Manual for Installation, Operation and Maintenance of

5 Stage Point of Use Reverse Osmosis System

System Flow Rate	Model Number
12 Gallons Per Day	AAA-125
24 Gallons Per Day	AAA-245
36 Gallons Per Day	AAA-365

System Flow Rate	Model Number
50 Gallons Per Day	AAA-505
75 Gallons Per Day	AAA-755
100 Gallons Per Day	AAA-1005

APPLIED MEMBRANES INC.®

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APPLIED MEMBRANES INC.® Systems ♦ AM® Membranes & Chemicals ♦ APPLIED® Filters

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Introduction

Please read this entire service guide prior to beginning installation.

The Applied Membranes reverse osmosis drinking water system has been designed for quick and simple installation and maintenance. By carefully reading this instruction manual and following the operational guidelines you will ensure a successful installation and reliable operation. Routine maintenance is essential to the longevity and performance of the system. Filters should be changed every three to six months depending on the quality of the feed water supply.

Conditions for Operation

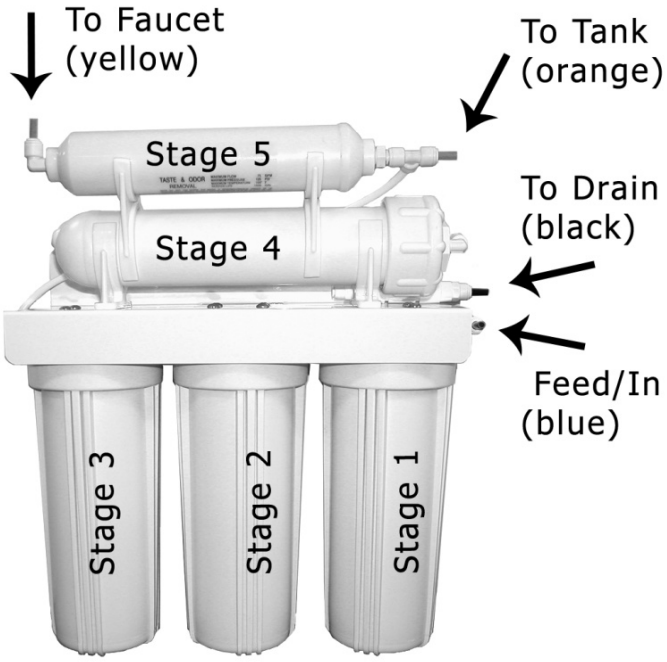
Source Water Supply	
Community/Private	Non-Chlorinated – or chlorinated as long as the carbon filter is in place and replaced every 6 months. Membranes will be damaged by chlorine.
System Pressure	40 psi minimum -100 psi maximum
Temperature	4º-38º C (40º-100º F)
Maximum Supply TDS Level	1500 ppm (mg/L)
Turbidity	<1.0 Net Turbidity (NTU)

Chemical Parameters	
Hardness (CaCO3)	<175 mg/L (<10 gpg)
Iron (Fe)	<0.1 mg/L
Manganese (Mn)	<0.05 mg/L
Hydrogen Sulfide (H2S)	0.00 mg/L
Chlorine (CL2)	0.00 mg/L

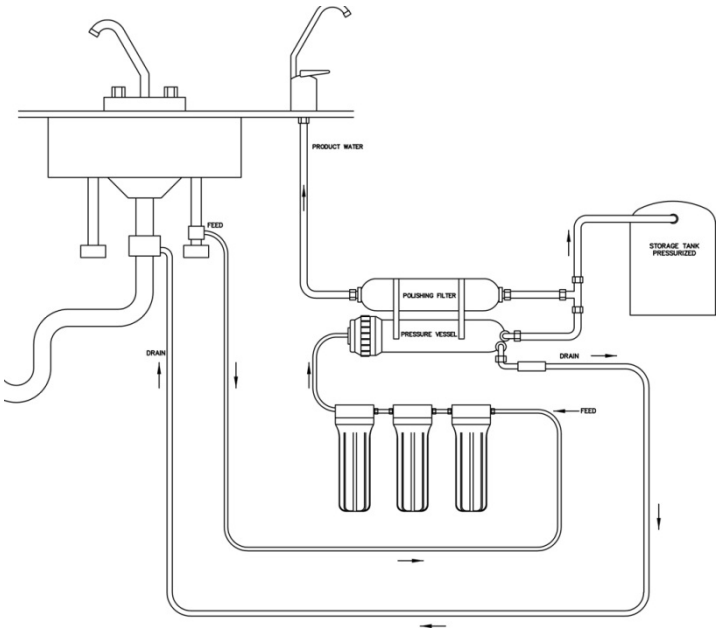
Warnings

- Only use this system on potable water supplies. Do not use this system where the water is microbiologically unsafe or of unknown quality.
- Never use hot water or allow the unit to freeze.
- Incorrect installation or operation will void the warranty.

