Annual Maintenance Procedure

FOR USE WITH M15/AD & CD15/AD

Maintenance of the ozone system is critical to its longevity and operating efficiency. Follow the steps below to perform the preventative annual maintenance. If you have additional questions regarding the maintenance of your ozone installation, please consult the operation manual or contact your dealer.

Before you start:

System Shutdown Procedures

Step 1: Turn off power to any peripheral system hydraulic components and air prep system.

Step 2: Turn the Main Power switch on the ozone generator to the "OFF" position. The LED display on the front cover should *not* be illuminated.

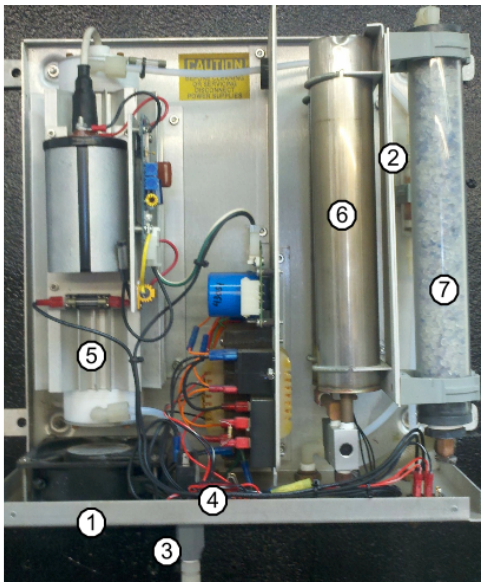
Step 3: Disconnect the power to the ozone system at the service disconnect box (if so equipped), main circuit breaker or by disconnecting the power cord.

Recommended Tools

Nut Drivers: 11/32", 3/8"
Screwdrivers: Phillips and flat-head
O-Ring Removal Pick
Hex Key: 7/64", 9/64"
Marking Pen
Wrench: 5/8" or adjustable
2" Ball hone (optional)
Channel lock-type Pliers
Snap Ring Pliers
Cloth Shop Towel
Denatured Alcohol
Scissors
Teflon Sealing Tape

Video Walkthroughs

Visit our video channel at:
http://www.youtube.com/ClearWaterTech
These, and other procedures are shown.



Included in this maintenance kit:

Pictured are overview images of the M15/AD and the contents of a M15/AD maintenance kit.

Numbered items correspond to descriptions below and their installed locations within the ozone generator.

M15/AD & CD15/AD systems will have the same maintenance kits and generator layouts. The difference between the systems are the drive systems and control options. Maintenance steps are the same.

Maintenance Will Involve the Following:

1. **Cooling Filter:** Clean or replace the cooling fan filter elements as required.
2. **Inline Particulate Filter:** Remove colored protective caps before installing the new filter. Re-tape threads with Teflon tape. Orientation is universal.
3. **Check Valves:** Replace both check valves, one at the ozone generator and one at the injector. Make note of check valve direction before removing old check valve and reinstall new valve in same direction. Re-tape threads with Teflon tape.
4. **Fuses:** Save the replacement fuses for use as needed.
5. **Reaction Chamber O-Ring Replacement:** See page 2 for reaction chamber maintenance instructions.
6. **Air Dryer Media:** See page 3 for air preparation maintenance instructions.
7. **Indicating Media:** See page 3 for air preparation maintenance instructions.

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Reaction Chamber Removal and Disassembly:

Note: Read through all the steps before disassembling the reaction chamber.

Step 1: Make sure all power to the ozone generator has been disconnected according to the "System Shutdown Procedures" outlined above.

