VERTEX Water Products

EasyPur Water Machine

REVERSE OSMOSIS UNDERSINK WATER FILTRATION SYSTEM

OWNERS MANUAL

EZ-575





VERTEX WATER PRODUCTS

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The VERTEX EasyPur Water Machine is made with quality components to provide cleaner, safer drinking water. No chemicals are added or used in this system. To preserve the filter capability, it is a must that the filter replacement be made at the intervals and with replacement elements as specified in section 4.0 of this manual.

WQA GOLD SEAL APPROVAL: The EasyPur Water Machine has been tested and certified by the Water Quality Association according to ANSI/NSF 58 for the specific performance claims as verified and substantiated by test data. See the Performance Data Sheet, page 13.

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i. NOTICE

This instruction manual was written to guide a professional plumber to make an easy installation of the Vertex **EasyPur Water Machine**TM. The installation must comply with state and local laws and plumbing codes.

This filter system can be installed by the homeowner who has sufficient tools and skills. Be cautioned that an extra faucet for purified water will be installed. This requires a 7/8-inch diameter hole in the sink top. If there is not an extra hole existing, a new one must be drilled. For a porcelain sink, this requires a special drill (7/8" Relton cutter) which costs about \$150 and requires skill to use.

ii. PARTS LIST

PARTS CONTAINED IN THE EasyPur Water Machine™ CARTON

1- Box containing storage tank

1 - Box with filter assemblies

1 - Set of 1/4" and 3/8" tubes, orange, white, black, yellow

1-Clean water faucet and fittings

1—Set of hardware consisting of: Inlet water 1/4" ball valve and 1/2" feed line adapter 3/8" plastic ball valve for tank shutoff Drain saddle clamp

1.0 INTRODUCTION

The Vertex EasyPur Water MachineTM is a 5-stage water cleansing system. The principal cleansing of the water of its dissolved solids is by the Reverse Osmosis membrane filter (stage 4).

Stage One is a sediment filter which removes particles of rust, sand and other trash in the water line down to 5-microns in size.

Stage Two and Three are activated carbon block filters which remove odors, chlorine and foreign tastes.

Stage Four is an advanced reverse osmosis membrane for removal of dissolved solids. This is the heart of the system. The reverse osmosis technology removes 95% of the dissolved solids on average. Dissolved solids are not removed by municipal water treatment. That is why the Vertex **EasyPur Water Machine[™]** is an important safety factor for the water you drink and use in your cooking. Chemical contaminants such as mercury, lead, nitrates, pesticides and others not yet identified which seep into municipal water systems are removed. Bacteria such as cryptosporidium, giardia lamblia, and others yet unknown are removed.

The water pressure against the reverse osmosis membrane forces the water molecules through the membrane, but the larger contaminant molecules and bacteria are kept behind and are flushed to the sewer. The clean water goes to the storage tank and is held there ready to use.

Stage Five is a Carbon polishing filter to remove any foreign tastes or odors that may occur from storing the water. When the faucet is opened, clean water from the storage tank flows through the final polishing filter (Stage Five) of activated carbon and into the faucet for your use. The tank is pre-pressurized with a bladder which pushes the water out through Stage Five to the faucet.

A special faucet is installed on your sink which dispenses safe, good tasting drinking water, which is especially good for coffee, tea and drinks. By extending a line to your refrigerator, it can be used to make ice cubes.

LIFE. The filter life is specified by the number of gallons of water flowing through the system. Normal household will use two to three gallons of purified water daily. The filters are good for 1500 to 3000 gallons total usage. The Reverse Osmosis membrane has a longer effective life-span (5-Year Maximum) and should be changed once every 4 years.

2.0 Installation

2.1 Location of RO Unit

The RO unit may be located under the kitchen sink or in the basement. A cold water supply line must be close by. When locating the system under a sink make sure there is adequate room for the filter module assembly as well as the storage tank. For best performance the tank should be located as close to the clean water faucet (supplied) as possible (within 20 feet).

