

Installation / Operation Manual

Optimizer™ System

Signature Series Control Valve

For Model Numbers :

- TSF32-10D
- TSF48-15D
- MSF32-10D
- MSF48-15D



Ashland, Ohio

General Specifications	Two Tanks in One			
	TSF32-10D	MSF32-10D	TSF48-10D	MSF48-15D
Regeneration Type	Timed	Metered	Timed	Metered
Filter Media Capacity	1 cu. ft.	1 cu. ft.	1.5 cu. ft.	1.5 cu. ft.
Softening Capacity	32,000	32,000	48,000	48,000
Service Flow Rate (gpm)*	5	5	8	8
Intermittent Flow Rate (gpm)	7	7	10	10
Backwash Flow Rate (gpm)	5	5	7	7
Mineral Tank Size (inches)	10 x 65	10 x 65	13 x 65	13 x 65
Gallons Used / Backwash	130	130	170	170
Space Required (D x W x H inches)	18 x 28 x 73	18 x 28 x 73	18 x 31 x 73	18 x 31 x 73
Approximate Shipping Weight (pounds)	126	126	182	182

* The pressure drop does not exceed 15.0 psi at the service flow rate.

Filter Media Selection

Media	Description	Handles
Neutralizer	Granular / White / Sacrificial to water with pH < 7.0 / Max pH correction to 7.2 / Lowest pH application 5.8 / Must be replenished about every 3 - 6 months	Sediment pH Correction
Corosex™	Semi-round / Off-White / Magnesium Oxide / Extremely reactive to pH dissolving rapidly adding alkalinity / 30% Corosex II - 70% Neutralizer is best blend for correcting low pH / Will raise pH from lows around 5.0 to as high as 9.0+ / Must be replenished frequently / Consult factory with specific application questions	Sediment pH Correction
Neu-Cor™	70% neutralizer / 30% Corosex™ mix / Sacrificial to water with any pH / Max pH correction determined by contact time used for correction of extremely low pH down to 5.0 / Must be replenished every 3-6 months	Sediment pH Correction
Granular Activated Carbon	Granular / Black / Wide application for removal of organic and some inorganic / Must be replenished on a regular basis / Life expectancy varies based on use	Sediment Taste/Odor/Color Chlorine/Iodine
Birm™	Granular / Gray / Must not be used on waters with a pH < 6.8 / Must have dissolved oxygen present at a level of at least 15% of Iron & Manganese ppm / Max Iron & Manganese level 10 ppm / Estimated life about 8 - 10 years	Sediment Iron (clear & red) Manganese (clear & red)
Filter Ag™	Granular / Off-White / Wide application for removal of sediment / Life expectancy is unlimited	Sediment
Filter Ag Plus™	Light tan to near white in color / Mesh size 14 x 40 / 55 lb/ft ³ / The Filter Ag Plus filter beds operate at less than half the hydraulic loading rate vs. 20 x 40 mesh sand and 50% of sand / anthracite or multi-media	Enhanced Particle Removal (down to 5 microns)

Installation Requirements

- A level floor position ahead of piping into water heater.
- Unit must be installed at least 10' ahead of the inlet to a water heater to prevent damage due to back-up of hot water.
- **DO NOT** install the unit in an area of direct sunlight or where freezing temperatures may occur!
- Locate the unit near an unswitched, 120 volt / 60 Hz grounded electrical outlet.
- Determine type and size of piping required for filter connection (e.g. copper, galvanized, PVC, plastic).

Note : If household plumbing is galvanized and you intend to make the installation with copper (or vice versa), obtain di-electric unions to prevent dissimilar metal corrosion.

Note : Where the drain line is elevated above the control valve or exceeds 20 feet in length to reach the drain, use 3/4" I.D. drain line tubing instead of 1/2" I.D. Drain line tubing is not included.

Caution : If sweat soldering copper pipe (remember to always use lead free solder and flux), cover yoke and bypass valve with wet rags to prevent heat damage to connections and control valve. If using PVC or plastic pipe, primers and solvent cements specifically recommended for use with potable water are required.

Note : All plumbing lines not requiring "soft" water should be connected "upstream" of the unit.

Installation Procedure

- Water Supply Connection and Bypass Valve -

To allow for filter servicing, swimming pool filling or lawn sprinkling, a manual Bypass Valve has been installed at the factory. The Bypass allows raw water to be manually routed around the filter.

