FCB PINNACLE

2 and 4 Flavor

Service Manual

FCB - 2 Flavor

FCB - 4 Flavor

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CONTACT INFORMATION

The products, technical information, and instructions contained in this manual are subject to change without notice. These instructions are not intended to cover all details or variations of the equipment, nor to provide for every possible contingency in the installation, operation or maintenance of this equipment. This manual assumes that the person(s) working on the equipment have been trained and are skilled in working with electrical, plumbing, pneumatic, and mechanical equipment. Appropriate safety precautions should be followed and all local safety and construction requirements should be met.

To inquire about current revisions of this and other documentation, or for assistance with any Cornelius product contact:

www.cornelius.com

800-238-3600

Printed in U.S.A.

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SAFETY

SAFETY INSTRUCTIONS

Read and Follow all Safety Instructions

Read and follow all safety instructions in this manual and on the machine (decals, labels, and laminated cards).

Read and understand all applicable OSHA (Occupation Safety and Health Administration) safety regulations before operating the machine.

Recognize Safety Alerts

This is the safety alert symbol. When you see it in this manual or on the machine be alert to the potential of personal injury or damage to the machine.

Different Types of Alerts

There are 3 types of safety 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 all safety messages in this manual and safety signs on the machine.
- Keep safety signs in good condition and replace missing or damaged safety signs.
- Learn how to operate the machine and how to use the controls properly.
- Do not let anyone operate the machine 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 machine in proper working condition and do not allow unauthorized modifications to the machine.

QUALIFIED SERVICE PERSONNEL

CAUTION — Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES.

CO_2 (CARBON DIOXIDE) WARNING

WARNING — CO_2 Displaces Oxygen. Strict Attention **must** be observed in the prevention of CO_2 gas leaks in the entire CO_2 and soft drink system. If a CO_2 gas leak is suspected, particularly in a small area, **immediately** ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO_2 gas will experience tremors which are followed rapidly by loss of consciousness.

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Shipping And Storage

CAUTION — Before shipping, storing, or relocating the Unit, syrup systems must be sanitized and all sanitizing solution must be purged from the syrup systems. All liquids, after sanitizing, must be purged from the unit. A freezing ambient environment will cause residual sanitizing solution or water remaining inside the Unit to freeze resulting in damage to the internal components.

Magnet Warning

CAUTION — After removing the very strong magnet from the freeze cylinder, be careful to avoid crushing fingers between the magnet and any ferrous metal. Keep the magnet free from metallic debris and wipe clean prior to reinstallation.

WARNING — Strong Magnetic Field.
Person wearing pacemaker, implanted cardioverter defibrillator, or other implanted medical device may be affected by the magnetic field and must keep the magnet at 6 or more inches from the device. The magnetic field can affect operation of these devices which may cause bodily injury or death.

If disruption of device occurs or operation is adversely effected, immediately move the victim far away from magnet and seek medical assistance.

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SYSTEM OVERVIEW

PRODUCT OVERVIEW

The 2 and 4 Flavor Pinnacle (see pictures below) consists of the following:

- 2 or 4 freeze cylinders each containing an internal beater bar driven by DC electric motors, utilizing external stator coils and internal rotor magnets. These motors contain no seals there by eliminating leakage and minimizing preventive maintenance.
- A DC motor using magnetics to drive the beater bars in each cylinder.
- 1 refrigeration systems per 2 barrels, 1 blendonator assembly per barrel, a programmable defrost system to defrost the freeze cylinders, and interconnecting tubing, components and fittings necessary to regulate, transfer, and dispense a quality frozen carbonated product.
- The components are enclosed in a steel frame. The frame is then covered with panels.
- The panels enclosing the components and frame are easily removable to facilitate installation, service, and maintenance.
- Each barrel has a transparent faceplate, with an integral relief valve and a removable self-closing dispensing valve mounted on the front of each faceplate.
- A removable drip tray, with cup rest is located directly below the dispensing valves.
- Lighted merchandising compliments each unit.
- 2 or 4 blendonators using a refrigerated ice coil and water bath to cool the product before carbonating.
- 1 self contained refrigeration system for the 2 flavor and 2 for the 4 flavor.
- A programmable system to defrost the freeze cylinders, and components that dispense the product.
- Control Panel with 5 buttons that control operational and diagnostic functions and settings.

FIGURE 1

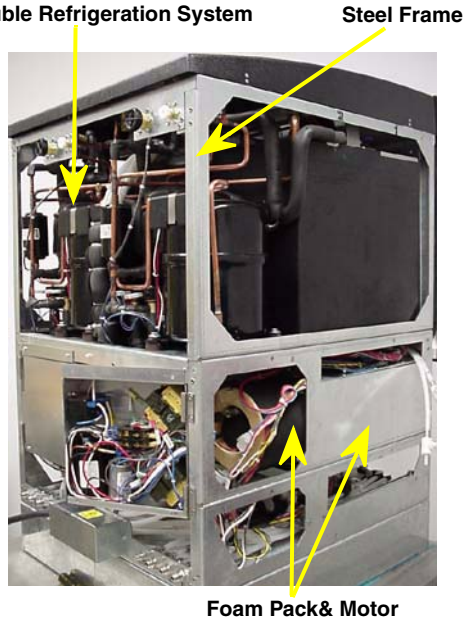

FIGURE 2

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SPECIFICATIONS

Dimensions

	Overcounter Integral/Remote 2 Flavor	Overcounter Integral/Remote 4 Flavor	Overcounter Integral/Remote 2 Flavor w/ Cornelius Cart	Overcounter Integral/Remote 4 Flavor w/ Cornelius Cart
Height	43.75 in.	43.75 in.	74.75 in.	74.75 in.
Width	14.5 in.	28 in.	14.5 in.	28 in.
Depth	31 in. 36 in. (with drip tray)	31 in. 36 in. (with drip tray)	32 in. 37 in. (with drip tray)	32 in. 37 in. (with drip tray)
Shipping weight	429 lbs. (approx.)	732 lbs. (approx.)	525 lbs. (approx.)	858 lbs. (approx.)

Line Voltage

The recommended line voltages for the Pinnacle unit are as follows:

The unit has a low voltage cut out at 180 VAC and a high voltage cut out at 260 VAC.

Voltage	Corrective Action
Below 180 V	Do not connect unit.
180 to 190 VAC	Boost voltage by +32 V.
191 to 207 VAC	Boost voltage by +16 V.
208 to 240 VAC	Use line voltage.
241 to 253 VAC	Reduce voltage by -16 V.
254 to 272 VAC	Reduce voltage by -32 V.
Above 272 VAC	Do not connect unit.

Accessories — Included

Magnet puller 560003662

John Guest fitting tool 560003481

Brush 325216000

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Accessories — Optional

Installation kit	1155
Cup holder	511006000
Cornelius refractometer, 0-30 scale	511004000
Transformer	325674000
Remote Condensing Unit (one required for each two barrels)	631700512
Refrigeration line sets (one required for each two barrels)	561441250
Refrigeration line sets with flexible end and 90 degree fittings (one required for each two barrels)	561441253
Cornelius cart, stainless steel, 2 Flavor	620201705
Cornelius cart, stainless steel, 4 Flavor	620201701
Leg 4” Height (4 required per unit)	3184
2 FL Generic main graphic and flavor card set	560007299
4 FL Generic main graphic and flavor card set	560007300

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OPERATION AND SERVICE

MAINTAINING PRODUCT QUALITY
CORNELIUS FCB EQUIPMENT - OPERATOR INSTRUCTIONS

It has been determined that the following factors can affect the rate at which product quality diminishes (as indicated by a change in product appearance).

1. Dispensed Product Throughput
2. Programmed Defrost Scheduling
3. Viscosity Setting

Cornelius recommends the following instructions be read and followed relative to operating and establishing settings with the FCB equipment. Cornelius equipment service manuals contain instructions on how to program settings within the control system. Operators who have not been trained on servicing Cornelius FCB equipment should not attempt to modify equipment settings but should contact an accredited service provider.

Cornelius makes the following recommendations to help assure maximum product quality:

1. Dispensed Product Throughput

FCB equipment is designed to provide a high throughput of frozen carbonated dispensed product to meet peak draw demands. Where low product throughput is experienced, there is the potential for product quality to diminish. The matrix below outlines the minimum throughput per barrel that must be dispensed on a 24 hour basis.

Dispensed product throughput matrix[1]

Pinnacle	Viscosity </= 4	Viscosity >4
Volume of dispensed product per barrel per 24 hours required to maintain product quality.	48 oz	60 oz

Cornelius recommends that, in conditions where the FCB machine is operational and the minimum throughput (set forth in the matrix above) is not met on a per barrel basis, product should be dispensed and discarded to increase throughput and help assure that product quality is maintained.

2. Programmed Defrost Scheduling

The control system in Cornelius FCB equipment includes a function to automatically defrost product in the barrel at programmed times. Programmed defrosts must be scheduled frequently to ensure that product quality within the barrel is maintained. Failure to defrost regularly during periods of low throughput will allow increased ice crystal growth, with a possible decrease in product quality and will cause drive errors. Regular throughput of dispensed product will replenish the barrel frequently with liquid and reduce the requirements of programmed defrosts.

Cornelius recommends that programmed defrosts be scheduled to occur during any 3 hour window during which time dispensed product throughput is low. Low throughput is defined as less than 8 x 16oz drinks per barrel during any 3-hour window.

1. Data in matrix assumes equipment has been correctly installed, commissioned and calibrated as per directions contained in all technical literature published by Cornelius and the recommendations contained in this document have been followed.

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3. Sleep Mode Recommendations

Cornelius recommends programming a sleep for any period of time, over 3 hours, in which the unit will not have any usage. If the programmed sleep is longer than 6 hours, Cornelius also recommends turning the ice bank off in the options menu. This will increase the life of the machine and reduce the energy consumption.

A wake time must be programmed to return the unit to normal operation. Cornelius recommends programming the wake 30 minutes before the unit is needed if the ice bank option is set to ON and 60 minutes before the unit is needed if the ice bank option is set to OFF. These are the time recommended if the ambient temperature is at 75^{o}F. The times will vary depending on the ambient temperature (a higher ambient temperature require more time for the ice bank to build).

4. Viscosity Setting

The control system in Cornelius FCB equipment includes a function to select the desired product viscosity. This function is referred to as “Viscosity Setting”. There is a selectable Viscosity range of 1–9 for the Pinnacle. The higher the number selected the more viscous the frozen product in the barrel will become. This increased viscosity is achieved by freezing the product in the barrel to a lower temperature thereby increasing ice crystal size/growth. As the ice crystal size increases, however, there is potential for product quality to diminish.

Cornelius recommends that the viscosity settings be set at the lowest possible setting to achieve the desired drink quality. In most typical installations using a sugar-based syrup, acceptable drink quality can be achieved by programmed Viscosity Settings in the range of 3-5 for Pinnacle.

Diet FCB syrups freeze much more readily than sugar based syrups, so the Viscosity Setting should be selected at the minimum value available (which is 1 for the Pinnacle).

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SERVICE

CAUTION — Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES.

PREVENTIVE MAINTENANCE

Preventive Maintenance Summary

Preventive Maintenance Summary	
Procedure	**Frequency**
Clean air filter (on air cooled units)	Monthly or as necessary
Clean condenser	every 6 months
Sanitize unit	every 6 months
Change or rotate scraper blades	every 6 months
Inspect Double Liquid Check Valve	every 6 months
Check for leaks	every 6 months
Check BRIX	every 6 months
Clean BIB connectors	every 6 months
Check clock setting	every 6 months

Cleaning Air Filter (Integral Only)

1. The air filter should be cleaned every month. Remove the filter by sliding it straight back. Wash with mild soap solution, rinse with clean water, and shake out excess water (or blow with low pressure compressed air if available).
2. Vacuum the condenser coil or blow it out with low pressure compressed air before reinstalling the air filter.
3. Reinstall the air filter.

Sanitizing

The syrup systems should be sanitized every 6 months per the following procedure using a non-scented liquid household bleach containing a 5.25% sodium hypochlorite concentration.

1. Press <OFF> from the BARREL STATUS menu on the Control Panels to stop beater and refrigeration on all cylinders.
2. Take the following actions from the Control Panel:
   - From the BARREL STATUS menu, press <MENU>.
   - From the CHOOSE MODE menu, select <MANUAL DEFROST> and press <GO>.
   - Select barrel and press <DFRST>.

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3. Close barrel # 1 freeze cylinder shutoff valve (see below).

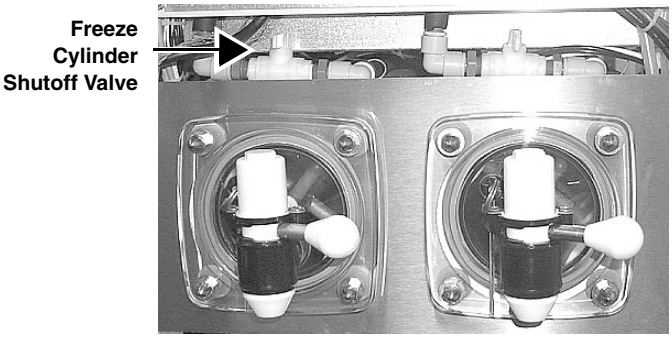

FIGURE 3

4. Turn blendonator #1 OFF (from the BLENDONATOR menu) to prevent more product from entering the blendonator.

5. Place container under barrel # 1 dispensing valve. Open the valve and dispense all product from the freeze cylinder and the blendonator. As product level lowers in the freeze cylinder partially close the valve to avoid spurting.

6. Disconnect bag-in-box from barrel # 1.

7. Wash the system by completing the following steps:

   • Use a clean 5-gallon pail (bag-in-box system) filled with a solution of household liquid detergent and warm water. Mix approximately 1 ounce of household liquid detergent per gallon of warm water.

   • Connect the sanitizing fitting (p/n cc 28688) to the bag-in-box connector. Put the connector in the bucket of wash water.

   • Turn barrel # 1 blendonator ON (from BLENDONATOR menu) to fill blendonator.

   • Fill barrel # 1 with washing solution by repeatedly pulling and releasing the faceplate relief valve until solution comes out.

   • Open the dispensing valve until solution flows from the valve, then close the valve.

   • Open blendonator sample valve (see FIGURE 4) until solution flows from the valve, then close the valve.

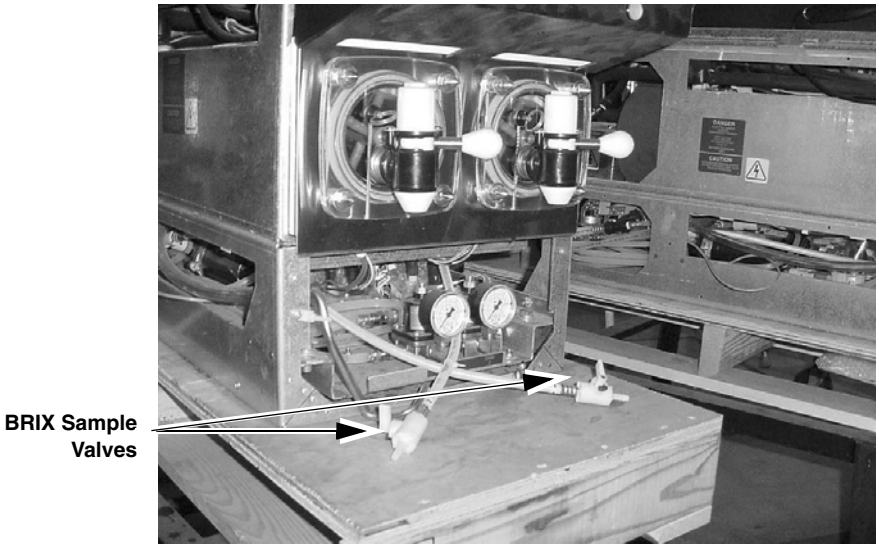

FIGURE 4

   • Place barrel # 1 in MOTOR mode (from ON/OFF/MOTOR menu) to start barrel # 1 beater. Allow beater to operate for 5–minutes, then place barrel # 1 in OFF mode (from ON/OFF/MOTOR menu) to stop the beater.

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8. Flush the wash water from the system by completing the following steps:
   - Turn barrel # 1 blendonator OFF (from BLENDONATOR menu) to prevent more wash water from entering the blendonator.
   - Place container under barrel # 1 dispensing valve. Open the dispense valve and dispense all wash water from the freeze cylinder and the blendonator. As the wash water level lowers in the freeze cylinder partially close the valve to avoid spurting.
   - Use a clean syrup tank (syrup tank system) or a clean 5-gallon pail (bag-in-box system) filled with plain water.
   - Connect the sanitizing fitting to the bag-in-box connector. Put the connector in the bucket of plain water.
   - Turn barrel # 1 blendonator ON (from BLENDONATOR menu) to fill blendonator.
   - Fill barrel # 1 with plain water by repeatedly pulling and releasing the faceplate relief valve until solution comes out.
   - Open the dispensing valve until water flows from the valve, then close the valve.
   - Open blendonator sample valve (see FIGURE 4) until water flows from the valve, then close the valve.
   - Place barrel # 1 in MOTOR mode (from ON/OFF/MOTOR menu) to start barrel # 1 beater. Allow beater to operate for 2–minutes, then place barrel # 1 in OFF mode (from ON/OFF/MOTOR menu) to stop the beater.
9. Sanitize the system by completing the following steps:
   - Turn barrel # 1 blendonator OFF (from BLENDONATOR menu) to prevent more plain water from entering the blendonator.
   - Place container under barrel # 1 dispensing valve. Open the dispense valve and dispense all plain water from the freeze cylinder and the blendonator. As the plain water level lowers in the freeze cylinder partially close the valve to avoid spurting.
   - Use a clean 5-gallon pail (bag-in-box system) to prepare sanitizing solution. Mix approximately 1 ounce of household bleach per gallon of warm water. When the blendonator runs it mixes with potable water to give proper mixture.
   - Put the sanitizing connector in the bucket of sanitizing solution.

NOTE: This mixture will provide 800-ppm of chlorine. Sanitizing solution will be diluted to approximately 200-ppm inside the blendonator tank after carbonated water has been mixed with the sanitizing solution.

NOTE: If powder sanitizer is used be sure it is thoroughly dissolved and mixed with the correct amount of water.

   - Turn barrel # 1 blendonator ON (from BLENDONATOR menu) to fill blendonator.
   - Fill barrel # 1 with sanitizing solution by repeatedly pulling and releasing the faceplate relief valve until solution comes out.
   - Open the dispensing valve until solution flows from the valve, then close the valve.
   - Open blendonator sample valve (see FIGURE 4) until solution flows from the valve, then close the valve.
   - Place barrel # 1 in MOTOR mode (from ON/OFF/MOTOR menu) to start barrel # 1 beater. Allow beater to operate for at least 10 minutes but not more than 15 minutes. Then place barrel # 1 in OFF mode (from ON/OFF/MOTOR menu) to stop the beater.
   - Turn barrel # 1 blendonator OFF (from BLENDONATOR menu) to prevent more sanitizing solution from entering the blender tank.

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- Place container under barrel # 1 dispensing valve. Open the valve and dispense all sanitizing solution from the cylinder. As sanitizing solution level lowers in the cylinder, partially close the valve to avoid spurting.
- Disconnect sanitizing solution syrup inlet line from pail of sanitizing solution.

10. Flush the system by completing the following steps:

CAUTION — Flush the system thoroughly, residual sanitizing solution left in the system could create a health hazard.

- Use a clean 5-gallon pail (bag-in-box system) filled with plain water.
- Turn barrel # 1 blendonator ON (from BLENDONATOR menu) to fill blendonator.
- Fill barrel # 1 with plain water by repeatedly pulling and releasing the faceplate relief valve until solution comes out.
- Open the dispensing valve until water flows from the valve, then close the valve.
- Open blendonator tank sample valve (see FIGURE 4) until water flows from the valve, then close the valve.
- Place barrel # 1 in MOTOR mode (from ON/OFF/MOTOR menu) to start barrel # 1 beater. Allow beater to operate for 2–minutes, then place barrel # 1 in OFF mode (from ON/OFF/MOTOR menu) to stop the beater.

11. Repeat procedure for side 2, 3, and 4.

Stainless Steel Double Check Valve Inspection & Cleaning

CAUTION — The product pump, double-liquid check valve must be inspected after any disruptions to the water supply system (plumbing work, earth quakes, etc.) It should also be inspected at least once a year under normal conditions. If particles lodge in the check valve CO_2 gas could back flow into the water system and create a health hazard.