2.2 Mounting the RO filter unit under a sink (Fig. 1)

Mount the unit to the wall of the sink cabinet. Pre-fit the unit by positioning the bottom of the pre-filer cartridges 2 inches off the floor of the cabinet. This clearance is necessary to make room to move the housing when replacing the filter cartridges. Mark the location of the 2 mounting holes in the mounting bracket. Install 2 mounting screws leaving 1/8 inch clearance under the screw head. Check the fit by mounting the RO filter unit but don't install yet.

A 1/4" ball valve is supplied so the homeowner can easily shut off feed water when leaving the home unattended as shown in Figure 1. An automatic water sensor and shutoff valve (battery powered) is available form Vertex to protect the system (P/N LC-8021). The best overall protection from potential water leaks in the kitchen, hot water heater, or utility room is to install an automatic leak detector shutoff valve to the house (Vertex P/N LC-8049).



Optional Main Water Shutoff P/N LC-8049



Figure 2



2.3 Connecting the feed water supply (Figure 3, 4)

The feed water assembly consists of 1/2" brass slip joint adapter, a black washer, and a 1/4" x 1/4" ball valve. Locate these parts in the installation kit.

Locate the cold water shut off valve under the sink and turn it off. Open the cold water faucet to release the pressure. On single handled faucets, the hot water may have to be turned off to prevent any hot water cross-over. If water continues to come out of the faucet with the under-sink valves turned off, the house main valve will have to be turned off.

Now that the water has been turned off, disconnect the cold water riser tube (flex line) from the valve. Install the slip joint connector with the black washer. Loosen the nut and separate the cold riser tube from the faucet shank. Gently bend the riser tube so that the slip joint adapter fits onto the faucet shank. Reinstall the cold riser tube on the slip joint connector using the existing cone washer. For Solid copper tube the procedure is the same except you must cut a piece of the riser tube about 3/4" to 1" so the slip joint adapter can fit between the valve and the riser tube. Wrap several turns of Teflon tape on the ball valve and install on the slip joint connector. (See Figure 3).

In some cases the EasyPur Water MachineTM is supplied with a saddle Valve which can clamp over a copper pipe and make the hole and seal at once. (See Figure 4).



2.4 Installation of drain connection (Figure 5)

Place the drain outlet saddle on the drain pipe. Allow proper space for the drilling operation. Tighten the saddle bolts evenly on both sides. Using the opening in the drain outlet saddle as a guide, drill a 1/4" hole in the drain pipe. Clean any debris out of the drain saddle connection.



2.5 Installation of clean water faucet (Fig. 6)

Step 1. Pilot Drill

The faucet should be positioned with aesthetics, function, and convenience in mind. An ample flat area is required for the faucet base so that it can be drawn down tight. The space under the sink below where the faucet will be mounted must be clear of any obstructions.



Some conditions may eliminate the need to drill a hole in the sink such as a faucet previously installed in the sink, a hole covered by a chrome hole cover, or an unused spray handle. If any of these situations are present, you may mount the faucet in one of these holes.

2.8 Tubing Connections (Figure 8)



[NOTE: This procedure is for the non air gap faucet provided.]

2.6 Porcelain/Enamel over Steel or Cast Iron Sinks

Using a small diameter carbide tipped drill, drill a pilot hole completely through the porcelain and the material underneath. Remove any metal chips that fall into the sink to prevent rust stains. Place the spring-loaded porcelain cutter bit in to the drill chuck. Make sure the pilot guide is inserted tightly. Insert the pilot guide onto the pilot hole. Push down gently on the drill motor to apply light pressure to the porcelain surface. Start the drill motor, turning as slowly as possible. After the initial cut has started, motor speed may be gradually increased. The cut may require three to four minutes to complete. Going faster could result in excessive chipping. Be sure a complete ring has been cut through the porcelain to the metal underneath.

Place the finish hole saw into the drill chuck. Make sure the pilot guide is inserted tightly. Insert the pilot guide into the pilot hole. Begin cut using a slow speed and light pressure until the porcelain has been penetrated to the material underneath. Remove the saw from the hole and clean all debris from the porcelain surface. Reinsert saw into the hole and cut through the remaining material.

