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## **DELTA FLOW PROCEDURE**

A delta flow check is very useful to determine the unit's correct functioning while on-line. This feature verifies the cell's operation in accordance with Faraday's Law, which is absolute. Hence, there is no need for calibration versus an external moisture standard.

The delta flow, while a test of the sensor's correct operation, is not a true test of the moisture in the sample unless all residual moisture or sources of moisture are eliminated from the sampling system from the test point to the sensor. This is because, as with any moisture analyzer or transmitter, the unit has no way of distinguishing between the moisture coming from a leak or a wet regulator and the true moisture in the sample - thus the importance of a high-integrity, leak-free sampling system.

### **Normal Delta Flow Procedure:**

Using a delta flow, the actual amount of water vapor flowing through the electrolytic sensor is reduced to half by lowering the sample flow rate from 100 sccm to 50 sccm. The instrument should respond by displaying a reading approximately half of that which is displayed before the flow reduction. Note that the water vapor concentration of the sample gas must remain constant during the time of this test for the result to be meaningful. It is also important to insure the readings have stabilized before recording them.

This procedure is as follows:

1. Let the unit equilibrate.
2. Record the readout of moisture at the 100 sccm flow rate.
3. Change the flow rate to 50 sccm.
4. Let the unit equilibrate.
5. Record the readout of moisture at 50 sccm flow rate.
6. Subtract the recorded 50 sccm readout from the 100 sccm readout.
7. Multiply the difference by a factor of two.

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### Normal Delta Flow Procedure: (Cont.)

8. If the result is within the specified accuracy of the analyzer in relation to the reading in step #2, you have confirmation of the instrument's proper functioning. If there is a large deviation, there is an instrument malfunction. Most likely the cell is contaminated.

If the sampling system is new and drying down, the moisture purged from wet components changes as the components dry. Therefore, the moisture in the gas entering the transmitter through the sampling system changes. A delta flow performed under these conditions will, of course, yield incorrect results, because the actual moisture in the sample is changing as the delta flow is being performed.

Often, after some period of purging, moisture from wet components or moisture from a small leak may be insignificant relative to the total moisture measurement on the transmitter. In terms of your moisture specification, the possibility that a small leak is adding moisture to the measured sample may not be important as long as the measurement is within specification.