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Installation/Service Manual

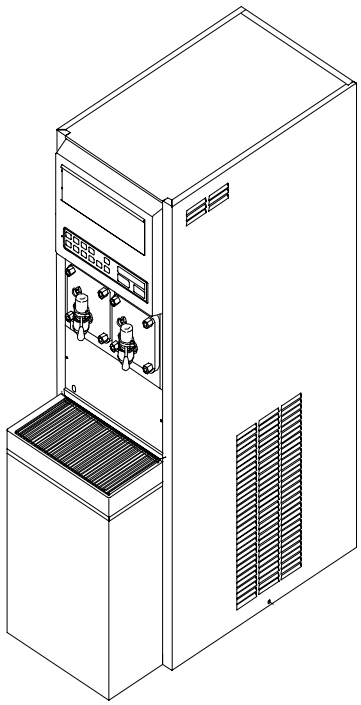
FCB 3 H.P. POST-MIX DISPENSER
TWO-FLAVOR W/HOT-GAS DEFROST AND V3+ FEATURES

IMPORTANT:

TO THE INSTALLER.

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

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



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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.

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

GENERAL DESCRIPTION

This section gives the description, theory of operation, and design data for the FCB 3 H.P. Two-Flavor Post-Mix Dispenser with Hot-Gas Defrost and V3+ Features (hereafter referred to as a Unit).

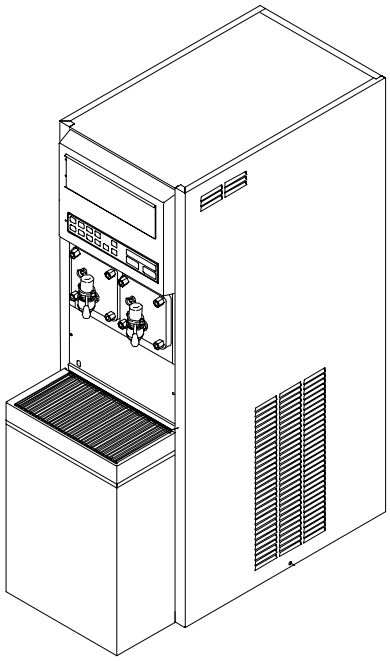

FIGURE 1. FCB DISPENSER

UNIT DESCRIPTION

The Two-Flavor FCB Dispenser (see Figure 1) consists basically of two freeze cylinders each containing an internal beater driven by an electric motor, one refrigeration system with a 3-horsepower compressor, two carbonated water tanks which feed 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.

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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.

Table 1. Design Data	
Unit Part Number:	
Two-Flavor 3 H.P. (Air--Cooled)	4166200000
Two-Flavor 3 H.P. (Water-Cooled)	4166220000
Overall Dimensions:	
Height	60-1/2 inches
Width	19-1/4 inches
Depth (W/O Drip Tray)	32-1/2 inches
Depth W/Drip Tray	38 inches
Shipping Weight (approx)	466 pounds
Compressor Horsepower	3 H.P.
Refrigeration System:	
Refrigerant Type and Charge	See Unit Nameplate
Ambient Operating Temp.	40° F to 100° F
Electrical Requirements:	
Operating Voltage	See Unit Nameplate
Current Draw	See Unit Nameplate

REFRIGERATION SYSTEMS

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

"AIR-COOLED"

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

"WATER-COOLED"

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

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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.

Note: The following paragraph describes the theory of operation for the Two-Flavor FCB Dispenser (see Figure 2).

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

DEFROST SYSTEMS

The 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 the ‘‘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 the end of the manual defrost cycle, the Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing the ‘‘CANCEL DEFROST’’ switch.

AUTOMATIC DEFROST SYSTEM

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

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“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.

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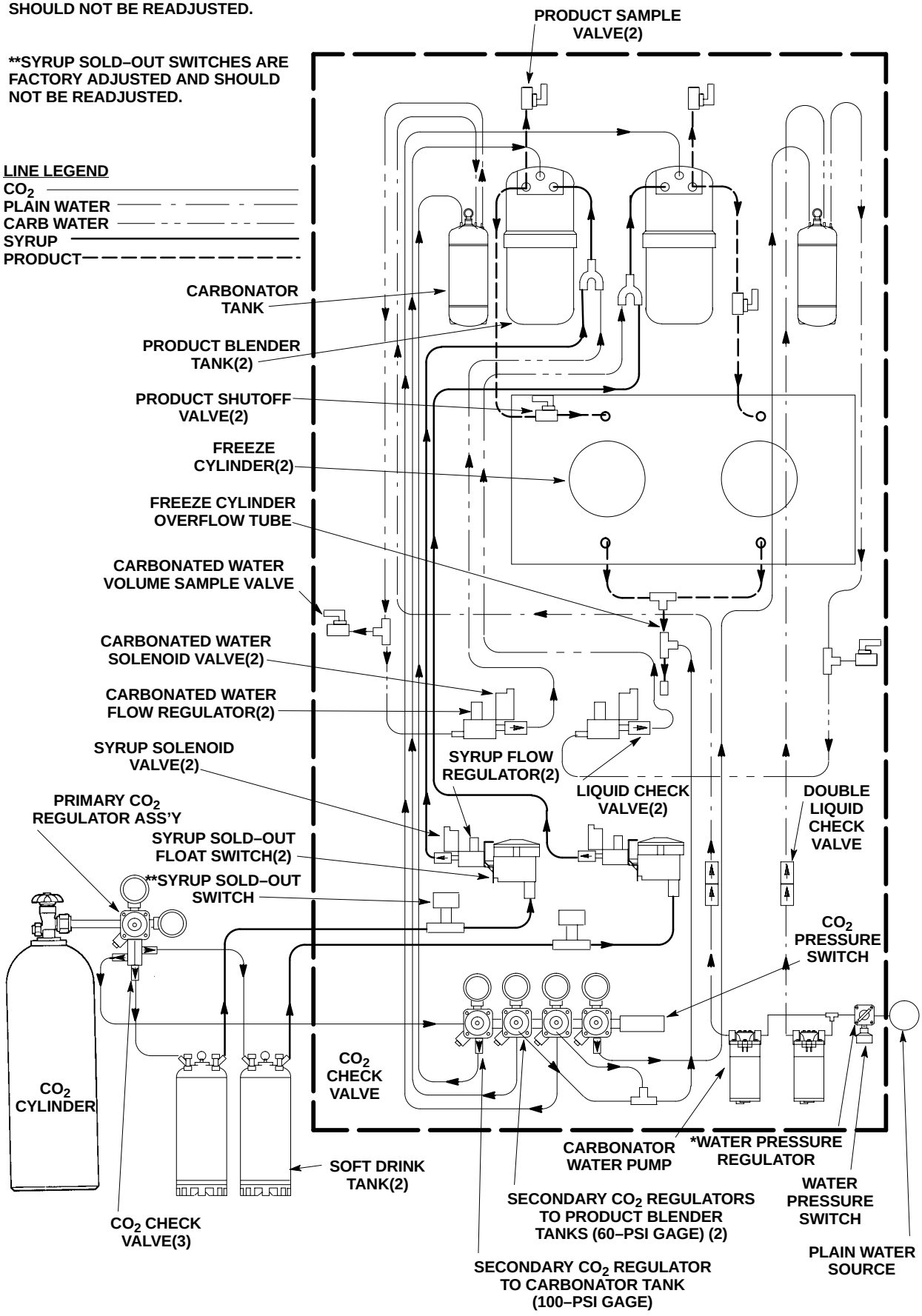

FIGURE 2. FLOW DIAGRAM

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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 4)

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 Cornelius Inc.

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

IDENTIFICATION OF LOOSE-SHIPPED PARTS

1. TAPERED GASKETS, WHITE (item 1) are used to seal connections when connecting Unit product inlet lines to product tanks and connecting Unit CO_2 inlet line to CO_2 source.
2. SPANNER WRENCH, DISPENSING VALVE (item 2) is used to remove shank nuts securing dispensing valves to faceplates.
3. CLEANING BRUSH (item 3) is used to clean faceplate relief valves passages.

Table 2. Loose-Shipped Parts

Item No.	Part No.	Name	Qty.
1	178025100	Tapered Gasket, White	4
2	322859000	Spanner Wrench, Dispensing Valve	1
3	325216000	Cleaning Brush	1
4	311304000	Tapered Gasket, Black	3
5	2899	Wrench, Rear Seal Housing	1
6	3810	Tool, Drive/Coupler Adjustment Gauge	1
7	325018000	Caster Kit, 4-inch diameter Casters	1
8	XXXX	Sound Baffle/Drip Tray Ass'y (see **NOTE**)	1

Note: All parts for the Sound Baffle/Drip Tray Assembly are shipped with the Dispenser in a separate box and must be installed on the Dispenser. Refer to Installation Instructions provided with the Sound Baffle/Drip Tray Assembly for installation procedure.

4. TAPERED GASKET, BLACK (item 4) is used to seal connection when connecting plain water source line to Unit water inlet line.
5. WRENCH, REAR SEAL HOUSING (item 5) used to remove the drive shaft/seal assembly from inside the freeze cylinder.
6. TOOL, DRIVE/COUPLER ADJUSTMENT GAUGE (item 6) is used for servicing the beater motor drive shaft/seal assembly (see Figure 7).

7. CASTER KIT (item 7) to be installed on the Unit as instructed in Instructions provided in the Kit.
8. All parts for the SOUND BAFFLE/DRIP TRAY ASS'Y (item 8) are shipped with the Dispenser in a separate box and must be installed on the Dispenser during Dispenser installation.

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.

A properly grounded 198-253 VAC, 60Hz single-phase electrical circuit with a 30-amp minimum-rated disconnect switch (not provided) fused at 30 amps (slow-blow) or circuit connected through an equivalent HACR circuit breaker must be available to the Unit. ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.

SELECTING LOCATION

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

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

Locate Unit so the following requirements are satisfied.

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

NOTE: "AIR-COOLED FCB DISPENSER

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

2. 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.

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

INSTALLING UNIT

PLACING UNIT IN OPERATING LOCATION

1. Place Unit in operating location meeting requirements of SELECTING LOCATION.

IMPORTANT NOTICE

The FCB Dispensers manufactured prior to the model documented in this manual were elevated in the front (dispensing valve side) 1/4 to 3/8-inch higher than the back when placing the Unit in operating position to eliminate gas pockets being trapped inside the freeze cylinders. Due to a redesign of the foam pack in the models documented in this manual, elevating the front of the Dispenser is no longer required. The Dispenser must be leveled at time of placing in operating location.

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Note: An alternate to sealing the Unit base to the floor would be to install the available 4-inch Caster Kit (P/N 309570000).

2. After Unit has been placed in operating location, make sure it is sitting in a level position.

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 SOUND BAFFLE/DRIP TRAY ASS'Y ON UNIT

All parts for the SOUND BAFFLE/DRIP TRAY ASS'Y (item 8) are shipped with the Dispenser in a separate box. Refer to Installation Instructions provided with the Sound Baffle/Drip Tray Assembly and install as instructed.

INSTALLING PRIMARY CO_2 REGULATOR ASSEMBLY ON CO_2 CYLINDER

(see Figure 2)

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

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) gas leaks in the entire CO_2 and soft drink system. If a CO_2 gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO_2 gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.

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

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

CONNECTING SOFT DRINK TANKS CO_2 LINES TO PRIMARY CO_2 REGULATOR ASSEMBLY

(see Figure 2)

1. Connect soft drink tanks CO_2 lines to primary CO_2 regulator manifold assembly as shown in Figure 2.

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

PREPARING UNIT SYRUP INLET LINES FOR CONNECTION TO SOFT DRINK TANKS

(see Figure 2)

1. Route Unit syrup inlet lines, labeled No. 1 and No. 2, out through hole provided in the Unit base to the soft drink tanks location.

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

CONNECTING CITY PLAIN WATER SOURCE LINE (S) TO UNIT

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

Connecting City Plain Water Source Line to Unit Post-Mix System.

(see Figure 2)

NOTE: Cornelius Inc. recommends that a water shutoff valve and water filter be installed in the city plain water source line (see applicable Figure NO TAG) that provides plain water to the Dispenser post-mix system. A Cornelius Water Filter (P/N 313860000) and Quick Disconnect Set (P/N 313867000) are recommended.

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

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

NOTE: The carbonator plain water inlet adjustable water pressure regulator (see Figure 2) is factory adjusted to 45-psi and should not be readjusted.

3. Connect Unit plain water inlet line to the city plain water source line (12-psi minimum pressure). Seal connection with TAPERED GASKET, BLACK (item 4). DO NOT OPEN THE CITY PLAIN WATER SOURCE LINE SHUTOFF VALVE AT THIS TIME.

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

(See Figure 16)

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

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

2. Connect the refrigeration cooling coil plain water inlet line labeled “COOLING WATER IN” to the City plain water inlet line. Seal connection with TAPERED GASKET, BLACK (item 4).

3. Route the line labeled “COOLING WATER OUT” to a permanent drain and connect. Seal connection with a black TAPERED GASKET, BLACK (item 4).

