IMI CORNELIUS INC

www.cornelius.com

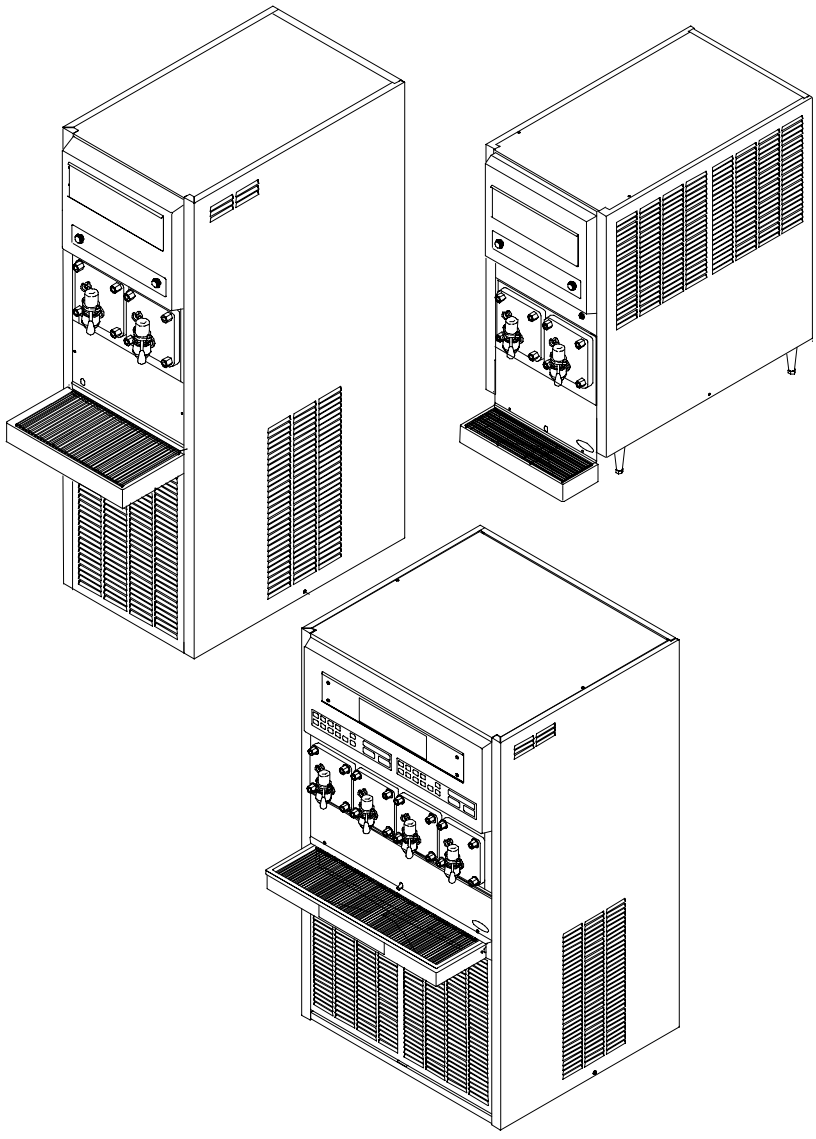
Installation/Service Manual
FCB POST-MIX DISPENSER
W/HOT-GAS DEFROST AND V4 ELECTRONICS
(DEFROST/ERROR INDICATOR LIGHTS)

IMPORTANT:

TO THE INSTALLER.

It is the responsibility of the Installer to ensure that the water supply to the dispensing equipment is provided with protection against backflow by an air gap as defined in ANSI/ASME A112.1.2-1979; or an approved vacuum breaker or other such method as proved effective by test.

Water pipe connections and fixtures directly connected to a potable water supply shall be sized, installed, and maintained according to Federal, State, and Local Codes.



Part No. 560001279SER
February 20, 2004
Revised: December 6, 2006
Revision: E

THIS DOCUMENT CONTAINS IMPORTANT INFORMATION

This Manual must be read and understood before installing or operating this equipment

PRINTED IN U.S.A

TABLE OF CONTENTS

SAFETY INFORMATION

Recognize Safety Information

This is the safety-alert symbol. When you see this symbol on our machine or in this manual, be alert to the potentially of personal injury.

Follow recommended precautions and safe operating practices.

Understand Signal Words

A signal word - ***DANGER, WARNING,*** *OR* ***CAUTION*** is used with the safety-alert symbol. ***DANGER*** identifies the most serious hazards.

Safety signs with signal word ***DANGER*** or ***WARNING*** are typically near specific hazards.

General precautions are listed on ***CAUTION*** safety signs. ***CAUTION*** also calls attention to safety messages in this manual.

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. 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 instructions. Keep your machine in proper working condition. Unauthorized modifications to the machine may impair function and/or safety and affect the machine life.

CO_2 (Carbon Dioxide) Warning

CO_2 Displaces Oxygen. Strict Attention *must* be observed in the prevention of CO_2 (carbon dioxide) 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 and suffocation.

Shipping, Storing, Or Relocating Unit

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 water must also be purged from the plain and carbonated water systems. A freezing ambient environment will cause residual sanitizing solution or water remaining inside the Unit to freeze resulting in damage to the internal components.

GENERAL INFORMATION

IMPORTANT: To the user of this manual - This manual is a guide for installing, operating, and maintaining this equipment. Refer to Table of Contents for page location of information pertaining to questions that arise during installation, operation, service and maintenance, or troubleshooting this equipment.

Warranty Registration Date (to be filled out by customer)
Model Number:
Serial Number:
Install Date:
Local Authorized Service Center:

GENERAL DESCRIPTION

This section gives the description, theory of operation, and design data for the FCB Two and Four-Flavor Floor Model Post-Mix Dispenser and the FCB Two-Flavor Overcounter (OC2) Post-Mix Dispenser with Hot-Gas Defrost and V4+ Electronics (hereafter referred to as Units).

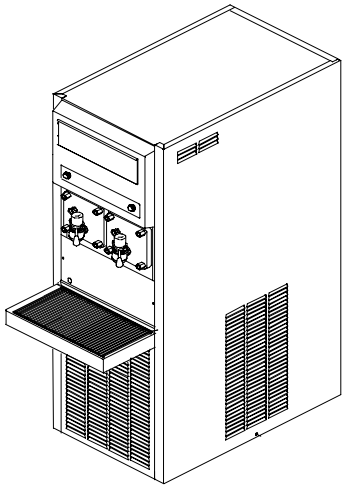


FIGURE 1. TWO–FLAVOR FLOOR MODEL

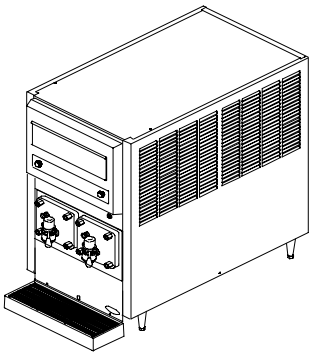


FIGURE 2. TWO–FLAVOR OVERCOUNTER (OC2) UNIT

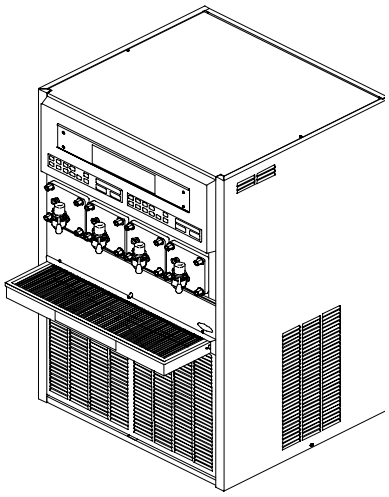


FIGURE 3. FOUR–FLAVOR FLOOR MOI

UNIT DESCRIPTION

2 AND 3 H.P. TWO–FLAVOR OVERCOUNTER (OC2) UNITS

The 2 and 3 H.P. Two–Flavor FCB Overcounter (OC2) Dispensers (see Figure 2 and Figure 5) consists basically of two freeze cylinders each containing an internal beater driven by an electric motor, one refrigeration system, one carbonator Tanks which feed both product blender tanks, a timer-controlled automatic hot-gas defrost system to defrost the freeze cylinders, and interconnecting tubing, components, and fittings necessary to regulate, transfer, and dispense product.

The Dispensers are equipped with V4 electronics and are also equipped with two indicator lights located on the front access door of the Unit. The purpose of the indicator lights is to inform the Operator if one or both of the freeze cylinders is in the defrost mode and also if an “OUT OF SYRUP”, “OUT OF WATER”, “OUT OF CO_2”, or if an error condition exist.

The components are attached to a steel frame and are enclosed in a steel cabinet. The cabinet panels are easily removed to facilitate installation and service and maintenance. A transparent faceplate, with an integral relief valve and a removable self-closing dispensing valve, is mounted on front of each freeze cylinder. A removable drip tray, with cup rest, is located directly below the dispensing valves.

TWO–FLAVOR FLOOR MODEL

The 3 H.P. Two–Flavor Floor Model FCB Dispenser (see Figure 1 and 4) consists basically of two freeze cylinders each containing an internal beater driven by an electric motor, one refrigeration system, two product blender tanks, two carbonator tanks which feed both product blender tanks, a timer-controlled automatic hot-gas defrost system to defrost the freeze cylinders, and interconnecting tubing, components, and fittings necessary to regulate, transfer, and dispense product.

The Unit is equipped with V4 electronics and is also equipped with two indicator lights located on the front access door of the Unit. The purpose of the indicator lights is to inform the Operator if one or both of the freeze cylinders is in the defrost mode and also if an “OUT OF SYRUP”, “OUT OF WATER”, “OUT OF CO_2”, or if an error condition exist.

The components are attached to a steel frame and are enclosed in a steel cabinet. The cabinet panels are easily removed to facilitate installation and service and maintenance. A transparent faceplate, with an integral relief valve and a removable self-closing dispensing valve, is mounted on front of each freeze cylinder. A removable drip tray, with cup rest, is located directly below the dispensing valves.

FOUR–FLAVOR FLOOR MODEL

The 2 H.P. Four–Flavor Floor Model FCB Dispenser (see Figure 3 and 4) consists basically of four freeze cylinders each containing an internal beater driven by an electric motor, two refrigeration systems, four product blender tanks, four carbonator tanks which feed the product blender tanks, a timer-controlled automatic hot-gas defrost system to defrost the freeze cylinders, and interconnecting tubing, components, and fittings necessary to regulate, transfer, and dispense product.

The Unit is equipped with V4 electronics and is also equipped with four indicator lights located on the front access door of the Unit. The purpose of the indicator lights is to inform the Operator if the freeze cylinders are in the defrost mode and also if an “OUT OF SYRUP”, “OUT OF WATER”, “OUT OF CO_2”, or if an error condition exist.

The components are attached to a steel frame and are enclosed in a steel cabinet. The cabinet panels are easily removed to facilitate installation and service and maintenance. A transparent faceplate, with an integral relief valve and a removable self-closing dispensing valve, is mounted on front of each freeze cylinder. A removable drip tray, with cup rest, is located directly below the dispensing valves.

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

Table 1. Design Data	
Unit Part Numbers:	
Two-Flavor 3 H.P. Floor Model (Air-Cooled), 230 VAC, 60 Hz	4166201000
Two-Flavor 3 H.P. Floor Model (Water-Cooled) 230 VAC, 60 Hz	4166221000
Two-Flavor 2 H.P. Overcounter (OC2) Air-Cooled 230 VAC, 60 Hz	4161361000
Two-Flavor 3 H.P. Overcounter (OC2) Air-Cooled (Top Condensing) 230 VAC, 60 Hz	4161367000
Two-Flavor 3 H.P. Overcounter (OC2) Water-Cooled 230 VAC, 60 Hz	4161362000
Four-Flavor 2 H.P. Floor Model Air-Cooled 230 VAC, 60 Hz	4166001000
Overall Dimensions:	
Two-Flavor Floor Model	
Height	60-1/2 inches
Width	19-1/4 inches
Depth (W/O Drip Tray)	32-1/2 inches
Depth W/Drip Tray	38 inches
Two-Flavor Overcounter (OC2) Model	
Height	32 inches Top Condenser Unit 44.5 inches
Width	19 inches
Depth (W/O Drip Tray)	31-1/8 inches
Depth W/Drip Tray	36 inches
Four-Flavor Floor Model	
Height	60-1/2 inches
Width	32–1/2 inches
Depth (W/O Drip Tray)	32-1/2 inches
Depth W/Drip Tray	38 inches
Shipping Weight: (approx)	
Two-Flavor Floor Model	460 pounds
Two-Flavor Overcounter (OC2) Model	420 pounds
Four-Flavor Floor Model	837 pounds
Compressor Horsepower	See Unit nameplate
Refrigeration System:	
Refrigerant Type and Charge	See Unit Nameplate
Ambient Operating Temp.	40° F to 100° F
Electrical Requirements:	
Operating Voltage	See Unit Nameplate
Current Draw	See Unit Nameplate

Table 2. Accessories and Tools	
ACCESSORIES	
Installation kits	1155
Cup Holder	511005000
Cup Holder	511006000
CO_2 Changeover Kit	511035000
GENERIC FLAVOR TABS	
Cola	1085
Cherry	1086
Orange	1087
Lemon-Lime	1089
Strawberry	1090
Banana	1091
SERVICE TOOLS	
3-gallon Sanitizing Tank	281884000
Socket Spanner, Shank Nut	620711709
Refractometer, 0-30 Scale	511004000
Wrench, Rear Seal Housing	2899
Tool, Drive/Coupler Adjustment Gauge	3810

REFRIGERATION SYSTEMS

NOTE: The FCB Dispenser (depending upon the model number) refrigeration system is either "air-cooled" or "water-cooled".

"Air-Cooled"

The "air-cooled" FCB Dispenser refrigeration system(s) is equipped with a condenser coil that is cooled by condenser coil fan(s).

"Water-Cooled"

The "water-cooled" Two-Flavor FCB Dispenser refrigeration system is equipped with a Refrigeration Cooling Coil Assembly that contains both refrigerant and plain water cooling coils. Circulating cool plain water through the cooling coil cools the refrigerant also inside the coil. During installation, City cold plain water is connected to the FCB Dispenser Refrigeration Cooling Coil water inlet line labeled "COOLING WATER IN". The water drain line labeled "COOLING WATER OUT" must be routed to and be connected to a permanent drain.

THEORY OF OPERATION

(see applicable Figure 4 or 5)

A CO_2 cylinder or a bulk CO_2 supply delivers carbon dioxide (CO_2) gas to an adjustable primary CO_2 regulator assembly attached to the cylinder. The primary CO_2 regulator assembly in turn delivers CO_2 gas to an adjustable secondary CO_2 regulators inside the Unit and also to the soft drink tanks. CO_2 is delivered from the adjustable secondary CO_2 regulator(s) to the carbonator tank(s) and also to the product-blender tanks inside the Unit. CO_2 gas pressure pushes syrup out of the soft drink tanks through the syrup sold-out switches, through adjustable syrup flow regulators, through electrically-operated syrup solenoid valves, and on to the product blender tanks. At the same time, plain water passes through the water pressure regulator and is pumped into the carbonator tank(s) by the water pump(s) and is carbonated by CO_2 gas pressure also entering the tank(s). Carbonated water is pushed by CO_2 gas pressure from the carbonator tank(s), through adjustable carbonated water flow regulators, through electrically operated carbonated water solenoid valves, and on to the product blender tanks. Carbonated water and syrup enter the tanks properly proportioned (blended) for desired BRIX of dispensed product by adjustment of the syrup flow regulators. From product blender tanks, product is pushed by the CO_2 gas into the freeze cylinders. The beater in each freeze cylinder is driven by an electric motor. Scraper blades, attached to the beaters, scrapes product from the cylinder walls as product enters the freeze cylinders and is frozen. Transparent faceplate, attached to the front of each freeze cylinder, includes a self-closing dispensing valve and a spring-loaded relief valve that protects freeze cylinder from accidental over pressure. The relief valve is also used to bleed CO_2 gas pressure from the freeze cylinder to atmosphere when filling the cylinder with product. Electronic sensing on each freeze cylinder motor provides a means of adjusting viscosity (consistency) of the dispensed product to suit customer preference.

DEFROST SYSTEMS

The Units are equipped with both manual and automatic hot-gas defrost systems. The automatic defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost time settings or the system may be completely turned off.

MANUAL DEFROST SYSTEM

Two-Flavor FCB Dispenser.

The Manual hot-gas defrost system may be activated at any time by pressing the “MANUAL DEFROST” switch on the control panel located located behind the front access door on the Unit. The refrigeration compressor will operate for a short time, then both freeze cylinders will go into defrost and defrost for approximately 60 seconds. At the end of the manual defrost cycle, the Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

Four-Flavor FCB Dispenser.

The Manual hot-gas defrost system may be activated at any time by pressing the “MANUAL DEFROST” switch on the control panel located behind the front access door on the Unit. The refrigeration compressor will operate for a short time, then both No. 1 and No.11 or No. 2 and No. 22 (depending upon which “MANUAL DEFROST” switch was pressed) freeze cylinder only will go into defrost and defrost for one minute. At the end of the manual defrost cycle, Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

AUTOMATIC DEFROST SYSTEM

NOTE: The following paragraph describes the Automatic Hot-Gas Defrost system operation for the Two-Flavor FCB Dispenser No. 1 and No. 2 freeze cylinders. This paragraph also describes the Automatic Hot-Gas Defrost system operation for the Four-Flavor FCB Dispenser No. 11 and No. 22 freeze cylinders, which is identical to the No. 1 and No. 2 freeze cylinders.

The automatic hot-gas defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost settings. At the start of each automatic defrost cycle, refrigeration compressor will operate for 30-seconds to pump freon out of the freeze cylinders evaporator coils. After freon has been pumped out of the freeze cylinders evaporator coils, No. 1 freeze cylinder only will go into defrost cycle and defrost for approximately 7-minutes, then will return to normal operation. This ends the automatic defrost cycle of No. 1 freeze cylinder. No. 2 freeze cylinder will defrost 30-minutes after the start of No. 1 freeze cylinder. The next automatic defrost cycle will occur according to the time programmed into the Unit. Automatic defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

“SLEEP” (SLEEP TIME)

“SLEEP” (SLEEP TIME) may be programmed into Unit to allow Unit to go into sleep time (Unit shut down, freeze cylinders beaters and refrigeration systems not operating). At start of sleep time, refrigeration compressor will operate for 30-seconds to pump freon out of freeze cylinders evaporator coils, then No. 1 freeze cylinder will go into defrost and defrost for 60-seconds. After No. 1 freeze cylinder has defrosted, No. 2 freeze cylinder will go into defrost and defrost for 60-seconds. At end of No. 2 freeze cylinder defrost, Unit will shut down and go into sleep time.

“WAKE UP” (WAKE UP TIME)

“WAKE UP” (WAKE UP TIME) may be programmed into the Unit to allow Unit to resume normal operation at a desired time. When programmed wake up time is reached, an alarm will sound for a short duration, then Unit will resume normal operation.

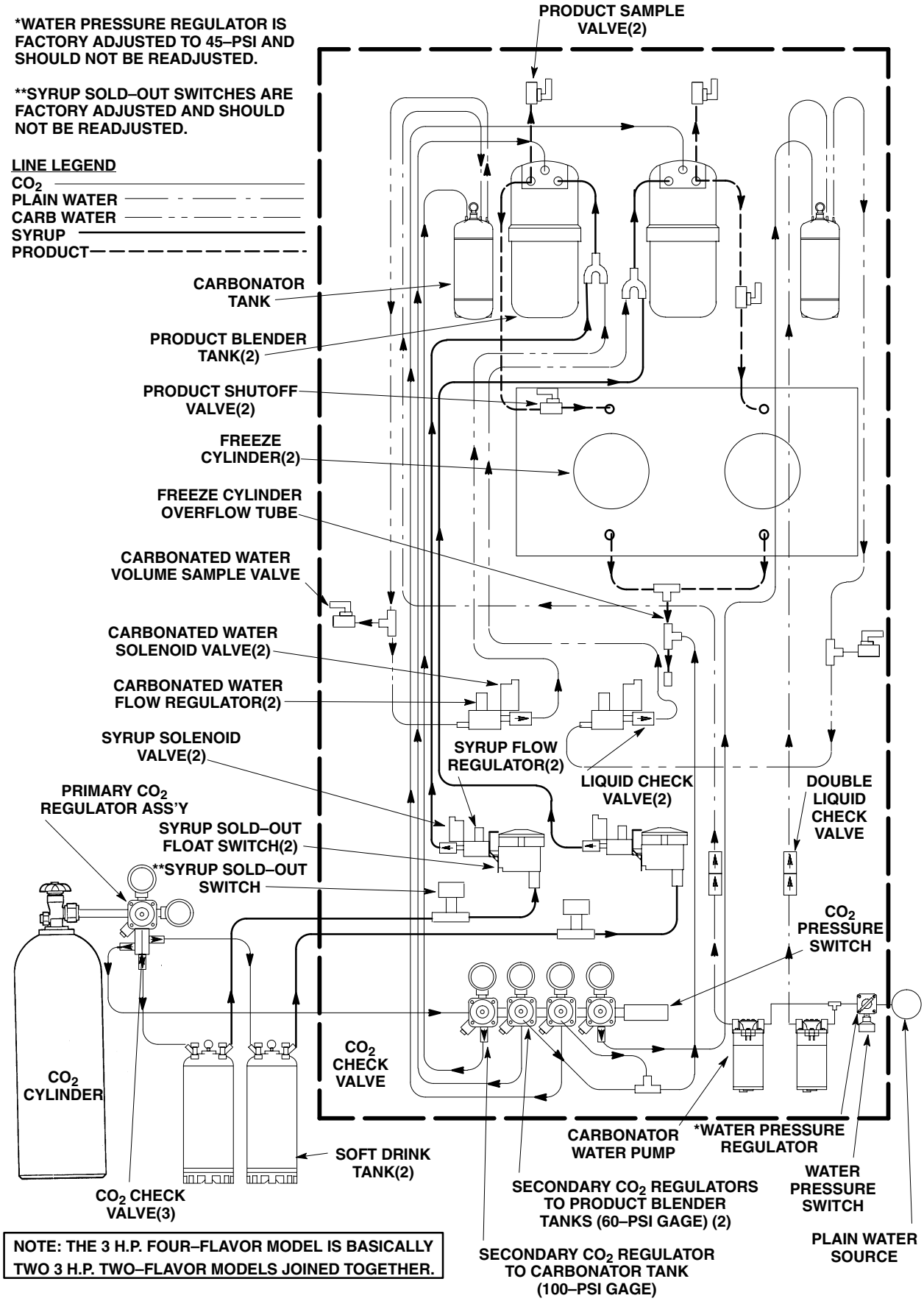


FIGURE 4. FLOW DIAGRAM. 3 H.P. DISPENSER (TWO–FLAVOR MODEL SHOWN)

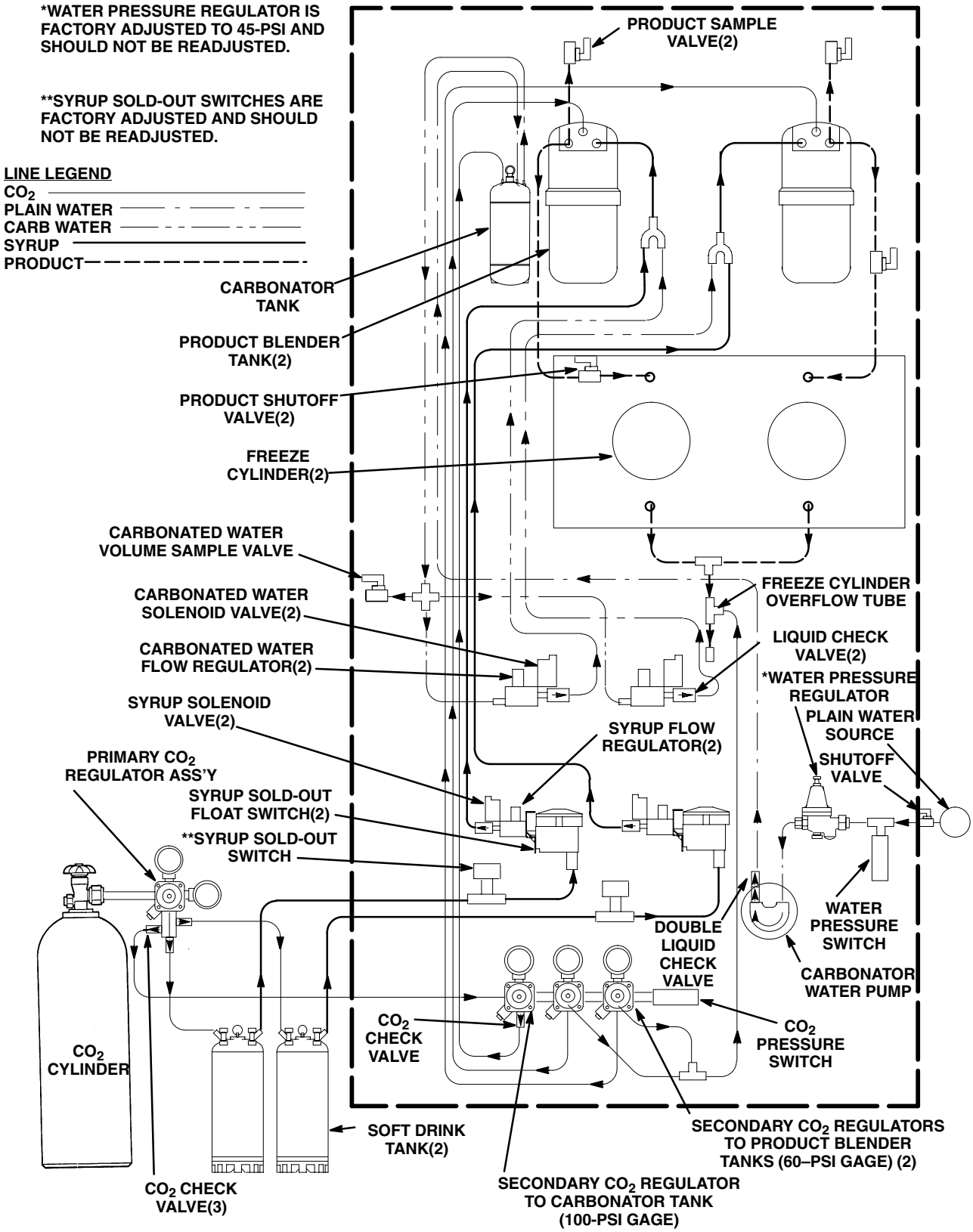


FIGURE 5. FLOW DIAGRAM (2 AND 3 H.P. OVERCOUNTER OC2 DISPENSER)

INSTALLATION

This section covers unpacking and inspection, installing LOOSE-SHIPPED PARTS, selecting location, installing Unit, preparing for operation, and operation.

UNPACKING AND INSPECTION

NOTE: The Unit was thoroughly inspected before leaving the factory and the carrier has accepted and signed for it. Any damage or irregularities should be noted at time of delivery (or not later than 15 days from date of delivery) and immediately reported to the delivering carrier. Request a written inspection report from Claims Inspector to substantiate any necessary claim. File claim with the delivering carrier, not with IMI Cornelius Inc.

1. After Unit has been unpacked, remove shipping tape and other packing material.
2. Remove Unit sides, top and back panels as instructed.
3. Unpack LOOSE-SHIPPED PARTS. Make sure all items are present and in good condition.

Table 3. Loose-Shipped Parts

Item No.	Part No.	Name	Qty. 2–fl Floor Model	Qty. OC2 Model	Qty. OC2 Model (Air Cooled Top Condensing)	Qty. 4–FL Model
1	178025100	Tapered Gasket, White	5	4	4	7
2	325216000	Cleaning Brush	1	1	1	1
3	311304000	Tapered Gasket, Black	1	1	1	1
4	620708530 620708529	Cup Rest, 2 FL Cup Rest, 4 FL	1 X	1 X	1 X	X 1
5	325282000	Thread Cutting Screw, Hx Hd.;No. 8 by 1/2-in. long	X	2	2	X
6	620051268 620051269 620052090 620052091 620051266 620051297	Drip Tray Support, LH Drip Tray Support, RH Drip Tray Support, LH Drip Tray Support, RH Drip Tray Support, LH Drip Tray Support, RH	X X 1 1 X X	1 1 X X X X	X X 1 1 X X	X X X X 1 1
7	620046231 620517149	Drip Tray, 2 FL Drip Tray, 4 FL	1 X	1 X	1 X	X 1
8	326002000	Kit, Drip Tray Drain Hose	1	1	X	1
9	2899	Wrench, Rear Seal Housing	1	1	X	1
10	3810	Tool, Drive/Coupler Adjustment Gauge	1	1	X	1
11	3184	Leveling Leg	X	4	X	X
12	325018000	Caster Kit, 4-inch diameter Casters	1	X	X	1
13	3247	Spacer, White	X	2	X	X

Table 3. Loose-Shipped Parts (Cont'd)						
Item No.	Part No.	Name	Qty. 2–fl Floor Model	Qty. OC2 Model	Qty. OC2 Model (Air Cooled Top Condensing)	Qty. 4–FL Model
14	3221 560003645	Front Access Panel Front Access Panel	X X	1 X	X 1	X X
15	3108	Thread Cutting Screw, Phil Pan Hd; No. 10 by 32 by 1-in. long	X	2	X	X
16	319941000	Thread Rolling Screw, Hex Washer Hd; No. 8-32 by 3/8-in. Long	4	2	X	4
17	313802000	Snap Bushing, 875 Electric (used in the top panel if installing a Merchandiser)	1	1	X	1
18	560001561	Bolt, 3/8–16	X	X	4	X

IDENTIFICATION OF LOOSE-SHIPPED PARTS

1. TAPERED GASKETS, WHITE (item 1) are used to seal connections when connecting Unit product inlet lines to product tanks and connecting Unit CO_2 inlet line to CO_2 source.
2. CLEANING BRUSH (item 2) is used to clean faceplate relief valves passages.
3. TAPERED GASKET, BLACK (item 3) is used to seal connection when connecting plain water source line to the Unit plain water inlet.
4. WRENCH, REAR SEAL HOUSING (item 9) used to remove the drive shaft/seal assembly from inside the freeze cylinder.
5. TOOL, DRIVE/COUPLER ADJUSTMENT GAUGE (item 10) is used for servicing the beater motor drive shaft/seal assembly (see Figure 13).
6. CASTER KIT (item 12) to be installed on the Floor Model Unit as instructed in Instructions provided in the Kit.
7. LEVELING LEGS (item 11) to be installed on the Overcounter (OC2) Unit base.
8. DRIP TRAY SUPPORTS (item 6) to be installed on front of the Unit and secured with applicable THREAD ROLLING SCREWS (item 16).
9. DRIP TRAY (item 7) to be installed on the drip tray supports, then CUP REST (item 4) is to be installed in the drip tray.
10. KIT, DRIP TRAY DRAIN HOSE (item 8) is to be installed on the Unit as instructed. Installation instructions are included in the Kit.
11. WRENCH REAR SEAL HOUSING (item 9) is used to remove the drive shaft/seal assembly from inside the freeze cylinder.
12. FRONT ACCESS PANEL (item 14) to be installed on the Overcounter (OC2) Unit and secured with THREAD CUTTING SCREWS (item 5), SPACERS, WHITE (item 13), and THREAD CUTTING SCREWS (item 15).