About Your RO System



Stages & Connection Points



Installation Diagram

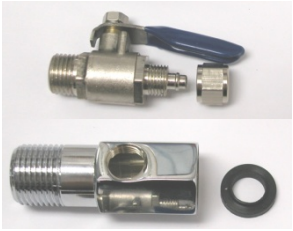
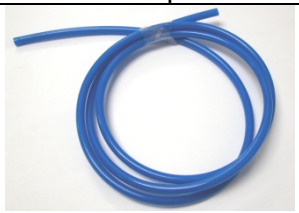
5 Stage Reverse Osmosis Water System

Stage	Description	Replacement Schedule
1st Stage	Sediment pre-filter	Every 3-6 months
2nd Stage	Carbon block pre-filter	Every 3-6 months
3rd Stage	Carbon block pre-filter	Every 3-6 months
4th Stage	Reverse osmosis membrane	Every 12 months
5th Stage	Post carbon filter	Every 3-6 months

Connection	Location	Tubing Color
System Feed (IN)	From feed line to port at the entrance of the first filter housing.	Blue
Reject Water	From the flow restrictor to the drain saddle.	Black
Product Water – Tank	From the tee on the post-carbon inlet to the tank inlet/outlet	Orange
Product Water – Final	From the post-carbon outlet to the faucet	Yellow

Preparing For Installation

Check the following list of components to ensure that all parts are packed with your system.

 RO System	 Storage Tank	 Faucet Kit	 Feed Adapter Kit
 Drain Saddle	 Tank Valve	 Filter Wrench	 Tubing: Blue, Yellow, Orange & Black

Recommended Tool List:

Have the below tools on hand before beginning installation. These are not included with the system.

- Variable speed drill with ⅛", ¼" & 7/16" drill bits
- ½" and 7/16" open-end wrenches (or adjustable)
- Phillips screwdriver
- Utility knife
- Teflon tape

Check Location:

Determine the location for the installation of the RO system. Avoid locations where the system might come in contact with hot water pipes or other hazards.

Determine the location for the faucet. Check to see that drilling the faucet hole will not damage pipes or wires running underneath the sink.

Determine the location for the storage tank. A maximum distance from tank to faucet of 15 feet is possible (additional tubing will be needed). The system will produce a faster flow at the faucet with the shortest tubing run from tank to faucet.

System Mounting

Determine whether mounting the system to the wall is necessary or desired. This can be optional. Dry wall anchors and screws may be necessary (not included with the system).

1. Mark screw locations at the desired positions. Use the two holes on the back of the RO System mounting bracket for marker guides.

2. Screw the screws into the mounting wall on the marked positions. Use an anchoring device appropriate for the type of material you are screwing into.

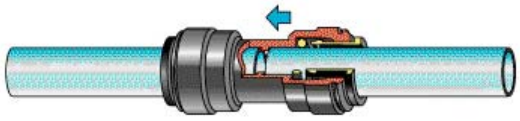
3. Hang the purification system onto the screws by the holes on the back of the unit.

Fittings and Tubing:

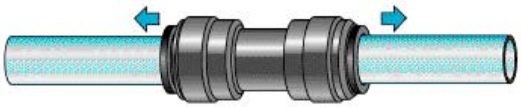
Compression fittings are used throughout the system. To ensure an optimal seal, tubing should be cut with the end square. An angled cut or distortion of the tubing will not provide an efficient seal and may cause leaks. Determine the length of tubing needed for each connection and cut each segment of tubing to the appropriate length.

To ensure a secure seal using quick connect fittings:

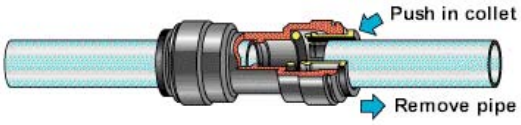
- Push the tubing into the fitting, to the pipe stop. The collet (gripper) has teeth which hold the tubing firmly in position while the 'O' Ring provides a permanent leak proof seal.