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CONNECTING ELECTRICAL POWER CIRCUIT TO UNIT

(see Figure 17)

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

IMPORTANT: Power circuit voltage across L_1 and L_2 terminals on the contactor inside the lower control box, with refrigeration compressor operating, must be in the range of 198-253 VAC, 60Hz single-phase for proper operation. Use No. 10 AWG copper wire, or larger, depending upon line length, in suitable conduit or BX sheath. POWER CIRCUIT TO UNIT *MUST* BE MADE UP OF COPPER CONDUCTORS AND ALL WIRING *MUST* CONFORM TO NATIONAL AND LOCAL CODES.

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

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

2. Connect electrical power from a 30-amp minimum-rated disconnect switch (not provided) fused at 30-amps slow-blow or through an equivalent HACR circuit breaker to L_1 and L_2 terminals on the contactor inside the 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

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_2O OUT" (No water supply to Unit)
"CO_2 OUT" (No CO_2 gas supply to Unit)
"SYRUP 1" (No syrup supply to Unit No. 1 syrup system)
"SYRUP 2" (No syrup supply to Unit No. 2 syrup system)

TURNING ON CO_2 SUPPLY TO UNIT

1. Open CO_2 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-in-box syrup supply system will be connected to the Unit instead of soft drink tanks, the primary CO_2 regulator (see figure 2) *must* be adjusted to no less than 80-PSI.

2. For soft drink tanks installation (see Figure 2), adjust primary CO_2 regulator by turning regulator adjusting screw to the right (clockwise) until regulator pressure reads 80 to 100-psig. OUT OF CO_2 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 stainless steel access panel as instructed for access to carbonator secondary CO_2 regulators (see Figure 4).

5. Check product blender tanks secondary CO_2 regulators with 60-psi gages for pressure setting which should be set at 25 to 30-psi for best textured product. If further adjustment is necessary, adjust as instructed.

IMPORTANT: The carbonated water tanks secondary CO_2 regulators *must* be adjusted 25-psi higher or more above product blender tanks secondary CO_2 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. Carbonated water tanks secondary CO_2 regulators not adjusted high enough will cause decreased flow of carbonated water into the product blender tanks which will increase brix of the dispensed product.

6. Adjust carbonated water tanks secondary CO_2 regulators, with 100-psi gages, by turning regulators adjusting screws to the right (clockwise) until gages reads 50 to 60-psi.

7. Pull up on carbonated water tanks relief valves plastic covers to purge air from the tanks.

TURNING ON CITY PLAIN WATER SOURCE LINE TO UNIT

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

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

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

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

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 5), 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_2 and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

To disconnect soft drink tank from Unit syrup system.

A. Disconnect liquid disconnect from soft drink tank. **NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.**

B. Second, disconnect CO_2 quick disconnect from soft drink tank.

2. 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.

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

NOTE: The Unit is equipped with one control panel (see Figure 4) which controls operation of the two freeze cylinders. The Unit control panel is equipped with a hidden "SECURITY SWITCH" located between "FILL 1" and "ERROR RESET" control switches (see Figure 4). Pressing in and holding the "SECURITY SWITCH" for 10-seconds deactivates the control switches preventing tampering with the Unit normal operation. To reactivate the control switches, press in and hold the "SECURITY SWITCH" for 10-seconds.

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

Note: The adjustable carbonated water flow regulators (see Figure 2 and 13) located in their respective systems, control carbonated water flow rate to the product blender tanks. The water flow regulators are factory adjusted at 1.3 $\pm$ 0.05 oz/sec and should not normally require adjustment. If adjustment is necessary, adjust as instructed.

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 Figure 2) and take sample (approximately 6-ounces) of product in a cup or glass.

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

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

   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.
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 adjustment on No. 2 system, only the "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 "WATER-COOLED" UNIT REFRIGERATION SYSTEM VARIABLE WATER REGULATOR

IMPORTANT NOTICE

Water-Cooled Refrigeration System Dispenser.

Water flow rate through the refrigeration cooling coil varies due to pressure change on the high side of the refrigeration compressor which influences opening and closing of the variable water regulator (see Figure 16). The variable water regulator must be adjusted to maintain 240-psi refrigeration high-side pressure.

Adjust the variable water regulator (see Figure 16) to maintain 240-psi refrigeration high-side pressure as instructed in the SERVICE AND MAINTENANCE section.

ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)

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

PROGRAMMING MAIN MENU SELECTIONS ONTO the MESSAGE DISPLAY

The MAIN MENU SELECTIONS (see Table 3) may be brought up on message display as instructed in SERVICE AND MAINTENANCE section.

Program ''CLOCK'' (TIME OF DAY) into Unit as instructed in SERVICE AND MAINTENANCE section.

PROGRAMMING ''DEFROST'' (AUTOMATIC) SETTINGS INTO the 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 the UNIT

''SLEEP'' (SLEEP TIME) may be programmed into the Unit to occur any time of the day after the Unit automatic defrost cycle has occurred. The Unit will shut down (go into sleep time) and will not wake up (return to normal operation) until programmed ''WAKE UP'' (WAKE UP TIME) has occurred. Program ''SLEEP'' (SLEEP TIME) into the Unit as instructed in SERVICE AND MAINTENANCE section.

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

''WAKE UP'' (WAKE UP TIME) May be programmed into the Unit to occur any time of the day to wake the Unit up (return to normal operation) after ''sleep time'' has occurred. Program ''WAKE UP'' into the 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 the Unit by placing No. 1 and No. 2 switches on the DIP SWITCH assembly on the master circuit board in appropriate positions. Program point of sale display messages into the Unit as instructed in SERVICE AND MAINTENANCE section.

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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.

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

“VIS READ” (actual viscosity readout) may be brought up on the message display to actually read the viscosity (product consistency) of product in the freeze cylinders while the Unit is in operation 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 the message display as instructed in SERVICE AND MAINTENANCE section.

“VOLTAGE” (DISPLAYED VOLTAGE READOUT)

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

PROGRAMMING COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE) INTO the UNIT

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

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

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

PROGRAMMING FREEZE CYLINDERS BEATER “MOTORS” INTO UNIT ELECTRONICS

IMPORTANT: Note in TABLE 5 MOTOR SELECT the number of freeze cylinders beater drive motors Manufacturer’s that are listed. Your Unit was manufactured and equipped with freeze cylinders beater drive motors from one of these Manufacturer’s. The beater motors were programmed at the factory to match the Unit electronics. THE BEATER MOTORS PROGRAMMING MUST BE RE-CHECKED AT THE TIME OF UNIT INSTALLATION as instructed in “PROGRAMMING FREEZE CYLINDERS BEATER MOTORS INTO UNIT ELECTRONICS” in SERVICE AND MAINTENANCE section.

PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Dispenser electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been installed in the refrigeration system. Note Dispenser serial plate for the type of refrigerant gas that has been installed, then proceed to SERVICE AND MAINTENANCE section for programming instructions.

DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in Table 8 DISPLAYED ERROR CONDITIONS.

INSTALLING CONTROL BOX COVER AND BACK, SIDES LOWER ACCESS, AND TOP PANELS ON UNIT

1. Install upper electrical control box cover and secure with four screws.
2. Install back, sides, lower access, and top panels on Unit by reversing removal procedures.

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

NOTE: The No. 1 freeze cylinder (see Figure 4) is the left-hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of No. 1 freeze cylinder.

CONTROL PANEL SWITCHES AND DISPLAYED MESSAGES

CONTROL PANEL SWITCHES

The Unit is equipped with one control panel which is equipped with a message display (See Figure 4). The control panel controls operation of the No. 1 and the No. 2 freeze cylinders.

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

“FILL 1” and “FILL 2” control switches, located on control panel (see Figure 4), 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 4), 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 4), 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 4), 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 4), are touch-type switches and require only pressing to activate. These switches are used to stop freeze cylinders beaters and refrigeration system.

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“ERROR RESET’’ Control Switch.

“ERROR RESET’’ control switch, located on control panel (see Figure 4), 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 4). 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 4)

“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_2O 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_2O OUT’’ fault message to appear on message display. Unit will continue to operate for 1–1/2 minutes after ‘‘H_2O 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_2O OUT’’ fault message will disappear from message display.

“CO_2 OUT’’ Fault Message.

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

Three ‘‘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.

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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 4), located in each freeze cylinder faceplate, are spring-loaded valves that protect freeze cylinders from accidental over-pressure. The relief valve is also used to manually bleed CO_2 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, are located behind the lower front access panel (see Figure 2) and 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 a 90° angle with line to close the valve.

PRODUCT SHUTOFF VALVES

The two product shutoff valves, located in lines leading from the product blender tanks to the freeze cylinders (see Figure 2), 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_2 REGULATOR

The primary CO_2 regulator (see Figure 2) controls CO_2 pressure to the soft drink tanks and the Unit secondary CO_2 regulators located behind the lower front access panel. If necessary to adjust the primary CO_2 regulator, adjust as instructed in SERVICE AND MAINTENANCE section.

SECONDARY CO_2 REGULATORS

The secondary CO_2 regulators, located behind the lower front access panel (see Figure 5), control CO_2 pressure to the two carbonated water tanks and the two product blender tanks. If necessary to adjust the secondary CO_2 regulators, adjust as instructed in SERVICE AND MAINTENANCE section

CARBONATED WATER FLOW REGULATORS

The adjustable carbonated water flow regulators (see Figure 2 and Figure 5), located in their respective systems, control carbonated water flow rate to the product blender tanks. The water flow regulators are factory adjusted at 1.3 ± 0.05 oz/sec and should not normally require adjustment. If adjustment is necessary, adjust as instructed in SERVICE AND MAINTENANCE section.

SYRUP FLOW REGULATORS

The syrup flow regulators (see Figure 2 and 5) , 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 in SERVICE AND MAINTENANCE section.

DISPENSING VALVES

Self-closing dispensing valves (see Figure 3 and 4), 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_2 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_2 gas in the system takes a "set". When first few drinks are drawn off after an idle period, CO_2 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_2 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_2 regulator setting from a high overrun light drink to a wet heavy drink. The length of freezing cycle and amount of CO_2 present in product combine to create drink dispensed. The dispensed product will have a normal variance due to the following conditions:

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

NOTE: A cylinder freeze–up may be expected under casual draw conditions if an attempt is made to eliminate 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 (see Drawing 3).

OPERATING UNIT

NOTE: The No. 1 freeze cylinder (see Figure 4) is the left–hand cylinder facing the front of the Unit. No. 2 freeze cylinder is to the right of No. 1 freeze cylinder.

1. Make sure "H_2O OUT" fault message is not displayed on message display. This indicates no water supply to Unit.
2. Make sure "CO_2 OUT" fault message is not displayed on message display. This indicates no CO_2 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_2 and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

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

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

PRODUCT FLAVOR CHANGE

Perform syrup flavor change as instructed.

CHECKING CO_2 SUPPLY

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) gas leaks in the entire CO_2 and soft drink system. If a CO_2 gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO_2 gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.

Make sure CO_2 cylinder shutoff valve is fully opened and regulator assembly 1800-psi gage indicator is not in shaded (“change CO_2 cylinder”) portion of dial. If so, CO_2 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 120-days and before and after storage periods following parent company requirements and sanitizer manufacturers recommendations.

CLEANING CONDENSER COIL

Circulating air, required to cool the refrigeration system condenser coil (see Figure 15), 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. The condenser coil air filter and the condenser coil *must* be cleaned periodically as instructed in SERVICE AND MAINTENANCE section.

LUBRICATION

The carbonator pump motor must be lubricated as instructed.

ADJUSTMENTS

CARBONATED WATER FLOW RATE

The black carbonated water flow regulators (see applicable Figure 2 and 5), 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 in SERVICE AND MAINTENANCE section.

CO_2 REGULATORS

Primary CO_2 Regulator.

The primary CO_2 regulator (see Figure 2) regulates CO_2 pressure to the soft drink tanks (also to the bag-in-box syrup system if used) and also to the secondary CO_2 regulators located inside the Unit. If necessary to adjust the primary CO_2 regulator, adjust as instructed in SERVICE AND MAINTENANCE section.

Secondary CO_2 Regulators.

The secondary CO_2 regulators (see applicable Figure 2 and 5) regulate CO_2 pressure to the carbonated water tanks and the product blender tanks. If necessary to adjust secondary CO_2 regulators, adjust as instructed in SERVICE AND MAINTENANCE section.

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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 3) 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 and No. 2, 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.

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

“VIS READ” (actual viscosity readout) may be brought up on the message display to actually read the viscosity (product consistency) of product in the freeze cylinders while the Unit is in operation 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 the message display as instructed in SERVICE AND MAINTENANCE section.

PROGRAMMING FREEZE CYLINDERS BEATER “MOTORS” INTO UNIT ELECTRONICS

Note in TABLE 5 “MOTOR SELECT” the number of freeze cylinders beater motors Manufacturer’s that are listed. Your Unit was manufactured and equipped with motors from one of these Manufacturer’s. A replacement freeze cylinder beater motor is also manufactured by one of these Manufacturer’s listed. NOTE THE MANUFACTURER’S NAME ON THE MOTOR(S). THE BEATER MOTOR(S) MANUFACTURER’S NAME(S) MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR(S) TO THE UNIT ELECTRONICS as instructed in SERVICE AND MAINTENANCE section.

PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Dispenser electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been installed in the refrigeration system. Note Dispenser serial plate for the type of refrigerant gas that has been installed, then proceed to SERVICE AND MAINTENANCE section for programming instructions.

DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in TABLE 8 DISPLAYED ERROR CONDITIONS.

