SensorTalks
CO Sensor

Types of Sensors

Hydrogen-Resistant CO Sensor
- Go from 48% hydrogen cross-sensitivity to 5%
- Needs to be on for about an hour to effectively work
- CO sensor is more sensitive to VOCs like alcohols, alkenes and alkynes
- Recommended for steel mills

CO-H_2S Sensor
- Standard Big-4 multigas sensor in the ALTAIR 4XR and ALTAIR 5X Detectors
- 0-2000ppm range
- Virtually no cross-channel interference between CO/H_2S partition
- Susceptible to cross-interference from alcohols, alkenes and alkynes

CO-HC
- No H_2S partition. Sensor will be CO only.
- Best for when alcohols are present
- For high concentration up to 10,000 ppm
- Available only with the ALTAIR 5X Detector

Things to Consider
- Do you have Carbon Monoxide(CO) or Carbon Dioxide (CO_2)?
- Are you looking at COMB (Combustible) or CO?
- **Radio Frequency Interference** - All electrochemical sensors can be affected by a 5 watt radio in close proximity

Sources
Did you see the reading while driving?
- Cars, trucks, forklifts, generators (gasoline or diesel) –all emit actual CO
- Using windshield washer fluid? *(e.g. wintertime after a big snowstorm)* SEE ALCOHOLS.
- Has the user recently switched cleaning chemicals? *(e.g. cleaners, degreasers)*

Potential False Response
(Alcohols and Cross-Senstivity)
- Methanol, ethanol, IPA (isopropanol or 2-propanol), Lysol (ethanol base)
- Can cause a time-delayed effect *(might be after moving to a new area or even in an office space)*
- Alcohols are unique, even compared to other VOCs
  - Carbon filter to working electrode
  - Filter to electrolyte *(can change/shift baseline response)*
  - H_2S inlet to electrolyte *(can change/shift baseline response)*

Presence of Hydrogen
- Hydrogen (H_2) gives ~2:1 or 48% response *(very sensitive to hydrogen)*
- MSA does not recommend using our CO sensor for H_2 detection as cross-sensitivity to H_2 changes over the life of the sensor. Use the LEL (COMB) sensor to detect hydrogen.
- Battery rooms and battery banks at large industrial plants or in vehicles, during charging of these heavy duty lead acid style batteries hydrogen gas is a byproduct that is released as well

Did the Device Get Exposed to High Heat?
- Can see false positive readings or alarms
- 50-60˚C can see a baseline shift of up to 10ppm
- High heat, like on a car dashboard, can also expose the sensor to VOCs.

Zeroing Yo-Yo
- Have a VOC *(could be an alcohol or other solvent)* hit and see positive CO reading
- VOC cooks off from the sensor and the filter *(bleed-off)*
- Remember, a little goes a long way
  - 1% VOL of a VOC, which is a relatively low exposure, is 10,000 ppm *(very high sensor hit)*
  - Let set after a VOC, or hydrogen exposure for 24-hours and recalibrate

TOOLS

Carbon Monoxide Sensor Cross-Sensitivities Alcohols, VOCs & Hydrogen

MSA XCell® Sensors

MSA ALTAIR® Gas Detectors: Cold Weather Performance

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Commonly Asked Questions

What does it mean when a sensor is under/over range and what should I do?
The Sensor needs to be calibrated, the instrument could have been powered off when it was still detecting gas concentrations and was not allowed to clear out or was not zeroed properly.

What are some common scenarios where "sensor error" displays?
Sensor not seated properly within instrument, damage to sensor pins or sensor body (leaking, corrosion), damage to printed circuit board.

Do you have a list of known interferences or contaminants?
Refer to the following document:
https://msa.webdamdb.com/bp/#/folder/1777763/47088752

What causes sensor drift?
Many environmental conditions can affect sensor readings and can often look like sensitivity drift, including gas interference and cross-sensitivity. Refer to the following document for more information:
https://msa.webdamdb.com/bp/#/folder/1777763/68776031

Why is the CO negative?
Negative sensor readings more commonly occur when your instrument has been "zeroed" in a contaminated atmosphere, where small levels of the sensors' target gasses are present. When the instrument is later in a clean-air environment, the sensors will show a negative reading that corresponds to the concentration on the contaminant that was present during the zeroing operation. For example, if there is 5 ppm carbon monoxide present when the sensor is zeroed, the reading will be -5 ppm when the sensor is returned to clean air.

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