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# VIPER (E) LOW OVERRUN

## Installation Manual



Release Date: October 30, 2015  
Publication Number: 621360241LOEWIN  
Revision Date: January 09, 2017  
Revision: C

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

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### **Correct Disposal of this Product**

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

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# SAFETY INSTRUCTIONS

## READ AND FOLLOW ALL SAFETY INSTRUCTIONS

### Safety Overview

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

### Recognition



### Different Types of Alerts

#### **DANGER:**

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

#### **WARNING:**

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

#### **CAUTION:**

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

### SAFETY TIPS

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

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

## QUALIFIED SERVICE PERSONNEL

### **WARNING:**

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. **ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

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

## SAFETY PRECAUTIONS

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

### **WARNING:**

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

**Failure to disconnect the power could result in serious injury, death or equipment damage.**

### **CAUTION:**

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

## SHIPPING AND STORAGE

### **WARNING:**

Do not use dispense spigot to lift or move unit as this could result in personal injury

### **CAUTION:**

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

## CO<sub>2</sub> (CARBON DIOXIDE) WARNING

### **DANGER:**

CO<sub>2</sub> displaces oxygen. Strict attention **MUST** be observed in the prevention of CO<sub>2</sub> gas leaks in the entire CO<sub>2</sub> and soft drink system. If a CO<sub>2</sub> gas leak is suspected, particularly in a small area, **IMMEDIATELY** ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentrations of CO<sub>2</sub> gas experience tremors which are followed rapidly by loss of consciousness and **DEATH**.

## MOUNTING IN OR ON A COUNTER

### **WARNING:**

When installing the unit in or on a counter top, the counter must be able to support a weight in excess of 450 lbs. to insure adequate support for the unit. **FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

**NOTE: Many units incorporate the use of additional equipment such as ice makers. When any addition equipment is used you must check with the equipment manufacturer to determine the additional weight the counter will need to support to ensure a safe installation.**

## VIPER MACHINE USAGE

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

This appliance is not intended to be used in household and similar applications such as:

- Staff kitchen areas in shops, offices and other working environments
- Farm houses and by clients in hotels, motels and other residential type environments
- Bed and breakfast type environments
- Catering and similar non-retail applications

The appliance has to be placed on a horizontal surface.

## DECOMMISSIONING AND/OR TRANSPORTING THE UNIT

Whenever the viper unit is going to be removed from service and/or transported, the unit must be completely drained of product and rinsed out to remove residual product.

When transporting the unit, make sure that the product bowl is removed from the top of the unit and stored in a safe place for shipment. The unit must be carefully tied down or stored in such a manner that the unit will not move during shipment.

## STORAGE WITHIN THE MACHINE

### CAUTION:

Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.

# INTRODUCTION

## SYSTEM OVERVIEW

### Introduction

The low overrun Viper system is a state-of-the-art FCB/FUB machine. The Low overrun Viper machine provides improved drink availability, reliability and reduced complexity in a compact, reduced footprint machine.

Viper provides the highest quality in drink appearance and consistency while keeping operation and maintenance simple and straightforward.

The unit consists of multiple freeze barrels that each contain an internal beater driven by an electric motor, a refrigeration system, a timer-controlled, intelligent defrost system and interconnecting tubing and controls required to dispense the product.

## DISPENSED PRODUCT CONDITIONS

### Overrun, as Applied to Carbonated Beverages

#### Overrun Definition

Overrun is defined as product expansion that takes place in the frozen carbonated drink. It is caused primarily by CO<sub>2</sub> gas breakout and secondarily by freezing.

#### Overrun is a Variable

The percentage or degree of overrun depends on a number of factors. The specific syrup, BRIX, low dispensing volume, carbonation level in the liquid product and freezing of the product. These items all affect overrun. After these factors have been considered, desired viscosity (product consistency) adjustment may be made on the unit. The viscosity adjustment adjusts product texture from very wet to light.

#### Specific Product Ingredients Affect Overrun

Each syrup has its own specific formulation of makeup. Fruit flavors contain citric acids that colas do not. Colas also differ in ingredients from one brand to another. Each product formulation has its own peculiarities regarding the way the product absorbs carbonation and the way it releases carbonation.

#### BRIX Affects Overrun

Sugar in carbonated drinks is like anti-freeze in water. The higher the BRIX, the greater the resistance of the product to freezing. Conversely, in products with lower BRIX, freezing takes place at higher temperatures than for high-BRIX products. Thus, BRIX affects overrun because the amount of sugar in a drink has a direct bearing on the product's freezing characteristics.



Figure 1.

#### Low Dispensing Volume Affects Overrun

When a unit sits idle for a period of time with no drinks being dispensed, CO<sub>2</sub> gas in the system takes a "set". When the first few drinks are drawn off after an idle period, CO<sub>2</sub> gas has less tendency to break out as the drink is dispensed. The result is that these first drinks have less overrun than drinks dispensed during peak-use periods.



**Carbonation Level in Liquid Product Affects Overrun**

The higher the specific carbonation level in a given product, the greater the potential for carbonation breakout in frozen carbonated form of that drink. For example, drinks with 3.0 volume of carbonation have more gas breakout in frozen carbonated form and more overrun than drinks that contain 2.0 volumes of CO<sub>2</sub> gas.

**Freezing Affects Overrun**

Freezing causes approximately a 5-7 percent expansion in dispensed frozen carbonated drinks. The degree of freezing is limited because the finished drink is intended to be sipped through a straw. This is not possible if the product is too “solid”.

# INSTALLATION

## DELIVERY, INSPECTION & UNPACKING

**NOTE: Cornelius is not responsible for damaged freight. If damage is found, you must save all packaging material and contact the freight carrier. Failure to contact the carrier within 48 hours of receipt may void your claim.**

1. Inspect the carton and note any damage, regardless if it appears minor. If the carton is damaged, note on the consignee copy of the freight invoice “exterior carton damage – concealed damage possible” and contact the freight company immediately.
2. Remove any staples along the bottom edge of the carton and lift the carton off the pallet.
3. Remove the exterior carton sleeve, internal fillers and plastic bag around the unit. Carefully inspect the unit for damage.
4. Remove the bolts holding the dispenser to the pallet.
5. Remove the packing fillers from the top of the unit.
6. Inspect the dispenser cabinet and make sure it has no scratches, dents or any other cosmetic defects.
7. Make sure that the glass or plastic merchandiser panels are not scratched or cracked.
8. Open the packages of loose parts and inspect all of the parts for damage or missing parts. Check the parts received against the packing list to insure receipt of all parts.

**NOTE: If unit is installed more than three months from date of production, replace the seals according to the instructions accompanying the spare seals supplied with the unit. Unite date of manufacture is included in the unit serial no. as follows: The date code follows the first letter of the serial number. The next four numbers reflect the date of manufacture. The first two represent the year, the next two the week. For example, 62A0815xxxxxx would be a unit produced during the 15th week of 2008.**

## COUNTER LOCATION

Select a location in a well ventilated area, close to a grounded electrical outlet and backroom connections. The counter must be capable of supporting a minimum of 400 pounds. If possible do not place the unit close to hot and/or steaming machines.

The minimum clearance is: 2 in. (5.08 cm) in back and 12 in. (30.48 cm) on top of the unit. If both sides have a minimum clearance of 2” (5.08 cm), then the unit may be flush to the wall in the back.

**NOTE: Condenser air is drawn in from the sides or back and discharged out the top. Failure to maintain clearance space will reduce the capacity of the unit and cause premature compressor failure.**

## INSTALLING LEG

**NOTE: Before installing legs, the plastic plugs must be removed.**

Unpack the four (4) legs and install them into the threaded holes provided in the bottom of the unit. The installer must provide flexibility in the product and utility supply lines to permit shifting the position of the dispenser sufficiently to clean the area beneath it.

## COUNTER MOUNTING

The Viper unit must be sealed to the counter. The **MOUNTING TEMPLATE** (Figure 2.) indicates where openings can be cut in the counter. Locate the desired position for the dispenser, then mark the outline dimensions on the counter using the **MOUNTING TEMPLATE**. Cut openings in the counter.

Apply a continuous bead of National Sanitation Foundation (NSF) listed silastic sealant (Dow 732 or equal) approximately 1/4” inside of the unit outline dimensions and around all openings. Then, position the unit on the counter within the outline dimensions. All excess sealant must be wiped away immediately.

The beverage tubes, drain tube and power cord are routed through the large opening in the bottom of the unit. See the MOUNTING TEMPLATE (see Figure 2.), for locating the required clearance hole in the counter for these utility lines.

## COUNTERTOP TEMPLATE INSTALLATION INSTRUCTIONS

Use the template shown in Figure 2. and the dimensions shown in Table 1: to drill the necessary holes for installing the unit.