1. Press both <OFF> switches to stop cylinders beaters and refrigeration system.
2. Disconnect electrical power to the unit.
3. Shut OFF CO_2, syrup, and water supplies to the unit.
4. Disassemble valve.
5. Check seat and O-rings. Replace if necessary.
6. Reassemble valve.
7. Check for leaks.

Check BRIX

Should be done whenever flavors are changed or any service is preformed.

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ADJUSTMENTS

Water, Syrup, & CO_2 Regulator Settings

Regulator Settings	
CO_2 source (at unit)	60 psi
CO_2 Blendonator	22 - 28 psi
Water source (at unit) (minimum)	25 psi flowing
Syrup source (at unit)	60 psi

PINNACLE CONTROL SYSTEM

Control System Overview

The Pinnacle uses a control system that monitors the major systems and components of the machine. Temperatures and pressures are monitored, and pumps, valves and the refrigeration system are managed by the control system to provide a consistently high quality product with optimal efficiency.

The control system is pre-programmed at the factory to perform the tasks necessary to keep the Pinnacle operating correctly. In addition to controlling the Pinnacle, the control system keeps track of the diagnostic information used when adjusting and/or repairing the machine.

The control system needs to be accessed in the following situations:

- Installing the Pinnacle,
- Checking performance,
- Servicing/repairing the machine,
- Checking for error messages.

The control system is accessed with the control panel located behind the lighted merchandiser. There are 2 levels of access to the control panel: 1 used by the operator for normal operations and 1 used by qualified service technicians for installation and service functions. The service functions can be secured (locked out) so that the operator will not have access to them. See the Security Lockout Function section under menu 15 for more information.

FIGURE 5

The control panel has a variety of displays called menus. The first menu (menu #1) that is displayed is the BARREL STATUS menu. From each menu there is a button to return to the previous menu and another button to advance to the next menu. The menus currently programmed into the computer are the following:

BARREL STATUS . . . . . menu 1
CHOOSE MODE . . . . . menu 2
CHANGE BARREL STATUS (ON/OFF motor) . . . . . menu 3
SET CLOCK . . . . . menu 4
SET WAKE UP . . . . . menu 5
SET SLEEP TIME . . . . . menu 6
SET DEFROST (select time) . . . . . menu 7
SET DEFROST (set time). . . . . menu 7A
VISC SET . . . . . menu 8
VISC DISPLAY . . . . . menu 9
EVAPORATOR TEMPERATURES . . . . . menu 10
TOTALS . . . . . menu 11
DIAGNOSTICS . . . . . menu 12
BARREL DATA . . . . . menu 13
BLENDONATOR . . . . . menu 14
OPTIONS . . . . . menu 15
BRIX . . . . . menu 16
MANUAL DEFROST. . . . . menu 17
VOLT . . . . . menu 18
ERROR. . . . . menu 19

The Control Panel display has 2 main areas. The first area presents information about the status and settings of the machine. It also displays menus of actions that are taken to change the functioning of the machine.

Control Panel Display

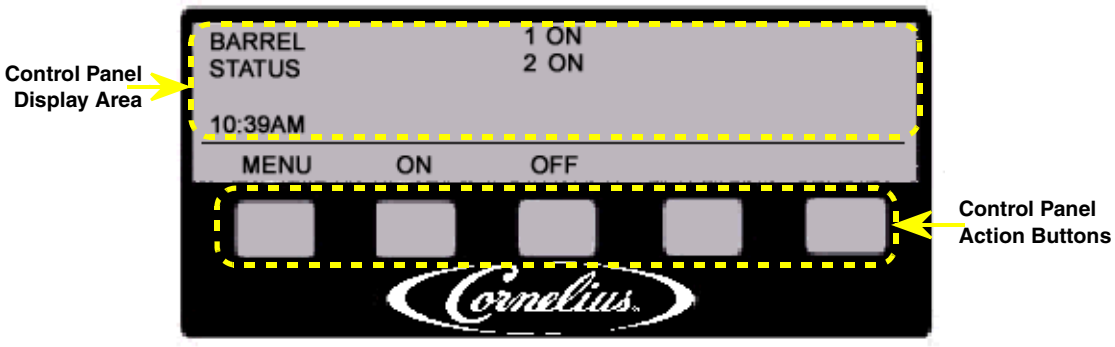

FIGURE 6

Control Panel Buttons

The second display area is the button area. There are 5 buttons that are pressed to activate various functions of the control system. Each button has a label directly above it that describes what happens if that button is pressed.

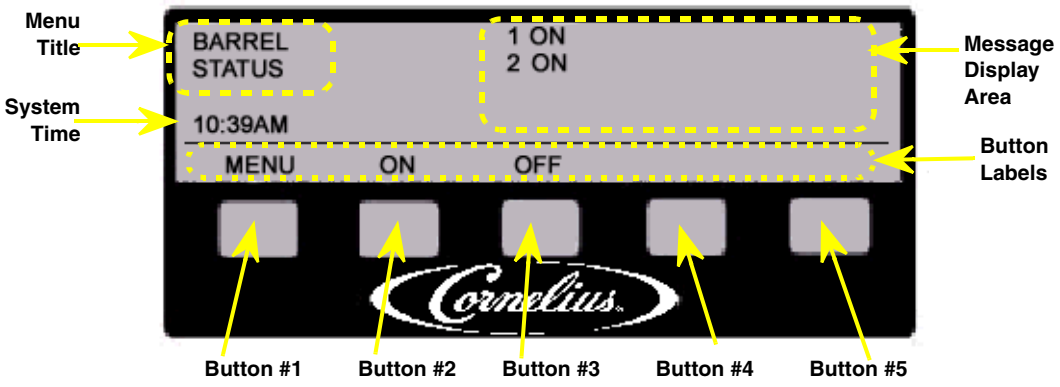

FIGURE 7

Pressing a button performs the action labeled just above the button. For example, from the BARREL STATUS menu, pressing button 1 (labeled MENU) displays a menu with more options — pressing button 5 (labeled ERR) displays error messages from the control system.

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Control Panel Menu Descriptions

The following section describes the information displayed on each Control Panel menu and the actions that are taken from each menu.

Menu 1 - BARREL STATUS

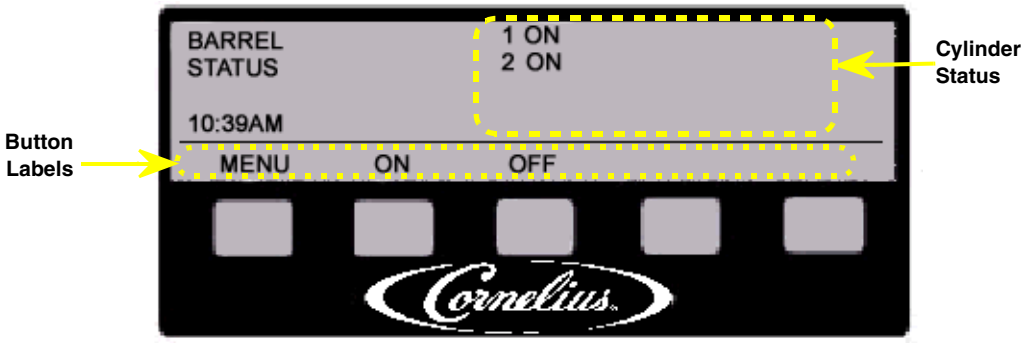

FIGURE 8

The BARREL STATUS menu is the main menu of the Control Panel. This menu displays the system clock and to the right of the words BARREL STATUS the present status of each cylinder. Listed below are the status messages that may be displayed for each cylinder.

BARREL STATUS Menu Button Descriptions:

#1 - MENU . . . . . bring up the CHOOSE MODE menu (menu 2)

#2 - ON. . . . . turn all freeze cylinders ON (beater bar TURNING and refrigeration ACTIVE)

#3 - OFF. . . . . turn all freeze cylinders OFF (beater bar OFF and refrigeration INACTIVE)

#5 - ERR . . . . . Pressing ERR displays the ERROR menu which lists all system errors.

NOTE: If there are no errors, the ERR message is not displayed for button #5.

BARREL STATUS Menu Non-Error Messages:

ON . . . . . beater bar is TURNING and refrigeration to this freeze cylinder is ACTIVE

OFF . . . . . beater bar is NOT TURNING and refrigeration to this freeze cylinder is INACTIVE

MOTOR . . . . . beater bar is TURNING and refrigeration to this freeze cylinder is INACTIVE

DFRST . . . . . freeze cylinder is presently in DEFROST mode

From the BARREL STATUS menu pressing <MENU> displays the CHOOSE MODE menu (menu 2).

NOTE: See the Control Panel Error Descriptions for a description of the system errors.

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Menu 2 - CHOOSE MODE

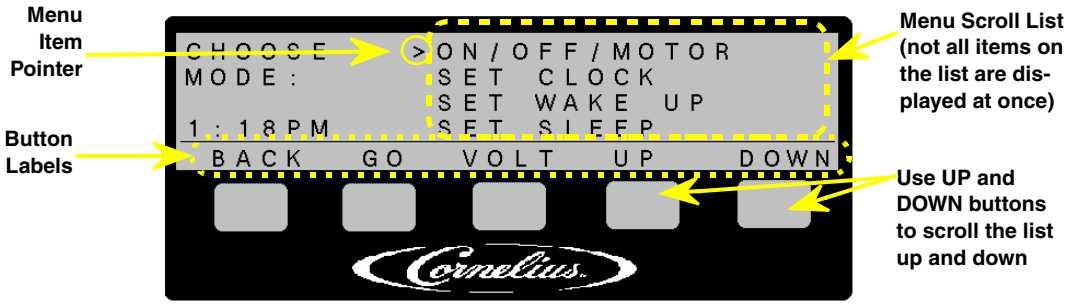

FIGURE 9

System menus are chosen from the CHOOSE MODE menu. The VOLT menu is accessed from this menu. The menu list is scrolled up and down pressing <UP> and <DOWN> buttons. The menu item that has the pointer in front of it is activated when <GO> is pressed.

CHOOSE MODE Menu Button Descriptions:

#1 - BACK . . . . . .go back to the BARREL STATUS menu (menu 1)

#2 - GO . . . . . .go to the menu that is selected by the pointer

#3 - VOLT . . . . . .go to the VOLT menu (menu 19)

#4 - UP . . . . . .scroll up the menu list

#5 - DOWN. . . . . .scroll down the menu list

CHOOSE MODE Menu Scroll List Item:

ON/OFF/MOTOR . . . . . .go to change BARREL STATUS menu

SET CLOCK. . . . . .go to SET CLOCK menu

SET WAKE UP. . . . . .go to SET WAKE UP menu

SET SLEEP . . . . . .go to SET SLEEP TIME menu

SET DEFROSTS . . . . . .go to SET DEFROST menu

VISCOSITY SET . . . . . .go to VISC SET Menu menu

VISC DISPLAY. . . . . .go to VISC DISPLAY menu

EVAPORATOR TEMPS . . . . . .go to EVAPORATOR TEMPERATURE menu

TOTALS . . . . . .go to TOTALS menu

DIAGNOSTICS . . . . . .go to DIAGNOSTICS menu

BARREL DATA . . . . . .go to BARREL DATA menu

BLENDONATOR . . . . . .go to BLENDONATOR menu

OPTIONS. . . . . .go to OPTIONS menu

BRIX. . . . . .go to BRIX menu

MANUAL DEFROST . . . . . .go to MANUAL DEFROST menu

From the CHOOSE MODE menu pressing <BACK> will display the BARREL STATUS menu and pressing <GO> will display the scroll list item with the pointer in front of it.

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Menu 3 - CHANGE BARREL STATUS (ON/OFF/MOTOR)

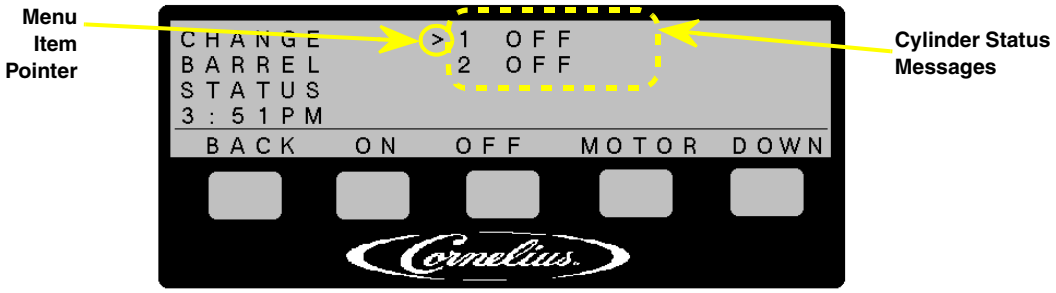

FIGURE 10

The CHANGE BARREL STATUS menu allows the operator to select the operational mode for each of the cylinders on a cylinder by cylinder basis. The present status of each cylinder is also displayed (see menu 1 for a list of messages).

CHOOSE MODE Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - ON. . . . . turn the selected cylinder “ON” (beater bar TURNING and refrigeration ACTIVE)

#3 - OFF. . . . . turn the selected cylinder “OFF” (beater bar OFF and refrigeration INACTIVE)

#4 - MOTOR. . . . . turn the selected cylinder “MOTOR” (beater bar TURNING and refrigeration INACTIVE)

#5 - DOWN. . . . . scroll down the menu list

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Menu 4 - SET CLOCK

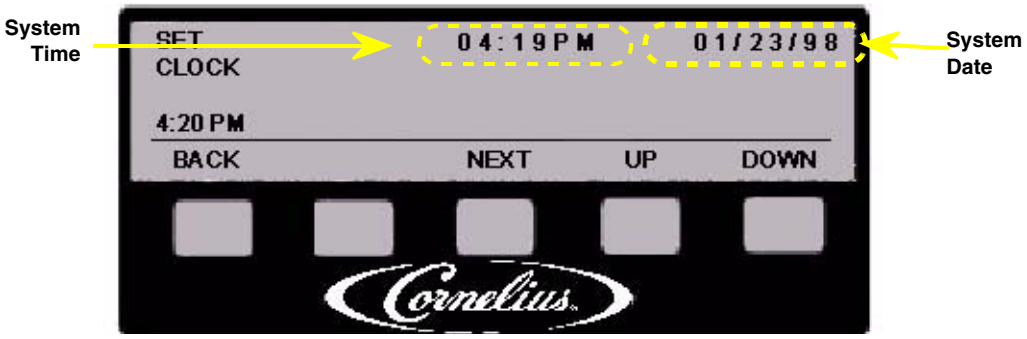

FIGURE 11

From the SET CLOCK menu the system (computer) time and date are entered or changed. The time is displayed in 12 or 24 hour format. The time display format is selected in the OPTIONS menu (menu 15).

The date is displayed in either a US format (mm/dd/yy) or a European format (dd/mm/yy). The date display format is selected in the OPTIONS menu (menu 15).

To set the time and/or date press <NEXT> to select 1 of 6 fields (HOURS, MINUTES, AM/PM if used, DAY, MONTH, YEAR). Press <UP> and <DOWN> to change the field. Then press <BACK> to save the changes.

The clock can be set to automatically adjust for Daylight Savings time using the OPTIONS menu (menu 15).

SET CLOCK Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#3 - NEXT . . . . . select the next field

#4 - UP . . . . . increase the selected field by 1 (hour, day, etc.)

#5 - DOWN. . . . . decrease the selected field by 1

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Menu 5 - SET WAKE UP

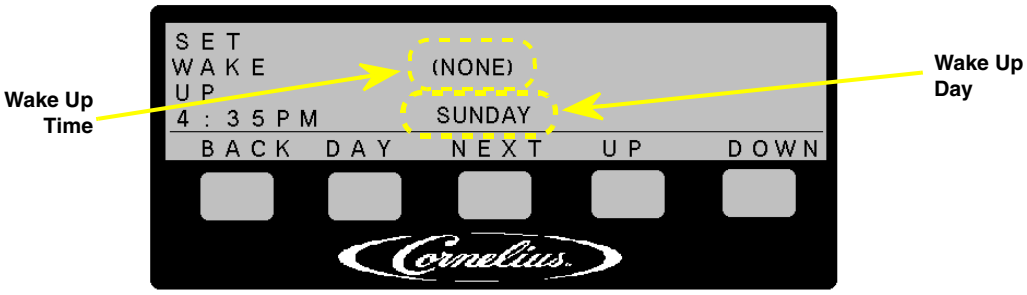

FIGURE 12

From the SET WAKE UP menu the system wake up times are set. These are the times when the system will resume normal operation (freeze cylinder refrigeration and beater motor operation) after an inactive period (sleep). Each day of the week can have a separate wake up time, or “ALL DAYS” of the week can be programmed to wake up at the same time.

Each cylinder will wake up in the mode that it was in when it went to sleep. For instance, if cylinder #1 was ON, and cylinder #2 was in MOTOR before going to sleep, the cylinders will wake up in those modes.

Wake up times can be set in 15 minute increments. When NONE appears, it means that no wake up time has been set for that day. The preset time format used by the system will be used by the SET WAKE UP menu.

A WAKE UP must be set for every SLEEP.

The wake up program will run a 2 minute defrost, whether it follows a sleep or not, on each barrel before returning the unit to normal operation.

SET WAKE UP Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - DAY . . . . . cycle through the list of days

#3 - NEXT . . . . . cycle through the time fields

#4 - UP . . . . . increase the selected field by 1 hour or 15 minute increment

#5 - DOWN. . . . . decrease the selected field by 1 hour or 15 minute increment

To set wake up times:

1. Press <DAY> to select 1 of 8 options (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, ALL DAYS)
2. Press <NEXT> to change the field from HOURS to MINUTES
3. Press <UP> and <DOWN> to change the setting in the field
4. Press <BACK> to save the changes.

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Menu 6 - SET SLEEP TIME

FIGURE 13

From the SET SLEEP TIME menu the system sleep times are set. These are the times when the system will discontinue normal operation (cylinder refrigeration and beater motor operation). Each day of the week can have a separate sleep time, or all days of the week can be programmed to sleep at the same time.

An item on the OPTIONS menu (menu 15) will allow the Ice Bank to be maintained during sleep, or allow the Ice Bank to discontinue normal operation.

Sleep times can be set in 15 minute increments. When NONE appears, it means that no sleep time has been set for that day. The preset time format used by the system will be used by the SET SLEEP TIME menu.

A WAKE UP must be set for every SLEEP.

See “3. Sleep Mode Recommendations” on page 7.

The merchandiser will stay ON during the SLEEP and the Motors and Barrel Refrigeration will be OFF. The function of the ice bank during the SLEEP will depend on the setting in OPTIONS.

The unit can be manually activated by pressing ON from the main menu.

SET SLEEP TIME Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - DAY . . . . . cycle through the list of days

#3 - NEXT . . . . . cycle through the time fields

#4 - UP . . . . . increase the selected field by 1 hour or 15 minute increment

#5 - DOWN. . . . . decrease the selected field by 1 hour or 15 minute increment

To set sleep times:

1. Press <DAY> to select 1 of 8 options (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, ALL DAYS)
2. Press <NEXT> to change the field from HOURS to MINUTES
3. Press <UP> and <DOWN> to change the setting in the field
4. Press <BACK> to save the changes.

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Menu 7 - SELECT DEFROST TIME & SET DEFROST TIME

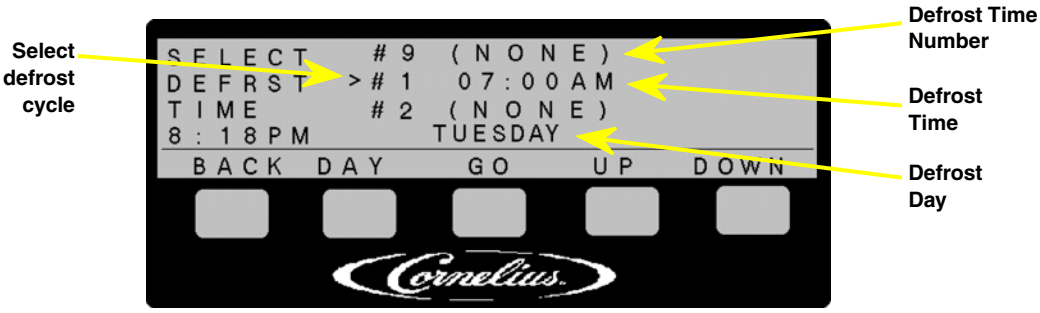

FIGURE 14

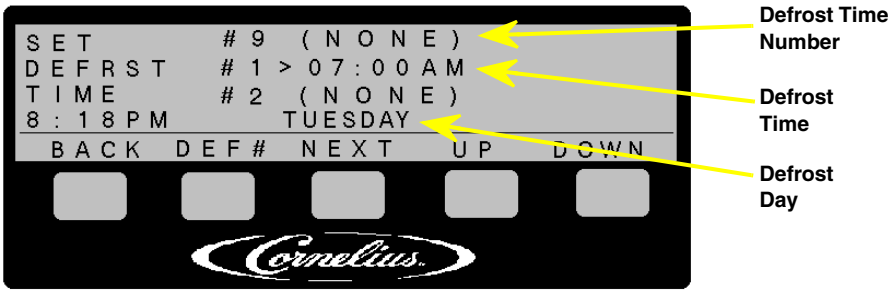

FIGURE 15

From the SELECT DEFROST TIME menu the system automatic defrost cycles are set. These menus program the automatic hot-gas defrost cycle for each freeze cylinder. The first menu sets the defrost day(s) and the second menu sets the defrost time(s).