SELECTING LOCATION

CAUTION: This Unit is intended for indoor installation *only. Do not* install this Unit in an outdoor environment which would expose it to the outside elements.

IMPORTANT: Unit operating ambient temperature *MUST NOT EXCEED* 100° F. Operating ambient in excess of 100° F will automatically void the factory warranty and will eventually result in Unit failure. Several means are available to achieve proper ambient temperature and air circulation around the Unit which are wall air intake grilles and ceiling exhaust fans, air conditioning, etc. Consult local codes.

Locate Unit so the following requirements are satisfied.

1. Close to a plain water inlet supply line with a minimum pressure of 12-psig.

NOTE: "AIR-COOLED FCB DISPENSER

The "air-cooled" FCB Dispenser refrigeration system is equipped with a condenser coil that is cooled by condenser coil fan(s). Circulating air, required to cool the refrigeration system's condenser coil, is drawn in through the grille on front and exhausted out through the sides and back of Unit. Restricting air circulation through the Unit will decrease its cooling efficiency.

2. A properly grounded 208–230 VAC, 60Hz single-phase electrical circuit with a 30 Amp minimum-rated disconnect switch (not provided) fused at 30 Amps (slow-blow) or circuit connected through an equivalent HACR circuit breaker *must* be available to the Unit (2 FL). 4 FL units require a 50 Amp minimum–rated disconnect switch (not provided) fused at 50 Amps (slow blow) or circuit connected through an equivalent HACR circuit breaker must be available to the Unit. *ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.*

CAUTION: Do not place or store anything on top of the Unit.

3. When installing the Unit, do not allow obstruction to block grille on front which will block off air intake to inside of THE Unit. If installation dictates only one side or the back being unobstructed, allow 18-inches clearance between the Unit and the obstruction. If both sides or one side and the back are unobstructed, allow 12-inches clearance. If both sides and the back are unobstructed, allow 6-inches clearance. A minimum of 12-inches must be provided above the Unit for service and maintenance.

INSTALLING UNIT

INSTALLING APPLICABLE CASTER KIT OR LEVELING LEGS

Floor Model 3 H.P. Unit

Install CASTER KIT, 4-INCH (item 12) on four corners of the Unit base.

Overcounter (OC2) Model 2 and 3 H.P. Units

Very carefully, tilt Unit up and install four LEVELING LEGS (item 11) in four corners of the Unit base.

INSTALLING DRIP TRAY SUPPORTS

Overcounter (OC2) Model 2 and 3 H.P. Units

1. Install DRIP TRAY SUPPORT, LEFT and DRIP TRAY SUPPORT, RIGHT (item 6) on front of the Unit and secure with THREAD CUTTING SCREWS (item 5).
2. Place DRIP TRAY (item 7) on drip tray supports.
3. Place CUP REST (item 4) in drip tray.

Floor Model 3 H.P. Unit

1. Install DRIP TRAY SUPPORTS (item 6) on front of the Unit and secure with THREAD ROLLING SCREWS (item 16).
2. Place DRIP TRAY (item 7) on drip tray supports.
3. Place CUP REST (item 4) in drip tray

INSTALLING DRIP TRAY DRAIN KIT

1. Install DRIP TRAY DRAIN HOSE KIT (item 8) on Unit as instructed in Installation Instructions provided with the Kit.

NOTE: Drip tray drain hose may be routed to a waste container, but is not recommended due to sanitation and cleaning problems. Connection of drain hose to a permanent drain is most highly recommended.

2. Route drip tray drain hose to and connect to permanent drain.
3. Place CUP REST (item 4) in drip tray.

PLACING UNIT IN OPERATING LOCATION

1. Place Unit in operating location meeting requirements of SELECTING LOCATION.
2. Make sure the Unit is sitting in a level position by using a carpenters level and adjusting the adjustable casters (Floor Model Unit) or the adjustable leveling legs (Overcounter (OC2) Unit.

INSTALLING PRIMARY CO_2 REGULATOR ASSEMBLY ON CO_2 CYLINDER (see applicable Figure 4 or 5)

WARNING: To avoid personal injury and/or property damage, always secure CO_2 cylinder in upright position with a safety chain to prevent it from falling over. Should the valve become accidentally damaged or broken off, CO_2 cylinder can cause serious personal injury.

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) 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 and suffocation.

1. Unscrew protector cap (with chain attached) from CO_2 cylinder valve. Open CO_2 cylinder valve slightly counterclockwise to blow any dirt or dust from outlet fitting before installing primary CO_2 regulator, then close valve.

2. Remove shipping plug from primary CO_2 regulator assembly coupling nut, then make sure gasket is in place inside the nut. Install regulator assembly on the CO_2 cylinder so gages can be easily read, then tighten coupling nut. *DO NOT OPEN CO_2 CYLINDER VALVE AT THIS TIME.*

CONNECTING SOFT DRINK TANKS CO_2 LINES TO PRIMARY CO_2 REGULATOR ASSEMBLY (see applicable Figure 4 or 5)

1. Connect soft drink tanks CO_2 lines to primary CO_2 regulator manifold assembly as shown in applicable Figure 4 or 5.

2. Install gas quick disconnects on ends of soft drink tanks CO_2 lines. *DO NOT CONNECT CO_2 LINES TO TANKS AT THIS TIME.*

PREPARING UNIT SYRUP INLET LINES FOR CONNECTION TO SOFT DRINK TANKS (see applicable Figure 4 or 5)

1. Route labeled Unit syrup inlet lines out through hole provided in the Unit base to the soft drink tanks location.

2. Install liquid disconnects on ends of Unit syrup inlet lines. *DO NOT CONNECT SYRUP LINES TO TANKS AT THIS TIME.*

CONNECTING CITY PLAIN WATER SOURCE LINE (S) TO UNIT

NOTE: All of the Units require connection to a city plain water source line with a minimum water pressure of 12-psig to be connected to the Unit plain water inlet line, which provides plain water to the Unit post-mix system. The Unit equipped with a water-cooled refrigeration system also requires a city plain water source line be connected to the refrigeration cooling coil assembly plain water inlet line. Proceed as follows to connect a city plain water source line to the Unit.

Connecting City Plain Water Source Line to Unit Post-Mix System. (see applicable Figure 4 or 5)

NOTE: IMI Cornelius Inc. recommends that a water shutoff valve and water filter be installed in the city plain water source line (see applicable Figure 4 or 5) that provides plain water to the Dispenser post-mix system. A Cornelius Water Filter (P/N 313860000) and Quick Disconnect Set (P/N 313867000) are recommended.

1. Before connecting the city plain water source line to the Unit that provides plain water to the post-mix system, open shutoff valve in city plain water source line for a period of time to flush out any metal shavings.

2. Route Unit plain water inlet line out through hole in bottom of Unit base.

NOTE: The carbonator plain water inlet adjustable water pressure regulator (see applicable Figure 4 or 5) is factory adjusted to 45-psi and should not be readjusted.

3. Connect Unit plain water inlet line to the city plain water source line (12-psi minimum pressure). Seal connection with TAPERED GASKET, BLACK (item 3). DO NOT OPEN THE CITY PLAIN WATER SOURCE LINE SHUTOFF VALVE AT THIS TIME.

Connecting City Plain Water Source Line to Unit With Water-Cooled Refrigeration System. (See Figure 24)

NOTE: The water-cooled Two-Flavor FCB Post-Mix Dispenser has one water-cooled refrigeration system that requires connection of a City plain water source line to its refrigeration cooling coil plain water inlet line. THE CITY PLAIN WATER SOURCE LINE MUST INCLUDE A WATER SHUTOFF VALVE. Proceed as follows to connect the City plain water source line to the Dispenser refrigeration cooling coil plain water inlet line.

1. Route the refrigeration cooling coil plain water inlet line labeled “COOLING WATER IN” and line labeled “ COOLING WATER OUT” out through hole in bottom of the Unit base.

2. Connect the refrigeration cooling coil plain water inlet line labeled “COOLING WATER IN” to the City plain water inlet line. Seal connection with TAPERED GASKET, BLACK (item 3).

3. Route the line labeled “COOLING WATER OUT” to a permanent drain and connect. Seal connection with TAPERED GASKET, BLACK (item 3).

CONNECTING CO_2 SOURCE LINE TO UNIT (see applicable Figure 4 or 5)

1. Connect and route a CO_2 source line from the primary CO_2 regulator up to the Unit.

2. Connect the CO_2 source line to the Unit CO_2 inlet line and seal connection with TAPERED GASKET, WHITE (item 1).

CONNECTING ELECTRICAL POWER SOURCE TO UNIT

IMPORTANT: The electrical power source voltage across L_1 and L_2 terminals on the contactor inside the lower electrical control box, with refrigeration compressor(s) operating, must be in the range of 208-230 VAC, 60Hz single-phase for proper operation. Use No. 10 AWG copper wire, or larger, depending upon line length, in suitable conduit or BX sheath. POWER CIRCUIT TO UNIT *MUST* BE MADE UP OF COPPER CONDUCTORS AND ALL WIRING *MUST* CONFORM TO NATIONAL AND LOCAL CODES.

Electrical Requirements

Refer to the nameplate to determine the power requirements before connecting electrical power to the unit. Voltage across contactor terminals L1 and L2, with the compressor running, must be within voltage limits described in Table .

Table 4	
Unit	**Requirements**
V–Series, 2 Flavor, Domestic	208–230V, 60Hz, 30 Amp
V–Series, 2 Flavor, Export	218–242V, 50Hz, 30 Amp (for AUS: 220–252V, 50Hz, 30 Amp)
V–Series, 4 Flavor	208–230V, 60Hz, 50 Amp

If the line voltage does not meet these requirements see the possible corrective actions in Table 5.

Table 5	
Voltage	**Corrective Action**
Below 180 VAC	Do Not Connect Unit
180–190 VAC	Boost voltage by +32 V
191–207 VAC	Boost voltage by +16 V
208–230 VAC	Use line voltage
231–246 VAC	Reduce voltage by –16 V
247–262 VAC	Reduce voltage by –32 V
Above 262 VAC	Do Not Connect Unit

WARNING: Make sure disconnect switch (not provided) or equivalent HACR circuit breaker is in "OFF'' position.

Floor Model 3 H.P. Unit

1. Remove lower electrical control box cover (located on lower-right side facing front of Unit) for access to contactor L_1 and L_2 terminals.

WARNING: This Unit must be electrically grounded to avoid possible fatal electrical shock or serious injury to the operator. A green screw, with lock washer, is provided inside the electrical control box to connect power circuit ground wire which will electrically ground the Unit.

2. A properly grounded 208–230 VAC, 60Hz single-phase electrical circuit with a 30 Amp minimum-rated disconnect switch (not provided) fused at 30 Amps (slow-blow) or circuit connected through an equivalent HACR circuit breaker *must* be available to the Unit (2 FL). 4 FL units require a 50 Amp minimum–rated disconnect switch (not provided) fused at 50 Amps (slow blow) or circuit connected through an equivalent HACR circuit breaker must be available to the Unit. *ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.*

3. Install lower electrical control box cover and secure with screws.

Overcounter (OC2) 2 and 3 H.P. Units.

1. Remove cover from electrical box located inside the Unit.

WARNING: This Unit must be electrically grounded to avoid possible fatal electrical shock or serious injury to the operator. A ground lug is located inside the electrical box to connect the power circuit ground wire which will electrically ground the Unit.

2. A properly grounded 208–230 VAC, 60Hz single-phase electrical circuit with a 30 Amp minimum-rated disconnect switch (not provided) fused at 30 Amps (slow-blow) or circuit connected through an equivalent HACR circuit breaker *must* be available to the Unit (2 FL). 4 FL units require a 50 Amp minimum–rated disconnect switch (not provided) fused at 50 Amps (slow blow) or circuit connected through an equivalent HACR circuit breaker must be available to the Unit. *ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.*

3. Install cover on the electrical box.

PREPARATION FOR OPERATION

NOTE: Two-flavor Unit- The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of the No. 1 freeze cylinder.

Four-flavor Unit- The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. The other three freeze cylinders, to the right of the No.1 freeze cylinder, are labeled 2, 11, and 22.

TWO–FLAVOR UNITS

NOTE: Two indicator lights are located on front of the Unit front access door (see Figure 8). The indicator light on the left side monitors conditions of the No. 1 system and the indicator light on the right side monitors conditions on the No. 2 system. A flashing red indicator light indicates a freeze cylinder is in the defrost mode. A flashing green indicator light indicates "OUT OF SYRUP", "OUT OF WATER", "OUT OF CO_2", or an "ERROR" condition has occured.

FOUR–FLAVOR UNITS

NOTE: Four indicator lights are located on front of the Unit front access door (see Figure 8). The indicator light on the left side monitors conditions of the No. 1 freeze cylinder and the indicator light on the right side monitors conditions on the No. 2 freeze cylinder. A flashing red indicator light indicates a freeze cylinder is in the defrost mode. A flashing green indicator light indicates "OUT OF SYRUP", "OUT OF WATER", "OUT OF CO_2", or an "ERROR" condition has occured. The other two indicator lights monitor conditions of the No. 11 and No. 22 freeze cylinders.

TURNING ON ELECTRICAL POWER TO UNIT

Turn on electrical power to the FCB Dispenser (Unit) at the disconnect switch or the HACR circuit breaker. Operational status of the Unit is now being displayed as fault messages on the control panel switch/ message display located behind the Unit front access door (see Figure 6).The following fault messages will be continuously displayed at 2-second intervals until all necessary operation requirements are satisfied.

"OFF 1" (Beater Motor No. 1 not operating)
"OFF 2" (Beater Motor No. 2 not operating)
"H_2O OUT" (No water supply to Unit)
"CO_2 OUT" (No CO_2 gas supply to Unit)
"SYRUP 1" (No syrup supply to Unit No. 1 syrup system)
"SYRUP 2" (No syrup supply to Unit No. 2 syrup system)

Green flashing indicator lights on front of the Unit front access door will be flashing indicating an out of syrup, out of water, and an out of CO_2 condition exist.

TURNING ON CO_2 SUPPLY TO UNIT

Unit Connected To a CO_2 Cylinder.

Open the CO_2 cylinder shutoff valve slightly to allow the lines to slowly fill with gas, then open the valve fully to back seat the valve. Back-seating the valve prevents leakage around the valve shaft. The "CO_2 OUT" fault message on the Unit control panel message display should have gone out.

Unit Connected To a Bulk CO_2 Supply.

Open the bulk CO_2 supply shutoff valve slightly to allow the lines to slowly fill with gas, then open the valve fully. The "CO_2 OUT" fault message on the Unit control panel message display should have gone out.

ADJUSTING CO_2 REGULATORS (see applicable Figure 4 or 5)

Adjusting CO_2 Source Primary CO_2 Regulator.

Unit Connected to a Bag-In-Box Syrup Source System.

Adjust CO_2 source (CO_2 cylinder or bulk CO_2) primary CO_2 regulator to read not less then 80 psi.

Unit Connected to a Syrup Tanks Syrup Source System.

Adjust CO_2 source (CO_2 cylinder or bulk CO_2) primary CO_2 regulator to read 80 to 100 psi.

Adjusting Unit Secondary CO_2 Regulators.

Product Blender Tanks Secondary CO_2 Regulators.

Check and if necessary, adjust the Unit product blender tanks secondary CO_2 regulators with 60-psi gages at 25 to 30-psi for the best textured dispensed product.

IMPORTANT: The Carbonator(s) secondary CO_2 regulator(s) *must* be adjusted 25-psi higher or more above the product blender tanks secondary CO_2 regulators pressure settings. The carbonated water and syrup pressures *must* be able to overcome and vent the product blender tanks head pressures while the tanks are filling with carbonated water and syrup. The carbonator(s) tank(s) secondary CO_2 regulator(s) not adjusted high enough will cause decreased flow of carbonated water into the blender tanks which will increase BRIX of the dispensed product.

Carbonator(s) Secondary CO_2 Regulator(s).

Adjust the carbonator(s) secondary CO_2 regulator(s) with 100-psi gages to read 50 to 80-psi. Pull up on carbonator(s) tank(s) relief valves to purge air from tank(s).

TURNING ON CITY PLAIN WATER SOURCE LINE TO UNIT

City Plain Water Source Line Connected to Unit Post-Mix System (Water-Cooled and Air-Cooled Refrigeration Units).

Open shutoff valve in City plain water line connected to the Unit Post-mix system. Check for water leaks and tighten or repair if evident. "H_2O OUT" fault message should have gone out but "SYRUP 1", and "SYRUP 2" fault messages will continue to be displayed.

City Plain Water Source Line Connected to Unit With Water-Cooled Refrigeration System.

Open shutoff valve in City water line connected to the refrigeration cooling coil assembly. Check for water leaks and tighten or repair if evident.

ACTIVATING SYRUP SOURCE SYSTEM

IMPORTANT: The product shutoff valves, located in the product lines leading from the product blender tanks to the freeze cylinders (see applicable Figure 4 or 5), must be closed at this time. Closing the valves prevents product from filling the freeze cylinders while checking BRIX of the product in the product blender tanks.

1. Close product shutoff valves, located in lines leading from the product blender tanks to the freeze cylinders, to prevent product from entering the freeze cylinders.

2. Press "BLEND ON/OFF" control panel switches to display "BLNDOFF 1" and "BLNDOFF 2" on the message display.

3. Activate the syrup source system (syrup tanks or bag-in-box system) to begin providing syrup to the FCB Dispenser. *CO_2 source (CO_2 cylinder or bulk CO_2) primary CO_2 regulator must be set at no less then 80-psi for the bag-in-box syrup pumps in a bag-in-box syrup system or 80 to 100-psi for the syrup tanks in a syrup tanks syrup system.* The "OFF 1", "OFF 2", "SYRUP 1", and the "SYRUP 2" fault messages will continue to be displayed.

ADJUSTING BRIX (WATER-TO-SYRUP "RATIO") OF DISPENSED PRODUCT

The following steps 1 through 9 are instructions for adjusting Brix (Water-to-Syrup) "Ratio" (mixture) of dispensed product on one of the systems.

NOTE: The adjustable carbonated water flow regulators (see applicable Figure 4 or 5 and16) located in their respective systems, control carbonated water flow rate to the product blender tanks. The water flow regulators are factory adjusted at 1.3 $\pm$ 0.05 oz/sec and should not normally require adjustment. If adjustment is necessary, refer to SERVICE AND MAINTENANCE section of this manual for adjustment procedure.

1. Press "SYRUP PRIME" switch to fill No. 1 syrup system sold-out float. "SYRUP 1" fault message will go out. The "OFF 1", "OFF 2", "BLNDOFF 1", "BLNDOFF 2" and the "SYRUP 2" fault messages will continue to be displayed.

2. Press "BLEND ON/OFF" switch to fill No. 1 system product blender tank with product. "BLND 1" fault message will go out when "BLEND ON/OFF" switch is pressed. When product blender tank is full, press the "BLEND ON/OFF" switch again to prevent more product from entering the blender tank. "OFF 1", "OFF 2", and "SYRUP 2" fault messages will continue to be displayed.

3. Open No. 1 product blender tank product sample valve and take a sample (approximately 6 ounces) of product in a cup or glass.

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

4. Check product BRIX with a temperature compensated hand-type refractometer. The BRIX should read 13 $\pm$ 1. If BRIX is not within this tolerance, adjust the syrup flow regulator for No. 1 syrup system as follows:

   Turn the syrup flow regulator adjusting screw to the left (counterclockwise) no more than 1/8-turn at a time to reduce syrup flow rate or turn screw to the right (clockwise) no more than 1/8-turn to increase flow rate.

5. Place container under No. 1 product sample valve. Open the valve to purge product out of the product blender tank, line, and valve, then close the valve.

6. Press "BLEND ON/OFF" switch to run new batch of product into the product blender tank. When the product blender tank is full, press the "BLEND ON/OFF" switch again to prevent more product from entering the tank. "OFF 1", "OFF 2", and "SYRUP 2" fault messages will continue to be displayed.

7. Repeat steps 3 and 4 preceding to check product sample for BRIX.

8. Repeat steps 5 through 7 preceding until proper BRIX adjustment is achieved.

9. Repeat steps 1 through 8 preceding to adjust BRIX of dispensed product on No. 2 system. After completing BRIX adjustment on No. 2 system, only the “OFF 1” and “OFF 2” fault messages should continue to be displayed.

NOTE: Syrup systems should be sanitized at this time before putting Dispenser into operation. Refer to SERVICE AND MAINTENANCE section of this manual for sanitizing instructions.

FILLING FREEZE CYLINDERS WITH PRODUCT

1. Open product shutoff valves, located in product lines leading from product blender tanks to the freeze cylinders (see applicable Figure 4 or 5)**.**

2. Press both “BLEND ON/OFF” switches to begin filling the freeze cylinders. Open the freeze cylinders faceplates relief valves to bleed air from the cylinders while filling them with product, then close the relief valves. *Do not relieve pressure from the freeze cylinders too fast or product in the cylinders will foam excessively causing a loss of product carbonation.*

CHECKING UNIT FOR SYRUP, CO_2 AND PLAIN WATER LEAKS

1. Inspect the entire Unit and the entire system for syrup, CO_2 and plain water leaks and repair if evident.

2. Install the Unit lower access, sides, top, and back panels.

ADJUSTING “WATER-COOLED” UNIT REFRIGERATION SYSTEM VARIABLE WATER REGULATOR

IMPORTANT NOTICE

Water-Cooled Refrigeration System Dispenser.

Water flow rate through the refrigeration cooling coil varies due to pressure change on the high side of the refrigeration compressor which influences opening and closing of the variable water regulator (see Figure 24). The variable water regulator must be adjusted to maintain 240-psi refrigeration high-side pressure.

Adjust the variable water regulator (see Figure 24) to maintain 240-psi refrigeration high-side pressure as instructed in the SERVICE AND MAINTENANCE section.

ADJUSTMENTS AND PROGRAMMING PROCEDURES

The following is a brief description of each item that may be programmed into the Dispenser electronics. After reviewing the brief descriptions, proceed to PROGRAMMING/ADJUSTMENTS and perform the Dispenser electronics programming procedures. After completing the Dispenser electronics programming procedures, proceed to and adjust the beaters motors currents into the Dispenser electronics as instructed in ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE).

SETTING CLOCK (TIME OF DAY)

NOTE: The CLOCK (TIME OF DAY) must be programmed into the Unit before "DEFROST" (AUTOMATIC), "SLEEP" (SLEEP TIME), and "WAKE UP" (WAKE UP TIME) can be programmed into the Unit.

The time of day (hour AM or PM and minutes) and the day of the week may be programmed into the Unit electronics to appear on the message "DISPLAY" when desired. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for programming instructions.

PROGRAMMING DEFROST (AUTOMATIC) INTO UNIT ELECTRONICS

The automatic defrost system may be programmed into the Unit electronics to occur up to nine different times during a day with a minimum of two hours between defrost time settings. If there is a daily defrost time defrost programmed into the Unit, the every day defrost are ignored. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for programming instructions.

PROGRAMMING "SLEEP" (SLEEP TIME) INTO UNIT ELECTRONICS

"SLEEP" (SLEEP TIME) may be programmed into the Unit electronics to occur any time of the day after the automatic defrost cycle has occurred. The Unit will shut down (go into sleep time) and will not wake up (return to normal operation) until programmed "WAKE UP" (WAKE UP TIME) has occurred. Refer to **PROGRAMMING /ADJUSTMENTS** section of this manual for programming instructions.

PROGRAMMING "WAKE UP" (WAKE UP TIME) INTO UNIT ELECTRONICS

"WAKE UP" (WAKE UP TIME) may be programmed into the Unit electronics to occur any time of the day to wake the Unit up (return to normal operation) after "SLEEP TIME" has occurred. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for programming instructions.

PROGRAMMING POINT OF SALE MESSAGE DISPLAY INTO UNIT ELECTRONICS

NOTE: Point of sale display messages may be turned off by turning the No. 1 DIP SWITCH in the "OPTION" menu to the "OFF" position and No. 2 DIP SWITCH to "ON" position.

Three point of sale messages are available and the desired one may be programmed into the Unit electronics to appear on the message "DISPLAY". Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for programming instructions.

ADJUSTING "VIS SET" (PRODUCT VISCOSITY) OF DISPENSED PRODUCT

Adjusting the "VIS SET (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to adjust product consistency of the dispensed product in each freeze cylinder .

“VIS READ” (ACTUAL VISCOSITY READOUT) OF PRODUCT IN FREEZE CYLINDERS

“VIS READ” (ACTUAL VISCOSITY READOUT) may be displayed on the message “DISPLAY” to actually read the viscosity (product consistency) of product in the freeze cylinders while the Unit is in operation. Refer to **PROGRAMING/ADJUSTMENTS** section of this manual for instruction to display “VIS READ” (ACTUAL VISCOSITY READOUT) on the message display.

DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES

The refrigeration coils inlet and common outlet temperature readings in Fahrenheit may be displayed on the message “DISPLAY”. *Celsius readings instead of Fahrenheit readings may be displayed on the message “DISPLAY” by turning the No. 7 DIP SWITCH in the “OPTION” menu to “ON” position.* Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to display the refrigeration coils inlet and common outlet temperature readings on the message “DISPLAY”.

“VOLTAGE” (DISPLAYED VOLTAGE READOUT)

Displayed voltage readout may be displayed on the message “DISPLAY”. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to display “VOLTAGE” (DISPLAYED VOLTAGE READOUT) on the message “DISPLAY”.

PROGRAMMING COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE) INTO UNIT

“DIAGNOSE” (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to program “DIAGNOSE” (DIAGNOSTIC MODE) into the Unit.

DISPLAYING “TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) ONTO MESSAGE DISPLAY

“TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on the message “DISPLAY”. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to display cycles and hours totals on the Unit message “DISPLAY”.

PROGRAMMING FREEZE CYLINDERS BEATER “MOTORS” INTO UNIT ELECTRONICS

During new Unit installation or when replacing one of the beater motors, note the Manufacturer’s name (see Table 7) on the motor(s). The beater motor(s) Manufacturer’s name(s) *must* be programmed into the Unit electronics which will match the motor(s) to the Unit electronics. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to program the beater motor(s) into the Unit electronics.

PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Unit electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been installed in the refrigeration system. Note Unit name plate for the type of refrigerant gas that has been installed in the Unit. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions to program the proper refrigerant type into the Unit electronics.

“OPTIONS” (DIP SWITCHES 1 THROUGH 10)

(see **PROGRAMMING/ADJUSTMENTS** section of this manual)

The “OPTIONS” (DIP SWITCHES 1 THROUGH 10) are used to:

1. Program one of three POINT OF SALE display messages to appear on the message display.
2. Program one of three POINT OF SALE display messages to appear on the message display.
3. Program in applicable pulse expansion valves or mechanical expansion valves the Unit is equipped with.
4. To adjust beater motor current (either side).
5. To enable or disable beater motors current from automatically self-calibrating at completion of each defrost cycle.
6. To enable or disable control panel security. *When DIP switch is in “ON” position, the control panel switches will disable (lock out) after 90-seconds. Pressing any switch on the control panel for 5-seconds will enable (activate) the control panel switches.*
7. To choose Celsius or Fahrenheit temperature readings to be displayed on the message “DISPLAY”.
8. To enable daylight savings time to be programmed into the Unit.
9. Program in applicable hot-gas or electric defrost the Unit is equipped with.
10. DIP10 (DIP switch 10) *is for service use only.*

PROGRAMMING CALENDAR INTO UNIT ELECTRONICS

The month, day, and year may be programmed into the Unit electronics to appear on the message “DISPLAY”. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions.

