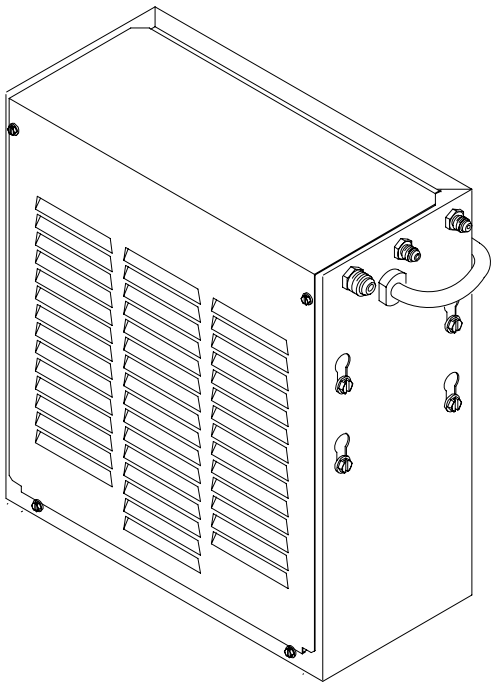
VA 13 CARBONATOR

Installation Manual



IMPORTANT:

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

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

When installing in an area regulated by the City of Los Angeles Plumbing and/or Mechanical Codes, a City of Los Angeles approved reduced pressure principle backflow preventer shall be installed on each potable water supply to each carbonator.

Manual Part No. 318511001

Control Code D

April 1,1982
Revised: November 30, 2001

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LIST OF FIGURES

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SAFETY INFORMATION

Recognize Safety Information

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

Follow recommended precautions and safe operating practices.

Understand Signal Words

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

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

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

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Learn how to operate the machine and how to use the controls properly. Do not let anyone operate the machine without instructions. Keep your machine in proper working condition. Unauthorized modifications to the machine may impair function and/or safety and affect the machine life.

CO_2 (Carbon Dioxide) Warning

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

Shipping, Storing, Or Relocating Unit

CAUTION: All water must be purged from the Unit if exposed to freezing temperature. A freezing ambient temperature will cause residual water remaining inside the Unit to freeze resulting in damage to internal components of the Unit.

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GENERAL INFORMATION

TO THE USER OF THIS MANUAL

This Manual is a guide for servicing and maintaining this equipment. Refer to Table Of Contents for page location of detailed information pertaining to questions that may arise. A Service Manual (P/N 318511005) for this equipment is available upon request.

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 IMI Cornelius immediately. In the event of damage, notify the carrier. **IMI 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

Table 1. Design Data	
Model Numbers	
115 VAC Unit (Liquid dual check valve)	416411000
115 VAC Unit (With vented dual check valve)	1621
230 VAC Unit (Liquid dual check valve)	496411000
230 VAC Unit (Liquid dual check valve)	496411020
230 VAC Unit (Liquid dual check valve)	496411040

Table 1. Design Data (cont'd)	
Overall Dimensions:	
Width	6-3/8 inches
Height	15 inches
Depth	14 inches
Weight:	
Dry	28-3/4 pounds
Shipping	30-1/4 pounds
Ambient Operating Temperature	40° F to 100° F
Maximum Operating CO_2 Pressure	125 PSI
Electrical Requirements:	
Operating Voltage and Current Draw	See Unit Nameplate