When ALL DAYS is selected, the defrost time entered into a specific defrost number will be scheduled for every day of the week. When NONE appears, it means 1 of the following:

- no defrost time has been set for that defrost number;
- all of the times for that defrost number are not the same.

NOTE: All days can NOT be used to verify defrost times, only to set them.

SELECT DEFROST TIME Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - DAY . . . . . cycle through the list of days

#3 - GO . . . . . go to the second defrost menu (SET DEFROST TIME)

#4 - UP . . . . . increase the defrost number for this day (#1-9)

#5 - DOWN. . . . . decrease the defrost number for this day (#1-9)

SET DEFROST TIME Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - DEF#. . . . . cycle through the list of 9 defrost times per day

#3 - NEXT . . . . . cycle through time fields

#4 - UP . . . . . increase item by 1 unit (hour or 15 minute segment)

#5 - DOWN. . . . . decrease item by 1 unit (hour or 15 minute segment)

Defrost times can be set in 30 minute increments. When NONE appears, it means that no sleep time has been set for that day. The preset time format used by the system will be used by the SET DEFROST TIME menu. See “3. Sleep Mode Recommendations” on page 7.

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Each freeze cylinder defrost cycle will terminate either when the suction temperature reaches 50°F or it will time out after 8 minutes. There may be 9 defrost times scheduled for each of the 7 days of the week. Cylinder 1 will begin defrosting at the set defrost time. Cylinder 2 will begin defrosting 30 minutes after cylinder 1 began defrosting. There are no defrosts programmed from the factory.

To set defrost times:

1. Press <DAY> to select 1 of 8 options (SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, ALL DAYS).
2. Press <GO> to advance to the SET DEFROST TIME menu.
3. Press <NEXT> to change the field from HOURS to MINUTES.
4. Press <UP> and <DOWN> to change the setting in the fields.
5. Press <BACK> to save the changes.
6. If desired, repeat steps 2–5 to set more defrost times for the selected day.
7. If desired, repeat steps 1–6 to select different days and times.

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Menu 8 - VISC SET (Set Cylinder Viscosity)

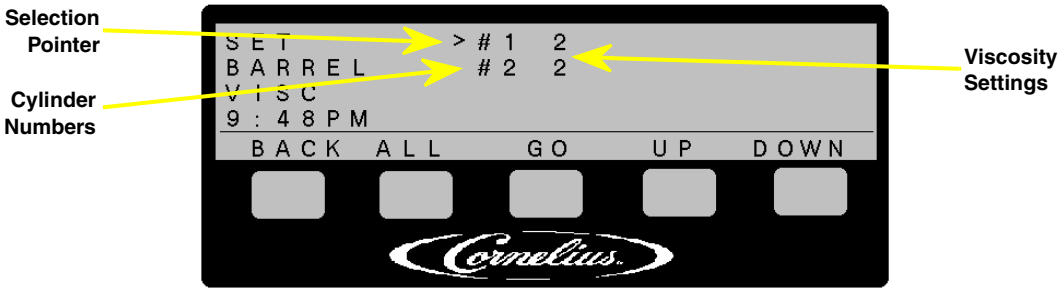

FIGURE 16

The desired viscosity (thickness) of the product in each cylinder is set from this menu. The viscosity set point can be set between 1 and 9. A viscosity setting of 1 produces a very thin watery product and a setting of 9 produces a very thick icy product. The factory default is 4.

VISC SET TIME Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - ALL . . . . . sets the viscosity of all cylinders to the setting of the currently selected cylinder

#3 - GO . . . . . toggle between “cylinder selection” and “viscosity setting”

#4 - UP . . . . . increase the selected field by 1 hour or 15 minute increment

#5 - DOWN. . . . . decrease the selected field by 1 hour or 15 minute increment

To change the viscosity setting for a cylinder:

1. Press <UP> or <DOWN> to select the cylinder to be adjusted. The pointer will be in front of the currently selected cylinder.
2. Press <GO> to move the selection pointer to the viscosity setting for that cylinder.
3. Press <UP> or <DOWN> to increase or decrease the viscosity setting.
4. Press <GO> to move selection pointer back to the cylinder selection.
5. Repeat steps 1 - 4 for remaining cylinders.

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Menu 9 - VISC DISPLAY (Actual Cylinder Viscosity)

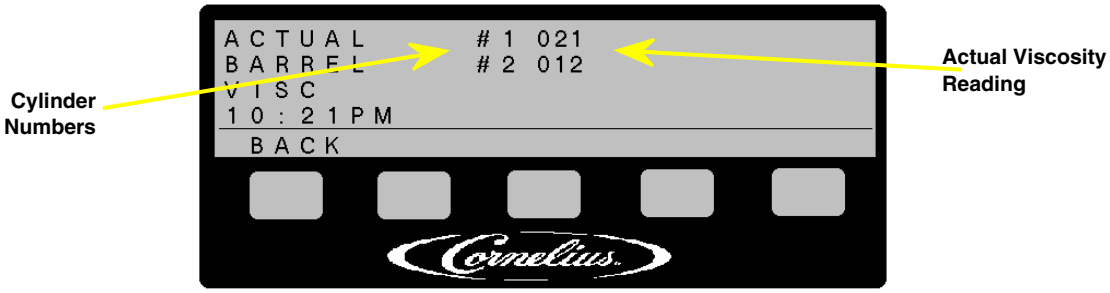

FIGURE 17

This menu displays the actual viscosity value for each cylinder. The smaller the number the lower the viscosity (thinner product).

VISC DISPLAY Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

The table below identifies the maximum and minimum viscosity values for specific viscosity settings. For example, with a viscosity setting of 2, the system calls for refrigeration when the viscosity drops below 43. Refrigeration continues until the viscosity reaches 60 when leveling begins.

NOTE: There is a 2 minute timer to prevent the compressor from short cycling. This timer is canceled out by a Blendonator actuation.

Viscosity Setting	Maximum Viscosity Value	Minimum Viscosity Value
1	50	36
2	60	43
3	70	58
4	80	68
5	90	78
6	100	86
7	110	96
8	120	106
9	130	116

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Menu 10 - EVAPORATOR TEMPERATURES

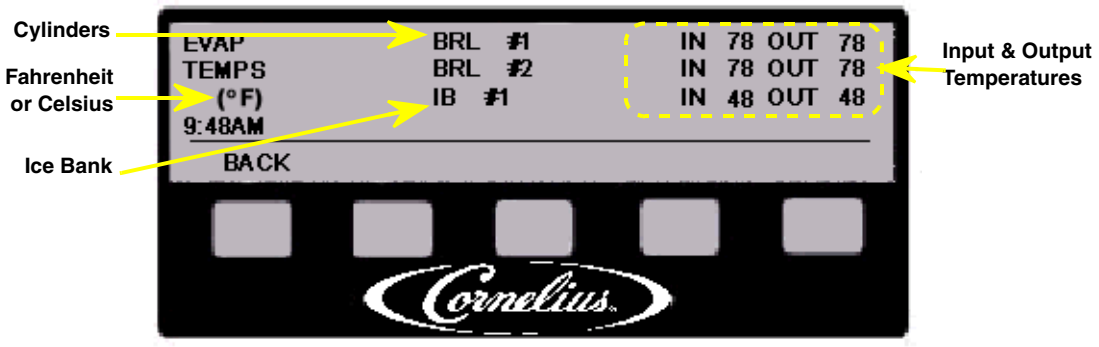

FIGURE 18

The input and output temperatures of each system evaporator (both product freeze cylinders and ice bank) are displayed. In the display the IN represents the inlet temperature and the OUT represents the outlet temperature. The temperature scale used (°F or °C) is based on your input in the OPTIONS menu (menu 15). The maximum temperatures are 97°F for the barrels (BRL #1 or #2) and 48°F for the ice bank (IB #1). The minimum temperatures for both the barrel and ice bank is -30°F.

EVAPORATOR TEMPERATURES Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

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Menu 11 - TOTALS

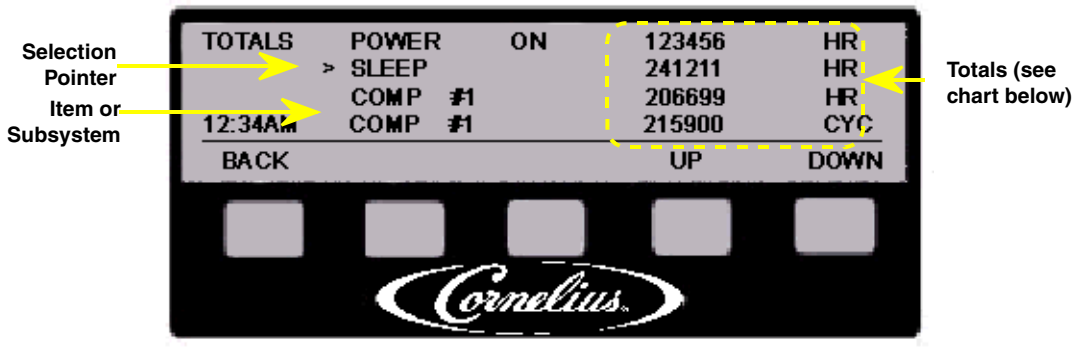

FIGURE 19

The TOTALS menu displays operational totals for the system. The totals tracked by the computer are listed below. Those totals marked with an * can be reset to zero. The RESET button will only appear when the reset option is enabled.

The reset option is enabled/disabled from the OPTIONS menu (menu 15).

TOTALS Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#4 - UP . . . . . scroll totals list up

#5 - DOWN. . . . . scroll totals list down

TOTALS Menu Messages:

POWER ON . . . . . xxxxx HRnumber of hours the system has been powered ON

SLEEP . . . . . xxxxx HRnumber of hours system has been in SLEEP mode

COMP #n . . . . . xxxxx HR*number of hours compressor “n” has run

COMP #n . . . . . xxxxx CYC*number of run cycles compressor “n” has performed

AGITAT #n . . . . . xxxxx HR*number of hours agitator motor “n” has run

BRL ON #n. . . . . xxxxx HRnumber of hours cylinder “n” has been in ON mode

MOTOR #n . . . . . xxxxx HR*number of hours cylinder motor “n” has run

SYRUP #n . . . . . xxxxx MIN*number of minutes syrup flow “n” has been called for

ERROR #n . . . . . xxxxx HR*number of hours cylinder “n” has had any errors

SYR SO #n. . . . . xxxxx HRnumber of hours cylinder “n” is out of syrup

DEFRST #n . . . . . xxxxx HRnumber of hours cylinder “n” has been in auto defrost

BLENDR #n . . . . . xxxxx HRnumber of blender cycles on cylinder “n”

* = resetting these totals to zero is allowed

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Menu 12 - DIAGNOSTICS

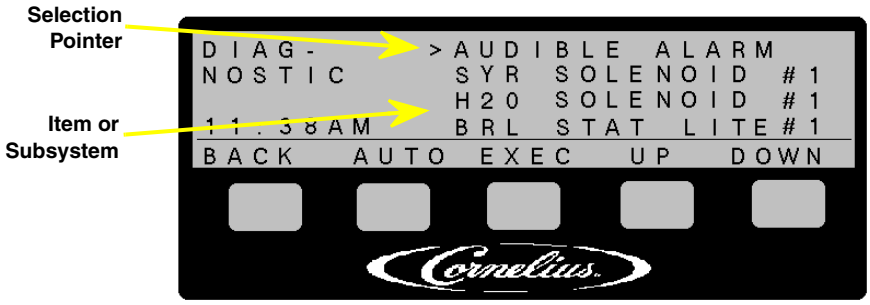

FIGURE 20

The DIAGNOSTICS menu allows the selection of manual or automatic display of system information. The manual mode allows the operator to select which output is activated. The automatic mode cycles through all of the outputs 1 after the other.

The automatic mode begins at the selection pointer and stops at the end of the list or when the AUTO is pressed again. The automatic mode cycles through each output for 2 seconds ON and 3 seconds OFF. The output list scrolls down as the automatic mode progresses.

All system functions and controls are disabled/terminated during the diagnostic mode.

The diagnostic display order is organized on a cylinder-by-cylinder basis. All outputs associated with a specific cylinder displayed as a group. When that cylinder is done the next cylinder group will begin. After the cylinders the ice banks information is displayed on an ice bank by ice bank basis.

DIAGNOSTICS Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - AUTO . . . . . toggle begin/end of automatic mode

#3 - EXEC . . . . . activate the output at the selection pointer

#4 - UP. . . . . scroll list up

#5 - DOWN. . . . . scroll list down

DIAGNOSTICS Menu Messages:

AUDIBLE ALARM. . activate audible alarm on display board

Cylinder Group #X:

BRL PULSE VLV #Xactivate cylinder pulse valve

H20 SOLENOID #X activate water solenoid

DEFROST VLV #X activate cylinder defrost valve

DISP VALVE LO #X activate dispense valve lockout

CARB MTR PUMP #Xactivate carbonator pump motor

SYR SOLENOID #Xactivate syrup solenoid

BEATER MOTOR #Xmake beater motor turn

BRL STAT LITE #X activate cylinder status light (red & green)

AUDIBLE ALARM . activate audible alarm on main logic board

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Menu 13 - BARREL DATA

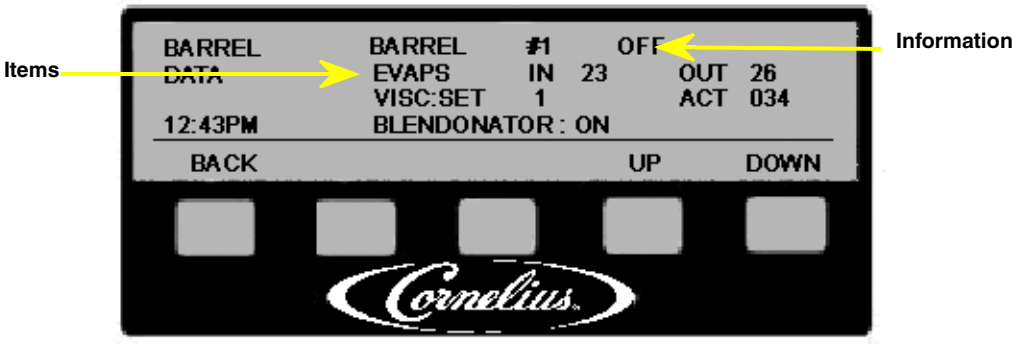

FIGURE 21

The BARREL DATA menu displays information about major system components for each cylinder.

BARAL DATA Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#4 - UP. . . . . scroll list up

#5 - DOWN. . . . . scroll list down

BARREL DATA menu information:

BARREL # . . . . . status of cylinder #n (ON, OFF, MOTOR, DEFROST, ERROR)

EVAPS IN . . . . . evaporator temperature IN

EVAPS OUT . . . . . evaporator temperature OUT

VISC SET. . . . . viscosity set value

ACT . . . . . actual viscosity value

BLENDONATOR . . blendonator mode (ON, OFF)

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Menu 14 - BLENDONATOR (Blendonator Status)

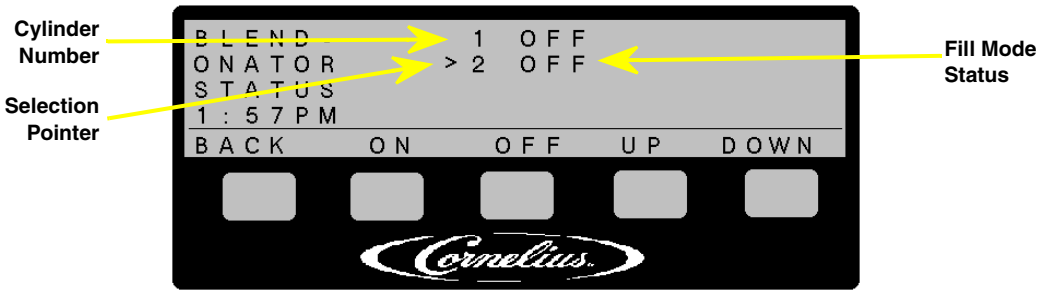

FIGURE 22

The BLENDONATOR menu allows the selection of automatic blendonator tank filling. With automatic mode ON the blendonator tank will fill when the float drops.

Scroll the selection pointer to the desired cylinder number and press <ON> or <OFF> to turn the automatic filling ON or OFF.

BLENDONATOR Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - ON. . . . . turns blendonator automatic fill mode ON

#3 - OFF. . . . . turns blendonator automatic fill mode OFF

#4 - UP. . . . . move selection pointer up

#5 - DOWN. . . . . move selection pointer down

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Menu 15 - OPTION SELECT STATUS

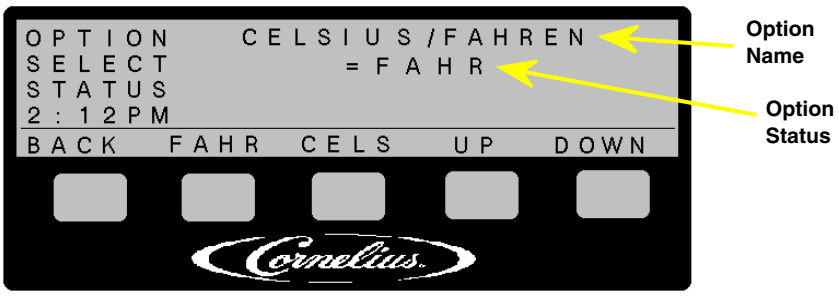

FIGURE 23

The OPTION SELECT STATUS menu allows system options to be selected and customized. These options will be displayed on the OPTIONS menu.

OPTION SELECT STATUS Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - OPTION #1 . . . select this option (the button label changes depending on the option being displayed)

#3 - OPTION #2 . . . select this option (the button label changes depending on the option being displayed)

#4 - UP . . . . . scrolls list up

#5 - DOWN. . . . . scrolls list down

To display, select, and change system options:

1. Press <UP> or <DOWN> to select the desired option
2. Press the <OPTION #1> button to change that option
3. Press the <OPTION #2> button to change that option
4. Press <UP> or <DOWN> to display the next option.

The options that can be displayed and changed are described below.

Option Name	Button #1	Button #2	Description
DAYLT SAVINGS	NO	YES	disable/enable Daylight Savings Time
CELCIUS/FAHREN	FAHR	CELS	select temperature for display
DATE FORMAT	USA	EURO	selects date format (U.S. mm/dd/yy or European dd/mm/yy)
TIME FORMAT	12HR	24HR	selects 12 hour (AM/PM) or 24 hour time format
SECURITY	OFF	ON	disable/enable security lockout of system parameters
LANGUAGE	ENGL	OTHER	select language (as available)
VALVE LOCK OUT	DISAB	ENAB	Not Used
RESET TOTALS	DISAB	ENAB	disable/enable resetting of totals in the TOTALS menu
ICE BANK/SLEEP	OFF	ON	Ice Bank and Ice Bank Agitator remains OFF/ON while system is sleeping
KEY BEEP	OFF	ON	turns beeping of key inputs OFF/ON
SYRUP SOURCE	BOX	TANKS	What is source of syrup. TANKS will enable “Syrup Prime” on syrup sold out.

Security Lockout Function:

The security function is enabled in the OPTION SELECT STATUS menu. When the security lockout is enabled, lockout will engage 15 minutes after last button press. Once lockout is engaged the display goes to BARREL STATUS menu, and the MENU button (#1) is disabled. Security is disengaged by pressing button #1 (far left) and #5 (far right) at the same time.

