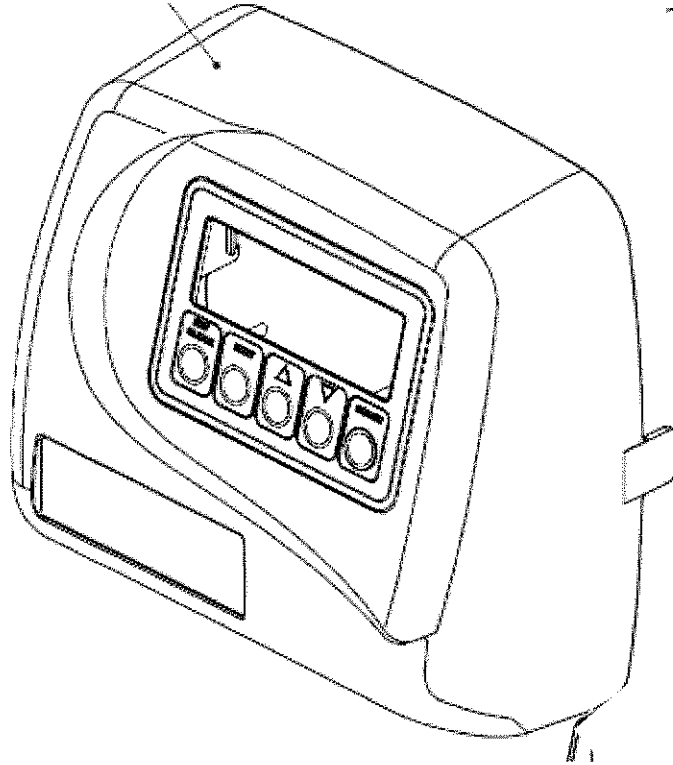




# **WATER TENDER®**

**Quality Water Treatment Products**



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## **WTC Series Residential Softeners**

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### **Installation and Operation Manual**

March 2015

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**Installation and Operating Instructions for WTC  
Top Mount Softeners**

**Model #:**

_____	WTC240	24,000 grain softener
_____	WTC320	32,000 grain softener
_____	WTC480	48,000 grain softener
_____	WTC640	64,000 grain softener

**Shipping Carton Description / unit:**

# of cartons	Contents	Description
1	Mineral tank	Distributor pipe installed
1	Brine tank	Brine tubing, brine well, brine shutoff valve, overflow fittings installed. <b>*NOTE:</b> WTC control shipped in brine tank.
1	WTC control valve	WTC control valve and bypass
	C-800	Pre-loaded @ factory

**Filter Media is Packaged as Follows:**

Model #	C-800 Cation Resin
WTC240	.75 CF*
WTC320	1.0 CF*
WTC480	1.5 CF*
WTC640	2.0 CF*

\*Already installed at the factory

**NOTE: THIS SOFTENER IS NOT INTENDED TO BE USED FOR TREATING WATER THAT IS MICROBIOLOGICALLY UNSAFE OR OF UNKNOWN QUALITY WITHOUT ADEQUATE DISINFECTION WHETHER BEFORE OR AFTER THE SYSTEM.**

### ***Water Softener Positioning:***

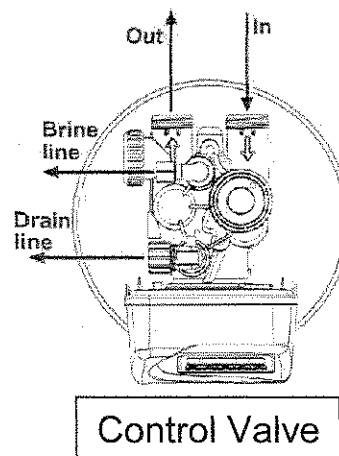
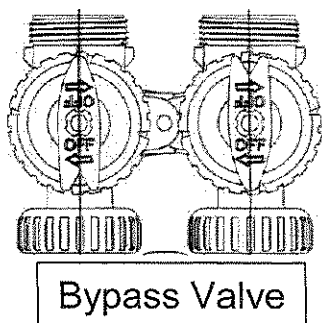
1. Place water softener in desired position, far enough from walls and other obstructions to allow for servicing the unit.
2. Place the water softener within reasonable access to a grounded 115V/60 HZ circuit and a legal drain line connection.

### ***Water Softener Tank Loading:***

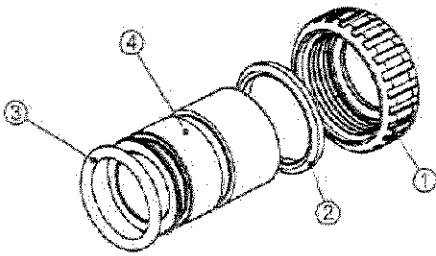
1. Center the distributor and make sure it is resting on the bottom of the tank. The top of the distributor pipe should be **flush with the top of the tank** (this was prefitted at the factory).
2. Cover the top opening of the distributor pipe before filling the tank with media.

### ***WTC Control Valve:***

1. Turn the control valve upside down and ensure that the control valve distributor o'ring is in place. Use silicone lubricant on the o'ring.
2. Place the control valve onto the distributor pipe and into the tank opening.
3. Thread the control valve hand tight . Do not overtighten.
4. Locate the bypass valve assembly that is packaged with the control valve. The bypass valve has two red handles that indicate flow direction, two threaded connections for the tail piece kit and two o'ring seal connections with nuts for the control valve. Align the insert connection ends with o'ring seals and nuts to the inlet and outlet connections of the control valve. Hand tighten the nuts. **DO NOT OVERTIGHTEN THE NUT.**



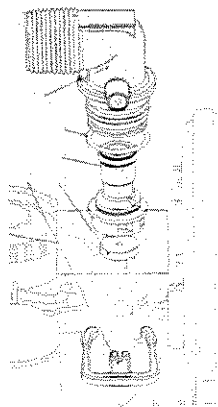
5. Locate the tail piece kit that is packaged with the control valve. The standard tail piece kit is  $\frac{3}{4}$ " PVC. Optional  $\frac{3}{4}$ " and 1" copper kits available as a special order. Each tail piece, o'ring, split ring and nut is presassembled at the factory. Align a tail piece assembly to the bypass valve threaded inlet and insert until the nut can be tightened. Hand tighten the nut because excessive tightening will damage the assembly. REPEAT THE PROCEDURE FOR THE OUTLET CONNECTION.



