

Best practise monitoring CO in the presence of H2, using CO compensated H2 cell technology.

Geotechs analysers designed for use on landfill sites where H2 is present, have only ever been recommended to use when levels of H2 are below 10,000ppm. In light of information gathered from a number of landfill operators in 2013, it has come to our attention that the levels of H2 on some sites are regularly exceeding this limit.

With this new information in mind, we have created this document to advise our customers of best practise when using any of our range of portable gas analysers on landfill sites measuring CO in the presence of hydrogen with our compensated CO cell technology.

The analyser specification.

GA5000, GEM5000 from 07/2014 firmware v1.11.15. GA2000PLUS, GEM2000PLUS, firmware v3.13 and below.

- 1) Range of CO measurement 0-2000ppm
- 2) H2 cross gas effect on carbon monoxide approximately 1%. Do not use where H2 is in excess of 10,000ppm
- 3) Indicator bar range
 - a. Low/Green 0-5000ppm H2
 - b. Med/Amber 5001-10,000ppm H2
 - c. High/Red 10,000ppm or greater H2
- 4) On screen warnings shown at 9500ppm H2
 - a. Additional early warning on GA/GEM5000 at 6500ppm H2
- 5) CO zeroing function
 - a. GA2000PLUS, GEM2000PLUS, able to zero any CO value.
 - b. GA5000, GEM5000, only able to zero below 50ppm CO.
 - i. This 50ppm limit was introduced to stop bad zeroing, negative offsets and potential for false readings on the CO channel.

Recommendations for use.

Analysers exposed for prolonged periods at H2 levels, approx.0.5-1%, will need longer fresh air purges and the chemical cell may need replacing more frequently.

Analysers exposed to levels of H2 (over 1%) even for short periods may require a long recovery time in fresh air (can vary from 5 minutes to a number of days) for the readings to return to zero levels.

- A) Do not use on boreholes where the H2 concentration is known to be equal to or greater than 10,000ppm
 - a. Do not use the gas analyser to take a bag sample on these wells.
- B) Where H2 levels are unknown, stop using the analyser as soon as H2 level reaches 10,000ppm as indicated by red colour on the indicator bar and by the on screen warning
 - a. Stop the pump immediately
 - b. Purge the analyser with clean fresh air immediately
- C) Where H2 levels range from 0-10,000ppm, ensure a fresh air purge is done between every reading for a minimum of 60 seconds or until the CO reading returns to less than 20ppm, whichever is longer.
 - a. Longer purges may be required depending on level and length of time exposed to H2 and CO gases.
- D) Regularly check the performance of your CO cell with check gas concentrations of 100ppm.
- E) Do not perform a zero calibration of your CO cell if the analyser is showing a reading of 20ppm or greater. The cell should be allowed time to recover in fresh air.

NOTE: H2S also has a cross gas effect on CO, so please use a H2S filter as per recommendations in the operating manual.

If you require any further information please contact our technical support team: technical@qedenv.co.uk