



NORTH STAR™
WATER TREATMENT SYSTEMS

Model NSTAS35

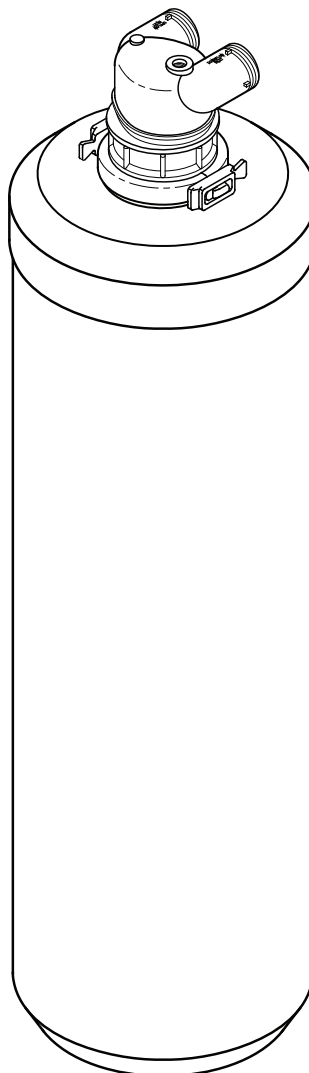
How to install, operate
and maintain your
Scale Defender™ System

If you have any questions or concerns when
installing, operating or maintaining your
water treatment system, contact us at:

info@northstarwater.com

or visit **www.northstarwater.com**

Point-of-entry system tested and certified by
NSF International for NSF/ANSI/CAN Standard
372, and is not certified for material safety,
contaminant reductions, or structural integrity
by NSF International.



Designed, Engineered &
Assembled in the U.S.A.

Manufactured and warranted by
Water Channel Partners
2805 Dodd Road, Suite 300
Eagan, MN 55121

7401273 (Rev. B 1/27/25)

Installation and Operation Manual

Table of Contents, Dimensions & Specifications

TABLE OF CONTENTS

	Page
Dimensions & Specifications	2
Before You Start	3
Typical Installation Illustrations	4
Installation Instructions	5
Adding Anti-Scale Media	6
Repair Parts	7
Warranty	8

