



## THE TOTAL WATER FILTRATION SYSTEM

### Installation Procedures

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**A filtration tank system combined with a multi-patented, salt-free, multi-stage magnetic device to condition hard water**



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## 1 Introduction

The Total Water Filtration System improves water quality WITHOUT the need for consuming electricity, using chemicals, or backwashing. The filtering tank reduces chlorine and heavy metals like lead and mercury, as well as copper, nickel, chromium, and other dissolved metals. The tank media also inhibits the growth of bacteria. Conditioning rings in the tank convert hardness from a dissolved contaminant to a sub-micron suspended solid, that literally washes through the plumbing system before it can react and form a scale or interfere with the action of soaps and detergents. A sediment pre-filter removes particulates in the water down to 5 microns, and a carbon post-filter removes bad tastes, odors, VOC's and SOC's including pesticides, herbicides, and chlorine by-products. The upflow design prevents water channeling for maximum filtration.

## 2 Precautions

**Read these instructions before initiating installation procedures, to assure all needed parts are on hand.**

- Install on cold water lines only.
- Protect unit from freezing.
- Install unit only in systems where line pressure does NOT exceed 100 psi (6.9 bar).
- Use Teflon tape for thread sealing. Do NOT use pipe dope.
- Use only warm, soapy water to clean outside of main tank and pre-filter housing. Do NOT use chemical or abrasive cleaners, which may damage filter housing.

## 3 System Unpacking

Do the following when unpacking a delivered system.

1. If damage is apparent, report damages to shipping carrier.
2. With all system components out of their cartons, inventory the items received. Verify the following:
  - Mineral Tank w/ Chrome Cover
  - Riser Tube w/ Bottom Filter Cone
  - Small Blue cap (inserts into riser tube opening)
  - 5 RWE Magnetic Conditioner rings (yellow)
  - RWE Magnetic Conditioners for water heater (red)
  - Distributor Head
  - Garnet (salt and pepper color gravel)
  - KDF® (gold media)
  - 2 - Mounting brackets w/ screws
  - 2 - Blue filter housings w/ Distributor Heads: 10" H, 20" H (Check for o-ring in channel around top of each housing. If missing, contact PuriTec.)
  - 2 - 1" x 6" PVC pipe nipples
  - Pleated filter element, 10" H
  - Carbon cartridge filter element, 20" H
  - Filter wrench
  - Funnel
3. If an item appears to be missing, contact PuriTec before proceeding.

## 4 Specifications

**Total Water Filtration Systems**

	TWFS-9C	TWFS-10C	TWFS-12C
<b>Tank Size</b>	9" x 48"	10" x 54"	12" x 52"
<b>Total Height</b>	50"	56"	54"
<b>Inlet/Outlet Connection</b>	1" MPT	1" MPT	1" MPT
<b>Flow Rate (gpm)</b>	8	12	18
<b>Peak Flow Rate (gpm)</b>	10	15	20
<b>Max. Temp.(°F)</b>	125°	125°	125°
<b>Max Pressure (psi)</b>	120	120	120
<b>Wt. (lbs)</b>	120	160	200
<b>Main Tank Capacity (gal.)</b>	2 million	2.5 million	3 million

## 5 Pre-Planning Considerations

Every installation is unique and has a unique set of conditions, but all water filtration systems have a common requirement -- periodic tank maintenance. While there is always an in-house master water shut-off valve, for example, it may not be in a location convenient to the intended location of the Total Water Filtration System. An additional shut-off valve may be desirable, as well as a backflow shutoff to prevent draining the whole house when the system needs to be serviced. Dual shutoffs provide convenience when the sediment tank filter and/or the carbon cartridge needs to be changed or the Main Filter Tank needs servicing. Although such an arrangement is shown in Figure 1 below, constructed using PVC technology as an example, aside from the PVC technology used to connect the components in the TWFS itself, the plumbing technology might well be copper.

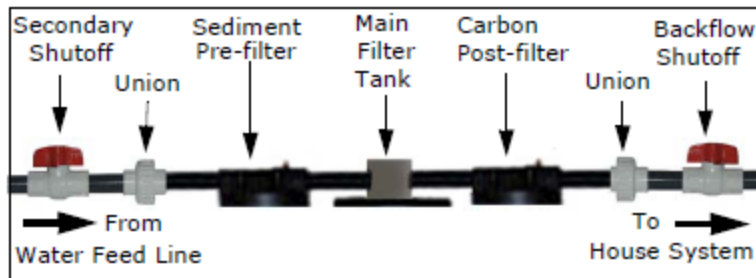


Figure 1 Depiction of Unions and Valves in TWFS Installation

Plumbing parts such as additional valves, piping, unions, elbows, couplings, adapters, etc., may be desirable or even required by the plan of the specific installation. Hardware not shipped with the product, however, is subject to local purchase by the customer. Both sediment filter and main filter inlet/outlet provisions are 1" FTP ports. Connection options to copper pipe include 1" MPT to sweat (be sure to keep the heat away from the plastic distributor caps), or 1" MPT to compression. Pre-planning helps assure that you have all components on hand necessary to complete the installation.