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Menu 16 - BRIX

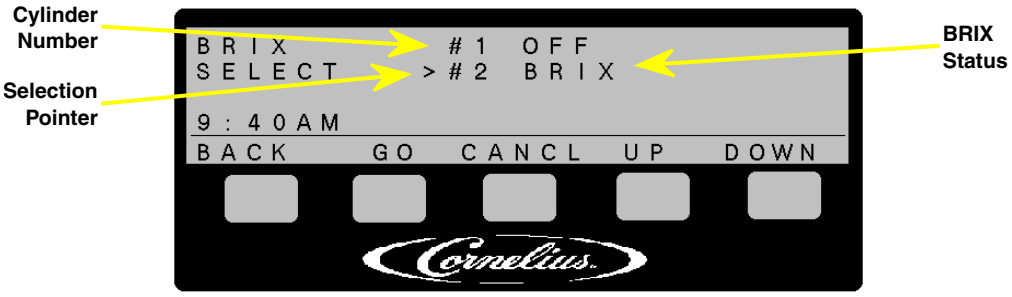

FIGURE 24

The BRIX menu allows the activation of syrup and water solenoids, and blendonator pump motor for a selected cylinder.

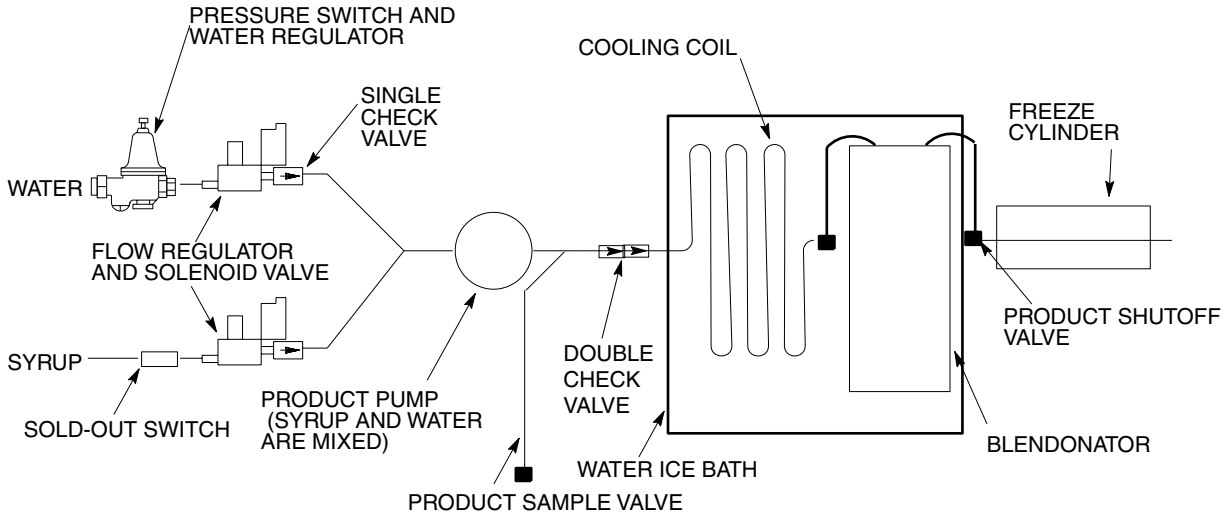

FIGURE 25

1. Make sure the status of all cylinders is OFF on the display.
2. Turn product supply valve to the 90 degree (OFF) position for the barrel you are using. It is recommended to close both valves to be sure the correct valve is chosen.
3. Press MENU. Then press UP repeatedly until BRIX is displayed. Press GO and select cylinder you wish to Brix. NOTE: Pressing CANCEL will stop the process.
4. Locate the appropriate (correct barrel) sample tube and hold a cup under it.

NOTE: If Product Sample Valve is located in a different position then FIGURE 25 see the schematics in Appendix A for the two alternate constructions (section 1 and 2) and their respective Brixing instructions.

5. Open the valve at the end of the sample tube. Press GO and wait 3-5 seconds. The product pump will pump product for approximately 3 seconds. After sample is dispensed Press Go twice more to dispense product two more times. Discard these first three samples.

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6. Press GO again. Collect sample from cup and close valve at end of sample tube. Place adequate amount on refractometer and read Brix. A target Brix reading of 13.0 (+/- 1.0) 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.
7. If reading is out of specification the syrup level needs to be adjusted. NEVER change the WATER FLOW CONTROL setting to adjust Brix (FIGURE 26).

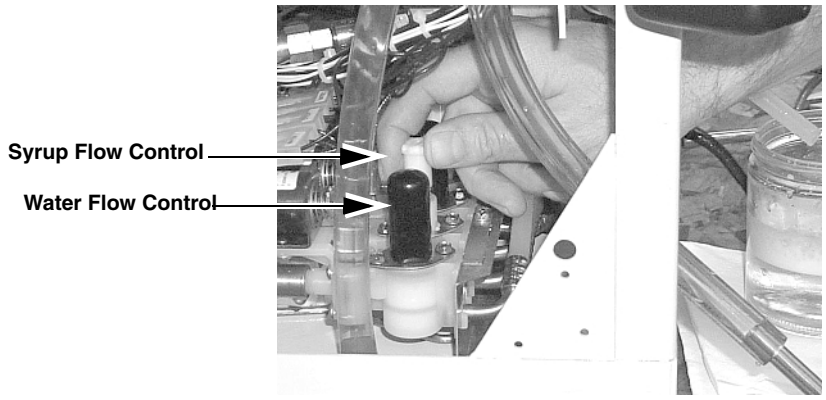

FIGURE 26

8. To increase Brix reading, turn syrup regulator clockwise. Turn counter-clockwise to decrease Brix. Adjust flow control in no more than ½-turn increments. Repeat steps 4 through 6 for each adjustment until desired Brix setting is achieved.
9. After finishing step 8 for first barrel, repeat steps 1 through 8 for next barrel.

NOTE: If Brix percent cannot be set in step 8, check the water flow rate. To do this verify flow in cup is at least 6.3 to 6.9 oz. (186 to 204 ml) in 3 seconds.

NOTE: If water flow is low, boost incoming water pressure.

BRIX Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - GO . . . . . turn ON syrup and water solenoids, and blendonator pump for selected cylinder for 3 seconds

#3 - CANCL . . . . . turn OFF syrup and water solenoids, and blendonator pump for selected cylinder

#4 - UP . . . . . move selection pointer up

#5 - DOWN. . . . . move selection pointer down

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Menu 17 - MANUAL DEFRST

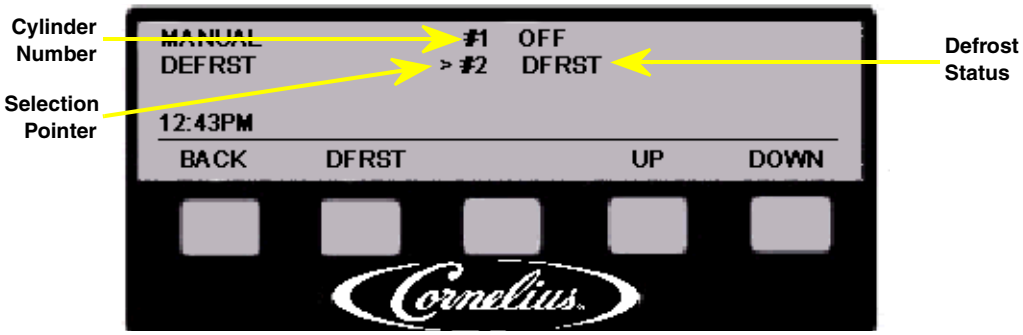

FIGURE 27

The MANUAL DEFRST menu allows the activation of 2 minute manual defrost mode for a selected cylinder. This defrost cycle can begin with the cylinder in any mode (ON, OFF, Motor) and will return the cylinder to that same mode. Manual defrost can be activated on only 1 cylinder associated with a compressor at a time.

The description of the button 2 will change based on the status of the selected cylinder. When not in defrost, button 2 will read DFRST. When in defrost, button 2 will read CANCL.

Pressing DFRST will begin a manual defrost on the selected cylinder, and pressing CANCL will end the manual defrost on the selected cylinder.

MANUAL DEFRST Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

#2 - DRFST . . . . . begin manual defrost on selected cylinder (defrost will last approx 2 minutes)

#4 - UP. . . . . move selection pointer up

#5 - DOWN. . . . . move selection pointer down

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Menu 18 - VOLT

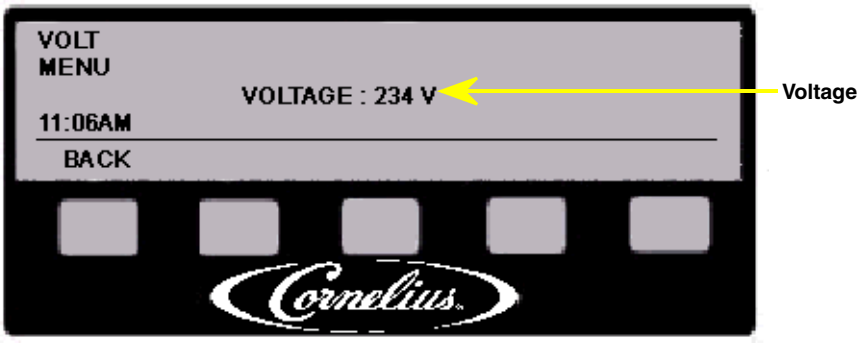

FIGURE 28

The VOLT menu displays line voltage at the contactor. The voltage will be displayed in Volts RMS.

VOLT Menu Button Descriptions:

#1 - BACK . . . . . go back to the previous menu

Menu 19 - ERROR

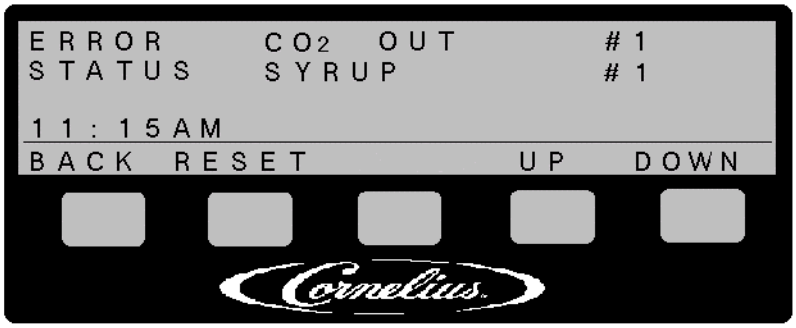

FIGURE 29

The ERROR menu displays a list of errors that are presently on the system. All system errors will be displayed on this list in the priority order. The error list will scroll if necessary. The display of the error list will be updated every 3 seconds.

The RESET function will silence the beeper (if sounding), and reset the errors that are capable of MANUAL ERROR RESET. As “automatically” correctable errors are satisfied, the error list will reflect this when updated.

NOTE: The Syrup Sold Out condition is not effected by the RESET button.

ERROR Menu Button Descriptions:

#1 - MENU . . . . . go back to the previous menu

#2 - ON. . . . . go to SYRUP SOLD OUT menu

#3 - OFF. . . . . begin MANUAL ERROR RESET

#4 - UP. . . . . scrolls list up

#5 - DOWN. . . . . scrolls list down

Error History Log Information

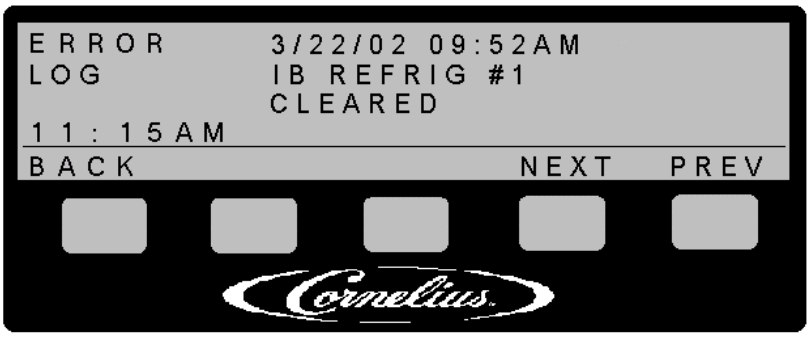

FIGURE 30

The error history log records errors to diagnose potential issues. The error log will retain information on the 50 most recent sets of events. All errors dated will have occurred during testing and set up. This is a default that is used before the time clock is programmed.

The error log history is only accessible from the BARREL STATUS menu. To enter the error history you must press the 2 far right buttons on the display panel. This will bring up the error history log menu and the most recent event will be displayed. PREV moves you backwards in the list of events and NEXT moves you forwards in the list of events.

The error history can be accessed while the security lock out is activated. To return to the main menu press BACK.

#1 - BACK . . . . . go back to the BARREL STATUS menu

#4 - NEXT . . . . . display the next (later) error log entry

#5 - PREV . . . . . display previous (earlier) error log entry.

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Control Panel Error Descriptions

The following section describes the error messages displayed on the Control Panel, the error priority, and the appropriate actions to be taken.
Errors are displayed on the following menus:

- Main menu (BARREL STATUS) - menu 1
- ON/OFF/MOTOR menu (CHANGE BARREL STATUS) - menu 3
- BARREL DATA menu - menu 13
- SET DEFROST menu - menu 17
- ERROR menu - menu 20

Errors are displayed in the above menus differently. The response to error conditions are listed below.

COMO Error: There is no communication between the J1 connector on the display board and the J17 connector on the main board.

ELECTRONICS Error: Means 1 of 2 things:

- Communication has been not established or broken between the main board and 1 or more of the product delivery boards for ten consecutive communication cycles.
- Failure of the real time clock chip. The new controls will display a “CLOCK ERROR” message.

HOT GAS Error X: Indicates that the barrel outlet sensor for barrel X exceeded 120°F for 2 minutes. Do not restart unit. Immediately call Service at (800) 238-3600.

HIGH VOLTAGE GENERATED Errors: It is possible to generate Electronic or Como errors by routing phone lines or low voltage communication lines in the vicinity of high voltage components on the Inverter Board.

LOW VOLTAGE GENERATED Errors: It is also possible to generate these errors if low voltage communication wires or phone cables are in the vicinity of the Inductor on the Main Board. That would be the black capacitors on the Invertor Board and the wire wrapped coil on the Main Board.

LOW or HIGH VOLTAGE Error: This message means that the incoming voltage is out of specification (180V to 260V) for the unit.

LOW VOLTAGE Error: If the voltage at the junction box is good, high voltage may not be getting up to the main board. Check this voltage at J10 on the main board. If the voltage is good at the board and the low voltage error remains, main board is bad. Display voltage to be ±5 VAC from measured J10 Voltage.

DRIVE Error: The motor has been commanded to rotate but will not rotate.

OVER TORQUE Error: This error occurs when the motor load is greatly increased and causes the barrel viscosity to be more than 250 and the motor is still turning. It can also occur when the inverter board has a problem. If the viscosity is less than 25 with the motor running, the high viscosity reading could have been because of a mechanical load.

REFRIG Error: Means that a specific evaporator has NOT been satisfied within a set time limit. The entire refrigeration system will be disabled. The REFRIG error time limits are:

- Freeze Barrel: 46 minutes; Ice Bath: 120 minutes for 60Hz or 240 minutes for 50Hz.

SYRUP Error: Syrup supply empty.

CO2 Error: Carbon dioxide supply empty.

H2O Error: Water supply empty.

SENSOR Error: Means that a thermal sensor (thermistor) is not functioning properly.

During a refrigeration cycle, if a barrel sensor’s reading is at 97^{o}F or at -30^{o}F for more than 600 seconds, the control system will display a SENSOR ERROR for that evaporator. During a refrigeration cycle, if a ice bank sensor’s reading is at 49^{o} F or at -30^{o} F for more than 2400 seconds, the control system will display a SENSOR ERROR for the Ice Bank.

NOTE: The 5600075xx Series controls will have an upper limit of 150°F for barrel sensors.

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Error	Display Priority	Error Reset Response	System Response				Display Output	
			Comp	Motor [1]	Blend [4]	Condition After Error Reset	Menu 1,3,13,17	Menu 20
Communication	1a	Cycle Power	OFF*	OFF	OFF	OFF	COMMO	COMMUNICATION
Electronics	1b	Cycle Power	OFF*	OFF	OFF	OFF	ERROR	ELECTRONICS
Real Time Clock	1c	Cycle Power	OFF*	OFF	OFF	OFF	CLOCK ERROR	CLOCK ERROR
Hot Gas Valve	1d	Cycle Power	OFF*	OFF	OFF OFF	OFF	HOT GAS #X	HOT GAS #X
High Voltage	2a	Auto	OFF*	OFF	OFF	"Last Known State" of System	VOLT	HIGH VOLTAGE
Low Voltage	2b	Auto	OFF*	OFF	OFF	"Last Known State" of System	VOLT	LOW VOLTAGE
Cylinder Drive	3	Manual	Cylinder OFF**	OFF	ON	"Last Known State" of System	DRIVE	DRIVE #X
Over Torque	4	Manual	Cylinder OFF**	OFF	ON	"Last Known State" of System	TORQUE	TORQUE #X
Cylinder Refg	5	Manual	OFF*	OFF	ON	"Last Known State" of System	REFRIG	BRL REFRIG #X
Ice Bank Refg	6	Manual	OFF*	OFF	ON	"Last Known State" of System	REFRIG	IB REFRIG #Y
Syrup Sold Out	7	Auto	Cylinder OFF**	Motor	OFF	"Last Known State" of System	SYRUP	SYRUP #X
CO2 Sold Out	8	Auto	OFF*	Motor	OFF	"Last Known State" of System	CO2	CO2 OUT
H2O Sold Out	9	Auto	OFF*	Motor	OFF	"Last Known State" of System	H2O	H2O OUT
Cylinder Sensor	10	Manual	Cylinder OFF**	OFF	OFF	"Last Known State" of System	SENSOR	BRL SENSOR #X
Ice Bank Sensor	10	Manual	IB OFF**	OFF	OFF	"Last Known State" of System	SENSOR	IB SENSOR #Y

Footnotes:

* - The compressor associated with this refrigeration system where the error occurs will be commanded OFF (not "no longer needed).
** - The compressor associated with this freeze cylinder/ice bank will stop providing cooling to this specific evaporator.
1 - The "motor condition means the motor will continue operating if it was in operation prior to the error. If the motor was OFF it will remain OFF.
2 - The "Beeper" will give a 5 beep sequence for each new error that occurs after a beeping sequence is completed.
3 - The "Cylinder Status Light" of the affected cylinder will flash green at a 1 Hz rate (50% DC) on all errors.
4 - The Blender will NOT respond to float activations wen "OFF", and will respond when "ON" only is previously enabled.

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COMPONENT SERVICE

NOTE: IF the LED on display panel is ON please see Tech Tip TT-04-13, on www.cornelius.com, for information on the Production Safety System Response.

The following are procedures for servicing the major components of the Pinnacle.

MAGNET ASSEMBLY REPLACEMENT

1. Defrost the cylinder.
2. Turn the blendonator OFF.

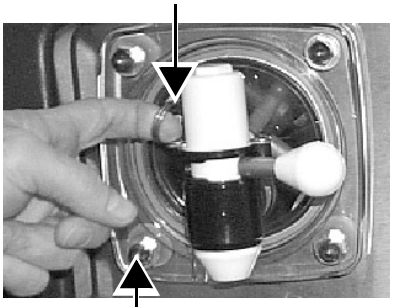

FIGURE 30

3. Drain the cylinder by opening the dispensing valve. When only CO_2 comes out, turn the cylinder product supply valve off. Relieve CO_2 pressure by opening the faceplate pressure relief valve.
4. Remove the cylinder face plate (4 nuts and washers).
5. Remove beater bar and scraper blades.
6. Use the magnet puller tool (p/n 560003662) that comes with the unit to remove the magnet.

NOTE: Sufficient force must be used to break the magnet lose from the end of the cylinder.

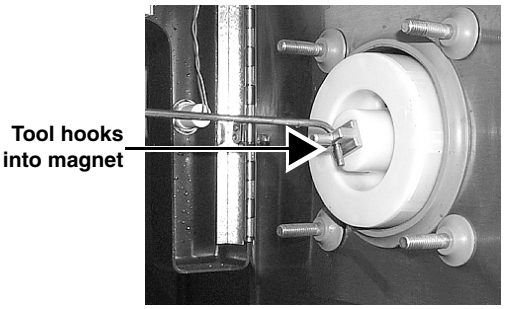

FIGURE 31

CAUTION — The magnet is very strong, heavy, and fragile. Be careful not to pinch hands and fingers between the magnet and a steel object. Make sure no foreign objects are attached to the magnet.

WARNING — Strong Magnetic Field. Person wearing pacemaker, implanted cardioverter defibrillator, or other implanted medical device may be affected by the magnetic field and must keep the magnet at 6 or more inches from the device. The magnetic field can affect operation of these devices which may cause bodily injury or death.

If disruption of device occurs or operation is adversely effected, immediately move the victim far away from magnet and seek medical assistance.