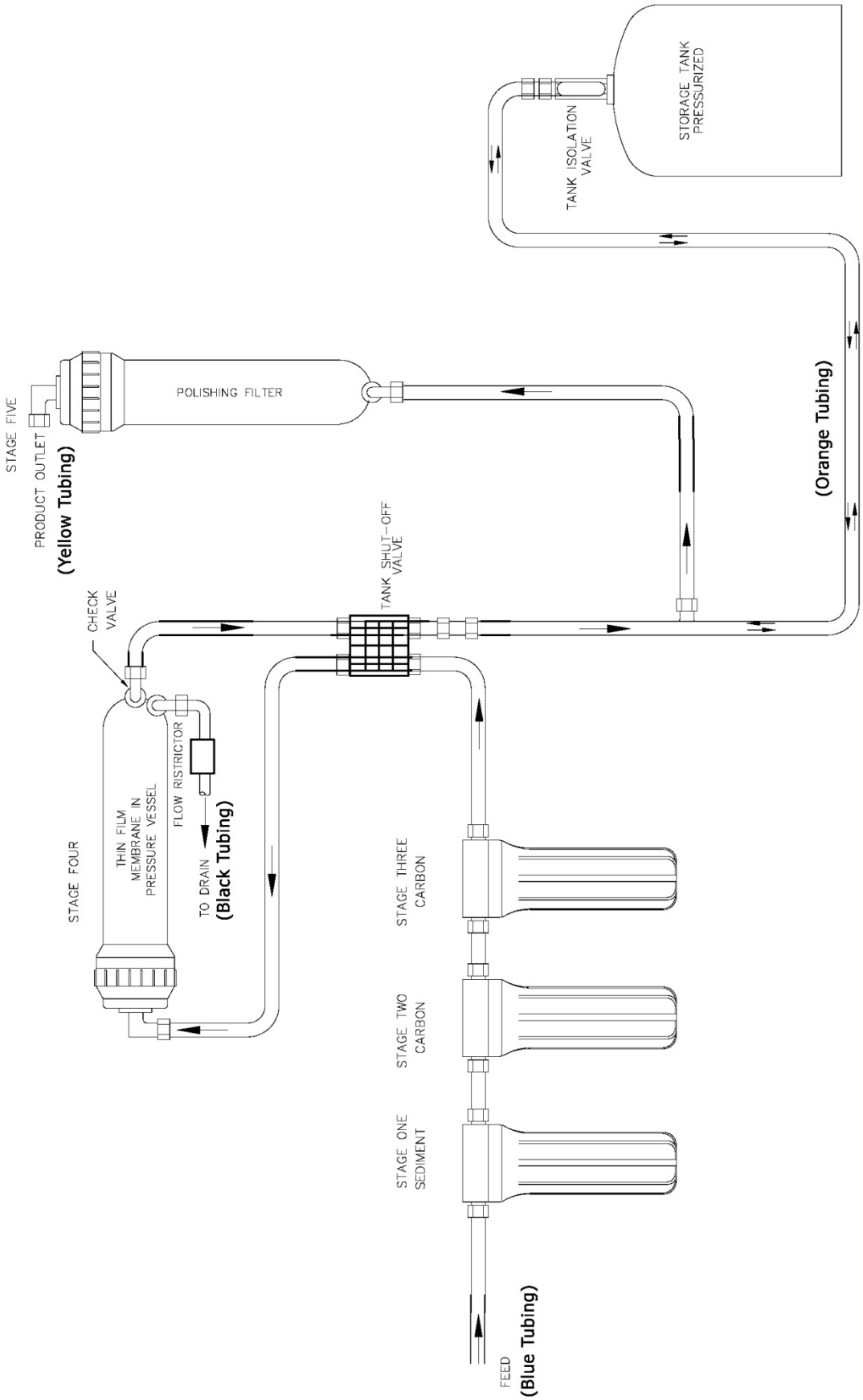


- **Check the Seal:** Pull on the tubing to check it is secure. It is good practice to test the system prior to leaving site and/or before use.



- **To Disconnect:** Ensure system is depressurized before removing fittings. Push in the collet against the face of the fitting. With the collet held in this position the tube can be removed. The fitting can then be re-used.





Starting Your Installation

1. Shut Off the Water

a. Locate the valve in the cold water feed line you use for the supply.

Accidentally hooking up the system to the hot water supply line will permanently damage the membrane (see conditions for operation). To assure you are using the cold water line, turn on both the hot and cold faucet. After the water is warm to the touch, feel the pipes under the sink. It will be easy to identify the hot and cold pipes.

b. Close the cold water valve. Turn on the cold water faucet only to assure that the line is completely shut off and the line is drained. If no shut off valve is located under the sink, or if water continues to come out of the faucet, turn off the main supply at the entry to the house.

