



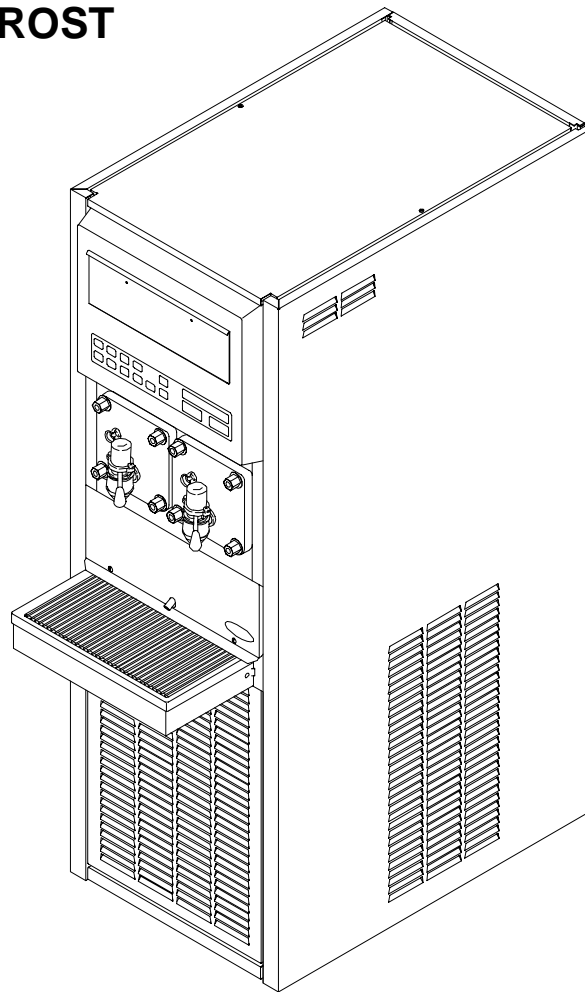
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# FCB (SOLID-STATE) POST- MIX DISPENSER TWO-FLAVOR/HOT-GAS DEFROST WITH V3 ELECTRONICS

## Service Manual



Part No. 326142000

April 24, 1989

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THIS DOCUMENT CONTAINS IMPORTANT INFORMATION

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

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# 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.

## GENERAL DESCRIPTION

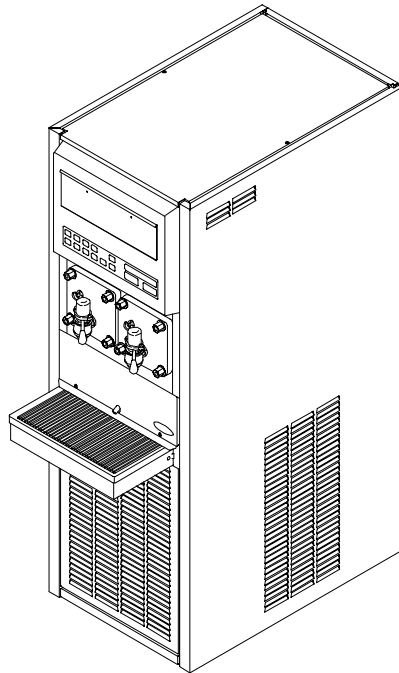
This section gives the description, theory of operation, and design data for the FCB Solid-State Post-Mix Two-Flavor Dispenser with Hot-Gas Defrost (hereafter referred to as a Unit).

## UNIT DESCRIPTION

The Unit (see Figure NO TAG) consists basically of two freeze cylinders each containing an internal beater driven by an electric motor, one refrigeration system with a 2-horsepower compressor, one carbonator which feeds both carbonator-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 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 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.



**FIGURE 1. FCB (SOLID-STATE) POST-MIX TWO-FLAVOR DISPENSER**

Table 1. Design Data	Table 2. Design Data
Part Number:	Part Number:
60 Hz Unit	416120XXX
	416120XXX
50 Hz Unit	496120XXX



Table 1. Design Data (cont'd)	Table 1. Design Data (cont'd)
Overall Dimensions:	Overall Dimensions:
Height	60-1/2 inches
Width	19-1/4 inches
Depth Without Drip Tray	32-1/2 inches
Depth With Drip Tray	38 inches
Shipping Weight (approx.)	466 pounds
Compressor Horsepower	2 H.P.
Refrigeration System:	Refrigeration System:
Refrigerant Type	R-502
Refrigerant Charge	See Unit Nameplate
Ambient Operating Temperature	40° F to 100° F
Electrical Requirements:	Electrical Requirements:
60 Hz Unit:	
Operating Voltage	219/242 VAC 60 Hz Single Phase
Current Draw	21.2 Amps
50 Hz Unit:	
Operating Voltage	219/242 VAC 50 Hz Single Phase
Current Draw	22 Amps

## THEORY OF OPERATION

(see Figure 2)

**IMPORTANT: Before connecting electrical power to Unit, refer to nameplate and note if Unit is to be operated with 50 or 60 Hz power source and also note beaters drive motors manufacturer's name. No. 6, No. 7, and No. 8 switches on DIP switch assembly on master circuit board must be set according to motors manufacturer and for 50 or 60 Hz operation.**

A CO<sub>2</sub> cylinder delivers carbon dioxide (CO<sub>2</sub>) gas to an adjustable primary CO<sub>2</sub> regulator assembly attached to the cylinder. Primary CO<sub>2</sub> regulator assembly in turn delivers CO<sub>2</sub> gas to adjustable secondary CO<sub>2</sub> regulators inside the Unit and also to two soft drink tanks. CO<sub>2</sub> is delivered from adjustable secondary CO<sub>2</sub> regulators to carbonator tank and also two product-blender tanks inside the Unit. CO<sub>2</sub> gas pressure pushes syrup out of soft drink tanks, through syrup sold-out float switches, through electrically-operated syrup solenoid valves, through adjustable syrup flow regulators, and on to product blender tanks. At the same time, plain water passes through water pressure regulator and is pumped into carbonator tank by water pump and is carbonated by CO<sub>2</sub> gas pressure also entering tank. Carbonated water is pushed by CO<sub>2</sub> gas pressure from carbonator tank, through electrically operated carbonated water solenoid valves through adjustable carbonated water flow regulators, and on to product blender tanks. Carbonated water and syrup enter tanks properly proportioned (blended) for desired BRIX of dispensed product by adjustment of syrup flow regulators. From product blender tanks, product is pushed by CO<sub>2</sub> gas into freeze cylinders. The beater in each freeze cylinder is driven by an electric motor. Scraper blades, attached to beaters, scrapes product from cylinder walls as product enters freeze cylinders and is frozen. Transparent faceplate, attached to 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<sub>2</sub> gas pressure from freeze cylinder to atmosphere when filling cylinder with product. Electronic sensing on each freeze cylinder motor provides a means of adjusting viscosity (consistency) of dispensed product to suit customer preference.

## DEFROST SYSTEMS

The Unit is equipped with both manual and automatic hot-gas defrost systems. The automatic defrost system may be programmed into 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**

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

## **AUTOMATIC DEFROST SYSTEM**

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

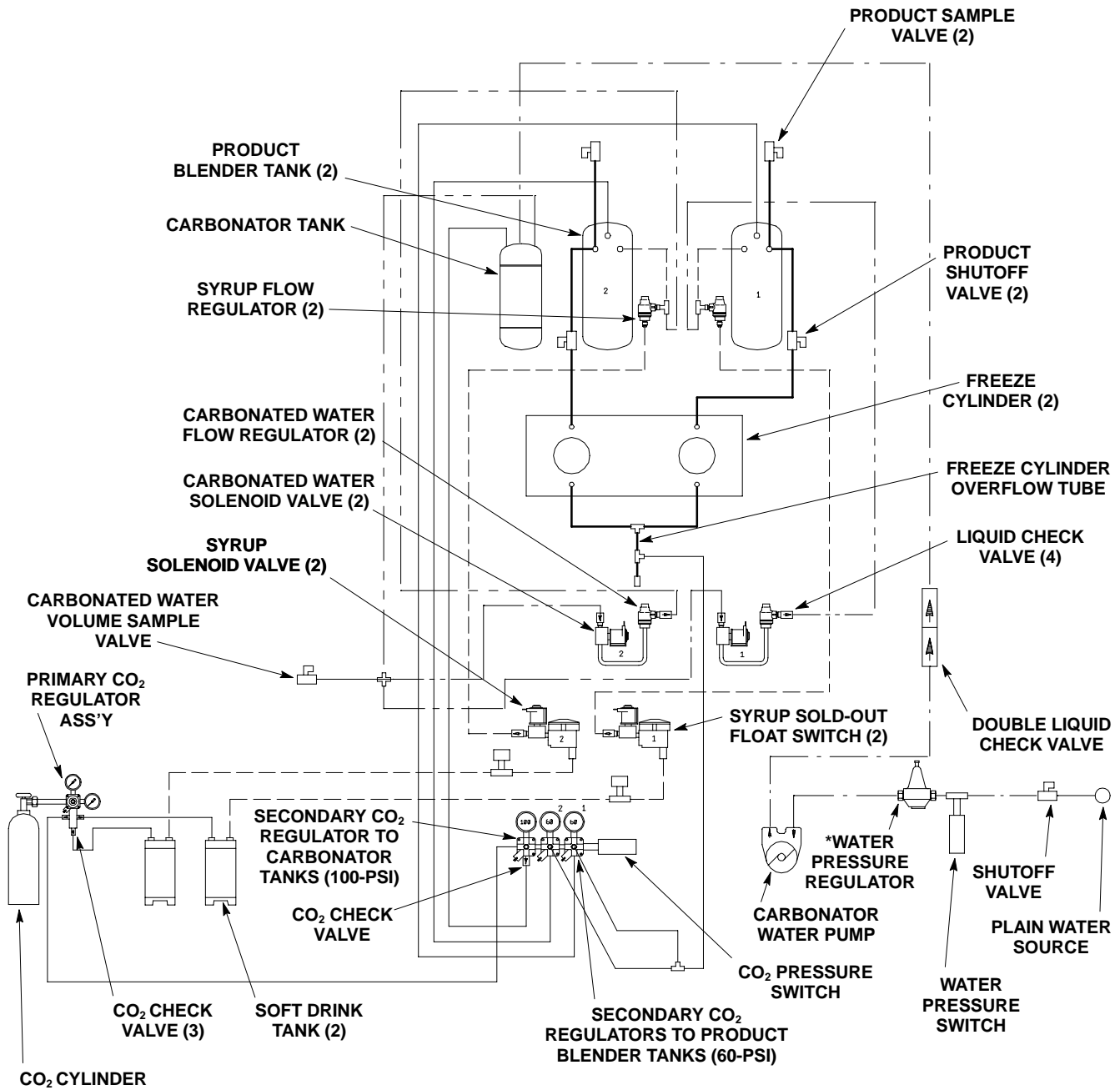
## **“SLEEP” (SLEEP TIME)**

“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.

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



\*WATER PRESSURE REGULATOR IS FACTORY ADJUSTED TO 45-PSI AND SHOULD NOT BE READJUSTED.

\*\*SYRUP SOLD-OUT SWITCHES ARE FACTORY ADJUSTED AND SHOULD NOT BE READJUSTED.

**LINE LEGEND**

CO <sub>2</sub>	—————
PLAIN WATER	- - - - -
CARB WATER	—————
SYRUP	—————
PRODUCT	—————

**FIGURE 2. FLOW DIAGRAM**

# INSTALLATION

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

## UNPACKING AND INSPECTION

(see Figure 5)

**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. Remove shipping bolts that secure Unit to skid, then remove skid.
4. Unpack LOOSE-SHIPPED PARTS. Make sure all items are present and in good condition.

<b>Table 3. Loose-Shipped Parts</b>			
<b>Item No.</b>	<b>Part No.</b>	<b>Name</b>	<b>Qty.</b>
1	178025-100	Tapered Gasket, White	4
2	151689	Spanner Wrench, Flow Regulator	1
3	322859	Spanner Wrench, Dispensing Valve	1
4	325216	Cleaning Brush	1
5	311304	Tapered Gasket, Black	1
6	325982	Cup Rest	1
7	325983-039	Drip Tray	1
8	325986	Drip Tray Support	2
9	319941	Thread Cutting Screw, Hex Hd, No. 8-32 by 3/8-in. long	4
10	325666	Instructions, Scraper Blades	1
11	325458	Beater (item 13)	2
12	325457	Scraper Blade (item 2)	4
13	325984	Frame, Drip Tray	1
14	326002	Kit, Drip Tray Drain Hose (includes items 15-19)	1
15	170413	Drain Fitting	1
16	151281	Lockwasher, Internal Tooth	1
17	170423	Hex Nut, 5/8-32	1
18	140133	Drain Hose Clamp	1
19	113500-039	Drain Hose, 1/2-in. I.D. by 60-in. long	1

\*Numbers in parentheses are in reference to items in Figure 3).

## 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<sub>2</sub> inlet line to CO<sub>2</sub> source.

2. SPANNER WRENCH, FLOW REGULATORS (item 2) is used to adjust flow regulators inside Unit.
3. SPANNER WRENCH, DISPENSING VALVE (item 3) is used to remove shank nuts securing dispensing valves to faceplates.
4. CLEANING BRUSH (item 4) is used to clean faceplate relief valves passages.
5. TAPERED GASKET, BLACK (item 5) is used to seal connection when connecting plain water source line to Unit water inlet line.
6. DRIP TRAY SUPPORTS (item 8) to be installed on front of Unit and secured with THREAD CUTTING SCREWS (item 9).
7. CUP REST (item 6) to be installed in DRIP TRAY (item 7), then drip tray to be installed in FRAME, DRIP TRAY (item 13). Assembled drip tray assembly then to be installed on drip tray supports on front of Unit.
8. INSTRUCTIONS, SCRAPER BLADES (item 10) pictorially shows how to install BEATERS (item 11) and SCRAPER BLADES (item 12) in freeze cylinders.
9. DRIP TRAY KIT (item 14) to be installed on drip tray as instructed.

## INSTALLING BEATERS (ITEM 11) AND SCRAPER BLADES (ITEM 12)

(see Figures 3 and 4)

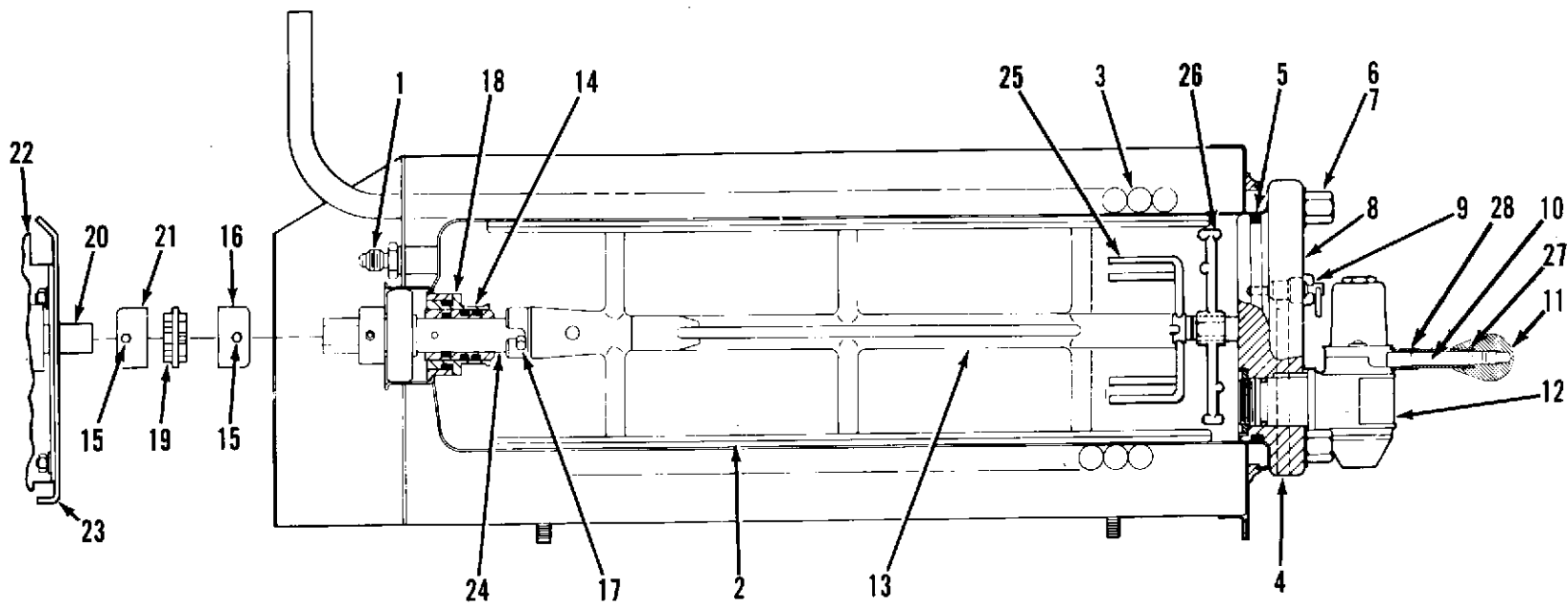
1. Remove four HEX NUTS (item 7) and FLATWASHERS (item 6) that secure each faceplate to freeze cylinders. Pull faceplates off freeze cylinders.
2. Position two SCRAPER BLADES (item 12) on BEATER (item 11) as shown in Figure 4.
3. Slide beater assembly into one of the freeze cylinders so beater slotted hooks engage DRIVE PIN (item 17) on DRIVE SHAFT (item 14) as shown in Figure 3.
4. Repeat procedure outlined in step 3 preceding to assemble and install beater assembly in other freeze cylinder.
5. Lubricate each faceplate O-RING (see Figure 3 with Dow-Corning (DC 111) light grade silicone to facilitate installing faceplates on freeze cylinders. Position each FACEPLATE On freeze cylinders so dispensing valves faucets face down. Secure each faceplate to freeze cylinder with four HEX NUTS (item 7) and FLAT WASHERS (item 6) removed in step 1 preceding. Tighten HEX NUTS until faceplates touch all the way around on freeze cylinder flanges. CAUTION-DO NOT OVERTIGHTEN HEX NUTS.

## ELECTRICAL POWER REQUIREMENTS

**IMPORTANT:** Before connecting electrical power to Unit, refer to nameplate and Note if Unit is to be operated with 50 or 60 Hz power source and also note beaters motors manufacturer. No. 6, No. 7, and No. 8 switches on DIP switch assembly on master circuit board *must* be set according to motors manufacturer and for 50 or 60 Hz operation.

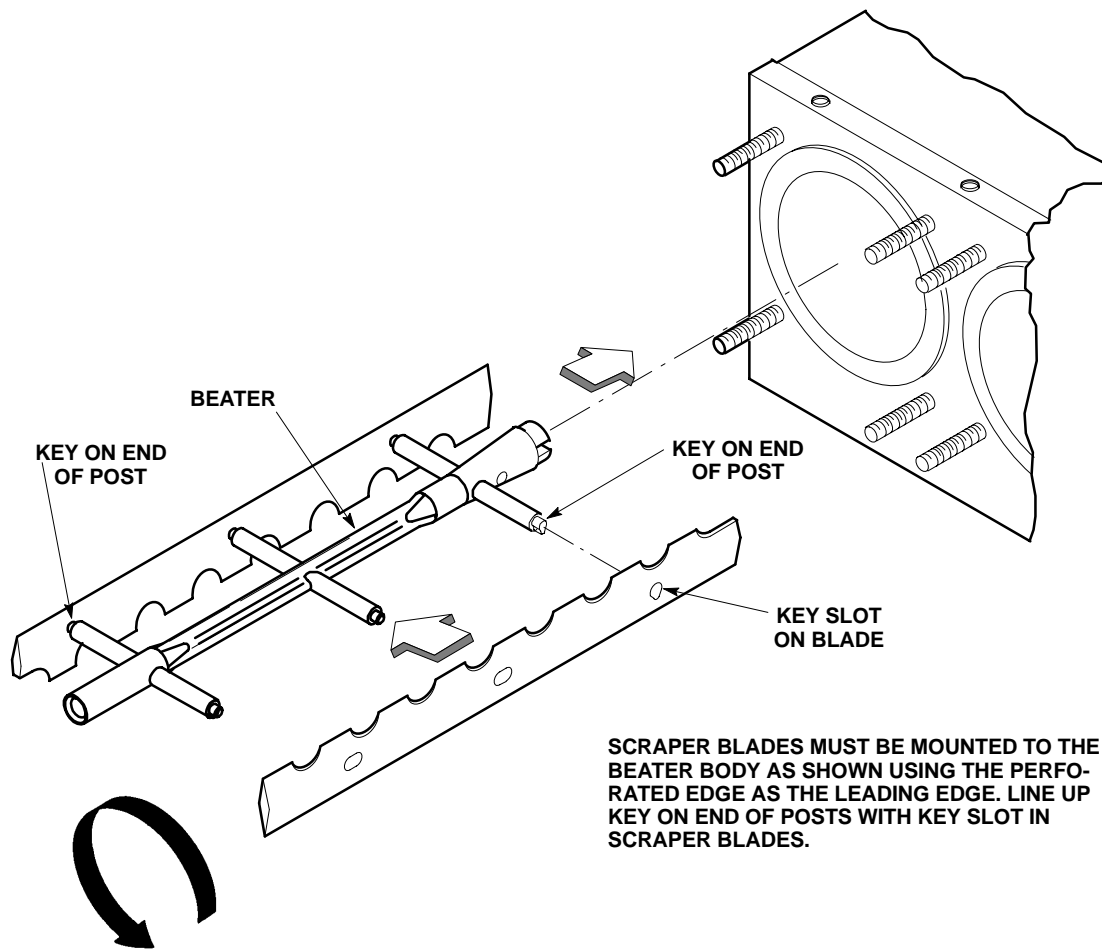
## DOMESTIC UNIT

**IMPORTANT:** Power circuit voltage across L<sub>1</sub> and L<sub>2</sub> terminals on contactor inside lower control box, with refrigeration compressor operating, *must* be in operating range of between 219/242 VAC, 60 Hz single-phase range for proper operation. If voltage is below or above this range, a .75 KVA Step Up/Step Down Transformer (P/N 326138000) is available to correct below or above voltage condition.



- |                          |                               |                                       |
|--------------------------|-------------------------------|---------------------------------------|
| 1. Product Inlet Fitting | 10. Valve Lever               | 19. Power Coupler (plastic)           |
| 2. Scraper Blade (2)     | 11. Knob                      | 20. Beater Motor Drive Shaft          |
| 3. Evaporator Coil       | 12. Dispensing Valve          | 21. Beater Drive Motor Shaft Coupling |
| 4. Relief Valve Port     | 13. Beater                    | 22. Beater Drive Motor                |
| 5. O-Ring                | 14. Drive Shaft Seal Assembly | 23. Unit Frame                        |
| 6. Flatwasher (4)        | 15. Allen Head Setscrew       | 24. Drive Shaft Assembly              |
| 7. Hex Nut (4)           | 16. Beater Shaft Coupling     | 25. Viscosity Sensor                  |
| 8. Faceplate             | 17. Drive Pin                 | 26. Spinner                           |
| 9. Relief Valve          | 18. Bearing Guide Pin (4)     | 27. spring                            |
|                          |                               | 28. Shaft Release                     |

**FIGURE 3. FREEZE CYLINDER CUTAWAY VIEW**



**FIGURE 4. BEATERS AND SCRAPER BLADES INSTALLATION**

A properly grounded 219 to 242 VAC, 60Hz single-phase electrical circuit with a 30-amp minimum-rated disconnect switch (not provided) fused at 30 amps (slo-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.

## EXPORT UNIT

**IMPORTANT:** Power circuit voltage across  $L_1$  and  $L_2$  terminals on contactor inside lower control box, with refrigeration compressor operating, *must* be in operating range of between 219 and 242 VAC, 50Hz single-phase range for proper operation. If voltage is below or above this range. A means to provide voltage within operating range must be provided.

A properly grounded 219 to 242 VAC, 50Hz single-phase electrical circuit with a 30-amp minimum-rated disconnect switch (not provided) fused at 30-amps (slow-blow) must be available to the Unit.

## SELECTING LOCATION

**IMPORTANT:** Unit operating ambient temperature *MUST NOT EXCEED* 100° F. 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: Circulating air, required to cool the refrigeration system's condenser coil, is drawn in through grille on front and exhausted out through sides and back of Unit. Restricting air circulation through the Unit will decrease its cooling efficiency.**

2. When installing Unit, do not allow obstruction to block grille on front which will block off air intake to inside of Unit. If installation dictates only one side or back being unobstructed, allow 18-inches clearance between Unit and obstruction. If both sides or one side and back are unobstructed, allow 12-inches clearance. If both sides and back are unobstructed, allow 6-inches clearance.

## INSTALLING UNIT

### PLACING UNIT IN OPERATING LOCATION

1. Place Unit in operating location meeting requirements of SELECTING LOCATION.
2. After Unit has been placed in operating location, make sure front (dispensing valve side) is 1/4 to 3/8-inch higher than the back to eliminate gas pockets being trapped inside the freeze cylinders.
3. To comply with National Sanitation Foundation (NSF) requirements, Unit installed with base contacting floor must have base sealed to floor with Dow Corning RTV 731 or equivalent.