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7. Install the magnet in the reverse order to removing it. Use the magnet puller tool to install the magnet being careful to insert the magnet slowly and not let it slam into the end of the cylinder.

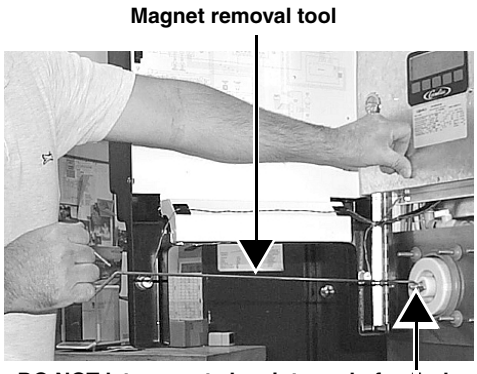

FIGURE 32

8. Inspect parts to see if they should be replaced, including the beater bars, face plate, O-ring, and beater bar bushing.

NOTE: Install faceplate by pressing until it contacts the front of the cylinder. Reinstall 4 washers and nuts finger tight. Then approximately 1/4 turn with a wrench.

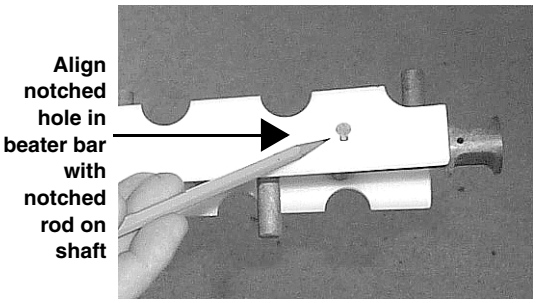

FIGURE 33

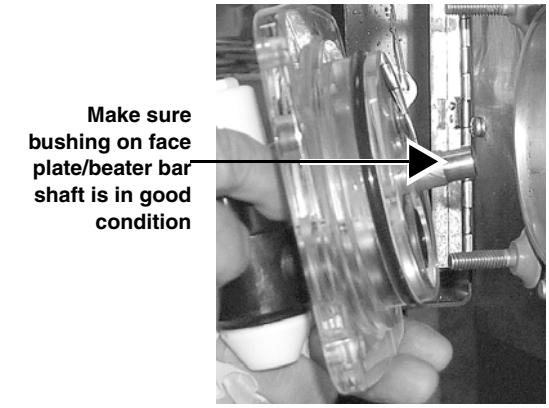

FIGURE 34

9. When all the hardware is securely in place turn the blendonator ON, then turn the product cylinder supply valve ON, bleed the cylinder, and use the control panel to turn the cylinder ON. There is a short delay before the beater bar starts rotating.

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DC Control Drive Motor Board Replacement - Emerson

CAUTION - Use a grounding strap.

1. Disconnect the power to the unit.

DC Control Drive Motor Board

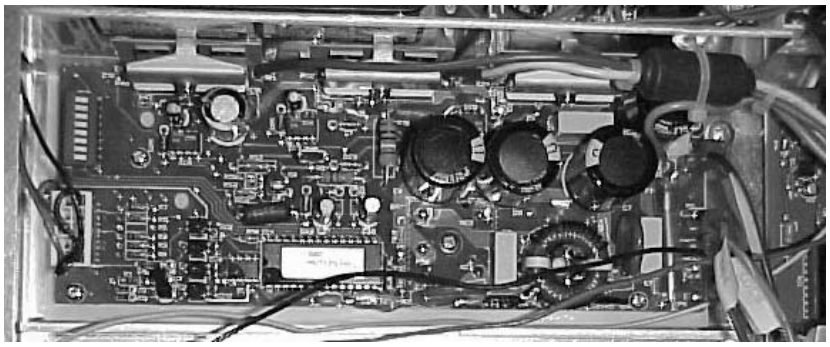

FIGURE 35

2. Open the merchandiser door, then remove the top front panel and front hinged panel.

DANGER — HIGH VOLTAGE, after disconnecting power wait for approximately 5 minutes to work on the unit. Working on the unit before the 5 minutes have passed could result in electrical shock or death!

3. Unscrew the 3 mounting screws on the Control Drive Motor board mounting bracket and slide the bracket up while tilting it out. Do NOT detach the wires from the board yet.
4. Secure the new board in place. One at time remove the wires from the old board and connect them to the new board. Make sure that the thermistor harness is **not** removed with the old board.
5. Connect the power.
6. Re-attach the panels.

Main and Product Delivery Board Replacement - Emerson

1. Disconnect the power to the unit.
2. Open the merchandiser door then remove top front panel and front hinged panel.

DANGER — HIGH VOLTAGE, after disconnecting power wait approximately 5 minuets to work on the unit. Working on the unit before the 5 minutes have passed could result in electrical shock or death!

3. Remove all wires from board being replaced.
4. Disconnect the 4 mounting standoffs and remove the board.
5. Secure the new board in place and reconnect the wiring.
6. If the Main Board was replaced, program the previous setting for time, defrost, sleep, walk-up, and viscosity.
7. Re-attach the panels.

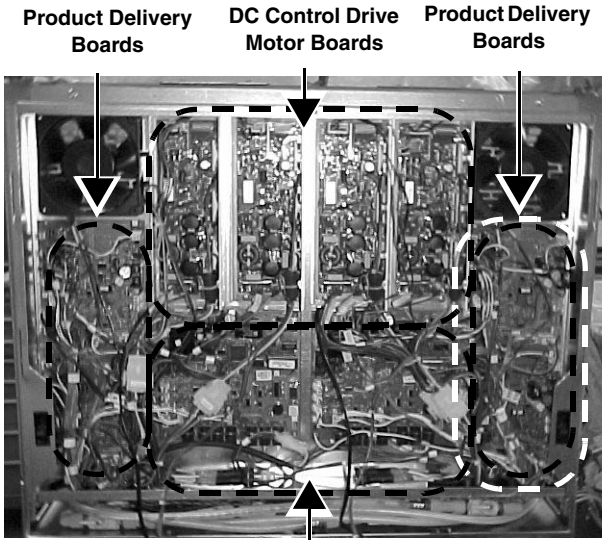

FIGURE 36

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CHIP CHANGE PROCEDURE

The purpose of this notice is to describe the proper method for changing a chip on the master board of a Cornelius machine should it become necessary.

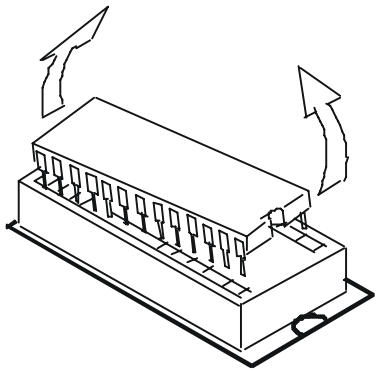
NOTE: Static electricity can destroy sensitive electronic circuits. Always wear static straps or keep yourself grounded to the machine while working in the electronic boards.

Tools needed:

- 32 pin dip extractor (chip puller) 790327

Wrist ground strap 790326

1. Unplug machine.
2. Remove top panel on floor models. Open door to access the control box on the OC2 machine.
3. Remove lid to control box on.
4. Place the chip puller and new chip on the machine (chip still in the container).
5. Attach ground strap to the bare metal control box.
6. Carefully remove the new chip from shipping container. Save shipping container to pack old chip in.
7. Place chip puller on chip and gently squeeze until tool grips the chip.
8. Pull the chip puller straight up with a gentle end–to–end rocking motion to remove the chip. Place old chip in the original container.
9. Pull the chip puller straight up with a gentle end–to–end rocking motion to remove the chip. Place old chip in the original container.



10. Carefully place new chip in the socket and make sure all pins are started in their holes. Press firmly straight down on the chip until it is fully engaged in the socket. Note: Proper placement of the chip can be confirmed by aligning the small indent on one end of the chip with the indent on the outline that is drawn on the board.
11. Remove ground strap.
12. Replace control box lid.
13. Replace top machine panel or close access door.
14. Plug in machine.
15. Defrost both barrels.
16. Check Viscosity read. If both sides read 0 go to 17.
17. If either side reads other than 0, beater motor currents needs to be reset.
18. Turn machine on auto and check for normal operation.
19. Secure machine.

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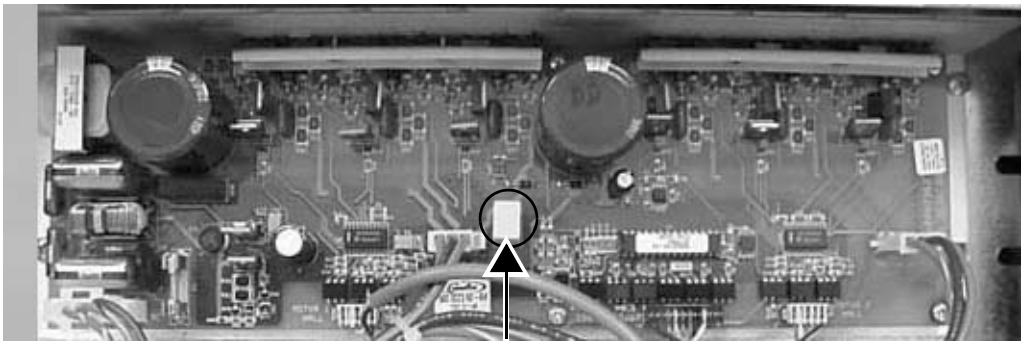
DC Inverter Board Replacement - Baldor

CAUTION - Use a grounding strap.

1. Disconnect the power to the unit.

DC Inverter board (Baldor)



D33 light (Baldor)

FIGURE 37

2. Open the merchandiser door, then remove the top front panel and front hinged panel.

DANGER — HIGH VOLTAGE, after disconnecting power wait for the D33 red light to go out indicating that it is safe to work on the unit. Working on the unit when the red D33 light is lit could result in electrical shock or death!

3. Unscrew the 4 mounting screws on the DC inverter board mounting bracket and slide the bracket up while tilting it out. Do NOT detach the wires from the board yet.
4. Secure the new board in place. One at time remove the wires from the old board and connect them to the new board.
5. Connect the power and check that the D33 light comes on.
6. Re-attach the panels.

Main and Product Delivery Board Replacement - Baldor

1. Disconnect the power to the unit.
2. Open the merchandiser door then remove top front panel and front hinged panel.

DANGER — HIGH VOLTAGE, after disconnecting power wait for the D33 red light to go out indicating that it is safe to work on the unit. Working on the unit when the red D33 light is lit could result in electrical shock or death!

3. Remove all wires from board being replaced.
4. Disconnect the 4 mounting standoffs and remove the board.
5. Secure the new board in place and reconnect the wiring.

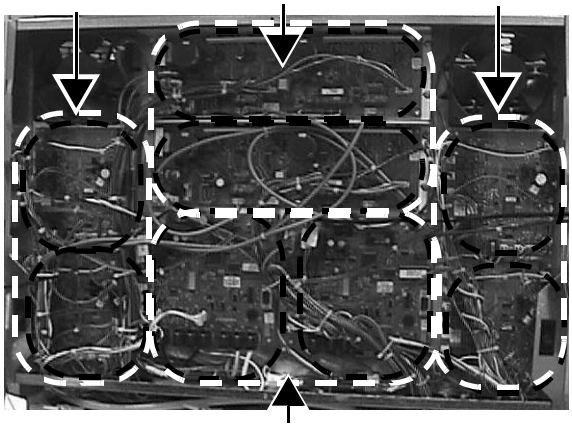


FIGURE 38

6. If the Main Board was replaced, program the previous setting for time, defrost, sleep, walk-up, and viscosity.
7. Re-attach the panels.

Display Board Replacement

1. Disconnect the power to the unit.
2. Open the merchandiser door then remove top front panel and hinged panel.

DANGER — HIGH VOLTAGE, after disconnecting power wait for the D33 red light to go out indicating that it is safe to work on the unit. Working on the unit when the red D33 light is lit could result in electrical shock or death!

3. Unscrew the 4 screws holding the board cover. Carefully reach behind the cover and disconnect the wires (ribbon cable, phone cable, power cable).

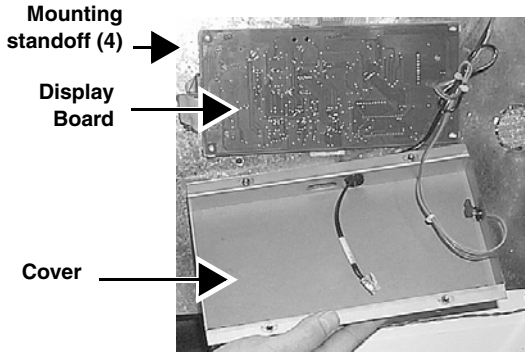


FIGURE 39

4. Remove the board from the 4 standoffs.

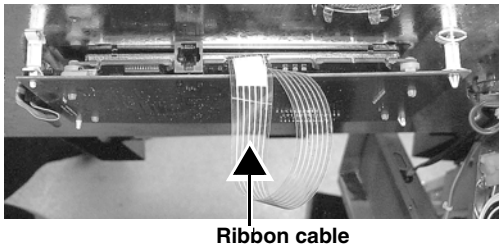


FIGURE 40

5. Install the new board with the ribbon cable protruding through the top.
6. Reconnect the wires while installing the cover.
7. Connect the power and check to see that the control panel works properly. Secure the circuit board door and follow a normal startup procedure.
8. Re-attach the panels.

NOTE: The error log is stored on the display board.

Merchandiser Light Ballast Replacement

1. Disconnect the power to the unit.
2. Lift the merchandiser and slide it left or right to lock it in place.
3. Remove the ballast cover (2 screws).
4. Remove the ballast (2 screws).
5. One ballast at a time, remove the wires from the old one then insert the wires to the same connector on the new ballast.
6. Install the new ballast and ballast cover (2 screws each). Flip the merchandiser back down and go through a normal start-up procedure.

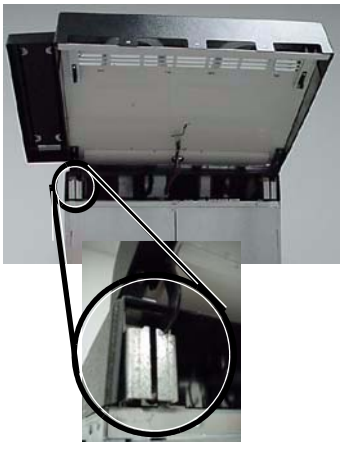


FIGURE 41

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TRANSFORMER REPLACEMENT

1. Disconnect the power to the unit.
2. Remove right side panel (3 screws).
3. Remove all 4 wires from the transformer, note the connection locations.
4. Remove the 2 nuts from the screws and remove the transformer.

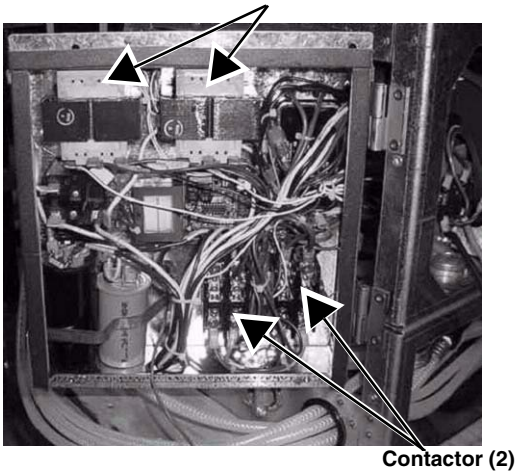

FIGURE 42

5. Attach the new transformer with the 2 nuts.

NOTE: The Coil on the Pinnacle Contactor has 24 VAC.

6. Re-attach the wires to the tabs on the transformer.

NOTE: Make sure the wires are replaced in the same location noted in step 3.

CONTACTOR REPLACEMENT

1. Disconnect the power to the unit.
2. Remove side panel.
3. Remove contactor/starter cover (1 screw).
   Disconnect contactor (2 nuts). Do NOT detach the wires from the contactor yet.
4. One at a time, remove the wires from the old contactor and connect them to the new contactor.
5. Secure the new contactor in place, install the cover, and re-attach the side panel.

START COMPONENTS REPLACEMENT

1. Disconnect the power to the unit.
2. Remove side panel.
3. Unfasten the strap (1 screw).

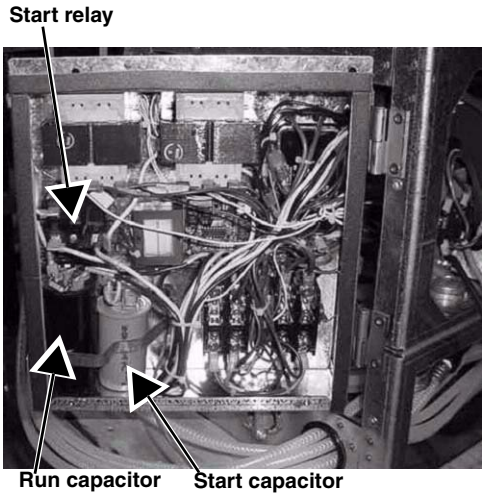

FIGURE 43

4. Replace all start and run components, note connection locations.
   Reassemble, re-connect power, and go through a normal startup procedure.

Pump Motor Replacement

1. Disconnect the power to the unit. Remove splash panel (2 screws), drip tray, and drip tray panel (2 screws).
2. Turn off CO_2, water, and syrup sources. Bleed pressure from the feed lines at the rear disconnects.

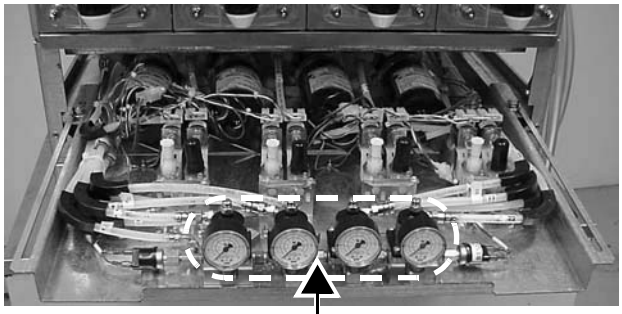

FIGURE 44

3. Loosen 2 bolts holding Tray from sliding out during ship (1 in each corner). Slide tray out.
4. Disconnect Guest fitting from pump. Disconnect electrical leads.
5. Remove 2 screws holding motor on angled brackets.
6. Replace the bad pump in the reverse order of steps 3 through 6.
7. Re-connect the CO_2, water, and syrup. Turn the bottom blendonator/brix valve to blendonator position.
8. Re-connect the power and go through the normal start-up procedure.

Agitator Motor Replacement

1. Disconnect the power to the unit. Remove the side panel (3 screws).
2. Unplug motor. Remove 4 screws. Remove ground wire (green/yellow wire) from motor. Lift motor.
3. Reverse the procedure to install new motor.

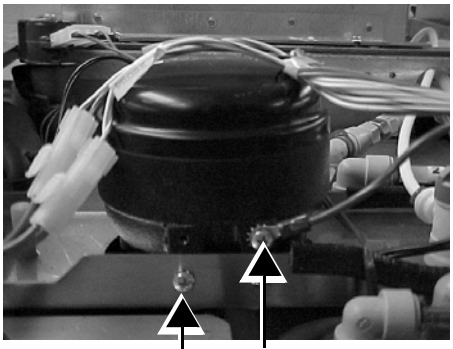

FIGURE 45

Syrup/Water Valve Replacement

1. Follow the instruction (629088599INS) included with the replacement kit, also located on www.cornelius.com.

CO_2 Regulator Replacement

1. Disconnect the power to the unit. If applicable remove the drip tray, drip tray mounting panel (2 screws), and splash panel (2 screws). Remove the side panel (3 screw) by the faulty regulator.
2. Turn off CO_2 source then turn off the cylinder product supply valve. Relieve pressure from blendonator by opening the face plate relief valve.
3. Disconnect 3 quick disconnect fittings to CO_2 regulator using a spanner tool. Remove 2 nuts from mounting bracket. Disconnect pressure switch wires.
4. Remove regulator assembly and replace regulator.
5. Reverse the procedure to install regulator assembly. Be sure to check for leaks after pressurizing the system.
6. Reset regulator pressure to desired setting.

Blendonator Float Switch Replacement

1. Use the control panel to turn the blendonator OFF. Remove the drip tray, drip tray mounting panel (2 screws), and splash panel (2 screws).
2. Turn off the cylinder product supply valve. Slide the product tray out by removing the 2 screws on the top and front side.
3. Turn CO_2 off at the source. Relieve pressure from blendonator by opening face plate relief valve.
4. Disconnect quick disconnect from float assembly. Unplug wires. Unscrew float assembly. Remove pins from wire connector.
5. Unscrew float from assembly.
6. Reverse the procedure to install new float switch. Be sure and check for leaks after pressurizing the system.
7. Bleed air from blendonator using pressure relief valve.
8. Go through the normal start-up procedure.

