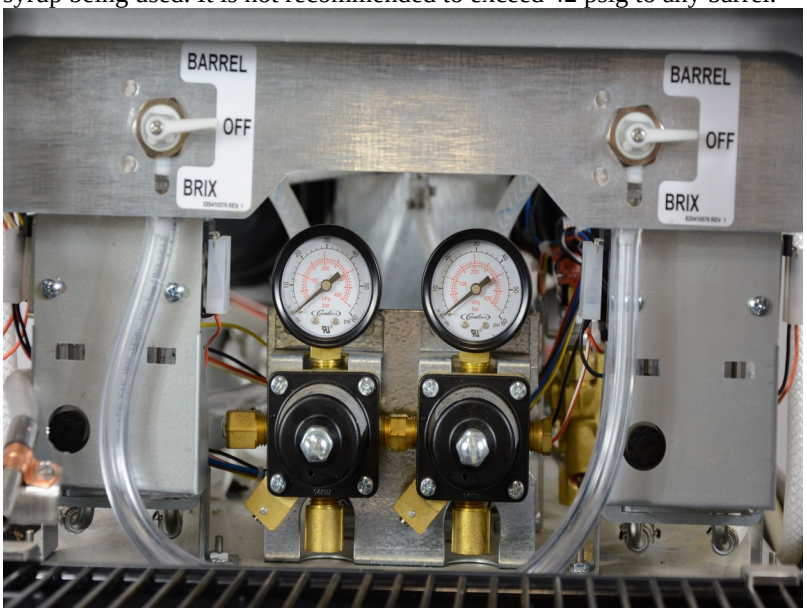
4. Faceplate – Relief Valve

The faceplate is held to freeze barrel with 4 hex nuts and metal washers. Spacers are placed over the 4 threaded bolts first before installing the faceplate to help with faceplate alignment. It is required to place a light film of Dow corning 111 on the faceplate O-ring prior to installing. Hand tighten nuts until the faceplate makes contact equally on all four corners then use a wrench to tighten nuts an additional ¼ turn making sure not to overtighten. The relief valve in the faceplate unseats at approximately 50 psi and drains out the bottom of the faceplate edge into the drip tray.

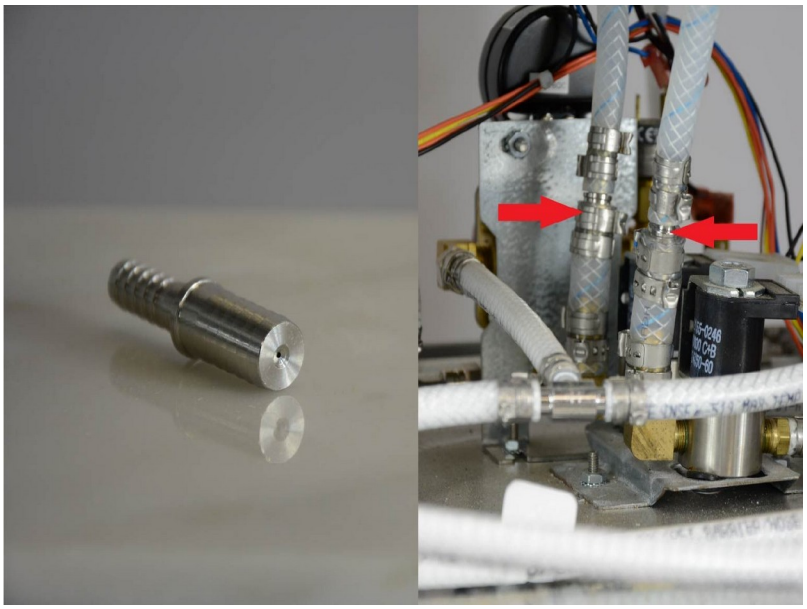


CO2 Regulator Settings

1. Freeze Barrel CO2
The Viper is supplied with 75 psig CO2. This pressure is routed to secondary regulators located behind the splash panel. The regulators are used to adjust the amount of product overrun (expansion) for each of the individual barrels. The factory setting is 36 psig. CO2 settings can be adjusted depending on the overrun you are trying to obtain and syrup being used. It is not recommended to exceed 42 psig to any barrel.



2. Orifice CO2 Function
The regulated CO2 pressure for each barrel flows from its secondary regulator to individual solenoids and then through a fitting with an orifice to meter the flow of gas. The CO2 then passes thru an in-line check valve before being introduced into the mixed product at a tee fitting prior to entering the particular freeze barrel. For standard overrun Vipers the inside orifice diameter is .030 inches and for low overrun Vipers the orifice diameter is .016 inches.
Note: The orifice adaptors should not be confused with common ¼ X 3/8 spliced barbed adaptors.



3. Expansion Tanks CO2

The Viper is supplied with 75 psig CO2. This pressure is routed to the expansion tank regulator which is located on the right side of the unit and is factory set at 30 psig. Do not change this setting. The regulator has a weep hole in the dome. As the product in the barrel expands from temperature differences, the product is pushed backwards into the expansion tank and against the tanks internal bladder. If the liquid side of the expansion tank is higher than the gas side of the expansion tank bladder (30 psig) the above 30psi pressure bleeds out the weep hole in the regulator cover.

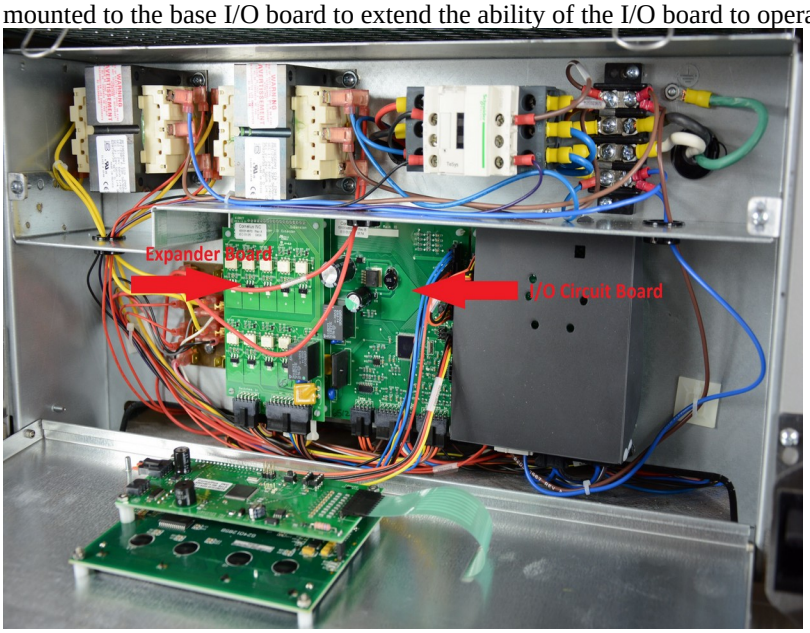


Control Boards

1. I/O Board plus Expander Board

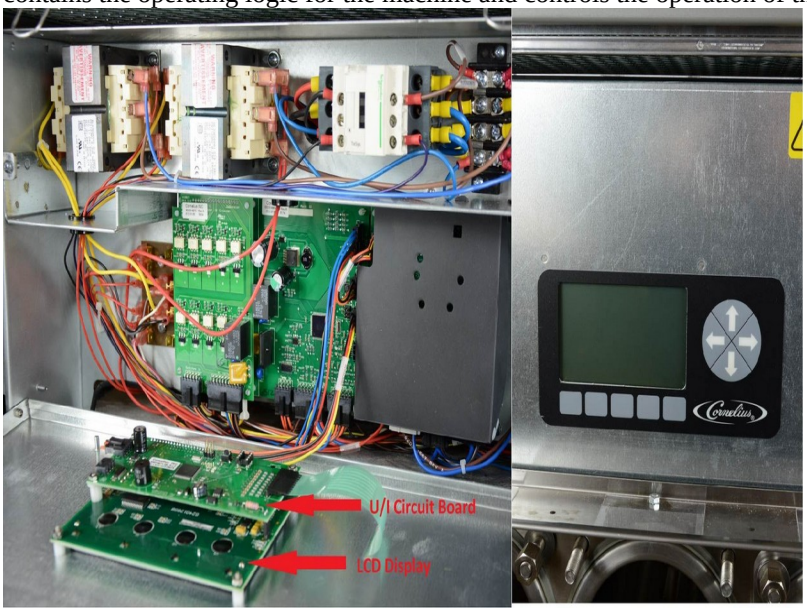
The Viper's control system I/O circuit board controls all input/outputs except for the motors. The I/O board communicates with the user interface, the motor control board and the status boards to carry out its programmed functions.

The two flavor Viper utilizes the base I/O board. And for the three and four flavor Vipers an expander board is mounted to the base I/O board to extend the ability of the I/O board to operate the additional barrels.



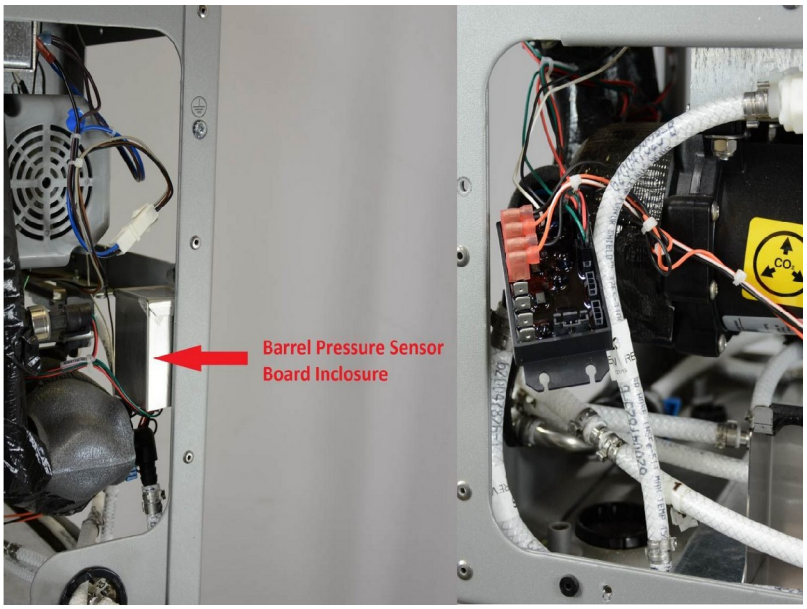
2. U/I Board, LCD Display and Touch Pad

The Operator interface board, also known, as the U/I board, communicates the user's inputs via the touchpad to the main I/O board. It also provides feedback on the condition of the machine using the LCD display. The U/I board contains the operating logic for the machine and controls the operation of the other system boards.

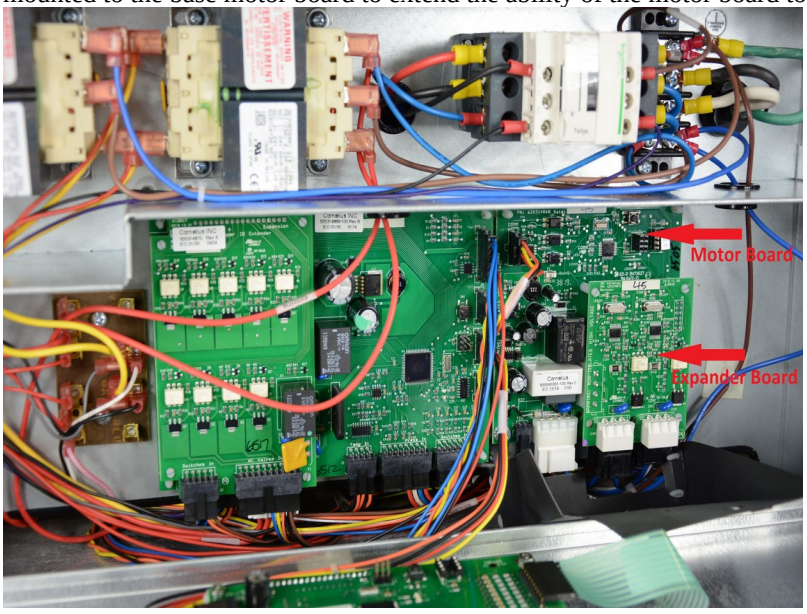


3. Barrel Pressure Sensor the Board PCBA Board

The barrel pressure sensor board is located in the rear of the Viper separate from the front panel electrical box. For Viper Elite's the freeze barrel transducers monitor actual pressures and are wired to the barrel pressure sensor board. The barrel pressure sensor board then sends a signal (open or closed) to the I/O board based on the freeze barrels' internal pressure. Earlier version Vipers were equipped with mechanical pressure switches and the switch would be an open or closed circuit based on the freeze barrel internal pressure the I/O board would monitor.



4. Motor Board plus Expander Board
The Motor board is used to correlate the motor power (current) to viscosity in the freezing barrel.
As the product in the barrel freezes, the rising viscosity increases the torque required to rotate thereby increasing the power delivered to the motor.
The power used by the motor is then reported to the main controller which in turn controls the refrigeration system based on viscosity cut-in and cut-out points to maintain the product at the desired consistency. The base motor board is common in the two, three, and four-barrel Vipers. For the three and four-barrel Vipers an expander board is mounted to the base motor board to extend the ability of the motor board to operate the additional barrels.



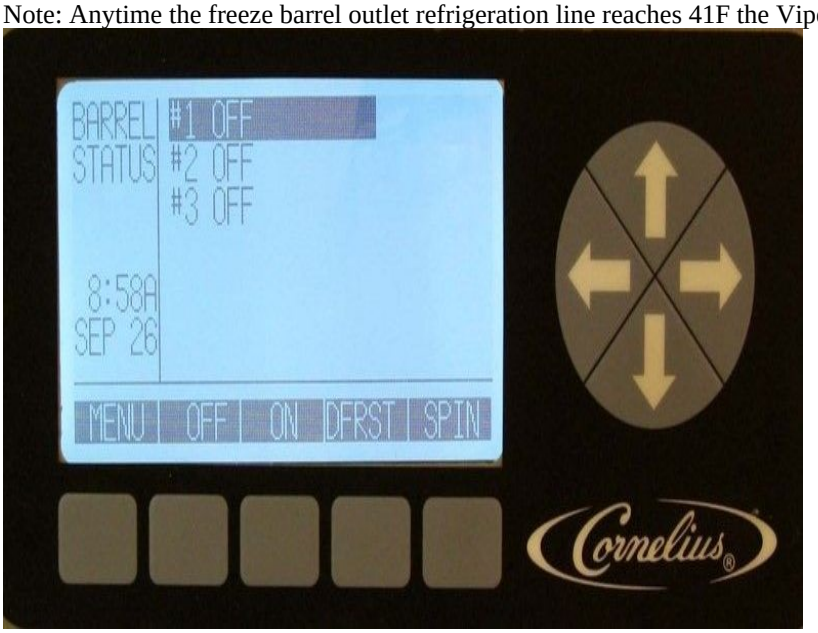
Defrost

1. Auto Defrost
The Viper utilizes a “Smart defrost” system. There is a 3-hour revolving clock that monitors the volume of product entering the barrels. Should anything less than ~40 to 45oz. per hour of FCB product per any barrel be dispensed within a 3-hour timeframe the barrel will perform a defrost. Only one barrel is allowed to be defrosted at a time. If a

barrel is in defrost and a customer pours a drink from another barrel, defrost on that barrel will suspend until the other barrel(s) are frozen and satisfied. Located on each freeze barrel (evaporator) refrigeration outlet line is a thermistor (temperature sensor). Once the sensor reaches 41F, defrost will be terminated. The typical defrost and recovery is ~ 12 minutes. The minimum time for a Defrost cycle is 4 minutes with the maximum time for a Defrost cycle including suspension being 20 minutes.
Note: Motor calibration takes place at the end of a programmed defrost cycle to account for possible mechanical change.

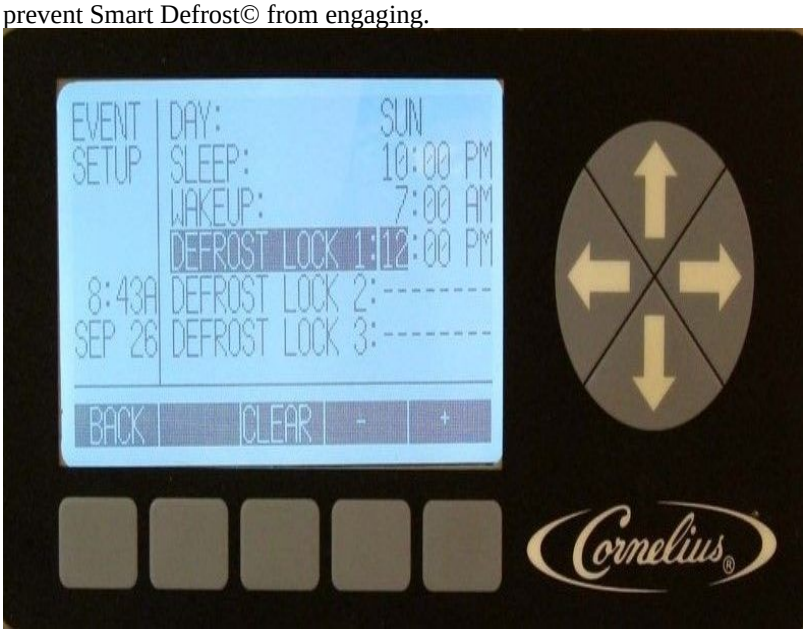


2. Manual Defrost
In the barrel status screen the DEF button is for manual defrost. While a barrel is running and put into manual defrost, the defrost cycle will last for four minutes and then go back into freeze mode. When a freeze barrel is off and put into a manual defrost the defrost cycle will last for four minutes and then shut back off.
Note: Anytime the freeze barrel outlet refrigeration line reaches 41F the Viper will terminate a defrost cycle.



3. Defrost Lockout
Defrost lockout prevents the Viper from automatically defrosting during set times and is typically enabled if the Viper or a specific barrel is constantly in defrost during peak times. The defrost lockout affects all barrels at the

same time and can be programmed to have 3 - three hour defrost lockout time slots, they can be individual or sequential for a maximum of 9 hours per day. Sequential defrost lockouts should be overlapped by 15 minutes to prevent Smart Defrost© from engaging.



Dispensing a Drink

1. Dispensing a Drink

When dispensing a drink, always pull the handle fully open. For the SPH valve the handle pushes down while the Motorman valve handle pulls to the right and is spring-loaded to close. Generally speaking FCB syrup is mixed with water at a ratio of 4 to 1 and a 13.5 brix. As an example a cup of frozen carbonated beverage (FCB) at 100% overrun is 10% syrup, 40% water and 50% CO2 gas. A quality drink does not collapse in the cup after dispensing and has no air gaps. It will easily draw through a straw and be “Stiff” enough to stack and form a dome above the brim of the cup. The mixture should be uniform and consistent without syrup draining to the bottom of the cup. And finally the temperature of the drink in the cup should be between 24F and 28F.

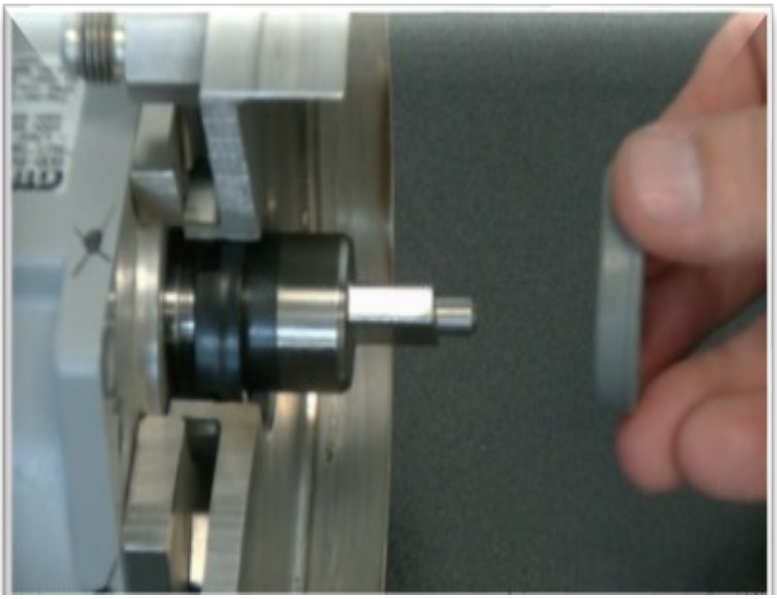


Drive Motor

1. Drive Motor & Run Capacitor
The current motor used is manufactured by Brother gear motor and is different than our competition. The drive motor mounting and setup is initially done at the factory. The motor utilizes an external run capacitor with a rating of 450 volts and 4uF. The drive motor and run capacitor should only be replaced with direct factory replacement parts.

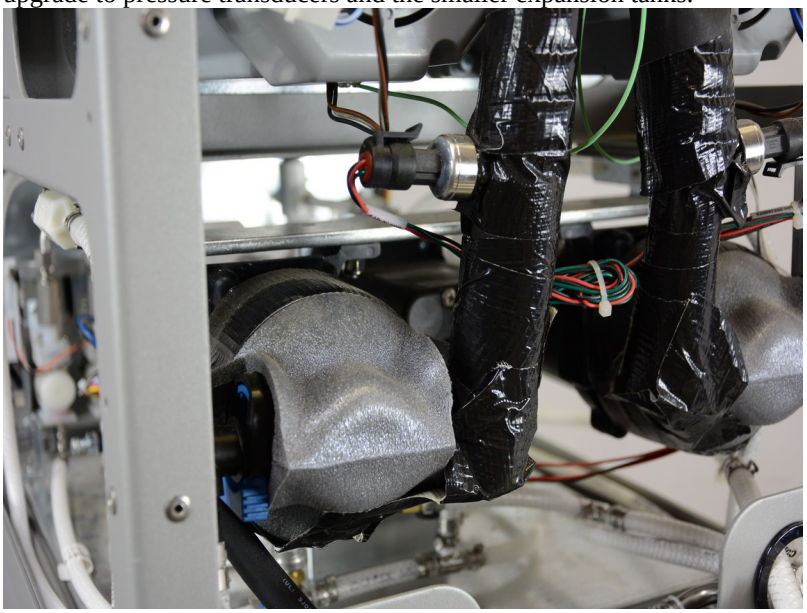


2. Seal & Drive Shaft Adaptor
The rear seal in the back of the freeze barrel is replaceable from the front of the Viper. When installing the replacement seal lubricate the inside diameter only. Barrel seals should be replaced every 6 months during a scheduled PM. The drive shaft stainless steel adapter has a ceramic surface that the seal rides on and provides a liquid-tight seal while the adaptor is rotating or stopped.
Note: Care should be taken when removing the seal not to damage the ceramic surface.



Expansion Tank

1. Expansion Tank and Pressure Switch
As the product freezes and expands in the barrel it overflows into the expansion tank. The Viper Elite incorporates a smaller expansion tank and uses a pressure transducer to monitor the tank. Earlier version Viper units had larger expansion tanks and mechanical fill switches instead of transducers. Backwards compatible kits are available to upgrade to pressure transducers and the smaller expansion tanks.

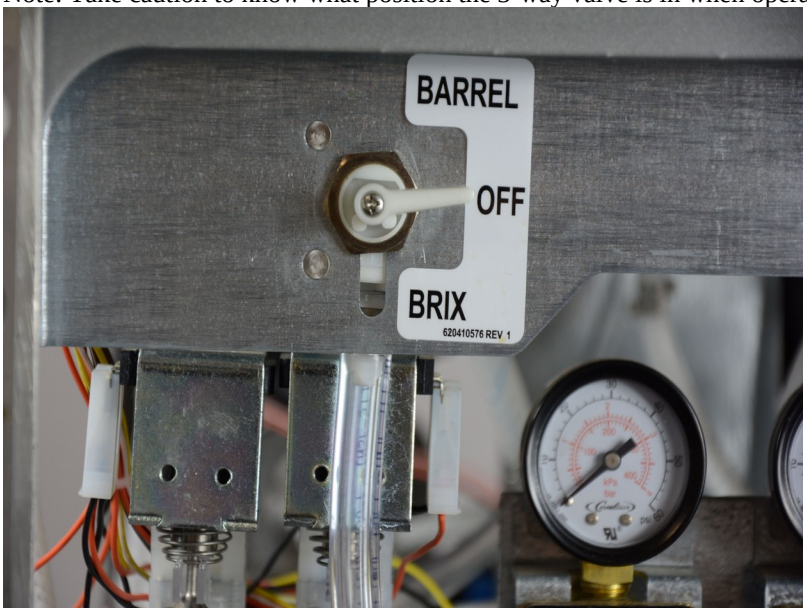


Flow Controls

1. Water and Syrup Flow Controls
The water flow is factory adjusted for 1.6 to 1.7 ounces per second and is not to be field adjusted. The flow control pistons are different orifice sizes, the water is larger and the syrup is smaller. When looking at the front of the unit the water flow control is on the right and the syrup is on the left. Both coils always energize at the same time. When the brix needs to be adjusted turn only the syrup adjusting screw CW for a higher flowrate and brix reading or turn the syrup adjusting screw CCW for a lower flowrate and a lesser brix reading. When activated, the flow of both water and syrup pass-thru check valves and into a T fitting where the water and syrup mix to become a uniform FCB product.
Note: An additional way to purge or flush water or syrup lines is by manually pressing in and holding the valve coil plunger.



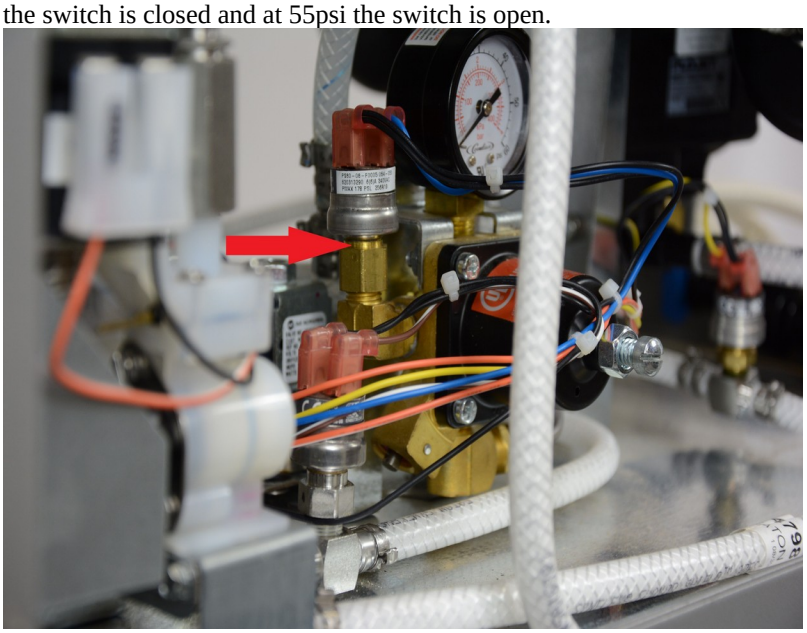
2. Three-Way Valve
The 3-way valve for each freeze barrel is located behind the Viper splash panel and has three different positions. With the handle pointing upward, the valve is in the BARREL position and the product (mixed water and syrup) from the flow controls will be directed to the freeze barrel. With the handle pointing downward, the valve is in the BRIX position and when using the brix menu, the sample product will be directed out of the vinyl sample tube in front of the unit. With the valve handle pointing in the middle position the valve is in the OFF position and no product will flow.
Note: Take caution to know what position the 3-way valve is in when operating the unit.



Mechanical Pressure Switches

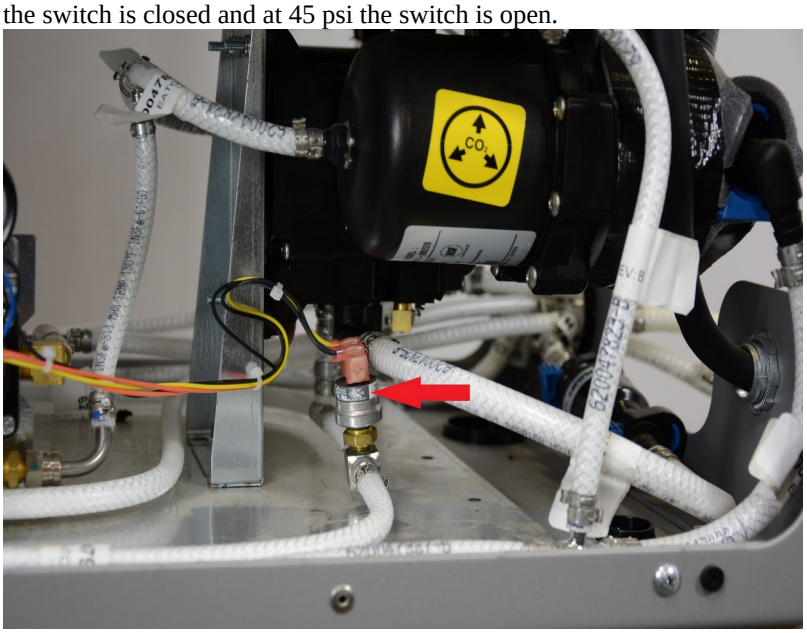
1. CO2 Sold Out Switch
The CO2 sold out switch is located on the high side port for the CO2 secondary regulator for the expansion tanks. The CO2 sold out switch is visually identified by a Gray dot between the wire terminals.

The switch cut-in pressure is 64psig and the cut-out pressure is 55psig. The switch is wired normally open. At 64psi the switch is closed and at 55psi the switch is open.