DIMENSIONS

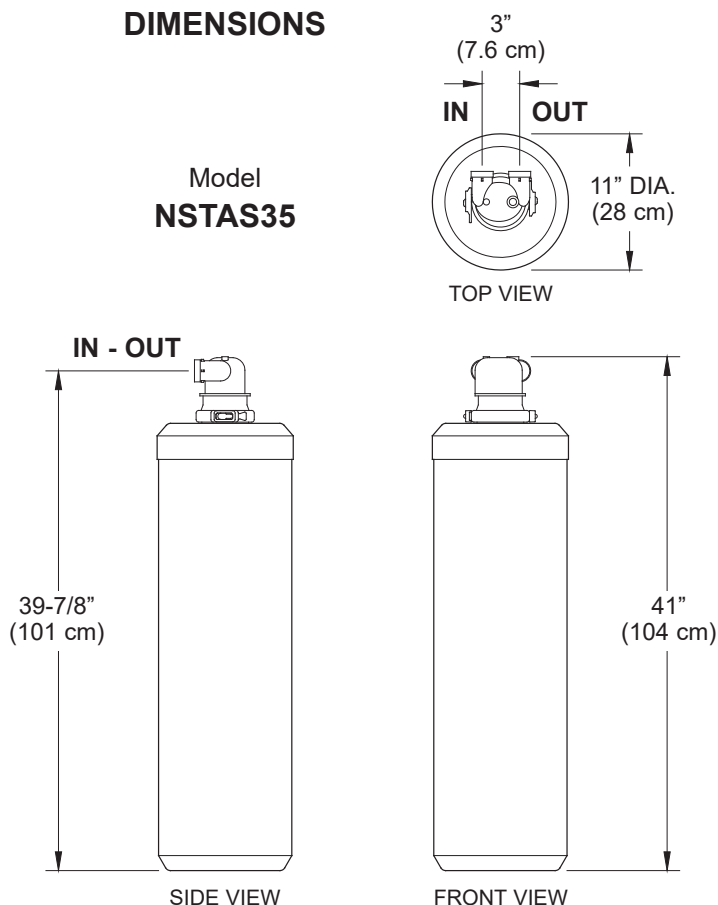


FIG. 1

SPECIFICATIONS

Model	NSTAS35
Nominal Mineral Tank Size	10" dia. x 35" tall (25.4 x 88.9 cm)
Amount of Anti-Scale Media	4.3 lbs. (1.95 kg)
Amount of HDPE Pellets	3 lbs. (1.36 kg)
Service Flow Rate	10 gpm (37.9 l/min.)
Maximum Flow Rate	15 gpm (56.8 l/min.)
Supply Water Pressure Limits (min./max.)	20 - 125 psi (1.4 - 8.8 kg/cm ²)*
Water Temperature Limits (min./max.)	40 - 120 °F (5 - 49 °C)

*Canada working pressure limits: 1.4 - 7.0 kg/cm².

INSPECT SHIPMENT

The parts required to install the Scale Defender™ system are included with the unit. Thoroughly check the system for possible shipping damage and parts loss. Remove and discard (or recycle) all packing materials.

Packing List

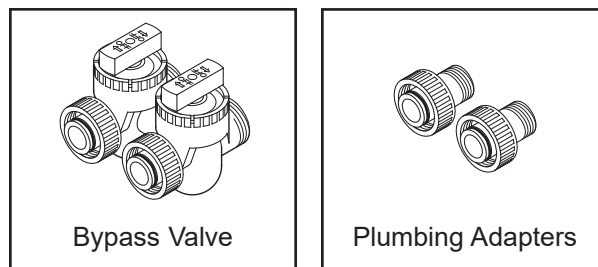


FIG. 2

Questions? Contact us at: info@northstarwater.com or visit www.northstarwater.com

Before You Start

HOW THE NORTH STAR SCALE DEFENDER™ SYSTEM WORKS

Hard water forms “scale” deposits in plumbing. These deposits are composed of calcium carbonate (CaCO_3) and magnesium carbonate (MgCO_3). As scale builds up over time, it can clog plumbing and coat the heating element in your water heater, significantly reducing its efficiency and life.

Unlike a traditional water softener which uses ion exchange media to remove calcium and magnesium ions from the water, the North Star Scale Defender™ system converts them into a crystalline form that is less prone to forming scale. This system does not require water for backwashing and does not discharge water to the drain.

Since the North Star Scale Defender™ system does not require the addition of salt or chemicals, it is practically maintenance free. The system may benefit from having anti-scale media added every few years, based on your water use and water conditions.

SAFETY GUIDES

- Follow the installation instructions carefully. Failure to install the system properly voids the warranty.
- Before you begin installation, read this entire manual. Then obtain all the materials and tools you will need to make the installation.
- Check local plumbing codes. The installation must conform to them.
- Use only lead-free solder and flux for all sweat-solder connections as required by state and federal codes.
- Use care when handling the system. Do not turn upside down, drop, or set on sharp protrusions.
- Recommended maximum allowable inlet water pressure is **125 psi** (8.8 kg/cm²). Use a pressure reducing valve if necessary.
- This system is not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

WHERE TO INSTALL THE SYSTEM

- Place the system as close as possible to the pressure tank (well system) or water meter (city water).
- Connect the system to the main water supply pipe upstream of the water heater. **Do not run hot water through the system.** The temperature of water passing through the system must not be above **120°F** (49°C). Damage caused by hot water is not covered by the warranty.
- Do not install the system where freezing temperatures could occur. Damage caused by freezing is not covered by the warranty.
- Keep outside faucets on untreated water to conserve media capacity.
- Put the system in a place water damage is least likely to occur if a leak develops. The manufacturer will not repair or pay for water damage.
- If installing in an outside location, you must take the steps necessary to assure the system is as well protected from the elements, contamination, vandalism, etc., as when installed indoors.
- Avoid installing in direct sunlight. Excessive sun heat may cause distortion or other damage to non-metallic parts.

