

## MINI INSTRUCTIONS

**FD** Always use extra length tubing to make your connections you may want to move the unit" to replace the filters in the future.

**GD** Read the Push – In fitting material, make sure you push the tube completely in.

**HD** If a fitting is not push – in, then use moderate pressure to snug up the fittings. Modern" fittings do not rely on brute strength. They rely on teflon tape, O-Rings or gaskets to" make the seal (just snug the fitting to make it secure) Do not over tighten plastic fittings" that have been screwed on too tightly are subject to splitting. Stressed fittings may take" days of even months to split and leak.

**ID** Please, Please, Please READ the installation guide before installing the unit. This guide" will answer a lot of your basic RO questions.

**ÍD** OK! You installed it without reading the guide. Please read the guide before calling or e-mailing us with any questions or problems.

**ÎD** Remember a 50 GPD system makes a maximum 2 gallons per hour, a slow trickle. Yes," more water goes to the drain than is made. All RO systems send water to drain while" operating.

**ÏD** P gxt "lpucm"l"tQ"u{ ugo "y j gtg"lprv"r tguwtg"gzegf u'97"r uk0

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Thanks,

Cliff the H2O Guru

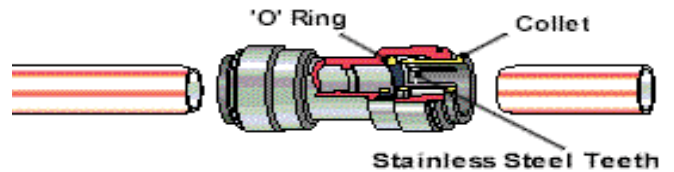
By the way this is the automatic shut off valve ASOV



## How to use Push-In Fittings

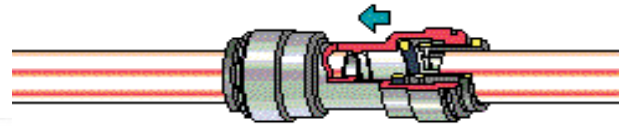
### Cut tube square

Cut the tube square. It is essential that the outside diameter be free of score marks and that burrs and sharp edges be removed before inserting into fitting.



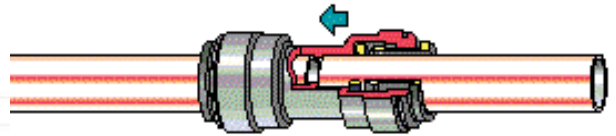
### Insert tube

Fittings grips before it seals. Make sure tube is pushed in the tube stop.



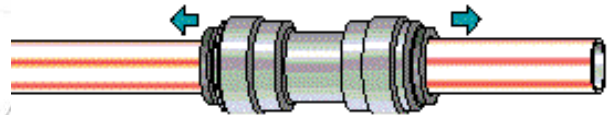
### Push up to tube stop

Push the tube into the fitting to the tube stop. The collet (gripper) has stainless steel teeth which hold the tube firmly in position while the O-Ring provides a permanent leak proof seal.



### Pull to check secure

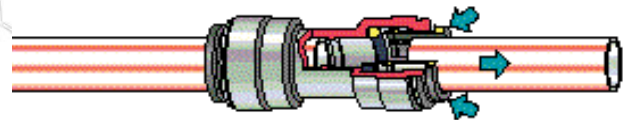
Pull on the tube to check it is secure. It is a good practice to test the system prior to considering your handy work is done. The system doesn't fully pressurize until the tank is full.



### Disconnecting

#### Push in collet and remove tube

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



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The blue dust caps that seal the end are removed in this manner.

## INSTALLATION GUIDE FOR THE INSTALLATION OF REVERSE OSMOSIS SYSTEMS

*Please read this guide it is also a basic lesson in Reverse Osmosis systems*

This is a generic guide. Our intent is to instruct you about the installation of the common components of these systems.

Prior to cutting the tubing to length, make sure it is long enough to allow you to move the unit for filter changing.

You need only simple tools and patience to complete a leak free reliable installation of your system.

Please exercise caution! You are in charge here.

- 1) Turn off electrical power near the work area. Check to make certain that you will not encounter any electrical wires or outlets. If you are unsure turn the power off to the work area.
- 2) Just look around before you drill a hole or pull on something. Will you have enough light to see what you are doing? Our equipment is marketed throughout the world; it may or may not meet local code requirements.
- 3) As is always the case, you should comply with local codes. Be prepared for spills with some rags and a small bucket. Turn off the water supply where you are working until you have finished the installation. Then turn it on slowly and leave it partially closed, until you verify that you have no leaks.

