

INSTALLATION MANUAL

NRS-1 Point-of-Use Nitrate Reduction System



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NRS-1 Manual 191206

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SECTION I. INTRODUCTION

Congratulations, you have just purchased one of the finest Point-of-Use Nitrate Reduction Appliances available.

Like any other fine product, this appliance requires periodic maintenance in accordance with the schedule outlined. Have your water checked periodically to verify nitrate reduction.

Your new Nitrate Reduction (NRS-1) Drinking Water system uses a non-leaching material to reduce unwanted nitrates in a water supply.

SECTION II. SPECIFICATIONS

LIABILITY

All information and recommendations appearing in this manual concerning the use of products described herein are based on information contained in good faith but makes no representation as to its comprehensiveness or accuracy. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by First Sales, LLC as to the effects of such use or the results to be obtained. First Sales, LLC assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Recommended Filter Change Schedule*

1 – NRC10 – Nitrate Filter:

<=10 ppm nitrate.....200 gallons
 <=15 ppm nitrate.....150 gallons
 <=20 ppm nitrate.....100 gallons
 >20 ppm nitrate, Install FSN Series nitrate softener at point-of-entry

TABLE A – RECOMMENDED OPERATING LIMITS FOR FEED WATER

| Specifications | NRC10 |
|----------------|--|
| Water Pressure | 40-100 psig |
| Temperature | 40-100°F |
| pH | 4.5-8.5 |
| Hardness | Less than 1 gpg |
| Iron | Less than 0.05 ppm |
| Manganese | Less than 0.05 ppm |
| Nitrate | Less than 21 ppm (Does not apply to FSN Series softener) |
| Bacteria | Must be potable** |

NOTE: The NRS-1 may be installed on waters containing nitrate; however the total nitrate concentration of the incoming water supply should be less than 21.0 ppm. Water containing nitrate concentration greater than 20.0 ppm will greatly reduce the cartridge capacity and leave potential for harmful levels of nitrate bleed through. Have your water checked periodically to avoid harmful levels of nitrate bleed through.

****DO NOT USE WITH WATER THAT IS MICROBIOLOGICALLY UNSAFE OR OF UNKNOWN QUALITY.**

TABLE B – SYSTEM SPECIFICATIONS

| Specifications | NRS-1 |
|----------------|-------|
| Overall Height | 14" |
| I/O | 1/4" |
| Flow Rate | 1 gpm |

SECTION III: PREPARATION

A. Major System Components

The following components comprise the NRS-1 Drinking Water System:

1. A Nitrate Reduction assembly consisting of the aluminum bracket, screws, wrench, filter housing, installed nitrate filter, installed shut-off ball valve with fittings.
2. An automatic shut-off water meter with installed fitting on OUTLET.
3. A faucet kit with 1/4" fitting.
4. A plastic tubing kit with self-piercing saddle valve.
5. Other items necessary for installation may include wood screws or machine screws for mounting the NRS-1 assembly, concrete anchors may be required for hanging on basement wall, additional tubing or tube connectors, and plastic wire ties for organizing tubing.

B. Tools Recommended for Installation

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

- 3/8" variable speed electric drill.
- Extension work light with outlet.
- Safety Glasses.
- 1-1/4" porcelain hole cutter kit.
- 1-1/4" Greenlee hole punch and 1/8" and 1/2" metal drill bits for pilot hole.
- Center punch and hammer.
- 1-1/4" wood bit.
- Assorted wood and metal drill bits including 7/32" metal drill bit.
- Phillips head and flat blade screwdrivers.
- 1/2", 9/16" and 5/8" open end wrench.
- 10" Crescent wrench with jaws taped to hold faucet.
- Teflon tape.
- Wide masking tape or duct tape.
- Plastic tubing cutter.
- Extra plastic tubing.
- Small bottle of liquid chlorine bleach.

C. Determine System Location

The NRS-1 system can be located under a sink or in a basement depending on space availability and the customer's preference. If a basement installation is selected, additional tubing, hardware and fittings may be needed and a hole will have to be made from inside the cabinet, through the floor, to the basement. Never install in an area of the home where temperature is freezing as damage to the system will result. If a reverse osmosis system is to be installed in-line with the NRS-1, the NRS-1 should be the last device before the faucet.