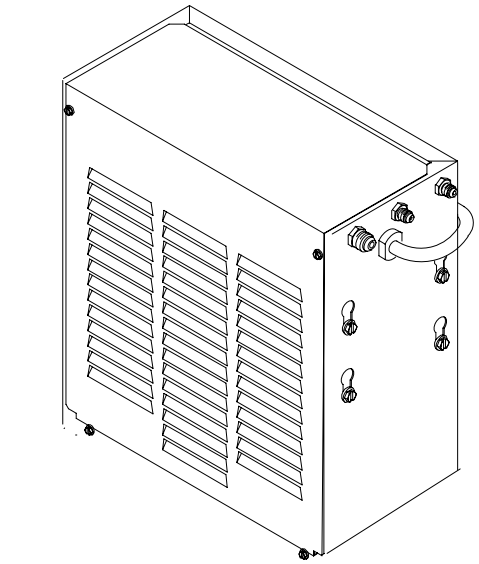

FIGURE 1. VA 13 CARBONATOR

UNIT DESCRIPTION

The carbonator is a compact Unit that may be installed in a remote location from where its carbonated water outlet is to be connected to a post-mix dispenser or a system. The purpose of the Unit is to mix plain water and carbon dioxide (CO_2) gas which results in and provides carbonated water for a post-mix dispenser or a system. The Unit consists basically of a water pump, motor, and a carbonated water tank. The water pump has a liquid dual check valve (Unit Model No. 416411000, 496411000, 496411020, and 496411040) or a Vented Dual Check Valve (Unit Model No. 1621) on its outlet to prevent carbonated water from back flowing into the city water system. The Vented Dual Check Valve vents water and possibly CO_2 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 CO_2 inlet has a single check valve to prevent carbonated water back flow into the CO_2 regulator.

THEORY OF OPERATION

A CO_2 cylinder delivers carbon dioxide (CO_2) gas through an adjustable CO_2 regulator to the carbonated water tank. At the same time, plain water is pumped into the carbonated water tank by the water pump and is carbonated by CO_2 gas also entering the tank. Carbonated water enters the tank until the weight of the water in the tank forces the tank and balance control mechanism down to activate the level control switches. Activating the level control switches disrupts electrical power to and stops the water pump motor. As carbonated water is dispensed from the tank, the tank becomes lighter allowing the tank and balance control mechanism to rise which again activates the level control switches. Activating the level control switches restores electrical power to the water pump motor allowing the carbonated water tank to be replenished.

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INSTALLATION

UNPACKING AND INSPECTION

NOTE: This 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 the time of delivery and immediately reported to the delivering carrier. Request a written inspection report from the Claims Inspector to substantiate any necessary claim. File the claim with the delivering carrier, not IMI Cornelius Inc.

1. After unit has been uncrated, 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	2
2	311304000	Tapered Gasket, Black	1

IDENTIFICATION OF LOOSE–SHIPPED PARTS

1. TAPERED GASKETS, WHITE (item 1) are used to seal connections when connecting lines to fittings labeled CO_2 INLET and CARB WATER OUTLET on the Unit.

2. TAPERED GASKET, BLACK (item 2) is used to seal connection when connecting plain water inlet supply line to the Unit.

SELECTING LOCATION

Locate unit so following requirements are satisfied.

1. Locate the Unit in a cool area close to a properly grounded electrical outlet with proper electrical requirements fused at 15-amps (slow-blow). No other electrical appliance should be connected to this circuit. For accessibility, the electrical outlet *must* not be located behind the Unit. ALL WIRING MUST CONFORM TO NATIONAL AND ELECTRICAL CODES.

2. 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.

3. Locate the Unit close to a permanent drain if installing Unit (P/N 1621) which is equipped with a vented Dual-Check Valve which *must* have it's vent tube routed to a permanent drain.

INSTALLING THE UNIT

PLACING UNIT IN OPERATING LOCATION

CAUTION: This Unit must not be installed in an unsheltered outdoor location where it will be exposed to the elements.

IMPORTANT: Before putting carbonator into operation, carbonator cover must be removed and packing block must be removed from below the water pump motor.

1. Place carbonator in operating location meeting requirements of SELECTING LOCATION. MAKE SURE CARBONATOR IS SITTING IN LEVEL POSITION FOR PROPER OPERATION.
2. Remove two screws securing the cover assembly on the Unit, then remove the cover.
3. Remove packing block from below the water pump motor.
4. Install cover assembly on the Unit and secure with two screws.
5. Unit Model No. 1621.

IMPORTANT: A vented dual-check valve assembly is installed in this carbonator between the water pump outlet and the water inlet to the carbonator tank as shown in Figure 3. The vented dual-check valve assembly vents carbonated water, and possibly CO_2 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.