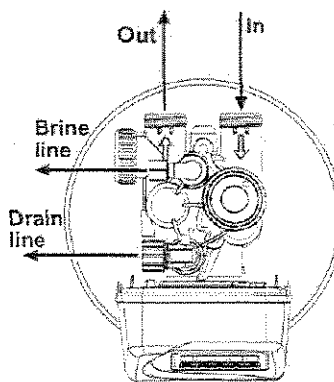
Tail piece assembly

6. The control valve's drain connection is  $\frac{3}{4}$ " npt and is located on the top of the control valve.

Drain Line Connection



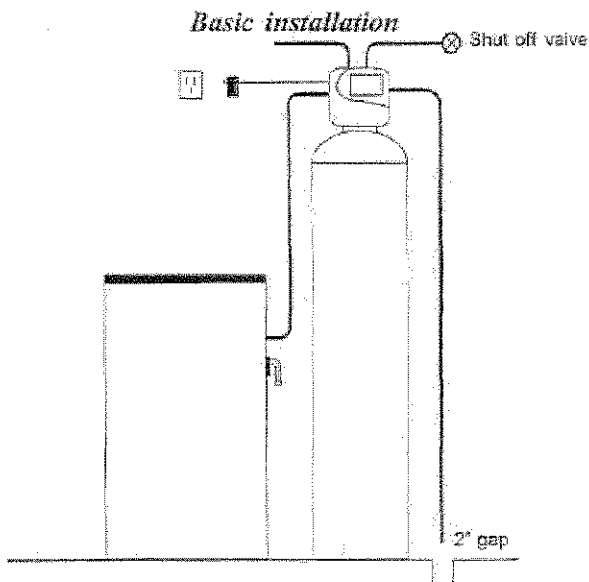
Control Valve



## ***Service and Drain Piping:***

1. Pipe softener system into the service lines (see Figure 1) using the bypass valve assembly supplied with the unit. The inlet and outlet connections of the control valve are located on the back of the valve body. As you face the timer the inlet is on the right and the outlet is on the left. Always follow local plumbing codes when installing our water treatment equipment.
2. If sweat fittings are used, be sure soldering is done in such a manner as not to allow heat to reach the valve. If Schedule 80 PVC is used make sure to follow the proper primer and solvent instructions.
3. The drain line connection is located on the top of the valve body as you face the timer. The drain line must be of adequate size to allow for full regeneration flow.
  - The control valve drain connection is 3/4" npt.
  - Never decrease the drain piping size to below 3/4".
  - Maximum drain line length is 20 feet.
  - Maximum drain line height is 8 feet above the control valve.
  - The end of the drain line must be piped to an open drain.
  - Always follow local plumbing codes when piping drain lines to a waste pipe.

**UNDER NO CIRCUMSTANCES SHOULD THERE BE A DIRECT CONNECTION WITH SANITARY SEWAGE FACILITIES.**



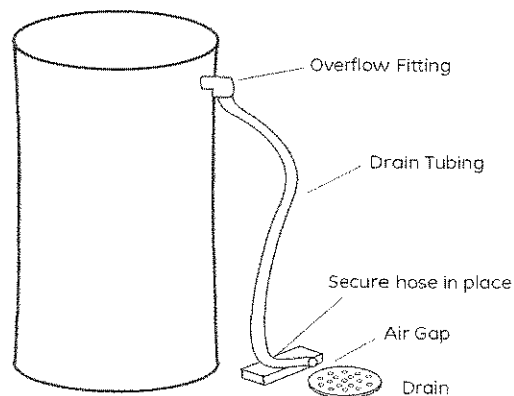
## ***Electrical Requirements:***

Always follow all local electrical codes when installing our water treatment equipment.

1. Provide a properly grounded 115V/60 HZ electrical outlet.
2. Maximum amperage required is 3 amps.
3. Make sure the electrical service provides power 24 hours per day. Avoid using outlets that are switch controlled.
4. Follow all local electrical codes when installing our water treatment equipment.

## ***Brine Tank:***

1. The brine tank should be located directly beside the water softener mineral tank.
2. Connect one end of the 3/8" poly tubing to the compression fitting on the top of the brine shutoff valve located in the brine tank and the other end to the compression fitting located on the right side of the WTC control valve.
3. Make sure the plastic gripper assembly is properly positioned on each end of the tubing.
4. The brine shutoff valve contains a float that controls the water level in the brine tank. The float height was preset at the factory.



### ***Filling Water Softener with Water:***

1. Connect the WTC control valve transformer into the electrical outlet provided.
2. Press and hold the Up and Down arrows simultaneously for three seconds until the drive motor starts. When the drive motor stops, the display will read "C1" backwash position.
3. Open the inlet ball valve 25% of its full open position to allow water to enter the water softener mineral tank slowly. The water is going to enter the tank from the bottom of the distributor pipe and leave the tank from the top. This will slowly purge all the air from the tank. IF WATER ENTERS THE TANK TOO FAST, ALL THE CATION RESIN WILL BE FLUSHED TO DRAIN DURING START UP.
4. When only water is running to the drain, open the inlet and outlet ball valves fully.
5. Press the Up button to advance the control valve to the brine/rinse position. The display will read "C2".
6. Once the drive motor stops, press the Up button to advance the control valve to the fast rinse position. The display will read "C4". The fast rinse position will rinse the softener tank.
7. The control valve will automatically advance to the brine refill position where the brine tank will fill with the proper amount of water. The display will read "C5".

