MARLO INCORPORATED®

OXIDIZER

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

COMPLETE FOR FUTURE REFERENCE:

MODEL NO:
SERIAL NO:
DATE INSTALLED:
DEALER:

Scan code to download

8-571 R4

Principle of Operation

The Oxidizer uses a three-step process called Oxidation/Filtration to reduce the levels of iron, manganese and hydrogen sulfide gas from potable water without the need for retention tanks, chemicals, air compressors and re-pressurizing pumps. The first being the Oxidizer Vessel and the second being filtration. The Oxidation/Filtration process modifies the characteristics of the water flowing through the vessel. The individual steps are described in their order of occurrence:

1. Oxygen Enrichment - Flowing water and air are combined under pressure. The flowing water takes on a higher concentration of air similar to carbonating a beverage. This step occurs in the top of the Oxidizer Vessel.

3. Precipitation - The oxygen component of the air reacts with dissolved compounds of iron, manganese and sulfide in the flowing water. The oxygen safely breaks the dissolved compounds down into a harmless particulate state that is readily removed by Filtration. This step occurs in the top of the Filter Vessel.

4. Filtration - Particles (oxides) of iron, manganese and sulfides are removed from flowing water. Multiple layers of granular media trap the oxides passing only clear, odorless, stain free water. This step occurs in the bottom of the Filter Vessel.

The **Oxidation/Filtration** process silently treats water on demand over a wide range of flows. During operation, the compressed air charge in the Oxidizer Vessel enriches the water with air containing Oxygen. The Oxygen provides the chemical energy needed to produce iron, manganese and sulfur oxides. The newly formed precipitated oxides are trapped in the Filter Vessel as water is treated. **The treated water exits the filter with an excess of dissolved air causing a cloudy (milky) appearance when first dispensed. Upon standing the water clears as the excess air escapes.**

Eventually the compressed air charge depletes and the Oxidizer Filter is filled to capacity with oxides. A charge sequence is required to both replenish the air and remove the filtered oxides. The system is fully automatic and self recharges on an adjustable, programmed time schedule. The amount of filtered water delivered is dependent on the amount of contaminants in the water and the frequency of recharges.

Installation Fitting Assemblies

Installation fittings connect to the control valve or the bypass valve **using nuts that only require hand tightening.** Hand tight nut connections between control valve and installation fittings, control valve and bypass valve, and bypass valve and installation fittings allow for ease serviceability. Do not use a pipe wrench to tighten nuts on installation fittings. **Hand tighten only.**

Split ring retainer design holds the nut on and allows load to be spread over the entire nut surface area reducing the chance for leakage. The split ring design, incorporated into the installation fittings allows approximately 2 degrees off axis alignment to the plumbing system. The installation fittings are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

When assembling the installation fitting package, connect the fitting to the plumbing system first and then attach the nut, split ring and o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting primer and solvent cements on any part of the o-rings or split rings, bypass valve or control valve. Solvent cements and primers should be used in accordance with the manufacturer's instructions.

Slip the nut onto the fitting first, then the split ring second and the o-ring last. hand tighten the nut. If the fitting is leaking, tightening the nut will not stop the leak. Remove the nut, remove the fitting, and check for damage or misalignment of the o-ring.

Do not use the pipe dope or other sealant on threads. Teflon tape must be used on the threads of the 1" NPT elbow and the 1/4" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection or caps because of o-ring seals.

Do not use Vaseline, oils or other unacceptable lubricants on o-rings. A silicon lubricant may be used on black o-rings.

Bypass Valve

The bypass valve easily connects to the control valve body using nuts that only require hand tightening. Hand tighten nut connections between control valve and fittings, control valve and bypass valve, and bypass valve and installation fittings allow for easy serviceability. The split ring retainer design holds the nut on and allows load to be spread over the entire nut surface area reducing the chance for leakage. The split ring design, incorporated into the bypass, allows approximately 2 degrees off axis alignment to the plumbing system. The bypass is designed to accommodate minor plumbing misalignments but is not designed to support the weight of a system or the plumbing.

Avoid getting primer and solvent cements on any part of the o-rings or split rings, bypass valve or control valve. Do not use pipe dope or other sealant on threads. Teflon tape is not necessary on the caps because of o-ring seals.

Do not use Vaseline, oil or other unacceptable lubricants on o-rings. A silicon lubricant may be used on black o-rings.

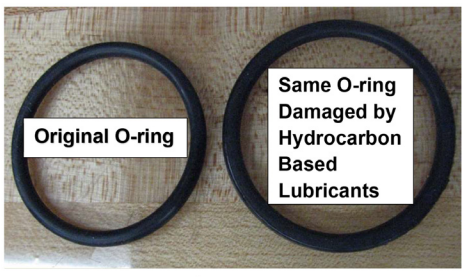
Lubrication

IMPORTANT: USE PURE SILICONE LUBRICANT ONLY.

The size increase shown in the picture to the right is due to the damaging effects of hydrocarbon-based lubricants such as Vaseline petroleum jelly. The O-ring has swollen and become soft, which caused a leak. This same swelling can cause O-rings to roll, stretch and get pinched. Hydrocarbon-based lubricants can also damage all plastic components they come into contact with.

Recommended Hydrocarbon free lubricants:

- DOW 7
- PolySi PST-599
- Chemplex 862
- Molykote 111
- Any other similar Hydrocarbon free lubricant



Specification Table

Model	10	12
Flow Rate, gpm	4	6
Backwash Flow, gpm	5.3	7.5
Inlet/Outlet, in	1	1
Tank Size, in	10x54	12x52

Cycle Times

Model	10	12
Rinse (minutes)	1	1
Backwash (minutes)	12	12
Fast Rinse (minutes)	6	6
Brine Draw (minutes)	15	15

NOTE: Regeneration occurs every 3 days at 12:00 AM.

