

MEMBRANE HOUSING REPLACEMENT AND START-UP INSTRUCTIONS

This is a general instruction for the loading of membrane(s) in Evoqua equipment. RO membrane housing closures come in several different styles. Determine the type of housing closure on your housing and ensure you have the proper tools.

RO membranes can come with two types of outer sealing mechanisms, brine seal and cage wrapped.

The brine seal type membrane is used on tape and fiberglass-wrapped (outer covering) style membranes. The brine seal is used to seal the membrane to the inner surface of the housing. This forces the water to pass through the layers of the membrane rather than bypass around the outside of the membrane. The brine seal is always installed at the inlet end of the housing.

The cage wrapped (sanitary) membrane is also referred to as a "full fit". Cage Wrapped membranes do not require a brine seal. The outer wrapping is a plastic mesh that extends the full length of the membrane. This is the seal for the membrane and the housing. The mesh design allows a small amount of water to flush the outside, preventing trapping of contaminants. The cage style membrane can be installed either end first.

New membranes are shipped in sealed bags. Please inspect all membranes prior to loading for physical damage that may have occurred during shipping.

Removal and Loading Procedure:

1. Turn off water supply and relieve pressure on the RO and then remove plumbing from membrane housing.
2. Remove both membrane housing end caps from membrane housing.

WARNING: Use appropriate snap-ring pliers to remove spring-type retaining rings. Serious injury can result from attempting to remove spring-type retainers with or without proper tools. Only qualified, trained persons should attempt removal.

3. Remove the membrane by sliding it out of the housing.
4. If replacing a membrane housing, note the clamp locations and mark the new housing accordingly. This will ensure the new housing will properly fit within the RO unit.
5. Ensure that the inside of the membrane housing is clean and free of dirt, dust, or foreign objects. The housings can be cleaned using a rag and warm soapy water.

CAUTION: All O-rings in housing should be checked for defects or distortions and replaced as needed. O-rings and brine seals should be lightly coated with silicone lubricant. Never use petroleum-based products.

6. If required, (Ref to Dwg, Pg. 4) insert the membrane end connector with a twisting motion into the end of the membrane.
7. Place the feed water end cap onto the housing end with the membrane brine seal, if applicable.
8. Slide the membrane into the housing.
9. Push endcap and membranes into the membrane housing:

- a. For U-pin Style, until the U-pin retainer can be placed through the holes in the housing.
 - b. For Snap Ring Style, until the endcap clears the snap ring groove in the housing end.
 - c. For Half Clamp Style, until the endcap bottoms out on the flared end of the housing.
10. Slide the second end cap into the membrane housing until it is seated appropriately and secure.
 11. For U-pin style, insert the U-pin through the housing and place cotter pins or C-clips on each U-pin retainer.
 12. For Snap Ring Style, using appropriate tool, compress the snap ring, place it into the groove on the housing end, and let it expand. Ensure the snap ring is in the groove all the way around.
 13. For Half Clamp Style, ensure even tightening of the hardware used to draw the two clamps together. Do not over-tighten one side or allow the clamps to overlap each other as this may cause damage to the housing. Torque to 140 lbs-inch or if supplied, torque to value provided.
 14. Repeat as necessary.
 15. Install plumbing to membrane housings.

Start-up and Rinse Procedure

WARNING: Product water should NOT be used for any purpose until properly tested and confirmed acceptable for use.

WARNING: Always confirm the absence of chlorine / chloramine in the pretreated water supply when using thin-film membranes. Exposure to chlorine / chloramine may result in RO membrane damage and patient harm.