Route free end of the vented dual-check valve vent tube, protruding out the end of the carbonator cabinet, to a permanent drain. **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

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 water pump outlet to disrupt electrical power to and stop the water pump motor. Overheating could occur if the plain water inlet supply line flow rate drops below 100-gallons per hour. WATER PRESSURE MUST BE 10-PSI LESS THAN THE CO_2 PRESSURE. (Example: operating CO_2 pressure is 80-psi, maximum water pressure can be no more than 70-psi, etc.). Water over pressure (higher than operating pressure) can cause carbonator flooding, malfunction, and leakage through the carbonator tank 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.

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

1. Make sure food grade flexible plastic 3/8-inch I.D. (minimum) plain water inlet line provides adequate water flow rate and pressure as outlined in CAUTION note.

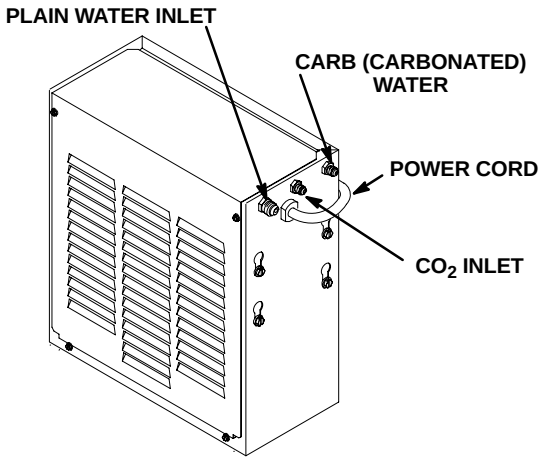

FIGURE 2. CARBONATOR CONNECTIONS

Before connecting plain water inlet line to the Unit, open the water line for a period of time to flush out any metal shavings resulting from connecting the water line to the fitting connector or saddle valve.

2. Remove shipping cap from the 3/8-inch flare (5/8-18) male fitting on the Unit labeled “WATER INLET”.

3. Install TAPERED GASKET (item 2) in the plain water inlet line swivel nut, then connect the water line to the 3/8-flare male fitting labeled “WATER INLET” on the Unit.

CONNECTING CO_2 INLET SUPPLY LINE (see Figure 2)

1. Remove shipping cap from the 1/4–inch flare (7/16-20) male fitting on the Unit stamped “CO_2 INLET”.

2. Connect CO_2 inlet supply line from the CO_2 regulator to the 1/4-inch flare (7/16-20) male fitting on the Unit labeled “CO_2 INLET”. Seal connection with TAPERED GASKET, WHITE (item 1).

CONNECTING CARBONATED WATER OUTLET LINE (see Figure 1)

WARNING: *Under no circumstances* should copper tubing, copper fittings, or brass fittings be used to connect the Unit carb (carbonated) water outlet to the post-mix dispenser or system. CO_2 gas contact with copper tubing, copper fittings, or brass fittings will cause a health hazard.

1. Remove shipping cap from the 1/4-inch flare (7/16-20) male fitting stamped “CARB WATER” on the Unit.

2. Extend length of food grade flexible plastic tubing from the Unit carbonated water outlet to the carbonated water inlet of the post-mix dispenser or system, then connect to dispenser or system.

3. Connect food grade flexible plastic tubing to 1/4-inch flare (7/16-20) male fitting labeled “CARB WATER” on the Unit. Seal connection with TAPERED GASKET, WHITE (item 1).

PERMANENT ELECTRICAL POWER CONNECTION TO DOMESTIC UNIT IF REQUIRED BY LOCAL CODES

(see applicable Figure 3, 4, or 5)

1. Remove two screws securing the cabinet cover, then remove cover.

2. Loosen two screws securing the motor wiring compartment cover, then remove the cover.
3. Disconnect ground electrical wire from under the ground terminal connection screw located inside the motor wiring compartment.
4. Disconnect the black and white power cord wires inside the motor wiring compartment.
5. Remove power cord and strain relief from the Unit.

