# BREAKMATE.

# Technical Service Manual - Level II



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# Service Manual - Level II Table of Contents

Section I.	Introduction
Operating The Dispenser.  Filling The Dispenser.  Dispenser Parts Description	1-1 
Section II.	Installation
Setting Up The Dispenser - Shop Filter Specifications Location Installation Connecting Water Filter/Supply L Flushing Water Line and Filter. Training The Key Operator	
Section III.	Accessories
Coin Mech Installation Coin Mech Operation. GM-1000 Single Coin Mech GM-3000 Three Coin Mech CO2 Filling Guidelines. CO2 Filling Equipment Required Filling Procedure. Sources of Supply Remote CO2 System - BA 126 Portable Water Supply - BA 104 Standard Installation Kit	3-1 3-3 3-4 3-4 3-5 3-6 3-6 3-7 3-8 3-9 3-12 3-13

ection IV.	Principles	of Operation

Carbonated Beverage Characteristics4-1
Carbonated Beverage Characteristics
The Dispensing System
Water Pump and Inlet Valve. 4-7
Water Pump and fillet Valve
A gitator
C C A
Water Outlet and Flow Control
Syrup System
Daffingungton Cretera
Cooper Cooling
[7]aal Constant
COs Emper Indicator
O1 Deard
Diagnostic Test Procedure
- ·
Section V. Troubleshooting Guide
Upper Green Light Flashing / Won't Accept CO25-1
Foreign Taste or Odor in Drink / Diet Syrup Freezing
Foreign Taste of Odor in Direct Sylup Freezing
Burst Safety Discs-CO2  Drinks-Warm / Mixing Channel Overflows  5-2  5-3
Drinks-Warm / Mixing Channel Overnows
CO2 Leaks / CO2 Leaks Into Water Supply
Lower Green Light Flashes / Too Little Water Dispensed
Water Drips Out Mixing Channel
Na Compa Dignarced / Drink Is Too Large
7 Calamaian / Coin Mach Incherative
Refrigeration Decision Tree
Section VI. Repair Procedures
Draining the Carbonator6-1
Demoving the Control Modille
Disconnecting the Flectrical Leads
Flow Control Removal
Water Outlet Valve Replacement
Outer Cabinet Removal
Outer Cabinet Removal
CO2 Regulator Replacement
A gitator Denlacement
Wasan Inlas Value / Pitma Reniacement
Dispenser Adjustments6-9
Dispenser Adjustments
Water Adjustment - Syrup Ratio Setting

Section VIII.	Service Parts
Parts I jet	
Cabinet	
Interior	
Single Coin Mech	***************************************
Spare Parts Price List - Single	Coin Mech.
Spare Parts Price List - The	hree Coin Mech
Spare Parts Kit	
Warranty Information	•••••••••••••••••••••••••••••••••••••••
Section IX.	Service Bulletins

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#### **BACKGROUND**

This manual is designed to assist Service Management in setting up service programs for the proper workshop preparation, field installation, and efficient maintenance and repair of the GA 3000 (BreakMate®) dispenser.

The GA 3000 is a compact, easy-to-use, and highly reliable carbonated soft drink dispensing system, developed and produced by Siemens exclusively for the products of The Coca-Cola Company.



THE GA 3000 (BreakMate®) DISPENSER

Although the practical minimum and maximum usage ranges of this dispenser will vary, depending upon local cost factors (e.g., overhead expenses, etc.) the GA 3000 is designed to operate efficiently and profitably with a usage of 12 liters per month to 50 liters per month. For higher daily volume, the use of additional dispensers is recommended.

#### **FEATURES**

In addition to being compact and lightweight, the GA 3000 has many advanced design features:







PLUG-IN CYLINDER

- Miniature high pressure water pump
- Stainless steel carbonator with removable top
- Pre-set syrup valves
- Electronic controls with built in diagnostic system
- Plumbed, filtered water supply for consistent high quality drink
- Optional "quarter only" or token coin mech
- Optional three-coin mech with 5¢ to \$1.55 pricing
- 6 1/2 ounce or 10 ounce drink size setting
- Internal leak sensor and water shut off

These and other feature are described in further detail in the operating sections of this manual.

#### OPERATING THE DISPENSER



To obtain a drink, place a cup properly sized for a 6 1/2 or 10 ounce drink in the position shown above, noted by an arrow and a cup symbol on the drip tray. Press the button for the flavor desired. If a coin mechanism is used, insert the coin(s) before pressing the selector button.

The dispenser will automatically shut off after dispensing the drink.

#### FILLING THE DISPENSER





#### REPLACING SYRUP

#### **REPLACING CO2**

When a drink is dispensed that is weak or has no syrup, the syrup cartridge is empty and must be replaced. Remove the empty cartridge and transfer the syrup valve to a full cartridge and replace.

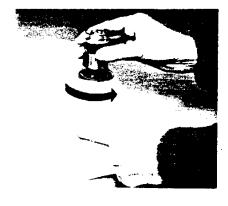
If the amber light near the selector buttons is flashing, the CO<sub>2</sub> cylinder is empty and needs replacing. Lift the CO<sub>2</sub> locking lever, remove the empty cylinder and replace with a full cylinder.

Detailed instructions for replacing syrup and CO<sub>2</sub> are shown on the inside of the syrup compartment door.

#### FILLING THE DISPENSER (cont'd)







#### Replacing The Syrup Cartridge

- Open the syrup compartment cover.
- All syrup valves are identical.
   Differences in syrup are pre-set in the syrup container fitting.
- Note the flavor placement. Flavors must correspond with labels on the inner syrup door.
- Pull out the mixing channel and remove the drip tray.
- Rinse the mixing channel and drip tray with hot water. Replace the drip tray.
- Remove the foil seal from a full syrup cartridge.
- Remove the syrup valve from the empty cartridge and rinse it in warm water.

# FILLING THE DISPENSER (cont'd)

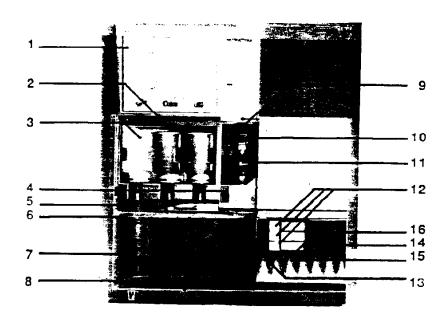




# Replacing The Syrup Cartridge (cont'd)

- Place the syrup valve into the neck of the full cartridge. Turn clockwise 1/4 turn until it clicks.
- Turn the cartridge over quickly to prevent syrup spilling. Reinsert the cartridge.
- The left syrup cartridge is for the lower push button.
- The center cartridge is for the lower push button.
- The right cartridge is for the center push button.
- Replace the mixing channel. Make certain the channel cover is in place.
   Push the channel into position until it clicks.

## DISPENSER PARTS DESCRIPTION





- 1. Syrup Compartment Cover
- Syrup Cooling Compartment
   Syrup Cartridge and Valve

- Off/On Switch
   Mixing Channel
- 6. Drink Outlet
- 7. Cup Placement Position
  8. Drip Tray and Grid
  9. CO2 Locking Lever

- 10. CO<sub>2</sub> Pressure Relief Pin

- 11. CO<sub>2</sub> Cylinder
- 12. Selector Buttons
- 13. Low CO<sub>2</sub> Indicator Light
- 14. No Water/Power On/6.5 oz. **Drink Indicator**
- 15. Internal Leakage/Power On/10 oz. Drink Indicator
- 16. Selector Panel
- 17. Syrup Cartridge
- 18. Valve Plunger
- 19. Valve Housing

#### GENERAL SPECIFICATIONS

**Dimensions:** 

18" high x 22" wide x 11" deep

Weight:

Empty - 60 lbs. Shipping - 66 lbs. Full - 78 lbs.

Capacity:

Syrup - 3 1-liter cartridges

Water - 2 liters carbonator capacity CO<sub>2</sub> - 20 oz. cylinder (1.25 lbs.)

Drink Size:

6.5 oz. or 10 oz. options

Capacity:

27 31 6.5 oz. drinks @ 1 per minute

Continous Draw:

1 drink every 4 minutes

Water Supply:

Plumbed water line connection

15 psig minimum, 120 psig maximum Flow Rate - 4 quarts/minute minimum

Electrical:

115v, 60hz, 3 amps 3.5A

74-6.6 amps starting current

.85.7 kwh per day

Refrigeration:

1/8 HP Danfoss compressor

Dual evaporators - water and syrup

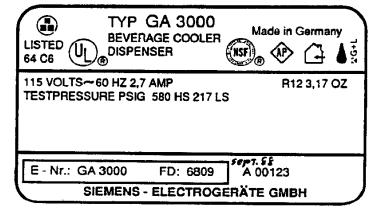
Static condenser

Serial Number Code:

FD 68 09 A 00123

| serial number model description month manufactured year manufactured (Add 20) manufacturer's code

Serial Number Plate



# BreakMate INSTALLATION GUIDELINE

2-1

#### GENERAL COMMENTS

The recommended procedure for installing a GA 3000 dispenser on location includes the following general steps:

- Set up the dispenser in your shop and run it overnight before transporting the unit to location.
- Equip your <u>shop workbench</u> with a permanently installed BreakMate Premium filter for setting up dispensers.
- When installing the dispenser on location, use an approved filter, flush the filter before connecting the water line to the dispenser, and check the water flow for 4 cutaru per minute flow rate.
- Listed below is a typical set of parts for connecting the dispenser to the water line on location. Users are cautioned to be aware of and comply with applicable local regulations concerning connecting appliances to city water lines.

### Installation Parts (Available from Break Time as a kit - BA 112)

Saddle Valve

3/8 compression

Tubing

3/8 OD polyethylene

Filter

Cuno CC717 or other approved filter - with 3/8

compression fittings

Dispenser

Fitting

Elbow fitting 3/8 compression

• Select a position for the dispenser that is convenient for the customer, near to a suitable cold water supply source, having a grounded electrical outlet, near to a sink with hot water; install on a level mounting surface with 4" clearance over the static condenser units. Note where the saddle valve and filter will be installed and where the water line will run. Check all connections after installation to be certain there are no leaks.

# BreakMate INSTALLATION GUIDELINES

#### SETTING UP THE DISPENSER - SHOP

- Connect a filtered water line to the dispenser.
- Plug the dispenser cord into a grounded wall outlet. The switch should be off.
- Press the CO<sub>2</sub> relief valve button, at the left side in the CO<sub>2</sub> compartment, to release the CO<sub>2</sub> pressure. Hold the button in until it stays in when all gas has been released.
- Turn on the main switch on the dispenser. The pump will run approximately 2 1/2 minutes and fill the carbonator.
- Install a CO<sub>2</sub> cylinder in the dispenser. Drain the carbonator by following the procedure on page 4-23 for operating the outlet valve.
- · Refill the carbonator.
- If a coin mechanism is to be used, connect it at this time.
- If the upper green light is on, the dispenser is set for a 6.5-ounce drink; if the lower green light is on, a 10-ounce drink.
- If a large drink is required, and no coin mechanism is to be used install the "Tene" Ounce Jumper" at this time (see "Coin Mechanism"), or set the drink size switch on the coin mechanism, if used.
  - Check the dispenser for operation and allow to run overnight before removal to location. Do not drain the carbonator.

#### FILTER SPECIFICATIONS

Activated carbon filters must meet certain requirements. Approved filter lists will be issued periodically from BreakTime Enterprises.

#### LOCATION INSTALLATION

Using a dispenser set up at Headquarters, it is only necessary to install the water line and filter and to flush the filter before connecting the water line to the dispenser. Install the syrup, and the dispenser is ready to use. Install the dispenser using the procedure following.

#### CONNECTING WATER FILTER AND SUPPLY LINE

- Locate the water supply line. The line must be 3/8" to 3/4" copper tube to use the saddle valve.
- Install the 3/8 compression saddle valve on cold copper water line.
- Connect the 3/8" OD Polyethelene tubing from the saddle valve to the water filter inlet fitting.\*
- Connect the tubing from the filter outlet to the plastic elbow dispenser fitting furnished with the dispenser. Attach a 2-inch piece of 3/8 redline tubing and a 3/8 Barb x 1/4 MPT fitting. Tighten the clamps with an end cutting pliers. Apply Teflon tape to the threaded fitting and screw it into the outlet port of the filter.
- \*Note: Approved water filters are required on all GA 3000 installations.

#### FLUSHING THE WATER LINE AND FILTER

- Put the end of the hose in a pail or in the sink, and turn on the saddle valve by turning in fully to pierce the tube, and turning out fully to turn on the water. Run a half pail of water through the line, or until it runs clear, to flush the air, carbon, and loose particles from the filter and lines.
- Note the water flow rate. Water must flow at the rate of four quarts or more per minute to supply the dispenser. The dispenser will not operate satisfactorily at a slower flow rate.
- Turn off the water at the saddle valve and connect the fitting to the dispenser. Turn on the water and inspect all connections to be certain there are no leaks.

2-4

# INSTALLATION GUIDELINES

#### TRAINING THE KEY OPERATOR

- Demonstrate doser insertion on one cartridge and have the operator(s) install the other two. (Empty cartridges are disposable.)
- Remove the CO2 cylinder. Bleed out the CO2 gas using the red button, until the CO2 light blinks, and point out that this is a low CO2 signal. Have the key operators install and remove a CO2 cylinder.
- Empty CO2 cylinders are refillable: do not discard.
- Demonstrate removal and cleaning of the mixing channel and drip tray, and emphasize that this must be done daily.
- · Show the key operator how to remove, clean, and replace the screen at the drink outlet. Show how to properly position the mixing channel cover on the channel and to be sure the channel "clicks" into position when replacing it.
- Show the key operator where to store syrup, CO2, and cups, and to keep one liter of each flavor refrigerated, if possible.
- Review the trouble shooting guide with the key operator.
- Write service phone number on the instructions inside the syrup compartment cover.
- Demonstrate the coin mechanism, if used, showing the 6.5 to 10-ounce switch and the operation of the "free play" switch.

#### CHECKING THE DISPENSER

- Draw one drink of each flavor and note the drink level in the cup. A 6.5-ounce drink delivered into a standard 7-ounce cup will fill the cup to about 1/8 inch from the top.
- If one or more drinks differ from this level, the carbonated water flow can be adjusted by turning the water flow adjustment screw (located at the water outlet point). A clockwise turn (full rotation) increases water flow by 2/3 ounce.
- Clean up the area around the dispenser. Set out a tube of cups in a convenient, sanitary location.

### MOST COMMON PROBLEMS - CORRECTABLE BY THE KEY OPERATOR

The signal lights on the selector panel and the taste and size of the drink will indicate common problems that can be corrected by the key operator.

#### WEAK DRINK OR NO SYRUP

Usually due to empty syrup cartridge or delivery of a short portion of syrup because it is the last portion in the cartridge.

#### FLASHING YELLOW LIGHT

Replace the CO<sub>2</sub> cylinder. The flashing yellow light is a signal that CO<sub>2</sub> pressure is low and the cylinder needs replacement.

#### DISPENSER DOES NOT DELIVER A DRINK

If the green indicator light is off, there is no power to the dispenser. Check the off-on switch to be sure it is in the "up" position, check the line cord to be sure it is plugged in, and that there is power to the electrical outlet.

#### TOP GREEN LIGHT FLASHING

Check the water supply to be sure it is on. Turn the off-on switch to the off position and remove the CO<sub>2</sub> cylinder. Press the red pin at the left side of the CO<sub>2</sub> handle and hold it in until it stays in. Turn the switch on. If the pump runs continuously until the green light flashes again, call your service representative. Do not repeat this procedure as it may cause damage to the dispenser.

# BreakMate TROUBLESHOOTING GUIDE

# MOST COMMON PROBLEMS (cont'd)

## LOWER GREEN LIGHT FLASHES

This signal indicates an internal leak in the dispenser. Call your service representative.

## DRINK FLOWS OUT SLOWLY

Check the screen outlet on the mixing channel for blockage. The screen can be removed for cleaning by pushing it upward. When replacing the screen, press it firmly in position in the mixing channel.

## MIXING CHANNEL OVERFLOWS

Check the position of the mixing channel to be sure it is pushed in fully until it clicks. The mixing channel cover must be positioned into the recess on top of the mixing channel, or syrup may flow over the top of the channel.