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WATER PUMP DOUBLE LIQUID CHECK VALVE MAINTENANCE

(see Figures 2 and 13)

WARNING: The carbonator water pump 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. Foreign particles lodged in the double liquid check valve could cause CO_2 gas to back flow into the water system and create a health hazard in the system.

Service water water pump double liquid check valve as instructed in SERVICE AND MAINTENANCE section.

CLEANING CO_2 GAS CHECK VALVES

(see applicable Figure 2 and 12)

The CO_2 gas check valves must be inspected and serviced at least once a year under normal conditions, and after any servicing or disruption of the CO_2 system as instructed in SERVICE AND MAINTENANCE section.

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_2 cylinder valve is fully opened and primary CO_2 cylinder regulator assembly 1800-psi gage indicator is not in shaded (“change CO_2 cylinder”) portion of dial. If so, CO_2 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 (see Figure 15), 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, AND BACK, SIDES, TOP, LOWER FRONT ACCESS, AND CONDENSER COIL ACCESS PANELS

(see Figure 4)

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.

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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 13)

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

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

Servicing Dispensing Valves Caged O-Rings.

(see Figure 3)

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

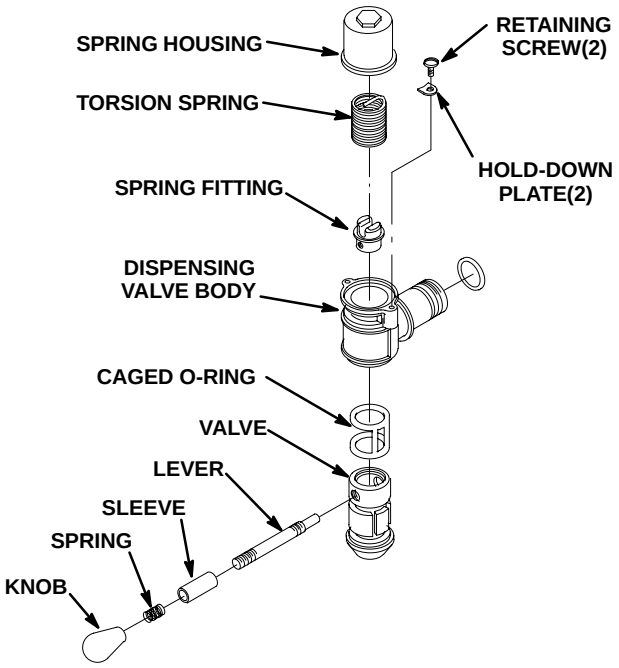
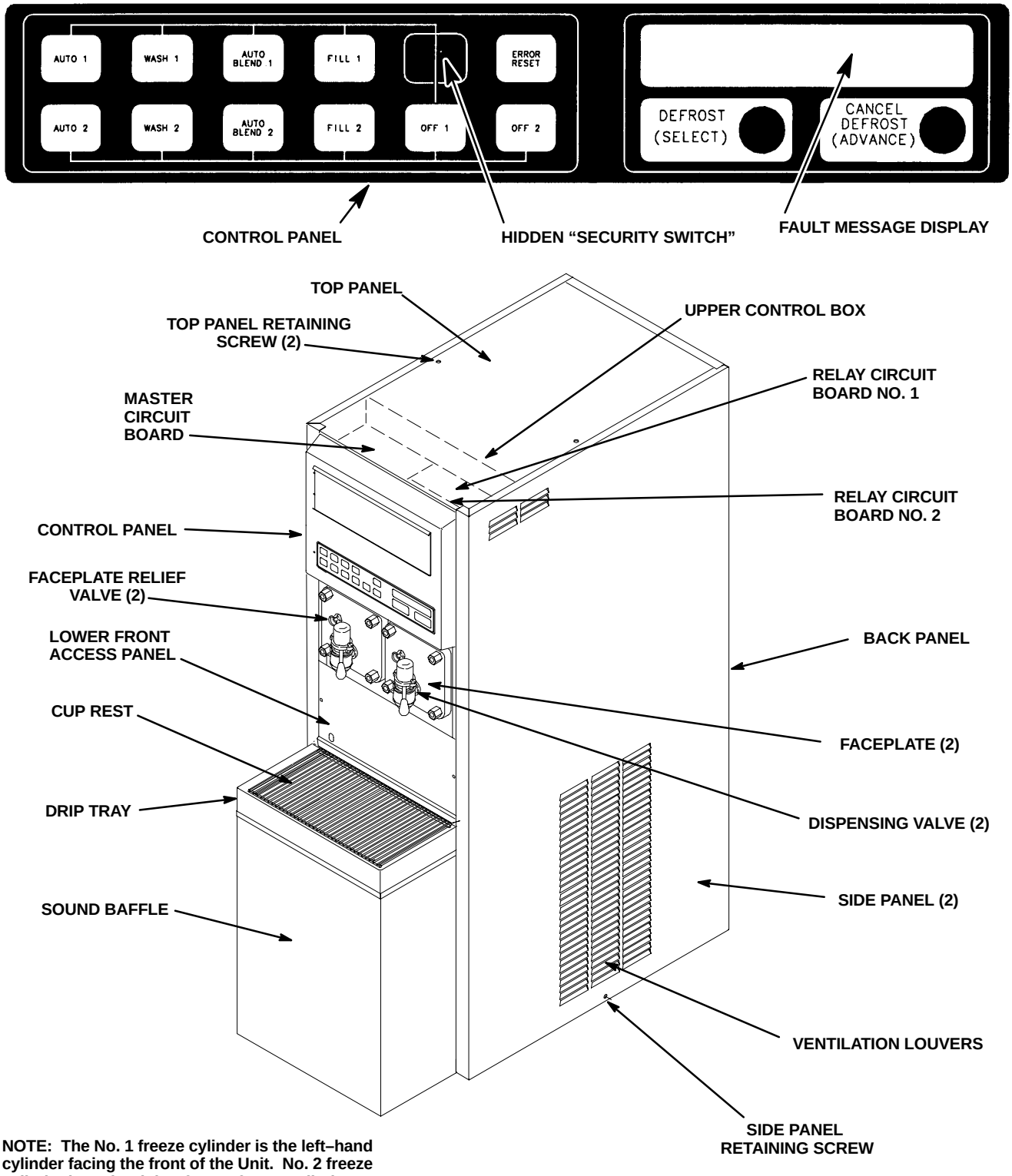


FIGURE 3. SELF-CLOSING DISPENSING VALVE



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

FIGURE 4. OPERATING CONTROLS

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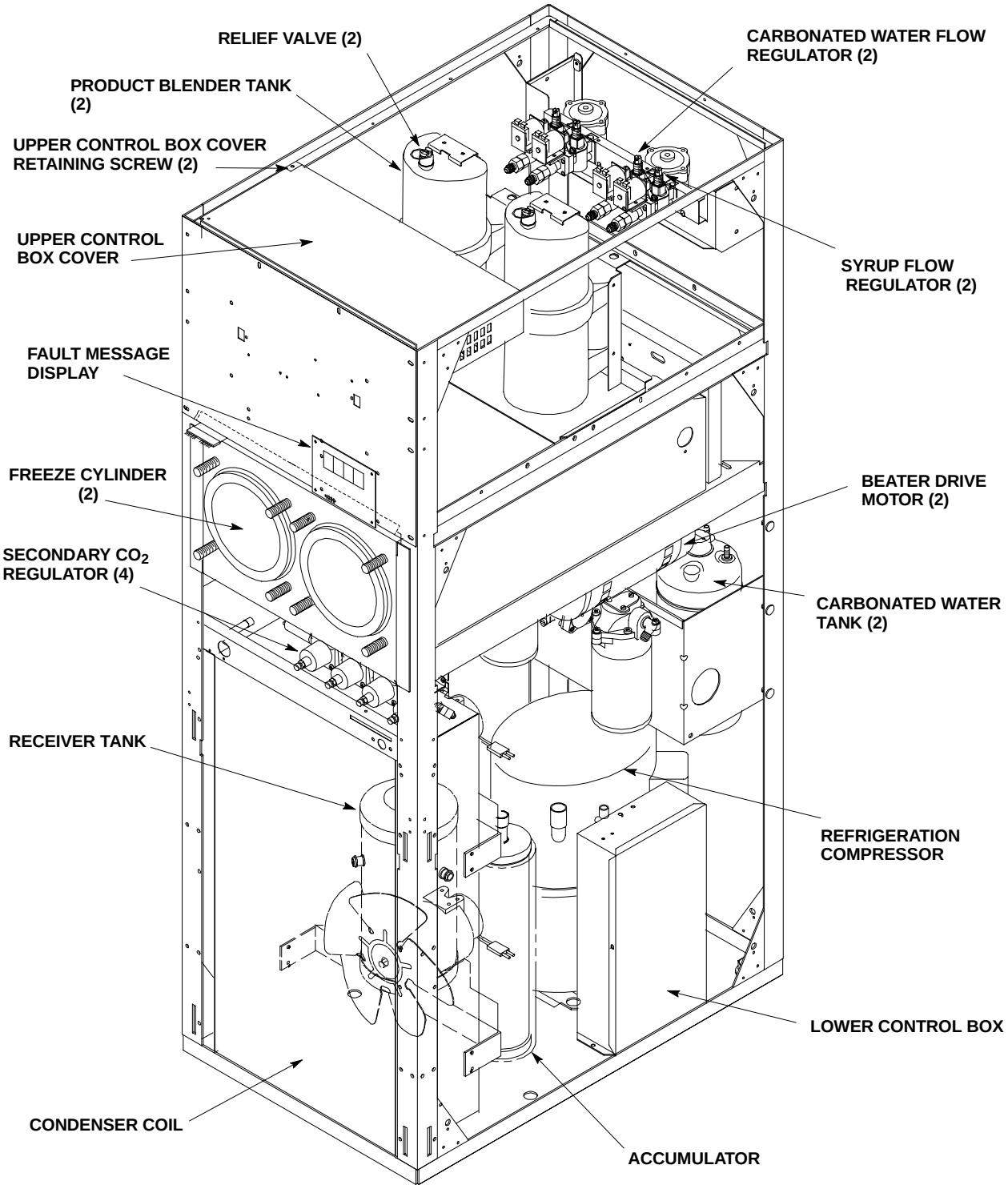

FIGURE 5. UNIT INTERNAL COMPONENTS

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

Note: Item numbers in parentheses in this paragraph are in reference to Figure 6 .

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

3. Carefully remove large O-RING (item 5) from FACEPLATE (item 8).

4. Unscrew RELIEF VALVE (item 9) from FACEPLATE (item 8).

5. Disassemble dispensing valve (see Figure 3) as follows:

   A. Remove two screws and hold-down plates securing spring housing to dispensing valve body, then remove housing.

   B. Remove torsion spring from dispensing valve.

   C. Remove knob, spring, sleeve, and lever from dispensing valve.

   D. Remove spring fitting from dispensing valve.

   E. Press valve, with caged O-ring, down and out of dispensing valve body.

   F. Carefully remove caged O-ring from valve.

6. Wash all parts in warm water. Remove all traces of syrup and lubricant, especially from faceplate, O-rings, and dispensing valve. If parts are excessively coated, wipe clean with paper towel to remove syrup and lubricant, especially from caged O-ring and dispensing valve. Use BRUSH (item 3, Table 2) to clean faceplates relief valve passages.

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

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

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

9. Assemble 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.

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

11. Proceed to Servicing Beater Motor Drive Shaft/Seal Assemblies.

Servicing Freeze Cylinders Drive Shaft/Seal Assemblies.