2.7 Install Faucet (Figure 7)



3/8" Tubing (White)

ed stud except for the top base plate and sealing gasket. Install the faucet in the sink hole. From below the sink assemble the mounting hardware. Use a deep socket to tighten the nut.

a.

The standard tubing connections on the **EasyPur Water Machine™** are of Quick Connect 0-ring seal design and manufacture. Use the tubing and follow the instructions in Figure 8 to make the connections. If you cut the tubing, make sure it is square cut to the tubing fits squarely in the fitting and seals properly.

Cut the tube square.



Cut the tube square. It is essential that the outside diameter is free of score marks and that burrs and sharp edges be removed before inserting into fitting For soft thin walled plastic tubing we recommend the use of a tube insert.

Insert tube



Fitting grips before it seals. Ensure tube is pushed into the tube stop

Push up to tube stop



Push the tube into the fitting, to the tube stop. The collet (gripper) has stain less steel teeth which hold the tube firmly in position while the "O" ring provides a permanent leak proof seal

Pull to check secure



Pull on the tube to check it is secure. It is good practice to test the system prior to leaving site and/or before use.

Disconnect

Push in collet and remove tube



To disconnect ensure the system is depressurized before removing fitting Push in collet squarely against face of fitting. With the collect held in this position, the tube can be removed. The fitting can then be re-used.

b. Feed Water Line

Connect the orange colored 1/4" inlet tubing to the ball valve, or saddle valve installed in step 2.3 above. To reduce the water hammer effect on this fitting, make a large loop in the tubing before the connection on the sediment filter. To connect, remove compression nut insert tube over the ball valve tube as shown in Fig. 3. Slide nut over threads and tighten. Connect the other end of the tube to the inlet fitting using the method as described in section 2.3

c. Drain Line

Find the black colored 1/4" tubing. Connect the tube to the drain saddle clamp from step 2.4. Push tube into fitting about 1/2 inch. Tighten plastic nut.

d. Faucet Line

Screw on the Faucet adapter to the end of the faucet. Find the white colored 3/8" tubing and insert into the quick connect fitting as described in section 2.8a. Connect the end of the tube to the quick connect fitting on the post filter (stage 5). Push the tube into the fitting until it stops.

e. Tank Line

Install the plastic ball valve on the storage tank. Find the yellow colored 3/8" tubing and connect the tube to the plastic ball valve on the tank. Push tube into fitting until it stops. Connect the other end of the yellow tube to the "T" fitting on the Post filter (stage 5). The tank comes pre-charged from the factory at 5-7 psi. Double check the pressure with a tire gage (the air fitting is on the opposite end of the tank from the ball valve). If it is less than 5 psi add 2 psi with a compressor or bicycle pump. Note: Putting more pressure than 7 psi does not help to increase water flow through the facet.

2.9 Air-Gap Faucet Installation

Air-Gap Faucets are sometimes required by municipal code. The faucet is designed to take the waste water from the membrane to the top of the sink and then let it flow by gravity to the drain saddle. The objective is to prevent possible backup of drain water from the sink to the membrane in the event of a sink clog. A drain saddle with 3/8" instead of 1/4" is used. An extra section of 3/8" tubing (yellow) is used from the faucet to the drain.

Sink Preparation

Drill the appropriate size hole in the kitchen sink to accommodate the air-gap faucet.

Drain Connection

Follow instructions of Section 2.5 except drill a 3/8" hole in the drain pipe.

Tubing Connections

Find the black colored 1/4" drain line from the membrane. Remove from membrane housing. Connect this tube to the 1/4" barbed fitting on the air-gap faucet.

Find the 3/8" yellow tubing in the parts kit. Connect this tube to the 3/8" barbed fitting on the air-gap faucet. Install the faucet assembly (with tubes attached) into the sink hole. Secure the faucet per instructions in section 2.8. Re-attach the 1/4" black tubing to the drain side of the RO membrane housing. Be sure to tighten the fitting nut securely. Attach the 3/8" tube to the drain connector. Tighten the fitting nut securely. Attach the pure water line to the faucet per the instructions in section 2.8 -d.

