HIGH--CAPACITY COLD CARBONATOR ASSEMBLIES INSTALLATION MANUAL

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The products, technical information, and instructions contained in this manual are subject to change without notice.

These instructions are not intended to cover all details or variations of the equipment, nor to provide for every possible contingency in the installation, operation or maintenance of this equipment. This manual assumes that the person(s) working on the equipment have been trained and are skilled in working with electrical, plumbing, pneumatic, and mechanical equipment. It is assumed that appropriate safety precautions are taken and that all local safety and construction requirements are being met, in addition to the information contained in this manual.

This Product is warranted only as provided in Cornelius' Commercial Warrant applicable to this Product and is subject to all of the restrictions and limitations contained in the Commercial Warranty.

Cornelius will not be responsible for any repair, replacement or other service required by or loss or damage resulting from any of the following occurrences, including but not limited to, (1) other than normal and proper use and normal service conditions with respect to the Product, (2) improper voltage, (3) inadequate wiring, (4) abuse, (5) accident, (6) alteration, (7) misuse, (8) neglect, (9) unauthorized repair or the failure to utilize suitably qualified and trained persons to perform service and/or repair of the Product, (10) improper cleaning, (11) failure to follow installation, operating, cleaning or maintenance instructions, (12) use of "non-authorized" parts (i.e., parts that are not 100% compatible with the Product) which use voids the entire warranty, (13) Product parts in contact with water or the product dispensed which are adversely impacted by changes in liquid scale or chemical composition.

Contact Information:

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

www.cornelius-usa.com

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This document contains the original instructions for the unit described.

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TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST FIGURES

LIST OF TABLES

SAFETY INSTRUCTIONS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

Safety Overview

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

Recognition

Recognize Safety Alerts
 *This is the safety alert symbol. When you see it in this manual or on the unit, be alert to the potential of personal injury or damage to the unit.*

DIFFERENT TYPES OF ALERTS

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

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

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

SAFETY TIPS

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

QUALIFIED SERVICE PERSONNEL

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

Publication Number: 560004885

Safety Precautions

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

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

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

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

Shipping And Storage

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

CO_2 (CO_2 Carbon Dioxide) Warning

DANGER:
CO_2 displaces oxygen. Strict attention **MUST** be observed in the prevention of CO_2 gas leaks in the entire CO_2 and soft drink system. If a CO_2 gas leak is suspected, particularly in a small area, **IMMEDIATELY** ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentrations of CO_2 gas experience tremors which are followed rapidly by loss of consciousness and **DEATH**.

Mounting in or on a Counter

WARNING:
When installing the unit in or on a counter top, the counter must be able to support a weight in excess of **50** lbs. to insure adequate support for the unit. **FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

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

GENERAL INFORMATION

TO THE USER OF THIS MANUAL

CAUTION:
This Unit must not be installed in an unsheltered outdoor location where it will be exposed to the elements. This unit must be located in a well ventilated area.

This is an Installation manual for the High Capacity Cold (HCC) Carbonating Systems (hereafter referred to as a Unit). Retain this manual with your equipment manuals for future reference.
This Unit must be serviced by a qualified Service Person. This Unit contains no user serviceable parts.

CLAIMS INSTRUCTIONS

Claims: In the event of shortage, notify the carrier as well as Cornelius immediately. In the event of damage, notify the carrier. **Cornelius is not responsible for damage occurring in transit, but will gladly render assistance necessary to pursue your claim. Merchandise must be inspected for concealed damage within 15 days of receipt.**

WARRANTY REFERENCE INFORMATION

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

DESIGN DATA

HCC Carbonating Systems include Vertical and Horizontal Carbonator Assemblies incorporated with Pump and Motor Assemblies. Reference the Cold Carb Drop--In and ED Series Products for system overview.

Table 1. Design Data	
HCC Carbonator Assembly Part Numbers:	
17” Horizontal Carbonator Assembly	710000028
12” Horizontal Carbonator Assembly	710000026
12” Vertical Carbonator Assembly	85170001
12” Vertical Carbonator Assembly	2600XX
Pump and Motor Part Numbers:	
1/3 Hp 120 VAC, 60Hz Pump Assembly with dual check valve	710000030
1/3 Hp 120 VAC, 60Hz Pump Assembly without dual check valve	560005105

