INSTALLATION AND OPERATION INSTRUCTIONS FOR

REVERSE OSMOSIS SYSTEMS

☐ Basic™

☐ Premium™

☐ MetalsMaster™

☐ BioMaster™

☐ Other / Custom

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A. Component Placement

A.1 Faucet Placement

Proper faucet placement should ensure a no-splash waterfall pattern into the sink. The faucet handle should normally be positioned to either the left or the right of your existing faucet as one faces the sink.

A.2 Pressurized Storage Tank

In a typical installation, the closer to the faucet that the storage tank can be, the better. If you locate the storage tank under the sink it should be placed so that it can be easily removed from under the sink. Avoid placing the storage tank in an out-of-the-way location. There are two reasons for this: First, the difficulty of installation increases significantly; Second, when the storage tank is located further away from the faucet, the flow rate decreases.

A.3 RO System Assembly Placement

The reverse osmosis system assembly bracket should be hung on a wall or sink cabinet side wall with the two screws provided. Be sure to either:

3.1 Leave enough length of both blue and orange tubing so the system assembly can be lifted off the mounting screws and removed from under the sink for periodic cartridge replacement , or...

3.2 Leave enough bottom clearance to remove and replace the cartridges from their respective housings after the housings have been unscrewed for servicing.

A.4 Pressurized Storage Tank Placement

The storage tank can be placed anywhere within the vicinity of the reverse osmosis system. It can be placed vertically or horizontally. It is suggested for proper flow rate not to exceed placement more than 5 feet away from the reverse osmosis system. If a distance of more than 5 feet from the reverse osmosis system is required, larger tubing may need to be installed between the storage tank and the reverse osmosis system.

B. Component Information

B.1 Filter Cartridges

Sediment Cartridges

Sediment cartridges are designed to remove large amounts of suspended particals from water to help reduce the probability of clogging the reverse osmosis membrane.

Carbon Cartridges (Basic and Premium Series)

Carbon cartridges remove taste and odor, chlorine, pesticides, and other contaminants from the water. These are a necessity on chlorinated water as a pretreatment for systems with thin film membranes (TFM), because the chlorine will greatly reduce the life of this type of membrane. They also help prevent fouling on the quartz sleeves in systems with ultraviolet sterilizers.

Special Metals Reduction Cartridge (MetalsMaster and BioMaster Series only)

B.2 Reverse Osmosis Membranes

The reverse osmosis membrane is made from a semi-permeable material. Its function is to separate water molecules from dissolved impurities in the water. This is accomplished by the application of pressure greater than the osmotic pressure in water containing dissolved solids.

There are two main types of reverse osmosis membranes. The first type (used in Basic Series) is made of cellulose acetate (CA). These have a higher resistance to chlorine, but should not be used on water supplies that have bacteriological contamination. The second type (used in Premium, MetalsMaster, and BioMaster Series) are made of a thin film composite material (TFM). These have a poor resistance to chlorine, but will not be destroyed by bacteriological contamination. These usually also have higher flow rates available.

B.3 Ultraviolet Sterilizers

The ultraviolet light used for sterilizing is at a specific wavelength (254 nm) that destroys or inactivates the DNA of micro-organisms to render them harmless.

Important Safeguards:

- ***Never look directly at an unshielded UV lamp.*** It can cause permanent eye damage. Always wear protective eye wear such as eye glasses or safety glasses.
- Great caution should be exercised when handling a lamp to avoid burns. UV lamps run extremely hot.
- To prevent electrical shock, never immerse or wash the unit in water while the bulb is inside or when the unit is plugged in.
- ***ALWAYS DISCONNECT THE UNIT FROM THE ELECTRICAL POWER SOURCE*** before replacing the UV bulb or servicing any part of the unit.
- Never operate the unit if it has malfunctioned, has a damaged cord or plug, or has been dropped or damaged in any manner.
- Use only those attachments recommended by the manufacturer.
- The Polisher Biolyte™ sterilizer should not be used for any purposes other than its intended function. This unit is designed to treat possible bacteria contamination at the rated specifications and operating limits listed below:

Water Pressure	100 psi
Capacity @ 10 mic. Clear Water	0.7 gpm (3 liters)
Lamp Life	9,000 hours (12 months)
Output	30,000 microwatt seconds/cm²

WARNING: This filter must be protected from freezing. Failure to do so may result in cracking of the filter and water leakage. UV is for bacteria and virus control only. UV does not kill giardia, cryptosporidium, or other cysts. Make certain that the installation complies with all state and local laws and regulations.

