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Service Note

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QUICK LEAK CHECK FOR TELEDYNE API ANALYZERS

I. PURPOSE:

This service note explains a method of calibrating pressure sensors and a quick leak check method for the M100, M200, M100A, M200A, M300 and M400 analyzers from Teledyne API.

II. TOOLS:

1/4" HOKE-style Cap for plugging a bulkhead fitting
1/8" HOKE-style Cap for plugging a bulkhead fitting plastic cap to fit over end of filter on dryer (Series 200A analyzers)
9/16", 1/2", and 7/16" wrenches (recommended) or adjustable
Tool for adjusting potentiometers (Tweaker or fine screwdriver)

III. PARTS:

N/A

IV. PROCEDURE:

Model 100:

1. Press TEST button until SAMPLE FLOW is displayed.
2. Plug sample inlet.
3. Sample flow should start to drop. When you see the sample flow warning, press the TEST button to suppress the warning.
4. Sample flow should continue to drop until it is <10 CC/Min. It should remain stable at this level. If it does not drop below 10, or is not stable, then a regular leak check should be performed.
5. Remove the cap from the sample inlet.
6. If you have IZS, place the cap on the Zero Air inlet, located on the tee just below the exhaust fitting on the rear panel.
7. Press CALS on the front panel.
8. Repeat steps 3 - 5.

Model 100A:

1. (Internal pump only). Remove power and cover from analyzer. **CAUTION! 115VAC PRESENT AT PUMP LEADS! USE CAUTION!** Remove one power lead from pump. Power on analyzer. Go to step 3.
2. Disconnect pump from analyzer.
3. Press TEST until you see SAMP PRESS. This number should be ambient ± .5" Hg. If not, adjust R1 on flowmeter board until this number is correct.
4. (Internal pump only). Remove power from analyzer. Connect power lead to pump. Replace cover on analyzer. Go to step 5.

5. Connect pump to analyzer.
6. Place the 1/4" cap on the sample inlet.
7. Press TEST until you see SFLOW. This number should be dropping.
8. When the SFLOW has stabilized, it should be <10CC/Min and stable. If not, then you have a leak and should use pressure to find it. Press the TEST button until SAMP PRESS is displayed. This number should be <10" Hg-A. If not then the pump diaphragm needs to be replaced.
9. Remove the cap from the sample inlet.
10. If you have IZS, remove the zero scrubber from the rear panel bulkhead. Install the 1/4" cap on the rear panel bulkhead.
11. Follow steps 7 - 8. If the SFLOW is not <10CC/Min and stable, then you have a leak in the IZS.

Model 200:

1. Disconnect the pump from the analyzer.
2. Cycle power on the analyzer.
3. Press the TEST button until VAC is displayed. The VAC number should match ambient pressure ± .5" Hg. If not, adjust R2 on the flowmeter board until the correct number is displayed.
4. Press the TEST button until PRESS is displayed. The PRESS number should match ambient pressure ± .5" Hg. If not, adjust as follows:

A. Measure the voltage at TP2 of the flowmeter board.
B. Adjust R1 of the flowmeter board until TP1 of the flowmeter board matches TP2 of the flowmeter board ± 10 mV.
C. Cycle power on analyzer. Verify PRESS is within .5" Hg of ambient.

5. Connect the pump to the analyzer.
6. Disconnect the 1/8" tube from the dry air inlet. Place a 1/8" cap on the fitting.
7. Place a 1/4" cap on the sample inlet.
8. Wait about 2 minutes, then cycle power on the analyzer without turning off the pump.
9. Press the TEST button until you see 03 FLOW. This should be <5CC/Min. If not, you have a leak in the 03 Generator system.
10. Press the TEST button until you see VAC. Record this number.
11. Press the TEST button until you see PRESS. This number should be within 1" Hg of the VAC number. If not, you have a leak and will need to perform a regular leak check.
12. Remove the caps and install the 1/8" tube to the dry air inlet.
13. For IZS, remove the Zero Air scrubber and place the 1/4" cap on the zero air inlet.
14. Press CALS on the front panel.
15. Press TEST until you see PRESS. You will have to watch this number until it stops decreasing (5-7 minutes). When it is stable, record it.
16. Press TEST until you see VAC. The PRESS number from step 15 must be within 1" Hg of the VAC reading or you have a leak in the IZS.
17. Remove all caps and plugs from the analyzer.

