

Overcoming the Challenges of Gas Detection in Cold Weather

Gas Detection Equipment | December 20, 2022 | Dave Wagner

With chilling months right around the corner, you might be concerned about a number of things: driving conditions, keeping your home heated, shoveling the driveway. For people who work outside, winter weather can pose a range of risks, from hypothermia to slipping on ice. However, if atmospheric hazards are a risk at your worksite, the way your life-saving gas detection equipment might react to the less-than-ideal conditions should be at the top of that list.

By following some simple tips, you can worry less about your portable gas monitor's performance and trust that you can depend on it to prevent exposure to toxic or combustible gases.

Temperature Thresholds

One of the obvious factors to consider is the minimum temperature your gas monitor can tolerate. While some instruments are rated as low as minus 40 degrees Celsius or minus 40 degrees Fahrenheit, the low temperature rating for continuous operation of most portable gas monitors is minus 20 C or minus 4 F. Even so, most instruments may be used at lower temperatures for short periods.

Regardless of the rating, you should try to limit exposure to extreme temperatures as much as possible. Consult your gas monitor's specification sheet to find its suggested temperature range.

Gas Reading Accuracy

You depend on accuracy from your gas monitor to respond appropriately to atmospheric changes. In the presence of toxic or combustible gases, an accurate reading from your gas

This may lead you to wonder if temperature plays a role in the readings you get from your gas detector. Sensor response will certainly change as the temperatures get colder, but more sophisticated gas monitors typically use “temperature compensation” to keep gas readings within +/-15% of the actual concentrations. All Industrial Scientific gas monitors feature temperature compensation so users can rely on the readings from their gas detectors to inform their next steps.

While there are many aspects of cold weather gas detection that you can't control, there are a few easy actions you can take to stay protected and maintain the health of your devices in frigid conditions.



Maintenance Needs

Atypical weather conditions call for some specific maintenance needs to help extend the life and performance of your gas detector fleet.

The first thing you can do is store your gas monitoring equipment in a humid area. The cold winter climate can be extremely dry, especially in the Northern Plains, Northwest Canada, and Alaska. The dry climate impacts the performance of some electrochemical sensors even more than cold temperatures. To prevent the aqueous electrolytes from drying out, store and charge your instruments in a humidified area. Keeping the ambient relative humidity at 40-50% will go a long way toward maintaining the sensitivity of your sensors and will keep them working longer.

If a gas monitor seems to be lagging, you may need to bump test more frequently. The response of the instrument may appear sluggish at temperatures below minus 20 C. The display may dim and even go blank if it freezes. If this happens, your gas monitor will likely still detect gas and will still alarm. If you must use it this way, you should bump test it before each use to make sure it responds, and you should get the instrument warmed up as soon as

readings may not be reliable, check the oxygen sensor to make sure it's not frozen. The electrochemical sensors in your instrument typically have an aqueous electrolyte, and in some cases, may freeze as temperatures drop below minus 20 C for an extended period. The oxygen sensor will normally be the first to freeze. When frozen, the sensors will not produce a reliable reading, but functionality should return once they warm up and thaw out.

Finally, be ready to charge your gas monitors more frequently in the winter. Battery run time may be reduced in cold temperatures; below minus 20 C, run time may be reduced by 50% or more.

In the Field

Your behavior and precautions when using your gas monitor out in the field can help it run better, too.

When you walk outside to start a job, your body senses the cold instantly. However, it will take a while for your gas monitor to reach equilibrium with the ambient temperature. The temperature compensation will typically track with the internal temperature of the monitor.

If you plan on being in the cold for less than 20 minutes, there is no need to stabilize your gas monitor and adjust to the outdoor temperature before using it. However, if you will be using your monitor outside for more than 20 minutes, let it stabilize at the ambient temperature for 15 - 20 minutes before use, and then turn it on and zero the sensors in the fresh air.

A final tip is to keep your gas monitor warm until you need it. This can be done by keeping your gas monitor close to your body until you're ready to use it. If you are using the monitor for remote sampling, keeping it inside your coat until you need to read the screen will help keep it warm and functioning longer.

A good rule of thumb for using gas detectors in cold weather is that if you can stand to be out working in the cold, so can your gas monitor. If it's too cold for you, it's probably too cold for the instrument.

Don't let the season leave you, or your gas detector, out in the cold. Stay safe and warm this winter season.