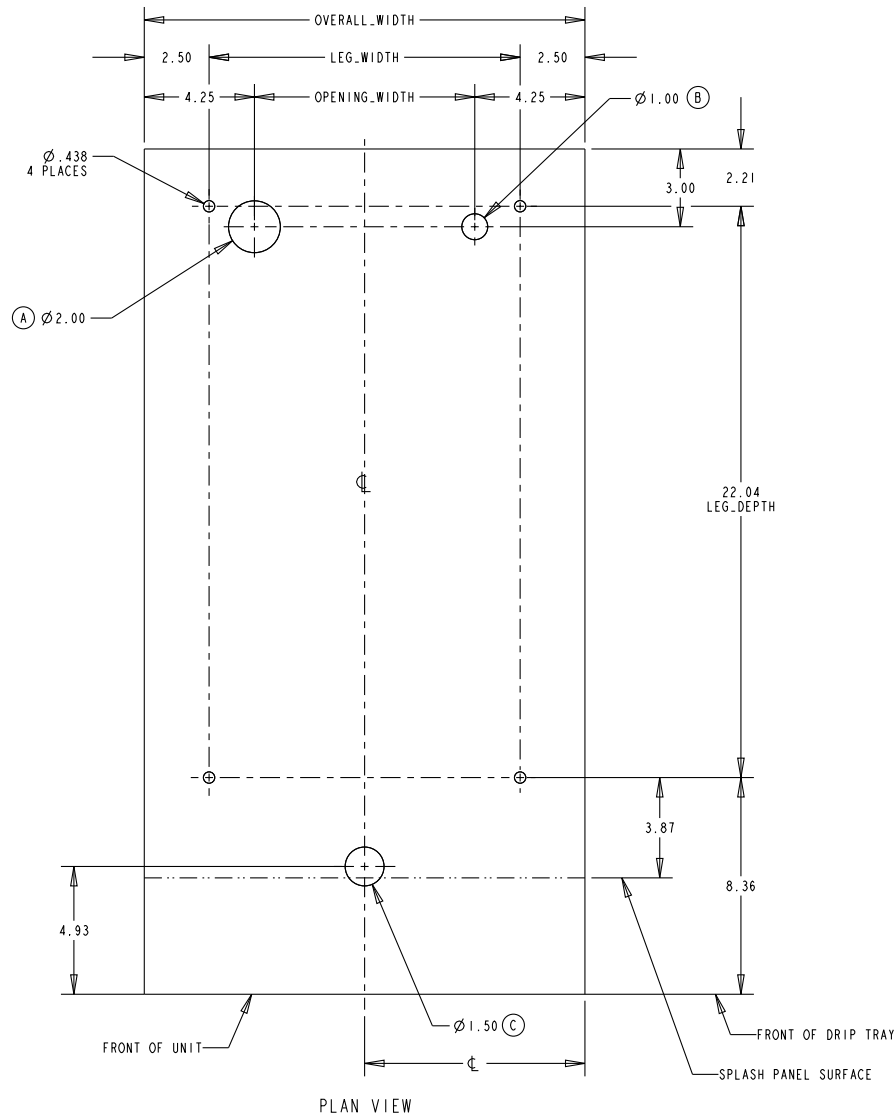


Figure 2.

- A - Opening for Product Tubes
- B - Opening for Electrical Cables
- C - Opening for Drip Tray Drain

Table 1.

Model	Overall Width (In.)	Leg Width (In.)	Opening Width (In.)	Center Line (In.)
2FL	17.00	12.00	10.25	8.50
3FL	22.90	17.90	14.40	11.45
4FL	29.00	24.00	22.25	14.50

## BACKROOM REQUIREMENTS

Typically the supplies for the unit are located in a backroom adjoining the service area. Syrup, water and CO<sub>2</sub> lines are then run from the backroom to the service area. The backroom supplies (syrup boxes, CO<sub>2</sub>, water filters and pumps) are typically installed on a rack system that sits on the floor, as shown in Figure 3. The CO<sub>2</sub> cylinder is normally mounted against the wall.



Figure 3.

## SUPPLY CONNECTIONS

All of the electrical and supply connections to the unit are typically located near the bottom rear of the unit. There are alternate locations for the electrical and supply connections on the bottom of the unit, below the rear locations. The bottom connection locations may be used if the unit is located directly against a wall.

The electrical connection is located at the left side of the rear panel and the tubing supplies are located on the right side, as shown in Figure 4.

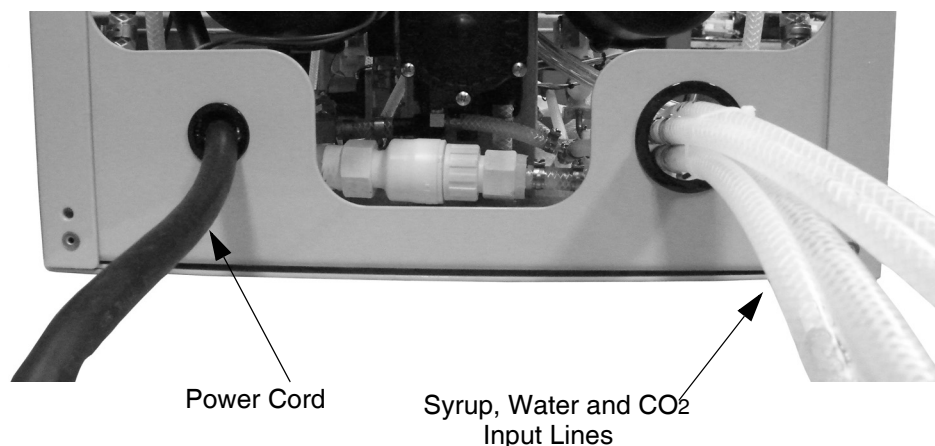


Figure 4.

## Electrical Requirements

Refer to the nameplate to determine the power requirements before connecting electrical power to the unit. All of the power cords shall comply with safety requirements outlined in the EC Standards (EN60335-1 1 Clause 24.1) in countries where CE compliance is required. All cords must be HD 21 or HD 22.

### Line Voltage

The recommended line voltage range for the Viper unit is 215 to 245VAC. Measure the voltage at the wall outlet to verify proper wiring of the outlet before plugging the Viper unit in.

### Power

The power circuit must have some sort of overload protection, such as a circuit breaker or fuse that meets local and national electrical codes. Table 2. shows the power requirements for the various types of units.

Table 2.

3-Barrel 60Hz	4-Barrel 60Hz
30 A. Circuit	30 A. Circuit

### Electrical Connections

To connect AC power to the unit, perform the procedure in Table 3. 60Hz units are supplied with the power cord attached. Skip installation information in Table 3. and begin with the Water Supply Requirements section.

Table 3.

Step	Action
1	Ensure that power to the unit is off. <b>DO NOT</b> plug the power cord into the wall outlet at this time.
2	60 Hz unit open the merchandiser door to access main electrical box.
3	Remove the cover from the electrical box.
4	Feed the power cord through the strain relief, as shown in Figure 5. for 60 Hz.
5	Pull the slack out of cable and tighten the strain relief (see Figure 5. for 60 Hz)
6	Connect the colored wire to the appropriate terminal on the terminal block.
7	Connect the black wire to the appropriate terminal on the terminal block.
8	Connect the green wire to the ground terminal next to the terminal block.
9	Replace the power box cover. <b>DO NOT TURN ON THE POWER</b> at this time.

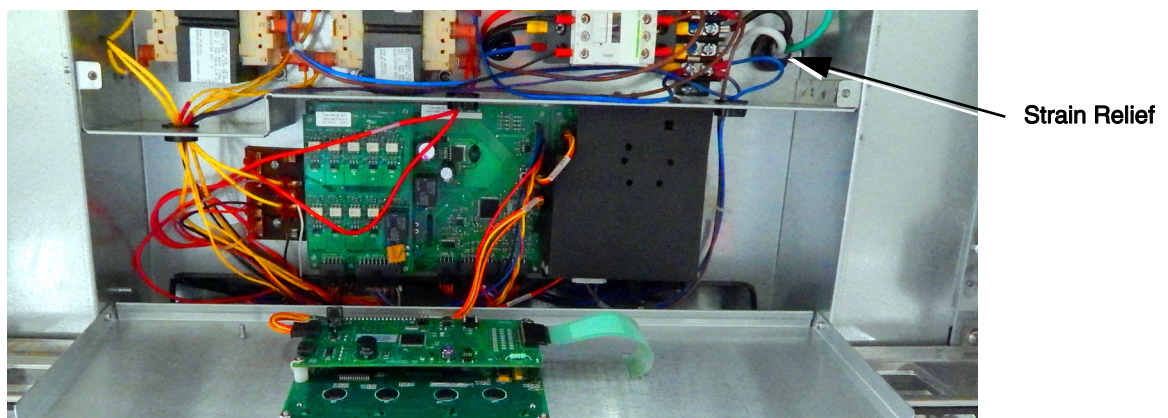


Figure 5. (60 Hz unit)

## Water Supply Requirements

**NOTE: Water connections require 1/2" I.D. tubing. All hoses must reach the back of the unit plus an adequate amount of extra tubing to allow the unit to be pulled out for servicing.**

The Viper unit is designed as a high throughput unit. It is very important that the incoming water line is dedicated to the unit. This line should not have any other machines connected which could cause a water surge, such as coffee makers or ice machines.