## INSTALLING DRIP TRAY SUPPORTS, DRIP TRAY, AND CUP REST

1. Install DRIP TRAY SUPPORTS (item 8) on panel above lower front access panel on front of Unit. Secure supports to panel with THREAD CUTTING SCREWS (item 9).
2. Place DRIP TRAY (item 7) in FRAME, DRIP TRAY (item 13), then slide frame up on drip tray supports on front of Unit.

## INSTALLING DRIP TRAY DRAIN KIT (ITEM 14)

(see Figure 5)

1. Drill 5/8-inch diameter hole in lowest point (center) in bottom of drip tray.
2. Install DRAIN FITTING (item 15) in drip tray and secure with LOCKWASHER, INTERNAL TOOTH (item 16) and HEX NUT, 5/8-32 (item 17).
3. Push DRAIN HOSE (item 17) over drip tray fitting and secure with DRAIN HOSE CLAMP (item 18).

**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.**

4. Route drip tray drain hose to and connect to permanent drain.
5. Place CUP REST (item 6) in drip tray.

## INSTALLING PRIMARY CO<sub>2</sub> REGULATOR ASSEMBLY ON CO<sub>2</sub> CYLINDER

(see Figure 2)



**WARNING: To avoid personal injury and/or property damage, always secure CO<sub>2</sub> cylinder in upright position with a safety chain to prevent it from falling over. Should the valve become accidentally damaged or broken off, CO<sub>2</sub> cylinder can cause serious personal injury.**





**WARNING:** CO<sub>2</sub> displaces oxygen. Strict attention *must* be observed in the prevention of CO<sub>2</sub> (carbon dioxide) gas leaks in the entire CO<sub>2</sub> and soft drink system. If a CO<sub>2</sub> gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO<sub>2</sub> gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.

1. Unscrew protector cap (with chain attached) from CO<sub>2</sub> cylinder valve. Open CO<sub>2</sub> cylinder valve slightly counterclockwise to blow any dirt or dust from outlet fitting before installing primary CO<sub>2</sub> regulator, then close valve.
2. Remove shipping plug from primary CO<sub>2</sub> regulator assembly coupling nut and make sure gasket is in place inside nut. Install regulator assembly on CO<sub>2</sub> cylinder so gages can be easily read, then tighten coupling nut. **DO NOT OPEN CO<sub>2</sub> CYLINDER VALVE AT THIS TIME.**

## **CONNECTING SOFT DRINK TANKS CO<sub>2</sub> LINES TO PRIMARY CO<sub>2</sub> REGULATOR ASSEMBLY**

(see Figure 2)

1. Connect soft drink tanks CO<sub>2</sub> lines to primary CO<sub>2</sub> regulator manifold assembly as shown in Figure 2.
2. Install gas quick disconnects on ends of soft drink tanks CO<sub>2</sub> lines. **DO NOT CONNECT CO<sub>2</sub> LINES TO TANKS AT THIS TIME.**

## **PREPARING UNIT SYRUP INLET LINES FOR CONNECTION TO SOFT DRINK TANKS**

(see Figure 2)

1. Route Unit syrup inlet lines, labeled No. 1 and No. 2, out through hole provided in Unit base to 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 PLAIN WATER INLET SUPPLY LINE TO UNIT**

(see Figure 2)

**NOTE:** IMI Cornelius Inc. recommends that a water shutoff valve and water filter be installed in plain water inlet supply line (see Figure 2). A Cornelius Water Filter (P/N 313860000) and Quick Disconnect Set (P/N 313867000) are recommended.

1. Before connecting plain water inlet supply line to Unit, open shutoff valve in water supply line for a period of time to flush out any metal shavings.
2. Route water inlet line out through hole in bottom of Unit base.

**NOTE:** Carbonator plain water inlet adjustable water pressure regulator (see Figure 12) is factory adjusted to 45-psi and should not be readjusted.

3. Connect Unit water inlet line to plain water inlet supply line (12-psi minimum pressure). Seal connection with TAPERED GASKET, BLACK (item 5). **DO NOT OPEN WATER INLET SUPPLY LINE SHUTOFF VALVE AT THIS TIME.**

## CONNECTING ELECTRICAL POWER CIRCUIT TO UNIT

(see Figure 17)



**WARNING:** Make sure Unit 30-amp minimum-rated disconnect switch (not provided) or equivalent HACR circuit breaker is in “OFF” position.

### Domestic Unit.

**IMPORTANT:** Power circuit voltage across L<sub>1</sub> and L<sub>2</sub> terminals on contactor inside lower control box, with refrigeration compressor operating, must be in operating range of between 219 and 242 VAC, 60Hz single-phase range for proper operation. If voltage is below or above this range, a .75 KVA Step Up/Step Down Transformer (P/N 326138-000) is available to correct below or above voltage condition. 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.**

### Export Unit.

**IMPORTANT:** Power circuit voltage across L<sub>1</sub> and L<sub>2</sub> terminals on contactor inside lower control box, with refrigeration compressor operating, *must* be in operating range of between 219 and 242 VAC, 50Hz single-phase range for proper operation. If voltage is below or above this range. A means to provide voltage within operating range must be provided.

1. Remove lower control box (located on lower-right side facing front of Unit) cover for access to contactor L<sub>1</sub> and L<sub>2</sub> 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 control box to connect power circuit ground wire electrically grounding the Unit.

2. Connect electrical power from 30-amp minimum-rated disconnect switch (not provided) fused at 30-amperes (slo-blow) or through an equivalent HACR circuit breaker to L<sub>1</sub> and L<sub>2</sub> terminals on contactor inside control box. **MAKE SURE GROUND WIRE IS CONNECTED TO GREEN GROUND SCREW INSIDE CONTROL BOX.**
3. Install lower control box cover and secure with screws.

## PREPARATION FOR OPERATION

### 50 OR 60 HZ OPERATION AND BEATER MOTOR SELECT

**IMPORTANT:** Before connecting electrical power to Unit, refer to Unit nameplate and note if Unit is to be operated with 50 or 60 Hz electrical power and also note beater motor manufacturer's name. No. 6, No.7, and No. 8 switches on DIP switch assembly on master circuit board must be set according to motor manufacturer and for 50 or 60 Hz operation as follows.

1. Remove four screws securing Unit upper control box cover, then remove cover for access to the master circuit board (see Figure 10).
2. After noting if Unit is to be operated with 50 or 60 Hz electrical power and beater motors manufacturer's name, refer to Figure 10 and Table 5 to place DIP switch assembly No. 6, No. 7, and No. 8 switches in appropriate positions.

## TURNING ON ELECTRICAL POWER TO UNIT

Turn on electrical power to Unit. Operational status of Unit is now being displayed as fault messages on control panel message display. The following fault messages will be continuously displayed at 2-second intervals until necessary operation requirements are satisfied.

- “OFF 1” (Beater Motor No. 1 not operating)
- “OFF 2” (Beater Motor No. 2 not operating)
- “H<sub>2</sub>O OUT” (No water supply to Unit)
- “CO<sub>2</sub> OUT” (No CO<sub>2</sub> 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)

## TURNING ON CO<sub>2</sub> SUPPLY TO UNIT

1. Open CO<sub>2</sub> cylinder valve slightly to allow lines to slowly fill with gas, then open valve fully to back seat valve. Back-seating valve prevents leakage around valve shaft.

**IMPORTANT: If bag-n-box syrup supply system will be connected to Unit instead of soft drink tanks, primary CO<sub>2</sub> regulator (see Figure 2) must be adjusted no higher than 80-psi maximum.**

2. Adjust primary CO<sub>2</sub> regulator (see Figure 2) by turning regulator adjusting screw to the right (clockwise) until regulator pressure reads 80 to 100-psig. OUT OF CO<sub>2</sub> warning light on control panel message display should have gone out.
3. Pull up on product blender tanks relief valves to purge air from tanks.
4. Remove Unit lower access panel as instructed for access to carbonator secondary CO<sub>2</sub> regulators (see Figures 2 and 6).
5. Check product blender tanks secondary CO<sub>2</sub> regulators with 60-psi gages for pressure setting which should be set at 30-psi for best textured product. If further adjustment is necessary, adjust as instructed.

**IMPORTANT: Carbonator secondary CO<sub>2</sub> regulator must be adjusted 25-psi higher or more above product blender tanks secondary CO<sub>2</sub> regulators pressure settings. Carbonated water and syrup pressures must be able to overcome and vent product blender tanks head pressures while tanks are filling with carbonated water and syrup. Carbonator tank secondary CO<sub>2</sub> regulator not adjusted high enough will cause decreased flow of carbonated water into blender tanks which will increase brix of dispensed product.**

6. Adjust carbonator secondary CO<sub>2</sub> regulator, with 100-psi gage, by turning regulator adjusting screw to the right (clockwise) until gage reads 60-psi.
7. Pull up on carbonator tank relief valve plastic cover to purge air from tank.

## TURNING ON PLAIN WATER SUPPLY TO UNIT

Open plain water inlet supply line shutoff valve. Check for water leaks and tighten or repair if evident. “H<sub>2</sub>O OUT” fault message should have gone out but “BM 1 OFF”, “BM 2 OFF”, “SYRUP 1”, and “SYRUP 2” fault messages will continue to be displayed.

## CONNECTING SOFT DRINK TANKS TO UNIT SYRUP SYSTEMS

**IMPORTANT: Product shutoff valves, located in lines leading from product blender tanks to freeze cylinders (see Figure 2 and 6), must be closed at this time. Closing valves prevents product from filling freeze cylinders while checking BRIX of product in product blender tanks.**

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

**IMPORTANT: The following CO<sub>2</sub> 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:**

**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<sub>2</sub> quick disconnect from soft drink tank.**

**NOTE: Unit control panel is equipped with a hidden “SECURITY SWITCH” located between “FILL 1” and “ERROR RESET” control switches (see Figure 5). Pressing in and holding “SECURITY SWITCH” for 3-seconds deactivates control switches preventing tampering with Unit normal operation. To reactivate control switches, press in and hold “SECURITY SWITCH” for 3-seconds.**

2. Pressurize soft drink tanks containing syrup, then connect tanks to Unit syrup systems. “OFF 1”, “OFF 2”, “SYRUP 1”, and “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 system.

1. Press “FILL 1” switch to fill No. 1 syrup system sold-out float. “SYRUP 1” fault message will go out and “FILL 1” fault message will come on. “OFF 1”, “OFF 2”, and “SYRUP 2” fault messages will continue to be displayed.
2. Press “AUTO BLEND 1” switch to fill No. 1 system product blender tank with product. “FILL 1” fault message will go out when “AUTO BLEND 1” switch is pressed. When product blender tank is full, press “FILL 1” switch to prevent more product from entering 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 (see Figures 2 and 6) and take sample (approximately 6-ounces) of product in 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. BRIX should read  $13.5 \pm 0.5$ . If BRIX is not within tolerance, adjust white syrup flow regulator for No. 1 syrup system as follows:
  - A. Loosen jamb nut on syrup flow regulator.
  - B. Turn 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.
  - C. Tighten jamb nut on syrup flow regulator, then lightly tap regulator to register adjustment.
5. Place container under No. 1 product sample valve. Open valve to purge product out of product blender tank, line, and valve, then close valve. “OFF 1”, “OFF 2”, and “SYRUP 2” will continue to be displayed.
6. Press “AUTO BLEND 1” switch to run new batch of product into product blender tank. When product blender tank is full, press “FILL 1” switch to prevent more product from entering product blender 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 on No. 2 system, “OFF 1” and “OFF 2” fault messages should continue to be displayed.

**NOTE: Syrup systems may be sanitized at this time as instructed.**

## **FILLING FREEZE CYLINDERS WITH PRODUCT**

1. Open product shutoff valves, located in lines leading from product blender tanks to freeze cylinders.
2. Press “AUTO BLEND 1” and “AUTO BLEND 2” switches to begin filling freeze cylinders. Open freeze cylinders faceplates relief valves to bleed air from cylinders while filling with product, then close valves. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.

## **ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)**

1. Remove four screws securing upper control box cover, then remove cover for access to master circuit board inside control box.
2. Adjust beaters motors currents as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY**

The MAIN MENU SELECTIONS (see Table 4) may be brought up on message display as instructed in SERVICE AND MAINTENANCE SECTION.

## **SETTING “CLOCK” (TIME OF DAY)**

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

Program “CLOCK” (TIME OF DAY) into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING “DEFROST” (AUTOMATIC) SETTINGS INTO UNIT**

The automatic defrost system may be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings. Program automatic defrost time settings into the Unit as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING “SLEEP” (SLEEP TIME) INTO UNIT**

“SLEEP” (SLEEP TIME) may be programmed into Unit to occur any time of the day after the Unit automatic defrost cycle has occurred. 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. Program “SLEEP” (SLEEP TIME) into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING “WAKE UP” (WAKE UP) TIME INTO UNIT**

“WAKE UP” (WAKE UP TIME) May be programmed into Unit to occur any time of the day to wake Unit up (return to normal operation) after “sleep time” has occurred. Program “WAKE UP” into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING POINT OF SALE MESSAGE DISPLAY**

Three point of sale display messages are available to choose from and may be programmed into Unit by placing No. 1, No. 2, and No. 3 switches on DIP SWITCH assembly on master circuit board in appropriate positions. Program point of sale display messages into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

## **ADJUSTING “VIS SET” (PRODUCT VISCOSITY) OF DISPENSED PRODUCT**

Adjust “VIS SET” (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Adjust “VIS SET” (PRODUCT VISCOSITY) of the dispensed product as instructed in SERVICE AND MAINTENANCE SECTION.

## **DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES**

Evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit may be displayed on message display as instructed in SERVICE AND MAINTENANCE SECTION

## **“VOLTAGE” (DISPLAYED VOLTAGE READOUT)**

Displayed voltage readout may be displayed on message display as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE) INTO UNIT**

“DIAGNOSE” (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Program “DIAGNOSE” into Unit and check components for proper operation as instructed in SERVICE AND MAINTENANCE SECTION.

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

“TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on message display as instructed in SERVICE AND MAINTENANCE SECTION.

## **DISPLAYED ERROR CONDITIONS**

Displayed error conditions, associated errors, and items affected by the errors are found in Table 9. DISPLAYED ERROR CONDITIONS.

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# OPERATORS INSTRUCTIONS

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



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

**NOTE: No. 1 freeze cylinder is left-hand cylinder facing front of Unit.**

## CONTROL PANEL SWITCHES AND DISPLAYED MESSAGES

### CONTROL PANEL SWITCHES

#### “FILL 1” and “FILL 2” Control Switches.

“FILL 1” and “FILL 2” control switches, located on control panel (see Figure 5), are touch-type switches and require only pressing to activate. “FILL 1” and “FILL 2” control switches are used when filling syrup systems sold-out floats during syrup replenishing, syrup flavor changeover, or sanitizing syrup systems. After syrup systems sold-out floats have been filled, “FILL 1” and “FILL 2” switches may be used to prevent more product entering product blender tanks during BRIX test.

#### “AUTO BLEND 1” and “AUTO BLEND 2” Control Switches.

“AUTO BLEND 1” and “AUTO BLEND 2” control switches, located on control panel (see Figure 5), are touch-type switches and require only pressing to activate. These switches are used to fill product blender tanks after sold-out floats have been filled using “FILL 1” and “FILL 2” switches. “AUTO BLEND 1” and “AUTO BLEND 2” and “AUTO 1” and “AUTO 2” switches must be pressed to operate freeze cylinders beaters and refrigeration system during normal operation.

#### “WASH 1” and “WASH 2” Control Switches.

“WASH 1” and “WASH 2” control switches, located on control panel (see Figure 5), are touch-type switches and require only pressing to activate. These switches are used to operate freeze cylinders beaters with no refrigeration during sanitizing.

#### “AUTO 1” and “AUTO 2” Control Switches.

“AUTO 1” and “AUTO 2” control switches, located on control panel (see Figure 5), are touch-type switches and require only pressing to activate. These switches are used to operate freeze cylinders beaters and refrigeration system after cylinders have been filled with product. Freeze cylinders beaters and refrigeration system may be stopped by pressing “OFF 1” or “OFF 2” switches.

#### “OFF 1” and “OFF 2” Control Switches.

“OFF 1” and “OFF 2” control switches, located on control panel (see Figure 5), are touch-type switches and require only pressing to activate. These switches are used to stop freeze cylinders beaters and refrigeration system.



### “ERROR RESET” Control Switch.

“ERROR RESET” control switch, located on control panel (see Figure 5), is a touch-type switch and requires only pressing to activate. “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.

### “SECURITY SWITCH.”

The Unit is equipped with a hidden “SECURITY SWITCH” located between “FILL 1” switch and “ERROR RESET” switch on control panel (see Figure 5). Pressing in and holding “SECURITY SWITCH” for 3-seconds deactivates control switches preventing tampering with Unit normal operation. To reactivate control switches, press in and hold “SECURITY SWITCH” for 3-seconds.

## **CONTROL PANEL DISPLAY MESSAGES**

(see Figure 5)

### “FILL 1” and “FILL 2” Fault Messages.

“FILL 1” and “FILL 2” fault messages will appear on message display only when “FILL 1” and “FILL 2” control switches have been pressed and syrup systems sold-out floats have been filled with product. “FILL 1” and “FILL 2” fault messages will continue to be displayed until “AUTO BLEND 1” or “AUTO BLEND 2” control switches have been pressed to fill product blender tanks with product.

### “ERROR 1” and “ERROR 2” Fault Messages.

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

### “OFF 1” and “OFF 2” Fault Messages.

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

### “H<sub>2</sub>O OUT” Fault Message.

The Unit plain water inlet system contains a water pressure switch. Should the plain water source to the Unit be disrupted or a water pressure drop occur, will cause “H<sub>2</sub>O OUT” fault message to appear on message display. Unit will continue to operate for 1-1/2 minutes after “H<sub>2</sub>O OUT” fault message has appeared and if water pressure has not been restored or water pressure improved after 1-1/2 minutes, Unit operation will shut down. After plain water source has been restored or water pressure has improved, Unit will resume operation and “H<sub>2</sub>O OUT” fault message will disappear from message display.

### “CO<sub>2</sub> OUT” Fault Message.

“CO<sub>2</sub> OUT” fault message will appear on message display when CO<sub>2</sub> supply to Unit has been turned off or if CO<sub>2</sub> pressure drops below 50-psi. A minimum CO<sub>2</sub> pressure of 75-psi must be available to Unit to extinguish “CO<sub>2</sub> OUT” fault message.

### “SYRUP 1” or “SYRUP 2” Fault Messages.

“SYRUP 1” or “SYRUP 2” fault messages will appear on message display if product tanks are not connected to Unit or product tanks are empty. Syrup systems syrup float switches must be filled with syrup to extinguish “SYRUP 1” or “SYRUP 2” fault messages.

### “DEFROST 1” or “DEFROST 2” Display Messages.

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

### “POINT OF SALE” Display Message.

Five “POINT OF SALE” display messages are available to choose from and may be programmed into Unit as instructed to appear on message display.

### Common Outlet Temperatures.

Evaporator refrigeration coils inlet 1 and inlet 2 and common outlet temperatures may be displayed on control panel message display as instructed.

## **FREEZE CYLINDERS MANUAL OR AUTOMATIC DEFROST SYSTEMS**

The Unit is 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**

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

### **AUTOMATIC DEFROST SYSTEM**

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

### **“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 for and defrost 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.

**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 (see Figure 5), located in each faceplate, are spring-loaded valves that protect freeze cylinders from accidental over-pressure. The relief valve is also used to manually bleed CO<sub>2</sub> gas from freeze cylinder to atmosphere during filling with product and if gas pockets form in cylinder during operation.

## **PRODUCT SAMPLE VALVES**

The two product sample valves (see Figures 2 and 6), located behind front lower access panel, are manually operated lever-type ball valves used to check product BRIX. Turn valve lever to line up with attached line to open valve and at 90° angle with line to close valve.

## **PRODUCT SHUTOFF VALVES**

The two product shutoff valves, located in lines leading from product blender tanks to freeze cylinders (see Figures 2 and 6), are manually operated lever-type ball valves and are used to prevent product from entering and filling freeze cylinders while adjusting BRIX of dispensed product. Shutoff valves may also be used to shut off product to individual freeze cylinder for service and maintenance without disrupting operation of other freeze cylinder.

## **PRIMARY CO<sub>2</sub> REGULATOR**

The primary CO<sub>2</sub> regulator (see Figure 2) controls CO<sub>2</sub> pressure to soft drink tanks and Unit secondary CO<sub>2</sub> regulators located behind lower front access panel. If necessary to adjust primary CO<sub>2</sub> regulator, adjust as instructed.

## **SECONDARY CO<sub>2</sub> REGULATORS**

The three secondary CO<sub>2</sub> regulators, located behind lower front access panel (see Figures 2 and 6), control CO<sub>2</sub> pressure to carbonator and product blender tanks. If necessary to adjust secondary CO<sub>2</sub> regulators, adjust as instructed.

## **CARBONATED WATER FLOW REGULATORS**

The adjustable carbonated water flow regulators (see Figures 2 and 6), located in their respective systems, control carbonated water flow rate to the product blender tanks. The water flow regulators are factory adjusted at 1.5± 0.05 oz/sec and should not normally require adjustment. If adjustment is necessary, adjust as instructed.

## **SYRUP FLOW REGULATORS**

The syrup flow regulators (see Figures 2 and 6), located in their respective systems, are adjustable regulators that control syrup flow rate to the product blender tanks for desired BRIX of dispensed product. Adjust syrup flow regulators for desired BRIX as instructed.

## **DISPENSING VALVES**

Self-closing dispensing valves (see Figure 5 and 7), located on faceplates on front of Unit, 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<sub>2</sub> gas breakout and secondary by freezing.*

### Overrun is a Variable.

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

### Specific Product Ingredients Affect Overrun.

Each syrup has its own specific formulation of makeup. 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 anti-freeze 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.*



**DRAWING 1**



**DRAWING 2**



**DRAWING 3**

### Low Dispensing Volume Affects Overrun.

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

### Carbonation Level in Liquid Product Affects Overrun.

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

### Freezing Affects Overrun.

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

## **OPERATING CHARACTERISTICS**

The product viscosity (product consistency) can be varied by adjustment and secondary CO<sub>2</sub> regulator setting from a high overrun light drink to a wet heavy drink. The length of freezing cycle and amount of CO<sub>2</sub> present in product combine to create drink dispensed. The dispensed product will have a normal variance due to the following conditions:

1. If some time has elapsed since last drink was drawn from particular freeze cylinder and 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 drink described above by adjusting viscosity.**

2. If product is drawn from freeze cylinder quite regularly, its viscosity (product consistency) will be maintained at whatever viscosity adjustment was made within the normal variance of the compressor off and on cycle. See Drawing 2.
3. If product is drawn continuously from freeze cylinder and rate is approaching capacity of the dispensing unit, overrun of drink will increase just prior to point capacity is exceeded, and drink dispensed will turn slightly wetter.

## OPERATING UNIT

**NOTE: No. 1 freeze cylinder is cylinder on left-hand side facing front of Unit.**

1. Make sure "H<sub>2</sub>O OUT" fault message is not displayed on message display. This indicates no water supply to Unit.
2. Make sure "CO<sub>2</sub> OUT" fault message is not displayed on message display. This indicates no CO<sub>2</sub> gas supply to Unit.
3. Make sure "SYRUP 1" or "SYRUP 2" fault messages are not displayed on message display. This indicates no syrup supply to Unit.
4. Make sure "AUTO BLEND 1", "AUTO BLEND 2", "AUTO 1", and "AUTO 2" control switches are pressed for normal operation.
5. Place cup under dispensing valve, then dispense until cup is full of product.
6. Make sure viscosity (product consistency) is as desired. If not, adjust as instructed.

## REPLENISHING SYRUP SUPPLY

**IMPORTANT: The following CO<sub>2</sub> 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<sub>2</sub> quick disconnect from soft drink tank.**
2. **To connect soft drink tank into Unit syrup system.**
  - A. **First, connect CO<sub>2</sub> quick disconnect to soft drink tank to pressurize tank.**
  - B. **Second, connect liquid quick disconnect to soft drink tank.**

Syrup supply should be checked daily and if necessary, replenished as instructed.

## PRODUCT FLAVOR CHANGE

Perform syrup flavor change as instructed.

## CHECKING CO<sub>2</sub> SUPPLY



**WARNING: CO<sub>2</sub> displaces oxygen. Strict attention *must* be observed in the prevention of CO<sub>2</sub> (carbon dioxide) gas leaks in the entire CO<sub>2</sub> and soft drink system. If a CO<sub>2</sub> gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO<sub>2</sub> gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.**

Make sure CO<sub>2</sub> cylinder shutoff valve is fully opened and regulator assembly 1800-psi gage indicator is not in shaded ("change CO<sub>2</sub> cylinder") portion of dial. If so, CO<sub>2</sub> cylinder is almost empty and must be replaced as instructed.