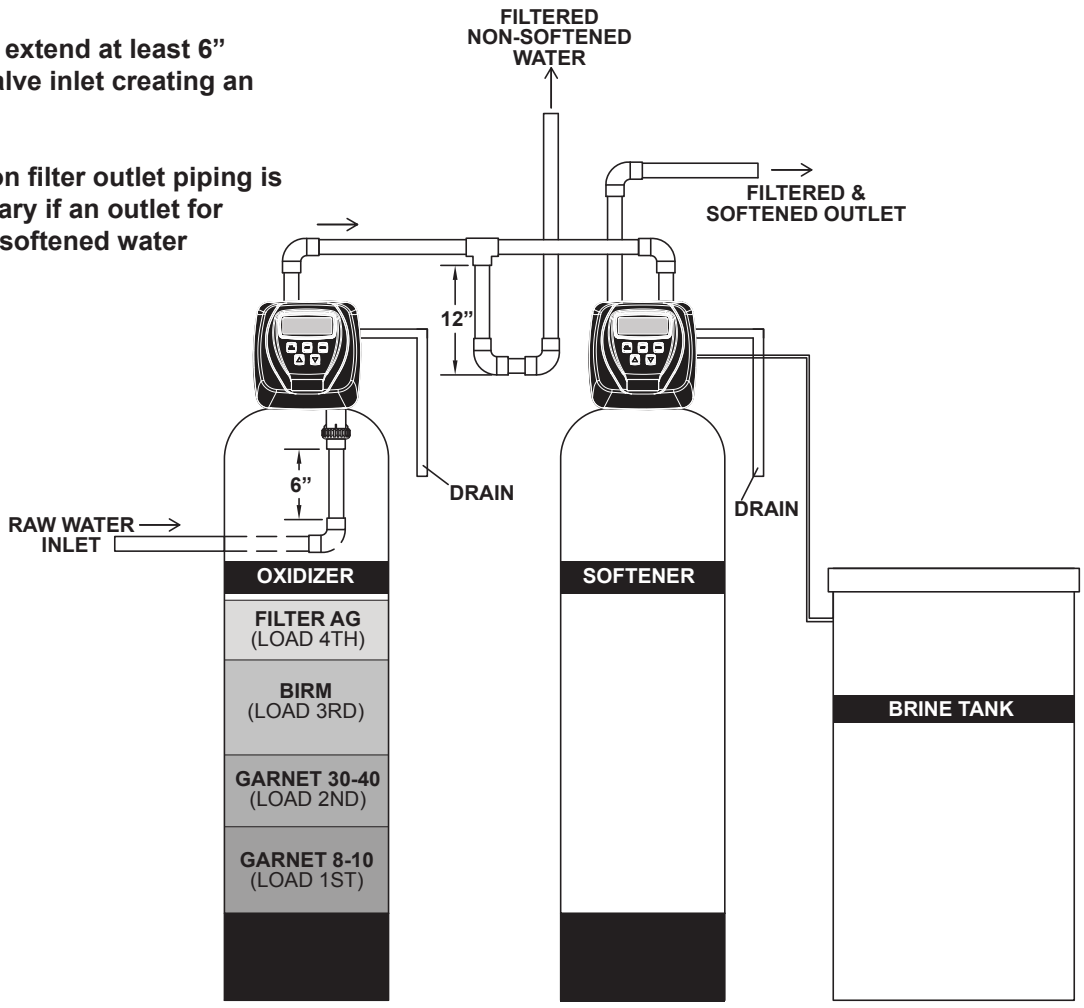
Media Loading Amounts (LBS)

Model	10	12
Garnet 8-12 (LOAD 1st)	25	38
Garnet 30-40 (LOAD 2nd)	18	24
Birm (LOAD 3rd)	29	38
Filter AG - Top Layer (LOAD 4th)	13	17

Oxidizer Installation Diagram

NOTES:
Piping must extend at least 6" below the valve inlet creating an air gap.

A 12" drop on filter outlet piping is only necessary if an outlet for filtered non-softened water is needed.



Oxidizer Checkvalve Installation

1. 

Find the vertical adapter and white check valve.

NOTE: The check valve installation should occur only on the INLET to the Oxidizer control valve.

2. 

Insert the check valve into the vertical adapter with the o-ring end of the check valve at the top as shown.

3. 

Use the small end of the second adapter as a tool to push the check valve into the vertical adapter.

4. 

Push the check valve into the vertical adapter until it is fully seated. A ridge in the molding of the adapter will stop the check valve from depressing too far.

Installation Instructions

Proper operation of this equipment is dependent on an installation that conforms to the manufacturers instructions and follows local plumbing and electrical codes. Meeting the following requirements will assure long, reliable product operation.

INSTALLATION REQUIREMENTS

- Select a heated installation location that has sufficient floor space and headroom to provide access for ease of installation and servicing. Refer to the Specification Table for dimensional data. Ambient temperature must never drop below 40°F to protect from freezing. Maximum water temperature + 110°F.
- Locate Filter System piping as close as possible to the source of the building water supply. The ideal location is after the pressure tank and all outside water taps and prior to an existing water softener. Never install between the water pump and pressure tank or on an intermittent water pressure source.
- A grounded uninterrupted electrical power source (115 volts, 60 Hertz, 1 Ampere) is required to operate the fully automatic controls.
- An adequately sized floor drain, dry well or sump pit is required collect wastewater during recharge of the Filter System. Refer to Specification Table for Backwash flow rate. The wastewater is harmless but can stain surfaces it comes in contact with.
- The Control Valve, Bypass and installation fittings are designed to accommodate minor plumbing misalignments. Components are not designed to support the weight of the Filter Vessel or the plumbing system.
- Soldering of plumbing fittings must be performed away from plastic valve components.

SYSTEM COMPONENTS

The Filter System is shipped in multiple cartons. Prior to starting installation, verify that all required components are available.

- One (1) Oxidizer Filter Vessel, with riser pipe, and control valve
- One (1) Bag Garnet 8-12 (provided with 13” or larger tanks, otherwise media will be preloaded.)
- One (1) Bag Garnet 30-40 (provided with 13” or larger tanks, otherwise media will be preloaded.)
- One (1) Bag Birm (provided with 13” or larger tanks, otherwise media will be preloaded.)
- One (1) Bag Filter AG Media (provided with 13” or larger tanks, otherwise media will be preloaded.)
- One (1) Funnel (provided with 13” or larger tanks.)
- One (1) Instruction Manual
- One (1) Red Cap Plug (provided with 13” or larger tanks.)

CAUTION: The inlet water temperature must not exceed 110º F.

OXIDIZER VESSEL PREPARATION

1. On sizes 10 and 12 the media has been pre-loaded at the factory. Skip this section.
2. Remove Oxidizer Filter Vessel from shipping carton. Carefully unscrew the Control Valve mounted on top of the Mineral Tank. Set the Valve aside. The Riser Pipe in the Oxidizer Vessel should be flush with the top of the Mineral Tank.
   Temporarily install plastic cap onto top opening of Riser Pipe.
3. Place Oxidizer Vessel at installation location.
4. Verify the distributor manifold is in the center of the tank with the distributor resting on the bottom of the tank. Verify the riser pipe is still plugged.
5. Refer to the specification table on page 5 for the correct amounts and the loading order of media. Load the bottom layer first and work your way up to the top layer. With the distributor riser pipe still plugged, add the proper amount of media supplied for each tank through the top opening in the tank and then level the media layer.
6. When loading is complete, remove plastic cap that was used to plug the distributor riser pipe. Be careful not to let any foreign debris fall into the pipe. The result could be damaging to the system.
7. Wipe dust from threads of Tank Adapter and Riser Pipe. Remove the plastic cap from Riser Pipe opening.
8. Lubricate both O-Rings on the base of the Oxidizer Control Valve with silicone (do not use petrolium based products). Install the Oxidizer Control Valve into the Fill Port Tank Adapter threads. Turn clockwise to tighten.
9. Repeat instruction steps 1-8 for each media tank.