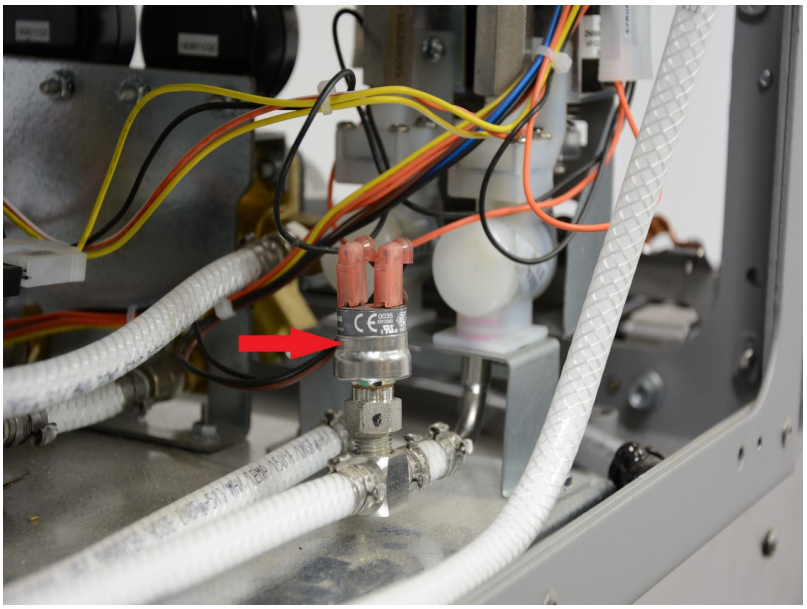
2. Water Sold Out Switch

The water pressure sold out switch is located on the outlet side of the water pump.
The water Sold Out switch is visually identified by a Blue Dot between the wire terminals
The switch cut-in pressure is 76psig and the cut-out pressure is 45psig. The switch is wired normally open. At 76psi the switch is closed and at 45 psi the switch is open.

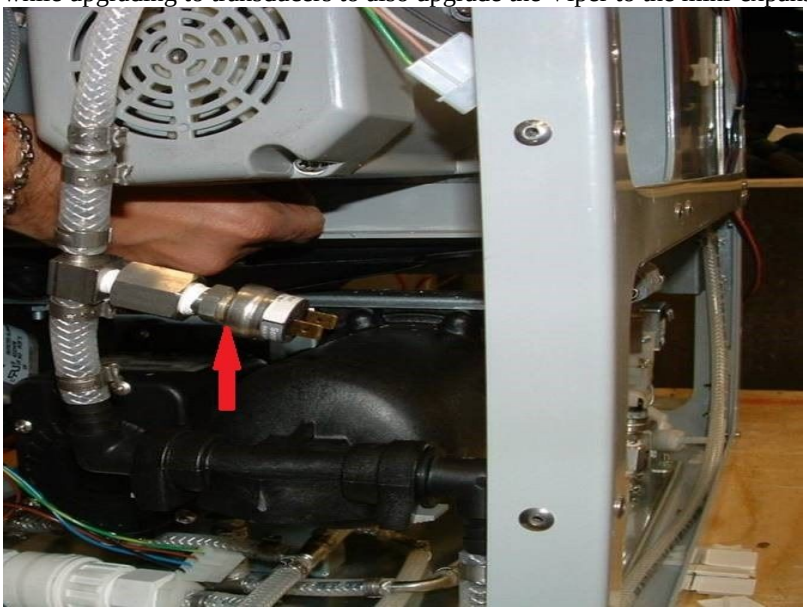


3. Syrup Sold Out Switch

The syrup sold out switches are located just before the syrup flow control for each freeze barrel.
The Syrup sold out switch is visually identified by a Red dot between the wire terminals.
The switch cut-in pressure is 55psig and the cut-out pressure is 48psig. The switch is wired normally open. At 55psi the switch is closed and at 48 psi the switch is open.



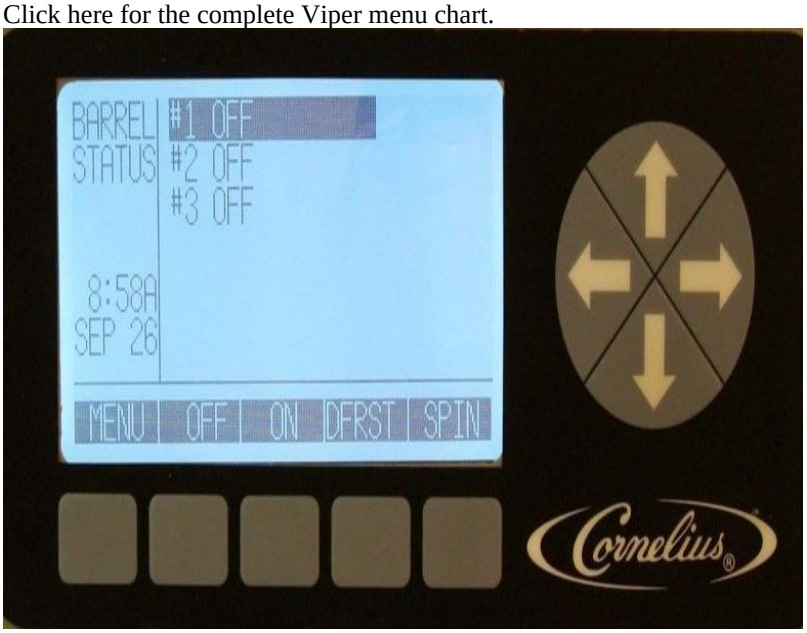
4. Barrel Fill Switch – Older Units
Older version Vipers were manufactured with mechanical barrel fill switches instead of pressure transducers.
The old mechanical barrel fill switch is visually identified by a Yellow dot between the wire terminals.
The mechanical switch cut-in pressure was 23psig and the cut-out pressure was 28psig. If the Viper is experiencing a lot of errors (freeze-ups, ice blocks, improper filling, etc.), it is recommended upgrading to pressure transducers.
Barrel transducer upgrade kits are available for legacy Vipers and are backwards compatible. It is recommended while upgrading to transducers to also upgrade the Viper to the mini-expansion tanks if not already done.



Barrel Status

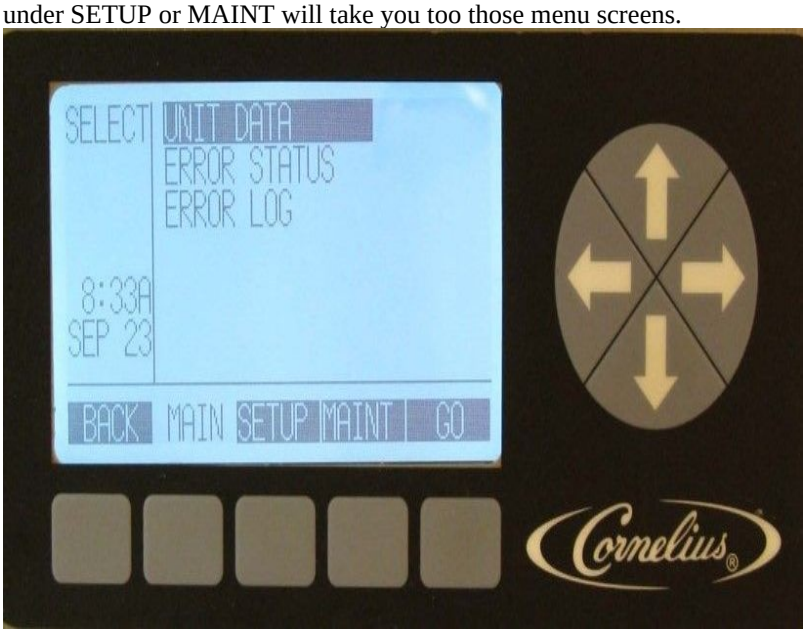
1. Barrel Status
The barrel status screen displays the current time and date as well as the status of the barrel viscosity and the status of the barrel(s). In the barrel status screen, you can turn the freeze barrels on or off, you can put the Viper into a 4 minute manual defrost, and you can spin the beater bar and scrapper blades without activating the refrigeration. Use

the arrows to move up or down to select different barrels and select ON, OFF, DEF, or SPIN. Pressing the MENU button in the lower left corner will display the option to select three menu categories, Main, Setup, and Maint. Click here for the complete Viper menu chart.



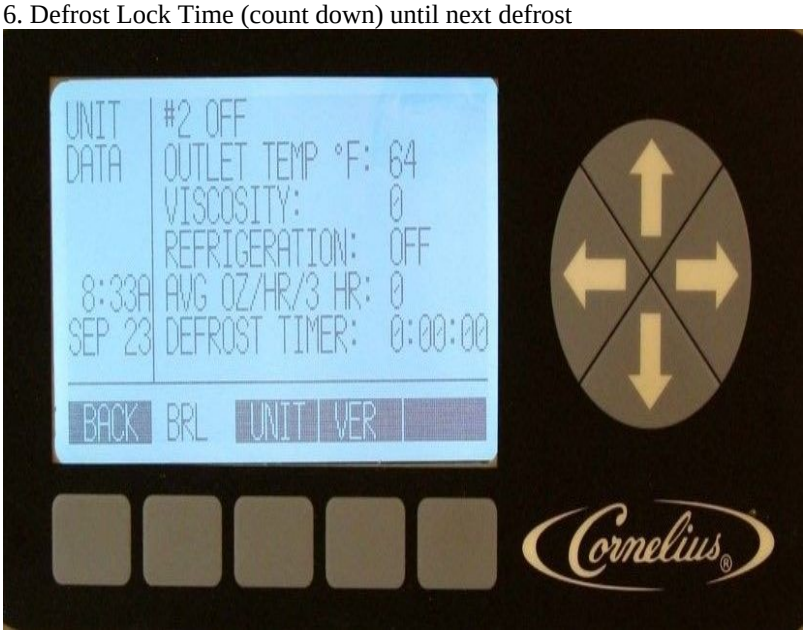
Main Selection

1. Main Selection
From the barrel status screen, by pressing the MENU selection button you will have the option of three-sub menu's MAIN, SETUP and MAINT. The first menu screen the Viper goes too is the MAIN screen. Pressing the button under SETUP or MAINT will take you too those menu screens.



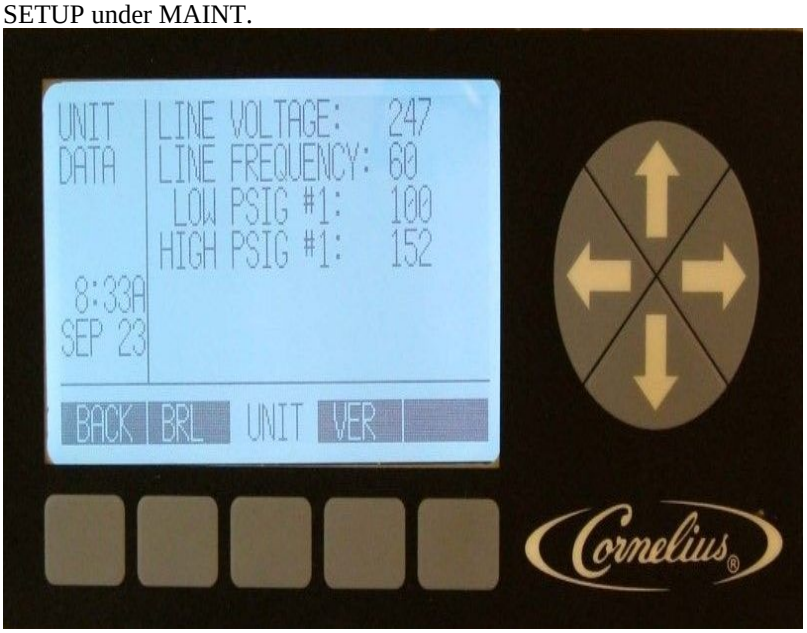
2. Unit Data - Barrel
Listed on the barrel (brl) screen are parameters being monitored for a specific barrel. Use the up or down arrows to change between barrels. Functions monitored:
1. Barrel status, ON, OFF, DEF, SPIN, or Error code.
2. Outlet temperature recorded by evaporator outlet sensor

3. Viscosity of product currently in the barrel
4. Refrigeration to the barrel ON or OFF (compressor on and LLS activated)
5. Average ounces of product dispensed per hour over a 3 hour time period
6. Defrost Lock Time (count down) until next defrost



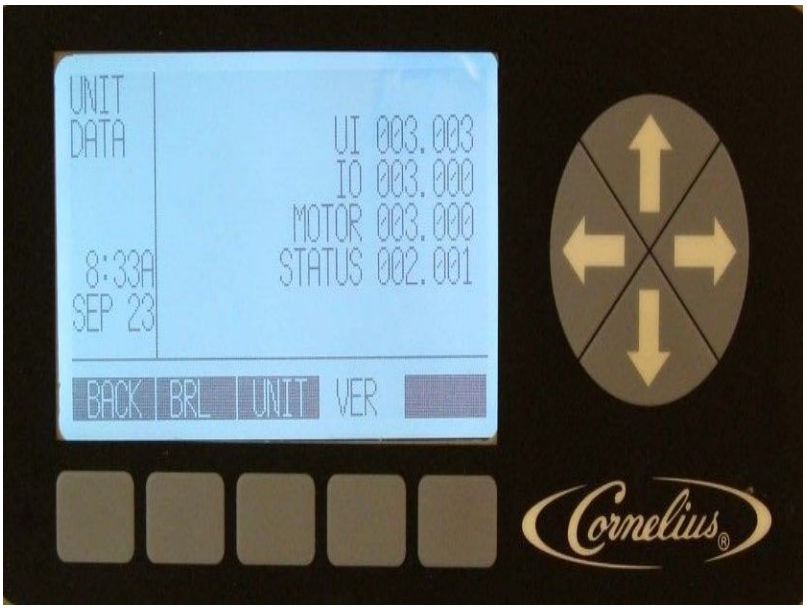
3. Unit Data - Unit

The UNIT DATA screen displays the real time input line voltage and frequency supplied to the Viper. It also displays the low, high, and or both refrigeration pressures for the Viper, depending on the settings set in SYSTEM SETUP under MAINT.

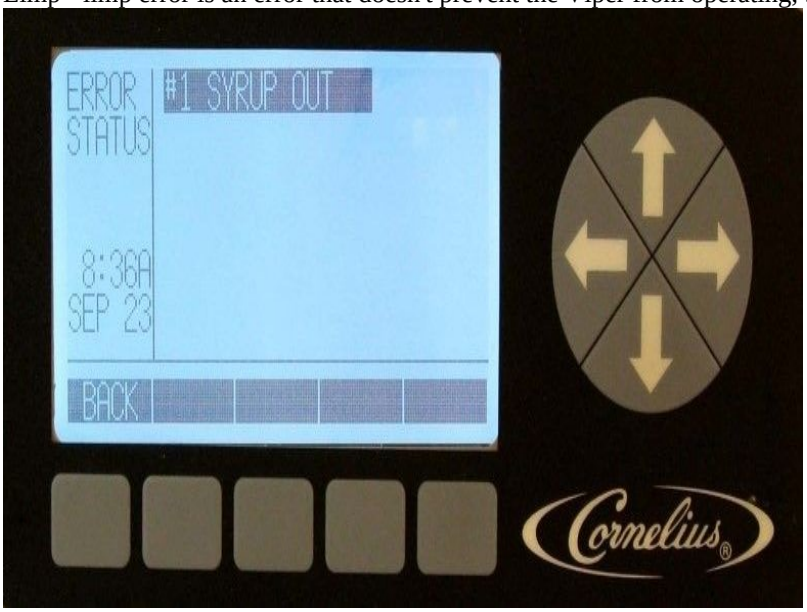


4. Unit Data - Version

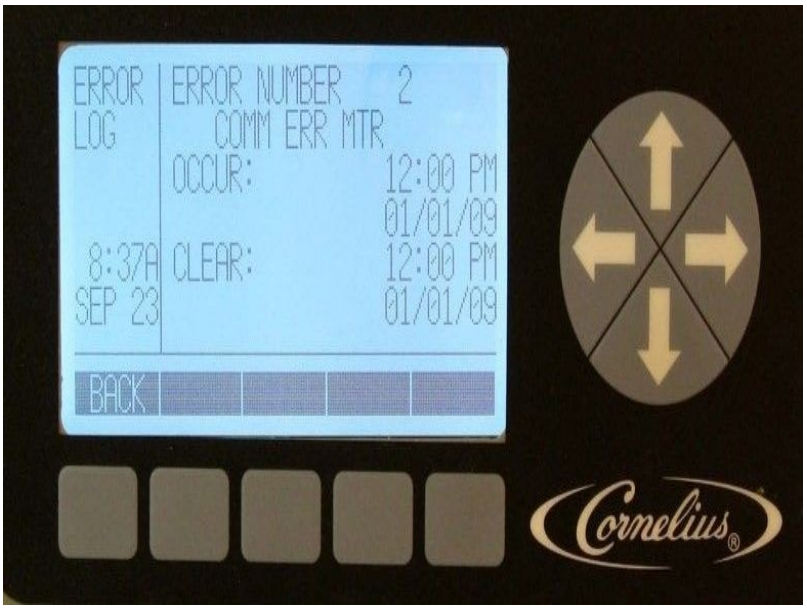
In the Unit Data VER screen, the Viper displays the version number of the UI, I/O, Motor and Status boards installed in the Viper.



5. Error Status - Current
In the ERROR STATUS screen the Viper displays any current errors the unit is in. Three types of errors codes can be display.
System – system error displays the same information across all barrels in the Viper.
Barrel – barrel error is limited to a specific barrel
Limp - limp error is an error that doesn't prevent the Viper from operating, but limits functionality.

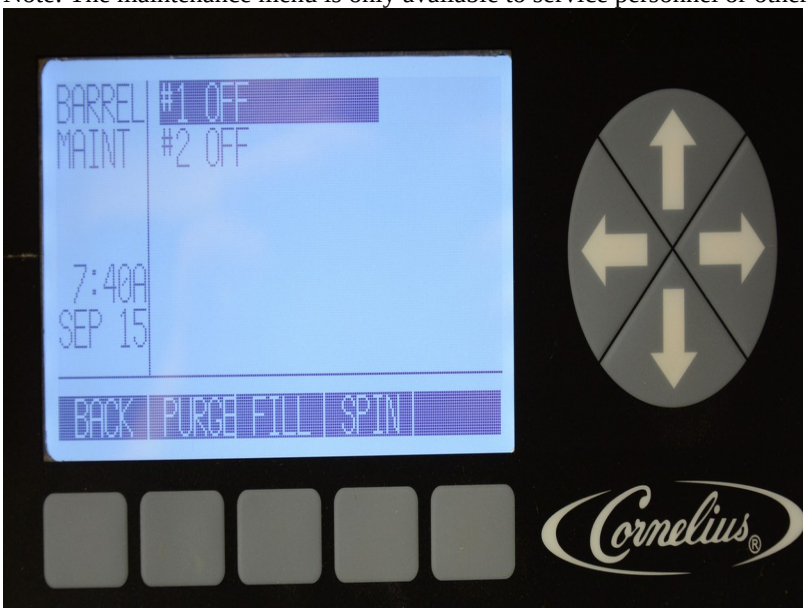


6. Error Status - Log
While in the select screen, highlight ERROR LOG and press GO. The ERROR LOG screen will appear starting with the first error in the log and will display the last 50 errors. It will display when the error occurred and when it cleared.

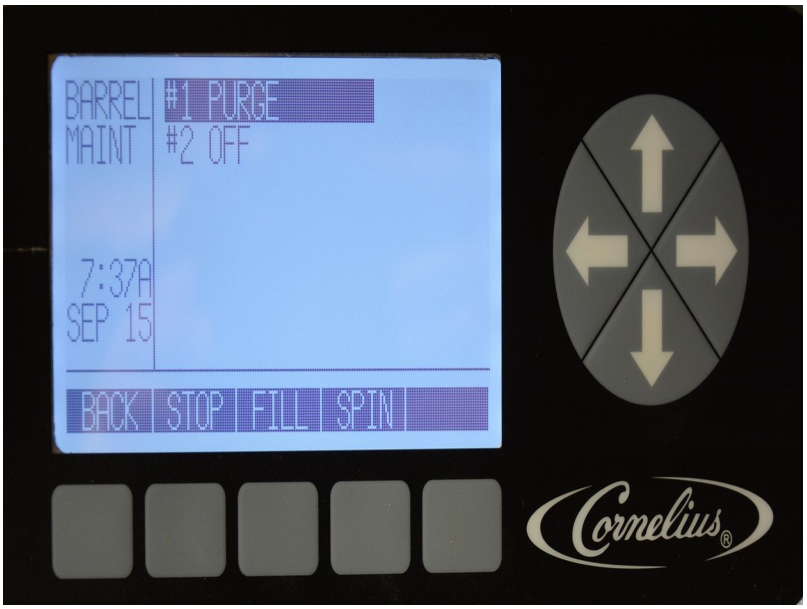


Maintenance Selection

1. Maintenance
The Barrel Maintenance menu allows the service technician to PURGE, FILL, and SPIN as needed and these options are used for maintenance and service. As a warning to the technician, the "Do Not Drink" status indicators are illuminated on the barrels when entering the Barrel Maintenance menu.
Note: The maintenance menu is only available to service personnel or other authorized users, if security is enabled.



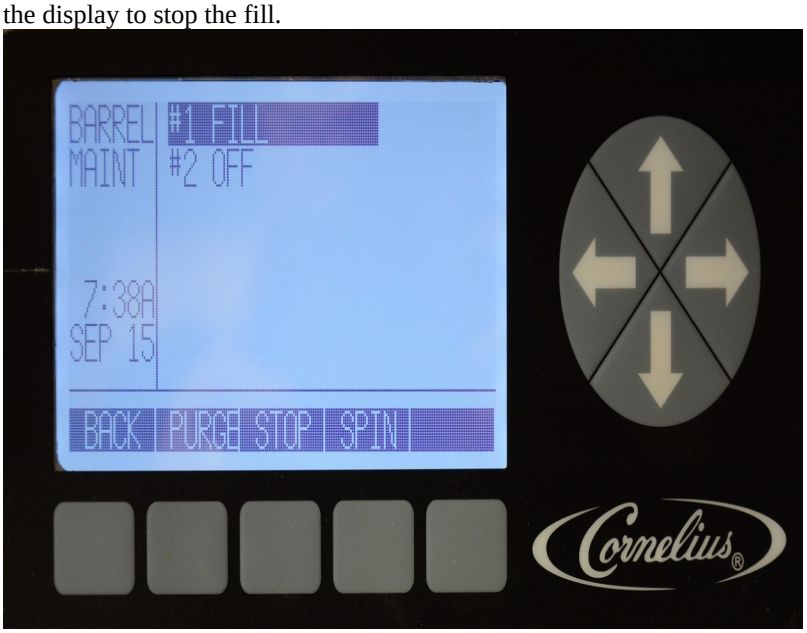
2. Barrel Maint - Purge
Purge is used to remove product from the barrel. Use the arrows to highlight the desired barrel.
Press the PURGE button at the bottom of the display and place a container under the barrel dispensing valve. Open the dispensing valve and dispense all the product from the barrel, the barrel will not refill while in purge mode. As the product level lowers in the barrel, partially close the valve to avoid spurting. When the barrel is completely empty, close the dispensing valve and press the STOP button to turn off purge mode.



3. Barrel Maint - Fill

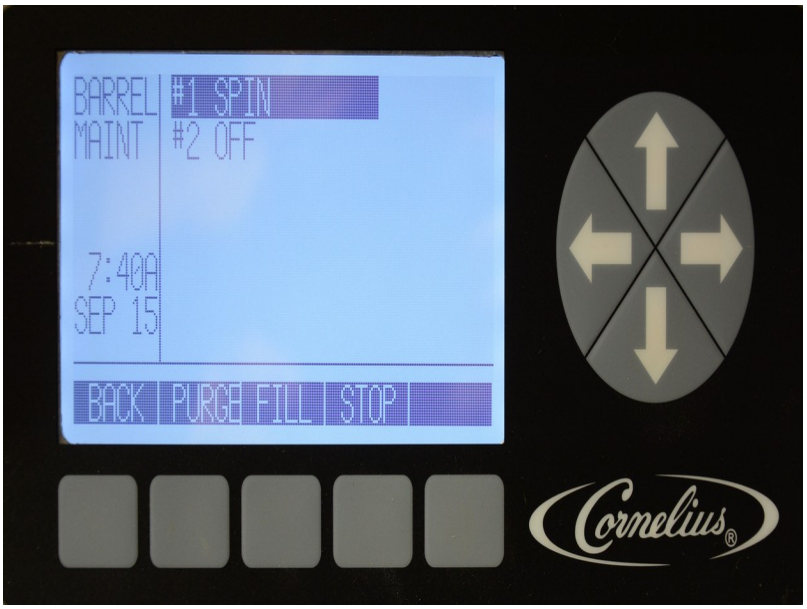
** Make sure the three-way valve is in BRL position**

Use the arrows to highlight the desired barrel. Press the FILL button at the bottom of the display to fill the highlighted barrel. As the barrel fills, the barrel pressure sensor shuts off the barrel at a pressure of 28 psi. When the fill completes, intermittently slowly open and close the relief valve to bleed CO2 from the barrel and fill the barrel approximately half way between the relief valve and the top of the barrel. Press the STOP button at the bottom of the display to stop the fill.



4. Barrel Maint - Spin

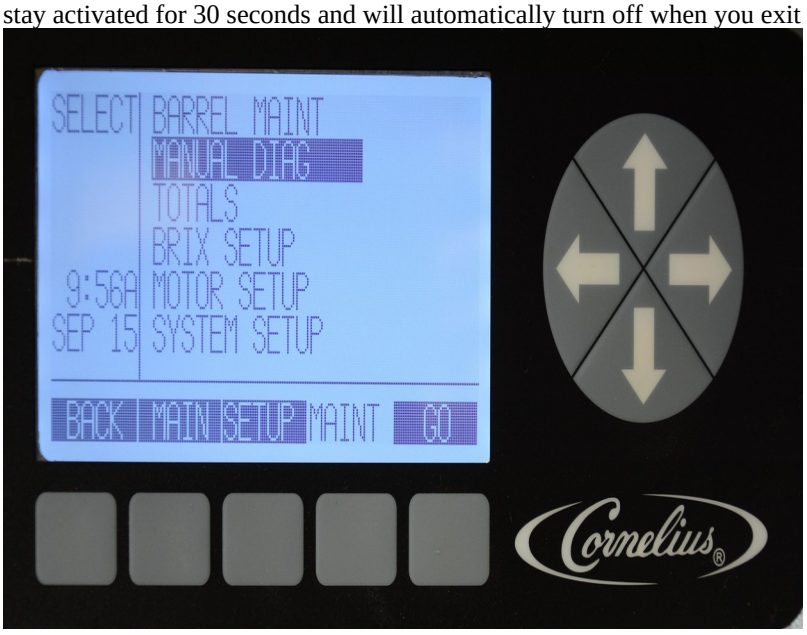
Use the arrows to highlight the desired barrel. Press the SPIN button at the bottom of the display. The drive motor for the selected barrel will come on and only spin the beater bar and scrapper blades, no refrigeration will come on for the barrel. Multiple barrels can be turned on at one time for this function. Pressing the stop button will stop the motor.



5. Introduction

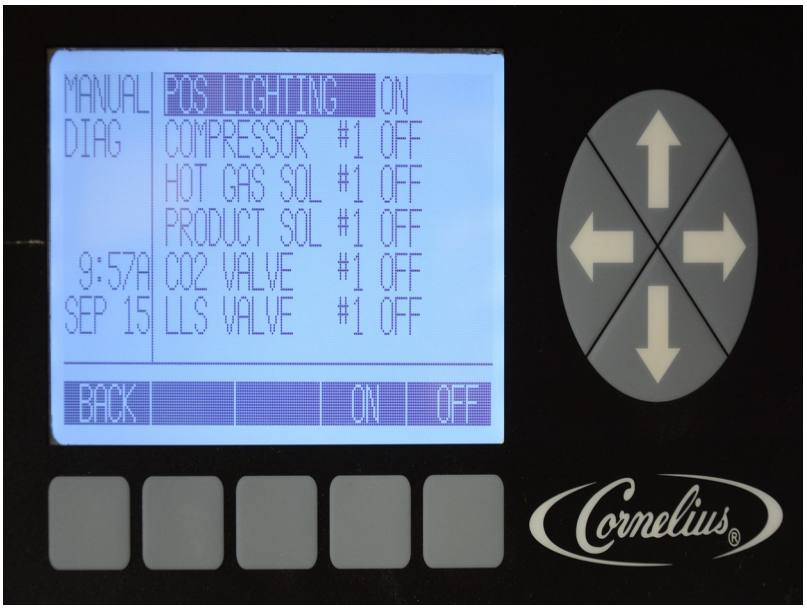
The Manual Diagnostic menu is used for troubleshooting and testing the system on a component basis. It allows the service technician to turn individual components of the Viper on and off for troubleshooting purposes. To move between one set of barrel parameters to the next, press the arrow keys. This moves the highlight to the first entry of the second barrel, etc. Pressing the BACK button returns the display to the Main menu and turns off all the active loads. All barrels and the POS lighting will turn off when in diagnostics.

NOTE: to avoid damage by deadheading the compressor, ensure that brl one LLS is working properly. Components stay activated for 30 seconds and will automatically turn off when you exit the menu.