## **CLEANING AND SANITIZING**

### **DAILY CLEANING**

Daily; or more often if necessary, wash all external surfaces of Unit, rinse with clean water, then wipe dry with clean soft cloth. DO NOT USE ABRASIVE CLEANERS. Remove and wash drip tray and cup rest with warm water and mild detergent, rinse with clean water, then install them on Unit.

### **SANITIZING**

The Unit should be sanitized as instructed every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturers recommendations.

### **CLEANING CONDENSER COIL**

NOTE: Circulating air, required to cool the refrigeration system condenser coil (see Figure 6), is drawn in through louvers on front and exhausted out through louvers on sides and back of Unit. Restricting air circulation through the Unit will decrease its cooling efficiency. Condenser coil must be cleaned periodically as instructed.

### **LUBRICATION**

Carbonator pump motor must be lubricated as instructed.

## **ADJUSTMENTS**

### **CARBONATED WATER FLOW RATE**

The black carbonated water flow regulators (see Figure 2 and 6), which control carbonated water flow rate into product blender tanks, are factory adjusted and normally do not require further adjustment. If adjustment should become necessary, adjust as instructed.

### **CO<sub>2</sub> REGULATORS**

#### Primary CO<sub>2</sub> Regulator.

The primary CO<sub>2</sub> (see Figure 2) regulator regulates CO<sub>2</sub> pressure to soft drink tanks (also to bag-in-box syrup system if used) and secondary CO<sub>2</sub> regulators located inside Unit. If necessary to adjust primary CO<sub>2</sub> regulator, adjust as instructed.

#### Secondary CO<sub>2</sub> Regulators.

The secondary CO<sub>2</sub> regulators (see Figures 2 and 6) regulate CO<sub>2</sub> pressure to carbonator and product blender tanks. If necessary to adjust secondary CO<sub>2</sub> regulators, adjust as instructed.

### **ADJUSTING BEATERS MOTORS CURRENTS**

Beaters motors currents must be adjusted as instructed in SERVICE AND MAINTENANCE SECTION.

## **PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY**

The MAIN MENU SELECTIONS (see Table 4) may be brought up on message display as instructed in SERVICE AND MAINTENANCE SECTION.

### **SETTING “CLOCK” (TIME OF DAY)**

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

Program “CLOCK” (TIME OF DAY) into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

### **PROGRAMMING “DEFROST” (AUTOMATIC) SETTINGS INTO UNIT**

The automatic defrost system may be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings. Program automatic defrost time settings into the Unit as instructed in SERVICE AND MAINTENANCE SECTION.

### **PROGRAMMING “SLEEP” (SLEEP TIME) INTO UNIT**

“SLEEP” (SLEEP TIME) may be programmed into Unit to occur any time of the day after the Unit automatic defrost cycle has occurred. 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. Program “SLEEP” (SLEEP TIME) into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

### **PROGRAMMING “WAKE UP” (WAKE UP) TIME INTO UNIT**

“WAKE UP” (WAKE UP TIME) May be programmed into Unit to occur any time of the day to wake Unit up (return to normal operation) after “sleep time” has occurred. Program “WAKE UP” into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

### **PROGRAMMING POINT OF SALE MESSAGE DISPLAY**

Three point of sale display messages are available to choose from and may be programmed into Unit by placing No. 1, No. 2, and No. 3 switches on DIP SWITCH assembly on master circuit board in appropriate positions. Program point of sale display messages into Unit as instructed in SERVICE AND MAINTENANCE SECTION.

### **ADJUSTING “VIS SET” (PRODUCT VISCOSITY) OF DISPENSED PRODUCT**

Adjusting “VIS SET” (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Adjust “VIS SET” (PRODUCT VISCOSITY) of the dispensed product as instructed in SERVICE AND MAINTENANCE SECTION.

### **DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES**

Evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit may be displayed on message display as instructed in SERVICE AND MAINTENANCE SECTION

## **“VOLTAGE” (DISPLAYED VOLTAGE READOUT)**

Displayed voltage readout may be displayed on message display as instructed in SECTION IV SERVICE AND MAINTENANCE

## **PROGRAMMING COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE) INTO UNIT**

“DIAGNOSE” (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Program “DIAGNOSE” into Unit and check components for proper operation as instructed in SERVICE AND MAINTENANCE SECTION.

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

“TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on message display as instructed in SERVICE AND MAINTENANCE SECTION.

## **DISPLAYED ERROR CONDITIONS**

Displayed error conditions, associated errors, and items affected by the errors are found in Table 9 DISPLAYED ERROR CONDITIONS.

## **WATER STRAINER SCREEN AND DOUBLE LIQUID CHECK VALVE MAINTENANCE**

(see Figures 2 and 12)



**WARNING:** The carbonator water pump water strainer screen and double liquid check valve must be inspected and serviced after any disruptions (plumbing work, earthquake, etc.) to the water supply system, and at least once a year under normal circumstances.

Water pump with no screen or defective screen in strainer would allow foreign particles to foul the double liquid check valve. CO<sub>2</sub> gas could then back flow into water system and create health hazard in system.

Service water strainer screen and double liquid check valve as instructed.

## **CLEANING CO<sub>2</sub> GAS CHECK VALVES**

(see Figures 2 and 12)

The CO<sub>2</sub> 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<sub>2</sub> system as instructed.



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# SERVICE AND MAINTENANCE

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



**WARNING:** Disconnect electrical power to Unit to prevent personnel 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. Make sure CO<sub>2</sub> cylinder valve is fully opened and primary CO<sub>2</sub> cylinder regulator assembly 1800-psi gage indicator is not in shaded ("change CO<sub>2</sub> cylinder") portion of dial. If so, CO<sub>2</sub> cylinder is almost empty and must be replaced.
2. Make sure soft drink tanks contain sufficient amount of syrup for Unit operation.
3. Circulating air, required to cool the refrigeration systems condenser coil, is drawn in through louvers on front and exhausted out through louvers on sides and back of Unit. Make sure louvers are not obstructed and refer to *CLEANING CONDENSER COILS* in this section.

## REMOVAL OF DRIP TRAY, BACK PANEL, SIDE PANELS, TOP PANEL, LOWER FRONT ACCESS PANEL, AND CONDENSER COIL ACCESS PANEL

(see Figure 5)

### DRIP TRAY

Pull drip tray forward to disengage from drip tray supports.

### BACK PANEL

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

### SIDE PANELS

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

### TOP PANEL

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

## LOWER FRONT ACCESS PANEL

Remove two screws securing lower front 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.

## LUBRICATION

### CARBONATOR WATER PUMP MOTOR

(see Figure 12)

Carbonator water pump motor bearings must be lubricated periodically. Refer to oiling instructions on motor. DO NOT OVER OIL.

### DISPENSING VALVES CAGED O-RINGS AND BEATERS DRIVE SHAFTS SEALS ASSEMBLIES

**NOTE: Defrost freeze cylinders, shut Unit down, close product shutoff valves in lines leading from product blender tanks to freeze cylinders, then drain product from freeze cylinders.**

Lubricate dispensing valves caged o-rings (see Figure 7) and beaters drive shafts seals assemblies (see Figure 8) each time Unit is sanitized as follows:

**NOTE: Item numbers in parentheses in this paragraph are in reference to Figure 3.**

1. Remove HEX NUTS (item 7) and FLATWASHERS (item 6) securing FACEPLATE (item 8) to freeze cylinder, then remove faceplate from cylinder.
2. Carefully remove large O-RING (item 5) from FACEPLATE (item 8).
3. Unscrew RELIEF VALVE (item 9) from FACEPLATE (item 8).
4. Disassemble dispensing valve (see Figure 7) 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.
5. 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 (item 4, Table 3) to clean faceplates relief valve passages.
6. Submerge all parts in four percent solution of approved sanitizing agent for time recommended by sanitizer manufacturer.

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

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

8. Assemble 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.
- 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.
- D. Turn spring housing to the left (counterclockwise) to put tension on torsion spring, then tighten hold-down plates to secure spring housing.
- E. Test dispensing valve to make sure it closes by itself when lever is released. If not, readjust torsion spring tension.

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

10. Service beater drive shaft seal assembly as follows:

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

- A. Pull BEATER (item 13) and SCRAPER BLADES (item 2) from freeze cylinder.
- B. Pull beater drive shaft seal assembly from freeze cylinder socket using seal puller, Cornelius (P/N 322063000) from front side. Disassemble shaft seal assembly and discard O-rings.

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

- C. Remove old lubricant from plastic sleeve and stainless steel seal retainer with paper towels. Do not scrape the sleeve. Wash sleeve, retainer, and socket and back of freeze cylinder in warm water.
- D. Install No. 1 stationary O-ring in groove of plastic sleeve and No. 2 stationary O-ring in inner groove of stainless steel seal retainer. Lubricate both O-rings.
- E. Install new "running" O-rings No. 3 and No. 4 in outer grooves of stainless steel seal retainer, then lubricate O-rings with generous amount of special light grade silicone grease.
- F. Slide stainless steel seal retainer in plastic sleeve until "running" O-ring No. 3 is just covered by plastic sleeve, as shown in View B of Figure 8.
- G. Carefully place shaft seal assembly over beater drive shaft and locate slots of seal retainer on drive shaft pin. Then, carefully and simultaneously, push and turn plastic sleeve to locate locking tabs on sleeve in notches of freeze cylinder retainer. When tabs are seated in notches, press assembly firmly in place.
- H. Position SCRAPER BLADES (item 2) on BEATER (item 13) as shown in Figure 3. Slide beater into freeze cylinder so slotted hooks engage DRIVE PIN (item 17) on DRIVE SHAFT (item 24). Turn beater to the right (clockwise) to lock in place.
- I. 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. Tighten hex nuts until faceplate touches freeze cylinder all around flange. CAUTION - DO NOT OVERTIGHTEN HEX NUTS.

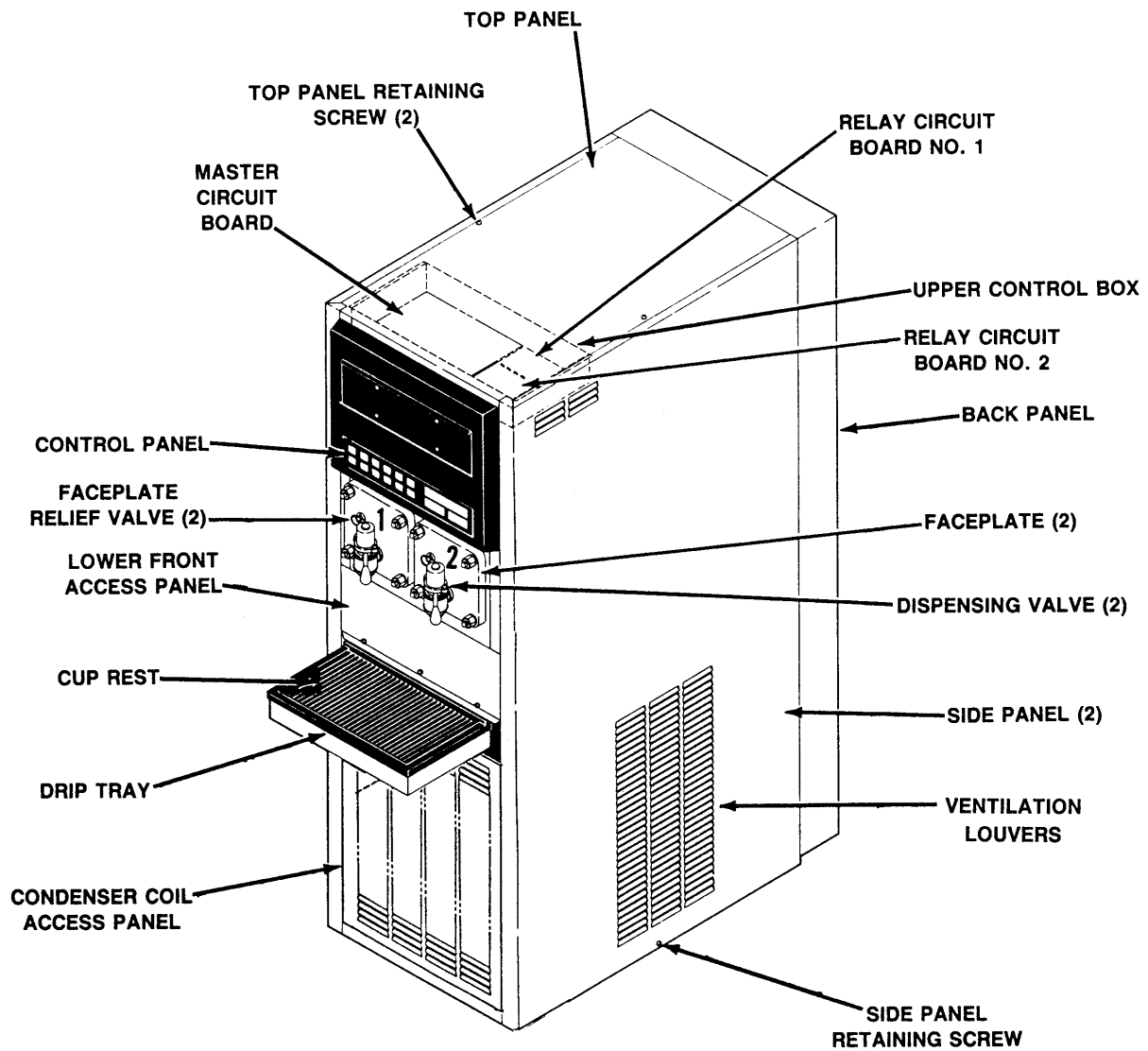
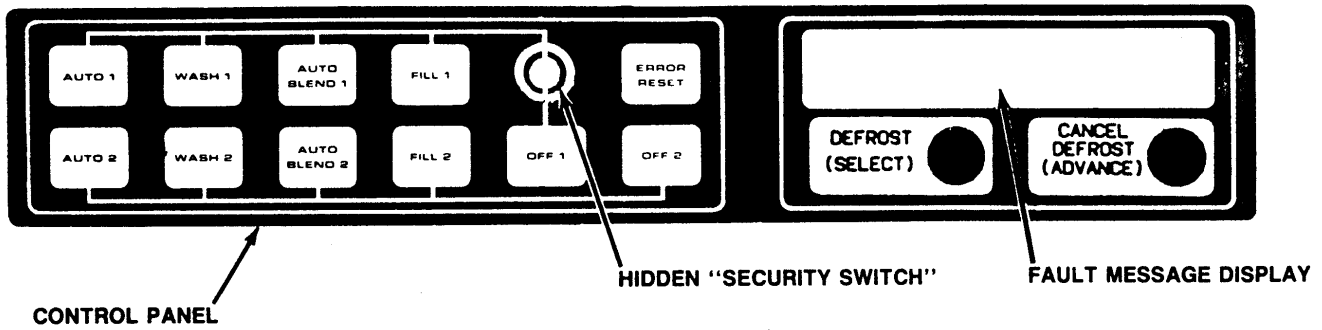
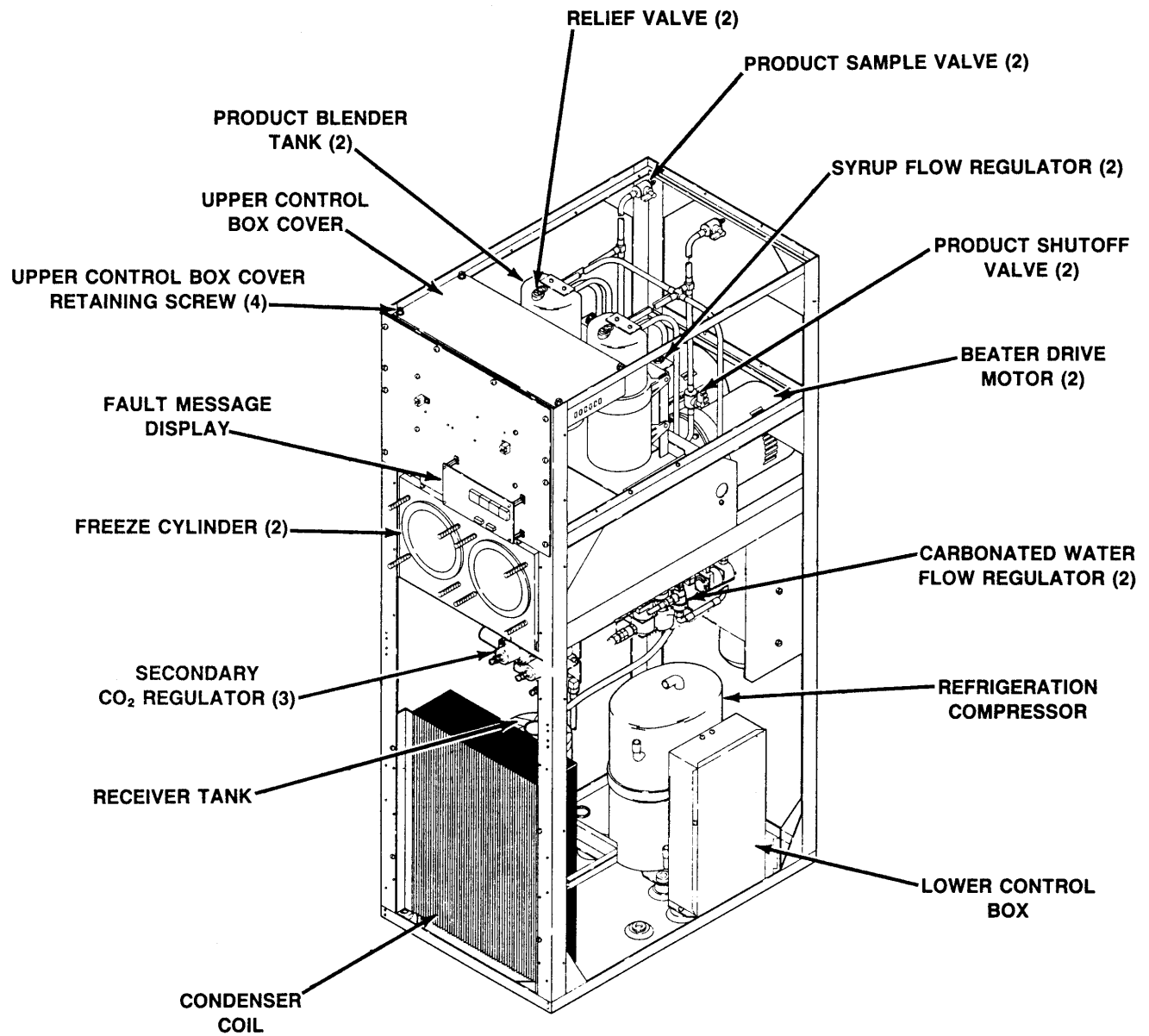
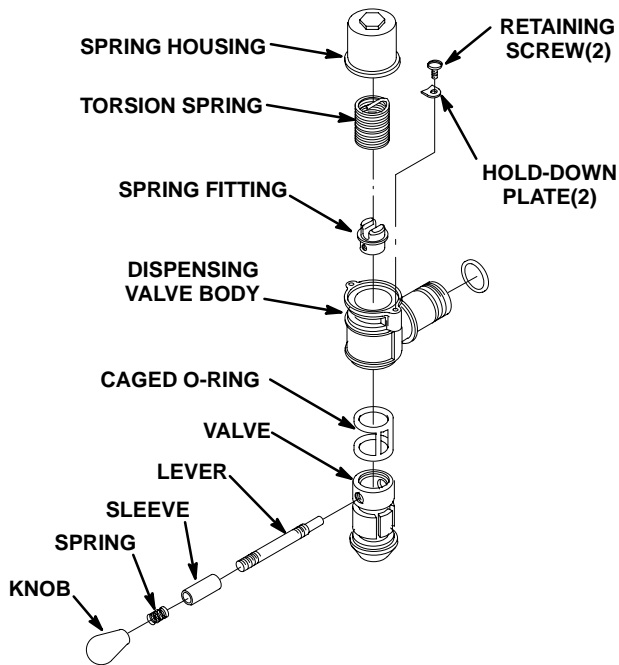


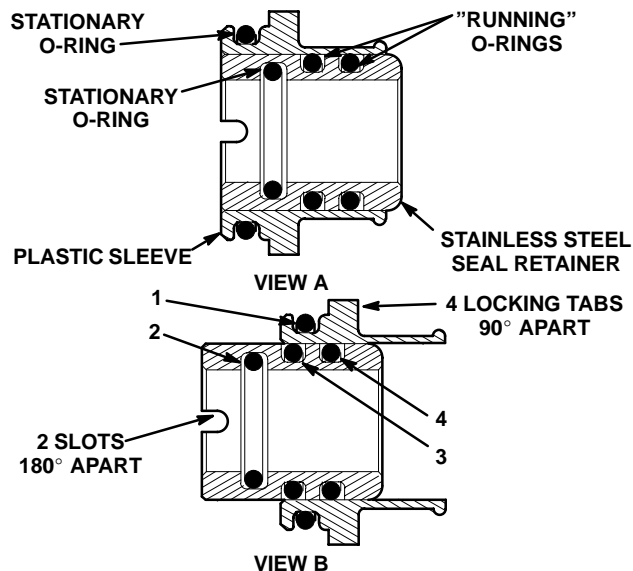
FIGURE 5. OPERATING CONTROLS



**FIGURE 6. UNIT INTERNAL COMPONENTS**



**FIGURE 7. SELF-CLOSING DISPENSING VALVE**



**FIGURE 8. SERVICING BEATER DRIVE SHAFT SEAL ASSEMBLY**

11. Open product shutoff valves leading from product blender tanks to freeze cylinders, fill freeze cylinders with product, then restore Unit to operation.

## CLEANING CONDENSER COIL

(see Figure 6)

**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:

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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 as instructed.
3. Clean condenser coil with vacuum cleaner, low pressure compressed air, or a soft brush.
4. Install 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.

## ADJUSTMENTS

### ADJUSTING PLAIN WATER PRESSURE REGULATOR

(see Figures 2 and 12)

Carbonator plain water inlet adjustable water pressure regulator is factory adjusted to 45-psi and should not be readjusted.

### ADJUSTING CARBONATED WATER FLOW RATE

The back carbonated water flow regulators (see Figures 2 and 6), which control carbonated water flow rate into product blender tanks, are factory adjusted for flow rate of  $1.5 \pm 0.05$  ounces per second and normally do not require adjustment. However, if adjustment is necessary, proceed as follows:

1. Press applicable "OFF 1" or "OFF 2" switch to prevent more product from entering applicable product blender tank.
2. Disconnect Unit syrup inlet line from applicable soft drink tank.
3. Remove applicable side panel from Unit as instructed for access to applicable carbonated water flow regulator, product shutoff valve, and product sample valve.
4. Close applicable product shutoff valve to prevent more product from entering freeze cylinder.
5. Place container under applicable product sample valve. Open valve and allow all product to be purged from product blender tank, then close valve.
6. Remove lower front access panel as instructed for access to secondary CO<sub>2</sub> regulators.
7. Note pressure setting on secondary CO<sub>2</sub> regulator with 60-psi gage for product blender tanks. Turn regulator adjusting screw out (counterclockwise) until gage reads 0-psi. Pull up on applicable product blender tank relief valve to release CO<sub>2</sub> pressure from tank.
8. Disconnect carbonated water line from outlet side of applicable carbonated water flow regulator.
9. Connect line, long enough to reach to outside of Unit, to water flow regulator outlet, then route line to outside of Unit.
10. Place end of carbonated water line, routed to outside of Unit, in container.
11. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch to activate electrically operated carbonated water solenoid.
12. When steady stream of water is flowing from added length of line, catch carbonated water in container graduated in ounces for exactly 10-seconds. Press applicable "FILL 1" or "FILL 2" switch to deactivate carbonated water solenoid. In 10-seconds, 14 to 16-ounces of water should have been dispensed.
13. If adjustment is necessary, loosen jam nut on carbonated water flow regulator. Turn regulator adjusting screw to the left (counterclockwise) to reduce carbonated water flow rate or turn screw to the right (clockwise) to increase flow rate. Tighten jam nut and tap on regulator to register adjustment.



14. Repeat steps 11 through 13 until desired carbonated water flow rate is achieved.
15. Remove added length of line from outlet side of carbonated water flow regulator. Connect carbonated water line, disconnected from carbonated water flow regulator in step 8 preceding, to regulator outlet.
16. Turn product blender tanks CO<sub>2</sub> regulator, with 60-psi gage, adjusting screw in (clockwise) until gage registers pressure noted in step 7 preceding.
17. Pull relief valve on applicable product blender tank to purge air from tank, then close valve.
18. Connect Unit syrup inlet line to soft drink tank.
19. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch to fill product blender tank with product.
20. Open product shutoff valve that was closed in step 4 preceding.
21. Install side panel and lower front access panel by reversing removal procedure.