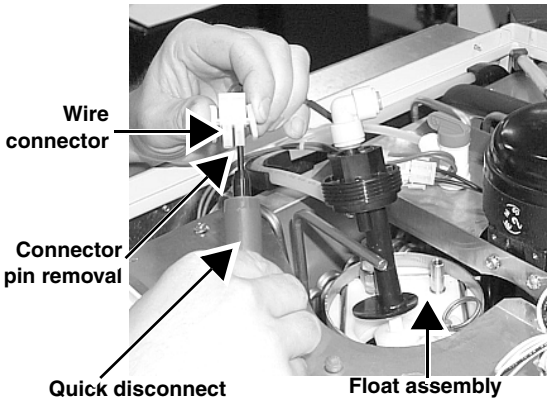

FIGURE 46

Blendonator Tank Replacement:

1. Use the control panel to turn the blendonator OFF.
2. Remove the drip tray, drip tray mounting panel (2 screws), splash panel (2 screws), and side panel closest to the faulty blendonator tank (3 screws).
3. Turn off the cylinder product supply valve.
4. Slide out the product tray by removing the 2 screws on the front, top side.
5. Turn CO_2 off at the source. Relieve pressure from blendonator by opening faceplate pressure relief valve.
6. Disconnect all quick disconnects. Lift blendonator up, note the location of the blendonator tank inputs.

NOTE: The waterbath cover and agitator motor bracket may need to be removed to get the blendanator tank out.

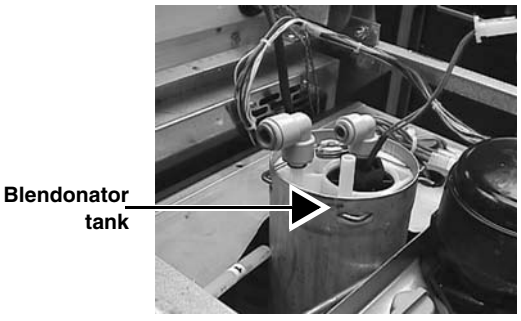

FIGURE 47

7. Reverse the procedure to install new blendonator. Be sure and check for leaks after pressurizing the system.
8. Bleed air from blendonator using pressure relief valve.
9. Run through the normal start-up procedure.

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HY-POT TEST PROCEDURE

The purpose of this test is to check earth leakage (insulation integrity) by applying 1450 VDC for 60 seconds across line and ground. In order to pass this test the current should be less than 4 mA.

1. Remove ground lead from terminal marked P2 on both Emerson Inverter Boards prior to Hy-Pot test (as indicated in FIGURE 48).

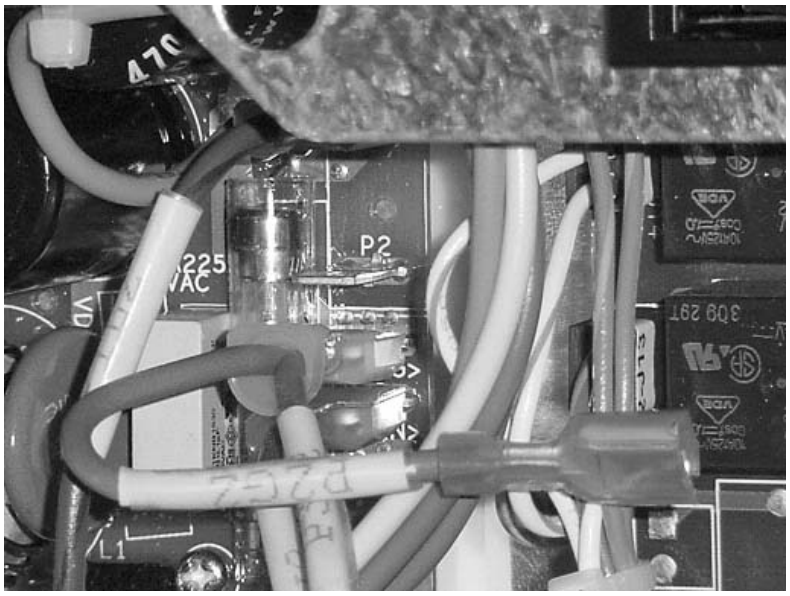

FIGURE 48. Emerson Inverter Board with disconnected Ground Lead

2. Set Hy-Pot tester to the following parameters (see FIGURE 49):

Test Voltage ..... 1.45 kVDC.

Time..... 60 seconds.

Hi-Limit ..... 4.00 mA.

Low-Limit ..... 0.00 mA.

Ramp ..... 6.0 seconds.

Continuity..... ON

3. Connect UK power cord plug to UK receptacle on the Hy-Pot tester (as indicated in FIGURE 49).
4. Push compressor contactor in with as electrically insulated bar (as shown in FIGURE 50).

FIGURE 49. Hy-Pot Tester with UK plug/receptacle

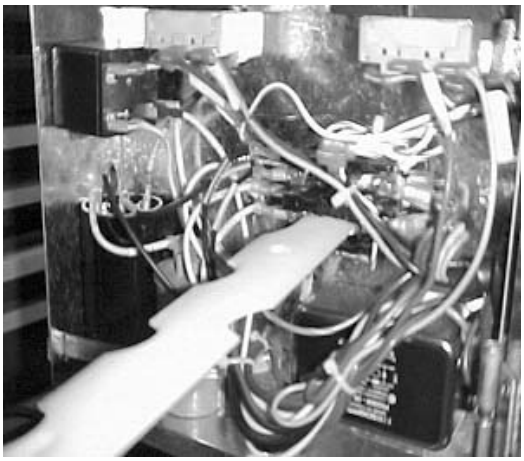

FIGURE 50. Compressor contactor pushed in during test.

5. Press “Test” button on the Hy-Pot tester.
6. Record result (Pass or Fail) as indicated by the display on the Hy-Pot tester.

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HALL EFFECT SENSOR DIAGNOSIS & REPLACEMENT - BALDOR

Hall Board Diagnostic Procedure:

DANGER — HIGH VOLTAGE, this testing is done with the Pinnacle power ON. Care must be taken to avoid high voltage areas of the inverter board.

This procedure will test the Hall Board on Barrel #1.

1. Locate Connector 'J2' on the Inverter Board
   - Pin 1 - Red - +5 volts
   - Pin 2 - White - Hall #1
   - Pin 3 - Brown - Hall #2
   - Pin 4 - Green - Hall #3
   - Pin 5 - Black - Ground

   Using a voltmeter in the 'DC' mode, measure 5 volts between Pin 1 and Pin 5 (Red and Black). If 5 volts is present, continue. If not, remove the connector from “J2”, and measure the same pins on the Inverter board. If 5 volts is present, the cabling to the Hall board, or the Hall board itself, is bad. Replace it. If the 5 volts is not present, the Inverter board is bad. Replace it.

Connect black lead from the meter to the black wire connection at connector. Rotate slowly and watch for the hall board to switch. Move the red lead and repeat test.

FIGURE 51

2. Place Barrel #1 in the OFF mode. Remove the product and face plate from barrel #1. Keep the beater bar engaged with the drive magnet in the back of the freeze cylinder. You will be slowly turning the beater bar by hand.

Rotate slowly.

FIGURE 52

3. Using a voltmeter in the 'DC' mode, place the black probe on pin 5 (Black), and the red probe on pin 2 (White). Slowly turn (5 to 10 degrees per second) the beater bar in either direction. Watch the voltmeter. If the Hall sensor is operating properly, the voltage will be changing between 0 volts and 5 volts. If you are turning at a uniform speed, the voltage on the voltmeter should toggle back and forth uniformly. If the voltage is NOT changing, replace the Hall Board. If the voltage is changing very erratically, replace the Hall Board.

FIGURE 53

Voltage should switch from 5 V.D.C. to .025 (approx.).

FIGURE 54

4. Repeat step 4 above between Pins 3 & 5, as well as Pins 4 & 5. If any of these three combinations show erratic voltage changing, replace the Hall board.
5. To test the Hall Board on Barrel #2, do steps 1 through 5 on connector J3 of the inverter board.

DC Stator Test - Emerson

1. Remove the stator connection from the inverter board. Test stator and connecting wiring at the inverter board.
2. Check the resistance of all 3 (yellow, red, and blue) of the terminals.

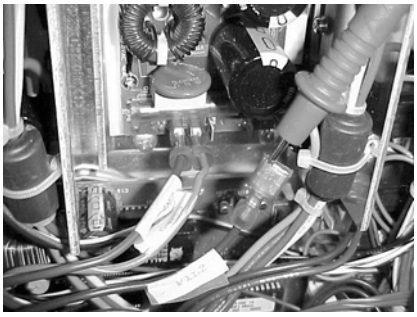

FIGURE 55

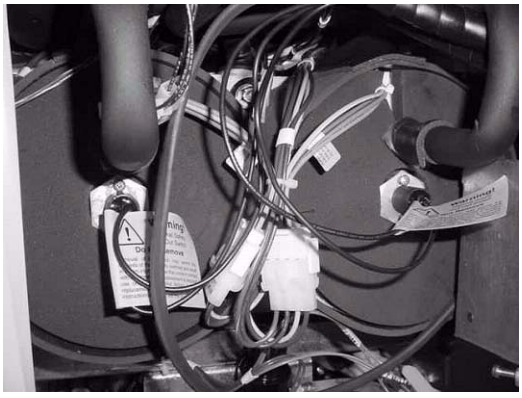

FIGURE 56

The correct reading should be approximately 37 ohms.

FIGURE 57

DC STATOR TEST - BALDOR

1. Remove the stator connection from the inverter board. Test stator and connecting wiring at the inverter board.

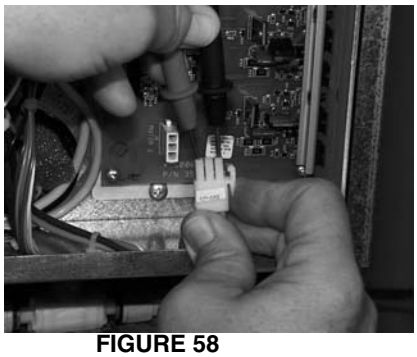

FIGURE 58

2. Check the resistance of all three of the terminals.

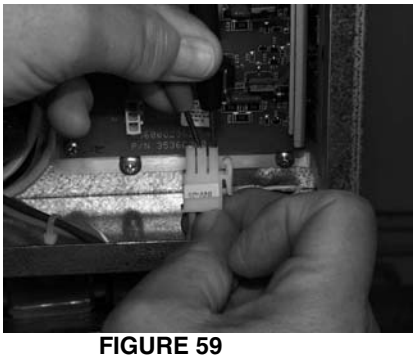

FIGURE 59

FIGURE 60

The correct reading should be approximately 80ohms.

FIGURE 61

DC Stator Assembly Replacement

1. Disconnect the power to the unit. Remove back panel (4 screws) and side panels (3 screws each).
2. Turn off the blendonator valve.
3. Drain the cylinder of the faulty motor by opening the dispensing valve. When only CO_2 comes out, turn the cylinder product supply valve off. Relieve CO_2 pressure by opening the faceplate pressure relief valve.
4. Remove the cylinder face plate (4 nuts).
5. Remove beater bar and scraper blades.
6. Use the magnet puller tool (p/n 560003662) that comes with the unit to remove the magnet.

NOTE: Sufficient force must be used to break the magnet lose from the end of the cylinder.

CAUTION — The magnet is very strong and heavy. Be careful not to pinch hands and fingers between the magnet and a steel object.

WARNING — Strong Magnetic Field. Person wearing pacemaker, implanted cardioverter defibrillator, or other implanted medical device may be effected by the magnetic field and must keep the magnet at 6 or more inches from the device. The magnetic field can affect operation of these devices which may cause bodily injury or death.

If disruption of device occurs or operation is adversely effected, immediately move the victim far away from magnet and seek medical assistance.

7. Disconnect product supply line. Disconnect wire harness. Remove foam insulation. Remove thermostat in center of stator assembly. Unbend the index tabs and remove end cap.

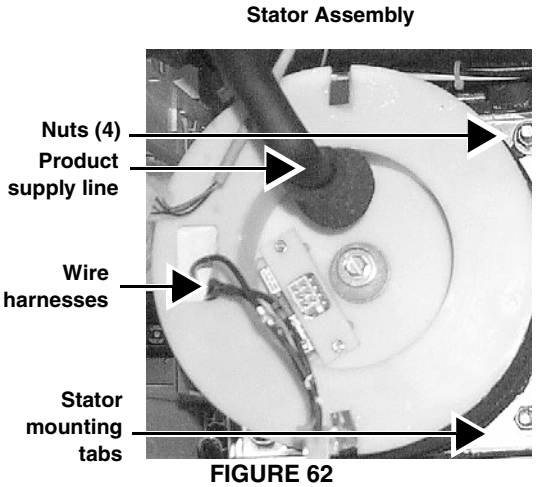

FIGURE 62

8. Remove stator assembly from cylinder (4 nuts).
9. Apply silicon grease (Dow Corning NC111) around the inside of the new stator and on the outside of the cylinder.
   Be sure to put a new gasket in the cylinder inlet tube.

FIGURE 63

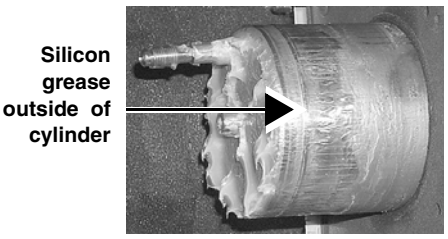

FIGURE 64

10. Slide new stator on end of cylinder. Torque nuts to 15-18 foot pounds. Replace end cap and bend index tabs down. Replace thermostat, be careful not to overtighten the brass insert, the threads may snap off inside the steel boss. Replace foam insulation. Reconnect wire harness. Reconnect product supply line.
11. Replace magnet into opening of cylinder. Use magnet removal tool to slowly and carefully push magnet to back of cylinder.

NOTE: As magnet approaches end of cylinder the magnet force increases and care must be taken to not let the magnet slam into the end of the cylinder.

12. Reinstall the beater bar and scrapper blades. Be sure the bushing is on the front of the beater bar shaft. Make sure that the beater bar is engaged with the magnet.
13. Reinstall the faceplate by pressing until it contacts the front of the cylinder and then install the washers and nuts (finger tight only).
14. Re-connect the power and go through the normal start-up procedure.

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DC Stator Assembly Replacement - Baldor

1. Disconnect the power to the unit. Remove back panel (4 screws) and side panels (3 screws each).
2. Turn off the blendonator valve.
3. Drain the cylinder of the faulty motor by opening the dispensing valve. When only CO_2 comes out, turn the cylinder product supply valve off. Relieve CO_2 pressure by opening the faceplate pressure relief valve.
4. Remove the cylinder face plate (4 nuts).
5. Remove beater bar and scraper blades.
6. Use the magnet puller tool (p/n 560003662) that comes with the unit to remove the magnet.

NOTE: Sufficient force must be used to break the magnet lose from the end of the cylinder.

CAUTION — The magnet is very strong and heavy. Be careful not to pinch hands and fingers between the magnet and a steel object.

WARNING — Strong Magnetic Field.
Person wearing pacemaker, implanted cardioverter defibrillator, or other implanted medical device may be effected by the magnetic field and must keep the magnet at 6 or more inches from the device. The magnetic field can affect operation of these devices which may cause bodily injury or death.

If disruption of device occurs or operation is adversely effected, immediately move the victim far away from magnet and seek medical assistance.

7. Disconnect product supply line. Disconnect wire harness. Remove foam insulation. Remove thermostat in center of stator assembly. Unbend the index tabs and remove end cap.

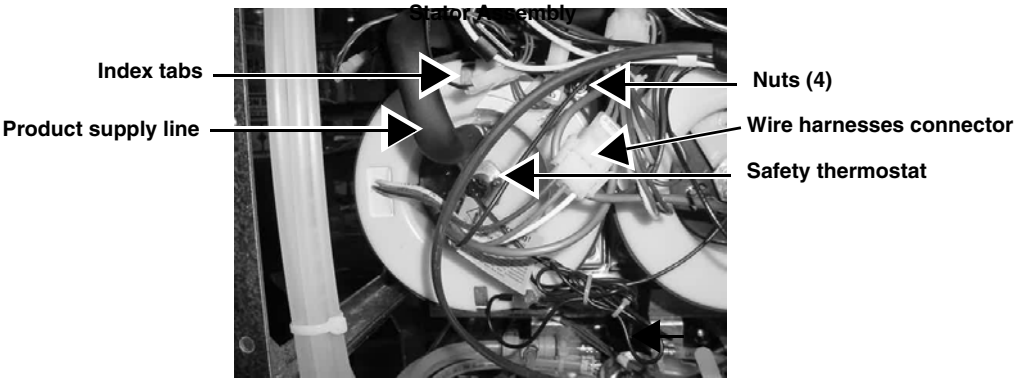

FIGURE 65

8. Remove stator assembly from cylinder (4 nuts).
9. Apply silicon grease around the inside of the new stator and on the outside of the cylinder. Be sure to put a new gasket in the cylinder inlet tube.

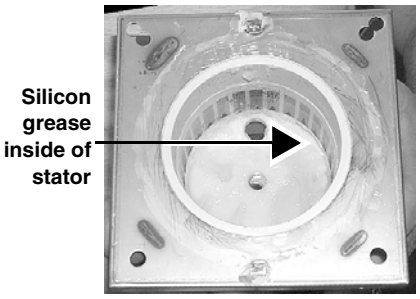

FIGURE 66

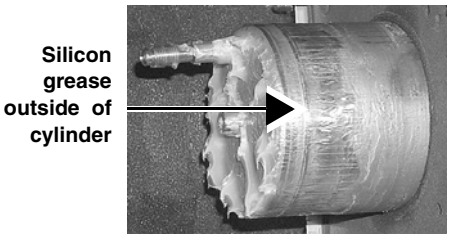

FIGURE 67

10. Slide new stator on end of cylinder. Torque nuts to 15-18 foot pounds. Replace end cap and bend index tabs down. Replace thermostat, be careful not to over tighten the brass insert, the threads may snap off inside the steel boss. Replace foam insulation. Reconnect wire harness. Reconnect product supply line.

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11. Replace magnet into opening of cylinder. Use magnet removal tool to slowly and carefully push magnet to back of cylinder.

NOTE: As magnet approaches end of cylinder the magnet force increases and care must be taken to not let the magnet slam into the end of the cylinder.

12. Reinstall the beater bar and scrapper blades. Be sure the bushing is on the front of the beater bar shaft. Make sure that the beater bar is engaged with the magnet.
13. Reinstall the faceplate by pressing until it contacts the front of the cylinder and then install the washers and nuts (finger tight only).
14. Re-connect the power and go through the normal start-up procedure.

CONDENSER FAN MOTOR REPLACEMENT (INTEGRAL ONLY)

1. Disconnect the power to the unit. Remove top cover (1 screw).
2. Unplug motor wiring harness and remove air filter.
3. Remove 4 screws securing fan shroud to frame.
4. Lift fan motor and shroud out.
5. Remove 4 screws securing fan motor to shroud.
6. Remove 2 fan covers and place them on the new fan.
7. Reverse the procedure to install new motor.

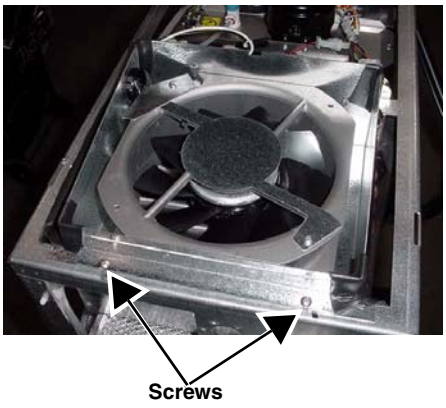

FIGURE 68

CONDENSER FILTER REPLACEMENT (INTEGRAL ONLY)

1. Slide filters out of tracks right and left side.
2. Clean or replace.
3. Re-install.

FIGURE 69

FOAM PACK REPLACEMENT:

1. Disconnect the power to the unit. Remove back middle panel (4 screws) and side panels (3 screw each).
2. Turn OFF the blendonator valve.
3. Drain the cylinder of the faulty foam pack by opening the dispensing valve. When only CO_2 comes out, turn the cylinder product supply valve off. Relieve CO_2 pressure by opening the faceplate pressure relief valve.
4. Remove the cylinder face plate (4 nuts).
5. Remove beater bar and scrapper blades.
6. Use the magnet puller tool (p/n 560003662) that comes with the unit to remove the magnet.

