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Water Housing Maintenance

To perform maintenance on the water housing does not require removal of the cathode from the chamber. Although the target may not be used for sputtering, vacuum integrity is maintained with the Water Housing removed and the system user can continue processing, if capable, with the cathode to be serviced offline.

Notes on Rotary Shaft Seals:

- *The rotary shaft seals used within the Water Housing are expected to maintain service for a minimum of 6 months. The most common mode of failure for these dynamic seals is the lip interface to the shaft, specifically, any debris that might try to pass through the water cooling system. For this reason it is recommended the user install a minimum of 75um water filtration in front of the cathode supply water connection.*
- *Rotary shaft seals such as those used by the Onyx Revolution are energized and maintain their seal by the pressure separating water from air or air from vacuum. When de-energized so that the pressure is equivalent on both sides of the seal, by turning off the water supply or venting the chamber, the seal will slightly relax and in some cases allow a small volume of the high pressure media to pass to the low pressure side. This is evident after venting the chamber, pumping down to HiVacuum, and then turning on the cathode rotation. The volume of media passing through the seals is minor and very temporary. The user will see the base pressure return within seconds of initiating rotation. The same is true for the water seals when first energizing the seal with cooling water pressure.*

Safety:

- *To avoid electrical shock, disconnect the power supply cable from the cathode*
- *After allowing sufficient time for a sputtered target to cool (< 10 min), be sure to turn off the cooling water supply to the cathode, remove as much excess water from the cathode by blowing dry air through the water passage, and, disconnect the water supply and return hose.*
- *The target assembly should be removed from the cathode assembly.*

To remove the Water Housing from the cathode assembly, follow the first 3 steps of the **First Installation** procedure.

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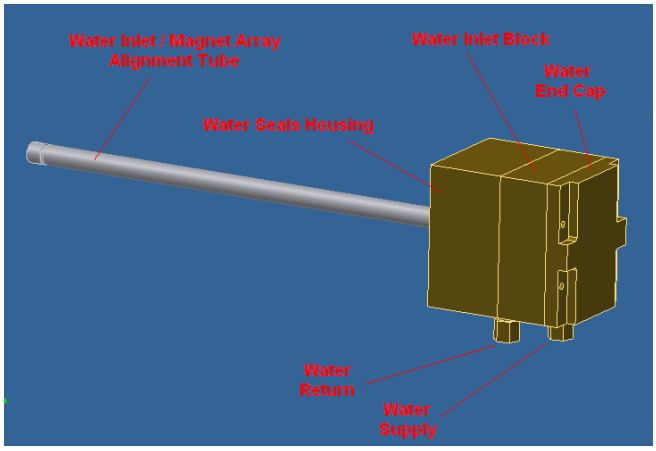
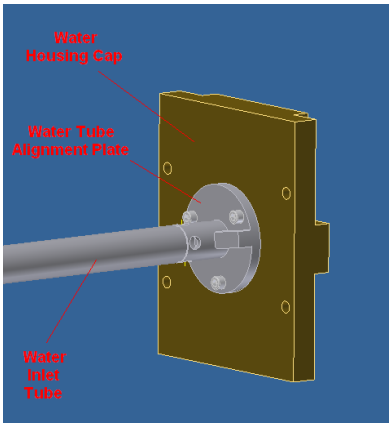


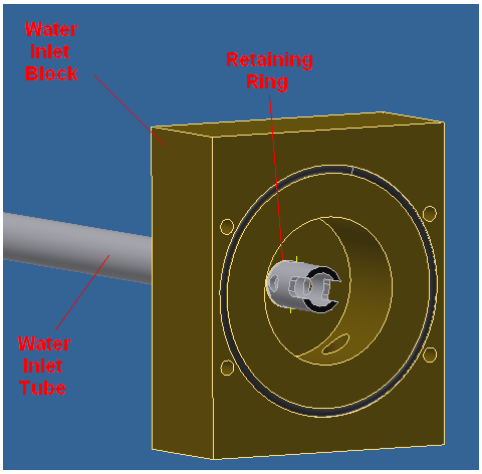
1. As depicted in the **First Installation** procedure, the Water Housing assembly should be removed to a work area to safely and accurately complete the following procedure.

NOTE: All of the seals and o-rings in the Water Housing are only sealing between water and atmosphere. Because there is no exposure to vacuum the best lubrication to safely use is a marine grease. This lubricant is water compatible and will offer a longer service life than vacuum compatible or standard grease.



2. The first piece to be removed from the Water Housing Assembly is the Water Housing Cap. The Water Inlet Tube is shown to clarify how the Alignment Plate is keyed to the Water Inlet Tube. The Alignment Plate is where the ultimate magnet array position is defined. Note the Alignment plate is "clocked" by 7 deg. This accounts for the tolerance stack-up to place the magnet array perpendicular to the substrate.

Generally, there is no expected or required maintenance for these components.