(see Figure 7)

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

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

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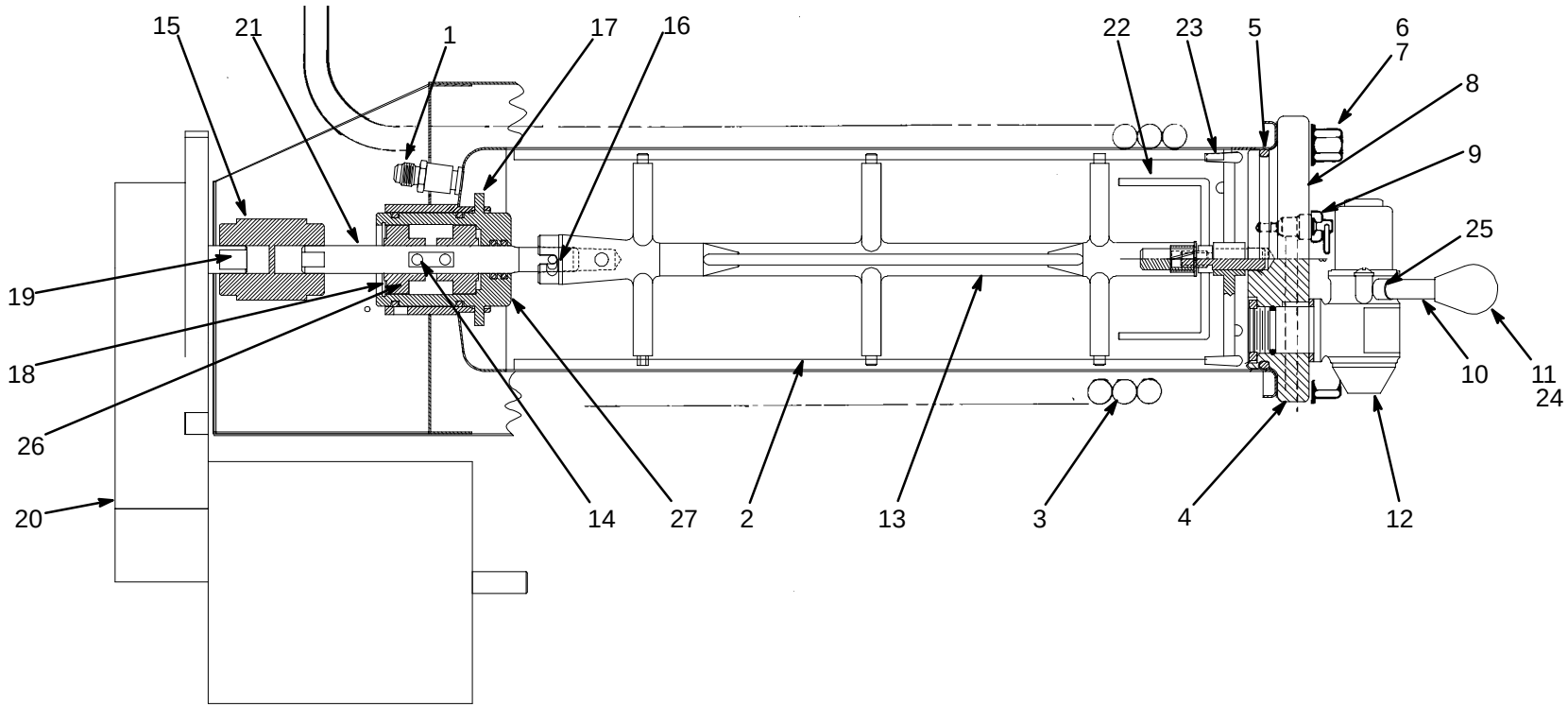

1	Product Inlet Fitting
2	Scraper Blade (2)
3	Evaporator Coi.l
4	Relief Valve Port
5	O-Ring
6	Flatwasher (4)
7	Hex Nut (4)
8	Faceplate
9	Relief Valve
10	Valve Lever
11	Knob
12	Dispensing Valve
13	Beater
14	Allen Head Setscrew
15	Beater Shaft Coupling
16	Drive Pin
17	Bearing Housing Locking Tab (4)
18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

FIGURE 6. FREEZE CYLINDER CUTAWAY VIEW

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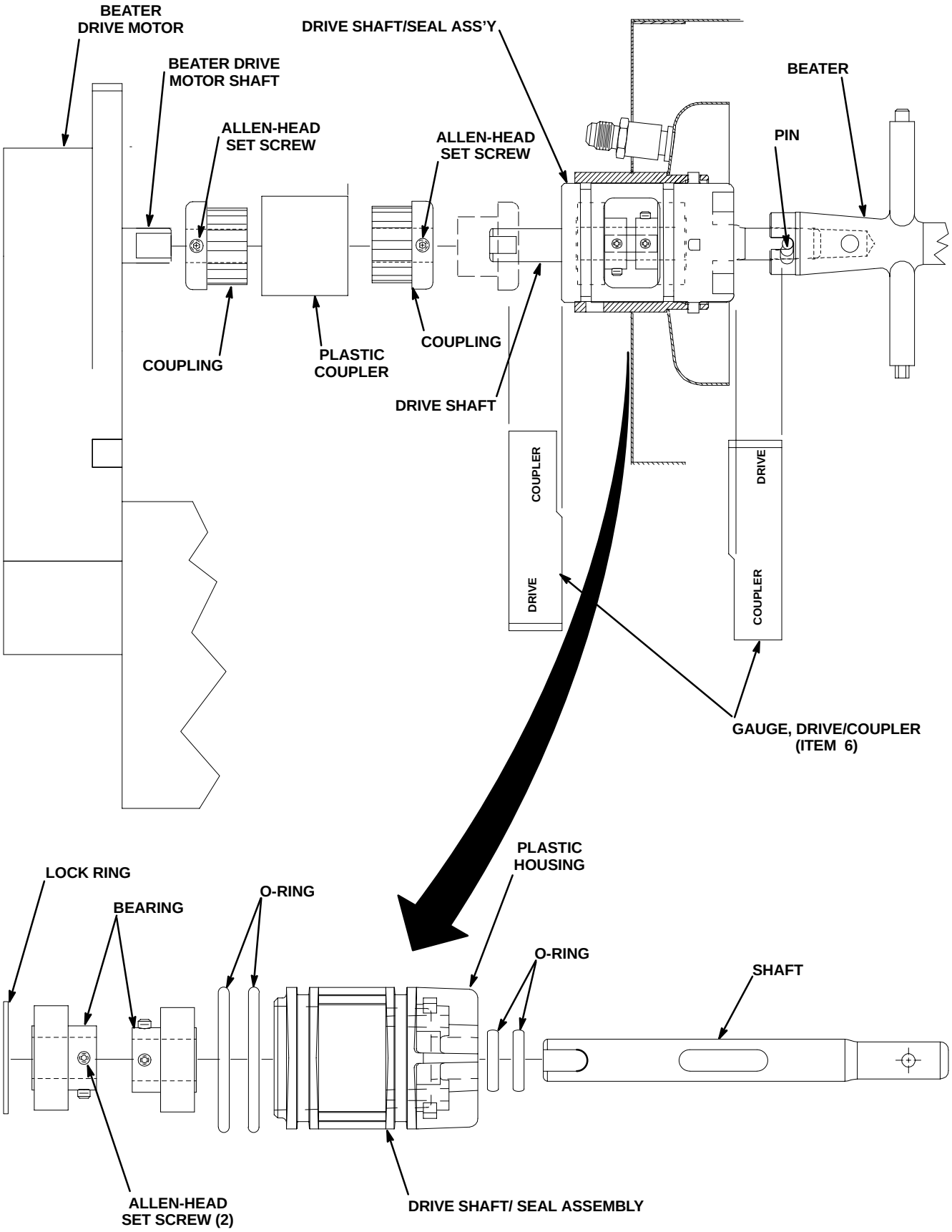

FIGURE 7. SERVICING BEATER MOTOR DRIVE SHAFT/SEAL ASSEMBLY

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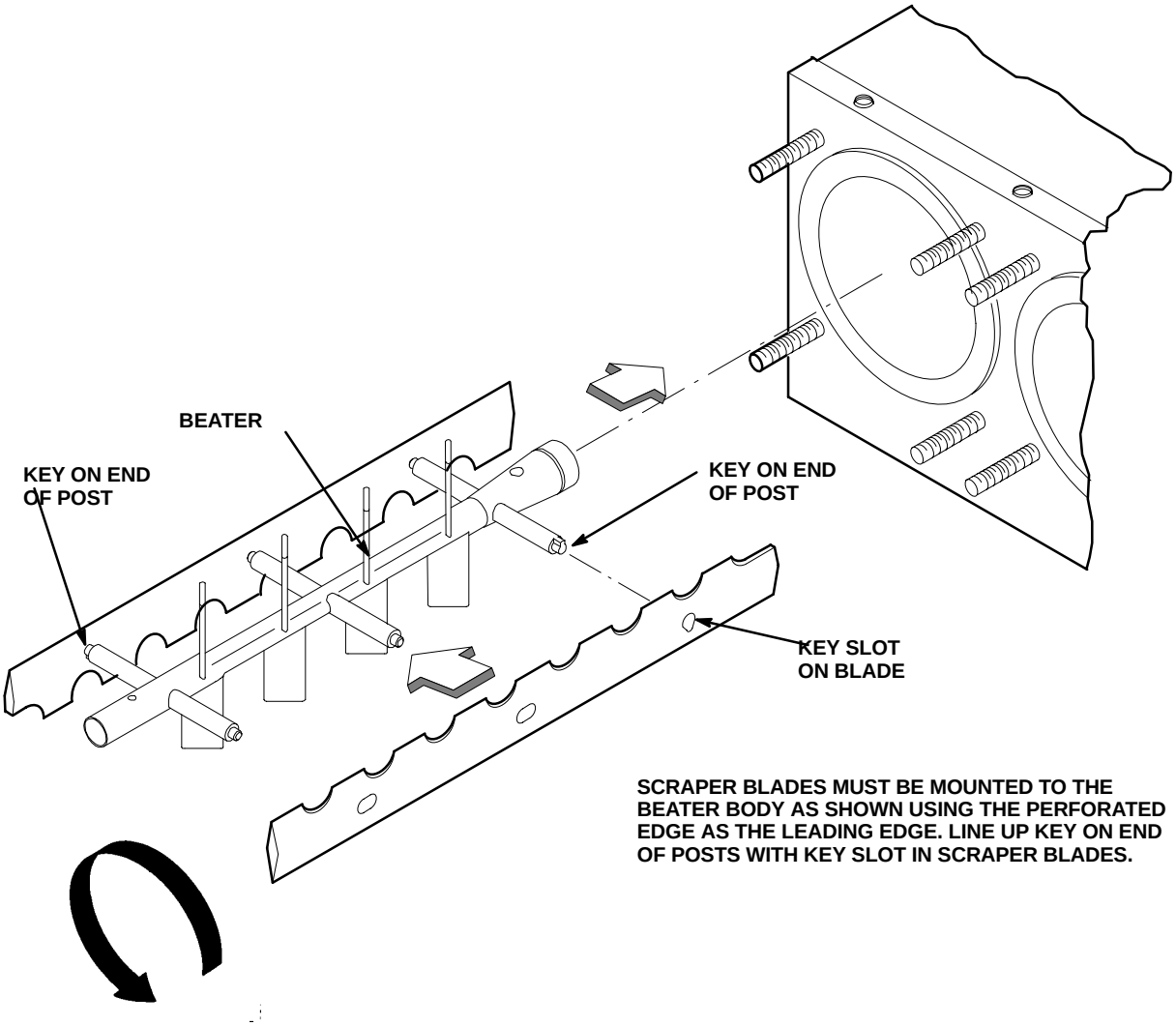

FIGURE 8. BEATERS AND SCRAPER BLADES INSTALLATION

1. Pull BEATER (item 13) and SCRAPER BLADES (item 2) from freeze cylinder.
2. Using WRENCH (item 5) reach into the freeze cylinder and turn the drive shaft/seal assembly to the right (clockwise) to unlock its four locking tabs from the notches in the freeze cylinder retainer. Pull the assembly out of the freeze cylinder retainer using the beater as a puller..
3. Remove the coupling end fitting from the shaft by loosening the set screw in the coupling, then slide coupling off the shaft.
4. Remove the lock-ring bearing retainer from the end of the plastic housing.
5. Using a block of wood, tap the drive shaft and both bearings out of the plastic housing.
6. Loosen bearings and remove shaft. Remove two old inner drive shaft O-Rings seals and two outer O-Rings seals from the plastic housing. Discard the old O-Ring seals.

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

7. Remove old lubricant from the plastic housing with paper towel. DO NOT SCRAPE THE PLASTIC HOUSING. Wash the housing and the back of the freeze cylinder with warm water.
8. Lubricate two new drive shaft O-Ring seals with a generous amount of special light-grade silicone grease, then install O-Rings inside the plastic housing.
9. Inspect the drive shaft and both bearings. Replace the drive shaft if worn and bearing(s) if found to be rough.

10. Reassemble the drive shaft/seal assembly. Using TOOL, DRIVE/COUPLER ADJUSTMENT GAUGE (item 6), insert “DRIVE” end of adjustment gauge between drive-pin and housing (see Figure 7) to set the shaft end at 1.542-inches out of the plastic housing. *Make sure* Allen-Head set screw in each bearing is securely tightened and properly seated on the shaft flat surface.

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

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

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

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

15. Position SCRAPER BLADES (item 2) on BEATER (item 13) as shown in Figure 8. Slide beater into freeze cylinder so slotted hooks engage DRIVE PIN (item 17) on DRIVE SHAFT (item 19) as shown in Figure 6. Turn beater to the right (clockwise) to lock in place.

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

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

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

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

20. Return Unit to operation.

CLEANING CONDENSER COIL

UNIT WITH AIR-COOLED REFRIGERATION SYSTEM

(see Figure 5)

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

Periodically clean condenser coil as follows:

1. Press “OFF 1” and “OFF 2” switches on Unit control panel to stop refrigeration system and beaters motors.

2. Remove condenser coil access panel and condenser coil air filter(s).

3. Clean condenser coil and condenser coil air filter(s) with vacuum cleaner, low pressure compressed air, or a soft brush.

4. Install condenser coil air filter(s) and condenser coil access panel by reversing removal procedure.

5. Press “AUTO 1” and “AUTO 2” switches on Unit control panel to start refrigeration system and beaters motors.

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UNIT WITH WATER-COOLED REFRIGERATION SYSTEM

The high-pressure cutout switch, located inside the lower control box (see Figure 16), will shut the Unit refrigeration system down when overheated (high head pressure) caused by lack of cooling water. After problem has been corrected and the head pressure has decreased, the reset button on the high-pressure cutout switch must be pressed to restart the refrigeration system.