Model 200A:

1. Disconnect the pump from the analyzer.
2. Cycle power on the analyzer.
3. Press the TEST button until RCEL is displayed. The RCEL number should match ambient pressure ± 0.5" Hg. If not, adjust R2 on the flow/pressure sensor board until the correct number is displayed. (On M200A with SN# lower than about 125 you will have to adjust R1).

4. Press the TEST button until SAMP is displayed. This number should match ambient pressure ± 0.5" Hg. If not, adjust as follows:
    A. Measure the voltage at TP2 of the flowmeter board.
    B. Adjust R1 of the flowmeter board until TP1 of the flowmeter board matches TP2 of the flowmeter board ±10 mV.
    C. Cycle power on analyzer. Verify SAMP is now within 0.5" Hg of ambient.
5. Connect the pump to the analyzer.
6. Place the plastic cap over the end of the filter on the dryer inlet. (The dryer is the coiled tube inside the analyzer next to the 03 generator.) You may want to remove the filter and use a union and cap instead.
7. Place a 1/4" cap on the sample inlet.
8. Wait about 2 minutes, then cycle power on the analyzer without turning off the pump.
9. Press the TEST button until you see RCEL. Record this number.
10. Press the TEST button until you see SAMP. This number should be within 1" Hg of the RCELL number. If not, you have a leak and will need to perform a regular leak check.
11. Remove the caps and the plug from the dryer.
12. If your unit has IZS installed, remove the Zero Air scrubber and place the 1/4" cap on the zero air inlet. Install the cap on the dryer.
13. Press CALS on the front panel.
14. Press TEST until you see SAMP. You will have to watch this number until it stops decreasing (5-7 minutes). When it is stable, record it.
15. Press TEST until you see RCEL. The SAMP number from step 15 must be within 1" Hg of the RCEL reading or you have a leak in the IZS.
16. Remove all caps from the analyzer.

Model M300:

1. Remove power and cover from analyzer.
2. Disconnect one of the power leads to the pump.
3. Apply power to the M300.
4. Press the TEST button until you see SAMP PRESS. This must be ambient ± .5" Hg-A. If not, adjust R1 on the flowmeter board until the pressure is correct.
5. Remove power from the analyzer. Plug the power lead onto the pump.
6. Apply power to the analyzer.
7. Press the TEST button until you see SAMP FLOW.
8. Place a 1/4" cap on the sample inlet.
9. The sample flow will start to decrease. At some point you will see sample flow and pressure warnings. Press the TEST button to suppress the warnings.
10. The sample flow should stabilize at <10CC/Min. If not, the analyzer has a leak and you will need to use pressure to find it.
11. Press the TEST button until you see SAMP PRESS. This number should be <10" Hg-A. If not, the pump diaphragm has failed and will need to be replaced.
12. Remove the cap from the analyzer.

Model M400:

1. Remove power and cover from analyzer.
2. Disconnect one of the power leads to the pump.
3. Apply power to the M400.
4. Press the TEST button until you see SAMP PRESS. This must be ambient ± .5" Hg-A. If not, adjust R1 on the flowmeter board until the pressure is correct.

5. Remove power from the analyzer. Plug the power lead onto the pump.
6. Apply power to the analyzer.
7. Press the TEST button until you see SAMP FLOW.
8. Place a 1/4" cap on the sample inlet.
9. The sample flow will start to decrease. At some point you will see sample flow and pressure warnings. Press the TEST button to suppress the warnings.
10. The sample flow should stabilize at <10CC/Min. If not, the analyzer has a leak and you will need to use pressure to find it.
11. Press the TEST button until you see SAMP PRESS. This number should be <10" Hg-A. If not, the pump diaphragm has failed and will need to be replaced.
12. Remove the cap from the analyzer.

If you have any questions about this procedure or any Teledyne API equipment, please contact a Customer Service Representative.