TOOLS, PIPE & FITTINGS, OTHER MATERIALS YOU WILL NEED

- Plastic inlet and outlet fittings included with the system allow water flow equivalent to 1 inch (2.54 cm) nominal pipe. To maintain full valve flow, 1" (2.54 cm) pipes to and from the system fittings are recommended. Do not reduce the pipes to less than 3/4" (1.9 cm) size.
- Use copper, brass or PEX plastic pipe and fittings.
- ALWAYS install the included bypass valve, or 3 shut-off valves. Bypass valves let you turn off water to the system for repairs if needed, but still have water available to the house pipes.

PLAN HOW YOU WILL INSTALL THE SYSTEM

You must first decide how to run in and out pipes to the system. Look at the house main water pipe at the point where you will connect the system. Is the pipe soldered copper, glued plastic, or threaded brass/galvanized? What is the pipe size?

Now look at the typical installation illustrations on page 4. Use them as a guide when planning your particular installation. **Be sure to direct incoming, untreated water to the “UPFLOW INLET” port.**

Typical Installation Illustrations

Model NSTAS35

INSTALLATION USING INCLUDED BYPASS VALVE

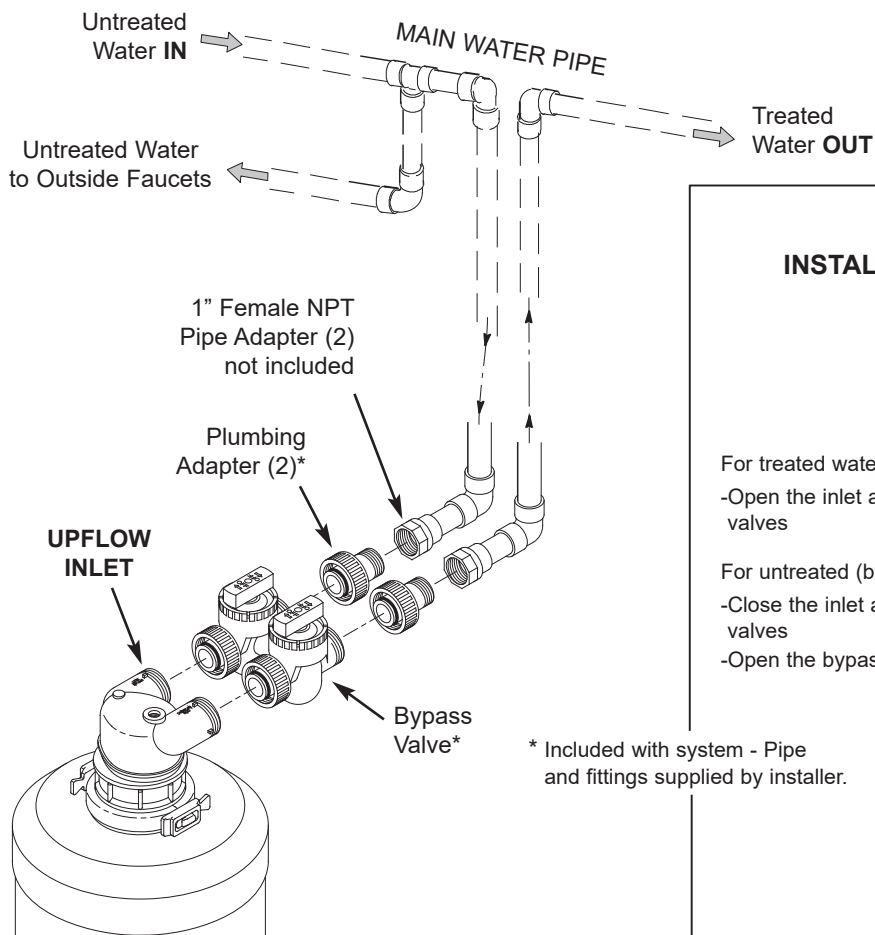


FIG. 3