## 6 Pre-installation Main Tank Assembly Procedure

To prevent damage during shipment, the main tank filter material is shipped separately from the tank. A funnel is provided for use in filling the tank with the Garnet and KDF<sup>®</sup> media at time of installation. Use the following procedure.

1. Slide 5 RWE Magnetic Conditioner rings (yellow) onto riser tube so that top ring is approximately 6" from top of tube and rings are positioned approximately 1" apart.

Note: Use pliers to pinch ends of rings to tighten on riser tube to prevent from further sliding, if needed. Installed rings should extend no lower than  $\approx$  upper third of riser tube.

2. Place main tank on firm flat surface in vertical orientation (open end up), and secure to prevent tipping.



Figure 2 Blue Cap

3. Assure blue cap (supplied), see Figure 2, is inserted partially into top end of riser tube as depicted in Figure 3 below.

Note: Do not force cap fully into tube. The cap functions only to prevent filter material from entering tube when tank is being filled, and must be removed when filling process has been completed. If cap has been forced into tube it can be difficult to remove, which may result in tube becoming dislodged from bottom of tank during removal.

If cap is unavailable, affix tape across riser tube opening.

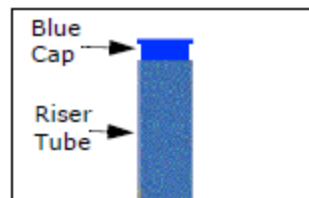


Figure 3 Blue Cap in Riser Tube

4. Insert tube into tank so that riser tube diffuser cone is centered at bottom of tank. See Note below.

Note: When properly positioned, top of riser tube is centered in tank opening just below top of thread line in tank, as depicted in Figure 4 at top of next page.

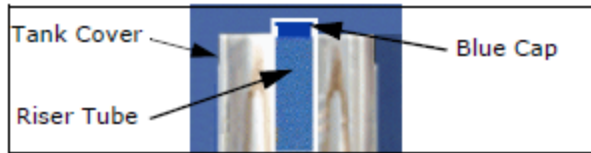


Figure 4 Main Tank w/ Cutout Showing Riser Tube

5. Position funnel (see Figure 5) in opening at top of tank.



Figure 5 Funnel

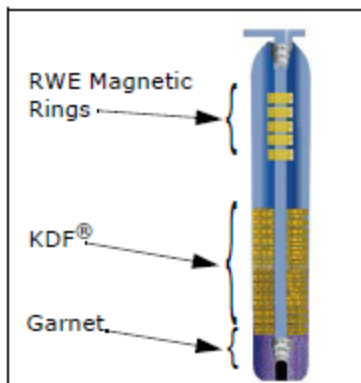


Figure 6 TWFS Filter Tank

Refer to Figure 6 at left for illustration of results of steps 6 - 12.

6. Pour Garnet (salt and pepper color gravel) into tank.  
Note: The garnet covers the bottom diffuser cone.
7. Gently rock main tank back and forth slightly to level media in tank, and assure riser tube is still centered in top of tank.
8. Pour all KDF® media (gold material) into tank.  
Note: Total height of garnet and KDF® is  $\approx \frac{1}{2}$  tank height.
9. Repeat step 7 and then continue to step 10.
10. Remove funnel from tank, and then carefully remove blue cap from riser tube.  
Note: Do NOT pull up on riser tube.
11. Safely store cap and funnel for possible future use in future tank maintenance.



Figure 7 Diffuser Cone on Distributor Head

12. Position distributor head on tank so riser tube inserts into diffuser cone on bottom of head (see Figure 7), and screw head securely into tank.

Note: Be sure the riser tube fits tightly inside the diffuser cone port (if not, contact PuriTec). **Hand tighten head on tank**, to avoid possible damage to distributor head as a result of overtightening.

13. Wrap teflon pipe tape onto threads on one end of 1" x 6" PVC pipe (supplied), and screw pipe securely into port marked "out" on distributor head. See following Note and **Caution**.