## ADJUSTING CO<sub>2</sub> REGULATORS

**NOTE: To readjust CO<sub>2</sub> regulator to a lower setting, loosen adjusting screw lock nut, then turn screw to the left (counterclockwise) until pressure gage reads 5-psi lower than new setting will be. Turn adjusting screw to the right (clockwise) until gage registers new setting, then tighten lock nut.**

### Primary CO<sub>2</sub> Regulator.

(see Figure 2)

Adjust primary CO<sub>2</sub> regulator by turning regulator adjusting screw to the right (clockwise) until regulator pressure reads 80 to 100-psig.

### Product Blender Tanks Secondary CO<sub>2</sub> Regulators.

(see Figures 2 and 6)

1. Remove Unit lower front access panel as instructed for access to product blender tanks secondary CO<sub>2</sub> regulators.
2. Adjust product blender tanks secondary CO<sub>2</sub> regulators, with 60-psi gages, by turning regulator adjusting screws to the right (clockwise) until gages reads 30-psig.
3. Install lower front access panel by reversing removal procedure.

### Carbonator Secondary CO<sub>2</sub> Regulator.

(see Figures 2 and 6)

1. Remove Unit lower front access panel as instructed for access to carbonator secondary CO<sub>2</sub> regulator.
2. Adjust carbonator secondary CO<sub>2</sub> regulator, with 100-psi gage, by turning regulator adjusting screw to the right (clockwise) until gage reads 60-psig.
3. Install lower front access panel by reversing removal procedure.

**IMPORTANT: Carbonator tank secondary CO<sub>2</sub> regulator must be adjusted 25-psi higher or more above product blender tanks secondary CO<sub>2</sub> regulators pressure settings. Carbonated water and syrup pressures must be able to overcome and vent product blender tanks head pressures while tanks are filling with carbonated water and syrup. Carbonator tank secondary CO<sub>2</sub> regulator not adjusted high enough will cause decreased flow of carbonated water into blender tanks which will increase brix of dispensed product.**

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

(see Figures 2 and 6)

1. Remove Unit front lower access panel as instructed for access to product blender tanks secondary CO<sub>2</sub> regulators and product sample valves.
2. Check product blender tanks secondary CO<sub>2</sub> regulators, with 60-psi gages, for proper pressure settings which is set at 30-psi for best textured dispensed product. If adjustment is necessary, adjust as instructed.
3. Remove both Unit side panels as instructed for access to product shutoff valves located close to product blender tanks.
4. Close product shutoff valve in line between applicable product blender tank and associated freeze cylinder BRIX adjustment will be performed on.
5. Press applicable “FILL 1” or “FILL 2” switch to prevent more product from filling product blender tank.
6. Open applicable product blender tank product sample valve and take sample (approximately 6-ounces) of product in cup.

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

7. Check product BRIX with a temperature compensated hand-type refractometer. BRIX should read  $13 \pm 1$ . If BRIX is not within tolerance, adjust applicable white syrup flow regulator as follows:
  - A. Loosen jamb nut on applicable syrup flow regulator.
  - B. Turn 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.
  - C. Tighten jamb nut on syrup flow regulator, then lightly tap regulator to register adjustment.
8. Place container under applicable product sample valve. Open valve to purge product out of product blender tank, line, and valve, then close valve.
9. Press applicable “AUTO BLEND 1” or “AUTO BLEND 2” switch to fill product blender tank 1/4-full of new batch of product. When product blender tank is 1/4-full of product, press applicable “FILL 1” or “FILL 2” switch to prevent more product from entering product blender tank.
10. Repeat steps 6 and 7 preceding to check product sample for BRIX.
11. Repeat steps 7 through 10 preceding until proper BRIX adjustment is achieved.
12. Open product shutoff valve in line between product blender tank and freeze cylinder.
13. Press applicable “AUTO BLEND 1” or “AUTO BLEND 2” switch.
14. Install Unit side panels and front lower access panel by reversing removal procedures.

## PRODUCT CARBONATION ADJUSTMENT

(see Figures 2 and 6)

Carbonation of dispensed product can also be varied to suit consumer preference by adjusting Unit carbonator secondary CO<sub>2</sub> regulator as follows:

**IMPORTANT: Carbonator tank secondary CO<sub>2</sub> regulator must be adjusted 25-psi higher or more above product blender tanks secondary CO<sub>2</sub> regulators pressure settings. Carbonated water and syrup pressures must be able to overcome and vent product blender tanks head pressures while tanks are filling with carbonated water and syrup. Carbonator tank secondary CO<sub>2</sub> regulator not adjusted high enough will cause decreased flow of carbonated water into blender tanks which will increase BRIX of dispensed product.**

1. Remove Unit front lower access panel as instructed for access to carbonator secondary CO<sub>2</sub> regulator with 100-psi gage.
2. Observe pressure setting on carbonator secondary CO<sub>2</sub> regulator gage.
3. To lower CO<sub>2</sub> 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<sub>2</sub> REGULATOR PRESSURE BELOW 25-PSI HIGHER THAN PRODUCT BLENDER TANKS CO<sub>2</sub> REGULATORS ARE ADJUSTED TO (SEE PRECEDING IMPORTANT NOTE).** Tighten adjusting screw lock nut after each adjustment.
4. To raise CO<sub>2</sub> pressure, turn regulator adjusting screw to the right (clockwise) until gage reads desired pressure. **DO NOT SET PRESSURE HIGHER THAN 60-PSI.** Make sure primary CO<sub>2</sub> regulator on CO<sub>2</sub> cylinder is set at 80 to 100-psi. Tighten adjusting screw lock nut after each adjustment.
5. Install Unit front lower access panel by reversing removal procedure.

## ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)

Adjusting beater motor current (either side) procedure is very important and *must* be performed as instructed. Be sure you fully understand the instructions before performing the current adjustments or doing any preventative maintenance current readings check.

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. Adjust beater motor current (either side) as follows:

1. Place No. 4 “BEATER MOTOR CURRENT READOUT” switch on DIP SWITCH assembly on master circuit board (see Figure 10) in “ON” position. Both freeze cylinders beater motors will start and operate and beaters motors current ratings will be displayed on message display.
2. Display should be adjusted to read  $A150 B150 \pm 2$  by adjusting MOTOR CURRENT ADJUSTMENTS located on No. 1 and No. 2 relay circuit boards (see Figure 10). These figures will fluctuate slightly with variations in line voltage and motor loads.
3. After completion of adjusting beater motor current to  $A150B150 \pm 2$ , make sure No. 5 “MOTOR CURRENT SELF-CALIBRATION” switch on DIP SWITCH assembly on master circuit board (see Figure 10) is in “OFF” position. No. 5 switch in “OFF” position allows the “MOTOR CURRENT” SELF-CALIBRATION” electronics to automatically self calibrate the beaters motors currents at completion of each defrost cycle.



**CAUTION: IF NO. 4 “BEATER MOTOR CURRENT READOUT” SWITCH ON DIP SWITCH assembly is placed in “ON” position and beater motor current readings were  $A155B145$  and switch was then placed back in “OFF” position without readjusting to  $A150B150 \pm 2$ , beater motor current has just been reset at  $A155B145$ . Operating the FCB Dispenser at these current readings may have serious effects on its operation.**

ANY TIME THE NO. 4 “BEATER MOTOR CURRENT READOUT” SWITCH ON DIP SWITCH ASSEMBLY IS PLACE IN “ON” POSITION, THE BEATER MOTOR CURRENT READINGS MUST BE READJUSTED TO  $A150B150 \pm 2$  AS INSTRUCTED, THEN SWITCH MUST BE PLACE BACK IN THE “OFF” POSITION.

## ADJUSTMENTS, AND PROGRAMMING MAIN MENU SELECTIONS INTO UNIT

**NOTE: The Unit control panel switches are as shown in Figure 9.**

The following instructions outline adjustments and programming main menu selections, components “DIAGNOSE” (DIAGNOSTIC MODE), and “TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) into the Unit.

**NOTE: Plain water, CO<sub>2</sub> and syrup supplies to Unit must be satisfied to turn off “H<sub>2</sub>O OUT”, “CO<sub>2</sub> OUT”, “SYRUP 1”, and “SYRUP 2” fault messages on message display before adjustments and programming procedures can be performed on the Unit.**

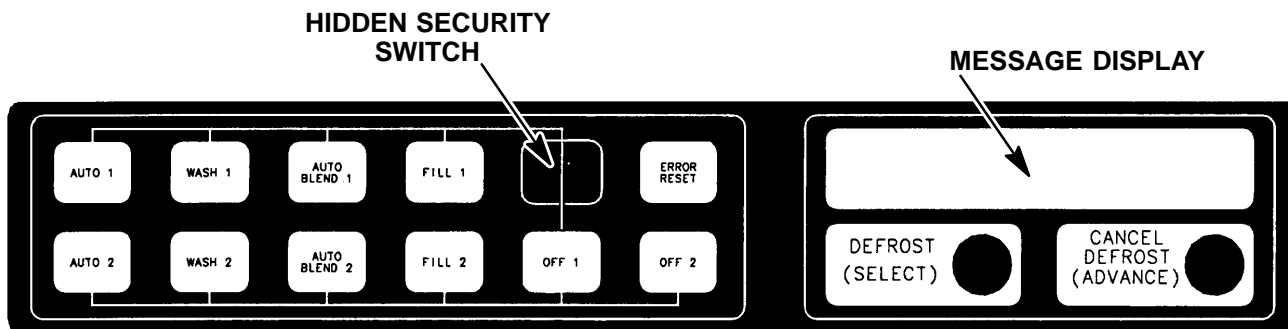


FIGURE 9. CONTROL PANEL

## PROGRAMMING MAIN MENU SELECTION ONTO MESSAGE DISPLAY

The MAIN MENU SELECTIONS (see Table 4) may be brought up on the message display as follows:

1. Press “AUTO 1”, “WASH 1”, and “BLEND 1” control switches (see Figure 9) at the same time and hold them pressed for a minimum of 1/2 second to bring up MAIN MENU SELECTIONS on message display. The word “CLOCK” will appear on display. You are now in the MAIN MENU SELECTIONS as shown in Table 4. To advance through the MENU SELECTIONS, repeatedly press the “CANCEL DEFROST” (ADVANCE) switch. Once you reach the desired selection, press the “DEFROST” (SELECT) switch to lock in on the selection.

**NOTE: to exit MENU SELECTION and go back to MAIN MENU SELECTIONS, press “ERROR RESET” (RESET) switch. Press “ERROR RESET (RESET) switch again to exit from MAIN MENU SELECTIONS.**

MENU COMMANDS	MESSAGE DISPLAY (EXAMPLE READOUTS)
“CLOCK” (TIME OF DAY) see note below	<u>C</u> _ <u>1</u> <u>2</u> : <u>0</u> <u>0</u> <u>A</u>
“DEFROST” (AUTOMATIC)	<u>3</u> <u>D</u> <u>1</u> <u>0</u> : <u>0</u> <u>0</u> <u>A</u>
“SLEEP” (SLEEP TIME)	<u>S</u> <u>1</u> <u>2</u> : <u>3</u> <u>0</u> <u>A</u> _
“WAKE UP” (WAKE UP TIME)	<u>W</u> _ <u>0</u> <u>7</u> : <u>1</u> <u>5</u> <u>A</u>
“VIS SET” (PRODUCT VISCOSITY SETTING)	<u>1</u> <u>2</u> _ _ _ _ <u>1</u> <u>0</u>
“VIS READ” (ACTUAL VISCOSITY READOUT)	<u>1</u> <u>6</u> _ _ _ _ <u>1</u> <u>1</u>
“SENSORS (TEMPERATURES READOUT)	<u>7</u> <u>5</u> * <u>7</u> <u>5</u> * <u>7</u> <u>5</u>
“VOLTAGE” (DISPLAYED VOLTAGE READOUT)	<u>V</u> <u>R</u> <u>M</u> <u>S</u> * <u>2</u> <u>3</u> <u>0</u>
“DIAGNOSE” (DIAGNOSTIC MODE)	See Programming Components Diagnose into Unit.
“TOTALS”	See Table 8 and programming “TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) into unit.

**NOTE: the “CLOCK” (TIME OF DAY) must be programmed into the Unit before “DEFROST” (AUTOMATIC) “SLEEP” (SLEEP TIME), and “WAKE UP” (WAKE UP TIME) will function.**

TABLE 4. MAIN MENU SELECTIONS

## SETTING CLOCK (TIME OF DAY)

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

Program “CLOCK” (TIME OF DAY) into Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up "CLOCK" on display. Press "DEFROST" (SELECT) switch to lock in on selection.
2. Press "CANCEL DEFROST" (ADVANCE) switch to bring up flashing hour number on display.
3. Press "CANCEL DEFROST" (ADVANCE) switch to advance hours on display to desired hour. Press "DEFROST" (SELECT) switch to lock in hour on display.
4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press "CANCEL DEFROST" (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press "DEFROST" (SELECT) switch to lock in minute (time of day) on display.
5. Press "ERROR RESET" switch two times to exit from MENU SELECTION.

## PROGRAMMING "DEFROST" (AUTOMATIC) SETTINGS INTO UNIT

The automatic defrost system may be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings. Program automatic defrost time settings into the Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ON TO MESSAGE DISPLAY and bring up "DEFROST" on message display. Press "DEFROST" (SELECT) switch to lock in on selection.
2. Press "CANCEL DEFROST"(ADVANCE) switch to bring up flashing hour number on display.
3. Press "CANCEL DEFROST"(ADVANCE) switch to advance hours on display to desired hour. Press "DEFROST"(SELECT) switch to lock in hour on display.
4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press "CANCEL DEFROST" (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press "DEFROST" (SELECT) switch to lock in minute (time of day) on display.
5. Press "DEFROST" (SELECT) switch, then repeat steps 2, 3, and 4 to program in next defrost time setting. MAKE SURE A MINIMUM OF TWO HOURS IS MAINTAINED BETWEEN DEFROST TIME SETTINGS. IF A TIME SETTING OF LESS THAN TWO HOURS IS PROGRAMMED INTO THE UNIT, A MOMENTARY "ERROR" MESSAGE WILL APPEAR ON THE MESSAGE DISPLAY WHEN OPERATOR TRIES TO EXIT "DEFROST". THE PROGRAM WILL NOT ALLOW THE OPERATOR TO EXIT THE DEFROST SETTING UNTIL THE LESS THEN TWO HOUR DEFROST TIME IS CORRECTED. THE OPERATOR *MUST* PRESS "CANCEL DEFROST" (ADVANCE) SWITCH, THEN REPEAT STEPS 2, 3, and 4) TO PROGRAM CORRECTED DEFROST TIME INTO UNIT.
6. Repeat step 5 as many times as necessary to program desired number of defrost time settings into the Unit.
7. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.

## PROGRAMMING "SLEEP" (SLEEP TIME) INTO UNIT

"SLEEP" (SLEEP TIME) may be programmed into Unit to occur any time of the day after Unit automatic defrost cycle has occurred. 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. Program "SLEEP" (SLEEP TIME) into Unit as follows:

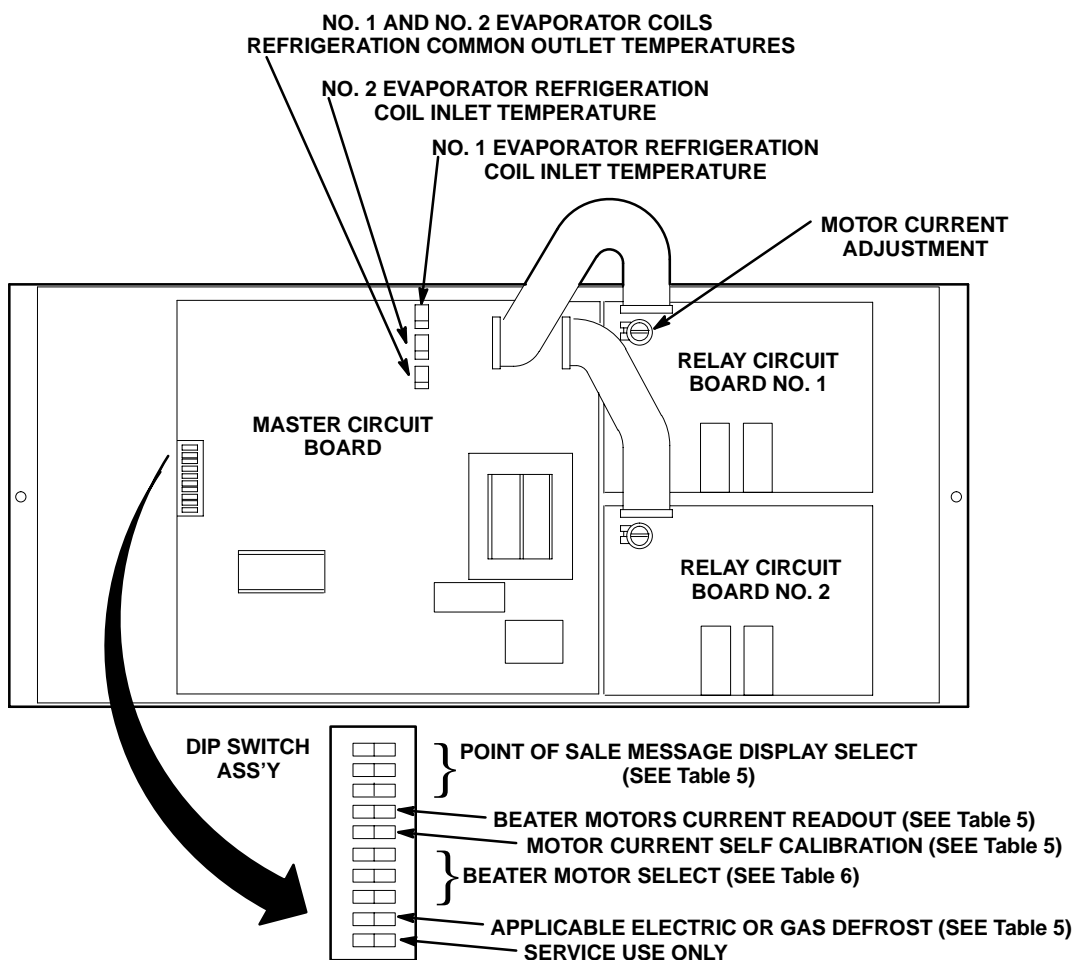
1. Refer to PROGRAMMING MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up "SLEEP" on message display. Press "DEFROST" (SELECT) switch to lock in on selection.
2. Press "CANCEL DEFROST" (ADVANCE) switch to bring up flashing hour number on display.
3. Press "CANCEL DEFROST" (ADVANCE) switch to advance hours on display to desired hour. Press "DEFROST" (SELECT) switch to lock in hour on display.
4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press "CANCEL DEFROST" (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press "DEFROST" (SELECT) switch to lock in minutes (time of day) on display.

5. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.

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

"WAKE UP" (WAKE UP TIME) may be programmed into Unit to occur any time of the day to wake Unit up (return to normal operation) after "sleep time" has occurred. Program "WAKE UP" into Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up "WAKE UP" on message display. Press "DEFROST" (SELECT) switch to lock in on selection.
2. Press "CANCEL DEFROST" (ADVANCE) switch to bring up flashing hour number on display.
3. Press "CANCEL DEFROST" (ADVANCE) switch to advance hours on display to desired hour. Press "DEFROST" (SELECT) switch to lock in hour on display.
4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press "CANCEL DEFROST" (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press "DEFROST" (SELECT) switch to lock in minutes (time of day) on display.
5. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.



**FIGURE 10. MASTER AND RELAY CIRCUIT BOARDS**

SWITCH NO.	FUNCTION	
1	POINT OF SALE MESSAGE SELECT	See Table 7
2	POINT OF SALE MESSAGE SELECT	See Table 7
3	POINT OF SALE MESSAGE SELECT	See Table 7
4	BEATER MOTOR CURRENT READOUT	ON-DISPLAY CURRENT READOUT OFF-NO DISPLAYED CURRENT READOUT
5	MOTOR CURRENT SELF CALIBRATION	NO-DISABLED OFF-OPERATING
6	BEATER MOTOR SELECT	See Table 6
7	BEATER MOTOR SELECT	See Table 6
8	BEATER MOTOR SELECT	See Table 6
9	DEFROST	NO-HOT GAS OFF-ELECTRIC
10	SERVICE USE ONLY	

**TABLE 5. DIP SWITCH FUNCTIONS**

DIP SWITCH NO. 6	DIP SWITCH NO. 7	DIP SWITCH NO. 8	MOTOR SELECTED
OFF	OFF	OFF	60 HZ KLAUBER
OFF	ON	OFF	NOT USED
ON	OFF	OFF	NOT USED
ON	ON	OFF	NOT USED
ON	ON	ON	NOT USED
ON	OFF	ON	50 HZ VON WEISE
OFF	ON	ON	60 HZ BODINE
OFF	OFF	ON	60 HZ VON WEISE

**TABLE 6. BEATER MOTOR SELECT**

DIP SWITCH NO. 1	DIP SWITCH NO. 2	DIP SWITCH NO. 3	MESSAGE
OFF	OFF	OFF	"ENJOY A FROZEN BEVERAGE"
OFF	ON	OFF	NOT USED - BLANK
ON	OFF	OFF	"HAVE A NICE DAY"
ON	ON	OFF	"DISFRUTE UNA BEBIDA CONGELADA CARBONATADA"
ON	ON	ON	NOT USED - BLANK
ON	OFF	ON	NOT USED - BLANK
OFF	ON	ON	NOT USED - BLANK
OFF	OFF	ON	DISABLES POINT OF SALE -- BLANK

\*For special messages, contact you local sales representative

**TABLE 7. POINT OF SALE DISPLAY MESSAGES**

## PROGRAMMING POINT OF SALE MESSAGE DISPLAY

(see Figure 7 and 10)

**Note: Point of sales display messages may be turned off by placing No. 1 and No. 3 switches on master circuit board (see Figure 10 and Tables 5 and 7) assembly in appropriate positions.**

Three point of sales display messages are available to choose from and may be programmed by placing switch No. 1 No. 2 and No. 3 on DIP SWITCH assembly on master circuit board in appropriate positions. See Figure 10 and Tables 5 and 7 and program desired point of sales display message which will be displayed on message display.

## ADJUSTING “VIS SET” (PRODUCT VISCOSITY) OF DISPENSED PRODUCT

Adjusting “VIS SET” (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Adjust “VIS SET” (PRODUCT VISCOSITY) of the dispensed product as follows.

1. Refer to PROGRAMMING MAIN MENU SELECTIONS INTO MESSAGE DISPLAY and bring up “VIS SET” on message display.
2. Press “DEFROST” (SELECT) switch to bring up numbers on message display.

**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 of dispensed product and a No. 12 setting indicates the thickest consistency of product dispensed.**

3. Press “CANCEL DEFROST” (ADVANCE) switch. The left-side freeze cylinder viscosity number will be flashing on message display.
4. Press “CANCEL DEFROST” (ADVANCE) switch to advance viscosity number to desired setting. Press “DEFROST” (SELECT) switch to lock in viscosity setting. The right-side freeze cylinder viscosity number will now be flashing.
5. Press “CANCEL DEFROST” (ADVANCE) switch to advance viscosity number to desired setting. Press “DEFROST” (SELECT) switch to lock in viscosity setting.
6. Press “ERROR RESET” switch two times to exit from MENU SELECTIONS.

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

“VIS READ” (ACTUAL VISCOSITY READOUT) may be brought up on message display to actually read the viscosity (product consistency) of the product in the freeze cylinders while the Unit is in operation. Bring “VIS READ” up on message display as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up “VIS READ” of product in freeze cylinders.
2. Press “DEFROST” (SELECT) switch to bring up actual viscosity readout of product in each freeze cylinder.
3. Press “ERROR RESET” switch two times to exit from MENU SELECTIONS.

## DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES.

Evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit may be displayed on message displays as follows:



1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up "SENSORS" (TEMPERATURES READOUT) on message display.
2. Press "DEFROST" (SELECT) switch to bring up evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit.
3. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.

## **"VOLTAGE" (DISPLAYED VOLTAGE READOUT)**

Displayed voltage readout may be displayed on message display as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up "VOLTAGE" (DISPLAYED VOLTAGE READOUT) on message display.
2. Press "DEFROST" (SELECT) switch to bring up voltage readout on message display.
3. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.

## **PROGRAMMING COMPONENTS "DIAGNOSE" (DIAGNOSTIC MODE) INTO UNIT**

"DIAGNOSE" (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Program "DIAGNOSE" into Unit and check components for proper operation as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ON MESSAGE DISPLAY and bring up the word "CLOCK" on display.
2. Press "CANCEL DEFROST" (ADVANCE) switch to bring up "DIAGNOSE" menu on message display. Press "DEFROST" (SELECT) switch to lock in place. The word "MOTOR 1" will appear on message display.
3. Press "DEFROST" (SELECT) switch. No. 1 beater motor will start and operate while switch is pressed.
4. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up the word "MOTOR 2" on message display.
5. Press "DEFROST" (SELECT) switch. No. 2 beater motor will start and operate while switch is pressed.
6. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "DEFROST 1" on message display.
7. Press "DEFROST" (SELECT) switch. No. 1 defrost relay will click when switch is pressed.
8. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "DEFROST 2" on message display.
9. Press "DEFROST" (SELECT) switch. No. 2 defrost relay will click when switch is pressed.
10. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "SYRUP 1" on message display.
11. Press "DEFROST" (SELECT) switch. No. 1 syrup solenoid relay will click when switch is pressed.
12. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "SYRUP 2" on message display.
13. Press "DEFROST" (SELECT) switch. No. 2 syrup solenoid relay will click when switch is pressed.
14. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "WATER 1" message display.
15. Press "DEFROST" (SELECT) switch. No. 1 carbonated water solenoid relay will click when switch is pressed.
16. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "WATER 2" on message display.