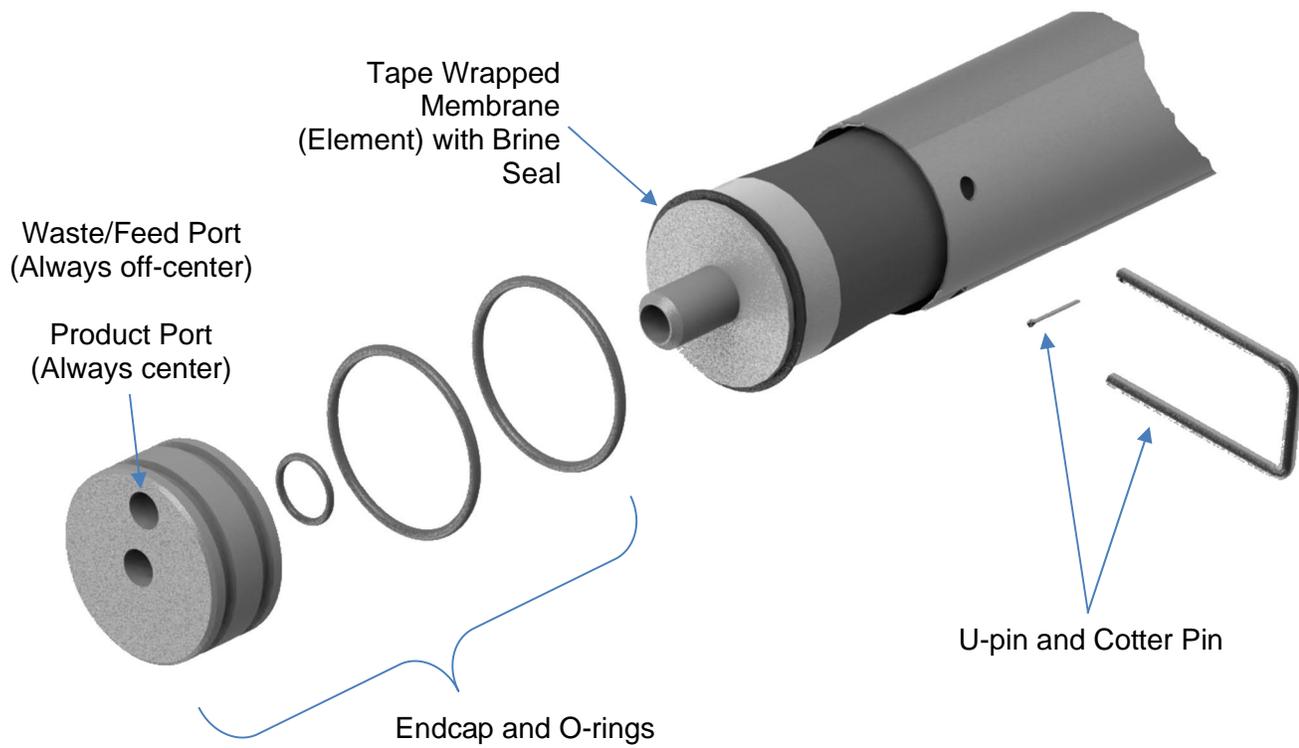
NOTE: Feedwater quality can change over time. Now is a good time to contact your water supply department for a current copy of the "drinking water analysis". Feedwater quality should be checked for changes and appropriate pretreatment modifications made prior to start-up.

1. Divert both product and waste to drain. If equipped, turn the "Flush/Operate" valve to the "Flush" position (older Portable ROs). Refer to operator or service manual (RO dependent) for full flushing instructions.
2. Turn on water to purge all air out of the system at low pressure and flow. Confirm water flow to drain.
3. Turn on RO and check system for leaks.
4. Slowly increase pressure and flow to obtain design performance by adjusting control valves. On older Portable ROs, gradually turn "Flush/Operate" valve to "Operate" position. Otherwise allow RO to perform its pre-programmed start-up. Recheck for leaks.
5. After system has stabilized (percent rejection, TDS/Conductivity, flows), flush system to drain for a minimum of 1 hour to rinse residual preservative solutions.
6. Record operating conditions and performance parameters on the system Operation Log.
7. Disinfect and rinse system per equipment manufacturer's procedure. See "Caution" below.

CAUTION: Membranes must be rinsed for a minimum of 6 hours before being disinfected with formaldehyde or any other disinfectants.

NOTE: Membranes used for dialysis applications must pass an AAMI water quality standards and bacteria culture test before use.

