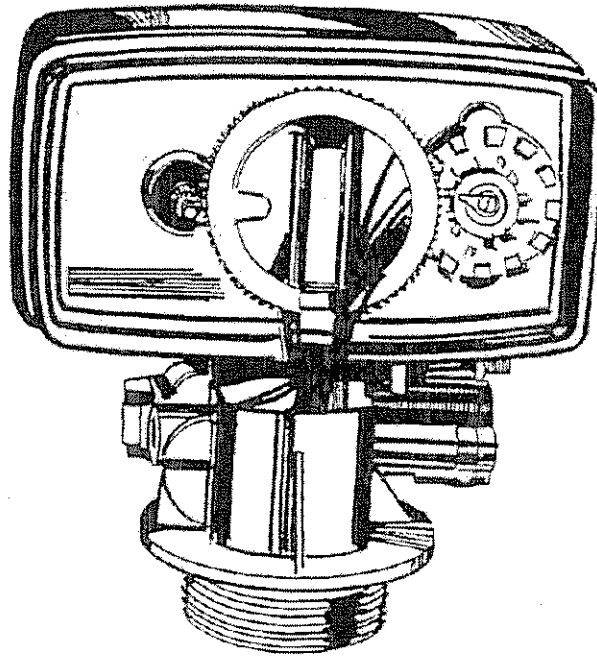


WATER TENDER®

Quality Water Treatment Products



WTF Time Clock Series Residential Softeners with Vortech

Installation and Operation Manual

March 2015 Version

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Installation and Operating Instructions for WTF
Top Mount Softeners

Model #:

_____	WTF240	24,000 grain softener
_____	WTF320	32,000 grain softener
_____	WTF480	48,000 grain softener
_____	WTF640	64,000 grain softener
_____	WTF250C	25,000 grain softener
_____	WTF320C	32,000 grain softener
_____	WTF320IH	32,000 grain iron handler softener
_____	WTF480IH	48,000 grain iron handler 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. *NOTE: WTF control shipped in brine tank.
1	WTF control valve	WTF control valve and bypass
	C-800	Pre-loaded @ factory

Note: The 320-640, and 320IH-480IH-640IH units have a Vortech Distributor.

Filter Media is Packaged as Follows:

Model #	C-800 Cation Resin
WTF240	.75 CF*
WTF320	1.0 CF*
WTF480	1.5 CF*
WTF640	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:

(Note: only for the WTF240, WTF250C, and WTF320C)

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.

WTF 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. The control valve's drain connection is 1/2" npt and is located on the back right of the control valve.