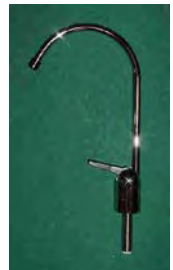
I like to start the installation on a drinking water system with the Goose neck Faucet.

- 4) The place to start is where the faucet will be. You need to consider looks, function, and space requirements. The area should be flat for at least an inch around the faucet. The location must allow for adequate space underneath the sink for the faucet as well as room for you to make and tighten the connection.

You will need to drill a hole in the sink.

- 5) I prefer to use a punch to make a dent for starting the drill.

5a) If you do not have a punch use a 1/8 to 1/4 inch drill bit and slowly with light to moderate pressure to start a small hole. Do not push too hard or the drill bit will skid and possibly scratch the sink.



- 6) The hole size varies with the style of faucet (7/16 – 9/16) of an inch being the range. I like to use a batter powered drill. They are safer and they turn more slowly than power drills. (If you do use a power drill make sure it is properly grounded and in good condition.) Slow speed steady light pressure will give you the best results. (If you want to buy a great tool get a step bit.) They drill various size holes with the same bit. Don't rush it or push too hard on the drill.
- 7) Now that you have drilled the hole mount the faucet.
- 8) Now attach enough tubing to the faucet bottom to reach the rest of the equipment. Cut the tube leaving enough room for moving the system for filter changes.
- 9) The faucet will connect to the system at the final filter. That filter will have an arrow on it. 9a) The arrow will point to the connection of the faucet. The other side of the filter is connected to the pressure tank. I will cover that later, when we discuss the pressure tank.

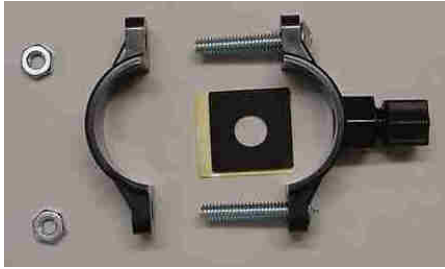
- 10) Next I install the supply valve. ***(Please Note: The supply valve is not designed to work on braided hose. If your home has braided hose, you will need a braided hose adapter. This part is available from us or at your local hardware store. The adapter is a watts brass fitting #BPAV-664)*** It has a couple parts of the valve assembly which includes a small rubber washer on the underside of the valve, a small aluminum block with two concave sides and a brass screw. (See photo left) The valve mounts on a cold water supply tube. (See photo right) **Never install this valve in front of the stop valve under your sink. This valve is to be installed on the supply tube between the stop valve and the sink faucet. The stop valve is the valve that allows you to turn off the water.**



If you are not sure which supply tube is cold, go up to the faucet and turn on the hot water for a couple minutes, turn off the hot water, go back under the sink and feel the supply tubes. The hot water supply tube will be warmer than the cold water supply tube.



The cold water supply tube can be either 3/8 or 1/2 inch. If you are not sure about your pipe than just lay the aluminum piece next to the pipe and use the concave side that fits the profile best. Pick a spot on the supply tube that is a couple of inches away from any other valve and mount the valve. Be careful not to interfere with the travel of the spray wand hose, if your sink is equipped with one. Just mount the valve securely not too tight. You just snug up the brass screw against the aluminum block that is fitted against the tube. The valve should not wiggle or turn when properly secured. (Very snug do not over tighten.) We will return to this valve later.



The drain saddle. This drain water is the life blood of the system. If the system cannot drain correctly, it will not function for long. The system is self-flushing and the drain should never be blocked or restricted. This is really simple. The drain saddle is two plastic parts that clamp over the waste water plumbing of your home. There is a small rubber foam washer that needs to be attached to the inside

of the connection on one piece of the drain saddle. Now clamp the drain saddle in place 3-5" above the top of the bend in the P Trap. (See photo left) Again, just snug the drain saddle in place. Do not over tighten. Now drill a 1/8 to 1/4 inch hole thru the fitting hole thru one side of the waste pipe. (See photo right) Do not drill into the backside of the waste pipe. Simple wasn't it? Connect enough tubing to the drain saddle to reach the unit's drain connection.