Considerations for an ice maker or other remote hook up should be determined, including routing and any additional tools, fittings, and tubing that may be required.

- 1) 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 tubing are considerations. A 2" diameter flat surface is required above and below the mounting site. The thickness of the mounting surface should not exceed 1-1/4". Watch for strengthening webbing on the underside of cast iron sinks.
- 2) NRS-1 Assembly - The NRS-1 Assembly may be mounted on either the right or left side of the under-sink area or a cabinet. Mounting in the basement is also an option. The mounting location should allow adequate clearance and accessibility for cartridge changes.
- 3) Feed Water Connection - The self-piercing feed water shut off valve should be located as close to the NRS-1 assembly as possible. **USE A POTABLE COLD WATER SUPPLY ONLY.**

D. Prepare the Area for Installation

To save time it is often advised to call the customer and request they clear under the sink prior to arrival. Otherwise, remove supplies from under the sink and stack them neatly away from the working area. Arrange a light for the work area, if necessary.

If a basement installation is called for, determine where components will be located and how they will be mounted. Special mounting brackets and

hardware may be necessary to secure the system to a wall or ceiling joists.

Inspect cold water supply line to determine if any special fittings, in addition to what is included in the kit, are required.

E. Prepare the Appliance for Installation

Open shipping carton and remove components. Check that all installation parts are present which includes the purification assembly, water meter, faucet, installation hardware, tubing, and wrench.

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.

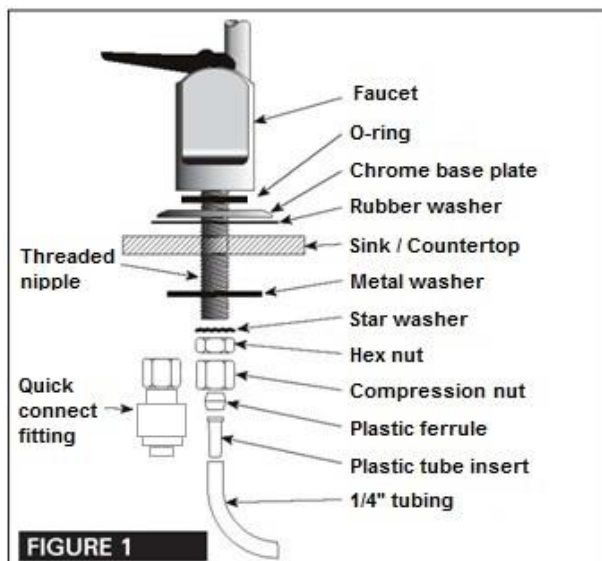
In restricted under-sink areas, it may be easier to install the faucet first. Allow adequate tubing lengths for any final component position.

A. Install the Faucet

See Figure 1 for Faucet Installation Diagram

The customer should be consulted before determining faucet location. The faucet should be positioned so that it empties into the sink and the spout swivels freely for convenience.

If the sink already has a hole provided that can accommodate the NRS-1 faucet, then no drilling is required and you can proceed to the section on mounting the faucet.



1. Make the Faucet Mounting Hole

IMPORTANT: It is mandatory that safety glasses be worn during sink hole drilling operations to prevent eye injury.

Before starting the hole making operation, always check below the sink so that nothing interferes with mounting the faucet such as reinforcing ribs, support brackets or cabinet construction.

STAINLESS STEEL SINK:

Recommended tools:

- Center punch
- Variable speed drill and high speed drill bits.
- Greenlee chassis punch 7/8" hole size (alternate 9/16" size may be used for non air gap faucet)
- Protective gloves

Procedure:

- a) Center punch a small indent at the desired faucet location.
- b) Slowly drill the required pilot hole for the chassis punch.
- c) Set up the chassis punch per instructions and tighten nut to cut the desired hole size.
- d) Clean up sharp edges with a file if necessary.