### **IMPORTANT:**

The water supply should be consistent with proper water quality standards (neutral pH of 7.0 to 8.0), and should not be connected to a water softener. Drink quality may be affected by poor water conditions. Water connections should be sized, installed and maintained according to federal, state and local laws.

**NOTE: Size, install, and maintain the water pipe, connections, and fixtures directly connected to a potable water supply in accordance with Federal, State, and Local codes. It is the installer's responsibility to ensure that the potable water supply is equipped with protection against backflow. This protection can be an air gap as defined by ANSI/ASME A112.1.2-1979 or by an approved vacuum breaker or other approved method. If the flowing water pressure at the back of the unit is less than the specified 25 psi and 100 GPH flowrate (per 2 barrels) a water pressure booster is required. It is recommended that a water shutoff valve and water filter be installed in the water supply line.**

### Water Connections

Use the appropriate fittings and clamps to connect the water line to the unit. Run the tubing for the water (1/2 in. ID, Min.) from the water source in the backroom to the unit and make all appropriate connections. **Do not** turn on the water supply to the unit.

## CO<sub>2</sub> Requirements

### **WARNING:**

CO<sub>2</sub> displaces oxygen. Persons exposed to high concentrations of CO<sub>2</sub> will experience tremors, followed by loss of consciousness and death. It is very important to prevent CO<sub>2</sub> leaks, especially in small unventilated areas. If a CO<sub>2</sub> leak occurs ventilate the area before fixing the leak.

**NOTE: There are two CO<sub>2</sub> delivery systems available:**

- High pressure Cylinder requires a Primary Regulator with a minimum inlet pressure of 500 psi.
- Low Pressure Bulk System requires a Secondary Regulator with a Maximum inlet pressure of 200 psi.

**NOTE: CO<sub>2</sub> connections require 3/8" I.D. tubing. All hoses must reach the back of the unit plus an adequate amount of extra tubing to allow the unit to be pulled out for servicing.**

**NOTE: Two secondary regulators are required after the CO<sub>2</sub> supply. The dedicated secondary regulator adjusted to 75 +/- 1 psig to supply the unit. It is highly recommended that this be within 10 ft. of the unit and that the CO<sub>2</sub> source is not shared.**

### CO<sub>2</sub> Connections

Use a source-dedicated secondary regulator, fittings and clamps to connect the CO<sub>2</sub> line to the unit, as shown in Figure 6. Set the regulator for 75 +/- 1 psig at the unit. Run the tubing for the CO<sub>2</sub> from the secondary regulator to the unit and make all appropriate connections. Ideally, locate the regulator within **3 ft.** of the unit. Another secondary regulator is to be used to supply the Bag in Box pumps. It is to be set to 75 psig, not lower. **Do not** turn on the CO<sub>2</sub> supply to the unit.

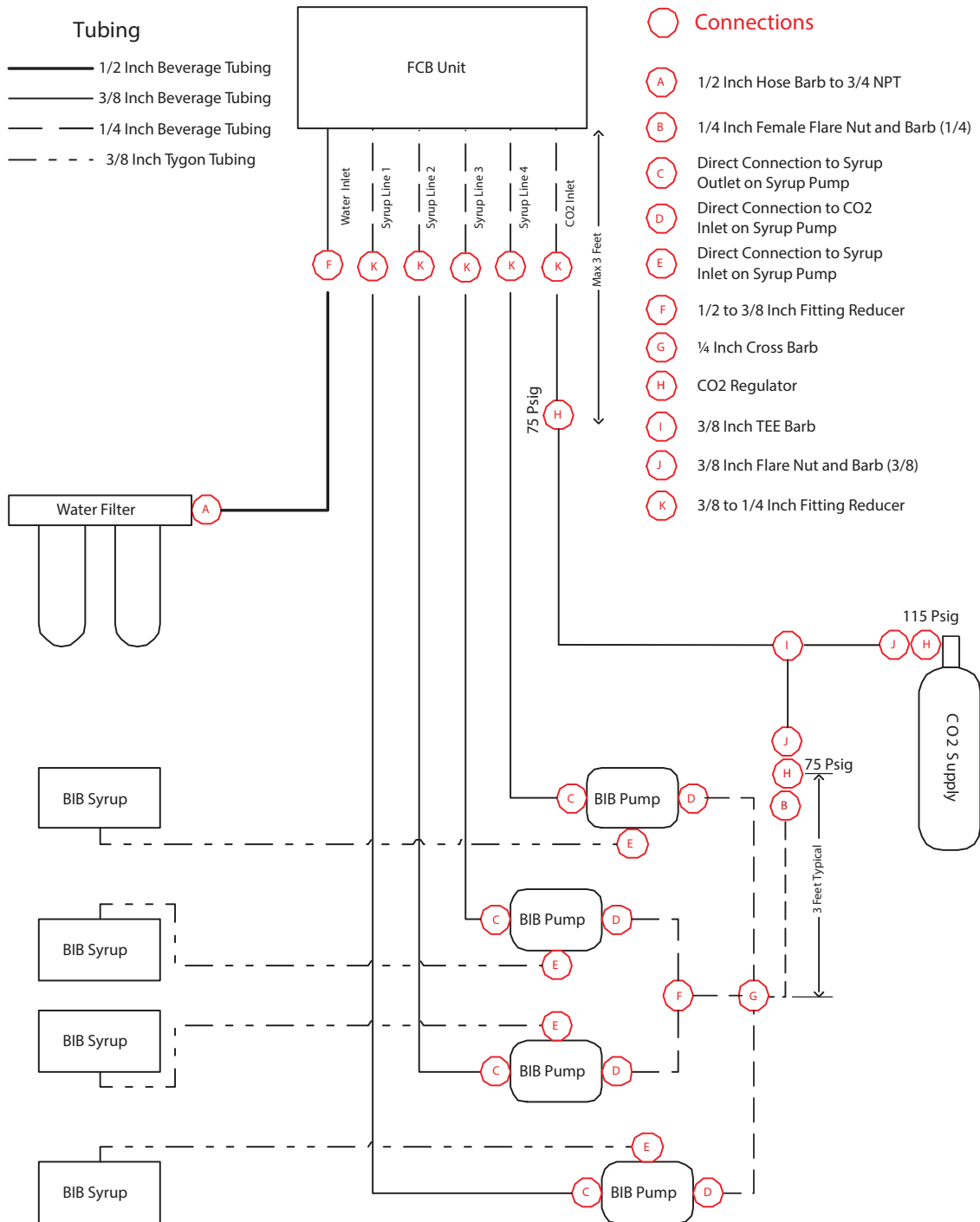


Figure 6. Cylinder CO2 Connection

## Syrup Requirements

**NOTE: Syrup connections require 3/8" I.D. tubing. All hoses must reach the back of the unit plus an adequate amount of extra tubing to allow the unit to be pulled out for servicing.**

## Syrup Connections

Use the appropriate fittings and clamps to connect the syrup line to the unit. Run the tubing for the syrup (3/8 in. ID, Min.) from the backroom to the unit and make all appropriate connections. **Do not** turn on the syrup supply to the unit.

## Testing Power

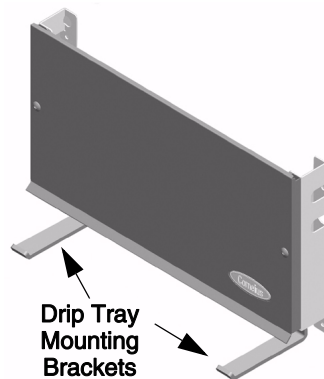
The following procedure provides a minimal operational test of the power to the unit. Perform the procedure in Table 4.

Table 4.

Step	Action
1	Verify the voltage being supplied to the unit. It should be between 215 and 245 Volts, measured at the wall outlet.
2	Plug in the unit power cord and turn on power to the unit.
3	The barrels are off when the unit is initially powered up and the unit displays the "Water Out" message.
4	Unit powers up with Do Not Drink and Out of Product lights on.
5	If the unit displays normal startup operation, proceed to "Setting Up the Control Panel" on page 14.

## INSTALLING THE DRIP TRAY

Slide the drip tray into the two brackets protruding from the bottom of the unit until the tray contacts the two detents in the brackets. Then place the cup rest on the drip tray.



## INSTALLING THE GRAPHICS SHEET

Remove the screw from the top of the merchandiser door, flip the top cover backward and insert the graphic sheet. The graphic sheet should be inserted between the diffuser and the clear plastic graphic lens. Once the graphics are in place, flip the top cover back to the original position, replace and tighten the screw.



Figure 7.



## CART INFORMATION AND MOUNTING

The Viper unit may be mounted on a mobile cart (Cornelius part no. 620043075 for 2-barrel unit, 620053990 for 3-barrel unit and 620046556 for 4-barrel unit) which allows some movement of the unit for service and cleaning. There are four captive nuts on the bottom of the Viper to accommodate four 3/8-16 bolts. These bolts must be installed to secure the unit to the cart.

These carts are also designed with movable wheels that act as outriggers to provide stability to the unit when it is being moved.

### **WARNING:**

The above listed mounting bolts must be installed and the wheels extended and locked in the outboard position prior to moving the unit.

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

This completes the initial installation of the unit. The following sections describe the control panel operation and commissioning the unit.