Feed Adapter Installation

For this, step, you will need:

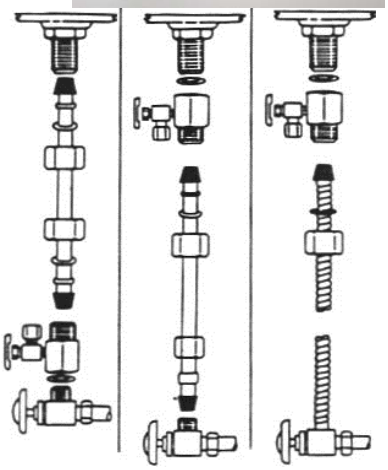
- Wrench
- Teflon Tape

Feed Adapter Kit		Blue Tubing
Slip Joint Adapter (with washer)	Ball Valve (with nut)	
		

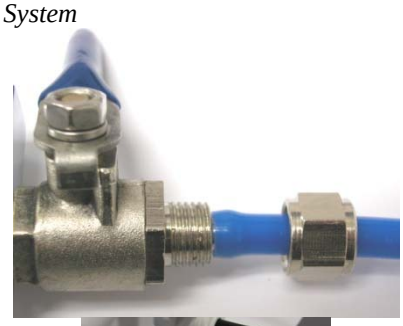
1. **Install the ball valve into the slip joint adapter.**
   Wrap the threads on the ball valve with Teflon tape, approximately 3 wraps. Screw the ball valve into the slip joint adapter.

2. **Install the Supply Feed**
   Wrap the slip joint adapter with Teflon tape, approximately 3 wraps.
   a. **<u>Flex Line</u>**: Loosen nut and separate cold water riser tube from faucet shank. Gently bend riser rube so that slip joint fits onto faucet shank. Make sure the flat washer is on top and the cone washer is on the bottom. Reinstall riser tubes onto slip joint adapter and tighten.

   b. **<u>Solid Copper Riser Tube</u>**: Same procedure as flex tubing except you must cut a piece of the riser tube about ¾" to 1" so the slip joint adapter can fit between faucet and riser tube



3. **Connect the feed line to the ball valve.**
   Unscrew the nut from the ball valve. Slide the nut onto the tubing, threaded sides facing the end of the tubing. Feed the nipple on the ball valve into the tubing, pushing the tubing until it slides over the lip. Slide the nut to the threads on the ball valve, and tighten the nut down over the tubing. Use a wrench to tighten ¼ turn past finger-tight.



4. Connect the other end of the blue tubing to the feed port on the RO System.

 *Feed Valve OPEN Position*	 *Feed Valve CLOSED Position*

Drain Saddle Installation

For this step you will need:

- Variable speed drill w/ ⅛” and ¼" drill bits
- Phillips Screwdriver

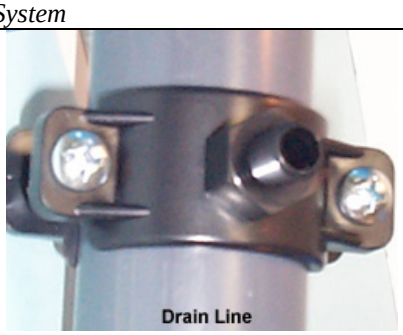
Drain Saddle Assembly	Black Tubing
	

1. **Drill a ¼” hole in the drain pipe**
   a. Select a location for the drain hole based on the design of the plumbing. It should be installed above the trap and on the vertical or horizontal tail piece. Locate the drain connection away from the garbage disposal to prevent potential contamination and system fouling.

   b. Starting with the ⅛” drill bit, drill a ⅛” hole in the drain pipe. Use the ¼” drill bit to enlarge the hole. Clean the debris from the pipe and the hole before continuing.

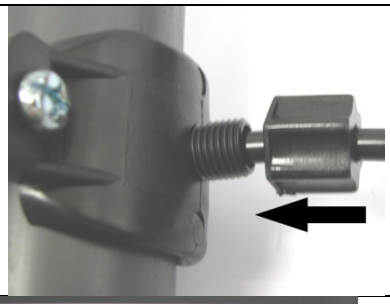
2. Install the drain clamp

a. Remove the black plastic nut from the front of the drain saddle assembly and set aside.
b. Place one half of the plastic drain saddle assembly on each side of the drain pipe with the fitting, and clamp loosely using the nuts and bolts included.
c. Align the hole drilled in the drain pipe with the hole in the drain saddle. A drill bit or other long narrow object may be used to help align correctly.
d. Use Phillips screwdriver to tighten the clamp. Avoid over-tightening.



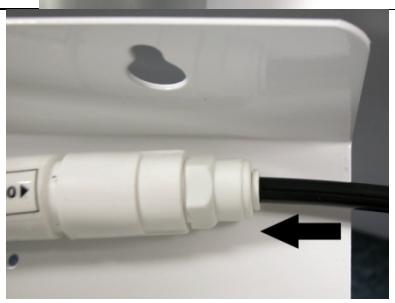
3. Install the drain tubing.