Model NSTAS35 INSTALLATION USING 3-VALVE BYPASS

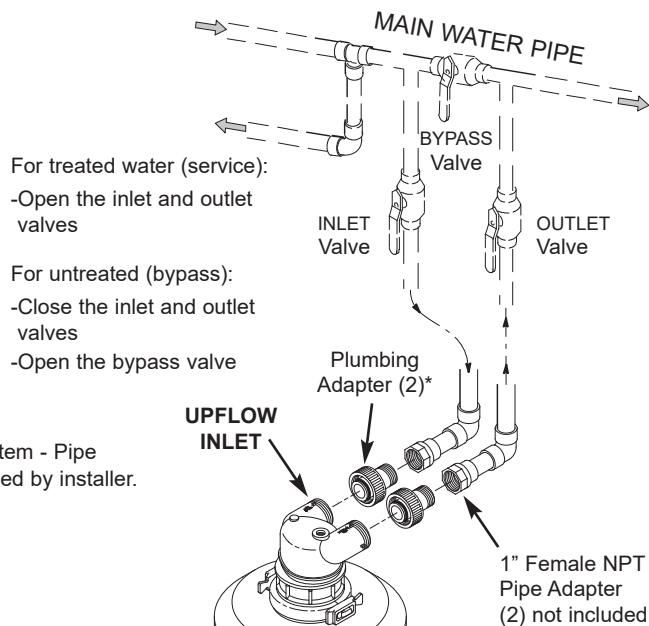
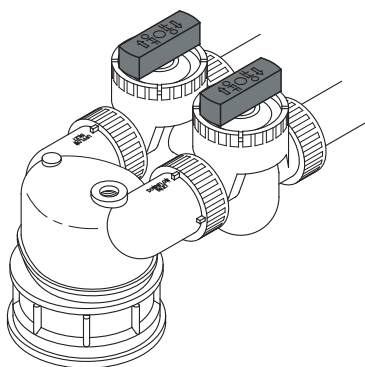


FIG. 4

BYPASS VALVE OPERATION

SERVICE

(water flows through Scale Defender™ system, and then to house plumbing)



BYPASS

(water flows to house plumbing without going through Scale Defender™ system)

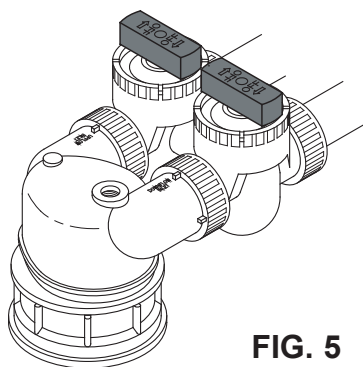


FIG. 5

METAL PIPE GROUNDING

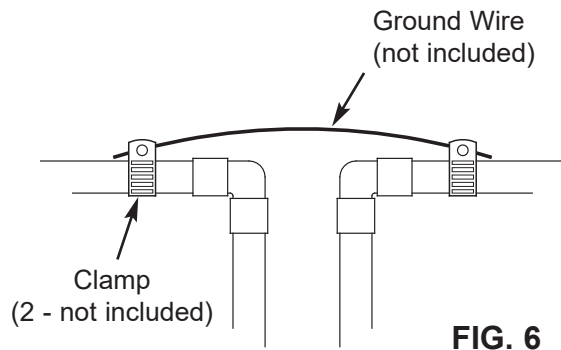


FIG. 6

Installation Instructions

1. TURN OFF WATER SUPPLY

- a. Close the main water supply valve near the well pump or water meter.
- b. Shut off the electric or fuel supply to the water heater.
- c. Open high and low faucets to drain all water from the house pipes.

2. INSTALL BYPASS VALVE AND/OR PLUMBING ADAPTERS:

- a. If installing a single bypass valve, thread the bypass valve, with lubricated o-ring seals in place, onto the head inlet and outlet ports (See Fig. 3). Tighten the collars by hand for a leak-tight seal.
- OR -
- b. If installing a 3-valve bypass system, thread the included plumbing adapters, with lubricated o-ring seals in place, onto the head inlet and outlet ports (See Fig. 4). Tighten the collars by hand for a leak-tight seal.