## CONTROL PANEL OVERVIEW

Behind the merchandiser is the control panel which includes the LCD display, shown in Figure 8. This panel controls all the functions of the unit including defrost cycles, viscosity control, sensing of supply pressures and the incoming line voltage as well as other functions and features.

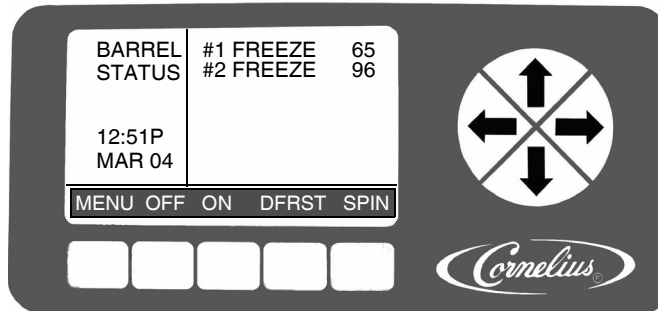


Figure 8.

## SETTING UP THE CONTROL PANEL

When the unit is initially powered up, the Main Check menu, shown in Figure 9, is displayed.

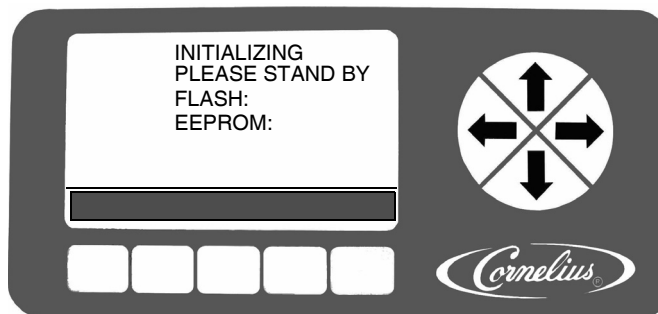


Figure 9.

The software runs tests on the flash memory and the EEPROM. If they pass, PASS is displayed to the right of the appropriate line and the system displays the System Check State screen, shown in Figure 10.

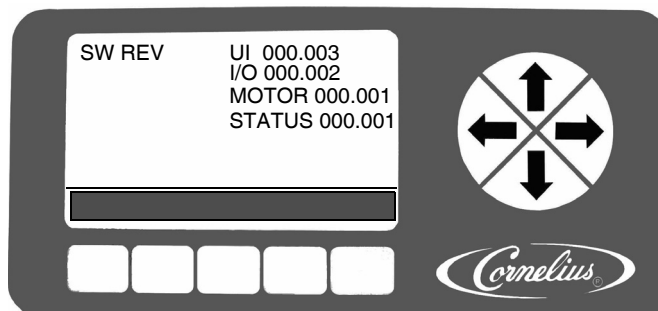


Figure 10.

Once the System Check State verification is complete, the display automatically displays the Barrel Status menu. This is the normal or home screen for the system when the unit is running properly. It shows the status of all barrels in the system, as shown in Figure 11. During initial power up, the barrel status is off, indicating that the unit is in idle mode, with refrigeration off, product delivery off and the barrel motor off.

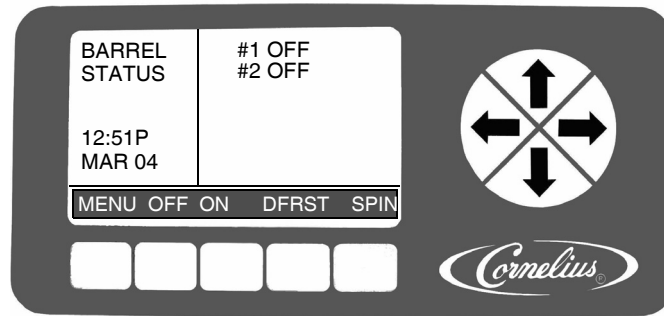


Figure 11.

From this screen, all the other screens may be accessed. The following procedures are required for initial setup of the unit.

- Set the Options
- Set the Clock
- Set the Sleep and Wake Times
- Set the Viscosity

## Setting the System Options

The first items that should be set are the formatting options. These formatting options are located in the Option Setup menu. To access the Option Setup menu, press the MENU button on the Barrel Status menu. This displays the MAIN menu, shown in Figure 12. Then press the SETUP button to display the Option Setup menu, shown in Figure 13.

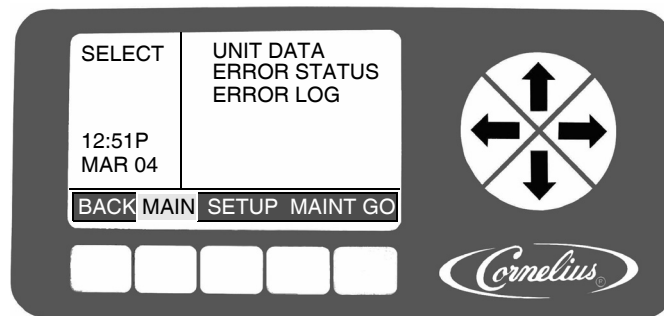


Figure 12.

Use the up and down arrows on the right side of the control panel to move between the various choices on the display. When the OPTION SETUP selection is highlighted, press the GO button to access the menu. The Option Setup menu (Figure 13.) is displayed.

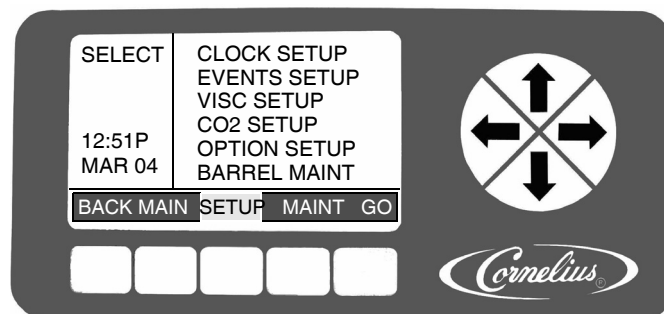


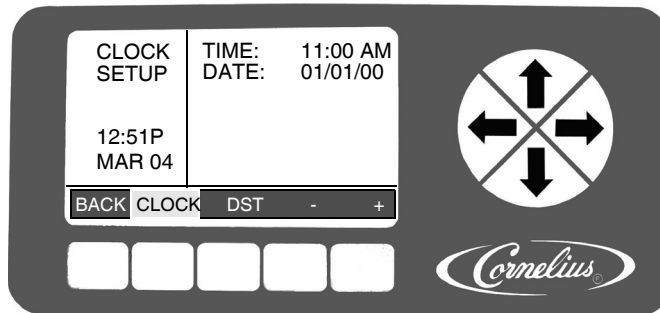
Figure 13.

### Setting the Clock

Highlight the CLOCK SETUP field from the Select menu, shown in Figure 13. This displays the Clock Setup menu, shown in Figure 14. To set the time, perform the procedure in Table 5.

**Table 5.**

Step	Action	Procedure
1	Set clock time	Use the up and down arrows on the right side of the control panel to highlight the TIME display on the screen.
2	Select hour field	Use the left and right arrows to select the hour field
3	Set correct hour	Use the + or - buttons at the bottom of the display to set the proper hour.
4	Select minute field	Use the left and right arrows to select the minute field.
5	Set correct minute	Use the + or - buttons at the bottom of the display to set the proper minute.
6	Select AM/PM field	If the 12 hour clock option is selected, use the left and right arrows to select the AM/PM field.
7	Set AM/PM	Use the + button at the bottom of the display to set the AM/PM setting, if using 12 hour format.



**Figure 14.**

To set the date, perform the procedure in Table 6. and refer to Figure 14.

**Table 6.**

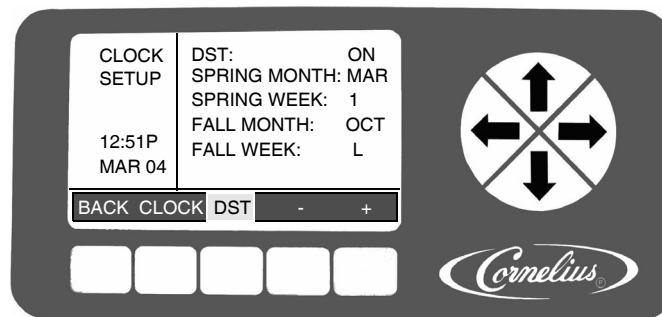
Step	Action	Procedure
1	Set date	Use the up and down arrows on the right side of the control panel to highlight the DATE display on the screen.
2	Select month field	Use the left and right arrows to select the month field
3	Set correct month	Use the + or - buttons at the bottom of the display to set the correct month.
4	Select day field	Use the left and right arrows to select the day field.
5	Set correct day	Use the + or - buttons at the bottom of the display to set the correct day.
6	Select year field	Use the left and right arrows to select the year field.
7	Set correct year	Use the + or - buttons at the bottom of the display to set the correct year.

### Setting Daylight Savings Time

Once the date and time are set properly, the daylight savings time settings can be done. Display the Daylight Savings Time menu (Figure 15.) by pressing the DST button at the bottom of the display. To set daylight savings time, perform the procedure in Table 7.

