

	<h1>Frequency for Verifying Gas Detector Accuracy</h1>				Date	05/19/11	Rev	A0
					N <sup>o</sup>	13-391		
	By	Jeffrey Emond						

One of the most common questions we are asked is: *“How often should I calibrate my gas detector?”*

### Sensor Reliability and Accuracy

Today’s gas sensors are designed to provide years of reliable service. In fact, most common sensors are designed so that with normal use they will only lose 5% to 10% of their sensitivity per year.

However, there are a number of reasons why a sensor may unexpectedly lose additional sensitivity or even fail to respond to gas. Such reasons include desiccation, poisoning, physical restriction of airflow, over exposure, internal leakage, or mechanical damage due to physical shock and immersion.

### Verification of Accuracy & Related Terminology

With so many reasons why a sensor can lose sensitivity and given the fact that dependable sensors are critical to survival in a hazardous environment, frequent verification of sensor performance is paramount.

There is only one sure way to verify that a sensor can respond to the gas for which it is designed. That is to expose it to a known concentration of target gas and compare the reading with the concentration of the gas to ensure that it is within a manufacturer’s recommended tolerable limits. This is referred to as a “calibration check”. This test is very simple and takes only a few seconds to accomplish. **The safest course of action is to do a “calibration check” prior to each day’s use.**

It is not necessary to perform a full calibration (adjustment) unless readings for LEL and toxic gases/vapors are outside of the range of 90% to 120% of the expected value. For oxygen, the acceptable range is considered to be  $\pm 0.5\%$  vol., so 20.4% to 21.4% O<sub>2</sub> in ambient clean air or via application of zero air. Further for oxygen, for application of Sperian

18.0% O<sub>2</sub> balance gases, the reading should again be within  $\pm 0.5\%$  vol., so 17.5% to 18.5% O<sub>2</sub>.

### Lengthening the Intervals between Calibration Checks

We are often asked whether there are any circumstances in which the period between calibration checks may be lengthened.

One of the professional organizations to which Honeywell Analytix, formerly Biosystems/Sperian, belongs is the Industrial Safety Equipment Association (ISEA). The “Instrument Products” group of this organization has been very active in developing a protocol to clarify the specific conditions under which the interval between calibration checks may be lengthened.

A number of leading gas detection equipment manufacturers have participated in the development of the ISEA guidelines concerning the recommended frequency and types of detector performance tests, as well as adoption of the associated standard terminology. Our procedures closely follow these guidelines.

If your operating procedures do not permit ongoing daily calibration checks, we recommend the following procedure to establish a safe and prudent accuracy check schedule for your detectors:

1. During a period of initial use of at least 10 days in the intended environment, perform a calibration check daily to be sure there is nothing in the atmosphere, which is poisoning the sensor(s). The period of initial use must be of sufficient duration to ensure that the sensors are exposed to all conditions that might have an adverse effect on them.
2. If these tests demonstrate that it is not necessary to make a full calibration (adjustment) the time between checks may be lengthened. The interval between calibration checks should not exceed 30 days.

3. When the interval has been extended the toxic and combustible gas sensors should be replaced upon warranty expiration. This will minimize the risk of failure during the interval between calibration checks.

4. The history of the instrument response between checks should be kept. Any conditions, incidents, experiences, or exposure to contaminants that might have an adverse effect on the calibration state of the sensors should trigger the need for an immediate calibration check before further use.

5. Any changes in the environment in which the instrument is being used, or changes in the work which is being performed, should trigger a resumption of daily calibration checks.

6. If there is any doubt at any time as to the accuracy of the sensors, perform a calibration check, before further use.

Gas detectors used for the detection of oxygen deficiencies, flammable gases and vapors, or toxic contaminants must be maintained and operated properly to do the job they were designed to do. Always follow the guidelines provided by the manufacturer for any gas detection equipment you use!

If there is any doubt regarding your gas detector's accuracy, do a calibration check! All it takes is a few moments to verify whether or not your detectors are safe to use.

### One Button Automatic Full Calibration and Calibration Docks

While it is only necessary to do a calibration check to ensure that the sensors are working properly, all current Biosystems/Sperian gas detectors offer a one button auto full calibration feature. This feature allows you to do a full calibration of a gas detector in about the same time as it takes to complete a calibration check.

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The use of calibration docks can further simplify the tasks, while automatically maintaining electronic records of sensor performance.

Don't take a chance  
with your life.  
Do calibration checks  
frequently!

Please read also Biosystems' application note: 13-366 "*Use of 'equivalent' calibration gas mixtures*". This application note provides procedures to ensure safe calibration of LEL sensors that are subject to poisoning