C. Installation

C.1 **Drilling the Faucet Hole** (Only if a sink hole is not already provided):

Once the location of the faucet has been determined, always check below the point you are about to drill to ensure it is unobstructed where the hole will exit, and that it isn't over a reinforcing rib.

1.1 Center punch the desired location to provide a starting point for your drill.

1.2 Drill a 1/8" pilot hole.

1.3 Enlarge the pilot hole with a 1/2" drill (or 1¼" high speed steel hole saw for an air gap faucet).

1.4 Remove all burrs and sharp edges.

1.5 Immediately clean up sink area.

Note: If an enamel or porcelain sink is encountered, it is very important that a layer of porcelain be removed before following the steps outlined above. This can be accomplished by gently grinding away, using a hobby grinder and a silicon carbide wheel, enough area of porcelain down to the metal base to accommodate the hole size needed. The drill or hole saw must not contact surrounding porcelain or chipping can occur.

C.2 Standard Faucet Installation

2.1 Slide the faceplate and black rubber gasket on to the faucet stud.

2.2 Place the stud through the hole from the top of the sink or countertop. Properly position the faucet, handle, and faceplate with gasket.

2.3 From under the counter, slide on the black locating washer, used where a 1/2" hole is available or reverse when mounting on stainless steel or when using drilled hole.

2.4 Slide on the washer and nut.

2.5 Be sure faucet spout and body are in proper position, and tighten nut, while holding the faucet in position with a padded crescent wrench. Be careful not to over tighten.

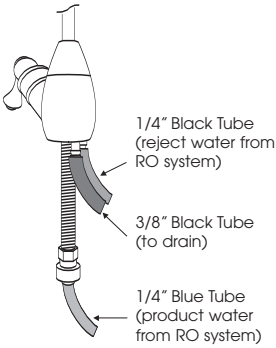
C.3 **Air Gap Faucet Installation** (optional on some equipment)

The air gap faucet includes an anti-siphon device as required by regulatory agencies in some states. The purpose of the air gap is to prevent water in the drain from backing up into the RO drinking water system. It is a dry air gap and allows 1" free fall above the clear line which satisfies all known agencies.

3.1 Slide the face plate and rubber gasket on to the stud.

3.2 Place the stud through the drilled hole. Properly position the faucet, handle, and face plate with gasket.

3.3 From under the counter, slide on the steel slotted washer, white plastic spacer (open end upwards), washer, and nut.



Be sure faucet spout and body are in position, and align the slotted washer and spacer to allow access to hose barbs. Tighten the hex nut while holding the faucet in position with a padded crescent wrench. Do not over tighten.

C.4 Angle Stop Valve Installation

4.1 Turn off cold water supply.

4.2 Disconnect riser hose from cold water supply valve.

4.3 Ensure that sealing gasket is fully seated into angle stop valve female thread. Install angle stop valve (female thread side) on cold water supply valve.

4.4 Connect riser hose to angle stop valve on male thread side.

DO NOT open the angle stop valve or cold water supply valve at this time.

C.5 Drain Saddle Assembly Installation

The RO system comes supplied with a drain saddle and mounting hardware which fits around a standard 1½" O.D. drain pipe.

5.1 The drain saddle should be installed above the trap, on the vertical or horizontal tailpiece. It should never be placed close to the outlet of a garbage disposal.

5.2 Drill a 5/16" hole in the drain pipe in the location where the drain saddle will be positioned. Support the drain against drilling pressure. Do not drill through both sides of the drain pipe. If possible, place the hole so the drain saddle fitting will angle toward the faucet location.

5.3 Position the drain saddle so that the drain fitting is over the hole in the drain pipe.

5.4 Tighten the drain saddle screws evenly and firmly so a good seal is made. Avoid over tightening.

Note: Some state or local codes may require that the drain saddle be served by a trap other than the one serving the garbage disposal. Before making a connection, please check your code regulations.