Publication Number: 560004885

Table 1. Design Data (cont'd)	
Overall Dimensions:	
Width	9--inches
Height	6--1/2 inches
Depth	8--3/4 inches
Weight:	
Dry	27 pounds
Shipping	32 pounds
Ambient Operating Temperature	40° F to 100° F
Maximum CO2 Operating Pressure	125-PSI
Electrical Requirements:	
120 VAC, 60 HZ Unit:	8.1/6.5 Amps
Operating Voltage	120 VAC, 60 Hz
230 VAC, 50 HZ Unit	
Current Draw	3.3 Amps
Operating Voltage	230 VAC, 50 Hz

UNIT DESCRIPTION

The carbonator system is a compact Unit that may be installed in a remote location from where it's carbonated water outlet is to be connected to a post--mix dispenser or system. The purpose of the Unit is to mix plain water and carbon dioxide (CO2) gas which results in and provides carbonated water for a post--mix dispenser or system. The Unit consist basically of a water pump, motor, and a carbonated water tank. The water pump may include a dual check valve or a Vented--Dual Check Valve on it's outlet to prevent carbonated water from back flowing into the city water system. The Vented--Dual Check Valve vents water and possibly CO2 gas out of a vent port on failure of the Primary Check Valves. Should such venting occur, the Primary Check Valve should be replaced. The Unit CO2 inlet has a single check valve to prevent carbonated water back flow into the CO2 regulator. If the check valve is not located on the water pump, it will be found on the carbonated water tank. The carbonated water tank may be integrated within the post--mix dispenser or system.

THEORY OF OPERATION

A CO2 cylinder delivers CO2 (carbon dioxide) gas through a pre--set (per design) CO2 regulator to the carbonator water tank. At the same time, plain water is pumped into the carbonator water tank by the water pump and is carbonated by CO2 gas also entering the tank. When carbonator water tank carbonated water level has been satisfied, liquid level sensing device inside the tank signals the liquid level control module which in turn shuts off the water pump motor and the water pump. As carbonated water is drawn and carbonated water level in the tank drops to a certain level, the liquid level sensing device inside the water tank signals the liquid level control module that carbonated water must be replenished which in turn starts the water pump motor and the pump.

INSTALLATION

UNPACKING AND INSPECTION

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

1. After Unit has been unpacked, remove shipping tape and other packing material. Check for obvious damage and follow procedure in preceding NOTE if damage is evident.
2. Unpack LOOSE-SHIPPED PARTS. Make sure items are present and in good condition.

Table 2. Loose-Shipped Parts

Item No	Part No.	Name	Qty
1	178025100	Tapered Gasket, White	1
2	311304000	Tapered Gasket, Black	2

IDENTIFICATION OF LOOSE-SHIPPED PARTS

1. TAPERED GASKET, WHITE (item 1) used to seal connection when connecting regulated CO2 source inlet line to check valve in carbonator tank CO2 inlet.

2. TAPERED GASKETS, BLACK (item 2) used to seal connections when connecting plain water inlet line to water pump inlet tee fitting and carbonated water line to carbonator tank carbonated water outlet fitting.

SELECTING LOCATION

Locate the Unit so the following requirements are satisfied.

1. Locate the Unit in a cool area close to a properly grounded 3--wire, 115V 60Hz electrical outlet with proper electrical requirements fused at 15-amps (slow-blow). For accessibility, the electrical outlet *must* not be located behind the Unit. No other electrical appliance should be connected to this circuit. ALL WIRING MUST CONFORM TO NATIONAL AND ELECTRICAL CODES.
2. For 220V, 50Hz International units, a 3--wire power cord is provided. An adapter plug for the particular country will need to be provided by the installer.
3. Locate the Unit close to a plain water source line with requirements as outlined in CAUTION note under CONNECTING PLAIN WATER INLET LINE TO UNIT. Plain water inlet line from plain water source line to the Unit should be 3/8-inch I.D. (minimum) food-grade plastic.
4. Locate the Unit close to a permanent drain if installing Units equipped with Vented--Dual Check Valves which *must* have their vent tube routed to a permanent drain.

Publication Number: 560004885

INSTALLING UNIT

PLACING UNIT IN OPERATING LOCATION

WARNING:
This Unit must not be installed in an unsheltered outdoor location where it will be exposed to the elements. Failure to comply could result in serious injury, death or damage to the equipment.

Place carbonator in operating location meeting requirements of SELECTING LOCATION. MAKE SURE CARBONATOR IS SITTING IN LEVEL POSITION FOR PROPER OPERATION.

NOTE: This unit is not designed for a wash down environment and must not be placed in an area where a water jet could be used.