17. Press "DEFROST" (SELECT) switch. No. 2 carbonated water solenoid relay will click when switch is pressed.
18. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "RF SOL 1" on message display.
19. Press "DEFROST" (SELECT) switch. Refrigeration relay clicks when switch is pressed.
20. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "RF SOL 2" on message display.
21. Press "DEFROST" (SELECT) switch. No. 2 refrigeration solenoid clicks when switch is pressed.
22. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "COMPRESS" on Message display.
23. Press "DEFROST" (SELECT) switch. Compressor and condenser fan motor will start and operate while switch is pressed.
24. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "HO PUMP" on message display.
25. Press "DEFROST" (SELECT) switch. Carbonator water pump relay on master circuit board clicks when switch is pressed.
26. "ERROR RESET" switch two times to exit from MENU SELECTIONS.

TOTALS MENU COMMANDS	DESCRIPTION
COMP HRS	COMPRESSOR RUN HOURS
COMP CYC	COMPRESSOR CYCLES X100
DFSTYC1	DEFROST SIDE 1 CYCLES
DFSTYC2	DEFROST SIDE 2 CYCLES
BLDRCYC1	BLENDER SIDE 1 CYCLES X100
BLDRCYC2	BLENDER SIDE 2 CYCLES X100
SOLDOUT 1	SOLDOUT SYRUP SIDE 1
SOLDOUT 2	SOLDOUT SYRUP SIDE 2
BMTRHRS1	BEATER MOTOR 1 HOURS
BMTRHRS2	BEATER MOTOR 2 HOURS
PWR ON	POWER ON HOURS
AUTO ON 1	AUTO SIDE 1 HOURS
AUTO ON 2	AUTO SIDE 2 HOURS
ERR HRS 1	ERROR SIDE 1 HOURS
ERR HRS 2	ERROR SIDE 2 HOURS
SLEEP HRS	SLEEP MODE HOURS
SYR MIN 1 (see note)	SYRUP MINUTES (SIDE 1)
SYR MIN 2 (see note)	SYRUP MINUTES (SIDE 2)

**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.**

<b>BRIX</b>	<b>"A"</b>
11.0	0.1358
11.5	0.1420
12.0	0.1481
12.5	0.1543
13.0	0.1605
13.5	0.1667
14.0	0.1728
14.5	0.1790
15.0	0.1852
15.5	0.1914
16.0	0.1975

GALLONS = "A" x SYRUP MINUTES

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

**TABLE 8. "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) MENU**

<b>MESSAGE DISPLAY</b>	<b>ERROR</b>	<b>ITEMS AFFECTED BY ERROR</b>			
		<b>BEATER MOTOR 1</b>	<b>BEATER MOTOR 2</b>	<b>REFRIG 1</b>	<b>REFRIG 2</b>
Motor 1	Low Current, < 109, Sensed on motor one	OFF		OFF	
Motor 2	Low Current, < 109, Sensed on motor two		OFF		OFF
Motor 1	High current > 255, Sensed on motor one	OFF		OFF	
Motor 2	High current > 255, Sensed on motor two		OFF		OFF
REFRIG	Maximum Run Time on compressor	OFF	OFF	OFF	OFF
SYRUP 1	Syrup Out Side One			OFF	
SYRUP 2	Syrup Out Side Two				OFF
CO <sub>2</sub> OUT	CO <sub>2</sub> Out			OFF	OFF
H <sub>2</sub> O	H <sub>2</sub> O Out			*OFF	*OFF
SENSOR 1	Temp Sensor Inlet One	OFF	OFF	OFF	OFF
SENSOR 2	Temp Sensor Inlet Two	OFF	OFF	OFF	OFF
SENSOR 3	Temp Sensor Outlet	OFF	OFF	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.

**TABLE 9. DISPLAYED ERROR CONDITIONS**

## DISPLAYING "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) ONTO MESSAGE DISPLAY

(see Tables 4 and 8).

1. "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on message display as follows:
2. Refer to PROGRAMMING MAIN MENU SELECTION ONTO MESSAGE DISPLAY and bring up the word "CLOCK" on message display.
3. Repeatedly press and release "CANCEL DEFROST" (ADVANCE) switch to advance through main menu until "TOTALS" menu appears on message display. Press "DEFROST" (SELECT) switch to lock "TOTALS" menu in place. The word "COMP HRS" will appear on message display.
4. Press and hold "DEFROST" (SELECT) switch. Compressor run hours will appear on message display.
5. Press "CANCEL DEFROST" (ADVANCE) switch to advance and bring up "COMP CYC" on message display.
6. Press and hold "DEFROST" (SELECT) switch. Compressor cycles x 100 will appear on message display.
7. Use CANCEL DEFROST (ADVANCE) switch to advance through remaining "TOTALS" (DISPLAYED CYCLES AND HOURS TOTAL MENU) see Table 8. Press "DEFROST" (SELECT) switch to obtain message display readings of the individual menu selections.
8. Press "ERROR RESET" switch two times to exit from MENU SELECTIONS.

## DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in Table 9 DISPLAYED ERROR CONDITIONS.

## CLEANING AND SANITIZING

### DAILY CLEANING OF UNIT

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

### SANITIZING SYRUP SYSTEMS

**NOTE: The Unit should be sanitized every 90-days following Sanitizer Manufacturer's recommendation. Use Chlor-Tergent (Oakite Products, Inc.) or equivalent sanitizer.**

The Unit should be sanitized every 90-days and before and after storage periods following parent company requirements and sanitizer manufacturer's recommendations. One or both syrup systems may be sanitized at one time for routine 90--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 exception of using applicable system switches. Proceed as follows:

1. Press "OFF 2" 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 "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 "AUTO 2" control switch to restart 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.

**IMPORTANT: The following CO<sub>2</sub> 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:**

**To disconnect soft drink tank from Unit syrup system.**

- A. **Disconnect liquid disconnect 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 adjustments.**
- B. **Second, disconnect CO<sub>2</sub> quick disconnect from soft drink tank.**

**To connect soft drink tank into Unit syrup system.**

- C. **First, connect CO<sub>2</sub> quick disconnect to soft drink tank to pressurize tank.**
- D. **Second, connect liquid quick disconnect to soft drink tank.**
6. Disconnect soft drink tank containing syrup from No. 1 syrup system.
7. Connect clean empty soft drink tank into No. 1 syrup system.
8. Place waste container under No. 1 cylinder dispensing valve nozzle. Open dispensing valve and dispense all product from cylinder. As product level lowers in cylinder, partially close valve to avoid spurting.
9. Remove Unit front lower access panel as instructed for access to No. 1 product blender tank product sample valve.
10. Place waste container under No. 1 product blender tank product sample valve. Slowly open valve and purge remaining product out of tank, then close valve.
11. Disconnect empty soft drink tank from No. 1 syrup system.
12. Refer to DISPENSING VALVES CAGED O-RINGS AND DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION and perform procedure to lubricate dispensing valve caged O-ring and drive shaft seal assembly.



**WARNING: To avoid possible injury or property damage, do not attempt to remove soft drink tank cover until CO<sub>2</sub> pressure has been released from tank.**

13. Pull up on empty soft drink tank cover relief valve to release CO<sub>2</sub> pressure from tank.



**WARNING: If powder type sanitizer is used, it must be thoroughly dissolved with water prior to adding to soft drink tank.**

**NOTE: Sanitizing solution is used in a more concentrated form because it will be diluted approximately four-to-one in product blender tank.**

14. Using clean empty soft drink tank, prepare full tank 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 product blender tank after carbonated water has been mixed with sanitizing solution.
15. Shake sanitizing solution tank to thoroughly mix solution, then connect tank into No. 1 syrup system.
16. Press "FILL 1" switch to fill No. 1 syrup system syrup float switch with sanitizing solution "SYRUP 1" fault message on message display will go out indicating syrup float switch has been filled with sanitizing solution.

17. Press "AUTO BLEND 1" switch to fill No. 1 product blender tank with sanitizing solution. Carbonator water pump will start and begin pumping carbonated water into product blender tank which will dilute sanitizing solution also entering tank.
18. After carbonator water pump cycles off, completely fill No. 1 freeze cylinder with sanitizing solution by repeatedly pulling and releasing relief valve knob on freeze cylinder faceplate and until sanitizing solution comes out of relief valve port. Open dispensing valve until sanitizing solution flows from valve, then close valve. Open product blender tank sample valve until sanitizing solution flows from valve, then close valve.
19. Press "WASH 1" switch to start No. 1 freeze cylinder beater. Allow sanitizing solution to remain in freeze cylinder for no less than 10 and no more than 15-minutes (max) contact time.
20. When sanitizing solution contact time has elapsed, press "OFF 1" switch to stop No. 1 freeze cylinder beater.
21. Hold appropriate container under dispensing valve and dispense until soft drink tank containing sanitizing solution is empty and all sanitizing solution has been dispensed from freeze cylinder. As sanitizing solution level lowers in freeze cylinder, partially close valve to avoid spurting. Dispose of sanitizing solution in a safe way.
22. Place waste container under No. 1 system product sample valve. Slowly open valve and purge remaining sanitizing solution out of product blender tank, then close valve.
23. Disconnect empty sanitizing solution tank from No. 1 syrup system.
24. Connect soft drink tank containing syrup into No. 1 syrup system.



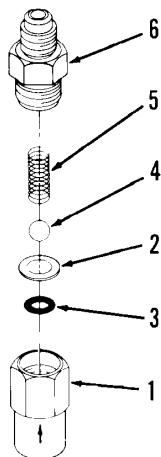
**WARNING: Flush residual sanitizing solution from syrup system as instructed. Residual solution left in system could create a health hazard.**

25. Press "FILL 1" switch to fill No. 1 syrup system syrup float switch with syrup. "SYRUP 1" fault message on message display will go out indicating syrup float switch has been filled with syrup.
26. Press "AUTO BLEND 1" switch to fill No. 1 Product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into product blender tank along with syrup to make product.
27. After carbonator water pump cycles off, completely fill No. 1 freeze cylinder with product by repeatedly pulling and releasing faceplate relief valve and until product comes out of relief valve port. Open dispensing valve until product flows from valve, then close valve. Open No. 1 system product sample valve until product flows from valve, then close valve.
28. Press "WASH 1" switch to start No. 1 freeze cylinder beater. Allow beater to operate for five minutes, then press "OFF 1" switch to stop beater.
29. Disconnect soft drink tank containing syrup from No. 1 syrup system.
30. Connect clean empty soft drink tank into No. 1 syrup system.
31. Hold appropriate container under dispensing valve and dispense until all Product has been dispensed from freeze cylinder. As product level lowers in freeze cylinder, partially close valve to avoid spurting.
32. Place waste container under No. 1 system product sample valve. Slowly open valve and purge remaining product out of product blender tank.
33. Disconnect empty soft drink tank from No. 1 syrup system and install tank containing syrup.
34. Press "FILL 1" switch to fill No. 1 syrup system syrup float switch with syrup. "SYRUP 1" fault message on message display will go out indicating syrup float switch has been filled with syrup.
35. Press "AUTO BLEND 1" switch to fill No. 1 product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into product blender tank along with syrup to make product.



**CAUTION: Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.**

36. After carbonator water pump cycles off, intermittently pull and release No. 1 freeze cylinder faceplate relief valve. This bleeds CO<sub>2</sub> from freeze cylinder and allows product to enter and fill cylinder.
37. Open No. 2 product blender tank product shutoff valve.
38. Press both "AUTO 1" and "AUTO 2" switches to start both freeze cylinders beaters and refrigeration system. Product will be ready for dispensing in approximately 10-minutes.
39. Install right-hand side panel and front lower access panel by reversing removal procedure.



INDEX NO	PART NO	NAME
1	317965000	Retainer
2	312196000	Spring
3	312419000	Ball
4	312415000	Washer, .300 I.D.
5	312418000	Quad Ring
6	317963000	Body

\*Install new ball seat each servicing.

FIGURE 11. LIQUID CHECK VALVE ASSEMBLY

## YEARLY OR AFTER WATER SYSTEM DISRUPTION)



**WARNING:** The carbonator water pump water strainer screen and double liquid check valve must be Inspected and serviced after any disruptions (plumbing work, earthquake, etc.) to the water supply system, and at least once a year under normal circumstances, Water pump with no strainer screen or defective screen would allow foreign particles to foul the double liquid check valves. CO<sub>2</sub> gas could then back flow into water system and create health hazard in water system.

## SERVICING CARBONATOR WATER PUMP WATER STRAINER SCREEN

(see Figure 12)

1. Press "OFF 1" and "OFF 2" switches to stop freeze cylinders beaters and refrigeration systems.
2. Disconnect electrical power from Unit.
3. Close CO<sub>2</sub> cylinder and water inlet supply line shutoff valve.

4. Remove lower front access panel and left-side panel as instructed for access to the water pump water strainer screen.
5. Pull up on carbonator tank relief valve plastic cover to release CO<sub>2</sub> pressure from tank.
6. Loosen screen retainer in water pump port, then remove screen retainer and strainer screen from port.
7. Pull strainer screen from screen retainer. Clean any sediment from screen retainer and water pump port.
8. Inspect strainer screen for holes, restrictions, corrosion, and other damage. Discard damaged strainer screen.
9. Check O-ring on screen retainer. Replace worn or damaged O-ring (P/N 315349000).

**NOTE: Strainer screen should always be used otherwise particles could foul double liquid check valve.**

10. Install good or new strainer screen (P/N 315348000) in screen retainer, then screw retainer into water pump port and tighten securely.
11. Proceed to SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE.

## SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE

(see Figures 2 and 12)

1. Service water pump water strainer screen before servicing water pump double liquid check valve.
2. Disconnect carbonator tank water line from double liquid check valve assembly outlet.
3. Remove double liquid check valve assembly from elbow in water pump outlet port. Retain white tapered gasket inside inlet (female) end of double liquid check valve.
4. Disassemble each check valve as shown in Figure 11.
5. Wipe each part with clean lint-free cloth. Inspect each part, especially ball for burrs, nicks, corrosion, deterioration, and other damage. Discard ball seat and any damaged or suspicious parts and replace with new parts during reassemble.
6. Reassemble liquid check valves as shown in Figure 11. ALWAYS INSTALL NEW BALL SEAT (QUAD RING) P/N 312418000.

**NOTE: Make sure when assembling check valves together, check valve female end with white tapered gasket inside is on inlet side of double liquid check valve assembly.**

7. Assemble check valves together. DO NO OVERTIGHTEN.
8. Make sure white tapered gasket is in place inside female end of double liquid check valve assembly, then install check valve assembly on elbow in water pump outlet port.
9. Connect carbonator tank water line to double liquid check valve assembly outlet. DO NOT OVERTIGHTEN.
10. Open CO<sub>2</sub> cylinder and water inlet supply lines shutoff valves. Check for water leaks and tighten any loose connections.
11. Install Unit back panel by reversing removal procedure.
12. Connect electrical power to Unit.
13. Press both "AUTO BLEND 1" and "AUTO BLEND 2" switches.
14. Press both "AUTO 1" and "AUTO 2" switches to start freeze cylinders beaters and refrigeration system.



## REPLENISHING SYRUP SUPPLY

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

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

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

1. Press applicable "OFF 1" or "OFF 2" switch to stop applicable freeze cylinder beater and refrigeration system.

**IMPORTANT:** The following CO<sub>2</sub> and liquid disconnect and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

### 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<sub>2</sub> quick disconnect from soft drink tank.

### To connect soft drink tank into Unit syrup system.

- C. First, connect CO<sub>2</sub> quick disconnect to soft drink tank to pressurize tank.
  - D. Second, connect liquid quick disconnect to soft drink tank.
2. Disconnect inlet (CO<sub>2</sub>) and outlet (syrup) lines from empty soft drink tank.
  3. Check soft drink tank quick disconnects for sticky or restricted operation. Rinse disconnects in warm water.
  4. First, pressurize full soft drink tank by connecting CO<sub>2</sub> line to tank, then connect Unit syrup inlet line to tank.
  5. Press applicable "FILL 1" or "FILL 2" switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
  6. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch to fill applicable No. 1 or No. 2 system product blender tank with product.
  7. Press applicable "AUTO 1" or "AUTO 2" switch to start 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 faceplate relief valve to slowly bleed CO<sub>2</sub> from freeze cylinder and allow product to fill cylinder. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.

## REPLENISHING CO<sub>2</sub> SUPPLY



**WARNING:** CO<sub>2</sub> displaces oxygen. Strict attention *must* be observed in the prevention of CO<sub>2</sub> (carbon dioxide) gas leaks in the entire CO<sub>2</sub> and soft drink system. If a CO<sub>2</sub> gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO<sub>2</sub> gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.

**NOTE:** When indicator on primary CO<sub>2</sub> cylinder regulator assembly 1800-psi gage is in shaded ("change CO<sub>2</sub> cylinder") portion of the dial, CO<sub>2</sub> cylinder is almost empty and should be changed.

1. Fully close (clockwise) CO<sub>2</sub> cylinder valve.

2. Slowly loosen CO<sub>2</sub> regulator assembly coupling nut allowing CO<sub>2</sub> pressure to escape, then remove regulator assembly from empty CO<sub>2</sub> cylinder.
3. Unfasten safety chain and remove empty CO<sub>2</sub> cylinder.
4. Position full CO<sub>2</sub> cylinder and secure with safety chain.



**WARNING: To avoid personal injury and/or property damage, always secure CO<sub>2</sub> cylinder in upright position with safety chain to prevent it from falling over. Should valve become accidentally damaged or broken off, CO<sub>2</sub> cylinder can cause serious personal injury.**

5. Make sure gasket is in place inside CO<sub>2</sub> regulator coupling nut, then install regulator on CO<sub>2</sub> cylinder.
6. Open (counterclockwise) CO<sub>2</sub> cylinder valve slightly to allow lines to slowly fill with gas, then open valve fully to back-seat valve. (Back-seating valve prevents leakage around valve shaft).
7. Check CO<sub>2</sub> connections for leaks. Tighten loose connections.

## SYRUP FLAVOR CHANGE

One or both syrup flavors can be changed at the same time. Perform flavor change on one system as follows:

1. Perform sanitizing procedure on syrup system syrup flavor change will be made on as instructed in SERVICE AND MAINTENANCE SECTION.

**IMPORTANT: The following CO<sub>2</sub> 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:**

### To disconnect soft drink tank from Unit syrup system.

- A. **Disconnect liquid disconnect from soft drink tank. NOTE - Disconnecting liquid disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.**
- B. **Second, disconnect CO<sub>2</sub> quick disconnect from soft drink tank.**

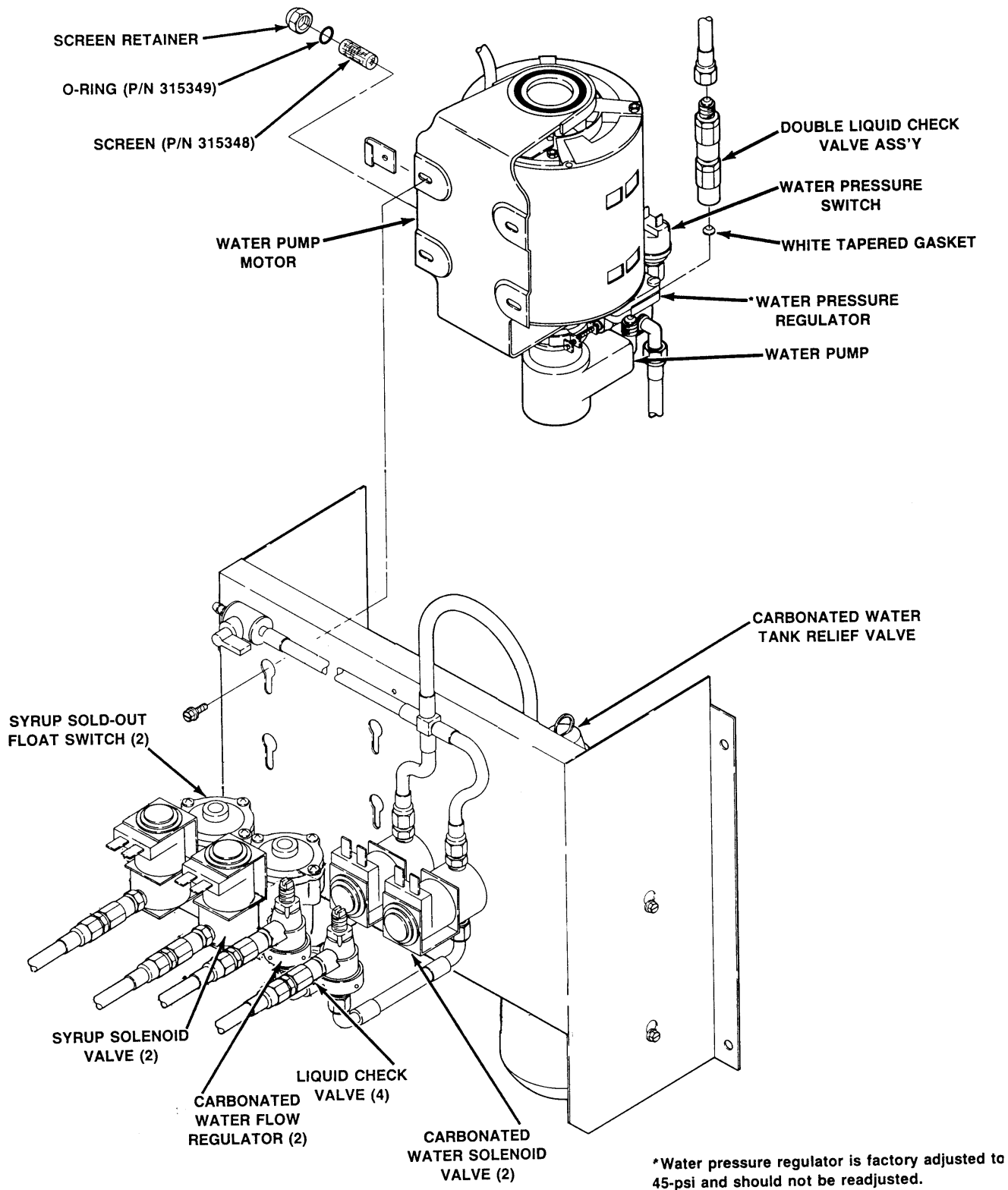
### To connect soft drink tank into Unit syrup system.

- C. **First, connect CO<sub>2</sub> quick disconnect to soft drink tank to pressurize tank.**
- D. **Second, connect liquid quick disconnect to soft drink tank.**
2. First, pressurize soft drink tank containing new flavor syrup by connecting CO<sub>2</sub> line to tank, then connect Unit syrup inlet line to tank.
3. Press applicable "FILL 1" or "FILL 2" switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
4. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch to fill applicable No. 1 or No. 2 system product blender tank with product.
5. Press applicable "AUTO 1" or "AUTO 2" switch to start refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.



**CAUTION: Do not relieve freeze cylinder pressure too fast or product will foam excessively in freeze cylinder and lose carbonation.**

6. After carbonator water pump cycles off, intermittently pull and release applicable No. 1 or No. 2 freeze cylinder faceplate relief valve. This bleeds CO<sub>2</sub> from freeze cylinder and allows product to enter and fill cylinder.
7. If necessary, adjust BRUX, product viscosity (product consistency), and product carbonation of dispensed product as instructed.



**FIGURE 12. WATER STRAINER SCREEN AND DOUBLE LIQUID CHECK VALVE**

## CLEANING CO<sub>2</sub> GAS CHECK VALVES

(see Figures 2 and 13)

The CO<sub>2</sub> 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<sub>2</sub> system. ALWAYS REPLACE QUAD RING SEAL EACH TIME GAS CHECK VALVES ARE SERVICED.

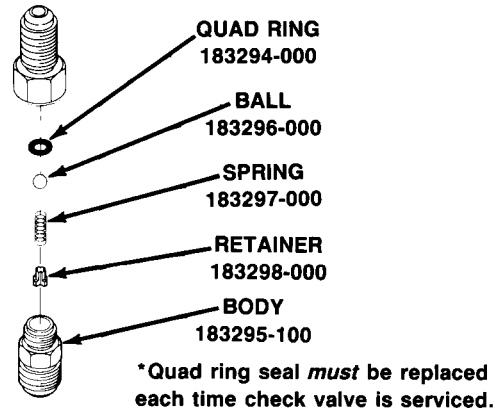


FIGURE 13. CO<sub>2</sub> GAS CHECK VALVE

## REPLACING FREEZE CYLINDER BEATER DRIVE SHAFT BEARING

(see Figures 3, 8, and 14)

### SHUTTING UNIT DOWN

1. Press “DEFROST” switch to defrost product in freeze cylinders.
2. After defrost cycle is completed, press “OFF 1” and “OFF 2” control switches to stop refrigeration system beaters motors.
3. Disconnect electrical power to Unit.
4. Remove back and side panels as instructed.
5. Close product shutoff valve leading from product blender tank to freeze cylinder beater drive shaft will be removed from.
6. Drain product from freeze cylinder.