**Almost done! Really the hard part is over!**

- 12) Mount the system to the cabinet with care. Do not drill or screw into something on the back side of the cabinet. Most cabinets today are made of particle board so do not hang the system here. Just place it on the cabinet floor and secure it. Particle board is famous for coming apart and dropping the system.
- 13) Locate the pressure tank connection, the pressure tank and the tank ball valve. The tank has only one plumbing connections, it is a threaded fitting at the top or side of the tank. That connection needs Teflon tape applied to the threads, prior to attaching the tank ball valve. How can this tank work with only one connection for the inlet and the outlet? Think about a balloon you blow it up and if you release it the air rushes back out the same opening.
- 14) Once you have mounted the tank ball valve, connect tubing to it and connect to the other end of the open end of the final filter. This is the small filter lying down alongside the membrane housing. (see 9a)
- 15) Now locate the waste water line of the RO unit. The waste water line has a flow restrictor device on it. The fast flush flow restrictor looks like this.





It also has an arrow on it. Please check that the arrow is pointing toward the drain saddle, water flowing to drain away from the machine. **Never impede, restrict or stop the waste water flow.** Your system automatically controls the waste water.

- 16) Now locate the supply connection. It is usually an elbow shaped fitting that is located on one end of the unit. It is screwed into the first vertical filter unit. The first filter is always the sediment filter. The water flows thru this filter first on to the rest of the system. Got it? Good! Connect some tubing to this fitting then to the supply valve.

Now we need to return to the supply valve. (See #10) It's a self-piercing valve. It has a needle in it that will poke a hole in the supply tube. Screwing the valve tee handle to the right will drive the needle into the tube. Slow steady pressure will work better than rushing it. Do not force it. Once you have bottomed out the needle turning the tee handle to the left will start the flow of water. At first you want to open the valve just a bit, and check for leaks. OK, let the water run for a few minutes and open the valve fully. (It will not fall out unless you really overdo it and manage to unscrew the cap nut as well.)

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**Your installation is complete! But you are not done yet!!**

- 17) You need to check on the system after about 4-5 minutes.
- 18) Check it again in another fifteen minutes and again over the next couple of hours. Why the system is filling and it make take three to six hours for the last part of the system to fill.
- 19) You will not be aware of any leaks in that part of the system unit it fills.
- 20) Once the system has filled; open the faucet and leave it open until the water slows to a trickle or small stream.
- 21) Now close the faucet and your system will be ready for use when it refills. Fill time is dependent on water pressure, temperature and membrane size.

It is your house. Use care and diligence in checking for leaks.

Remember to push the tubing completely into the fitting see Push-in Fittings page.

**Your membranes output was determined using 77 degree at 60 pounds of pressure per square inch. If you have 50 degree water you can expect 60% of the rating. If your water pressure is lower than 50 PSI your production will be lower.**

**Your system and its care:**

Once installed your system should not produce any vibration or noise. In some instances if you listen for it you may hear water running to the drain. It also appears not to be making any water though water is running to drain by none is being made. This is normal the system needs to displace a lot of air and the membrane needs to be rinsed of the preservation chemical it was stored in. Please be patient. It will be at least ten to twenty minutes before you will get some water at the RO faucet. Remember to test or verify the operation of your unit. Also, empty the contents of the storage tank every couple of weeks. Just flip the faucet handle up or open it until the water becomes a small stream.

**Remember the blue plastic dust caps are to be removed according to the instructions on the push in fitting page: “Push in collet and remove the tube”.**

## Typical questions:

How do I know when to change the filters?

The sediment filter traps dirt and will become clogged. When it becomes clogged, the system production will slow down. This is how you determine when to change it. You may go all year before it needs changed.

The Carbon block filters have a very high capacity for chemical removal. The average family of four on average city water can go all year. Please change your filters at least annually. Failure to maintain the filters will result in poor quality water or in the failure of the membrane.

The Membranes typically provides 1-4 years of service. It is a thin film composite membrane and is not subject to bacterial attack. It can be damaged by exposure to chlorine. Once damaged it as to be replaced. Many water chemistry matters go into membrane life and we cannot predict how your membrane will perform or how long it will last.

The DI cartridge is rated for 3000 gallons of water before it exhausts. This is compared to the vertical DI that is rated for 9000 gallons of water. This is what takes your TDS down to 0 PPM.

The final filter sees extremely good quality water and lots of our customers go 2 years between changes. I prefer you change it annually.