C.6 Pressurized Storage Tank Valve Installation

6.1 Remove the protective plastic cap from the 1/4" NPT fitting on the top of the storage tank.

6.2 Wrap the 1/4" NPT fitting with Teflon tape (plumbers tape).

6.3 Thread the storage tank valve onto the 1/4" NPT fitting. Avoid over tightening.

C.7 Filter Cartridge Installation

7.1 Unscrew the filter housing sumps by hand or with a spanner wrench.

7.2 Rinse out each of the housings and fill about 1/3 full with water. Add about 2 to 3 tablespoons of bleach and scrub thoroughly with a brush or sponge. Rinse thoroughly.

7.3 Install the cartridge into the sump making sure that it slips down over the sump standpipe.

7.4 Turn the sump into the cap and hand tighten. Do not over tighten.

C.8 Using Quick Connect Fittings

8.1 Insert tube through collet of fitting. The fitting will be gripped before it will seal.

8.2 Push the tube all the way into the fitting to the stop. The collet has stainless steel teeth which grip the tube while the o-ring provides a permanent leakproof seal.

8.3 Pull the tube to check that it is secure. It is good practice to check the system before it is used.

8.4 To disconnect, ensure that the system is depressurized. Push the collet against the face of the fitting. With the collet held in this position, pull on the tube to remove it.

C.9 Reverse Osmosis Membrane Installation

9.1 Disconnect the processed water line from the RO housing end cap via the quick connect fitting.

9.2 Twist off the end cap from the housing.

9.3 Apply a fresh coating of a FDA approved silicone lubricant to the two o-rings on the end of the membrane.

9.4 Insert the membrane into the housing with the "two o-ring end" first.

9.5 Thread the cap back on and hand tighten firmly.

9.6 Reconnect the processed water line by inserting it into the quick connect fitting.

C.10 Ultraviolet Lamp Installation

(Systems with the Polisher Biolyte™ Ultraviolet Sanitizer Only)

10.1 Unscrew white cap with silicon plug from stainless steel UV chamber.

10.2 Carefully insert bulb into the quartz sleeve. Be sure the wire is hanging out of the quartz sleeve.

10.3 Push the stopper (which is attached to the wire) into the quartz sleeve.

10.4 Remove the silicon plug from the white cap.

10.5 Slide the wire through the hole in the cap.

10.6 CAREFULLY screw the cap onto the UV chamber. DO NOT CROSS THREAD. There is a glow bottle starter attached to the lamp. This should be left inside of the cap.

10.7 Replace the silicon plug around the wire into the cap.

10.8 Plug the wire into the power adapter.

10.9 DO NOT attach the power adapter to a power source at this time.

C.11 Connecting Components

Most connections are with plastic quick connect type fittings (see C.8 above). The exception is the drain saddle which has a compression type fitting that uses a nut and a plastic insert. Systems with air gap faucets have two slip-on barbed tubing connections.

11.1 Connect the orange tube (feed water) to the angle stop valve on the cold water supply line.

11.2 Connect the blue tube (product water) from the RO system assembly to the quick disconnect fitting on the faucet.

11.3 Connect the yellow tube (processed water) to the storage tank valve fitting.

11.4 Connect the black tube (reject water) to the drain saddle fitting. If you are using a system with an air gap faucet: connect the 1/4" black tube to the 1/4" barb on the faucet and the 3/8" black tube from the faucet to the drain saddle fitting. ***The 3/8" black tube should not have any loops or should not drop below the drain saddle connection. Shorten the 3/8" tubing if required.***

Note: Make sure there are no kinks in any of the tubing.

D. Startup Procedures

1. Turn on the cold water line valve and check for leaks. Correct any problems if necessary.

2. Purge the air out of the system by slowly opening the angle stop valve on the cold water supply line. Be sure the storage tank valve is open. When open, the valve handle should be parallel with the tubing.

3. Open the faucet. The water should begin to trickle within a few minutes. The RO system should now be processing water.

4. Close the faucet when water begins to trickle, and DO NOT open the faucet again for at least 2 to 3 hours. It will take approximately 2 to 3 hours for the holding tank to fill.

5. After 2 to 3 hours, open the faucet and completely drain the storage tank. You should expect air and carbon fines (black powder) from the carbon filter. This is normal and not hazardous.

6. It is important that the system be flushed at least once. If there is still a slight foul taste in the water or carbon fines after flushing the system once, repeat steps 4 and 5.

Note: It will not be uncommon to experience air bubbles or effervescence in the product water. This will disappear after the system is in service for a short period of time.

