
Service Bulletin

Procedure for Cleaning Contaminated Mirrors

The 2000/3000 Series is intended to measure very clean low water content gas (no more than 20 lbs/MMscf). SpectraSensors has other models available that are capable of measuring gas with higher moisture concentration. **The sample gas inlet line must have a membrane separator filter to prevent contamination of the internal optical components by free liquids.** SpectraSensors can supply sample-conditioning components that provide the necessary protection to the gas stream. Although a SpectraSensors Series 2000/3000 gas sensor can tolerate significant loss of reflectivity from its mirror, it may still be necessary to clean the optics. Should gross contamination occur, such as in the case of a filter failure, the optics may become severely contaminated and the optics inside the sampling cell must be cleaned. Because of the substantial risk to the optics during the cleaning process, cleaning should only be attempted when the presence of contamination is certain. If you have any questions, please contact the factory first.

Note that if the gas sensor has become contaminated, the tubing and instrumentation upstream of the sensor are likely to be contaminated as well. Be sure to clean or replace these parts when the sensor is cleaned to prevent recontamination of the sensor.



CAUTION! – Never open the sample cell with the power to the analyzer turned on. The analyzer contains a Class IIIb invisible laser. Direct exposure to the beam must be avoided.



CAUTION! – Never connect or disconnect any electrical cables when power to the analyzer is turned on. It can damage the laser or create a hazardous electrical spark.



CAUTION! – It is extremely important that disassembly of the measurement cell take place in a clean area so that dirt or other contaminants do not get on the optical components during the cleaning operation. In addition, the area should be well ventilated and personnel should wear protective gear to prevent accidental contact with cleaning solvent. Read the directions on the solvent before using.

Be careful not to touch any of the optical surfaces.

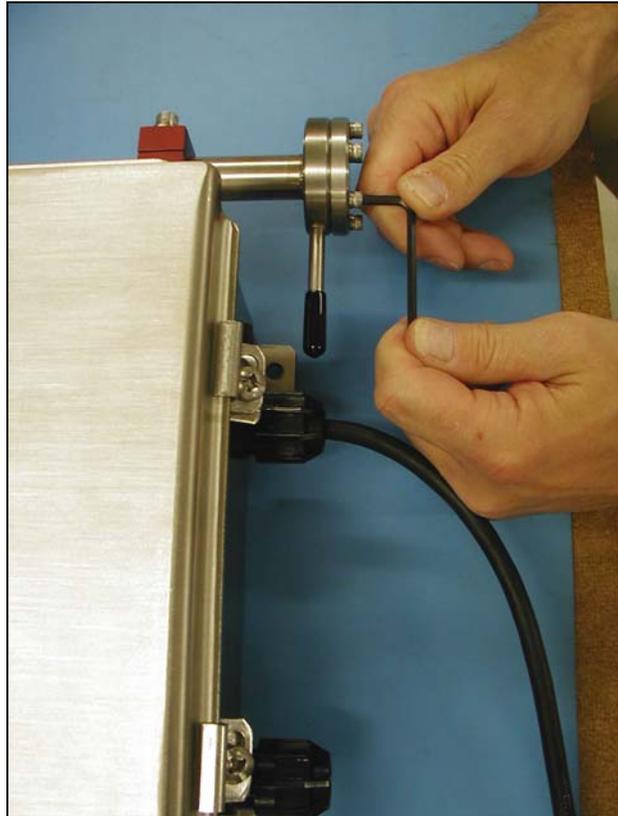
Do not use air from an air compressor to blow off the optics. It may contain either liquid or solid contaminants and the high velocity of some nozzles may propel dust into the mirror surface.

Method:

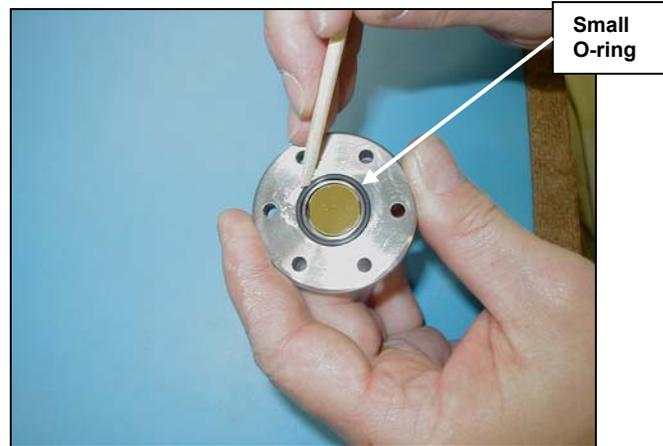
SpectraSensors recommends using a solvent rinse cleaning process to avoid the possibility of scratching the optics. In most cases this should be sufficient to restore the optics to usable condition. A Spares Kit is available from the factory or local sales representative. The Kit includes mirror safe spray solvent, an ultra pure air duster, o-rings, spare screws and washers, and spare fuses.