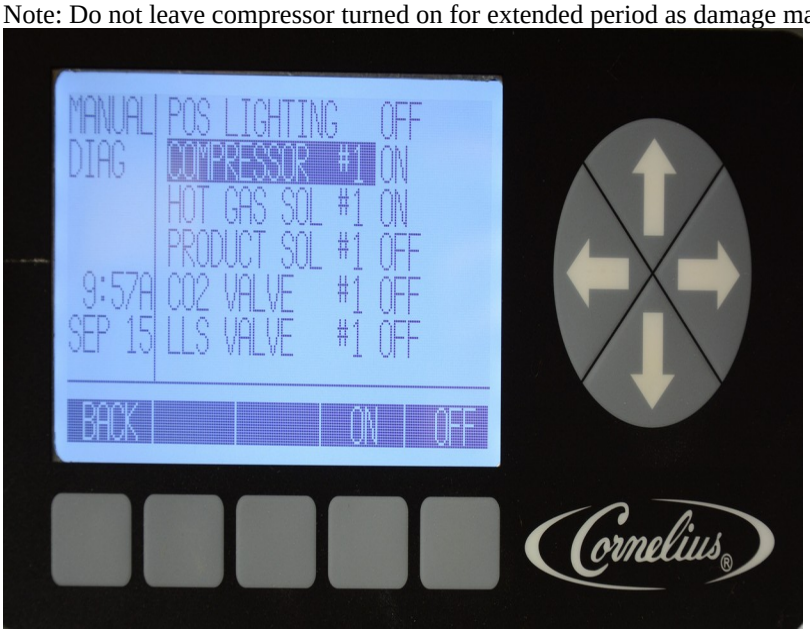


6. Manual Diagnose – POS Lighting

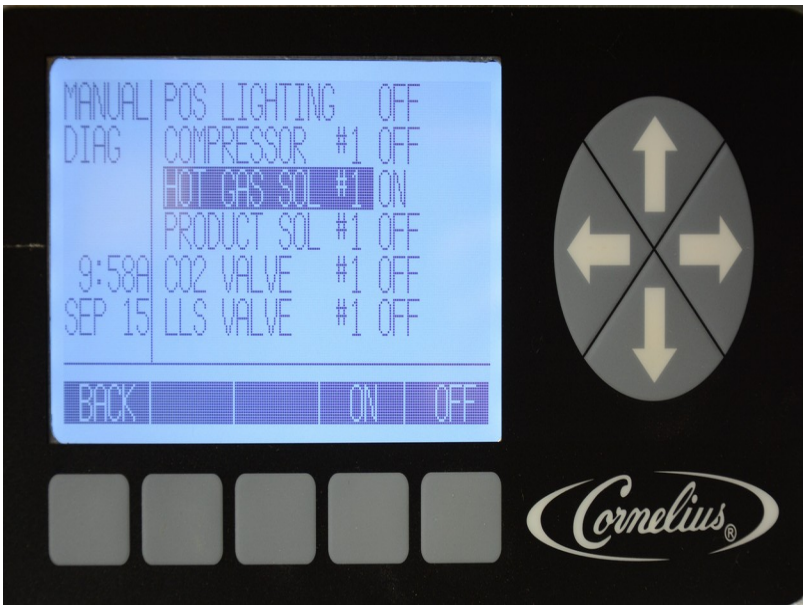
This selection in the manual diagnostics menu turns the Point-Of-Sale lighting on and off.



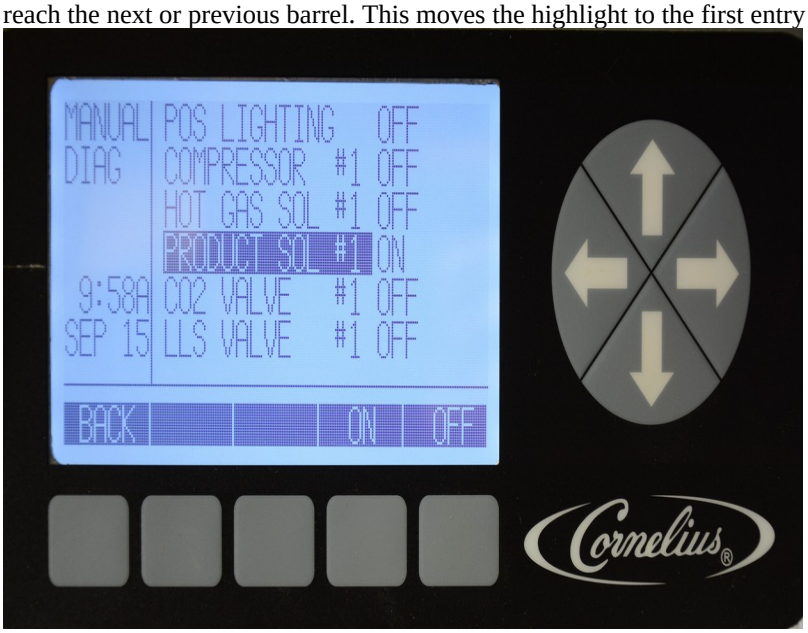
7. Manual Diagnose – Compressor
This selection in the manual diagnose menu turns just the refrigeration compressor on and off. LLS for barrel 1 will activate at the same time to avoid deadheading.
Note: Do not leave compressor turned on for extended period as damage may occur.



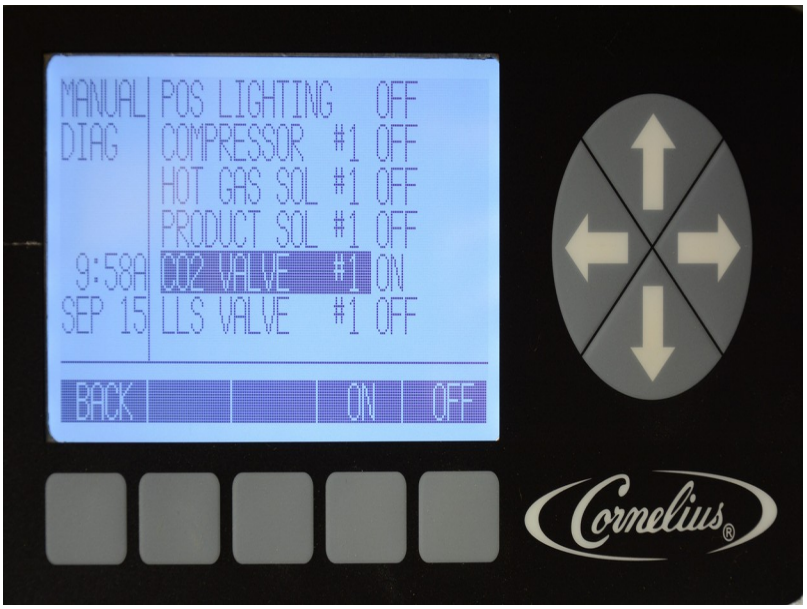
8. Manual Diagnose – Hot Gas Solenoid
This selection in the manual diagnostics menu opens and closes the hot gas solenoid for one barrel.
To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.



9. Manual Diagnose – Product Solenoids
This selection in the manual diagnose menu opens and closes the product (water and syrup) solenoids and valves for a barrel. To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.

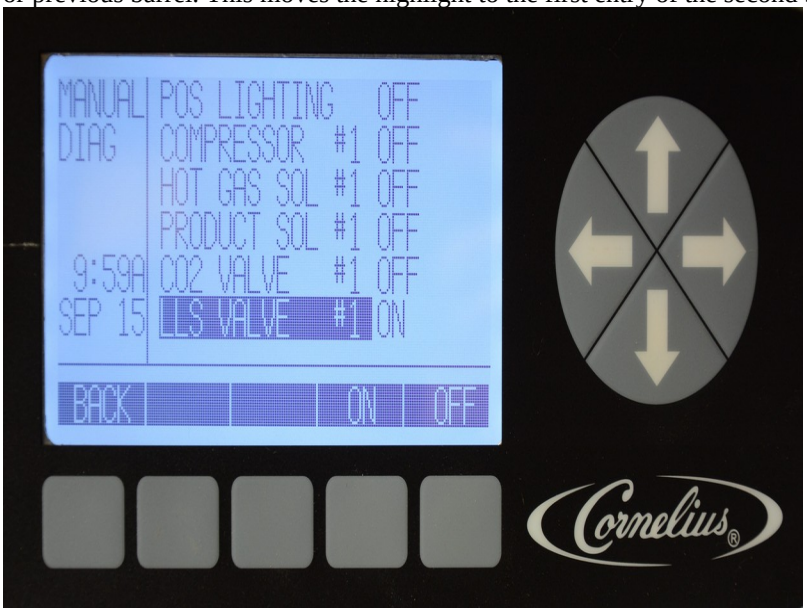


10. Manual Diagnose – CO2 Solenoid
This selection in the manual diagnose menu opens and closes the CO2 solenoid for a barrel. To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.



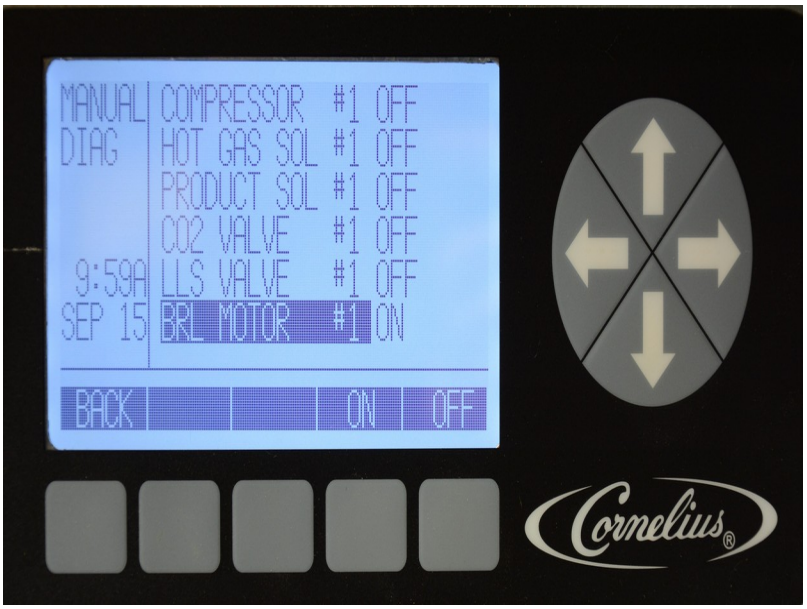
11. Manual Diagnose – Liquid Line Solenoid

This selection in the manual diagnose menu opens and closes the Liquid Line solenoid for refrigerant for a barrel.
To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.



12. Manual Diagnose – Barrel Motor

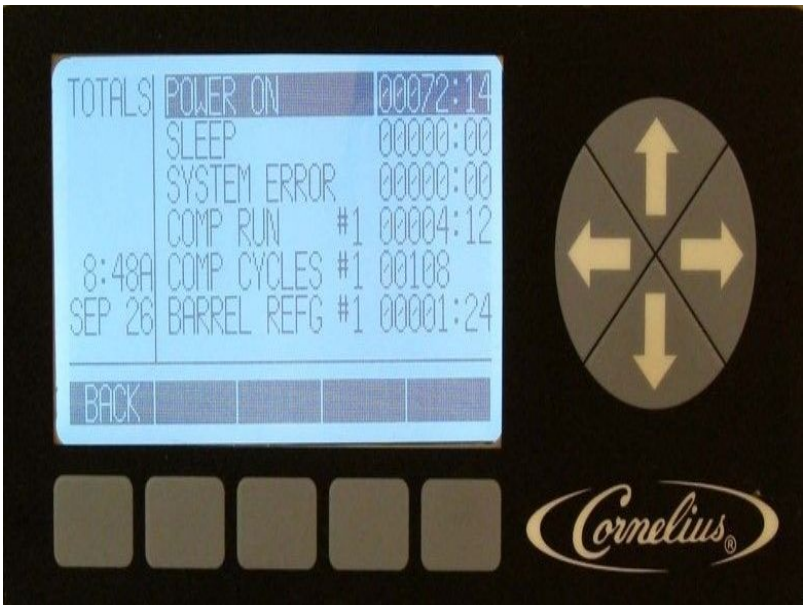
This selection in the manual diagnose menu turns a barrel drive motor on and off.
To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.



13. Totals

The Totals menu shows the cumulative run time of the system, components of the system or an error. Some individual items may be reset by highlighting the item and pressing the RESET button. The RESET button is only displayed for items that can be reset, such as hours since the motor seal was changed or the number of compressor cycles. Pressing the BACK button returns to the Choose menu and saves the changes. To move between one set of barrel parameters to the next, press the up and down arrow keys until you reach the next or previous barrel. This moves the highlight to the first entry of the second barrel, etc.

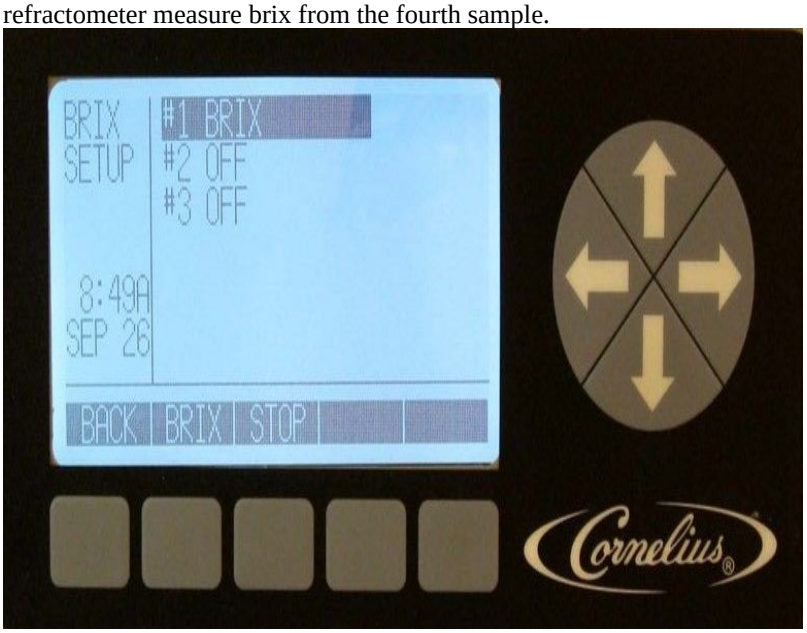
Totals table (Display | Value format | Description): - POWER ON | HHHHH:MM | Shows how long the machine has been powered up - SLEEP | HHHHH:MM | Shows how long the machine has been in sleep mode - SYSTEM ERROR | HHHHH:MM | Shows how long the machine has had a system error - COMP RUN #1 | HHHHH:MM | Shows how long the compressor has been running since the last reset - COMP CYCLES #1 | ######## | Shows the number of compressor cycles since the last reset - BARREL REFG #1 | HHHHH:MM | Shows how long the barrel has been in refrigeration mode - MOTOR ON #1 | HHHHH:MM | Shows how long the motor has been running on a specific barrel - MOTOR SEAL #1 | HHHHH:MM | Shows how long it has been since the motor seal was inserted on a specific barrel - DEFROST #1 | HHHHH:MM | Shows how long the barrel has been in defrost mode - FILL CYCLES #1 | ######## | Shows the number of times the barrel has filled with product - SYRUP RUN #1 | HH:MM:SS | Shows how long the syrup solenoid has been open - SYRUP OUT #1 | HHHHH:MM | Shows how long the syrup has been out - ERROR #1 | HHHHH:MM | Shows how long the barrel has had an error



14. Brix Setup

Checking the Brix determines the amount of sugar in the product. The higher the brix the more sugar, the lower the brix the less sugar.

The BRIX SETUP menu is located in the MAINT menu. The Viper is programmed for a three second dispense so that brix comparisons can be made between samples. Start by using the up and down arrows to highlight the barrel to be brixed. Next, turn the three-way valve down to brix position and remove the end cap of the sample tube. While holding the tube in a container press the brix button and collect and discard the first three samples. Then using a refractometer measure brix from the fourth sample.

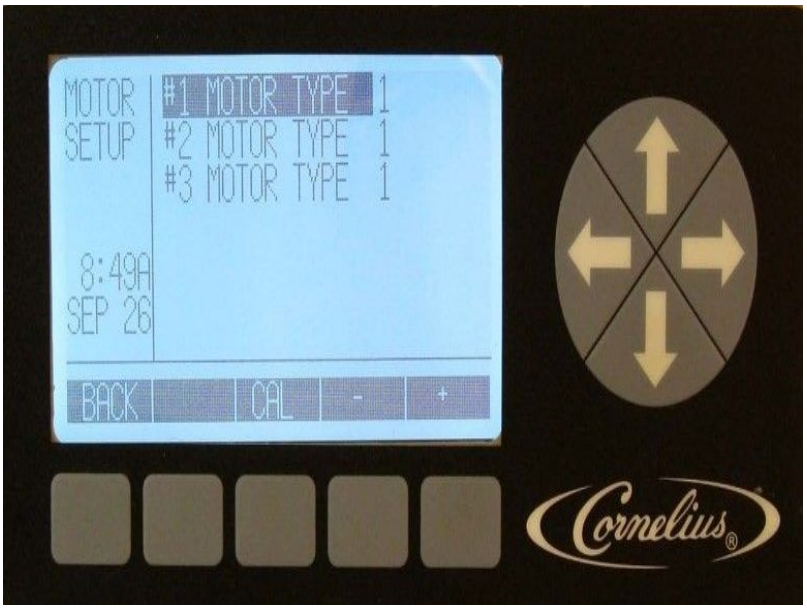


15. Introduction

This menu allows you to select different motor types for each barrel in the unit and run the calibration procedure on that motor. From the maintenance screen Highlight MOTOR SETUP and press button below GO.

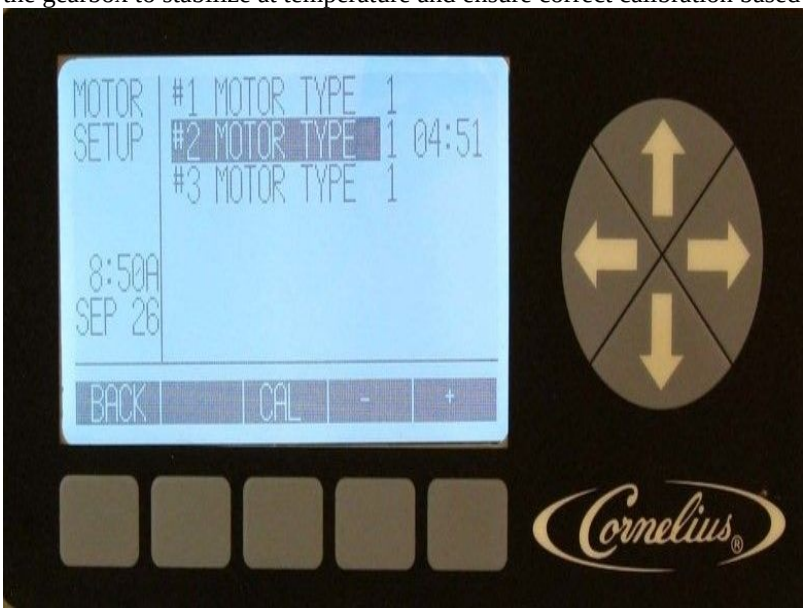
Ensure that the motor type matches the model of unit. Use the arrows to highlight the desired barrel and press the + or - buttons to select the proper motor type. Motor setup is done at the factory and does not need to be changed but should be checked and verified.

Motor type table (Model | Motor Type): - All 60 Hz | 1 - All 50 Hz | 2



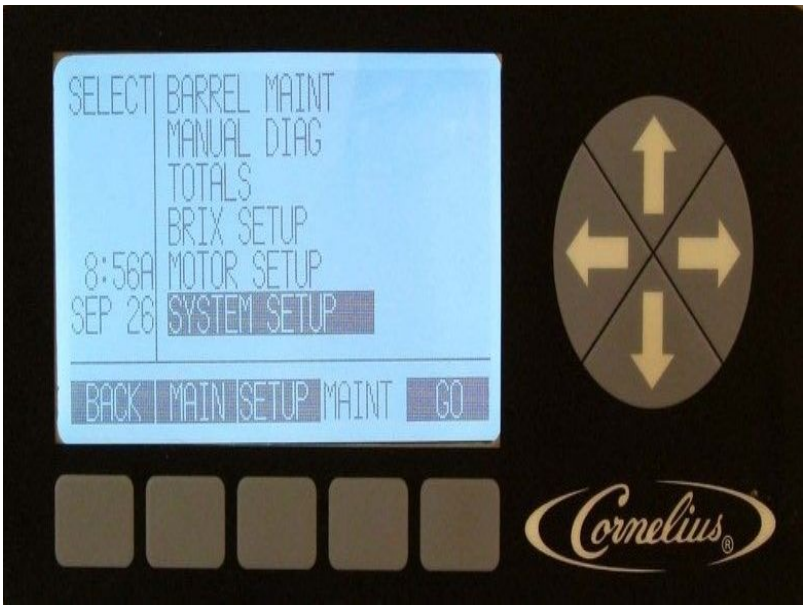
16. Motor Setup - Calibrate

Calibration establishes a new baseline for the motor assembly. This allows the system to determine proper viscosity settings for the new motor. It is VERY IMPORTANT that calibration be performed when the product in the barrel is in a 100% liquid state. There can be no ice in the barrel or on the beater bar. Press the CAL button at the bottom of the Motor Setup menu to start the calibration process. The calibration cycle continues for five (5) minutes to allow the gearbox to stabilize at temperature and ensure correct calibration based off of the liquid product.

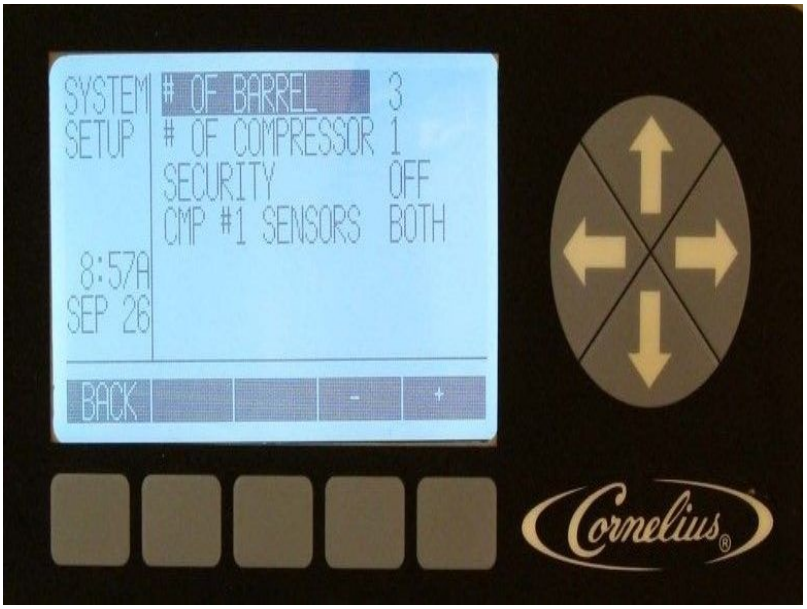


17. Introduction

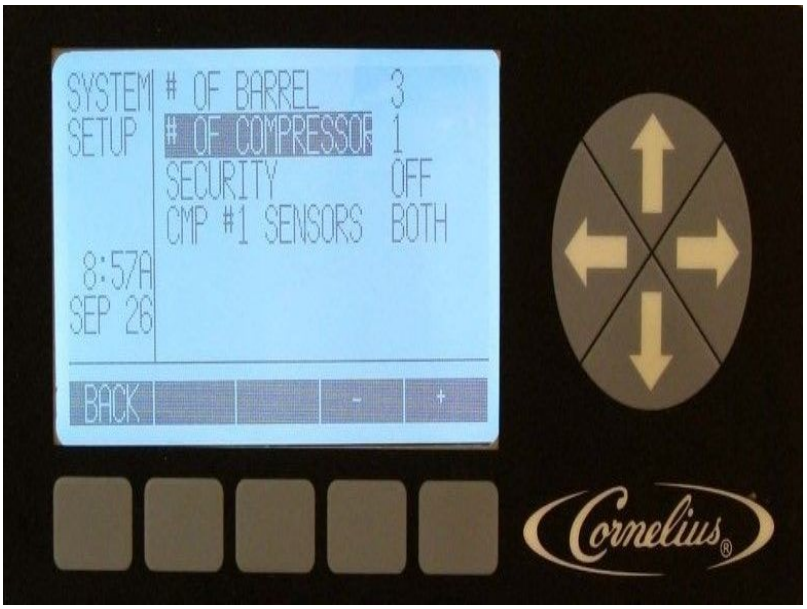
From the maintenance screen, Highlight SYSTEM SETUP and press button below GO.
The System menu is used during production to set up the unit parameters. It also allows the technician to view the number of barrels, the number of compressors and the number of pressure sensors present in the system
NOTE: Changing these values to a number that doesn't match the physical number of items in the system generates errors or turns off some of the equipment present in the system. When the individual fields are highlighted, the display buttons change.
System setup table (Option | Button 2 | Button 3 | Button 4 | Button 5): - # of barrels | | | - | + - # of compressors | | | - | + - Security | | | OFF | ON - Compressor sensors | NONE | LOW | HIGH | BOTH



18. System -
This selection in the system menu shows the number of barrels and should only be set for number of barrels in the Viper.
Note: the Viper can sometimes convert to two barrels after electrical surges and will only display two barrels on the status screen.

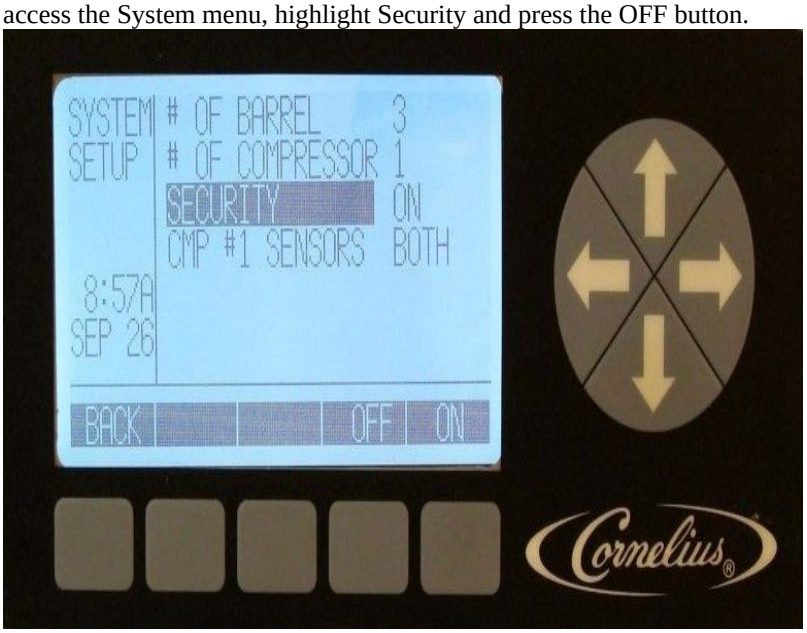


19. System -
This selection in the system menu shows the number of compressors. Currently this number is fixed at one and cannot be changed.



20. System - Security

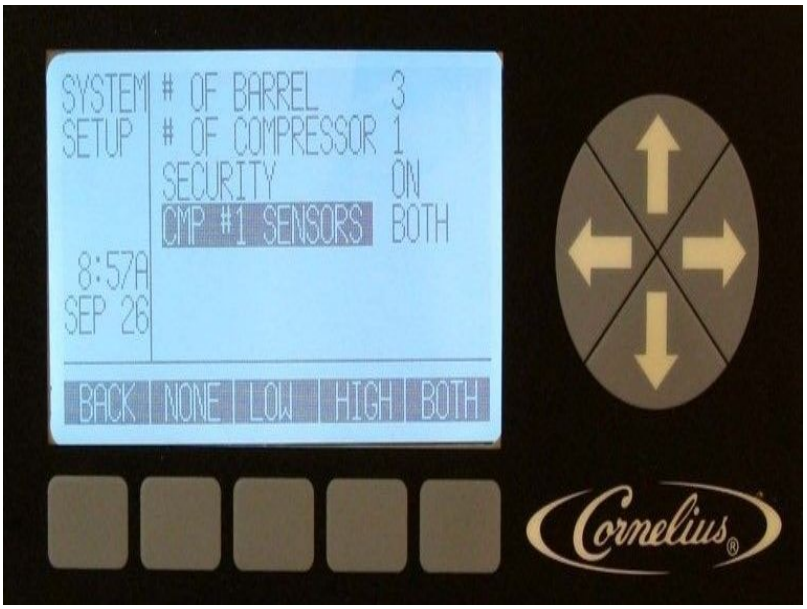
This selection in the systems menu allows the user to turn security on or off and keep unauthorized personnel from accessing the MAINT menu. When security is turned on, users can only access the Main and Setup menus. Pressing the far Left and Right buttons (Buttons 1 and 5) on the bottom of the display simultaneously and holding them for approximately five (5) seconds unlocks the Security menu. If security is left ON in the System menu the system will time out or when the user goes back to the Main menu and the security will be re-activated. To disable security, access the System menu, highlight Security and press the OFF button.