Installation Instructions (continued)

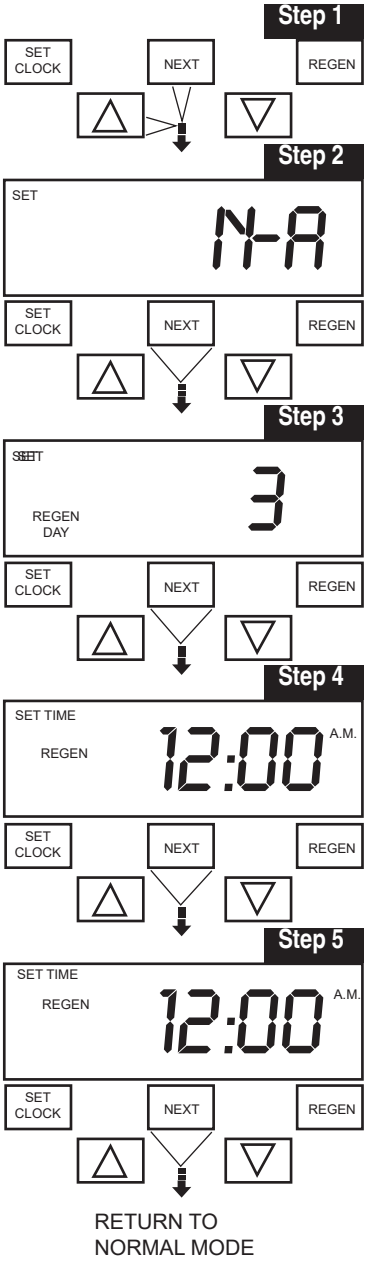
1. Follow all local and state plumbing and electrical codes.
2. Turn off the water supply
3. If you have a water softener installed place the water softener in bypass and close the shut off valve to the water heater.
4. Drain down the plumbing system
5. Connect the bypass to the control valve.
6. Once the bypass is installed, install the vertical adaptors. **Make sure that the vertical adaptor labeled "CHECK VALVE" is installed on the inlet side. Vertical adaptors should be oriented as shown on the installation diagram.**
7. Once vertical adaptors are installed, install the fitting kit, required for connecting to the plumbing lines.
8. Connect the inlet line to the pressurized water source.
9. Connect the outlet line to the treated water piping of the building.
10. Run the drain line in accordance with State and Local plumbing codes. The drain line will require 1 inch drain line. The drain line will have excess surges of air and must be secured.

*** Drain lines should not exceed 5' above the top of the valve or 25' in length.**

Start Up Procedures

NOTE: DO NOT PLUG THE CONTROL VALVE INTO AN ELECTRICAL OUTLET UNTIL INSTRUCTED TO DO SO.

1. Close all valves that were opened during Step 4 in the installation.
2. If you have water softener installed make sure it is bypassed.
3. Turn on the main water supply. Turn water on at the closest cold water tap. Allow water to run until all excess air has been relieved and water runs clear.
4. Close faucet.
5. Open the inlet valve a 1/4 turn to allow water to enter the filter. The control valve is shipped in the Fast Rinse cycle. This allows water to run to the drain.
6. Let water run to drain for 10 minutes or until water runs clear.
7. Close inlet allow water to stop running to the drain.
8. Remove cover and plug the four prong adaptor into the circuit board. Replace cover.
9. Plug the transformer into a 120V electrical outlet.
10. Open inlet and outlet valves.
11. Unit will cycle back to the home position.
12. **DO NOT INITIATE REGENERATION.**
13. The unit must sit for 24 to 48 hours before a complete regeneration should occur. This gives the media time to saturate. Insufficient saturation time will cause media to be lost to drain. **FAILURE TO FOLLOW PROPER START-UP INSTRUCTIONS WILL RESULT IN EQUIPMENT MALFUNCTION NOT COVERED UNDER OXIDIZER WARRANTY.**
14. Once the unit is in home position, set time of day by pressing SET CLOCK button and using UP and DOWN arrows to adjust values.
15. Open the nearest cold water faucet.
16. Allow water to run until clear and excess air has been purged from the line.
17. Close faucet.
18. If you have placed the water softener in bypass, return the softener to the Service position.
19. Open shut off valve to the water heater.



Installer Displays/Settings

STEP 1 - Press NEXT and △ simultaneously for 3 seconds.

STEP 2 - Hardness: This display will show "-nA-"

STEP 3 - Day Override: Value is set as a number (allowable range from 1 to 28) a regeneration initiation will be called for on that day. Set Day Override using ▽ or △ buttons:

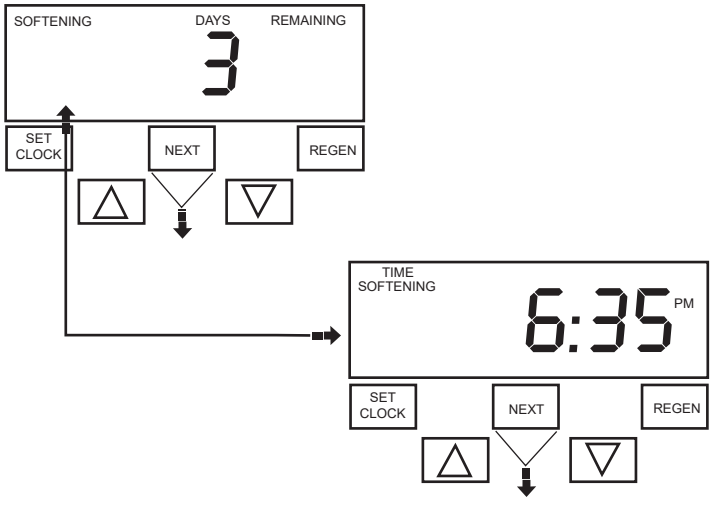
- number of days between regeneration (1 to 28)

Press NEXT to go to step 4. Press REGEN to return to previous step.

STEP 4 - Next Regeneration Time (hour): Set the hour of day for regeneration using ▽ or △ buttons. AM/PM toggles after 12. The default time is 2:00 a.m. This display will show "REGEN on 0 GAL" if "on 0" is selected in by the installer. Press NEXT to go to Step 5. Press REGEN to return to previous step.

STEP 5 - Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▽ or △ buttons. This display will not be shown if "on 0" is selected by the installer (2 a.m. is the factory setting). Press NEXT to exit Installer Displays/Settings. Press REGEN to return to previous step.
To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The control valve may be stepped through the various regeneration cycles by pressing the "REGEN" button.

User Displays/Settings



General Operation

When the system is operating one of two displays will be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day which has to be set. The other screen will be days left before regeneration will occur.

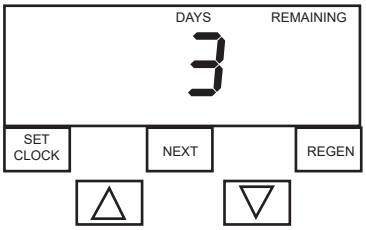
If the system has called for a regeneration that will occur at the preset time of regeneration, the words REGEN TODAY will appear on the display.

When water is being treated (i.e. water is flowing through the system) the word "Softening" or "Filtering" flashes on the display.

Regeneration Mode

Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.

When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

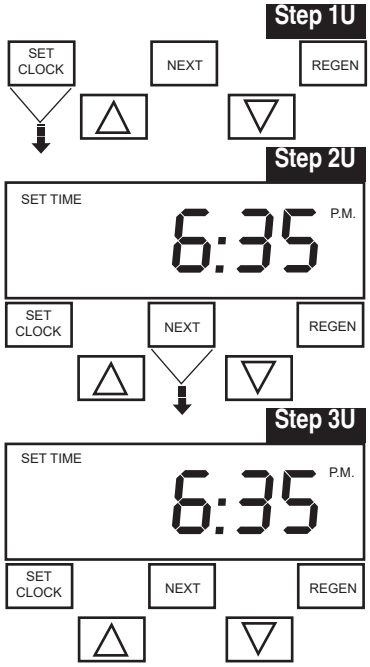


Manual Regeneration

Sometimes there is a need to regenerate the system, sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.