WARNING: This reverse osmosis membrane contains a preservative to prevent microbiological growth and freezing, which, if ingested, may cause irritation of the gastrointestinal tract, colic, diarrhea, or other similar symptoms. Therefore, 2 to 5 gallons (approximately 1 to 2 full tanks) must be drawn from the faucet to flush out the preservative before the unit should be considered operational. If there is still a slight foul taste to the water, run another 2 to 3 gallons of water through the faucet.

E. Maintenance

E.1 Filter Cartridges

Sediment and carbon filters have different effective lives when used on different water systems. The amount of use that the cartridge receives also determines its life. A family of two usually will not use as much filtered water as a family of six. No amount of water metering or maintenance scheduling will be an absolute guarantee of performance. Common sense, and the help of your local water treatment professional is still the best way to maintain a properly functioning filtration system. New cartridges (and changing cartridges often) will enhance performance.

A sediment filter's function is to remove suspended particles from the water, thus reducing the possibility of clogging the reverse osmosis membrane. The flow rate will slow down as the cartridge becomes clogged. When the water flow slows down perceptively, it's time to change the cartridge. Depending on your water supply, this could be as soon as 2 months, or as long as 1 year. We recommend at least an annual change.

Carbon cartridges remove taste and odor, chlorine, pesticides, and other contaminants from water. Special advanced-style carbon blocks also remove metals such as lead, iron, and copper. They also prevent iron fouling of the quartz sleeves in UV equipped systems. The carbon cartridges should be changed at a minimum every 12 months (or earlier if you notice any change in the taste or smell of your water). Again, your local water professional will be familiar with the quality of your water supply and can offer valuable advice and/or periodic testing, depending on the quality of your feed water.

Replacing Filter Cartridges

1.1 Turn off the feed water supply to the RO system assembly. Open the RO faucet and let it bleed all the water from the RO holding tank.

1.2 Turn the storage tank valve to the closed position. (90 degree angle to the water line.)

1.3 Unscrew the filter housing sumps by hand or with a spanner wrench.

1.4 Remove the used cartridge and discard. Rinse out each of the housings and fill about 1/3 full with water. Add 2 to 3 tablespoons of bleach and scrub thoroughly with a brush or sponge. Rinse thoroughly.

1.5 Remove the o-ring from the housing and wipe the groove and o-ring clean. Lubricate the o-ring with a coating of clean petroleum jelly. Place the o-ring back into the groove. If the o-ring appears damaged or crimped, it should be replaced immediately.

1.6 Install the new cartridge into the sump making sure that it slips down over the sump standpipe.

1.7 Turn the sump into the cap and hand tighten. DO NOT OVER TIGHTEN.

If the membrane needs to be changed, go to ***Replacing the RO Membrane***

1.8 Slowly turn on the feed (incoming) water supply and allow the housings to fill with water. Check for any leaks.

1.9 Turn the storage tank valve to the open position (parallel with the water line).

E.2 Reverse Osmosis Membrane

RO membranes remove dissolved (not visible) contamination from water (all the way down to the molecular level). The membrane in your system may last for several years in the proper application. The most obvious indication that your membrane needs to be changed is a slow down in the manufacturing of water (i.e. your storage tank does not refill as quickly with water as it once did). If your RO system contains a pressure gauge the membrane should be changed when a 15 psi drop is determined. Your water can also be periodically checked to determine its TDS level.

Replacing the Reverse Osmosis Membrane

2.1 Turn off the feed waterline. Open the RO faucet and drain the water from the tank.

2.2 Disconnect the processed water line from the RO housing end cap via the quick connect fitting.

2.3 Twist off the end cap from the housing. (Reasonable force may have to be used if the end cap has been on for several years).

2.4 Remove and discard the old membrane.

2.5 Apply a fresh coating of a FDA approved silicone lubricant to the two o-rings on the end of the membrane.

2.6 Insert the membrane into the housing with the 'two o-ring end' first.

2.7 Apply a fresh coating of a FDA approved silicone lubricant to the o-rings on the membrane housing.

2.8 Thread the cap back on and hand tighten firmly.

2.9 Reconnect the processed water line by inserting it into the quick connect fitting.

2.10 Slowly turn on the feed water while checking for any leaks.

WARNING: This reverse osmosis membrane contains a preservative solution to prevent microbiological growth and freezing, which, if ingested, may cause irritation of the gastrointestinal tract, colic, diarrhea, or other similar symptoms. Therefore, 2 to 5 gallons (approximately 1 to 2 full tanks) must be drawn from the faucet to flush out the preservative before the unit should be considered operational. If there is still a slight foul taste to the water, run another 2 to 3 gallons of water through the faucet.