#### LOUD PUMP NOISE

An unusually loud pump noise indicates water flow has been shut off. Check water supply at inlet valve to be sure water is flowing and no air lock is in the filter. Turn unit off at on/off switch, remove CO2 cylinder and bleed carbonator by pressing red pin until it stays in. Turn unit back on. After pump stops, insert CO2 cylinder. Do not repeat this process - Call your service representative.

# SYRUP YIELD TOO LOW

The standard yield for a liter of syrup is  $31 \pm 1$  drinks for all syrup flavors. If the yield is less than 30, check to be sure the key operator is turning the doser fully into the cartridge until several "clicks" are heard.

Syrup yield is based upon syrup temperature at 45°F. Warm syrup - at room temperature - will yield fewer drinks per liter.

#### COIN MECH ATTACHMENT

The coin mech attaches to the right side of the dispenser. The cable from the coin mech is fed through the hole at the bottom right rear of the dispenser; the plug(s) attaches to the control board.

#### INSTALLATION PROCEDURE

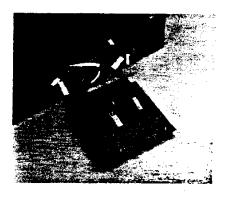
- 1. Unplug the line cord for the dispenser.
- 2. Remove the selector panel cover. Remove the screw at the lower left side of the panel and carefully pry out the lower right corner. Lift off the cover.
- 3. Remove the control board by loosening the two screws. Lift the panel out.
- 4. Unpack the coin mech. Feed the cable plug(s) through the hole in the back of the dispenser in the following order: two white single connectors; the two wire angle connector, and the gray connector. Push the cable until it is visible through the front of the dispenser.
- 5. Remove the "ten ounce jumper" if it is on the control board. The single coin mechanism plugs into that terminal position.
- If a GM-3000 3-coin mech is used, see page 3-3 for cable connections and instructions.
- 7. Slide the grommet down the cable to the hole and snap into position.
- 8. Reinstall the control board and selector panel.
- 9. Remove the covering from the self-adhesive pad on the coin mech and press mech into position at the right side of dispenser.
- 10. Attach the three mounting straps to fasten the coin mech: one at the top rear, one at the bottom rear, one at the front underneath.
- 11. Remove the cash box set the switch for regular or large drink. Be sure the "Free-Play" switch is in the "Coin-Op" position when setting the drink size switch.

# BreakMate ACCESSORIES

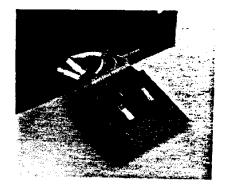
# INSTALLATION PROCEDURE (cont'd)

- 12. If 3-coin mech, set the price switch. (See page 3-5, Coin Mech Operation)
- 13. If a single coin, check setting for coin or token. (See page 3-4, Coin Mech Operation)
- 14. Replace coin mech and cash box.
- 15. Apply the price labels
- 16. Insert coin/token and test the machine.

## 3-COIN MECH INSTALLATION



- After having followed steps 1-5 on page 3-1:
- Locate the two white plugs for CO<sub>2</sub> at left of control board compartment.



- Attach the two white plugs to identical plugs on coin mech cable (male to female).
- Connect the grey 7-channel plug to ECM board (same as single coin).
- Connect the two channel plug at remaining gap in ECM board.
- Finish installation by following steps 7-16 on pages 3-1 and 3-2.

#### **COIN MECH OPERATION**

Two different coin mechs are available for coin control on the GA 3000. Both mechs have locked cash boxes and are furnished with two keys. Both mechs have a 6 1/2 - 10 ounce switch to change drink sizes and a free play switch. When setting the 6 1/2 - 10 ounce switch, the "free play" switch must be in the "coin operate" position. The drink size switch does not operate when the coin mech is set on free play. Switches are located just above the cash box, accessible when the cash box is removed.

#### **GM-1000 SINGLE COIN MECH**

The GM-1000 single coin mech is shipped for use at 25¢ sale with quarters only.



- To reset for tokens, remove the cash box.
- Remove the screw at the top of the cash box opening and pull mech forward.

COIN MECH



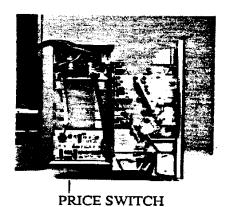
- Remove the screw holding the plastic rail.
- Invert plastic rail on side of coin acceptor.
   And replace the screw.
- Replace the mechanism into the cabinet.

PLASTIC RAIL

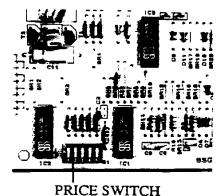
## **GM-3000 THREE COIN MECH**

The GM-3000 3 coin mech accepts nickels, dimes and quarters with sale price settings from  $5\phi$  to \$1.55 in  $5\phi$  increments. Price setting on the GM-3000 is accomplished by the following procedure.

To set a price, remove the cash box. Remove the screw at the top of the cash box opening and pull the mechanism forward.



- Find the small price switch located at the lower left interior of the mechanism.
- Each switch turned on <u>adds up</u> to the selling price.

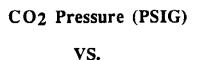


- The switches are numbered 1-5 and are for 5, 10, 20, 40 and 80¢.
- Push switches that add up to the selling price, to the "on" position.
- If 25¢ is desired, push the 5¢ and 20¢ switches to "on".

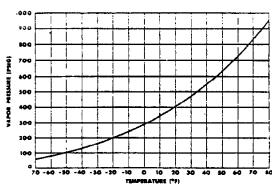
# **BreakMate** ACCESSORIES

#### CO2 CYLINDER FILLING GUIDELINES - GENERAL COMMENTS

Filling a small CO<sub>2</sub> cylinder from a large CO<sub>2</sub> supply cylinder requires a higher pressure in the supply cylinder than in the small cylinder to force the liquid CO<sub>2</sub> into the small cylinder. This pressure difference is attained by cooling the small cylinder, since gas pressure drops as temperature drops. The supply cylinder must be at room temperature of 72°F or higher (do not heat the supply cylinder) and the small cylinder at 0°F or lower to cause liquid CO<sub>2</sub> to flow. A 20-lb. supply cylinder will fill 12-13 GA 3000 cylinders; a 50-lb. dip tube cylinder will fill 25-28 cylinders.



CO<sub>2</sub> Temperature °F



Users must be aware of and comply with applicable regulatory codes and safe practices when installing equipment and filling cylinders. Users remain responsible for all decisions, including those with respect to acceptance, rejection, or modification of information contained in these guidelines.

#### **EOUIPMENT REOUIRED**

- CO2 cylinder filling head with gauge and high pressure hose
- CO<sub>2</sub> supply cylinder 50 lb. cylinder with dip tube
- Scale 5 lb. capacity; 1/2 oz. graduations (postal scale, e.g.)
- Empty CO<sub>2</sub> cylinders 1.25 lb. (20-oz.) capacity
- Plastic cylinder caps
- Chest type freezer set for 0° to -10°F

# FILLING PROCEDURE

<u>Old</u> BA101	New BA141	•
x	х	<ol> <li>Cool the small cylinders by placing them in the freezer. Allow six hours to cool.</li> </ol>
Х	х	2. Set up the filled 50 lb. dip tube supply cylinder in an upright position or, if a 20 lb. cylinder is used, invert it on a rack. Place the cylinder where it cannot be knocked over. Tether or otherwise secure the cylinder. Be sure the supply cylinder is at room temperature, 72' to 90'F. The pressure gauge should read 750 psi or highter.
x	х	<ol> <li>Attach the CO<sub>2</sub> line from the filling head to the supply cylinder. Be sure the o-ring seal is in place in the connecting fitting. <u>Tighten by hand - a wrench may not be necessary.</u></li> </ol>
х		<ol> <li>Close the inlet and vent valves at the filling head. The closed position is indicated by the valve handle at a right angle to the line.</li> </ol>
х	x	5. Place a cooled cylinder into the fill head and close the latch.
х	x	6. Open the valve on the CO <sub>2</sub> supply cylinder.
х		7. Open the fill valve at the fill head.
x	x	<ol><li>Allow gas to flow into the cylinder for 45 seconds or until the gas stops flowing.</li></ol>
x		<ol> <li>Shut off the fill valve and open the vent valve. A loud hiss will be heard and seen as vapor, as the head is vented.</li> </ol>
х	x	10. Lift the latch and remove and weigh the cylinder. The cylinder is properly filled if the weight is between 3 lbs. 3 oz. and 3 lbs. 5 oz. Do not exceed 3 lbs 5 oz. (53 oz) total weight. Bleed off excess gas. Every cylinder must be weighed. If the cylinder is underfilled it may be neccessary to recool it in order to make it accept more CO2.
х		11. Close the vent valve.
x	x	12. Insert an empty cold cylinder and close the latch.
x		13. Open the inlet valve to fill the next cylinder.

Caution: Use a glove to protect your hand as the cylinders are at 0°F to -10°F.

#### SOURCES OF SUPPLY

• <u>CO2 Cylinders</u> The preferred supply cylinder for use in filling GA 3000 cylinders is a 50 lb. capacity aluminum cylinder equipped with a dip tube extending to within 1/2 inch of the bottom of the tank. Cylinders are normally rented from the CO2 supplier, filled with CO2. You may wish to purchase your own cylinders to assure availability. Aluminum cylinders are manufactured by Luxfer. For your nearest distributor, call:

Luxfer U.S.A. LTD - phone (714) 684-5110

- CO2 Gas Supplies of CO2 gas in cylinders, or filling service for your cylinders are available from commercial gas and welding suppliers, listed under Gas-Industrial. Carbonic Gas. or Welding Supplies, in your yellow page phone directory. Some national companies are Holox, Airco, Carbonic Industries, Cardox, and Liquid Red Diamond. CO2 gas is priced by the pound, and the price depends upon the supplier, quantity used, whether picked up or delivered and may run from 25¢ to 50¢ per lb. Check to be sure that "F.D.A. Grade" gas is furnished.
- Filling Heads The filling heads for GA 3000 cylinders are available from:

BreakTime Enterprises, Inc. 2859 Paces Ferry Road Suite 1520 Atlanta, Georgia 30339

• Scales GA 3000 cylinders must be weighed after filling to prevent under or overfilling. The filled weight must not exceed 53 oz.: 32 ounces for the cylinder and 21 oz. of gas maximum, and should have graduations of 1/2 oz. or less. A platform beam scale can be used by placing the filling head on the scale, set to balance when full.

Platform Beam Scale:

Chatillon 50 lb.

\$480.00

Postal Scale:

5 lb.. Pelouze

\$ 30.00

Postal scales are available from office supply stores. Platform beam scales must be obtained from scale suppliers.

#### **REMOTE CO2 SYSTEM - BA 126**

This accessory for the GA-3000 permits the use of 20 lb. 10 lb or other standard size CO2 cylinders to replace the requirement for three or more 1 1/4 lb cylinders for each GA-3000 Dispenser. One 20 lb cylinder should supply CO2 gas to an average location (12 to 20 Liters per month) for five to eight months before replacement is required. Many local CO2 suppliers will replace CO2 cylinders at the location, no spare cylinder required on location.

#### DESCRIPTION

The BA 126 Remote CO<sub>2</sub> System includes the following assembled parts:

Bracket Assembly
CO2 Pressure Regulator
3/8 x 3/8 Compression Union
3/8" Tubing - 250 PSI - UVR [10 Ft per Kit]
3/4 x 1/2 Rubber Grommet
Installation Instructions

In addition, to the above, the following items are required for installation:

Drill Template 19mm (3/4") Hole Saw 3/8 Electric Drill 20 lb CO Supply Cylinder

### **INSTALLATION**

The system is installed by drilling a 3/4" hole at the rear of the dispenser, threading the CO<sub>2</sub> hose through the opening in the bottom of the CO<sub>2</sub> well, through the new hole in the rear of the dispenser, and making a connection to the CO<sub>2</sub> cylinder. The steps for installing the system are as follows:

(continued)

# **BreakMate** ACCESSORIES

#### BA 126 REMOTE CO2 SYSTEM INSTALLATION - (CONT'D)

- <u>Preparation</u> the system should be installed at headquarters before installing the dispenser. Disconnect the electric cord from the outlet and remove the CO<sub>2</sub> cylinder.
- <u>Drill a 3/4" diameter hole</u> at the rear of the dispenser, using the hole saw. The hole is to be located in the center of the space directly above the coin mech cable grommet. Use a drill template to locate the hole center, mark the hole, center punch the mark and drill the hole. Use a file if necessary to remove any burrs on the hole edge.
- Install the mounting bracket. Remove the selector panel and ECM board. Hold the mounting bracket assembly so the tube points to the right. Push the end of the CO<sub>2</sub> tube through the opening in the bottom of the CO<sub>2</sub> well, towards the ECM board. Reach in with a finger to locate the tube end and pull through. Push the bracket into position to engage the CO<sub>2</sub> regulator in the dispenser. Thread the tubing below the wiring harness, around the base of the compressor and out the drilled hole. Install the rubber grommet over the tube and insert the grommet in the hole. Replace the ECM board and selector panel.
- Connect the CO2 Cylinder. Set the CO2 cylinder in a safe place where it cannot be knocked over. Connect the CO2 regulator to the tank, making sure the gauges are visible. Use a small chain or other tie around the neck of the cylinder to prevent it from falling over. Run tubing from the rear of the dispenser to the regulator. Use the 3/8 x 3/8 compression union to connect the tube from the dispenser to the regulator line. Simply push the tubes into each side of the union tighten finger tight plus 1/4 turn with a wrench. Pull the tube to the regulator allowing proper slack, cut off and insert the tube end into the regulator fitting and tighten the nut 1/4 turn beyond finger tight.

### BA 126 REMOTE CO2 SYSTEM - (cont'd)

#### ADJUSTMENT AND TESTING

- Adjust The CO2 Regulator. Open the tank valve on the supply cylinder.
  The high pressure gauge will show 800-900 PSI. Loosen the nut on the
  pressure regulator adjusting screw. Turn the screw in (clockwise) until the
  low pressure gauge reads 120 PSI. Tighten the nut to lock the adjusting
  screw in position.
- Test For Leaks. The valve bracket should be uncoupled from the CO2 regulator in the dispenser. Turn off the valve on the CO2 cylinder. Watch the high pressure gauge, allow to stand for five minutes. There should be no drop in pressure. If the pressure drops, check all connections to locate the leak and tighten. Open the tank valve.
- Test for CO2 Flow. Set up the dispenser for operation. Make sure to first vent the carbonator. Fill the carbonator. Couple the adapter to the CO2 regulator. The CO2 blinking light will go out in about 10 seconds if the carbonator is full, and in about 30 seconds if the carbonator is empty.
- Instruct the Key Operator. A 20# cylinder of CO<sub>2</sub> Gas will last for 5 to 8 months or about 150 liters of syrup the equivalent of about 25 small cylinders. Have the key operator check the high pressure gauge once a week. When the gauge needle drops to the gray area, a week's supply of gas remains and the operator should call for a replacement cylinder. Show the key operator where the tank shut-off valve is located and demonstrate shutting off the valve on the tank.

#### Portable Water Supply System - BA104

#### **DESCRIPTION**

The water supply provides a means to operate the GA3000 dispenser where it is not feasible to connect the dispenser to a water line.

A stainless steel tank provides a capacity of 3.0 gallons of water - enough for about 75-6.5 oz. drinks. The pump furnishes constant water pressure to the dispenser, shutting off when the pump outlet pressure reaches about 50 PSI.

A built in timer cuts off the pump if the water tank runs empty. The system is equipped with an in-line filter and an elbow connector for the dispenser water inlet.

#### **OPERATING INSTRUCTIONS**

- 1. Unpack the supply unit. Remove the cover from the water tank and inspect the tank interior to be sure no foreign materials are in the tank. Place the supply system in a convenient location.
- 2. Fill the tank with clean tap water and replace the tank cover.
- 3. Prime and flush the system: Connect the pump inlet fitting to the tank. Put the filter outlet fitting into a container to catch the flushed water. Plug the line cord into an electrical outlet. Allow at least a gallon of water to flow through to flush the filter. Unplug the line cord.
- 4. Connect the system to the dispenser: Remove the CO2 cylinder and press the red button in the dispenser to bleed the carbonator. Connect the elbow fitting to the rear of the dispenser. Plug in the line cord and press the reset button on the pump. The pump will run a few seconds and stop. Check the connections for leaks. Be sure the cover is on the water tank and latched in position.