NOTE: Sufficient force must be used to break the magnet lose from the end of the cylinder.

CAUTION — The magnet is very strong and heavy. Be careful not to pinch hands and fingers between the magnet and a steel object.

WARNING — Strong Magnetic Field.
Person wearing pacemaker, implanted cardioverter defibrillator, or other implanted medical device may be effected by the magnetic field and must keep the magnet at 6 or more inches from the device. The magnetic field can affect operation of these devices which may cause bodily injury or death.

If disruption of device occurs or operation is adversely effected, immediately move the victim far away from magnet and seek medical assistance.

7. Disconnect product supply line. Disconnect wire harness. Remove foam insulation. Remove screw in center of stator assembly. Unbend the index tabs and remove end cap.
8. Remove the stator assembly from the cylinder (4 nuts).
9. Reclaim refrigerant.
10. Remove 4 bolts and pry off stator plate.
11. Remove front splash panel and drip tray mounting panel.
12. Remove 2 nuts on bottom of foam pack front and rear mounting bars.

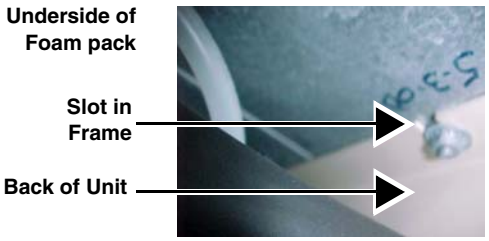

FIGURE 70

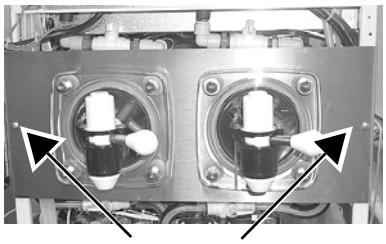

FIGURE 71

13. Remove refrigeration line insulation from back of foam pack and remove thermistors (sensors) from refrigeration lines. Unsweat fittings from the back of the foam pack. Lift the foam pack out the front of the unit.
14. Reverse the procedure to install new foam pack. Replace the dryer. Evacuate and recharge the system.

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COMPRESSOR REPLACEMENT:

1. Disconnect the power to the unit. Remove bottom rear cover (4 screws) and side panels (3 screws each).
2. Disconnect all wires to compressor. Remove 4 mounting nuts.

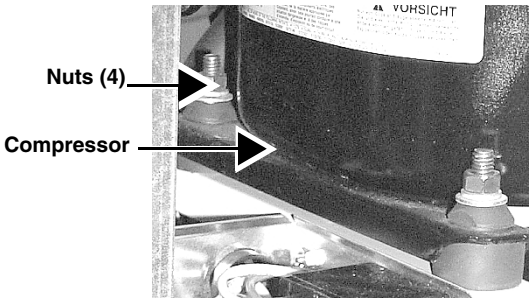

FIGURE 72

3. Reclaim refrigerant. Remove insulation from around fittings. Unsweat suction line first. Cut the discharge line on top of the compressor (be careful so the line can be spliced back together).
4. Remove the compressor and unsweat the discharge line. Reverse the procedure to install new compressor. Replace the dryer. Evacuate and recharge the system.

HOT GAS VALVE REBUILDING:

1. Disconnect the power to the unit. Remove side panels (3 screws each).
2. Reclaim refrigerant.
3. Rebuild the hot gas valve per the manufacturer's instructions.
4. Replace the dryer. Evacuate and recharge the system.

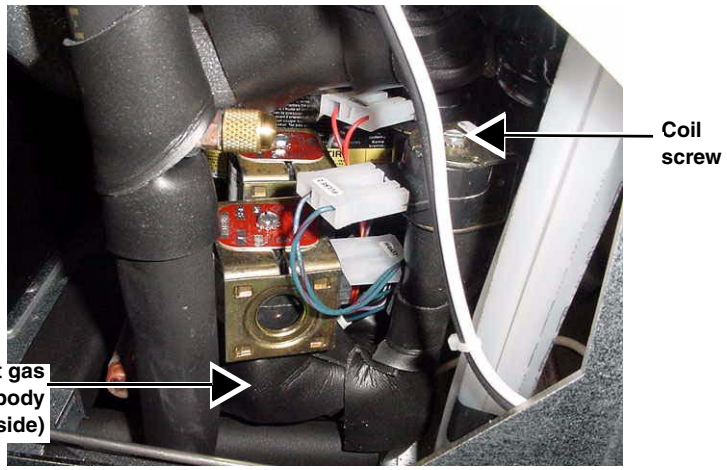

FIGURE 73

PULSE VALVE REPLACEMENT:

1. Disconnect the power to the unit.
   Remove side panels (3 screws each) and rear panels if necessary.

   CAUTION — There are 6 pulse valves on a 4 Flavor unit, one for each cylinder and one for each water bath. The pulse valve for the water bath and the pulse valves for the cylinders are NOT the same. DO NOT interchange these valves.
2. Reclaim refrigerant. Disconnect pulse valve wires. Remove coil (1 screw).
3. Unsweat and remove valve.

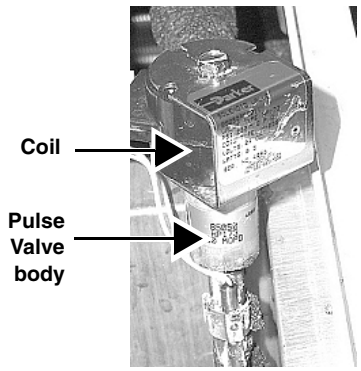

FIGURE 74

4. Install new valve by reversing the procedure. Be sure to place a heat sink on the valve body when sweating the new valve to avoid damage to the valve components.
5. Replace the dryer. Evacuate and recharge the system.

WATER PRESSURE REGULATOR / SWITCH REPLACEMENT:

1. Disconnect the power to the unit. Remove back lower and middle panel (4 screws each).
2. Turn off water at source. Bleed pressure from water feed line at the rear disconnect.
3. Disconnect wires on pressure switch. Disconnect 2 quick disconnect fittings using a spanner tool.

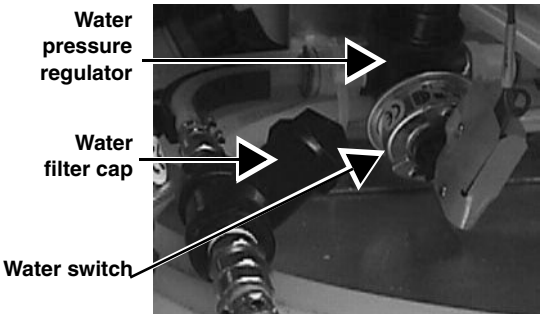

FIGURE 75

4. Remove and replace the regulator and/or switch.
5. Reassemble in the reverse order. Be sure and check for leaks after pressurizing the system.
6. Check regulator pressure setting.

WATER STRAINER CLEANING:

1. Disconnect the power to the unit. Remove rear middle panel (4 screws)
2. Turn off water source then bleed pressure from water feed line at the rear disconnect.
3. Unscrew cap and remove Strainer.
4. Clean Strainer and reassemble in the reverse order. Be sure and check for leaks after pressurizing the system.

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MERCHANDISER LAMP REMOVAL AND INSTALLATION

Removal

1. SHUT OFF POWER TO UNIT. Remove lens and lens support.

FIGURE 76

2. Press lamp locks to unlock lamp pins.

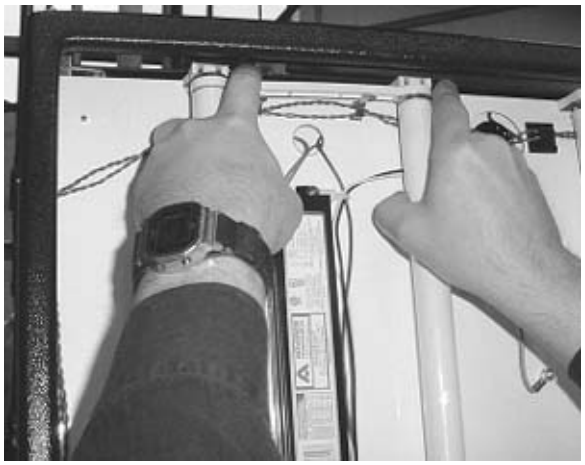

FIGURE 77

3. Disengage lamp pins by pulling lamp in a direction forward away from reflector surface and remove lamp.

   NOTE: Pulling down on lamp to disengage pins may result in damage to lampholders and spring clips.

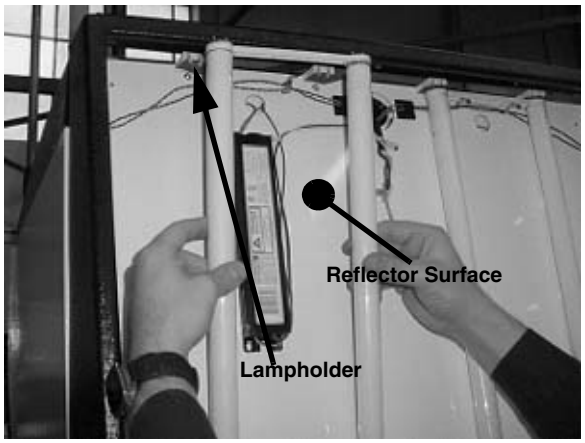

FIGURE 78

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FIGURE 79 demonstrates lampholder with lock completely disengaged (lamp omitted for clarity).

NOTE: Locks must be completely disengaged before removing lamp or damage to the lamp or the lock may result.

FIGURE 79

Installation

1. Slide lamp into spring clips at bottom of reflector.

FIGURE 80

2. Engage lamp pins by pushing lamp in a direction toward the reflector surface, making certain pins are fully engaged in lampholder (see FIGURE 81).

NOTE: Pushing up on lamp to engage pins may result in damage to lampholders.

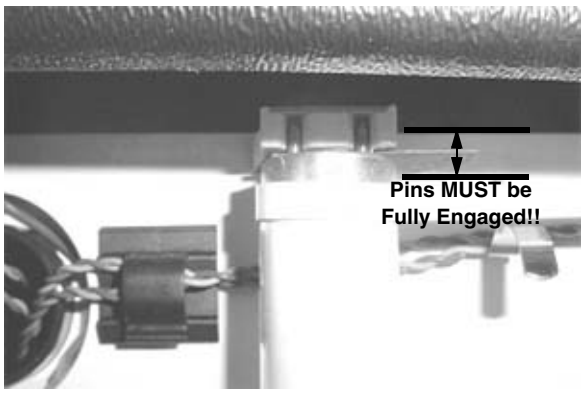

FIGURE 81

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3. Press the lamp into the lampholder firmly to engage locks. Reinstall lens and lens support. Restore power to unit.

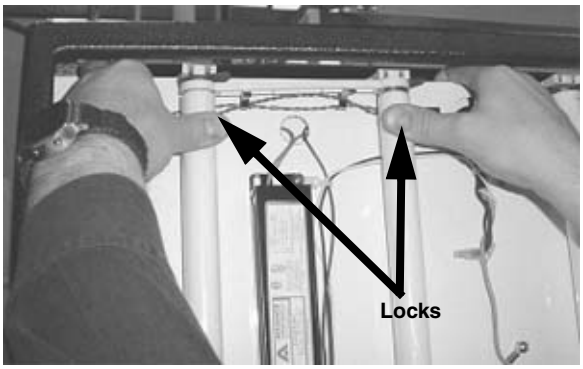

FIGURE 82

FIGURE 83 demonstrates lampholder with lock properly engaged (lamp omitted for clarity).

WARNING: For proper and effective lamp function, locks must be completely engaged.

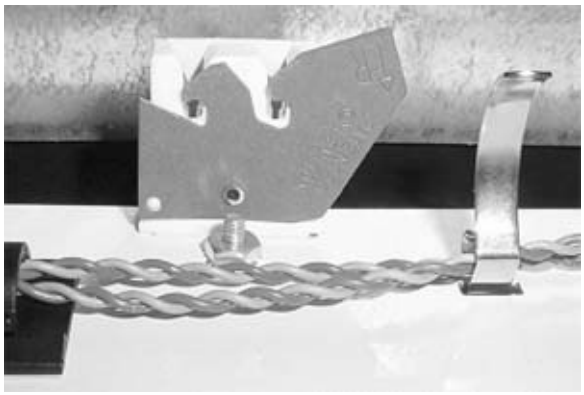

FIGURE 83

TROUBLESHOOTING

- If foul smell or bad taste, check water filter.
- If water out message, check water filter.

TROUBLESHOOTING THE SYSTEM

Problem	Probable Cause	Remedy
Unit will not run.	A. Unit not plugged in. B. Circuit breaker. C. No power at L1 or L2 on contactor. D. Low voltage at T1 or T2. E. Solid Red LED above display.	A. Plug in unit. B. Reset/replace circuit breaker C. Check voltage at outlet. Check wiring to contactor. D. Replace the contactor. E. If LED is lighted, do not restart dispenser. Immediately call Service at (800) 238-3600.
“Sleep” display on cylinder status menu.	A. Sleep time set. B. Clock incorrectly set. C. No wake time set.	A. Check programming. B. Check programming. C. Check programming.
Barrel status OFF #1 and #2.	A. Not activated. B. Error has shut off motors. C. Unit in Diagnostics. D. Defective touch switch.	A. Turn to ON or MOTOR. B. Correct error & turn to ON or MOTOR mode. C. Exit diagnostics & turn to ON or MOTOR mode. D. Replace.
Low/High voltage ERROR.	A. Line Voltage out of SPEC (spec is 198-253 VAC for 60 Hz and 196-265 VAC for 50 Hz). B. Error range 180/260.	A. 1 - Check line voltage. 2 - Check T1/T2 with Compressor running. B. Correct line voltage.
Como ERROR.	A. Display board is not communicating with the main board.	A. Check connections at J6 and J17. See display board test in the Service manual.
Torque ERROR.	A. Freeze up. B. Magnet and stator not aligned. C. Magnet binding.	A. Defective pulse valve. B. Stator or magnet not installed correctly. C. Inspect and correct problem.
Electronic ERROR.	A. Clock chip or bad line frequency. B. Faulty communication.	A. Replace the clock chip. B. Check phone connections.
Drive ERROR.	A. Motor not turning when it is commanded to. Freeze up. B. Bad inverter board (Emerson).	A. 1 - Check Brix. 2 - Check sold out. 3 - Check for leaking pulse valve. 4 - Defective binding magnet 5 - Broken beater bar. B. Test and replace as necessary.

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Frozen Cylinder	A. Low Brix B. Pulse valve leaking C. Broken beater bar D. Broken drive coupler. E. No defrost. F. Are defrosts programmed all days?	A. Correct cause and reset Brix. B. Replace pulse valve. C. Replace beater bar. D. Replace the drive coupler. E. Program defrosts in unit. F. Reprogram to all days.
Detective Stator	A. Open or shorted.	A. See stator test.
Defective Hall Board (Baldor)	A. Open or shorted.	A. See Hall board test.
Stator or Misalignment	A. Loose mounting nuts. B. Missing or extra gasket. C. Debris causing interference. D. Hall board not mounted correctly.	A. Tighten nuts. B. Add or remove gasket. C. Remove debris and tighten. D. Assemble correctly.
No Power to Stator	A. Blown inverter fuse. B. Blown thermistor (Emerson). C. One side of inverter is defective. D. Incorrect wiring. E. Poor connections.	A. Emerson - replace board. Baldor - replace fuse. B. Replace thermistor harness. C. Swap side 1 & 2 controls, see if motor will run. D. Check wiring with Pinnacle schematic. E. Check all connections.
Bad Magnet	A. Defective beater bar coupler. B. Worn magnet bushing. C. Cracked/damaged magnet housing. D. Cylinder shaft not aligned.	A. Replace the defective part. B. Replace bushing assembly/check cylinder shaft. C. Replace magnet. D. Replace foam pack.

TROUBLESHOOTING PRODUCT NOT COLD

Problem	Probable Cause	Remedy
Compressor not Running	A. Cylinder not in ON mode. B. No voltage to compressor. C. Bad start components. D. Compressor's thermal overload protector "open". E. Open or shorted compressor windings. F. Bad control board.	A. Turn cylinder to ON. B. Check power at contactor L1, L2 - T1, T2. C. Check components and wiring. D. Check resistance of compressor windings and check incoming line voltage. E. Check resistance of compressor windings. F. Troubleshoot, replace if necessary.

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Compressor Running but not Cooling	A. Low refrigerant. B. Restricted condenser/filter. C. Condenser fan motor/blade defective. D. Any pulse valve stuck open or closed. E. Hot gas valve leaking or open. F. Defective compressor.	A. Repair leak and weigh in new charge. B. Clean or repair. C. Repair or replace. D. Replace. E. Repair or replace. F. Repair or replace.
Restricted Air Flow	A. Dirty filter. B. Dirty condenser. C. Damaged fins. D. Not enough “clearance” around unit.	A. Clean filter. B. Clean condenser. C. Repair/replace if necessary. D. Ensure proper spacing around unit.
Fan Motor	A. Bad connection B. Bad motor C. Cracked or bent fan blade	A. Check/connect B. Replace motor C. Replace fan blade
Pulse Valve	A. Miswired. B. Defective coil. C. Defective valve. D. Defective product delivery board.	A. Correct wiring. B. Replace coil. C. Replace valve. D. Replace board.
Hot Gas Valve	A. Miswired. B. Defective coil. C. Defective product delivery board.	A. Correct wiring. B. Replace coil. C. Replace.
No/Low Refrigerant	A. Leak.	A. Repair and weigh in new charge.
Sensors	A. Bad connection. B. Bad sensor. C. Sensor out of position. D. Defective product delivery board.	A. Correct wiring. B. Replace sensor. C. Reposition sensor and clip. D. Replace.

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APPENDIX A - HISTORIC BRIX PROCEDURES

NOTE: See page 28, step 4 to determine if Section 1 or 2 applies to the unit.

SECTION 1: 3-WAY VALVE BRIXING PROCEDURE

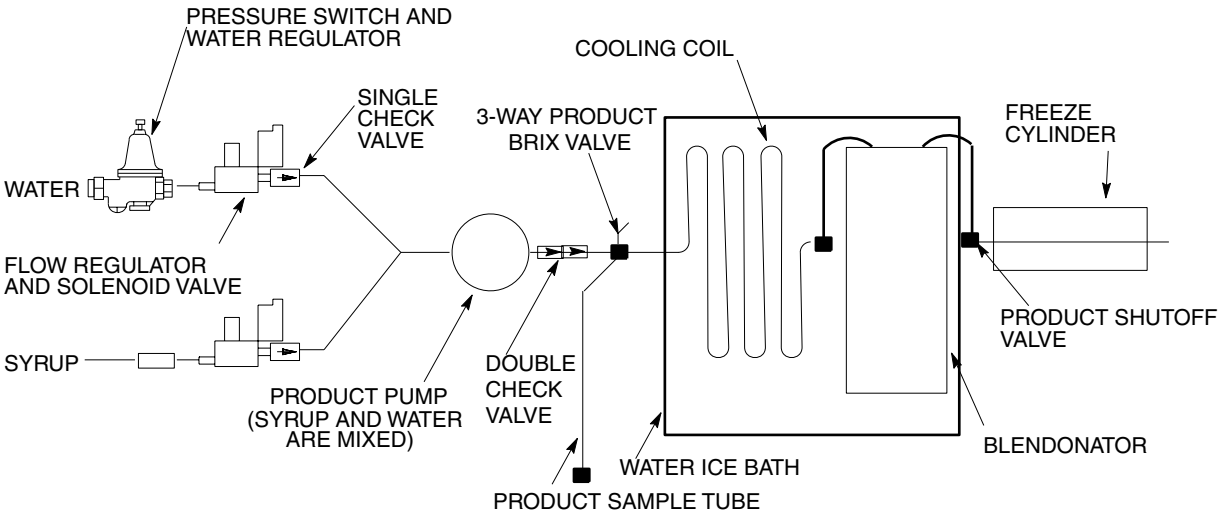

FIGURE 5

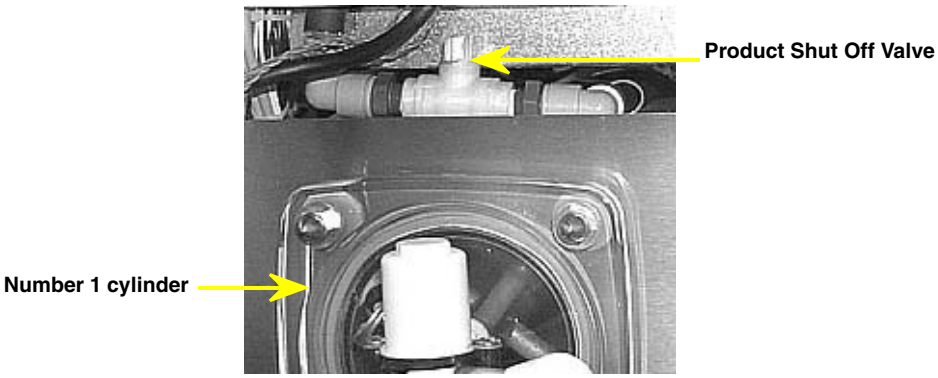

FIGURE 6

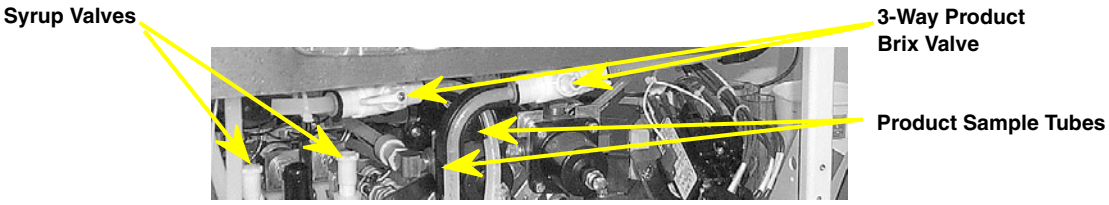

FIGURE 7

1. Make sure the status of all cylinders is OFF.
2. Press MENU, press UP until BRIX is selected, press GO, select cylinder to be BRIXed.