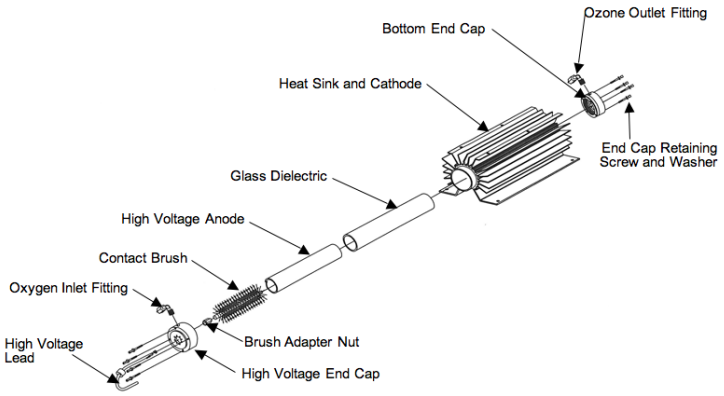
Step 2: Disconnect the white high voltage lead from the black transformer, the black insulation boot will have to be drawn back to expose the connection.

Step 3: Disconnect the tubing connections on both ends of the reaction chamber.

Step 4: If rebuilding a M15/AD: Disconnect wires from the drive module, you may leave it attached to the reaction chamber for this process.
If rebuilding a CD15/AD: Disconnect wire connections to the drive board and remove the 4-20mA control board with mounting bracket from the reaction chamber.

Step 5: Remove the 4 nuts securing the chamber and remove the reaction chamber from ozone generator.

2" Reaction Chamber – Exploded View



Step 6: Remove retaining screws and washers from the end caps (4 each).

Step 7: Using a gentle back-and-forth twisting motion, remove the non-high voltage end cap (the one *without* the high voltage attachment screw) from the heat sink/cathode assembly. A flat-head screwdriver may be used to gently pry the end cap off, as long as equal pressure is applied to each side of the end cap.

Step 8: Remove the high voltage end cap and dielectric from the heat sink/cathode assembly.

Step 9: Draw back the white cap along the white high voltage lead at the end cap, this will expose a screw to be removed. Pull/twist the end cap off the glass. Push the contact brush out of the dielectric glass. Also remove the anode (foil-like material) from within the glass, it may come out with the brush.

Step 10: Inspect the dielectric, foil, end caps and cathode for breakage, corrosion or debris; then follow the assembly and re-installation steps below.

Reaction Chamber Assembly and Re-installation:

Step 1: Remove o-rings from end caps, then clean the dielectric glass, end caps and interior of the stainless steel cathode cylinder. Use denatured alcohol and shop towels to clean the above components and be sure to remove all old o-ring debris. A 2" ball hone can be used to clean the major debris out of the cathode if there is heavy buildup. **Note:** If the brush's core is intact, but discolored, it is likely fine. The anode foil may also have been discolored from residual oil and heat, it will not require replacement. If there are ragged ends on the foil, trim them off (1/8"-1/4") with a pair of scissors.

Step 2: Prepare the end caps for re-assembly by replacing the o-rings. Attach the high voltage lead to the screw and install it onto the high voltage end cap. Thread the hex brush adapter nut, with contact brush attached, onto the interior of the high voltage end cap. Re-tape the threads of the elbow fittings if needed.

Step 3: Using a gentle twisting motion, press the *non*-high voltage end cap onto the heat sink/cathode assembly until flush with the heat sink cooling fins. Turn the end cap to the correct orientation.

Step 4: Slide the four end cap retaining screws with washers through the holes in the non-high voltage end cap, aligning them with the heat sink screw bosses. Thread screws into screw bosses until heads are snug against the end cap.

Step 5: Next we focus on assembling the rest of the subcomponents before installing them into the reaction chamber. Roll and insert the anode foil into the glass dielectric, center the anode foil in the glass. Secure the foil with a finger against the inside of the glass to keep it centered and insert the contact brush into the dielectric. Insure the foil is centered before fully seating the glass into the high voltage end cap. Clean the glass with denatured alcohol once more, and do not retouch the glass without re-cleaning.

Step 6: Hold the reaction chamber upright on a flat surface, empty side up. Grasp the high voltage end cap and lower the glass into the reaction chamber. Press directly downwards on the high voltage end cap to fully seat the dielectric assembly; the end caps should be flush with the heat sink cooling fins. Turn the end cap to the correct orientation.