#### OPERATING INSTRUCTIONS (cont'd)

- 5. Turn on the dispenser and complete the set up procedure for starting the dispenser. Replace the CO<sub>2</sub> cylinder in the dispenser.
- 6. Fill the water tank DAILY. If the tank runs empty and shuts off the pump, fill the water tank, press the reset button and bleed the carbonator pressure before operating the system.
- 7. Be sure the cap fitting is not removed from the inlet fitting on the water tank, as this fitting allows air to enter the tank when water is drawn off.

#### **OPERATING COMMENTS**

- The pump will shut off during pumping if the water line fitting is disconnected from the water tank and the line is filled with water.
- If the BA104 tank runs empty, it may be necessary to vent the carbonator and draw a drink several times to push all the air in the line through the system. Fill the tank daily to avoid this inconvenience.
- When latching the tank cover, place the cover in the tank so that when the cover is latched, the cover latch handle is towards the tank handle.
- The water system is available as separate components for use with other water containers. The BA 105 Base/Motor Assembly and BA 103 Tank Assembly may be purchased separatly. the BA 120 Water Cap Kit is used to connect the BA 105 to a five gallon water bottle for bottled water use.

GA	-3000
UA	

# BreakMate ACCESSORIES

3-14

Installation Kit - Everpure Filter - BA-113					
<b>Ouantity</b>	Item	P/N	Source		
1	3/8 Compression-Saddle Valve	HV105-D6	Portage		
1	10 Ft. 3/8 OD P.E. Tubing	PE-64	Portage		
1	Filter Mounting Plate	BA-114	ВТЕ		
1	Everpure Head w/ 3/8 Comp Elbows	BA-115	BTE		
2	Oteker Clamp 170	17.0-706R	C/W		
1	3/8 Comp x 3/8 Barb Fitting	•	C/W		
1	3/8 ID Red Line Tube - 2" Long	-	C/W		
Use pla	stic elbow shipped in the dispenser with	the above parts.	-		
Order filte	r cartridge separately:				
	BreakMate Premium	BA 116	BTE		
	BreakMate Fine	BA 118	BTE		

## CARBONATED BEVERAGE CHARACTERISTICS

#### General Comments

A carbonated beverage is composed of three elements: water, CO<sub>2</sub> gas, and beverage syrup. These elements must be cooled, combined, mixed and delivered in the correct proportions, by a dispensing mechanism, to form a quality carbonated beverage. Each of these elements and the relationship between them is described below. The sections that follow in this chapter describe the mechanisms and operating principles used to combine and dispense these elements to obtain a quality carbonated beverage from the GA 3000 dispenser.

Water

The water used to make carbonated beverages must be taste and odor free with minimum amounts of dissolved gases, minerals or other materials. The dissolved odors and tastes in most city water supplies can be removed with an activated charcoal filter.

#### Carbon Dioxide

CO2 gas used to make carbonated water is furnished in liquid form in a high pressure cylinder containing 1.3 lbs. of CO2. Filled cylinders are obtained from the supplier for use in the GA 3000 dispensers CO2 gas in liquid form is stored in the cylinder at a pressure of 800 pounds per square inch (PSI) and the liquid is converted to a gas with the pressure feduced to 75 PSI for use in the carbonator.

Syrup

Used in the GA 3000 dispensers is furnished in patented one liter disposable cartridges, in a variety of flavors. The date of packaging should be noted for inventory purposes to assure peak flavor of the beverage. Be sure to control syrup inventory to assure use within 90 days of the date on the cartridge.

#### **Temperature**

A quality carbonated beverage must be served at a temperature of 40°F or lower. Higher drink temperatures cause loss of carbonation and loss of drink flavor. The storage temperatures of the ingredients in The GA 3000 are 45° for syrup and 32°F for carbonated water.

34-36 F

#### Carbonation

is the presence of carbon dioxide (CO<sub>2</sub>) gas dissolved in water. CO<sub>2</sub> gas forms a mild (carbonic) acid when dissolved in water to give the drink a tangy taste and to form bubbles when the drink is poured. The amount of carbonation in the drink is measured in "volumes", indicating the number of units of gas dissolved in the same size unit of water. A usual level of carbonation in a finished drink such as Coca-Cola is 3.5 volumes of CO<sub>2</sub> gas. The carbonation level is measured with a carbonation tester.

## CARBONATED BEVERAGE CHARACTERISTICS (cont'd)

#### **Brix**

is the measurement of the amount of sugar which is present in a soft drink or other liquid. Brix is measured in degrees (11.5° brix for example) and is the measure of the percentage of sugar, by weight, dissolved in the liquid. A soft drink which contains 10% sugar by weight is a 10° brix drink. Popular soft drinks have a brix of 10° to 12°, depending upon the type of drink. Brix is commonly measured by using a refractometer, a hand held optical instrument, in which the refraction index of the sugar solution is read in degrees brix directly on the view plate of the refractometer. The sweetness of Sugar Free drinks cannot be expressed or measured in brix, because sugar is not used as a sweetner, and therefore, the syrup/water ratio must be used.

#### Syrup Ratio

is the proportion of water to syrup used to make a carbonated beverage. Syrups are manufactured with different formulations of sweemers and flavorings, and the syrup manufacturers ratio must be followed to obtain the desired flavor level in the drink. Syrups used in the GA 3000 dispenser may have ratios between 5.0 and 6.0 units of water, to one unit of syrup. The correct ratio for Coca-Cola syrup as used in The GA 3000, for example, is 5.0 to 1: one ounce of Coca-Cola syrup and 5.0 ounces of water will make a 6.0 ounce drink. Syrup portions are predetermined by the syrup dispensing valve, for the type of syrup used. The syrup ratio can be measured by removing the mixing channel and measuring water and syrup separately.

#### GA 3000 Drink Specification

A casual drink (one drawn singly after no drink has been drawn for several minutes) is the the normal drink served by the dispenser. The casual drink will be close to the following specifications:

Carbonation 3.6 Volumes
Temperature 34°F

Syrup Ratio/Brix Coca-Cola 5:1/11.5° Brix

Diet Coke 5:1 / NA

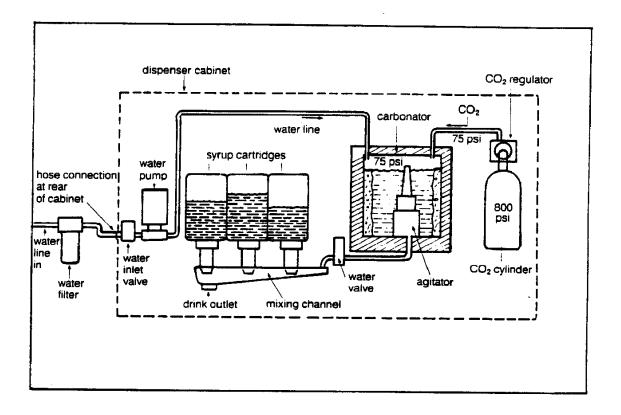
Sprite 5:1 / 11\* Brix

Syrup Throw 32 ML  $\pm$  1 (1.1 oz.) / 48 ML (1.6 oz.) Water Portion 160 ML  $\pm$  5 (5.4 oz.) / 240 ML (8.1 oz.)

Drink Sizes 192 ML (6.5 oz.) / 288 ML (9.7 oz.)

4-2

## THE DISPENSING SYSTEM



The diagram above shows the major components of the dispensing system and how they are connected when operating in the GA 3000 dispenser.

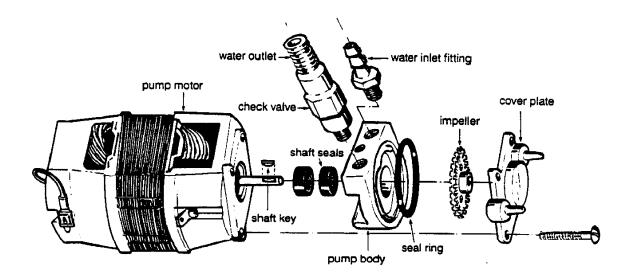
The system operates as follows:

- Water flows under pressure from the <u>water line</u>, through a <u>water filter</u>, to the hose <u>connection</u> and <u>inlet valve</u> at the rear of the cabinet.
- When the <u>water pump</u> is energized, the inlet valve opens allowing water to flow to the pump. The pressure is raised by the pump to 75 psi (pounds per square inch). The high pressure water is fed through a <u>water line</u> connected to the top of the carbonator where the water flows into the <u>carbonator</u>.
- Carbon dioxide (CO<sub>2</sub>) is stored in the <u>CO<sub>2</sub> cylinder</u> in liquid form at a pressure of 800 psi. The cylinder feeds CO<sub>2</sub> gas to the <u>CO<sub>2</sub> regulator</u>.

## THE DISPENSING SYSTEM (cont'd)

- The <u>CO2 Regulator</u> reduces the 800 psi gas pressure to 75 psi, and feeds it through a tube to the top of the carbonator where it is available for carbonating the water and providing delivery pressure for carbonated water.
- The carbonator is a stainless steel tank in which water is cooled by an <u>ice bank</u>, carbonated by agitation, and stored for delivery to the outlet valve.
- The <u>agitator</u> continuously circulates the water in the carbonator, providing cooling to incoming water by directing the water against the ice bank on the inside wall of the carbonator tank. As the water is circulated, CO<sub>2</sub> gas is drawn into and mixed with the water to form carbonated water. The carbonated water is then available for delivery through the outlet <u>water valve</u>.
- When a drink is dispensed, the outlet <u>water valve</u> opens, allowing carbonated water to flow into the <u>mixing channel</u>, where it is mixed with syrup and delivered to the cup.
- The syrup is provided in <u>cartridges</u> fitted with a syrup valve or "doser", which delivers two (for a 6.5 oz. drink) measured portions of beverage syrup to the mixing channel, where it is mixed with the carbonated water to form the finished drink and is delivered to the cup.
- The Mixing Channel blends the syrup and water to insure complete mixing when the drink is poured. The water flow is timed to wet the channel before the first 1/2 portion of syrup is delivered, and to rinse it after the second 1/2 portion of syrup is delivered. The timing assures complete mixing, and eliminates the possibility of any carry-over of flavor from the prior drink. If a ten ounce drink is dispensed, syrup is delivered in three portions.

### THE WATER PUMPING SYSTEM



### The Water Pump Assembly

The water pump is a high speed impeller pump, operating at 10,000 rpm to deliver water at a rate of 20 gallons per hour, or 1/3 gpm, into the carbonator against the 75 psi carbonator pressure.

Water entering the dispenser at the fitting at the back of the cabinet is admitted by the inlet valve which opens at the same time the pump is energized. The inlet valve also contains a flow washer which limits water flow to 1/3 gpm. Water is fed to the pump inlet through a plastic tube.

Water enters the <u>water inlet fitting</u> and is picked up by cavities in the <u>impeller</u> and delivered at high velocity through the <u>water outlet</u> and <u>check valve</u> to the carbonator.

The impeller is pressed onto the motor shaft and held in place by a woodruff key (shaft key). The shaft is sealed against leakage by shaft seals. The pump assembly is fastened to the pump motor by four screws, holding the cover plate to the pump body, sealed by a seal ring.

The check valve prevents carbonated water or CO2 gas from the carbonator, backing up into the pump if the inlet water pressure is below the 75 psi carbonator pressure.

# BreakMate PRINCIPLES OF OPERATION

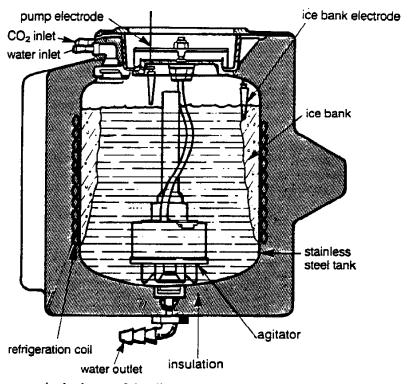
4-6

## THE WATER PUMPING SYSTEM (cont'd)

The water pump is primed by incoming water pressure and must not be run dry nor at zero flow rate or the impeller will overheat and disable the pump. As discussed under "installation", the CO<sub>2</sub> pressure must be vented from the carbonator when initially filling the dispenser to permit full flow rate of water during initial filling.

Note: The pump is mounted on flexible bushings to minimize pump noise. When replacing a pump, be certain to remove the plastic bushing support and transfer it to the new pump.

## THE CARBONATOR ASSEMBLY



The carbonator is the heart of the dispenser and provides these major functions:

- Cooling of incoming water to 32°F for best carbonation conditions and drink cooling.
- · Maintaining an "ice bank" to provide for capacity to cool successive drinks.
- Providing carbonated water by combining CO<sub>2</sub> gas with tap water to make carbonated water.
- Storing a quantity of carbonated water for ready use when dispensing drinks.

The carbonator body is a stainless steel tank with a capacity of one-half gallon. A refrigerant coil wrapped around the tank body cools the water and freezes water to form the ice bank. The water inlet and CO2 inlet fitting are located on the top of the tank. A water outlet fitting on the bottom provides an exit for the carbonated water.

### THE CARBONATOR ASSEMBLY (cont'd)

A removeable top cover provides access to the agitator, mounts the pump electrode water level control probe, and feeds the agitator supply wire into the carbonator. The top cover is sealed by a gasket and retained by a clamp and nut. The assembly is insulated with foam insulation covered by a plastic jacket.

The pump electrode controls the water level. When the water level drops below the bottom of the electrode, the flow of electrical current is interrupted and signals the control module to run the pump until the water level reaches the electrode.

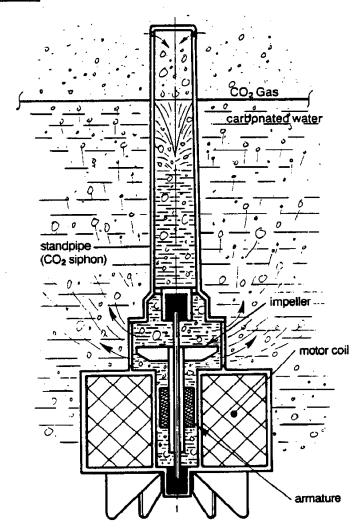
The tip of ice bank electrode is below the water surface and next to the tank wall where ice will cover the exposed tip of the electrode when the water freezes to form an ice bank. When ice covers the tip of the ice bank electrode, it insulates the tip and interrupts the flow of electrical current to signal the control board to turn off the refrigeration to the carbonator.

A second ice bank electrode in the carbonator is used in overseas unit, not in U.S. dispensers.

Under normal operating conditions, the carbonator will have a two pound ice bank and will store about 40 ounces of carbonated water at 32°F.

WATER COOLS DOWN TO 25°F BEFORE ICE BANK STANTS FORMING, AS IT FORMS, HID TEMP GOES UP TO 32°F. IF HID IS DRAWN AT 25°F, ICE CRYSTALS WILL FROM IN THE MIXING TRAY.

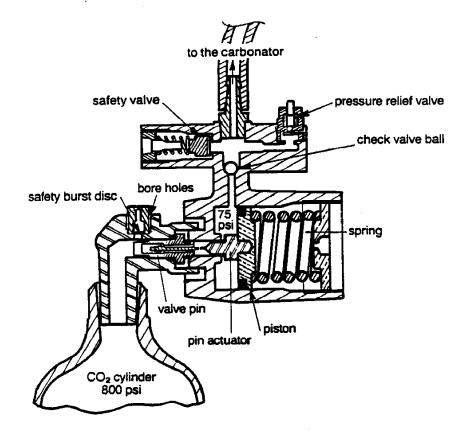
## THE AGITATOR



The agitator is a continuously running, submerged, motor driven <u>impeller</u> which circulates water coming into the carbonator. The constant circulation melts the ice bank to attain a water temperature of 32°F (0°C), the most ideal temperature for carbonation.

As the impeller circulates the water, a <u>standpipe</u> extending above the surface of the water into the CO<sub>2</sub> gas, has two small holes to admit CO<sub>2</sub> gas. The gas is then pulled in and mixed with the water and absorbed, as gas bubbles are pumped into the water flow and rise to the surface. This process continuously carbonates the water.