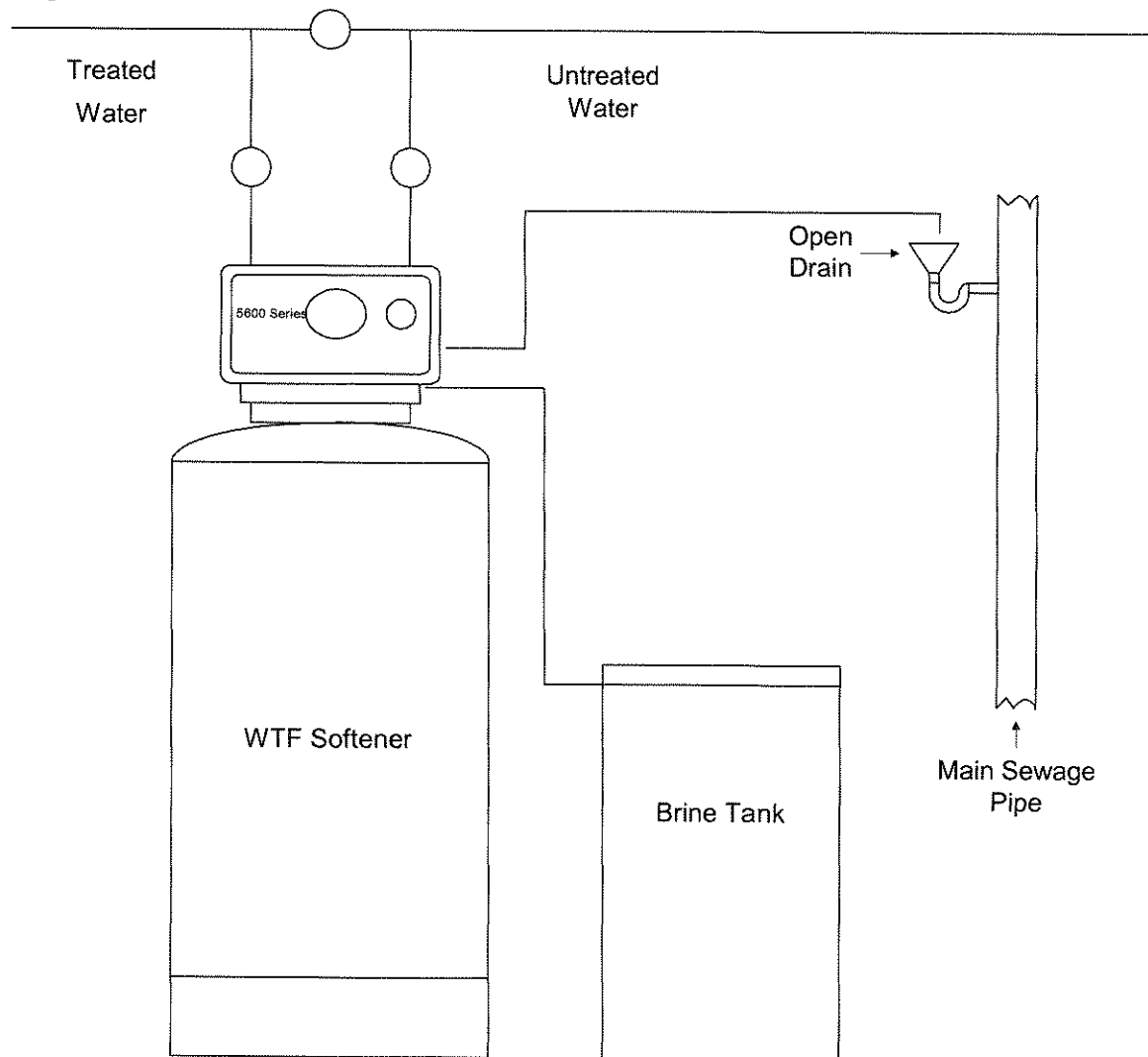
Service and Drain Piping:

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 1/2" npt.
- Never decrease the drain piping size to below 5/8".
- 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.

Figure 1



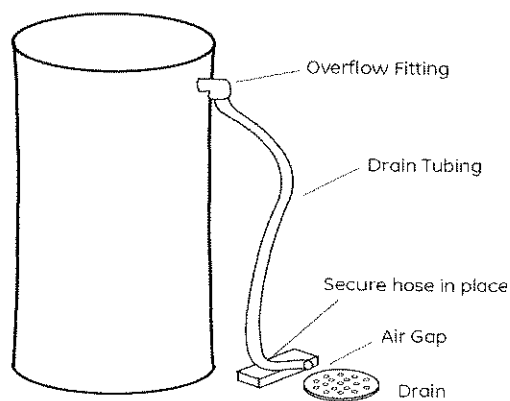
Electrical Requirements:

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:

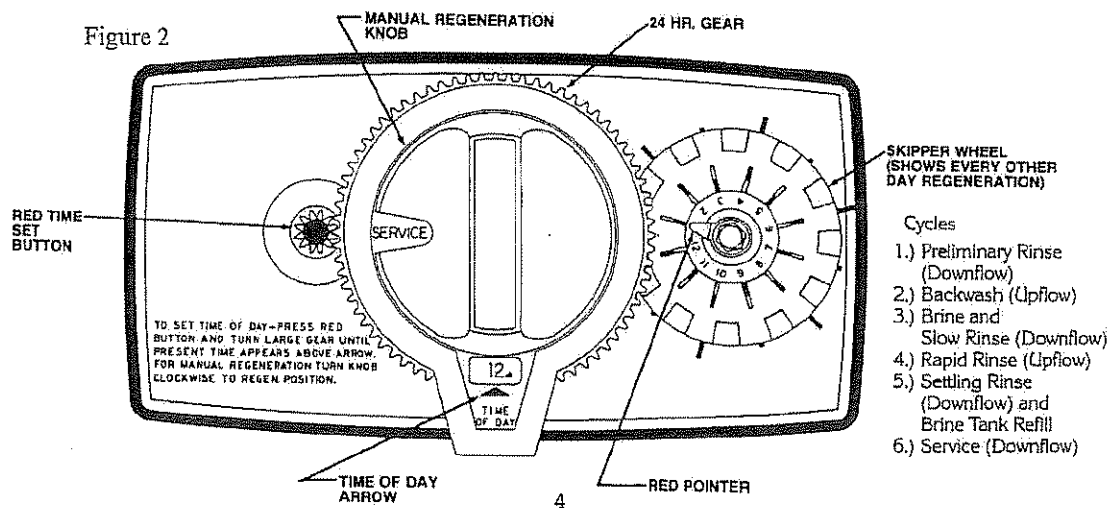
1. The brine tank should be located directly beside the water softener mineral tank.
2. Connect one end of the 3/8" poly tubing to the compression fitting on the top of the brine shutoff valve located in the brine tank and the other end to the compression fitting located on the right side of the WTF 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. Close inlet and outlet ball valves.
2. Turn Manual Regeneration Knob in a clockwise direction until you reach the Backwash position.
3. Open inlet ball valve 1/4 turn and allow water to fill tank slowly for approximately 10 minutes. After all air has been purged from tank, fully open inlet ball valve and allow water to run in this position for 15 minutes.
4. Turn the Manual Regeneration Knob in a clockwise direction until you reach the Rapid Rinse position. Allow the unit to stay in this position for approximately 10 minutes to purge the media fines to drain.
5. Plug the timer into the electrical outlet. The timer will automatically advance to the service position after completing the Rapid Rinse cycle. If water runs dirty to service, place unit in backwash position and allow the timer to go through a complete regeneration. The total regeneration will take approximately 2 hours. The unit will be in the service position after regeneration is complete.

WTF Control Valve Timer Settings:



Time of Day Setting

- 1) To set the proper time of day, depress the Red Time Set Button and turn the 24 Hour Gear until the correct time of day is aligned with the Time of Day Arrow. **Note whether the time is A.M. or P.M.**
- 2) The timer is preset to regenerate at 12:00 AM.

Time of Regeneration Setting (1-99 Days Between Regeneration Option) (the factory default is 2 AM)

- 1) Locate the Skipper Wheel on the timer. (See Figure 2).
- 2) The Skipper Wheel has a total of 12 pins which means you have a variety of choices for regeneration frequency. To set a regeneration simply slide a pin to the outside of the Skipper Wheel. This exposes the pin beyond the outer edge of the Skipper Wheel and will engage a regeneration cycle on that day.
le: Sliding the # 1 pin to the outside sets the timer to regenerate once every 12 days.
- 3) The recommended regeneration frequency will change according to your water quality problems. You can use the formulas below to calculate regeneration frequency.

Calculate Total Compensated Hardness:

$$\text{Compensated Hardness (gpg)} = \text{Total Hardness (gpg)} + [3 \times \text{Iron (ppm)}]$$

Calculate Daily Water Usage:

$$\text{Gallons per day} = (\# \text{ of people}) \times 60$$

Calculate Total Capacity (gallons):

$$\text{Total Capacity (gallons)} = \text{Softener Capacity (grains)} \div \text{Total Compensated Hardness (gpg)}$$

Calculate Setting for Time Clock Units:

$$\text{Setting (Days)} = \text{Total Capacity (gallons)} \div \text{Daily Water Usage (gallons/day)}$$

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.

Troubleshooting

Symptom: Unit Fails to Regenerate

Cause	Solution
Faulty electrical supply	Verify that electrical power is getting to the outlet
Low inlet water pressure	Verify a minimum 20 psi inlet water pressure
Drain line is restricted	Insure that the drain line is free of blockage
Defective timer motor	Replace the timer motor
Plugged backwash flow control	Clean or replace the backwash flow control
All skipper pins are slid inward	Slide the desired number of pins outward
The injector is plugged	Clean the injector

Symptom: Hard Water When Unit is in Service Position

Cause	Solution
The bypass valve is open or defective	Insure that the bypass valve is in the service position
No salt in the brine tank	Add solar salt to the brine tank
Not enough water in the brine tank	Verify that the 5600 timer is set for the proper amount of salt usage
Unit fails to draw brine (salt water)	See symptom: Unit fails to draw brine
Excessive water usage	Set the timer to regenerate more often
Loss of cation resin	See symptom: Loss of cation resin
Change in raw water hardness level	Test the raw water hardness level and adjust regeneration frequency
Leak at the distributor tube	Verify that the distributor is flush with the top of the tank