Process (see illustrations where shown for each step):

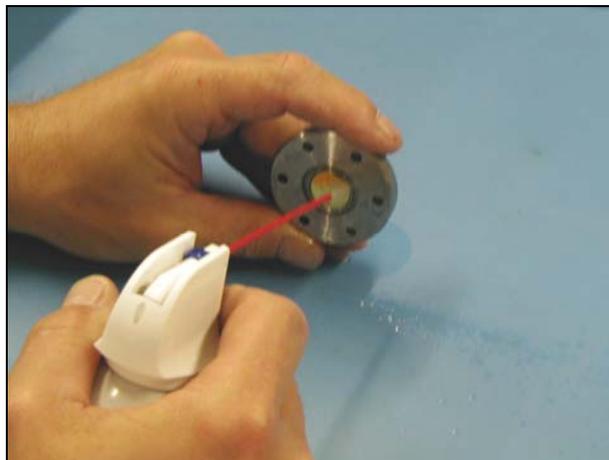
1. Carefully cut the laser safety warning label in half from left to right along the joint between the mirror flange and the flange on the sample cell. Keeping each half of the label attached to its respective flange will allow the mirror flange to be reinstalled with the same rotation it had before it was removed.
2. Remove the six screws holding the mirror assembly to the bottom of the sample cell. Note the arrangement of the lock washers, and screws so that the flange can be attached the same way on reassembly.



3. Inspect the mirror surface for contamination. **Unless there is obvious contamination on the mirror, stop this procedure and replace the mirror.** In this case, the low power reading on the unit is most likely caused by an alignment problem rather than a contaminated mirror.
4. Carefully remove the o-ring from the mirror assembly and place it on a clean surface. Use a soft tool, such as a wooden stick, to avoid damaging the o-ring sealing surface.

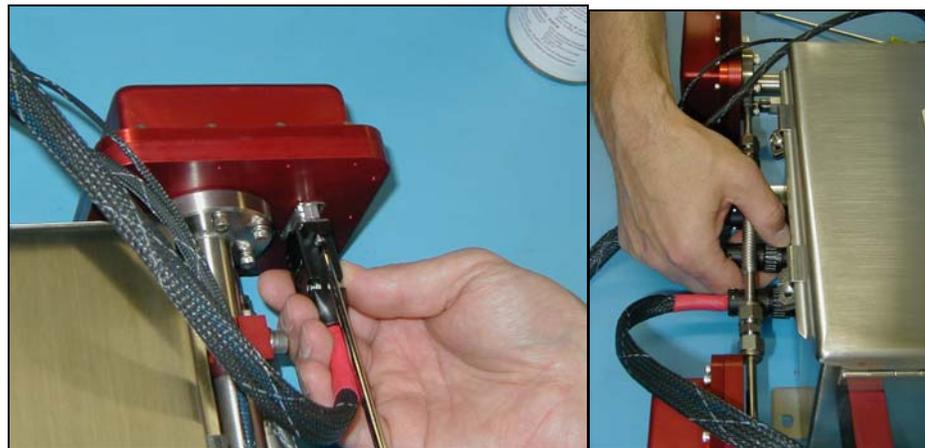


5. **Do not touch the mirror with the end of the spray nozzle.** Hold the mirror assembly over a sink or bucket (test bucket first to ensure compatibility with the solvent) to catch any drips. Position the mirror vertically so that the solvent flows down the surface of the mirror when it is sprayed. Hold the solvent can vertically while spraying. Gently spray the surface of the mirror and flange starting from the top and flushing the solvent down while spraying. Less than five seconds of spraying should be sufficient to clean normal contamination from the mirror.