PORCELAIN/ENAMEL/CERAMIC ON SHEET METAL OR CAST IRON BASE:

Recommended tools:

- Variable speed drill
- Relton porcelain cutter tool set 7/8" size (alternate 9/16" size may be used for air gap or non-air gap faucet)
- Plumber's putty

It is important to understand what is involved in this procedure. First, the glassy layer of porcelain must be penetrated through to the base metal. Second, a center disc of porcelain must be removed while protecting the surrounding porcelain against chip ping or fracturing. Third, the base metal must be drilled through to complete the hole.

Procedure:

- a) Mark the center for the 7/8" hole

- b) Form shallow putty dam around hole area and fill with enough water to lubricate carbide drill bit.
- c) Carefully drill pilot hole through porcelain/enamel and base metal using carbide type pilot drill.

IMPORTANT: Always operate drill with light pressure at slow speed (300-400 rpm).

- d) Insert pilot tip of spring-loaded porcelain cutter into pilot hole.
- e) Drill porcelain/enamel using spring-loaded porcelain cutter, making certain a complete ring has been cut through the porcelain/enamel to the metal base.
- f) Change to the metal cutter. With slow speed and light pressure, cut away the inner porcelain/enamel disc down to base metal. Make certain that the cutter does not touch outer rim of the cut porcelain/enamel. Continue with this bit to cut through metal until sink has been completely penetrated.

IMPORTANT: When using a porcelain cutter it is critical to take precautions that it is always in a sharpened condition. Dull cutters are known to chip sinks.

2. Mount the Faucet:

- a) Familiarize yourself with all components shown in faucet diagram.
- b) Disassemble hardware from the threaded nipple, except for chrome base plate and rubber washer.

NOTE: Rubber washer may be replaced with bead of plumber's putty for neater appearance.

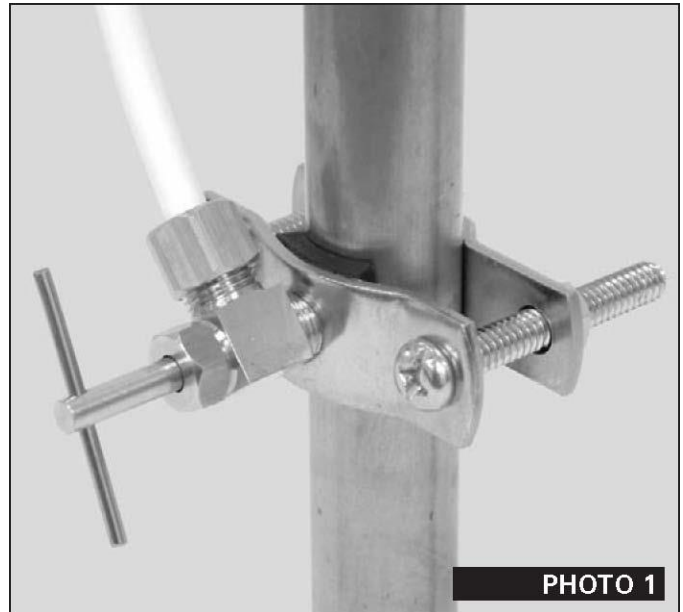
- c) Connect length of standard 1/4" tubing to faucet. Ensure plastic insert is in tubing. Push on firmly until it seats.
- d) Feed the threaded nipple through sink/counter mounting hole and orient the faucet as discussed with the customer.
- e) From below sink/counter assemble the black plastic washer, star washer and hex nut on threaded nipple and tighten by hand.
- f) After rechecking faucet orientation, tighten hex nut (9/16" wrench or deep socket) until faucet feels secure.
- g) From above the sink make any minor orientation corrections by turning the faucet with a padded adjustable wrench.
- h) Install plastic ferrule and compression nut on tubing.

Note: Flats on chrome faucet may be used for tightening with an adjustable wrench. Use care not to mar chrome finish.

B. Install the Feed Water Valve and Tubing

The saddle tapping valve supplied is designed for use with 3/8" to 1/2" OD soft copper supply tubing (plain or chromed), rigid metal pipe, or CPVC plastic pipe. Do not use with flexible ribbed supply tubing which has too thin a wall thickness and requires special hard ware.

