

TECHNICAL UPDATE - TU-4001

SUBJECT: Pressure/Vacuum/Electrical Commissioning Tests Unitherm Heated Analyzer Bundles

1. Scope

This procedure covers pressure and vacuum tests run on sample line tubing and electrical tests run on electric heating elements prior to commissioning Unitherm electrically heated analyzer bundles.

2. Equipment Required

- a. pressure gauge capable of reading 0-30psig
- b. vacuum pump with gauge and flowmeter (typically analyzer sample group)
- c. portable volt-ohm meter
- d. portable megger

3. Procedure

.1 Pressure Test

The purpose of the pressure test is to determine if there are any leaks or pinholes in the sample tubing

1. Cap the tubing at the probe end of the bundle.
2. Pressurize the sample tube to 30psig and close off the supply.
3. Watch the pressure gauge for any drop. Typically, the tube pressure could drop up to 5psig over 10 minutes due to cooling of the air, any further drop could indicate a leak.
4. If the gauge pressure drops more than 5psig in 10 minutes, check all connections to insure that there are no leaks at the connection points, and repressurize the tube.
5. If the gauge pressure again drops, and there are no detectable leaks at the fittings, check for mechanical damage at the ends of the bundle, where the tubing is unprotected.
6. Continued pressure drop with no observable leaks indicates a pinhole within the bundle.

.2 Vacuum Test

The purpose of the vacuum test is to determine if the tubing is plugged or kinked within the bundle.

1. Attach the probe end of the bundle to a filter to prevent dust and dirt from being drawn into the sample tube.
2. Attach the analyzer end to the analyzer pump or auxiliary vacuum pump.
3. Energize the pump and record the air flow rate and vacuum level.
4. The values recorded above must be within the analyzer manufacturer's specification to insure that the proper sample volume is pulled into the analyzer.
5. A high vacuum level with very little flow could indicate a kink or plug in the sample line.
6. A moderate to high vacuum level with a normal flow could indicate the sample line is undersized for the flow rate required and the length of the sample line.
7. A moderate to low vacuum level with normal flow indicates there are no plugs or kinks in the sample tubing.

.3 Electrical Tests

The purpose of the electrical tests are to insure that the heater is continuous and has no faults in its electrical insulation.

1. Tie the two heater bus wires together at the analyzer end of the bundle.
2. Read the resistance across these bus wires from the probe end of the bundle. Typical bus wire resistance should be less than 10 ohms. A high bus wire resistance indicates a broken lead wire within the bundle.
3. Tie the two heater bus wires together at the probe end of the bundle and electrically insulate them to insure they do not short out against the braid or any ground point adjacent to the

- heater cable. Note, the bus wires are tied together only for this test. They must be separated for final installation and termination.
4. Attach a portable megger at the analyzer end of the bundle. The positive lead of the megger should be connected to the two heater bus wires that were twisted together in the earlier test. The negative lead of the megger should be connected to the heater braid.
 5. Megger the heater at 500 VDC. The megger reader should be greater than 10Meg Ohm.
 6. If the megger reading is less than 10Meg Ohm, check for contact between the braid and the heater bus wires at both ends of the bundle.
4. On completion of the above tests, the sample line is ready for final installation and commissioning. Install termination and input power kits to bundle per the instructions supplied with the kits.

Dekoron/Unitherm can provide a checklist to help the installer complete all the testing outlined above. Contact your Dekoron/Unitherm representative for the "Electric Traced Bundle Commissioning Checklist". Or check our website: www.unithermcc.com.