### REMOVING BEATER DRIVE MOTOR AND BEATER DRIVE SHAFT ASS'Y FROM UNIT

1. Remove access cover plate from back of beater drive motor for access to motor electrical terminals.
2. Tag motor electrical wiring for identification, then disconnect wiring from motor terminals,
3. Remove bolts and lockwashers securing beater drive motor to Unit frame.
4. Very carefully, remove beater drive motor from Unit. BE CAREFUL NOT TO LOSE PLASTIC COUPLER LOCATED BETWEEN BEATER DRIVE MOTOR SHAFT COUPLING AND BEATER DRIVE SHAFT ASSEMBLY COUPLING.

**NOTE: Items in parentheses are in reference to Figure 3.**

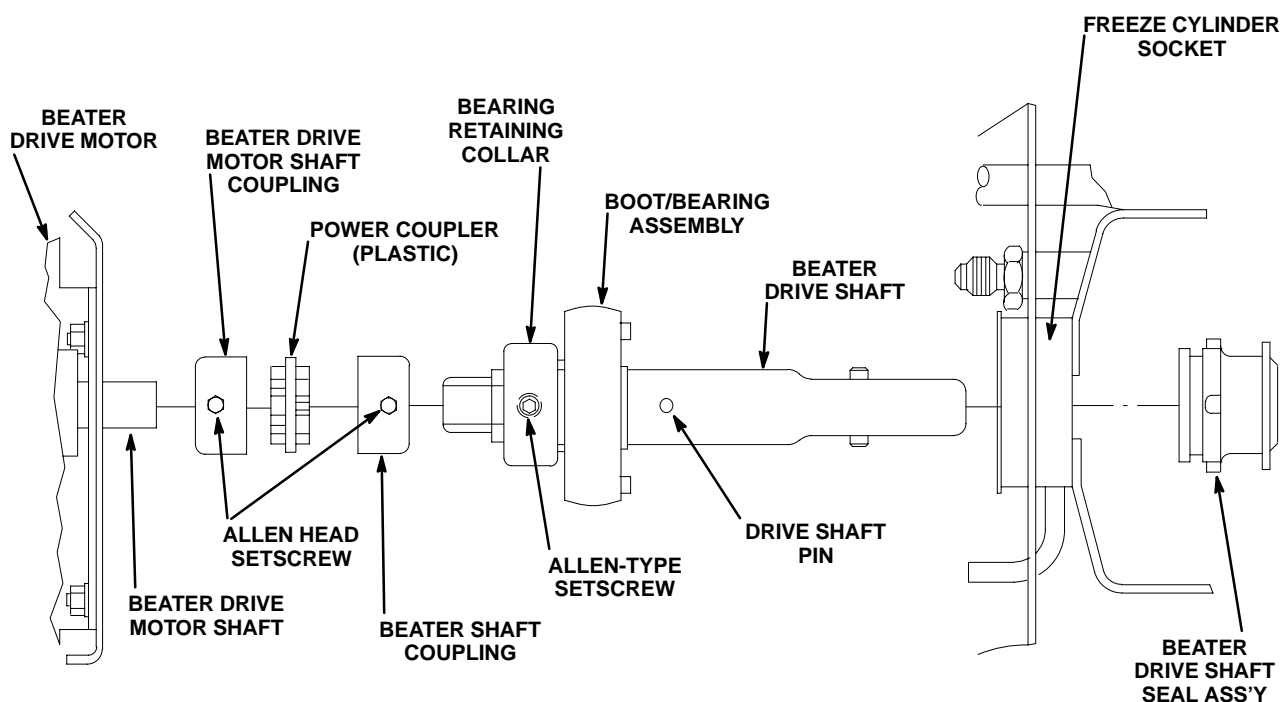
5. Remove HEX NUTS (item 7) and FLATWASHERS (item 6) securing FACEPLATE (item 8) to freeze cylinder, then remove faceplate.
6. Remove beater shaft and scraper blades from inside freeze cylinder.
7. Pull beater drive shaft seal assembly from socket in back of freeze cylinder using Cornelius Puller (P/N 322063000).
8. Pull beater drive shaft assembly out back of freeze cylinder.

## INSTALLING BEATER DRIVE SHAFT BEARING ASS'Y

(see Figure 14)

**IMPORTANT: Bearing retaining collar has a special cam action that locks it up tightly against bearing inner race when properly installed. Cam-action type bearing retaining collar prevents bearing inner race from turning on beater drive shaft and prevents drive shaft from working in and out of freeze cylinder causing a knock when in operation.**

1. Loosen allen-type setscrew securing bearing retaining collar on beater drive shaft. Rotate collar slightly to the left (counterclockwise) to unlock cam action from bearing inner race, then remove collar and bearing from shaft.
2. Remove boot from old bearing and install on new bearing.
3. Install new bearing, with boot in place, on beater drive shaft.
4. Install bearing retaining collar as follows:
  - A. Slide bearing retaining collar up on beater drive shaft to bearing inner race.
  - B. Rotate bearing retaining collar to the right (clockwise) so its cam action locks it securely against bearing inner race. When in locked position, its allen-type setscrew must align with flat on beater drive shaft.
  - C. Tighten allen-type setscrew to secure bearing retaining collar on beater drive shaft.



**FIGURE 14. BEATER DRIVE MOTOR AND SHAFT SEAL ASS'Y REPLACEMENT**

## INSTALLING BEATER DRIVE SHAFT ASS'Y AND BEATER DRIVE MOTOR ON UNIT

**NOTE: Use Beater Drive Shaft Assembly Alignment Tool Kit (P/N 0726) when installing beater drive shaft assembly.**

1. Lubricate beater drive shaft bearing boot with DOW-CORNING DC-111 (P/N 321471000) light grade silicone lubricant.
2. Install beater drive shaft assembly in freeze cylinder.
3. Place plastic power coupler in beater drive motor shaft coupling. **TAPE POWER COUPLER TO MOTOR SHAFT COUPLING TO PREVENT COUPLER FROM FALLING OUT DURING INSTALLATION OF MOTOR IN UNIT.**
4. Very carefully, slide beater drive motor shaft through hole in Unit frame up to coupling on end of beater drive shaft assembly.
5. Engage plastic coupler, on end of beater drive motor shaft, in coupling on end of beater drive shaft assembly.
6. Secure beater motor to Unit frame with bolts and lockwashers.
7. Connect electrical wiring to beater drive motor terminals, then install access cover plate on motor.
8. Refer to DISPENSING VALVES CAGED O-RINGS AND BEATER DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION and perform procedure to lubricate beater drive shaft seal assembly.
9. Carefully place shaft seal assembly over beater drive shaft and locate slots of seal retainer on drive shaft pin. Then, carefully and simultaneously push and turn plastic sleeve in notches of freeze cylinder retainer. When tabs are seated in notches, press assembly firmly in place.
10. Install beater shaft and scraper blades in freeze cylinder (see Figure 4).
11. Lubricate faceplate O-ring with water to facilitate installation, then install faceplate on Unit. Secure faceplate with hex nuts and lockwashers. **DO NOT OVERTIGHTEN HEX NUTS.**

## RESTORING UNIT OPERATION

1. Open product shutoff valve leading from product blender tank to freeze cylinder.
2. Connect electrical power to Unit.
3. Sanitize syrup system as instructed in CLEANING AND SANITIZING.
4. Press "AUTO BLEND 1" and "AUTO BLEND 2" to begin filling freeze cylinder. Open freeze cylinder faceplate relief valve to bleed air from cylinder while filling with product, then close valve. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.
5. Press "AUTO 1" and "AUTO 2" switches to start freeze cylinder and refrigeration system.
6. Check for leaks and repair if evident.
7. Install back and side panels by reversing removal procedure.

## REPLACING BEATER DRIVE SHAFT SEAL ASS'Y

(see Figures 3 and 14)

1. Refer to DISPENSING VALVES CAGED O-RINGS AND BEATER DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION for instructions to replace beater drive shaft seal assembly.

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

## REPLACING FREEZE CYLINDER BEATER MOTOR

(see Figure 6 and 14 )

**NOTE: Use Beater Drive Shaft Assembly Alignment Tool Kit (P/N 0726) when installing beater drive shaft assembly.**

1. Press "OFF 1" and "OFF 2" control switches to stop refrigeration system and beaters motors.
2. Disconnect electrical power from Unit.
3. Remove back and side panels as instructed.
4. Tag beater drive motor electrical wiring for identification, then disconnect wiring from motor terminal block on Unit frame.
5. Remove hex nuts and lockwashers securing beater drive motor to Unit frame.
6. Very carefully, remove old beater drive motor from Unit. **BE CAREFUL NOT TO LOSE PLASTIC COUPLER LOCATED BETWEEN BEATER DRIVE MOTOR SHAFT COUPLING AND BEATER DRIVE SHAFT ASSEMBLY COUPLING.**
7. Very carefully, pull old beater drive motor out of Unit. **BE CAREFUL NOT TO LOSE PLASTIC COUPLER LOCATED BETWEEN BEATER DRIVE MOTOR SHAFT COUPLING AND BEATER DRIVE SHAFT ASSEMBLY COUPLING.**
8. Note how far beater drive motor shaft protrudes inside coupling. Using allen wrench, loosen allen head setscrew in coupling, then remove coupling from motor shaft.
9. Install coupling on new beater drive motor shaft, then tighten allen head setscrew securely. **MAKE SURE COUPLING IS INSTALLED ON MOTOR SHAFT SAME DISTANCE AS NOTED IN STEP 8 preceding.**



**CAUTION: The new beater drive motor is provided with a gear box vent that is plugged with a hex-socket plug to prevent oil from leaking out of the gear box. After beater drive motor has been installed, remove hex-socket plug and install vent plug loose-shipped with beater drive motor.**

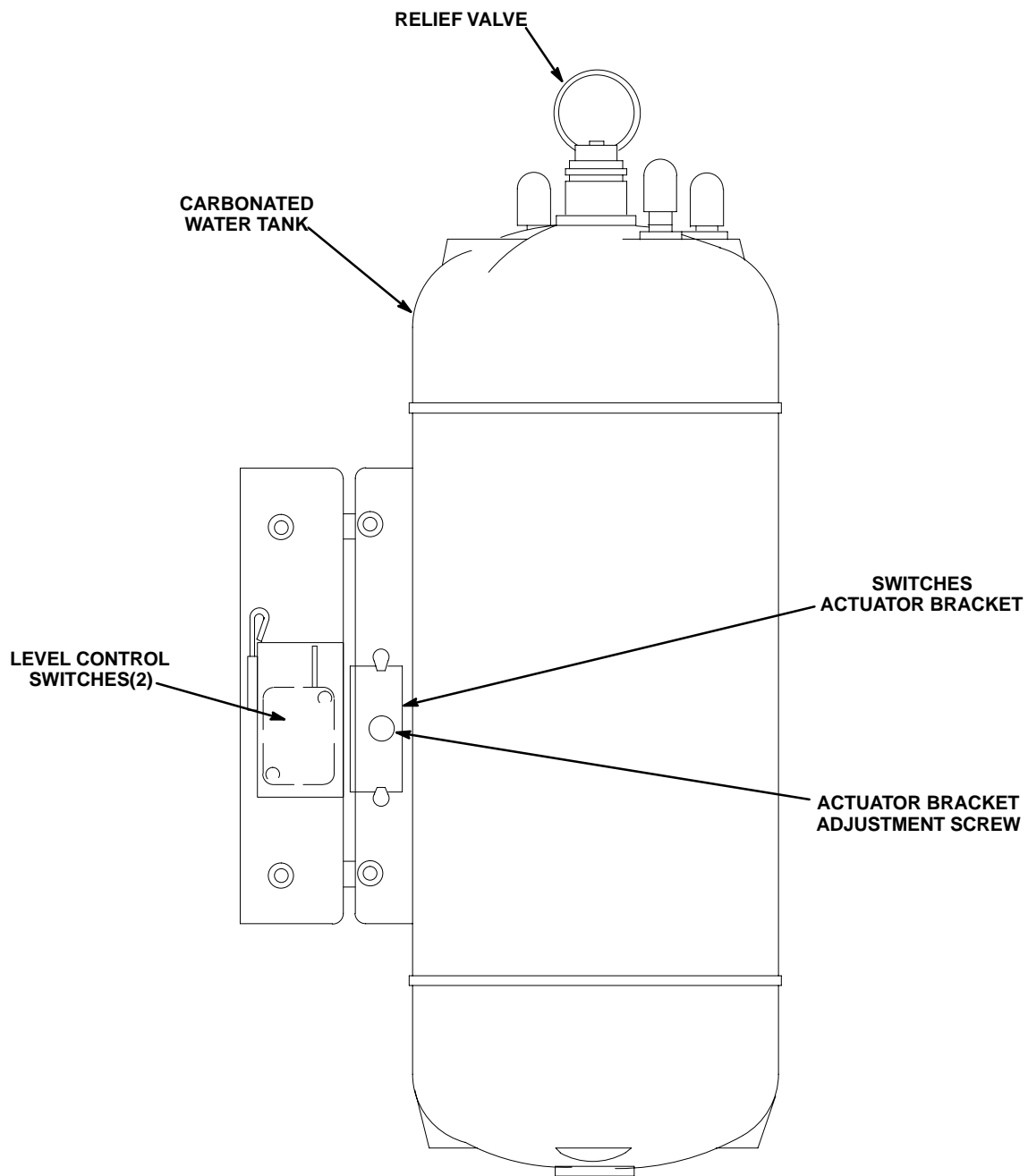
10. Determine which beater drive motor gear box vent hole will be in "up" position when motor is in installed position.
11. Remove hex-socket plug from vent hole and install loose-shipped vent plug. **DO NOT LAY MOTOR IN POSITION THAT WILL ALLOW OIL TO LEAK OUT OF GEAR BOX THROUGH VENT PLUG.**
12. Place plastic power coupler in beater drive motor shaft coupling. **TAPE POWER COUPLER TO MOTOR SHAFT COUPLING TO PREVENT COUPLER FROM FALLING OUT DURING INSTALLATION OF MOTOR IN UNIT.**
13. Very carefully, slide beater drive motor shaft through hole in Unit frame up to coupling on end of beater drive shaft assembly.
14. Engage plastic coupler, on end of beater drive motor shaft, in coupling on end of beater drive shaft assembly.
15. Secure beater drive motor to Unit frame with bolts and lockwashers.
16. Connect electrical wiring to beater drive motor terminals, then install access cover plate on motor.
17. Install back and side panels.
18. Connect electrical power to Unit.
19. Press "AUTO BLEND 1" and "AUTO BLEND 2" control switches, then press "AUTO 1" and "AUTO 2" switches to start freeze cylinders beaters and refrigeration system.

## ADJUSTING CARBONATOR TANK LIQUID LEVEL

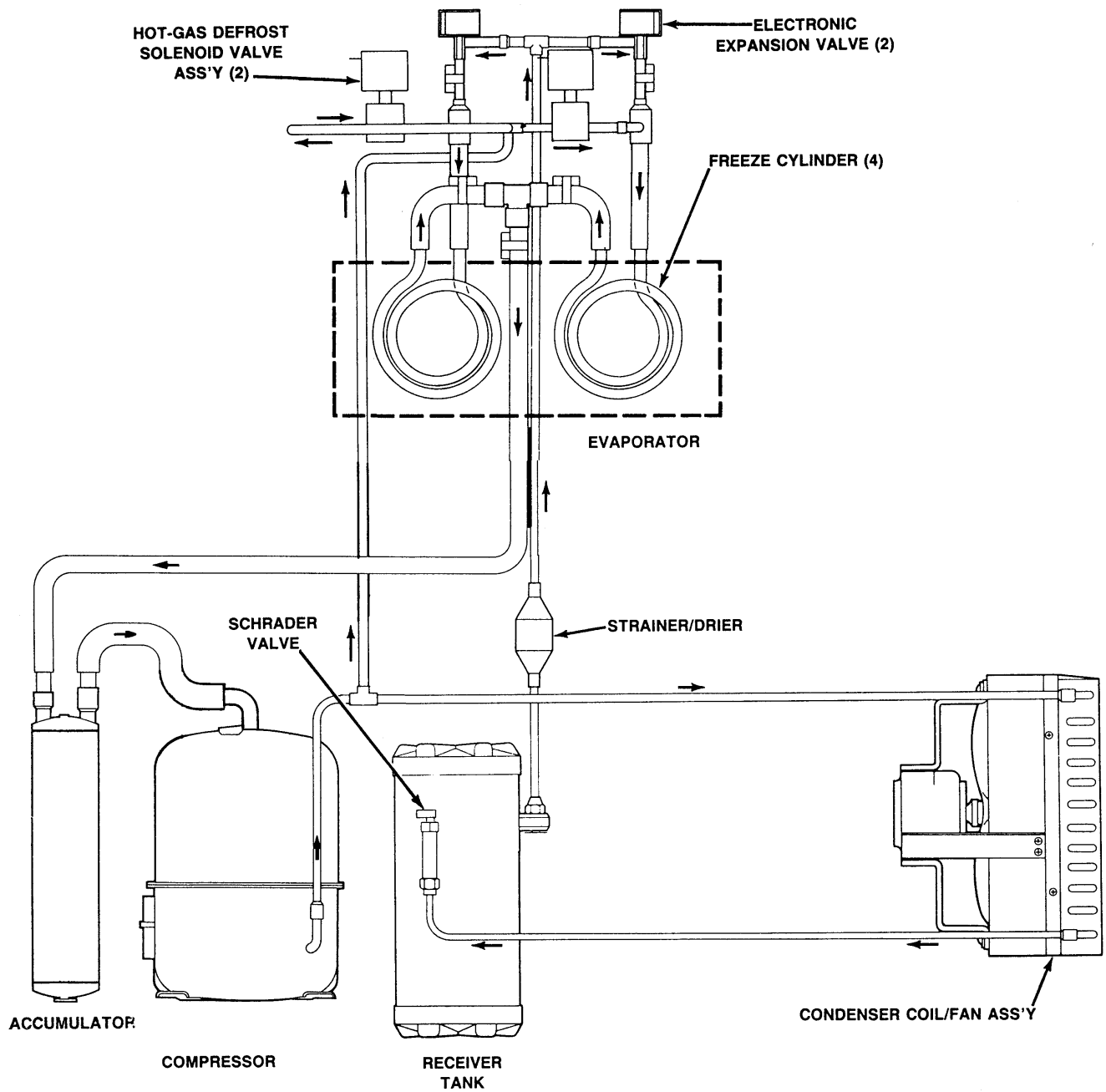
The carbonator tank liquid level (pump cut-in and cutout was adjusted at the factory and should require no further adjustment. However, if incorrect setting is suspected, check and make necessary adjustments as follows:

1. Remove Unit back and side panels as instructed for access to carbonator and carbonated water volume sample valve (see Figures 2 and 6).
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 15 ) 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 and 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.
7. To check differential; using container graduated in ounces, open carbonated water volume sample valve and dispense into container until carbonator water pump cycles on, then immediately close sample valve. Total volume dispensed (differential) should be 7 to 20-ounces.
8. Install back and side panels by reversing removal procedure.
9. Press "AUTO 1" and "AUTO 2" switches to resume normal operation.





**FIGURE 15. CARBONATOR LIQUID LEVEL CONTROL SWITCH ADJUSTMENT**



**FIGURE 16. REFRIGERATION FLOW DIAGRAM**

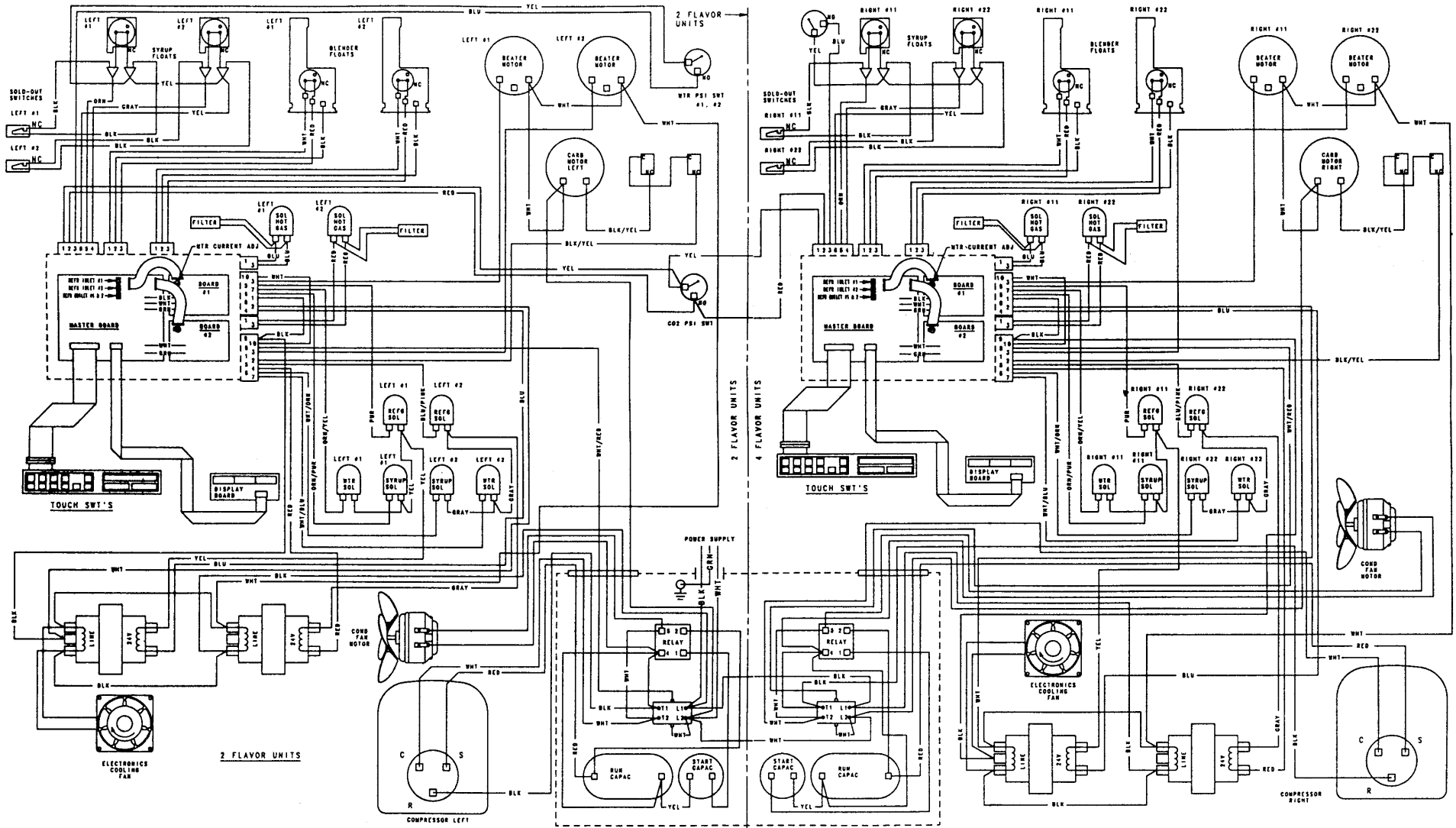


FIGURE 17. WIRING DIRGRAM

# 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<sub>2</sub> system, stop dispensing, shut off the CO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> quick disconnect from soft drink tank.
2. To connect soft drink tank into Unit syrup system.
  - A. First, connect CO<sub>2</sub> 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.
ALL CONTROL PANEL SWITCHES NOT OPERATING.	A. Electric power disconnected from Unit.	A. Restore electric power to Unit.
	B. "SECURITY SWITCH" has not been pressed to activate control panel switches.	B. Press and hold "SECURITY SWITCH" for 3-seconds to restore control panel switches to operation.
	C. "SECURITY SWITCH" inoperable (control switches deactivated).	C. Replace control panel switch module.
	D. Flat cable not properly connected to control switch module or master circuit board.	D. Properly connect flat cable to control switch module or master circuit board.

Trouble	Probable Cause	Remedy
ALL CONTROL PANEL SWITCHES NOT OPERATING. (cont'd)	E. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable.	E. Check cable for pinched or broken wire condition and repair or replace as necessary.
	F. Master circuit board not operating properly.	F. Replace master circuit board.
CONTROL PANEL SWITCHES CANNOT BE DEACTIVATED.	A. Not pressing and holding "SECURITY SWITCH" for 3-seconds to deactivate control switches.	A. Press and hold "SECURITY SWITCH" for 3-seconds to deactivate control switches.
	B. "SECURITY SWITCH" inoperable.	B. Replace control panel switch module.
PARTIAL MESSAGE OR DULL (POORLY ILLUMINATED) DISPLAY.	A. Extremely low voltage.	A. Upgrade 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.
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.

