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Flat or Unresponsive Baseline Problems

Applies to 5989A/B MS

Possible causes of the problem:

There are several possible causes of an unresponsive or dead baseline. Typically, when the baseline goes flat during the run (especially if it seems to stop during a peak eluting) the most common cause is a blown filament in the Mass Spec source. Even though a blown filament is one of the most common problems to cause a flat or unresponsive baseline, there still exist the possibility of other hardware or electronics problems.

WHAT TO DO:

- 1) Go into [MANUAL TUNE] and perform a spectrum scan:

NOTE: If the spectrum scan is successful then the Mass Spec is most likely okay and the problem may be sample introduction related. This can be an Auto-sampler or syringe, a obstructed or possibly broken column, column flow or lack thereof, or column installation. These are but a few of the problems that can cause a dead or flat baseline and do not involve direct problems with the Mass Spec.

- 2) If hardware or electronic problems exist, most will generate and display an error. The following errors could appear:

a) NO EMISSIONS CURRENT

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- b) EXCESSIVE SIGNAL LEVEL
- c) EXCESSIVE SOURCE PRESSURE
- d) DIFFICULTY OF MASS FILTER ELECTRONICS

NOTE: This is just a few of the errors that could appear, if your error does not appear in this list, refer to your hardware manual or call Agilent Technologies technical support for clarification of your particular error.

WHAT TO DO ABOUT AN ERROR:

If you're getting the error -

NO EMISSION CURRENT...

Typically this error points to a blown filament. The filament can be tested by referring to the, "Testing the ion source" section of the 5989A/B hardware manual and following that procedure or by venting the Mass Spec and checking the filaments visually. If the filament is open then it needs to be replaced. If the filament appears to be in good condition check the external connections to the ion source. For those more familiar and comfortable with the 5989A/B electronics, the filament fuses, located on the POWER SUPPLY PCA at the top rear of the 5989A/B mainframe can be checked.

WARNING: THE SYSTEM should be VENTED, SHUT DOWN and DISCONNECTED from EXTERNAL POWER BEFORE THIS IS ATTEMPTED.

If fuses appear to be bad, replace with the proper size fuse. Attempt spectrum scans to determine if problem has been resolved. If the problem still exists, Agilent Technologies technical support or on-site service is recommended.

EXCESSIVE SIGNAL LEVEL...

This error typically is a result of electron multiplier voltage set too high, or a Saturated Signal level. It can also result from cleaning the source (and not lowering the Multiplier voltage before performing the first tune after cleaning), a sample that is too concentrated, too much sample/solvent injected or an electronics problem.

If the problem occurred after the source was cleaned, it could be a result of the high multiplier voltage caused by the dirty source, which could cause an excessive signal level when the Mass Spec is initially tuned or scanned after the clean source is installed. To correct this problem, lower the Multiplier voltage to approximately 1000 volts in [MANUAL TUNE] and save this value to, "[TUNE PARAMETERS]", in the ATUNE.U tune file and re-tune the Mass Spec. If the Mass Spec passes the tune, more than likely the MS is okay.

If the problem still exists during the analytical run, make a blank run (no injection) to determine if the MS will complete the run without generating the error. If the Mass Spec will complete the blank run, the error could be the result of too much or too concentrated sample or by a solvent delay time that's not sufficiently long enough to allow the solvent peak to elute before the MS filament is turned on. Also don't forget to check the vacuum manifold pressure, as read from the gauge controller.

If the error is generated under all of the above conditions, reset the Electron Multiplier voltage to zero in [MANUAL TUNE], then save to [TUNE PARAMETERS] in the Atune.U file. Retry performing a scan, or start a blank run. If the error still exists, then Agilent Technologies technical support or on-site service is recommended!

EXCESSIVE SOURCE PRESSURE...

Excessive source pressure error typically indicates that pressure has exceeded 8.0×10^{-3} Torr in either the Source manifold or the Analyzer manifold, causing the Ion gauge tube to turn off. Once this happens, the Ion gauge tube **MUST** be turned back on manually. (Even if the vacuum problem corrects itself the Gauge tube will not re-light itself.)

Check that both the source and analyzer Ion gauge tubes will light and that you can achieve proper vacuum measurements in both the Source and Analyzer vacuum manifolds. Confirm that Isolation valves are completely open by looking down through the glass vacuum manifold cover into the top of the Diffusion pumps.

OTHER THINGS TO CHECK:

Column flow rate (not too high), and if operating in the CI mode, be careful that the CI reagent gas flow is not too high also, or that it was not initially turned on with the CI reagent gas set to a higher than normal supply pressure. If the calibration vial was recently filled, this could cause an air spike that could trigger the error the first time a tune is attempted.

If the system will complete a spectrum scan, make sure that an air leak does not exist. Verify that foreline pressure is below 300 mtorr, and that diffusion pumps are turned on and operational (heating up). If diffusion pump and foreline pump maintenance has not been done then you may elect to follow the procedure in the hardware manual to perform this vital vacuum system maintenance, including checking and replacing diffusion pump o-rings, on drain/fill spouts, 4 total, two on each diffusion pump. If the above steps/procedures do not correct the problem then there exist the possibility of an electronics malfunction, such as a Gauge tube or gauge tube controller or some other vacuum problem and Agilent Technologies technical support or onsite service is recommended!

DIFFICULTY IN MASS FILTER ELECTRONICS...

Difficulty in MASS FILTER ELECTRONICS means that for some reason the Mass Spec has lost control of the MASS FILTER, otherwise know as the QUADS or Quadrupoles. This can be the result of a mechanical problem, Quad contacts or Quads, or an electronics problem, or even possibly improper vacuum. Verify that vacuum is good in both the Source and Analyzer manifolds (front and rear). By following the appropriate vent procedure. Vent the MS and check the Quad contacts leads/wires for proper connection. Check that there are no visible burn or electric arching marks on the portion of the quads that you can see, also check for visible signs of dust in the quad area that could have come from the glass or ceramic insulation beads that are on the quad heater leads. If needed, you can clean these insulation beads with an electronic aero duster if required. Pump system down and give an appropriate time to get a proper operating vacuum. Retry a scan or start an analytical run to determine if the problem still exist. If error still occurs, Agilent Technologies technical support or on-site service is recommended.