PROGRAMMING DST+1HR INTO UNIT ELECTRONICS

“DST+1HR” daylight (summer) savings time may if desired, be programmed into the Unit electronics. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions.

PROGRAMMING DST–1HR INTO UNIT ELECTRONICS

“DST–1HR” standard (winter) time may if desired, be programmed into the Unit electronics. Refer to **PROGRAMMING/ADJUSTMENTS** section of this manual for instructions.

DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors may be found in Table 6.

ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)

IMPORTANT: Any current adjustments or preventative maintenance current readings check on the beater motor current (either side) must be performed with both freeze cylinders fully defrosted. A partially defrosted freeze cylinder will cause false current readings to be displayed on the message display.

1. Press and hold the “MENU/SELECT” (M/S) switch on the control panel (see Figure 6) until the word “CLOCK” appears on the message “DISPLAY”.

2. Use “CANCEL DEFROST” (FORWARD) switch to toggle to “OPTIONS” which will appear on the message ”DISPLAY”.

MESSAGE DISPLAYED	ERROR	ITEMS AFFECTED BY ERROR			
		BEATER MOTOR 1	BEATER MOTOR 2	REFRIG 1	REFRIG 2
MOTOR 1 ERROR	Low Current, < 109, Sensed on Motor One	OFF		OFF	
MOTOR 2 ERROR	Low Current, < 109, Sensed on Motor Two		OFF		OFF
MOTOR 1 ERROR	High Current > 255, Sensed on Motor One	OFF		OFF	
MOTOR 2 ERROR	High Current > 255, Sensed on Motor Two		OFF		OFF
REFRIG ERROR	**Maximum Run Time on Compressor	OFF	OFF	OFF	OFF
SYRUP OUT SIDE 1	Syrup Out Side One			OFF	
SYRUP OUT SIDE 2	Syrup Out Side Two				OFF
CO_2 OUT	CO_2 Out	*** OFF	*** OFF	***OFF	***OFF
H_2O	H_2O Out			*OFF	*OFF
SENSOR 1 ERROR	Temp Sensor Inlet One			OFF	OFF
SENSOR 2 ERROR	Temp Sensor Inlet Two			OFF	OFF
SENSOR 3 ERROR	Temp Sensor Outlet			OFF	OFF

* The refrigeration system and carbonator shall continue to operate for 1.5 minutes after a water pressure loss has been detected. If water pressure loss continues beyond 1.5 minutes, the refrigeration system and carbonator will stop.

** 25 minutes on Standard System, 30 minutes on Remote System.

*** Unit will complete a defrost cycle before beater motors will shut down.

TABLE 6. DISPLAYED ERROR CONDITIONS

3. Use “MENU/SELECT” (M/S) switch to toggle to “DIP4 OFF” (beater motor current readout switch) which will appear on the message “DISPLAY”.

4. Use “CANCEL DEFROST” (FORWARD) switch to change “DIP4 OFF” to “DIP4 ON” on which will appear on the message “DISPLAY” (“DIP4 ON” will be flashing on the display). Press “ERROR RESET”. Both freeze cylinders beater motors will start and operate and beaters motors current ratings will be displayed on the message “DISPLAY”.

NOTE: Motors must run at least 15 minutes before adjusting the current.

5. The “DISPLAY” should be adjusted to read A150 B150 ± 2 by adjusting the MOTOR CURRENT ADJUSTMENTS located on No. 1 and No. 2 relay circuit boards located inside the upper control box (see Figure 7). These figures will fluctuate with variations in line voltage and motor loads.

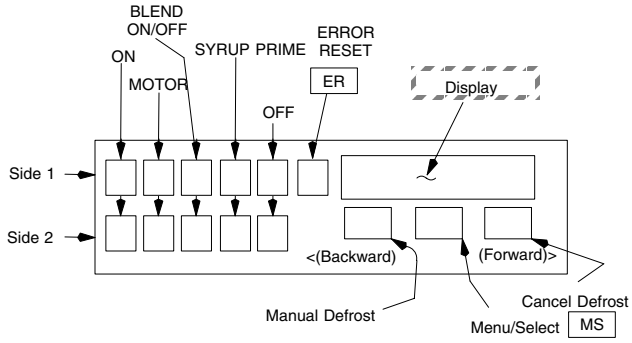


FIGURE 6. CONTROL PANEL SWITCH/MESSAGE DISPLAY

6. After completion of adjusting the beater motor current to A150 B150 ± 2, *make sure* the “DIP5” (motor current self-calibration switch) switch is in the “OFF” position. No. 5 switch in the “OFF” position allows the “MOTOR CURRENT SELF-CALIBRATION” electronics to automatically self calibrate the beater motors currents at completion of each defrost cycle.

CAUTION: IF the “DIP 4” (beater motor current readout switch) switch is placed in the “ON” position and the beater motor current readings were A155 B145 and the switch was then placed back in the “OFF” position without readjusting to A150 B150 ± 2, the beater motor current has just been reset at A155 B145. Operating the FCB Dispenser at these current readings may have serious effects on its operation.

ANYTIME THE “DIP4” (BEATER MOTOR CURRENT READOUT SWITCH) SWITCH ON THE MESSAGE DISPLAY IS PLACED IN THE “ON” POSITION, THE BEATER MOTOR CURRENT READINGS *MUST* BE RE-ADJUSTED TO A150 B150± 2 AS INSTRUCTED, THEN THE SWITCH *MUST* BE PLACED BACK IN THE “OFF” POSITION.

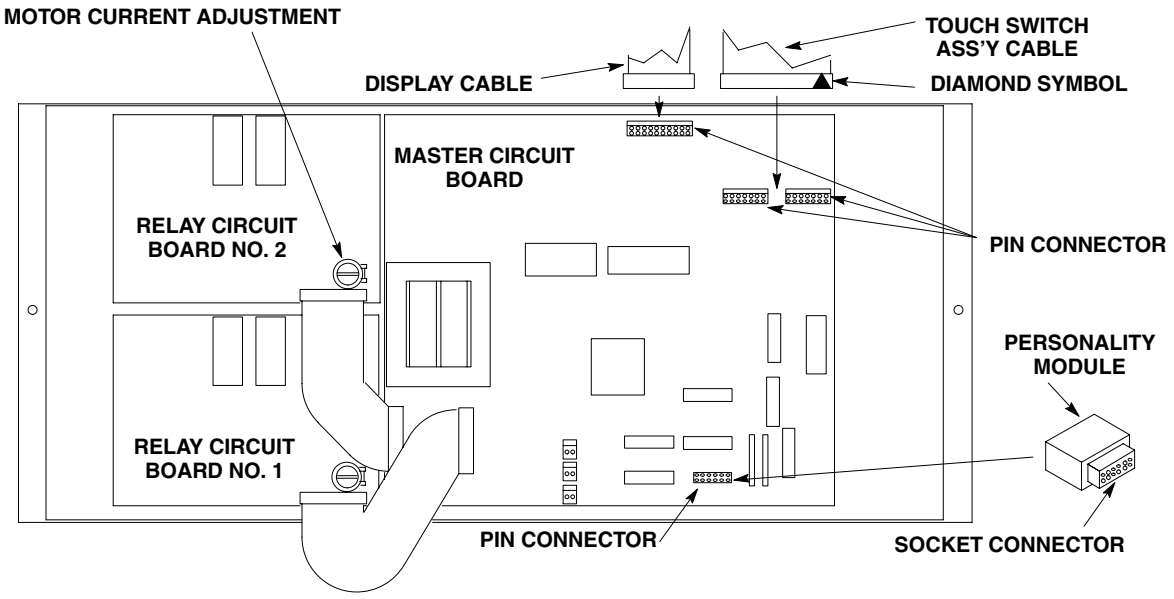
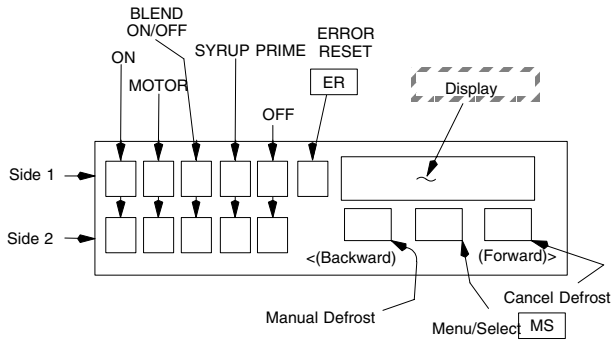


FIGURE 7. MASTER AND RELAY CIRCUIT BOARD

DISPLAYED	MODEL	HZ	MOTOR DESCRIPTION
KLBER_60	Klauber	60	Over/under gear box with a GE wide-range voltage motor.
FASV3+60	Fasco/VW	60	Over/under gear box with a Fasco wide-range voltage motor.
FASCWR 60	Fasco/VW	60	Standard gear box using a Fasco wide-range voltage motor.
VW/GE 60	Fasco/VW	60	Standard gear box with a GE 219/242 volt motor.
EMRSN 60	Emerson	60	Over/under gear box with an Emerson wide-range motor.
BODINE 60	Bodine	60	Special wide-range motor.
KLBER_50	Klauber	50	Over/under gear box with a GE wide-range voltage motor.
FASV3+50	Fasco/VW	50	Over/under gear box with a Fasco wide-range voltage motor.
FASCWR 50	Fasco/VW	50	Standard gear box using a Fasco wide-range voltage motor.
VW/GE 50	Fasco/VW	50	Standard gear box with a GE 219/242 volt motor.
EMRSN 50	Emerson	50	Over/under gear box with an Emerson wide-range motor.

TABLE 7. MOTOR SELECT

QUICK REFERENCE GUIDE FCB V4 PROGRAMMING



CONTROL PANEL SWITCH IDENTIFICATION

MENU SELECTIONS AND DESCRIPTIONS

Enter the Programming Mode, *by* pressing and holding the switch **"Menu/Select"** until **"Clock"** appears on **"MESSAGE DISPLAY".**

To advance through the **"MENU SELECTIONS"** you must repeatedly press and release the **"Forward" (Cancel Defrost)** switch. The following is a list of menu selections and their brief descriptions.

MENU SELECTIONS	BRIEF DESCRIPTIONS
CLOCK (see **NOTE 1**)	Time of day and the day of the week.
DEFROST (AUTOMATIC)	Time of day, defrost cycle is to occur.
SLEEP (SLEEP TIME)	Time of day, the Unit is to go to sleep.
WAKE UP (WAKE UP TIME)	Time of day, Unit is to wake up.
VIS SET	Adjust product viscosity setting.
VIS READ	Displays actual viscosity readout.
SENSORS	Displays sensors temperatures readout.
VOLTAGE	Displays voltage readout.
DIAGNOSE	Checks Unit components for proper operation.
TOTALS	Displays cycles and hours totals.
MOTORS	Programs beater motors into Unit electronics.
REF TYPE	Programs refrigerant type into Unit electronics.

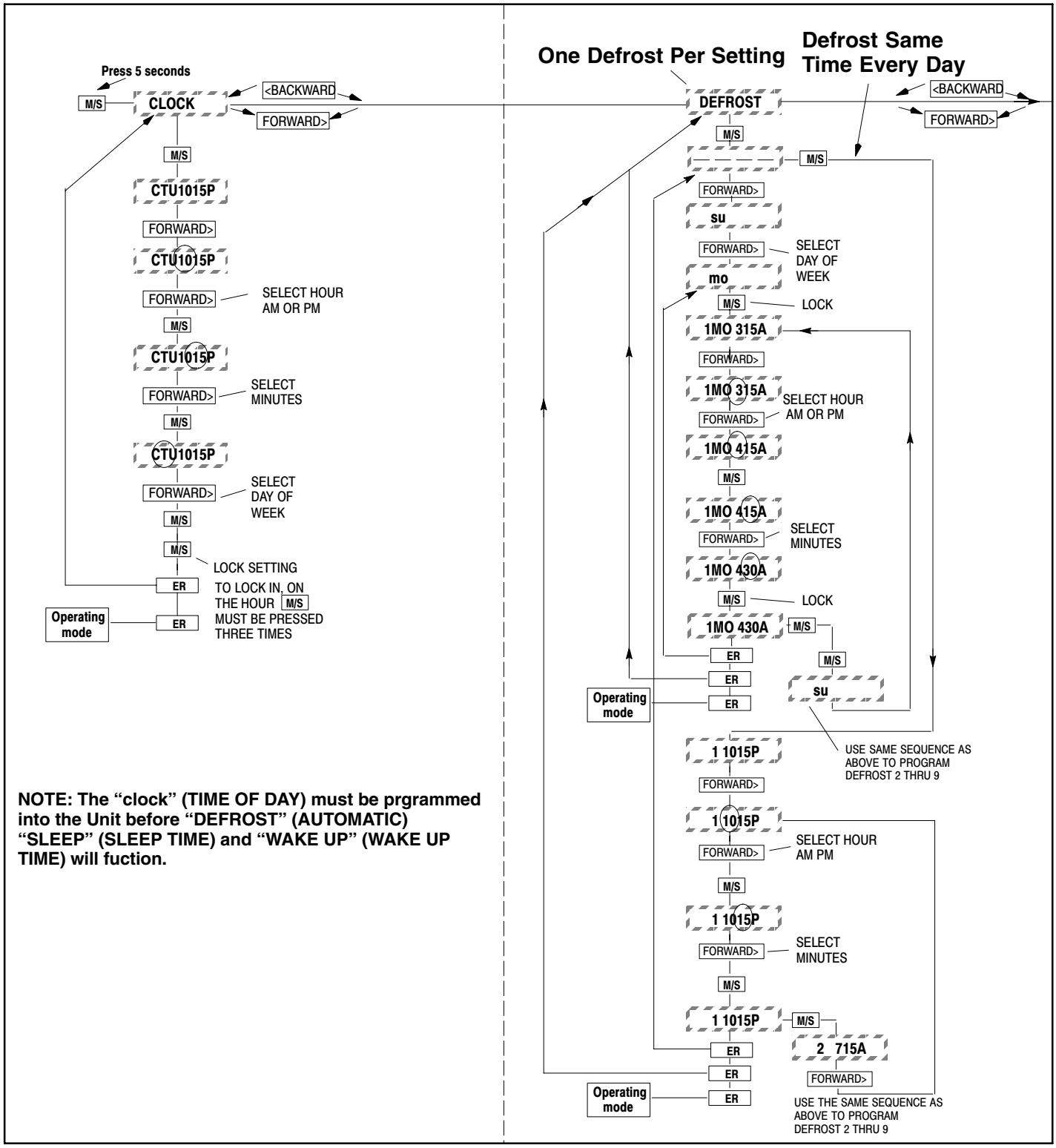
OPTIONS: (DIP SWITCHES 1 THROUGH 10)

DIP1 (POS MESSAGE)	Used to program POINT OF SALE display messages into Unit electronics.
DIP2 (POS MESSAGE)	Used to program POINT OF SALE display messages into Unit electronics.
DIP3 (EXPANSION VALVES)	Switch No. 3 *must* be in the "OFF" position for standard Units with pulse expansion valves. Switch No. 3 *must* be in the "ON" position for older Units with mechanical expansion valves.
DIP4 (BEATER MOTOR CURRENT CALIBRATION)	Used to adjust beater motor current (either side).
DIP5 (DISABLE AUTO CALIBRATION)	Switch in "ON" position prevents beater motors current from automatically self-calibrating at completion of each defrost cycle.
DIP6 (CONTROL PANEL SECURITY)	Switch in "ON" enables and switch in "OFF" disables control panel security. (see **NOTE 2**)
DIP7 (CELSIUS MODE)	Switch "ON" for celsius or "OFF" for fahrenheit readings.
DIP8 (DAYLIGHT SAVINGS TIME)	Switch No. 8 must be in "ON" position to enable daylight savings (summer) or standard (winter) time to be programmed into the Unit electronics.
DIP9 (HOT-GAS DEFROST)	Switch "ON" hot-gas defrost or "OFF" electric defrost.
DIP10	Service use only.

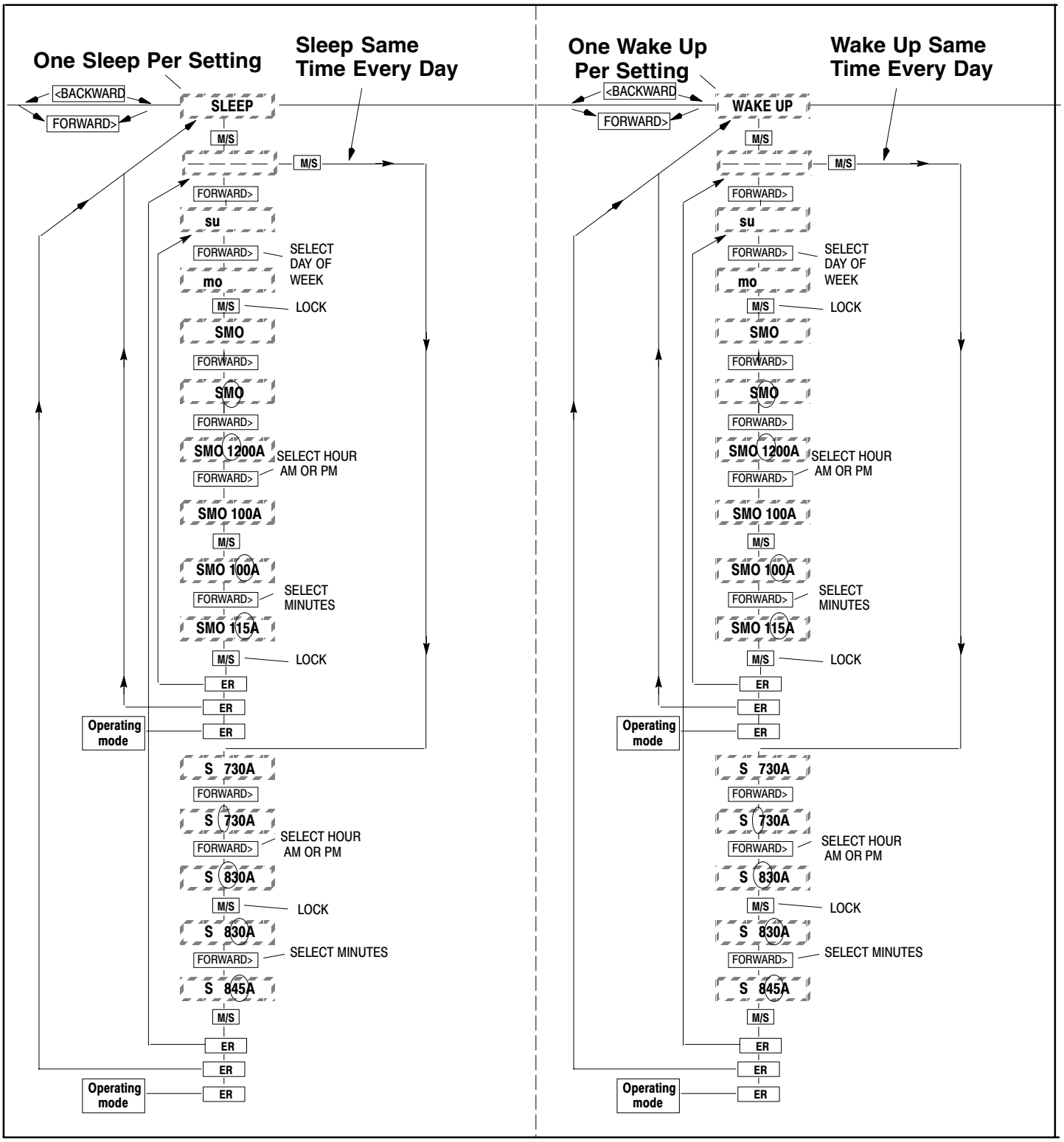
CALENDAR	Used to program month, day, and year into the Unit electronics.
DST+1HR (see **DIP8**)	Programming daylight savings time (summer) into Unit electronics.
DST–1HR (see **DIP8**)	Programming standard time (winter) into Unit electronics.

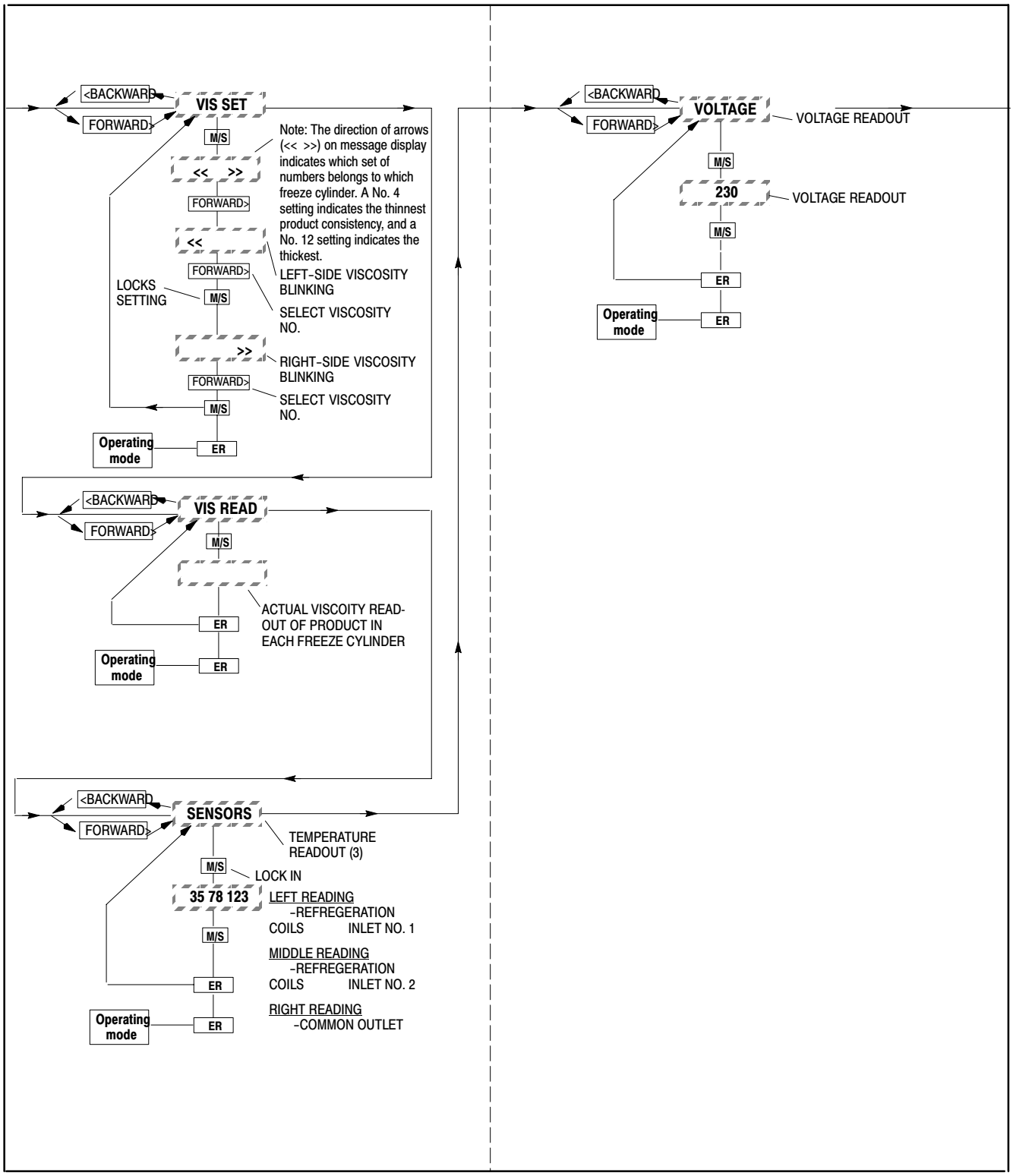
NOTE 1: The "CLOCK" (time of day) must be programmed into the Unit electronics before the Unit "DEFROST" (AUTOMATIC), SLEEP (SLEEP TIME), and "WAKE UP" (WAKE UP TIME) WILL FUNCTION.

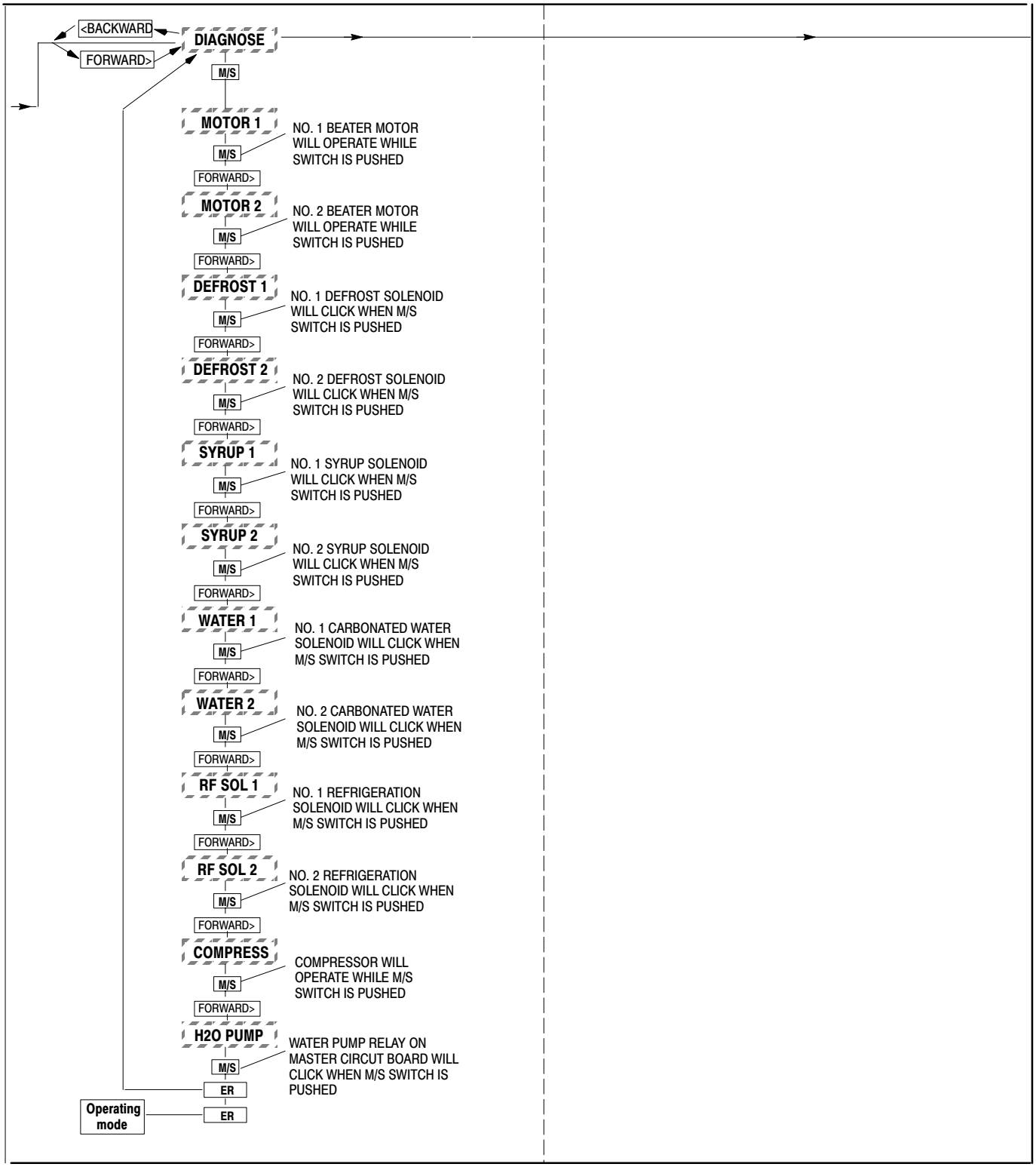
NOTE 2: When DIP6 switch is in "ON" position, the control panel switches will disable (lock out) after 90-seconds. Pressing any switch on the control panel for 5-seconds will enable (activate) the control panel switches. When in programming menu, control panel security will not re-establish until after exiting programming menu. **REVISED: 11/21/97**

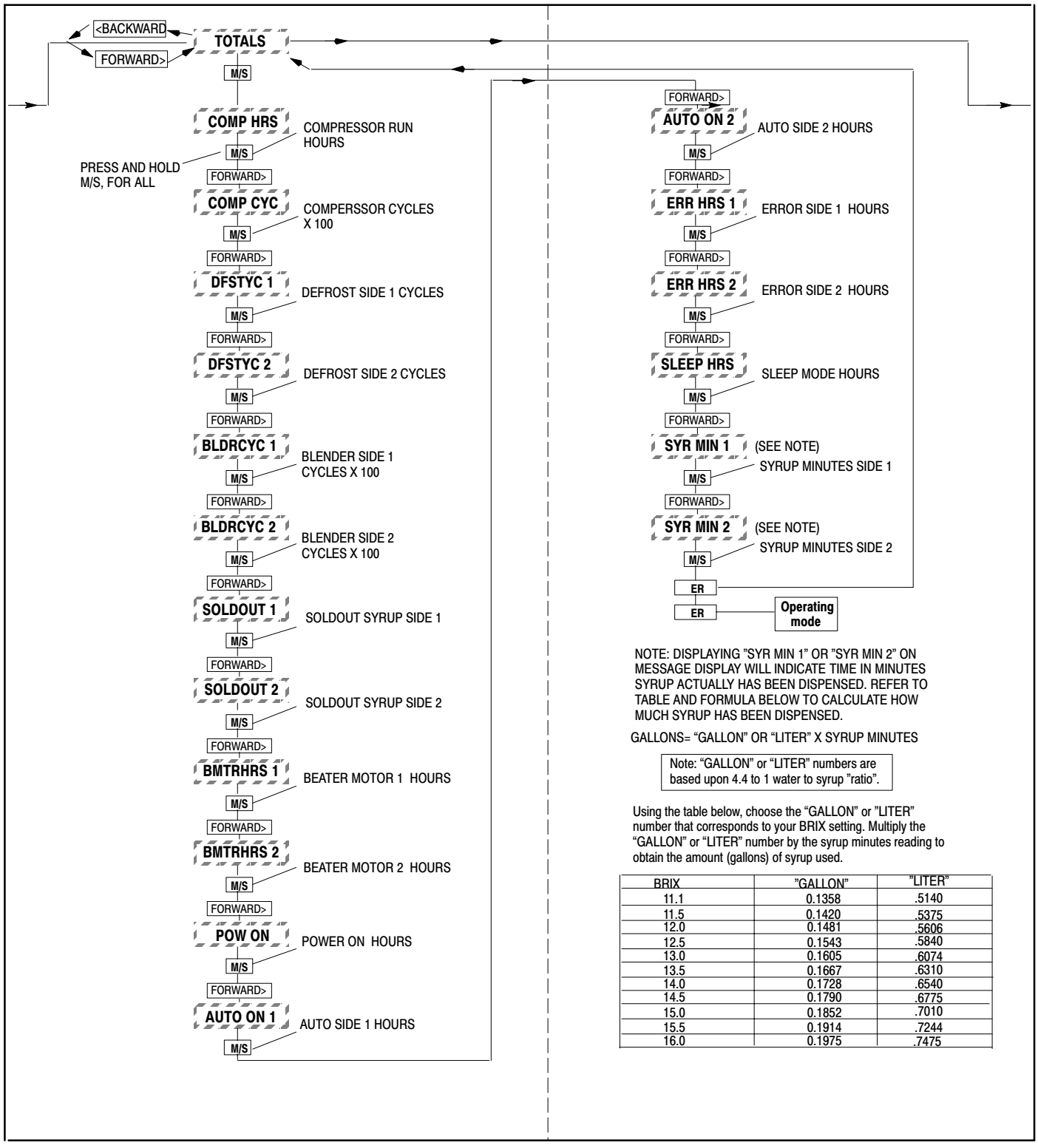


NOTE: The “clock” (TIME OF DAY) must be prgrammed into the Unit before “DEFROST” (AUTOMATIC) “SLEEP” (SLEEP TIME) and “WAKE UP” (WAKE UP TIME) will fuction.