Symptom: Unit uses too Much Salt

Cause	Solution
Improper salt usage timer setting	Verify that salt usage setting on the back of the timer is set according to the Specification Reference Table
Excessive water in the brine tank	See symptom: Excessive water in Brine Tank

Symptom: Loss of Cation Resin

Cause	Solution
Backwash flow control is missing or is the incorrect size	Verify that the proper backwash flow control is installed
Air in the system	Verify that the well system is operating properly

Symptom: Excessive Water in the Brine Tank

Cause	Solution
Injector is plugged	Clean or replace the injector
Defective or damaged piston/spacers assembly	Replace the piston/spacers assembly
The brine float assembly seals on the 464 brine tank shutoff are dirty or worn	Replace the 464 brine float assembly
Salt setting at the back of the timer assembly is set incorrectly	Verify that the salt setting on the timer assembly corresponds with the reference table
Drain line is restricted	Insure that there are no restrictions in the drain line piping
Plugged backwash control	Clean the backwash flow control (BWFC)

Symptom: Unit Fails to Draw Brine

Cause	Solution
Injector is plugged	Clean or replace the injector
Loose suction line connection	Verify that all suction line connections are tight
Drain line is restricted	Insure that there are no restrictions in the drain line piping
Low inlet water pressure	Verify a minimum 20 psi inlet water pressure
Improper installation of distributor pipe	Verify that the distributor is flush with the top of the tank

Symptom: Continuous Flow to Drain

Cause	Solution
Defective or damaged piston/spacers assembly	Replace the piston/spacers assembly
Piston rod assembly is damaged	Replace piston rod assembly
Drive motor failure	Replace the drive motor

Symptom: Loss of Water Pressure

Cause	Solution
Dirt build-up in softener tank	Clean or replace the Cation Resin
Dirt build-up in the inlet piping to the Water Softener Unit	Clean or replace the inlet piping
Distributor pipe is plugged	Clean or replace the distributor pipe

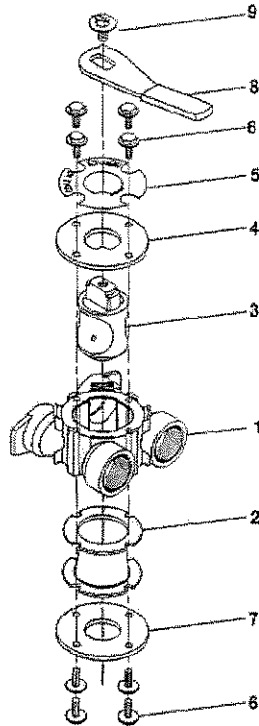
Symptom: Control Valve Cycles Continuously