Note: To help reduce drain noise, gently curve the tubing form the air-gap faucet to the drain connection.

3.0 System Start Up

3.1 Air Purge

The filter elements of stage 1, 2, 3, and 5 filters as shipped are dry and contain air in the pores. The air will slowly be expelled but may collect in the system and will need to be purged for peak operating efficiency. Proceed with section 3.2 for air purge and initial start-up procedure.

3.2 Start-Up

Start the system by opening the feed water ball valve. Make sure the ball valve on the storage tank is in the closed position. Check for leaks for at least 10 minutes. Open the product water faucet and let the water flow until all the air has been expelled from the system. This will take about 30 minutes.

Close the product water faucet. Now open the tank valve. Let the system run about 2-hours to get a complete tankful. Then open the clean water faucet on the sink and empty the tank. This is to flush the tank and remove the preservative from the RO membrane, as well as carbon "fines" from the post filter that may have collected in the tank.

If the waste continues to run after the tank is full, it may mean there is air binding the autovalve. Empty the tank again by opening the faucet. This will help to clear more air from the system. If the waste water running persists, remove the connection and the stainless steel check valve at the outlet of the RO stage. Clean the check valve, reassemble and start the system again.

4.0 Recommended Filter Changes

This system contains a replacement treatment component, the reverse osmosis membrane element, which is critical to effective reduction of TDS. Replacement of the reverse osmosis component should be with one of identical specifications, as defined here-in, to assure the same efficiency and contaminant reduction performance. Replacement part numbers and changeout periods for the RO and other filter elements are shown below. The product water should be tested periodically to verify that the system is performing satisfactorily in addition to making the parts replacements specified.

To maintain the GoldSeal Certification, only these replacement parts should be used.

	Kecommenaea Changeout Interval
RO Membrane Element 75gpd, P/N MH-4206	once each 3 years
First stage sediment filter, 5-micron, P/N TF-4004	once each year
Second stage activated carbon, P/N TF-4003	once each year
Third stage activated carbon filter, P/N TF-4003	once each year
Post filter fifth stage, activated carbon, P/N IFA-4036	once each year

These filter replacement elements are available from your dealer. When you buy or install your **EasyPur Water Machine**TM filter, we recommend that you buy the first year filter replacement kit (FK-103). This includes Stage 1, 2, 3 and 5 filter elements.

This kit comes in a plastic satchel which can be attached to the installed **EasyPur Water MachineTM** under your sink. There is a space to write in the date of replacement, which is a maximum of one year from date of installation. In the replacement kit are instructions for replacement and cleaning,

At year 4 (or sooner if you have severe water problems), we recommend that the Stage 4 reverse osmosis assembly be changed also. When you order your fourth year kit from your Vertex dealer, request the RO membrane along with the other four elements.

5.0 Filter Replacement Procedure

Turn off the feed water at the feed water ball valve. Empty at least 2.0 gallons from the storage tank to take any back pressure off the system. Put a shallow pan under the RO system to catch any water that may spill during the operation.

BE SURE TO CLOSE THE FEED WATER VALVE ON STAGE-1 SEDIMENT FILTER BY TURNING THE VALVE HAN-DLE DOWN. Unscrew the filter body and carefully lift it to the sink to drain or empty the water remaining in it. Discard spent filter body. Install new filter body cartridge. Tighten housing securely. Repeat for all 3 pre-filters.