One Sleep Per Setting
Sleep Same Time Every Day
<BACKWARD
FORWARD>
SLEEP
M/S
FORWARD>
su
SELECT DAY OF WEEK
mo
LOCK
SMO
SMO 1200A
SELECT HOUR AM OR PM
SMO 100A
SMO 100A
SELECT MINUTES
SMO 115A
ER
Operating mode
S 730A
S 730A
SELECT HOUR AM OR PM
S 830A
S 830A
SELECT MINUTES
S 845A
One Wake Up Per Setting
Wake Up Same Time Every Day
WAKE UP


<BACKWARD
FORWARD>
VIS SET
M/S
<< >>
FORWARD>
<<
FORWARD>
LOCKS SETTING
M/S
>>
FORWARD>
M/S
Operating mode
ER
Note: The direction of arrows (<< >>) on message display indicates which set of numbers belongs to which freeze cylinder. A No. 4 setting indicates the thinnest product consistency, and a No. 12 setting indicates the thickest.
LEFT-SIDE VISCOSITY BLINKING
SELECT VISCOSITY NO.
RIGHT-SIDE VISCOSITY BLINKING
SELECT VISCOSITY NO.
<BACKWARD
FORWARD>
VIS READ
M/S
ER
Operating mode
ER
ACTUAL VISCOITY READ-OUT OF PRODUCT IN EACH FREEZE CYLINDER
<BACKWARD
FORWARD>
SENSORS
M/S
35 78 123
M/S
ER
Operating mode
ER
TEMPERATURE READOUT (3)
LOCK IN
LEFT READING -REFREGERATION COILS INLET NO. 1
MIDDLE READING -REFREGERATION COILS INLET NO. 2
RIGHT READING -COMMON OUTLET
<BACKWARD
FORWARD>
VOLTAGE
VOLTAGE READOUT
M/S
230
VOLTAGE READOUT
M/S
ER
Operating mode
ER


<BACKWARD
FORWARD>
DIAGNOSE
M/S
MOTOR 1
M/S
NO. 1 BEATER MOTOR WILL OPERATE WHILE SWITCH IS PUSHED
FORWARD>
MOTOR 2
M/S
NO. 2 BEATER MOTOR WILL OPERATE WHILE SWITCH IS PUSHED
FORWARD>
DEFROST 1
M/S
NO. 1 DEFROST SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
DEFROST 2
M/S
NO. 2 DEFROST SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
SYRUP 1
M/S
NO. 1 SYRUP SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
SYRUP 2
M/S
NO. 2 SYRUP SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
WATER 1
M/S
NO. 1 CARBONATED WATER SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
WATER 2
M/S
NO. 2 CARBONATED WATER SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
RF SOL 1
M/S
NO. 1 REFRIGERATION SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
RF SOL 2
M/S
NO. 2 REFRIGERATION SOLENOID WILL CLICK WHEN M/S SWITCH IS PUSHED
FORWARD>
COMPRESS
M/S
COMPRESSOR WILL OPERATE WHILE M/S SWITCH IS PUSHED
FORWARD>
H2O PUMP
M/S
WATER PUMP RELAY ON MASTER CIRCUT BOARD WILL CLICK WHEN M/S SWITCH IS PUSHED
ER
Operating mode
ER



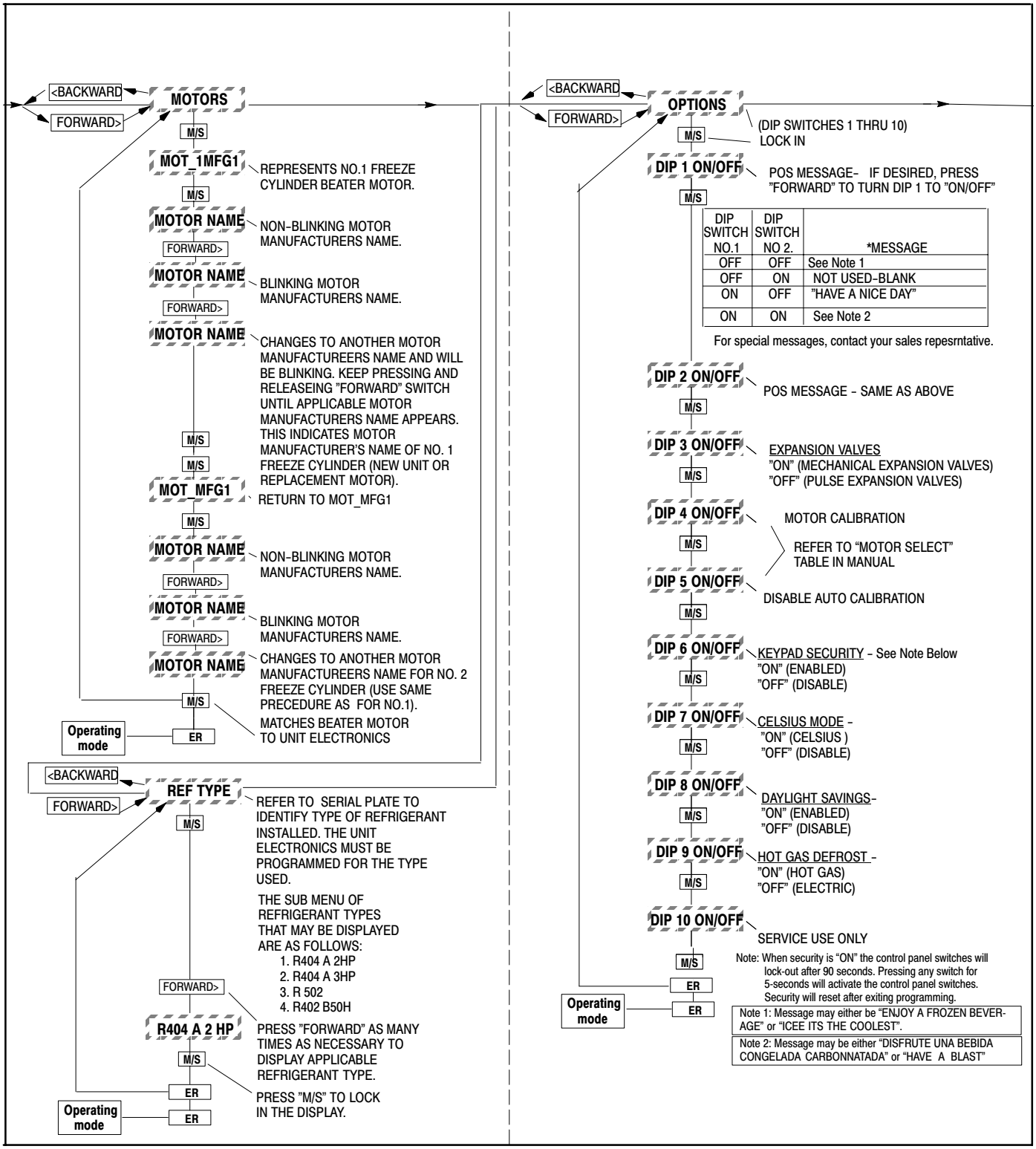
NOTE: DISPLAYING "SYR MIN 1" OR "SYR MIN 2" ON MESSAGE DISPLAY WILL INDICATE TIME IN MINUTES SYRUP ACTUALLY HAS BEEN DISPENSED. REFER TO TABLE AND FORMULA BELOW TO CALCULATE HOW MUCH SYRUP HAS BEEN DISPENSED.

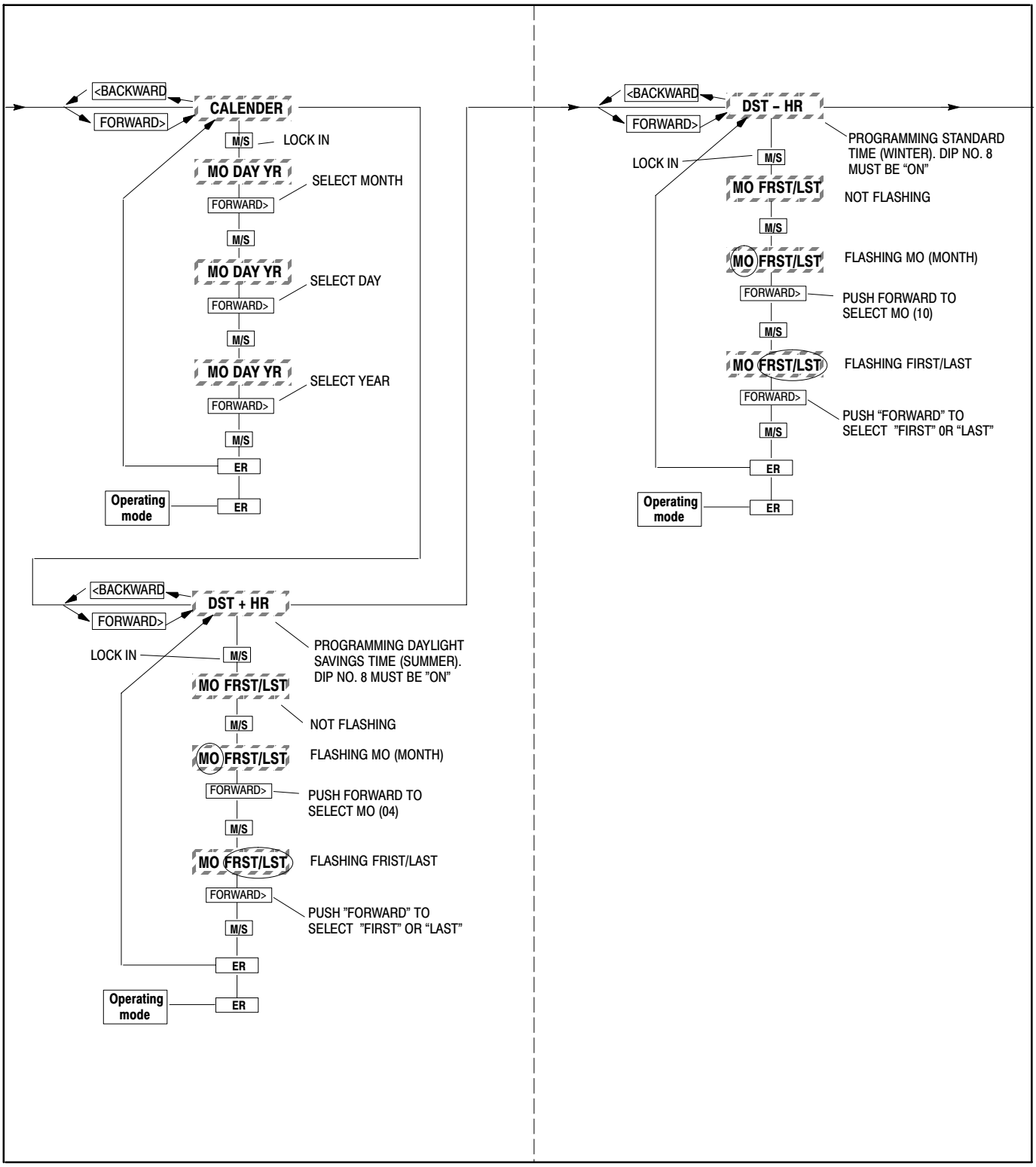
GALLONS= "GALLON" OR "LITER" X SYRUP MINUTES

Note: "GALLON" or "LITER" numbers are based upon 4.4 to 1 water to syrup "ratio".

Using the table below, choose the "GALLON" or "LITER" number that corresponds to your BRIX setting. Multiply the "GALLON" or "LITER" number by the syrup minutes reading to obtain the amount (gallons) of syrup used.

BRIX	"GALLON"	"LITER"
11.1	0.1358	.5140
11.5	0.1420	.5375
12.0	0.1481	.5606
12.5	0.1543	.5840
13.0	0.1605	.6074
13.5	0.1667	.6310
14.0	0.1728	.6540
14.5	0.1790	.6775
15.0	0.1852	.7010
15.5	0.1914	.7244
16.0	0.1975	.7475


<BACKWARD
FORWARD>
MOTORS
M/S
MOT_1MFG1
REPRESENTS NO.1 FREEZE CYLINDER BEATER MOTOR.
M/S
MOTOR NAME
NON-BLINKING MOTOR MANUFACTURERS NAME.
FORWARD>
MOTOR NAME
BLINKING MOTOR MANUFACTURERS NAME.
FORWARD>
MOTOR NAME
CHANGES TO ANOTHER MOTOR MANUFACTUREERS NAME AND WILL BE BLINKING. KEEP PRESSING AND RELEASEING "FORWARD" SWITCH UNTIL APPLICABLE MOTOR MANUFACTURERS NAME APPEARS. THIS INDICATES MOTOR MANUFACTURER'S NAME OF NO. 1 FREEZE CYLINDER (NEW UNIT OR REPLACEMENT MOTOR).
M/S
M/S
MOT_MFG1
RETURN TO MOT_MFG1
M/S
MOTOR NAME
NON-BLINKING MOTOR MANUFACTURERS NAME.
FORWARD>
MOTOR NAME
BLINKING MOTOR MANUFACTURERS NAME.
FORWARD>
MOTOR NAME
CHANGES TO ANOTHER MOTOR MANUFACTUREERS NAME FOR NO. 2 FREEZE CYLINDER (USE SAME PRECEDURE AS FOR NO.1).
M/S
MATCHES BEATER MOTOR TO UNIT ELECTRONICS
Operating mode
ER
<BACKWARD
FORWARD>
REF TYPE
REFER TO SERIAL PLATE TO IDENTIFY TYPE OF REFRIGERANT INSTALLED. THE UNIT ELECTRONICS MUST BE PROGRAMMED FOR THE TYPE USED.
M/S
THE SUB MENU OF REFRIGERANT TYPES THAT MAY BE DISPLAYED ARE AS FOLLOWS:
1. R404 A 2HP
2. R404 A 3HP
3. R 502
4. R402 B50H
FORWARD>
R404 A 2 HP
PRESS "FORWARD" AS MANY TIMES AS NECESSARY TO DISPLAY APPLICABLE REFRIGERANT TYPE.
M/S
PRESS "M/S" TO LOCK IN THE DISPLAY.
ER
Operating mode
ER
<BACKWARD
FORWARD>
OPTIONS
M/S
(DIP SWITCHES 1 THRU 10) LOCK IN
DIP 1 ON/OFF
POS MESSAGE- IF DESIRED, PRESS "FORWARD" TO TURN DIP 1 TO "ON/OFF"
M/S
DIP SWITCH NO.1 | DIP SWITCH NO 2. | *MESSAGE
OFF | OFF | See Note 1
OFF | ON | NOT USED-BLANK
ON | OFF | "HAVE A NICE DAY"
ON | ON | See Note 2
For special messages, contact your sales repesrntative.
DIP 2 ON/OFF
POS MESSAGE - SAME AS ABOVE
M/S
DIP 3 ON/OFF
EXPANSION VALVES
"ON" (MECHANICAL EXPANSION VALVES)
"OFF" (PULSE EXPANSION VALVES)
M/S
DIP 4 ON/OFF
MOTOR CALIBRATION
M/S
REFER TO "MOTOR SELECT" TABLE IN MANUAL
DIP 5 ON/OFF
DISABLE AUTO CALIBRATION
M/S
DIP 6 ON/OFF
KEYPAD SECURITY - See Note Below
"ON" (ENABLED)
"OFF" (DISABLE)
M/S
DIP 7 ON/OFF
CELSIUS MODE -
"ON" (CELSIUS)
"OFF" (DISABLE)
M/S
DIP 8 ON/OFF
DAYLIGHT SAVINGS-
"ON" (ENABLED)
"OFF" (DISABLE)
M/S
DIP 9 ON/OFF
HOT GAS DEFROST -
"ON" (HOT GAS)
"OFF" (ELECTRIC)
M/S
DIP 10 ON/OFF
SERVICE USE ONLY
M/S
Note: When security is "ON" the control panel switches will lock-out after 90 seconds. Pressing any switch for 5-seconds will activate the control panel switches. Security will reset after exiting programming.
ER
Operating mode
ER
Note 1: Message may either be "ENJOY A FROZEN BEVERAGE" or "ICEE ITS THE COOLEST".
Note 2: Message may be either "DISFRUTE UNA BEBIDA CONGELADA CARBONNATADA" or "HAVE A BLAST"


<BACKWARD
FORWARD>
CALENDER
M/S
LOCK IN
MO DAY YR
SELECT MONTH
FORWARD>
M/S
MO DAY YR
SELECT DAY
FORWARD>
M/S
MO DAY YR
SELECT YEAR
FORWARD>
M/S
ER
Operating mode
ER
<BACKWARD
FORWARD>
DST + HR
PROGRAMMING DAYLIGHT SAVINGS TIME (SUMMER). DIP NO. 8 MUST BE "ON"
LOCK IN
M/S
MO FRST/LST
NOT FLASHING
M/S
MO FRST/LST
FLASHING MO (MONTH)
FORWARD>
PUSH FORWARD TO SELECT MO (04)
M/S
MO FRST/LST
FLASHING FRIST/LAST
FORWARD>
PUSH "FORWARD" TO SELECT "FIRST" OR "LAST"
M/S
ER
Operating mode
ER
<BACKWARD
FORWARD>
DST – HR
PROGRAMMING STANDARD TIME (WINTER). DIP NO. 8 MUST BE "ON"
LOCK IN
M/S
MO FRST/LST
NOT FLASHING
M/S
MO FRST/LST
FLASHING MO (MONTH)
FORWARD>
PUSH FORWARD TO SELECT MO (10)
M/S
MO FRST/LST
FLASHING FIRST/LAST
FORWARD>
PUSH "FORWARD" TO SELECT "FIRST" 0R "LAST"
M/S
ER
Operating mode
ER

OPERATOR'S INSTRUCTIONS

This section describes operating controls and indicators, dispensed product conditions, operating characteristics, Unit operation, replenishing syrup supply, product flavor change, checking CO_2 supply, operators daily cleaning of Unit, and sanitizing requirements.

WARNING: Disconnect electrical power to the Unit to prevent personal injury before attempting any internal maintenance. Only qualified personnel should service internal components or electrical wiring.

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]

V-Series	Viscosity </= 8	Viscosity >8
Volume of dispensed product per barrel per 24 hours required to maintain product quality.	48 oz	60 oz
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.

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.

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. 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.

3. 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”. With V-series there is a selectable Viscosity Setting range from 4–12, and with Pinnacle, the range is 1–9. 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 8-9 range for V-series and in the range of 4-5 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, 4 for V-series and 1 for Pinnacle equipment.

FRONT ACCESS DOOR INDICATOR LIGHTS (SEE FIGURE 8)

NOTE: Two-flavor Unit- The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of the No. 1 freeze cylinder.

Four-flavor Unit- The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. The other three freeze cylinders, to the right of the No.1 freeze cylinder, are labeled 2, 11, and 22.

TWO–FLAVOR UNITS

NOTE: Two indicator lights are located on front of the Unit front access door (see Figure 8). The indicator light on the left side monitors conditions of the No. 1 system and the indicator light on the right side monitors conditions on the No. 2 system. A flashing red indicator light indicates a freeze cylinder is in the defrost mode. A flashing green indicator light indicates “OUT OF SYRUP”, “OUT OF WATER”, “OUT OF CO_2”, or an “ERROR” condition has occured.

FOUR–FLAVOR UNITS

NOTE: Four indicator lights are located on front of the Unit front access door (see Figure 8). The indicator light on the left side monitors conditions of the No. 1 freeze cylinder and the indicator light on the right side monitors conditions on the No. 2 freeze cylinder. A flashing red indicator light indicates a freeze cylinder is in the defrost mode. A flashing green indicator light indicates "OUT OF SYRUP", "OUT OF WATER", "OUT OF CO_2", or an "ERROR" condition has occured. The other two indicator lights monitor conditions of the No. 11 and No. 22 freeze cylinders.

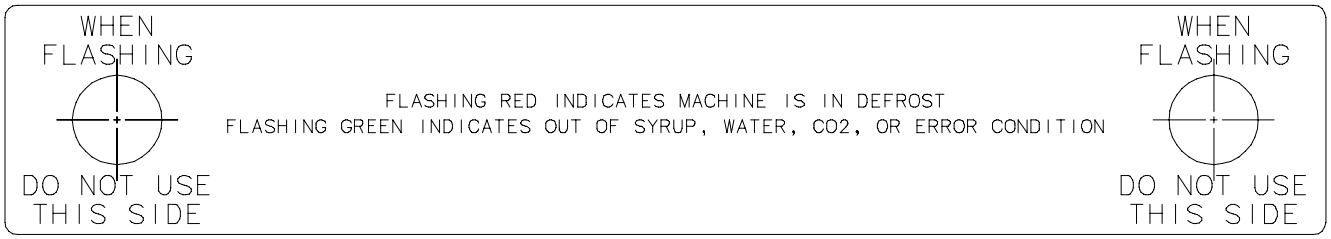


FIGURE 8. FRONT ACCESS DOOR INDICATOR LIGHTS

CONTROL PANEL (KEYPAD) SECURITY

The optional control panel (keypad) security (options DIP6 switch) may be programmed into the Unit to enable (activate) or disable (de-activate) the control panel security. When the control panel security is enabled, any control panel switch can be pushed and held for 5-seconds to override the control panel security. An audible beep will be heard when the switch is first pushed, then another beep will be heard when the security override has taken place and the switch may be released. Control panel security will be re-established 90-seconds after switch pushing activity has ceased. Control panel (keypad) security should be programmed into the Unit electronics by a qualified Service Person.

Note: When in programming menu, the control panel security will not re-establish until after exiting programming menu.

CONTROL PANEL SWITCHES (SEE FIGURE 9)

NOTE: <u>Two-flavor Unit-</u> The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of the No. 1 freeze cylinder.

<u>Four-flavor Unit-</u> The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. The other three freeze cylinders, to the right of the No.1 freeze cylinder, are labeled 2, 11, and 22.

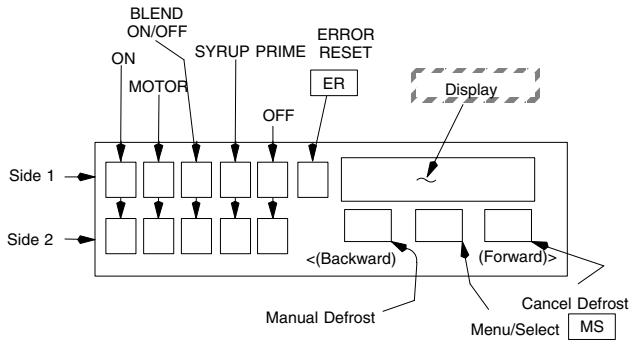


FIGURE 9. CONTROL PANEL SWITCH IDENTIFICATION

“SYRUP PRIME” SWITCHES

The “SYRUP PRIME” switches, located on the control panel, are touch-type switches and require only pressing to activate. The “SYRUP PRIME” switches are used only when filling the syrup systems sold-out floats during syrup replenishing, syrup flavor changeover, or sanitizing the syrup systems.

“BLEND ON/OFF” SWITCHES

The “BLEND ON/OFF” switches, located on the control panel, are touch-type switches and require only pressing to activate. These switches are used to fill the product blender tanks after the sold-out floats have been filled using the “SYRUP PRIME” switches. After the product blender tanks have been filled, the “BLEND ON/OFF” switches may be pressed again to prevent more product from entering the product blender tanks during BRIX test. The “ON” and “BLEND ON/OFF” switches must be pressed to operate the freeze cylinders beaters and refrigeration system during normal operation.

“MOTOR” SWITCHES

The “MOTOR” switches, located on the control panel, are touch-type switches and require only pressing to activate. These switches are used to operate the freeze cylinders beaters with no refrigeration during sanitizing.

“ON” SWITCHES

The “ON” switches, located on the control panel, are touch-type switches and require only pressing to activate. These switches are used to operate the freeze cylinders beaters and refrigeration system after cylinders have been filled with product. The freeze cylinders beaters and refrigeration system may be stopped by pressing the “OFF” switches.

“OFF” SWITCHES

The “OFF” switches, located on the control panel, are touch-type switches and require only pressing to activate. These switches are used to stop freeze cylinders beaters and refrigeration system.

“ERROR RESET” SWITCH

“ERROR RESET” switch, located on the control panel, is a touch-type switch and requires only pressing to activate. The “ERROR RESET” switch is used to restore normal operation after error within Unit (indicated by “ERROR 1” or “ERROR 2” on message display) has been corrected.

CONTROL PANEL DISPLAY MESSAGES

“FILL 1” and “FILL 2” FAULT MESSAGES

“FILL 1” and “FILL 2” fault messages will appear on the message display only after the “SYRUP PRIME” switches have been pressed and the syrup systems sold-out floats have been filled with product. “FILL 1” and “FILL 2” fault messages will continue to be displayed until the “BLEND ON/OFF” switches have been pressed to fill the product blender tanks with product.

“ERROR 1” and “ERROR 2” FAULT MESSAGES

“ERROR 1” and “ERROR 2” fault messages will appear on the message display only if an error within the Unit has developed interrupting normal operation. Error will have to be located and corrected, then press the “ERROR RESET” to restore the Unit to normal operation. “ERROR 1” or “ERROR 2” fault message will disappear from the display.

“OFF 1” and “OFF 2” FAULT MESSAGES

“OFF 1” and “OFF 2” fault messages will appear on the message display when either freeze cylinder beater is not operating.

“H_2O OUT” FAULT MESSAGE

The Unit plain water inlet system contains a water pressure switch. An “H_2O OUT” fault message will appear on the message display if the plain water source to the unit has been disrupted or if a water pressure drop should occur. The Unit will continue to operate for 1-1/2 minutes after “H_2O OUT” fault message has appeared. If the water pressure has not been restored or the water pressure improved after 1-1/2 minutes, the Unit operation will shut down. After plain water source has been restored or the water pressure has improved, the Unit will resume it’s normal operation and the “H_2O OUT” fault message will disappear from the message display.

“CO_2 OUT” FAULT MESSAGE

“CO_2 OUT” fault message will appear on the message display when CO_2 supply to the Unit has been turned off or if the CO_2 pressure drops below 50-psi. A minimum CO_2 pressure of 75-psi must be available to the Unit to extinguish the “CO_2 OUT” fault message.

“SYRUP 1” or “SYRUP 2” FAULT MESSAGES

“SYRUP 1” or “SYRUP 2” fault messages will appear on the message display if the syrup supply is not connected to the Unit syrup system or if the syrup supply is exhausted. The Unit syrup systems syrup float switches must be filled with syrup to extinguish the “SYRUP 1” or “SYRUP 2” fault messages.

“DEFROST 1” or “DEFROST 2” DISPLAY MESSAGES

“DEFROST 1” or “DEFROST 2” display messages will appear on the message display if either freeze cylinder is in the defrost mode. “DEFROST 1” or “DEFROST 2” messages will remain on during the defrost cycle and will disappear when the cycle has ended.

