

Four-Gas Meter Training Form and Usage Guide

Overview

This direct reading instrument measures three specific gases (oxygen, carbon monoxide, and hydrogen sulfide) and total combustible gas. Oxygen measurements (O₂) are displayed as a percent of total atmosphere (% VOL), which is typically 20.9% (+/- 0.1%) under normal atmospheric conditions. Carbon monoxide (CO) and hydrogen sulfide (H₂S) are displayed in parts per million (PPM), which means one part of gas in one million parts of air. Combustible gas measurements are displayed in percent of pentane's lower explosive limit (%LEL). Please contact EH&S using the information at the bottom of this page if you have any questions or concerns regarding instrument calibration or use.

Limitations

All instruments must be maintained, calibrated and bump tested per the manufacturer's instructions. This instrument cannot detect low concentrations of combustible gases (<50-100 ppm) and toxic gases other than carbon monoxide and hydrogen sulfide. LEL readings have been calibrated for pentane and may differ for other types of explosive gas.

Operation

1. Review the manufacturer's product manual(s) and heed all warnings and cautionary statements.
2. Check the instrument's calibration records and ensure the instrument has been calibrated within the past 30 days or per the manufacturer's requirements. If not, ensure the instrument is properly calibrated before use.
3. Bump test the instrument before use following the manufacturer's instructions. If the instrument fails the bump test, it must be recalibrated before use.
4. Zero the instrument per the manufacturer's instructions. The instrument should display readings of 20.9% O₂, 0% LEL, 0ppm CO, and 0ppm H₂S if properly zeroed. If not, re-zero the instrument in a known clean air environment. If the instrument fails the zero process again, it must be recalibrated before use.
5. Ensure battery is fully charged and double check alarm settings prior to use. Recommended alarm settings are as follows: O₂ Low = 20.5%, O₂ High = 21.5%, H₂S Low = 5 ppm, H₂S High = 20 ppm, H₂S Alarm TWA = 1 ppm, H₂S Alarm STEL = 5 ppm, LEL Low = 5%, LEL High = 10%, CO Low = 50 ppm, CO High = 200 ppm, CO Alarm TWA = 25 ppm, CO Alarm STEL = 200 ppm.
6. Connect sampling tube to the instrument to monitor the potentially hazardous atmosphere remotely from a known clean air environment. Never enter an unknown environment prior to, or while taking samples. Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. Allow the instrument to draw from each potentially hazardous location until stable readings are achieved. Do not allow the instrument to draw liquid through the tube and into the meter.
7. Readings **must** be above 19.5% O₂ and below 23.5% O₂, 10% LEL, 25 ppm CO, and 10 ppm H₂S for **legal** entry into a space. EHS **strongly recommends** that individuals **not enter atmospheres** containing more than 21.5% oxygen, less than 20.5% oxygen, or more than 5% LEL, 10 ppm CO or 5 ppm H₂S.
8. If the alarm sounds while entering/working in a potentially hazardous environment, immediately exit the area and notify your supervisor.
9. When finished, turn off the meter and reconnect to battery charger if applicable. If the instrument is in need of service, notify your supervisor or EH&S.