Trouble	Probable Cause	Remedy
ALL FAULT MESSAGES NOT OPERATING. (cont'd)	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 <sub>2</sub> OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. CO <sub>2</sub> supply turned off or exhausted.	A. Open CO <sub>2</sub> cylinder shutoff valve or replenish CO <sub>2</sub> supply as instructed.
	B. Primary CO <sub>2</sub> regulator set too low.	B. Adjust primary CO <sub>2</sub> regulator as instructed.
	C. Inoperable CO <sub>2</sub> pressure switch.	C. Replace CO <sub>2</sub> pressure switch.
"H <sub>2</sub> O OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. Water supply turned off or water pressure inadequate.	A. Turn on water supply or check water supply line pressure.
	B. Plugged water filter or water pump strainer screen.	B. Change water filter or clean water pump 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. Soft drink tank empty.	A. Replenish syrup supply as instructed.
"ERROR 1" OR "ERROR2" 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.
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 "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 "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.

Trouble	Probable Cause	Remedy
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 controls 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.

### 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. "AUTO BLEND 1" or "AUTO BLEND 2" switches have not been pressed.	B. Press "AUTO BLEND 1" or "AUTO BLEND 2" switch.
	C. "H <sub>2</sub> O OUT" fault message is on.	C. Restore water supply to Unit.
	D. "CO <sub>2</sub> OUT" fault message is on.	D. Replenish CO <sub>2</sub> supply as instructed.
	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 restricted pump discharge.
	G. Binding water pump (new or replacement pump only).	G. Remove water pump from motor. Rotate pump coupling shaft 180 degrees, then reinstall pump.
	H. Inoperative water pump and/or motor.	H. Replace pump and/or motor.
	I. Inoperative carbonated water tank level control switches.	I. Replace level control switches.
	J. Binding, damaged, or dirty carbonated water tank balance mechanism.	J. Clean, repair, or replace balance mechanism.
	K. Inoperative water pump and/or motor.	K. Replace water pump and/or motor.
CARBONATOR WATER PUMP WILL NOT SHUT OFF.	A. Binding, damaged, or dirty carbonated water tank balance mechanism.	A. Clean, repair, or replace balance mechanism.

Trouble	Probable Cause	Remedy
ERRATIC CARBONATOR WATER PUMP CYCLING.	A. Insufficient water supply pressure. "H <sub>2</sub> O 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.
<b>TROUBLESHOOTING DISPENSED PRODUCT</b>		
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 1.5 ± 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.
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 1.5 ± 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 <sub>2</sub> regulators not properly adjusted.	A. Adjust secondary CO <sub>2</sub> regulators as instructed.
	B. Dirty CO <sub>2</sub> supply. CO <sub>2</sub> must be clean and free of water, oil, and dirt. Water will not absorb dirty CO <sub>2</sub> gas in same way as clean gas. This can also cause off-taste problems.	B. Replace CO <sub>2</sub> 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. "AUTO BLEND 1" or "AUTO BLEND 2" switch not pressed.	A. Press "AUTO BLEND 1" or "AUTO BLEND 2" switch.
	B. Carbonator water pump not operating.	B. Check carbonator and restore to operation.
	C. Lines restricted.	C. Sanitize Unit as instructed.



Trouble	Probable Cause	Remedy
FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY.	A. Dispensed product BRIX varying because:	A.
	Syrup and/or water flow regulator sticking.	a.Clean regulator(s).
	Primary CO <sub>2</sub> regulator pressure insufficient.	b.Primary CO <sub>2</sub> 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.
<b>NOTE: DEFROST AFFECTED FREEZE CYLINDER AS INSTRUCTED.</b>		
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

### ACCESSORIES AND TOOLS

#### ACCESSORIES

1155	Installation Kit
511005000	Cup Holder
511006000	Cup Holder
511035000	CO <sub>2</sub> Changeover Kit
1040	Seal Kit, Rear O-Ring Housing and O-Rings

#### GENERIC FLAVOR TABS

1085	Cola
1086	Cherry
1087	Orange
1088	Grape
1089	Lemon-Lime
1090	Strawberry
1091	Banana

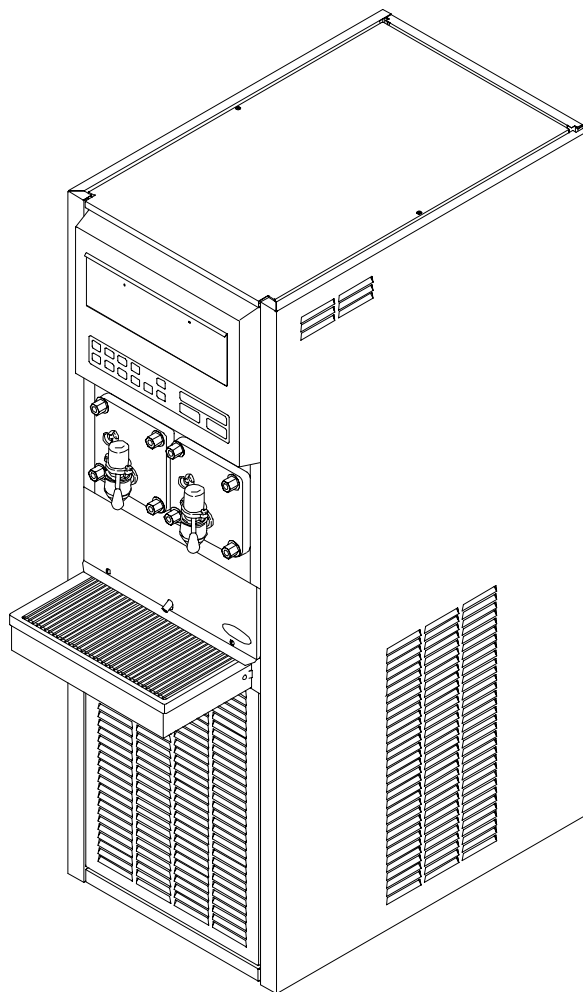
#### SERVICE TOOLS

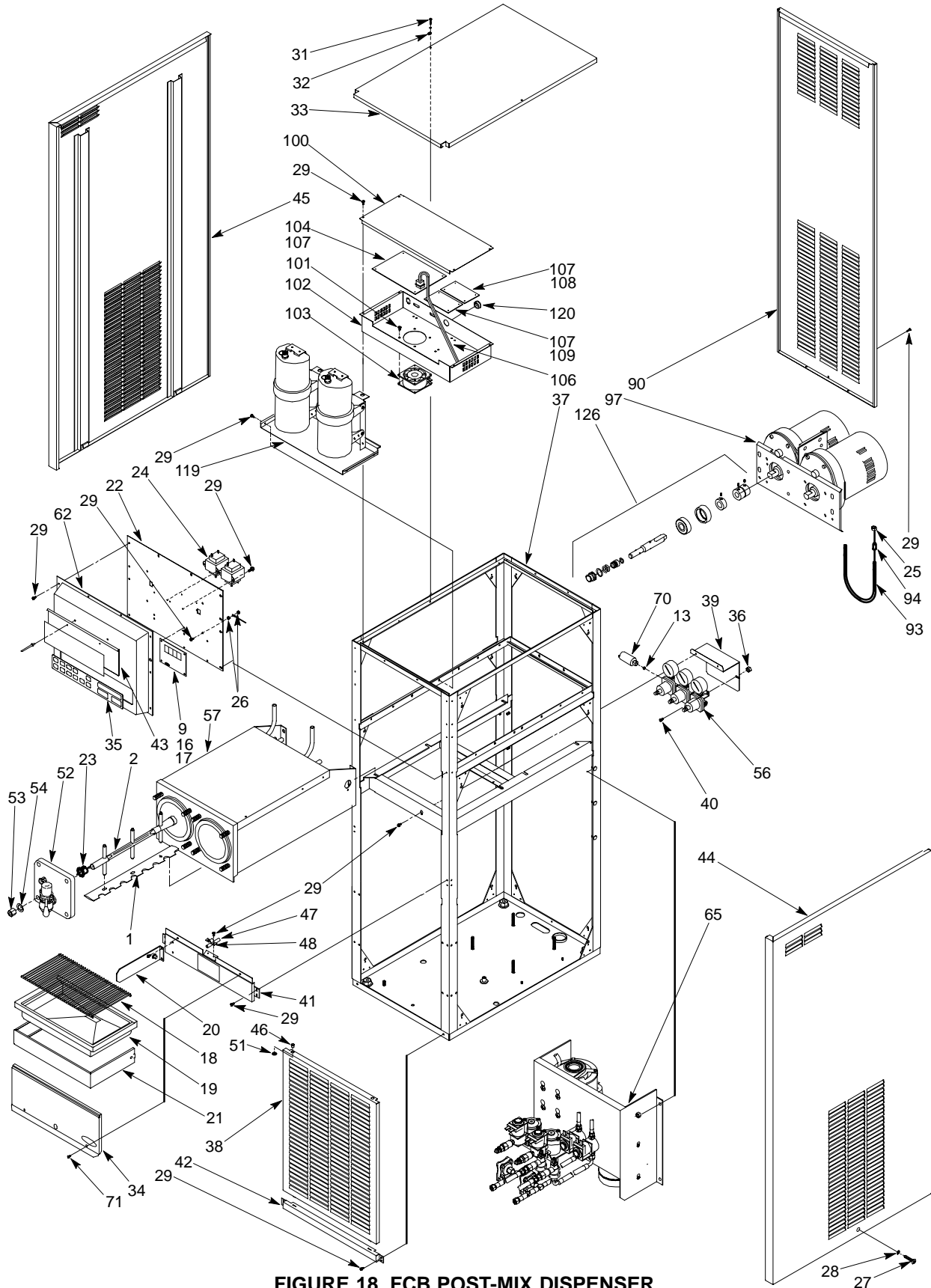
151689000	Spanner Wrench, Flow Regulator
281884000	3-gallon Sanitizing Tank
322859000	Spanner Wrench, Dispensing Valve
511004000	Refractometer, 0-30 Scale
322063000	Shaft Seal Assembly Puller
0726	Alignment Tool Kit, Beater Drive Shaft Ass'y

# FCB (SOLID-STATE) POST-MIX DISPENSER TWO-FLAVOR/HOT-GAS DEFROST WITH V3+ ELECTRONICS

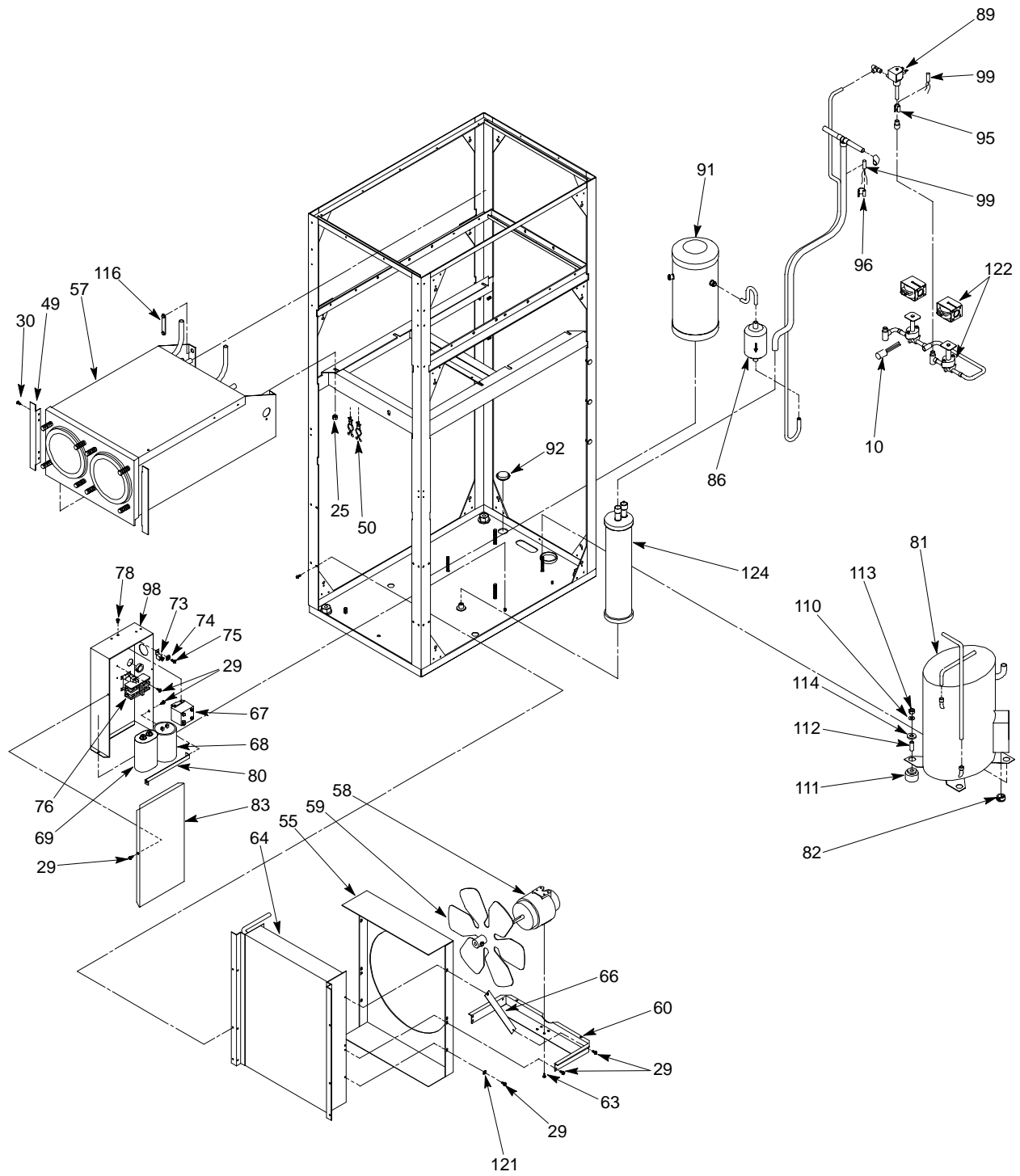
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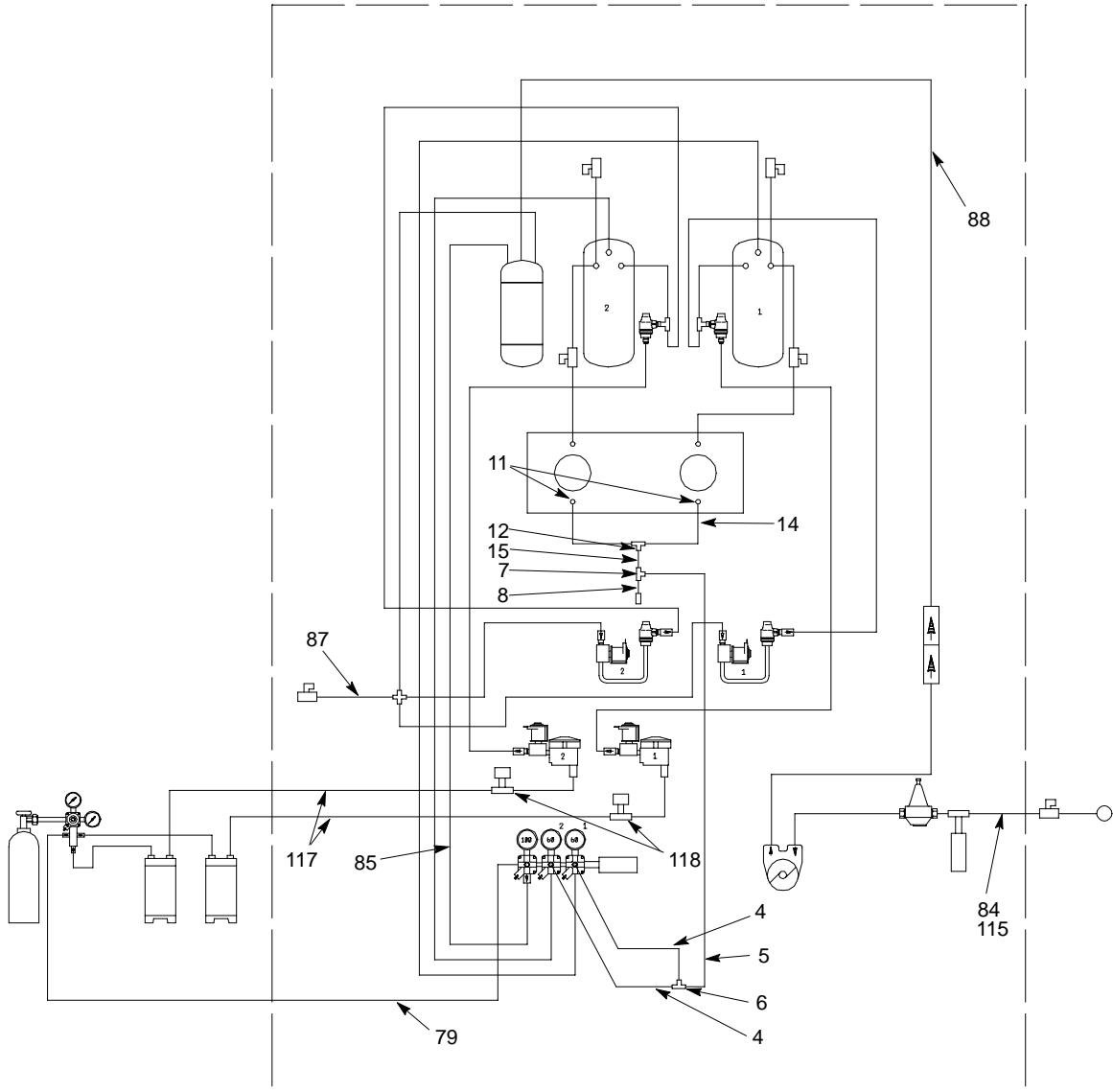




**FIGURE 18. FCB POST-MIX DISPENSER**



**FIGURE 19. FCB POST-MIX DISPENSER (CONT'D)**



**FIGURE 20. FCB FLOW DIAGRAM**

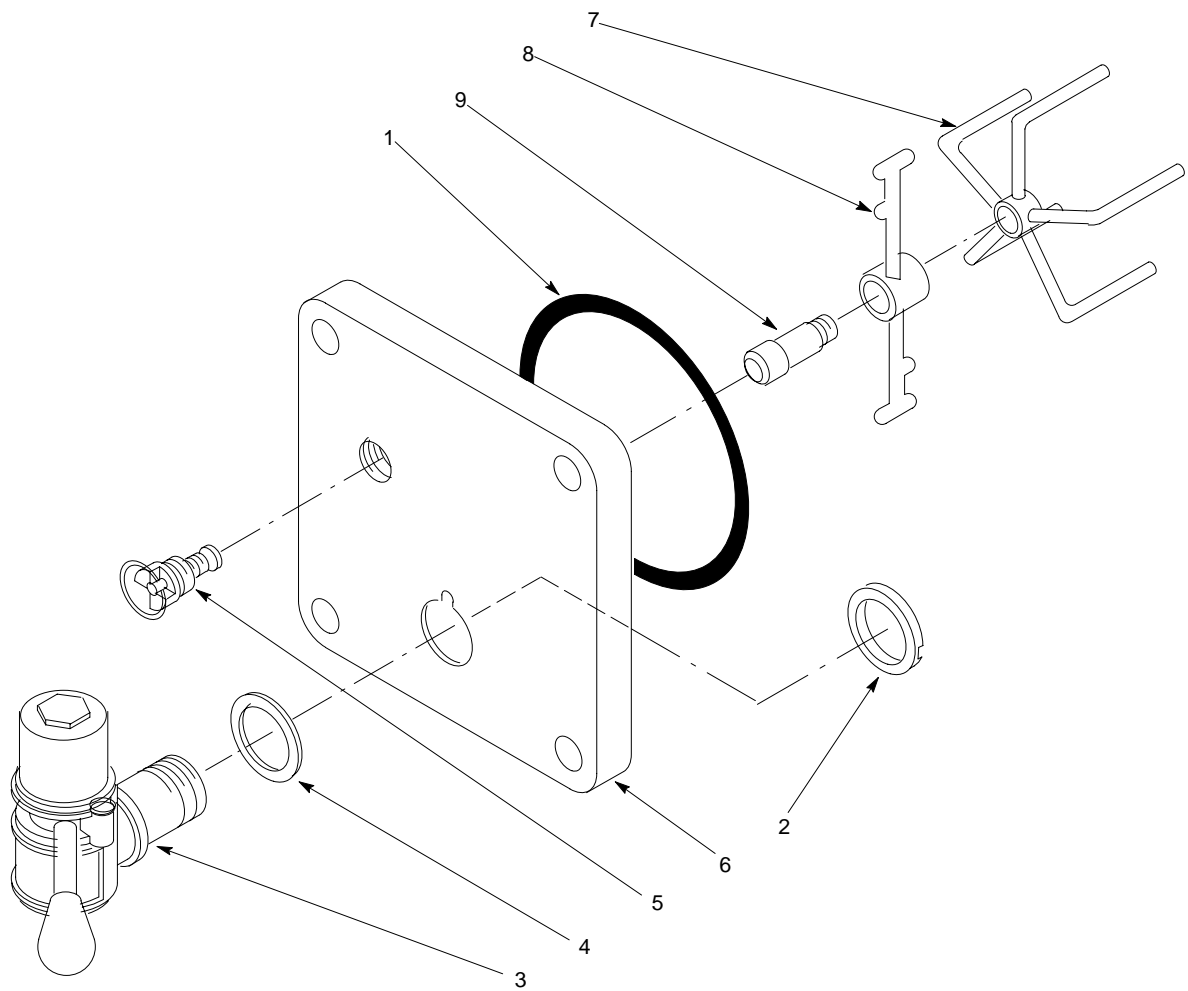
## FCB POST-MIX DISPENSER

Item No.	Part No.	Name
1	325457000	Blade, Scraper
2	2353	Body, Beater
3	326002000	Tube Kit, Drain Tube (Not Shown; See Figure)
4	324218000	Tube, .156 I.D. By 3-In. Long, CO <sub>2</sub> Regulator to Tee
	324219000	Tube, .156 I.D. By 1-In. Long, CO <sub>2</sub> Regulator to Tee
5	324220000	Tube, .156 I.D. By 11-In. Long, Regulator Tee to Drain Tee
6	317528000	Fitting, Tee, 1/8-Barb
7	300393000	Fitting, Tee, 3/16-Barb By 3/8-Barb
8	324221000	Tube, .312 I.D. By 6-In. Long, Drain
9	326079000	Cable Ribbon, Display Board
10	1317	Filter, Solenoid
11	311908000	Clamp, .437 O.D. Tube
12	325668000	Fitting, Tee, 5/16-Barb
13	178025100	Tapered Gasket, White
14	320969000	Tube, .312 I.D. By 8-In. Long, Drain
15	187462000	Tube, .312 I.D. By 20-In. Long, Drain
16	325957000	Support, P.C. Board
17	326078000	P.C. Board Display
18	325982000	Cup Rest
19	325983039	Drip Tray
20	325986000	Support, Drip Tray
21	325984000	Frame, Drip Tray
22	326151073	Plate, Backup, Display
23	2392	Bushing, Split
24	319739000	Transformer, 240V. 50/60HZ.
25	189429000	Hex Nut, 1/4-20
26	200498003	Hex Nut, No. 8-32
27	188206000	Thread Rolling Screw, Phil Truss Hd., No. 10-24 By 3/4-In. Long
28	343304000	Washer, .204 I.D.
29	319941000	Thread Rolling Screw, Hex Washer Hd., No. 8-32 By 3/8-In. long
30	310461000	Thread Rolling Screw, Phil Pan Hd., No. 8-32 By 3/8-In. Long
31	320106000	Thread Rolling Screw, Phil Pan Hd., No. 6-32 By 1-In. Long
32	322967000	Washer, .142 I.D.
33	325721068	Panel, Top

Item No.	Part No.	Name
34	3004	Access Door (Domestic)
	325726000	Access Door (Export)
35	325962040	Touch Switch
36	398024603	Hex Nut, No. 10-24
37	3062	Frame
38	3007	Panel, Lower Front (Domestic)
	0161	Panel, Lower Front (Export)
39	325725000	Bracket, Regulator
40	186770000	Machine Screw, Phil Rd. Hd., No. 10-24 By 5/8-In. Long
41	3008	Panel, Drip Tray (Domestic)
	325733069	Panel, Drip Tray (Export)
42	325731068	Trim, Lower Front
43	325981069	Holder, Flavor Tab
44	0157	Panel, Right-Hand Side
45	0156	Panel, Left-Hand Side
46	321503000	Catch Bullet
47	320754000	Tube, Drain, 2-1/4-In. Long, Stainless Steel
48	320776000	Strap, Tube
49	325701000	Extension, Foam Pack
50	0831	Retainer, Syrup Lines
51	316753000	Push-on Nut
52	326106000	Door Ass'y, Freeze Cylinder (See Figure 21)
53	320553001	Hex Nut, 7/16-14
54	320916000	Washer, .450 I.D.
55	326128000	Shroud, Condenser
56	326097000	Regulator Ass'y, CO <sub>2</sub> (See Figure 23)
57	325467011	Foam Pack
58	319357	Motor, Condenser Fan, 230V. 1550RPM
59	319358000	Fan, Condenser Motor, 6-Blade
60	325711011	Bracket, Motor
61	2340	Wire Harness, Input (Not Shown)
62	325740039	Housing, Display
63	186154	Machine Screw, Phil Pan Hd., No. 8-36 By 3/8-In. Long
64	2104	Condenser
65		Carbonator Ass'y (See Figure 24)
66	326090000	Strap, Fan Motor

Item No.	Part No.	Name
67	325940000	Relay, Start, Compressor, 230V. 60HZ. 35 Amp (Domestic)
	197466000	Relay, Start, Compressor, 230V. 50HZ. 35 Amp (Export)
68	325938000	Capacitor, Start, 250V. 60HZ
69	325939000	Capacitor, Run, 440V. 60HZ (Domestic)
	2162	Capacitor, Run, 370V. 50/60HZ (Export)
70	325776000	Pressure Switch, CO <sub>2</sub>
71	150918000	Machine Screw, Sl. Truss Hd., No. 8-32 By 3/8-In. Long
72	2341	Wire Harness, Output (Not Shown)
73	325644000	Lug, Ground
74	325145000	Washer, .205 I.D.
75	325069000	Machine Screw, Sl. Truss Hd., No. 10-24 By 1/2-In. Long
76	320620000	Contact, 208/240V. 50/60HZ
77	326016068	Panel, Offset, Back (Export; Not Shown)
78	187552000	Machine Screw, Phil Rd. Hd., No. 8-32 By 1/4-In. Long
79	174061196	Tube Ass'y, .265 I.D. By 96-In. Long, CO <sub>2</sub> Cylinder to CO <sub>2</sub> Regulator
80	325956000	Strap, Capacitor
81	2237	Compressor, 2H.P. 230V. 60HZ (Domestic)
	2239	Compressor, 2H.P. 230V. 50HZ (Export)
82	313802000	Bushing, .875 Dia.
83	325635000	Cover, Control Box
84	311304000	Tapered Gasket, Black
85	325558000	Tube Ass'y, .250 I.D. By 40-In. Long, CO <sub>2</sub> Regulator to Carbonator
86	319871000	Dryer
87	326131000	Tube Ass'y, With Shutoff Valve, Carb Water
88	318045	Tube Ass'y, .250 I.D. By 18-In. Long, Water Pump to Carbonator
89	326071000	Expansion Valve, Refrigeration
90	0163	Panel, Back (Domestic)
	0752	Panel, Back (Export)
91	325621011	Receiver
92	321818000	Button Plug, 1-1/8 Dia.