**Table 7.**

Step	Action	Procedure
1	Set daylight savings time	Press the DST button at the bottom of the display to open the daylight savings time display, shown in Figure 15.
2	Select DST	Use the up and down arrows to select DST.
3	Set DST on	Use the + button to turn on daylight savings time.
4	Select SPRING MONTH	Use the up and down arrows to select SPRING MONTH.
5	Set SPRING MONTH	Use the + or - buttons at the bottom of the display to set the correct month.
6	Select SPRING WEEK	Use the up and down arrows to select SPRING WEEK.
7	Set SPRING WEEK	Use the + or - buttons at the bottom of the display to set the correct week. The choices are 1, 2, 3 or L.
8	Select FALL MONTH	Use the up and down arrows to select FALL MONTH.
9	Set FALL MONTH	Use the + or - buttons at the bottom of the display to set the correct month.
10	Select FALL WEEK	Use the up and down arrows to select FALL WEEK.
11	Set FALL WEEK	Use the + or - buttons at the bottom of the display to set the correct week. The choices are 1, 2, 3 or L.



**Figure 15.**

When the daylight savings settings are complete, press the BACK button to save the settings and return to the Select menu, shown in Figure 13.

### Options Setup Menu

The Option Setup menu allows the user to set the various options available in the system. These options are listed in Table 8. The functions of the display buttons change, depending on the highlighted selection on the Option Setup screen. The Option Setup menu is shown in Figure 16.

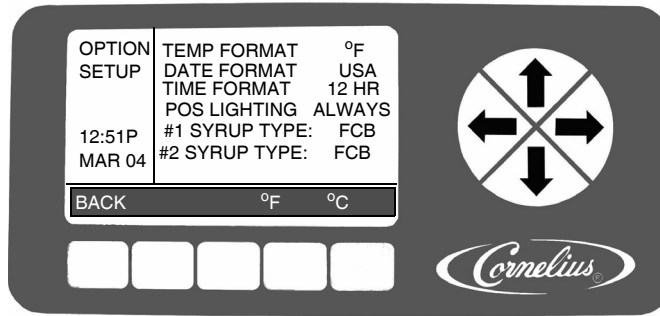


Figure 16.

Table 8.

Option	Button 2	Button 3	Button 4	Button 5
Temp Format			°F	°C
Date Format			USA	EURO
Time Format			12 HR	24 HR
POS Lighting		OFF	ALWAYS	SLEEP
#1 SYRUP TYPE	FCB	FCB-L	FUB	FUB-L
#X SYRUP TYPE	FCB	FCB-L	FUB	FUB-L

When all the options are set to the desired settings for the unit, press the BACK button to store these settings and return to the Select menu, shown in Figure 13.

### Setting the Temperature Format

The temperature format displayed by the unit may be set to either Centigrade or Fahrenheit. Press the °F button to display readings in Fahrenheit and press the °C button to display readings in Centigrade.

### Setting the 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.

### Setting the Time Format

Time format 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 (23:05), press the 24 HR button.

### Setting the POS Lighting

POS Lighting is controlled by the POS LIGHTING field on the Option Setup menu (Figure 16.). To turn off the merchandiser lighting, press the OFF button while the POS LIGHTING field is highlighted. To turn on the merchandiser lighting permanently, press the ALWAYS button. To turn the merchandiser lighting on and off with the Sleep settings, press the SLEEP button.

### Setting the Type of Syrup

Syrup type for each barrel may be selected by highlighting the desired barrel and pressing the appropriate button, FCB, FCB-L, FUB or FUB-L. FCB is for Frozen Carbonated Beverage, FCB-L is for Frozen Carbonated Beverages - Light (diet), FUB is for Frozen Un-carbonated Beverages and FUB-L is for Frozen Un-carbonated Beverages - Light (diet). Each of these settings provides the proper viscosity and temperature settings for the type of syrup being used.

## Events Setup Menu

Events setup allows the user to set sleep periods for the unit and to lock out the defrost cycle during peak busy times. Sleep periods and defrost lockouts may be programmed for individual days of the week or for every day of the week, depending on location requirements.

### Setting Defrost Lockout

From the Barrel Status menu, shown in Figure 11., press the MENU button and then press the SETUP button to display the Setup menu. Use the up and down arrows on the right of the control to highlight the Events Setup menu, then press GO to enter the menu (Figure 17.).

This menu allows the user to set the unit for a sleep period on individual days or all days of the week. It also provides a lockout for the automatic defrost cycle, so that all barrels have product available during peak usage hours. The lockout can also be set day by day or for all days with up to three lockout periods per day. The defrost lockout affects all barrels in the unit. To set the defrost lockouts, perform the procedure in Table 9. Defrost lockouts should be overlapped by 15 minutes for sequential lockout.

**Table 9.**

Step	Action	Procedure
1	Set defrost lockout	Open the Events Setup menu, shown in Figure 17.
2	Select DAY	Use the up and down arrows to highlight DAY.
3	Set DAY	Use the + and - buttons at the bottom of the display to set the desired day or all days.
4	Select DEFROST LOCK 1	Use the up and down arrows to highlight DEFROST LOCK 1.
5	Set hour field	Use the left and right arrows to select the hour field
6		Use the + and - buttons at the bottom of the display to set the desired hour.
7	Set minute field	Use the left and right arrows to select the minute field
8		Use the + and - buttons at the bottom of the display to set the desired minute (in 15 min. increments).
9	Select AM/PM field	If the 12 hour clock option is selected, use the left and right arrows to select the AM/PM field.
10		Use the + button at the bottom of the display to set the AM/PM field.
11	Save the setting	Press the BACK button at the bottom of the display to save the settings.
12	Select DEFROST LOCK 2	Repeat Steps 2 through 11 for the DEFROST LOCK 2 time, if desired.
13	Select DEFROST LOCK 3	Repeat Steps 2 through 11 for the DEFROST LOCK 3 time, if desired.

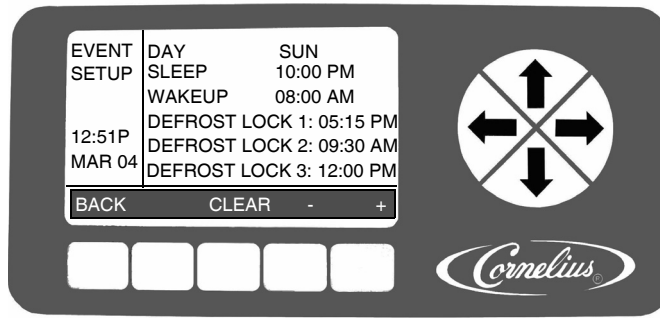


Figure 17.

When the defrost lockout settings are complete, press the BACK button to save the settings and return to the Select menu, shown in Figure 13.

### Setting the Sleep and Wakeup Times

Sleep and wakeup times are set on the Event Setup menu shown in Figure 17. To set the sleep and wakeup times, perform the procedure in Table 10.

**NOTE: Setting the wakeup time ahead of the sleep time on a given day will cause the unit to go into the sleep mode for a week unless the operator initiates a manual wakeup.**

Table 10.

Step	Action	Procedure
1	Set sleep and wakeup times	Open the Events Setup menu, shown in Figure 17, by pressing the GO button.
2	Select DAY	Use the up and down arrows to highlight DAY.
3	Set DAY	Use the + or - buttons at the bottom of the display to set the desired day or all days.
4	Select SLEEP	Use the up and down arrows to highlight SLEEP.
5	Set hour field	Use the left and right arrows to select the hour field
6	Set minute field	Use the left and right arrows to select the minute field
7	Select AM/PM field	If the 12 hour clock option is selected, use the left and right arrows to select the AM/PM field.
8	Select DAY for Wakeup	Repeat Steps 1 through 3.
9	Select WAKEUP	Use the up and down arrows to highlight WAKEUP and repeat Steps 6 through 8 to set the WAKEUP times.
10	Set Wakeup day/time	Repeat Steps 5 through 7.
11	Save the WAKEUP setting	Press the BACK button at the bottom of the display to save the wakeup setting.

When the sleep and wakeup settings are complete, press the BACK button to save the settings and return to the Select menu, shown in Figure 13.

### Setting Viscosity

The viscosity maintained in the freeze barrels depends on the type of product being served. Some products are served best at a higher viscosity, while others require a lower viscosity for best quality. The Viscosity menu allows the user to adjust the viscosity in each barrel to the optimum setting for each type of syrup.

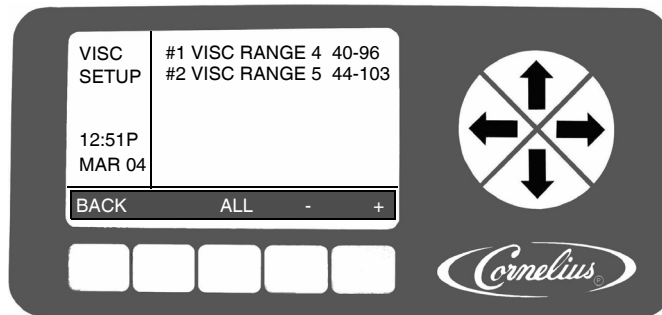


Refer to for Table 14. recommended settings based on syrup type.