1. Position filter between pressure tank and hot water tank (if well system) or between water meter and hot water tank (if municipal water).
2. The filter material is shipped separately from the mineral tank. The top tank must be loaded with material after unit has been placed at the desired location.
 - A. Remove the control valve by unscrewing from the tank. Do not fill through dome hole.
 - B. Use a cork or tape to place over top of distributor tube to prevent material from entering tube while filling.
 - C. Place media funnel (part # U-1006) in hole on top of tank.
 - D. Pour several gallons of water in the tank. (Fill until upper chamber is about 1/3 full.)
 - E. Pour in the required filter media. **No gravel is required.** The required quantity of media is listed in the Optimizer™ specifications.
 - F. After filling the tank with material, use a garden hose or several buckets to fill the tank with water.

Note : This will permit the filtering media to become soaked while preparing the installation and will prevent the control valve from being plugged with floating material on initial backwash.

- G. Remove funnel and clean filter media from tank threads.
- H. Remove cork or tape from distributor tube.
- I. Replace control valve on mineral tank. Do not use Teflon tape or paste on valve threads, as the valve to tank o-ring seals this joint.

Caution : *Be extremely careful to position distributor tube into control valve distributor tube pilot hole.*

3. Turn **OFF** main water supply and **OPEN** nearest faucet to relieve pressure.
4. Cut main line and install appropriate elbows and extensions. Inlet and outlet connections on the control valve are 3/4" FNPT.

Note : An optional 1" FNPT yoke is available.

Caution : *Raised arrows located on the sides of control valve body and bypass valve indicate proper direction of water flow. Install inlet and outlet piping in direction of arrows.*

- Drain Line Connection -

1. Pull out clip and remove drain line assembly located on the left side of control valve. Remove drain line hose barb and wrap threads with Teflon tape. Reinstall drain line hose barb. **Caution :Hand tighten only!** Replace drain line assembly and reinstall clip.
2. Install 1/2" I.D. drain line tubing (not included) from hose barb to an open drain. A 4" gap between end of the drain line and the open drain is required to prevent waste water backflow. Keep the drain line as short as possible. An overhead drain line can be used if necessary, but should discharge below the control valve. A syphon trap (taped loop) at the outlet of the drain line is advisable to keep the drain line full and assure correct flow during backwash. Elbows or other fittings must be kept at a bare minimum.

Note : Where the drain line is elevated above the control valve or exceeds 20 feet in length, 3/4" I.D. drain line tubing should be used.

- Brine Line and Overflow Connection -

1. Position brine tank on a smooth, level surface near the softener resin tank. If necessary, the brine tank can be placed at a higher level than the resin tank, but **never at a lower level.**
2. Install one end of 3/8" O.D. by 1/4" I.D. brine line tubing (included with unit) to compression fitting located on left side of control valve.
3. Remove brine tank cover.
4. Remove cap from brine well.
5. Insert opposite end of brine line through outer hole in brine tank.
6. Connect brine line to compression fitting on safety brine valve located inside brine well. Replace brine well cap.
7. Install 1/2" I.D. drain line tubing (not included) to the overflow fitting on brine tank located just below the brine line.
8. Run the opposite end of brine tank drain line to a suitable drain.

Note : The brine tank drain line is gravity flow and must discharge below the overflow fitting. **Caution : Do not "TEE" to the main drain line from control valve.**

Notice : The brine overflow is provided as a back-up in the event the safety float shut-off should fail, allowing the brine tank to overflow. This drain connection would then carry the excess water to the drain and prevent flooding of the floor. Therefore, no liability will or can be assumed by the manufacturer of the softener should this occur.

- Electrical Connection -

1. Connect the power supply to the control valve and plug into a 115 volt / 60 Hz receptacle.

Note : Do not plug into an outlet controlled by a wall switch or pull chain that could inadvertently be turned off.

- Installing Battery Back-Up -

1. Remove the rear cover.
2. Install a 9 volt battery. Refer to page 3, item 3 of the Signature Series Service Manual.
3. Reinstall rear cover.

