MICROLINE®

TRI-FILTER™
DRINKING WATER SYSTEM
MODEL NUMBER BRS–3NG

INSTALLATION, OPERATION & SERVICE MANUAL

TABLE OF CONTENTS

CAUTION:

The Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) have issued guidance to people with severely weakened immune systems who may want to take extra precautions to reduce the risk of infection with Cryptosporidium from drinking water. This guidance pertains to people with HIV/AIDS, patients receiving treatment for cancer, recipients of organ or bone marrow transplants, transplant patients taking immunosuppressive drugs, and persons who have congenital immunodeficiencies.

The EPA has stated that they do not know the importance of drinking water compared to other possible sources of Cryptosporidium to determine how most people become infected. The CDC-EPA guidance suggest that immunosuppressed individuals discuss their risks with their health care provider.

Immunosuppressed individuals should take the extra precaution of boiling their drinking water. According to the CDC-EPA, bringing water to a rolling boil for one minute is the most certain approach for killing Cryptosporidium.

All individuals should take adequate precaution when changing the filter cartridges, including wearing protective gloves, to avoid direct contact with the exhausted cartridges.

SECTION I. INTRODUCTION

Your new Tri–Filter™ Drinking Water System uses a combination of filtration technologies to reduce unwanted contaminants in a water supply. The following steps combine to give you the best in clear sparkling drinking water:

MECHANICAL FILTRATION–The sediment prefilter will remove the larger particles such as silt, rust and scale. Its 5 micron (equal to 0.0002 inch) nominal rating helps to give maximum life to the Activated Carbon Filter and Ceramic Element.

ACTIVATED CARBON–The Activated Carbon Filter contains carbon particles with a vast network of pores. The tremendous surface area of these pores (typically 800–1200 square meters per gram of carbon) gives the carbon very good adsorptive sites for substances that contribute to tastes and odors.

BACTERIA REDUCTION–The Ceramic Element removes 99.9% of suspended solids and waterborne bacteria down to 1 micron.* It incorporates a silver compound to make the element self sterilizing (bacteriostatic). Silver content is precisely controlled to keep well within World Health Organization (WHO) levels. This stage is also effective for the reduction of cysts such as Giardia Lamblia and the Cryptosporidium Oocyte. The Ceramic Element is cleanable and reusable.