To initiate a manual regeneration at the preset delayed regeneration time, press and release “REGEN”. The words “REGEN TODAY” will flash on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the “REGEN” button in error, pressing the button again will cancel the request. Note: If the regeneration time option is set to “on 0” there is no set delayed regeneration time so “REGEN TODAY” will not activate if “REGEN” button is pressed.

To initiate a manual regeneration immediately, press and hold the “REGEN” button for three seconds. The system will begin to regenerate immediately. The request cannot be cancelled.



Set Time of Day

The user can also set the time of day. Time of day should only need to be set after extended power outages or when daylight saving time begins or ends and at the time of start-up. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset.

STEP 1U - press SET CLOCK.

STEP 2U - Current Time (hour): Set the hour of the day using ▽ or △ buttons. AM/PM toggles after 12. Press NEXT to go to step 3U.

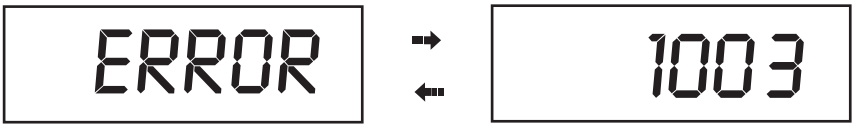
STEP 3U - Current Time (minutes): Set the minutes of the day using ▽ or △ buttons. Press NEXT to exit Set Clock. Press REGEN to return to previous step.

Power Loss

If the power goes out for **less than two hours**, the system will automatically reset itself. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset. The system will retain the other information entered by the installer.

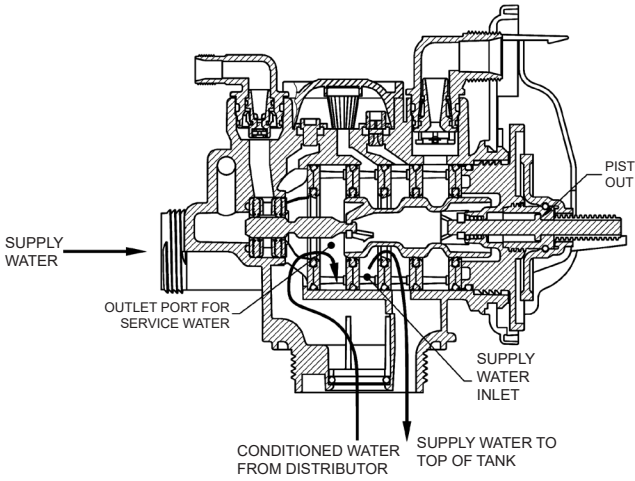
Error Message

If the word “ERROR” and a number are alternately flashing on the display contact the Installer for help. This indicates that the valve was not able to function properly. Refer to “Troubleshooting” for “ERROR RESET” procedure.

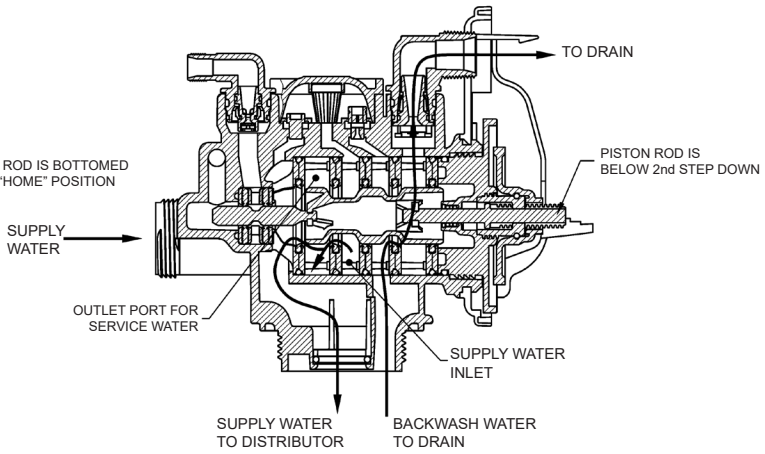


FLOW DIAGRAMS

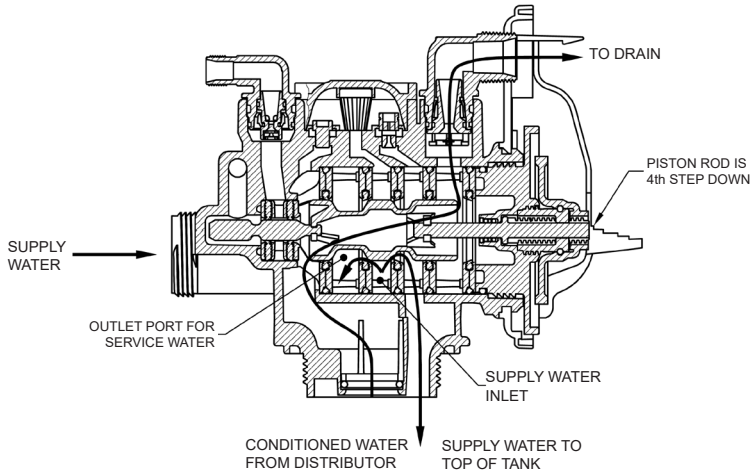
flow diagram...service



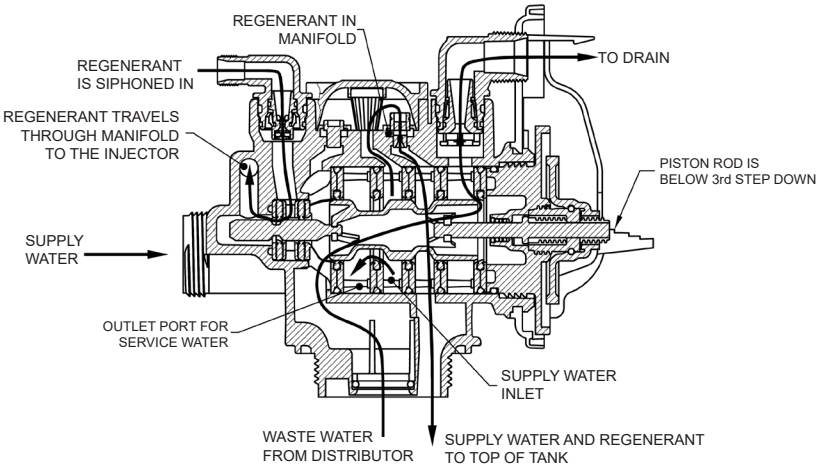
flow diagram...backwash



flow diagram...rinse



flow diagram...air injection



Recharge Sequence

The Oxidizer filter system is comprised of one individual pressure vessel having plumbing connections providing a means for installation into a continuously pressurized water system. A demand for treated water causes flow to occur through the vessel. Raw water entering the filter is first oxygenated then filtered. This cycle of operation is referred to as SERVICE. Eventually the filter system requires a recharge of oxygen and a thorough cleaning of the filtration media. This multi step process is referred to as the RECHARGE SEQUENCE.