Cause	Solution
Defective timer assembly	Replace the timer assembly

WTF SOFTENER CONTROL VALVE & PARTS

MODEL 5600

by-pass valve assembly



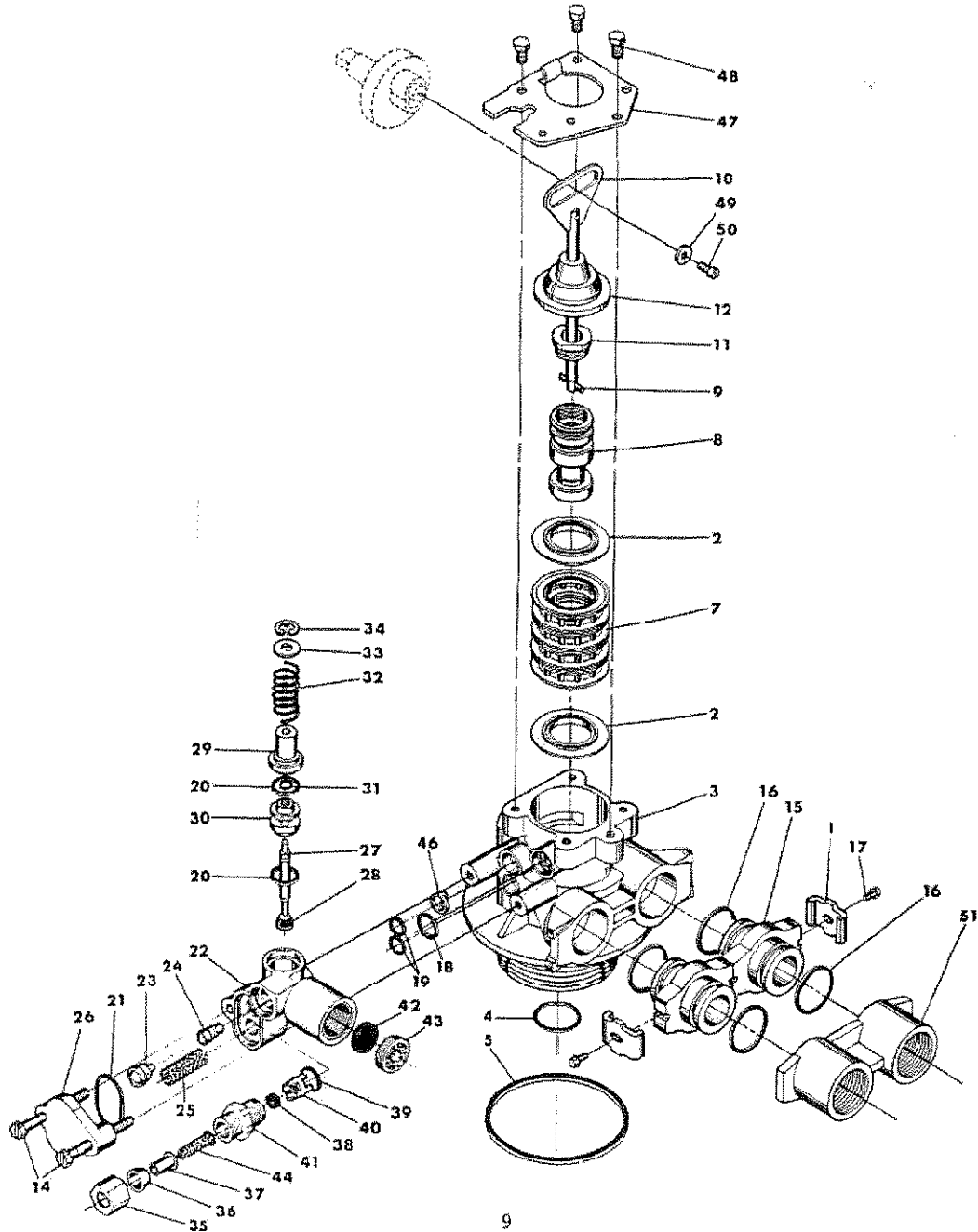
PARTS LIST

Item No.	Quantity	Part No.	Description
1	1	17290	By-Pass Valve Body, 3/4"
	1	17290NP	By-Pass Valve Body, 3/4" Nickel Plate
	1	13399	By-Pass Valve Body, 1"
	1	13399NP	By-Pass Valve Body, 1", Nickel Plate
2	1	11726	Seal, By-Pass
3	1	11972	Plug, By-Pass
4	1	11978	Side Cover
5	1	13604-01	Label
6	8	15727	Screw
7	1	11986	Side Cover
8	1	11979	Lever, By-Pass
9	1	11989	Screw, Hex Head, 1/4-14

MODEL 5600

control valve assembly

(see opposite page for parts list)