*Per Fairey Industrial Ceramics Limited

TYPICAL BRS–3NG UNDER SINK INSTALLATION DIAGRAM

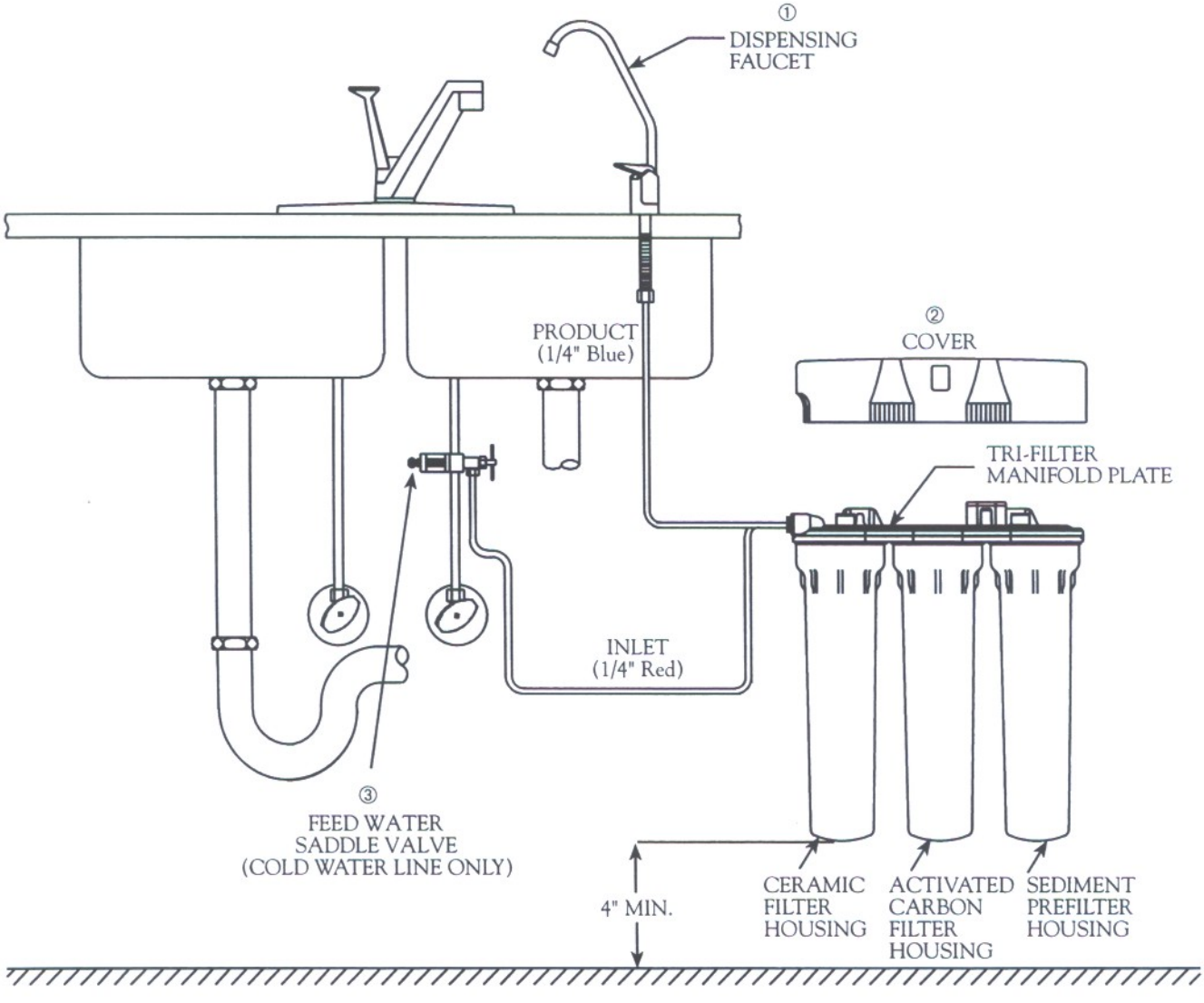


Figure 1

SECTION II. SPECIFICATIONS

TABLE A – SYSTEM RATING AND RECOMMENDED OPERATING LIMITS FOR FEED WATER

SYSTEM RATING	U.S.	Metric
Production[1]	0.5 gpm	2 liters per min.
Capacity[2]	1500 gallons	5700 liters
RECOMMENDED OPERATING LIMITS FOR FEED WATER		
Water Pressure	20–125 psi	140–860 kPa
TDS	Less than 500 ppm recommended	Less than 500 mg/l recommended
Temperature	35–110°F	2–43°C
pH	6.5–8.5 recommended	6.5–8.5 recommended
Iron	Less than 0.1 ppm	Less than 0.1 mg/l
Manganese	Less than 0.05 ppm	Less than 0.05 mg/l
Hydrogen Sulfide	None	None
Chlorine	0–2 ppm	0–2 ppm

[1] Measured at 50 psi (307 kPa).

[2] Claims of capacity or rated service cycle are not applicable for mechanical filtration units because of broad variations in the quality and quantity of particulate matter found in drinking water. Capacity is estimated at 1500 gallons.

SECTION III. PREPARATION

A. Major System Components

The following components comprise the R.O. Drinking Water System. (Refer to Fig. 1, page 1 for general system layout.)

1. A Tri–Filter™ Manifold assembly.
2. Housings and Housing O–rings.
3. A Dispensing Faucet.
4. A Feed Water Saddle Valve.
5. Plastic Tubing and tube connectors.
6. A 5–micron Sediment Prefilter, shrink wrapped.
7. An Activated Carbon Filter, shrink wrapped.
8. An recleanable Ceramic Element, bubble wrapped.
9. Other items necessary for installation may include wood screws or machine screws and nuts for mounting the manifold, or concrete anchors for hanging on basement wall. Additional tubing or tube connectors. Plastic wire ties for organizing tubing.