Saddle Valve Installation



SOFT COPPER TUBING INSTALLATION:

- 1) Turn off cold water valve under the sink, or main valve for the house.
- 2) Before installing saddle tapping valve, make sure piercing lance does not protrude beyond rubber gasket.
- 3) Assemble saddle tapping valve on copper tubing. Tighten clamp.
- 4) To pierce soft copper tube, turn handle clockwise until it is firmly seated. The valve is closed in this position.
- 5) Turn on main supply valve to pressurize coldwater line. Check for leaks. With a wrench snug nut/seal around valve stem.
- 6) Connect one end of the tubing to the feed water valve using brass compression nut and plastic sleeve and insert the other end into the ball valve on INLET of NRS-1 housing.

NOTE: For basement installations the existing feed water tubing may have to be longer to reach feed valve.

RIGID METAL PIPE AND CPVC PLASTIC PIPE INSTALLATION:

- 1) Turn off cold water supply valve and drain the line to prevent spillage.
- 2) Drill 3/16" hole at the desired location. To prevent shock hazard, use a battery operated drill.
- 3) Before installing saddle tapping valve, make sure piercing lance does not protrude beyond rubber gasket.
- 4) Assemble saddle tapping valve on copper tubing.
- 5) Turn saddle valve handle clockwise to close valve. With a wrench tighten nut/seal around valve stem.
- 6) When you wish to open valve and supply cold water to the unit, turn valve handle counter clock wise.
- 7) Connect one end of the tubing to the feed water valve using brass compression nut and plastic sleeve and insert the other end into the ball valve on INLET of NRS-1 housing.

NOTE: For basement installations the existing feed water tubing may have to be longer to reach feed valve.

C. Automatic Water Meter

Apply Teflon tape to threads on the INLET of the water meter and screw the inlet of the meter into the OUTLET of the filter housing. Meter should be tightened enough so that there are no leaks and the meter is facing the front of the NRS-1 housing assembly. This will allow for ease of setting the meter in gallons.

Tubing installation

- 1) Insert free end of feed water tubing into the 1/4" fitting on the water meter.
- 2) Insert the tubing into the fitting on the faucet.

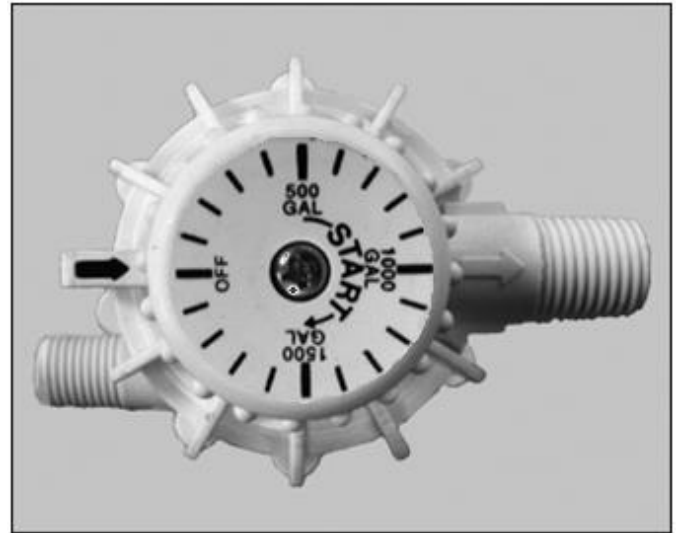
D. Setting the Shut-off Meter

IMPORTANT: Before starting this procedure, make sure a complete nitrate water test has been done and those numbers provided.

The NRS-1 may be installed on water containing ni; however the total nitrate concentrations of the incoming water supply should be less than 21.0 ppm. Water containing nitrate concentration greater than 20.0 ppm will greatly reduce the cartridge capacity and leave potential of harmful

levels of nitrate bleed through. Desired level of nitrate should be less than 10.0 ppm.

Turn the setting dial of the water meter clockwise so that the arrow point to 100, 150 or 200 gallons for nitrate levels less than or equal to 20, 15 or 10 ppm (respectively). After the number of gallons is exhausted the automatic shut-off meter will cut the OUTLET flow of water and no more water will be allowed to pass through the system until the cartridge is changed and the meter reset. See "Changing Filter" for filter replacement procedure.