21. System – Compressor

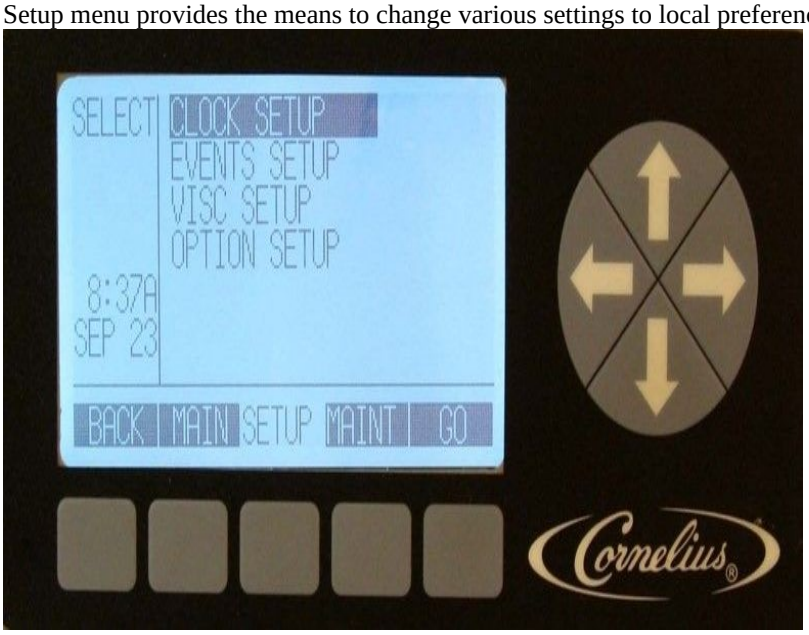
Pressure sensors allow the technician to view the high and low-side refrigeration pressures in the Viper without having to connect external gauges to the system. When the pressure sensors selection is highlighted, pressing the NONE button removes the pressure readings from the Unit Data screen, If LOW is selected, only the low pressure reading is displayed and if HIGH is selected, only the high pressure reading is displayed and if BOTH is selected the low and high pressure readings are displayed

The low side pressure sensor is used to monitor compressor reversal. The number of sensors in the unit are set at the factory and should not be changed.

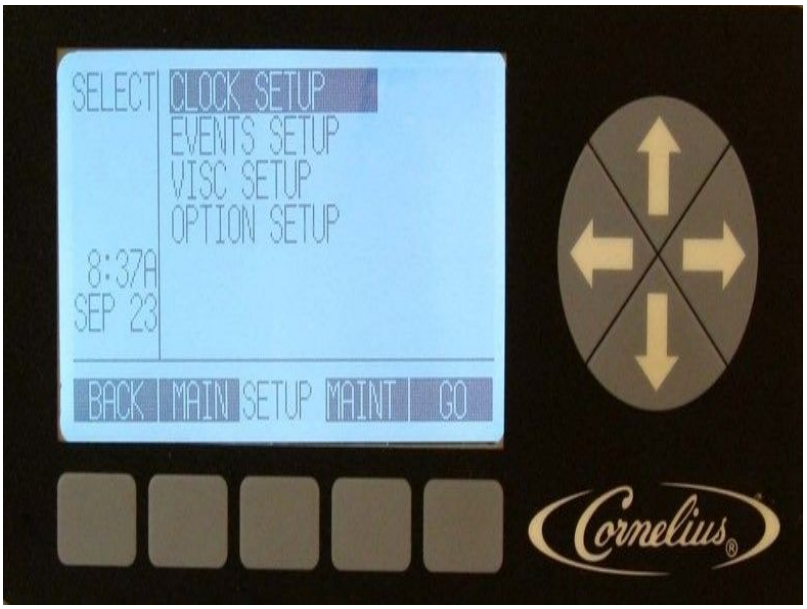


Setup Selection

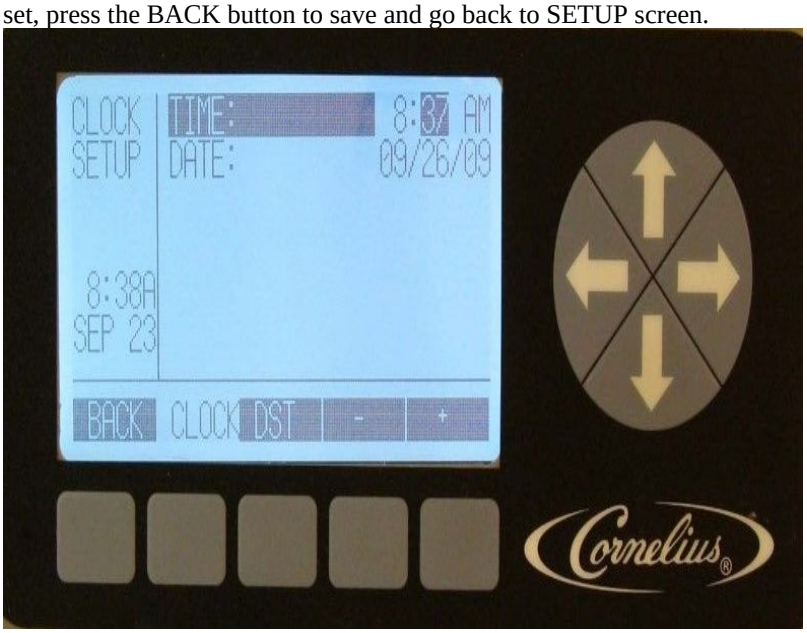
1. Set Up
To access the SETUP menu from the Barrel Status screen, press the MENU button. The next screen will have three options, MAIN, SETUP, and MAINT. Press the button under SETUP, this displays the setup screen menu. The Setup menu provides the means to change various settings to local preferences.



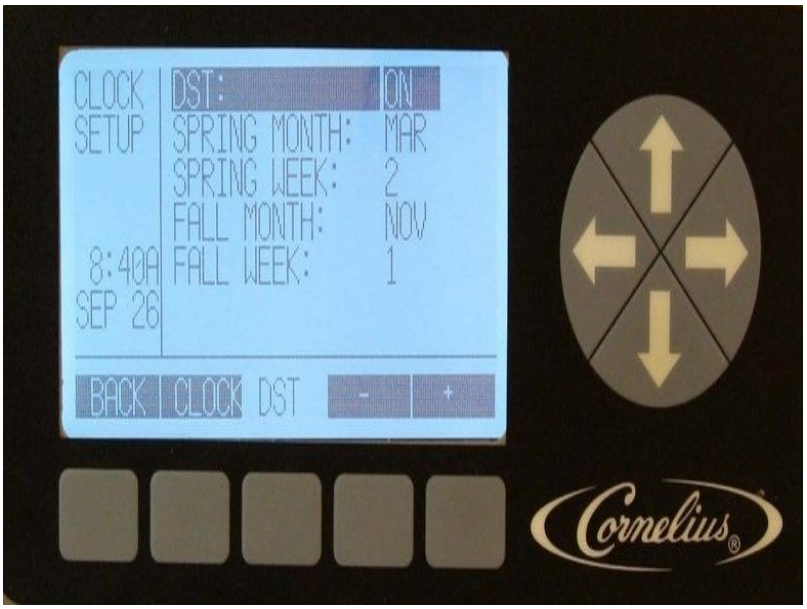
2. Clock
In the SETUP screen, use the arrows to highlight CLOCK SETUP on the display. When the desired option is highlighted, press the GO button to access that menu screen.



3. Clock Setup
When in the CLOCK SETUP screen, use the keypad arrows to toggle between hours, minutes, AM/PM and months, days and years to highlight. Then use the minus (-) and plus (+) buttons to make changes. When time and date are set, press the BACK button to save and go back to SETUP screen.

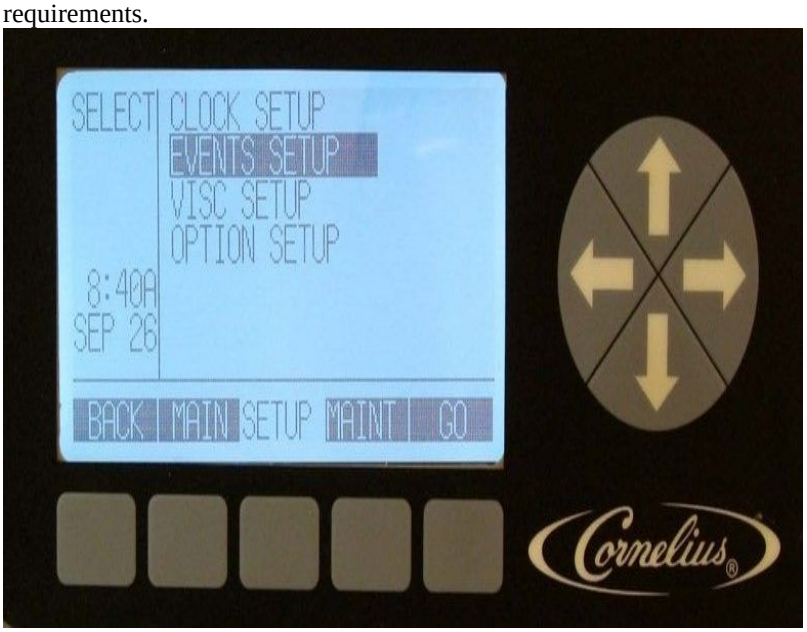


4. DST
When in the DST set up screen, use the minus (-) button to turn off Daylight Savings Time and plus (+) button to turn on Daylight Savings Time. When ON is selected, a secondary screen will display. In this screen you can select the months and weeks DST will change. Use the up and down arrows to highlight the spring and fall months and weeks. Then use minus (-) and plus (+) buttons to select the correct month and week. For weeks, the selections are 1, 2, 3 and L for last.



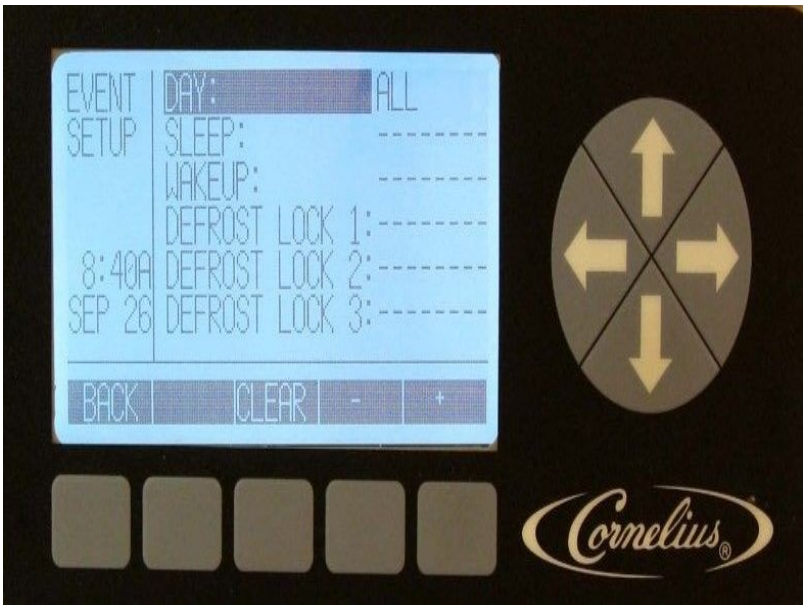
5. Events

In the SETUP screen, use the arrows to highlight the choices on the display. When EVENTS SETUP is highlighted, press the GO button to access that menu screen. The EVENTS SETUP menu allows the user to set SLEEP and WAKEUP periods. Set sleep for one hour after closing and set wake for 1 hour prior to open. And Defrost LOCKOUT can be set to prevent the defrost cycle during peak busy times and are set in 15 minutes increments. These parameters may be programmed for any day or for all days and should be set depending on business requirements.



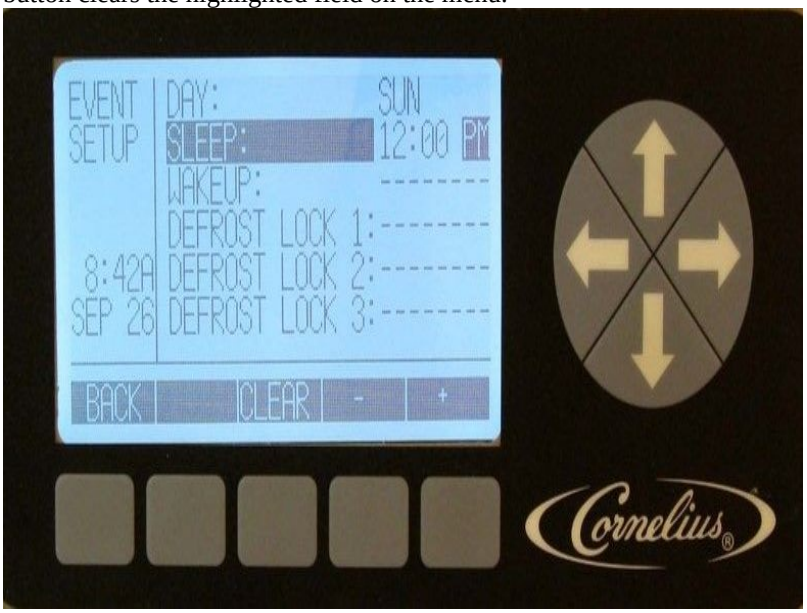
6. Events -Day

When in the EVENT SETUP screen, use the keypad arrows to toggle to DAY and then use the minus (-) and plus (+) button's to set the desired day or all days. The CLEAR button clears the highlighted field on the menu. A specific day will override the setting for ALL.



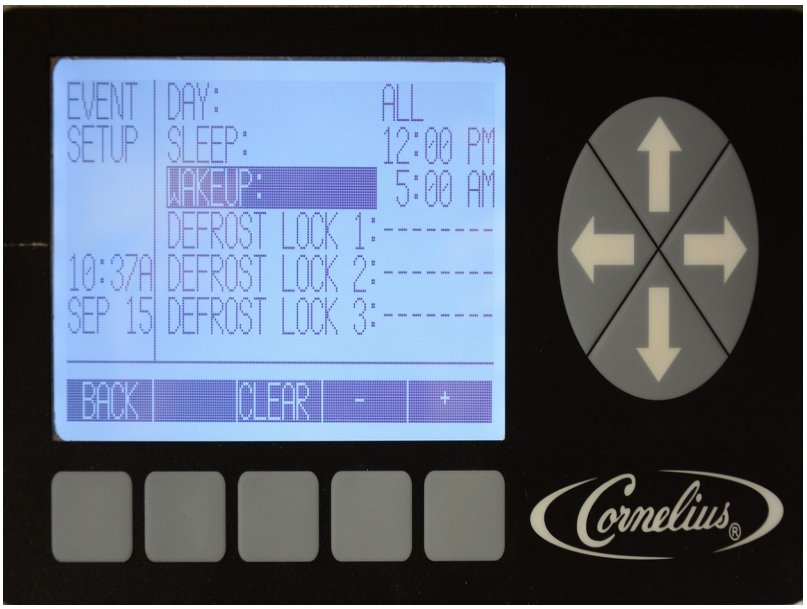
7. Events -Sleep

When in the EVENT SETUP screen, use the arrows to select SLEEP. First, use the arrows to select the hour and the minute fields, then press the plus (+) or minus (-) buttons to change the hour and minutes. Times are set in 15-minute increments. If the 12-hour clock option is selected, use the arrows to select the AM/PM field. The CLEAR button clears the highlighted field on the menu.



8. Events -Wakeup

In the EVENT SETUP screen, use the arrows to select WAKEUP and to select the hour and the minute fields. Then press the plus (+) or minus (-) buttons to change the hour and minutes. Times are set in 15-minute increments. If the 12-hour clock option is selected, use the arrows to select the AM/PM field. The CLEAR button clears the highlighted field on the menu.



9. Events – Defrost Lockout

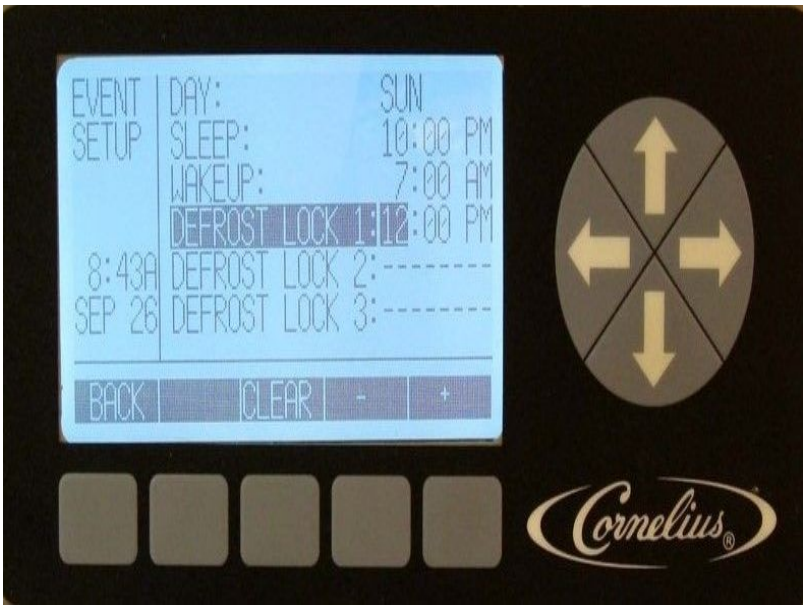
When in the EVENT SETUP screen use the arrows to toggle to Defrost lock 1, 2 or 3 to highlight. Then use the arrows to select the hour and the minutes fields and press the plus (+) or minus (-) buttons to change the hour and minutes. Times are set in 15 minute increments. If the 12 hour clock option is selected, use the arrows to select the AM/PM field. The lockout can be set per day or for all days with up to three lockout periods of three hours each. The lockout periods can be overlapped to provide up to 8 1/2 hours of defrost lockout time. For sequential lockout periods defrost lockouts need to be overlapped by 15 minutes. The defrost lockout affects all barrels in the unit. The CLEAR button clears the highlighted field on the menu and when time and days are set press the BACK button to save and go back to SETUP screen.

Set Defrost Lock Out

Defrost lockout prevents the Viper from automatically defrosting during set times and is typically enabled if the Viper or a specific barrel is constantly in defrost during peak times. The defrost lockout affects all barrels at the same time and can be programmed to have 3 - three hour defrost lockout time slots, they can be individual or sequential for a maximum of 9 hours per day. Sequential defrost lockouts should be overlapped by 15 minutes to prevent Smart Defrost© from engaging. The Viper defrost lockouts can be set for individual days or all days to lockout the automatic defrost cycle. To set the defrost lock out times, highlight EVENTS SETUP in the select menu and press the GO button. To activate the defrost lockouts use the up or down arrows to highlight DAY, then use the + and - buttons to set the desired day or all days. To set specific lockout times, use the up or down arrows to highlight DEFROST LOCK 1, then use the left or right arrows to select the hour field and use the + and - buttons to set the desired hour. Next use the left and right arrows to select the minute field, then use the + and - buttons to set the desired minute (in 15 min increments). If the 12 hour clock option is selected, use the left and right arrows to select the AM/PM field and the + button to set the AM/PM field.

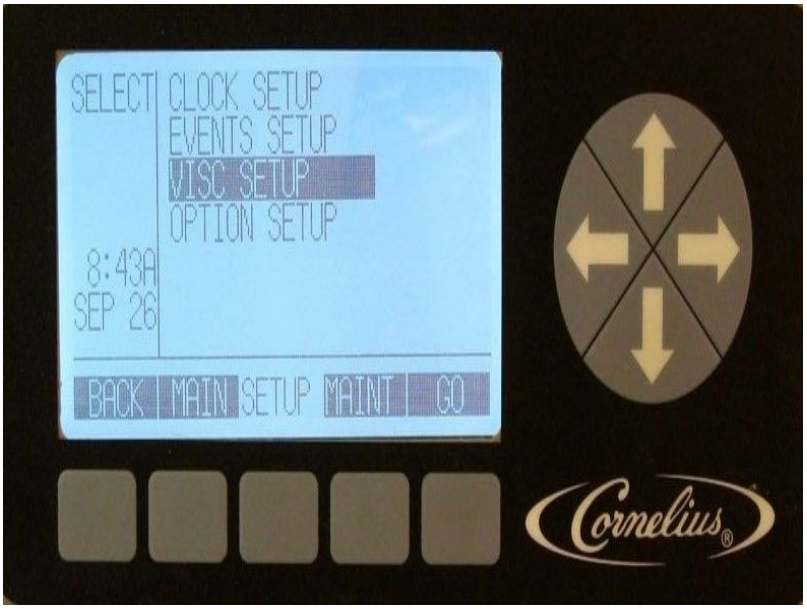
Note: Defrost lockouts are not set during manufacturing. Do not set the defrost lockout unless the times are mandated by the account based off peak times.

Example of 15 min overlapping if setting consecutive lockouts. 12:00pm-2:45pm, 2:45pm- 5:30pm, and 5:30pm-8:15pm.



10. Introduction

In the SETUP screen, use the arrows to highlight the VISC SETUP on the display and press the GO button to access that menu screen.



11. Viscosity - Range

The viscosity setting controls how thick the product is by controlling the refrigeration cut in and cut out to maintain proper product viscosity. The viscosity range is 1-9, 1 being the least frozen and 9 being the most frozen with 4 being the default factory setting. To enter the viscosity setting, highlight EVENTS SETUP in the select menu and press the GO button. Use the up or down arrows to highlight VISC SETUP and press the GO button. Highlight the desired barrel and use the + or - buttons to set the desired range.

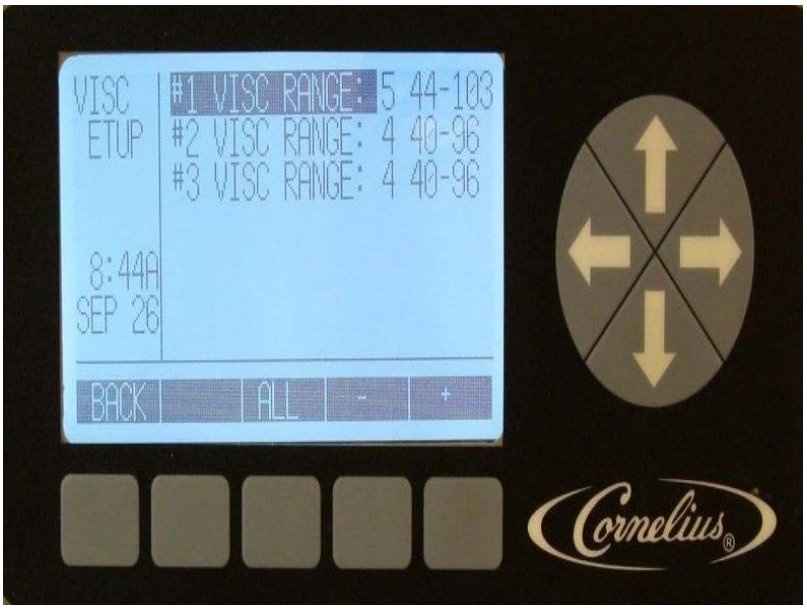
If you increase the viscosity, let the compressor cycle multiple times before making changes. This allows the change to take effect. If you need to decrease viscosity, defrost the barrel, adjust the viscosity and freeze down again.

Factory recommended settings:

FCB syrup w/ foaming Agent use range #4

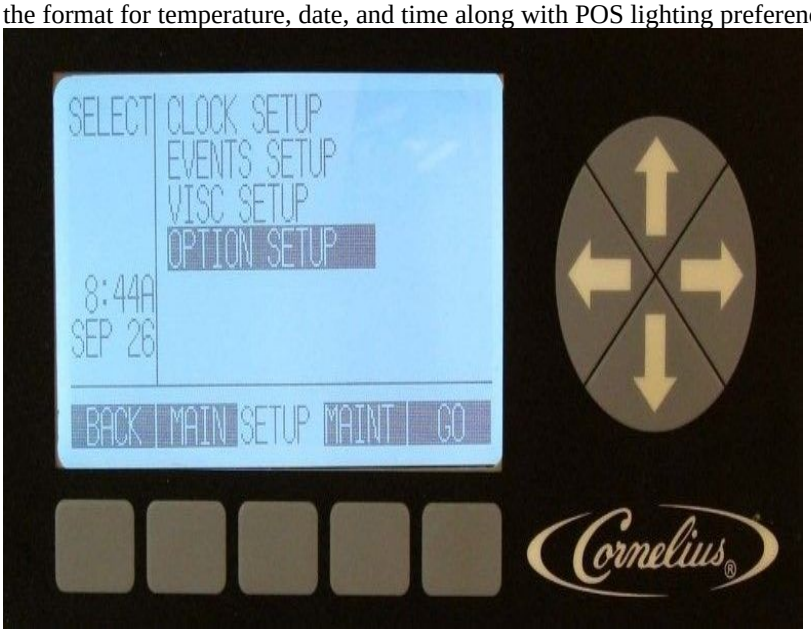
FCB syrup w/o foaming Agent use range #4

FUB syrup use range #3



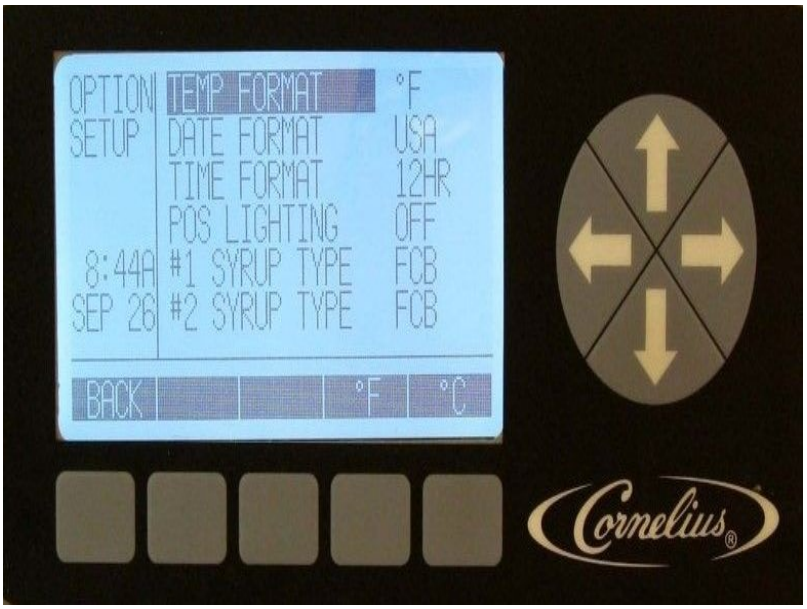
12. Introduction

In the SETUP screen, use arrows to highlight the OPTION SETUP on the display. In Option Setup, you can select the format for temperature, date, and time along with POS lighting preference and FCB syrup type used.



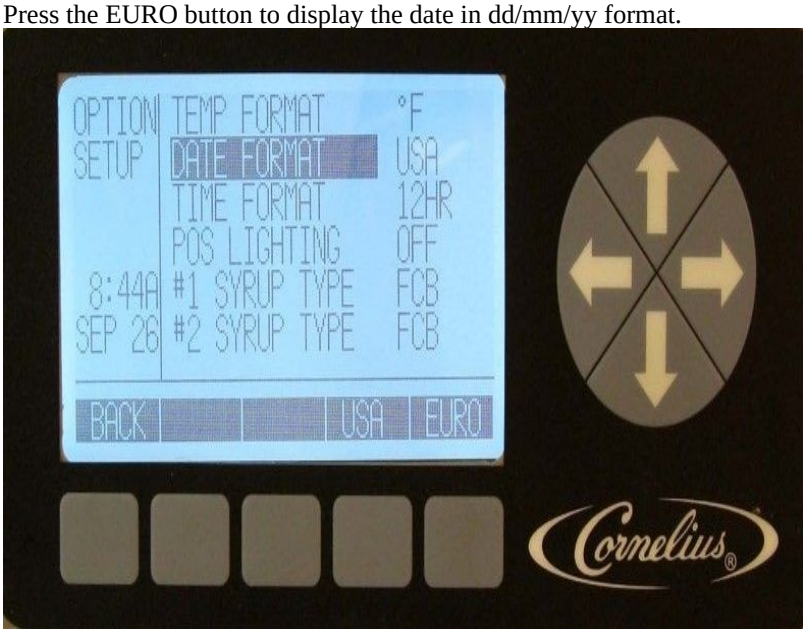
13. Options – Temp Format

The first option in OPTION SETUP will be TEMP FORMAT. You can change format preference for the Viper display by pressing the button below F for Fahrenheit or C for Celsius.



14. Options – Date Format

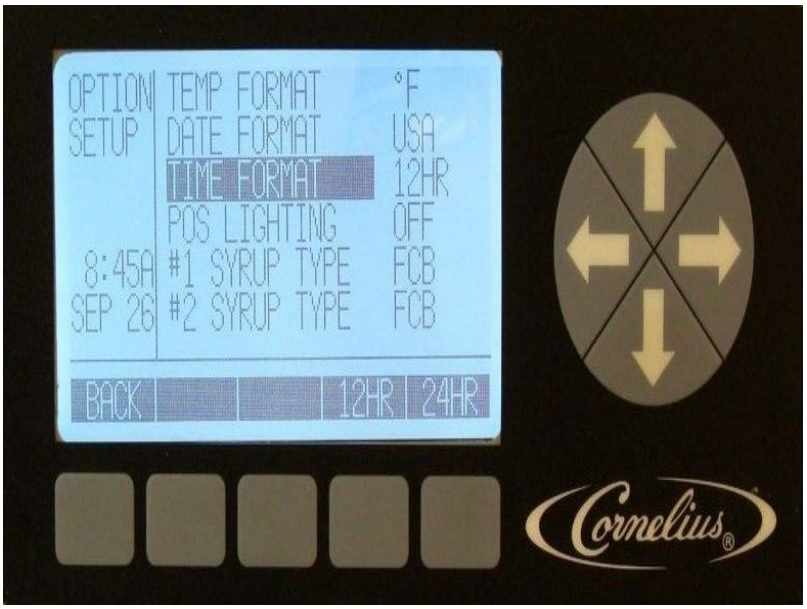
The second option in OPTION SETUP is Date Format. The date format can be displayed in either United States or European format. To display U.S. date format, press the USA button. This displays the date in mm/dd/yy format. Press the EURO button to display the date in dd/mm/yy format.