NOTE: Manufacturer recommends that the flow capillary be changed every time the membrane is replaced. Disconnect the black reject water tubing from the RO housing drain port. Remove the flow capillary from the tubing and replace it with a new one. *IMPORTANT: Be sure to match the size of the new flow capillary to the new membrane.*

E.3 Ultraviolet Lamp

(Systems with the Polisher Biolyte™ Ultraviolet Sanitizer Only)

Change the ultraviolet lamp annually. The ultraviolet lamp in your filtration system emits a very powerful and specific UV wave length for the sterilization of microorganisms. This wave length is not visible to the naked eye. It is very important that the lamp be changed once every year even if the lamp is still lit. Visible light is not an indication of UV output. After one year, a UV lamp degrades very quickly until it is no longer effective, even if the lamp is still lit.

Replacing the Ultraviolet Lamp

3.1 Unplug the power adapter from the electrical outlet.

3.2 Unplug the lamp from the power cord.

3.3 Loosen and remove the white silicone plug from the white end cap.

3.4 Unscrew the white end cap with the silicone plug.

3.5 **CAUTION:** The old lamp could be very hot. Do not handle until lamp has cooled down sufficiently.

3.6 Slide the old lamp out of the quartz sleeve and discard the lamp and the silicone plug.

3.7 Carefully insert bulb into the quartz sleeve. Be sure the wire is hanging out of the quartz sleeve.

3.8 Push in stopper (cap) which is attached to the wire into the quartz sleeve.

3.9 Remove silicon plug from cap.

3.10 Slide the wire through the hole in the cap.

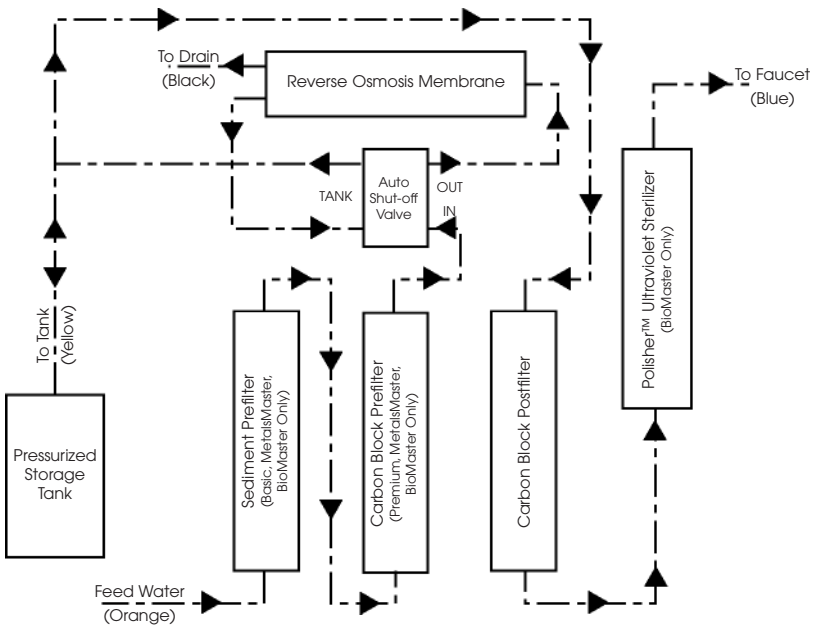
3.11 Carefully screw the cap onto the UV chamber. DO NOT CROSS THREAD. There is a glow bottle starter attached to the lamp. This can be left inside of the cap.