6.0 Installation Troubleshooting

PROBLEM	CAUSE	SOLUTION
• No or low water production	• Feed water shut off.	• Turn on feed water.
	• Tank valve vlosed or partially closed.	• Open tank valve.
	• Low feed pressure. Feed pres sure must be at least 40 psi.	• Increase inlet water pressure or install booster pump if feed water pressure is less than 40 psi.
• Leak at threaded connection	• Not properly installed	• Remove tube and reinstall into fitting.
Bad tasting water	• Post-filter cartridge not flushed completely.	• Flush one or two tanks of pure water through system.
Water runs to drain all the time	• Auto-valve not closing properly.	• Purge system again.
	• Check-valve clogged or stuck open.	Clean check-valve.
• RO production good at first but falls off in months or weeks	High TDS and/or Iron Manganese in water.	• Consult your dealer of the factory and provide water analysis.

7.0 Conditions Of Use

Water must be microbiologically safe. System pressure, 40 to 100 PSIG. Temperature, 40 to 100 degrees F. PH Range, 3 to 10. Maximum TDS, 1500 PPM. Maximum Iron (Fe) 0.3ppm, Maximum Manganese (Mn) .0.1ppm, Turbidity, less than 1.0 NTU.

8.0 Five-Year Limited Warranty

Vertex Water Products sells its products through independent water dealers who re-sell the product to the end user.

Vertex warrants the **EasyPur Water Machine**TM be free from defects in materials and workmanship for a period of FIVE YEARS from the date of purchase. This warranty does not cover damage resulting from accident, misuse, neglect, improper installation, or subjection to water pressure in excess of 100 lbs. per square inch. The warranty shall extend only to the original purchaser of the product from a Vertex dealer for use by the purchaser. Any modifications of the product shall render the warranty invalid and Vertex will have no further responsibility. All warranty claims must be made to the Vertex dealer from which the product was purchased.

Vertex shall in no event be liable for any incidental or consequential damages of any kind; the sole obligation of Vertex being limited to repair or replacement of defective parts of product. Proof of purchase, date of purchase, and name of dealer are required.

Any implied warranties herein are limited in duration to a period of five years form the date of original purchase or the shortest period allowed by law.

9.0 Performance Data Sheet

Vertex EasyPur Water Machine™ Reverse Osmosis Water Filter System This is a water filter system optimized to produce good drinking water for home use. Model EZ-575



WQA GOLD SEAL APPROVAL (Water Quality Association)

This system has been tested by the Water Quality Association according to **ANSI/NSF 58** for reduction of Totally Dissolved Solids (TDS) listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified by NSF/ANSI 58. Test results; Average Clean Water Production Rate = 28.4gpd (31lpd) at an efficiency rate percentage of 14.2% efficiency. Efficiency rating is the percentage of influent water to the system that is available to the user as reverse osmosis treated water under operating conditions that approximate typical daily usage. Test parameters: 25°C, 50psig and pH of 7.5. Performance under actual conditions may vary.

Contaminant	Average Influent Challenge Concentration	Average Product Water Concentration	Average Percent Reduction	Maximum Permissible Product Water Concentrations
Total Dissolved Solids (TDS)	771 mg/L	78 mg/L	90 %	187 mg/L

Specifications

75 gallon per day reverse osmosis membrane

28 gallon per day clean water production at 50 psig inlet and at 77°F(25°C)

Storage tank: 4.0 gallon total volume; 2.2 gallon water volume Dimensions: 14in. long by 7in. wide by 18in. high: Tank: 11in. dia by 15 1/2in. high Weight: 26 pounds

Conditions of Use

Do not use with water this is microbiologically unsafe, or of unknown quality, without adequate disinfection before or after the system. Pressure: Minimum-40psig: Maximum-100psig Temperature: 40 to 100°F pH Range = 3.0 to 10, max iron content - 0.3ppm Turbidity of inlet water-less than 1.0 NTU, maximum TDS-1500ppm

This system contains replaceable treatment components critical to effective reduction of TDS. Replacement parts and numbers are shown below. The product water should be tested periodically to verify that the system is performing satisfactorily in addition to making the parts replacement specified.