ADJUSTMENTS

ADJUSTING PLAIN WATER PRESSURE REGULATOR

(see Figure 2 and 13)

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

ADJUSTING CARBONATED WATER FLOW RATE

The carbonated water flow regulators (see Figure 2 and 5), which control carbonated water flow rate into the product blender tanks, are factory adjusted for a flow rate of 1.3 ± 0.05 ounces per second and normally do not require adjustment. However, if adjustment is necessary, proceed as follows:

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

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

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

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

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

18. Connect Unit syrup inlet line to the soft drink tank.

19. Press the applicable ‘‘AUTO BLEND 1’’ or ‘‘AUTO BLEND 2’’ switch to fill the product blender tank with product.

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

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

ADJUSTING CO_2 REGULATORS

NOTE: To readjust CO_2 regulator to a lower setting, loosen the adjusting screw lock nut, then turn the screw to the left (counterclockwise) until the pressure gage reads 5-psi lower than the new setting will be. Turn the adjusting screw to the right (clockwise) until the gage registers new setting, then tighten the lock nut.

Primary CO_2 Regulator. (see Figure 2)

Adjust the primary CO_2 regulator by turning the regulator adjusting screw to the right (clockwise) until the regulator pressure reads 80 to 100-psig.

Product Blender Tanks Secondary CO_2 Regulators. (see Figure 2)

1. Remove the Unit lower front stainless steel access panel as instructed for access to the product blender tanks secondary CO_2 regulators.

2. Adjust the product blender tanks secondary CO_2 regulators, with 60-psi gages, by turning their regulator adjusting screws to the right (clockwise) until their gages read 25 to 30-psig.

3. Install the lower front stainless steel access panel by reversing the removal procedure.

Carbonated Water Tank Secondary CO_2 Regulators. (see Figure 2)

1. Remove the Unit lower front access panel as instructed for access to the carbonated water tanks secondary CO_2 regulators.

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

2. Adjust carbonated water tanks secondary CO_2 regulators, with 100-psi gages, by turning regulators adjusting screws to the right (clockwise) until gages reads 50 to 60-psig.

3. Install the lower front access panel by reversing the removal procedure.

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

(see Figures 2 and 5)

1. Remove Unit front lower stainless steel access panel as instructed for access to product blender tanks secondary CO_2 regulators and product sample valves.

2. Check product blender tanks secondary CO_2 regulators, with 60-psi gages, for proper pressure settings which is set at 25 to 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:

   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.

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 5)

Carbonation of dispensed product can also be varied to suit consumer preference by adjusting Unit carbonated water tanks secondary CO_2 regulators as follows:

IMPORTANT: The carbonated water tanks secondary CO_2 regulators must be adjusted 25-psi higher or more above product blender tanks secondary CO_2 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. Carbonated water tanks secondary CO_2 regulators not adjusted high enough will cause decreased flow of carbonated water into the product blender tanks which will increase BRIX of the dispensed product.

1. Remove Unit front lower stainless steel access panel as instructed for access to the carbonated water tanks secondary CO_2 regulators with 100-psi gages.

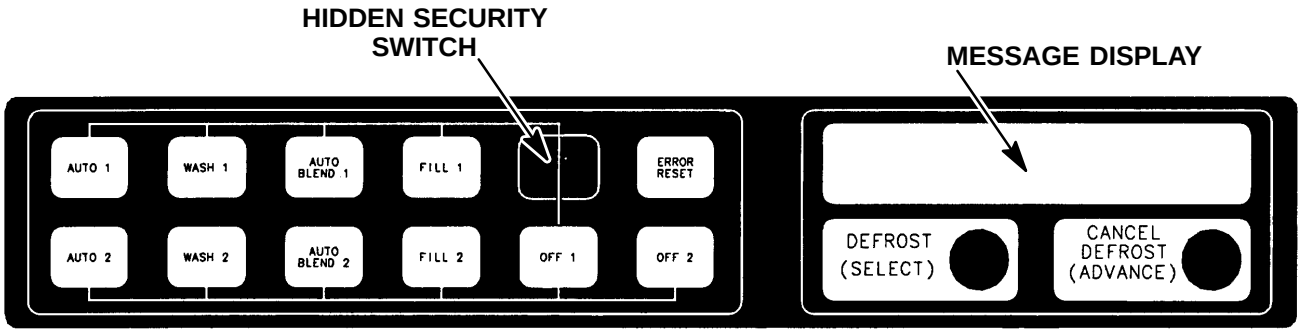

FIGURE 9. CONTROL PANEL

2. Observe pressure settings on the carbonated water tanks secondary CO_2 regulators gages.
3. To lower CO_2 pressure, loosen regulator adjusting screw lock nut. Turn adjusting screw to the left (counterclockwise) until pressure gage reads 15-psi below desired reading, then turn screw to the right (clockwise) until gage reads desired pressure. DO NOT SET CO_2 REGULATOR PRESSURE BELOW 25-PSI HIGHER THAN PRODUCT BLENDER TANKS CO_2 REGULATORS ARE ADJUSTED TO (SEE PRECEDING IMPORTANT NOTE). Tighten adjusting screw lock nut after each adjustment.
4. To raise CO_2 pressure, turn regulator adjusting screw to the right (clockwise) until gage reads desired pressure. DO NOT SET PRESSURE HIGHER THAN 60-PSI. Make sure primary CO_2 regulator on CO_2 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 A150 B150 $\pm$ 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 A155 B145 and switch was then placed back in “OFF’’ position without readjusting to A150 B150 $\pm$ 2, beater motor current has just been reset at A155 B145. Operating the FCB Dispenser at these current readings may have serious effects on its operation.

ANY TIME THE NO. 4 “BEATER MOTOR CURRENT READOUT’’ SWITCH ON DIP SWITCH ASSEMBLY IS PLACED 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.

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MENU SELECTIONS	MESSAGE DISPLAY (EXAMPLE READOUTS)							
"CLOCK" (TIME OF DAY) see note below	C	_	1	2	-	0	0	A
"DEFROST" (AUTOMATIC)	3	D	1	0	-	0	0	A
"SLEEP" (SLEEP TIME)	S	1	2	-	3	0	A	_
"WAKE UP" (WAKE UP TIME)	W	_	0	7	-	1	5	A
"VIS SET" (PRODUCT VISCOSITY SETTING)	1	2	_	_	_	_	1	0
"VIS READ" (ACTUAL VISCOSITY READOUT)	1	6	_	_	_	_	1	1
"SENSORS (TEMPERATURES READOUT)	7	5	*	7	5	*	7	5
"VOLTAGE" (DISPLAYED VOLTAGE READOUT)	V	R	M	S	*	2	3	0
"DIAGNOSE" (DIAGNOSTIC MODE)	See Programming Components Diagnose into Unit.							
"TOTALS"	See Table 7 and programming "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) into unit.							
"MOTORS" (BEATER MOTOR MANUFACTURER)	See Table 5							
"REF TYPE" (REFRIGERANT TYPE)	See PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS							
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 3. MAIN MENU SELECTIONS

ADJUSTMENT 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_2 and syrup supplies to Unit must be satisfied to turn off "H_2O OUT", "CO_2 OUT'', "SYRUP 1", and "SYRUP 2" fault messages on message display before adjustments and programming procedures can be performed on the Unit.

PROGRAMMING MAIN MENU SELECTION ONTO MESSAGE DISPLAY

The MAIN MENU SELECTIONS (see TABLE 3) 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 3 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.

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.

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SWITCH NO.	FUNCTION	
1	POINT OF SALE MESSAGE SELECT	See Table 6
2	POINT OF SALE MESSAGE SELECT	See Table 6
3		See **Note**
4	BEATER MOTOR CURRENT READOUT	ON- Display current readout. OFF- No displayed current readout.
5	MOTOR CURRENT SELF CALIBRATION	ON- Disabled. OFF- Operating.
6	NOT USED	
7	NOT USED	
8	NOT USED	
9	DEFROST	ON- Hot gas. OFF- Electric.
10	SERVICE USE	
Note: Switch No. 3 must be in "OFF" position for standard Units with pulse expansion valves. Switch No. 3 must be in "ON" position for older Units with mechanical expansion valves.		

TABLE 4. DIP SWITCH SETTINGS

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

TABLE 5. MOTOR SELECT

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

*For special messages, contact you local sales representative

TABLE 6. POINT OF SALE DISPLAY MESSAGES

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 advance hours on display to desired hour. Press ‘‘DEFROST’’ (SELECT) switch to lock in hour on display.

3. 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.

4. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to bring up flashing hour number on display.

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

PROGRAMMING POINT OF SALE MESSAGE DISPLAY

(see Figure 10 and TABLE 6)

Note: Point of sale display messages may be turned off by placing No. 1 DIP SWITCH on master circuit board in “OFF” position and No. 2 DIP SWITCH in “ON” position (see Figure 10 and 4 and 6) assembly in appropriate positions.

Three point of sales display messages are available and the desired one may be programmed in to appear on the message display by placing No. 1 and No. 2 switches (see Figure 10 and TABLE 4 and TABLE 6) on the DIP SWITCH ASSEMBLY in the appropriate positions.

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.

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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.

   Left Reading–Refrigeration Coils Inlet No. 1

   Middle Reading–Refrigeration Coils Inlet No. 2

   Right Reading–Common Outlet

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.

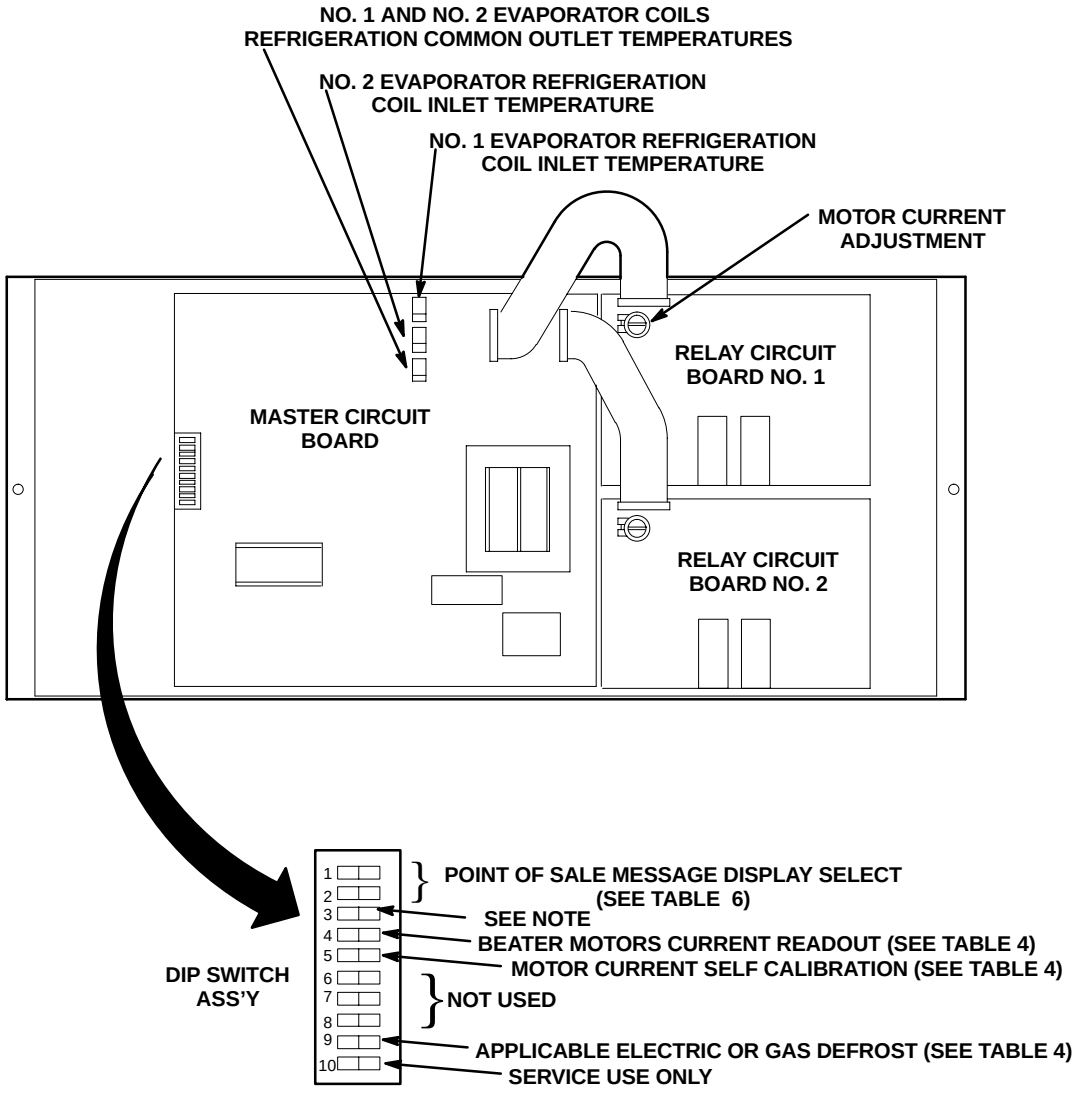
2. Press ‘‘DEFROST’’ (SELECT) switch to bring up voltage readout on message display.

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 ONTO MESSAGE DISPLAY and bring up the word ‘‘CLOCK’’ on display.



Note: Switch No. 3 must be in "OFF" position for standard Units with pulse expansion valves. Switch No. 3 must be in "ON" position for Units with mechanical expansion valves.

FIGURE 10. MASTER AND RELAY CIRCUIT BOARD

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.