**NOTE: THE TIMER WILL AUTOMATICALLY ADVANCE TO THE SERVICE POSITION AND THE DISPLAY WILL READ TIME OF DAY.**



## ***WTC Control Valve Timer Settings:***

**NOTE:** When system is operating one of two displays will be shown: time of day or days until the next regeneration. Pressing the UP or DOWN buttons will toggle between the two choices.

### ***Time of Day Setting***

- 1) Press and hold the CLOCK button. The screen will display "Set Time" and the hour will be blinking.
- 2) Press the UP or DOWN arrows to adjust the hour —check for correct am or pm mode.
- 3) Press the CLOCK button.
- 4) Press the UP or DOWN arrows to adjust the minutes.
- 5) Press the CLOCK button.

### ***Time of Regeneration Setting (the factory default is 2 AM)***

Simultaneously press the CLOCK and the UP arrow for 3 seconds: The screen will display "Set Time Regen" and the hour will be blinking.

- 1) Use the UP or DOWN arrows to adjust hour.
- 2) Press the CLOCK button.
- 3) Press the UP or DOWN arrows to adjust the minutes.
- 4) Press the CLOCK button.

### ***Regeneration Frequency Setting (the factory default is every 7 days)***

The screen will display "Set Regen Day" and the days of regeneration frequency will be blinking.

- 1) To change the number, use the UP or DOWN arrows.
- 2) Press the CLOCK button.
- 3) Set up is complete and the screen will now show the time.

### ***Manual Regeneration***

- 1) For Immediate Regeneration: Press and hold the UP and DOWN buttons simultaneously until valve motor starts (typically 3 seconds).
- 2) For Regeneration Tonight: Press and release the UP and DOWN buttons simultaneously (notice that arrow points to Regen).

**NOTE: For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 hours before regeneration.**

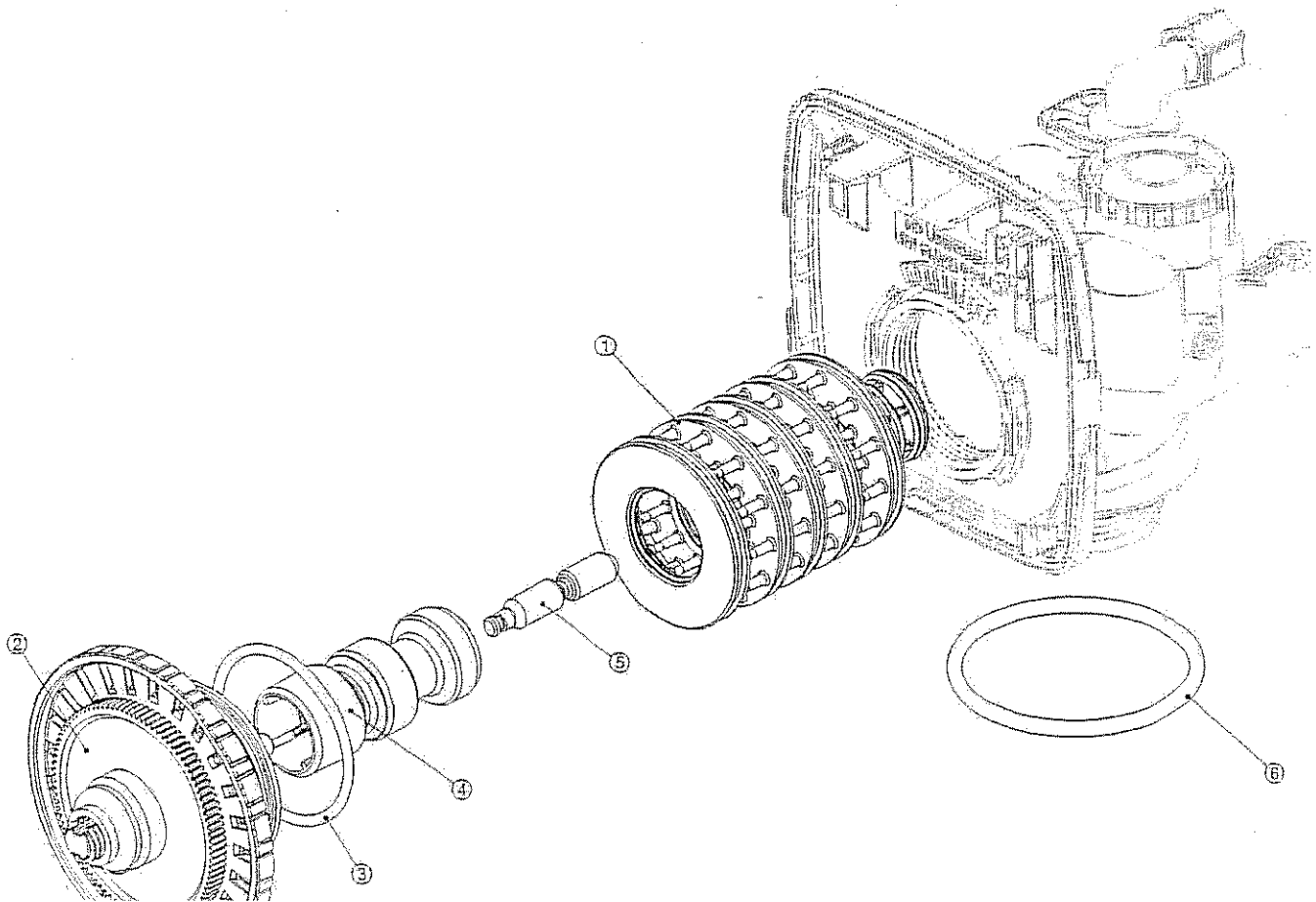
**NOTE: If the display shows “E1,” “E2” or “E3” (for error), call a service technician.**