## THE CO2 PRESSURE REGULATOR



## The CO<sub>2</sub> pressure regulator provides these functions:

- Reduces the pressure of CO<sub>2</sub> gas from 800 psi in the cylinder to 75 psi for use in the carbonator.
- Provides a <u>pressure relief valve</u> to bleed off gas pressure in the carbonator before
  initially filling the carbonator, and when replacing parts in the water or CO<sub>2</sub>
  systems. Pressing the red pin after removing the CO<sub>2</sub> cylinder allows carbonator
  pressure to be vented.
- A <u>safety valve</u> set for 90 psi will automatically open if the regulated pressure or pressure in the carbonator reaches that level.

## THE CO2 PRESSURE REGULATOR (cont'd)

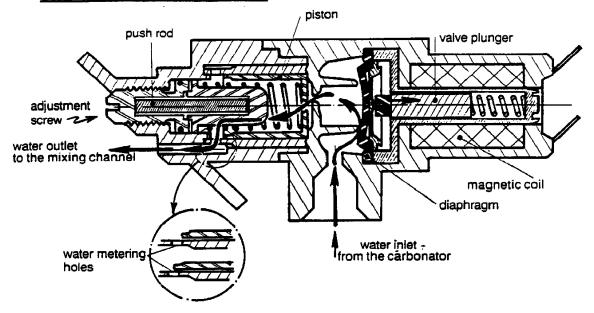
• A ball check valve stops CO<sub>2</sub> gas or water from the carbonator from backing up to the regulator and CO<sub>2</sub> cylinder when the cylinder is removed or is empty.

The CO<sub>2</sub> regulator operates to reduce CO<sub>2</sub> pressure from 800 psi to 75 psi by controlling the amount of gas pressure against the <u>piston</u>. When the CO<sub>2</sub> cylinder is inserted in the regulator, the <u>pin actuator</u> in the regulator pushes against the valve pin in the cylinder neck. Gas coming into the regulator moves the piston back until 75 psi pressure is developed against the piston. At that point, the piston has moved the pin actuator back far enough to allow the valve pin to move forward, shutting off gas flow.

As gas is used, the pressure drops, allowing the spring to push the piston and pin actuator forward, thus maintaining a constant pressure.

# **BreakMate**PRINCIPLES OF OPERATION

### THE WATER OUTLET VALVE



The water outlet valve has the following functions:

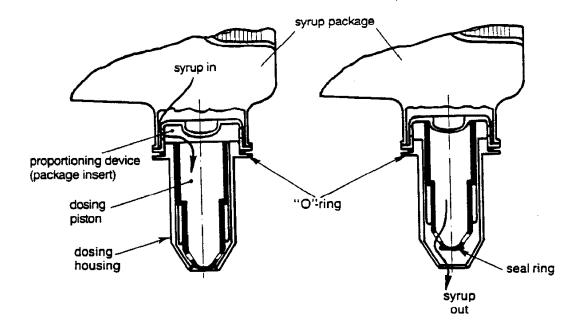
- Turns the carbonated water flow on and off as required.
- Maintains a constant flow rate for carbonated water even with variation in carbonator pressure.
- Provides an external means of adjusting water flow rate to provide the correct syrup to water ratio. The adjustment screw is accessible at the water outlet.
- Directs the flow of carbonated water into the mixing channel.

The outlet valve is an electrically operated solenoid valve with an adjustable flow control built into the outlet side of the valve.

Carbonated water at 75 psi flows from the bottom outlet of the carbonator to the <u>water inlet</u> of the valve. When the valve is energized, the <u>valve plunger</u> lifts allowing the water pressure to lift the diaphragm and go the <u>flow regulator</u>. Water pushes the piston downward and flows through a sized hole in the top of the piston, to the <u>water metering holes</u>. As the holes align, the pressure drop at the holes is counteracted by the pressure of the spring, maintaining a constant flow rate.

Turning the adjustment screw clockwise increases the flow rate by about 20cc (2/3 ounce) per turn.

### THE SYRUP SYSTEM



The syrup system is made up of the <u>syrup package</u> and the <u>syrup valve</u> or <u>doser</u>. The syrup package is a sealed one liter (33 ounce) container which stores the syrup and provides part of the syrup measuring system in the <u>proportioning device</u> or "spyder", in the neck of the package. Each package is labeled and dated. To insure top quality drinks, syrup should be used within 90 days.

The syrup valve is a volumetric measuring device which accurately measures the amount of syrup dispensed. When the valve is attached to the syrup package, syrup fills the <u>dosing piston</u> as shown at left, above. When a drink is drawn, an electromagnet in the cabinet lifts the dosing piston, sealing the top of the piston against the proportioning device (spyder). The <u>seal ring</u> at the lower end of the piston is lifted, allowing the syrup portion to pour into the mixing channel. The spyder displaces enough syrup to fix the portion for the particular syrup in the package.

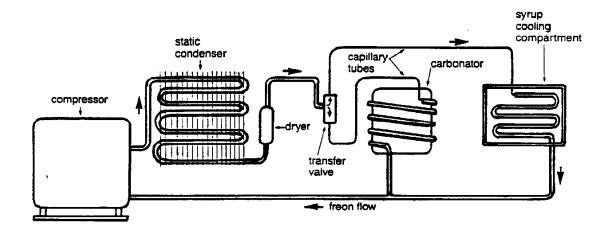
One syrup portion is the correct amount for three ounces of finished drink. Two portions are delivered for a six ounce drink three for a nine ounce drink.

## THE SYRUP SYSTEM(cont'd)

The syrup valves are set to deliver the correct portion of syrup cooled to a temperature of 45°F (7°C). Syrup at room temperature will be delivered in slightly larger portions, so storage of a few liters in a refrigerator is recommended.

The three syrup valves are identical, even though they are used on syrups with different viscosities. The difference between syrups is corrected by the use of an insert in the syrup container, which is put into the container when packaged.

## THE REFRIGERATION SYSTEM



The purpose of the refrigeration system is to cool the carbonator and the syrup compartment to provide syrup and carbonated water at such temperatures as to deliver a finished drink at 35°F (2°C). A further purpose is to build an ice bank in the carbonator to provide cooling capacity for drawing drinks in quick succession.

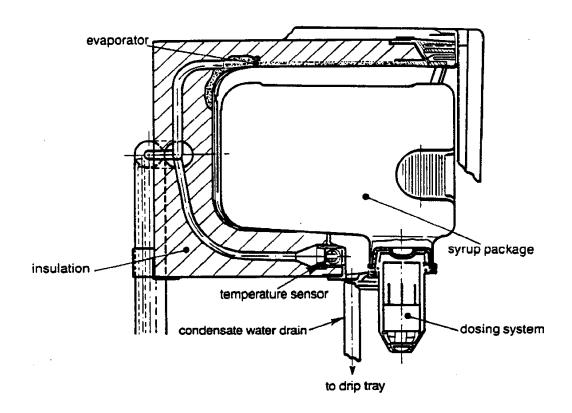
A refrigeration system operates by removing heat from an area to be cooled. In a system of this type, heat removal is accomplished by compressing freon gas so the temperature of the gas rises. The hot gas is then cooled in a condenser, removing heat. The gas condenses to a liquid which is further cooled in the condenser and is fed to the evaporator where it vaporizes by absorbing heat, and then goes back to the compressor.

In the diagram above, the components of the system are shown as used in the GA 3000. The compressor is supplied with freon gas at its inlet. Gas is compressed in the compressor and the gas temperature rises to about 160°F (72°C) and the pressure to about 150 psi (15 bar). The hot gas flows to the static condenser where the gas is cooled and condenses to a liquid. The freon charge in the system is 3 ounces (90 grams).

# BreakMate PRINCIPLES OF OPERATION

### THE REFRIGERATION SYSTEM

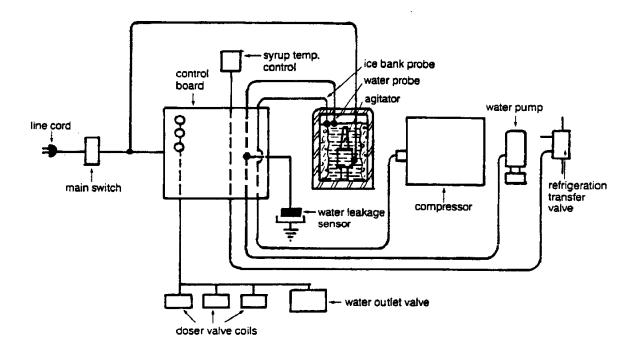
The liquid freon flows through a <u>drver</u> to the <u>transfer valve</u>, a 3-way solenoid valve which directs the flow to the <u>capillary</u> tube going to the evaporator coils on the carbonator. the capillary is a small copper tube about 20 ft. long, which has a small inside diameter and controls the freon flow. As the liquid freon flows through the vaporator, it vaporizes, and the gas temperature drips to about -10°F (-24°C) as it enters, warming up to 20°-30°F as it exits, and returns to the compressor.



## Syrup Cooling Compartment

When the carbonator cools down, a layer of ice 1/2 - 3/4 inch thick forms on the inner side wall of the carbonator and covers the tip of the ice probe. This event signals the electronic control to operate the transfer valve to direct freon flow to the syrup cooling compartment. When the syrup is cooled, the temperature sensor signals the electronic control to shut off the compressor.

## THE ELECTRICAL SYSTEM



The various electrical components are shown above as a "block diagram", showing the general layout and connection of the parts. The schematic diagram is shown on page 7-1.

When the line cord i plugged into an electrical outlet, power flows to the <u>main switch</u> which controls both sides of the line. The agitator is connected directly to the line after the main switch, and runs continually as long as the switch is on.

The power line then goes to the <u>control board</u> for electronic control of all other electrical components by the control board circuitry.

The drink dispensing, initiated by pressing a <u>selector button</u>, is controlled by timers in the control board to turn on and off, the selected doser coil for the flavor desired, and to turn on the <u>water outlet valve</u> for the amount of time to dispense carbonated water to make the finished drink.

The water probe in the carbonator senses the water level. When water level drops below this electrode, current is interrupted, signalling the control board to start the <u>water pump</u>, until the water level again touches the probe.

# BreakMate PRINCIPLES OF OPERATION

4-18

## THE ELECTRICAL SYSTEM (cont'd)

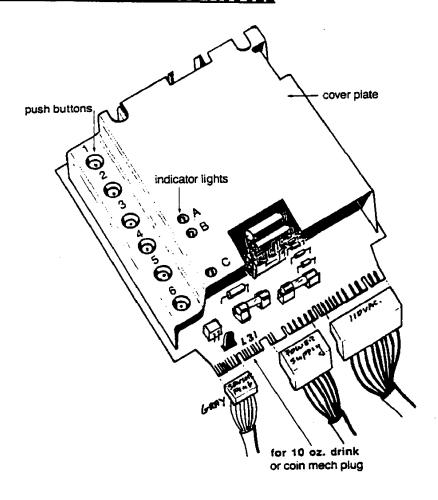
The <u>ice bank probe</u> sends a small signal current through the carbonated water. As long as this current flows, the current flow signals the control board to run the refrigeration compressor to cool the carbonator. When enough ice forms to cover the probe, the ice insulates the probe, shutting off the current flow. The control board then energizes the refrigeration transfer valve to divert freon to cool the syrup compartment.

The <u>syrup temperature control</u> signals the control board to turn off the compressor when an ice bank is formed in the carbonator and the syrup compartment is cold.

The <u>water leakage sensor</u> is a contact located just behind at the left of the control board, spaced about 1/16 inch (1mm) above the metal base inside the dispenser. If water leakage from internal parts occurs, or failure of the pump control permits water to leak inside the dispenser, the sensor signal the control board to shut down the water inlet valve, water pump and selection system so no more water can be admitted to the dispenser. The lower green light flashes until the problem is corrected.

The <u>CO2</u> empty indicator light is operated by a separate CO2 light control board, located on the inside of the front panel to the left of the control module. CO2 pressure is sensed by a <u>pressure switch</u> connected to the water line from the pump to the carbonator. When the CO2 pressure drops below 45 psi (3 bar), the switch sends a signal to the CO2 light control board to cause the amber light to flash.

## THE ELECTRONIC CONTROL MODULE



The electronic control module (ECM control board, circuit board) performs all of the control functions of the dispenser, as well as making possible the diagnostic testing of the controls and electrical components.

The major functions of the electronic control module are the following:

- Providing for flavor selection, using the top three buttons on the board.
- Controlling the water pump by responding to signals from the pump probe.
- Limiting the pump running time on initial filling to maximum 2 1/4 minutes.

# BreakMate PRINCIPLES OF OPERATION

## THE ELECTRONIC CONTROL MODULE

- Limiting the pump running time in normal operation to 45 seconds, in the event of a water shut off.
- Controlling the refrigeration by responding to signals from the ice bank probe.
- Controlling the refrigeration by responding to signals from the temperature sensor in the syrup cooling compartment.
- Providing for 10 ounce drinks when a jumper plug is plugged onto the board. The upper green light "on" indicates a 6.5 oz. drink setting. The lower green light indicates a 10 oz. drink.
- Flashing the upper green signal light when the pump has run too long.
- Flashing the lower (second) green light if the water sensor is wetted.

The diagnostic test procedure is outlined later in this section.

All component circuits are controlled by miniature relays mounted on the board. The seven relays have heavy duty contacts. The components on the board are protected by the metal cover fastened to the board.

## DIAGNOSTIC TEST PROCEDURE

### General Comments

All of the electrical parts in the GA 3000 may be checked individually, by pressing the buttons on the control board and observing the three indicator lights and the operation of each part. The buttons are pressed in the sequences shown below and summarized on the attached chart.

#### Preparation

Set up the dispenser by connecting the power, water and CO2 as shown in "Installation Guidelines". Put the syrup valves (dosers) in position in the syrup compartment. Remove the selector panel cover by removing the screw at the lower left side of the panel, and carefully pry out the lower right corner to release the locking tab. Lift off the cover. Turn on the power switch by sliding to the "up" position.

The six buttons and three lights on the panel are now visible in vertical rows. Buttons are numbered 1 to 6 from top to bottom, green lights are identified as "A", "B", and "C" top to bottom. Light "A" should be "on" at this time, if set for 6.5 oz. drinks.

## **Normal Button Functions**

Button	Function
1 2 3 4 5 6	Dispenses drink with doser #2 (Coke) Dispenses drink with doser #3 (Diet) Dispenses drink with doser #1 (Sprite) Changes portion to 3 oz. (for Europe only) Dispenses carbonated water only Selects large or normal ice bank

## Indicator Light Status - During Use

Light	On	Blinking	Off
A	Normal-6.5 oz. drink	No water	Power off/
B	Normal-10 oz. drink	Leakage in	Normal
C	Large ice bank	unit	Standard ice bank
Yellow		No CO2	Normal

## DIAGNOSTIC TEST PROCEDURE (cont'd)

## **Button and Light Circuit Test**

- To begin the test program, turn off the dispenser switch, and hold in button #4 while turning the switch on. The green lights should flash in sequence. If they do not, press button #6.
- Press each button, starting with the top button. The lights should burn steadily, while pressing in each button, to indicate that the button and light circuits are working. The lights will stay on after pressing button #6. Press button #6 again the lower green light will stay on.

## Continue with the next sequence.

## **Electrical Component Test**

Press buttons in sequence as follows:

Buttons	<u>Tests</u>
1	Doser #2 lifts
2	Doser #3 lifts
3	Doser #1 lifts
1 & 4	Water pump/inlet valve operates
2 & 4	Outlet valve operates
1 & 5	Compressor runs
2 & 5	Refrigeration valve clicks

## Continue with the next test sequence.

## Sensor Operation Test

Press and hold in button #4 and note indicator light status.

Light	$\Omega_{\Omega}$	Off
A B C	Water over flow indication Carbonator water low N.A.	Normal Carbonator filled N.A.

# BreakMate PRINCIPLES OF OPERATION

4-23

## DIAGNOSTIC TEST PROCEDURE (cont'd)

• Press and hold in button #5 and note indicator light status

Light	<u>On</u>	Off
A	No large ice bank	Has large ice bank
В	No standard ice bank	Has normal ice bank
С	Syrup compartment warm	Syrup compartment cold

- · Turn off the switch, then turn it on to restore the dispense to normal operation.
- The above test-procedure is summarized in chart form on the inside of the selector panel cover, as shown below.