- Pressurizing The System -

1. Make certain Signature Series Control Valve is in **SERVICE** position.
2. Slowly rotate inlet knob of the bypass valve to the **SERVICE** position. Slowly rotate outlet knob to the **SERVICE** position. (Position of bypass knobs are parallel to inlet / outlet piping.)
3. Open the nearest faucet to evacuate air from plumbing lines.
4. Check for leaks! If water is observed leaking from bottom of bypass knobs, close and open bypass knobs several times to seat o-rings.
5. After air is evacuated from plumbing lines, close inlet knob (position of bypass knob is perpendicular to the direction of inlet pipe) on bypass valve.

- Programming The Control Valve -

Refer to page 2 of the Signature Series Service Manual for main menu programming and instruction.

1. Set time of day.
2. Set a.m. or p.m.
3. Set number of days between regeneration for TSF units (refer to Regeneration Charts) (Figure 1) or water hardness in grains per gallon (gpg) for MSF units.

Note : If the water contains iron and / or manganese, multiply the total parts per million (ppm) by "four" (4) and then add to the grains per gallon (gpg) of hardness. Use this COMPENSATED HARDNESS level when programming the regeneration frequency.

Refer to page 7 of the Signature Series Service Manual for master programming and instruction.

1. Set regeneration time if other than 2:00 a.m. is desired.

Note : Salt settings are pre-set at the factory for the maximum shown on the capacity charts. If an economy salt setting is desired, refer to page 8, item 4 in the Signature Series Service Manual.

Warning : Do not reduce salt settings below 9 lbs. as the water level in the brine tank will not reach the grid plate.

How To Use The Capacity Charts -

EXAMPLE			
HARDNESS = 20 gpg	=	20 gpg	UNIT SELECTED = 32,000 grain
IRON = 3 ppm x "4"	=	12 gpg	SALT SETTING = 15 lbs.
MANGANESE = 1 ppm x "4"	=	4 gpg	NUMBER OF PERSONS = 4
TOTAL COMPENSATED HARDNESS	=	36 gpg	COMPENSATED HARDNESS = 36 gpg

Figure 1

Model	TSF32-10D System								
	# of People	1	2	3	4	5	6	7	8
Salt Setting	15 lbs. / Regeneration - 10 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	21	14	10	8	7	6	5	4
11 - 20	21	10	7	5	4	3	3	2	2
21 - 30	14	7	4	3	2	2	2	1	1
31 - 40	10	5	3	2	2	1	1	1	1
41 - 50	8	4	2	2	1	1	1	1	-
51 - 60	7	3	2	1	1	1	1	-	-
61 - 75	5	2	1	1	1	-	-	-	-

Example : The regeneration frequency should be programmed for every two (2) days.

Note : If the water contains iron and / or manganese, increase regeneration frequency to a minimum of every 12 days to assure adequate cleaning of the resin. Use of resin cleaners or iron inhibiting salt is encouraged.

Model	TSF32-10D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	9 lbs. / Regeneration - 6 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	16	10	8	6	5	4	4	3
11 - 20	16	8	5	4	3	2	2	2	1
21 - 30	10	5	3	2	2	1	1	1	1
31 - 40	8	4	2	2	1	1	1	1	-
41 - 50	6	3	2	1	1	1	-	-	-
51 - 60	5	2	1	1	-	-	-	-	-
61 - 75	4	2	1	1	-	-	-	-	-

Model	TSF32-10D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	12 lbs. / Regeneration - 8 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	18	12	9	7	6	5	4	4
11 - 20	18	9	6	4	3	3	2	2	2
21 - 30	12	6	4	3	2	2	1	1	1
31 - 40	9	4	3	2	1	1	1	1	1
41 - 50	7	3	2	1	1	1	1	-	-
51 - 60	6	3	2	1	1	1	-	-	-
61 - 75	4	2	1	1	-	-	-	-	-

Model	TSF32-10D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	15 lbs. / Regeneration - 10 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	21	14	10	8	7	6	5	4
11 - 20	21	10	7	5	4	3	3	2	2
21 - 30	14	7	4	3	2	2	2	1	1
31 - 40	10	5	3	2	2	1	1	1	1
41 - 50	8	4	2	2	1	1	1	1	-
51 - 60	7	3	2	1	1	1	1	-	-
61 - 75	5	2	1	1	1	-	-	-	-