### ***Final Check:***

1. Make sure the water level in the brine tank is at least 1" above the plastic grid plate.
2. Fill the brine tank with Solar Salt
3. Make sure the drain line connection meets all plumbing codes and that the drain line size can handle the backwash flow rate of the softener.
4. Make sure the Inlet and Outlet ball valves are open and the Bypass ball valve is closed.
5. Make sure the control valve timer is plugged into an electrical outlet with power 24 hours per day.
6. Check all piping for leaks.

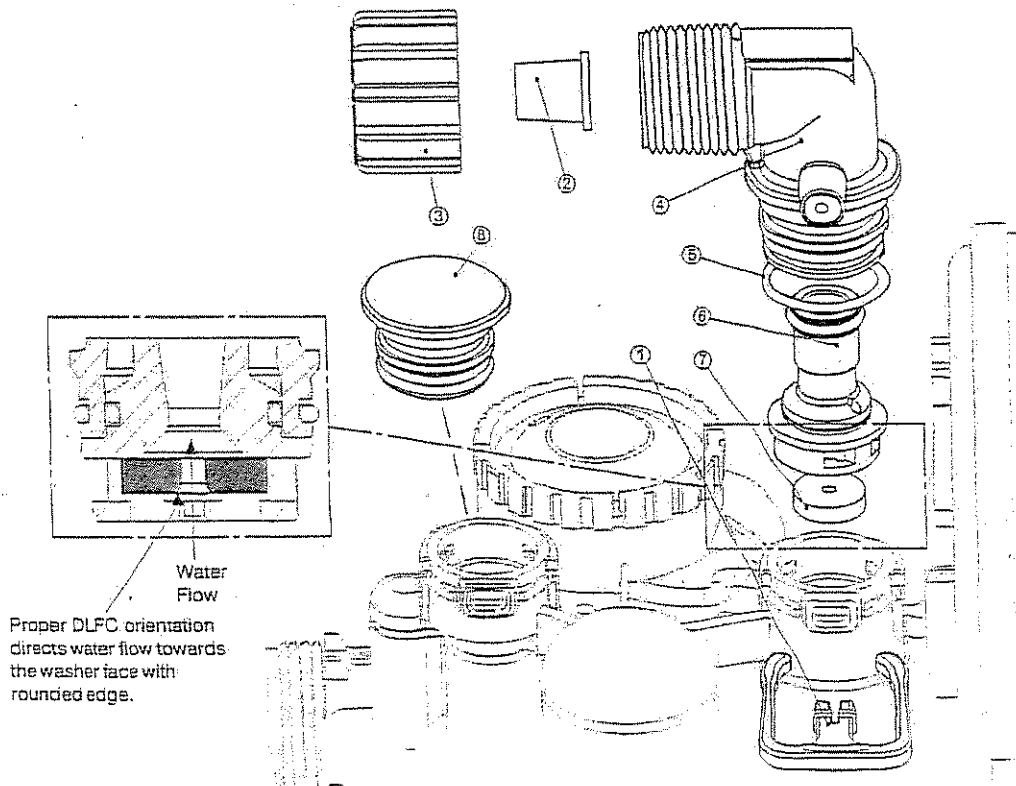
## WTC SOFTENER CONTROL VALVE & PARTS

Part Number	Item number	Description
WTC control valve	n/a	WTC Filter Valve with 7 day timer
V3005	1	Spacer Stack Assembly
V3004	2	Drive Cap Assembly
V3135	3	O'ring 228
V3011	4	Piston Downflow Assembly
V3174	5	Regenerant Piston
V3180	6	O'ring 337