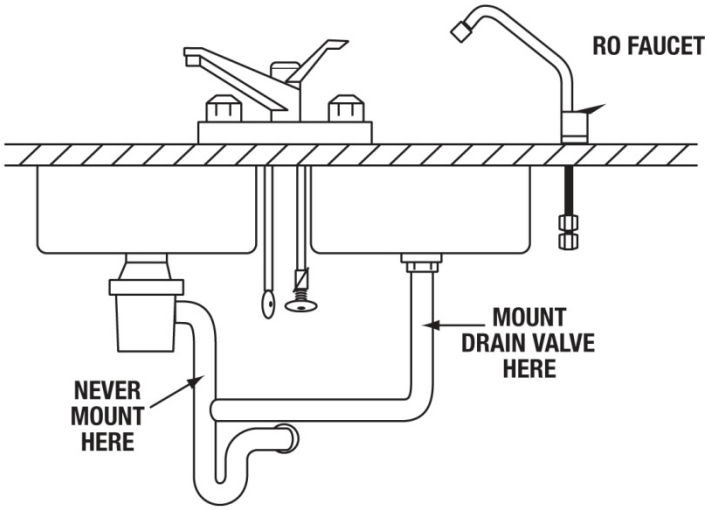
a. Slide the black nut onto the end of the black plastic tubing, threads facing outward.
b. Insert the end of the black tubing into the fitting on the drain saddle.
c. Secure the connection by tightening the nut onto the threaded fitting.



4. Connect to the RO System

Connect the other end of the black tubing to the 'out' side of the flow restrictor on the RO System.





NOTE: Some states require the use of an air gap faucet. Check your local plumbing code to assure compliance.

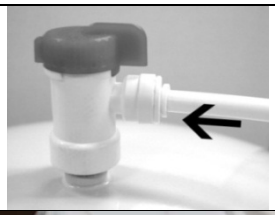
Mounting the Tank Ball Valve & Connecting the Tank

For this step you will need:

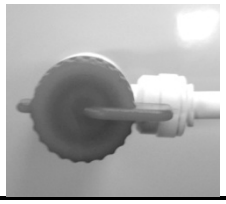
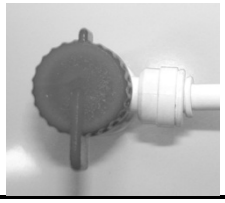
Tank Valve Assembly	Storage Tank	Orange Tubing
		

Note: Do not tamper with the air valve on the low side of the storage tank. It has been factory charged and covered with a black cap.

1. Locate the in/out port on the top of the tank. Connect the tank ball valve by threading onto the fitting. Do not over-tighten.
2. Insert the tubing into the quick connect fitting on the ball valve.



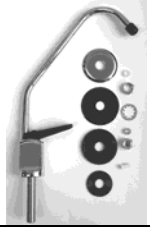
3. Connect the other end of the orange tubing to the tee on the inlet of the post-carbon filter.

Tank Valve in OPEN Position	**Tank Valve in CLOSED Position**
	

Faucet Installation

For this, step, you will need:

- Wrench
- Variable speed drill w/ ⅛” and 7/16” drill bits

Faucet Assembly Kit	**Yellow Tubing**
	

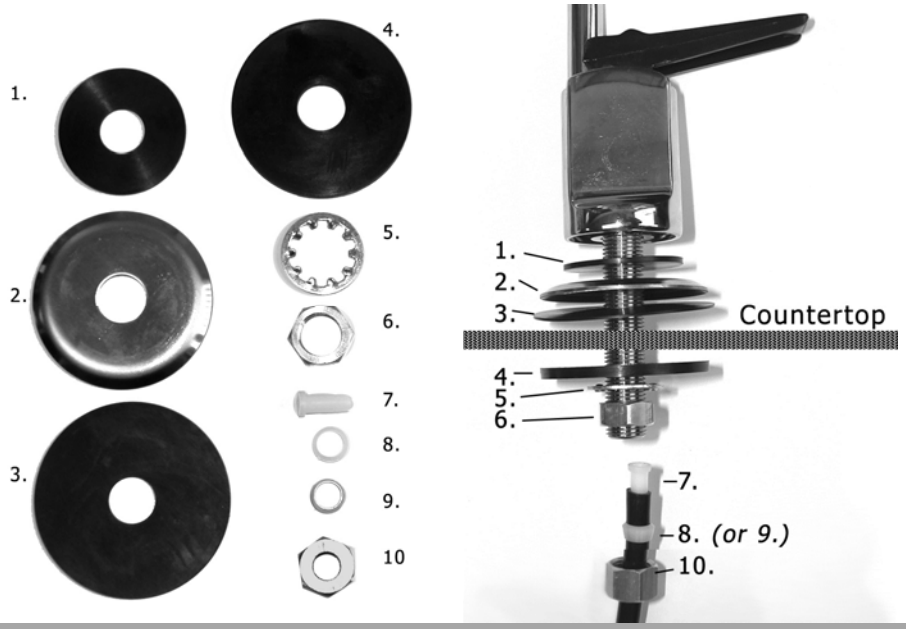
1. Determine the desired location for your RO Faucet

The product water faucet may be installed on any flat surface at least 2" in diameter. Check the underside of the location for interference. The standard faucet that is supplied with the system requires a ½" diameter hole. The optional air-gap faucet requires a larger hole of ¾" to allow for the additional tubing connections required.