B. Tools Recommended for Installation

The following tools will cover most of the installation sites encountered:

1. 3/8" variable speed electric drill.
2. Extension work light with outlet.
3. Safety glasses.
4. 7/16" carbide drill.
5. 1/8" metal drill bit for pilot hole.
6. Center punch and hammer.
7. Concrete drill bits.
8. Phillips head and flat blade screwdrivers.
9. ½", 9/16" and 5/8" open end wrenches.
10. 10" Crescent wrench with jaws taped to hold faucet.
11. Basin wrench or 10" pipe wrench.
12. Teflon tape.
13. Wide masking tape or duct tape.
14. Plastic tubing cutter.
15. Extra plastic tubing.
16. Small bottle of liquid chlorine bleach.
17. Paper towels, wisk broom and assorted clean up materials.

C. Site Selection for Major System Components

The Tri–Filter™ System was designed to fit under a sink, however, because of space limitations or other reasons, the system's flexible design allows for other locations. When determining the location remember that access to a cold water tap line and ease of filter replacement are important considerations.

All components and tubing should be located in an area which is not exposed to freezing temperatures. If winter temperatures are severe, the area should be above the minimum

temperature listed in Table A, page 2 for proper performance. Do not expose unit or tubing to direct sunlight.

1. **Dispensing Faucet**–The faucet should be placed near the sink where drinking water is normally obtained. Convenience of use (filling of water pitchers and glasses), and an open area beneath the faucet under the sink for attaching product and drain tubing are considerations. A 2" diameter flat surface is required above and below the installation site. Watch for strengthening webbing on the underside of cast iron sinks.
2. **Tri–Filter™ Manifold Assembly**–The manifold can be installed on either the right or left side of the under–sink area or a cabinet. The right side is recommended because all the tubing will be to the back of the cabinet and out of the way. Installation in the basement is also an option, one location is near the laundry/utility sink where cold potable water is handy. The mounting location should allow adequate clearance and accessibility for filter changes.
3. **Feed Water Connection**–The Feed Water Saddle Valve should be located as close to the manifold assembly as possible. USE A POTABLE COLD WATER SUPPLY ONLY. Softened water is preferred as it will extend the life of the Activated Carbon Filter and Ceramic Element.

SECTION IV. INSTALLATION STEPS

All plumbing should be done in accordance with state and local plumbing codes.

NOTE: Some codes may require installation by a licensed plumber; check with the local plumbing authority prior to installation.

In restricted under–sink areas, it may be easier to install the faucet first. Allow adequate tubing lengths for any final component position.

A. Faucet Installation–The easiest installation is to use an existing spray attachment hole. If the spray faucet hole is not available, then the sink top must be drilled. Choose a convenient location as described in Sec. III, C.1, page 3.

1. Mark the location of the center of the faucet base.

2a. Drilling a stainless steel sink:

- Center punch the hole to provide a starting point for the drill.
- Drill a 7/16" hole
- Clean away any chips.
- Deburr any sharp edges.

2b. Drilling a porcelain sink:

It is best to use a special $^{7}/_{16}$" diameter cutter designed for porcelain. A carbide tipped masonry bit is a second choice.

- Place a piece of tape over the area to be drilled to help prevent chipping.
- Drill a pilot hole for the porcelain cutter. Use the pilot drill supplied with the kit or a carbide tipped drill.
- When drilling the $^{7}/_{16}$" hole, drill slowly and carefully; the porcelain chips easily.
- After drilling, clean the area well. Iron filings, if left in place, can cause rust stains.

2c. Drilling a counter top:

NOTE: Treat ceramic tile as porcelain until the tile is penetrated, then use the carbide tipped metal cutter.

Formica counter tops may be drilled with a good $^{7}/_{16}$" wood bit, drilling a $^{3}/_{32}$" pilot hole will help keep the bit going straight.