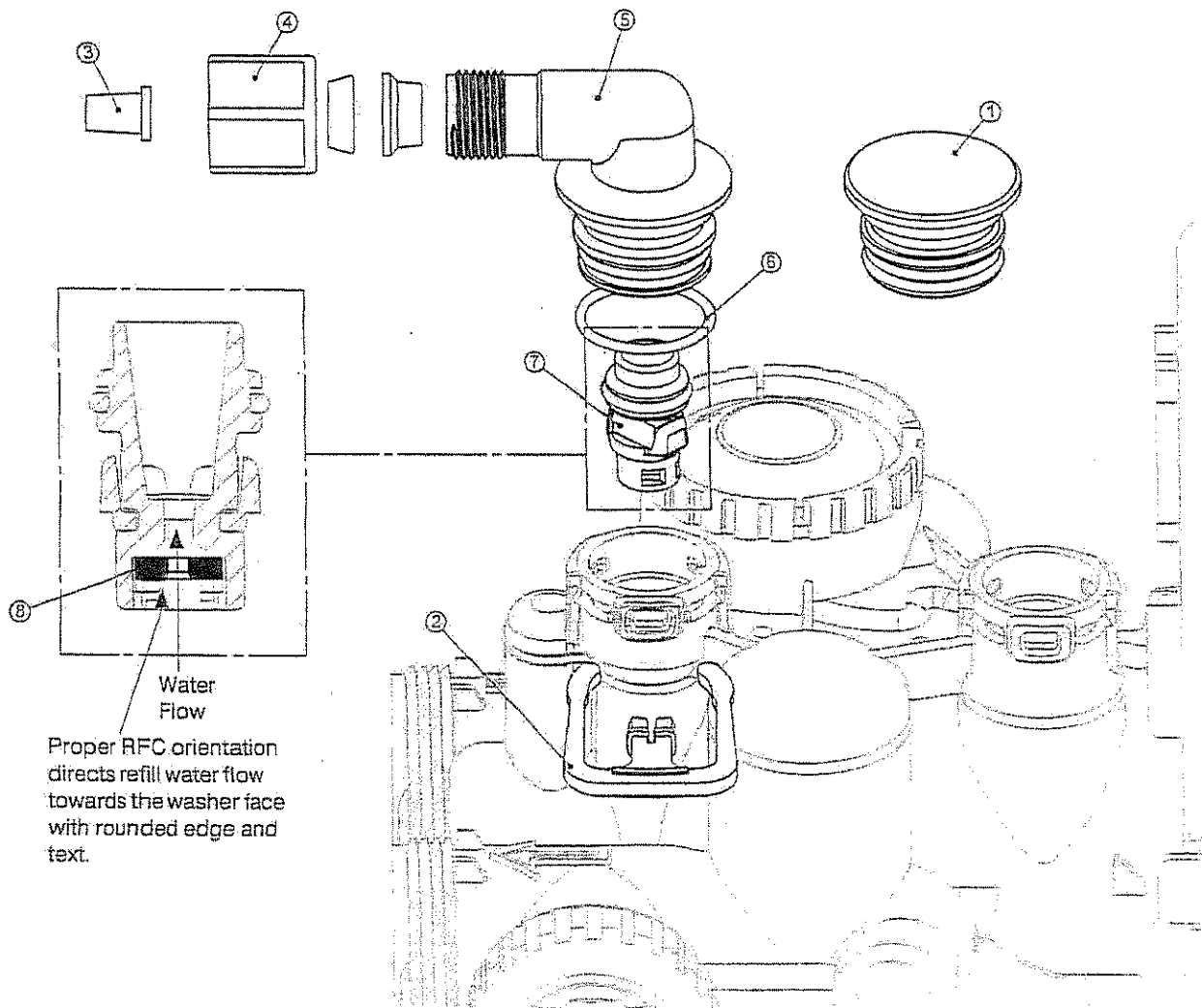
# WTC Softener Control Valve and Parts

Part Number	Item number	Description
H4615	1	Elbow Locking Clip
PKP10TSB	2	Polytube insert 5/8
V3192	3	3/4 Elbow Drain Nut
V3158-01	4	3/4 Drain Elbow Assembly
V3153	5	O'ring 019
V3159-01	6	DLFC Retainer Assembly
V3162-____	7	Drain Flow Control (contact factory for gpm)
V3195-01	8	WTC Refil Port Plug