“POINT OF SALE” DISPLAY MESSAGES

Three “POINT OF SALE“ display messages are available to choose from and may be programmed into the Unit to appear on the message display. The “POINT OF SALE” display messages should be programmed into the Unit electronics by a qualified Service Person.

DEFROST SYSTEMS

NOTE: The automatic defrost, “SLEEP” (SLEEP TIME), and “WAKE UP” (WAKE UP TIME) should be programmed into the Unit electronics by a qualified Service Person.

The Units are equipped with both manual and automatic hot-gas defrost systems. The automatic defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost time settings or the system may be completely turned off.

MANUAL DEFROST SYSTEM

Two-Flavor FCB Dispenser.

The Manual hot-gas defrost system may be activated at any time by pressing the “MANUAL DEFROST” switch on the control panel located located behind the front access door on the Unit. The refrigeration compressor will operate for a short time, then both freeze cylinders will go into defrost and defrost for approximately 60 seconds. At the end of the manual defrost cycle, the Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

Four-Flavor FCB Dispenser.

The Manual hot-gas defrost system may be activated at any time by pressing the “MANUAL DEFROST” switch on the control panel located behind the front access door on the Unit. The refrigeration compressor will operate for a short time, then both No. 1 and No.11 or No. 2 and No. 22 (depending upon which “MANUAL DEFROST” switch was pressed) freeze cylinder only will go into defrost and defrost for one minute. At the end of the manual defrost cycle, Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

AUTOMATIC DEFROST SYSTEM

NOTE: The following paragraph describes the Automatic Hot-Gas Defrost system operation for the Two-Flavor FCB Dispenser No. 1 and No. 2 freeze cylinders. This paragraph also describes the Automatic Hot-Gas Defrost system operation for the Four-Flavor FCB Dispenser No. 11 and No. 22 freeze cylinders, which is identical to the No. 1 and No. 2 freeze cylinders.

The automatic hot-gas defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost settings. At the start of each automatic defrost cycle, refrigeration compressor will operate for 30-seconds to pump freon out of the freeze cylinders evaporator coils. After freon has been pumped out of the freeze cylinders evaporator coils, No. 1 freeze cylinder only will go into defrost cycle and defrost for approximately 7-minutes, then will return to normal operation. This ends the automatic defrost cycle of No. 1 freeze cylinder. No. 2 freeze cylinder will defrost 30-minutes after the start of No. 1 freeze cylinder. The next automatic defrost cycle will occur according to the time programmed into the Unit. Automatic defrost may be cancelled at any time by pressing the “CANCEL DEFROST” switch.

“SLEEP” (SLEEP TIME)

“SLEEP” (SLEEP TIME) may be programmed into Unit to allow the Unit to go into sleep time (Unit shut down, freeze cylinders beaters and refrigeration systems not operating). At start of sleep time, the refrigeration compressor will operate for 30 seconds to pump freon out of the freeze cylinders evaporator coils, then No. 1 freeze cylinder will go into defrost and defrost for 60 seconds. After No. 1 freeze cylinder has defrosted, No. 2 freeze cylinder will go into defrost and defrost for 60 seconds. At end of the No. 2 freeze cylinder defrost, Unit will shut down and go into sleep time.

“WAKE UP” (WAKE UP TIME)

“WAKE UP” (WAKE UP TIME) may be programmed into the Unit to allow Unit to resume normal operation at a desired time. When programmed wake up time is reached, an alarm will sound for a short duration, then the Unit will resume normal operation.

NOTE: Automatic defrost, sleep time, and wake up time may be used in any combination together or separately.

FACEPLATE RELIEF VALVES

The faceplate relief valves, located in each freeze cylinder faceplate (see Figure 11), are spring-loaded valves that protect the freeze cylinders from accidental over-pressure. The relief valve is also used to manually bleed CO_2 gas from the freeze cylinder to atmosphere during filling with product and if gas pockets form in the cylinder during operation.

DISPENSING VALVES

Self-closing dispensing valves, located on the faceplates on front of the Unit (see Figure 10), are operated one at a time or simultaneously to deliver product to the customer.

DISPENSED PRODUCT CONDITIONS

"OVERRUN", AS APPLIED TO FROZEN CARBONATED BEVERAGES

Overrun Defined.

Overrun is product expansion that takes place in the frozen carbonated drink. *It is caused primarily by CO_2 gas breakout and secondary by freezing.*

Low Dispensing Volume Affects Overrun.

When the Unit sits idle for a period of time and no drinks are dispensed, CO_2 gas in the system takes a "set". When the first few drinks are drawn off after an idle period, the CO_2 gas has less tendency to break out as the drink is dispensed. *The result is these casual drinks have less overrun than drinks dispensed during the peak-use periods.*

DRAWING 1

DRAWING 2

DRAWING 3

Carbonation Level in Liquid Product Affects Overrun.

The higher the specific carbonation level in a given product, the greater the potential for carbonation breakout in the frozen carbonated form of that drink. For example, *drinks with 3.0 volume of carbonation will have more gas breakout in frozen carbonated form, and more overrun, than will drinks that contain 2.0 volumes of CO_2 gas.*

Overrun is a Variable.

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

Specific Product Ingredients Affect Overrun.

Each syrup has its own specific formulation of makeup. Baume, an important ingredient factor, may fall within an extremely wide range. Fruit flavors contain citric acids that colas do not. Colas also differ in ingredients from one brand to another. *Each product formulation has its own peculiarities regarding the way the product will absorb carbonation and the way it will release carbonation.*

BRIX Affects Overrun.

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

Freezing Affects Overrun.

Freezing causes approximately a 10 percent expansion in a dispensed frozen carbonated drink. The degree of freezing is limited because the finished drink is intended to be sipped through a straw. This is not possible if the product is too "solid".

OPERATING CHARACTERISTICS

The product viscosity (product consistency) can be varied by adjustment and secondary CO_2 regulator setting from a high overrun light drink to a wet heavy drink. The length of the freezing cycle and the amount of CO_2 present in the product combine to create the drink dispensed. The dispensed product will have a normal variance due to the following conditions:

1. If some time has elapsed since the last drink was drawn from a particular freeze cylinder and the compressor has not cycled on, the drink dispensed will have a tendency to be wetter, have slightly less overrun than normal for the setting, and will not mound up as high. See Drawing 1.

NOTE: A cylinder freeze-up may be expected under casual draw conditions if an attempt is made to eliminate the drink described above by adjusting viscosity.

2. If product is drawn from the freeze cylinder quite regularly, its viscosity (product consistency) will be maintained at whatever viscosity setting was made within the normal variance of the compressor off and on cycle. See Drawing 2.

3. If product is drawn continuously from the freeze cylinder and the rate is approaching capacity of the dispensing Unit, overrun of the drink will increase just prior to point capacity is exceeded, and drink dispensed will turn slightly wetter (see Drawing 3).

UNIT OPERATION

NOTE: <u>Two-flavor Unit-</u> The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of the No. 1 freeze cylinder.

<u>Four-flavor Unit-</u> The No. 1 freeze cylinder is the left-hand cylinder facing the front of the Unit. The other three freeze cylinders, to the right of the No.1 freeze cylinder, are labeled 2, 11, and 22.

1. Make sure "H_2O OUT" fault message is not displayed on the message display. This indicates no water supply to the Unit.

2. Make sure "CO_2 OUT" fault message is not displayed on message display. This indicates no CO_2 gas supply to the Unit.

3. Make sure "SYRUP 1" or "SYRUP 2" fault messages are not displayed on the message display. This indicates no syrup supply to the Unit.

4. Make sure both "BLEND ON/OFF" and both "ON" control switches are pressed for normal operation.

5. Place cup under the dispensing valve, then dispense until the cup is full of product.

6. Make sure viscosity (product consistency) is as desired. If not, adjust as instructed.

ADJUSTING CO_2 REGULATORS

PRIMARY CO_2 REGULATOR

The primary CO_2 regulator controls CO_2 pressure to the syrup tanks (syrup tanks syrup source system) or to the syrup pumps (bag-in-box syrup source system). If adjustment of this CO_2 regulator should become necessary, call a qualified Service Person to make the adjustment.

SECONDARY CO_2 REGULATORS

The secondary CO_2 regulators, located inside the Unit, control CO_2 pressure to the Unit carbonator(s) and the product blender tanks. If adjustment of these CO_2 regulators should become necessary, call a qualified Service Person to make the adjustments.

ADJUSTING BRIX (WATER-TO-SYRUP “RATIO”) OF DISPENSED PRODUCT

BRIX is the Water-to-Syrup “Ratio” of the dispensed product and should be periodically checked and if necessary, be adjusted by a qualified Service Person.

REPLENISHING SYRUP SUPPLY

NOTE: Sugar-free diet syrup cannot be used with this Unit.

Although syrup replenishing can be done anytime, the syrup supply must be replenished when either the “SYRUP 1” or “SYRUP 2” fault messages are displayed on the message display indicating either No. 1 or No. 2 syrup system syrup is depleted of syrup. Replenish syrup supply as instructed in SERVICE AND MAINTENANCE section of this manual.

SYRUP FLAVOR CHANGE

The Unit syrup system that the syrup flavor change will be made on *must* be sanitized before connecting new flavor syrup into the system. It may be necessary to readjust BRIX (Water-To-Syrup) “Ratio” of the dispensed product after making a syrup flavor change. Perform syrup flavor change as instructed in SERVICE AND MAINTENANCE section of this manual.

REPLENISHING CO_2 SUPPLY

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) 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 and suffocation.

The Unit and it’s syrup supply source may be connected to either a bulk CO_2 supply or to a CO_2 cylinder. If your Unit is connected to a CO_2 cylinder, refer to SERVICE AND MAINTENANCE section of this manual for instructions to replenish the CO_2 supply.

CLEANING AND SANITIZING

DAILY CLEANING OF UNIT

Daily, or more often if necessary, wash all external surfaces of the Unit with a mild soap solution. Rinse with clean water, then wipe the Unit dry with a clean soft cloth. DO NOT USE ABRASIVE CLEANERS. Remove and wash the drip tray in a mild soap solution, rinse with clean water, then install drip tray on the Unit.

SANITIZING SYRUP SYSTEMS

The Unit syrup systems should be sanitized every 120-days and before and after storage periods following parent company requirements and Sanitizer Manufacturer’s recommendations. Refer to SERVICE AND MAINTENANCE section of this manual for sanitizing instructions.

CLEANING CONDENSER COIL

Circulating air, required to to cool the refrigeration system condenser coil, is drawn in through the condenser coil and is exhausted out through louvers on sides and back of the Unit. *MAKE SURE THE LOUVERS ARE NOT OBSTRUCTED. RESTRICTING AIR CIRCULATION THROUGH THE UNIT WILL DECREASE IT’S COOLING EFFICIENCY.* The condenser coil *must* be periodically cleaned by a qualified Service Person.

SERVICE AND MAINTENANCE

This section describes service and maintenance to be performed on the Unit.

WARNING: Disconnect electrical power to Unit to prevent personal injury before attempting any internal maintenance. Only qualified personnel should service internal components or electrical wiring.

PREPARING UNIT FOR SHIPPING, STORING, OR RELOCATING

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

PERIODIC INSPECTION

1. If using a CO_2 cylinder instead of a bulk CO_2 supply, make sure the CO_2 cylinder regulator assembly 1800-psi gage indicator is not in shaded ("change CO_2 cylinder") portion of the dial. If so, the CO_2 cylinder is almost empty and must be replaced as instructed in this section of the manual.
2. Make sure syrup supply to the Unit is sufficient for proper operation.
3. Circulating air, required to cool the refrigeration system condenser coil, is drawn in through the condenser coil to inside of the Unit and is exhausted from inside the Unit out through louvers in the Unit panels. Make sure the louvers are not obstructed and refer to *CLEANING CONDENSER COIL* in this section for instructions to clean the condenser coil.

REMOVAL OF PANELS

DRIP TRAY

Lift drip tray up out of the drip tray supports.

BACK PANEL

Remove screws securing bottom of back panel, then lift panel straight up to remove.

SIDE PANELS

Remove screws securing bottom of side panel, then lift panel straight up to remove.

TOP PANEL

Remove screws securing top panel, then lift panel up off Unit.

LOWER FRONT ACCESS PANEL

Remove screws securing lower front access panel, then pull panel down to remove from Unit.

CONDENSER COIL ACCESS PANEL

Pull out on top of condenser coil access panel, then lift panel up and out to remove.

OPENING AND CLOSING FRONT ACCESS DOOR

TWO–FLAVOR MODELS AND OVERCOUNTER (OC2) MODELS

1. Pull out on bottom right side of the front access door to disengage it's latch, then open door to the left.
2. Close the front access door by carefully pushing the door shut until it's latch engages.

FOUR–FLAVOR FLOOR MODEL

1. Pull out on bottom of the front access door to disengage it's latch, then lift door up to open..
2. Close the front access door by carefully lowering the door the until it's latch engages.

ADJUSTMENTS

ADJUSTING PLAIN WATER PRESSURE REGULATOR (see applicable Figure 4 or 5)

The carbonator(s) plain water inlet adjustable water pressure regulator is factory adjusted to 45-psi and should not be readjusted.

ADJUSTING CARBONATED WATER FLOW RATE (see applicable Figure 4 or 5 and 16)

The carbonated water flow regulators, which control carbonated water flow rate into the product blender tanks, are factory adjusted for a flow rate of 1.3 ± 0.05 ounces per second and normally do not require adjustment. However, if adjustment is necessary, proceed as follows:

1. Press applicable "OFF" switch to prevent more product from entering the applicable product blender tank.
2. Disconnect syrup source supply from applicable Unit syrup system.
3. Remove applicable side panel from the Unit as instructed for access to the applicable carbonated water flow regulator, product shutoff valve, and product sample valve.
4. Close applicable product shutoff valve to prevent more product from entering the freeze cylinder.
5. Place container under applicable product sample valve. Open the valve and allow all product to be purged from the product blender tank, then close the valve.
6. Remove the lower front access panel as instructed for access to the secondary CO_2 regulators.
7. Note pressure setting on the applicable secondary CO_2 regulator with 60-psi gage for the applicable product blender tank. Turn regulator adjusting screw out (counterclockwise) until gage reads 0-psi. Pull up on the applicable product blender tank relief valve to release CO_2 pressure from the tank.
8. Disconnect carbonated water line from the outlet side of the applicable carbonated water flow regulator.
9. Connect line, long enough to reach to the outside of the Unit, to the water flow regulator outlet, then route the line to the outside of the Unit.
10. Place end of the carbonated water line, routed to the outside of the Unit, in the container.
11. Press applicable "BLEND ON/OFF" switch to activate the electrically operated carbonated water solenoid.
12. When steady stream of water is flowing from the added length of line, catch carbonated water in a container graduated in ounces for exactly 10 seconds. Press applicable "SYRUP PRIME" switch to deactivate the carbonated water solenoid. In 10 seconds, 12 to 14-ounces of water should have been dispensed.

13. If adjustment is necessary, turn the carbonated water flow regulator adjusting screw to the left (counterclockwise) to reduce carbonated water flow rate or turn the screw to the right (clockwise) to increase the flow rate.

14. Repeat steps 11 through 13 until the desired carbonated water flow rate is achieved.

15. Remove added length of line from the outlet side of the carbonated water flow regulator. Connect the carbonated water line, disconnected from the carbonated water flow regulator in step 8 preceding, to the regulator outlet.

16. Turn the product blender tanks CO_2 regulator, with 60-psi gage, adjusting screw in (clockwise) until gage registers pressure noted in step 7 preceding.

17. Pull relief valve on the applicable product blender tank to purge air from the tank, then close the valve.

18. Restore syrup supply to the Unit syrup system.

19. Press the applicable "BLEND ON/OFF" switch to fill the product blender tank with product.

20. Open the product shutoff valve that was closed in step 4 preceding.

21. Install the side panel and the lower front access panel by reversing removal procedure.

PRODUCT CARBONATION ADJUSTMENT (see applicable Figure 4 or 5)

Carbonation of dispensed product can also be varied to suit consumer preference by adjusting Unit carbonator(s) secondary CO_2 regulator(s) as follows:

IMPORTANT: The carbonator tank secondary CO_2 regulator must be adjusted 25-psi higher or more above the product blender tanks secondary CO_2 regulators pressure settings. The carbonated water and syrup pressures must be able to overcome and vent the product blender tanks head pressures while the tanks are filling with carbonated water and syrup. The carbonator tank secondary CO_2 regulator not adjusted high enough will cause decreased flow of carbonated water into the blender tanks, which will increase BRIX of the dispensed product.

1. Remove Unit lower front access panel as instructed for access to the carbonator secondary CO_2 regulator with 100-psi gage.

2. Observe pressure setting on the carbonator secondary CO_2 regulator gage.

3. To lower CO_2 pressure, loosen regulator adjusting screw lock nut. Turn adjusting screw to the left (counterclockwise) until pressure gage reads 15-psi below desired reading, then turn screw to the right (clockwise) until gage reads desired pressure. DO NOT SET CO_2 REGULATOR PRESSURE BELOW 25-PSI HIGHER THAN PRODUCT BLENDER TANKS CO_2 REGULATORS ARE ADJUSTED TO (SEE PRECEDING **IMPORTANT** NOTE). Tighten adjusting screw lock nut after each adjustment.

4. To raise CO_2 pressure, turn regulator adjusting screw to the right (clockwise) until gage reads desired pressure. DO NOT SET PRESSURE HIGHER THAN 60 PSI. Make sure CO_2 source primary CO_2 regulator is set at 80 to 100 psi. Tighten adjusting screw lock nut after each adjustment.

5. Install Unit lower front access panel by reversing removal procedure.

SERVICING DISPENSING VALVES CAGED O-RINGS AND FREEZE CYLINDERS DRIVE SHAFT/ SEAL ASSEMBLIES

SERVICING DISPENSING VALVES CAGED O-RINGS. (see Figure 10)

NOTE: Dispensing valves caged O-Rings should be serviced (lubricated) every six months and O-Rings should be replaced once a year.

1. Defrost freeze cylinders, shut Unit down, disconnect electrical power from Unit, close product shutoff valves in lines leading from the product blender tanks to the freeze cylinders, then drain product from the freeze cylinders.

NOTE: Item numbers in parentheses in this paragraph are in reference to Figure 11.

2. Remove HEX NUTS (item 7) and FLATWASHERS (item 6) securing FACEPLATE (item 8) to freeze cylinder, then remove faceplate from cylinder.

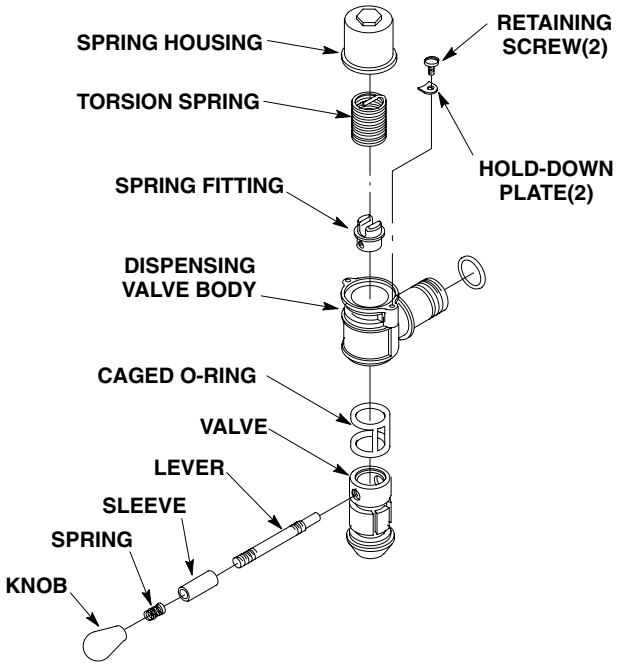


FIGURE 10. SELF-CLOSING DISPENSING VALVE

3. Carefully remove large O-RING (item 5) from FACEPLATE (item 8).
4. Unscrew RELIEF VALVE (item 9) from FACEPLATE (item 8).
5. Disassemble dispensing valve (see Figure 10) as follows:
   A. Remove two screws and hold-down plates securing spring housing to dispensing valve body, then remove housing.
   B. Remove torsion spring from dispensing valve.
   C. Remove knob, spring, sleeve, and lever from dispensing valve.
   D. Remove spring fitting from dispensing valve.
   E. Press valve, with caged O-ring, down and out of dispensing valve body.
   F. Carefully remove caged O-ring from valve.

6. Wash all parts in warm water. Remove all traces of syrup and lubricant, especially from faceplate, O-rings, and dispensing valve. If parts are excessively coated, wipe clean with paper towel to remove syrup and lubricant, especially from caged O-ring and dispensing valve. Use BRUSH (provided with the Unit) to clean the faceplates relief valve passages.

7. Submerge all parts in 4-percent solution of approved sanitizing agent for time recommended by the sanitizer manufacturer.

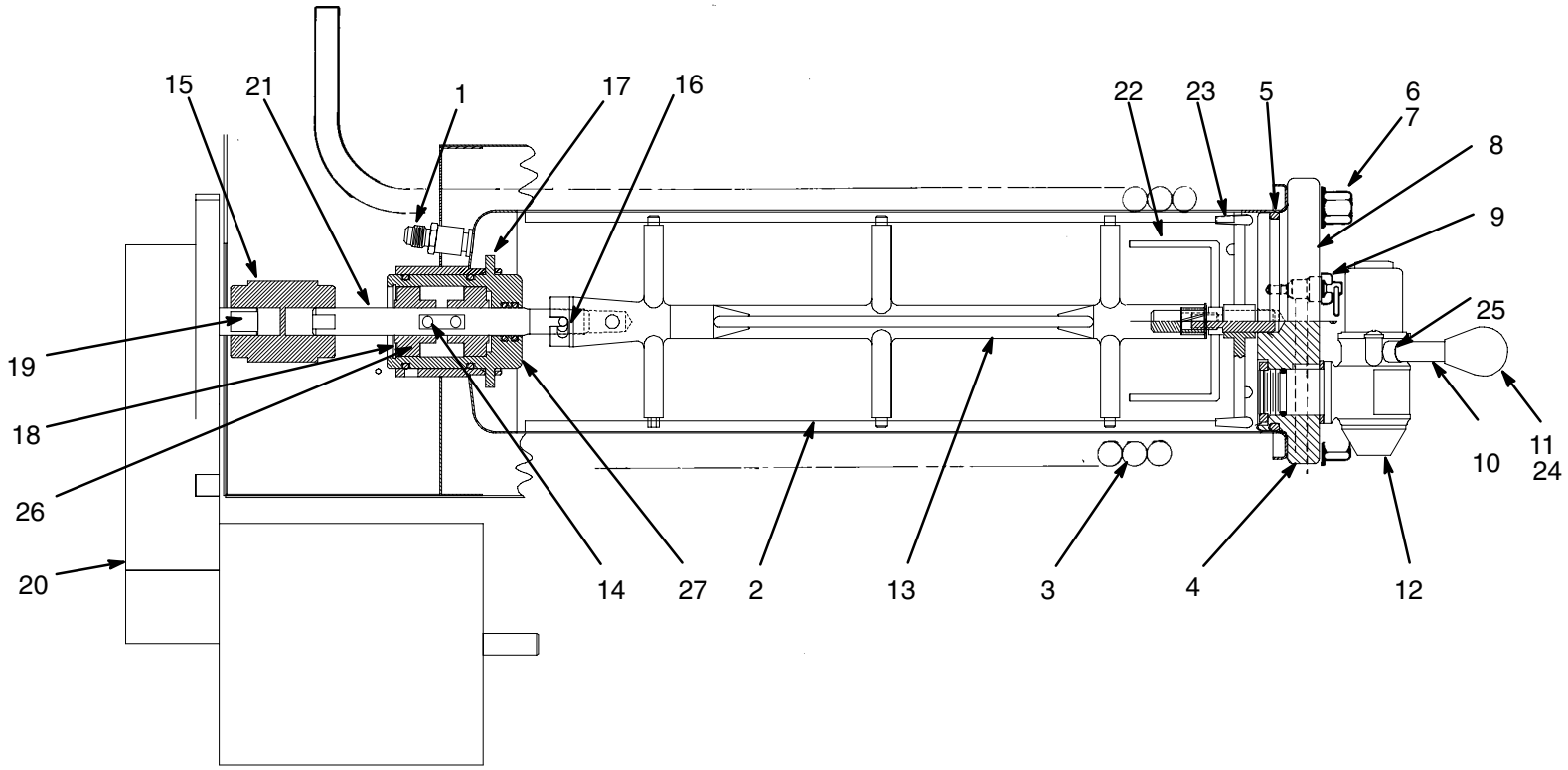
8. Remove parts from sanitizing solution and place on clean paper towels.

NOTE: Use Dow-Corning DC-111 (P/N 321471000) light grade silicone lubricant.

9. Assemble the dispensing valve as follows:

   A. Lubricate caged O-ring. Carefully install caged O-ring on valve from straight end (opposite tapered end). Lubricate grooves in which O-ring rides to fill in all void areas around O-ring.

   B. Carefully install valve with caged O-ring in dispensing valve body.



1	Product Inlet Fitting	10	Valve Lever	20	Beater Drive Motor
2	Scraper Blade (2)	11	Knob	21	Drive Shaft Assembly
3	Evaporator Coil	12	Dispensing Valve	22	Viscosity Sensor
4	Relief Valve Port	13	Beater	23	Spinner
5	O-Ring	14	Allen Head Setscrew	24	Spring
6	Flatwasher (4)	15	Beater Shaft Coupling	25	Shaft Release
7	Hex Nut (4)	16	Drive Pin	26	Bearing
8	Faceplate	17	Bearing Housing Locking Tab (4)	27	Bearing Housing
9	Relief Valve	18	Bearing Retainer		
		19	Beater Motor Drive Shaft		

FIGURE 11. FREEZE CYLINDER CUTAWAY VIEW

C. Install spring fitting, knob and lever parts, torsion spring, and spring housing assembly by reversing removal procedure. Do not tighten down hold-down plates securing spring housing at this time.

10. Thoroughly clean RELIEF VALVE (item 9), then screw relief valve into FACEPLATE (item 8).

11. Proceed to **SERVICING FREEZE CYLINDERS DRIVE SHAFT/SEAL ASSEMBLIES**.

SERVICING FREEZE CYLINDERS DRIVE SHAFT/SEAL ASSEMBLIES.

(see Figure 13)

IMPORTANT: The freeze cylinders drive shaft/seal assemblies must be removed and inspected every four months. Their shafts and bearings must be inspected and replaced if necessary. All O-Ring seals must be replaced at this time.

NOTE: Use Dow-Corning DC-111 (P/N 321471000) light grade silicone lubricant.

1. Pull BEATER (item 13) and SCRAPER BLADES (item 2) from freeze cylinder.

2. Using WRENCH, provided with the Unit, reach into the freeze cylinder and turn the drive shaft/seal assembly to the right (clockwise) to unlock its four locking tabs from the notches in the freeze cylinder retainer. Pull the assembly out of the freeze cylinder retainer using the beater as a puller.

3. Remove the coupling end fitting from the shaft by loosening the set screw in the coupling, then slide coupling off the shaft.

4. Remove the lock-ring bearing retainer from the end of the plastic housing.

5. Using a block of wood, tap the drive shaft and both bearings out of the plastic housing.

6. Loosen bearings and remove shaft. Remove two old inner drive shaft O-Rings seals and two outer O-Rings seals from the plastic housing. Discard the old O-Ring seals.

NOTE: If old lubricant cannot be removed from the plastic housing by washing, use a nylon "pot and pan'' scrubber (3M Company "Scotchbrite'', or equivalent) to remove the residue. Do not scrape plastic housing. Replace any housing that has rough edges in O-Ring sealing areas.

7. Remove old lubricant from the plastic housing with paper towel. DO NOT SCRAPE THE PLASTIC HOUSING. Wash the housing and the back of the freeze cylinder with warm water.

8. Lubricate two new drive shaft O-Ring seals with a generous amount of special light-grade silicone grease, then install O-Rings inside the plastic housing.

9. Inspect the drive shaft and both bearings. Replace the drive shaft if worn and bearing(s) if found to be rough.

10. Re-assemble the drive shaft/seal assembly. Using TOOL, DRIVE/COUPLER ADJUSTMENT GAUGE (provided with the Unit), insert "DRIVE" end of adjustment gauge between drive-pin and housing (see Figure 13) to set the shaft end at 1.542-inches out of the plastic housing. *Make sure* Allen-Head set screw in each bearing is securely tightened and properly seated on the shaft flat surface.

11. Install coupling end fitting on end of the drive shaft. Insert "COUPLER" end of the adjustment gauge between coupling end fitting and the plastic housing. The adjustment gauge in place places the coupling end fitting 0.750-inch away from the plastic housing. *Make sure* Allen-Head set screw in the coupling end fitting is securely tightened and properly seated on the shaft flat surface.

12. Lubricate the two outer O-Ring seals on the outside of the plastic housing with a generous amount of special light-grade silicone grease.

13. Reinstall the drive shaft/seal assembly in the freeze cylinder.

14. Push in and turn the drive shaft/seal assembly to the left (counterclockwise) to lock its four locking tabs into four notches in the freeze cylinder retainer.