**Table 11.**

Step	Action	Procedure
1	Set viscosity range	From the Setup menu (Figure 13.), open the Viscosity Setup menu, shown in Figure 18.
2	Select barrel	Use the up and down arrows to highlight the desired barrel.
3	Set range	Use the + or - buttons at the bottom of the display to set the desired range.
4	Select barrel	Repeat Steps 2 and 3 for each barrel in the machine.

To set all barrels in the system to the same viscosity setting, follow Table 11. and then press the ALL button at the bottom of the display while highlighting the viscosity setting you desire for all the barrels.



**Figure 18.**

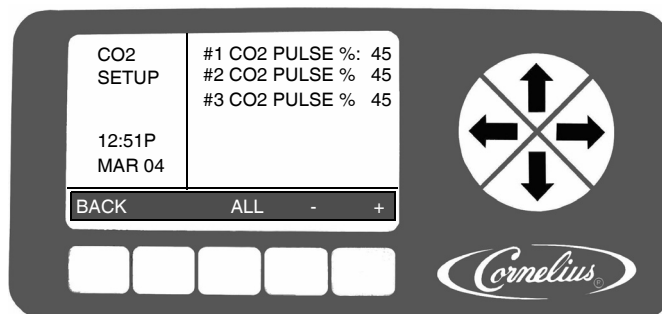
When the viscosity settings are complete, press the BACK button to save the settings and return to the Select menu, shown in Figure 13.

**NOTE: Refer to the service manual for other controller functions and features.**

### CO2 Setup Menu

The CO2 Setup menu, shown in Figure 19. allows the user to adjust the percentage of time that the CO2 pulse valves are open. This provides an adjustment of the overrun for the unit when using different syrups. The valves use a one second interval duration time. Setting a valve to 45 activates the valve for 450 msec. out of each second.

The CO2 pulse valves may be set between 0 and 100%, in 5% increments. To change the settings of the CO2 pulse valves, perform the procedure in Table 12.



**Figure 19. CO2 Pulse Valve Setup Screen**

**Table 12.**

<b>Step</b>	<b>Action</b>	<b>Procedure</b>
1	Set CO <sub>2</sub> Pulse valve duration	From the Setup screen (Figure 13.), select the CO <sub>2</sub> Setup screen, shown in Figure 19.
2	Select barrel	Use the Up and Down arrows to highlight the desired barrel.
3	Select duration field	Use Left and Right arrows to select duration field
4	Set duration	Use the + or - buttons at the bottom of the display to set the desired duration.
5	Select barrel	Repeat Steps 2 through 4 for all barrels.

To set all barrels in the system to the same duration setting, perform Steps 1 through 4 in Table 12. and then press the ALL button at the bottom of the display while highlighting the duration setting you desire for all the barrels. When the duration settings are complete, press the BACK button to save the settings and return to the Select menu, shown in Figure 13.

Refer to the service manual for other controller functions and features.

# COMMISSIONING THE UNIT

## UNIT LOCATION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the unit.

## Pressurizing the CO<sub>2</sub> System

The Viper unit is designed to operate on a CO<sub>2</sub> input pressure of 75 +/- 1 psig. If the installation location has either an independent tank and regulator or a bulk CO<sub>2</sub> supply that feeds more than one machine, a shutoff valve and secondary regulator must be placed in the line from the bulk supply to the Viper unit to reduce the CO<sub>2</sub> pressure at the unit to 75 +/- 1 psig. Perform the procedure in Table 13. to pressurize the CO<sub>2</sub> system.

Table 13.

Step	Action
1	Open the CO <sub>2</sub> cylinder valve <b>slightly</b> to allow lines to slowly fill with gas. When lines are fully pressurized, open the CO <sub>2</sub> cylinder valve all the way until it back-seats itself (this prevents leaks from the valve).
2	Adjust the CO <sub>2</sub> cylinder regulator for the unit to 75 +/- 1psig at the unit. <b>DO NOT TURN THE SYRUP CO<sub>2</sub> REGULATOR ON AT THIS TIME.</b>
3	On the right side of the unit, verify that the expansion tank CO <sub>2</sub> regulator is set to 7 psig, if not correct.  <b>NOTE: The expansion tank regulator should not be adjusted when pressure is applied to the barrels.</b>
4	The Do Not Drink and Out of Product lights remain on. The "H <sub>2</sub> O Out" message should clear and the "Syrup Out" message displays.
5	<b>NOTE: Check for CO<sub>2</sub> leaks by turning off the CO<sub>2</sub> supply to the Viper. Wait at least 3 minutes and check the CO<sub>2</sub> cylinder gauge to see if the pressure has dropped.</b>
6	The Do Not Drink and Out of Product lights remain on.

Table 14. provides guidelines for machine settings based on general syrup type. Several factors, including syrup formulation, level of citric acids, etc, will impact settings. These settings are to provide initial adjustments to achieve product overruns in the 5-40% range.

Table 14.

Syrup Type	Syrup Type Set	Viscosity	CO <sub>2</sub> Setting	Expansion
FCB Syrup w/ Foaming Agent	FCB	3	50	7

**NOTE: For citric syrups, adjust the CO<sub>2</sub> pressures down by 5-10% PSIG from the above to compensate for the lower CO<sub>2</sub> adsorption.**

## Pressurizing the Water System

Perform the procedure in Table 15. to verify the water connection to the unit.

Table 15.

Step	Action
1	Turn on the water supply to the unit.
2	Check the system for leaks.
3	The Do Not Drink and Out of Product lights remain on. <b>NOTE: The H<sub>2</sub>O Out error does not clear until CO<sub>2</sub> pressure is applied.</b>
4	Turn the product supply valve to the down (BRIX) position and open the valve at the end of the sample tube.
5	Place the end of the tube in a bucket.
6	Manually lift the water valve at the front of the unit (Figure 20.) to fill the water system.
7	When water flows from the sample tube, the system is full and you may proceed to Table 13. and pressurize the CO <sub>2</sub> system.
8	Repeat Steps 4 through 7 for each barrel in the unit.

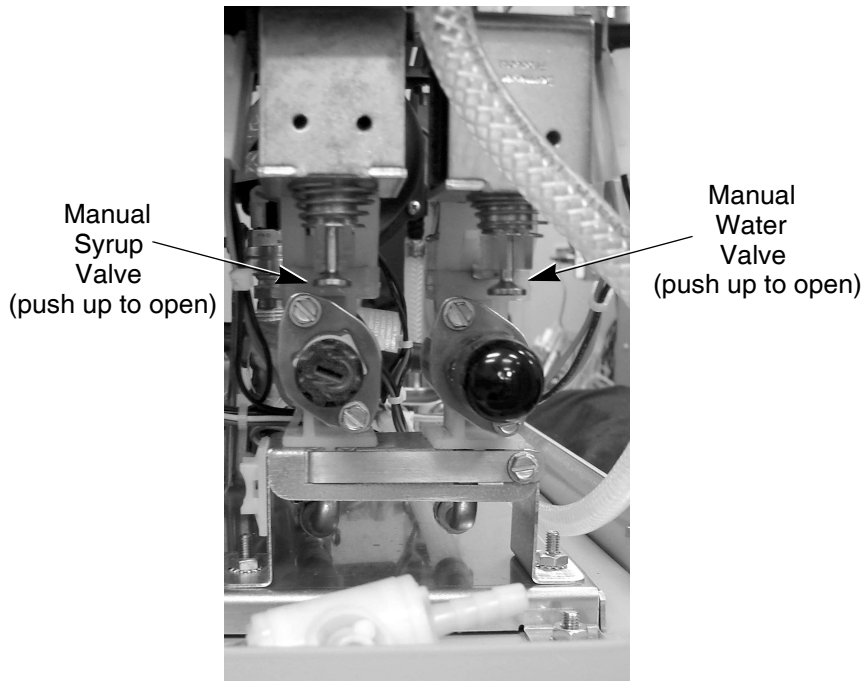


Figure 20.

**NOTE: Remove the valve cover to access syrup and water valves.**

### Pressurizing the Syrup System

Perform the procedure in Table 16. to pressurize the syrup system.

Table 16.

Step	Action
1	Slowly turn on the CO <sub>2</sub> regulator for the syrup BIB pumps to avoid damaging them and set them so there is 75 psig, not lower syrup pressure at the unit.
2	Turn the product supply valve to the down (BRIX) position and open the valve at the end of the sample tube.

Table 16.

Step	Action
3	Place the end of the tube in a bucket.
4	Manually press the syrup valve at the front of the unit (Figure 20.) to fill the syrup system.
5	When syrup flows from the sample tube, the system is full
6	Check the system for syrup leaks.
7	Repeat Steps 2 through 5 for each barrel in the unit.
8	Verify that the Do Not Drink and Out of Product lights go off on all barrels and the "Syrup Out" message clears.

## Setting BRIX

BRIX is important to the quality of the final product. The BRIX menu provides a measured amount of product with a constant volume so that a BRIX comparison can be made between samples. The unit is set to provide a three second dispense of the product for BRIX testing.