The vessel is individually recharged during a time period when treated water demand is low. The recommended times for recharge are 12:00 AM for the Oxidizer Vessel. The time intervals must be staggered from other water treatment so that each vessel has access to an adequate water supply. The vessel is equipped with an adjustable calendar clock controller capable of initiating the recharge sequence at a user-deterrnined schedule. (Refer to Determining a Recharge Schedule) The following is a description of each step in the RECHARGE SEQUENCE.

The Oxidizer Vessel is sequenced first (Steps # 1 - 4) followed by the Filter Vessel (Steps # 5 - 8). Water pressure and flow is available during all steps of the RECHARGE SEQUENCE, however the water quality may be unsatisfactory during this time interval.

1. **BACKWASH #1** - Raw water directed into the bottom of the Oxidizer Vessel. The top of the Oxidizer Vessel is vented to atmosphere and routed to a drain. The remaining air charge is released. Simultaneously the trapped particles in the filter media are removed by a reverse flow of water and discharged to the drain.

2. **RINSE #1** - The Oxidizer Vessel is rinsed with water. The down flow of water is directed through the media up through the distributor tube.

3. **AIR INJECTION** - All water is removed from the Oxidizer Vessel and replaced with a fresh supply of air at atmospheric pressure. This process is accomplished with a venturi. There will be a low flow of water to the drain.

4. **OXIDIZER RETURN TO SERVICE** - Oxygenated, filtered water is available. There will not be a flow to the drain.

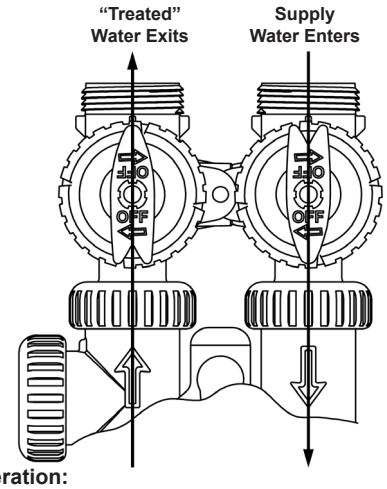
Bypass Valve

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance. The WS1 bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows service personal to work on a pressurized system while still providing untreated bypass water to the facility or residence. Its completely non-metallic, all plastic, design allows for easy access and serviceability without the need for tools.

The bypass body and rotors are glass filled Noryl and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal o-rings can easily be replaced if service is required.

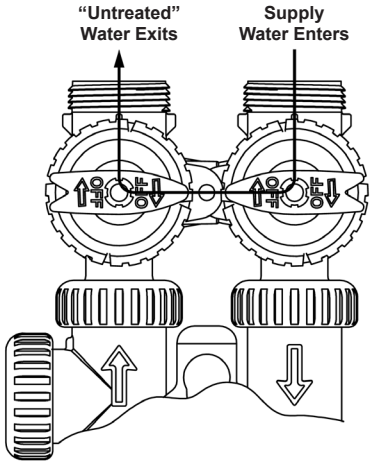
The bypass consists of two interchangeable plug valves that are operated independently by red arrow shaped handles. The handles identify the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

Figure 1
NORMAL OPERATION



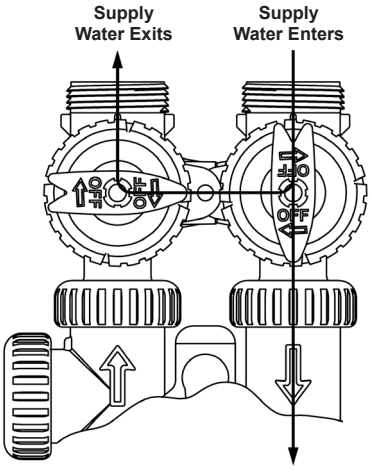
Normal Operation:
The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle.

Figure 2
BYPASS OPERATION



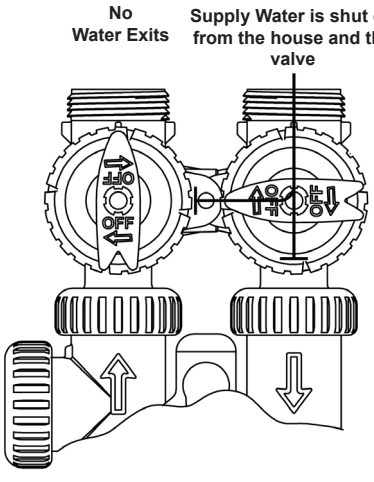
Bypass:
The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system.

Figure 3
DIAGNOSTIC MODE



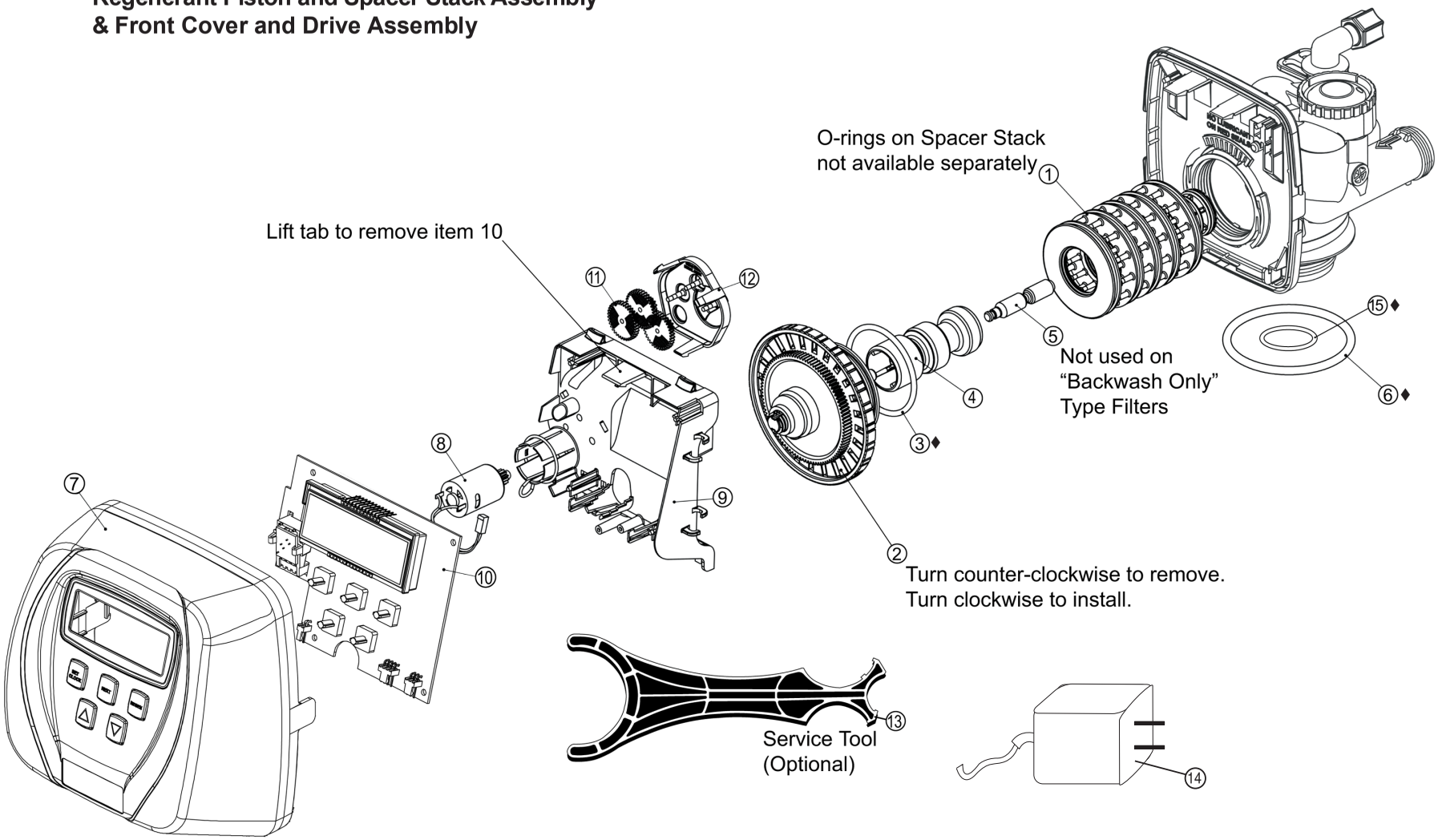
Diagnostic:
The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing.