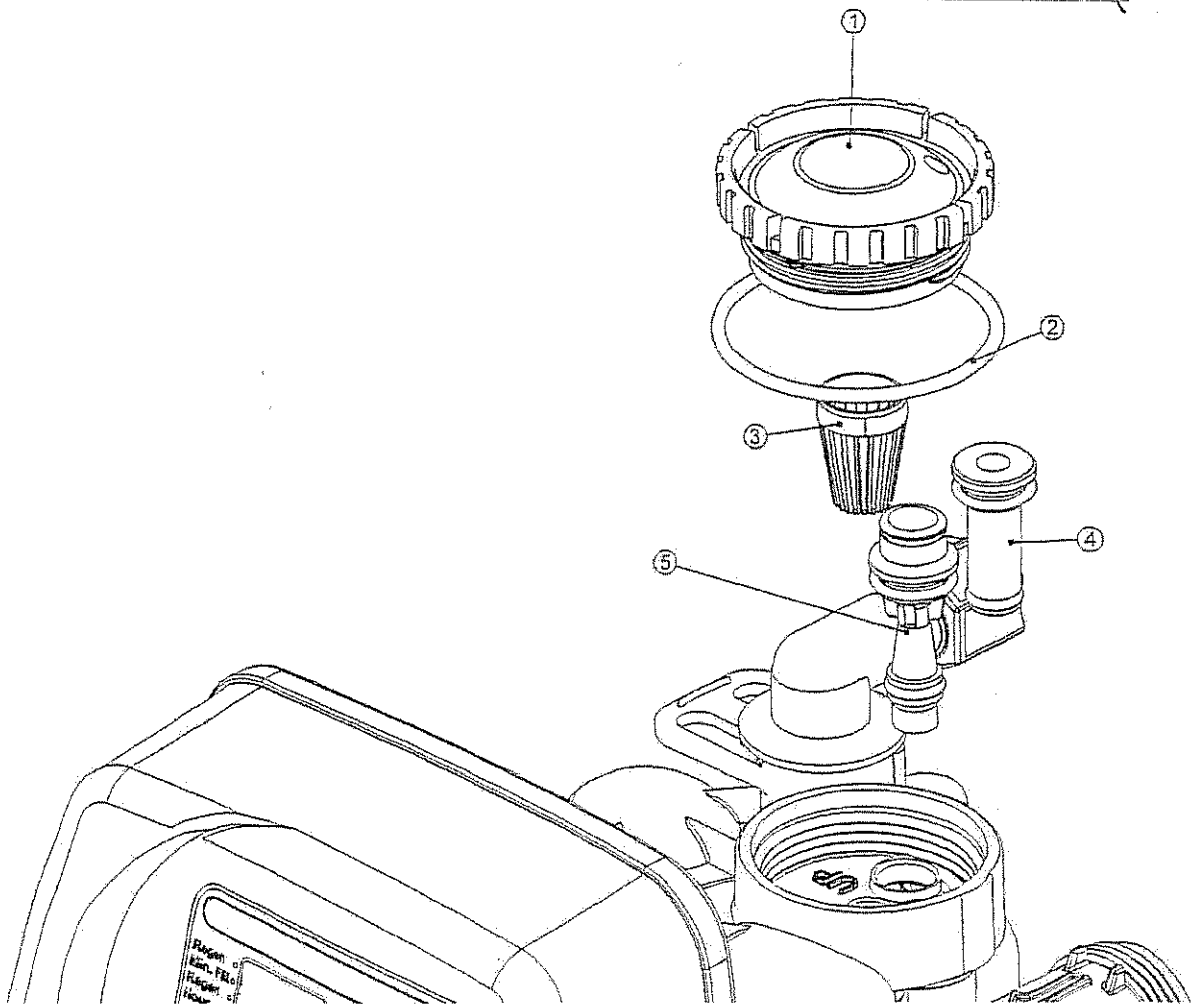
## WTC Softener Control Valve and Parts

Part Number	Item Number	Description
H4615	2	Elbow Locking Clip
JCP-P-6	3	Polytube Insert 3/8"
JCPG-6PBLK	4	Nut 3/8"
H4613	5	Elbow Cap 3/8"
V3163	6	O'ring
V3182	8	Refill Flow Control

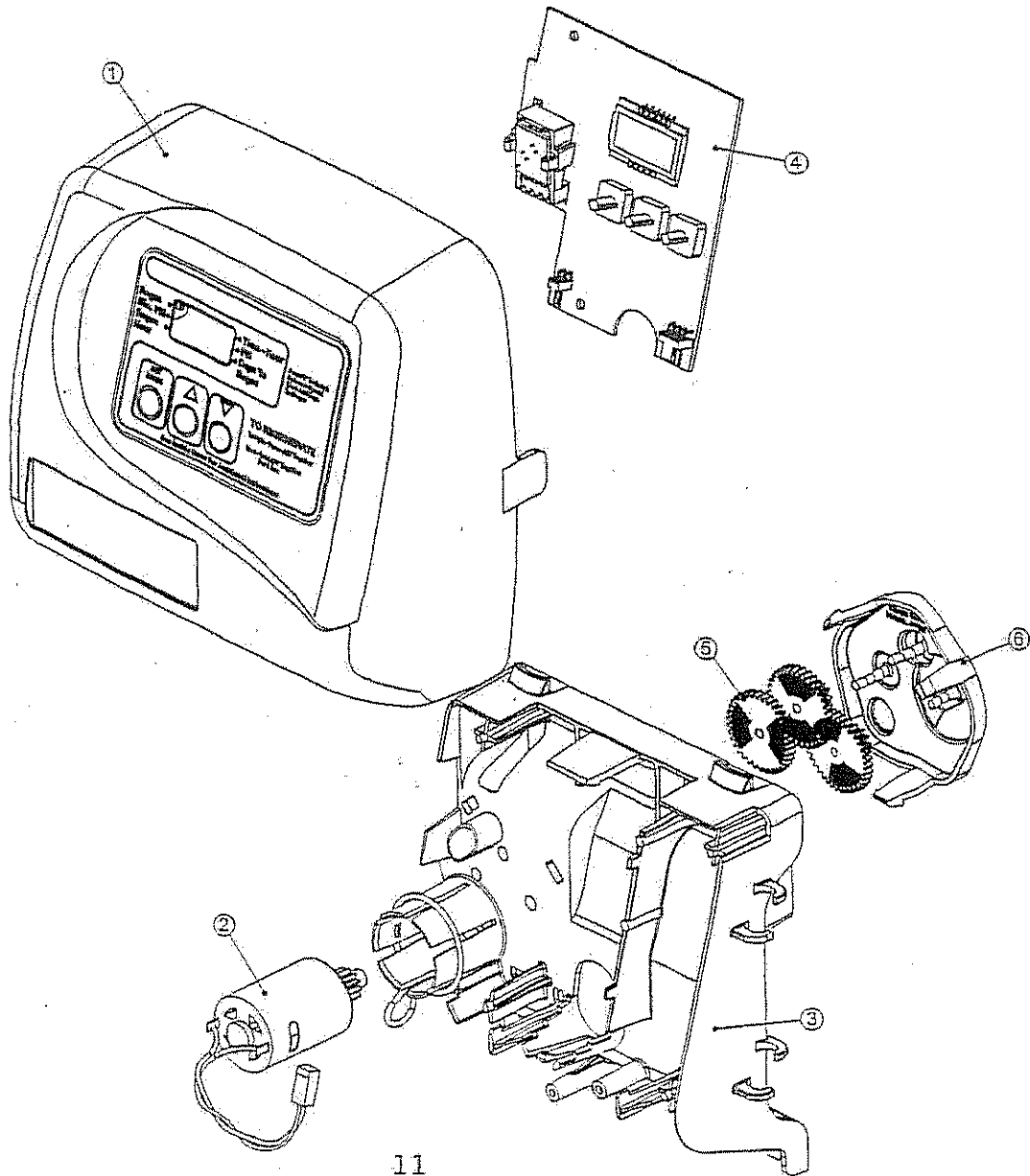


## WTC Softener Control Valve and Parts

Part Number	Item number	Description
V3176	1	Injector Cap
V3152	2	O'ring
V3177	3	Injector Screen
V3010-1Z	4	Injector Plug
V3010-( )*	5	Injector Body (contact factory for gpm)