15. Options – Time Format

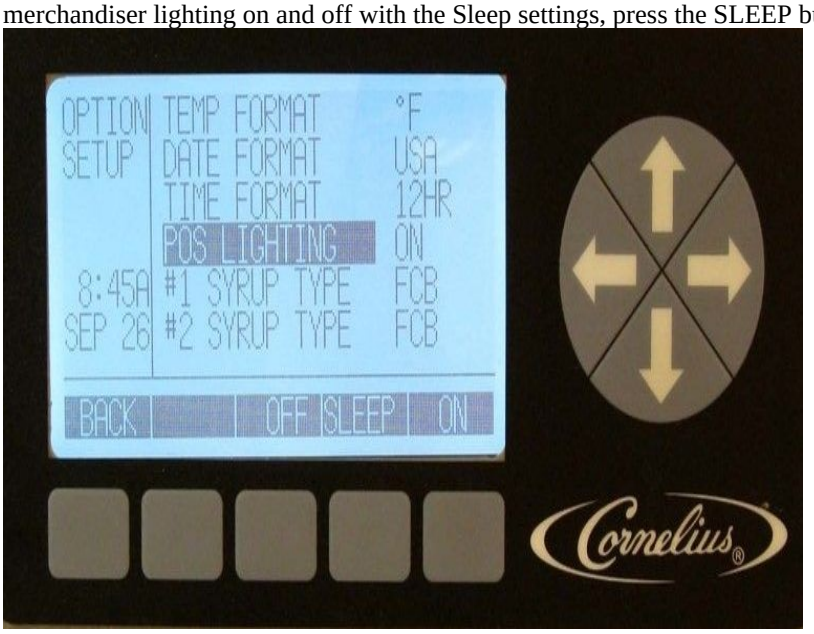
The third option IN OPTION SETUP is TIME FORMAT.

Time can be displayed in either 12 or 24-hour format. To display the clock settings in 12-hour format (1:08 P), press the 12 HR button. To display settings in 24 hour format (13:08), press the 24 HR button.



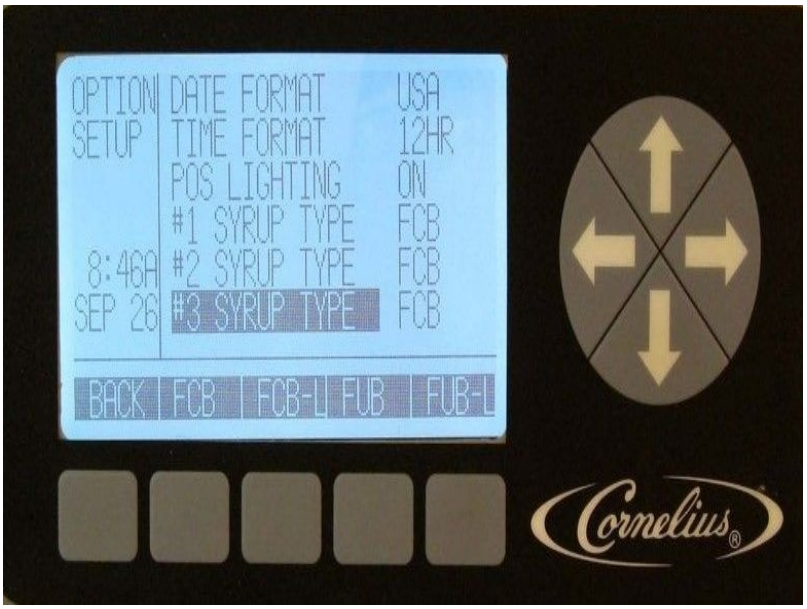
16. Options – POS Lighting

The fourth option in OPTION SETUP is POS LIGHTING. With the POS Lighting field highlighted, press off to turn merchandiser lighting off. To turn the merchandiser lighting on permanently, press the ON button. To turn the merchandiser lighting on and off with the Sleep settings, press the SLEEP button.



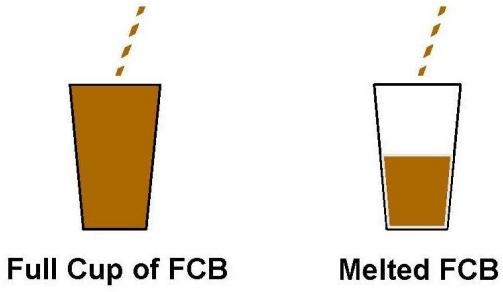
17. Options – Syrup Type

To set the syrup type, highlight EVENTS SETUP in the select menu and press the GO button. In the OPTION SETUP menu, highlight the individual barrels and select the desired syrup type by pressing the appropriate button. FCB is for Frozen Carbonated Beverage, FCB-L is for Frozen Carbonated Beverages - Light (diet), FUB is for Frozen Non-Carbonated Beverages, and FUB-L is for Frozen Non-Carbonated Beverages - Light (diet). Selecting FCB-L, FUB, or FUB-L will automatically decrease the viscosity cut in setting by 10 points.



Overrun

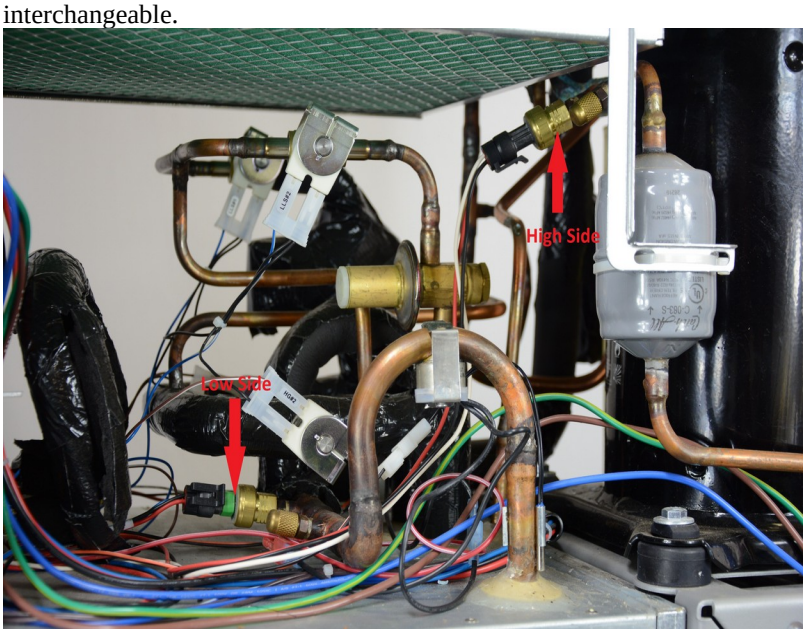
1. Overrun
Overrun (expansion) is the percent increase in the volume of the dispensed product caused by the introduction of C02 and freezing. It is measured by the difference between a full cup of the finished product less the same product melted down. FCB expands due to its ability to suspend C02 within the frozen drink. FCB syrups have a foaming agent that is made from yucca extract from the Mohave yucca plant. This helps in the expansion of the frozen product. Overrun is adjustable for each barrel by changing the freeze barrel CO2 pressure. The typical CO2 overrun is 80% – 110%



Pressure Transducers

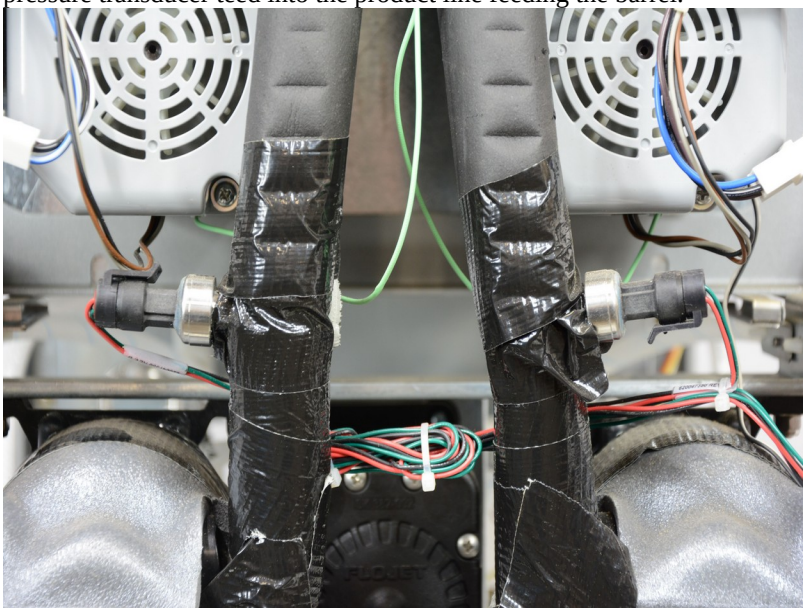
1. Refrigeration System Transducers

The Viper refrigeration system contains pressure transducers for monitoring refrigeration operating pressures without attaching external gauges. The low side transducer is located on the refrigeration line (copper tubing) outlet side of the freeze barrels. The high side transducer is located on the refrigeration line (copper tubing) before the liquid line solenoid and the AEV at the inlet to the freeze barrels. The low side transducer marked with a green ban has a range of 0 to 300psi and the high side transducer (no band) has a range of 0 to 500 psi. The transducers are not interchangeable.



2. Pressure Transducers

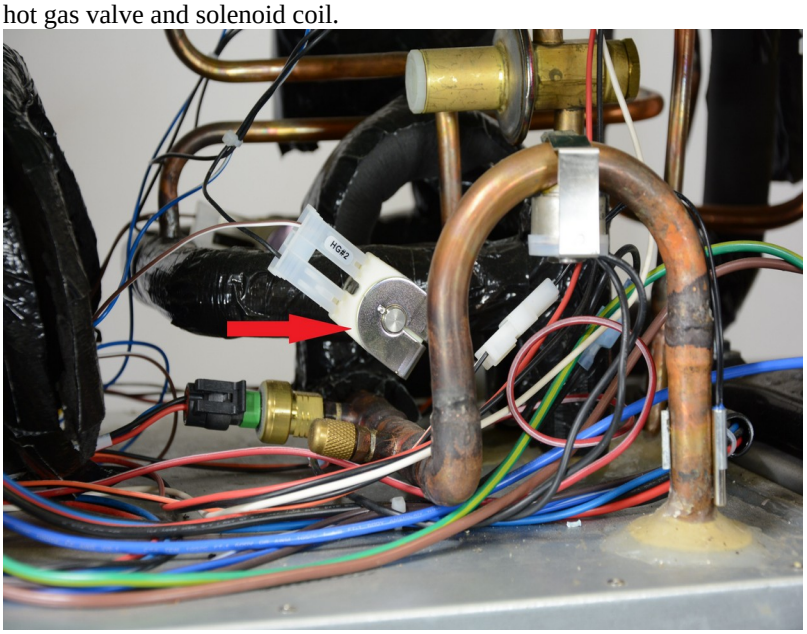
The Viper contains pressure transducers for monitoring the individual freeze barrel pressure to keep the barrel filled with product. When the barrel pressure falls to 23 psig the transducer signal calls for the syrup, water and C02 solenoids to open and allow the product to flow to fill until the pressure reaches 28psig. Each freeze barrel has a pressure transducer teed into the product line feeding the barrel.



Solenoids

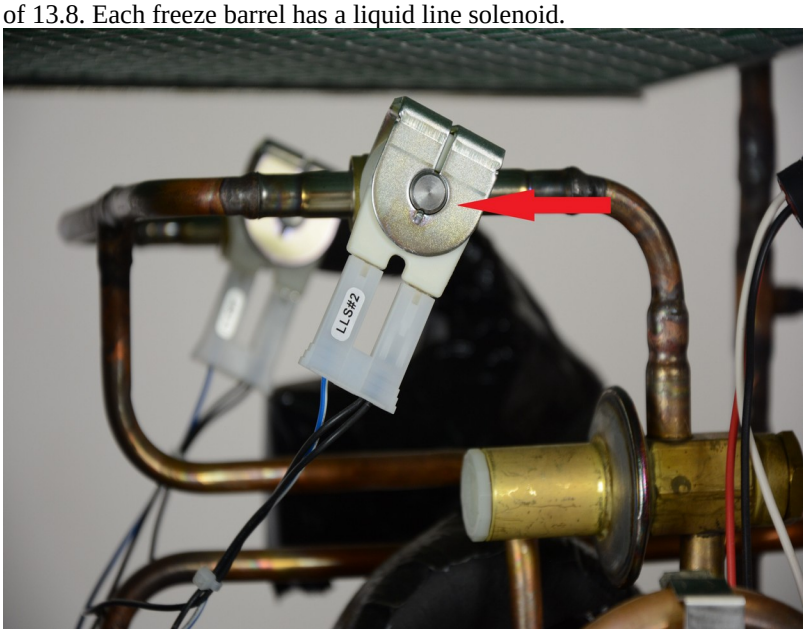
1. Hot Gas Solenoid

The hot gas solenoid opens up to let high temperature, high-pressure gas from the compressor discharge directly into the freeze barrels for defrosting of the frozen product. The hot gas valve and solenoid and the liquid line valve and solenoid are identical components. The coil is 24VAC and has a value of 13.8 ohms. Each freeze barrel has its own hot gas valve and solenoid coil.



2. Liquid Line Solenoid

The liquid line solenoid only opens when the barrel viscosity is such that it calls for refrigerant for that particular barrel. The liquid line solenoid is located before the AEV and the freeze barrel (evaporator) inlet. The liquid line valve and its solenoid and the hot gas valve and its solenoid are the same. The coil is 24VAC and has an ohm value of 13.8. Each freeze barrel has a liquid line solenoid.

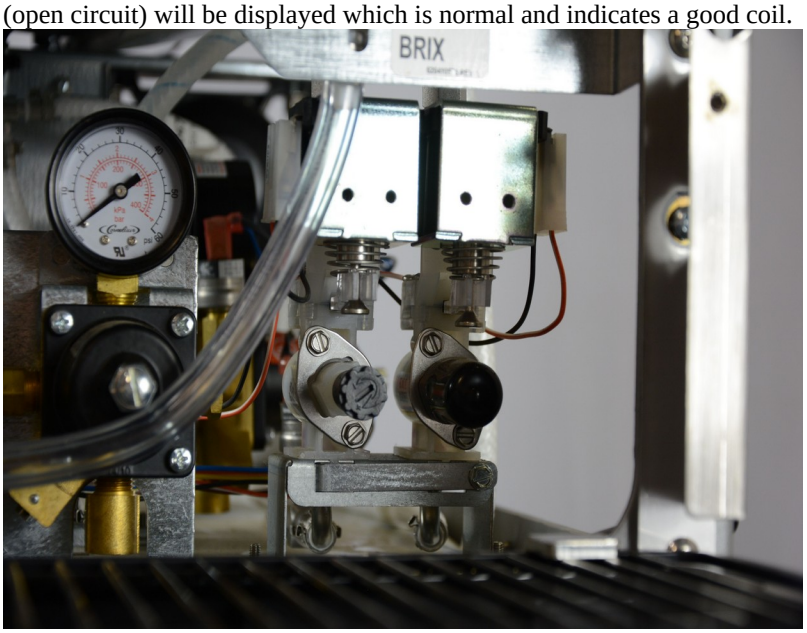


3. Freeze Barrel CO2 Inlet Solenoid

CO2 pressure flows from the secondary regulator behind the splash panel to the CO2 control solenoid. When the barrel calls for filling, by the barrel transducer, the CO2 solenoid is energized allowing CO2 to past thru to a tee fitting where it is absorbed into the mixed product (water/syrup) flowing to the freeze barrel. When the freeze barrel pressure is satisfied the CO2 solenoid it turned off. The coil is 24VAC and has an ohm value of 82.



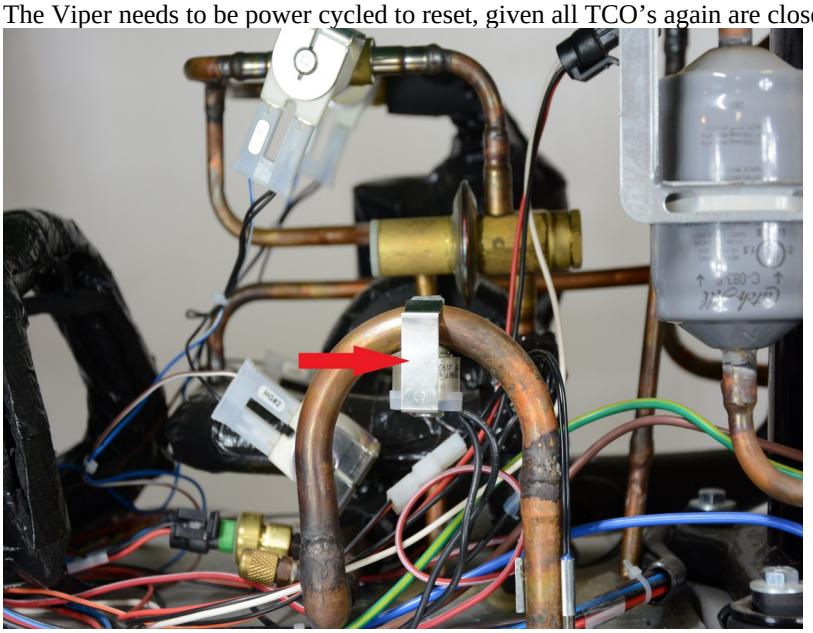
4. Water and Syrup Solenoids
The water and syrup solenoids are always activated simultaneously under normal operation. The supply voltage to the water and syrup solenoids is 24VAC, the internals of the coil converts it to ½ wave DCV. Due to this the wiring plugs must be installed correctly or solenoids will remain energized. When checking continuity on a water or syrup solenoid coil, take care. Attaching a meter's probes as shown should display a resistance (resistance will vary depending on the impedance of the meter used). Should a meter's probes be placed in reverse a reading of infinity (open circuit) will be displayed which is normal and indicates a good coil.



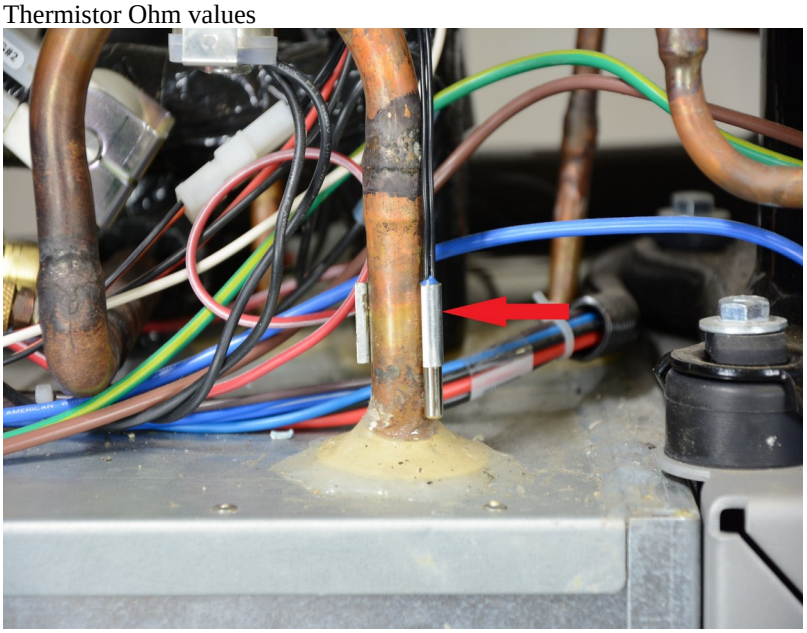
Temperature Sensing

1. TCO - Thermal Cut out Switch (Barrel)
The thermal cut-out switch (TCO switch) is a third level safety device and is a mechanical switch that is not software controlled. The Viper has one TCO per Barrel that is mounted on the barrel (evaporator) outlet.
The TCO is designed to open its contact if a barrel outlet refrigeration line exceeds 120 degrees Fahrenheit. When the switch temperature drops down to 105F the switch will automatically reset and close the circuit. All the TCO's

in a Viper are wired in series, if anyone opens up with high temperature it breaks the circuit to the I/O board and the Viper shuts down on error (TCO OPEN).
The Viper needs to be power cycled to reset, given all TCO's again are closed circuits.



2. Freeze Barrel Outlet Thermistor
Each barrel has a sensor that is located on the freeze barrels refrigeration outlet line (copper tubing) and mounted with the wires hanging downward for each freeze barrel. This sensor is used to terminate the defrost cycle at 41F and if the sensor temperature reaches 115F for more than 1 minute the Viper will display the error HOT GAS and shut the Viper off.
Thermistor Ohm values

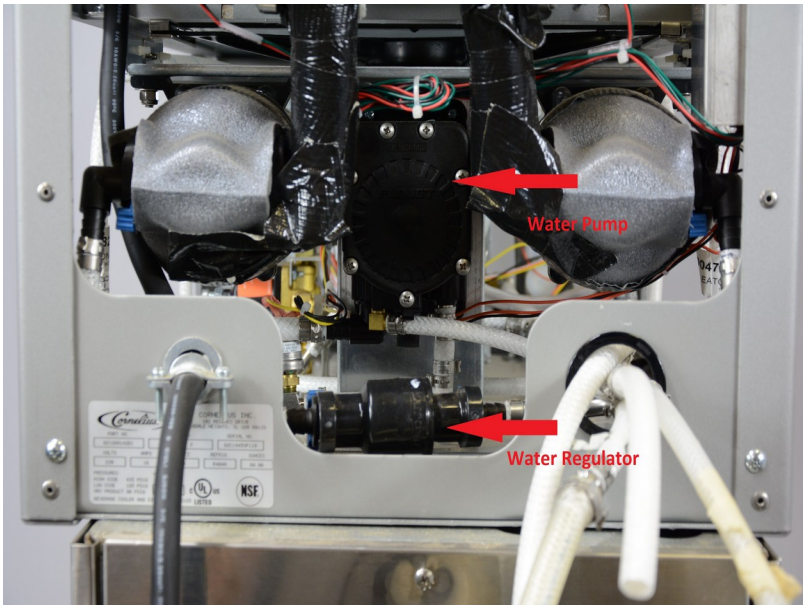


3. TCO – Thermal Cut-out Switch (Compressor)
Exclusive to Vipers running R448a refrigerant is a unique TCO switch (pn 620072408) mounted on the compressor discharge line. This TCO is different than the barrel TCO switches but is wired in series with the barrel TCO's, so all Viper TCO's share the same 24VAC circuit.
The compressor TCO opens when the discharge line temperature exceeds 275F (135C) and closes at 240F (115C). If the compressor TCO opens, the entire Viper will shut down on a "TCO Open" error, just like for the barrel TCO's.

The compressor TCO is identified by its copper sensing element, smaller size compared to the barrel TCO, and white dot on top of the sensing element where the wires enter.

Water Pump and Regulator

1. Water Pump and Regulator
The water pump must first be primed with water before adding CO2 to the unit. When connecting water to the unit, you must manually bleed the water valve on at least one barrel to assure the water pump is filled with water.
The Viper's internal water pump is gas driven by the incoming 75psi CO2 pressure to the Viper. The incoming water pressure to the Viper is recommended to be between 25psi and 90psi dynamic pressure. The current in-line water regulator is now black in color and preset for 30psi. A prior version water regulator was white with a built in strainer.

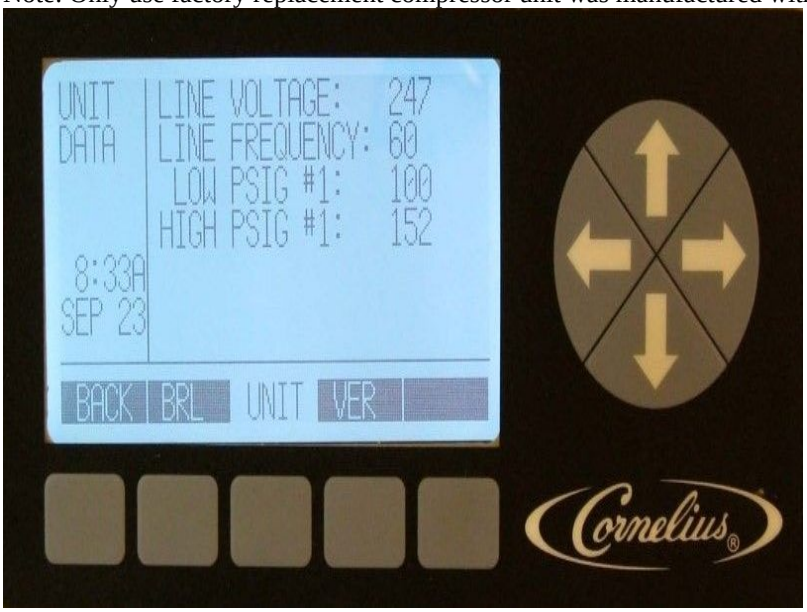


Refrigeration System

2 Flavor Operating Pressures

1. 2 Flavor Operating Pressures
Viper 2 Barrel 60 Hz – 404a With Copeland ZB-15 compressor Charge : 96 oz.
Refrigeration High Side
70F = 240 +/- 10 psi
80F = 275 +/- 10 psi
90F = 315 +/- 10 psi
100F = 360 +/- 10 psi
Low Side
1 brl 41+/- 2psi or 2brl 47 +/- 2psi
Hot Gas Defrost High Side
70F = 150 +/- 10 psi
80F = 180 +/- 10 psi
90F = 210 +/- 10 psi
100F = 240 +/- 10 psi
Low side
70F = 37 +/- 5 psi

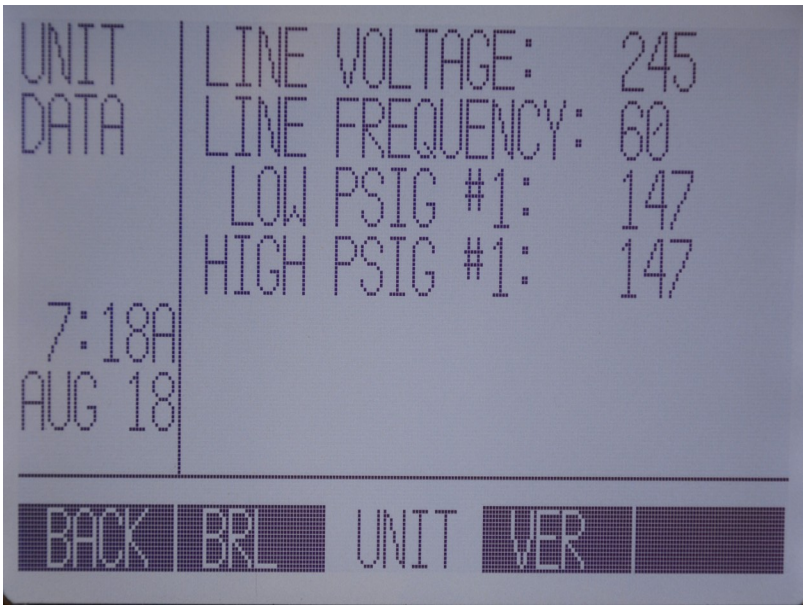
80F = 48 +/- 5 psi
90F = 58 +/- 5 psi
100F = 67 +/- 5 psi
Note: Only use factory replacement compressor unit was manufactured with.
Viper 2 Barrel - 448a With Copeland ZS-15 compressor
60Hz Viper
50Hz Viper
Note: For 2 FL Vipers ZB model compressors are used for units manufactured with 404a refrigerant. ZS model compressors are used for units manufactured with 448a refrigerant.
Note: Only use factory replacement compressor unit was manufactured with.



3 or 4 Flavor Operating Pressures

1. 3 or 4 Flavor Operating Pressures
Viper 3 / 4 Barrel 60 Hz 404a With Copeland ZB-19 compressor Charge : 3brl:96oz 4brl: 108oz
Refrigeration High Side
70F = 225 +/- 10 psi
80F = 260 +/- 10 psi
90F = 300 +/- 10 psi
100F = 340 +/- 10 psi
Low Side
1 brl 39+/- 2 psi
2 brl 45 +/- 2 psi
3 brl 47 +/- 2 psi
Hot Gas Defrost High Side
70F = 150 +/- 10 psi
80F = 180 +/- 10 psi
90F = 210 +/- 10 psi
100F = 240 +/- 10 psi
Low side
70F = 30 +/- 5 psi
80F = 41 +/- 5 psi
90F = 51 +/- 5 psi
100F = 60 +/- 5 psi
Note: Only use factory replacement compressor unit was manufactured with.

Viper 3 and 4 Barrel 60 Hz 404a With Copeland ZS-19 compressor Charge : 3brl: 74.1oz 4brl: 81.1oz
Refrigeration High Side
75F = 275 +/- 20 psi
90F = 330 +/- 20 psi
104F = 380 +/- 20 psi
Low Side
1 brl = 38 +/- 2 psi
2 brl = 42 +/- 2 psi
3 & 4 brl = 47 +/- 2 psi
Hot Gas Defrost High Side
75F = 175 +/- 20 psi
90F = 230 +/- 20 psi
104F = 280 +/- 20 psi
Low side
75F = 30 +/- 5 psi
90F = 41 +/- 5 psi
104F = 51+/- 5 psi
Viper 3 & 4 Barrel 60 Hz 448a With Copeland ZS-19 compressor Charge : 3brl: 49.4oz 4brl: 63.5oz
Refrigeration High Side
75F = 265 +/- 20 psi
90F = 330 +/- 20 psi
104F = 370 +/- 20 psi
Low Side
1 brl = 37 +/- 2 psi
2 brl = 42 +/- 2 psi
3 & 4 brl = 47 +/- 2 psi
Hot Gas Defrost High Side
75F = 165 +/- 20 psi
90F = 230 +/- 20 psi
104F = 270 +/- 20 psi
Low side
75F = 30 +/- 5 psi
90F = 41 +/- 5 psi
104F = 51 +/- 5 psi
NOTE: Starting with 62E2022VP001 production of 60Hz 3 Barrel Vipers changed from Copeland ZB to Copeland ZS model compressors.
Note: ZB model compressors are rated for units manufactured with 404a refrigerant. ZS model compressors are rated for units manufactured with either 404a or 448a refrigerant.
Note: Only use factory replacement compressor unit was manufactured with.