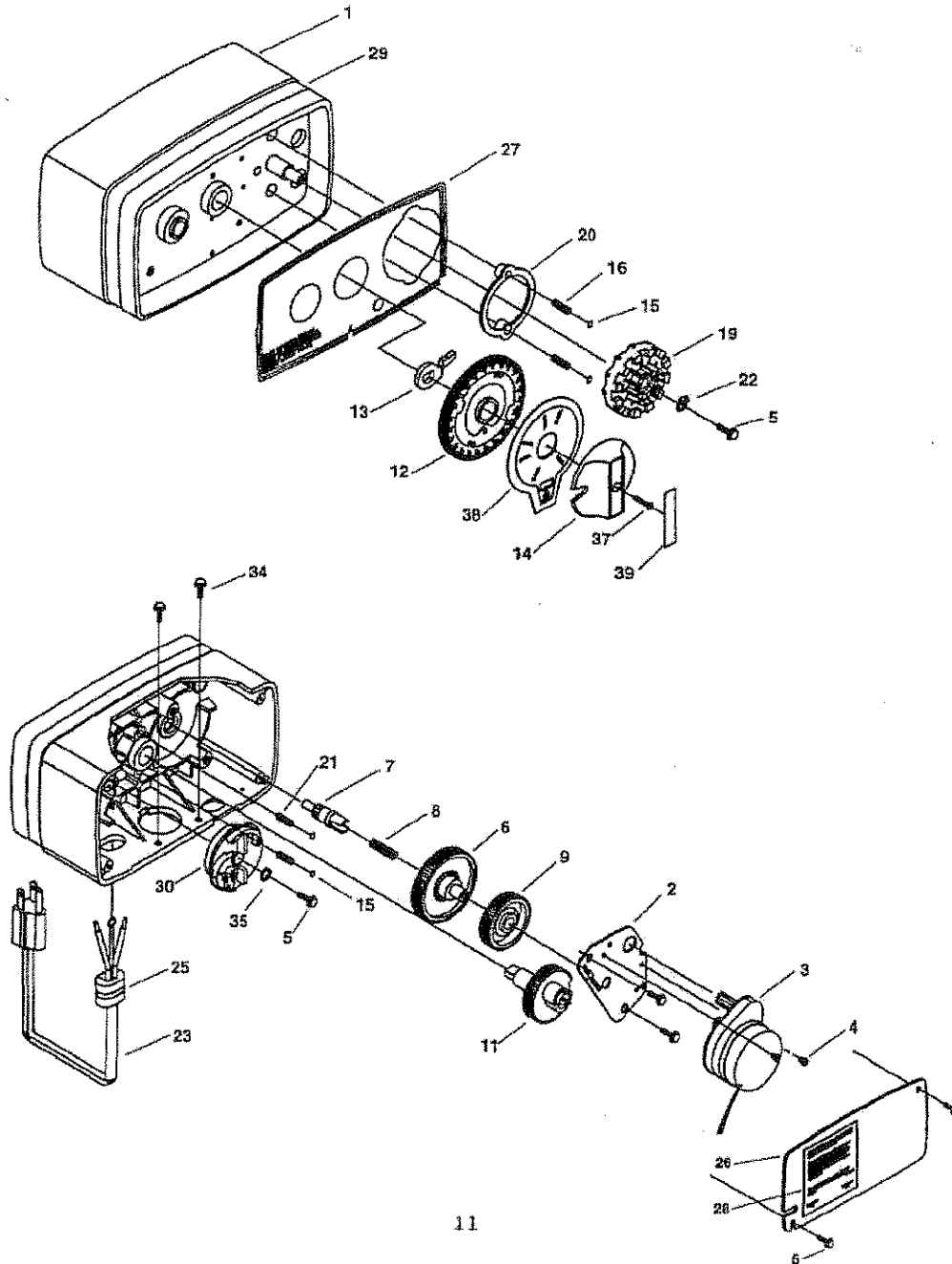
**MODEL 5600
CONTROL VALVE ASSEMBLY
PARTS LIST**

ITEM NO.	NO. REQ'D.	PART NO.	DESCRIPTION
1	2	13255	Adapter Clip
2	5	13242	Seal
3	1	14449	Valve Body Assembly - 1" Dist.
	1	14450	Valve Body Assembly - 1/2" Dist.
4	1	13304	"O" Ring - Distributor Tube - 1"
	1	10244	"O" Ring - Distributor Tube - 1/2"
5	1	12281	"O" Ring - Top of Tank
6			Not Assigned
7	4	14241	Spacer
8	1	13247	Piston - Standard
	1	13781	Piston - Low Water
	1	13852	Piston - Filter
9	1	10696	Piston Pin
10	1	13001	Piston Rod Assembly
11	1	12953	Piston Retainer
12	1	13446	End Plug Assembly Std. - White
	1	13446-10	End Plug Assembly Filter - Black
	1	13446-20	End Plug Assembly Low Water - Gray
13			Not Assigned
14	2	13315	Screw - Injector Mounting
15	2	13709	Adapter Coupling
16	4	13305	"O" Ring - Adapter Coupling
17	2	13314	Screw - Adapter Coupling
18	1	12638	"O" Ring - Drain
19	2	13301	"O" Ring - Injector
20	2	13302	"O" Ring - Brine Spacer
21	1	13303	"O" Ring - Injector Cover
22	1	13163	Injector Body
23	1	10913	Injector Nozzle - Specify Size
24	1	10914	Injector Throat - Specify Size
25	1	10227	Injector Screen
26	1	13166	Injector Cover
27	1	13172	Brine Valve Stem
28	1	12626	Brine Valve Seat
29	1	13165	Brine Valve Cap
30	1	13167	Brine Valve Spacer
31	1	12550	Quad Ring
32	1	11973	Spring - Brine Valve
33	1	18098	Washer - Brine Valve
34	1	11981-01	Retaining Ring
35	1	10329	B.L.F.C. Fitting Nut
36	1	10330	B.L.F.C. Ferrule
37	1	10332	B.L.F.C. Tube Insert
38	1	12094	B.L.F.C. Button - .25 GPM
	1	12095	B.L.F.C. Button - .50 GPM
39	1	12977	"O" Ring - B.L.F.C.
40	1	13245	B.L.F.C. Button Retainer
41	1	13244	B.L.F.C. Fitting
42	1		D.L.F.C. Button - Specify Size
43	1	13173	D.L.F.C. Button Retainer
44	1	12767	Screen - Brine Line
45	1	15348	"O" Ring - D.L.F.C. (not shown)
46	1	13497	Air Dispenser
47	1	13546	End Plug Retainer
48	3	12112	Screw
49	1	13363	Washer
50	1	13296	Screw
51	1	13708	Adapter - 3/4" N.P.T.
	1	13398	Adapter - 1" N.P.T.