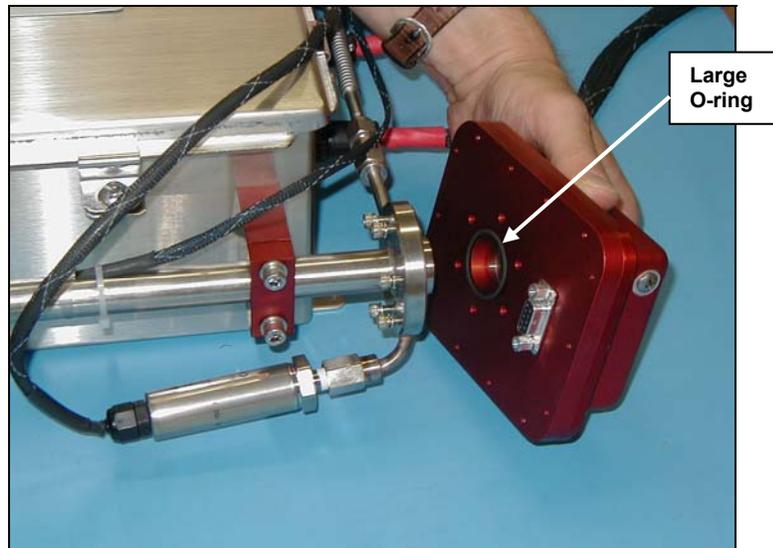
6. Immediately blow the residual solvent from the mirror surface with the air duster. Keep end of duster nozzle at least 3” from mirror surface. Inspect the mirror for remaining contamination. If contamination is not completely removed, repeat the spraying process.
7. When the mirror looks clean, blow off any solvent that has been trapped in the space between the mirror and flange using the air duster can.
8. Set the mirror assembly aside in a clean area.
9. Inspect the o-ring that was removed from the flange. If it is clean and undamaged it can be reused. If not, replace the o-ring with a new one of the same size from the Spares Kit. Be careful to keep the new o-ring clean.
10. Replace the o-ring into the mirror assembly. Do not touch the mirror with the o-ring.
11. Re-attach the mirror assembly to the bottom of the sample cell, aligning to two halves of the warning label to ensure proper rotation of the mirror flange.
12. Turn on the analyzer and wait two minutes for the system to stabilize. Check the laser power reading using the Mode #4 as described in the Operators Manual. If the power is above 800 the mirror cleaning has been sufficient. If not, proceed with cleaning the window as described below.

13. Disconnect the measurement head cables from the top of the control box. (One cable is for the optical head and the other, if applicable, is for the temperature and pressure sensors.)

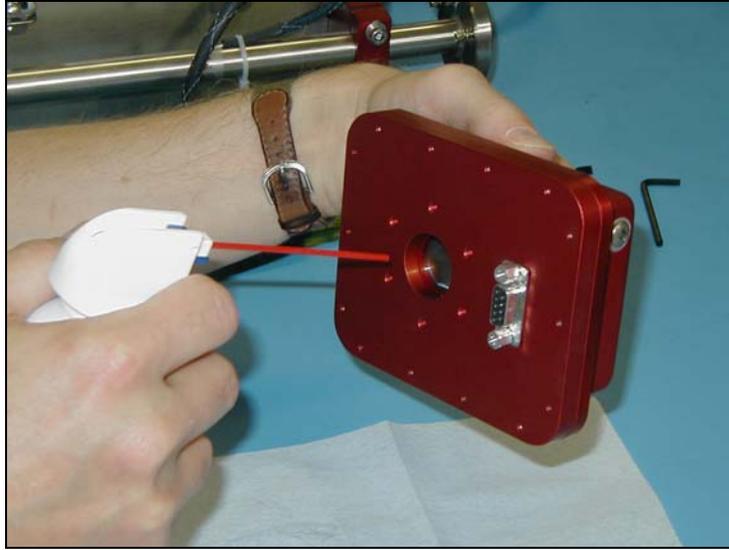




14. Remove the six screws holding the optical head assembly to the top of the sample cell. Note the arrangement of the washers and lock washers so that the flange can be attached the same way on reassembly.
15. If the o-ring sticks to the optical head, replace it the groove in the top of the flange on the sample cell.



16. Clean the window on the bottom of the optical head assembly using the same procedure as for cleaning the mirror.



17. Re-attach the optical head assembly to the top of the sample cell.
18. Re-connect the measurement head cables.
19. The gas sensor is now ready to power up. Repeat step 12. If the power is still not above 800, call SpectraSensors for additional troubleshooting support.

For factory support, contact
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