Accumulator

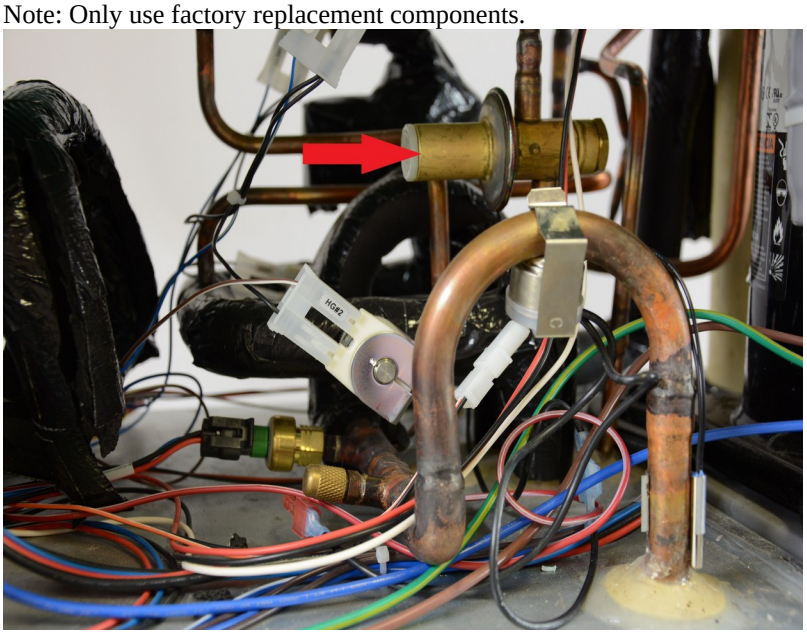
1. Accumulator
The accumulator's primary function is to store liquid refrigerant that is exiting the evaporator (foam pack) to prevent it from reaching the compressor. If liquid refrigerant were to enter the compressor, it could cause damage as the compressor is not designed to pump liquid, only vapor.
Note: Only use factory replacement components.



AEV (Automatic Expansion Valve)

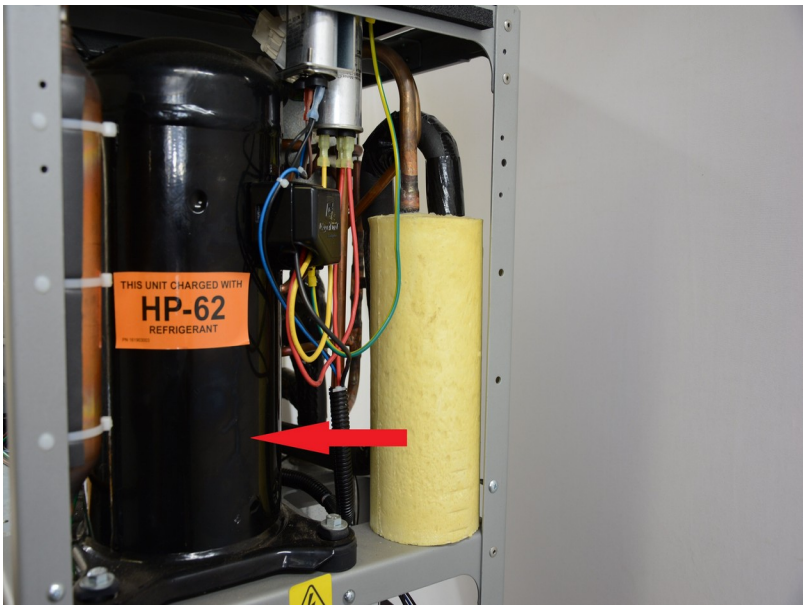
1. AEV (Automatic Expansion Valve)
Each freeze barrel has its own AEV. The AEV maintains a constant low side pressure within the evaporator (foam pack) and is pre-set during manufacturing. The AEV maintains a constant 7-12 degree evaporator temperature with an approximate 4 degree superheat.

(Superheat is the temperature of the refrigerant gas that is above the boiling point and is measured at the exit of the evaporator).
Note: Do not adjust the AEV without talking to a Cornelius representative.
Note: Only use factory replacement components.



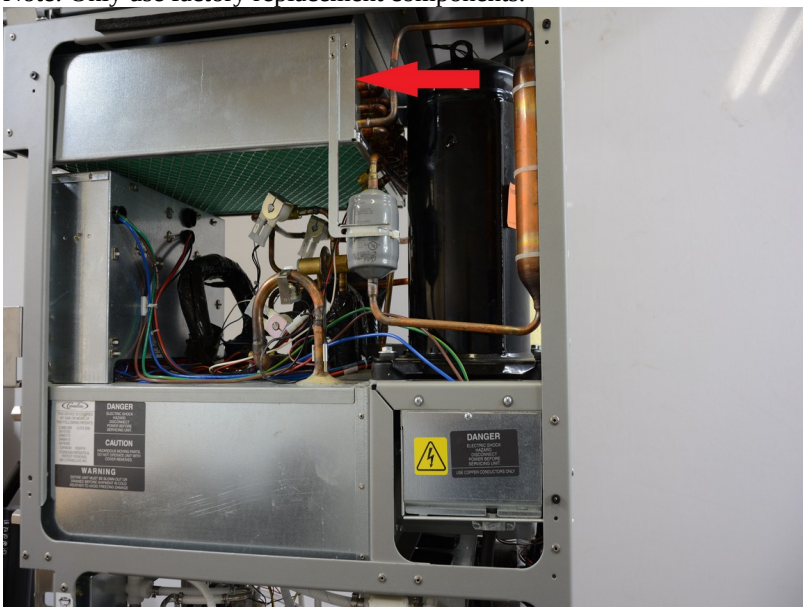
Compressor

1. Compressor
The Viper Elite refrigeration system uses a high capacity Scroll compressors by Copeland.
2 barrel - Copeland ZB15
-Rated at 15,000 btu's
-Common to Run = 1.2 ohms
-Common to Start = 2.4 ohms
-Start to Run = 3.6 ohms
3 & 4 barrel - Copeland ZB19
-Rated at 19,000 btu's
-Common to Run = 1.2 ohms
-Common to Start = 3.1 ohms
-Start to Run = 3.9 ohms
2 barrel – Copeland ZS15
-Rated at 15,000 btu's
-Common to Run = 1.2 ohms
-Common to Start = 1.8 ohms
-Start to Run = 2.9 ohms
3 & 4 barrel – Copeland ZS19
-Rated at 19,000 btu's
-Common to Run = 1.1 ohms
-Common to Start = 1.5 ohms
-Start to Run = 2.6 ohms
NOTE: Starting with 62E2022VP001 production changed from Copeland ZB to Copeland ZS model compressors.
Note: ZB model compressors are rated for units manufactured with 404a refrigerant. ZS model compressors are rated for units manufactured with either 404a or 448a refrigerant.
Note: Only use factory replacement compressor unit was manufactured with.
Note: Observe the refrigerant type and amount noted on unit nameplate.



Condenser Coil

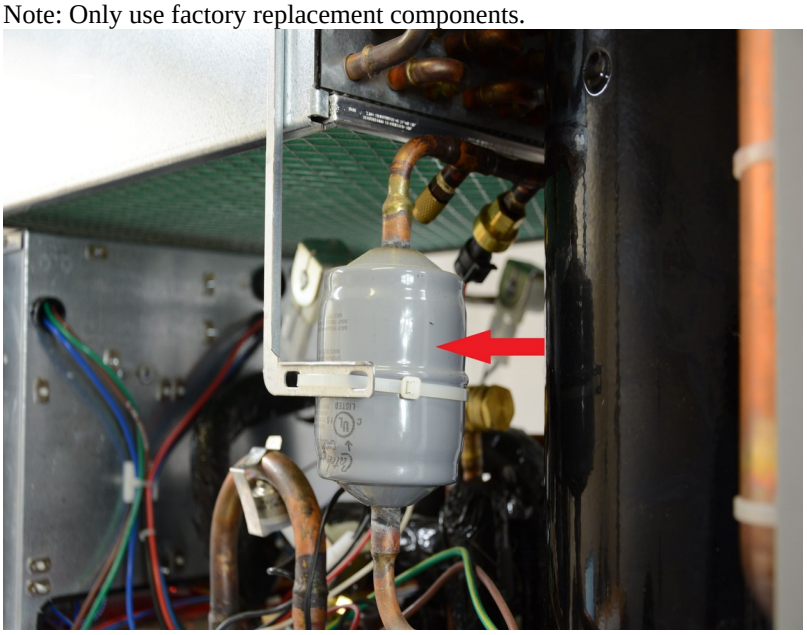
1. Condenser Coil
The 3 & 4 flavor Vipers use the same condenser coil but have a different sized condenser coil then the two flavor unit. Both are large condenser coils that maintain a 30 degree difference between the condensing temperature and ambient air temperature.
Note: the condenser filter should be cleaned regularly to ensure sufficient airflow.
Note: Only use factory replacement components.



Drier

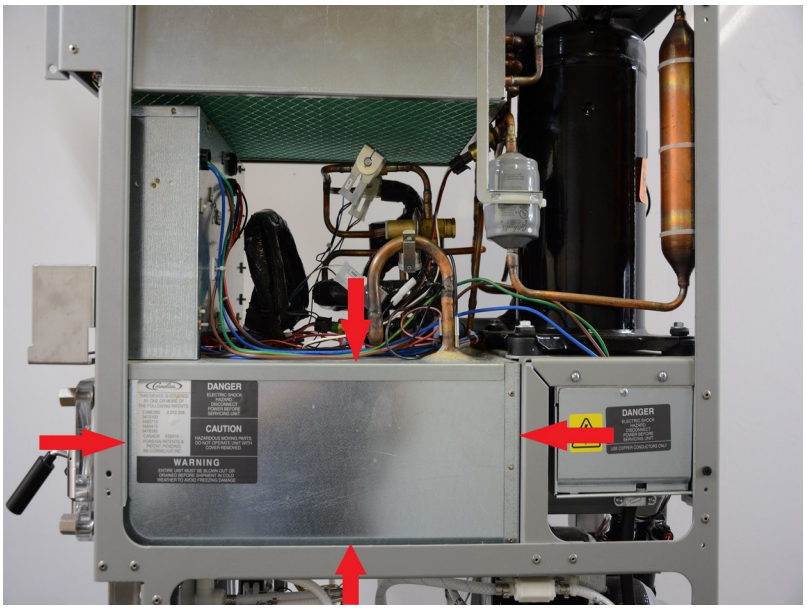
1. Drier

The purpose of a refrigerant drier is to ensure the refrigerant system stays clean and dry. It removes contaminants including moisture, dirt, acid and solder flux, beads and filings. Whenever the refrigerant system is opened for repair or to replace a component, always replace the filter drier.
Note: Only use factory replacement components.



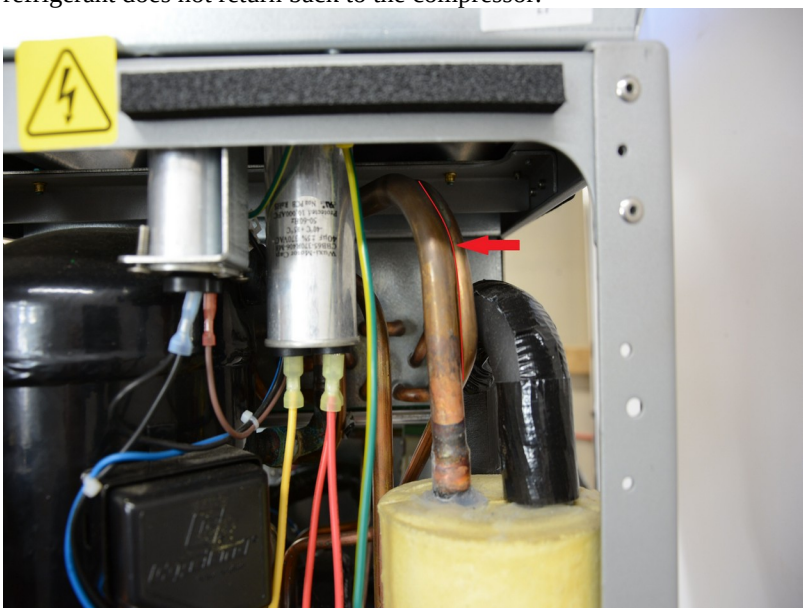
Evaporator (Foam Pack)

1. Evaporator (Foam Pack)
Viper evaporators are often referred to as a Foam Pack due to the nature of their design. Copper tubing is then carefully wrapped around the freeze barrel and soldered in place for efficient heat transfer. Foam is then injected between and around the freeze barrels to add and increase insulating properties and prevent heat transfer from taking place between freeze barrels. All Viper foam packs are a front feed design for refrigerant and flows from the front of the freeze barrel to the back.
Barrel - Efficient design provides increased capacity and superior defrost capabilities.
No refrigerant "seals", copper coil wound and soldered to barrel. The coil is brazed to the refrigeration tubing to minimized potential for refrigerant leaks in the foam pack.
Note: Only use factory replacement components



Heat Exchanger

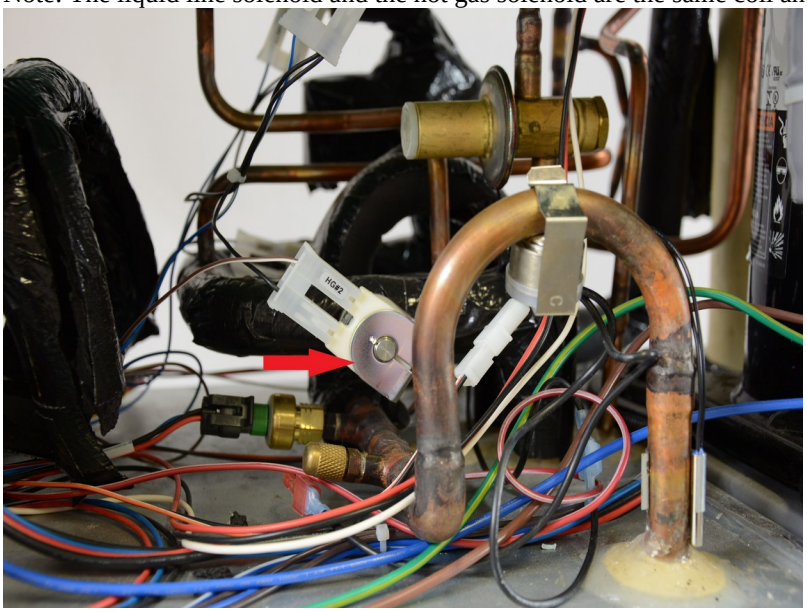
1. Heat Exchanger
The Refrigerant Heat Exchanger built into the Viper has a section of the high and low side system tubing brazed together. It is intended to transfer heat between liquid refrigerant leaving the condenser on the high pressure side of the system and refrigerant vapor leaving the evaporator on the low pressure side of the system. This insures liquid refrigerant does not return back to the compressor.



Hot Gas Valve

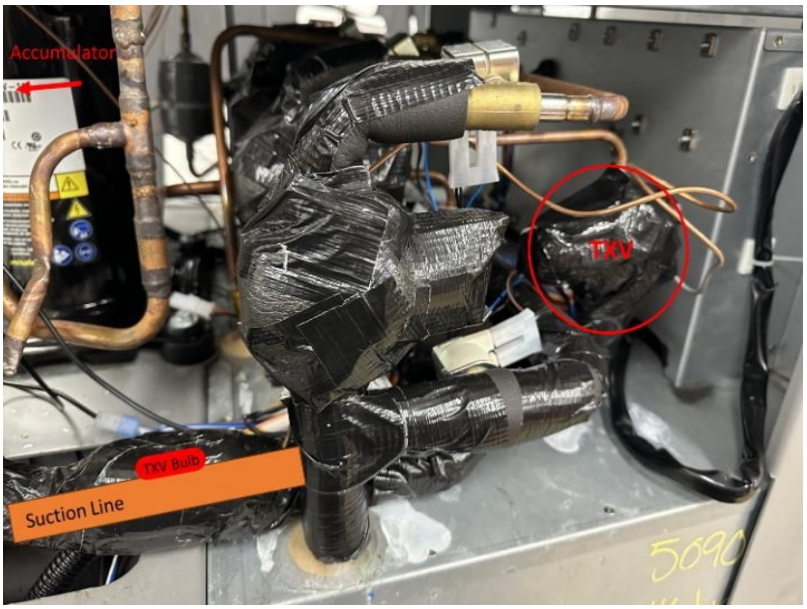
1. Hot Gas Valve
The output of the hot gas valve connected to the inlet of the evaporator bypasses the AEV and LLS when open. When the Viper goes into defrost, manual or Intelligent Defrost©, the hot gas valve opens and hot, high pressure

discharge gas flows from the compressor thru the copper tubing around evaporator (foam pack). The hot gas then transfers heat to the frozen product in the freeze barrel and changes product from a frozen state to a liquid state.
Note: Only use factory replacement components.
Note: Voltage is 24Vac and Resistance is 13.8 ohms +/- 10%.
Note: The liquid line solenoid and the hot gas solenoid are the same coil and valve.



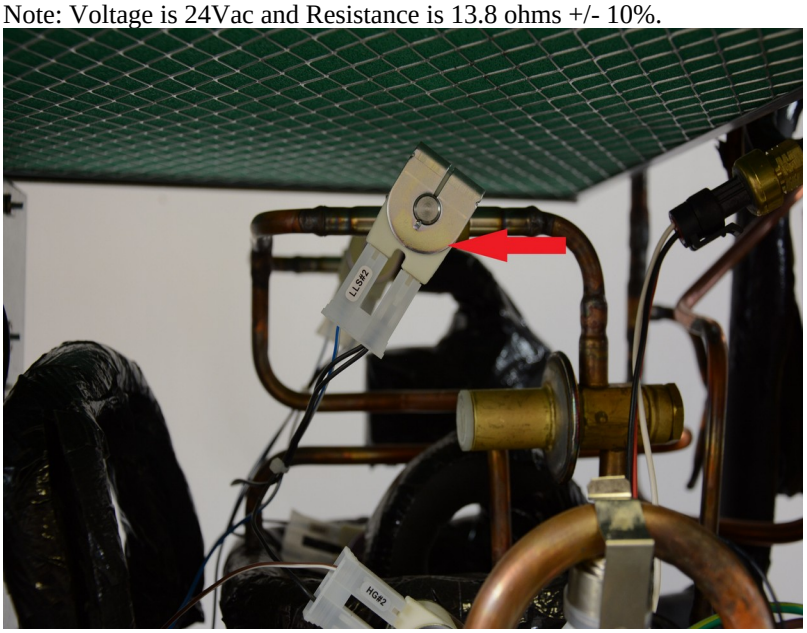
Liquid Injection TXV (R448a units only)

1. Liquid Injection TXV (R448a units only)
Viper units running R448a refrigerant utilize a thermal expansion valve (TXV) on the suction line leading back to the accumulator and compressor.
The purpose of this TXV is to inject liquid refrigerant into the suction line to help cool the refrigerant returning to the compressor.
With multiple barrels in freeze, the typical temperature of the suction line where the TXV bulb is attached should be about 35°F (1.7C). If the temperature rises too much above this, the TXV will meter liquid refrigerant into the line to cool the charge and bring the temperature down. This is done to help maintain refrigeration efficiency and prevent damage to the compressor due to excessively hot returning refrigerant.



Liquid Line Solenoid (LLS)

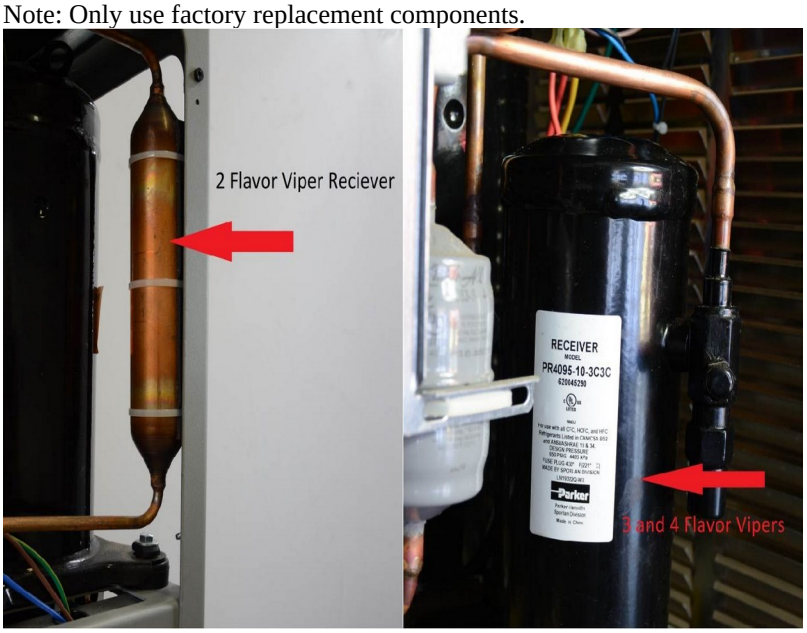
1. Liquid Line Solenoid (LLS)
The LLS controls the flow of refrigerant and there is a liquid line solenoid located before each AEV on each evaporator inlet. When a freeze barrel calls for cooling, based on the viscosity reading, the compressor is engaged, the IO board sends 24VAC to the LLS and LLS is energized. The LLS opens and allows liquid refrigerant to flow thru the AEV and into the individual freeze barrel.
Note: The liquid line solenoid and the hot gas solenoid are the same coil and valve.
Note: Only use factory replacement components.
Note: Voltage is 24Vac and Resistance is 13.8 ohms +/- 10%.



Receiver

1. Receiver

The function of the Viper receiver is to store liquid refrigerant to provide a continuous flow of liquid refrigerant to the AEV and to provide storage for the excess refrigerant. The liquid receiver ensures that the liquid refrigerant is entering the AEV as a liquid to make sure that it is cooling the evaporator (foam pack) efficiently. The receiver also contains a King Valve to pump down if needed and access the high side of the refrigeration system. Please use proper refrigeration practices when actuating the king valve.
Note: Only use factory replacement components.



Sub Cooler Coil

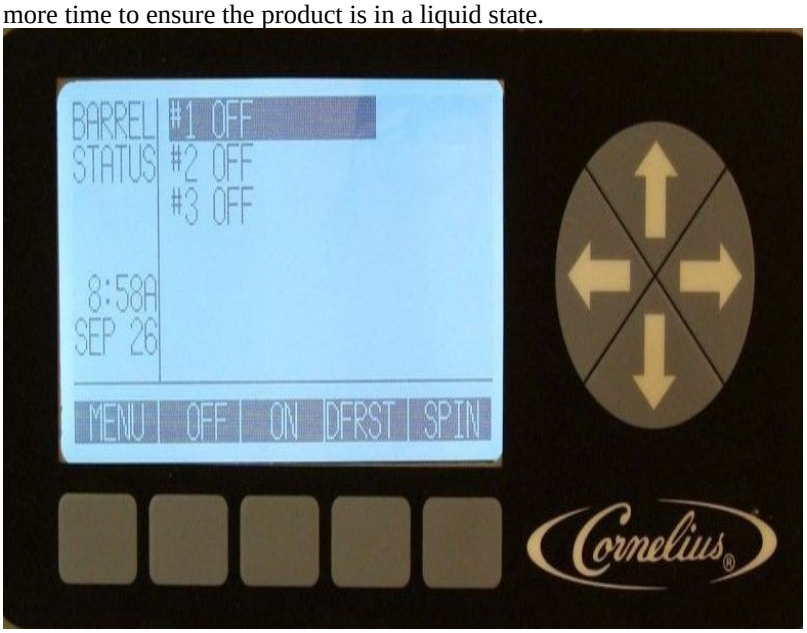
1. Sub Cooler Coil
The sub cooler coil is an "S" shaped copper coil located within the foam pack on the underside of the freeze barrels. Its purpose is to help prevent condensation from forming on the bottom of the foam pack. Also, the saturated refrigerant is sub-cooled to below the boiling point to insure pure liquid enters the AEV.



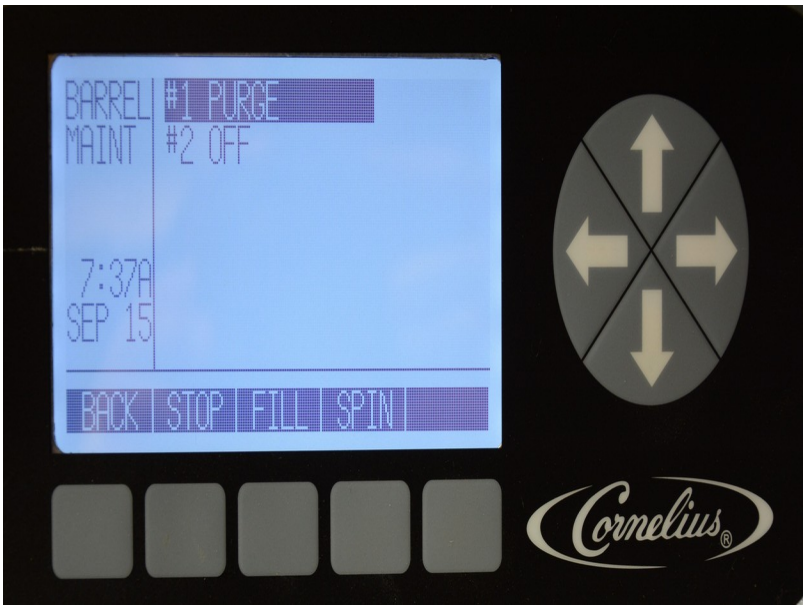
Troubleshooting

Baselining

1. Defrost Barrel or if Barrel is Liquid Turn Barrel OFF
Place the barrel you would like baseline on through two defrost cycles. *If product is liquid, move to step 2.
a. Select off for the barrel you are working on.
b. Select Defrost; the manual defrosts cycle takes 4 minutes. After the first defrost cycle finishes, press defrost one more time to ensure the product is in a liquid state.



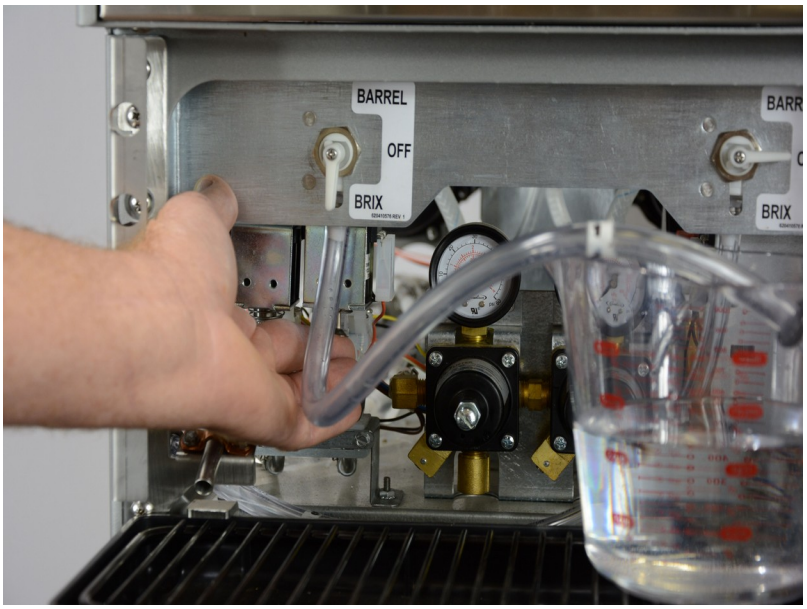
2. Purge the product from the barrel
Note: When you activate Purge, it activates the motor and Co2 solenoid. The barrel will not fill during the PURGE process.
a. Enter the menu, enter the MAINT option, enter the BARREL MAINTENANCE, highlight the barrel you would like to purge and select PURGE. Once the product is purged, turn purge option off.
Note: you won't be able to remove all of the product, the product that is below the dispense point of the valve you will have to remove manually by removing the faceplate.
b. Select STOP to stop the purge process. Once you stop the purge process, actuate the dispense valve to remove the pressure in the barrel.



3. Remove the splash panel
Splash panel is located below the dispense nozzles
a. Place the sample tube for the barrel you are working on into a large cup or clean container.
b. Turn the 3-way valve for the barrel you are working on to the brix position.



4. Before Brixing the barrels
Always check for proper flow rate at the water valve prior to brixing the unit. The water valve must be set/adjusted to 16-17 oz in 10 seconds.
Note: These valves may not be preset and must be checked on every install and baselining.



5. Checking the Brix

You will need a Refractometer to perform this step.