3. COMPLETE PLUMBING TO AND FROM THE SYSTEM

Using the "Typical Installation Illustrations" on the previous page as a guide, observe all of the following cautions while you connect inlet and outlet plumbing:

- Be sure incoming, **untreated water** is directed to the **UPFLOW INLET** port. It may be necessary to plumb a crossover if the water pipe's flow is from right to left.
- Be sure to install bypass valve(s).
- If making a soldered copper installation, do all sweat soldering before connecting pipes to the included plastic adapters. Torch heat will damage plastic parts.
- Use pipe joint compound on all external pipe threads.
- When turning threaded pipe fittings onto plastic fittings, use care not to cross-thread.
- Support inlet and outlet plumbing in some manner (use pipe hangers) to keep the weight off of the system.

4. COLD WATER PIPE GROUNDING

CAUTION: The house cold water pipe (metal only) is often used as a ground for the house electrical system. The 3-valve bypass type of installation, shown in Figure 4, will maintain ground continuity. If you use a plastic bypass valve at the unit, continuity is broken. To restore the ground, do the following:

- a. Install a #4 copper wire across the removed section of main water pipe, securely clamping it at both ends (See Figure 6) - parts not included.

5. FLUSH PIPES AND TEST FOR LEAKS

CAUTION: To avoid water or air pressure damage to system inner parts, be sure to do the following steps exactly as listed:

- a. Fully open two treated water faucets, one cold and one hot, nearby the system.
- b. Place bypass valve(s) into BYPASS position. On a single valve, turn both handles perpendicular to water flow (See Fig. 5). On a 3 valve system, close the inlet and outlet valves, and open the bypass valve (See Fig. 4).
- c. Fully open the house main water pipe shutoff valve. Observe a steady flow from both opened faucets.
- d. Close both faucets.
- e. Check your plumbing work for leaks and, if any are found, fix right away. Be sure to observe previous caution notes.
- f. Turn on the gas or electric supply to the water heater. Light the pilot, if applicable.

6. START UP PROCEDURE

- a. Place bypass valve(s) into SERVICE position, EXACTLY as follows:
 - **Single Bypass Valve:** Turn the outlet (marked downflow inlet on head) handle parallel to water flow. SLOWLY, turn the upflow inlet handle parallel to water flow, pausing several times to allow the system to pressurize slowly.
 - **3 Valve Bypass:** Fully close the bypass valve and open the outlet valve. SLOWLY, open the inlet valve, pausing several times to allow the system to pressurize slowly.
- b. Check all connections for leaks.
- c. Fully open a cold water faucet, downstream from the system, and allow 50 gallons (190 liters) of water to pass through the system. This should take at least 20 minutes. Close the faucet.

Adding Anti-Scale Media

PROCEDURE FOR ADDING ANTI-SCALE MEDIA

1. Bypass the system by turning both bypass handles perpendicular to the flow of water (See Fig. 7).
2. Slowly loosen the installation collars between the bypass valve and in/out head (See Fig. 8), allowing pressure to escape from system.
3. When both installation collars between bypass and in/out head are completely loosened from the in/out head, pull the system away from the bypass valve.
4. Holding the tank neck adapter with a strap wrench, unscrew the in/out head from the tank neck adapter (See Fig. 9). Once the in/out head is completely unscrewed, check to see whether the riser pipe (See Fig. 9) is still inserted in the in/out head. Remove it by lifting the in/out head enough to grasp the riser pipe and pull it free from the head.
5. Using a hose or tube that is 3/4" (1.9 cm) O.D. or less, siphon the water from the mineral tank through the riser pipe. This will prevent the top-bedding HDPE from floating out of the tank as the water rises when adding media.
6. Remove clips and clamps (See Fig. 10), and lift tank neck adaptor and top distributor from the tank neck. Be careful not to lose the o-rings.
7. Plug, cap or tape the open top of the riser pipe (See Fig. 10) to prevent media from entering the riser pipe.

IMPORTANT: Media entering the riser pipe will restrict flow and increase system pressure drop significantly.