Model	TSF48-15D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	12 lbs. / Regeneration - 8 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	22	11	7	5	4	3	3	2	2
21 - 30	15	7	5	3	3	2	2	1	1
31 - 40	11	5	5	2	2	2	1	1	1
41 - 50	9	4	3	2	1	1	1	1	1
51 - 60	7	3	2	1	1	1	1	-	-
61 - 70	6	3	2	1	1	1	-	-	-
71 - 80	5	2	1	1	1	-	-	-	-
81 - 90	5	2	1	1	1	-	-	-	-
91 - 100	4	2	1	1	-	-	-	-	-

Model	TSF48-15D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	15 lbs. / Regeneration - 10 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	25	12	8	6	5	4	3	3	2
21 - 30	16	8	5	4	3	2	2	2	1
31 - 40	12	6	4	3	2	2	1	1	1
41 - 50	10	5	3	2	2	1	1	1	1
51 - 60	8	4	2	2	1	1	1	1	-
61 - 70	7	3	2	1	1	1	1	-	-
71 - 80	6	3	2	1	1	1	-	-	-
81 - 90	5	2	1	1	1	-	-	-	-
91 - 100	5	2	1	1	1	-	-	-	-

Model	TSF48-15D System								
# of People	1	2	3	4	5	6	7	8	9
Salt Setting	24 lbs. / Regeneration - 16 minute Brine Tank Fill								
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	29	16	10	8	6	5	4	4	3
21 - 30	21	10	7	5	4	3	3	2	2
31 - 40	16	8	5	4	3	2	2	2	1
41 - 50	12	6	4	3	2	2	1	1	1
51 - 60	10	5	3	2	2	1	1	1	1
61 - 70	9	4	3	2	1	1	1	1	1
71 - 80	8	4	2	2	1	1	1	1	-
81 - 90	7	3	2	1	1	1	1	-	-
91 - 100	6	3	2	1	1	1	-	-	-

- Control Valve Operation -

Refer to page 4, item 2 of the Signature Series Service Manual Instructions.

1. Advance **control valve** to **BACKWASH** (cycle 1) position and allow water to run to drain for 3 to 4 minutes.

Warning : Close *inlet valve on bypass* prior to selecting the backwash position. After backwash position has been established, *slightly open inlet valve on bypass to evacuate air from the media tank. Fully open inlet valve when all air is depleted. This procedure will prevent media from being uplifted into control valve.*

2. Advance **control valve** to **BRINE REFILL** (cycle 4) position and allow the brine tank to fill just over the salt grid plate.
3. Advance **control valve** to **BRINE & RINSE** (cycle 2) and allow the control valve to draw water from the brine tank until it stops. If no draw is observed, check tightness of brine line compression fittings.
4. Advance **control valve** to **RAPID RINSE** (cycle 3) position and allow water to run to drain for 3 - 4 minutes.
5. Advance **control valve** to **BRINE TANK REFILL** (cycle 4) position and allow the control valve to automatically fill the brine tank.

Note : Control valve will advance to service position automatically.

Start Up Procedure

- Disinfection -

The material used in the construction of the modern water softener will not support the growth of bacteria. However, the conditions existing during shipment, storage and installation are unknown and thus dictates the disinfecting of a softener after installation, before it is used to treat potable water. With this in mind, your newly installed water softener should be disinfected using the recommended procedure described in this section. Ordinary laundry bleach is an excellent disinfecting agent for this purpose. The proper dosage for your particular softener model is listed below.

Figure 5

Unit Capacity	Cubic Feet of Resin	Chlorine Dosage
32,000	1.00	1.2 ounces
48,000	1.50	1.8 ounces

1. Measure the proper amount of chlorine bleach as shown above.
2. Pour the chlorine directly into brine well located inside brine tank.
3. Replace brine well cap.

- Filling The Brine Tank With Salt -

To expect a high level of performance and reliability, a salt manufactured specifically for water softeners must be used. Salt of this grade is virtually free from dirt and other particulates that would eventually cause the softener to malfunction. A pellet type salt is recommended, although any high quality water softener salt (such as solar salt) will suffice. If iron is present in raw water, use of iron inhibiting salt is recommended. The salt level will decrease after each regeneration cycle. Consequently, the brine tank will need to be checked and replenished periodically.

1. Fill the brine tank with water softener salt as described above. This will be approximately 250 pounds of salt.

Warning : Do not fill salt above level of the brine well.