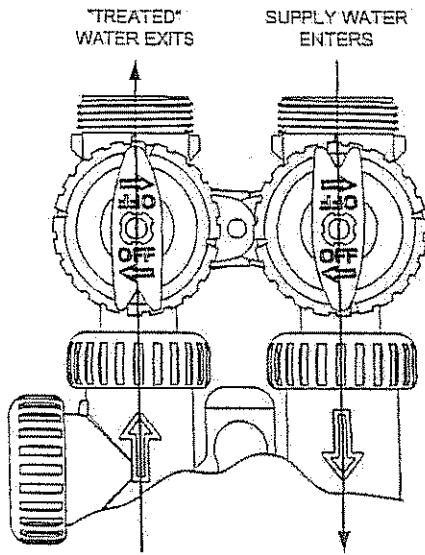
Part Number	Item number	Description
V3175TC-01	1	Timer Cover
V3107-01	2	Timer Motor
V3106-01	3	Drive Bracket and Spring Clip
V3108TC	4	PC Board
V3110	5	Drive Gear
V3109	6	Drive Gear Cover
V3002TC	n/a	Drive Assembly
V3186	n/a	Transformer



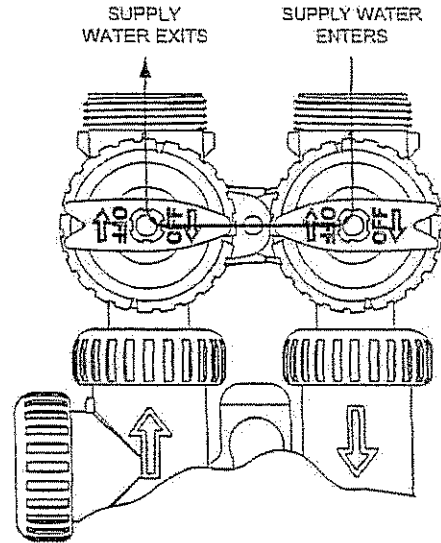
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# BYPASS VALVE OPERATION

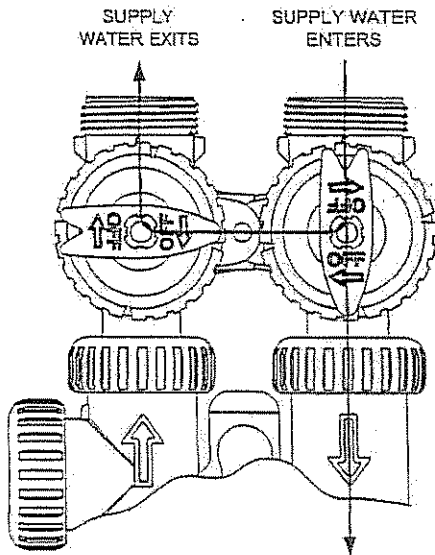
## NORMAL OPERATION



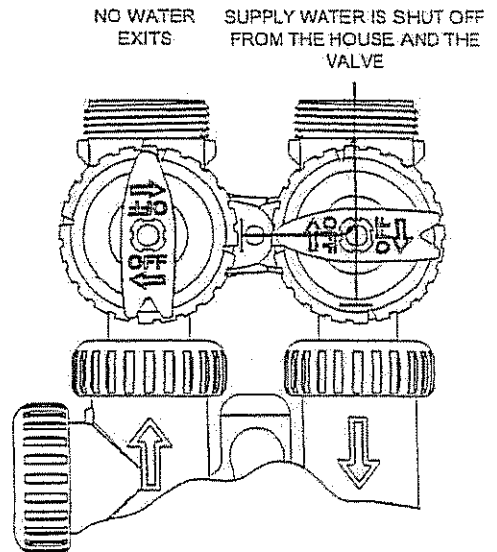
## BYPASS OPERATION



## DIAGNOSTIC MODE



## SHUT OFF MODE





## Troubleshooting

**Symptom:** Water conditioner fails to regenerate. No soft water.

Possible Cause	Solution
Faulty electrical supply	Verify that electrical power is getting to the outlet
Low inlet water pressure	Verify a minimum 30 psi inlet water pressure
Drain line restriction	Insure that the drain line is free of blockage
Defective timer motor	Replace timer motor
No salt in brine tank.	Add salt and regenerate.
Manual bypass valve is open.	Close manual bypass valve.
Leak at riser pipe seal.	Insure that riser pipe is properly sealed at o'ring seal. Inspect pipe for cracks.
Insufficient brine.	Check brine float height and clean assembly if necessary. Check flow rate capabilities of safety float and air check assembly.
Plugged injector or injector screen.	Inspect and clean injector and/or injector screen.
Incorrect P Value Programming	Reprogram with proper P Value

**Symptom:** No Brine Draw

Possible Cause	Solution
Plugged injector or injector screen.	Inspect and clean injector and/or injector screen.
Insufficient water pressure.	Verify a minimum 30 psi inlet water pressure
Obstructed drain line.	Remove obstruction.

**Symptom:** Insufficient brine draw

<b>Possible Cause</b>	<b>Solution</b>
Partially clogged injector or injector screen.	Inspect and clean injector and/or injector screen assembly.
Restricted flow rate in brine line.	Check flow rate capabilities of the safety float/aircheck assembly.
Insufficient water pressure.	Verify a minimum 30 psi inlet water pressure
Excessive back pressure on injector due to elevated drain line.	Reduce drain line elevation to height of valve.
Damaged piston stack assembly	Replace piston stack assembly
Damaged piston rod assembly	Replace piston rod assembly
Incorrect P Value Programming	Reprogram with proper P Value
Partially restricted drain line.	Remove restriction.

**Symptom:** Insufficient Refill to Brine Tank

<b>Possible Cause</b>	<b>Solution</b>
Incorrect P Value Programming	Reprogram with proper P Value
Restricted flow rate in brine line.	Check flow rate capabilities of the safety float/aircheck assembly.

**Symptom:** Excessive Water in Brine Tank

<b>Possible Cause</b>	<b>Solution</b>
Plugged drain line flow control.	Clean flow control.
Incorrect P Value Programming	Reprogram with proper P Value
Plugged injector and/or injector screen	Inspect and clean injector and/or screen.