Item No.	Part No.	Name
93	325619000	Support, Motor
94	325620000	Spacer
95	309338011	Clip, Sensor Expansion Valve
96	309338012	Clip, Sensor, Thermostat
97		Drive Motor Ass'y (See Figure)
98	325738000	Control Box, Lower
99	326073011	Thermostat Sensor
100	325767000	Cover, Control Box, Upper
101	322251000	Thread Rolling Screw, Phil Pan Hd., No. 10-24 By 3/8-In. Long
102	324184000	Control Box, Upper
103	0150	Fan, 230V. 9-Watt
104	324136000	Board, P.C.
105	1020	Wire Harness, Circuit Board (Not Shown)
106	325998000	Cable, Circuit Board
107	325925000	Support, Board
108	326076000	Board, Circuit, Motor No. 1
109	326077000	Board, Circuit, Motor No. 2
110	186148000	Washer, .319 I.D.
111	325529000	Grommet, Compressor
112	325530000	Spacer, Compressor
113	186146000	Hex Nut, 5/16-18
114	318418000	Washer, .312 I.D.
115	176272396	Tube Ass'y, .375 I.D. By 96-In. Long, Water Inlet
116	320604000	Twin Nut, 5/16-18
117	326113000	Tube Ass'y, Syrup
118	326111000	Soldout Switch
119		Blender Ass'y (See Figure)
120	320389000	Bushing, .875 Dia.
121	188346000	Washer, .191 I.D.
122	325579000	Solenoid, 208/240V. 50/60HZ
123	2342	Wire Harness, Upper Control Box (Not Shown)
124	325577010	Accumulator
125	309524011	Service Cord (Not Shown)
126		Drive Shaft Ass'y and Coupler (See Figure)

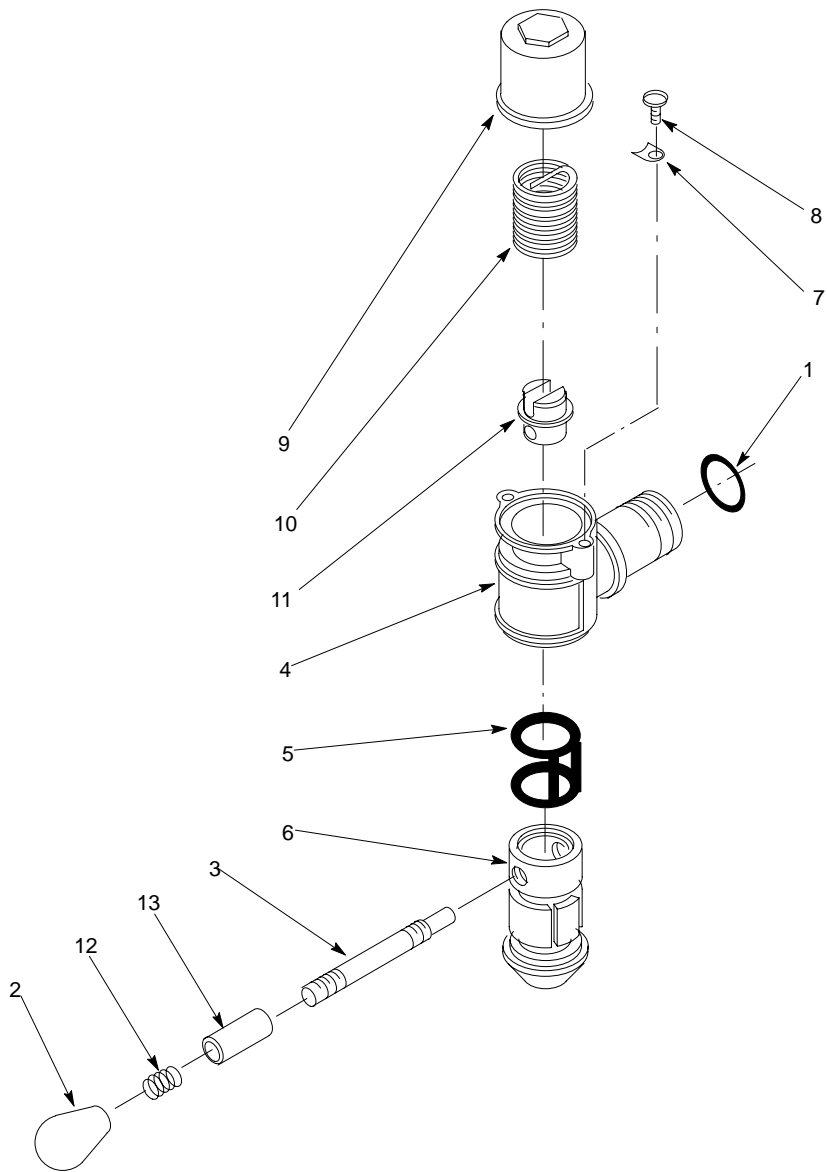


**FIGURE 21. FACEPLATE ASSEMBLY**

Item No.	Part No.	Name
	326106000	Door, Freeze Cylinder Ass'y
1	320678000	O-Ring, 4.60 I.D. By .210 C.S.
2	321652000	Shank Nut
3	1557	Valve Head Ass'y (See Figure 22)
4	325936000	Spacer

Item No.	Part No.	Name
5	325954088	Relief Valve Ass'y
6	325918000	Door, Freeze Cylinder
7	321269001	Spinner
8	322441000	Sensor
9	326109000	Shaft

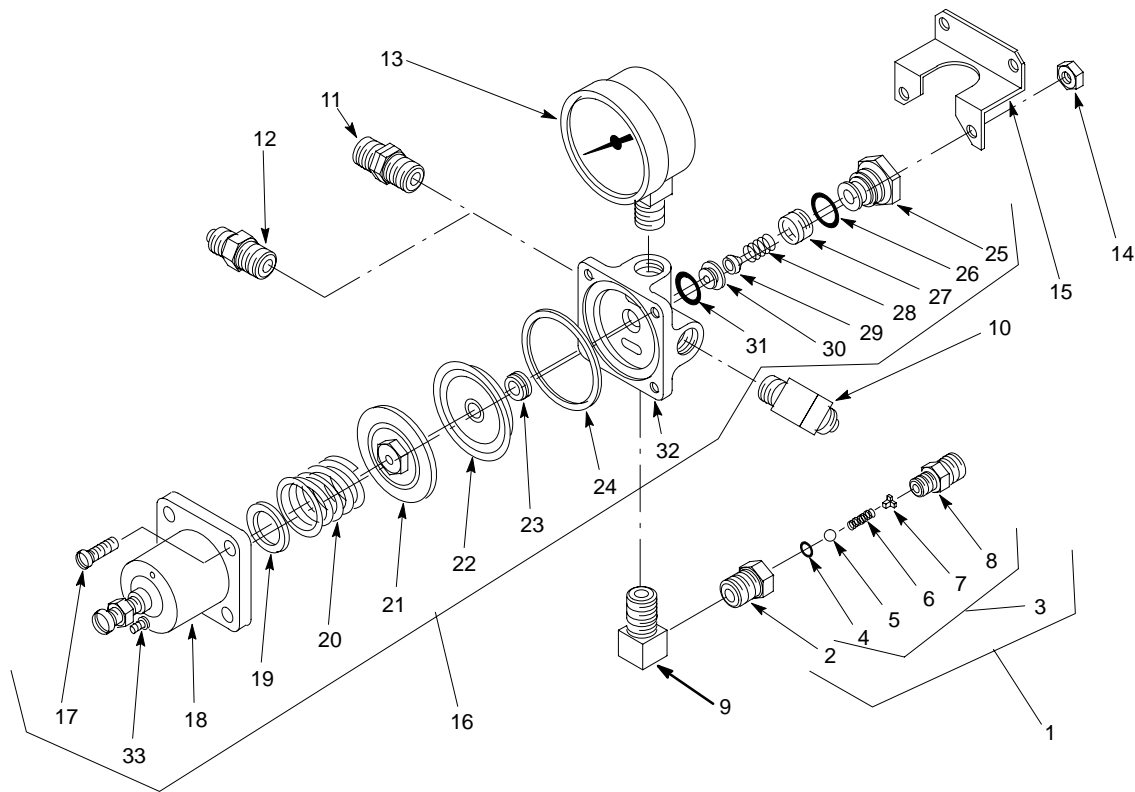




**FIGURE 22. DISPENSING VALVE ASSEMBLY**

Item No.	Part No.	Name
	1557	Dispensing Valve Ass'y
1	321653000	O-Ring, .862 I.D. By .103 C.S.
2	1553	Knob
3	321651000	Lever, Knob
4	1556	Body and Shank
5	321514000	O-Ring, Caged, .562 I.D. By .210 C.S.
6	1554	Valve

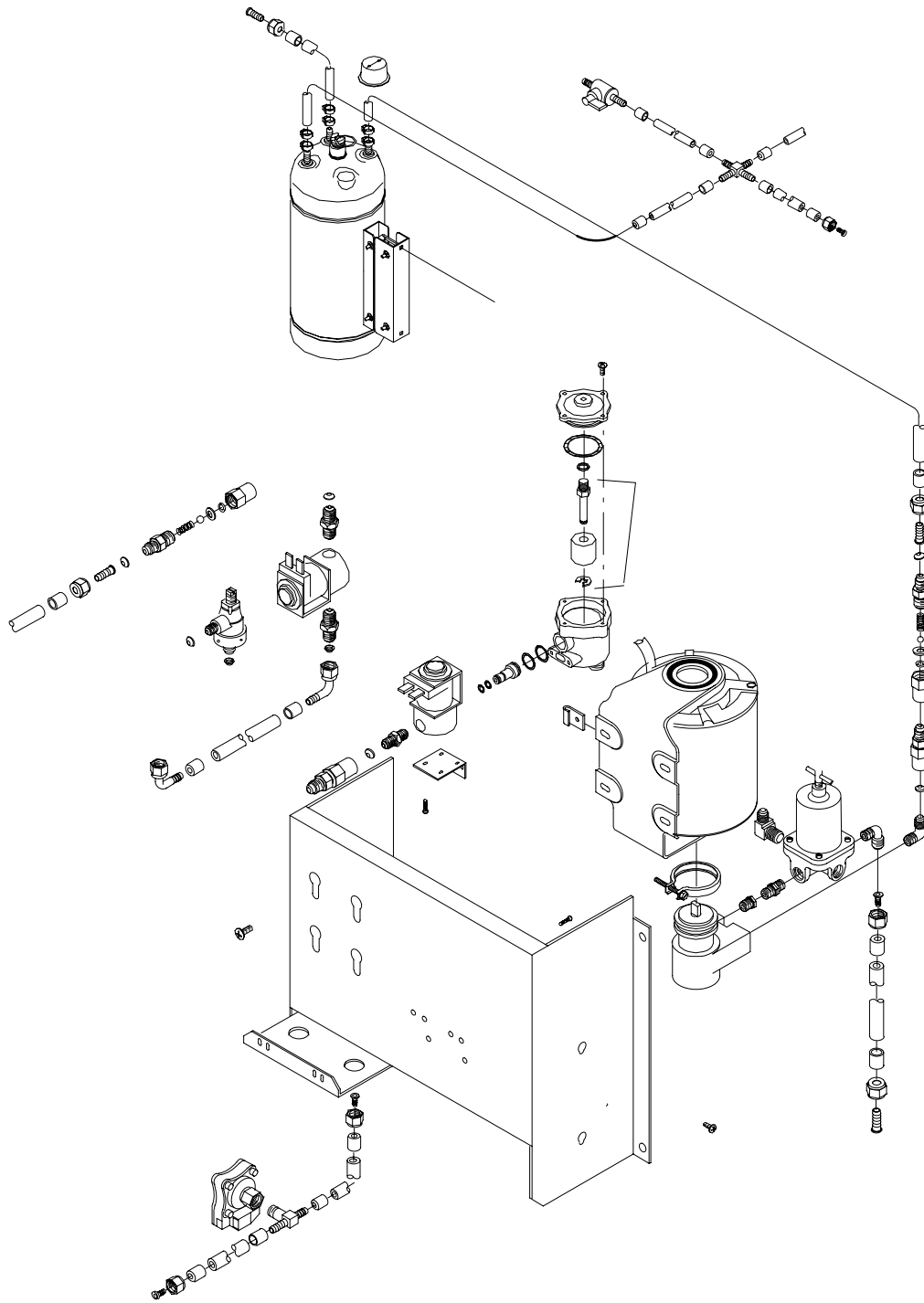
Item No.	Part No.	Name
7	325647000	Plate
8	317784000	Thread Cutting Screw, Phil Truss Hd., Stainless Steel, No. 8-32 By 3/8-In. Long
9	1576	Housing
10	325305000	Spring
11	1575	Fitting
12	1544	Spring
13	1543	Shaft Release



**FIGURE 23. CO<sub>2</sub> REGULATOR ASSEMBLY**

Item No.	Part No.	Name
	326097000	CO <sub>2</sub> Regulator Ass'y, and Bracket
1	183301100	Check Valve Ass'y With Adaptor (Includes 2-8)
2	183300001	Adaptor
3	183320100	Check Valve Ass'y (Includes 4-8)
4	183294000	Quad Ring, .145 I.D. By .070 C.S.
5	183296000	Ball
6	183297000	Spring
7	183298000	Retainer
8	183295100	Body
9	183068000	Elbow, 1/4-NPT By 1/4-NPTF
10	187485000	Elbow, 1/4-NPT By 7/16-20
11	183047000	Fitting, 1/4-NPT
12	183061000	Fitting, 1/4-NPT By 7/16-20
13	183286000	Gage, 100 PSI
	183287000	Gage, 60 PSI
14	321811000	Hex Nut, Keps, No. 10-32
15	183317000	Bracket, Regulator
16	183412000	CO <sub>2</sub> Secondary Regulator Ass'y, 100 PSI, Gold (Includes 17-32)
	183449000	CO <sub>2</sub> Secondary Regulator Ass'y, 60 PSI, Orange (Includes 17-32)

Item No.	Part No.	Name
17	183040000	Machine Screw, Phil Fil Hd., No. 10-32 By 7/8-In. Long
18	183233059	Cover Kit (Includes Non-Removable Adjusting Screw)
19	183021000	Retainer, Spring
20	183020000	Adjusting Spring, 100 PSI, Gold
	315424000	Adjusting Spring, 60 PSI, Orange
21	130174000	Diaphragm Ass'y
22	183011047	Baffle
23	130167000	Guide
24	183010000	Gasket
25	183009007	Retainer, Seat
26	183008000	O-Ring, .489 I.D. By .070 C.S.
27	183007000	Filter Screen
28	183006000	Spring, Poppet
29	130170000	Valve, Poppet
30	130168000	Reducing Valve Seat
31	183003000	Gasket, Seal
32	183001015	Body
33	324211000	Adapter Fitting, 1/16-27-NPT By 3/16



**FIGURE 24. CARBONATOR ASSEMBLY**

Item No.	Part No.	Name
		Carbonator and Motor Ass'y
1	326131000	Tube Ass'y, CO <sub>2</sub> Water Outlet (Includes 2-10)
2	325012000	Shutoff Valve
3	176001000	Ferrule, For .395 O.D. Tube, 40 Jaw
4	174103000	Tube, .250 I.D. By 34-In. Long
5	174103001	Tube, .250 I.D. By 13-In. Long
6	174103000	Tube, .250 I.D. By 6-In. Long

Item No.	Part No.	Name
7	174103000	Tube, .250 I.D. By 4-In. Long
8	770104000	Nipple, For .250 I.D. Tube
9	176017000	Swivel Nut, 7/16-20
10	770602000	Fitting, Cross, 1/4-Barb
11	325558000	Tube Ass'y (Includes 12-15)
12	174103001	Tube, .250 I.D. By 30-In. Long
13	176001000	Ferrule, For .395 O.D. Tube, 40 Jaw

Item No.	Part No.	Name
14	770104	Nipple, For .250 I.D. Tube
15	176017000	Swivel Nut, 7/16-20
16	318045000	Tube Ass'y (Includes 17-20)
17	174103001	Tube, .250 I.D. By 12-3/4-In. Long
18	176001000	Ferrule, For .395 O.D. Tube, 40 Jaw
19	770104	Nipple, For .250 I.D. Tube
20	176017000	Swivel Nut, 7/16-20
21	309854000	Clamp, For .395 O.D. Tube
22	320767000	Machine Screw, Phil Pan Hd., No. 10-24 By 3/8-I. Long
23	326136000	Carbonator Tank Ass'y (See Figure
24	178025100	Tapered Gasket, White
25	77075	Fitting, 1/4-NPT By 7/16-20
26	320734000	Machine Screw, Phil Pan Hd., No. 6-32 By 3/8-In. Long
27	343487000	Machine Screw, Phil Pan Hd., No. 8-32 By 1/2-In. Long
28	325742000	Solenoid Valve, Carb Water
29	326130000	Tube Ass'y (Includes 30-32)
30	770401	Swivel Elbow, 7/16-20
31	176000000	Ferrule, For .465 O.D. Tube
32	174478000	Tube, .265 I.D. By 3-In. Long
33	310757000	Flow Regulator, Water (See Figure
34	315927001	Bracket, Solenoid
35	324227000	Connector, Solenoid
36	183008000	O-Ring, .489 I.D. By .070 C.S.
37	315916000	Cover, Float Switch
38	315925000	O-Ring, 1.609 I.D. By .139 C.S.
39	315931000	O-Ring, .364 I.D. By .070 C.S.
40	325170000	Float Switch Ass'y (Includes 41-43)
41	325289000	Retaining Ring
42	325148000	Float
43	325147000	Body, Switch
44	311764001	Single Check Valve Ass'y (Includes 45-50)
45	317965000	Retainer
46	312196000	Spring
47	312419000	Ball, .312 Dia.
48	312415000	Washer, .300 I.D.
49	312418000	Quad Ring, .239 I.D. By .070 C.S.
50	317963000	Receptacle
51	318976000	Machine Screw, Sl. Hex Washer Hd., 1/4-20 By 1/2-In. Long

Item No.	Part No.	Name
52	311855000	J-Nut, 1/4-20
53	176272396	Tube Ass'y (Includes 54-57)
54	174292000	Tube, .375 I.D. By 96-In. Long
55	176204000	Ferrule, For .610 O.D. Tube, 61 Jaw
56	176205000	Nipple, For .375 I.D. Tube
57	311242000	Swivel Nut, 5/8-18
58	325777000	Pressure Switch, Water
59	325753000	Motor and pump Ass'y (Domestic; Includes 60-77)
	197473000	Motor and Pump Ass'y (Export; Includes 60-77)
60	311765001	Double Check Valve (Includes 61-67)
61	311764001	Single Check Valve Ass'y (Includes 62-67)
62	317965000	Retainer
63	312196000	Spring
64	312419000	Ball, .312 Dia.
65	312415000	Washer, .300 I.D.
66	312418000	Quad Ring, .239 I.D. By .070 C.S.
67	317963000	Receptacle
68	178025100	Tapered Gasket, White
69	187502	Ebow, 3/8-NPT By 7/16-20
70	187485	Fitting, Elbow, 1/4-MPT By 7/16-20
71	311738	Fitting, Elbow, 1/4-MPT By 5/8-18
72	0784	Regulator, Water Pressure, 300-PSI
73	183047000	Fitting, 1/4-NPT By 3/8-MPT
74	311284000	Fitting, 1/4-FPT By 3/8-MPT
75	187483000	Clamp, 2-In. Dia.
76	312996000	Pump, Water, 90-GPH
77	320626000	Motor, 1/4HP 230V 60HZ/220V 50HZ
	199020000	Motor, 1/4HP 230V 50HZ
78	317974000	Deflector, Relief Valve
79	326111000	Sold-Out Switch
80	326113000	Tube Ass'y, Syrup Inlet (Includes 81-
81	770104	Nipple, For .265 I.D. Tube
82	176017000	Swivel Nut, 7/16-20
83	176000000	Ferrule, For .465 O.D. Tube, 47 Jaw
84	174478000	Tube, .265 I.D. By 92-In. Long
85	176271000	Nipple, For .265 O.D. Tube
86	311242000	Swivel Nut, 5/8-18
87	174478000	Tube, .265 I.D. By 3-In. Long
88	770698	Fitting, Tee, 1/4-Barb By 1/4-MPT

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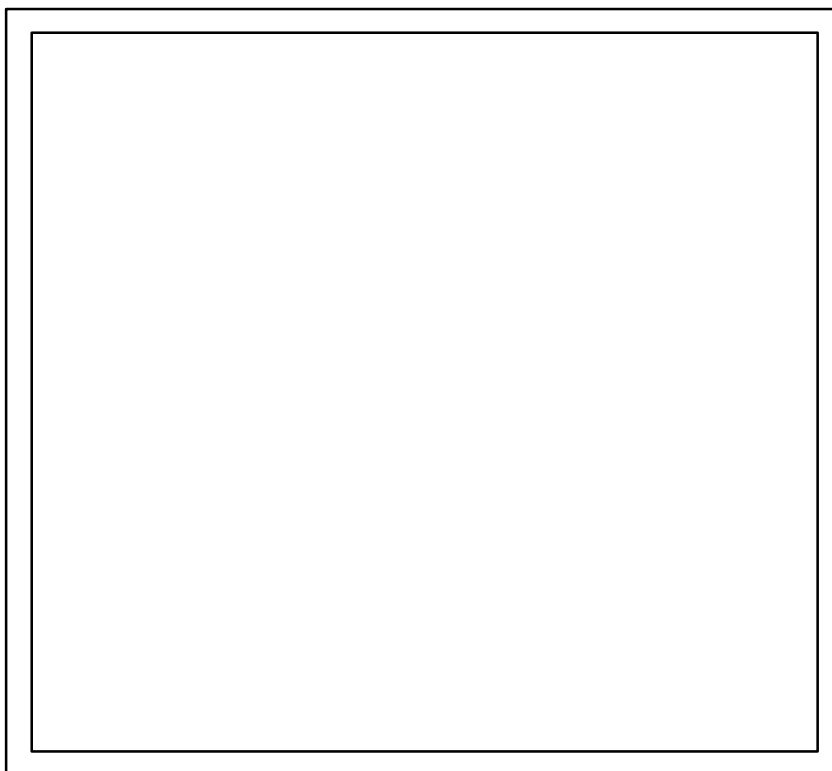
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