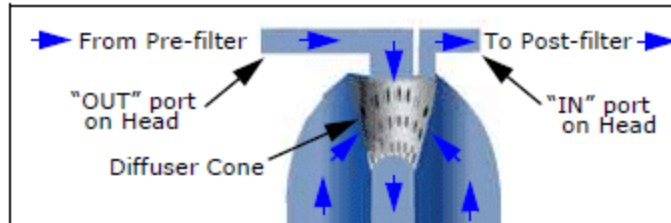


Figure 8 Depiction of Water Flow Direction in Tank Head

Note: The TWFS uses an upflow design, meaning that the water flows down the riser tube and up through the filter media. See Figure 8. This requires that the inflow to the main filter tank be connected to the "out" port on the main filter tank distributor head.

**Caution: Hand-tighten only. Use of pipe wrench or other such tool can damage pipe and/or plastic distributor head if pipe is overtightened.**

14. Screw outlet port of sediment pre-filter distributor head securely onto 6" pipe nipple just installed in "out" port of main tank head, so that orientation of secured head provides for sediment filter housing to hang parallel to filter tank when installed. See Figure 10 on page 6.

Note: When properly assembled, the outlet port on the sediment pre-filter distributor head is connected to the "out" port on the main tank distributor head.

15. Wrap teflon pipe tape onto threads on one end of 1" x 6" PVC pipe (supplied), and screw pipe securely into port marked "in" on main tank distributor head. See following Note and **Caution**.

Note: The outflow from the main filter tank is from the "in" port on the main filter tank distributor head.

**Caution: Hand-tighten only. Use of pipe wrench or other such tool can damage pipe and/or plastic distributor head if pipe is overtightened.**

16. Screw inlet port of carbon post-filter distributor head securely onto 6" pipe nipple just installed in "in" port of main tank head, so that orientation of secured head provides for carbon filter housing to hang parallel to filter tank when installed. See Figure 10 on page 6.

Note: When properly assembled, the inlet port on the carbon post-filter is connected to the "in" port on the main tank distributor head.

17. Continue to Section 7.

## 7 Installation Instructions

It is recommended that installation of the Total Water Filtration System be done by a professional plumber. The installed system must adhere to local and state plumbing codes.

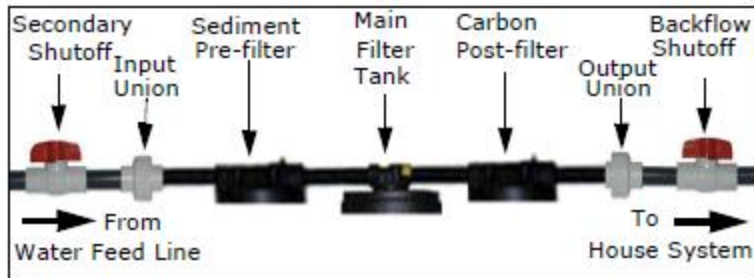


Figure 9 Arrangement of Unions and Valves in TWFS Installation

The following installation procedure assumes an installation similar to that shown in Figure 9. Although Figure 9 illustrates use of PVC, the same arrangement of components is applicable to copper components, if preferred, using copper/PVC adapters at the inlet to the Sediment Pre-filter and outlet from Carbon Post-filter (see Figure 10 below). Assure unit is installed in only a vertical orientation and NOT in direct sunlight.



Figure 10 Total Water Filtration System



1. Close house main house water shut-off valve.
2. Open any cold water faucet nearby to proposed location for water filtration system installation, to relieve line pressure.
3. Cut cold water pipe on house side of water meter in metered system, or on house side of shut-off valve in private system.
4. Remove piping from water line, consistent with system planning, to permit insertion of water filtration system.
5. Extend water supply line, if necessary, from water source line to input side of location of water filtration system.
  - 5.1 If location is remote from master shut-off, install secondary shut-off valve (supplied) in close proximity to proposed location of water filtration system. Otherwise, continue to step 5.2.
  - 5.2 Install input side of input union to output side of secondary shutoff (if installed), or otherwise directly to water source line. See Figure 9 on page 6.
  - 5.3 Wrap teflon tape onto threads of 1" adapter required to connect output side of input union on water source line to inlet port of sediment pre-filter. See Figure 10.
  - 5.4 Screw adapter into inlet port.

Note: **Hand-tighten** adapter in inlet port, to avoid possible damage to head as a result of overtightening.
6. Connect output side of union to adapter in sediment filter input port.