2. Replace brine tank lid.

- Final Check -

1. Be certain the bypass valve is in the **SERVICE** position.
2. Make sure the power supply is connected to an uninterrupted 115 volt outlet.
3. Check that the time of day is set.
4. Double check regeneration schedule.
5. Make final check for leaks!
6. Fill out and mail warranty card.
7. Leave all manuals with unit.

Operation, Care and Cleaning

When the inlet / outlet knobs on the bypass valve are in the **SERVICE** position (position of bypass knobs are parallel to the inlet / outlet piping), water is directed through the water softener. Water may be bypassed by turning the inlet / outlet knobs to the bypass position (position of bypass knobs are at right angles to inlet / outlet piping). Water to the home will bypass the softener and be *untreated*.

You should manually bypass the unit if :

1. The outside lines do not bypass the system and water is to be used for lawn sprinkling or other similar uses.
2. Servicing the water softener.
3. A water leak from the water softener is evident.
4. *Shock treating* water well and piping with chlorine or other disinfectant.

- Extra Regeneration -

If soft water demands are unusually heavy, an extra regeneration can be initiated manually :

Refer to page 4, item 2 of the Signature Series Service Manual.

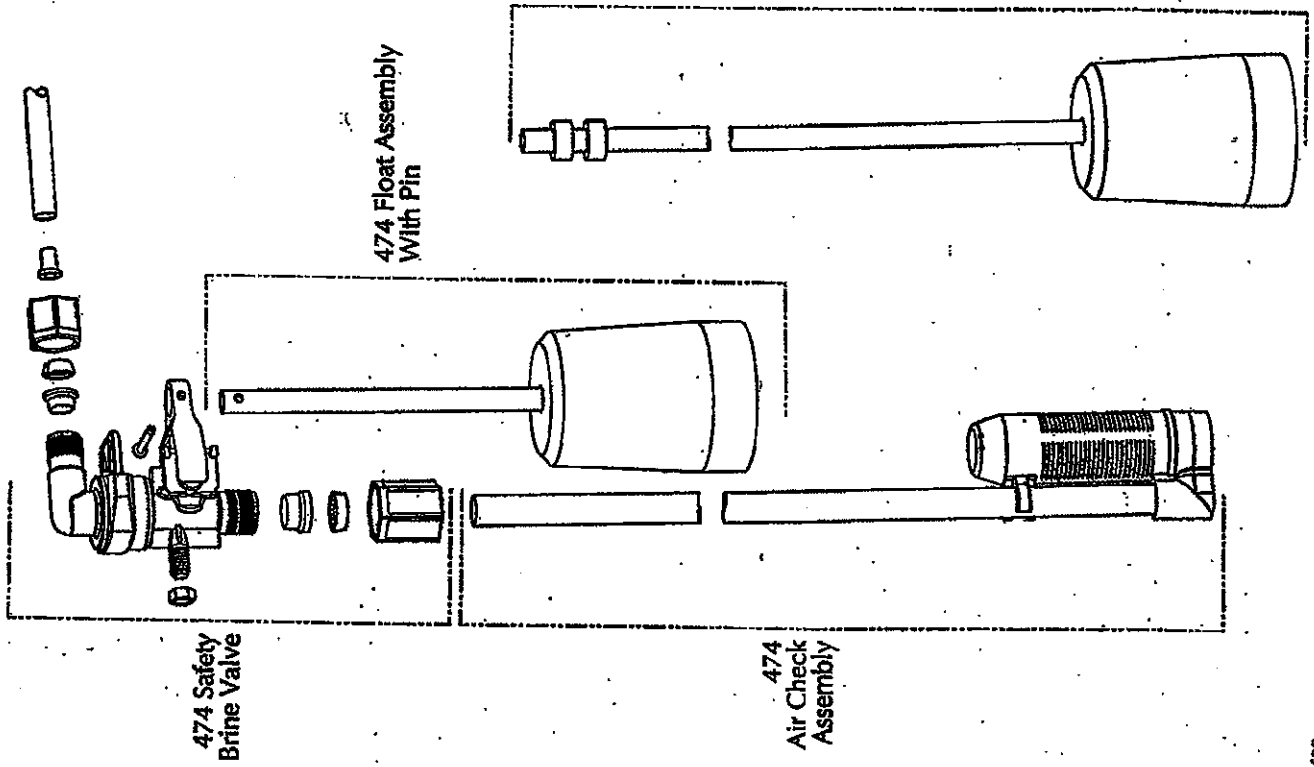
- To Skip A Regeneration -

1. For vacations or extended periods of absence, the power supply can be disconnected from the control valve. It is recommended that the 9 volt battery be removed.
2. Upon return, plug in cord and reset the time of day. Replace 9 volt battery.