	Recommended Changeout Interval					
RO Membrane Element 75gpd, P/N MH-4206	once each 3 years					
First stage sediment filter, 5-micron, P/N TF-4004	once each year					
Second stage activated carbon, P/N TF-4003	once each year					
Third stage activated carbon filter, P/N TF-4003	once each year					
Post filter fourth stage, activated carbon, P/N IF-4036	once each year					
See OWNER INSTALLATION manual for complete installation/operation and maintenance requirements, including manufacturer's limited warranty.						
5138 Brooks Street - Unit A. Mon	tclair. California 91763					

Tel: (909) 626-2100

Appendix A: Theory Of Operation

Flow Schematic (Figure A-1)



A.1 Pre-Filters

The pre-filters have two purposes, one is to clean the water for better consumption, and the second is to prevent the RO membrane from being polluted. The first stage filter removes sediment materials such as sand, rust, pipe scale, and dirt. It is made of a spun polypropylene material that will take out particles down to 5 -microns.

The water then goes to the carbon block filters, which are important for two reasons. The first takes out 90% of the chlorine in the water thereby protecting the RO membrane from damage by the presence of chlorine. It also removes the taste of the chlorine, as well as other tastes and odors that affect the drinking water . (The carbon accomplishes this by adsorption on its surface). This is a chemical/mechanical process unique to carbon that has been activated -made to have high surface area. The second Carbon Block filter is there to also takes out VOCs (volatile organic chemicals) which are contaminants from industrial pollution.

A.2 The Reverse Osmosis Membrane

This is the heart of the machine, and the great protector. The membrane is a replication of human or animal stomach tissue, which permits the water molecule to pass through, but holds the dissolved molecules back. This occurs naturally by osmotic pressure developed because of the content of dissolved solids. To make this happen with the RO membrane we reverse the osmotic pressure by applying pressure to the water (reversing the process of generating pressure) to push the water molecules through the membrane, but keeping most of the dissolved solid molecules behind. "Most" means about 70% of nitrates and 99% of copper, lead, and other high molecular weight material.

The reverse osmosis technology will, on average, reject 93% of the total dissolved solids in the incoming water. Over time, the RO membrane will foul with a very thin layer of materials and the efficiency will drop, so that the TDS content of the clean water will rise. When it rises to greater than 30% of the inlet TDS value, it is an indicator that the RO membrane should be replaced. This occurs every 3-4 years. (See Section 4)

About 4 gallons of water is discarded for every gallon of pure water made. In Figure A- 1, the discard is shown with a flow control orifice at the outlet of the RO stage. This is designed to hold back the discard water to the above ratio, and maintain pressure on the water in the membrane. For a 75-gallon per day membrane, approximately 668 milliliters per minute of water are discarded. Note there is a check valve on the clean water outlet from the RO. The purpose is to prevent backflow of water to the membrane from the tank or faucet or because of autovalve failure. In the average household, about 3 gallons of drinking water are used a day.

A.3 Auto Control

As water is produced the pressure in the storage tank increases. To stop production of water when the tank is full, an auto control valve is used in the system, as shown in Figure A-1. The pressure in the tank is set nominally to be 2/3 of the incoming line pressure. When this ratio is reached the autovalve will close. Normal U.S. city water pressure is 60-psi, therefore the tank pressure, when water flow stops, is 40-psi.

The purified water goes to the tank where it is stored at pressure as described above. The tank has a bladder in it, and on one side is air at 6-psi, initially. The initial volume of the storage tank is 4.0 gallons. As the water fills the tank, it pushes against the bladder, and raises the pressure as it takes space in the tank. When the pressure increases to 40-psi, water flow stops. The net amount of water in the tank when full, less the space taken by the air at 40-psi is approximately 2.5 gallons. When water is drawn through the clean water faucet on the sink, the water flows through the final activated carbon post filter, which polishes the water by taking out any staleness which has set in.When water is supplied to the refrigerator, the line should be therefore taken after the post filter.

When the raw feed water pressure available is 40-psi or less, the RO membrane will not operate efficiently or produce water at a reasonable rate. To overcome this use a system with a booster pump which will raise the water pressure in the system to about 80-psi.



VERTEX WATER PRODUCTS Montclair, California, USA



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