3. Assemble and attach the Faucet (refer to Fig. 2, page 4).

- Assemble the Body and Spout by removing the plastic shipping plug from the Body and then firmly pressing in the Spout.
- In the following order, place the Face Plate (Escutcheon) on the $^{7}/_{16}$" stud.
- From the top of the counter place the stud through the mounting hole.
- From the bottom of the counter top, in the following order, assemble the Steel Washer, the $^{7}/_{16}$" Washer and the $^{7}/_{16}$" Hex Nut.
- To the end of the $^{7}/_{16}$" stud screw on the ¼" Polytube Quick Connect Fitting. Once snug by hand take a pair of pliers and tighten the fitting an additional half turn. Don't over tighten.
- Rotate the Spout and Body into position. Tighten the Hex Nut while holding the faucet in alignment with a padded Crescent wrench. Do not over tighten.

1/4" LONG REACH DISPENSING FAUCET

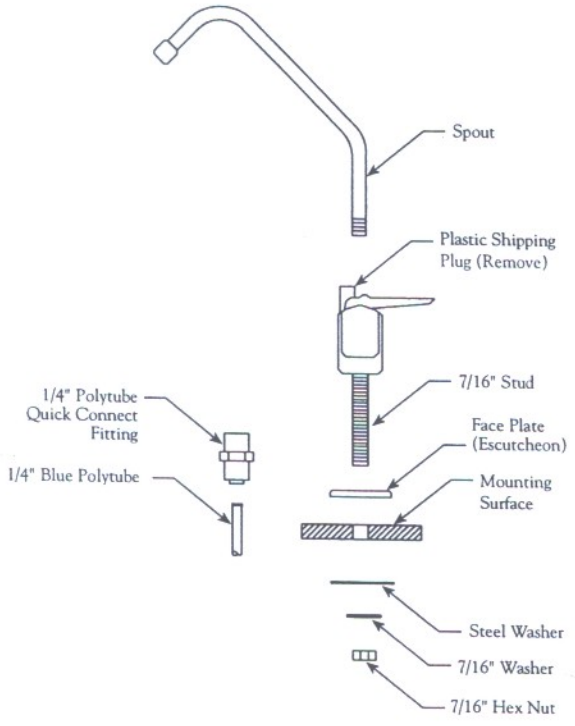


Figure 2

B. Feed Water Saddle Valve Installation

Decide on location. Do NOT connect to a hot water feed line. If you are not sure of the supply, run the hot water and feel the supply piping. (Refer to Fig. 3.)

1. Shut off the water supply and drain the line.

2a. To install on (soft) Copper Tubing supply line:

- Turn the Handle of the Feed Water Saddle Valve counter clockwise (outward) until the lance does not protrude from the gasket. It may have to be pushed in.
- Assemble the Feed Water Saddle Valve on the tubing.

–for $^3/_8$" OD tubing use the back plate side with the small groove to prevent distortion of the tubing.

–for larger tubing (up to $^5/_8$" OD) use the large groove of the back plate.

- Assemble and tighten the brass screw.
- To pierce the tubing, turn the Valve Handle fully clockwise (inward). A small amount of water may escape from the outlet until it is fully pierced.
- When you feel the Valve Handle firmly seated in the clockwise direction, the copper tube is pierced and the valve is closed.

FEED WATER SADDLE VALVE

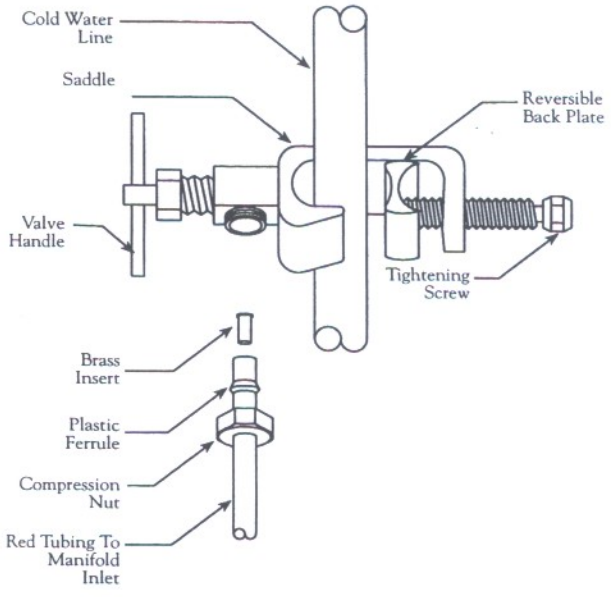


Figure 3

2b. To install on (hard) Steel or Brass Tubing supply line.

