Bump Test/Calibration of a M5 CO and NO2

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To test the sensors you will need a calibration gas that has a known concentration value, a .5 LPM regulator, a calibration adapter, and teflon tubing (see list of part numbers and links on the next page). We recommend doing a bump test and calibration check with the calibration gas per the service agreement of the building maintenance schedule. If the service agreement doesn't determine how often they should be tested, we suggest at least once a year for CO and 6 months for NO2. The process we recommend for testing is a bump test and calibration check. You would need to take a cylinder of CO or NO2 with a known percentage value of the content of gas. Attach the bayonet adapter to the sensor and crack the regulator for a few seconds until the detector starts to read the gas. Compare what is indicated on the display to what the calibrated gas is. For example, purchase a 50 PPM of CO cylinder and confirm it is reading very close to 50 PPM on the display. To actually calibrate the CTS-M5 transmitter you will need all the material listed below with the addition of Zero calibration gas (clean air or Nitrogen).

Note: NO2 has a short shelf life. Less than a year. NO2 is a reactive gas making it very unstable. The lower the ppm concentration, the more likely it is to degrade quickly

-A **"bump test" (function check)** is defined as a qualitative check in which the sensors are exposed to challenge gas for a time and at a concentration to activate all of the alarms to at least the lower alarm settings. It is important to understand what a qualitative test of this kind does not do. The test confirms that the gas is capable of reaching the sensors, that when they are exposed to gas the sensors respond, the response time (time to alarm) after gas is applied is within normal limits, and that the alarms are activated and function properly. However, a qualitative function test does not verify the accuracy of the readings or output of the sensors when exposed to gas.

-A **"calibration check"** is a quantitative test using a traceable source of known concentration test gas to verify that the response of the sensors is within the manufacturer's acceptable limits. For instance, a manufacturer might specify that readings in a properly calibrated instrument should be within ±10% of the value of the gas applied. If this is the pass / fail criterion, when 20 ppm H2S is applied to the instrument, the readings must stabilize between 18 ppm and 22 ppm in order to pass the test. It should be stressed that these pass / fail criteria are manufacturer guidelines. Different manufacturers are free to publish different requirements.

-A **"full calibration"** is defined as the adjustment of an instrument's response to match a desired value compared to a known traceable concentration of test gas. Once again, the calibration procedure, including the concentration of gas applied, method used to apply gas, and method used to adjust the readings are determined by the manufacturer.

The calibration process is on pages 14 and 15. The "Bump" test is not addressed in the manual.

To see a calibration test demonstration(note that this shows Q5, but bump test will be very similar to M5): https://www.youtube.com/watch?v=quhqp1QsCBk&t=2s

Equipment for Calibration Test:

-Part: 83830-020-000 (Calibration Adapter for CTS-M5, CO-R, ,NO2-R)

-Part: CAL GAS KIT (Includes – 1ea C10 0.5lpm regulator, 1ea C10 to CGA600 adapter, Carry case, and ten feet of 1/4" tubing.)

-CO gas with Nitrogen balance

Part: H101650PN (50PPM Carbon Monoxide, 34L, Certified)
Or
Part: H1016100PN (100PPM Carbon Monoxide, 34L, Certified)

-NO2 Gas with air balance

Part: F10675PA (5 ppm Nitrogen Dioxide, A34L, Certified)
Or
Part: F106710PA (10 ppm Nitrogen Dioxide, A34L, Certified)

- Zero gas for zero calibration only

Part: H1066 (100% Nitrogen, 34L, Certified)
Or
Part: H107220.9VN (20.9% Oxygen, 34L, Certified)

Note: ACI recommends 50 ppm CO gas for span gas and 10 ppm for NO2.
Zero gas can be 20.9% by Volume Oxygen or 100% Nitrogen.

Below is the procedure and equipment needed for calibration. It is also on Page 14 & 15 on the Installation Manual.

Gas Calibration

Calibration should not vary significantly over a period of years; however, it is best to perform a verification calibration after installation, and at one-year intervals thereafter. All units are factory calibrated.

Equipment Required:

- Zero air, (clean air or nitrogen).
- Appropriate span gas as close to the range of interest as possible
- Pressure and Flow Limiting Regulator(s) 0.4 to 0.8 lpm (0.8 to 1.6 scfh)
- Tubing and bayonet adapter.

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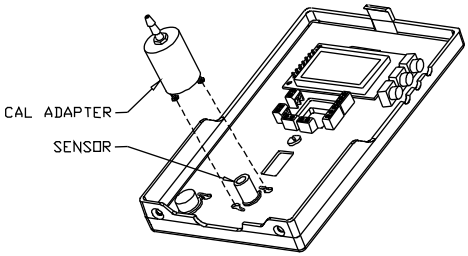

Calibration Procedure:
Enter the configuration menu system and proceed to "CALZERO". This disables alarm outputs, and forces the output signal to 4.00 milliamps.

Response of the sesensors to gas varies with the sensor, but in most cases the signal should be sufficiently stable in less than 5 minutes. Pre-calibration stabilization times vary from 24 hours (CO and NO2) to a week or more (NH3).

Apply zero gas (clean air) and wait for the display reading to stabilize. (Remember that the 4-20 milliamp signal may be set to a different range.) Press Accept to automatically zero the reading.

Press Down to go to CALSPAN.

Apply an appropriate span gas, and adjust the Gain potentiometer to get the correct reading on the display.

On removing the gas,you may find that the display does not completely re-zero. Return to CALZERO to re-Zero.

Note: Allow enough time for the sensor to stabilize at zero in order not to set an incorrect zero calibration.

Output verification:
Verify the unit outputs 4mA/ or 2VDC, at 0ppm.

If the output is still a little off, you can perform a Range Adjustment on the low end. The Range Adjustment is explained on page 10 in the Operation Manual.
https://www.workaci.com/sites/default/files/category-files/I0000861.pdf

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