The system will on occasion trap air in it when first installed. This trapped air will be absorbed by the water in a couple of days.

Sometimes trapped air prevents the automatic shut off valve from working correctly. This trapped air will cause water to go to drain nonstop. Do not worry it's not that much water and it will stop in either hours or at the most days.

System production may be slow during the first 96 hours. But by that time that it should be as good as it will get. Please wait 96 hours prior to calling with production questions.

Your system may run water to drain for the first several hours after the unit is installed. Once you purge the system it will run again for a long time. Once the system is full, the drain water will stop running. When you use water again, the drain water will run again but only long enough to replenish the water used.



Mini with Storage Tank Record

IMMEDIATELY AFTER FLUSHING THE SYSTEM:

Test Pure Water\* after membrane \_\_\_\_\_ TDS (Should be 5-10% of tap water)

\*To get pure water turn off the pre-charged Storage Tank. Flip faucet up. Allow to drip for 5 full minutes and then test the drip. Collect a sample and test TDS. Ex – Tap water 200 TDS – RO only water 10-20 TDS, Pure water 0 TDS. Remember to turn tank back on.

Test Tap Water \_\_\_\_\_ TDS

Notify us if the pure water TDS is more than 5-10% of tap water TDS.

AFTER 3 DAYS DO THE FOLLOWING FOR BOTH OF US

Your new RO system is not going to be operating at full capacity for at least 3 days.

How long did it take to fill? It took \_\_\_\_\_ to fill a \_\_\_\_\_ ounce container.

\*Find a common container like an empty coke can. Start making pure water, and after a couple of minutes fill the container.

RO membrane TDS output (after the membrane) \_\_\_\_\_ PPM TDS

To get pure water turn off Storage Tank. Flip Faucet up. Wait 5 minutes. Collect a sample and test TDS. Ex – Tap water 200 TDS Pure Water 10-20 TDS.

Tap Water TDS \_\_\_\_\_ PPM TDS

Drain Water TDS \_\_\_\_\_ PPM TDS

Water Temperature \_\_\_\_\_ F or C

Colder water is denser and takes longer to process

Water Pressure was \_\_\_\_\_ PSI

(Your water pressure will alert you to the need of filter changes. Your RO system will make more water in the summer than in the winter.)

If you have a DI: TDS after DI \_\_\_\_\_ should have been 0 or very close.

(Testing the DI without testing the membrane output tells you nothing.)

If you cannot answer all of these questions, answer as many as possible.

Please date \_\_\_\_/\_\_\_\_/\_\_\_\_ Model \_\_\_\_\_

Any Modifications made \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTE: Air can confuse the ASOV for up to three days. No more. Also air trapped in the system can cause some interesting vibrations.

Please remember the tip of the TDS meter and the container can get very contaminated. Start with the cleanest water (Pure Water or DI Water) and work toward the tap water. Thoroughly rinse the tip of the meter and the container 2-3 times with Pure water or DI water between testing.

6/25/2015

# CHANGING FILTERS

OCTOBER 2012

## Caution

Do not attempt to open a filter that is under pressure.  
Have a sponge and perhaps a small pail handy. You will spill some water.  
Turn off any close electrical systems.  
The floor might become wet and slippery.

## The Process

Turn off the water supply to the unit.  
Open the unit faucet/valve to relieve the unit of water pressure.

## When to change filters, DI and membrane:

1. At least once a year or if your water production slows down, you need to replace the pre-filters!
2. Sediment filters need replacement when volume output drops. Normal life is one year. If you are on well water, you will have more sediment in your water and will need to replace this filter more often. Every case is different, watch for production slow down.
3. Carbon filter life depends on the chlorine content of your water. Normal life is one year. If you have typical city water you can process over 3,000 gallons of water per carbon block before needing to replace the pre-filters. The in-line In units with a DI filter, when the DI resin is exhausted it will smell (fishy?). The best way to tell is to use a TDS meter.
4. Membranes need replacement if you observe poor taste or have high TDS. Membranes last 3 to 5 years. Chlorine exposure or inadequate carbon filter replacements are usually to blame. Low pressure can also cause a membrane to foul prematurely.

## Replacing the Filters

The standard drinking water system has three to six filter housings across the bottom; the first three filters are the pre-filters to clean the water before it goes into the membrane. These three filters are: a 10 micron sediment filter, a 5 micron carbon and a 1 micron carbon. These filters should be replaced annually. (The Extreme TPack has an upgraded granular activated catalytic carbon filter which replaces one of the carbon block filters.)