IMPORTANT: For Units with a vented dual-check valve assembly installed between the water pump outlet and the water inlet to the carbonator tank, the following applies:

The vented dual-check valve assembly vents carbonated water, and possibly CO2 gas out of a vent port upon failure of the primary check valves. Should such venting occur, the vented dual-check valve assembly must be replaced.

CAUTION:
Route free end of the vented dual-check valve vent tube to a permanent drain to avoid serious water damage in the event of a check valve failure.

TO AVOID POSSIBLE BACK-SUCTION FROM THE PERMANENT DRAIN, LOCATE THE END OF THE VENTED DUAL-CHECK VALVE VENT TUBE ABOVE THE DRAIN OR AS REQUIRED BY THE LOCAL PLUMBING CODE.

CONNECTING PLAIN WATER INLET SUPPLY LINE TO UNIT

NOTE: Cornelius Inc. recommends that a water shutoff valve and water filter be installed in the plain water inlet supply line. A Cornelius Water Filter (P/N 313860000) and QUICK DISCONNECT SET (P/N 313867000) are recommended.

CAUTION:
Check minimum flow rate and maximum pressure of the plain water inlet supply line. MINIMUM FLOW RATE MUST BE AT LEAST 100-GALLONS PER HOUR. If flow rate is less than 100-gallons per hour, starving of the carbonator water pump will occur. Starving will allow the carbonator water pump to overheat causing the safety thermostat on the pump outlet to stop the water pump motor. Overheating could occur if the plain water inlet supply line flow rate drops below 100-gallons per hour. INCOMING PLAIN WATER INLET SUPPLY LINE WATER PRESSURE MUST REMAIN A MINIMUM OF 10-PSI BELOW THE CARBONATOR CO2 OPERATING PRESSURE. (Example: Carbonator CO2 operating pressure is 80-psi and the maximum water pressure can be no more than 70-psi, etc.)Water over pressure (higher than CO2 operating pressure) can cause carbonator flooding, malfunction, and leakage through the carbonator relief valve. If water is exceeding maximum pressure specifications, a Water Pressure Regulator Kit (P/N 310150000) or equivalent must be installed in the plain water inlet supply line. If fitting connector is not available, tap into the plain water supply line with a 3/8-flare saddle valve (P/N 315664000) or equivalent.

1. Make sure food grade flexible plastic plain water inlet supply line provides adequate water flow rate and pressure as outlined in CAUTION note.
2. Before connecting plain water inlet supply line to Unit, open water line for a period of time to flush out any metal shavings resulting from connecting water line to fitting connector or saddle valve.
3. Remove shipping cap from 3/8-inch flare (5/8-18) male fitting on tee fitting in water pump inlet port.
4. Install TAPERED GASKET, BLACK (item 2) in plain water inlet supply line swivel nut, then connect water line to tee fitting in water pump inlet port.

CONNECTING CO2 INLET SUPPLY LINE

1. Remove shipping cap from CO2 inlet 1/4-inch flare (7/16-20) male fitting on top of the carbonator water tank.
2. Connect CO2 inlet supply line, from CO2 regulator, to CO2 inlet fitting on top of the carbonator water tank.

CONNECTING CARBONATED WATER OUTLET LINE

WARNING:
Under no circumstances should copper tubing, copper fittings, or brass fittings be used to connect Unit carbonated water outlet to post-mix dispenser or system. CO2 gas contact with copper tubing, copper fittings, or brass fittings will cause a health hazard. Failure to comply could result in serious injury.

1. Remove cap nut from one of the carbonated water 3/8-inch flare (5/8-18) outlet fittings on the carbonator water tank.
2. Make up carbonated water line by extending length of food grade flexible plastic tubing from the Unit carbonated water outlet to the carbonated water inlet of a post-mix dispenser or system.
3. Connect carbonated water line to post-mix dispenser or system carbonated water inlet.
4. Connect other end of carbonated water line to 3/8-inch flare (5/8-18) water outlet fitting on carbonator water tank. Seal connection with TAPERED GASKET, BLACK (item 2).