NOTE: Pressing CANCLE will stop the process.

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1. Turn three-way product valve to BRIX position. Hold a 12 ounce cup under the appropriate sample tube.

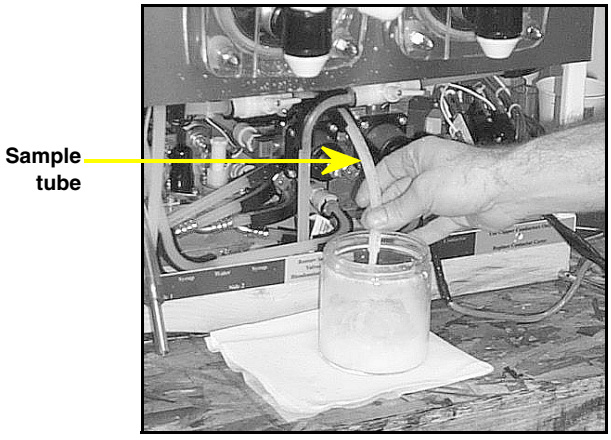

FIGURE 2

3. Press GO and wait 3-5 seconds.
   The unit will dispense product for 3 seconds. Discard this first sample.
4. Hold cup under the tube again and press GO.
5. Put sample on refractometer and read BRIX.

NOTE: Temperature compensated hand–type refractometers (P/N 511004000) are available from Cornelius.

6. Adjust syrup regulator to get a BRIX reading of 13 ± 1. To increase reading, turn syrup regulator clockwise.

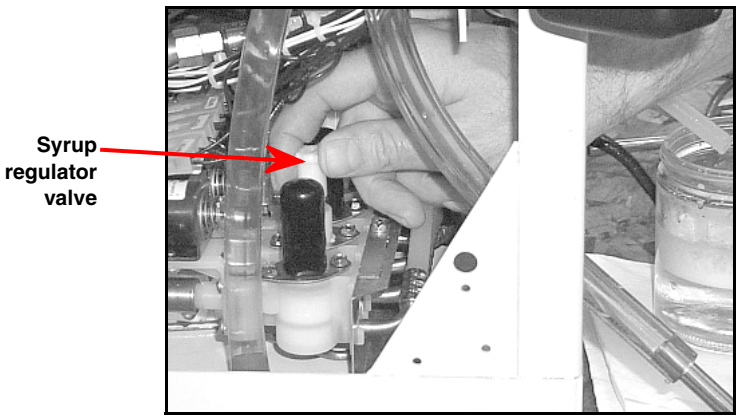

FIGURE 7

8. After BRIX is adjusted, turn 3-way product valve to blendonator position.
9. Repeat procedure for additional freeze cylinders.
10. Turn the freeze cylinder shutoff valves to the ON position. Press MENU, press UP until blendonator is selected, press GO, select the desired cylinder, press ON.

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11. When the cylinders have stopped filling pull the faceplate relief valves until product comes out. Do not bleed air too fast or product will foam in the freeze cylinders.

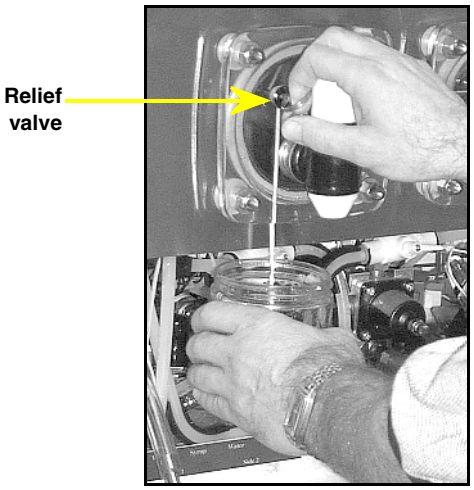

FIGURE 12

13. Repeat steps 10 and 11 for the other freeze cylinders.
14. Press BACK twice to go to the Main menu.
15. Press ON, after 5 seconds the compressor will start and the beater bars will rotate counterclockwise. Wait 10 – 15 minutes and test the product.

NOTE: Make sure the controller is programmed before pressing ON.

16. Install the second side panel, splash panel, drip tray, and top cover.

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SECTION 2: SHUT-OFF VALVE AND BLENDONATOR OUTLET BRIX SAMPLE TUBE PROCEDURE

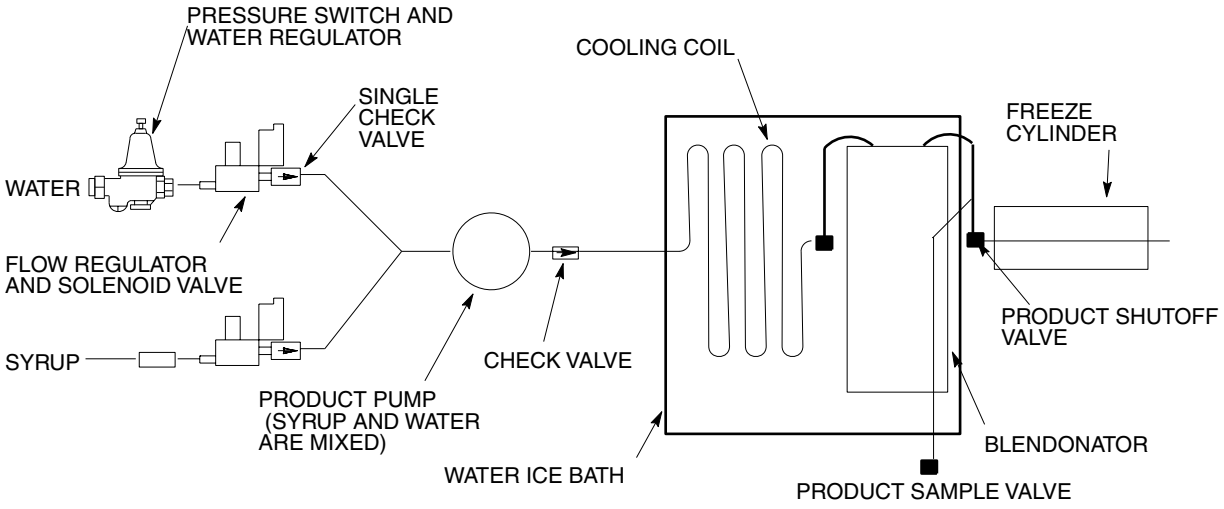

FIGURE 17

The BRIX menu allows the activation of syrup and water solenoids, and blendonator pump motor for a selected cylinder.

1. Press MENU.
2. Scroll up to BLENDONATOR.
3. Turn Blendonators 1 and 2 OFF.
4. Drain each Blendonator through the BRIX Sample Valve.
5. Press BACK.
6. Scroll down to BRIX.
7. Press GO.
8. Once the BRIX SELECT menu is selected press GO to partially fill Blendonator #1 with a BRIX sample.
9. After the sample is complete (Blendonator pump has stopped turning), remove the sample from the Blendonator (through the BRIX Sample Valve) for refractometer testing.
10. If the BRIX reading is within specification, the BRIX adjustment for this barrel is complete.
11. If the BRIX reading is NOT within specification, adjust the syrup Flow Control to bring the product within specification (clockwise to increase BRIX, counter-clockwise to decrease BRIX). Adjust Flow Control in no more than 1/2 turn increments.
12. Repeat step 8 above 3 times, drain the Blendonator, and dispose of this product.
13. Repeat steps 8 and 9 above and measure the sample with the refractometer.
14. Repeat steps 11-13 until the product BRIX is within specification.
15. Repeat steps 8-14 until Blendonator #2 product BRIX is within specification.
16. Scroll to the BLENDONATOR menu and turn both Blendonators ON.

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APPENDIX B

VALVE TORQUE AND STAKING

Cornelius provided Service Bulletin number TSB-06-3 concerning the proper torquing and staking of FCB equipment using the Delta stainless steel dispensing valve. The procedures in the Service Bulletin ensured that the shank nut used to retain the Delta dispensing valve to the faceplate was tightened to the correct torque and then staked so that the shank nut could not be dislodged. All newly manufactured equipment utilizing the Delta dispense valve, beginning with serial numbers 62B0620FC001, has been staked in the factory. Consequently, all Delta valves should now be torqued and staked. A procedure for properly attaching and torquing a Motorman Valve is also included.

This dispensing valve shank nut torque procedure must be followed (a) if a Delta valve has not previously been torqued and staked, (b) if the shank nut on a Delta stainless steel valve that has been staked is later removed and then reinstalled, or (c) the FCB equipment has a Motorman valve. The processes for checking the torque of the shank nut for both the Delta and Motorman valve configurations and for staking the shank nut (Delta valve configuration ONLY) are detailed in this Procedure. The Cornelius tool (part number 620711709) to be used to torque the shank nut can be purchased by contacting BEVCORe at 763-488-3000.

NOTE: When reinstalling a shank nut that has been removed from a staked Delta valve, the shank nut must be FLUSH with the faceplate before applying the torque setting. If the thread or shank nut have been damaged during removal and/or the shank nut cannot be installed flush with the faceplate, the valve should be replaced.

WARNING: Failure to torque the shank nut to 10 lb-ft (120 lb-in) may result in loosening of shank nut which eventually may become detached from valve. Valve will then be forced from face plate and contents of dispenser will spill out. Follow torquing and staking procedures carefully using tools designated to retain shank nut on valve.

The following procedure details the proper method to apply torque to the shank nut on Pinnacle dispensing valves, both Delta and Motorman configurations. This procedure begins with the faceplate assembly removed from the barrel and the inside surface of faceplate wiped dry, especially around shank nut. (See section “COMPONENT SERVICE” steps 1-4 on Page 38 for instructions to drain barrels).

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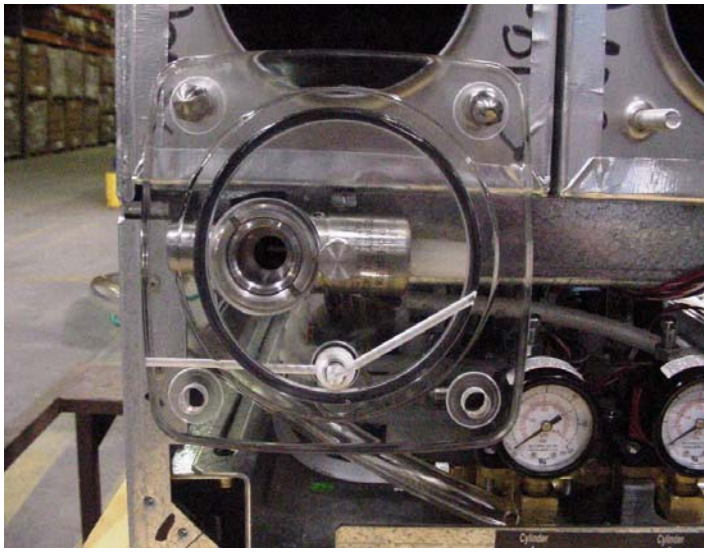
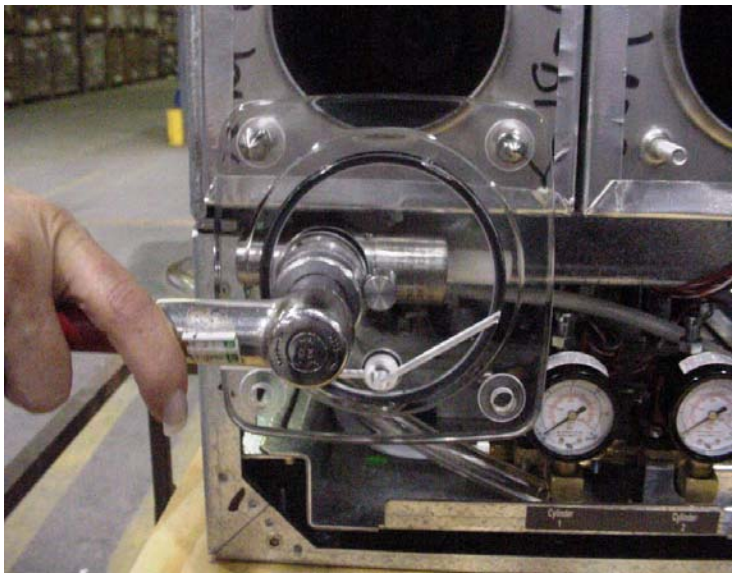
Delta Valve

1. Remove and rotate faceplate, as shown, with valve facing Barrel. Attach faceplate to two studs with cap nuts finger tight. This holds assembly in place for applying torque to shank nut.



2. Place special spanner socket in two slots on shank nut, making sure slots are fully engaged. Tighten shank nut, as shown, with torque wrench and spanner socket. Torque wrench setting is 10 lb-ft (or 120 lb-in). Socket part number is 620711709.

NOTE: Do not use any other tool or method to tighten the shank nut.



3. After torquing shank nut locate hammer and punch. The faceplate must be removed from the unit and secured to sustain impact from staking.

NOTE: This procedure is used for the stainless steel Delta valve only. DO NOT use on plastic Motorman Valve threads.

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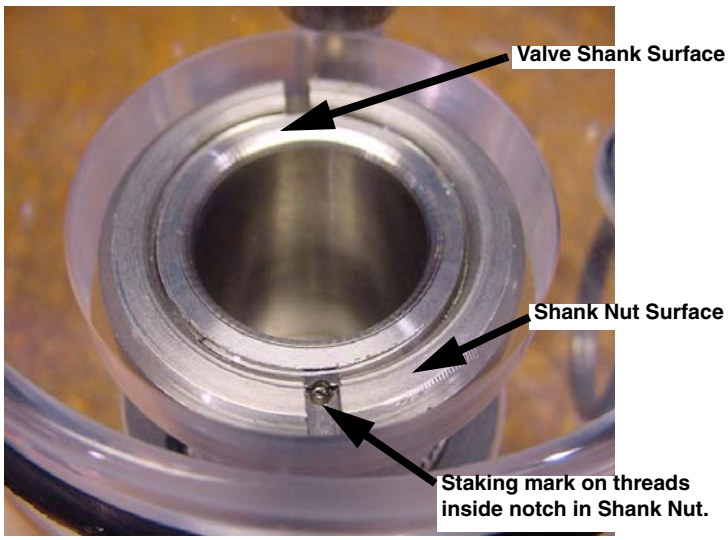
4. Place point of punch in slot on shank nut right against valve threads.

5. Strike end of punch with hammer.

6. After applying torque and performing staking (stainless steel valve threads only) inspect the threads and shank nut to ensure proper thread engagement.

This is what the Delta shank nut clearance should look like.

- Shank nut surface flush-to-0.023" above Valve surface.



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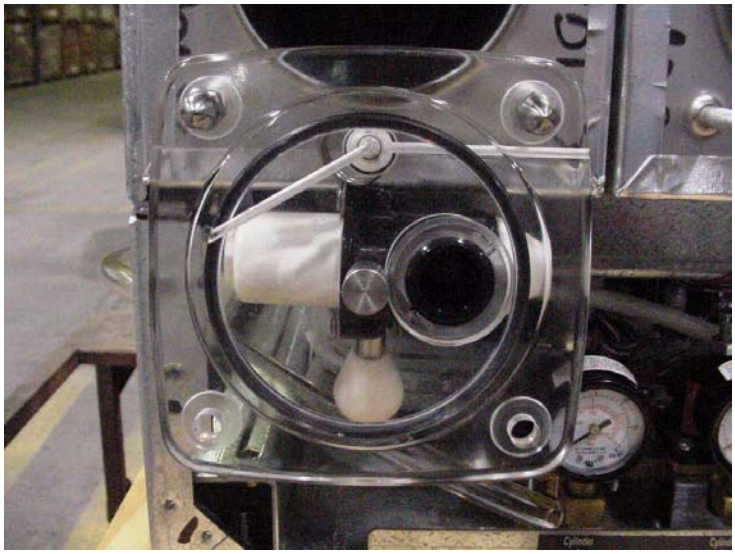
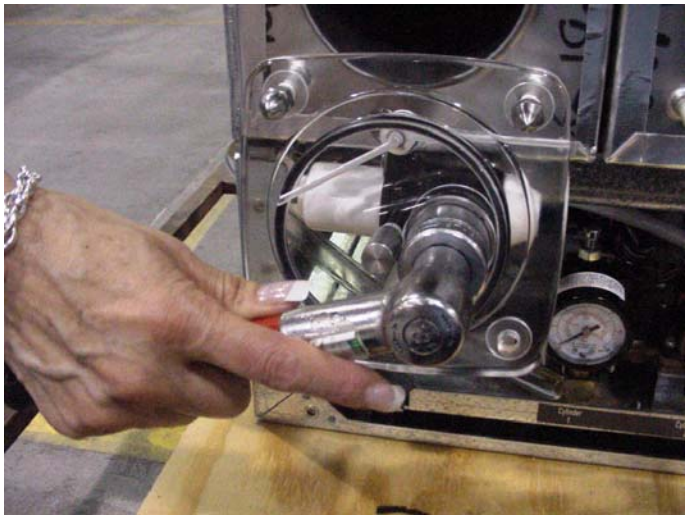
Motorman Valve

1. Remove and rotate faceplate, as shown, with valve facing Barrel. Attach faceplate to two studs with cap nuts finger tight.



2. Place the special spanner socket in two slots on shank nut, making sure slots are fully engaged. Tighten shank nut, as shown, with torque wrench and socket. Torque wrench setting is 10 lb-ft (or 120 lb-in). Socket part number is 620711709.

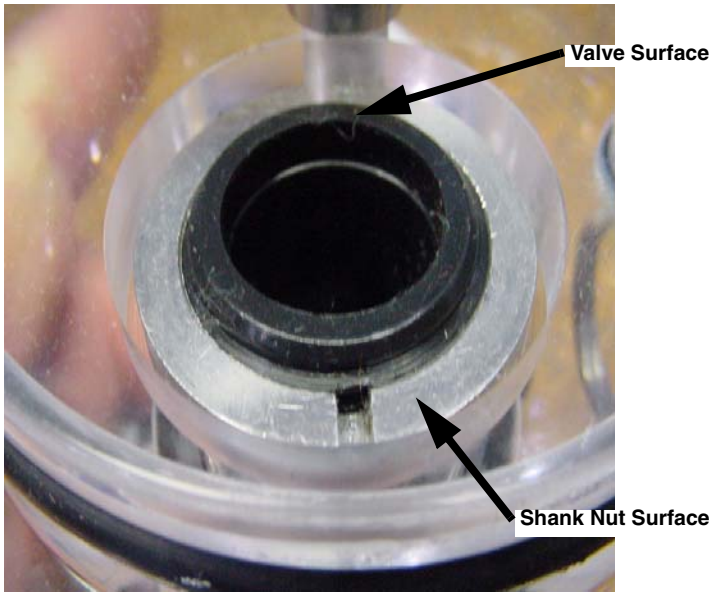
NOTE: Do not use any other tool or method to tighten the shank nut.



3. After applying torque, inspect the threads and shank nut to ensure proper thread engagement.

This is what the Motorman shank nut clearance should look like.

- Shank nut surface 0.083” below valve surface.



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