Step 8: Slide the four end cap retaining screws with washers through the holes in the end cap, aligning them with the heat sink screw bosses. Thread screws into screw bosses until heads are snug against the end cap.

Step 9: Re-install the complete reaction chamber assembly into the ozone generator by securing the reaction chamber to its mounts, reinstalling the delivery line and connecting the drive board and high voltage insulated wires. For CD15/AD: Reinstall the 4-20mA control board with bracket, and reconnect disconnected wires. **Note:** Insure the black and red wires are reconnected to the proper slots to prevent damage to the 4-20mA control board.

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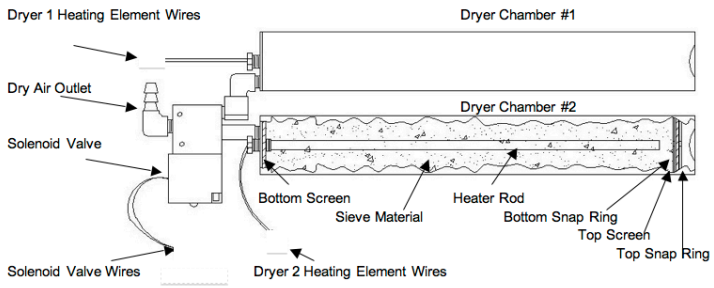
Air Preparation System

The tan colored beads in the maintenance kit are an air dryer desiccant. The blue and white media is typically called indicating media. It is silica gel and acts as an indicator of the health of the air dryers.

If the air dryer desiccant requires replacement, moisture will be present in the dryer's output. The silica media will absorb the moisture and will change the blue crystals to pink, then white. If the indicating media has changed color, this maintenance of replacing the media should resolve the issue and restore proper ozone output. If the indicating media has yet to change color, it is recommended to replace the air dryer media for preventative maintenance. The indicating crystals can be saved for future use, or installed; it is optional in this case.

Air Dryer Desiccant Replacement

Note: You will need to remove the unit from the wall in order to pour out the media. Allow the air dryer chambers to cool completely and read all steps before continuing.



Step 1: Straighten out the ends of the dryer chambers using pliers.

Step 2: Using a snap ring tool, remove the top snap rings.

Step 3: Remove the top screens; the o-ring pick is handy for this. The bottom snap ring may be left remaining within the air dryer chambers.

Step 4: Turn the ozone generator over to pour the old sieve material from the dryer chambers and dispose. **Note:** When removing the sieve material, be sure not to discard the bottom screens.

Step 5: Re-seat/Re-install the bottom screens. **Note:** The heater rod must be put through the center of the bottom screens.

Step 6: Fill chamber with new sieve material to 3/4" to 1" below the top of the dryer chambers. You will have more media than needed.

Step 7: Re-install the top screens.

Step 8: Using a snap ring tool, place the top snap rings snug against the top screen.

Step 9: Bend the ends of the dryer chambers in-ward for added retention of the sieve material (optional).

Step 10: The ozone generator must be turned on for 24 hours prior to system start-up to eliminate any moisture trapped in the new sieve material.

Indicating Media Replacement

Step 1: Using wrench, loosen and disconnect the compression fitting located at the top of the indicating media chamber.

Step 2: With a flat-head screwdriver, unlock the two gray clamps securing the indicating media chamber.

Step 3: Pull the chamber free of the clamps, the chamber will only be held within the unit by the bottom cap. Rotate the chamber downwards to position the bottom cap to be at the top of the chamber.

Step 4: Secure the bottom cap with channel lock pliers and turn the chamber counter-clockwise to unscrew it. Be mindful to not spill the indicating media.

Step 5: Remove the indicating chamber from the unit, **remove the interior screen** and dispose of the media.

Step 6: Remove the Teflon tape from the bottom cap's threads and re-tape the threads with 2-3 wraps.

Step 7: Refill the indicating chamber with new blue and white indicating crystals. You will have more media than needed.

Step 8: Replace the interior screen and reinstall the chamber following steps 1 through 4 in reverse order.