- The supply line should now be drained. Use a battery powered or properly grounded drill to avoid shock hazard.
- Drill a $^3/_{16}$" hole in the supply line; (do not drill through the opposite wall).
- Turn the handle to expose the lance no more than $^3/_{16}$" beyond the rubber gasket.
- Place the body of the valve over the hole so that the lance fits into the hole.
- Assemble and tighten the brass screw.
- Turn the Valve Handle clockwise (inward) until firmly seated. The valve is closed.

3. With the Feed Water Saddle Valve closed, open the sink faucet and the water supply and allow the water to run for a few minutes to flush any debris caused by the installation.

   •Close the faucet and check the Feed Water Saddle Valve for leaks.

C. Tri–Filter™ Assembly Installation

Locate the site per Sec. III, C.2, page 3. Various installation sites will require different types of mounting fasteners; be sure the fastener selected will provide a firm, solid mounting. A support panel may be necessary on thin cabinet walls or to span between wall studs on particleboard or drywall.

Do not drill through exterior cabinet walls or leave sharp wood screw points exposed in readily accessible cabinet interiors.

The close proximity of a dishwasher or a trash compactor may require special fabrication of a mounting plate.

1. The mounting bracket will accept either #10 or #12 (5mm) mounting screws spaced on 6" (15 cm) centers. Allow at least 4" (10 cm) of clearance beneath the filter housings to accommodate filter changes. Mark the two locations (the bracket can be used as a template). Install the screws and tighten them until the heads are about $^5/_8$" from the wall.
2. Locate the ¼" Red Feed Water Tubing. Remove the red plug from the fitting labelled "In" on the manifold and insert the tubing. Reference the special supplement sheet in the carton for proper connection of all tubing and removal of plugs. Run the tubing along its course to the Feed Water Saddle Valve, trim to length. (Refer to Fig. 1, page 1.)

   Refer to Fig. 3, page 4. To the end of the red polytube install the Compression Nut, the Plastic Ferrule, and the Brass Insert. Connect to the Feed Water Saddle Valve.
4. Locate the ¼" blue tubing. Remove the blue plug from the fitting labelled "Out" on the manifold and insert the tubing. The fittings will grab the tubing and seal it in place. Make sure the tubing is pressed all the way in to create a pressure tight connection.

   Run the blue tubing along its course to the Dispensing Faucet. Trim to length.

   To the end of the $^7/_{16}$" stud on the faucet screw on the ¼" Polytube Quick Connect Fitting. Once snug by hand take a pair of pliers and tighten the fitting an additional half turn. Don't over tighten.

   Insert the ¼" blue tubing into the fitting. The fitting will grab the tubing and hold and seal it in place.

   NOTE: If you want to pull the tubing out for some reason, push the ring around the tubing in and pull the tubing out.
5. Hang the Manifold Assembly on the mounting screws and tighten. DO NOT OVERTIGHTEN.

D. Start Up

At time of start up and each time the filters are changed the system should be sanitized (also see Operation and Maintenance Sec. V, B.1–4, page 6).

1. Sanitizing the system and installing the Sediment Prefilter and Ceramic Element. Use a drip pan to aid clean–up.

   NOTE: The system should be sanitized BEFORE installing the Activated Carbon Filter.

   •Use a good quality unscented 5¼% liquid chlorine household bleach.

   •Open the Dispensing Faucet by lifting the black handle.

   •Remove the plug on the underside of the manifold labelled "SEDIMENT". Pour one capful of bleach (this is approximately 2 tsp. or 10 ml) into one of the white Housings. Insert a Housing O–ring into the Housing groove, (press firmly in place). Locate and remove the shrink wrap from the Sediment Filter and install. Engage and firmly tighten the Housing hand tight only.