# BreakMate PRINCIPLES OF OPERATION

## **DIAGNOSTIC SUMMARY - BUTTONS AND LIGHTS TEST**

## **Basic condition:**

- 1. Switch-off dispenser
- 2. Remove selector panel
- 3. Switch-on dispenser while pushing button #4

## LED-TEST

# **BUTTON-TEST**

⊕ Ø ⊕ ⊕ ⊕ ⊕ ⊕

⊕ 8 ⊕ 9 ⊕ 9 ⊕ 9 ⊕

If light moves from top to bottom (A-B-C, Repeat), LED's are functioning properly. Push all buttons in turn from top to bottom (1-6).
All LED's should stop while each button is depressed. If not, button is defective.

NOTE: To continue on to next program (component test) push button #6 a second time.

## **DIAGNOSTIC SUMMARY - COMPONENTS TEST**

# **COMPONENTS-TEST**

component	button operation	reaction
dosing magnet 2	push #1	dosing piston pulls up
dosing magnet 3	O push #2	dosing piston pulls up
dosing magnet 1	00 push #3	dosing piston pulls up
water pump	push #1 O and o ; push #4 O •	pumping noise
outlet valve	O push #2 O and O push #4 O •	water is flowing
compressor	push #1 O and o push #5 O •	click and low humming noise
refrigeration valve	push #2 c and push #5	click

## SENSOR-TEST

(with LEDs)

Sensor	LED indicator & button operation	LED on	LED off
water leakage safety device indicated by LED A	push button while reading LED	leakage water in appliance	no leakage water in appliance
water sensor indicated by LED B	push button while reading LED	carbonator not filled	carbonator filled
super-ice indicated by LED A	O Push #5	ice bank not built-up	ice bank built-up
normal-ice indicated by LED B	OC Push 45	ice bank not built-up	ice bank built-up
Cold Control syrup compartment indicated by LED C	0 0 0 0 0 0	temperature too warm	temperature cold

① If appliance is filled with water

5-1

The listing of problems shown below is in the approximate order of frequency of occurrence. Trouble calls due to mechanical failure in the dispenser can be expected to be fewer than one call per year. Items marked (\*) under each heading are these most likely to occur.

Problem: Upper Green Light Flashin	g
* • Water supply shut off	Turn on water
Water supply pressure too low	<ul> <li>Be sure valves are fully open. Check for kinked line or undersize water line. Check for 2 quart/min flow rate.</li> </ul>
Water filter blocked	Replace filter
<ul> <li>Air in carbonator - pump cannot fill</li> </ul>	<ul> <li>Remove CO<sub>2</sub> cylinder and vent the carbonator</li> </ul>
Water pump failure	Replace the pump
Problem: Won't Accept CO2 In Regu	lator
Check Ball stuck in CO <sub>2</sub> Regulator	Loosen check ball
<ul> <li>Pin in Regulator or in CO<sub>2</sub> bottle broken.</li> </ul>	<ul> <li>Replace CO<sub>2</sub> Regulator</li> </ul>
bottle broken.	• Use another CO <sub>2</sub> bottle.
Problem: Foreign Taste Or Odor In I	Orinks
Filter cartridge needs replacement	<ul> <li>Filters may require replacement every six months, depending upon local water quality - replace the filter and drain and refill the carbonator.</li> </ul>
Unusual local water conditions	<ul> <li>If problem exists with a Cuno CC-717 filter then install a BreakMate premium filter and flush machine until ice bank is melted.</li> </ul>
Problem: Diet Syrup Freezing	
<ul> <li>Syrup container sitting too long on cold evaporator</li> </ul>	<ul> <li>Place thin insulating strip on evaporator in syrup compartment.</li> </ul>

5-2

Problem: Burst Safety Discs CO <sub>2</sub> Bo	ttle
<ul> <li>Over filling of CO<sub>2</sub> bottles - filled cylinder must not exceed 3 lbs, 5 ounces (53 oz.) in weight.</li> </ul>	Return cylinders for burst disc replacement.
Problem: Drinks Too Warm	
Refrigeration inoperative	<ul> <li>Use diagnostic sequence to check component sensor operation (Also see p. 5-6)</li> </ul>
Refrigeration delay loose	Push into position
ECM board defective	Replace board
Too many drinks drawn in succession	<ul> <li>If the sales volume exceeds the dispenser capacity, install an additional dispenser</li> </ul>
Condenser blocked	<ul> <li>Make sure there is a 4-inch clearance above the air outlet at the top of the dispenser</li> </ul>
<ul> <li>Incoming water is hot</li> </ul>	Connect to cold water supply
<ul> <li>Power was off allowing dispenser to warm up</li> </ul>	Allow to cool down
Problem: Mixing Channel Overflows	
Mixing channel not pushed in fully	Position correctly
<ul> <li>Mixing channel cover is not in the correct position</li> </ul>	Position correctly
Channel outlet screen blocked	<ul> <li>Remove the screen and clean with brush</li> </ul>
* • Ice particles on screen	<ul> <li>Not a problem unless it causes overflow. Usually occurs with carbonated water only.</li> </ul>
* • Drink drawn during super cooling Slush ice delivered	Allow machine time to form ice bank.
Outlet screen blocked	<ul> <li>Remove screen from mixing channel and clean with brush.</li> </ul>

5-3

### Problem: CO<sub>2</sub> Leaks

· Leaks at regulator

- Replace the CO<sub>2</sub> cylinder.
   The o-ring seal is defective on the cylinder removed.
- Replace regulator if leak is around safety relief valve.

## Problem: CO<sub>2</sub> Leaks Into Water Supply Line

- Double check valve defective
- · Replace with new double check valve

### Problem: Lower Green Light Flashes

- · Water sensor is covered
- Internal leak at a connection connection in water system
- Water overflows through CO<sub>2</sub> safety valve
- Same as above. Check valve ball in CO<sub>2</sub> regulator stuck and pump was run manually.
- Same as above. With water Water supply pressure above 75 psiinlet valve stays open or leaks through, allowing carbonator to over fill leak through safety valve - water pump does not run when drawing a drink.
- Moisture on sensor connections at ECM board.

- Locate leak source
- Locate and repair leak
- Pump does not shut off.
   Check pump probe lead wire.
- Loosen check valve ball or replace CO<sub>2</sub> regulator.
- Replace the water inlet valve.
- Disconnect plug and dry.

### Problem: Too Little Water Dispensed

- \* Carbon particles in flow control
- \* Use approved filter and flush filter to remove carbon fines.
- Water flow control needs adjustment

 Turn screw inward to deliver 5 1/4 oz. (160 ml) for a 6.5 oz. (192ml) drink.

5-4

## Problem: Too Little Water Dispensed (cont'd)

- \* Water flow control sticking
- Replace water outlet valve or clean flow control mechanism.

· CO2 pressure too low

 Amber light should be flashing - replace CO<sub>2</sub> cylinder

## Problem: Water Drips Out Mixing Channel

- Water outlet valve drips and does not shut off
- Replace valve

 Relay sticks on control board Replace control board

- Low CO<sub>2</sub> Pressure

Replace Cylinder

## Problem: No Syrup Dispensed

- Doser plunger does not lift
- Doser coil defective - burned out, broken wire, not connected.
- Doser plunger stuck replace doser.
- · ECM is defective replace

\* • Out of syrup

\* • Syrup cartridge empty

## Problem: Drink Is Too Large

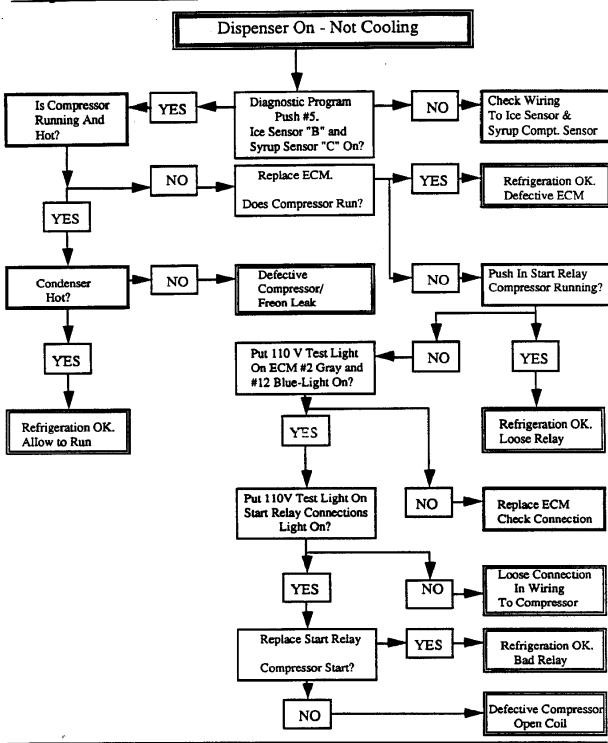
• Dispenser set for 10 oz.

- Remove 10 oz. jumper on control board, or if a coin mech unit, switch selector switch on the coin mech to "6.5 oz. drink".
- Be sure to use a 8 oz. cup for a 6.5 oz. drink, and a 12 oz. or larger cup for a 10 oz. drink

Problem: Low Carbonation	
Too many drinks drawn in succession	<ul> <li>After drawing three or four drinks, in succession, allow one minute between further drinks for maximum carbonation</li> </ul>
<ul> <li>Agitator inoperative or not in position</li> </ul>	• Place agitator in position, or replace it
<ul> <li>Low CO<sub>2</sub> pressure - amber light blinking</li> </ul>	Replace CO <sub>2</sub> cylinder
Air in Carbonator	<ul> <li>Bleed off pressure until CO<sub>2</sub> light blinks then reconnect CO<sub>2</sub> supply.</li> </ul>
Problem: Coin Mech Inoperative	
Will not change drink size	Be sure toggle switch is set on Coin Required before changing drink size.
	Check for broken toggle switch
<ul> <li>Returns money - will not dispense drink.</li> </ul>	<ul> <li>Power Failure solenoid stuck in power off condition.</li> </ul>
	Set on Free Vend.
	<ul> <li>CO2 light connectors not connected on 3-coin coin mech or CO2 pressure low.</li> </ul>
• Free Vends when set on coin	Broken toggle switch causing machine to stay in Free Vend.
<ul> <li>Accepts money - Won't dispense drink</li> </ul>	Check for correct price setting

· Coin Switch broken

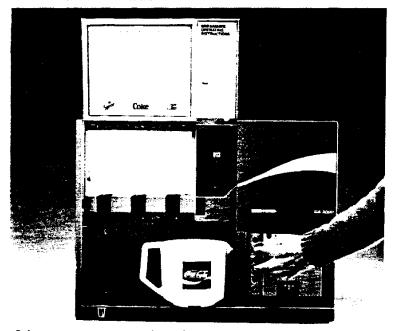
## Refrigeration "Decision Tree"



### **GENERAL COMMENTS**

This section describes the procedures for replacing parts and repairing the dispenser. Be sure to follow the sequence shown to avoid inconveniences during the repair procedure.

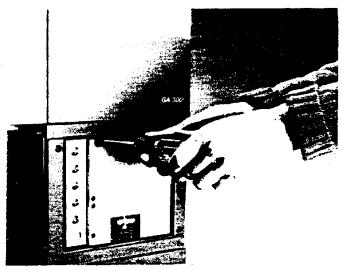
### DRAINING THE CARBONATOR



If any part of the water system, such as the water outlet valve, water pump or carbonator is to be repaired, the system must be vented and drained before disassembly to avoid the inconvenience of water leaks and spillage while working on the unit. Proceed as follows:

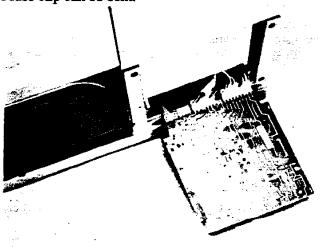
- Remove the screw at the lower left side of the selector panel cover.
- Carefully pry out the lower right corner of the selector panel. Lift the panel to disengage the top, and remove the cover.
- Go through the test sequence on back of selector panel to "component test" and press buttons #2 and #4 to open the outlet valve and drain the carbonator.
- Remove the CO<sub>2</sub> cylinder and press the red CO<sub>2</sub> valve button to vent CO<sub>2</sub> gas pressure.

## REMOVING THE CONTROL BOARD



The control board is removed as follows:

- Use a phillips head screwdriver to loosen the two screws at the top of the control board.
- Lift out the control board, remove the three (or four is a coin mech) connector plugs from the board. Note that the connections are "keyed" for easy identification and replacement.
- Do not tilt the board forward any more than necessary to remove the board or the 100 MA fuse clip can be bent.

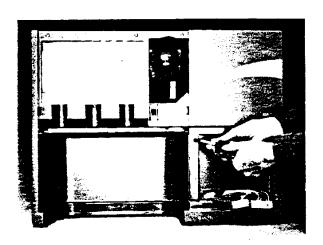


## DISCONNECTING THE DISPENSER

To disconnect the dispenser and remove loose parts, proceed as follows:

- Remove the drip tray by pressing down the front edge and lifting it out. Remove the mixing channel by grasping with one hand on each side and pulling out.
- Remove the syrup compartment door by prying up the head of the black pivot pin. Pull the pin out, remove the door, and reinsert the pin in the door for safe keeping.
- Disconnect the electrical plug, and if necessary for your repairs, turn off the water, and disconnect waterline connection at the rear of the dispenser.

### REMOVING THE DISPENSER FRONT



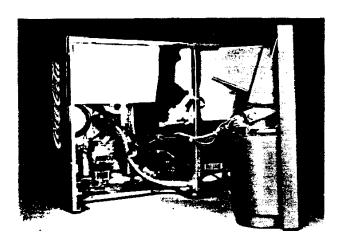
To remove the front of the dispenser, proceed as follows:

- · If necessary, drain the carbonator.
- Remove loose parts, and if necessary, shut off and disconnect the water line.
- The front is held in place by 12 screws. Ten screws, all the same length are on the outside front. Two longer screws are in the CO<sub>2</sub> compartment.
- Remove three screws from the top of the panel.
- Remove three screws around the control board.
- Remove two screws behind the drip tray position.
- · Remove one screw in the center doser slot.
- Remove one screw at the top of the delivery area, behind the water valve.
- Remove two screws at the top of the CO<sub>2</sub> compartment at the CO<sub>2</sub> regulator.
- Pull out the top of the panel.

## REMOVING THE DISPENSER FRONT (cont'd)

After removing the screws and loosening the front, swing panel down to access interior. Use care so as not to damage the coil or switch terminals.

## DISCONNECTING THE ELECTRICAL LEADS



# Do Not Disconnect The Leads Except To Replace The Panel Or Parts On The Panel

- Remove the wires from the doser coil, use long nose pliers to pull off the terminals. Note that the blue wire is a common lead to all coils. The #1 coil wire is orange, #2 is yellow and #3 is white.
- Remove the lead from the power switch. black wires are on top, blue on the bottom. The white insulated terminals are on the control board side of the switch.
- Locate the CO<sub>2</sub> empty light board, to the left of the control panel position. Remove the screw and lift out the board.

When reassembling the front to the cabinet, the following items will simplify assembly.

- Be sure the CO2 cylinder guide tab is engaged in the slot at the rear of the cabinet.
- Put a paper towel or cloth in cylinder well to catch screws if they drop.
- Replace the screw into the outlet valve, then the two screws in the CO<sub>2</sub> compartment before inserting the remaining screws.
- Be sure there is no water in the cabinet base at the water sensor.

## FLOW CONTROL REMOVAL

To remove the flow control mechanism only:

- Loosen the three phillips head screws holding the housing together.
- Separate the two housing pieces.
- · Remove the flow control piston, barrel and spring.
- Check for free movement of piston in the barrel. Clean if carbon or dirt is apparent.
- Assemble with single hole in the end of the piston opposite 4 holes in the barrel.
- Reassemble with spring on spring post inside the piston.
- · Be sure tab for screw is toward rear of machine.
- Replace 3 phillips head screws.
- · Check for proper water flow after reassembly of machine.