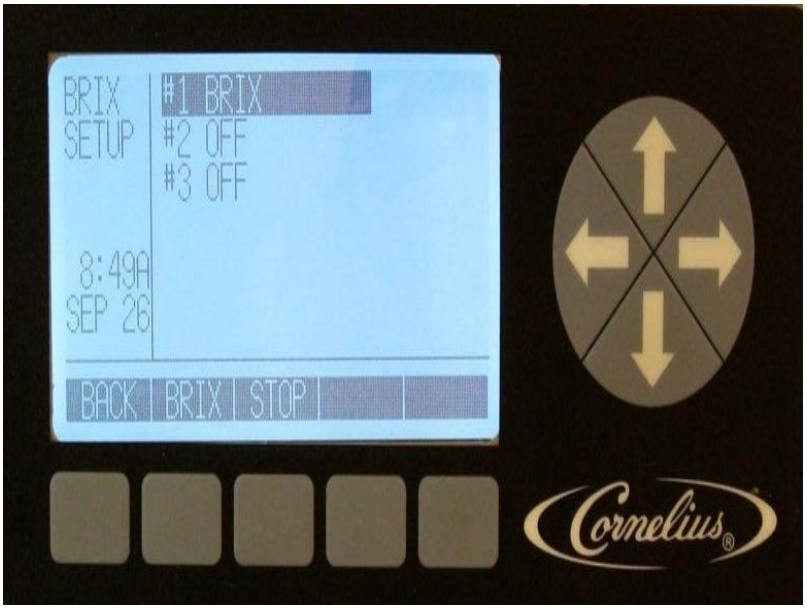
a. Make sure you calibrate your refractometer before each unit to ensure it is zeroed out. Apply cold plain water to refractometer and it should read 0, adjust if needed.

b. Enter the MENU, enter the MAINT option and enter BRIX SETUP

c. Highlight the barrel you are working on and select BRIX, once you press BRIX, it will dispense product out of the sample tube for 3-4 seconds (it stops dispensing on its own)

d. Discard three samples and collect a fourth to take a reading. A standard brix setting is 13 +/- 1 but may change based on the syrup manufacturer.

Note: Cornelius recommends a BRIX of 13.5 – 14.0

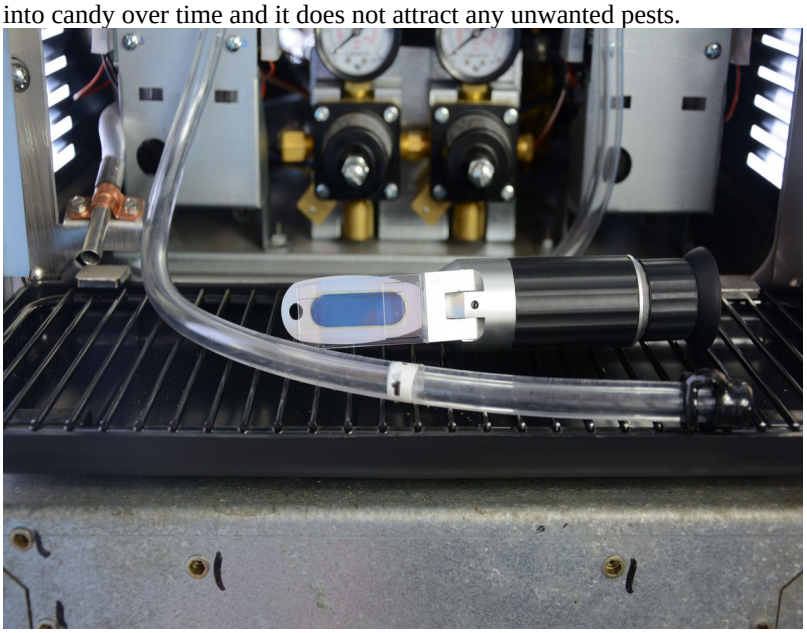


6. Adjusting and setting the brix

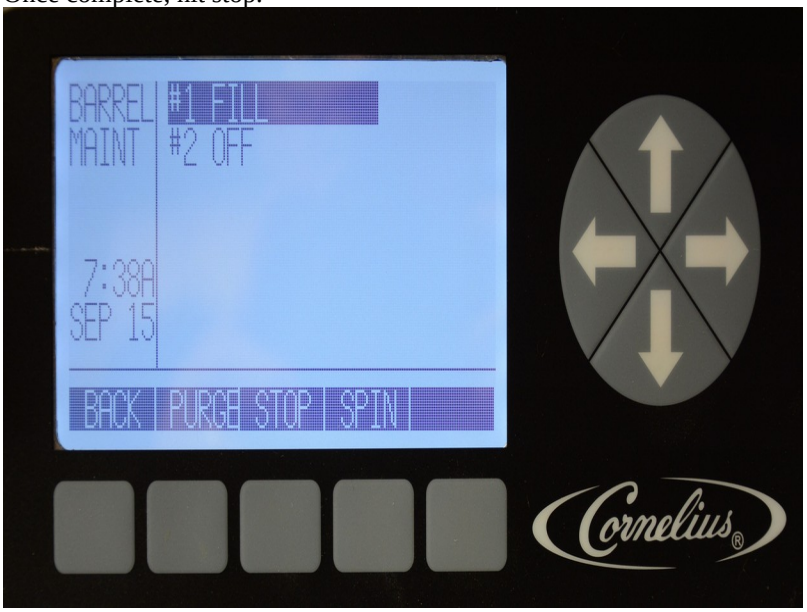
You will need a Refractometer to perform this step.

a. If you need to make adjustments to your brix you will adjust your syrup flow control; CW to increase your flow and CCW to decrease your flow.

b. Discard 3 samples after each adjustment to let the adjustment take effect. Check your reading on the fourth sample looking for 13.5 - 14.0.
c. Once the proper brix is achieved, flush the sample tube with water by manually activating the water solenoid. You can activate the water valve using your finger or by inserting a flat head pocket screwdriver into the slot in front of the flow control at a 45° angle and push the screwdriver down towards the ground. This will lift up on the solenoid plunger and allow the water to flow. We flush the sample tube with water to ensure the brixed product does not turn into candy over time and it does not attract any unwanted pests.

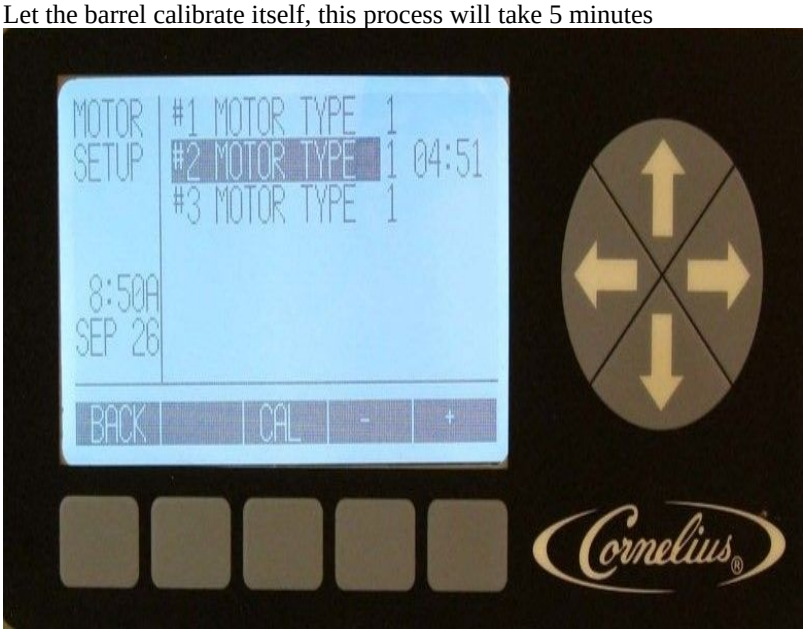


7. Filling the barrel
Only fill one barrel at a time
a. Enter the menu, select MAINT, select BARREL MAINTENANCE, highlight the barrel you are working on, select FILL. Let the barrel fill, as it stops filling, relieve the pressure slowly using the relief valve on the faceplate, release the relief valve as it starts to fill and continue until the barrel is filled to a ½" below the top of the barrel. Once complete, hit stop.



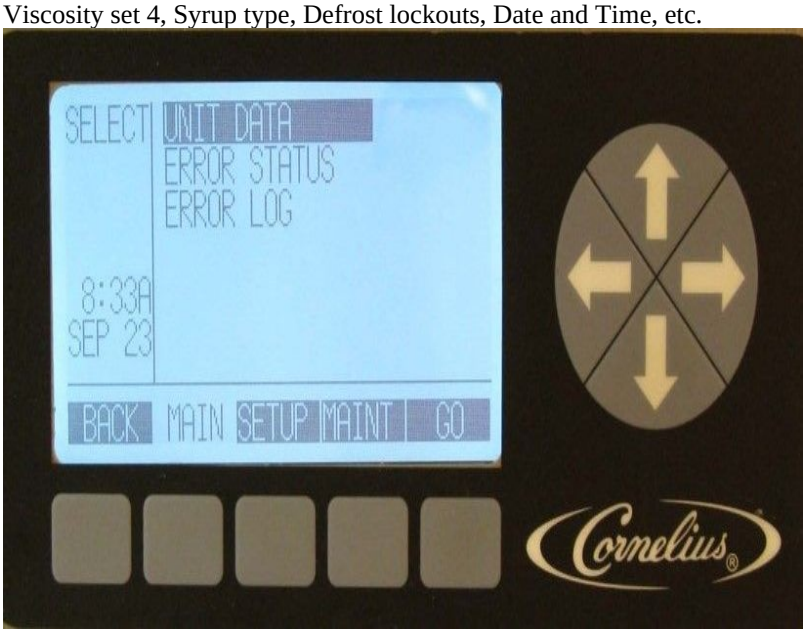
8. Calibrate the motor.

a. Enter the menu, select MAINT, select MOTOR SETUP, highlight the barrel you are working on and select CAL. Let the barrel calibrate itself, this process will take 5 minutes



9. Check and verify all of your settings

Viscosity set 4, Syrup type, Defrost lockouts, Date and Time, etc.

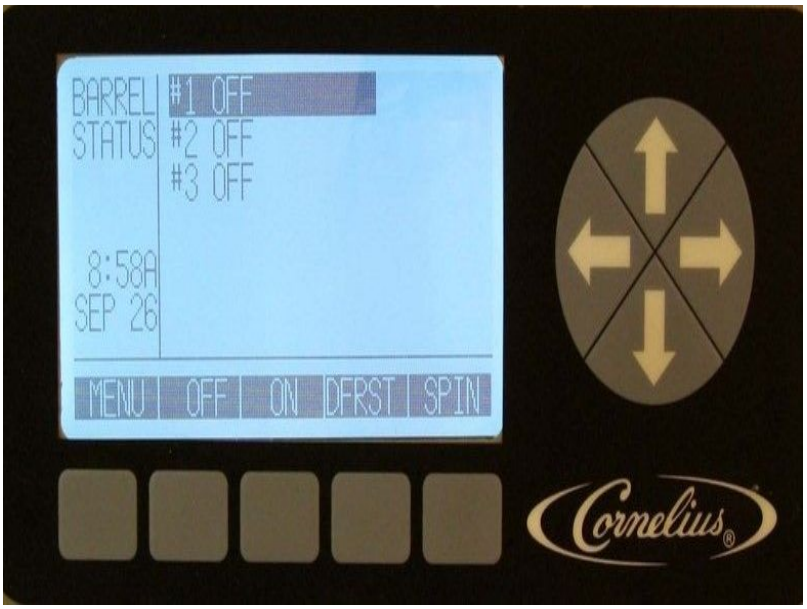


10. Placing barrel into freeze mode

a. Highlight the barrel you are working on and select ON to freeze Barrel.

b. Viscosity readout on the display should be between 17-22 on initial startup and slowly increase and the product freezes.

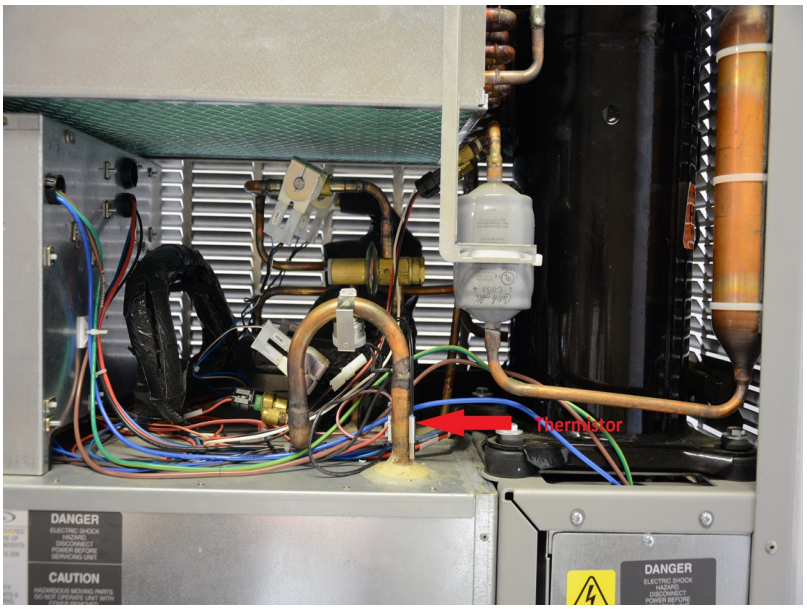
c. Make sure the product is of good quality once the freeze cycle is completed.



11. Settings are as follow…
Co2 – 2 secondary regulators; one feeding the Viper unit at 75Psi and one to the FCB BIB pumps set at 75Psi
Secondary Co2 Regulators (behind splash panel) – 36-38psi to achieve 100% overrun
Water – 50-60Psi
Viscosity – default of 4
Motor – Type 1 (60 Hz) Type 2 (50Hz)
Brix – 13.5 – 14.0Exp
Expansion Tank Reg (side of unit) – 30Psi

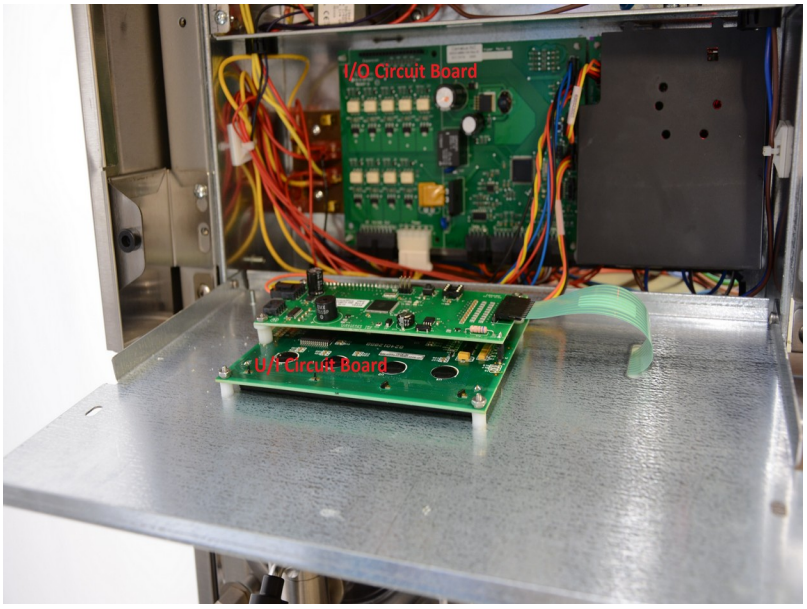
Barrel Temp out Error Message

1. Symptom – Barrel Temp out Error Message
Each freeze barrel has a thermistor clipped to the bottom of the evaporator outlet copper refrigeration tube and is insulated. The thermistor low limit is -30F and the high limit is +115F. If either of the limits is observed for 30 continuous seconds, the barrel temp out message is displayed. The most probable cause is a bad sensor that is dead shorted or an open circuit.
You can test by placing the thermistor into a cup of ice water and look for 32°F (0°C). Rub it between your hands and should read 90°F (32°C).



Comm Error IO Error Message

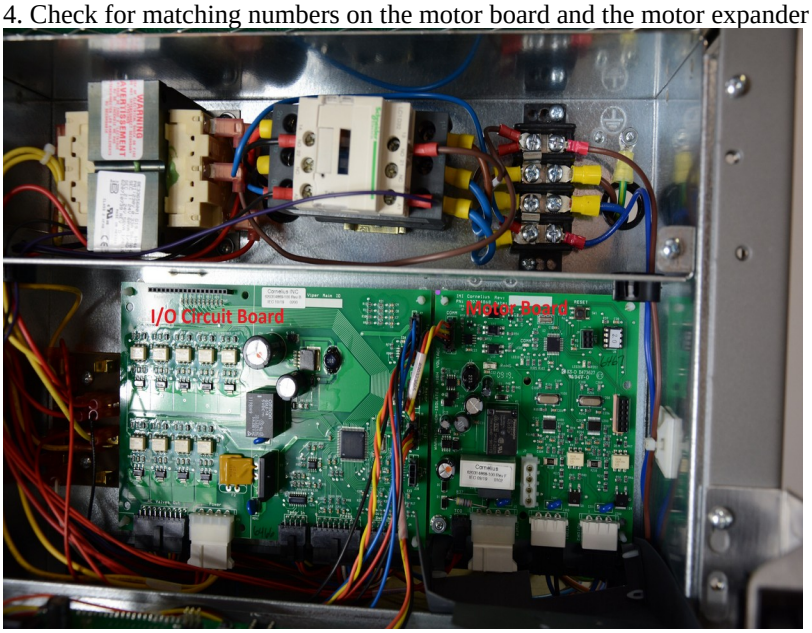
1. Symptom – Comm Error IO Error Message
Comm error IO message is caused by a communication failure between the IO board and the UI board and could be the result of:
1. Bad harness or loose connection between IO and UI. Check connection point and harness for continuity.
2. Bad IO board



Comm Error Motor Error Message

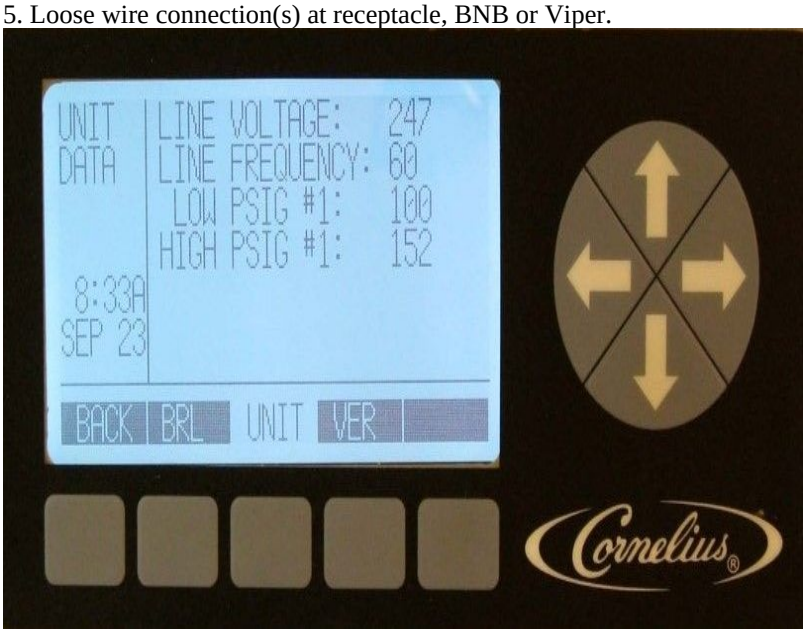
1. Symptom – Comm Error Motor Error Message
Comm error motor message is caused by a communication failure between the IO board and the motor board and could be the result of:
1. Harness between IO and Motor Board. Check connection point and harness for continuity.

2. Bad motor board
3. Loose wire/pin connection(s)
4. Check for matching numbers on the motor board and the motor expander board



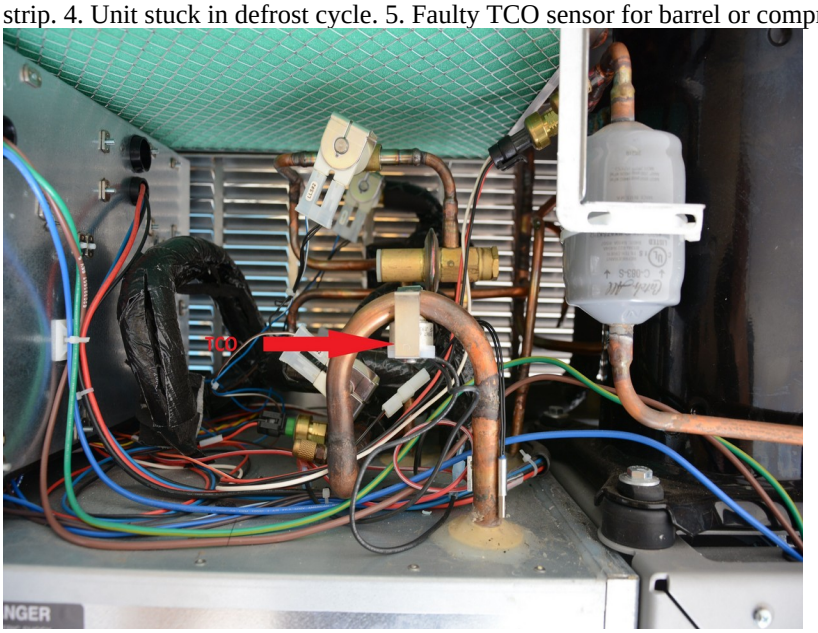
High or Low Voltage Error Message

1. Symptom – High or Low Voltage Error Message
The voltage operating limits for the Viper are 200VAC (low) to 260VAC (high). If the incoming line voltage is outside of this range for more than 2 minutes, the Viper will shut down. Check for the following:
1. Voltage or Phase at the wall receptacle
2. Voltage out of the BNB
3.BNB miss-wired
4. Faulty wiring – 3 phase to single phase (hot leg)
5. Loose wire connection(s) at receptacle, BNB or Viper.



TCO Open Error Message

1. Symptom – TCO Open Error Message
Each Viper freeze barrel (evaporator) outlet line has a temperature cut off (TCO) sensor clipped to the copper tube. Any Viper running R448a refrigerant will have an additional unique TCO clipped to the compressor discharge line. All TCO sensors are wired in series with one leg of the 24VAC passing through to power the IO Board and the Motor Control Board.
If any of the barrel TCO's exceed 120°F (49C), or if the compressor TCO exceeds 275°F (135C), then that sensor will open which then opens the entire TCO circuit, shutting down the refrigeration and barrel motor operation for the entire unit and showing a "TCO Open" error on the display.
Items to check for: 1. Verify proper voltage to the TCO circuit (24VAC). A unit Low Voltage error could cause a TCO Open error due to a drop in voltage on the TCO circuit, simulating an open circuit to the control boards. 2. Hot Gas Solenoid leaking through. 3. Faulty/loose TCO wiring or harness connections to sensors, boards, or terminal strip. 4. Unit stuck in defrost cycle. 5. Faulty TCO sensor for barrel or compressor.



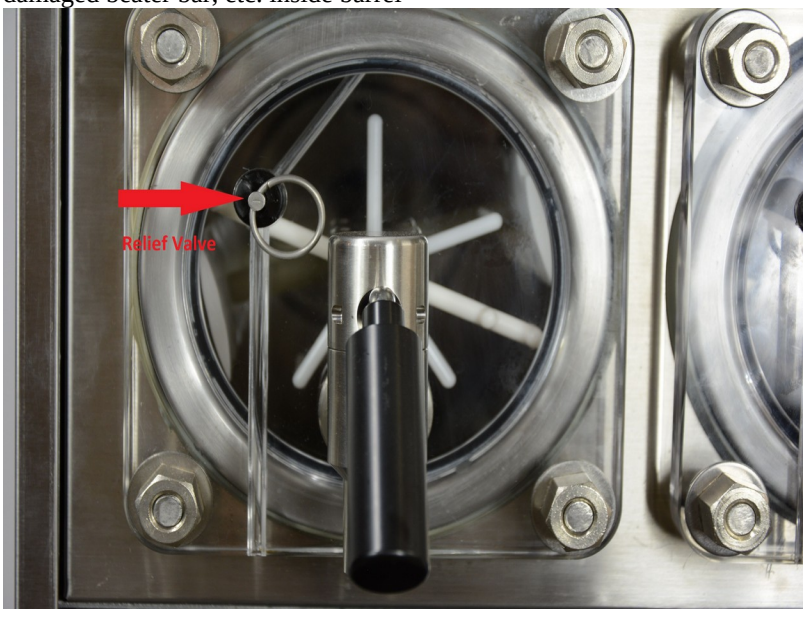
Error Codes

1. Error Status Mode Chart
list of Viper displayed error messages, the Viper units response to the error, the type of error and a description of the error.
System error - displays the same information across all barrels in the Viper.
Barrel error - is limited to a specific barrel
Limp error - is an error that doesn't prevent the Viper from operating, but limits functionality.

Display Priority	Error Level	Error	Can Reset?	Display Output	Current	Previous	Current	Previous	Error Description	Originator of value used for detecting the error condition	Originator of error	UI Processing
1	1	Hot Gas	No	#X HOT GAS	SysEntStop	SysEntStop	BitOff	BitOff	Occurs when the barrel outlet temperature for any barrel exceeds 115 °F for more than 1 minute and the compressor is on	temperature sensed in the IO	UI	Y
2	1	Hot Barrel	No	#X HOT BARREL	SysEntStop	SysEntStop	BitOff	BitOff	Occurs when the barrel outlet temperature for any barrel exceeds 115 °F for more than 1 minute and the compressor is off.	temperature sensed in the IO	UI	Y
3	1	Motor Control Error	No	#X MTR CTL FAIL	SysEntStop	SysEntStop	BitOff	BitOff	Motor control board electronics are bad, triacs are shorted loss of motor on/off functionality	meter chip on the motor board	Motor	N
4	1	TCO Error	No	TCO OPEN	SysEntStop	SysEntStop	BitOff	BitOff	TCO on either the refrigeration outlet of a barrel or the 24VAC power to the loads has dropped below 18VAC. TCO is determined by the motor board - if it sees no AC voltage after its onboard safety relay (controlled by 24VAC load transformer) for 2.5 seconds or greater it trigger an AC relay failure. This is then translated into a TCO error by the UI board	clock mater chip on the motor board.	Motor	N
4	2	IO Board Communication Err	N/A-Auto	COM ERR IO	SysEntRec	SysRun	BitOff	BitOff	Will occur if UI can not communicate to the main IO board. It has higer priority than motor since all communications branches from the IO board. If UI to IO communications lines are open, by default motor communication lines are also open.	N/A	UI	Y
5	2	Motor Board Communication Err	N/A-Auto	COM ERR MTR	SysEntRec	SysRun	BitOff	BitOff	Will occur if UI can not communicate to the motor control & sense board.	N/A	UI	Y
7	3	High Voltage	N/A-Auto	HIGH VOLTAGE	SysErr	SysRun	BitOff	BitOff	A High Voltage error occurs when line voltage is greater than 260 VAC for at least 3 seconds. The system will be re-enabled when the line voltage is less than 260 VAC for 30 seconds.	voltage is read from the motor board	UI	Y
8	3	Low Voltage	N/A-Auto	LOW VOLTAGE	SysErr	SysRun	BitOff	BitOff	A Low Voltage error occurs when line voltage is less than 200 VAC for 3 seconds. The error will be cleared when the line voltage is greater than 200VAC for 30 seconds.	voltage is read from the motor board	UI	Y
9	3	Compressor High Pressure	N/A-Auto	#X CMP HI-PRESS	SysEntRec	SysRun	BitOpn	Prev. State	A compressor high pressure error is generated if a compressor reversal error condition persists after 3 retries (each retry starts with 45 seconds wait time) See CMP RECOVER for details.	pressure value read from IO	UI	Y
11	2	Barrel Refg	Y-Front Panel	#X BARREL REFRIG	SysErr	SysRun	BitErr, on faulted barrel, All Others BitOff	BitOff, for all barrels	A Barrel Refrigeration error occurs when a barrel in the ON mode does not satisfy the viscosity within 45 minutes. The 45-minute timer will be reset if a drink is drawn; there is a timer for each barrel. Any single barrel causing the fault will shut down all barrels.	refrigeration status is read from IO	UI	Y
12	3	Motor Factory Cal Err	Y-Front Panel	#X MTR CAL ERR	SysRun	SysRun	BitErr	BitOff	Occurs if a factory or field calibration initiated from the motor setup menu fails, this typically indicates a mechanical system error which is causing the motor watts to be outside of allowable calibration range - current +/- 20W (normalized by motor type)	Meter chip on the motor board	Motor board	N
13	3	Barrel Sensor Outlet	Y-Front Panel	#X BRL TEMP OUT	SysRun	SysRun	BitErr	BitOff	A Sensor Error occurs when the thermistor reading does not change from a Min. or Max. value for 30 seconds. Limits for low are 0F and limit for high is 150F	temperature read from the IO board.	UI	Y
14	3	Motor Stall Error	Y-Front Panel	#X MOTOR STALL	SysRun	SysRun	BitErr	BitOff	Motor stall error occurs if motor is still stalled after 2 retries (each retry incorporate a 2 minute defrost with motors off, then a startup). If all retries fail then message is displayed.	Meter chip on the motor board	Motor board, but error flag is cleared and set also in the UI	Y
15	3	Meter Error	N/A-Auto	#X METER FAIL	SysEntRec	SysRun	BitErr	BitOff	Metering chip is non responsive for 20 seconds.	Meter chip on the motor board	Motor board	N
16	3	No Motor Error	Y-Front Panel	#X NO MOTOR	SysRun	SysRun	BitErr	BitOff	Motor is unplugged or Thermo-Cutoff on Motor Tripped.	Meter chip on the motor board	Motor board	N
17	3	Barrel Fill Error	Y-Front Panel	#X FILL ERROR	SysRun	SysRun	BitErr	BitOff	Barrel fill not satisfied within 2 minutes	DISPENSING_PRODUCT flag read from IO	UI	Y
18	4	CO2 Sold Out	N/A-Auto	CO2 OUT	SysEntRec	SysRun	BitSupply	Prev. State	A Carbon Dioxide sold out error occurs when the CO2 sensor reports no CO2 for more than 5 sec, this will self clear once it is present for 5 seconds.	IO	IO	N
19	4	H2O Sold Out	N/A-Auto	H2O OUT	SysEntRec	SysRun	BitSupply	Prev. State	A water sold out error occurs when the H2O sensor reports no H2O for more than 5 sec, will self clear once it is present for 5 seconds.	IO	IO	N
20	4	Syrup Sold Out	N/A-Auto	#X SYRUP OUT	SysRun	SysRun	BitSupply	Prev. State	A Syrup Sold Out error occurs when the syrup sold out sensor reports no syrup for more than 5 sec, this will self clear once it is present for 5 seconds	IO	IO	N
NA	5	Status Board Communication Err	N/A-Auto	COM ERR STAT	SysRun	SysRun	Run	Run	A status communications error will be logged, but the system will continue to run	N/A	UI	Y
NA	5	Auto Calibration Error	N/A-Auto	AUTO CAL #X	SysRun	SysRun	Run	Run	An Auto Calibration Failed, motor out of range for auto calibration (average power variance in the motor board is greater than 50). Barrel will auto reset if barrel is set to freeze or defrost.	Meter chip on the motor board	Motor board, but error flag set and cleared in the UI also.	Y
NA	5	Nd/Bad Motor EEPROM	N/A-Auto	MTR CTL EEPROM	SysRun	SysRun	Run	Run	If motor board fails to read internal EEPROM this error will be generated. If generated unit will run with defaults which may not produce drinks within specification. This error is checked for only immediately after powering on the unit.	E2 on the motor board	Motor board	N
NA	5	Clock	N/A-Auto	CLOCK	SysRun	SysRun	Run	Run	A Clock error occurs when the system Real Time Clock is not functioning	RTC on the UI	UI	Y
10	5	Compressor Reverse	N/A-Auto	CMP RECOVER					A compressor recover error is generated if the low side pressure is greater then 55 PSI for greater than 45 seconds. This condition only is checked for when barrels are in freeze mode and after the compressor has been running for at least 2 minutes. If any barrel is in defrost the low side pressure is at the mercy of the ambient temperature and can not be used to detect compressor reversal. Motor is moved to spin mode will drinks are happening.	pressure value read from IO	UI	Y