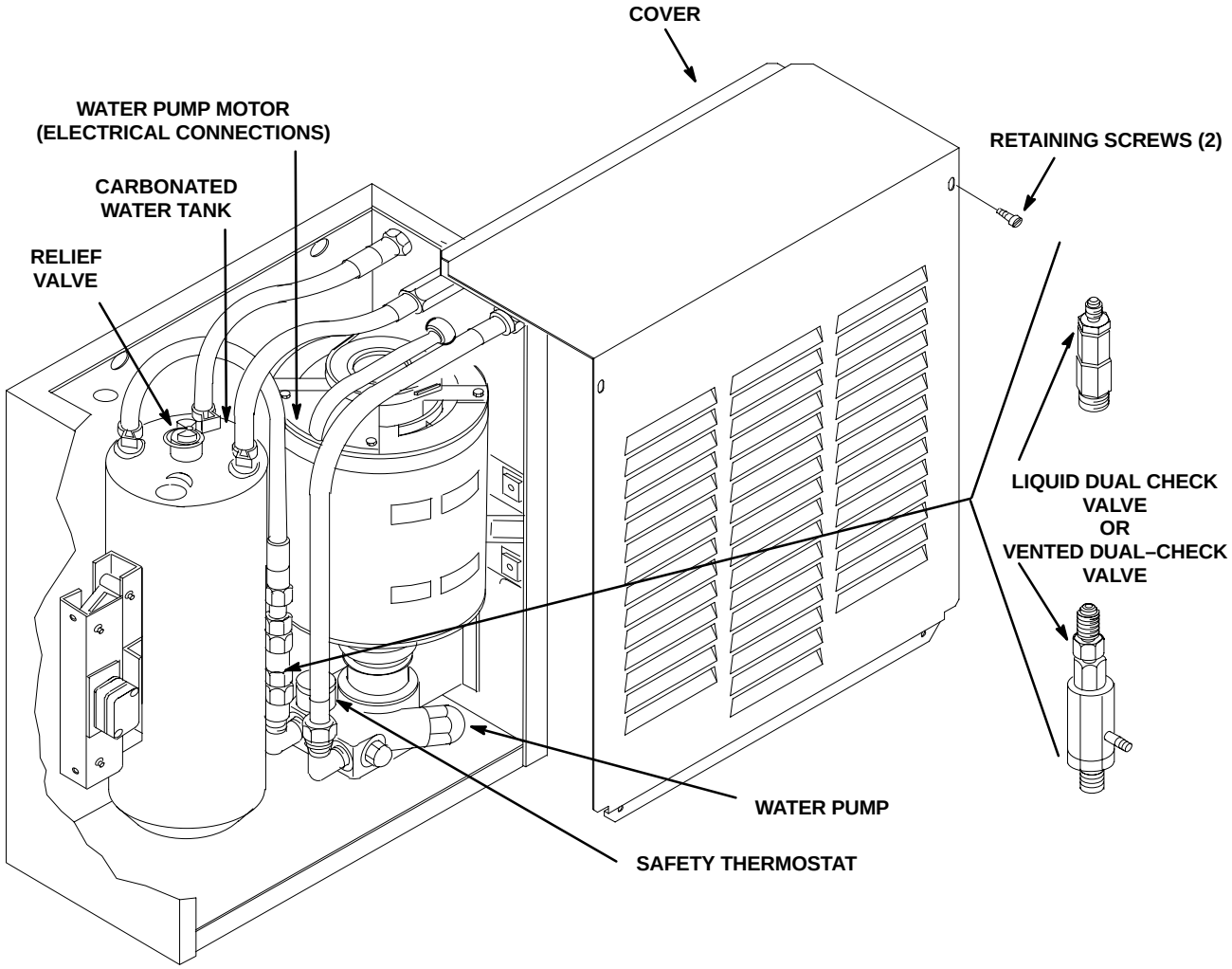

FIGURE 3. CARBONATOR ASSEMBLY COMPONENTS

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.