- **Stainless Steel Sinks**
  Begin by placing a piece of masking tape or duct tape on the determined location where the hole is to be drilled. Make a small indent to mark the desired drilling location using a center punch. Drill a pilot hole with a ⅛" metal drill bit. Enlarge the hole using a ¼" metal drill bit, using factory approved method or approved plumbing practice.

- **Porcelain/Enamel Sinks or Tile Countertop**
  Sinks of this type are very easy to damage due to the nature of the materials of construction. A successful installation into these sinks requires a knowledgeable technician with the proper cutting tools. We strongly recommend the use of a "Relton" type device. Follow the directions that accompany the tool carefully.

2. Faucet Installation



Above the Countertop
1. Small Rubber Washer
2. Metal Faucet Hole Cover
3. Large Rubber Washer

Below the Countertop
4. Plastic Locating Washer
5. Metal Lock Washer
6. Brass Nut

Installed in/on tubing:
7. Plastic Tubing Insert
8. Plastic Ferrule *(recommended)*
9. Brass Ferrule *(included only for those who prefer to use brass instead of plastic)*
10. Brass Compression Nut

- Slide the small rubber washer, then the metal cover, then the large rubber faucet over the mounting tube onto the faucet base, in that order so that the small rubber washer is on top.
- Insert the mounting tube into the hole in the sink and position the faucet correctly.
- From under the sink, install the plastic locating washer followed by the metal lock washer onto the threaded mounting tube, and secure them with the brass nut. Screw on the brass nut and tighten.
- Feed the brass compression nut onto the yellow tubing, threaded side facing the end, then feed the plastic ferrule and install the tubing insert into the end of the tubing. Insert the end of the tubing into the faucet mounting tube as far as it will go then tighten the nut with a wrench.

Note: Only one ferrule is required. We recommend using the plastic ferrule. The brass ferrule is included only for those who prefer to use brass instead of the plastic. The unused ferrule may be discarded.

Note: Non-Air Gap Faucet – Comes with the system. (Air Gap may be purchased separately - part number H-T5022.) Some states require the use of an air gap faucet. Check your local plumbing code to assure compliance.

3. Connect Tubing

Connect the other end of the yellow tubing to the elbow in the "out" end of the post filter.

4. Additional Point of Use Connection (Optional)

To connect an additional point of use (icemaker, extra faucet, etc.), place an additional tee connector in the ¼" yellow tubing line between the faucet and the outlet of the post-filter. Ensure that all tubing and fittings used for RO product water are poly material, and not copper. Due to RO product water being very pure, it can leach the minerals from copper tubing which will cause a metallic taste in the water or ice and cause the copper tubing to develop pinhole leaks over time.

Turning the System On for the First Time

Make sure all water supply /drain lines are secure and free from leaks.

Slowly turn the feed valve counterclockwise until fully open (the handle should be in line with the tubing as it enters the connection). Check the stem seal for leakage. If necessary, tighten stem nut lightly.

Turn storage tank valve one quarter turn counterclockwise to open the valve (the handle should be in line with the tubing as it enters the connection).

Open the product water faucet and let the water flow until all the air has been expelled from the system. This will take about an hour.

Close the product water faucet. In 30 minutes, check the connections for leaks and correct if necessary.

Do Not Use the First Two Reservoirs of Water

Allow the reservoir to fill for 4-6 hours. Dispense this water to drain. This process removes the factory installed sanitizing solution from the entire system and sends it to the drain. Repeat this process one more time. Allow the tank to fill for 4-6 hours and dispense this water to the drain. Do not drink this water!

Note: Air bubbles may be present in the product water after initial system startup, causing a milky color in the water. This is normal and safe to drink. The air bubbles will disappear within a few days of regular use.

System Maintenance

Membrane Replacement Instructions

The membrane should be replaced every 1-2 years, depending on the water quality.

Before starting, shut off the cold water supply to the unit. Lift the handle on the faucet to drain out the storage tank completely and allow the system to stand for 10 minutes in order to fully decompress the tank. Leave the faucet open until the membrane change is complete.