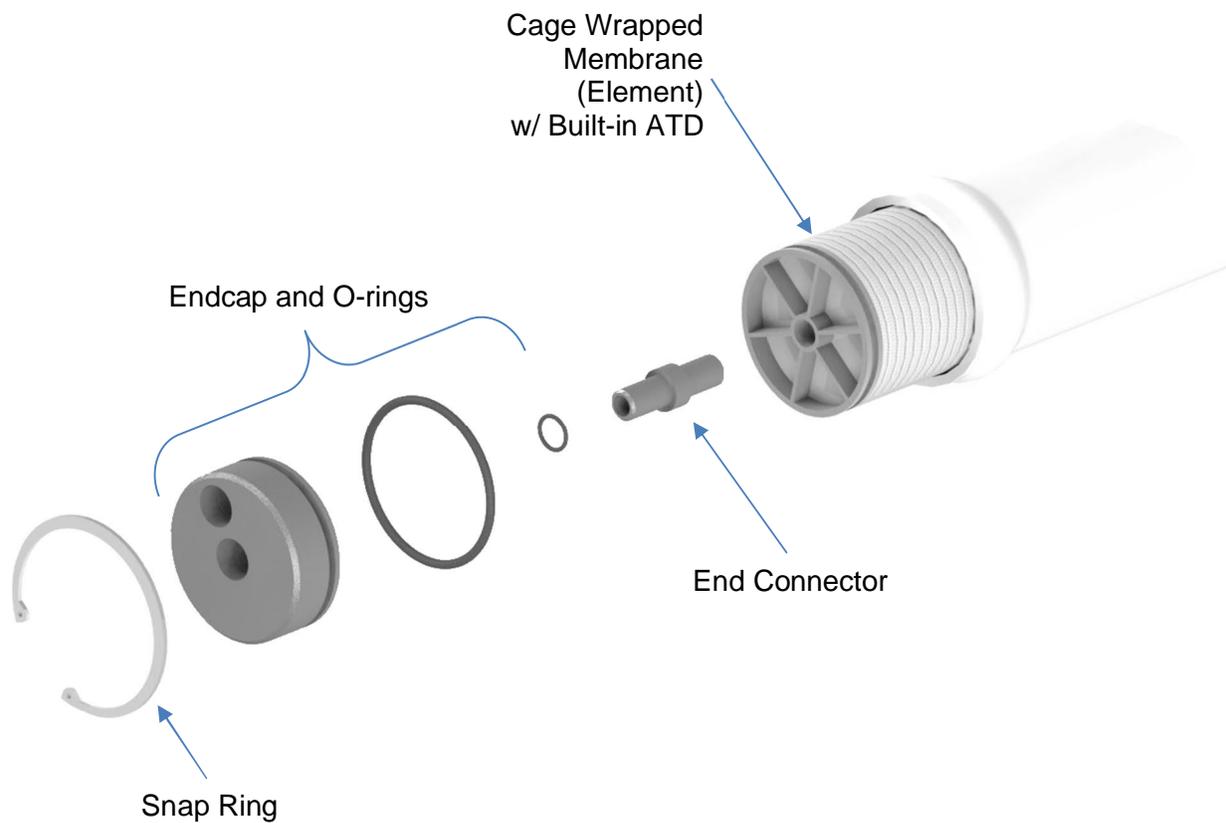
Membrane and Housing Reference – U-pin Style



Notes:

1. The above configuration can represent the 2.5" x 21", 2.5" x 40", or the 4" x 40" housings.
2. Cage wrapped or tape wrapped membrane (shown) may be used with this configuration.
3. Tape wrapped membranes must always be installed with the brine seal on the feed/inlet end of the assembly.