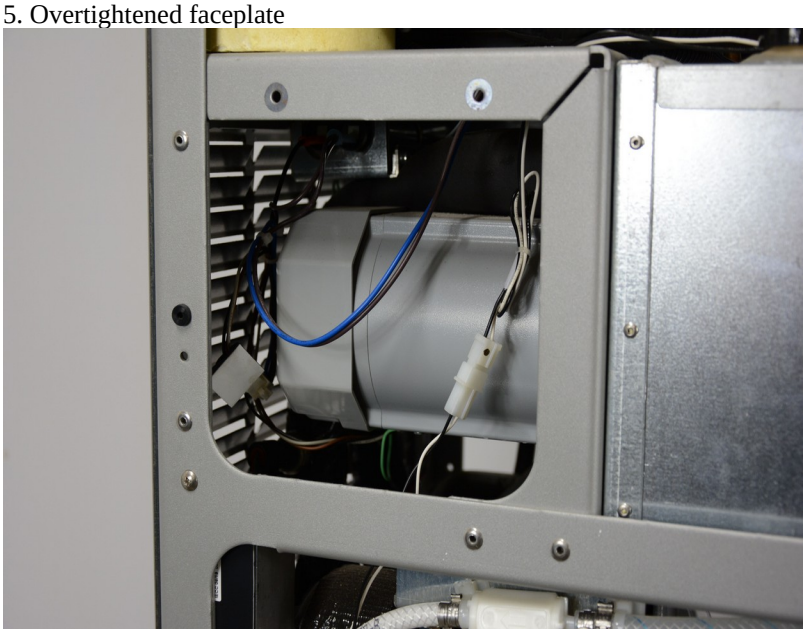
Barrel over-filling, leaking faceplate relief valve

1. Symptom - Barrel over filling, leaking from faceplate relief valve
The faceplate relief valve unseats at 50psi. Items to check for:
1. Bad expansion tank
2. Leaking CO2 solenoid
3. PCBA transducer board
4. Barrel fill transducer
5. Leaking water or syrup solenoid.
6. Verify Motor Type is correct in Motor Setup menu (Type1=60Hz units, Type2=50Hz units) 7. Check for damaged beater bar, etc. inside barrel



Barrel Recovery Error Message

1. Symptom – Barrel Recovery Error Message
Barrel recovery is displayed when the barrel viscosity is too high and the drive motor cannot rotate. The Viper will go into an automatic two minute defrost. Items to check:
1. Low brix, see brix category in installation segment
2. Drive motor not calibrated, see category in installation segment
3. Leaking LLS (over freezing)
4. Low voltage – 205Vac or below
5. Overtightened faceplate



Brix Issue High

1. Symptom – Brix Issue High
The nominal brix reading is 13.5 to 14.0. If the brix reading for a barrel is high check for the following:
1. Improperly adjusted syrup or water flow control
2. Low water pressure
3. Syrup leaking thru the flow control banjo
4. Syrup brand changed – LTO or wrong BIB
5. Compare brix at sample tube to brix in barrel. If different, check flow path to barrel.
6. Water solenoid sticking closed or syrup solenoid sticking open



Brix Issue Low

1. Symptom – Brix Issue Low
The nominal brix reading is 13.5 to 14.0. If the brix reading for a barrel is low check the following:
1. Improperly adjusted syrup or water flow control
2. Compare brix at sample tube to brix in barrel. If different, check flow path to barrel.
3. Low CO2 pressure causing the syrup sold out to short cycle
4. High water pressure causing water to leak through flow control banjo
5. Water solenoid sticking open
6. Syrup solenoid sticking closed



CO2 Out Message

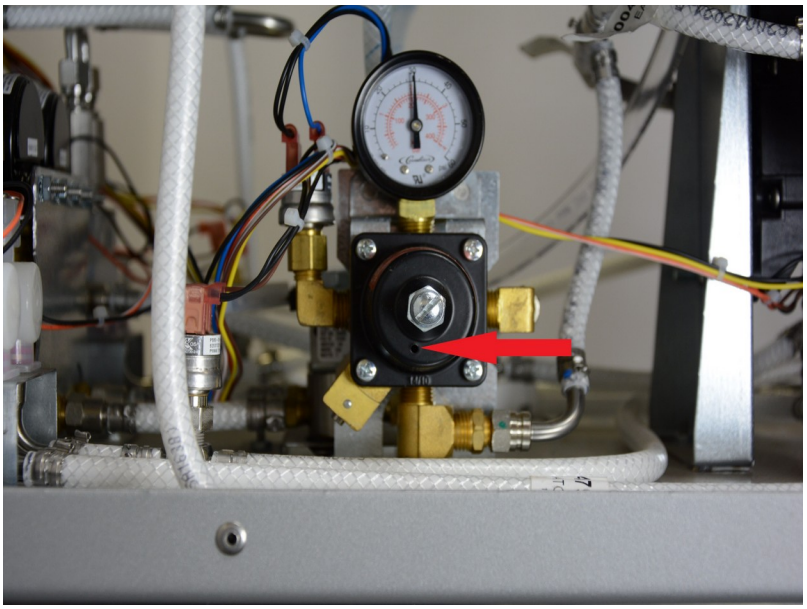
1. Symptom – CO2 Out Message

When the CO2 pressure in the unit drops to or below 55 psi, the CO2 sold out switch opens and the Viper displays CO2 Out message. Check for the following items:
1. Low incoming pressure or no pressure – must be at 75psi
2. Line size from regulator to unit needs to be 3/8” ID
3. Faulty regulator or not a dedicated regulator
4. Improperly plumbed, kinked line or extreme line length
5. Faulty CO2 sold out switch, faulty IO board.



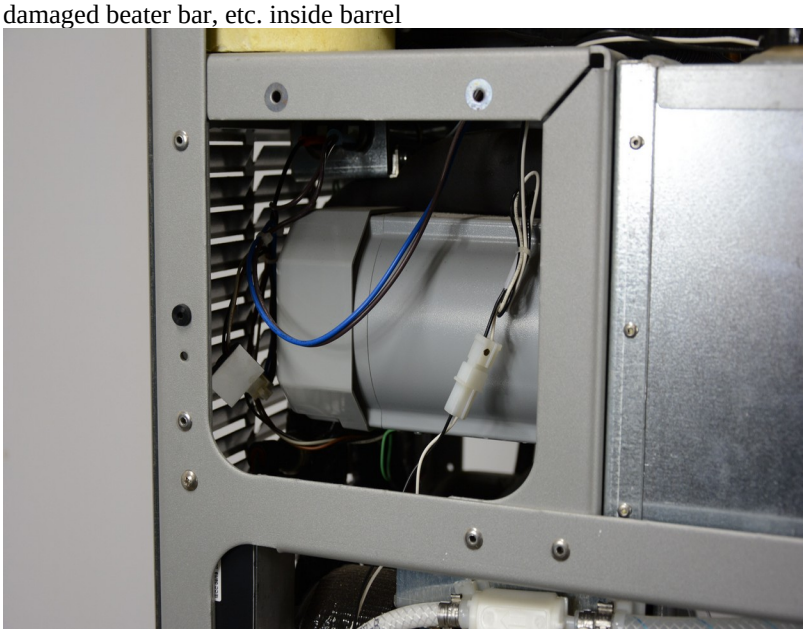
Leaking Liquid From Side Regulator

1. Symptom – Leaking Liquid From Side Regulator (expansion tank regulator)
The CO2 regulator located on the side of the Viper unit is set for 30 psi and provides Co2 pressure to the expansion tanks. When the liquid side of the bladder pressure exceeds 30 psi CO2 gas is pushed back thru the bleed hole in the CO2 regulator. If liquid is leaking from the regulator bleed hole:
1. The expansion tank rubber bladder has a tear or hole and expansion tank needs to be replaced
2. The CO2 regulator located on the side needs to be replaced.
3. All tubbing and stainless steel fittings need to be replaced or cleaned thoroughly.



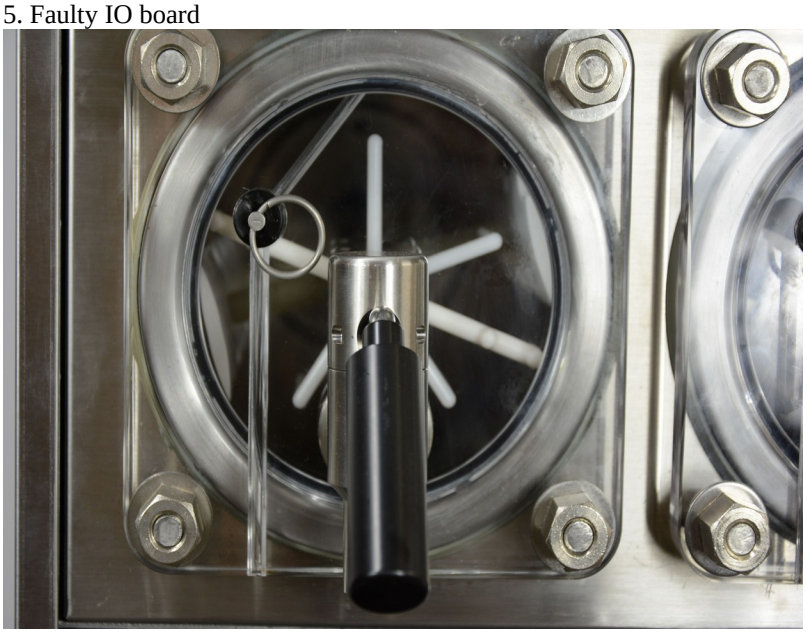
Motor Stall Error Message

1. Symptom – Motor Stall Error Message
Before the Motor Stall message is displayed, the Viper unit puts the affected barrel into a 2 minute defrost and two retries before displaying the message. You will see barrel recovery prior to motor stall.
Check for the following:
1. Low brix in barrel – see brix category in installation segment
2. Low voltage
3. Bad motor or motor controller board
4. Motor capacitor
5. Overtightened faceplate
6. Verify Motor Type is correct in Motor Setup menu (Type1=60Hz units, Type2=50Hz units) 7. Check for damaged beater bar, etc. inside barrel



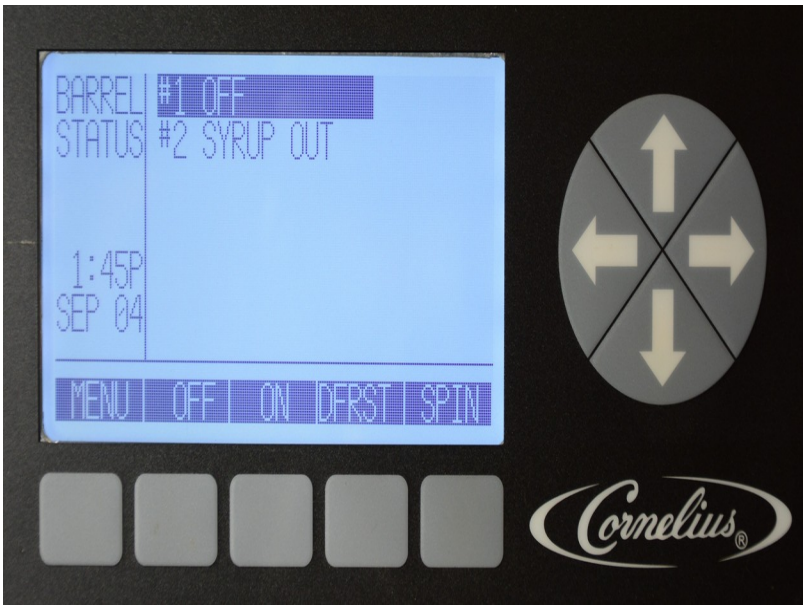
Barrel Under Filling

1. Symptom - Barrel Under Filling
The freeze barrel not completely filling check items listed:
1. Leaking expansion tank causing barrel to over pressurize
2. Leaking CO2 solenoid
3. PCBA transducer board
4. Barrel fill transducer
5. Faulty IO board



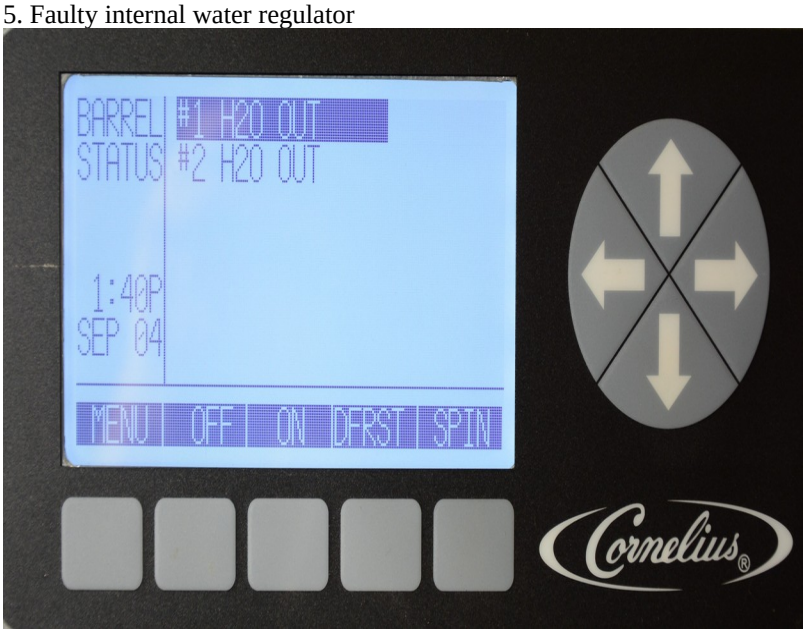
Syrup Out Message

1. Symptom – Syrup Out Message
Syrup out occurs when the syrup pressure drops to or below 48 psi. The syrup sold out switch opens and the Viper displays Syrup Out message. Check for the following items:
1. Low pressure or no CO2 at BIB pump, must be at 75Psi
2. No syrup BIB connected or bad BIB connector
3. Bad sold out switch, harness or IO board
4. Bad BIB pump
5. Not on dedicated Co2 regulator.



Water Out Message

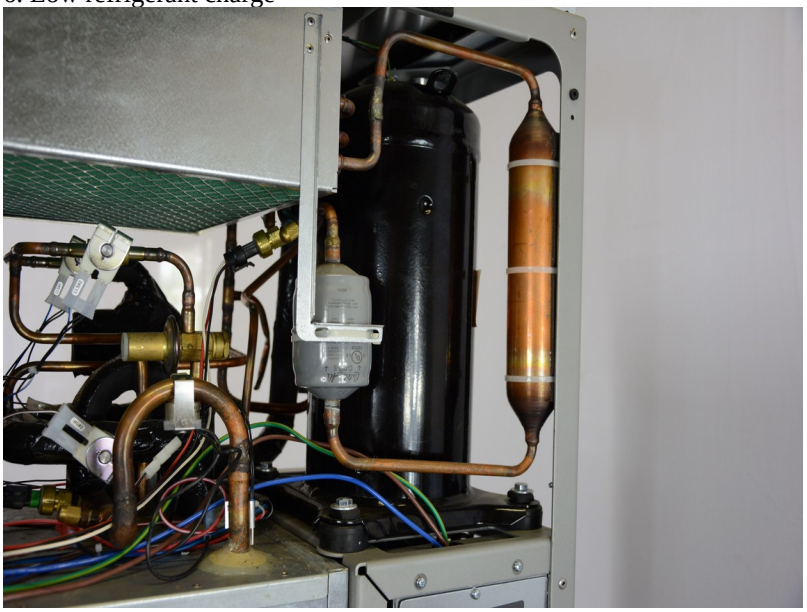
1. Symptom – Water Out Message
When the Viper internal water booster pump outlet pressure drops to or below 45 psi, the water sold out switch opens and the Viper displays the Water Out message. Check for the following items:
1. Low incoming water pressure
2. Low CO2 pressure driving internal water booster pump
3. Faulty sold out switch or faulty harness
4. Faulty IO board
5. Faulty internal water regulator



Barrel Refrigeration Error Message

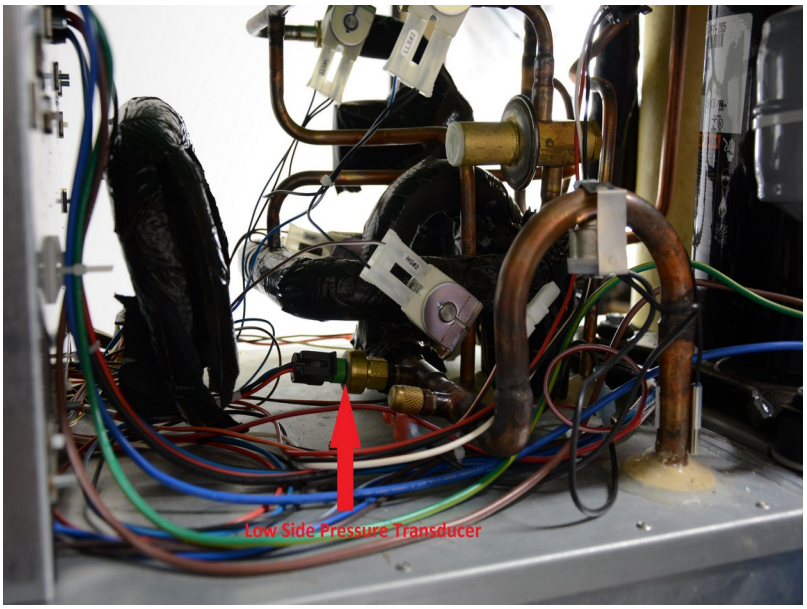
1. Symptom – Barrel Refrigeration Error Message

The Barrel Refrigeration error message occurs when the compressor has been running continuously for 45 minutes without any drinks drawn and the barrel viscosity has not been satisfied. Check for the following:
1. Hot gas valve leaking
2. High brix in barrel – see brix category in installation segment
3. Lack of air flow or a dirty condenser / filter
4. Liquid line solenoid not opening or not fully opening up
5. Improperly calibrated motor
6. Low refrigerant charge



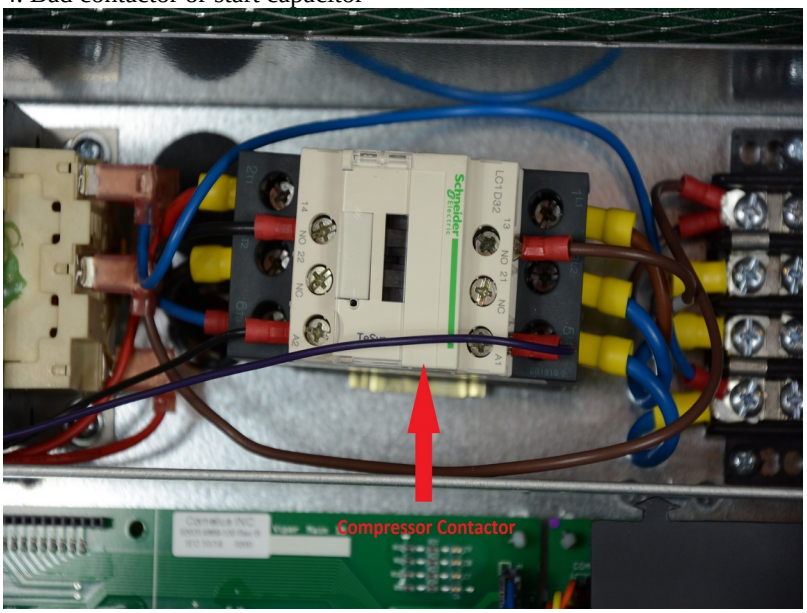
CMP High Pressure error message

1. Symptom – CMP High Pressure error message
After the Viper is in freeze mode and the compressor has been running for more than 2 minutes, the system checks the low side pressure. If the low side pressure has been higher than 55 psi for more than 30 seconds this message is displayed and the unit shuts down. Check for the following:
1. Low side pressure transducer not functioning properly – pressures can be checked in through the menu.
2. System over charged
3. Scroll compressor running backwards
4. IO Board defective



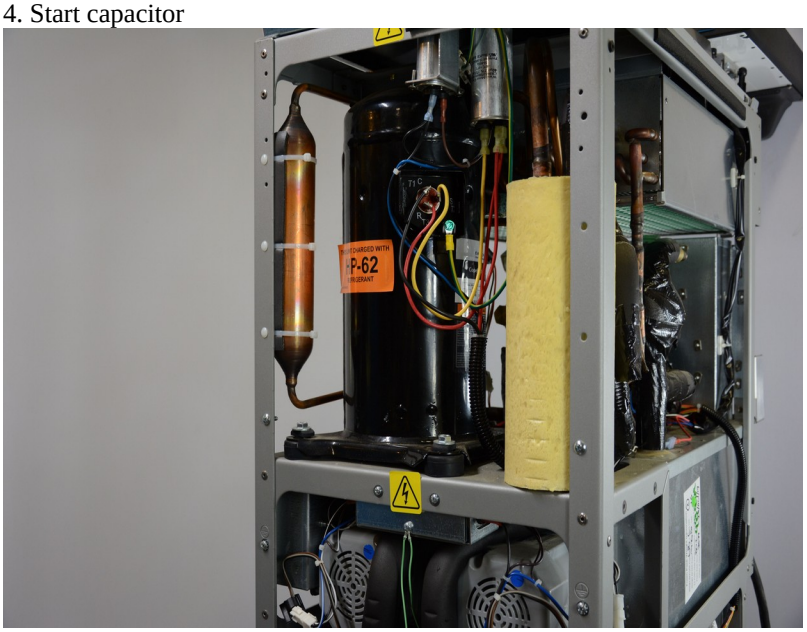
Compressor Doesn't Turn On

1. Symptom – Compressor Doesn't Turn On
The contactor coil receives 24vac and then the contacts for line voltage closes. The Line voltage is then routed to the compressor and the condenser fan motor. If the condenser fan is running the compressor should also be. Items to check:
1. Voltage going to the compressor or bad wire connection
2. Winding of the compressor open (Reference Compressor section in Refrigeration Segment for resistance readings)
3. System not calling for refrigeration
4. Bad contactor or start capacitor



Compressor Turns On But Turns off Right Away

1. Symptom – Compressor Turns On But Turns off Right Away
The compressor turning on and then off can be a defective compressor and related components. It also can be tuned on and off due to other conditions. Listed are the most common reasons:
1. Internal compressor overload
2. Faulty motor board or viscosity read out
3. Compressor windings
4. Start capacitor



Hot Gas Error Message

1. Symptom – Hot Gas Error Message
Troubleshooting service and repairs to be conducted only by authorized and trained professionals!
Hot Gas Error Message Explanation:
The Hot Gas error message will appear on unit when the outlet thermistor reaches ~115°F for more than one-minute while the compressor is running. The built-in safety features will proceed to disable that individual barrel until that error message is addressed.
See Figure 1
Potential Failure Modes:
Hot gas solenoid leaking through
Faulty evaporator outlet thermistor
Evaporator outlet thermistor not making good contact. Rusted clip or dried heat transfer paste
Bad Harness Connection or IO Board
Recommended Troubleshooting Steps:
Identify Hot Gas leak
With the barrel(s) identified from Error log there are two methods to confirm leaking.
Defrost all barrels and then stop the refrigeration system (shut it off).
Use either Method 1 or Method 2 to diagnose and locate the leaking valve
Method 1 - Purge suspect barrel(s) of product and remove front faceplate assembly, beater bar and scraper blades. Next turn on only the barrel with product and allow to refreeze. With refrigeration system running carefully place hand to the inside, top rear of the empty non running barrel. If a Hot Gas valve is leaking the surface of the barrel will feel warm to the touch. CAUTION: surface may be HOT!
Method 2 – Without purging any product, remove side panel(s). Locate suspect Hot Gas valve and carefully peel back insulation. Turn refrigeration system back on for the other barrel except the suspect barrel, leaving the suspect

barrel from the error log OFF. Carefully place hand on the copper tubing between the Hot Gas valve and the evaporator (foam pack), if the copper tubing feels warm it is leaking past the Hot Gas valve. CAUTION: tubing may be HOT!
See Figure 2
Potential Cause – Hot Gas Valve not Opening and Closing Properly
The identified leaking hot gas valve may have debris in the seat area as part of the sealed refrigeration system that is preventing it from operating properly. It may be possible to clear the debris from the seat area and then be captured in the filter/dryer. To do this pulse the Hot Gas valve on/off by going into the screen menu:
MENU > MAINT > MANUAL DIAG > HOT GAS SOL#
Now cycle Hot Gas solenoid ON for 10-15 seconds and then turn it OFF. Complete this 5 times. During this process, you will hear a click activation and refrigeration flowing through. Repeat this process if you have Hot Gas Error Messages on additional barrels.
See Figure 3
Example: If Error message was found in Barrel #1 scroll down to HOT GAS SOL #1
After going through the cycling of Hot Gas Solenoid (5 times 10-15 seconds between cycles), keep pressing the Back button to return to the MAIN screen.
See Figure 4
At the MAIN Screen, proceed to turn each barrel with product back ON and close merchandiser door.
See Figure 5
Next repeat Method 1 or Method 2 to again check for a leaking hot gas valve. If no leaking is found after pulsing, the debris was cleared and unit can be put back into operation.
If a Hot Gas valve is still leaking the unit will need to be shut down and the Hot Gas valve replaced using proper refrigeration system procedures
Potential Cause – Faulty Thermistor
When a Hot Gas Error is found in the error log history. And after checking Hot Gas valve(s) for leaking with no leaks detected (Method 1 or Method 2) and still getting the Hot Gas Error message. It is possible the unit has an improper reading thermistor located on the evaporator (foam pack) outlet copper tubing. To properly check a thermistor, you will need a Volt/Ohm meter.
See Figure 6
1. Shut the unit off and remove side panel(s). Locate the thermistor for the barrel(s) triggering the Hot Gas error and carefully peel back the insulation.
2. After removal of insulation, make sure the thermistor is properly positioned and mounted to the copper tube in order to provide accurate reading. There should be no rust or dried paste between thermistor and copper line. If needed, provide adequate amount of thermal paste.
3. Unplug the two-wire connector and unclip the thermistor from the copper tubing. Save the clip and thermo paste for reuse.
4. Using a glass of 32F ice water, fully submerse the thermistor and stir the ice water for 1 minute.
5. Using an ohm meter measure across the two wires of the thermistor. A good thermistor will be 16.3K +/- 5% (15.5K to 17.1K). If the thermistor is out of specification, it should be replaced.
6. The insulation must be sufficient and snug, leaving no air gaps or opening.
IV. Potential Cause – Bad Harness Connection or IO Board
If no leaking hot gas valve is detected and the thermistor on the evaporator outlet has been tested and found to be in spec, it is possible a shorted or pinched wire(s) in the unit harnessing could also cause the Hot Gas Error. After checking for a leaking Hot Gas valve, defective thermistor and wiring harness problems it is possible it could be a defective IO Board.
See Figure 7
The IO Board sends and receives voltage and ohm values for components such as the Hot Gas valve and thermistor. The replacement of this board should be a last resort
If problems persist, please contact Cornelius Customer Service @ (800) 238-3600



Refrigeration Leak

1. Symptom – Refrigeration Leak
In a Viper unit, there are many brazed joints and refrigeration components with the potential for leaking refrigerant. Listed are the more common components to check:
1. Evaporator (foam pack): inlet, outlet and around faceplate.
2. Accumulator
3. Receiver
4. Condenser
5. All brazed joints
Note: pressurize with nitrogen and use bubbles to check. A sniffer may pick up traces of refrigerant in foam.



Viper Menu Programming Flowchart

Program Flow Chart

1. Flow Chart

(No text content in Sanity for this step — this page consists solely of the referenced flowchart image.)