PERMANENT ELECTRICAL POWER CONNECTION TO UNIT IF REQUIRED BY LOCAL CODES

1. Remove screws securing the control box cover, then remove the cover.
2. Disconnect power cord ground electrical wire from under ground terminal connection hex nut located inside the control box.
3. Disconnect applicable black or brown and white or blue electrical wires from terminals on the control module.
4. Remove the power cord and strain relief from the control box.
5. Connect 115 VAC, 50/60 Hz or 220--240 VAC, 50/60 Hz electrical power from disconnect switch (not furnished) fused at 15-Amps to Unit with No. 16 AWG wire in suitable conduit or BX sheath. Make sure power source ground wire is installed under ground terminal hex nut located inside the control box as shown in Figure NO TAG. ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL ELECTRICAL CODES.
6. Install control box cover and secure with screws.

PREPARATION FOR OPERATION

CAUTION:
To prevent a fire hazard, no object should be placed or stored on top of the Unit.

ADJUST CARBONATOR CO2 REGULATOR AND TURN WATER INLET SUPPLY LINE ON

CAUTION:
Before connecting CO2 regulator assembly to CO2 cylinder, turn regulator adjusting screw to the left (counterclockwise) until all tension is relieved from adjusting screw spring. Failure to comply could result in equipment damage.

1. Open (counterclockwise) CO2 cylinder valve slightly to allow lines to slowly fill with gas, then open the valve fully to back-seat the valve. (Back-seating the valve prevents leakage around the valve shaft).
2. Adjust carbonator CO2 regulator to a nominal 80-psi.
3. Open one of the post-mix system dispensing valves to exhaust trapped air inside the carbonator tank.

Publication Number: 560004885

CAUTION:
Never operate the carbonator with the water inlet supply line shutoff valve closed. “Dry running” the water pump will burn out the pump. A pump damaged in this manner is not covered by warranty.

4. Open water inlet supply line shutoff valve.

UNIT OPERATION

WARNING:
The Unit must be electrically grounded to avoid possible fatal electrical shock or serious injury to the operator. The Unit power cord is equipped with a three-prong plug. If a three-hole (grounded) electrical outlet is not available, use an approved method to ground the Unit. Failure to comply could result in serious injury, death or damage to the equipment.

1. Connect electrical power to the Unit. The water pump will start and fill the carbonator tank with carbonated water. The water pump will stop when the carbonator tank is full.
2. Check for water and CO_2 leaks and tighten any loose connections.
3. Enable the carbonator pump by turning the switch ON. The switch is located on the junction box of the carbonator pump. The water pump will start and fill the carbonator tank with carbonated water. The water pump will stop when the carbonator tank is full. The carbonator pump will now cycle on whenever a drink is dispensed and the liquid level in the carbonator tank drops below the low level probe (approximately 22 oz).
4. Dispense a drink until the carbonator pump cycles on. The refill time should be about 5 - 7 seconds.
5. If the carbonator pump appears to be short-cycling where the refill time is 1 - 2 seconds, refer to the Troubleshooting section.

The dispenser is not designed for a wash down environment and must not be placed in an area where a water jet could be used.

OPERATORS INSTRUCTIONS

This section covers operators cleaning and maintenance responsibilities for the Unit.

PERIODIC INSPECTION

CHECKING CO2 SUPPLY

Make sure CO2 cylinder regulator assembly 1800-psi gage indicator is not in shaded ("change CO2 cylinder") portion of dial. If so, CO2 cylinder is almost empty and must be replaced.

CHECKING FOR CO2 AND WATER LEAKS

Check Unit for CO2 and water leaks and if found, call a qualified Service Person to repair as necessary.

WATER PUMP YEARLY MAINTENANCE (OR AFTER WATER SYSTEM DISRUPTION)

The water pump water strainer screen and liquid dual check valve must be inspected and cleaned at least once a year under normal circumstances and after any water system disruption (plumbing work, earthquake, etc.). Call a qualified Service Person to Inspect and clean the strainer screen and liquid dual check valve.

IMPORTANT: A vented dual-check valve assembly is installed in the carbonator between the water pump outlet and the water inlet to the carbonator tank. The vented dual-check valve assembly vents carbonated water, and possibly CO2 gas out of a vent port upon failure of the primary check valves. Should such venting occur, call a qualified Service Person to replace the vented dual-check valve assembly.

REPLENISHING CO2 SUPPLY

NOTE: When indicator on CO2 cylinder regulator assembly 2000-psi gage is in shaded ("change CO2 cylinder") portion of the dial, CO2 cylinder is almost empty and should be changed.

1. Fully close (clockwise) CO2 cylinder valve.
2. Slowly loosen CO2 regulator assembly coupling nut allowing CO2 pressure to escape, then remove regulator assembly from empty CO2 cylinder.
3. Unfasten safety chain and remove empty CO2 cylinder.