   •Remove the plug on the underside of the manifold labelled "CERAMIC". Pour one capful of bleach (this is approximately 2 tsp. or 10 ml) into one of the white Housings. Insert a Housing O–ring into the Housing groove, (press firmly in place). Locate and remove the bubble wrap from the Ceramic Element and install. Engage and firmly tighten the Housing hand tight only.

- Remove the plug on the underside of the manifold labelled "ACTIVATED CARBON". Pour one capful of bleach (this is approximately 2 tsp. or 10 ml) into one of the white Housings. Insert a Housing O–ring into the Housing groove, (press firmly in place). DO NOT install the Activated Carbon Filter at this time. Engage and firmly tighten the Housing hand tight only.
- Slowly open the Feed Water Saddle Valve (turning counter clockwise).
- As soon as the water begins to come out of the Dispensing Faucet, close the Faucet.
- Let stand for 15 minutes.

  NOTE: During this time, check the system carefully for leaks.
- At the end of 15 minutes, CLOSE the Feed Water Saddle Valve and open the Dispensing Faucet.
- Remove the Activated Carbon Filter Housing, empty, and install the Activated Carbon Filter. Firmly tighten the Housing hand tight only.

3. Rinsing the system:
   - Slowly open the Feed Water Saddle Valve fully counter clockwise.
   - Rinse the system of chlorine bleach.
   - When the Faucet is first opened, expect air and carbon fines (very fine black powder) from Activated Carbon Filter to be rinsed out. This is normal after the Activated Carbon Filter is changed.

SECTION V. OPERATION & MAINTENANCE

A. Normal Operation

1. With each use it is recommended that you run the tap for at least 10 seconds prior to using water. This is especially important if the water tap has not been used daily. After periods of non–use, such as a week of vacation, allow water to run for 1 minute in order to rinse the system. If the system is not used for 3–4 weeks or longer, it is a good idea to resanitize the system and to change the Sediment Prefilter and the Activated Carbon Filter.

B. Changing Filters

THIS TRI–FILTER SYSTEM CONTAINS FILTERS WHICH MUST BE REPLACED AT REGULAR INTERVALS TO MAINTAIN PROPER PERFORMANCE. USE ONLY FACTORY APPROVED FILTERS.

All individuals should take adequate precautions when changing the filters, including wearing protective gloves, to avoid direct contact with the exhausted filters.

The recommended interval for changing the filters (not the Ceramic Element) is every six (6) months. Local conditions may dictate more frequent changes.

Use a drip pan to catch any water that may spill when the Filter Housings are removed. Refer to Fig. 1 page 1 for component location.

1. Close the Feed Water Saddle Valve by turning fully clockwise and open the Dispensing Faucet by lifting the handle.
2. Loosen and remove the Sediment Filter, Ceramic Element and the Activated Carbon Filter Housings. Discard the Sediment and Activated Carbon Filters.

   NOTE: Ceramic Element is cleanable and may be reused. Gently scrub the surface of the Ceramic Element with the scrubbing pad provided until clean.
3. Wash the inside of the Housings using a mild detergent and a soft cloth. Do not use abrasive cleaners or pads. Thoroughly rinse all soap from the Housings before reassembly.
4. To sanitize the system and replace the filters:

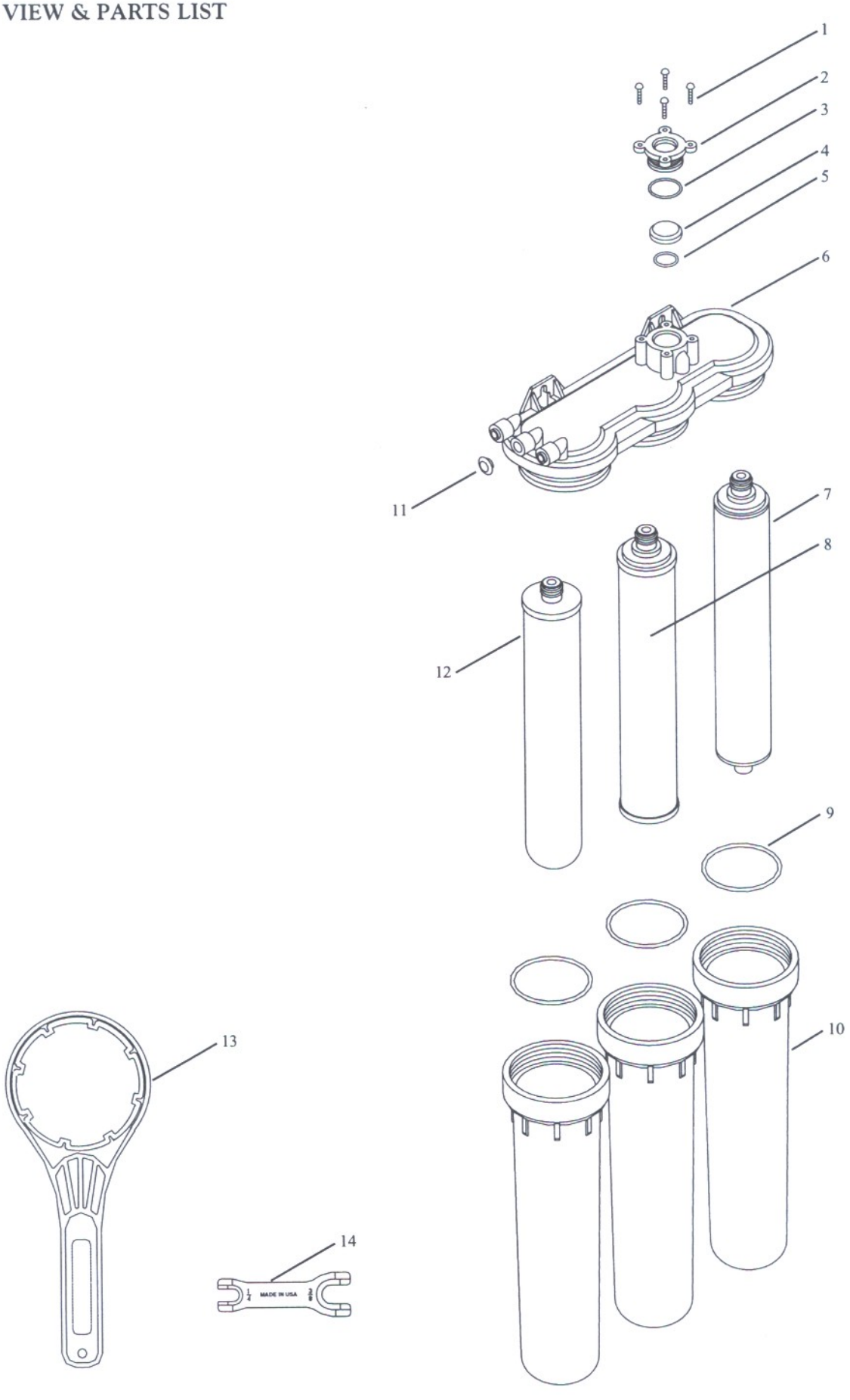
   NOTE: The system should be sanitized before installing the Activated Carbon Filter.
   - Use a good quality unscented 5¼% liquid chlorine household bleach.
   - Add one capful of bleach (this is 2 tsp. or 10 ml) to the Sediment Filter and Ceramic Element Housings and install the new Sediment Filter and Ceramic Element. Check the Housing O–ring for proper position in its groove, engage and firmly tighten the Housing hand tight only.
   - Add one capful of bleach to the Activated Carbon Filter Housing. Temporarily install the Housing without the Activated Carbon Filter.