E. Make Final Tubing Connections

With all of the components in place, the final tubing connections can be made. When routing tubing between components, several guidelines should be observed.

- Tubing runs should generally follow the contour of the cabinets rather than interfere with the cabinet storage area.
- Strive for neatness and an orderly tubing "flow" using fasteners (e.g. insulated staples) to secure the tubing. Cut tubing to the desired length.
- Arrange the tubing so there are no sharp bends and leave some "play" in the tubing for ease of servicing.
- Try to keep the tubing from the purification assembly to the tank and faucet as short as practical for good flow.

F. Install Ice Maker Hookup (optional)

Note: Check with refrigerator manufacturer for compatibility with your refrigerator model.

The NRS-1 drinking water appliance can be connected to any standard refrigerator ice maker or ice maker/water dispenser. It should never be connected to a commercial type bar ice maker.

Hooking up an ice maker involves connecting a tee with shut off valve into the faucet tubing and routing tubing over to the refrigerator.

Before turning off the existing tap water supply to a refrigerator ice maker, always shut off the ice maker first (usually by lifting the lever arm above the bin to the upper most position). The ice maker should only be turned on again after 1-2 gallons are flushed through the NRS-1 system.

NOTE: Before any service is performed on the NRS-1 system, always turn off ice maker valve and the ice maker unit. Only turn on when system is operating.

G. Start up the System

- 1) Double check that all connections are secure.
- 2) Turn on feed water saddle valve and check for leaks. If any leaks are noted, turn off valve and correct before proceeding.
- 3) Turn on ball valve and open faucet until a steady stream of water flows. Close faucet, wait at least 5 minutes and carefully check for leaks. Correct as necessary.

H. Flush System of Preservative and Check Operation

- 1) Lift faucet handle and allow NRS-1 system to flush 1-2 gallons down the drain or flush system until water runs clear. The flushed water should be discarded.

SECTION V. OPERATION & MAINTENANCE

A. Changing Filter

NOTE: THIS NRS-1 SYSTEM CONTAINS A FILTER WHICH MUST BE REPLACED AT REGULAR INTERVALS TO MAINTAIN PROPER PERFORMANCE. USE ONLY FACTORY APPROVED FILTERS.

Please see Page 3 for the recommended interval for changing the filters. Local conditions may dictate more frequent changes.

Use a drip pan to catch any water that may spill when the filter housings are removed:

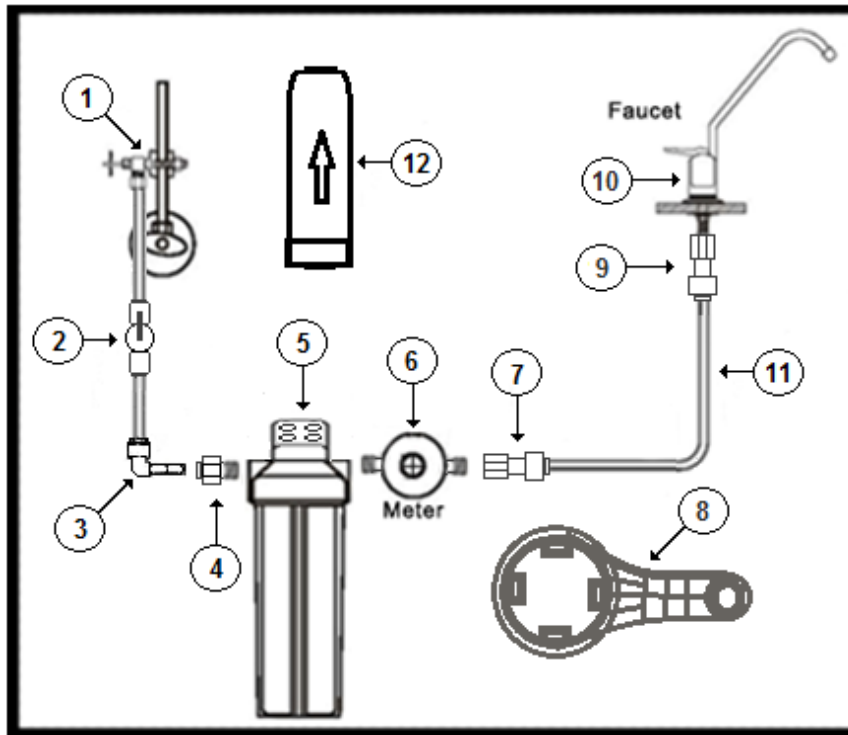
- 1) Close the Ball Valve on the INLET of the housing and push the red button on top of the housing to relieve the operating pressure.
- 2) Loosen and remove the Filter Housing with the provided wrench. Discard the cartridge. **NOTE:** Exhausted filter cartridge may be disposed by normal means, due to non-leaching material. Dispose as nonhazardous solid waste.
- 3) Wash the inside of the Housing(s) using a mild detergent and a soft cloth. Do not use abrasive cleaners or pads. Thoroughly rinse all soap from the housing before reassembly.
- 4) To sanitize the system and replace the filter cartridge(s):