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

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

Publication Number: 560004885

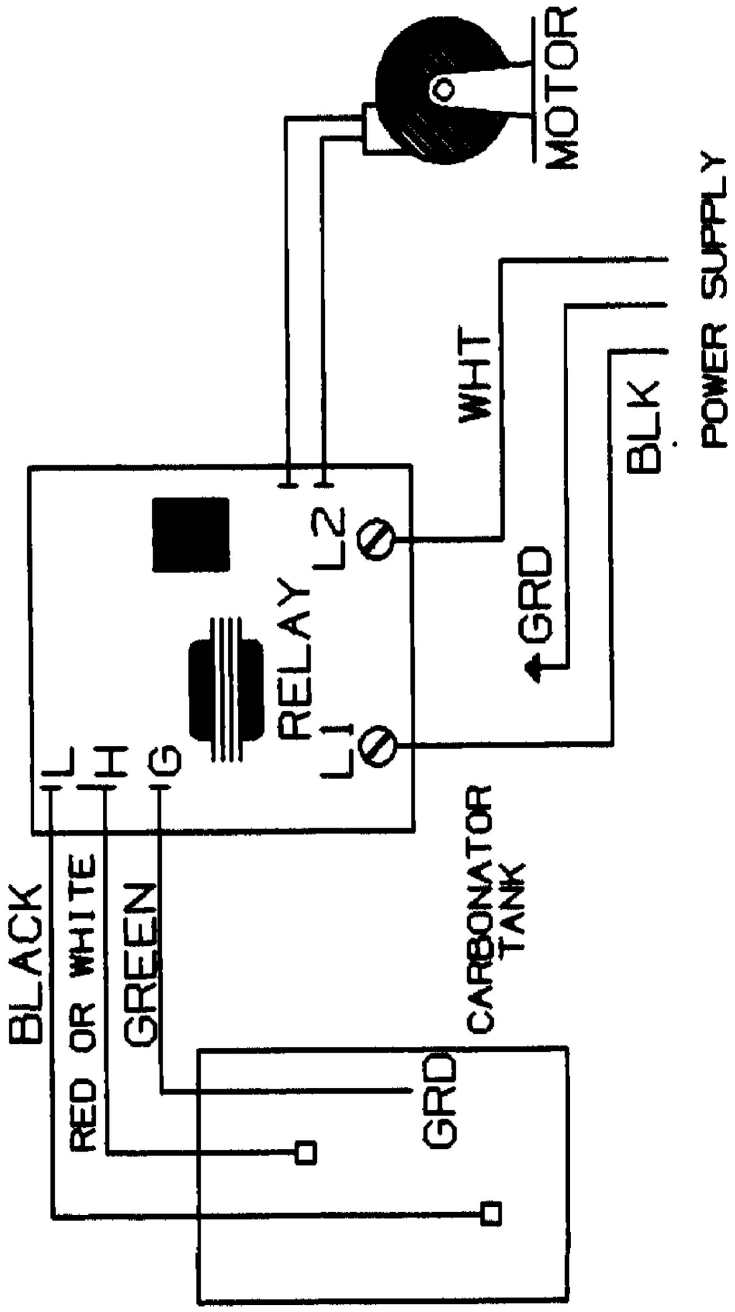

Figure 1. Wiring Diagram

TROUBLESHOOTING

WARNING:
Disconnect power to the unit before servicing following all lock out \ tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

WARNING:
Water and CO2 to the system must be turned off and the system depressurized prior to performing this service. Failure to comply could result in serious injury, death or damage to the equipment.

Trouble	Probable Cause	Remedy
CARBONATOR WILL NOT OPERATE	A. Power cord disconnected B. Inoperative carbonator.	A. Call a qualified Service Person. B. Call a qualified Service Person
WATER PUMP MOTOR WILL NOT SHUT OFF.	A. Carbonator Internal Problem	A. Call a qualified Service Person.
ERRATIC CYCLING OF CARBONATER	A. Carbonator Internal Problem.	A. Call a qualified Service Person
WATER PUMP MOTOR OPERATES BUT WATER PUMP DOES NOT PUMP WATER	A. Carbonator Internal Problem or a water supply line problem.	A. Call a qualified Service Person.
CARBONATOR CARBONATE WATER CAPACITY TOO LOW	A. Carbonator internal problems or a water supply line problem. B. Water filter Clogged	A. Call a qualified Service Person. B. Replace water filter

Publication Number: 560004885

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