1. Unscrew the fitting to the cap of the membrane housing.
2. Using pliers, pull out the old membrane from the housing.
3. Remove the new membrane from its bag.
4. Insert the membrane in the housing in the same direction as the old membrane.
5. Push the membrane firmly into the housing until it seats on the far end.
6. Screw the housing cap back on, making sure the o-ring is positioned correctly.
7. Screw the fitting (with tubing) back onto the housing.
8. The system is ready. Turn on the water supply. Check for any leaks.
9. Drain the first two tanks of water before drinking.

Filter Replacement Instructions

All pre-and post filters should be replaced every 6 months.

Before starting, shut off cold water supply to unit. Lift the handle on the faucet to drain out the storage tank completely and allow the system to stand for 10 minutes in order to fully decompress the tank, reserving some of the RO water to use to rinse the filter housings. Leave the faucet open until the filter change is complete.

1. Remove pre-filters from filter housings. Use a filter wrench if the housings are too tight.
2. Discard used filters, but save o-rings for re-use.
3. Clean inside of all housings with a mild soap solution, and then rinse with RO water.
4. Lubricate the o-ring and replace in filter housing.
5. Insert the new filters into the appropriate housings and replace the housings onto the system.
6. Disconnect the post-filter by removing the fittings on either end. Replace with new post-filter and re-use the existing fittings. *(Feed end tee is connected by a short length of tubing, remove this and use to connect to new filter.)*
7. Follow the normal Start-up Procedures. (Drain the first tank of water after changing the filters before drinking.)

Sanitizing

We recommend sanitizing the system at least once a year. This can be done while changing your filters. Shut down the system. If you have an icemaker hook-up installed, be sure the ball valve in the line to the refrigerator is in the closed position during this procedure. Open the faucet to drain the system, including the tank. Remove the pre-filter cartridges and RO Membrane from the system, leaving the old post-filter cartridge in place. Wash the internal filter housing & membrane housing areas with warm soapy water and rinse well to remove the soap. Pour about ¼ teaspoon of Hydrogen Peroxide or household bleach into each filter housing and replace housings on the RO system. Open the feed water valve and open the RO faucet until water flows freely from the spout. Close the faucet and hold the solution in the system for a minimum of 10 minutes. Drain the tank completely, close the faucet to allow tank to fill again, and then drain again. Replace filters and membrane as indicated in the replacement instructions. The post filter should be changed after sanitizing the system.

Troubleshooting Chart

Symptom	Possible Cause	Remedy
No water in the storage tank	Filter Cartridges have failed.	Replace filter cartridges as indicated in maintenance section.
	Cartridges are out of sequence.	Install cartridges in proper sequence as indicated in system components.
	Cartridges are upside-down.	Install carbon block filter right-side-up as indicated on the filter.
	No pressure in storage tank.	Check pressure with gauge. Refill or reduce pressure to max 8 psi.
	Automatic shut-off valve malfunctioning.	Check lines to valve for correct hook-up and check water running into the drain. Replace if necessary.
	Kinked lines.	Straighten lines if necessary.
Getting low flow	Incoming water pressure too low.	Check source of feedwater (city water, well water, etc.) for pressure. A booster pump may be required.
	Change in feedwater temperature.	The reverse osmosis membrane used in your unit is rated at 77ºF and 60psi. Water production will decrease approximately 1.5% for each degree that your incoming water is below 77ºF. It may be necessary to change to a higher flow membrane (and flow restrictor).
	Storage tank pressure is too low.	Check pressure with gauge and refill to maximum 8 psi.
	Filters are clogged.	Replace Filters.
Water leakage at filter bowls	Filter bowls are loose.	Retighten.
	Burr on edge of filter bowl.	Remove burr with emery cloth or sand paper.
	O-Ring in filter bowls is missing, damaged, or not sealed properly	Replace or position correctly.
Water backing up to air gap in faucet (Systems w/ air gap faucets only)	Line is clogged.	Clean out the line.
	Line is too long.	Must be as short and straight as possible.
	Drain line is clogged.	Disconnect 3/8” dia. Line and clean out with probe or by flushing.
Faucet spout is dripping	Handle sticking or worn.	Replace the faucet
Milky colored water	Air in the system	Air in the system is normal after startup of the RO. Water should lose the milky look within a few days of normal usage.