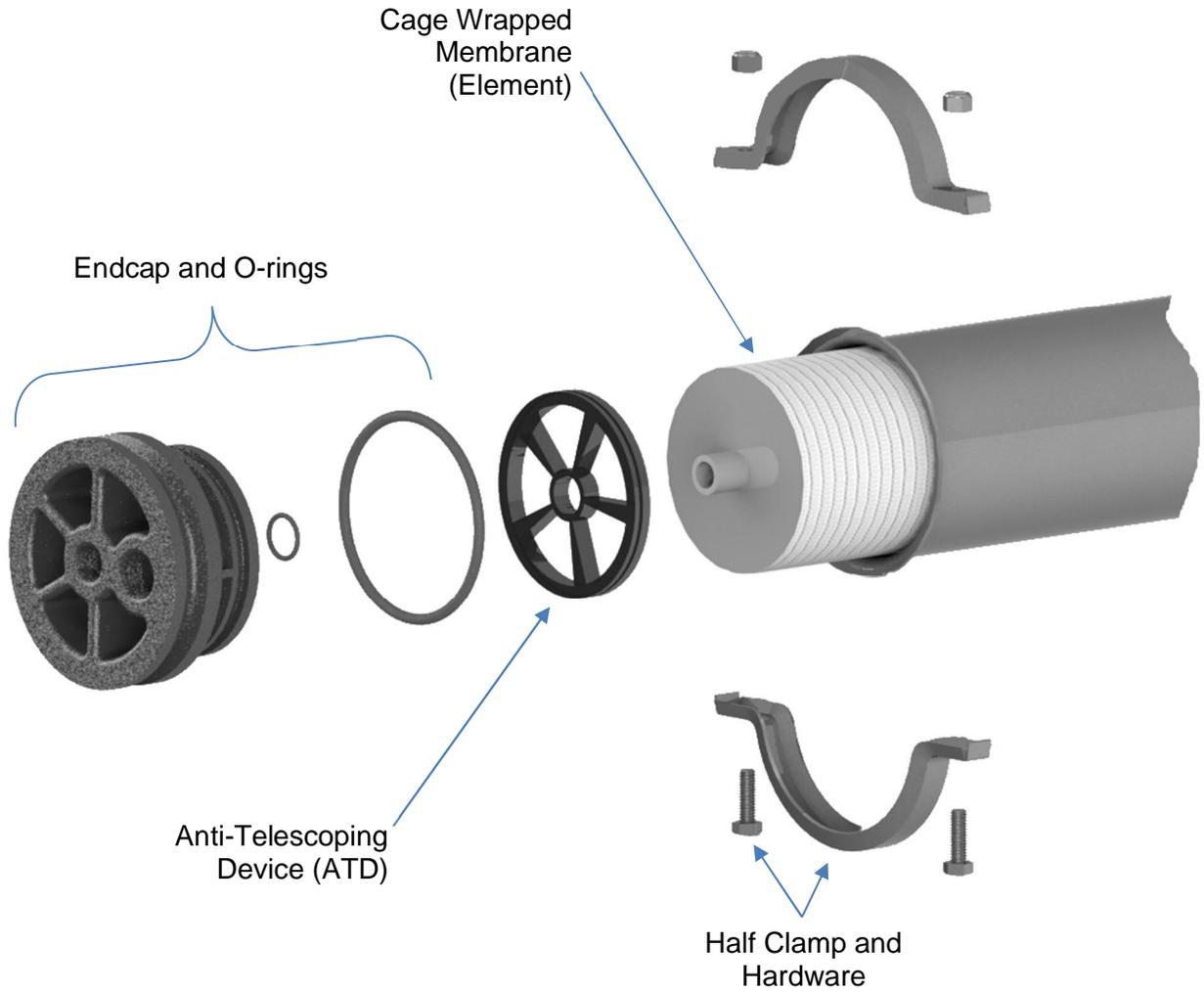
Membrane and Housing Reference – Snap Ring Style



Notes:

1. Cage wrapped (shown) or tape wrapped membrane may be used with this configuration.
2. Tape wrapped membranes must always be installed with the brine seal on the feed/inlet end of the assembly.

Membrane and Housing Reference – Flared Housing Style



Clamp Guidelines

1. Tighten each side evenly until clamp is snug. If a torque value is supplied torque to that value. **DO NOT** compress clamps until housing is damaged. If this occurs, housing needs replaced.