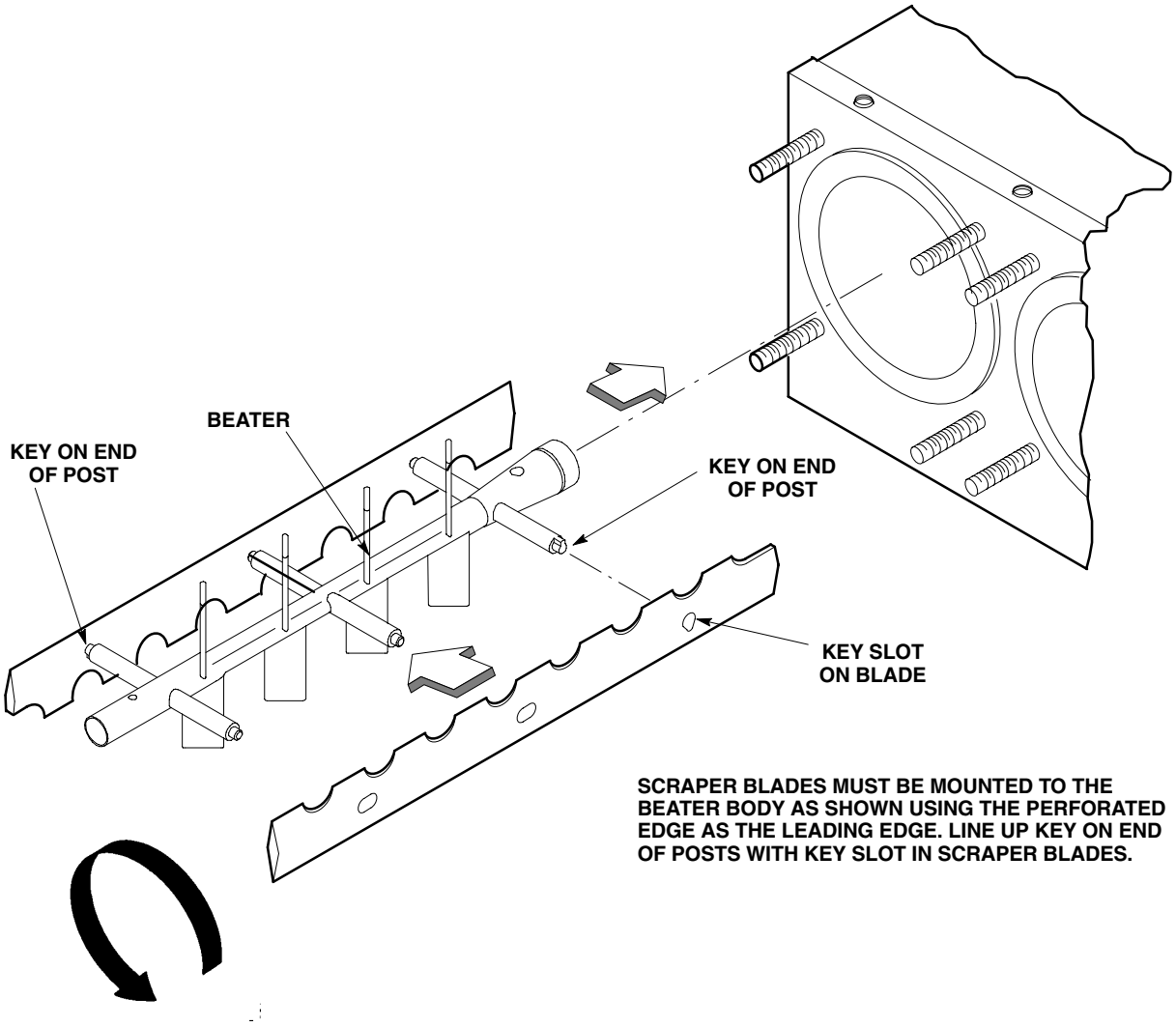


FIGURE 12. BEATERS AND SCRAPER BLADES INSTALLATION

15. Position SCRAPER BLADES (item 2) on BEATER (item 13) as shown in Figure 12. Slide beater into freeze cylinder so slotted hooks engage DRIVE PIN (item 16) on DRIVE SHAFT (item 21) as shown in Figure 9. Turn beater to the right (clockwise) to lock in place.

16. Lubricate O-RING (item 5) with water to facilitate faceplate installation. Position O-RING (item 5) on FACEPLATE (item 8). Install faceplate on Unit so dispensing valve spout faces down. (MAKE SURE FEMALE END OF THE BEATER IS PLACED OVER THE FACEPLATE STAINLESS-STEEL STUD AND BUSHING BEFORE PUSHING THE FACEPLATE INTO POSITION ON ITS FOUR THREADED MOUNTING STUDS). Tighten hex nuts until faceplate touches freeze cylinder all around flange. CAUTION – DO NOT OVERTIGHTEN HEX NUTS.

17. Turn dispensing valve spring housing to the left (counterclockwise) to put tension on torsion spring, then tighten hold-down plates to secure spring housing.

18. Test dispensing valve to make sure it closes by itself when lever is released. If not, readjust torsion spring tension.

19. Sanitize syrup system as instructed in CLEANING AND SANITIZING.

20. Return Unit to operation.

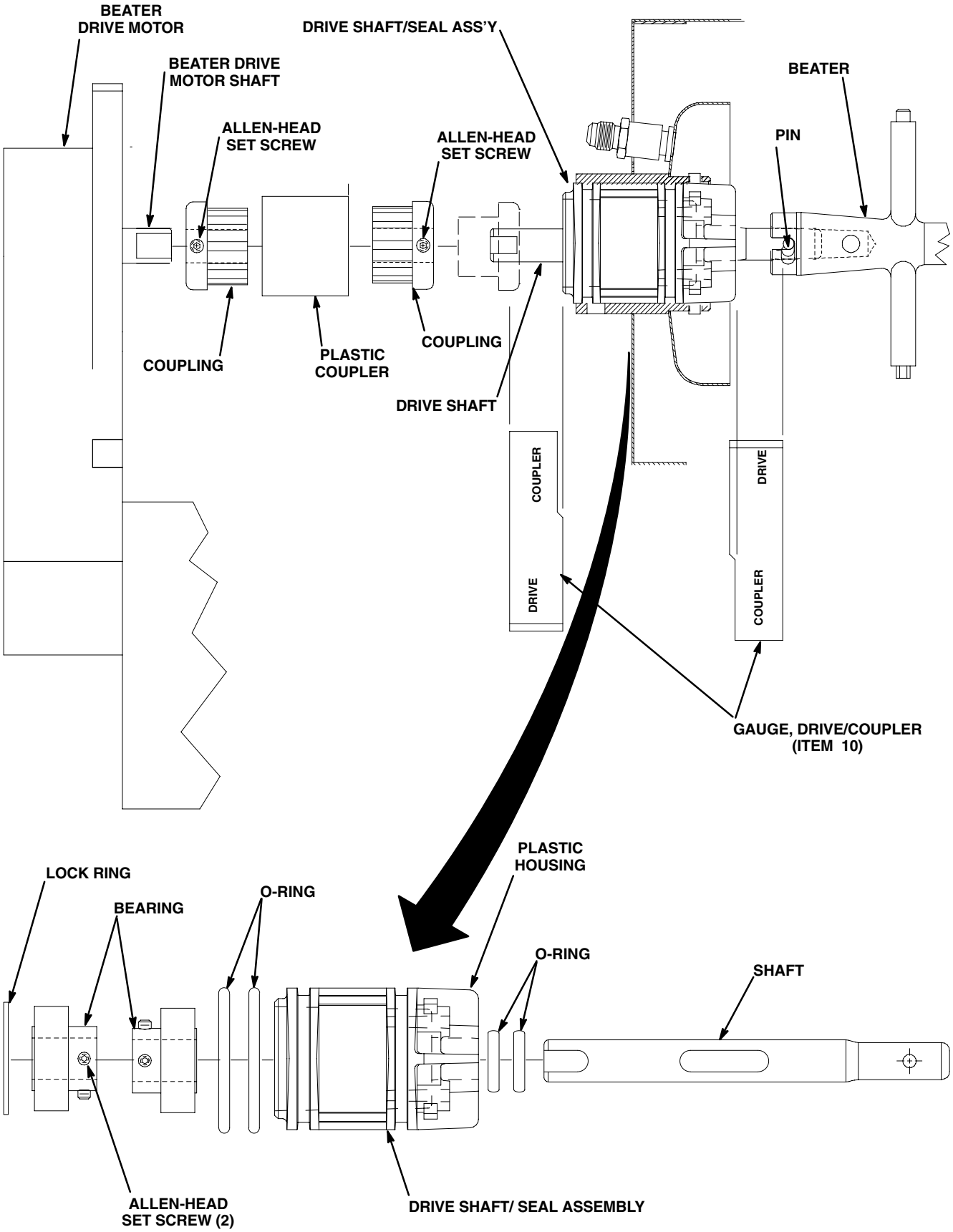


FIGURE 13. SERVICING BEATER MOTOR DRIVE SHAFT/SEAL ASSEMBLY

CLEANING CONDENSER COIL (SEE FIGURE 23)

UNIT WITH AIR-COOLED REFRIGERATION SYSTEM

NOTE: Circulating air, required to cool the refrigeration system condenser coil, is drawn in through louvers on front and exhausted out through louvers on sides and back of Unit. Restricting air circulation through Unit will decrease its cooling efficiency.

Periodically clean condenser coil as follows:

1. Press “OFF 1” and “OFF 2” switches on Unit control panel to stop refrigeration system and beaters motors.
2. Remove condenser coil access panel and condenser coil air filter.
3. Clean condenser coil and condenser coil air filter with vacuum cleaner, low pressure compressed air, or a soft brush.
4. Install condenser coil air filter and condenser coil access panel by reversing removal procedure.
5. Press “AUTO 1” and “AUTO 2” switches on Unit control panel to start refrigeration system and beaters motors.

UNIT WITH WATER-COOLED REFRIGERATION SYSTEM

The high-pressure cutout switch, located inside the lower control box (see Figure 24), will shut the Unit refrigeration system down when overheated (high head pressure) caused by lack of cooling water. After problem has been corrected and the head pressure has decreased, the reset button on the high-pressure cutout switch must be pressed to restart the refrigeration system.

CLEANING AND SANITIZING

DAILY CLEANING OF UNIT

Daily, or more often if necessary, wash all external surfaces of the Unit with a mild soap solution. Rinse with clean water, then wipe the Unit dry with a clean soft cloth. DO NOT USE ABRASIVE CLEANERS. Remove and wash the drip tray in a mild soap solution, rinse with clean water, then install drip tray on the Unit.

SANITIZING SYRUP SYSTEMS

NOTE: The Unit should be sanitized every 90-days by a qualified Service Person following the Sanitizer Manufacturer’s recommendation. Use Chlor-Tergent (Oakite Products, Inc.) or equivalent sanitizer.

The Unit should be sanitized every 120-days following the parent company requirements and the sanitizer manufacturer’s recommendations. One or both of the syrup systems may be sanitized at one time for routine 120-days sanitizing requirements. The following sanitizing instructions use No.1 syrup system as an example. No. 2 syrup systems sanitizing instructions are identical to No. 1 syrup system with the exception of using applicable system switches. Proceed as follows:

1. Press SIDE 2 “OFF” switch to stop beater motor and refrigeration in No. 2 freeze cylinder, which is not to be defrosted. “OFF 2” fault message will appear on message display.
2. Press “MANUAL DEFROST” switch to start defrost cycle on No. 1 freeze cylinder. “DEFROST 1” message will appear on message display as long as defrost cycle is in progress.
3. Immediately press SIDE 2 “BLEND ON/OFF” switch to restart the beater in No. 2 freeze cylinder. Refrigeration in No. 2 cylinder will not be operating.
4. Remove right-hand side panel as instructed for access to No. 2 product blender tank product shutoff valve.

5. Close No. 2 product blender tank product shutoff valve to prevent product bleeding back into No. 1 product blender tank during sanitizing procedure.

6. Press SIDE 1 “BLEND ON/OFF” switch to prevent more product from entering the product blender tank.

7. Place waste container under No. 1 cylinder dispensing valve nozzle. Open dispensing valve and dispense all product from the freeze cylinder and the product blender tank. As product level lowers in the freeze cylinder, partially close the valve to avoid spurting.

8. Remove Unit lower front access panel as instructed for access to No. 1 product blender tank product sample valve.

9. Place waste container under No. 1 product blender tank product sample valve. Slowly open valve and purge remaining product out of the tank, then close the valve.

10. Syrup Tank Syrup System.

    Disconnect syrup tank containing syrup from No. 1 syrup system.

    Bag-in-Box Syrup System.

    A. Disconnect No. 1 syrup pump syrup inlet line from bag-in-box containing syrup.

    B. Cut connector from empty bag-in-box container, then connect connector to No. 1 syrup pump syrup inlet line.

NOTE: Sanitizing solution is used in a more concentrated form because it will be diluted approximately four-to-one in the product blender tank. If a powder–type sanitizer is to be used, it must be thoroughly dissolved with water prior to adding to a sanitizing solution container.

11. Using a clean syrup tank (syrup tank system) or a clean 5-gallon pail (bag-in-box system), prepare a full tank or pail of sanitizing solution using Chlor-Tergent (Oakite Product, Inc.) or equivalent sanitizer. Mix sanitizing solution by using 70° F to 100° F (max) plain water and 2.65 oz./gallon sanitizer. This mixture will provide 800-ppm of chlorine. Sanitizing solution will be diluted to approximately 200-ppm inside the product blender tank after carbonated water has been mixed with the sanitizing solution.

12. Syrup Tank System.

    Shake sanitizing solution tank thoroughly to mix the solution, then connect tank to the No. 1 syrup system.

    Bag-in-Box Syrup System.

    Mix pail of sanitizing solution thoroughly, then immerse end of No. 1 syrup pump syrup inlet line into pail of sanitizing solution.

13. Press SIDE 1 “SYRUP PRIME” switch to fill No. 1 syrup system syrup float switch with syrup.

14. Press SIDE 1 “BLEND ON/OFF” switch to fill No. 1 product blender tank with sanitizing solution. The carbonator water pump will start and begin pumping carbonated water into the product blender tank which will dilute sanitizing solution also entering the tank.

15. After carbonator water pump cycles off, completely fill No. 1 freeze cylinder with sanitizing solution by repeatedly pulling and releasing the relief valve knob on the freeze cylinder faceplate and until sanitizing solution comes out of the relief valve port. Open the dispensing valve until sanitizing solution flows from the valve, then close the valve. Open the product blender tank sample valve until sanitizing solution flows from the valve, then close the valve.

16. Press SIDE 1 “MOTOR” switch to start No. 1 freeze cylinder beater. Allow sanitizing solution to remain in the freeze cylinder for no less than 10 and no more than 15 minutes (max) contact time.

17. When sanitizing solution contact time has elapsed, press SIDE 1 “OFF” switch to stop the No. 1 freeze cylinder beater.

18. Press SIDE 1 “BLEND ON/OFF” switch to prevent more sanitizing solution from entering the product blender tank.

19. Place waste container under No. 1 dispensing valve nozzle. Open the dispensing valve and dispense all sanitizing solution from the freeze cylinder. As sanitizing solution level lowers in the freeze cylinder, partially close the valve to avoid spurting.

20. Place waste container under the No. 1 product blender tank product sample valve. Slowly open the valve and purge remaining sanitizing solution out of the tank, then close the valve.

21. Syrup Tank System.

    A. Disconnect sanitizing solution tank from No. 1 syrup system.

    B. Connect syrup tank containing syrup into No. 1 syrup system.

    Bag-in-Box Syrup System.

    A. Remove end of No. 1 syrup pump syrup inlet line from pail of sanitizing solution.

    B. Remove empty bag-in-box connector from No. 1 syrup pump syrup inlet line.

    C. Connect No. 1 syrup pump syrup inlet line to bag-in-box containing syrup.

22. Press SIDE 1 “SYRUP PRIME” switch to fill No. 1 syrup system syrup float switch with syrup.

23. Press SIDE 1 “BLEND ON/OFF” switch to fill No. 1 product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into the product blender tank along with syrup to make product.

WARNING: Flush residual sanitizing solution from the syrup system as instructed. Residual sanitizing solution left in the syrup system could create a health hazard.

24. After carbonator water pump cycles off, completely fill No.1 freeze cylinder with product by repeatedly pulling and releasing the faceplate relief valve and until product comes out of the relief valve port. Open the dispensing valve until product flows from the valve, then close the valve. Open No. 1 system product sample valve until product flows from the valve, then close the valve.

25. Press SIDE 1 “MOTOR” switch to start No. 1 freeze cylinder beater. Allow beater to operate for 5-minutes, then press SIDE 1 “OFF” switch to stop the beater.

26. Syrup Tank System.

    A. Disconnect syrup tank containing syrup from No. 1 syrup system.

    B. Connect empty syrup tank into No. 1 syrup system.

    Bag-in-Box Syrup System.

    A. Disconnect No.1 syrup pump syrup inlet line from bag-in-box containing syrup.

    B. Install connector from empty bag-in-box on No. 1 syrup pump syrup inlet line.

27. Hold waste container under the dispensing valve and dispense until all product has been dispensed from the freeze cylinder. As product level lowers in the freeze cylinder, partially close the valve to avoid spurting.

28. Place waste container under No.1 system product sample valve. Slowly open the valve and purge remaining product out of the product blender tank, then close the valve.

WARNING: To avoid possible injury or property damage, do not attempt to remove the empty syrup tank cover until CO_2 pressure has been released from the tank.

29. Syrup Tank System.

    A. Disconnect empty syrup tank from No. 1 syrup system.

    B. Connect syrup tank containing syrup into No. 1 syrup system.

    Bag-in-Box Syrup System.

    A. Remove empty bag-in-box connector from No. 1 syrup pump syrup inlet line.

    B. Connect No. 1 syrup pump syrup inlet line to bag-in-box containing syrup.

30. Press SIDE 1 “SYRUP PRIME” switch to fill No. 1 syrup system syrup float switch with syrup.

31. Press SIDE 1 “BLEND ON/OFF” switch to fill No. 1 product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into the product blender tank along with syrup to make product.

32. After carbonator water pump cycles off, intermittently pull and release the No. 1 freeze cylinder faceplate relief valve. This bleeds CO_2 from the freeze cylinder and allows product to enter and fill the cylinder.

33. Open No. 2 product blender tank product shutoff valve.

34. Press both “ON” switches to start both freeze cylinders beaters and refrigeration system. Product will be ready for dispensing in approximately 10 minutes.

35. Install right-hand side panel and lower front access panel by reversing removal procedure.

YEARLY OR AFTER WATER SYSTEM DISRUPTION

WARNING: The Unit plain water inlet line water strainer must be disassembled and it’s strainer screen must be inspected and cleaned and the water pump outlet double liquid check valve (P/N 3253) must be replaced after any disruptions (plumbing work, earthquake, etc.) to the water supply system, and at least once a year under normal circumstances. A plain water inlet line water strainer with no strainer screen or a defective screen would allow foreign particles to foul the double liquid check valves. CO_2 gas could then back flow into the water system and create a health hazard in the water system.

SERVICING CARBONATOR WATER PUMP WATER STRAINER SCREEN (2 AND 3 H.P. OVERCOUNTER UNITS)

(see Figure 5 and 15)

1. Press both “OFF” switches to stop freeze cylinders beaters and refrigeration systems.
2. Disconnect electrical power from Unit.
3. Shut off CO_2 and water supplies to the Unit.
4. Remove lower front access panel and side panel as instructed for access to the Unit plain water inlet line water strainer.
5. Pull up on carbonator tank relief valve plastic cover to release CO_2 pressure from the tank.
6. Loosen screen retainer in the water inlet water strainer, then remove screen retainer and strainer screen from the water strainer port.
7. Pull strainer screen from screen retainer. Clean any sediment from screen retainer and the water strainer port.
8. Inspect strainer screen for holes, restrictions, corrosion, and other damage. Discard strainer screen if damaged and replace with a new strainer screen (P/N 313253000).
9. Check O-ring on the screen retainer. Replace worn or damaged O-ring with new O-ring (P/N 310784000).

NOTE: A strainer screen should always be used otherwise particles could foul the double liquid check valve.

10. Install good or new strainer screen in the screen retainer, then screw the screen retainer into the water strainer port and tighten securely.
11. Proceed to SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE.

REPLACING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE (see applicable Figure 4 or 5 and 14 or 15)

1. Service water pump water strainer screen before replacing the water pump double liquid check valve.
2. Disconnect carbonator tank water line from the double liquid check valve assembly outlet.
3. Remove the double liquid check valve assembly from the water pump outlet connector.

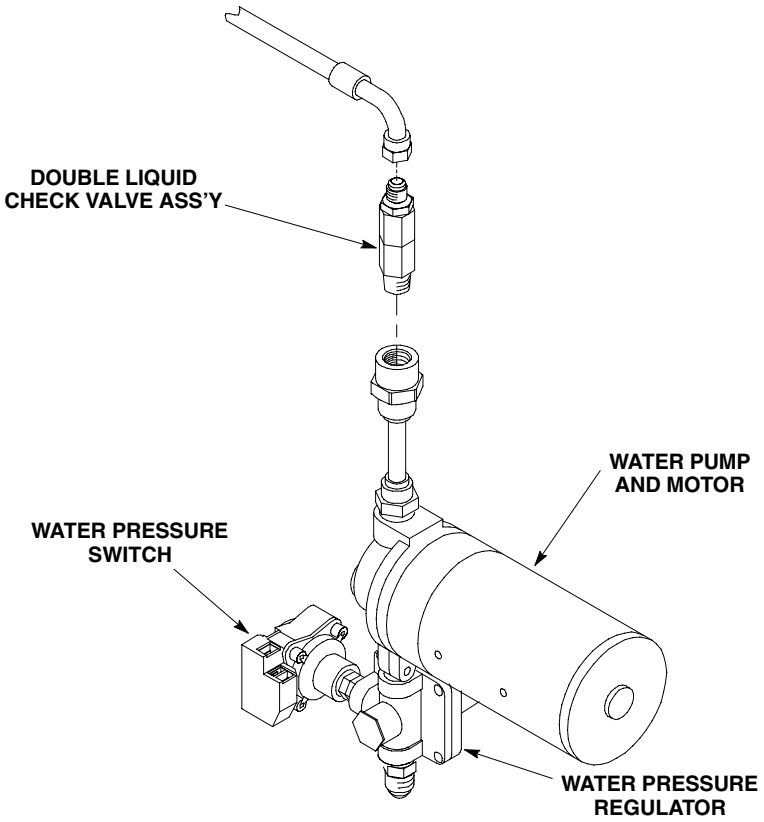


FIGURE 14. DOUBLE LIQUID CHECK VALVE (3 H.P. FLOOR MODEL UNIT)

4. Install new double liquid check valve assembly (P/N 3253) in the water pump outlet fitting. Seal connection with teflon tape. *DO NOT OVERTIGHTEN.*
5. Connect carbonator tank water line to the double liquid check valve assembly outlet. *DO NOT OVERTIGHTEN.*
6. Restore CO_2 and water supplies to the Unit. Check for water leaks and tighten any loose connections.
7. Install panels on the Unit by reversing removal procedures.
8. Connect electrical power to Unit.
9. Press both " BLEND ON/OFF" switches.

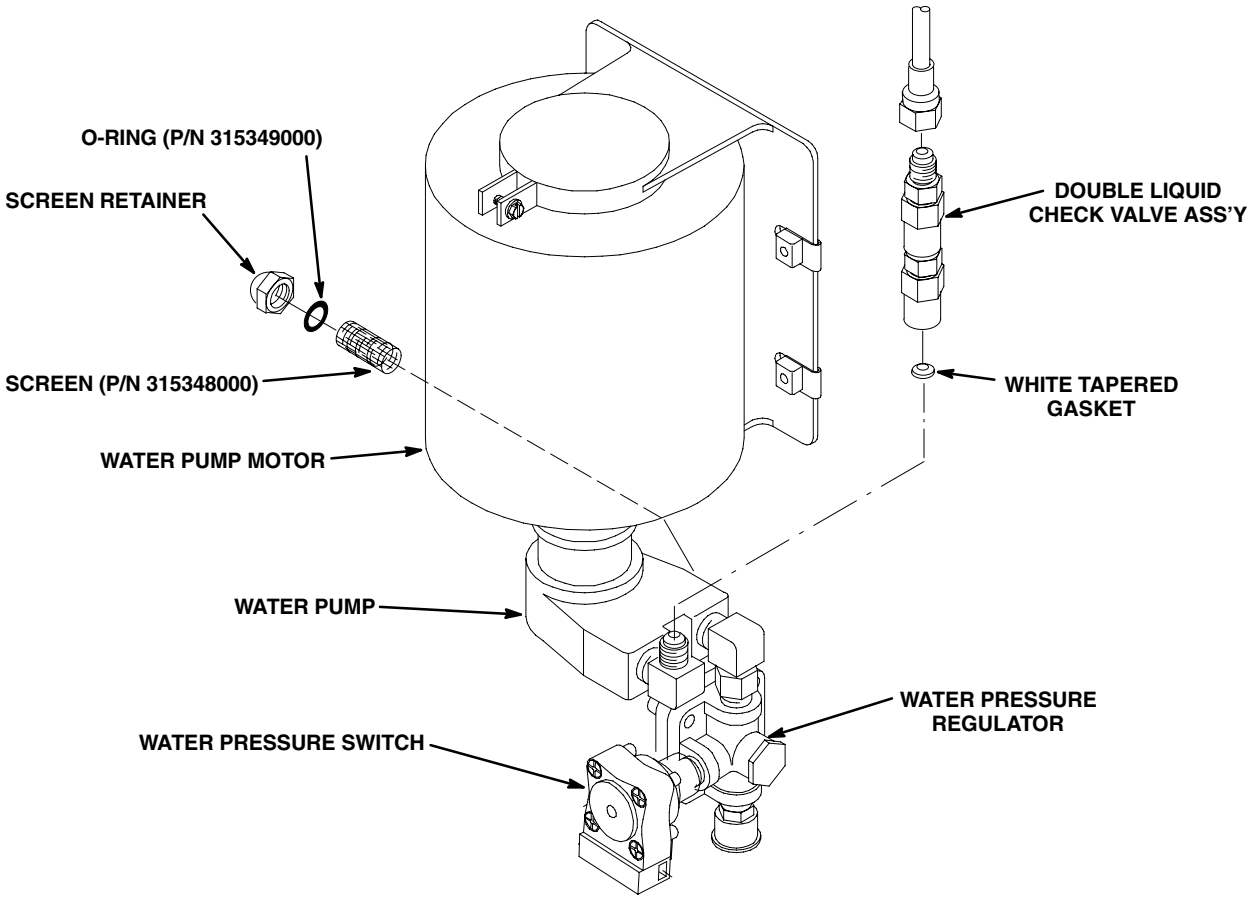


FIGURE 15. DOUBLE LIQUID CHECK VALVE AND WATER STRAINER SCREEN (OVERCOUNTER OC2 UNIT)

ADJUSTING CARBONATOR TANK LIQUID LEVEL

The carbonator tank liquid level (pump cut-in and cutout) was adjusted at the factory and should require no further adjustment. However, if incorrect setting is suspected, check and make necessary adjustments as follows:

1. Remove Unit back and side panels as instructed for access to carbonator and carbonated water volume sample valve (see applicable Figure 4 or 5).

2. To check carbonator tank total fill; allow carbonator water pump motor to operate and fill tank with carbonated water. After pump cycles off, disconnect electrical power from Unit.

3. Using container graduated in ounces, open carbonator carbonated water sample valve and completely drain carbonator tank into container. Total carbonated water volume dispensed should be 40 to 58-ounces maximum.

4. If total carbonated water dispensed is below 40 ounces, loosen screw securing level control switches actuator bracket (see Figure 17) and move actuator bracket up slightly. If more than 58 ounces, maximum of carbonated water was dispensed, move actuator bracket down, then tighten screw. *MAKE ADJUSTMENTS IN SMALL INCREMENTS.*

5. Connect electrical power to Unit and allow carbonator tank to fill with water until water pump cycles off.

6. Repeat steps 2 through 5 preceding as many times as necessary until correct carbonated water volume adjustment is achieved.

REPLACING FREEZE CYLINDER BEATER DRIVE MOTOR (SEE FIGURE13)

IMPORTANT: Note in TABLE 7. MOTOR SELECT the number of freeze cylinders beater drive motors manufacturers that are listed. Your Unit was manufactured and equipped with freeze cylinders beater drive motors from one of these manufacturers. The replacement freeze cylinder beater drive motor is also manufactured by one of these manufacturers listed. WHEN REPLACING ONE OF THE BEATER MOTORS, NOTE THE MANUFACTURER'S NAME ON THE MOTOR. THE BEATER MOTOR MANUFACTURER'S NAME MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR TO THE UNIT ELECTRONICS. Proceed as follows to replace the freeze cylinder beater drive motor.

1. Press "OFF 1" and "OFF 2" control switches to stop the refrigeration system and the beater drive motors.
2. Disconnect electrical power to the Unit.
3. Remove back and applicable side panels from the Unit.
4. Tag the beater drive motor electrical wiring for identification, then disconnect the wiring from the terminal block.
5. Remove bolts, hex nuts, and lockwashers securing the beater drive motor to the Unit frame.
6. Very carefully, remove the old beater drive motor from the Unit. *BE CAREFUL NOT TO LOSE THE LARGE PLASTIC DRIVE SHAFT COUPLER.*
7. Remove the plastic coupler from the old beater drive motor shaft and install it on the new motor shaft. *MAKE SURE THE ALLEN-HEAD SET SCREWS ARE SECURELY TIGHTENED AND PROPERLY SEATED ON THE SHAFT FLAT SURFACE.*

CAUTION: The new beater drive motor has a screw in the vent hole on top of the gear box that must be removed before the motor is put into operation.