6. Connect 115 VAC, 60 Hz or 220–240 VAC, 50 Hz electrical power from the disconnect switch (not furnished) fused at 15-amps (slow-blow) to the Unit with No. 16 AWG wire in suitable conduit or BX sheath. Install power source green or green/yellow wire under the ground terminal lug located inside control box as shown. Connect black or brown power cord wire with wire nut and white or blue wire under nut on motor terminal. All WIRING MUST CONFORM TO NATIONAL AND LOCAL ELECTRICAL CODES.

7. Install motor wiring compartment cover and secure the two cover screws.

8. Install cabinet cover and secure with two screws.

PREPARATION FOR OPERATION

ADJUSTING CARBONATOR CO_2 REGULATOR AND TURN PLAIN WATER INLET LINE ON

CAUTION: Before connecting the CO_2 regulator assembly to the CO_2 cylinder, turn the regulator adjusting screw to the left (counterclockwise) until all tension is relieved from the adjusting screw spring.

1. Open (counterclockwise) CO_2 cylinder valve slightly to allow the lines to slowly fill with CO_2 gas, then open the valve fully to back-seat the valve. (Back-seating the valve prevents leakage around the valve shaft).

2. Adjust the carbonator CO_2 regulator to a nominal 80-psi.

3. Open one of the Post-Mix Dispenser dispensing valves to exhaust trapped air inside the carbonator tank.

CAUTION: Never operate the carbonator with the plain water inlet 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 the plain water inlet line shutoff valve.

UNIT OPERATION

NOTE: The carbonator tank liquid levels (pump cut-in and cut-out) were adjusted at the factory and should require no further adjustment. If carbonator tank relief valve opens before the water pump motor cycles off, adjust carbonator tank liquid levels as instructed in Service Manual (P/N 318511004).

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.

1. Connect electrical power to the Unit. Water pump will start and fill the carbonated water tank with carbonated water. Water pump will stop when tank is full.

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.