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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.

DISPLAYING ‘‘TOTALS’’ (DISPLAYED CYCLES AND HOURS TOTALS) ONTO MESSAGE DISPLAY

(see TABLE 3 and TABLE 7).

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.

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.

BRIX	"A"
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

Note: "A" numbers are based upon a 4.4 to 1 water to syrup "ratio".

Using the table to the left, 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 7. "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) MENU

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MESSAGE DISPLAYED	ERROR	ITEMS AFFECTED BY ERROR			
		BEATER MOTOR 1	BEATER MOTOR 2	REFRIG 1	REFRIG 2
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_2 OUT	CO_2 Out			OFF	OFF
H_2O	H_2O 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.

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

TABLE 8 DISPLAYED ERROR CONDITIONS

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 7. 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.

PROGRAMMING FREEZE CYLINDERS BEATER “MOTORS” INTO UNIT ELECTRONICS

IMPORTANT: Note in “5 MOTOR SELECT” the number of freeze cylinders beater motors Manufacturer’s that are listed. Your Unit was manufactured and equipped with motors from one of these Manufacturer’s. A replacement freeze cylinder beater motor is also manufactured by one of these Manufacturer’s listed. DURING NEW UNIT INSTALLATION, OR WHEN REPLACING ONE OF THE BEATER MOTORS, NOTE THE MANUFACTURER’S NAME ON THE MOTOR(S). THE BEATER MOTOR(S) MANUFACTURER’S NAME(S) MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR(S) TO THE UNIT ELECTRONICS. Proceed as follows to program the beater motors into the Unit electronics.

1. Refer to “PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY” and bring up “MOTORS” on the message display. Press “DEFROST” (SELECT) switch to lock in on the selection. “MOT_1 MFG 1” (represents No. 1 freeze cylinder beater motor) will appear on the message display.

2. Press “DEFROST” (SELECT) switch again. A motor Manufacturer’s name (see TABLE 5) will appear on the message display and will be non-blinking.

3. Press “CANCEL DEFROST” (ADVANCE) switch. The motor Manufacturer’s name will start blinking.

4. Press the “CANCEL DEFROST” (ADVANCE) switch again which will change to another blinking Manufacturer’s name.

5. Keep pressing and releasing the “CANCEL DEFROST’ (ADVANCE) switch until the applicable blinking Manufacturer’s name appears on the message display. This indicates Manufacturer’s name of the No. 1 freeze cylinder beater motor (new Unit installation) or the new installed replacement motor.

6. After applicable beater motor Manufacturer’s name has been selected, press “DEFROST” (SELECT) switch which will match the beater motor to the Unit electronics. The motor Manufacturer’s name will no longer be blinking.

7. Press “DEFROST” (SELECT) switch to return to “MOT_MFG1”.

8. Press “CANCEL DEFROST” (ADVANCE) switch to go from “MOT_MFG1” to “MOT_MFG2” (represents No. 2 freeze cylinder beater motor) which will appear on the message display.

9. Repeat steps 2 through 6 to program in the correct beater motor Manufacturer’s name for No. 2 freeze cylinder.

PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Dispenser electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been istalled in the refrigeration system. Note Dispenser serial plate for the type of refrigerant gas that has been installed, then proceed as follows to program the Dispenser.

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up “REF TYPE” (REFRIGERANT TYPE) on the message display. Press “DEFROST (SELECT) switch to lock in on the selection. The sub menu of refrigerant types that may be brought up on the MESSAGE DISPLAY from “REF TYPE” (REFRIGERANT TYPE) are as follows:

   A. “R404A2HP”
   (V3+ Dispenser with 2 H.P. Copeland Compressor and R-404A Refrigerant).

   B. “R404A3HP”
   (V3+ Dispenser with 3 H.P. Copeland Compressor and R-404A refrigerant).

   C. “R502”
   (V3 and V3+ Dispensers using Bristol or Tecumseh Compressor and R502 refrigerant).

   D. “R402B5OH
   V3 and V3+ Dispensers using a Bristol Compressor and R-402B refrigerant).

2. Refer to Dispenser serial plate to identify the type of refrigerant gas installed in the refrigeration system.

3. Press “CANCEL DEFROST” (ADVANCE) switch as many times as necessary to bring up applicable refrigerant type from sub menu of “REF TYPE” (REFRIGERANT TYPE) on MESSAGE DISPLAY.

4. Press “DEFROST” (SELECT) switch to lock in on the selection. This programs the proper refrigeration pulse rate into the Dispenser electronics.

5. Press “ERROR RESET” switch two times to exit from “MAIN MENU SELECTIONS”.

DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in TABLE 8 DISPLAYED ERROR CONDITIONS.

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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 120-days following Sanitizer Manufacturer's recommendation. Use Chlor-Tergent (Oakite Products, Inc.) or equivalent sanitizer.

The Unit should be sanitized every 120-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 120-days sanitizing requirements. The following sanitizing instructions use No. 1 syrup system as an example. No. 2 syrup systems sanitizing instructions are identical to No. 1 syrup system with 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_2 and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

6. **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_2 quick disconnect from soft drink tank.**
7. **To connect soft drink tank into Unit syrup system.**
   - **A. First, connect CO_2 quick disconnect to soft drink tank to pressurize tank.**
   - **B. Second, connect liquid quick disconnect to soft drink tank.**
8. Disconnect soft drink tank containing syrup from No. 1 syrup system.
9. Connect clean empty soft drink tank into No. 1 syrup system.
10. 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.
11. Remove Unit front lower access panel as instructed for access to No. 1 product blender tank product sample valve.
12. 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.

13. Disconnect empty soft drink tank from No. 1 syrup system.

14. Refer to SERVICING DISPENSING VALVES CAGED O-RINGS AND FREEZE CYLINDERS DRIVE SHAFT/SEAL 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_2 pressure has been released from tank.

15. Pull up on empty soft drink tank cover relief valve to release CO_2 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.

16. 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.

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

18. 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.

19. 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.

20. 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.

21. 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.

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

23. 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.

24. 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.

25. Disconnect empty sanitizing solution tank from No. 1 syrup system.

26. 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 heath hazard.

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27. 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.

28. 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.

29. 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.

30. 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.

31. Disconnect soft drink tank containing syrup from No. 1 syrup system.

32. Connect clean empty soft drink tank into No. 1 syrup system.

33. 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.

34. Place waste container under No. 1 system product sample valve. Slowly open valve and purge remaining product out of product blender tank.

35. Disconnect empty soft drink tank from No. 1 syrup system and install tank containing syrup.

36. 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.

37. 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.

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

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

40. 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.

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

YEARLY OR AFTER WATER SYSTEM DISRUPTION)

WARNING: The carbonator water pump 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. Foreign particles lodged in the double liquid check valve could cause CO_2 gas to back flow into the water system and create a health hazard in the system.

SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE

(see Figure 2 and 13)

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_2 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 double liquid check valve assembly.
5. Pull up on carbonator tank relief valve plastic cover to release CO_2 pressure from tank.
6. Disconnect carbonator tank water line from double liquid check valve assembly outlet.
7. 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.
8. Disassemble each check valve as shown in Figure 11.
9. 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.
10. 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.

11. Assemble check valves together. DO NO OVERTIGHTEN.
12. 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.
13. Connect carbonator tank water line to double liquid check valve assembly outlet. DO NOT OVERTIGHTEN.
14. Open CO_2 cylinder and water inlet supply lines shutoff valves. Check for water leaks and tighten any loose connections.
15. Install Unit back panel by reversing removal procedure.
16. Connect electrical power to Unit.
17. Press both ‘‘AUTO BLEND 1’’ and ‘‘AUTO BLEND 2’’ switches.
18. 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_2 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:

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

A. Disconnect liquid disconnect from soft drink tank. NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.

B. Second, disconnect CO_2 quick disconnect from soft drink tank.

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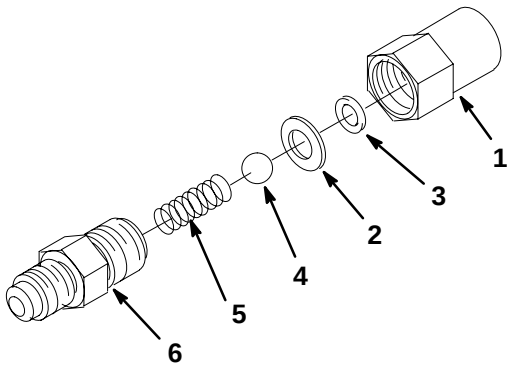

index no	part no	name
1	317965000	Retainer
2	312196000	Spring
3	312419000	Ball
4	312415000	Washer, .300 I.D.
5	312418000	Quad Ring
6	317963000	Body

*Install new ball seat each servicing.

FIGURE 11. LIQUID CHECK VALVE ASSEMBLY

3. **To connect soft drink tank into Unit syrup system.**
   - **A. First, connect CO_2 quick disconnect to soft drink tank to pressurize tank.**
   - **B. Second, connect liquid quick disconnect to soft drink tank.**
4. Disconnect inlet (CO_2) and outlet (syrup) lines from empty soft drink tank.
5. Check soft drink tank quick disconnects for sticky or restricted operation. Rinse disconnects in warm water.
6. First, pressurize full soft drink tank by connecting CO_2 line to tank, then connect Unit syrup inlet line to tank.
7. Press applicable ‘‘FILL 1’’ or ‘‘FILL 2’’ switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
8. Press applicable ‘‘AUTO BLEND 1’’ or ‘‘AUTO BLEND 2’’ switch to fill applicable No. 1 or No. 2 system product blender tank with product.
9. Press applicable ‘‘AUTO 1’’ or ‘‘AUTO 2’’ switch to start refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.
10. If freeze cylinder is not full of product, repeatedly pull and release faceplate relief valve to slowly bleed CO_2 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_2 SUPPLY

WARNING: CO_2 displaces oxygen. Strict attention *must* be observed in the prevention of CO_2 (carbon dioxide) gas leaks in the entire CO_2 and soft drink system. If a CO_2 gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of CO_2 gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.

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

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

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

5. Make sure gasket is in place inside CO_2 regulator coupling nut, then install regulator on CO_2 cylinder.
6. Open (counterclockwise) CO_2 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_2 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_2 and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:

2. 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_2 quick disconnect from soft drink tank.**

3. To connect soft drink tank into Unit syrup system.
   - **A. First, connect CO_2 quick disconnect to soft drink tank to pressurize tank.**
   - **B. Second, connect liquid quick disconnect to soft drink tank.**

4. First, pressurize soft drink tank containing new flavor syrup by connecting CO_2 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.

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

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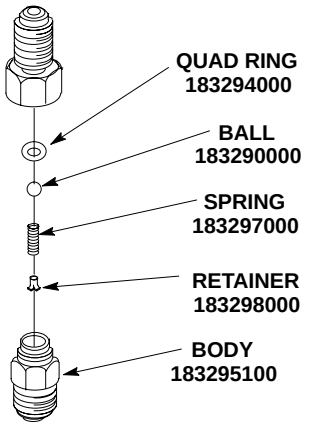
8. After carbonator water pump cycles off, intermittently pull and release applicable No. 1 or No. 2 freeze cylinder faceplate relief valve. This bleeds CO_2 from freeze cylinder and allows product to enter and fill cylinder.

9. If necessary, adjust BRIX, product viscosity (product consistency), and product carbonation of dispensed product as instructed.



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

FIGURE 12. CO_2 GAS CHECK VALVE

CLEANING CO_2 GAS CHECK VALVES

(see Figure 2 and 12)

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

REPLACING FREEZE CYLINDER BEATER DRIVE MOTOR

(see Figures 5 and 7)

IMPORTANT: Note in "5 MOTOR SELECT" the number of freeze cylinders beater drive motors Manufacturer's that are listed. Your Unit was manufactured and equipped with freeze cylinders beater drive motors from one of these Manufacturer's. The replacement freeze cylinder beater drive motor is also manufactured by one of these Manufacturer's listed. WHEN REPLACING ONE OF THE BEATER MOTORS, NOTE THE MANUFACTURER'S NAME ON THE MOTOR. THE BEATER MOTOR MANUFACTURER'S NAME MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR TO THE UNIT ELECTRONICS. Proceed as follows to replace the freeze cylinder beater drive motor.

1. Press "OFF 1" and "OFF 2" control switches to stop the refrigeration system and the beater drive motors.

2. Disconnect electrical power to the Unit.

3. Remove back and applicable side panels from the Unit.

4. Tag the beater drive motor electrical wiring for identification, then disconnect the wiring from the terminal block.

5. Remove the bolt, hex nuts,and lockwashers securing the beater drive motor to the Unit frame.

6. Very carefully, remove the old beater drive motor from the Unit. BE CAREFUL NOT TO LOSE THE LARGE RUBBER DRIVE SHAFT COUPLER.