1. Unscrew the filter housing and remove the filter. (Use the housing wrench)
2. Clean the housing with soap and water, rinse thoroughly and then install the new filters.
3. Make sure the O-ring is in place and properly seated. (Re-attach the housing hand tighten only, do not use the wrench).
4. For drinking water systems there is a horizontal, inline carbon filter labeled GAC or "taste and odor." Please pay attention to the flow arrow.
5. The larger horizontal cartridge with the cap and also has three elbow fittings is the RO membrane housing. Membranes last 3-5 years.
6. The Compact ReefKeeper has the same 3 filters on the bottom, but the membrane and smaller DI are horizontal. Note the flow direction arrows.
7. The Dual Home Reef is a standard drinking water unit, plus it has a horizontal DI.
8. Horizontal filters all have quick-connect fittings, just remove & discard. Please note the directional water flow. The Mini Ro System, the Max 50 system and the Mighty Mite system all come with quick connect horizontal disposable filters.

## **DI Filter Change**

In units with in-line, horizontal DI, the DI is the second cartridge and has our blue label. In our typhoon units we use a color changing DI Resin that starts out as either green or blue and changes color to a dull orange/brown color as it exhausts. It is time to change the DI cartridge when you start getting readings of more than 3 PPM.

When exhausted, the water will have a strange (fishy?) odor. Please note flow direction. The in-line DI filter has about 50% of the amount of DI resin as is in the vertical refillable cartridge. Large RODI water users should buy the 5 pound bag of DI resin which makes over three DI cartridge refills.

ReefKeepers, like the Typhoon, have 4 filters on the bottom; the last is the DI cartridge housing (the membrane is horizontal on the top). The DI resin is color changing and if it is significantly discolored it is time for a change. Note that even though you may see good color on the outside of the cartridge the resin inside can be fully exhausted. Test the TDS with a TDS meter!

A rough mathematical equation to determine the number of ZERO TDS RODI water that a DI cartridge will process is as follows: Divide 1,200 by the PPM reading on your TDS meter of your RO water coming out of your membrane. For example: if your tap water is 200, the PPM of your RO water from a 75 GPD filmtec membrane will be about 5 PPM. So then divide 1,200 by 5 for a result of 240 gallons of pure RODI water that can be produced from each cartridge.

## **Membrane Replacement**

Open the housing and pull on the small, plastic tube that is the center of the membrane. You can use pliers or a small screwdriver to remove the membrane, after about an inch, the membrane will pull free. The new membrane will come to you with the O-rings already lubricated with silicone lubricant. After replacement, flush the system by allowing it to fill and empty completely. If you have a ReefKeeper, just waste the first 3-5 gallons.

## **Final Step ... Fast Flush Your System**

Now that you have replaced your filters and/or your membrane, please fast flush your system for 3 to 5 minutes. What this will do is to wash the preservative off of the membrane and wash any small dust particles off of the new filters. You are now good to go. Fast flushing your system is a great way to keep your membrane clean and preserve its life. Always fast flushing your system before you make any RODI water will also help preserve the life of your DI resin, because this will waste the stale water in your unit before you start making pure RO water.

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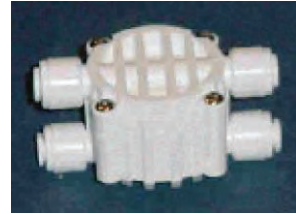
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## THE AUTOMATIC SHUT OFF VALVE ASOV



Looks very complex, but is really very simple.

The water is simply traveling across the valve from left to right or right to left depends on how you look at it.

Pure water travels across the top of the unit.

Filtered water across the bottom.

The valve has a top and a bottom. The top is the side with the (4) screws visible. The bottom has no visible screws and is marked in and out.

The bottom of the valve is connected between the pre-filters and the membrane. Water from the pre-filters is directed to the (in). The filtered water continues from the out to the membrane end with only one connection. The membrane water inlet.

So the bottom of this valve goes in between the filters and the membrane.

The top is the side with the (4) screws connects across the pure water line. From the membrane pure water outlet. You connect to the (in). The pure water outlet of the membrane is on the end with two connections. One connection goes to drain, the other is the pure water. The drain connection is not the one you want.

Once you have located the pure water line, cut it and install the automatic shut off valve. From the membrane to (in) and to the rest of the system (out).