Note: If using heat to connect copper fittings, be careful to prevent heat from damaging sediment tank input adapter or tank head.
7. Extend water line from house system, if necessary, to output side of location in which water filtration system is to be installed.
  - 7.1 Install water backflow shutoff valve (local purchase) on pipe to house system.

Note: A water backflow shutoff valve is optional, but is recommended to facilitate periodic cleaning of the sediment pre-filter element and/or the charcoal post-filter cartridge.
  - 7.2 Install output side of output union to input side of water backflow shutoff valve (if installed), or directly to house water system pipe if no backflow valve. See Figure 9 on page 6.
  - 7.3 Wrap teflon tape onto threads of 1" adapter required to connect carbon post-filter outlet port to input side of union. See Figure 10 on page 6.
  - 7.4 Screw adapter into outlet port.

Note: **Hand-tighten** adapter in outlet port, to avoid possible damage to head as a result of overtightening.

8. Connect input side of output union to adapter in carbon post-filter outlet port.

Note: If using heat to connect copper fittings, be careful to prevent heat from damaging carbon post-filter outlet adapter or tank head.

9. Secure assembled water filtration system in proposed installation location.

Note: Install sediment pre-filter bracket (supplied) and carbon post-filter bracket (supplied) in installation locations, and secure filters in brackets. Be sure Main tank stands securely on firm flat surface between the two brackets.

10. Mate halves of system input union to connect water source line to inlet port of sediment pre-filter
11. Mate halves of output union to connect outlet port of carbon post-filter to house water system.
12. Insert filter element (supplied) into sediment filter housing, and screw housing securely into distributor head.

Note: **Hand-tighten only**, to prevent damaging the distributor head as a result of overtightening.

13. Insert carbon filter cartridge (supplied) into carbon post-filter housing, and screw housing securely into distributor head.

Note: **Hand-tighten only**, to prevent damaging the distributor head as a result of overtightening.

14. Install RWE Water Heater Conditioners (red) on hot water output pipe from hot water tank (if installed), spaced 1" apart.

- 14.1 Route strap through holes at one end of RWE unit, and loop through locking device pulling strap almost tight. See Figure 11.

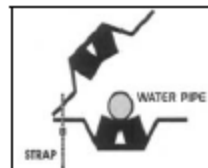


Figure 11 Step 1

- 14.2 Place RWE unit around pipe (if not already done as in step 11), and repeat step 14.1 for other strap.

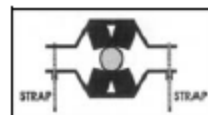


Figure 12 Step 2.

- 14.3 Tighten both straps until unit is tight on pipe.

15. Continue to Section 8.

## 8 System Test

1. With secondary shutoff and backflow valves open, if installed, and all faucets and other water outlets in the house closed, open master house water shut-off valve to pressurize system.
2. Verify no water leaks from filter system installation as well as from any newly installed associated plumbing.
3. After verifying filter system and associated plumbing are water tight, thoroughly flush filter system as follows:
  - 3.1 **Slowly** open cold water faucet nearest to filter outlet (such as an outdoor faucet or cold water faucet in utility sink) and run cold water only, until water runs clear.

Note: "Slowly" open the one faucet to prevent a sudden onrush of water in the Main Tank, which might force filter material into distributor head and clog the head. The flush water may be initially blackish in color as a result of carbon dust from a new carbon post-filter. This is normal and completely harmless.

## 9 System Maintenance

### 9.1 Pre-Filter Element and Post-Filter Cartridge Replacement Procedure

Replacement of the pre-filter element is dependent on the amount of particulate content in the source water. High particulate content requires more frequent change-out of the pre-filter pleated element. When the element has noticeably darkened, as determined by a visual check using steps 1-5 below to access the element, and/or the water pressure has dropped, it is time to replace the sediment pre-filter element.

Change of carbon cartridge in post-filter is recommended every 18 months to two years, on average. Noticeable taste or odor in the house water before the recommended time period indicates need for change in post-filter carbon cartridge.

1. Close main house water shutoff valve, and open near-by faucet to relieve line pressure.
2. Close backflow valve, if installed.
3. Place bucket under filter housing.
4. Press red button on top of filter head to assure all pressure has been released.



Figure 13 Filter Wrench

5. Slide filter wrench (see Figure 13) up filter housing, and unscrew housing in counter-clockwise direction of rotation.
6. Remove old filter element from housing, and empty water from housing into bucket.  
 Note: While housing is off, lubricate O-ring (silicon grease, or vegetable oil) on housing. Reorder part number SD10-0.35 from PuriTec.
7. Insert new filter element into housing and securely re-install housing into distributor head.  
 Note: Make sure filter element is positioned in lower and upper dowels, and hand-tighten housing to prevent possible damage to distributor head as a result of overtightening.
8. Close faucet opened in step 1, and open backflow shutoff valve (if installed).
9. Open main water shut-off valve, and verify No water leaks.