8. Use a funnel that either fits around the riser pipe or alongside of it and fits inside of the tank neck.
9. Add anti-scale media to the tank. Systems are shipped from the factory with 4.3 lbs. (1.95 kg) of media. Replacement media is supplied in 1.5 lb. (0.68 kg) containers (P/N 7353755).
10. Uncover the riser pipe and reassemble the system in reverse order, making sure that all o-rings are in place.

NOTE: The riser pipe (See Fig. 9) may have been pulled up from the bottom of the mineral tank. If this has happened, the in/out head may not engage the threads of the neck adapter. To correct this, apply air or water pressure to the riser pipe. This will move the media at the bottom of the tank, allowing the riser pipe to be lowered to the bottom of the mineral tank.

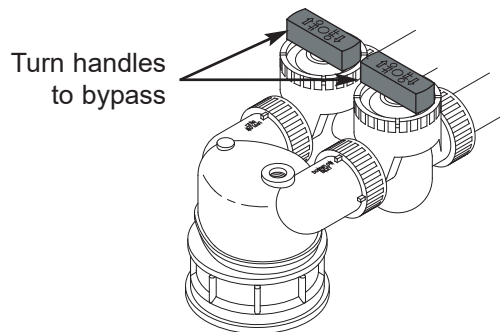


FIG. 7

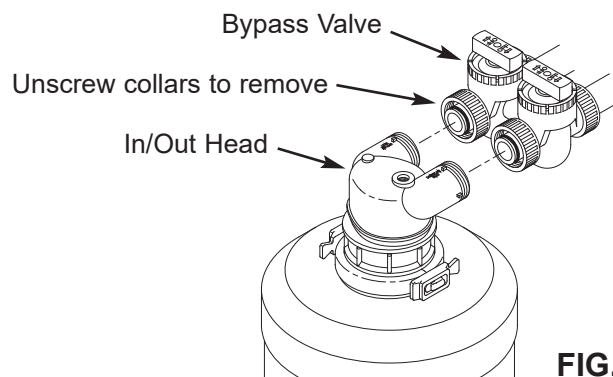


FIG. 8

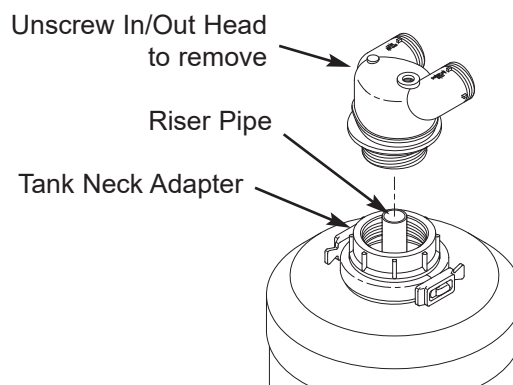


FIG. 9

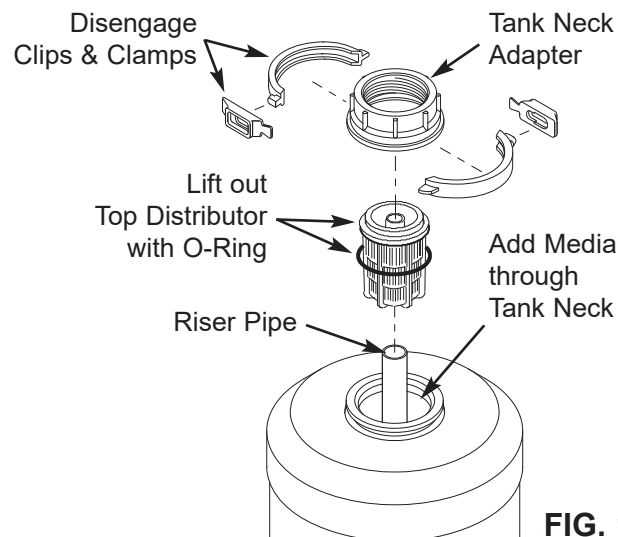
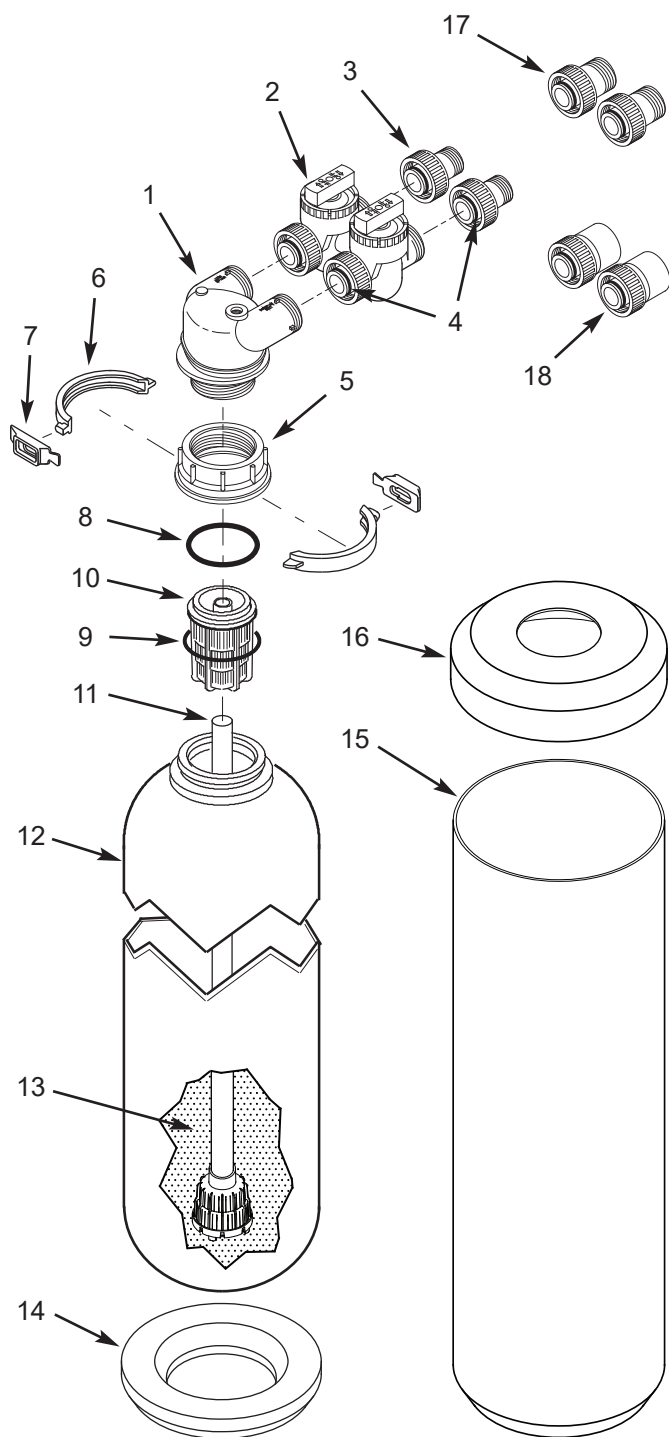


FIG. 10

Repair Parts