NOTE: The system should be sanitized before installing the nitrate cartridge.

- a) Use a good quality unscented 5-1/4% liquid bleach such as Clorox.
- b) Add one cap full of bleach (this is 2 tsp. or 10 ml) to the filter housing.
- c) Turn the water meter to any number of gallons to allow for water flow.
- d) The dispensing faucet should be open, slowly open the ball valve on the feed water line.
- e) As soon as water begins to drip out of the dispensing faucet, close the faucet.
- f) Let the system stand for 15 minutes.

- g) At the end of the 15 minutes, in the following order, open the ball valve; open the dispensing faucet to allow purging of the chlorine to the drain.
- h) Reset the automatic shut-off meter to 100, 150 or 200 gallons for nitrate levels of 20, 15 or 10 ppm (respectively).
- i) Install with new NRC10 filter and check for leaks.

B. Diagram and Parts List



| Ref | Part Number | Description |
|-----------|-------------|---|
| 1 | F-SAD | Supply saddle valve, 1/4" thread |
| 2 | BV-101 | Ball valve, 1/4" tube X 1/4" tube |
| 3 | 4SE4 | Stem elbow, 1/4" tube X 1/4" stem |
| 4 | 4MC | Male connector, 1/4" tube X 1/4" MNPT |
| 5 | USH10 | 1/2" white housing & cap, 10" with bracket & wrench |
| 6 | ASO-14 | Automatic shut-off, 1,800 gallons cap. |
| 7 | 4FC4-NPT | Female connector, 1/4" tube X 1/4" FNPT |
| 8 | WR200 | Wrench for USH, included with housing |
| 9 | 4FC4 | Faucet connector, 1/4" tube X 7/16" UNF |
| 10 | RO-DW-1 | Luxury long reach faucet, non air gap, chrome |
| 11 | TU-2W | 1/4" OD white poly tubing, per foot |
| 12 | NRC10 | Nitrate reduction cartridge |
| NOT SHOWN | ORUSH | Housing O-ring |

C. For System Equipped with Quick Connect Fittings

Your new NRS-1 Drinking Water Appliance may be outfitted with new generation of user-friendly quick connect push-in fittings. Proper use of the fittings is shown in the diagrams.

It is important that the tubing selected for use with these connectors be of high quality exact size and roundness, and with no surface nicks or scratches. If it is necessary to cut the tubing, use a plastic tubing cutter or sharp razor knife. Make a clean, square cut.