Replacement Parts

Replacement Filter Cartridges

Sediment Pre-Filter, 5 Micron. Stage 1 **Model: H-F1005CF** Qty. 1 Per System *Replace every 3-6 months* 	Carbon Pre-Filter, Extruded Carbon Stage 2 & 3 **Model: H-F2510AC** Qty. 2 Per System *Replace every 3-6 months* 	Carbon Post-Filter, GAC Inline Stage 5 **Model: H-F1032-43QC** Qty. 1 Per System *Replace every 3-6 months* 

Replacement Membranes & Flow Restrictors

System Flow Rate	Model Number	Replacement Membrane Model	Replacement Flow Restrictor
12 GPD	AAA-125	M-T1512A12	H-R2051QC
24 GPD	AAA-245	M-T1812A24	H-R2062QC
36 GPD	AAA-365	M-T1812A36	H-R2064QC
50 GPD	AAA-505	M-T1812A50	H-R2068QC
75 GPD	AAA-755	M-T1812A75	H-R2069QC
100 GPD	AAA-1005	M-T1812A100	H-R1000QC

Other Replacement Components

Part #/ Description	Image
H-H14FWW33 Filter Housing, White	
OR-H10F O-Ring for Filter Housing	
PV2012PME Membrane Housing	
H-S4010ANW Storage Tank, White, 4.4 Gallon (3.2 Gal Usable) Bladder Tank	
H-J2021KW Clip - Membrane Housing to Inline Filter	
H-J2025PW Membrane Housing Clip	

Part #/ Description	Image
H-T5019 Faucet, Non-Airgap, Long- Reach, Chrome	
H-V1050W-QC Shut-Off Valve, QC Connection	
PPSV500822W Tank Shut-Off Valve	
H-D3000M Drain Saddle	
H-V1003 Check Valve, in elbow fitting (membrane reject)	
H-C9200 Filter Wrench	
H-B2031W Filter Bracket	

Part #/ Description	Image
PE-08-EI-0500FW (white) **PE-08-BI-0500FY** (yellow) **PE-08-BI-0500FO** (orange) **PE-08-BI-0500FB** (blue) **PE-08-BI-0500FE** (black) *Sold in 500' Rolls Only*	**¼" Tubing** 
PN-4-P ¼" Hex Nipple (connects filter housings)	
CI0208W ¼"Union Tee Fitting (for feed end of post filter)	
PI220808S ¼"Stem Elbow Fitting (for filtrate end of post filter)	
PI480821S ¼"Tx ⅛"M Elbow Fitting For Membrane Housing (Membrane Housing)	
PI480822S ¼"T x ¼"M Elbow Fitting, Quick Connect (Filter In/Out)	

APPLIED MEMBRANES INC.®

Product Warranty

- SELLER hereby warrants to CUSTOMER that the goods herein described will be free from any liens or encumbrances, that good title to said goods will be conveyed to CUSTOMER by sale of same.

  SELLER warrants materials of its own manufacture against defects in material and workmanship under normal conditions of usage and service as specified in this manual for one year from whichever of the following events occur first:

  - First use of the system
  - Three (3) months following date of shipment from Vista.

  Materials not manufactured by SELLER receive only such warranty, if any, of the manufacturer thereof and which are hereby assigned to CUSTOMER without recourse to SELLER.

  SELLER'S obligation under this warranty is limited to and shall be fully discharged by repairing or replacing any defective part FOB its works. SELLER shall not be liable for repair or alterations made without SELLER'S prior written approval; for membrane elements becoming plugged by suspended matter, precipitates, or biological growth; or for failure to properly maintain the element. SELLER shall not be liable for damages or delay caused by defective material. Products returned to SELLER for warranty examination must be shipped freight prepaid.

- **SELLER'S Liability.** SELLER SHALL NOT BE LIABLE FOR PROSPECTIVE PROFITS OR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, NOR SHALL RECOVERY OF ANY KIND AGAINST SELLER BE GREATER IN AMOUNT THAT THE PURCHASE PRICE OF THE SPECIFIC GOODS SOLD AND CAUSING THE ALLEGED DAMAGE, WHETHER SUCH CLAIM BE BASED ON CONTRACT OR TORT; provided, however, the aforesaid to the contrary notwithstanding, SELLER shall not be liable for any bodily injuries or property damage directly caused by its willful, wanton or negligent acts.

- **All Other Warranties and Damages.** THERE ARE NO WARRANTIES ESTABLISHED, EXPRESS OR IMPLIED OR STATURTORY, INCLUDING THE WARRANTY OF MERCHANTABILITY, EXCEPT THOSE SET FORTH ABOVE OR ANY PERFORMANCE WARRANTY WHICH IS ATTACHED TO THIS ORDER.

- **Permits, Ordinances and Code Compliance.** CUSTOMER has full responsibility for obtaining any licenses, permits and inspections required with respect to installation and use of the goods herein described.

- **Governing Law.** Any agreement based upon this Order and the obligations thereby imposed on SELLER and CUSTOMER shall be governed by and construed according to the laws of the State of California.