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

2. Check for CO_2, carbonated water, and plain water leaks and if evident, tighten any loose connections.

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

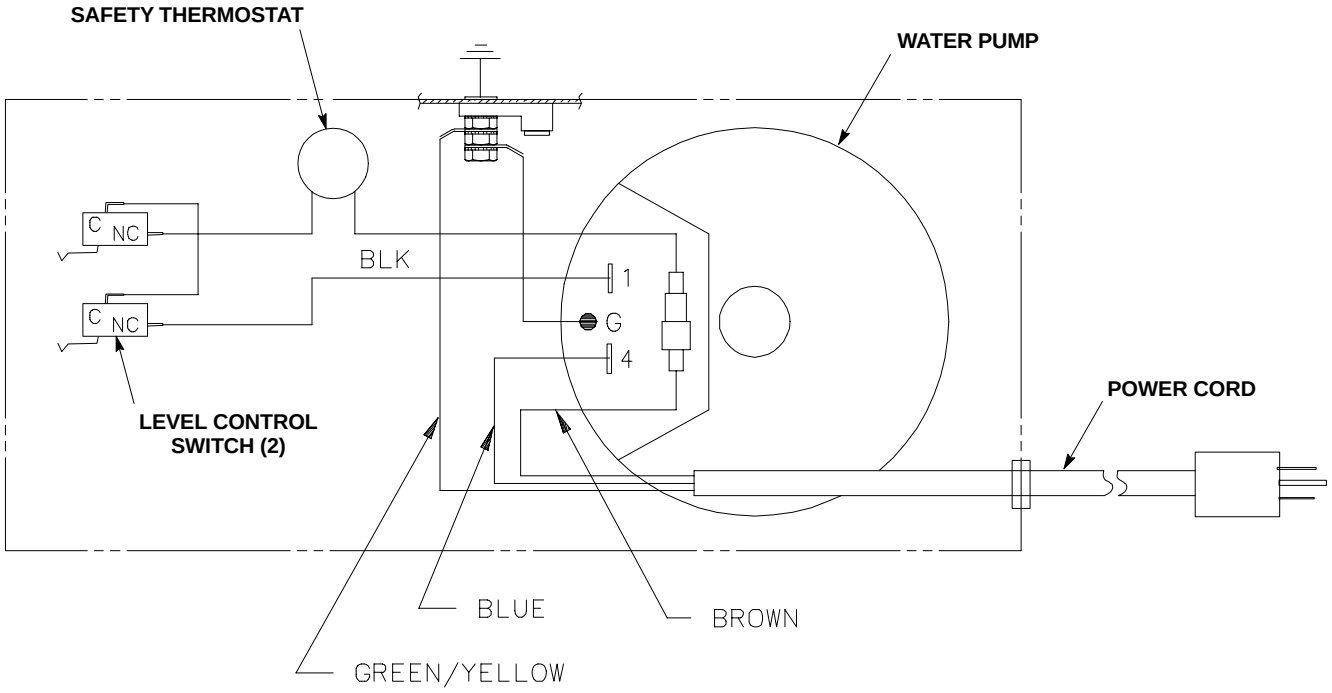

FIGURE 4. WIRING DIAGRAM (MODEL NO. 416411000, 1621, AND 496411000)

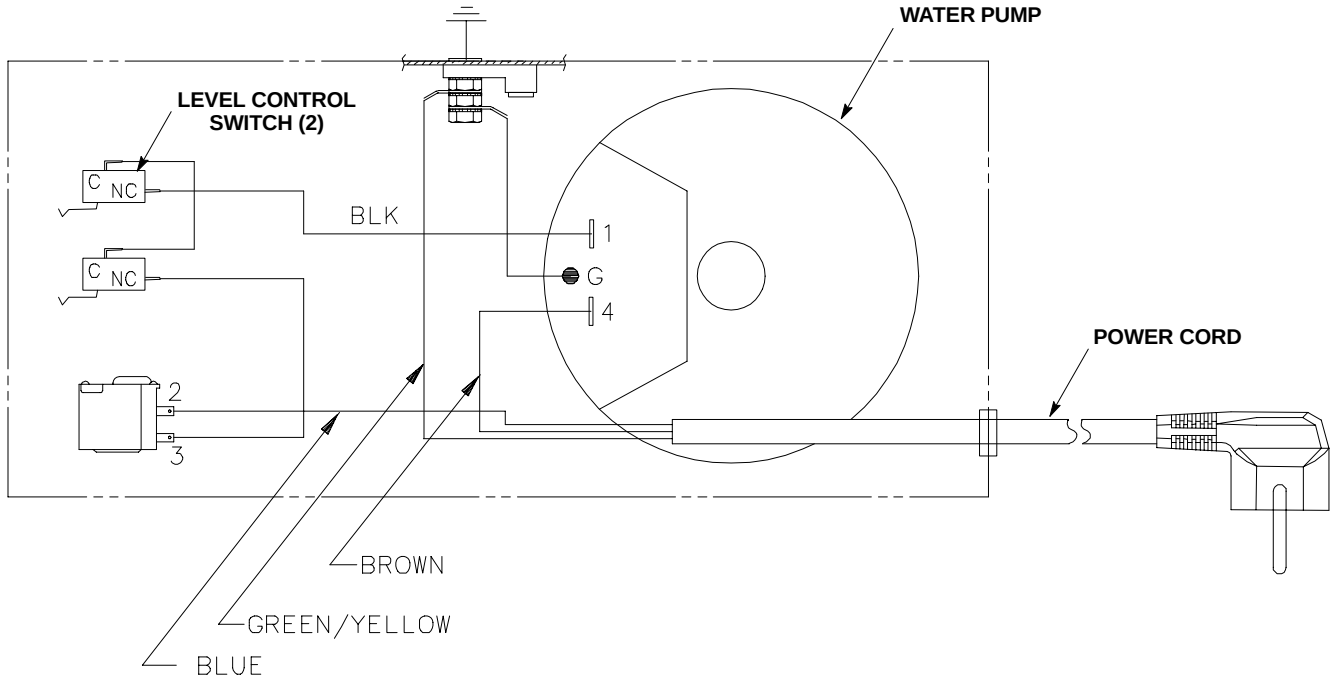

FIGURE 5. WIRING DIAGRAM (MODEL NO. 496411020)