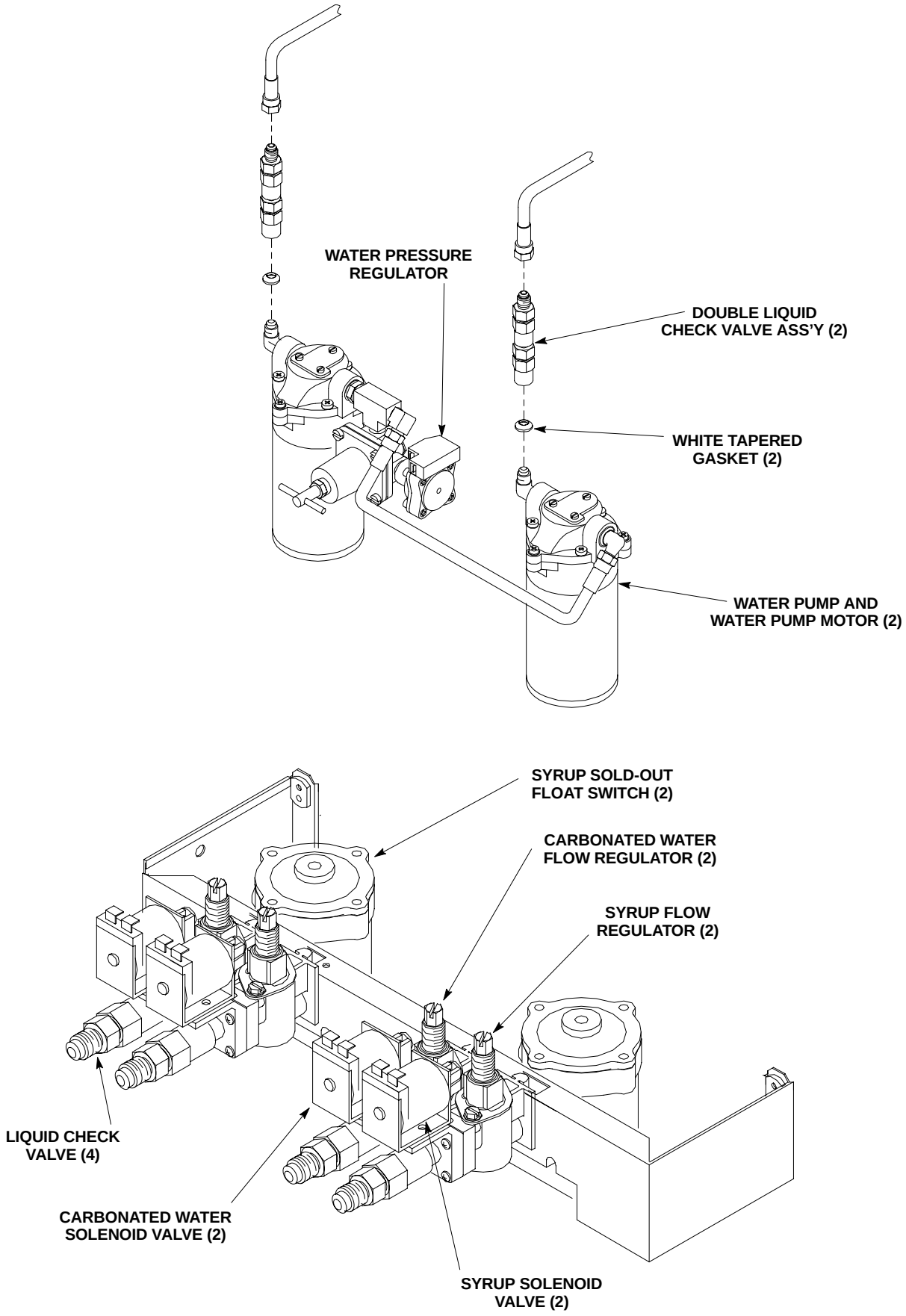


FIGURE 13. WATER STRAINER SCREEN AND DOUBLE LIQUID CHECK VALVE

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7. Remove platic coupler from the old beater drive motor shaft and install on the new motor shaft. MAKE SURE THE ALLEN-HEAD SET SCREWS ARE SECURELY TIGHTENED AND PROPERLY SEATED ON THE SHAFT FLAT SURFACE.

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

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

ADJUSTING CARBONATED WATER TANKS LIQUID LEVEL

The carbonated water 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 the carbonated water tanks and the carbonated water volume sample valves (see Figure 2 and 5).
2. To check carbonator tank total fill; allow carbonator water pump motor to operate and fill tank with carbonated water. After pump cycles off, disconnect electrical power from Unit.
3. Using container graduated in ounces, open applicable carbonated water tank carbonated water sample valve and completely drain carbonated water tank into the 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 14) 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 carbonated water 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.

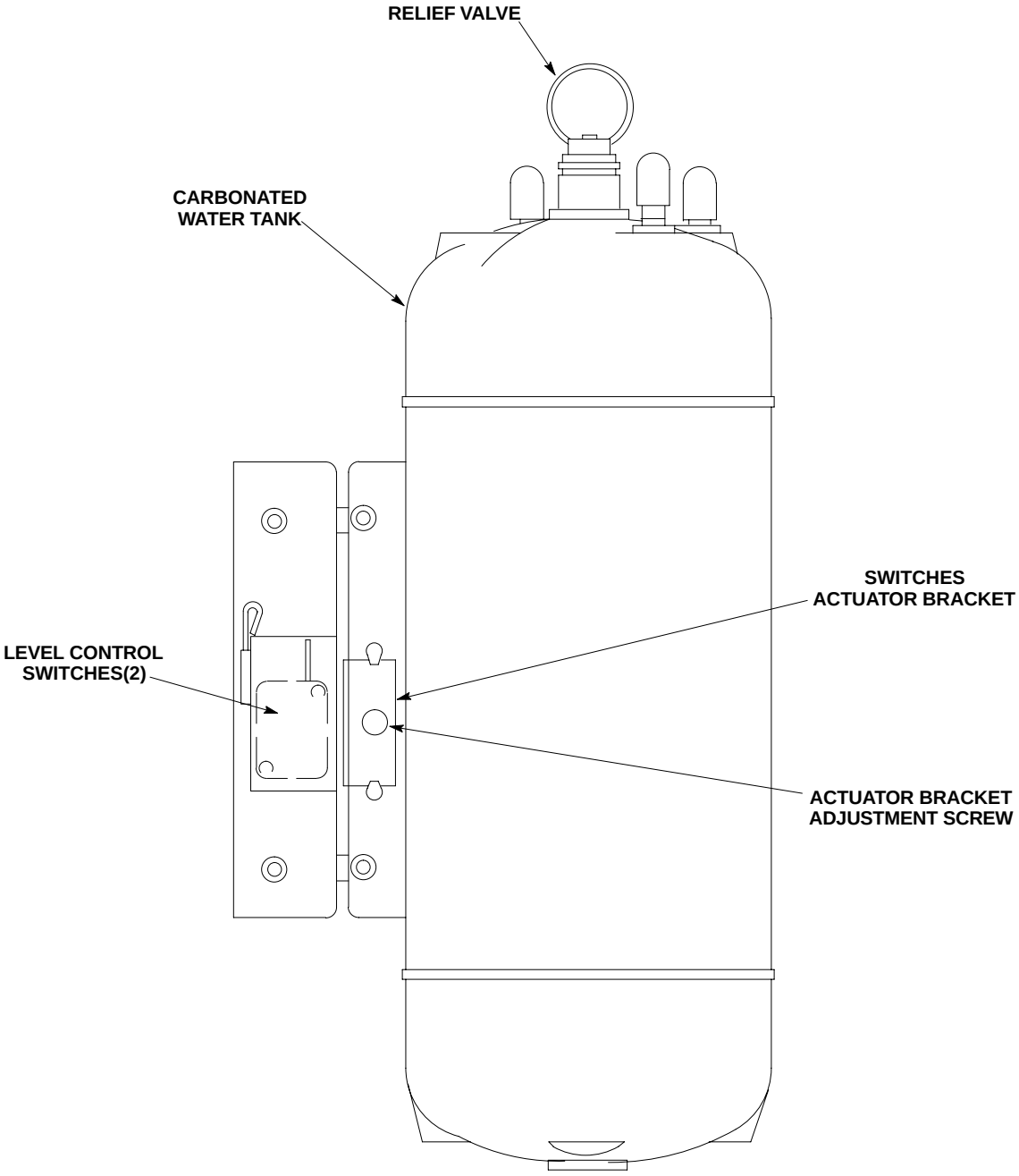

FIGURE 14. CARBONATOR LIQUID LEVEL CONTROL SWITCH ADJUSTMENT

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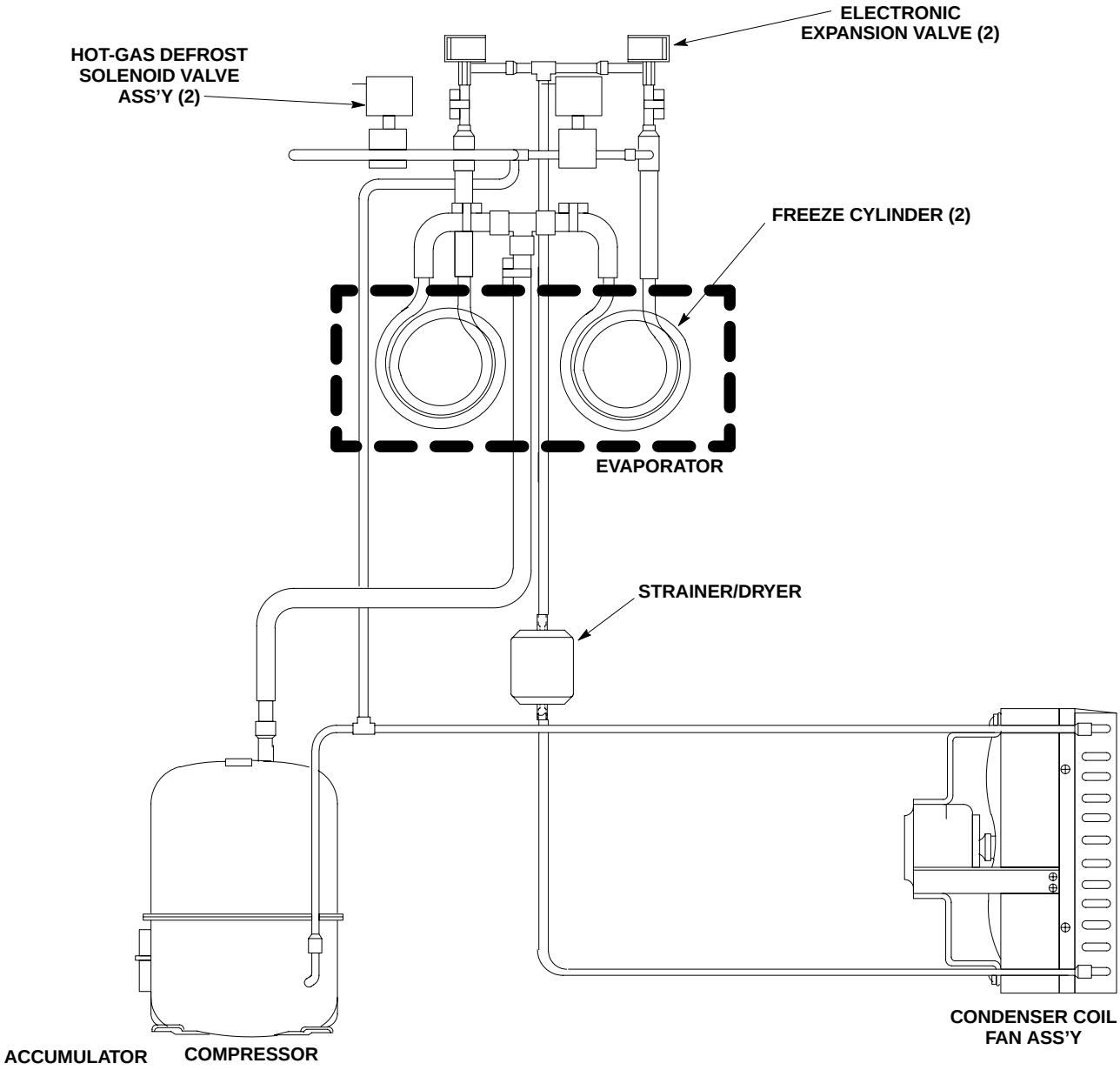
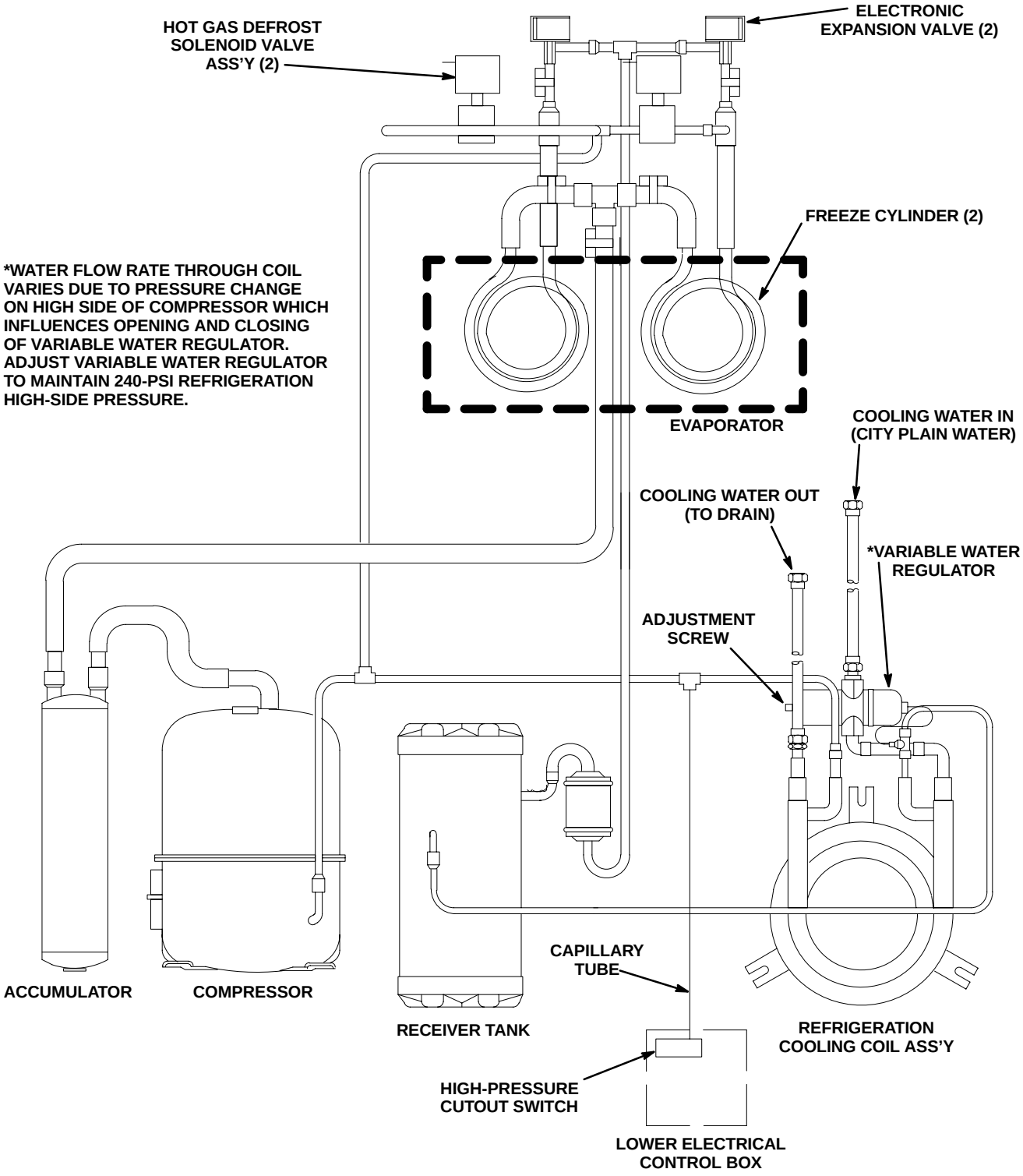