MODEL 5600

control valve drive assembly

(see opposite page for parts list)



**MODEL 5600
CONTROL VALVE DRIVE ASSEMBLY
PARTS LIST**

ITEM NO.	NO. REQ'D.	PART NO.	DESCRIPTION
1	1	13162-000	Drive Housing
2	1	13175	Motor Mounting Plate
3	1	13400	Motor - 110V, 60 Hz.
	1	13494	Motor - 24V, 60 Hz.
4	3	11384	Screw - Motor Mtg. & Ground Wire
5	6	13296	Screw - Component Mounting
6	1	13017	Idler Gear
7	1	13018	Idler Pinion
8	1	13312	Spring - Idler
9	1	13164	Drive Gear
11	1	13170	Main Gear & Shaft
12	1	19205	24 Hour Gear Assembly, Silver
	1	19205-01	24 Hour Gear Assy, Tan
13	1	13011	Cycle Actuator Gear
14	1	14177	Knob - Manual Regeneration
15	4	13300	Ball - 1/4" Dia.
16	2	13311	Spring - Detent - Skipper Wheel
19	1	14381	Skipper Wheel Assembly - 12 Day
	1	14860	Skipper Wheel Assembly - 7 Day
20	1	13864	Skipper Wheel Ring
21	2	14457	Spring - Detent - Main Gear
22	1	13014	Regeneration Pointer
23	1	11842	Electrical Cord - Standard
24	2	12681	Wire Connector (Not Shown)
25	1	13547	Strain Relief
26	1	13229	Back Cover
27	1	13309	Front Label - Brown on Beige
	1	13437	Front Label - Blue/Silver on Black
28	1	13310	Rear Label
29	1	13348	Tape Stripe - Brown on Beige
	1	13436	Tape Stripe - Blue on Silver
30	1	60514	Brine Cam Assembly, 3-18
	1	60514-01	Brine Cam Assy., 6-36
34	2	12473	Screw-Drive Mounting
35	1	12037	Washer
37	1	15151	Screw - Knob
38	1	14176	Valve Position Dial - Standard
	1	14278	Valve Position Dial - Low Water
	1	15478	Valve Position Dial - Chemical Filter
	1	16715	Valve Position Dial - Filter
39	1	14175	Knob Label - Beige
	1	14207	Knob Label - Silver



Quality Water Treatment Products

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.

PHYSICAL PROPERTIES		COMPONENT PART	WARRANTY PERIOD
Max. Pressure	75 PSI	Media Tank	10 yrs. From Date of Purchase
Max. Temperature	100 Degrees Fahrenheit	Salt Storage Tank	5 yrs From Date of Purchase
Min. Temperature	32 Degrees Fahrenheit	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.

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■ WARRANTY REGISTRATION CARD ■

■ Purchaser Name: ■

■ and Address ■

■ Model # _____ Date of Purchase: _____ ■

■ Dealer Name: ■

■ and Address ■

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MILBY COMPANY
6201 South Hanover Road
Elkridge, MD 21075-5651

Phone: 410- 796-7700
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