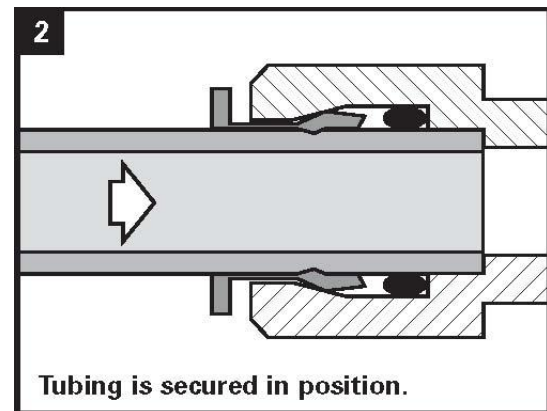
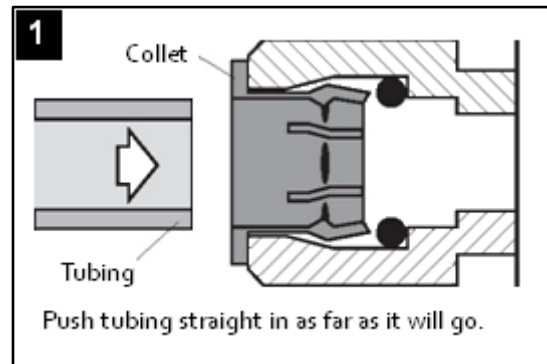
An optional blue locking clip is installed in certain fittings to provide extra security. Remove this clip first before trying to remove tubing by sliding away from fitting.

Should a leak occur at a fitting, the cause is usually defective tubing.

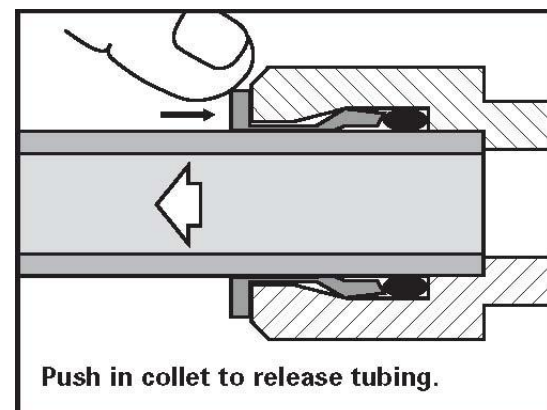
To fix:

- Relieve pressure
- Release tubing
- Cut off at least ¼" from end
- Reattach tubing
- Confirm connection is leak free

TO ATTACH TUBING...



TO RELEASE TUBING...



SECTION VI. TROUBLE SHOOTING GUIDE

| Problem | Possible Cause | Solution |
|---|---|--|
| Low quantity of Product Water from Treatment System or Low Pressure at the Dispensing Faucet | Feed Water Saddle Valve is plugged or closed. | Open Valve or unclog. |
| | Clogged filter. | Replace filter. |
| | Low water pressure | Feed Water pressure must be above 40 psig. |
| | The Shut-off Meter reads "0" | Reset Shut-off valve. |
| | The INLET ball valve is closed. | Open valve. |
| Faucet leaks or drips | Leaks from base of the delivery tube. | O-ring is bad, replace O-ring. |
| Fitting leaks in general | Close the Feed Water Saddle Valve or ball 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 re-tape with Teflon tape. | |



NITRATE DRINKING WATER SYSTEM LIMITED WARRANTY

What Does This Warranty Cover?

This warranty covers any defects in materials and workmanship of the Nitrate Drinking Water System when installed and operated within recommended parameters, with the exceptions stated below.

How Long Does The Coverage Last?

The manufacturer will warrant its Nitrate Drinking Water System, for a period of one year from the date of purchase. All implied warranties including merchantability and fitness for a particular purpose are limited to one year from the date of purchase for the Nitrate Drinking Water System. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

What Will The Manufacturer Do?

The manufacturer will repair or replace at its discretion any defective component. You must pay any labor charges. You must also pay for shipping or travel charges to return the defective part(s).

What Does This Warranty Not Cover?

The above warranty will not apply to any part of the Nitrate Drinking Water System that is damaged because of neglect, misuse, alterations, accident, misapplication, physical damage, or damage caused by fire, acts of God, freezing or hot waters or similar causes. Consequential and incidental damages are not recoverable under this warranty. 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.

We recommend that you use only the manufacturer's replacement parts since improper parts or incorrectly performed maintenance or repair voids this warranty.

How Do You Get Service?

In order to be eligible for service under this warranty you must (a) contact your local dealer who supplied the unit.

How Does State Law Apply?

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