Fresh Air Setup, Bump Test & Full Calibration
Frequently Discussed Topics

Technical Brief

Fresh Air Setup (FAS)

- Fresh air setup allows an instrument sensor to establish a zero baseline, but within only a limited window of correction. If sensor readings are not within acceptable range relative to zero, FAS will fail and full calibration is recommended.
- Fresh air setup should be performed only within air that is not contaminated with background gas.

Bump Test

- A bump test is a qualitative functional check to quickly confirm that instrument sensors are open to flow and function properly.
- A bump test verifies calibration by exposing the instrument to known concentration of test gas. The instrument reading is then compared to the actual quantity of gas present (as indicated on the compressed gas cylinder). If instrument response is within acceptable range of the actual concentration, then calibration is verified.
- When performing a bump test, test gas concentration should be high enough to trigger the instrument alarm. If bump test results are not within acceptable range, then full calibration must be performed.
- MSA recommends performing a bump test (calibration verification) before each day's use to verify proper instrument operation. If the instrument fails the test, perform full calibration before using the instrument.

Full Calibration

- Full calibration is a quantitative test to confirm that instrument sensors are open to flow and function to within specified tolerance.
- Full calibration adjusts an instrument sensor so that the sensor reading coincides with known concentration of test gas.
- Full calibration consists of zero calibration and span calibration.

Zero Calibration

- Zero calibration is similar to fresh air setup, but is a more thorough adjustment at the sensor level than is fresh air setup, executed by resetting the sensor to zero values.
- Zero calibration can adjust for significant non-zero readings to return to baseline.
- Zero calibrations are generally done prior to span calibrations in which the sensor is adjusted against known gas concentration.
- Zero calibration should be performed within only fresh air that is not contaminated with background gas.
- Zero air compressed gas cylinders are available for situations where fresh background air cannot be guaranteed.

Span Calibration

- Span calibration is an adjustment of sensor output to match the known traceable calibration gas concentration that is applied to the instrument, usually through use of a compressed gas cylinder.
- Full calibration ensures the instrument's maximum accuracy.

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