FIGURE 15. REFRIGERATION FLOW DIAGRAM (AIR-COOLED REFRIGERATION SYSTEM)



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

FIGURE 16. REFRIGERATION FLOW DIAGRAM (WATER-COOLED REFRIGERATION SYSTEM)

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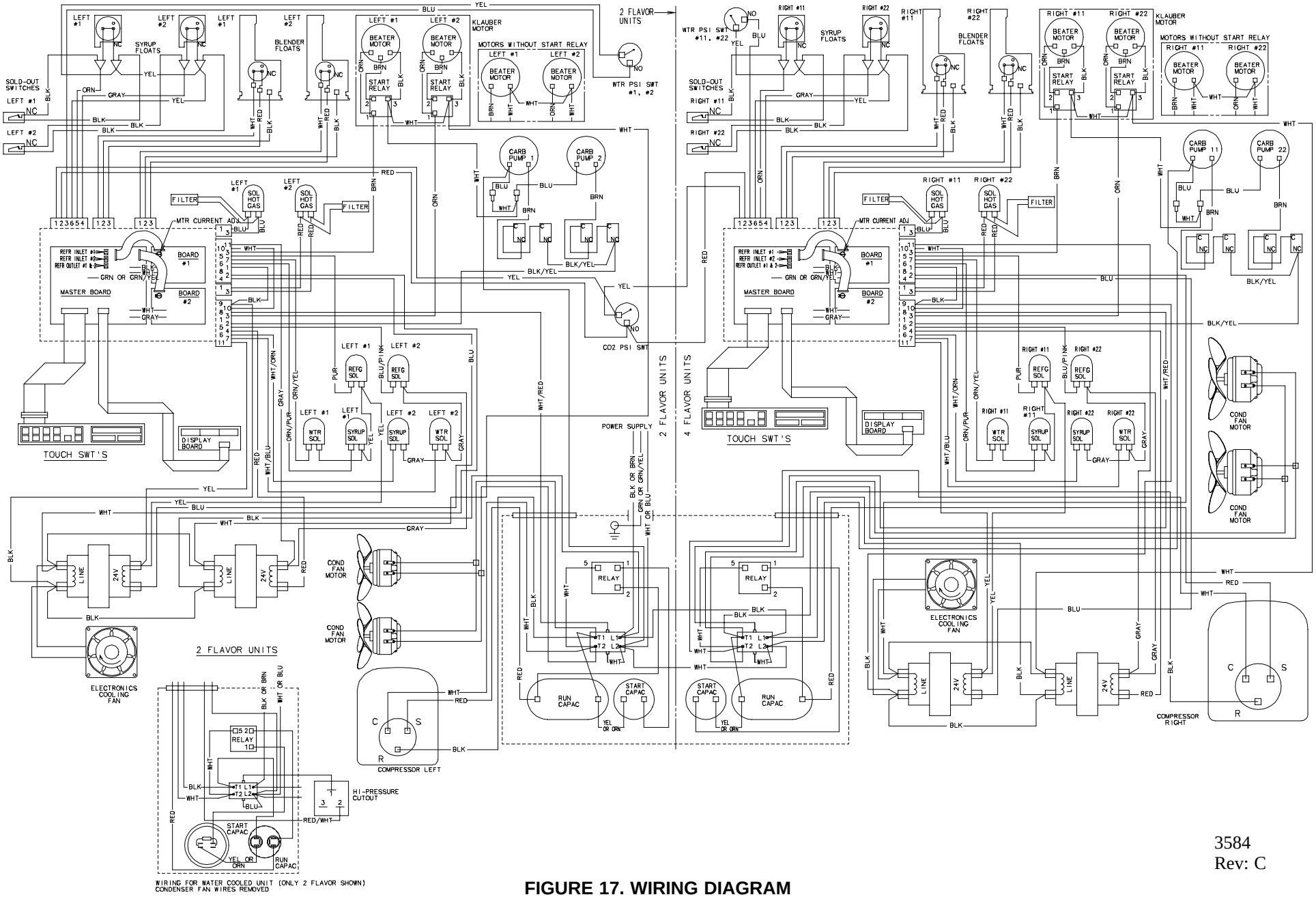

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FIGURE 17. WIRING DIAGRAM

TROUBLESHOOTING

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

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

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

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

A. Disconnect liquid disconnect from soft drink tank. NOTE – Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.

B. Second, disconnect CO_2 quick disconnect from soft drink tank.

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

A. First, connect CO_2 quick disconnect to soft drink tank to pressurize tank.

B. Second, connect liquid quick disconnect to soft drink tank.

TROUBLESHOOTING CONTROL PANEL SWITCHES AND FAULT MESSAGES

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

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Trouble		Probable Cause		Remedy
ALL CONTROL PANEL SWITCHES NOT OPERATING. (cond't)	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. (cond't)	D. Master circuit board not operating.	D. Replace master circuit board.
	E. Fault message display module not operating properly.	E. Replace fault message display module.
"CO_2 OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. CO_2 supply turned off or exhausted.	A. Open CO_2 cylinder shutoff valve or replenish CO_2 supply as instructed.
	B. Primary CO_2 regulator set too low.	B. Adjust primary CO_2 regulator as instructed.
	C. Inoperable CO_2 pressure switch.	C. Replace CO_2 pressure switch.
"H_2O OUT" FAULT MESSAGE GOES ON DURING OPERATION.	A. Water supply 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 "ERROR 2" FAULT MESSAGE GOES ON DURING OPERATION.	A. Error within Unit has developed interrupting normal operation.	A. Locate and correct error, then press "ERROR RESET" switch to restore normal operation.
FREEZE CYLINDER AUTOMATIC DEFROST CYCLE DOES NOT OPERATE.	A. Loose or broken electrical wires.	A. Repair electrical wires.
	B. Inoperable automatic defrost timer.	B. Replace master circuit board.
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.

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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_2O OUT” fault message is on.	C.	Restore water supply to Unit.
	D.	“CO_2 OUT” fault message is on.	D.	Replenish CO_2 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 for restricted pump discharge.
	G.	Inoperative water pump and/or motor.	G.	Replace pump and/or motor.
	H.	Inoperative carbonated water tank level control switches.	H.	Replace level control switches.
	I.	Binding, damaged, or dirty carbonated water tank balance mechanism.	I.	Clean, repair, or replace balance mechanism.
	J.	Inoperative water pump and/or motor.	J.	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.
ERRATIC CARBONATOR WATER PUMP CYCLING.	A.	Insufficient water supply pressure. “H_2O OUT” fault message goes on and off intermittently and water pump cycles on and off during carbonator tank fill cycle.	A.	Increase water inlet supply line pressure. Water inlet supply line must have large enough I.D.
	B.	Water filter restricted.	B.	Replace water filter.

Trouble	Probable Cause	Remedy
TROUBLESHOOTING DISPENSED PRODUCT		
BRIX (WATER–TO–SYRUP) ‘‘RATIO’’ TOO LOW.	A. Quick disconnect not secure on soft drink tank.	A. Secure tank quick disconnect.
	B. Syrup flow regulator set too low.	B. Adjust BRIX of dispensed product as instructed.
	C. Water flow regulator set too high.	C. Water flow regulator must be set at 1.3 ± 0.05 oz/sec.
	D. Syrup flow regulators stuck.	D. Clean syrup flow regulators.
	E. Restriction in syrup line.	E. Sanitize Unit as instructed.
	F. Syrup Baume not in proper range.	F. Change syrup supply as instructed.
BRIX (WATER–TO–SYRUP) ‘‘RATIO’’ TOO HIGH.	A. Syrup flow regulators set too high.	A. Adjust BRIX of dispensed product as instructed.
	B. Water flow regulator set too low.	B. Water flow regulator must be set for 1.3 ± 0.05 oz/sec.
	C. Water flow regulator stuck.	C. Clean regulator.
	D. Syrup Baume not in proper range.	D. Change syrup supply as instructed.
	E. Restricted water filter.	E. Replace water filter.
IMPROPER PRODUCT DISPENSED.	A. Secondary CO_2 regulators not properly adjusted.	A. Adjust secondary CO_2 regulators as instructed.
	B. Dirty CO_2 supply. CO_2 must be clean and free of water, oil, and dirt. Water will not absorb dirty CO_2 gas in same way as clean gas. This can also cause off–taste problems.	B. Replace CO_2 supply as instructed.
PRODUCT WILL NOT DISPENSE OUT OF DISPENSING VALVE, IN ONLY SMALL AMOUNTS, OR ONLY LIQUID.	A. Dispensing valve has ice particles in it.	A. Open and close dispensing valve repeatedly. Defrost freeze cylinder as instructed. If necessary, check and adjust BRIX as instructed. Adjust viscosity of dispensed product as instructed.
	B. Cylinder freeze–up.	B. Refer to CYLINDER FREEZE–UP.
FREEZE CYLINDER DOES NOT REFILL AT ALL TIMES WHEN DISPENSING.	A. ‘‘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.
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_2 regulator pressure insufficient.	b. Primary CO_2 regulator must be adjusted from 80 to 100–psi.

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Trouble	Probable Cause	Remedy
FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY. (cont'd)	B. Cylinder freeze-up causing ice formation in center of cylinder and liquid product channels around ice formation.	B. Refer to CYLINDER FREEZE–UP.
	NOTE: DEFROST AFFECTED FREEZE CYLINDER AS INSTRUCTED.	
CYLINDER FREEZE–UP.	A. Dispensed product BRIX too low.	A. Refer to BRIX (Water–to–Syrup) "Ratio" too low.
	B. Viscosity of dispensed product not properly adjusted.	B. Adjust dispensed product viscosity as instructed
TROUBLESHOOTING REFRIGERATION SYSTEM		
UNIT EQUIPPED WITH AIR-COOLED REFRIGERATION SYSTEM	A. Dispenser refrigeration system overheating.	A. Clean Unit condenser coil as instructed (see **NOTE** below)
	NOTE: The Dispenser condenser coil must be periodically cleaned to maintain proper cooling of the refrigeration system.	
UNIT EQUIPPED WITH WATER-COOLED REFRIGERATION SYSTEM	A. Water supply to refrigeration cooling coil assembly disruppted.	A. Restore water supply to refrigeration cooling coil assembly.
	B. Insufficient water supply to refrigeration cooling coil assembly disruppted.	B. Increase water supply to refrigeration cooling coil assembly.
	C. Variable water regulator on the refrigeration cooling coil assembly not properly adjusted.	C. Properly adjust variable water regulator as instructed in manual.

ACCESSORIES AND TOOLS

ACCESSORIES

1155	Installation Kit
511005000	Cup Holder
511006000	Cup Holder
511035000	CO_2 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

281884000	3–gallon Sanitizing Tank
322859000	Spanner Wrench, Dispensing Valve
511004000	Refractometer, 0–30 Scale
2899	Wrench, rear Seal Housing
3810	Gauge, Shaft/Housing Adjustment

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