

How Often Should I Calibrate My Gas Monitor?



When a client needs to purchase or rent a gas monitor, I'm routinely asked either "How do I calibrate a gas meter?" or "How often should I calibrate (or recalibrate) the monitor?"

A purchased gas monitor typically ships directly from the manufacturer. As part of the manufacturer's QC/QA a calibration is performed, and a calibration certificate, or card, is sent with the instrument. This calibration, however, may not have been recent because the monitor may have been sitting on a shelf for a period of time before it was shipped out. For this reason, if you do not already own a calibration kit, I suggest you purchase one with the instrument so you can test the instrument's sensors out of the box at your site.

If you are renting a gas meter, a reputable supplier will always include a recent calibration record for you to keep. However, it is always a good practice to rent a calibration kit too. It is mandatory in some circumstances to calibrate your instrument before use, and it is always a safe practice. An OSHA bulletin titled Verification Of Calibration for Direct-Reading Portable Gas Monitors states, "In the past, there often has been confusion regarding proper calibration procedures and

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frequency. To clarify this issue, the International Safety Equipment Association (ISEA) issued a position statement on instrument calibration that states, "A bump test or full calibration of direct-reading portable gas monitors should be made before each day's use in accordance with manufacturer's instructions, using an appropriate test gas." If the instrument fails a bump test, it must be adjusted through a full calibration before it is used."

Let the Calibrations Begin

Most gas monitors allow you to do a quick and easy "Fresh Air Calibration" or "Zero" calibration. After this is done, the oxygen sensor should read 20.9% and the other sensors should just read "0". You will not know if the other sensors are functioning properly until you move a known concentration of gas over the sensors to check their response and accuracy. There are two ways to determine this:

Perform a "Bump Test"

Perform a "Full Calibration"

The "Bump Test" is a quick check that the sensors are responding correctly to a known gas typically within $\pm 10\%$ accuracy. The "Full Calibration" is when you follow the manufacturer's suggested calibration procedure which commonly starts with a fresh air calibration and ends with a span calibration of the instrument's sensors. With the "Bump Test" it is up to you to determine if the sensors are working properly by viewing the real-time readings. With the "Full Calibration" the instrument's electronics determine if they pass or fail. After your initial "Bump Test" or "Full Calibration" you are ready to begin using the unit.

TIP: If you decide to purchase a new gas meter make sure the unit allows you to change the span concentrations of each sensor installed. This way you can purchase calibration gas cylinders from any vendor you like that carries NIST traceable gases. You would now simply adjust your monitor to calibrate to that cylinder's concentrations, be sure the cylinder stays within the manufacturer's specifications though. You can save a lot of money this way since purchasing the manufacturer's suggested gas direct can be quite costly. I always get a certificate of analysis of the

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gases I buy for my files in case of audits.

You will want to verify the unit is working properly every time you use it. This is your personal safety at stake here and perhaps the safety of those around you. Do not take any chances and perform a "Bump Test" at least daily. I would perform a "Full Calibration" weekly if I was using the instrument every day. If using the instrument only once a week, I would do a "Full Calibration" each time, as it does not take much time or use much calibration gas.

TIP: When performing your Bump Test or Full calibration you must utilize a regulator with the correct flow rate on your gas cylinders. Check your instrument's manual to see which rate is correct. If you have several different types of gas monitors check each instrument's manual; they may all require different flow rates for calibration.

Each time you perform either the "Bump Test" or "Full Calibration", you should also consider the temperature, pressure and humidity of the area in which you will be using the unit. The best course of action to ensure good sensor accuracy is to perform either test on-site. This way both the instrument and the calibration gas cylinder/s are exposed to the same elements.

If you see any inconsistencies during a "Bump Test" then proceed with a "Full Calibration." If the "Full Calibration" fails, try again. If the calibration passes the second time allow the unit to run for awhile, and then perform a "Bump Test" to see if the instrument is able to hold the calibration as it should. If the unit fails you will need to seek a replacement until the instrument can be repaired or replaced.

If the alarms begin going off on a monitor, heed the warnings -they mean something. Do not just turn it off because the site looks fine or you cannot smell anything. Be safe, take the time, and most importantly, make it home safely!

For more information on the correct way to calibrate portable gas monitors, please check out these links:

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* The International Safety Equipment Association (ISEA)

* RAE Systems Technical TN-148

(Please note that Enviro-Equipment, Inc. is a factory authorized service center for Rae Systems portable gas monitor repair, parts and sensors in addition to offering the repair, calibration and maintenance of other brands of gas meters used for confined space entry)

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