**Symptom: Loss of Media to Drain**

<b>Possible Cause</b>	<b>Solution</b>
No flow control installed in drain line.	Install drain line flow control.

**Symptom: Leak to Drain**

<b>Possible Cause</b>	<b>Solution</b>
No flow control installed in drain line.	Install drain line flow control.
Insufficient water pressure.	Increase water pressure above 25 psig (172kPa) minimum.
Damaged piston stack assembly	Replace piston stack assembly
Damaged piston rod assembly	Replace piston rod assembly

**Symptom: Loss of Water Pressure**

<b>Possible Cause</b>	<b>Solution</b>
Fouled resin bed due to iron accumulation.	Clean control valve and mineral bed with cleaner.
Slots in riser pipe or laterals are filled with resin fines.	Inspect and clean distributor pipe slots as needed.

**Symptom: Salt in Water to Service After Regeneration**

<b>Possible Cause</b>	<b>Solution</b>
Injector is too small for system size.	Install correct injector
Brine draw time excessively long due to low water pressure.	Increase water pressure above 25 psig (172 kPa) minimum.
Restricted drain line.	Remove drain line restriction.
Insufficient rinse volume.	Increase slow rinse time, fast rinse time, or both.
Damaged piston stack assembly	Replace piston stack assembly
Damaged piston rod assembly	Replace piston rod assembly
Incorrect P Value Programming	Reprogram with proper P Value
Plugged injector and/or injector screen.	Inspect and clean injector and/or injector screen.

## ERROR CODES

Display	Description	Cause
E1 (1001)	Unable to recognize start of regeneration	Defective motor, damaged wiring, or poor wire connection.
E2 (1002)	Unexpected electrical or mechanical stall	Defective motor, damaged wiring, poor wire connection, or mechanical component failure.
E3 (1003)	Motor running too long or timeout during piston relocating	Damaged wiring, poor wire connection, or mechanical component failure.
E4 (1004)	Motor timeout when piston is relocating to service position	Damaged wiring, poor wire connection, or mechanical component failure.
(1006)	MAV-No Hard Water Bypass motor ran too long, piston can't find proper position	Unplug transformer from electrical outlet. After 1 minute, connect transformer to electrical outlet. The MAV will synchronize to the proper position.
(1007)	MAV-No Hard Water Bypass motor ran too short, piston can't find proper position and movement is stalled	Unplug transformer from electrical outlet. After 1 minute, connect transformer to electrical outlet. The MAV will synchronize to the proper position.
(1009)	Internal software error generated by detection of an invalid motor start	Replace circuit board.



QUALITY WATER TREATMENT SYSTEMS

LIMITED WARRANTY

This LIMITED WARRANTY applies to original purchasers of water conditioners and filters ("Unit" or "Units") distributed by the Milby Company. The Units are made from the finest materials available and are warranted for the periods shown below so long as the Units are operated in conformity with the specified Physical Properties and only in residential applications.

Any component part of a purchased Unit identified in the attached Warranty Registration Card by model and serial number that is installed by a licensed contractor according to the applicable installation manual and local plumbing and electrical codes will be repaired or replaced, at Milby's option, if a failure occurs due to defective material or workmanship. Any accident to the Unit, misuse, abuse or alteration of the Unit, or any unauthorized attempt to repair the Unit will void this warranty. Modifications or repairs by anyone other than an authorized Milby dealer are not covered by this warranty.

Table with 2 columns: Physical Properties and values. Max. Pressure: 75 PSI, Max. Temperature: 100 Degrees Fahrenheit, Min. Temperature: 32 Degrees Fahrenheit

Table with 2 columns: Component Part and Warranty Period. Media Tank: 10 yrs. From Date of Purchase, Salt Storage Tank: 5 yrs From Date of Purchase, Control Valve: 3 yrs From Date of Purchase, Media Performance due to misapplication, faulty installation, or clogging: None

Under this warranty, Milby will only repair or replace a Unit or component part with an identical or similar Unit or component part distributed by Milby. A replacement Unit or component part shall be warranted only for the remainder of the warranty period of the original purchased Unit or part. The purchaser is responsible for all other costs, including, but not limited to (1) labor charges for service, removal, repair or reinstallation of the Unit or component part, (2) shipping, delivery, handling and administrative charges for necessary or incidental costs for any materials required for installation of the replacement Unit or component parts.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHATSOEVER WITH RESPECT TO THE INSTALLATION, OPERATION, REPAIR OR REPLACEMENT OF A UNIT AND/OR ITS COMPONENT PARTS THAT EXTEND BEYOND THE APPLICABLE LIMITED WARRANTY HEREIN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

UNDER NO CIRCUMSTANCES SHALL MILBY BE LIABLE TO THE PURCHASER OR ANY OTHER PERSON FOR WATER DAMAGE, LOSS OF USE OF THE UNIT, INCONVENIENCE, LOSS OR DAMAGE TO PERSONAL PROPERTY, OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, TORT, OR OTHERWISE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

To obtain coverage under this warranty, the consumer must complete and return the attached Warranty Registration Card within thirty (30) days from the date of purchase to Milby at: Attn: Customer Service, Milby Company, 6201 South Hanover Road, Elkridge, Maryland 21075-5651. Any claim under this warranty should be initiated with the dealer who sold the Unit to the purchaser. If this is not practicable, the purchaser should contact Milby directly at 410-796-7700.

WARRANTY REGISTRATION CARD
Purchaser Name:
and Address
Model # \_\_\_\_\_ Date of Purchase: \_\_\_\_\_
Dealer Name:
and Address

MILBY COMPANY
6201 South Hanover Road
Elkridge, MD 21075-5651
Phone: 410- 796-7700
Fax: 410- 796-7739