Figure 4
SHUT OFF MODE



Shut Off:
The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system. If water is available on the outlet side of the softener it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system).

Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly & Front Cover and Drive Assembly



Drive Cap Assembly, Downflow Piston, Upflow Piston, Regenerant Piston and Spacer Stack Assembly

Item No.	Part No.	Description	Quantity
1	A2466034	*Spacer Stack Assembly w/o o-rings	1
2	A2080077	Drive Cap Assembly	1
♦3	use item 16	O-Ring 228 (use Valve O-ring Kit)	1
▲4	A2309040	Piston Downflow Assembly	1
⊗5	A2438033	Regenerant Piston	1
♦6	use item 51	O-Ring 337 (use Valve O-ring Kit)	1
♦15	use item 51	O-Ring 215 (use Valve O-ring Kit)	1

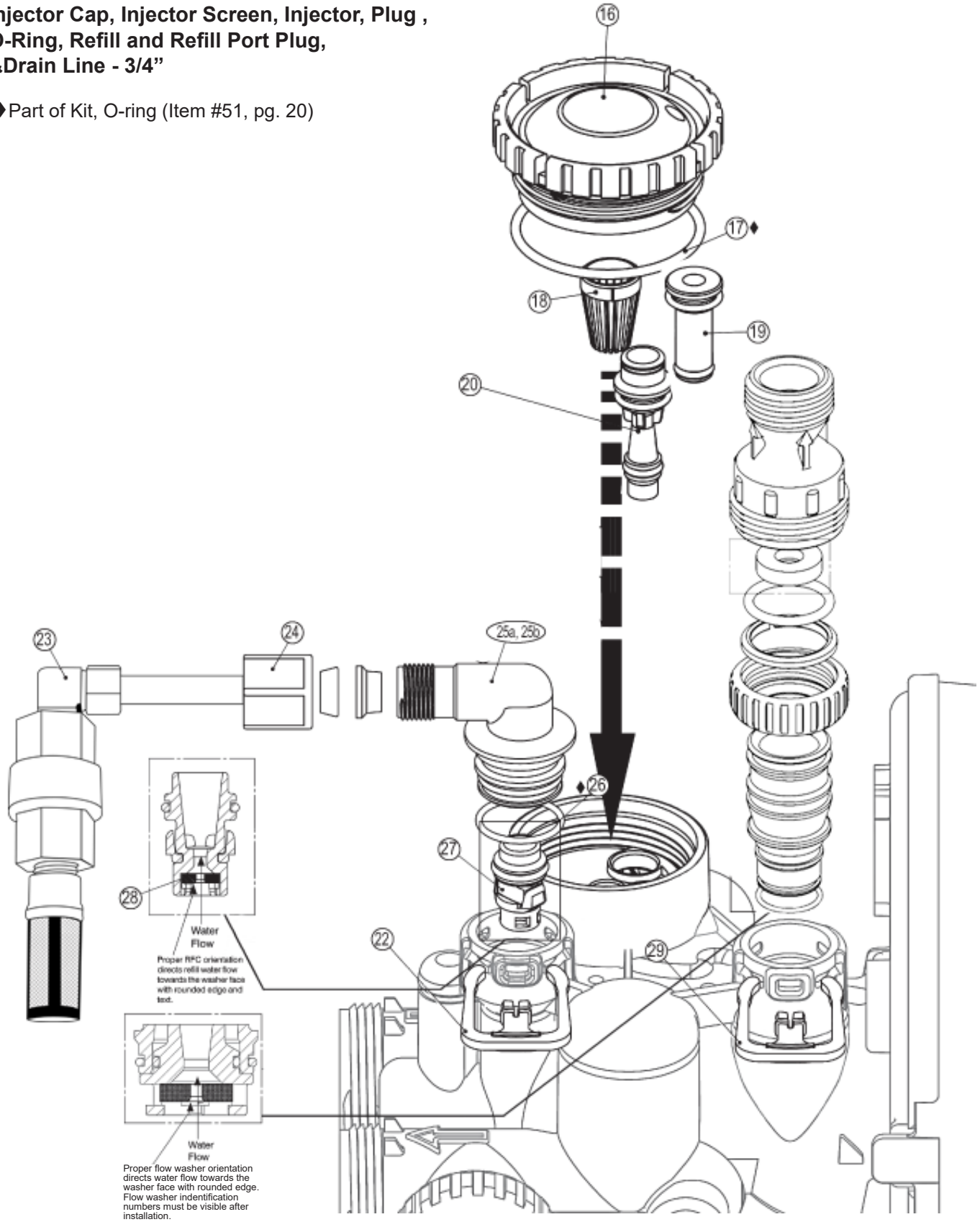
▲Item #4 identified with “DN” code.
⊗Item #5 not used with Backwash Only filter applications.
♦ See page 20 for Valve O-ring Kit.

Front Cover and Drive Assembly

Item No.	Part No.	Description	Quantity
7	A2103133	Front Cover ASSY	1
8	A2085050	Motor	1
9	A2328046	Drive Bracket & Spring Clip	1
10	A2341012	PC Board	1
11	A2393046	Drive Gear 12 x 36	3
12	A2103132	Drive Gear Cover	1
13	A2491086	Service Tool	1
14	A2242054	Transformer 110V - 12V	1

Injector Cap, Injector Screen, Injector, Plug , O-Ring, Refill and Refill Port Plug, &Drain Line - 3/4”

♦Part of Kit, O-ring (Item #51, pg. 20)



Injector Cap, Injector Screen, Injector, Plug and O-Ring

Item No.	Part No.	Description		Quantity
16	A2080079	Injector Cap		1
♦17	Use Item 51	O-Ring 135 (Use Valve O-ring Kit)		1
18	A2142016	Injector Screen		1
19	A2079059	Injector Assembly Z Plug	See note	1
20	A2079060	Injector Assembly A Black		
	A2079048	Injector Assembly B Brown		
	A2079046	Injector Assembly C Violet		
	A2079045	Injector Assembly D Red		
	A2079049	Injector Assembly E White		1
	A2079047	Injector Assembly F Blue		
	A2079050	Injector Assembly G Yellow		
	A2079055	Injector Assembly H Green		
	A2079062	Injector Assembly I Orange		
	A2079063	Injector Assembly J Light Blue		
	A2079064	Injector Assembly K Light Green		

*The injector plug and the injector each contain one 011 (lower) and 013 (upper) o-ring.

