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Technical Bulletin

Model 43i/43i-HL/43i-TLE SO2 Analyzer Troubleshooting

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The purpose of this Technical Bulletin is to troubleshoot Model 43i/43i-HL/43i-TLE SO2 Analyzer units when exhibiting high lamp voltage – low intensity symptoms.

High Lamp Voltage – Low Intensity symptoms are typically related to one of 3 components-

- Flash Lamp
- UV Socket Assembly i.e. trigger pack
- Flash Intensity Assembly i.e. detector assembly

Symptoms could also be related to the measurement interface board or mirror block assembly but that would be in the more remote instance.
If any one of these components fail or has an issue the above symptoms would occur.

The instrument works by the detector assembly measuring the intensity of the UV light flashes given off by the flash lamp. If the light intensity should go down or not be seen by the detector assy. for some reason, the detector assy. will recognize this and send a signal to increase the lamp voltage to keep the intensity at a constant level.
If the light is not seen or is of low intensity – the lamp voltage will go high and the intensity will read low.
If the detector assy. has an issue where it does not recognize the intensity – the lamp voltage will also go high and the intensity will read low.

To diagnose which component may be bad:

1. First, take the top cover off the unit.
2. Listen carefully at the measuring bench for the ticking flashing sound. It is a very noticeable regular high pitched ticking sound that would normally occur 10 times every second. Depending on the noise level in the room at the time, it may appear faint, but it is clearly audible.

3. Two things can occur here:
   A) There may be no ticking sound. If there is no ticking sound the lamp may not be flashing or the socket assembly may be causing the lamp not to flash.
   No flashes = no light = low intensity.
   If there is no ticking sound, turn off the unit and replace the UV socket assembly.
   This is the typical cause of lamp the lamp not firing.
   On power up again, let warm up for a few minutes, and listen for the ticking sound to see it restores to normal.
   If replacing the socket assembly does not correct the flashing issue, again turn off the unit and replace the flash lamp.
   Again listen for the ticking sound.
   You can also verify that the lamp is in fact flashing by carefully removing the lamp holder set screw and remove the socket and lamp together while flashing. DO NOT LOOK AT THE LAMP. Remove the assembly and shine the lamp at something like the center divider panel or the floor plate to very that it is in fact flashing and flashing brightly. Reinsert the lamp assembly and secure with the set screw.
   With the lamp flashing and ticking sound restored see separate instrument model specific Technical Bulletin, 43i, 43i-HL, 43i-TLE, for Pre-Calibration Set Up.

   B) The unit may be missing flashes. If it is missing flashes the detector assy. will see an irregular intensity and fight the jump in intensity levels registering low and then normal ultimately driving the lamp voltage up and down accordingly. This rate would depend on the rate of the flashes.
   It the unit is missing lamp flashes you can easily distinguish that it is missing flashes as the ticking sound is not regular. The lamp flashes 10 times every second without fail. If it sounds irregular, follow the same steps as per Step 3 A starting with the socket assembly and then the lamp.

4. If the lamp is flashing and not missing any flashes, the detector assembly could be defective. If this occurs, the lack of light intensity detection will drive the lamp voltage higher.
   Change the detector assembly.
   With the detector assembly replaced and reading the light intensity properly see separate instrument model specific Technical Bulletin, 43i, 43i-HL, 43i-TLE, for Pre-Calibration Set Up
5. Performing the above steps will diagnose and correct most issues. If replacing the lamp, socket assembly or detector assembly does not rectify the issue the measurement bench must be removed from the instrument for further troubleshooting. Remove the bench and inspect the mirrors in the mirror block assembly one at a time.
   These mirrors are a set and must be replaced in the same location as removed. The mirrors must not be cleaned as there is a special coating on them that can easily be damaged. They are also protected from any gas by lenses and o rings so they do not get dirty.

If the mirrors look damaged or bad or even fell off (the UV light can over time work on the epoxy adhesive and cause it to fail) the mirror block assembly must be replaced.
The only mirror that can singly be replaced it the entrance mirror. This is mirror that the UV light hits first.
If any other mirror is bad the mirror block assembly must be replaced.
With the mirror block assembly replaced see separate instrument model specific Technical Bulletin, 43i, 43i-HL, 43i-TLE, for Pre-Calibration Set Up.

6. If none of the above corrects the issue the last step would the replacement of the measurement interface board. This can go bad in rare occurrences.
Replace the measurement interface board.
With all parameters operating and reading correctly see separate instrument model specific Technical Bulletin, 43i, 43i-HL, 43i-TLE, for Pre-Calibration Set Up.

If none of the above steps correct the issue please contact Thermo Fisher Scientific Technical Support for additional assistance at T: 508-520-0430 Option 2 for Technical Support.

Units can also be returned for factory repair at the Franklin, MA Repair Depot. Please contact the Thermo Customer Service Group at T: 508-520-0430 Option 1 for Customer Service or the Thermo Technical Support Group at T: 508-520-0430 Option 2 Technical Support for an RA (return authorization).

Model units, 43i, 43i-HL, 43i-TLE have model specific internal components and are not all the exact same.
Please contact the Thermo Technical Support Group at T: 508-520-0430 Option 2 Technical Support for specific part identification if required.