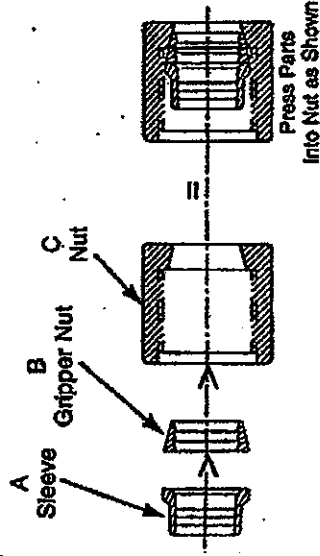
- General Care and Cleaning -

1. Do not place heavy or sharp objects on water softener or cabinet.
2. Use only mild soap and warm water to clean exterior of the unit. Never use harsh, abrasive cleaners.
3. Protect the system and drain line from freezing.
4. Reset time for daylight saving time periods.
5. Replace 9 volt battery once a year.
6. Inspect and clean the brine tank when sediment appears in the bottom of the salt compartment.
7. Always keep the brine tank supplied with good quality salt, a type designed for use in water softeners.

Assembly Guide For 474 Safety Brine Valve System



**If GFN Nut Assembly
is unassembled,
follow these steps**





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"LIMITED" WARRANTY

Water Treatment Equipment

During the time periods and subject to the conditions hereinafter set forth, CSI Water Treatment, will repair or replace to the original user or consumer, any portion of your new CSI Water Treatment product which proves defective due to defective materials or workmanship of CSI Water Treatment. Contact your nearest authorized CSI Water Treatment dealer for warranty service. At all times CSI Water Treatment shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to conditions beyond the control of CSI Water Treatment is **NOT COVERED BY THIS WARRANTY**. (Contact parcel or freight company for claims on freight damage in transit.)

WARRANTY PERIODS :

ITEM	*10 YRS	*5 YRS	*3 YRS	*1 YRS
Residential Mineral Tanks	●			
Commercial Mineral Tanks		●		
Softener/Filter Control		●		
Brine Tank Assemblies			●	

ITEM	*5 YRS	*3 YRS	*1 YRS
Reverse Osmosis System	●		
Other Accessories & Parts			●

* From Date of Installation

LABOR, ETC., COSTS : CSI Water Treatment shall **IN NO EVENT** be responsible or liable for the cost of field labor or other charges incurred by any customer removing and/or reaffixing any CSI Water Treatment product, part or component thereof.

THIS WARRANTY WILL NOT APPLY : (a) To defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) unit is used for purposes other than for what it was designed and manufactured, and (g) filter media and exchange resins.

RETURN OF REPLACED COMPONENTS : Any item to be replaced under this Warranty must be returned to CSI Water Treatment in Ashland, Ohio, or such other place as CSI Water Treatment may designate, freight prepaid.

PRODUCT IMPROVEMENTS : CSI Water Treatment reserves the right to change or improve its products or any portions thereof without being obliged to provide such change or improvement of units sold and/or shipped prior to such change or improvement.

WARRANTY EXCLUSIONS : As to any specific CSI Water Treatment product, after the expiration of the time period of the warranty applicable thereto as set forth under the heading "Warranty Periods" above, **THERE WILL BE NO WARRANTIES, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.**

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. No warranties or representations at any time made by any representative of CSI Water Treatment shall vary or expand the provisions hereof.

LIABILITY LIMITATION : **IN NO EVENT SHALL CSI WATER TREATMENT BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY CSI WATER TREATMENT PRODUCT OR PARTS THEREOF.**

Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

The Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

For your warranty protection (Magnason-Moss Warranty Act) the warranty card must be completed and returned to CSI Water Treatment within ten (10) days of installation. In the absence or other suitable proof of installation date, the effective date of this warranty will be based upon the date of manufacture plus thirty (30) days.

Direct all notices, etc. To : Service Department, CSI Water Treatment, 710 Orange Street, Ashland, Ohio 44805

Date : December, 2007