### Testing BRIX Level

The BRIX Setup menu is located on the Maintenance menu. The Maintenance menu is shown in Figure 21.

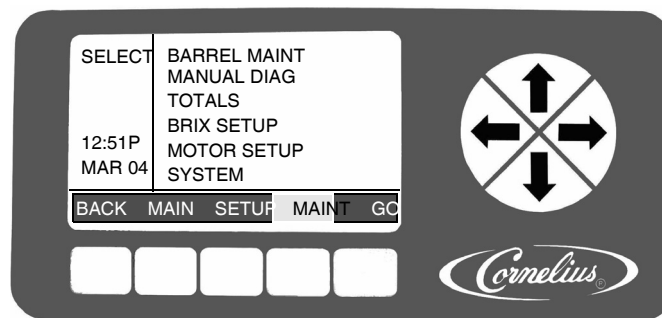


Figure 21.

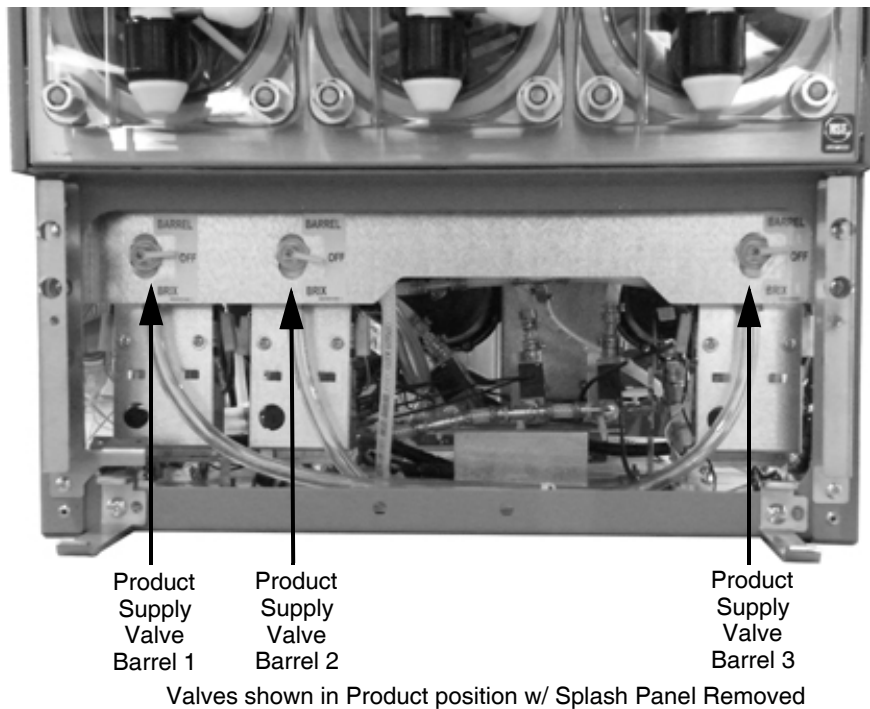
The BRIX Setup menu facilitates the extraction of a sample of product from the unit for BRIX measurement. There is a three second dispense that produces a constant volume dispense so that BRIX comparison can be made between samples.

Table 17.

Step	Action
1	Remove the drip tray by sliding it forward off the mounting brackets.
2	Remove the splash panel behind the drip tray (if not removed).
3	Turn product supply valve to the Down (BRIX) position for the barrel you are going to test. (See Figure 22.)
4	From the Maintenance menu (Figure 21.), open the BRIX Setup menu. <b>NOTE: Entering the BRIX Setup menu turns off all the barrels in the system.</b>
5	Use the up and down arrows to highlight BRIX SETUP. Press the GO button at the bottom of the display.
6	Again use the up and down arrows to select the barrel you wish to perform BRIX on. <b>NOTE: Pressing CANCEL will stop the process.</b>
7	Locate the appropriate barrel sample tube and hold a cup under it.

**Table 17.**

Step	Action
8	Open the valve at the end of the sample tube. Press the BRIX button. The product pump will pump product for approximately 3 seconds. After the sample is dispensed Press the BRIX button twice more to dispense product two more times. Discard all three of these samples.
9	Press the BRIX button again. Collect a sample from the cup.
10	Place adequate amount of the sample on a refractometer and read the BRIX value. A target BRIX reading of <b>12.2 (+/- 0.2)</b> is normally desired for sugar-based syrups. Lower values for some diet syrups can be specified. Check with the syrup manufacturer if you are not sure.
11	If BRIX level needs to be adjusted, perform the Adjusting BRIX Level procedure in Table 18.
12	Repeat this procedure for each barrel in the system.
13	Replace splash panel on unit.



**Figure 22.**

**Adjusting BRIX Level**

If the BRIX reading is out of its proper range, the syrup level should be adjusted to bring BRIX into the proper range. NEVER change the WATER FLOW CONTROL setting to adjust BRIX. The syrup flow control adjustment valve is shown in Figure 23. Perform the procedure in Table 18.

**Table 18.**

Step	Action
1	Remove the drip tray and the access panel behind it, if not already removed.
2	To increase the BRIX reading, turn the syrup flow control knob clockwise. Turn it counter-clockwise to decrease the BRIX reading. Never adjust the flow control more than 1/2-turn at a time.
3	Repeat steps 7 through 10 of Table 17. for each adjustment until the proper BRIX setting is achieved.

Table 18.

Step	Action
4	Manually press the water valve at the front of the unit (Figure 20.) in the middle of the water flow regulator to clean out the sample tube and close the valve at end of the sample tube.
5	Once the BRIX is properly set, turn the product supply valve to the upright (Product) position for the barrel you are testing. (See Figure 22.)
6	From the Barrel Maintenance menu, press the PURGE button to fill the barrel with CO <sub>2</sub> .
7	Bleed the air from the face plate relief valves for 30 seconds each to remove air from the barrels.
8	Go to the Barrel Maintenance menu and press FILL to fill the barrel.
9	Fill the barrel by opening up the barrel faceplate relief valve for the barrel (See Figure 24.). Fill the barrel to the level shown in Figure 24. (approx. half way between the relief valve and the top of the barrel) for 20-25% overrun.
10	After finishing BRIX testing and adjustment for the first barrel, repeat this procedure for each of the other barrels, as required.
11	When BRIX adjustments are complete and all the air is purged from the system, replace the splash panel.  <b>NOTE: If any of the valve covers were removed during the process, make sure to replace them.</b>

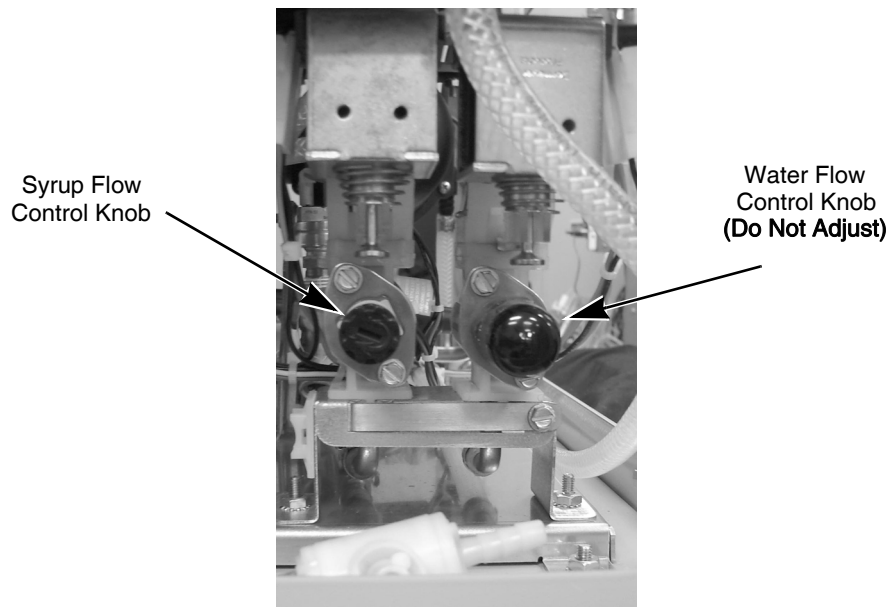


Figure 23.

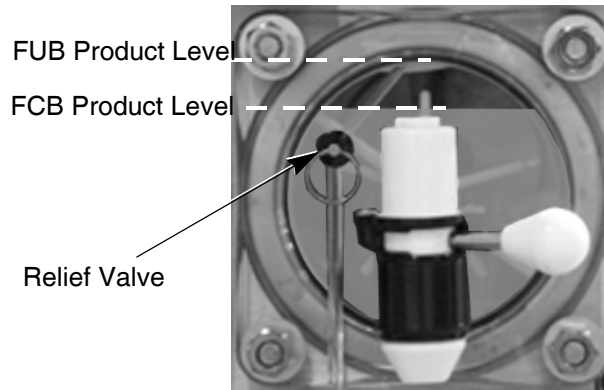


Figure 24.