### WATER OUTLET VALVE REMOVAL

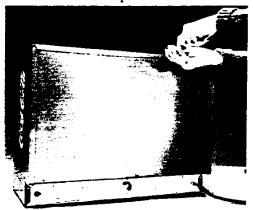


### Replace the outlet valve as follows:

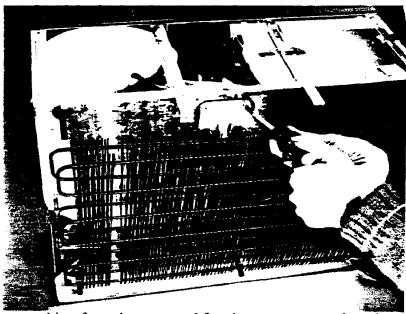
- Be sure the carbonator is drained, CO<sub>2</sub> cylinder removed, and CO<sub>2</sub> pressure is vented before proceeding.
- Remove the dispenser front as outline on page 6-3, 6-4.
- Remove the wires to the valve coil.
- · Unscrew the knurled plastic nut to disconnect the valve.
- Be sure to remove the plastic dust cap which may be in the inlet of a new valve, before installing.
- When replacing the cabinet front, be sure the valve slides into the guides on the front cover.
- Reassemble the dispenser and check the water portion for 5.4 oz. (160 ml) for a 6.5 oz. drink. Adjust if necessary.

## **OUTER CABINET REMOVAL**

- Remove six screws on the rear panel, two screws at the lower rear and two screws on each side of the bottom which hold the outer cabinet in place.
- · Slide the cabinet off the back of the dispenser.



## CO2 REGULATOR REPLACEMENT



- Remove cabinet front shown on p. 6-3 and remote water outlet valve. Remove the outer cabinet as outlined above.
- Lift the two black plastic posts holding the top of the condenser coil in position.

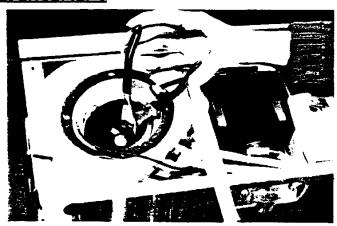
#### CO2 REGULATOR REPLACEMENT (cont'd)

 Swing back the top of the condenser, far enough to remove the two screws holding the regulator in place.

· Remove the two screws and lift out the regulator.

- Use a wrench to hold the CO<sub>2</sub> Outlet fitting and unscrew the regulator. Be careful not to lose the check valve ball under the fitting. If stuck us a small screwdriver.
- Transfer the black plastic handle and mounting bracket to the new regulator.
- Screw the regulator back onto the fitting.
- Install the new regulator.
- Reassemble

#### **AGITATOR REPLACEMENT**

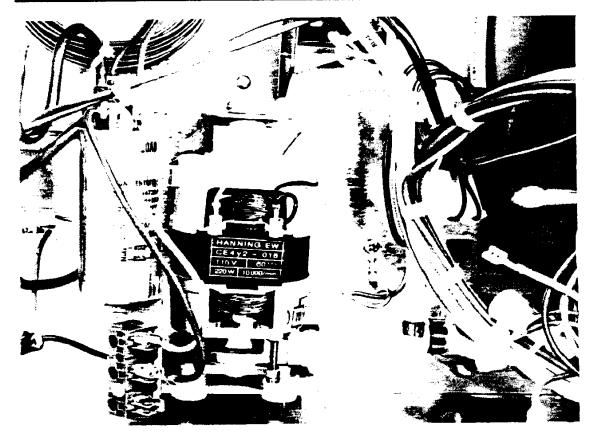


- Be sure the carbonator is drained and that the CO2 is vented before proceeding.
- · Remove the outer cabinet as shown on page 6-5.
- Remove four screws holding the carbonator outside cover. Lift off the cover.
- Slide the wire terminal off the pump electrode on the cover. Turn and pull out the stainless electrode from the fitting. Be sure "o"-ring doesn't fall out.
- Cut the cable tie holding the agitator wire lead to the CO2 line. Disconnect the white electrical connector plug and pull up to the wire to clear.
- Remove the plastic "C" retainer on the agitator lead fitting, and push the fitting into the carbonator cover.
- Remove the nut from the carbonator cover clamp and remove the clamp.
- Push the carbonator cover into the carbonator, turn it 90° and pull it out.
- Push the agitator wire and connector through the fitting hole in the carbonator cover to free the cover.
- Grasp the top of the agitator post with a pair of pliers and turn counter-clockwise 1/4 turn and lift it out. Note the position of the agitator for ease in replacement. The agitator wire lead is toward the front of the cabinet.
- Install the new agitator, making sure the two bottom locking tabs on the agitator line up with the clearance slots in the fitting in the bottom of the carbonator. Press the agitator down in place and turn 1/4 turn clockwise to lock into position. Check to be sure it is secure.

# AGITATOR REPLACEMENT (cont'd)

- Thread the plug and wire through the fitting hole in the carbonator cover.
- Reassemble the unit.

### WATER PUMP/INLET VALVE REPLACEMENT



- Cut the two wire ties on the pump cable.
- Remove the wires from the CO<sub>2</sub> pressure switch, pump and ground wire from the pump.
- Unscrew the knurled nut at the pump outlet. Be careful to keep the check valve parts from falling out.
- Remove the two screws in the bracket above the pump.
- Remove the pump/inlet valve assembly and install the new assembly.
- Transfer the plastic bushing support from the top of the old pump to the new pump.
- Be sure to locate ans save the three yellow mounting bushings when installing the pump, and to locate the guide pin in the rear cabinet wall.
  Reassemble the unit.

#### **DISPENSER ADJUSTMENTS**

#### Six and One-Half or Ten Ounce Drink

Dispensers equipped with a coin mechanism may be switched from six and one-half ounce to ten ounce drink sizes by operating the changeover switch, accessible when the cash box is removed. Dispensers without a coin mechanism are set for a six and one-half ounce drink as shipped from the factory. If a ten ounce drink is desired, lift out the control board as described in "Dispenser Front Removal". Place the 10 ounce jumper - P/N 27756 on the open terminal on the board and replace the board.

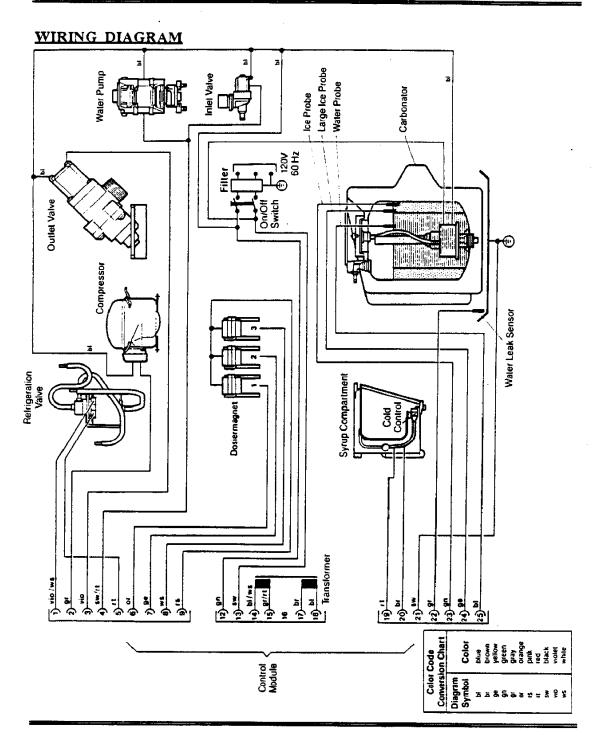
#### WATER ADJUSTMENT - SYRUP RATIO SETTING

Syrup portions are fixed and predetermined by the syrup valve and the fitting in the neck of the cartridge. Syrup portions are specified for each flavor to achieve the correct ratio. For a six and one-half ounce drink, the standard syrup portions for some flavors are as follows, using 160 ml of water.

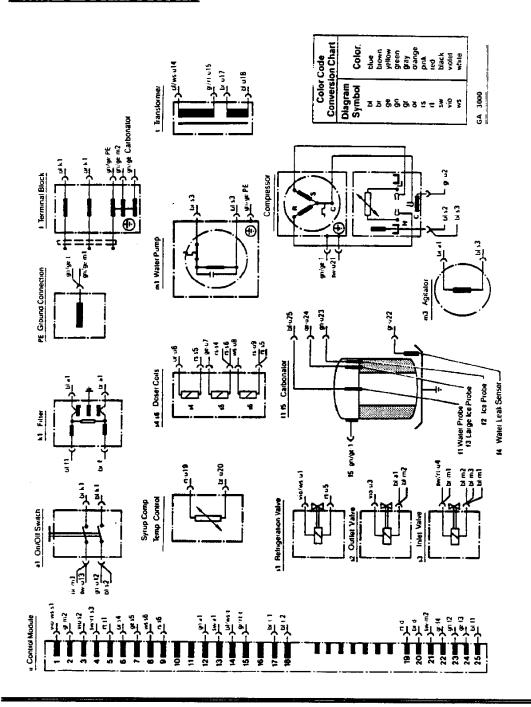
Syrup	<u>Portion</u>	Ratio
Coca-Cola Sprite	32 ml 32 ml	5 to 1 5 to 1
Diet Coke	32 ml	5 to 1

The syrup ratio for a six and one-half ounce drink is adjusted to the standard ratio, if necessary by adjusting the water flow to 5 1/3 ounces or 160 ml (157 - 163). Water flow is adjusted by turning the water adjusting screw, located at the carbonated water outlet point. One turn inward (clockwise) increases water flow by 20 ml (2/3 ounce).

To measure drink portions, use a ratio cup set. These are plastic cups graduated in ounces or milliliters (ml) for syrup and water. Remove the mixing channel and catch the water in the water cup and syrup in the syrup cup, and compare with the above figures. The part number for the water cup (220 ml) is #05-0081, 5-1 syrup cup is #05-0170.



### WIRING CONNECTIONS



# TECHNICAL SPECIFICATIONS

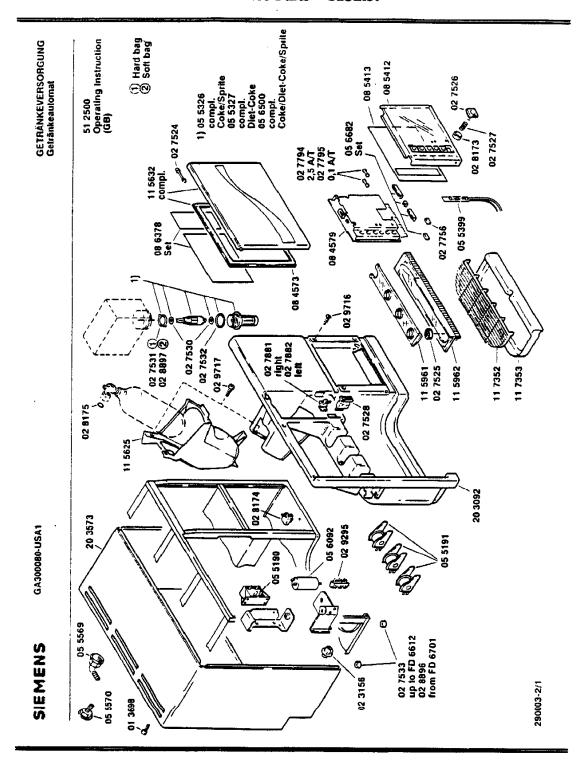
Part No.	<u>Part</u>	<b>Specifications</b>
21547	Temperature Sensor - Warm	850 OHMS @ 75°F
-	Temperature Sensor - Cold	2350 OHMS @ 32°F
55188	Outlet Valve	1100 OHMS - 120 VAC
55189	Inlet Valve	1100 OHMS - 120 VAC
55190	Transformer - Primary	105 OHMS - 120 VAC
-	Transformer - Secondary	1.1 OHMS - 12 VAC
55191	Doser Coil	110 OHMS - 110 VDC
84577	Ref. Transfer Valve	3980 OHMS - 140 VDC
104039	Compressor - Start Winding	5 OHMS - 120 VAC
-	- Run Winding	8 OHMS - 120 VAC
104350	Agitator Motor	710 OHMS - 120 VAC
104351	Water Pump (Coil Res)	3.5 OHMS Ea 120 VAC
-	Refrigerant Charge	90 Grams - R12
056641	CO <sub>2</sub> Regulator Setting	75 PSI $\pm$ 5 PSI

Part No.	Description	Oty/Pkg	Price Group
13698	Screw, Machine Rear	20	01
21457	Strain Relief Bushing	1	01
21547	Cold Control-Syrup Compt	1	01
23156	Grommet	1	01
27506	Fitting - Compressor Mount	1	03
27507	Holder	2	01
27508	Pump Electrode Assembly	1	05
27510	Hose Clamp-CO2- Oteker 110	4	02
27511	CO2 Water Line	1	01
27512	Hose Clamp-Water-Oteker 165	4	02
27513	Elbow Fitting-Water Outlet	1	01
27514	O-Ring-Water Outlet Fitting	10	01
27515	Plastic Nut-Water Outlet	1	01
27517	Clip Nut - CO2 Regulator	5	01
27518	Spring - CO2 Clamp	5	01
27519	Latch _	5 5 1	01
27524	Pivot Pin - Syrup Door	5	01
27525	Screen Disc - Mixing Trough	Ţ	01
27526	Selector Button	6	01
27527	Selector Button Switch	6	01
27528	Mains Switch	1 5 3 5 5 2) 5	04
27530	Seat Seal - Doser	2	03
27531	Lock Ring - Doser	3	02
27532	O-Ring - Doser Set	. 3	01
27533	Rubber Foot - Cabinet (up to FD 661)		01
27534	Starting Relay - Compressor	1	23
27535	Valve Coil - Inlet/Outlet Valve	1 2	07
27552	Oteker Hose Clamp - Inlet Valve	3 5	02
27633 27634	O-Ring - Pump Fitting	2	01
27634 27635	Nut - Carbonator Top	3	01
27635	Pump Inlet Fitting	1	02
27755 27766	Check Valve Assembly	ļ	04
27756	Jumper Plug - for 10 oz. drink	1	01
27794	Fuse - 2.5 AMP	3 3 5 5	01
27795 27881	Fuse1 AMP	3	02
27882	Clip - Right	5	01
27893	Clip - Left CO2 Pressure Switch	3 1	01 24
27894	Tee - CO2 Line	1	04
27895	Barb Connector - Pressure Switch	1	06
27896	Suppressor-Compressor	1	06
28173	Selector Button Spacer	5	01
28174	Water Leak Detector	5	01
		-	01

# **BreakMate**Service Parts - Parts List

Part No.	Description	Oty/Pkg	Price Group
28175	O-Ring - CO2 Cylinder	5	01
28270	O-Ring - Pressure Switch	10	01
28816	Outlet Fitting Elbow	ī	01
28896	Rubber Foot (From FD 6701)	5	01
29295	Plug Board	1	01
29716	Screw	20	01
29717	Screw	20	01 .
29757	Plastic Bushing, Pump	1	01
29777	Check Ball	2 5	01
29778	O-Ring		01
29788	Connectors	1	02
55173	Carbonator Tank Top	1	07
55174	Carbonator Top Gasket	1	01
55175	Carbonator Top Lock Bracket	1	02
<b>55178</b>	CO2 Regulator Mounting Flange	1	02
55179	CO2 Lock Lever	1	02
55181	Hose - Pump/Valve	1	01
55183	Suppressor - Pump (Not Shown)	1	
55188	Outlet Valve Assembly	1	20
55189	Inlet Valve Assembly	1	10
55190	Transformer	1	13
55191	Doser Coil	1	09
55399	CO2 Empty Light Board	1	28
55569	Inlet Fitting - Right Angle	l	02
55570	Inlet Fitting - Straight	I	02
56076	Electrode	1	
56092	Suppressor	1	15
56500	Doser (Universal)	1	12
56641	CO2 Regulator (Compl)	I	30
56682	Plug Connectors	1	
84568	Accumulator	1	02
84569	Dryer	1	02
84571	CO2 Tubing - Reg/Tee	1	01
84572	CO2 Tubing - Tee/Carb	1	01
84573	Gasket - Syrup Compt.	1	04
84577	Refrigeration Valve	Ţ	31
84579	Control Board Assembly (ECM)	1	43
85412	Selector Panel USA	I 1	03
85413 96279	Display Card Selection	1	02 01
86378 115622	Label Condenser	1	25
115622	Syrup Compartment	1	23 34
115625	CO2 Cyllinder Housing	1	05
115632	Door - Syrup Compt.	1	23
	2001 Oylup Compti	•	23

Part No.	Description	Oty/Pkg	Price Group
84579	Control Board Assembly (ECM)	1	43
85412	Selector Panel USA	I	03
85413	Display Card Selection	1	02
86280	Agitator Upper Assy	1	03
86378	Label	1	01
115622	Condenser	1	25
115623	Syrup Compartment	1	34
115625	CO2 Cyllinder Housing	1	05
115632	Door - Syrup Compt.	1	02
115961	Cover - Mixing Channel	1	02
115962	Mixing Channel	1	05
116415	Carbonator Assembly-Compl	1	45
117352	Grid	1	04
117353	Drip Tray	1	05
140349	Compressor (With Relay)	1	43
140350	Agitator Assembly	1	29
140351	Water Pump	1	43
203092	Cabinet Front	1	33
203573	Cabinet Wrapper	1	28
512500	Operating Instructions	1	00



(

### Dispenser Start-Up Procedures Reminder

Problem:

Slush Ice on Start Up.