8. Remove screw from the vent hole on top of the beater drive motor gear box. *BE CAREFUL NOT TO LAY MOTOR ON IT'S SIDE–THIS WILL CAUSE OIL TO LEAK OUT OF THE GEAR BOX.*
9. Very carefully, place the new beater drive motor into position in the Unit with the motor shaft engaged in the beater drive shaft large plastic coupler.
10. Secure beater drive motor to the Unit frame with bolts, hex nuts, and lock washers.
11. Connect the beater drive motor electrical wiring to the terminal block.
12. Install the sides and back panels by reversing the removal procedures.
13. Restore the Unit to operation.
14. Refer to **"**PROGRAMMING FREEZE CYLINDERS BEATER MOTORS INTO UNIT ELECTRONICS**"** in INSTALLATION section of this manual to program the new replacement beater motor into the Unit to match the Unit electronics.
15. Remove the screw from the vent hole on top of the beater drive motor gear box. BE CAREFUL NOT TO LAY THE MOTOR ON IT'S SIDE – THIS WILL CAUSE OIL TO LEAK OUT OF THE GEAR BOX.
16. Very carefully, place the new beater drive motor into position in the Unit with the motor shaft engaged in the beater drive shaft large plastic coupler.
17. Secure beater drive motor to the Unit frame with bolt, hex nuts, and lockwashers.

REPLENISHING SYRUP SUPPLY

SYRUP TANKS SYSTEM

NOTE: Sugar-free diet syrup cannot be used with this Unit.

Although syrup replenishing can be done anytime, the syrup supply must be replenished when either the "SYRUP 1" or "SYRUP 2" fault messages are displayed on the message display indicating either No. 1 or No. 2 syrup system syrup tank is empty.

NOTE: The following instructions are applicable only when replenishing the syrup supply. Refer to SYRUP FLAVOR CHANGE when changing syrup flavors.

1. Press applicable "OFF" switch on the control panel to stop the applicable freeze cylinder beater and refrigeration system.

IMPORTANT: The following CO_2 and liquid disconnect and connecting procedure for the syrup tank replacement or filling the syrup tank in place must be performed in the order as follows:

<u>To disconnect syrup tank from the Unit syrup system.</u>

First, disconnect liquid disconnect from the syrup tank. NOTE - Disconnecting the liquid quick disconnect from the syrup tank first prevents syrup from backflowing through the Unit syrup flow regulator which may alter the regulator adjustment.

Second, disconnect CO_2 quick disconnect from the syrup tank.

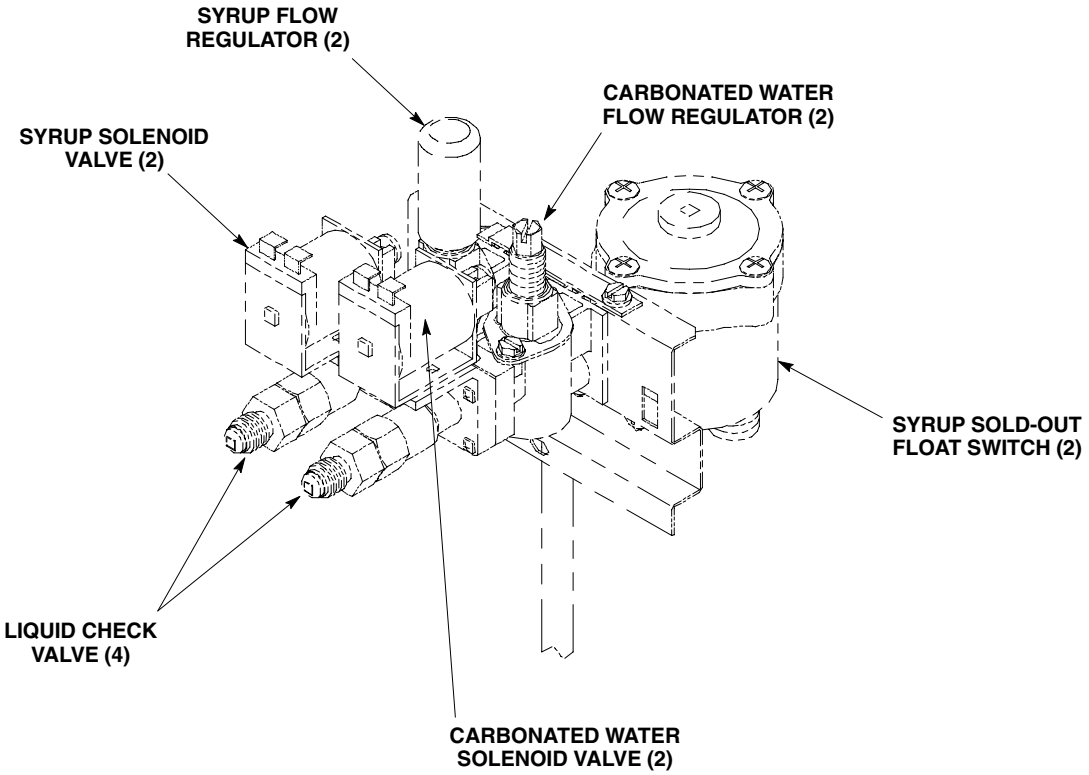


FIGURE 16. PARTS IDENTIFICATION

To connect syrup tank into the Unit syrup system.

First, connect CO_2 quick disconnect to the syrup tank to pressurize the tank.

Second, connect liquid quick disconnect to the syrup tank.

2. Disconnect inlet (CO_2) and outlet (syrup) lines from the empty syrup tank.
3. Check syrup tank quick disconnects for sticky or restricted operation. Rinse the disconnects in warm water.
4. First, pressurize the full syrup tank by connecting CO_2 line to the tank, then connect the Unit syrup inlet line to the tank.
5. Press applicable “SYRUP PRIME” switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
6. Press applicable “BLEND ON/OFF” switch to fill applicable No. 1 or No. 2 system product blender tank with product.
7. Press applicable “ON” switch to start the refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.
8. If freeze cylinder is not full of product, repeatedly pull and release the faceplate relief valve to slowly bleed CO_2 from the freeze cylinder and allow product to fill the cylinder. Do not relieve freeze cylinder pressure too fast or the product will foam excessively in the cylinder and lose carbonation.

BAG–IN–BOX SYSTEM

1. Press applicable “OFF’’ switch on the control panel to stop the applicable freeze cylinder beater and refrigeration system.
2. Disconnect syrup outlet tube from empty bag-in-box container, then remove empty container.
3. Open flap on full bag-in-box container.
4. Pull bag-in-box container connector from the container, then remove dust cap from the connector.
5. Rinse syrup outlet tube in warm water.
6. Connect syrup outlet tube to full bag-in-box container. *Make sure syrup outlet tube is securely connected to the container.*
7. Press applicable “SYRUP PRIME” switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
8. Press applicable “BLEND ON/OFF” switch to fill applicable No. 1 or No. 2 system product blender tank with product.
9. Press applicable “ON” switch to start the refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.
10. If freeze cylinder is not full of product, repeatedly pull and release the faceplate relief valve to slowly bleed CO_2 from the freeze cylinder and allow product to fill the cylinder. Do not relieve freeze cylinder pressure too fast or the product will foam excessively in the cylinder and lose carbonation.

REPLENISHING CO_2 SUPPLY

The Unit may be connected to either a bulk CO_2 supply or to a CO_2 cylinder. If your Unit is connected to a CO_2 cylinder, proceed as follows to replenish the CO_2 supply.

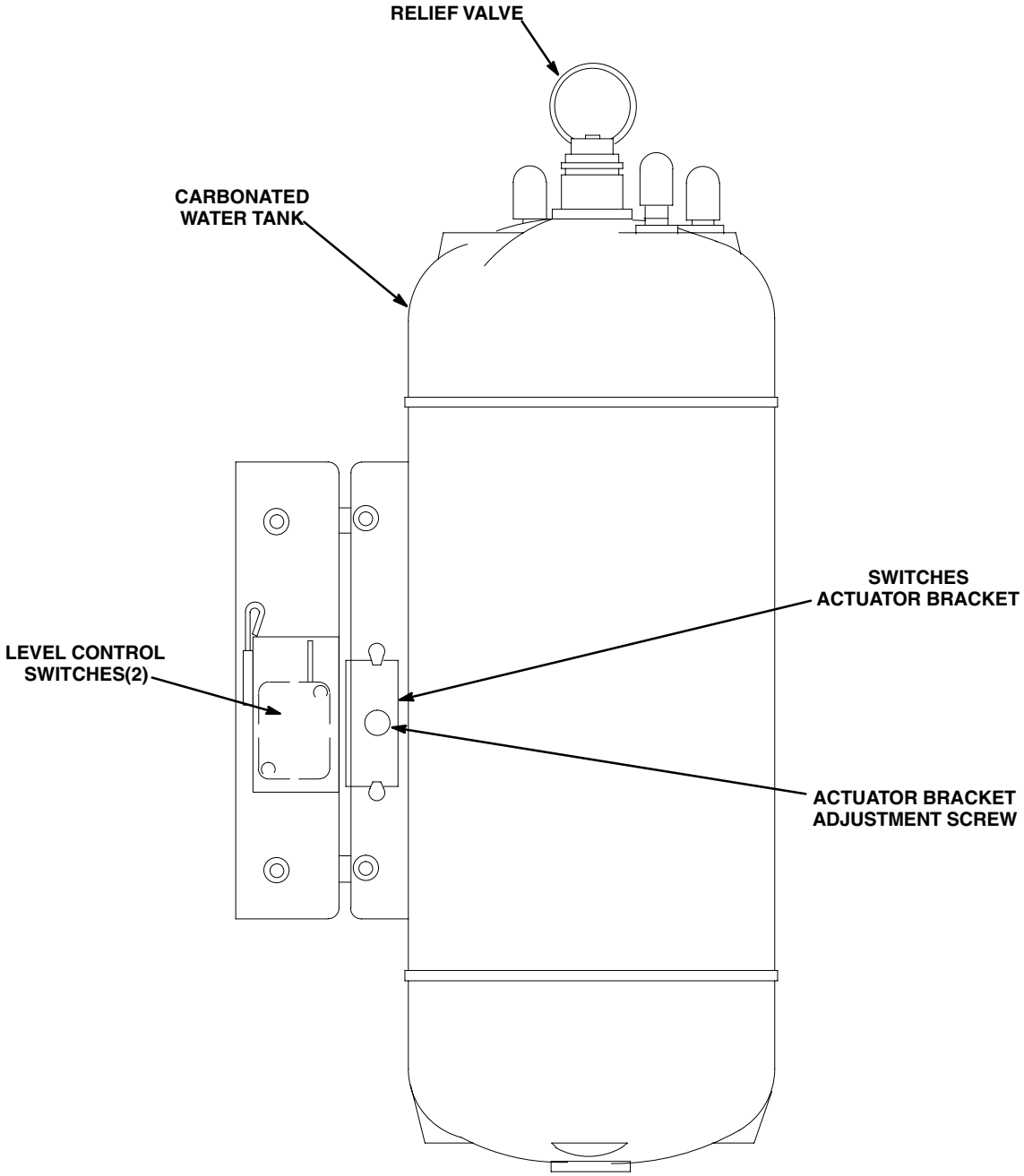


FIGURE 17. CARBONATOR LIQUID LEVEL CONTROL SWITCH ADJUSTMENT

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) 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 and suffocation.

NOTE: When indicator on primary CO_2 cylinder regulator assembly 1800-psi gage is in shaded ("change CO_2 cylinder") portion of the dial, CO_2 cylinder is almost empty and should be changed.

1. Fully close (clockwise) CO_2 cylinder valve.
2. Slowly loosen the primary CO_2 regulator assembly coupling nut allowing CO_2 pressure to escape, then remove regulator assembly from empty CO_2 cylinder.
3. Unfasten safety chain and remove empty CO_2 cylinder.
4. Position full CO_2 cylinder and secure with safety chain.

WARNING: To avoid personal injury and/or property damage, always secure CO_2 cylinder in an upright position with safety chain to prevent it from falling over. Should the shutoff valve become accidentally broken off, CO_2 cylinder can cause serious personal injury.

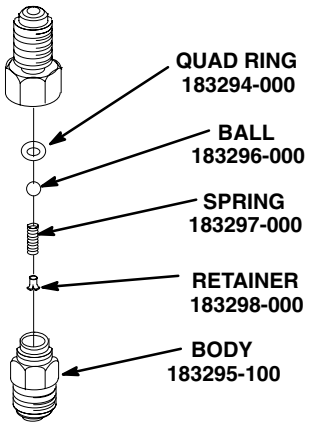
5. Make sure gasket is in place inside the primary CO_2 regulator coupling nut, then install regulator on CO_2 cylinder.
6. Open (counterclockwise) CO_2 cylinder valve slightly to allow the lines to slowly fill with gas, then open the valve fully to back-seat the valve. (Back-seating the valve prevents leakage around the valve shaft).
7. Check CO_2 connections for leaks. Tighten loose connections.

SYRUP FLAVOR CHANGE

The Unit syrup system that the syrup flavor change will be made on *must* be sanitized before connecting new flavor syrup to the system. It may be necessary to readjust BRIX (Water-To-Syrup) “Ratio” of the dispensed product after making a syrup flavor change.

CLEANING CO_2 SYSTEM GAS CHECK VALVES (SEE APPLICABLE FIGURE 4 OR 5 AND 18)

The CO_2 gas check valves must be inspected and serviced at least once a year under normal conditions and after any servicing or disruption of the CO_2 system. *ALWAYS REPLACE QUAD RING SEAL EACH TIME GAS CHECK VALVES ARE SERVICED.*



QUAD RING SEAL *MUST* BE REPLACED EACH TIME CHECK VALVE IS SERVICED.

FIGURE 18. CO_2 GAS CHECK VALVE

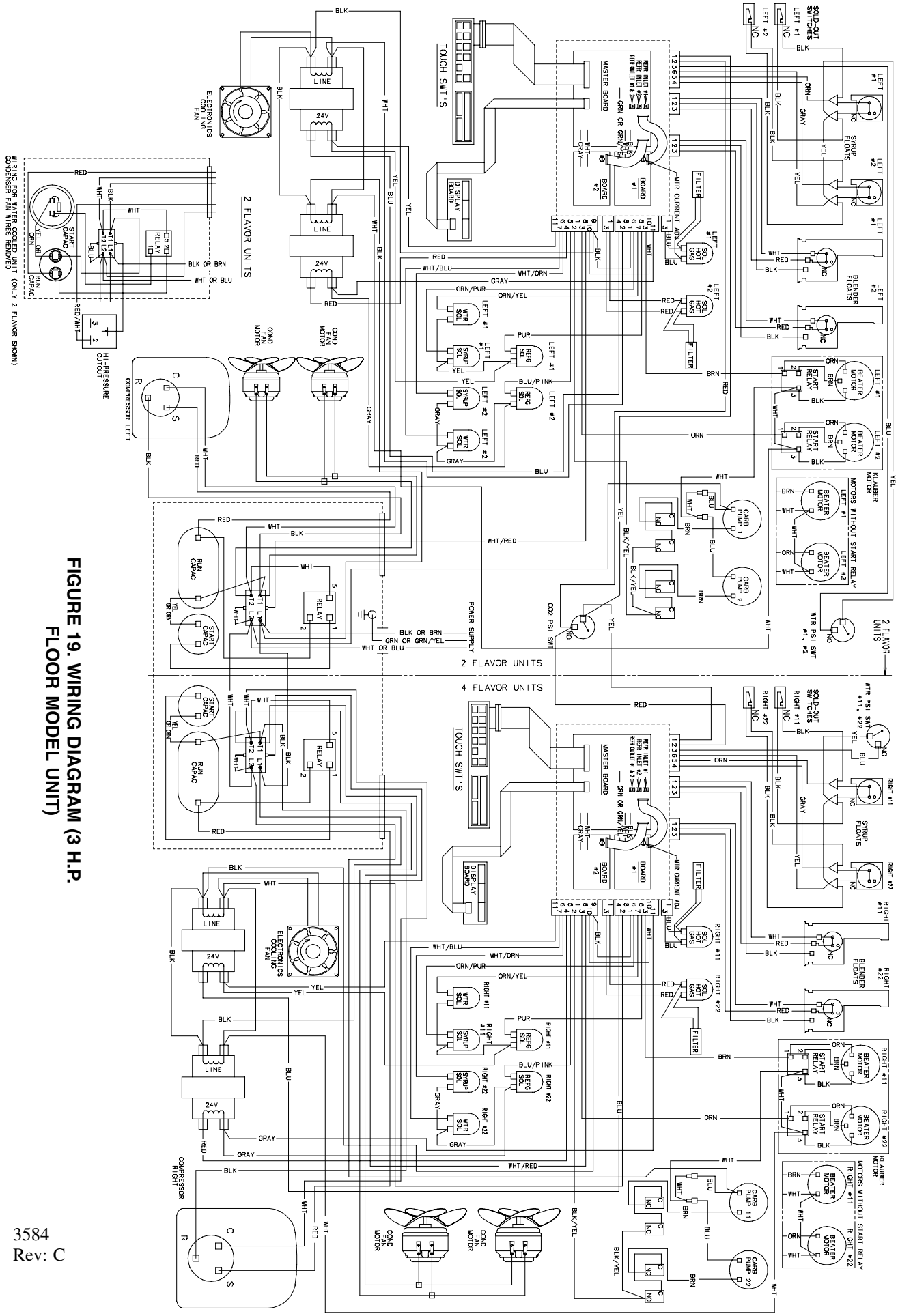


FIGURE 19. WIRING DIAGRAM (3 H.P. FLOOR MODEL UNIT)

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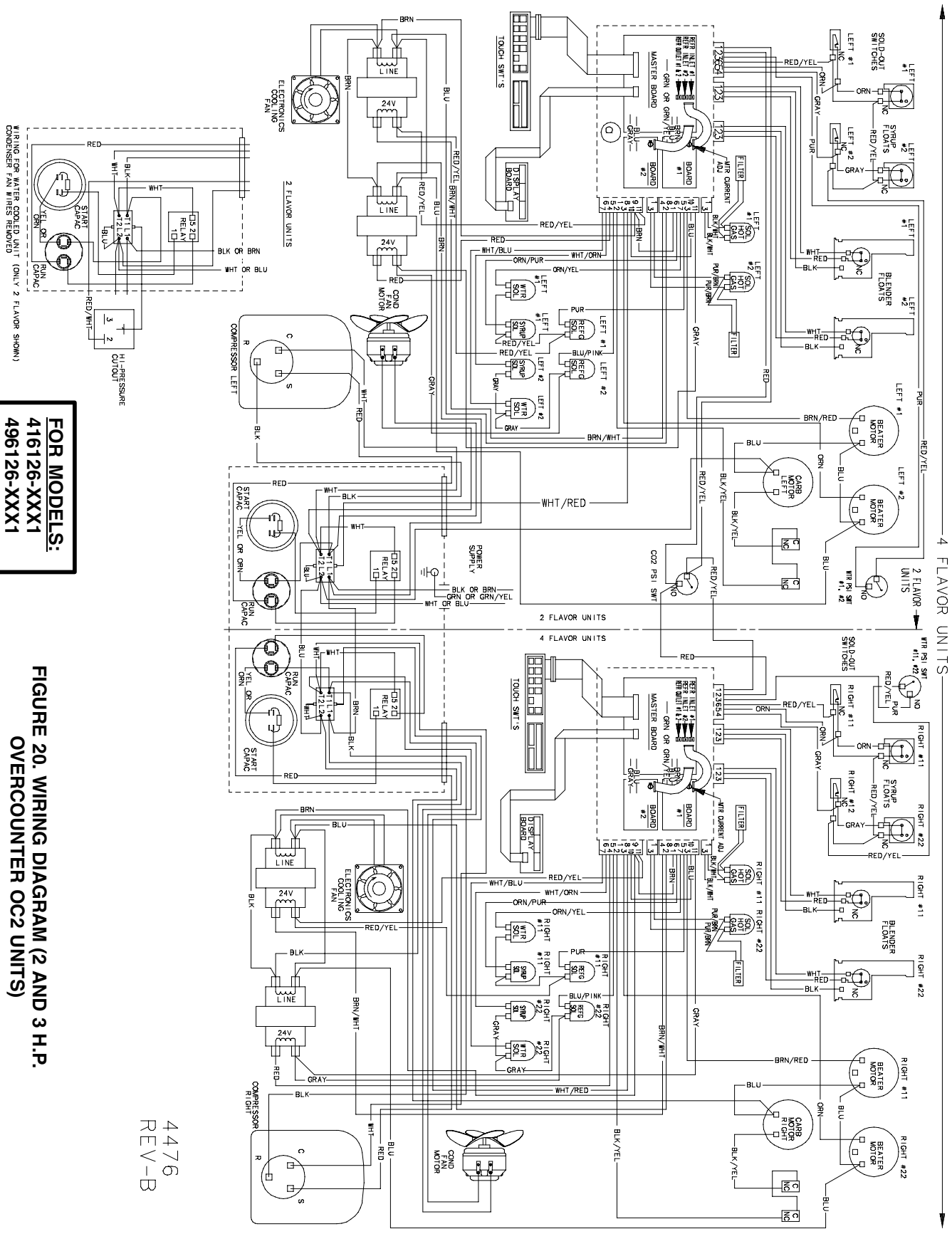
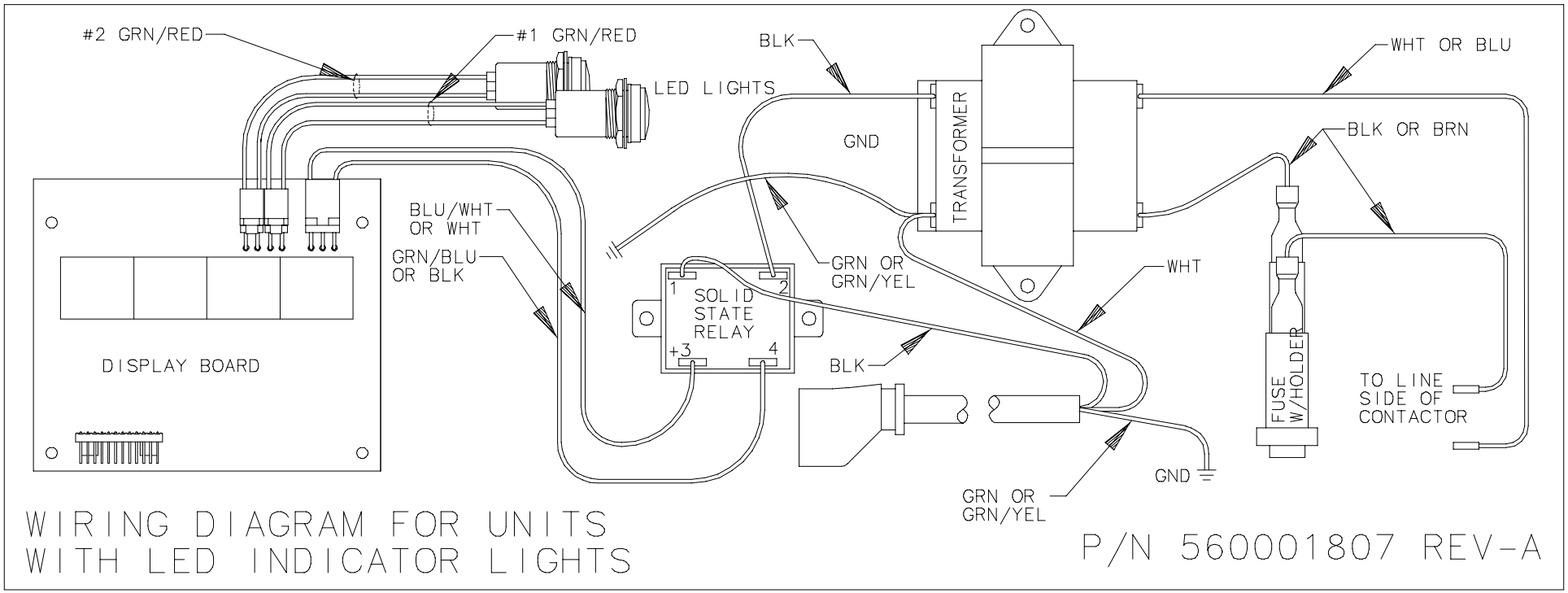
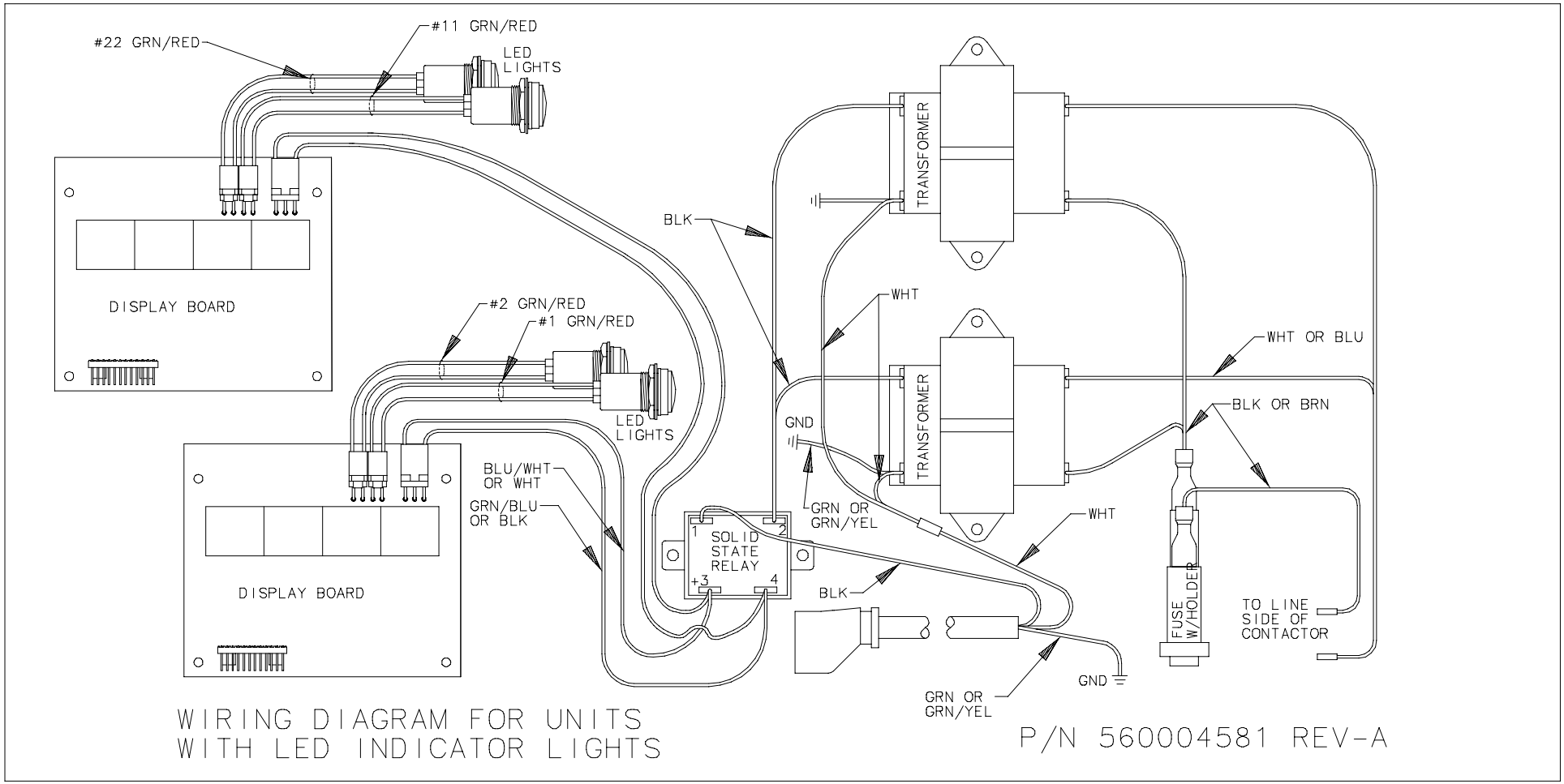


FIGURE 20. WIRING DIAGRAM (2 AND 3 H.P. OVERCOUNTER OC2 UNITS)