### Filling the Barrels

Once the barrels have been BRIXed and purged, they may be filled with product. This is accomplished by going to the Barrel Maintenance menu and pressing the FILL button. This starts the fill process for the highlighted barrel. As the barrel fills, the barrel pressure sensor shuts off the barrel at a pressure of 28 psi. To completely fill the barrel, open the relief valve on the faceplate of the barrel and allow some of the barrel pressure to escape. This allows the barrel to continue filling. Repeat this process until the unit reaches the scribe mark indicated in Figure 24. Once the product reaches the proper level, press the OFF button to stop filling the barrel. Press the FREEZE button to start mixing and cooling the product and the CO<sub>2</sub> present in the barrel.

### Calibrating a Motor

Motors are factory calibrated, but storage and transit can cause a shift in calibration. Calibration establishes a new baseline for the motor assembly. This allows the system to determine proper viscosity settings for the motor. As a part of installation, each barrel should be calibrated using the procedure in Table 19. and Table 20..

#### **⚠ CAUTION:**

Calibration must be performed when the product in the barrel is completely liquid. There must not be any ice on the scraper blade.

The Motor Setup Screen in Figure 25. allows you to select different motor types for each barrel in the unit and run the calibration procedure on that motor. This procedure correlates the actual viscosity of the barrel and its contents with the electrical characteristics of the motor. These characteristics are stored by the control system and are accessed at the time of calibration for each particular motor.

Perform the procedure described in Table 19. to verify the motor type setting.

**NOTE: If the Motor Type shown is “DEFAULT”, it indicates that the EEPROM is not installed or is faulty.**

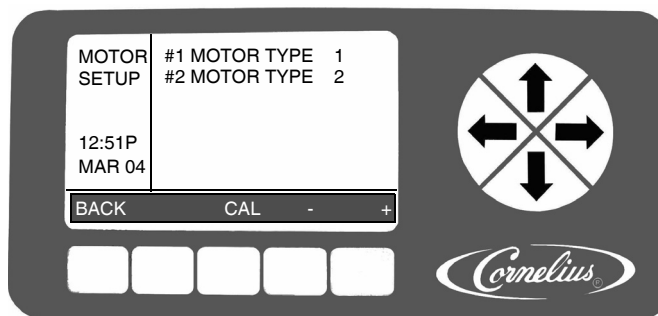


Figure 25.. Motor Setup Screen



Table 19..

Step	Action	Procedure
1	Set barrel for Motor Type	From the Maintenance menu (Figure 26.), open the Motor Setup menu, shown in Figure 25.
2	Select the barrel	Use the Up and Down arrows to highlight the desired barrel
3	Select the proper motor type	Press the + or - buttons at the bottom of the display to set the motor type to 1.
4	Complete the procedure	Press the BACK button at the bottom of the display to save the settings and return to the Setup menu.

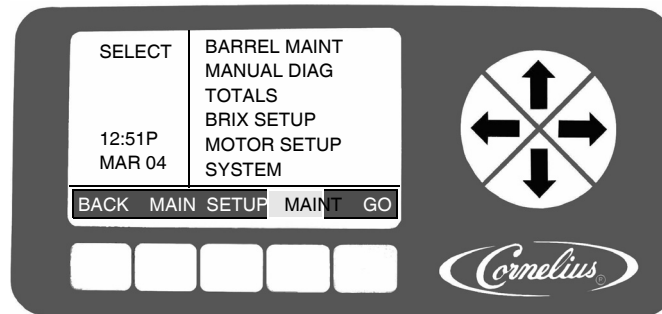


Figure 26. Select Screen

Table 20.

Step	Action	Procedure
1	Select Motor Setup	Use the Up and Down arrows to highlight MOTOR SETUP on the Maintenance menu.
2	Select the barrel	Use the Up and Down arrows to highlight the desired barrel
3	Start calibration	Press the CAL button at the bottom of the Motor Setup menu to start the calibration process.
4		The calibration cycle continues for five (5) minutes to allow the gearbox to stabilize at temperature and ensure correct calibration. At that time the motor stops and it is calibrated.
5	Complete the procedure	Press the BACK button at the bottom of the display to return to the Maintenance menu.
6	Verify	Select SPIN to run the motor and visually ensure that the calibration reading is 20 +/- 2.

## Security Menu

The security is enabled at the factory before shipping the Unit. It is recommended that security be remains enabled after installation.

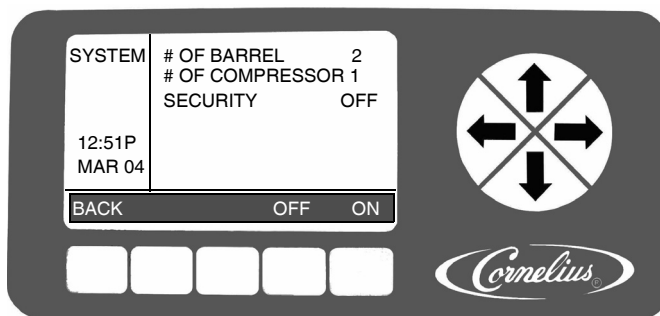


Figure 27.

**Security Disabling:** System security is located on the System menu. It allows a supervisor or service technician to keep unauthorized personnel from accessing the Maintenance menu. This feature is activated on the System menu. When security is turned on, users can only access the Main and Setup menus. The word LOCKED appears in the upper left corner of the display to inform users that security is enabled.

Pressing the extreme 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, on the System menu, when the system times out or when the user goes back to the Main menu, security is reactivated and the Maintenance menu is not accessible. To disable security, access the System menu, highlight Security and press the OFF button

# TROUBLESHOOTING

Table 21.

Problem	Probable Cause	Remedy
Unit will not run.	<ul style="list-style-type: none"> <li>A. Unit not plugged in</li> <li>B. Circuit breaker</li> </ul>	<ul style="list-style-type: none"> <li>A. Plug in unit.</li> <li>B. Reset/replace circuit breaker</li> </ul>
“Sleep” display on Barrel Status menu	<ul style="list-style-type: none"> <li>A. Sleep time set</li> <li>B. Clock incorrectly set</li> <li>C. No or incorrect wakeup time set</li> </ul>	<ul style="list-style-type: none"> <li>A. Check programming</li> <li>B. Check programming</li> <li>C. Check programming</li> </ul>
Barrel Status OFF	<ul style="list-style-type: none"> <li>A. Not activated</li> <li>B. Error has shut down barrels</li> <li>C. Unit in diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>A. Turn barrels to ON or SPIN</li> <li>B. Correct error &amp; turn barrels to ON</li> <li>C. Exit diagnostics &amp; turn barrels ON</li> </ul>
No water pressure	<ul style="list-style-type: none"> <li>A. Water source not turned on</li> <li>B. Filter blocked</li> <li>C. Other</li> </ul>	<ul style="list-style-type: none"> <li>A. Turn on water</li> <li>B. Change filter</li> <li>C. Call Service</li> </ul>



# SPECIFICATIONS

Line Voltage: ..... 215-245VAC

**Max. Current Draw (FLA):**

2 Barrel Unit ..... 20 amps  
 3 Barrel Unit ..... 30 amps  
 4 Barrel Unit ..... 30 amps

Syrup Tubing Size: ..... 3/8 in. I.D., 75 ft. max.

Syrup Pressure: ..... 75 psig (0.52 MPa) max.

Water Inlet Size: ..... 1/2 in. I.D., 75 ft. max.

Water Flow Rate (2 barrel unit) ..... 100 gal. per hr. at 25psig min. flowing pressure

Water Flow Rate (3 barrel unit) ..... 100 gal. per hr. at 25psig min. flowing pressure

Water Flow Rate (4 barrel unit, low cap., single compressor) ..... 100 gal. per hr. at 25psig min. flowing pressure

Water Pressure ..... 25 psig min (0.17 MPa), 90 psig (0.62 MPa) max.

Ventilation Clearance, Standard Condenser ..... 2" on both sides or back  
 ..... 12" on top of the unit

**Equipment Weight:**

2 Barrel Unit ..... 410 lb.  
 3 Barrel Unit ..... 465 lb.  
 4 Barrel Unit ..... 500 lb.

CO<sub>2</sub> Tubing Size: ..... 3/8 in. I.D., 75 ft. max.

CO<sub>2</sub> supply pressure to Viper should **never exceed 75 psig (0.52 MPa)**

**CO<sub>2</sub> Pressures:**

To Unit ..... 70-75 psig  
 To BIB Pumps ..... 75 psig  
 To Barrels ..... (36-40 psig typically for FCB)  
 To Expansion Tank (non-adjustable) ..... 7.0 psig

Product Flow Rate: ..... 2 oz./sec.

BRIX: ..... 13 ±1 standard

Viscosity Setting Range ..... 1-9

Height: ..... 37 in.

**Width:**

2 Barrel Unit ..... 17 in.  
 3 Barrel Unit ..... 22.75 in.  
 4 Barrel Unit ..... 29 in.

Depth (including drip tray): ..... 35 in.

Operating Temperature: ..... 55° to 95° F

## NOISE LEVEL

This unit emits acoustical noise with an A-weighted sound pressure level no greater than 75dB, as measured in accordance with ED 60335-2-75.



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