Some service managers have reported instances of ice crystals or "slush" being delivered into the mixing channel shortly after connecting a dispenser. During the initial "pull down" period, the temperature of this water in the carbonator drops well below the 32 degrees - as low as 23 degrees - before ice starts forming. If a drink is drawn during this time, the water will form into crystals as it is delivered from the outlet valve and can cause the valve to stay open and fill the mixing channel with ice crystals.

#### Solution:

Set up the dispenser in the shop and run overnight before installing. This procedure will permit an ice bank to form in the carbonator and keep drinks from being dispensed during the short time (5-10 minutes) that the water is "super cooled", and has the additional advantage of serving cold drinks to the customer immediately upon installation of the dispenser. The carbonator will retain its ice bank for many hours on a hot day in an installation vehicle because the carbonator is well insulated.

Problem: Half cup or short drink delivered.

Some reports have been received of short drinks immediately after new installation of the dispenser.

#### Solution:

1. Follow the pre-cooling procedure above to prevent ice crystal formation causing temporary sticking of the flow control.

2. Be sure to flush the filter completely to remove any possibility of carbon particles getting the water flow regulator in the outlet valve. Run the water for five minutes or five gallons of water, before connecting the water line to this dispenser, to be sure all carbon particles are flushed.

3. Disassemble the flow control on the outlet valve. Wipe clean the piston cylinder surfaces and reassemble.

Service procedures to cover recently reported incidents are listed below for your information.

PROBLEM:

Check Valve Ball Sticking - Red Vent Pin Stays In - Carbonator does not accept CO2 gas when the CO2 cylinder is inserted. Occurs when setting up a new dispenser after pressing red pin to relieve carbonator pressure. The problem is caused by the check valve ball in the CO2 regulator sticking in the seated position (see Service Manual Pages 4-10), when the dispenser has been stored for some time.

SOLUTION: Be sure that the red pin on the relief valve has been pressed to exhaust the CO2 gas pressure from the carbonator, and that the pin stays in. Insert and remove the CO2 cylinder repeatedly into the regulator until the CO2 flows.

> If this procedure fails to loosen the check valve ball, insert the cylinder and allow to stand for several hours or overnight.

> Occasionally it will be necessary to remove the CO2 regulator (see Service Manual Page 6-6) and use a paper clip to loosen the ball. When replacing the regulator, be sure to hold the check valve opening pointing upward when turning the regulator back onto the fitting.

PROBLEM:

Safety Disc Bursting on CO2 Cylinder - Reports have been received of safety discs on CO2 cylinders bursting when filled cylinders are stored or transported in a service truck.

SOLUTION: Check Weight of Cylinder After Filling - Do not exceed a total weight of 53 (3lbs, 50z) ounces for a filled cylinder. Refer to Service Manual Pages 3-9.

#### RETURN GOODS PROCEDURE REMINDER

When returning <u>complete dispensers</u>, please observe the following steps to insure proper handling and to avoid unnecessary charges.

#### 1. <u>AUTHORIZATION.</u>

Call BreakTime customer service, at (404) 436-8877, for an equipment return authorization number. Unauthorized shipments will not be accepted.

#### 2. IDENTIFICATION.

Attach a completed return goods tag to the dispenser showing date of installation, ER number, your company name and address, the problem with the dispenser, and serial number which must include the four digit prefix (i.e. 6705-000999).

#### 3. RECORDS.

Remove the white copy from the return goods tag and retain for your records and remove the carbon from under the yellow copy to avoid smudging during shipment.

#### 4. COMPLETE DISPENSERS.

Return the dispenser in a clean condition with all parts except the dosers.

Note: Missing parts will be replaced at customer expense for parts and labor.

#### 5. PACKING.

Pack the dispenser carefully, using the <u>original packing material and carton</u>. Put the serial number on the outside of the box, crossing out any other serial number. Note: Damage to the dispenser due to the use of other than original packing material will be charged to your account.

#### 6. CARRIER.

Ship the dispenser prepaid via U.P.S. or other carrier specified by BreakTime.

# BreakMate

Service Bulletin #3 - cont'd.

### 7. <u>DESTINATION.</u> Ship the dispenser, <u>prepaid</u> to:

Spears Refurbishing Center 106 Ross Street Heflin, AL 36624

or other destination as specified by BreakTime.

# 8. TURNAROUND TIME. The expected turnaround time is about 30 days for dispensers returned for refrigeration repair.

#### APPROVED WATER FILTERS

To assure the highest quality drink possible, all BreakMate-GA3000 dispensers <u>must</u> be installed with an adequate water filter.

Experience has shown that some filters available to the trade for use on the BreakMate vary in quality and introduce unnecessary or undesirable ingredients into the water supply. Some do not have sedimentation filters and can pass carbon granules into the dispenser causing mechanical problems. The sediment and other ingredients pass-through may also contribute off-flavors to the water and affect the taste of the finished drink.

Filters used on the BreakMate dispensers must meet quality requirements and pass the testing procedures used by The Coca-Cola Company Quality Assurance Lab. Filters which have met these quality standards to date are listed below. Other filters are being tested, and you will be advised by bulletin as additional filters are approved. Note: Filters for coffee brewers containing phosphates are not to be used with the BreakMate.

Water conditions in different areas of the country vary widely from system to system and can change during different times of the year within the same water system. Filters for the BreakMate are categorized accordingly.

#### WATER OUALITY CATEGORIES:

- I. Average water conditions with less than 2.5 parts per million chlorine.
- II. Heavy chlorine conditions above 2.5 parts per million.
- III. Heavy chlorine conditions above 2.5 parts per million and/or the presence of chloramines in the water supply.

Source	Type	<u>Name</u>	Model No.	Water Quality CATEGORY
Cuno	In Line	Taste and Odor	CC-717	I
Everpure	Wall Mount	BreakMate Fine	-	II
Everpure	Wall Mount	BreakMate Prem.	-	III

The Cuno and BreakMate filters are available from BreakTime.

### Check Valve Ball Sticking in the CO2 Regulator

As previously reported in Service Bulletin No. 2, some new GA-3000 dispensers will not accept CO2 gas from the CO2 cylinder when dispensers are set up for installation. This problem has, in some cases, required the disassembly of the dispenser to loosen the ball.

The stuck ball may be loosened by placing the CO2 cylinder upright in a pail of hot (140°F) tap water, for two or three minutes, to warm the cylinder to increase the cylinder pressure before inserting it into the dispenser. The initial surge of pressure should provide enough force to loosen the ball from its seat in most dispensers. Once released, the ball remains free.

#### Please note the following:

- 1. Be sure the CO2 Cylinder is not overfilled with CO2, or the safety disc in the CO2 cylinder valve may burst. The maximum cylinder weight is 3 1/4 lbs. when filled.
- 2. Do not apply heat to the cylinder except in a pail of hot tap water at 125°-150°F. Do not use water over 150°F, nor boiling water. Hot tap water is usually 140°F.
- 3. The proper use of this procedure is the responsibility of the user.

\* \* \*

### Leaks In Filling Heads for CO2 Cylinders

A few reports of problems with CO2 filling heads have been received. The problem is with leaks of CO2 gas through the valve stems of the inlet valve, outlet valve, or failure of the valve to shut off.

The valves were examined upon return to BreakTime. In every case, the valve seats had been damaged by rust or dirt particles from the 50 lb. supply cylinders. Many 50 lb. cylinders in use are cast iron cylinders with date stamps of initial inspection as old as 50 or 60 years, containing large amounts of accumulated dirt, rust, and other materials.

If possible, purchase for your own use, new 50 lb. aluminum diptube cylinders from Luxfer or other suppliers. If you wish to continue using a CO2 supplier's cylinders, request aluminum cylinders or cylinders which have been cleaned by removing the valve and inverting the cylinder to remove dirt deposits.

Damage to filling heads by rust or dirt may void the warranty, and incur a repair charge when returned.

For your nearest Luxfer distributor call:

Luxfer USA Ltd. - (714) 684-5110

\* \* \*

### Syrub Freezing

#### Problem:

There have been some cases of syrup freezing in the syrup cooling compartment. Most often it is diet syrups that freeze and typically the package is about 20 percent full or less. Freezing occurs when the syrup package sits too long in direct contact with the very cold evaporator. This contact time is lengthened by leaving the syrup compartment door open or ajar or by putting a fresh container of unrefrigerated syrup in with partially empty already cold containers.

#### Solution:

Place a strip of thin insulating material on the lower edge of the syrup cooling compartment so that the syrup packages rest on it. This will prevent direct contact between the syrup bottle and the evaporator assembly. A sample insulating strip is enclosed so you can make a similar one or order others from BreakTime Enterprises at (800) 627-8877.

#### BreakMate

Service Bulletin #4
Revised 5/11/89

#### APPROVED WATER FILTERS

To assure the highest quality drink possible, all BreakMate (GA3000) dispensers must be installed with an adequate water filter.

Experience has shown that some filters available to the trade for use on the BreakMate vary in quality and introduce unnecessary or undesirable ingredients into the water supply. Some do not have sedimentation filters and can pass carbon granules into the dispenser causing mechanical problems. The sediment and other ingredients pass-through may also contribute off-flavors to the water and affect the taste of the finished drink.

Filters used on the BreakMate dispensers must meet quality requirements and pass the testing procedures used by The Coca-Cola Company Quality Assurance Lab. N. S. F. approval is also recommended. Filters which have met these quality standards to date are listed below. Other filters are being tested, and you will be advised by bulletin as additional filters are approved. Note: Filters for coffee brewers containing phosphates are not to be used with the BreakMate.

Water conditions in different areas of the country vary widely from system to system and can change during different times of the year within the same water system. Filters for the BreakMate are categorized accordingly.

#### WATER OUALITY CATEGORIES:

- I. Average water conditions with less than 2.0 parts per million chlorine.
- II. Higher "Free" chlorine conditions above 2.0 parts per million.
- III. Higher "Free" chlorine conditions above 2.0 parts per million and/or the presence of chloramines in the water supply.

Source	Type	Name	Model No.	Water Quality CATEGORY	NSF Approved
Cuno	In Line	Taste and Odor	CC-717	ī	Yes
Everpure	Wall Mount	BreakMate Fine	•	IĪ	Yes
Everpure	Wall Mount	BreakMate Prem.	-	III	Yes
N.S.A.	In Line	-	251	Ī	No
Touch Flo	In Line	Water Bay	F120T2	Ī	No.
Touch Flo	In Line	Water Bay	F120T4	Ť	No
Aqua Thin	In Line	Mini-YES	-	ř	No
Aqua Thin	In Line	YES	-	ıi	No

The Cuno and BreakMate filters are available from BreakTime.

DOUBLE CHECK VALVE

. "O" Rings Clear Plastic Spacers . Stainless Steel Balls . Elastomer Seats

Retainer Nut Elbow with Barb Tube Connection Springs

TOLERAS 434-0319 15 GELEGE SWIFT

Dire . 02- 11-88

Gt-3000 Donshe Check Valve



# Read These Instructions Carefully!

This BreakMate/WaterMate has been fitted with a water filter which must be properly flushed before operating the dispenser. Failure to follow the directions below can cause serious damage to the WaterMate and void the Warranty. Study and become thoroughly familiar with your BreakMate Service Manual before proceeding with the filter flushing process below.

- 1. Remove the water reservoir tank and discard styrofoam packing.
- 2. Rinse out water tank and fill with drinking water.
- 3. Insert water tank into proper position in the WaterMate. (Tank will automatically connect when inserted)
- 4. Plug in WaterMate to standard 115V electrical outlet with power switch in the "OFF" position. (Refer to BreakMate service manual to determine proper power switch position.)
- 5. Locate the water line coming out of the back of the reservoir which has the plastic fitting attached to the end and which will later be connected to the rear of the dispenser. (Do not connect yet!)
- 6. Place the end of the water line with the plastic fitting into a 1/2 gallon or larger container for collecting the water as the filter is flushed.

Note: to perform the next steps, a clock or watch with a second hand is needed.

- 7. Turn the machine power switch to the "ON" position for 15 seconds. Turn power switch off. (Machine and water reservoir pumps will run while switch is in the "ON" position. Water will be pumped into the water container).
- 8. Leave the dispenser turned off for a minimum of 30 seconds.
- Repeat steps 7 and 8 three additional times. Note: Do Not Leave Dispenser Turned On For More Than 15 Seconds At A Time, And Do Not Repeat The Process For More Than Four Times Total.
- 10. Connect the water line to the rear of the WaterMate. Note: A proper connection can be made without the use of tools. Hand tightening of the fitting is all that should be necessary.
- 11. Refill the water reservoir tank with drinking water and proceed with machine set up and installation procedures as covered in your BreakMate service manual.

Service Bulletin No. 7 May 11, 1989 Water Filters

# Time to Change Water Filters?

Good operators know a key ingredient in the great taste of the drinks dispensed from the BreakMate is the water quality. That's why approved water filters are required on non-bottled water installations.

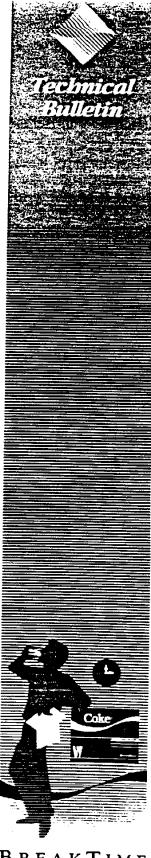
Systematic, scheduled changing of the BreakMate water filter is also very important to insure continued quality drinks. This makes for customer satisfaction and fewer service calls. As a general rule, in line water filters should be changed every six months. Larger, cartridge type filters will last up to one year with one BreakMate attached. Note: These are average filter lives. Local water conditions and volume through-put can shorten the filter life.

Symptoms of a spent filter include: drink off-taste, clogged outlet valves, burned out water pumps, and service calls because of a flashing LED light indicating a shortage of water to the BreakMate.

Avoid these problems by instituting and maintaining a systematic filter exchange program!

As a reminder...When a BreakMate/WaterMate (GA3450) is pulled from service, all the water should be drained from the system (water reservoir and carbonator). A new filter should be installed unless the WaterMate is put back in use within three to five days.

Included in this mailing is a revised copy of BreakMate Service Bulletin No. 4 with an updated list of approved filters. This revised Bulletin should replace Bulletin No. 4 in your Level II Technical Service Manual.



#### O.K. BREAKMATE (USED)

SERIAL #: FD6904-005722-R-S-2511

				₹	
PART	DESCRIPTION CON	<u>ID</u>	PART	DESCRIPTION	COND
203092	CABINET FRONT	- <del>-</del>	29808	ON/OFF SWITCH	
203573	CABINET WRAPPER	<u> </u>	84579	ECM BOARD	
83412	SELECTOR PANEL	<u>.</u>	140351	PUMP/INLET ASSY	
85413	FLAVOR CARD	<del>-</del>	56076	WATER PROBE	
30707	BLACK BUTTONS	<u> </u>	TEST	WATER FILL RATE	
115632	SYRUP DOOR		TEST CA	ARBONATOR CHILLS	
86378	INSTRUCTION LABEL		55188	WATER OUT VALVE	
270396	DRIP TRAY	_	55189	WATER IN VALVE	
117352	BLK DRIP GRILL	<del>-</del>	55191	DOSER COILS (3)	
115962	MIXING CHANNEL		84577	TRANSFER VALVE	
115961	CHANNEL LID	· <del></del>	TEST AGI	TATOR OPERATION	
27525	MIXING SIEVE		TEST SYRU	JP COMPART COOLIN	G
NPN	AGITATOR FUSE	<del>-</del>	56500	DOSER VALVES (3)	
BT404	COMPRESSOR TIEWRAP		55569		
55399	CO2 CKT BOARD	<del>-</del>	512500 IN	STRUCTION MANUAL	
57065	CO2 REGULATOR/VENT	-	BT407	POWER CORD	
	•	,	$\bigcirc$	$\mathcal{I}$	

Q.C. CHECKLIST 5/92 TESTED 84: 3-15-93

QCLIST

# HOW TO SET AND PROGRAM THE SMARTBOARD

#### SETTING SYRUP SOLD-OUT 1

- FACTORY SETTING IS 60 PULSES (30 6.5 OZ. DRINKS)
- MECHANICAL DIP.SWITCH POUND ABOVE SELECTOR BUTTON:

-NOTTIZO9

1 2 3 4 5

COUNT VALUE:

1 2 4 8 16 32

- BASE PULSE COUNT IS 20 PULSES AUTOMATICALLY
- FXAMPLE: TO SET 60 PULSES -

20 BASE COUNT =

SWITCH 4 = 1

SWITCH 6 = 32

R

TOTAL PULSES = K٨

NOTE:

SETTING ALL SWITCHES "DOWN" OR OFF DE ACTIVATES SOLD-OUT FEATURE; I.E. THE LOWEST PULSE COUNT WHICH MUST BE ENTERED TO ACTIVATE SOLD-OUT IS SWITCH 1, YIELDING 21 PULSES (BASE=20+1).