Note: For downflow brine, injector is located in the down hole and injector plug in the up hole. For a filter that only backwashes injector plugs are located in both holes.

Refill and Refill Port Plug

Drawing No.	Order No.	Description	Quantity
22	A2411015	Elbow Locking Clip	1
23	A2409016	Polytube insert 3/8	1
24	A2095071	Nut 3/8	1
25a	A2080078	Elbow Cap 3/8 (use w/ 3/8" tubing)	1
25b	A2129100	Elbow 1/2" with nut and insert (use w/ 1/2" tubing)	Option
26	Use Item 51	O-Ring 019 (Use Valve O-ring Kit)	1
♦27	A2104033	RFC Retainer Assembly*	1
28	A2253108	RFC Brine Refill Flow Washer	

1

*Assembly includes RFC.

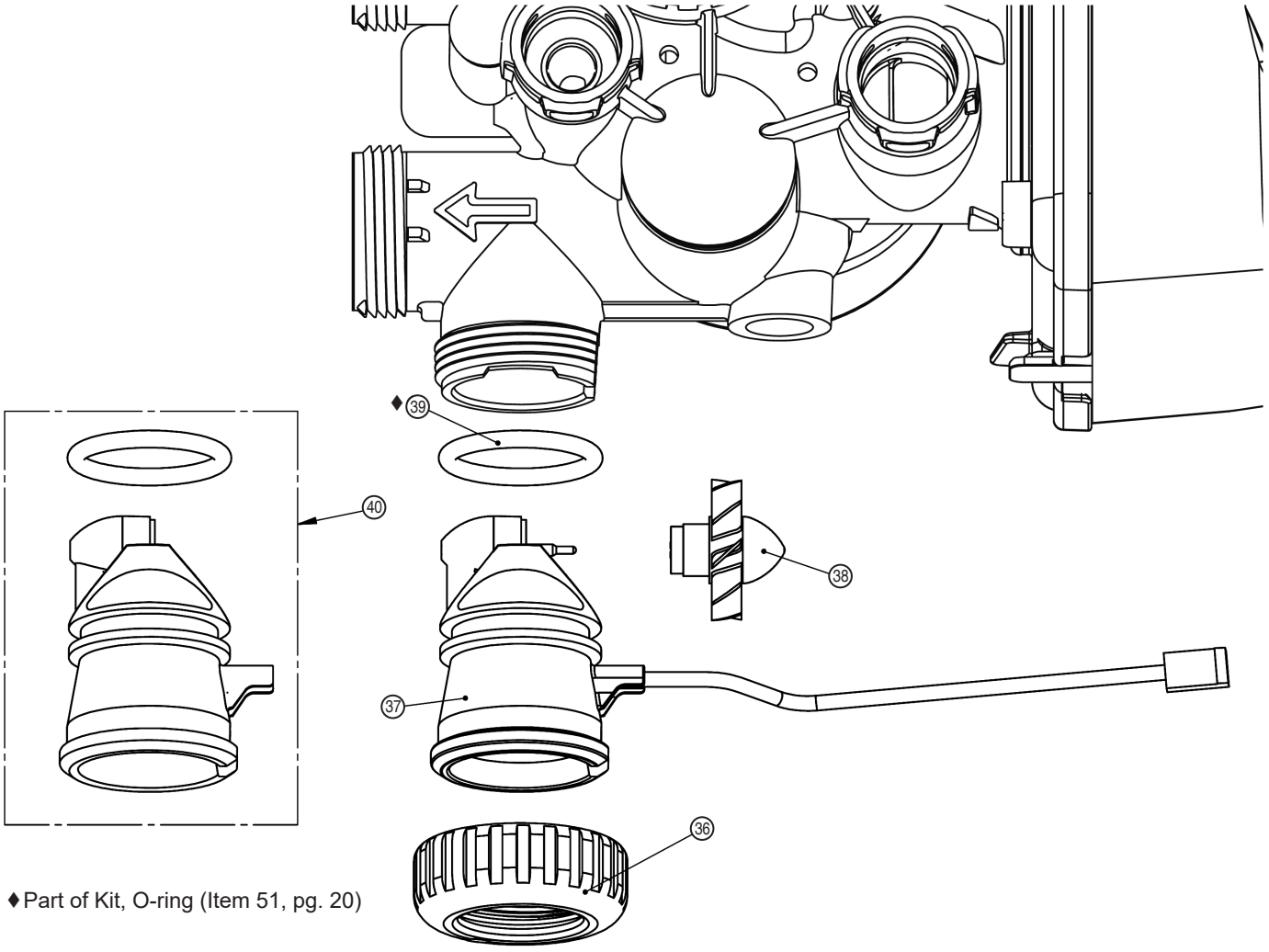
Drain Line - 3/4"

Drawing No.	Order No.	Description		Quantity
29	A2411015	Elbow Locking Clip		1
30	A2409013	Polytube insert 5/8		Option
31	A2095065	Nut 3/4 Drain Elbow		Option
32	A2099056	Drain Elbow 3/4 Male Assembly		1
♦33	Use Item 51	O-Ring 019 (Use Valve O-ring Kit)		1
34	A2104034	Drain Flow Washer Retainer Assembly		1
35	A2253114	Drain Flow Washer 0.7 gpm for 3/4		One DLFC must be used if 3/4 fitting is used
	A2253099	Drain Flow Washer 1.0 gpm for 3/4		
	A2253084	Drain Flow Washer 1.3 gpm for 3/4		
	A2253083	Drain Flow Washer 1.7 gpm for 3/4		
	A2253081	Drain Flow Washer 2.2 gpm for 3/4		
	A2253082	Drain Flow Washer 2.7 gpm for 3/4		
	A2253085	Drain Flow Washer 3.2 gpm for 3/4		
	A2253086	Drain Flow Washer 4.2 gpm for 3/4		
	A2253087	Drain Flow Washer 5.3 gpm for 3/4		

Water Meter and Meter Plug

Item No.	Part No.	Description	Quantity
36	A2095069	Nut 1" Quick Connect	1
*37	A2360039	Meter Assembly	1
38	A2100027	Turbine Assembly	1
39	use item 51	O-Ring 215 (Use Valve O-ring Kit)	1
40	A2287077	Meter Plug Assembly (Time clock option)	1

*Item #37 includes Items #38 & #39.