SYSTEM EXPLODED VIEW



SYSTEM PARTS LIST

Key No.	Part No.	Description
1	7351753	Head, In/Out
2	7346805	Bypass Valve Assembly, includes o-rings (See Key No. 4)
3	7346790	Adapter, Plumbing, 1" NPT, pack of 2, includes o-rings (See Key No. 4)
4	7337597	O-Ring, 1-1/16" x 1-5/16", pack of 4
5	7342788	Adapter, Tank Neck
—	7331177	Tank Neck Clamp Kit (includes 2 ea. of Key Nos. 6 & 7)
6	↑	Clamp Section
7	↑	Retainer, Clamp
—	7112963	Distributor O-Ring Kit (includes Key Nos. 8 & 9)
8	↑	O-Ring, 2-7/8" x 3-1/4"
9	↑	O-Ring, 2-3/4" x 3"
10	7077870	Top Distributor
11	7105047	Repl. Bottom Distributor
12	7334696	Repl. Mineral Tank, 10" x 35"
13	7353755	Anti-Scale Media, 1.5 lbs. (4.3 lbs. provided in NSTAS35)
	7351761	HDPE Pellets, 3 lbs. (3 lbs. provided in NSTAS35)
14	7026196	Base, Foam
15	7402619	Shroud (order decal below)
■	7401338	Decal, Shroud Front, NSTAS35
16	7402627	Cap, Shroud
17	7352822	Adapter, Plumbing, 1-1/4" NPT, pack of 2, includes o-rings *
18	7352830	Adapter, Plumbing, 1-1/4" & 1-1/2" PVC Solvent, pack of 2, incl. o-rings *