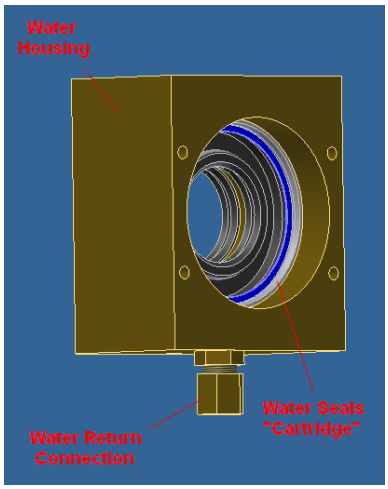


3. The 2nd component of the Water Housing assembly is the Water Inlet Block. When this is removed you will find it is attached to the Water Inlet Tube. To remove the Water Inlet Tube, remove the small retaining ring and slide the tube out. Inside the hole where the Water Inlet Tube was removed the user will find a small o-ring. This o-ring serves as a water baffle between water supply and water return. It is not a "hard" seal

Prior to reassembly the face seal o-ring

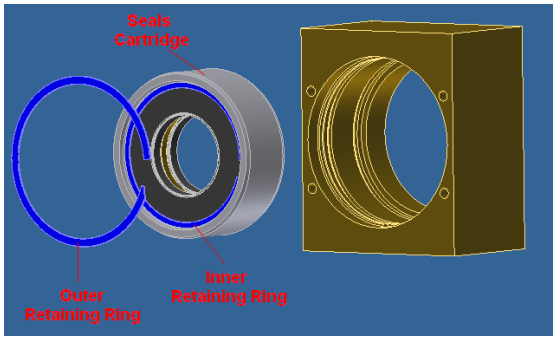
grooves should be cleaned and the o-rings should be cleaned/inspected for replacement.

4. The Water Seals Housing is the same component for the Water Return connection as well as the Water Seals cartridge. To complete maintenance on this component a small bench press is recommended.



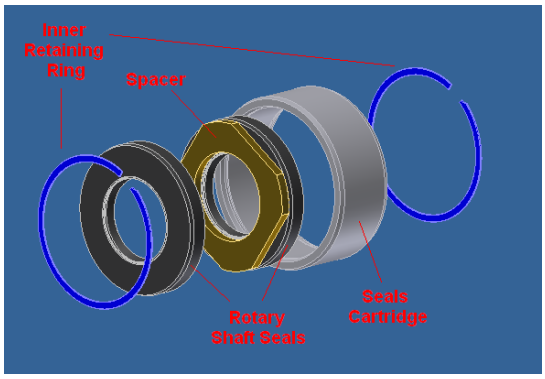
It is important to note that disassembly of the Water Seals cartridge will almost always cause distortion of the rotary shaft seals. So, prior to complete disassembly be prepared with spare seals for replacement if this unit needs to be immediately returned to service.

5. To remove the seals cartridge, use a small blade screwdriver to lift out the Outer spiral Retaining Ring. The Seals Housing can them be placed on a small bench press and the seals cartridge pressed out of the Housing.



At this time the 2 orings and oring grooves inside the seals housing can be cleaned and inspected for wear.

6. The rotary shaft seals inside of the cartridge can now be accessed by first using a small blade screwdriver and removing the 2 Inner Retaining Rings. Return the cartridge assembly to the bench press and remove the rotary shaft seals and spacer.



The Rotary Shaft seals should be discarded and replaced with new. Clean the seals cartridge and spacer

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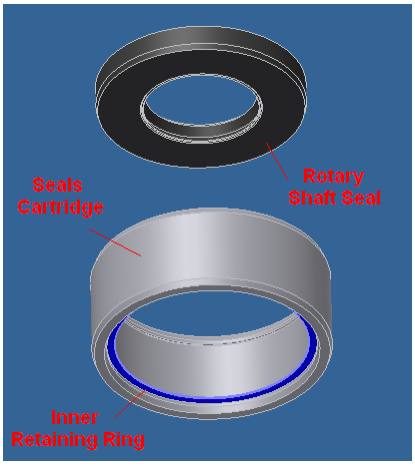
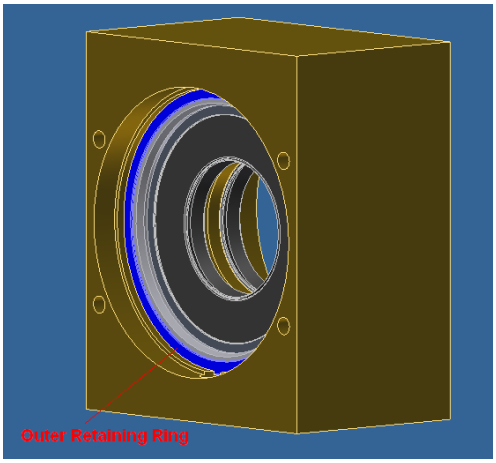
7. After cleaning the individual components, replace one of the Inner Retaining Rings into the Seals Cartridge. Place the cartridge on the bench press and install one of the Rotary Shaft Seals. Use marine grease as the lubricant and assure the seal is pressed in level and all the way down to meeting the Inner Retaining Ring.



The "flat" face of the seal should be against the retaining ring and the open or cupped end of the seal should be facing out. The open or cupped side will be the side filled with water.

8. Drop the spacer into the seals cartridge and use the bench press to install the 2nd rotary seal. Again this pressing process needs to be level and flat until the seal is seated against the spacer.



After installing the 2nd Inner Retaining Ring the seals cartridge is ready to be inserted into the Water Seals Housing.

The rest of the assembly of the Water Housing can be completed by reversing steps 1-3 above.