#### RESET SYRUP SOLD-OUT 2

- TURN OFF MAIN SWITCH
- PRESS & HOLD FLAVOR SELECTOR BUTTON TO BE RESET WHILE TURNING ON THE MAIN SWITCH.
- RELEASE SELECTOR BUTTON.
- DISPENSER GOES TO "RUN" MODE AUTOMATICALLY.
- RESET IS POSSIBLE AT ANY TIME DURING THE COUNT DOWN PROCESS. (A)
- SEQUENCE FOR RESET MUST BE DONE FOR EACH FLAVOR WHEN (B) SOLD-OUT OR LOADING NEW SYRUP CARTRIDGE.
- TO SET LOCK-OUT FEATURE FOR SOLD OUT FLAVOR SELECTION BUTTONS .... 3.
  - TURN OFF MAIN SWITCH.
  - PUSH AND HOLD BUTTONS 1 + 5 WHILE TURNING ON MAIN SWITCH.
  - **RELEASE BUTTONS 1 + 5**
  - LOOK AT RED L.E.D. INDICATORS:

IF ALL 5 RED L.E.D.'S ARE ON, THE "LOCK OUT" FEATURE IS ACTIVE, AND SYRUP FLAVOR SELECTIONS WILL LOCK OUT WHEN SOLD OUT BLINKS. TO DE-ACTIVATE. PRESS BUTTON I

IF ONLY LOWER TWO RED L.E.D.'S ARE ON, THE "INDICATOR ONLY" MODE IS ACTIVE, AND THE SYRUP FLAVOR SELECTIONS WILL N-O-T LOCK OUT WHEN THE SYRUP SOLD OUT BLINKS. TO ACTIVATE, PRESS BUTTON 1.

- WHEN THE RED L.E.D.'S INDICATE THE CORRECT MODE TO BE USED, I.E. LOCK OUT OR INDICATOR ONLY, PRESS BUTTON 5 TO VERIFY SELECTION AND SET IT IN MEMORY.
  - ALL L.E.D.'S WILL BRIEFLY ILLUMINATE INDICATING PROGRAM SET.
- THE UNIT RETURNS TO "RUN" MODE AUTOMATICALLY.

#### LOCKING OUT DRINK SIZES

A MAXIMUM OF TWO (2) DRINK SIZES CAN BE LOCKED OUT. USE THIS PROGRAM ALSO WHEN SETTING DRINK SIZE FOR GM1000. NOTE:

- TURN OFF MAIN SWITCH.
- PRESS AND HOLD BUTTON 5 WHILE TURNING ON MAIN SWITCH.
- **RELEASE BUTTON 5.**
- PUSH BUTTON 1, 2 OR 3 TO ACTIVATE/DE-ACTIVATE THE CORRESPONDING DRINK SIZE L.E.D. FOR S (small), M (medium) OR L (large).

BLINKING = ACTIVATED: OFF = DE-ACTIVATED.

- WHEN THE BLINKING GREEN L.E.D.'S INDICATE YOUR PREFERRED SELECTABLE DRINK SIZES, PRESS BUTTON 5 TO VERIFY SELECTION AND SET IT INTO MEMORY
- ALL L.E.D.'S WILL ILLUMINATE BRIEFLY.
- SMARTBOARD AUTOMATICALLY RETURNS TO THE "RUN" MODE

# HOW TO SET AND PROGRAM THE SMARTBOARD CONT'D

- SETTING DRINK SIZES FOR DUAL DRINK COIN MECHANISMS
  - TURN OFF MAIN SWITCH.
  - PRESS AND HOLD BUTTONS 4 + 5 WHILE TURNING ON MAIN SWITCH.
  - RELEASE 4 + 5. THE GREEN L.E.D.'S SET AT FACTORY WILL BLINK.
  - PUSH BUTTON 1, 2 OR 3 TO ACTIVATE/DE-ACTIVATE THE CORRESPONDING DRINK SIZE L.E.D. FOR S (small), M (medium), OR L (large).

NOTE: BLINKING = ACTIVATED; OFF = DE-ACTIVATED. ONE DRINK SIZE MUST BE DE-ACTIVATED FOR DUAL DRINK MECHS.

- WHEN THE BLINKING GREEN L.E.D.'S INDICATE YOUR PREFERRED SELECTABLE DRINK SIZES, PRESS BUTTON 5 TO VERIFY SELECTION AND SET IT INTO MEMORY.
- ALL L.E.D.'S WILL ILLUMINATE BRIEFLY.
- SMARTBOARD AUTOMATICALLY RETURNS TO THE "RUN" MODE.

NOTE: A MAXIMUM OF ONE (1) DRINK SIZE CAN BE LOCKED OUT.

- 6. NIGHT SECURITY LOCK-OUT
  - TURN OFF THE MAIN SWITCH.
  - PRESS AND HOLD BUTTONS 1+2+3 WHILE TURNING ON MAIN SWITCH.
  - RELEASE BUTTONS 1+2+3
  - ALL 3 DRINK SIZE L.E.D.'S WILL ILLUMINATE SIMULTANEOUSLY AND ALL SELECTION BUTTONS WILL BE LOCKED OUT. THE COOLING SYSTEM WILL RUN NORMALLY.
  - TO RESET, REPEAT EXACT PROCEDURE AS ABOVE. SMARTBOARD WILL AUTOMATICALLY RETURN THE UNIT TO "RUN" MODE.
- 7. TO ALLOW PUMP TO RUN MORE THAN 6 SECONDS LIMIT OF FLOW SENSOR ...
  - TURN OFF MAIN SWITCH.
  - PRESS AND HOLD BUTTON 1+2 WHILE TURNING ON MAIN SWITCH.
  - RELEASE BUTTON 1+2: SMARTBOARD AUTOMATICALLY ALLOWS PUMP TO RUN 45 SECONDS MAXIMUM, ONE TIME. THE FLOW SENSOR CONTROL THEN TAKES OVER AGAIN.
  - SMARTBOARD AUTOMATICALLY RETURNS TO THE "RUN" MODE.
     NOTE: THIS FEATURE ESPECIALLY USEFUL WHEN CHANGING WATER FILTER.
- OTHER SOLD OUTS
  - WHEN WATER IS SOLD OUT, ALL SELECTION BUTTONS ARE LOCKED OUT.
    - THE RED L.E.D. ADJACENT THE SODAWATER BUTTON (#4) BLINKS
    - MAY INDICATE RESERVOIR UNIT IS EMPTY OR
    - FLOW SENSOR TIMES OUT AFTER 6 SECONDS OF NO WATER FLOW
  - WHEN CO2 IS SOLD OUT, ALL SELECTION BUTTONS ARE LOCKED OUT.
    - THE CORRESPONDING RED L.E.D. WILL BLINK
  - WHEN THE LEAK SENSOR IN THE BASE PAN DETECTS WATER, ALL SELECTION BUTTONS ARE LOCKED OUT.
    - ALL 5 RED LE.D.'S WILL BLINK INDICATING WATER LEAK.

# SMARTBOARD TEST PROCEDURE

- TURN OFF MAIN SWITCH
- PRESS AND HOLD BUTTON #4 WHILE TURNING ON MAIN SWITCH
- PRESS ALL BUTTONS IN SEQUENCE FROM TOP TO BOTTOM
- STAGE I TEST (RED L.E.D. ADJACENT BUTTON #1 IS ON)
  - PUSH BUTTON 1/2/3 FOR CORRESPONDING DOSER MAGNET TEST
  - PUSH 1+2 TO LOCK OUT COIN ACCEPTANCE OF COIN MECH
  - DRINK SIZE L.E.D. "ON" INDICATES:
    - UPPER LARGE DRINK SELECTED
    - \* MIDDLE COIN MECH ATTACHED
    - \* LOWER FREE VEND SELECTED/NO COIN MECH
- STAGE II TEST (RED L.E.D. ADJACENT BUTTON #2 IS ON WHEN . . .)
  - PUSH BUTTON 4 + 1 TEST PUMP/INLET VALVE
  - PUSH BUTTON 4 + 2 TEST OUTLET VALVE
  - PUSH BUTTON #4 AND DRINK SIZE L.E.D. "ON" INDICATES:
    - UPPER WATER LEAK DETECTED
    - \* MIDDLE FLOW SENSOR TIMED OUT (SEE NOTE 1 BELOW)
    - \* LOWER CARBONATOR IS NOT FULL
- STAGE III TEST (RED L.E.D. ADJACENT BUTTON #3 IS ON WHEN . . .)
  - PUSH BUTTON 5 + 1 TEST COMPRESSOR
  - PUSH BUTTON 5 + 2 TEST REFRIGERATION SWITCHOVER VALVE
  - PUSH BUTTON #5 AND DRINK SIZE L.E.D. "ON" INDICATES:
    - \* UPPER NO ICE DETECTED IN CARBONATOR
    - \* MIDDLE LOW CO2 PRESSURE
    - LOWER SYRUP COMPARTMENT TEMPERATURE TOO HIGH

NOTE 1: L.E.D. SHOULD GO OUT APPROX. 4 SECONDS AFTER WATER IS RE-ESTABLISHED AND PUMP IS ACTIVATED.

# SMARTBOARD INSTALLATION INSTRUCTIONS

RETROFIT KIT: NEW ELECTRONIC CONTROL MODULE WITH SOLD-OUT

#### KIT CONTENTS:

- ELECTRONIC CONTROL MODULE (ECM)
- SELECTOR PANEL 3-BUTTON
- FLAVOR CARD
- WIRING HARNESS

- ASSEMBLY INSTRUCTIONS
- INSTRUCTION LABELS (3)
- OPERATOR'S MANUAL

#### **TOOLS REQUIRED:**

SCREWDRIVER - PHILLIPS HEAD

#### **INSTALLATION INSTRUCTIONS:**

- 1. TURN OFF DISPENSER AT MAIN (ON/OFF) SWITCH.
- PULL POWER CORD FROM ELECTRICAL OUTLET.
- 3. REMOVE CO2 CYLINDER FROM DISPENSER.
- 4. VENT CARBONATOR COMPLETELY (push red pin at CO2 regulator).
- 5. REMOVE SELECTOR PANEL.
- 6. REMOVE TOP TWO (2) SCREWS HOLDING CONTROL MODULE. SAVE SCREWS FOR LATER. REMOVE OLD ECM BOARD.
- DISCONNECT EDGE CONNECTORS FROM ECM BOARD.
  - (7.1) FOR DISPENSER WITHOUT COIN MECHANISM: L31, L33, L35, AND IF USED, L32 JUMPER.
  - (7.2) FOR DISPENSERS WITH COIN MECHANISM: L31, L32, L33, L34, L35, AND THE TWO CO2-OUT CONNECTORS (SEE FIG. 4).
- 8. CAREFULLY SWAP THE WHITE AND YELLOW WIRE LEADS IN THE L35 CONNECTOR (FIG. 3). HINT: USE SMALL SCREW DRIVER BLADE TO PUSH CLIP-TYPE CONNECTORS OUT FROM PLASTIC EDGE CONNECTOR.
- 9. INSTALL THE DISPENSER WIRE HARNESS CONNECTORS ONTO THE NEW ECM BOARD (FIG. 4) IN SAME LOCATION AS OLD ECM BOARD.
- 10. PULL SHIELDED WIRE WITH TWO-PIN GRAY CONNECTOR INTO POSITION OF ST-2 ON NEW ECM (FIG. 4).

# SMARTBOARD INSTALLATION INSTRUCTIONS CONT'D

- 11. PUSH TWO-PIN GRAY CONNECTOR INTO ST-2 RECEPTACLE.
- 12. INSERT TWO SCREWS (FROM STEP 6 ABOVE) INTO TOP HOLES OF NEW ECM BOARD. POSITION NEW ECM BOARD PROPERLY INTO HOLDERS OF FRONT HOUSING. TIGHTEN TWO TOP SCREWS.
- 13. PLACE NEW FLAVOR CARD INTO NEW SELECTOR PANEL.
- 14. INSTALL NEW INSTRUCTION LABEL ON INSIDE OF SYRUP COMPARTMENT DOOR.
- 15. RE-INSTALL CO2 CYLINDER.
- 16. PLUG IN THE DISPENSER POWER CORD.
- 17. TURN ON THE MAIN (ON/OFF) SWITCH.

# SMARTBOARD INSTALLATION **INSTRUCTIONS**

RETROFIT KIT: NEW ELECTRONIC CONTROL MODULE WITH SOLD-OUT

### KIT CONTENTS:

- ELECTRONIC CON-ASSEMBLY TROL MODULE (ECM) INSTRUCTIONS INSTRUCTION
- SELECTOR PANEL - 3 - BUTTON LABELS (3)
- FLAVOR CARD
- OPERATOR'S MANUAL WIRING HARNESS

## **TOOLS REQUIRED:**

SCREWDRIVER - PHILLIPS HEAD

# INSTALLATION INSTRUCTIONS:

- 1. TURN OFF DISPENSER AT MAIN (ON/OFF) 2. PULL POWER CORD FROM ELECTRICAL OUTLET.
- 3. REMOVE CO2 CYLINDER FROM DISPENSER. 4. VENT CARBONATOR COMPLETELY (push red pin at CO2 regulator).
- 5 REMOVE SELECTOR PANEL 6. REMOVE TOP TWO (2) SCREWS HOLDING
- CONTROL MODULE SAVE SCREWS FOR LATER. REMOVE OLD ECM BOARD.
- 7. DISCONNECT EDGE CONNECTORS FROM ECM (7.1) FOR DISPENSER WITHOUT COIN
- MECHANISM: L 31, L 33, L 35, AND IF USED, L 32 JUMPER. (7.2) FOR DISPENSERS WITH COIN
  - MECHANISM: L 31, L 32, L 33, L 34, L 35, AND THE TWO CO2-OUT CONNECTORS (SEE FIG. 4).
- 8. CAREFULLY SWAP THE WHITE AND YELLOW WIRE LEADS IN THE L 35 CONNECTOR (FIG. 3). HINT: USE SMALL SCREW DRIVER BLADE TO PUSH CLIP-TYPE CONNECTORS OUT FROM PLASTIC EDGE CONNECTOR.
- 9. INSTALL THE DISPENSER WIRE HARNESS CONNECTORS ONTO THE NEW ECM BOARD (FIG. 2) IN SAME LOCATION AS OLD ECM BOARD.
- 10. PUSH TWO-PIN GRAY CONNECTOR INTO ST-2 RECEPTACLE (FIG. 4) ON NEW ECM AND INSTALL THE OTHER WHITE CONNECTOR.
- 11. INSERT TWO SCREWS (FROM STEP 6 ABOVE) INTO TOP HOLES OF NEW ECM BOARD. POSITION NEW ECM BOARD PROPERLY INTO HOLDERS OF FRONT HOUSING, TIGHTEN TWO
- 12. PLACE NEW FLAVOR CARD INTO NEW SELECTOR PANEL.
- 13. INSTALL NEW INSTRUCTION LABEL ON INSIDE OF SYRUP COMPARTMENT DOOR.
- 14. RE-INSTALL CO2 CYLINDER. 15. PLUG IN THE DISPENSER POWER CORD.
- 16. TURN ON THE MAIN (ON/OFF) SWITCH.



#### Attention

Refitting and commissioning must be made by a trained fitter (customer service) only.