■ Not illustrated.

* Optional parts, not included with system.

Questions? Contact us at: info@northstarwater.com or visit www.northstarwater.com

Warranty

SCALE DEFENDER™ SYSTEM WARRANTY - MODEL NSTAS35 (except anti-scale media)

Warrantor: Water Channel Partners, 2805 Dodd Road, Suite 300, Eagan, MN 55121

Warrantor guarantees, to the original purchaser when the product is purchased from an authorized dealer, and when installed and maintained in accordance with the instructions, that:

One Year Full Warranty:

- For a period of one (1) year from the date the product is delivered, all parts will be free from defects in materials and workmanship and will perform in accordance with their written specifications.

Limited Warranties:

- For a period of ten (10) years from the date the product is delivered, the fiberglass mineral tank, excluding filtration media, will not rust, corrode, leak, burst, or in any other manner, fail to perform in accordance with its written specifications.
- For a period of three (3) years from the date the product is delivered, the in/out head will be free of defects in materials and workmanship and will perform in accordance with its written specifications.

If, during such respective period, a part proves to be defective, Warrantor will ship a replacement part, directly to your home, without charge. Should a defect or malfunction occur, contact your contractor. If you are unable to contact your contractor, return the part, freight prepaid, directly to the factory at the address below. Enclose with the part a full description of the problem, with your name, full address, date purchased, model and serial numbers, and selling contractor's name and address. We will repair or replace the part and return it to you at no cost if our repair department determines it to be defective under the terms of the warranty.

General Provisions

The above warranties are effective provided the water treatment system is operated at water pressures not exceeding 125 psi (8.8 kg/cm²), and at water temperatures not exceeding 120°F (49°C); provided further that the water treatment system is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and provided further that the water treatment system is not damaged as the result of any force of nature such as, but not limited to, flood, hurricane, tornado or earthquake.

The limited warranty does not cover damage due to: (a) transportation, (b) storage, (c) improper use, (d) failure to follow the product instructions or to perform any preventive maintenance, (e) modifications, (f) unauthorized repair, (g) normal wear and tear, or (h) external causes such as accidents, abuse, or other actions or events beyond Warrantor's reasonable control. Use of aftermarket, used, or non-manufacturer provided parts will void all warranties. Warranty does not cover failures due to improper product installation. Warrantor is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages, or other circumstances beyond its control.

THERE ARE NO WARRANTIES ON THE WATER TREATMENT SYSTEM BEYOND THOSE SPECIFICALLY DESCRIBED ABOVE. ALL IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE EXTENT THEY MIGHT EXTEND BEYOND THE ABOVE PERIODS. THE SOLE OBLIGATION OF WARRANTOR UNDER THESE WARRANTIES IS TO REPLACE OR REPAIR THE COMPONENT OR PART WHICH PROVES TO BE DEFECTIVE WITHIN THE SPECIFIED TIME PERIOD, AND WARRANTOR IS NOT LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. NO DEALER, AGENT, REPRESENTATIVE, OR OTHER PERSON IS AUTHORIZED TO EXTEND OR EXPAND THE WARRANTIES EXPRESSLY DESCRIBED ABOVE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty applies to consumer-owned installations only.

This water treatment system is manufactured by
Water Channel Partners, 2805 Dodd Road, Suite 300, Eagan, MN 55121
Customer Information Telephone No. 1-800-972-0136