- The Dispensing Faucet should be open, slowly open the Feed Water Saddle Valve.
- As soon as water begins to drip out of the Dispensing Faucet, close the Faucet.
- Let the system stand for 15 minutes.
- At the end of 15 minutes, close the Feed Water Saddle Valve and open the Dispensing Faucet to release the pressure.
- Remove the Activated Carbon Filter Housing and empty. Remove the wrapping and install the Activated Carbon Filter. Firmly tighten the Housing hand tight only.
- Slowly open the Feed Water Saddle Valve.
- Rinse the system of chlorine bleach.
- When the Faucet is first opened, expect air and carbon fines (very fine black powder) from Activated Carbon Filter to be rinsed out. This is normal after the Activated Carbon Filter is replaced.

SECTION VII. TROUBLE SHOOTING GUIDE

Problem	Possible Cause	Solution
Tastes and odors in the Product water	The Activated Carbon Filter is ex–hausted	Replace filter
	Dissolved gases in the Feed Water	Pretreat Feed Water to remove dis solved gases
Faucet leaks or drips	Leaks from spout.	Adjust Faucet by turning the tee bar just below the handle to provide a small amount of free play in handle when shut off.
		O–rings are bad, repair or replace faucet
	Leaks from base of the delivery tube	O–ring is bad, replace O–ring
	Leaks from beneath the handle	O–rings are bad. Repair or replace faucet
Low Production	Filter clogged	Change filters
		Clean or change Ceramic Element
Fitting leaks in general	Close the Feed Water Saddle Valve and relieve pressure before disconnecting any tubing or replacing any fitting. Before replacing a fitting, re–cut the tubing and re–insert into the fitting to see if that solves the leak. If pipe threads are leaking, remove and retape with Teflon tape.	

EXPLODED VIEW & PARTS LIST



DRAWING NO.	PART NO.	DESCRIPTION
1	S2009	Self Tapping Screw
2	S2005	ASO Cap
3	S2013	ASO Cap O–Ring
4	S2008	ASO Disk
5	S2025	Small ASO O–Ring
6	S2128-02	Manifold Tri–Filter™ Plate Assembly
7	S7011	Sediment Prefilter–5 Micron
8	S7025	Activated Carbon Filter
9	S3069	Housing O–Ring
10	S7029–09	Housing
11	S1759	Port Cap
12	S7026	Ceramic Element
13	S3072	Housing Wrench
14	S1405	Fitting Wrench

OTHER COMPONENTS AS SHOWN IN FIGURE 1, PAGE 1.

DRAWING NO.	PART NO.	DESCRIPTION
1	S1089–09	1/4" Long Reach Non–Air Gap Faucet
2	S2119	Cover
3	S1118–01	Feed Water Saddle Valve

Tri–Filter™ DRINKING WATER SYSTEM

FIVE YEAR LIMITED WARRANTY

Microline® warrants its Tri-Filter™ Drinking Water System to be free from defects in materials and workmanship for a period of five years from the date of purchase when installed and operated within recommended parameters.

Microline® will repair or replace at its discretion any defective component. This warranty does not cover the disposable sediment, carbon and ceramic filters whose service life depends on feed water conditions.

CONDITIONS OF WARRANTY

The above warranty shall not apply to any part of the Microline® Tri-Filter™ Drinking Water System that is damaged because of occurrences including but not limited to neglect, misuse, alteration, accident, misapplication, physical damage, or damage caused by fire, acts of God, freezing or hot water.

All replacement filters must be Microline® filters or the warranty is void. If the unit is altered by anyone other than Microline® the warranty is void.

To obtain warranty service: (A) contact your local dealer who supplied the unit, or (B) contact the factory for the dealer nearest you. It is the obligation of the owner to pay for shipping or travel charges to return the defective part.

This is the sole warranty made by Microline® with respect to the Tri-Filter™ Drinking Water System. No other warranties, expressed or implied, are given including merchantability or fitness for a particular purpose, incidental or consequential damages, or other losses.

This exclusion applies to the extent exclusion is permitted by the law.

No person or representative is authorized to assume for Microline® any liability on its behalf, or in its name, except to refer the purchaser to this warranty.

This warranty gives you specific legal rights, you may also have other rights which vary from state to state.

microline®
4462 Duraform Lane • Windsor WI 53598-9716
Phone (608) 846-3010

Form No. S2078
CAI 01/2006