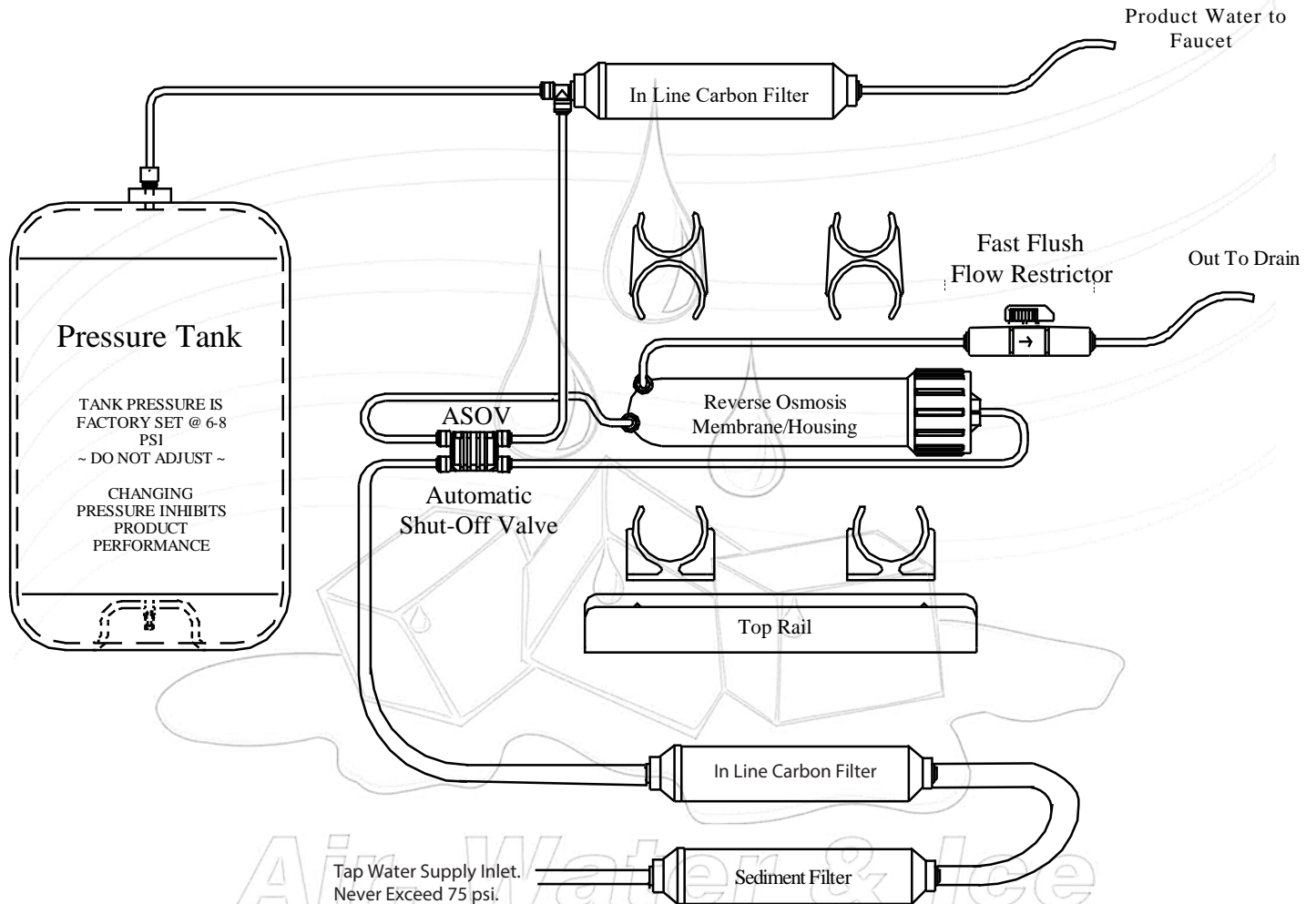
Install the ASOV in the position shown, i.e. with the bottom side down flat.

It can take a few days to get the air of a new system... In the interim the ASOV may hum or vibrate and let water drain thru to the drain constantly. Sometimes several days are needed to absorb the air. Turn unit on its left side, then right side while opening and closing the fast flush 10 times quickly.

# AIR WATER ICE, LLC

## Installation Diagram

### Mini Under Sink RO



~Basic home reverse osmosis system layout~  
\*\*Your unit's assembly may differ slightly\*\*