## 9.2 Main Tank Media Replacement

Depending on the size of the installed system (see Table on page 2), the main filter is designed to remove dissolved calcium carbonate (temporary hardness) from  $\geq 2,000,000$  gallons of municipally treated water (about ten years). PuriTec recommends replacement of filter media every ten years.

Two replacement methods are available from PuriTec.

- Media Refill Kit
- Replacement Tank

### Media Refill Kit

1. Close main water shutoff valve and open near-by faucet to relieve line pressure.
2. Close backflow valve (if installed).  
 Note: The backflow valve functions to prevent water from draining out of the house water system when the filter tank of main filter needs to be serviced.
3. Place bucket under pre-filter, and press red button on top of filter to assure all pressure has been released.
4. Open pipe unions on both sides of water filter system and slide assembly out from between pipes to free tank assembly from water system.  
 Note: Place bucket under each union as union is opened.
5. Unscrew distributor head and sediment/charcoal filter assemblies from top of filter tank using pipe on main tank outlet and pipe nipples between main filter and pre-/post-filter tanks for leverage.  
 Note: Riser tube may lift out with cap. If so, slide riser tube down out of cone to separate tube from cap and leave tube in tank.
6. Pour contents of tank into bucket.  
 Note: Recycle filter media in accordance with local regulations.

7. Remove riser tube from tank and rinse any remaining filter media from tube cone and from tank.  
 Note: While tank is separated from distributor head, dry O-ring and then lubricate O-ring (silicone grease, or vegetable oil). Reorder part number SD10-0.35 from PuriTec.
8. Refer to Section 6 starting on page 3 for procedure to use in refilling tank.
9. Position distributor head on tank so that riser tube inserts into cone on center of head, and screw tank securely into distributor head. Hand-tighten only to prevent possible damage to distributor head.
10. Verify proper functioning of system. Refer to procedures in Section 8 on page 9.

Replacement Tank

If you prefer to change out the tank, a tank can be ordered from PuriTec to replace the old unit.

1. Turn off main water line and open near-by faucet to relieve line pressure.
2. Close backflow valve, if installed.
3. Place bucket under sediment filter, and press red button on top of sediment filter to assure all pressure has been released.
4. Open pipe unions on both sides of water filter system and slide assembly out from between pipes to free tank assembly from water system.  
 Note: Place bucket under each union as union is opened.
5. Unscrew distributor head and sediment/charcoal filter assemblies from top of filter tank using pipe on main tank outlet and pipe nipple between filter and sediment tank for leverage.  
 Note: Riser tube may lift out with cap. If so, slide riser tube down out of cone to separate tube from cap and leave tube in tank.
6. Invert tank in bucket to drain water from tank.
7. Recycle old tank in accordance with local regulations.
8. Use procedure from Section 6 starting on page 3 to prepare replacement tank for installation.
9. Plumb new tank into water system, reversing steps 4 and 5 above, as required to remove old tank.
10. Functionally verify proper operation of filter system, using procedure in Section 8 on page 9.

## 10 Warranty

Warranty against defects in material and workmanship in parts of the TWFS is valid to only the original owner at the original installation location, and is limited to the repair or replacement of parts returned to Puritec for inspection by the manufacturer.

Tank, Distributor heads, riser tube, and sediment and charcoal filter housings: 10 year warranty.

Media: KDF<sup>®</sup> media is guaranteed to last at least 10 years (or 2,000,000 gallons, whichever comes first). Replacement under the warranty is at a pro-rated cost. Puritec assumes no responsibility for use of the TWFS on private water sources.

Pleated Sediment Filter and Charcoal Cartridge: No warranty.

**N.B: This warranty does not cover damage resulting from abuse, neglect, freezing, fire, acts of God or other fortuitous event. No allowance is made for the consequential damage, labor or expense incurred as a result of a proven defect in system components not supplied by Puritec nor in installation workmanship.**

## Contacting the Company for Company or Product Information

By Internet <http://www.puriteam.com>

By Telephone or Fax, 8 am - 7 pm Eastern Standard Time  
Toll Free: 1-888-491-4100  
Fax: 888-491-4100  
24-Hour Ordering: 1-888-491-4100

By email [sales@puriteam.com](mailto:sales@puriteam.com)

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