♦Part of Kit, O-ring (Item 51, pg. 20)

Item No.	Part No.	Description	Quantity
41	A2095069	Nut 1” Quick Connect	2
42	A2453012	Split Ring	2
●43	use item 52	O-Ring 215 (Kit available - see Item #10)	2
44	A2607004	Bypass 1” Rotor	2
45	A2080090	Bypass Cap	2
46	A2395009	Bypass Handle	2
47	A2104036	Bypass Rotor Seal Retainer	2
●48	use item 52	O-Ring 135 (use Bypass Valve Kit)	2
●49	use item 52	O-Ring 112 (use Bypass Valve Kit)	2
●50	use item 52	O-Ring 214 (use Bypass Valve Kit)	2

●Part of Kit, O-ring By-Pass(Item 52)

♦Valve O-ring Kit

51	B1213022	KIT O-ring (contains 1 each of 3, 6, 15, 17, 26, & 33)	1 per valve

●Bypass Valve O-ring Kit

52	B1213021	KIT O-ring Bypass (Incl. 2 ea. of items 43,48,49,& 50)	1 per valve

(Not Shown) Description Bypass Vertical Adapter Assembly

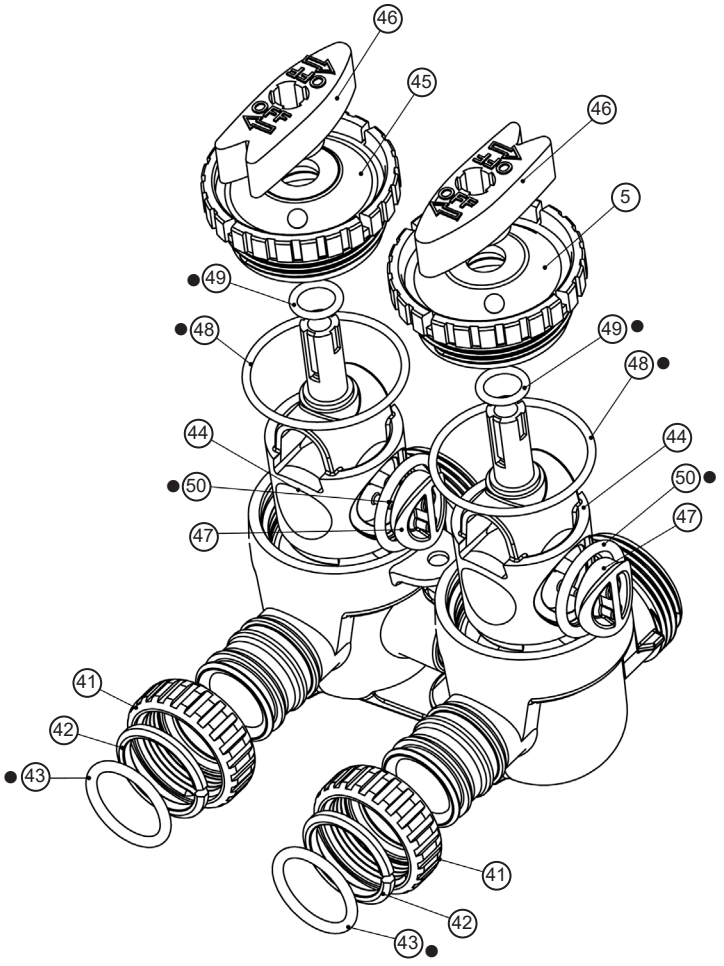


Table 15
Troubleshooting Procedures

Problem	Possible Cause	Solution
1. Timer does not display time of day	a. Transformer unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day
	c. Defective PC board	c. Replace PC board
3. No softening/filtering display when water is flowing	a. Bypass valve in bypass position	a. Put bypass valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
4. Control valve regenerates at wrong time of day	a. Power outages	a. Reset control valve to correct time of day
	b. Time of day not set correctly	b. Reset to correct time of day (a.m./p.m.)
	c. Time of regeneration incorrect	c. Reset regeneration time (a.m./p.m.)
	d. Control valve set at “on 0” (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL + on 0	e. Check control. valve set-up procedure regeneration time option
5.ERROR followed by code number 1001 Error Code - Unable to recognize start of regeneration 1002 Error Code - Unexpected stall 1003 Error Code - Motor ran to long, timed out trying to reach next cycle position 1004 Error Code - Motor ran to long, timed out trying to reach home position If other Error Codes display contact the factory ERROR Reset Procedure: 1. Correct error condition. 2. Press NEXT and REGEN simultaneously for three seconds.	a. Control valve has just been serviced	a. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter
	c. High drive forces on piston	c. Replace piston(s) and spacer stack assembly
	d. Control valve piston not in home position	d. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear(s)
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive bracket

Troubleshooting Procedures (continued)

Problem	Possible Cause	Solution
6. Control valve stalled in regeneration	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or drive cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
7. Control valve does not regenerate automatically when REGEN button is depressed and held	a. Transformer unplugged	a. Connect transformer
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
8. Control valve does not regenerate automatically but does when REGEN button is depressed	a. By-pass valve in bypass position	a. Put control valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
9 Time of day flashes on and off	a. Power has been out more than two hours, the transformer was unplugged and then plugged back into the wall outlet, the transformer plug was unplugged and then plugged back into the board or the NEXT and REGEN buttons were pressed to reset the valve.	a.. Reset the time of day

LIMITED WARRANTY
RESIDENTIAL WATER CONDITIONERS AND FILTERS

Marlo Incorporated, P.O. Box 044170, 2227 South Street, Racine, Wisconsin 53404, makes the following guarantees to the original consumer buyer of its water conditioners and filters:

Pressure Vessel - TEN YEARS
Marlo Incorporated guarantees to the original consumer buyer that the water conditioner or filter fiberglass pressure vessel will not rust, corrode, leak or burst during the first ten years of original installation, provided that the conditioner or filter is installed in accordance with manufacturers' printed instructions and is not subjected to water pressure exceeding 125 psi and/or water temperature exceeding 120°F, providing further that the vessel is not subjected to misuse, alteration, neglect, freezing, fire or accident, and further providing the vessel is not damaged by an act of nature such as, but not limited to, a flood, hurricane or tornado.

Brine Tank, Brine Cabinet, or Chemical Solution Container - FIVE YEARS
Marlo Incorporated guarantees to the original consumer buyer, that the brine tank or brine cabinet or chemical solution container, to be free from defects in material or workmanship for five years after original installation provided that the brine tank, cabinet, or solution container is not subjected to misuse, alteration, neglect, freezing, fire or accident, and further providing the same is not damaged by an act of nature such as, but not limited to, a flood, hurricane, or tornado.

Control Valve Module - FIVE YEARS
Marlo Incorporated guarantees to the original consumer buyer that the water conditioner or filter control valve to be free from defects in material and workmanship for five years after original installation provided that the control valve is not subjected to misuse, alteration, neglect, freezing, fire or accident, and further providing the same is not damaged by an act of nature such as, but not limited to, a flood, hurricane, or tornado.

General Provisions
If any of the product components stated above proves, within the respective warranty period, to be defective in material or workmanship, Marlo Incorporated will repair or furnish a new replacement component without charge. You pay freight one way and local labor charges. No allowance is made for consequential or incidental damages, labor, or expense incurred as a result of proven defect.

The warranties set forth herein are contingent upon receipt by Marlo Incorporated of written notice of any defect within thirty days after the same is discovered and upon the proper installation and operation of the water conditioner in accordance with factory specifications and applicable plumbing codes and ordinances. Marlo Incorporated's sole obligation under these warranties is to repair or replace the component or part in question which proves to be defective in material or workmanship within the time periods specified. No Marlo Incorporated dealer, agent, representative, or other person is authorized to alter, extend or to expand these warranties. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Registration Protection
To register your product warranty with the factory, please complete the online form on our web-site at https://www.marlo-inc.com/warranty.

NOTES

MARLO INCORPORATED®
2227 South Street • P.O. Box 044170 • Racine, WI 53404-7003
Ph. (262) 681-1300 • Fax (262) 681-1318 • Info@Marlo-Inc.com • www.Marlo-Inc.com