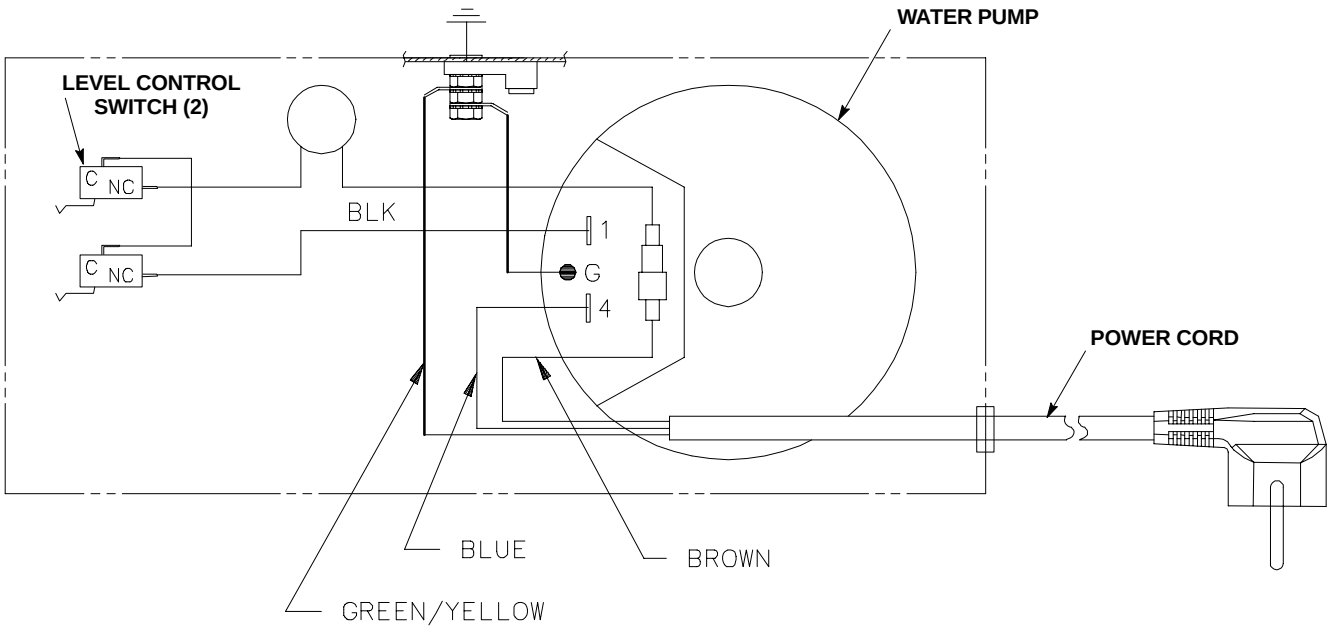

FIGURE 6. WIRING DIAGRAM (MODEL NO. 496411040)

TROUBLESHOOTING

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

If repairs to the carbonated water or the plain water systems must be made, disconnect electrical power to the Unit, then shut off CO_2 and plain water sources. Dispense from dispensing valve until carbonator tank CO_2 pressure has been relieved.

Trouble	Probable Cause	Remedy
WATER PUMP MOTOR WILL NOT OPERATE.	A. Power cord unplugged or circuit breaker open in panel box.	A. Plug in power cord or reset circuit breaker.
	B. Inoperative water pump motor.	B. Replace water pump motor as instructed.
	C. Dirty balance mechanism.	C. Clean balance mechanism.
	D. Loose connections and/or open electrical circuit.	D. Tighten connections and/or repair open circuit. Check line voltage.
	E. Overheated motor cut off by thermal overload protector.	E. Check for proper line voltage. Check for restricted pump discharge.
	F. Inoperative level control switches.	F. Replace level control switches as instructed.
	G. Binding or damaged balance mechanism.	G. Repair or replace balance mechanism.
	H. Water pump binding (new or replacement pumps only).	H. Remove water pump from motor, rotate pump or motor shaft 180 degrees, then recouple pump to motor.
	I. Water pump damaged.	I. Replace water pump as instructed.
	J. Safety thermostat inoperative (Models 416411000 and 1621).	J. Replace safety thermostat as instructed.
	K. Water pressure low or pressure switch inoperative (Model 496411020 only)	K. Restore water pressure or replace pressure switch.
WATER PUMP MOTOR WILL NOT SHUT OFF.	A. Foreign object restricting tank movement.	A. Remove foreign object.
	B. Dirty balance mechanism.	B. Clean balance mechanism.
	C. Leak in carbonated water line.	C. Tighten or replace line.
	D. Inoperative level control switches.	D. Replace level control switches as instructed.
	E. Binding or damaged balance mechanism.	E. Repair or replace balance mechanism.