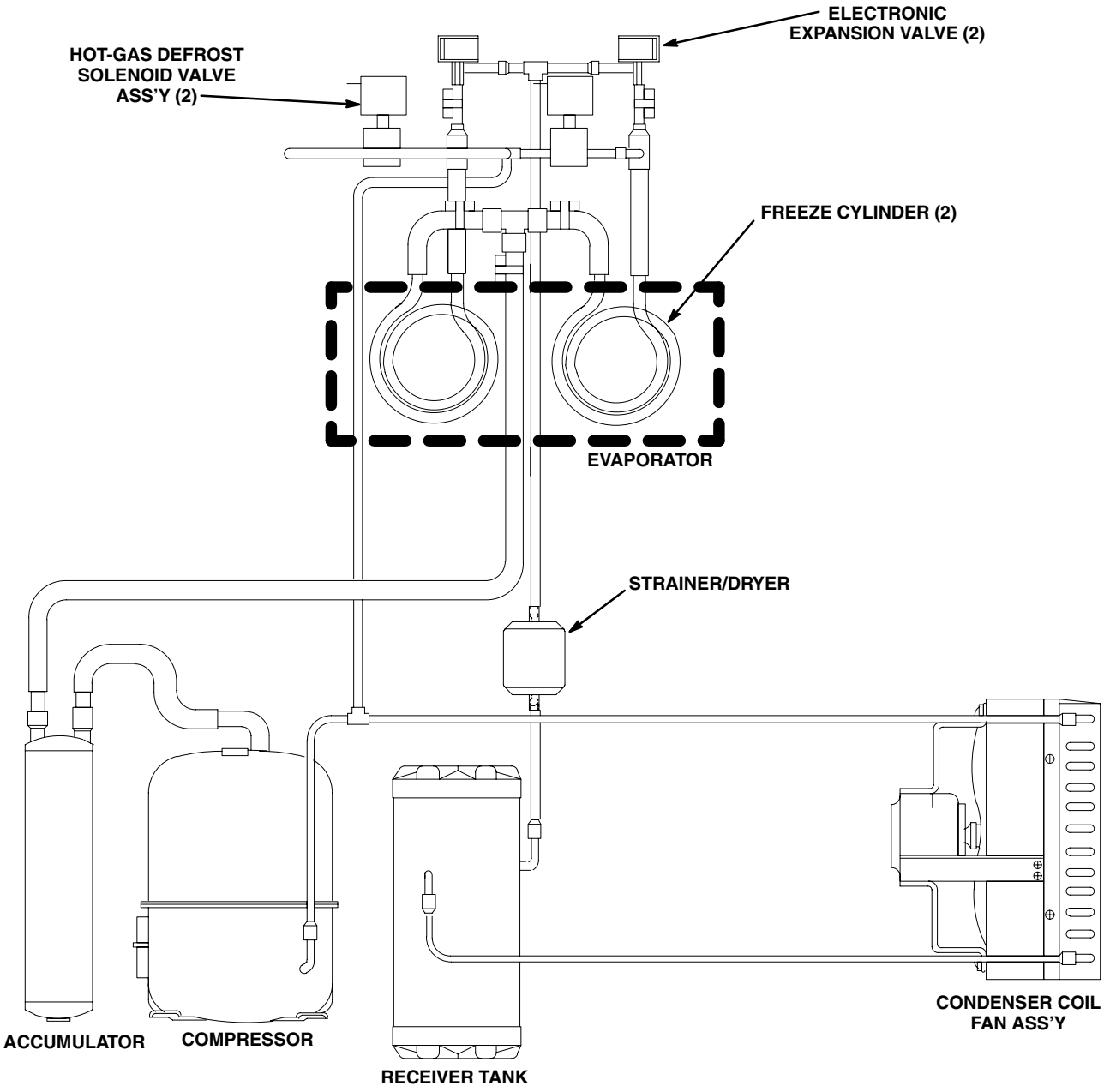
FOR MODELS:
416126-XXX1
496126-XXX1

FIGURE 21. WIRING DIAGRAM (TWO–FLAVOR UNITS)



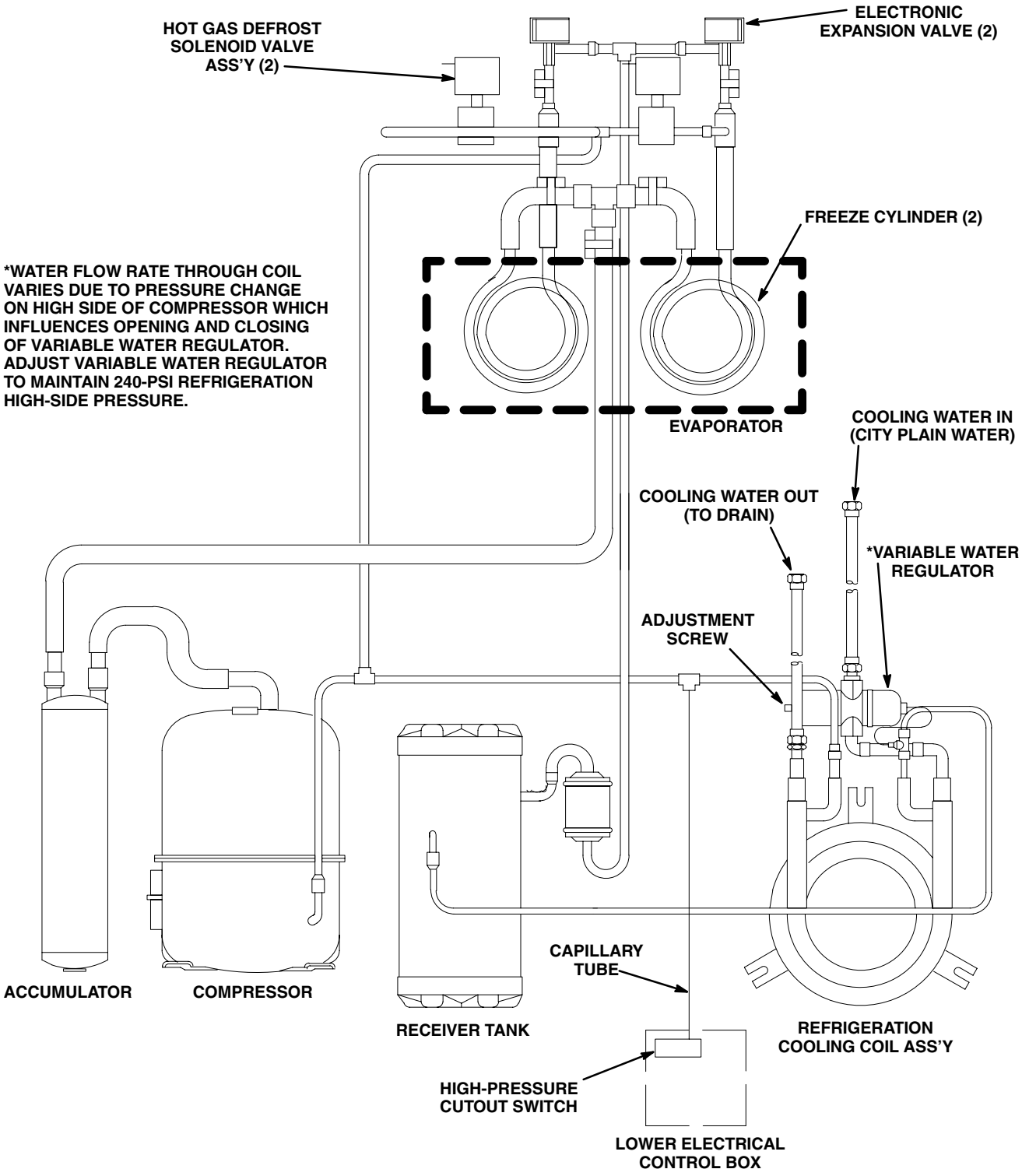
FOR MODELS:
416126-XXX1
496126-XXX1

FIGURE 22. WIRING DIAGRAM (FOUR–FLAVOR UNITS)



NOTE: One refrigeration system is shown in this illustration. A two-flavor Unit has one refrigeration system. A four–flavor Unit has two refrigeration systems.

FIGURE 23. REFRIGERATION FLOW DIAGRAM (AIR-COOLED REFRIGERATION SYSTEM)



NOTE: One refrigeration system is shown in this illustration. A two-flavor Unit has one refrigeration system.

FIGURE 24. REFRIGERATION FLOW DIAGRAM (WATER-COOLED REFRIGERATION SYSTEM)

TROUBLESHOOTING

IMPORTANT: Only qualified personnel should service internal components or electrical wiring.

WARNING: If repairs are to be made to a product system, remove quick disconnects from the applicable product tank, then relieve the system pressure before proceeding. If repairs are to be made to the CO_2 system, stop dispensing, shut off the CO_2 supply, then relieve the system pressure before proceeding. If repairs are to be made to the refrigeration system, make sure electrical power is disconnected from the unit.

IMPORTANT: The following CO_2 and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

1. **To disconnect soft drink tank from Unit syrup system.**
   - **A. Disconnect liquid disconnect from soft drink tank. NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.**
   - **B. Second, disconnect CO_2 quick disconnect from soft drink tank.**
2. **To connect soft drink tank into Unit syrup system.**
   - **A. First, connect CO_2 quick disconnect to soft drink tank to pressurize tank.**
   - **B. Second, connect liquid quick disconnect to soft drink tank.**

TROUBLESHOOTING CONTROL PANEL SWITCHES AND FAULT MESSAGES

Trouble	Probable Cause	Remedy
ONE OR MORE CONTROL PANEL SWITCHES NOT OPERATING.	A. Flat cable not properly connected to control switch module or master circuit board.	A. Properly connect flat cable to control switch module or master circuit board.
	B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable.	B. Check cable for pinched or broken wire condition and repair or replace as necessary.
	C. Inoperable switch(s) on control panel switch module.	C. Replace control panel switch module.
	D. Master circuit board not operating properly.	D. Replace master circuit board.

Trouble	Probable Cause	Remedy
ALL CONTROL PANEL SWITCHES NOT OPERATING.	A. Electric power disconnected from Unit.	A. Restore electric power to Unit.
	B. Control panel security enabled.	B. Press and hold any one of the control panel switches for 5-seconds to override the control panel security. Control panel security will return 90-seconds after switches have not been pressed.
	C. Flat cable not properly connected to control switch module or master circuit board.	C. Properly connect flat cable to control switch module or master circuit board.
	D. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable.	D. Check cable for pinched or broken wire condition and repair or replace as necessary.
	E. Master circuit board not operating properly.	E. Replace master circuit board.
	F. "SECURITY SWITCH" inoperable.	F. Replace control panel switch module.
PARTIAL MESSAGE OR DULL (POORLY ILLUMINATED) DISPLAY.	A. Extremely low power source voltage.	A. Upgrade power source voltage.
ONE OR MORE FAULT MESSAGES NOT OPERATING.	A. Flat cable not properly connected to fault message module or master circuit board.	A. Properly connect flat cable to fault message module or master circuit board.
	B. Flat cable connected between fault message module and master circuit board pinched and shorted out or broken wire in cable.	B. Check cable for pinched or broken wire condition and repair or replace as necessary.
	C. External sensing device failing to signal master circuit board, which in turn signals fault message display.	C. Replace or repair external sensing device.
	D. External sensing devices cable connectors not securely connected to master circuit board connectors.	D. Make sure external sensing devices cable connectors are securely connected to master circuit board connectors.
	E. Disconnected or broken wire between master circuit board connector and external sensing device.	E. Connect or repair wire between master circuit board connector and external sensing device.
	F. Master circuit board not operating properly.	F. Replace master circuit board.
	G. Fault message display module not operating properly.	G. Replace fault message display module.

Trouble	Probable Cause	Remedy
ALL FAULT MESSAGES NOT OPERATING.	A. No electrical power to Unit.	A. Connect electrical power to Unit.
	B. Flat cable not properly connected to fault message module or master circuit board.	B. Properly connect flat cable to fault message module or master circuit board.
	C. Flat cable connected between fault message module and master circuit board pinched and shorted out or broken wire in cable.	C. Check cable for pinched or broken wire condition and repair or replace as necessary.
	D. Master circuit board not operating.	D. Replace master circuit board.
	E. Fault message display module not operating properly.	E. Replace fault message display module.
"CO_2 OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. CO_2 supply turned off or exhausted.	A. Restore CO_2 supply to the Unit.
	B. Primary CO_2 regulator set too low.	B. Adjust primary CO_2 regulator as instructed.
	C. Inoperable CO_2 pressure switch.	C. Replace CO_2 pressure switch.
"H_2O OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. Water supply to the Unit turned off or water pressure inadequate.	A. Turn on water supply to the Unit or check water supply line pressure.
	B. Plugged water filter or water inlet line strainer screen.	B. Change water filter or clean water inlet line strainer screen as instructed.
	C. Inoperative water pressure switch.	C. Replace water pressure switch.
"SYRUP 1" OR "SYRUP 2" FAULT MESSAGE GOES ON DURING OPERATION.	A. Syrup supply exhausted.	A. Replenish syrup supply.
"ERROR 1" OR "ERROR 2" FAULT MESSAGE GOES ON DURING OPERATION.	A. Error within Unit has developed interrupting normal operation.	A. Locate and correct error, then press "ERROR RESET" switch to restore normal operation.
FREEZE CYLINDER AUTOMATIC DEFROST CYCLE DOES NOT OPERATE.	A. Loose or broken electrical wires.	A. Repair electrical wires.
	B. Inoperable automatic defrost timer.	B. Replace master circuit board.

Trouble	Probable Cause	Remedy
UNIT DOES NOT GO OFF AUTOMATIC DEFROST CYCLE.	A. Automatic defrost timer stuck in automatic defrost cycle.	A. Replace master circuit board.
MANUAL DEFROST CYCLE DOES NOT OPERATE WHEN “MANUAL DEFROST” SWITCH IS PRESSED.	A. Flat cable not properly connected to control switch module or master circuit board.	A. Properly connect flat cable to control switch module or master circuit board.
	B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable.	B. Check cable for pinched or broken wire condition and repair or replace as necessary.
	C. Inoperable “MANUAL DEFROST’’ switch on control panel switch module.	C. Replace control panel switch module.
	D. Loose or broken wire.	D. Repair wire.
	E. Master circuit board not operating properly.	E. Replace master circuit board.
DEFROST CYCLE DOES NOT CANCEL AFTER PRESSING “CANCEL DEFROST ” SWITCH.	A. Flat cable not properly connected to control switch module or master circuit board.	A. Properly connect flat cable to control switch module or master circuit board.
	B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable.	B. Check cable for pinched or broken wire condition and repair or replace as necessary.
	C. Inoperable “CANCEL DEFROST’’ switch on control panel switch module.	C. Replace control panel switch module.
	D. Master circuit board not operating properly.	D. Replace master circuit board.

Trouble	Probable Cause	Remedy
TROUBLESHOOTING PRODUCT BLENDER TANKS AND CARBONATORS		
CARBONATOR WATER PUMP MOTOR WILL NOT OPERATE.	A. No electrical power to Unit.	A. Connect electrical power to Unit. Check power source.
	B. "BLEND ON/OFF" switches have not been pressed.	B. Press "BLEND ON/OFF" switches.
	C. "H_2O OUT" fault message is on.	C. Restore water supply to Unit.
	D. "CO_2 OUT" fault message is on.	D. Restore CO_2 supply to the Unit.
	E. Loose or broken electrical wires.	E. Tighten connections or replace wires.
	F. Overheated water pump motor cut off by overload protector.	F. Check for proper line voltage. Check for restricted pump.
	G. Inoperative water pump/motor assembly.	G. Replace water pump/motor assembly.
	H. Inoperative carbonated water tank level control switches.	H. Replace level control switches.
	I. Binding, damaged, or dirty carbonated water tank balance mechanism.	I. Clean, repair, or replace balance mechanism.
CARBONATOR WATER PUMP WILL NOT SHUT OFF.	A. Binding, damaged, or dirty carbonated water tank balance mechanism.	A. Clean, repair, or replace balance mechanism.
ERRATIC CARBONATOR WATER PUMP CYCLING.	A. Insufficient water supply pressure. "H_2O OUT" fault message goes on and off intermittently and water pump cycles on and off during carbonator tank fill cycle.	A. Increase water inlet supply line pressure. Water inlet supply line must have large enough I.D.
	B. Water filter restricted.	B. Replace water filter.
TROUBLESHOOTING DISPENSED PRODUCT		
BRIX (WATER-TO-SYRUP) "RATIO'' TOO LOW.	A. Quick disconnect not secure on soft drink tank.	A. Secure tank quick disconnect.
	B. Syrup flow regulator set too low.	B. Adjust BRIX of dispensed product as instructed.
	C. Water flow regulator set too high.	C. Water flow regulator must be set at 1.3 ± 0.05 oz/sec.
	D. Syrup flow regulators stuck.	D. Clean syrup flow regulators.
	E. Restriction in syrup line.	E. Sanitize Unit as instructed.
	F. Syrup Baume not in proper range.	F. Change syrup supply as instructed.

Trouble	Probable Cause	Remedy
BRIX (WATER-TO-SYRUP) "RATIO" TOO HIGH.	A. Syrup flow regulators set too high.	A. Adjust BRIX of dispensed product as instructed.
	B. Water flow regulator set too low.	B. Water flow regulator must be set for 1.3 $\pm$ 0.05 oz/sec.
	C. Water flow regulator stuck.	C. Clean regulator.
	D. Syrup Baume not in proper range.	D. Change syrup supply as instructed.
	E. Restricted water filter.	E. Replace water filter.
IMPROPER PRODUCT DISPENSED.	A. Secondary CO_2 regulators not properly adjusted.	A. Adjust secondary CO_2 regulators as instructed.
	B. Dirty CO_2 supply. CO_2 must be clean and free of water, oil, and dirt. Water will not absorb dirty CO_2 gas in same way as clean gas. This can also cause off-taste problems.	B. Replace CO_2 supply as instructed.
PRODUCT WILL NOT DISPENSE OUT OF DISPENSING VALVE, IN ONLY SMALL AMOUNTS, OR ONLY LIQUID.	A. Dispensing valve has ice particles in it.	A. Open and close dispensing valve repeatedly. Defrost freeze cylinder as instructed. If necessary, check and adjust BRIX as instructed. Adjust viscosity of dispensed product as instructed.
	B. Cylinder freeze-up.	B. Refer to CYLINDER FREEZE-UP.
FREEZE CYLINDER DOES NOT REFILL AT ALL TIMES WHEN DISPENSING.	A. "BLEND ON/OFF" switch not pressed.	A. Press "BLEND ON/OFF" switch.
	B. Carbonator water pump not operating.	B. Check carbonator and restore to operation.
	C. Lines restricted.	C. Sanitize Unit as instructed.
FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY.	A. Dispensed product BRIX varying because:	A. See Below
	Restricted syrup and/or water flow regulator.	a. Clean regulator(s).
	Primary CO_2 regulator pressure insufficient.	b. Primary CO_2 regulator must be adjusted from 80 to 100-psi.
	B. Cylinder freeze-up causing ice formation in center of cylinder and liquid product channels around ice formation.	B. Refer to CYLINDER FREEZE-UP.
		NOTE: Defrost affected freeze cylinder as instructed.
CYLINDER FREEZE-UP.	A. Dispensed product BRIX too low.	A. Refer to BRIX (Water-to-Syrup) "Ratio" too low.
	B. Viscosity of dispensed product not properly adjusted.	B. Adjust dispensed product viscosity as instructed.

Trouble	Probable Cause	Remedy
TROUBLESHOOTING REFRIGERATION SYSTEM		
UNIT EQUIPPED WITH AIR-COOLED REFRIGERATION SYSTEM	A. Dispenser refrigeration system overheating.	A. Clean Unit condenser coil as instructed (see **NOTE** below)
	NOTE: The Dispenser condenser coil must be periodically cleaned to maintain proper cooling of the refrigeration system.	
UNIT EQUIPPED WITH WATER-COOLED REFRIGERATION SYSTEM	A. Water supply to refrigeration cooling coil assembly disruppted.	A. Restore water supply to refrigeration cooling coil assembly.
	B. Insufficient water supply to refrigeration cooling coil assembly disruppted.	B. Increase water supply to refrigeration cooling coil assembly.
	C. Variable water regulator on the refrigeration cooling coil assembly not properly adjusted.	C. Properly adjust variable water regulator as instructed in manual.

WARRANTY

IMI Cornelius Inc. warrants that all equipment and parts are free from defects in material and workmanship under normal use and service. For a copy of the warranty applicable to your Cornelius, Remcor or Wilshire product, in your country, please write, fax or telephone the IMI Cornelius office nearest you. Please provide the equipment model number, serial number and the date of purchase.

IMI Cornelius Offices

Locate your local office on www.cornelius.com under the contact menu.

APPENDIX A

VALVE TORQUE AND STAKING

IMI 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.

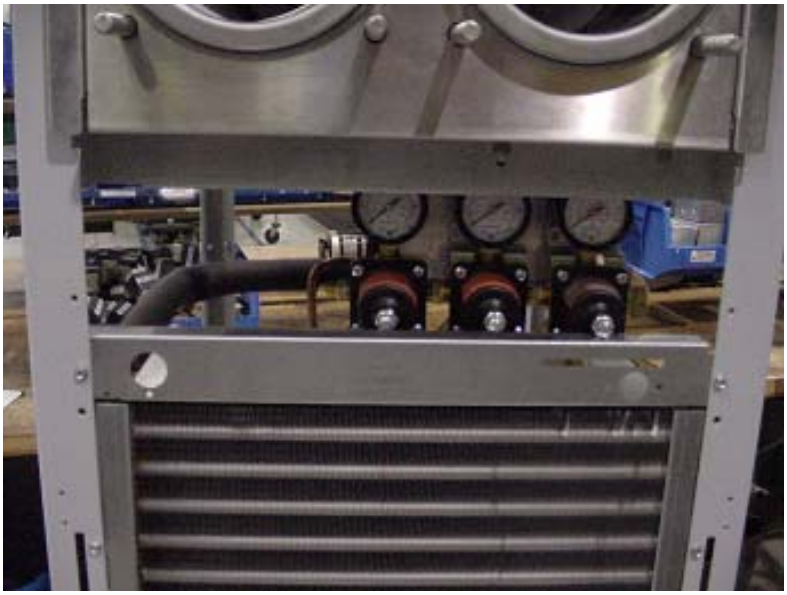
NOTE: When reinstalling a shank nut that has been removed from a staked Delta valve, the shank nut must be FLUSH with the faceplate before applying the torque setting. If the thread or shank nut have been damaged during removal and/or the shank nut cannot be installed flush with the faceplate, the valve 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 V–Series 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 Servicing Dispensing Valves Page 50 for instructions to drain barrels).

1. Loosen splash panel, as shown.

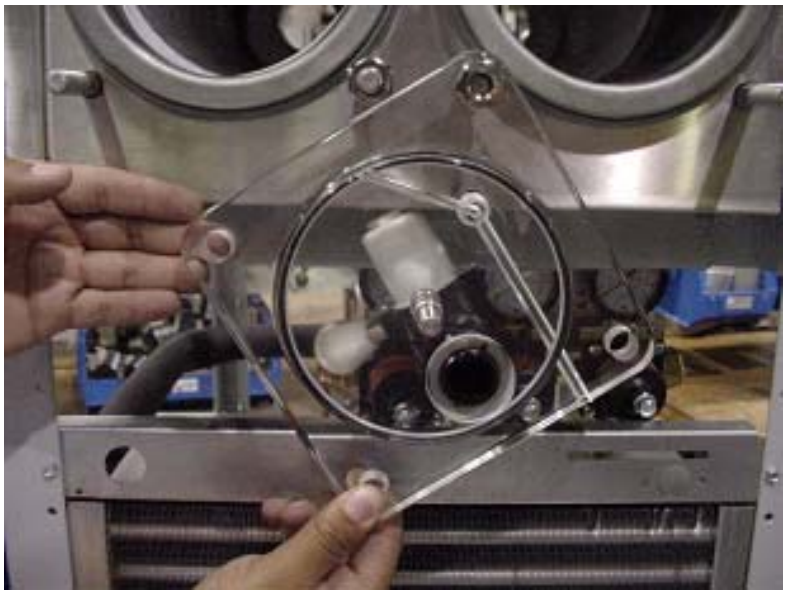
2. Remove splash panel.



3. Remove nut and plastic pieces from rear of faceplate to obtain unobstructed access to shank nut. Do this for BOTH Motorman and Delta type valves (Delta not shown).

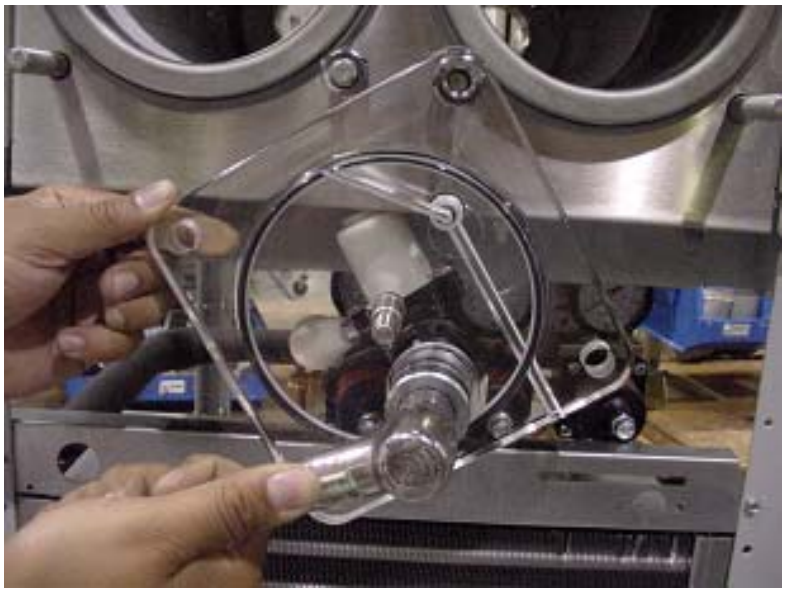
Motorman Valve

1. Attach one nut finger tight to bottom, right of Barrel #1. Attach Faceplate to bottom, left of Barrel #2, as shown, with top edge of faceplate resting on first nut. Attach second nut finger tight to faceplate to hold it in place.



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 socket. Torque wrench setting is 10 lb–ft (or 120 lb–in).

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

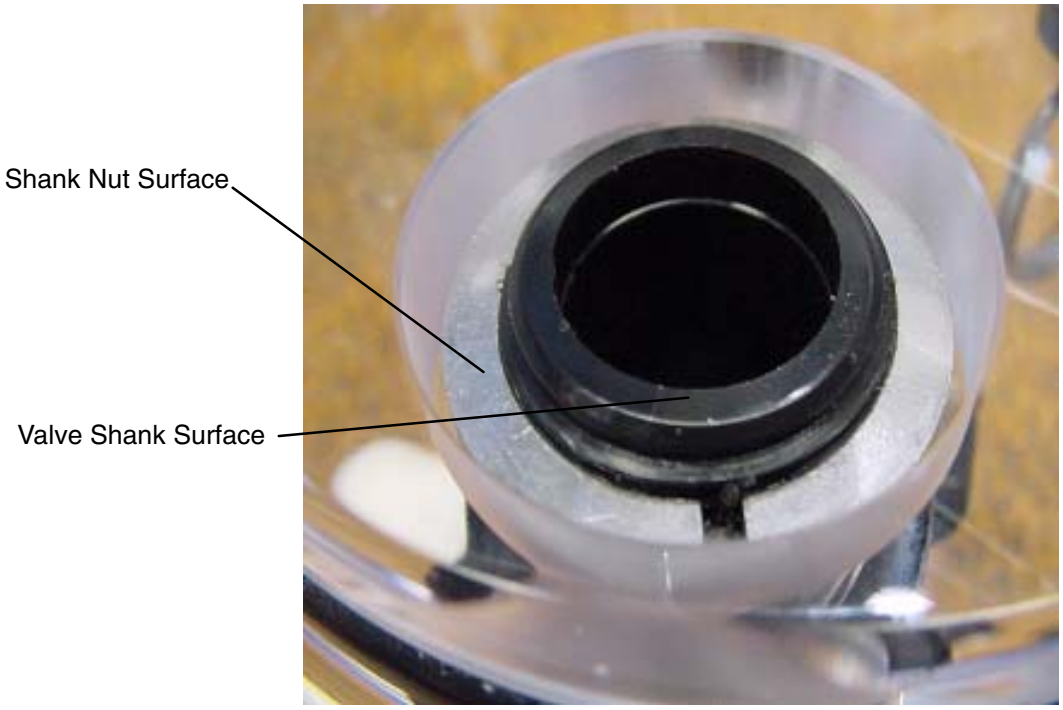


3. After applying torque, inspect the threads and shank nut to ensure proper thread engagement.

Motorman Shank Nut

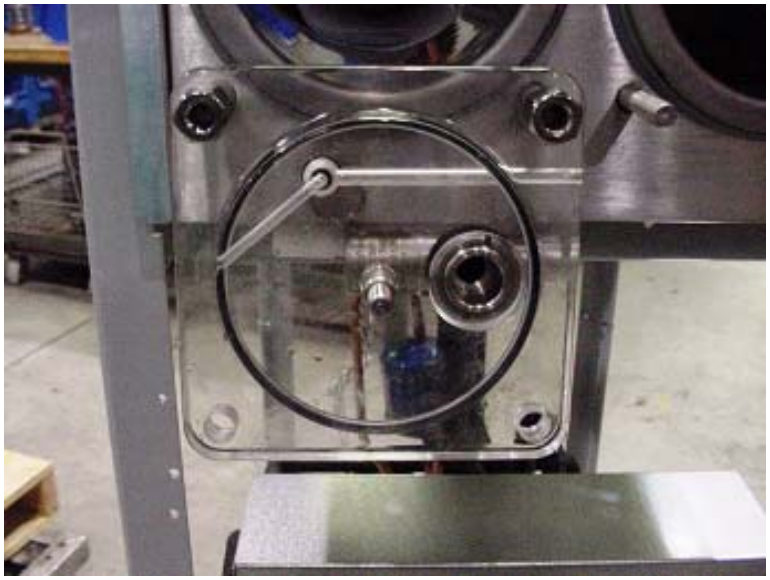
This is what the Motorman shank nut clearance should look like.

- Shank nut surface 0.1965 below valve shank surface.



Delta Valve

1. Rotate faceplate, as shown, with valve facing barrel. Attach faceplate to two studs with 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.

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.

Delta Shank Nut

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

- Shank nut surface 0.1025 below valve shank surface.