3.12 Replace the silicon plug around the wire into the cap.

3.13 Plug the wire into the power adapter.

3.14 Plug the adapter into the correct power supply. (The use of a ground fault protected outlet is recommended).

F. Flow Diagram



G. Troubleshooting

Problem	Possible Cause	Solution
1. No product water/ not enough product water.	a. Feed water supply turned off. b. Feed water pressure too low. c. Feed water tubing kinked or plugged. d. Flow/pressure control plugged. e. Product water check valve plugged. f. Membrane fouled/clogged. g. Storage tank is over pressurized. h. System has been used too much. i. Storage tank valve turned off. j. Prefilter(s) fouled or clogged.	a. Turn on feed water supply. b. Feed water pressure must be at least 35psi. c. Remove blockage or kink in line. d. Flush out flow control; replace if necessary. e. Clean or replace check valve. f. Replace membrane element. g. Drain tank, and relieve air to 10 psi. h. Convert system to higher production output. i. Open tank valve. j. Replace prefilter(s).
2. Low flow rate from faucet.	a. Low precharge in storage tank. b. Storage tank diaphragm ruptured. c. Tank valve partially closed.	a. Increase air pressure to 7 to 10 psi in tank with product water drained. b. Replace storage tank. c. Completely open tank valve.
3. High TDS product water.	a. Check-valve failure on flow control. b. Membrane fouled, hydrolyzed, ruptured or attacked by bacteria. c. TDS increased in feedwater. d. Filters weren't flushed properly.	a. Replace check-valve tee. b. Replace membrane. c. Contact dealer for revised product water TDS. d. Flush system again.
4. Bad tasting or smelling product water.	a. Increase in product water TDS. b. Post-filter exhausted. c. Storage tank and system contaminated. d. Product line and waste line connections are reversed. e. Membrane life expired. f. UV bulb burned out.	a. See High TDS Product Water above. b. Replace post-filter. c. Replace sediment and carbon filters. Sanitize tank and system. d. Check lines and make corrections. e. Replace membrane and flush system. f. Replace UV bulb.
5. Cloudy water.	a. Dissolved oxygen in feedwater, which is concentrated in product water.	a. Usually clears up as condition of feedwater changes. Letting water stand will allow dissolved air to dissipate.

(CONTINUED ON NEXT PAGE)

G. Troubleshooting (Continued)

Problem	Possible Cause	Solution
6. Cloudy ice cubes.	a. TDS increased in product water. b. Dissolved oxygen in feedwater, which is concentrated in product water. c. Larger (square shaped) ice cubes are usually clearest; small, round ice cubes are usually cloudier.	a. See High TDS Product Water above. b. See Cloudy Water above. c. Change ice cube shape. Let water stand to release dissolved oxygen before freezing.
7. Faucet leaks.	a. Leak through spout. Valve tee bar is set too low or valve seat is defective. b. Leak around stem. O-ring seals worn on valve assembly.	a. Raise tee bar so there is just a little play in handle in the off position, or replace valve assembly. b. Replace valve assembly.
8. Overflow at faucet air gap.	a. Drain tubing kinked or plugged. b. Tubing connections are reversed. c. Air gap plugged. d. Drain tubing not in downward sloped position. e. Pipe tap (drain saddle) not aligned properly.	a. Straighten and clean/flush drain tubing. b. Check tubing connections and correct. c. Clean with vinegar and/or soap. d. Check for low spots and loops. e. Realign pipe tap (drain saddle).
9. No blue glow emitting from UV chamber site ports.	a. Lamp burnt out. b. Power adapter not plugged into wall outlet. c. Lamp not plugged in properly to PIN connector. d. Ballast is burnt out.	a. Replace lamp. b. Plug into wall. c. Check connections and adjust. d. Replace ballast.

UV Quartz Sleeve Cleaning and Maintenance

UV lamps produce heat and UVC output, which may cause certain water characteristics to adhere to and bond on the quartz sleeve. This can cause the quartz sleeve to foul. A fouled quartz sleeve will prevent the UVC from reaching the targeted pathogens.

Denatured alcohol, mild citric acid, or a lime/calcium/rust removal product (LimeAway or CLR) and a ScotchBrite pad (non-scratching) can be used to aid in the cleaning of the quartz sleeve. After the quartz sleeve is rinsed off with water and dry, wipe with a lint free cloth with denatured alcohol as a final step.

The quartz sleeve should be cleaned annually or more frequently, depending on the operating conditions.

Use gloves when handling a clean or new lamp and quartz sleeve. Skin oils will adhere to the lamp and quartz sleeve and prevent UV light from properly emanating.

A quartz sleeve should be changed every three (3) to five (5) years, or sooner if they show wear.