Trouble	Probable Cause	Remedy
ERRATIC CYCLING OF CARBONATOR.	A. Balance mechanism spring obstructed or “cocked”.	A. Remove obstruction. Make sure spring is perpendicular to spring release and is not twisted.
	B. Dirty balance mechanism.	B. Clean balance mechanism.
WATER PUMP MOTOR OPERATES BUT WATER PUMP DOES NOT PUMP WATER.	A. Water pump inlet water strainer screen dirty.	A. Clean or replace water strainer screen as instructed.
	B. Kinked water supply line.	B. Straighten water supply line.
	C. Restriction between water pump outlet and carbonator tank inlet.	C. Remove restriction.
	D. Foreign object in water pump bypass.	D. Clean. (Note: Count number of turns bypass screw makes when removing and install same number of turns.)
	E. Water pump worn out.	E. Replace water pump as instructed.
WATER PUMP CAPACITY TOO LOW.	A. Water pump inlet water strainer screen dirty.	A. Clean or replace water strainer screen as instructed.
	B. Water supply capacity too low.	B. Inlet water supply must be at a minimum of 100-gallons per hour with a maximum water pressure of 70-psi.
	C. Water filter clogged.	C. Replace water filter.
	D. Inoperative water pump.	D. Replace water pump as instructed.

WARRANTY

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

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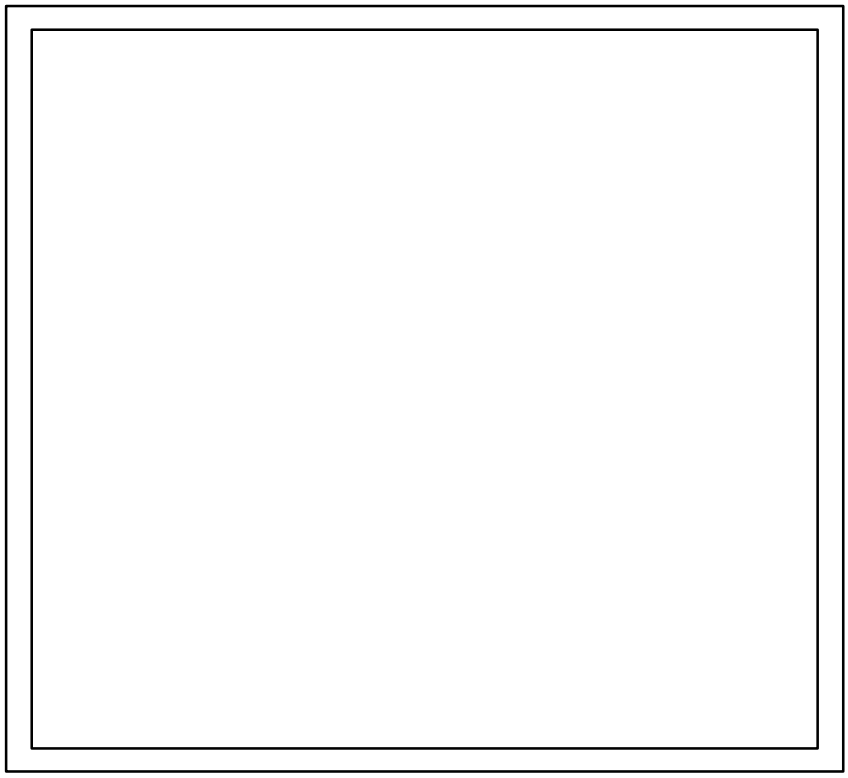

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