

# 3 Confined Space Air Monitoring Options

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If a worksite has confined spaces, air monitoring requirements before entry will be important. Air monitoring is also referred to as “remote entry tests.”

Know the different methods that can use to accomplish them. This article will weigh the benefits of 3 options for remote testing of atmospheric conditions prior to [confined space](#) entry.



Air Monitoring Options

## Confined Space Air Monitoring Pre-Entry Requirement

OSHA 1910.146(c)(5)(ii)(C) states the following: “Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order.”

The simple explanation – before entering a confined space, use a gas detection monitor to test for hazardous gasses in the atmosphere. A hazardous atmosphere includes the presence of carbon monoxide, any explosive gasses, hydrogen sulfide, and even whether there is enough oxygen present.

All confined spaces must be tested before entry. No entry should be attempted until “pre-entry testing” or “remote testing” for confined space air monitoring is completed.

## 3 Confined Space Remote Testing Methods

There are three primary [methods for confined space air monitoring](#):

1. Lower a gas monitor on a rope
2. Attach an external sample pump to the monitor and lower the pump’s sample tube into the confined space
3. If the monitor has one, use the monitor’s internal pump and lower the pump’s sample tube into the confined space

## Rope Method

Most, if not all, gas monitors have a clip or ring for easy rope attachment. This makes it pretty simple to just lower the monitor into the confined space to take a remote test air reading before entry.

This method makes it easy to test multiple depths of the atmosphere, taking readings at different levels when the monitor is lowered slowly.

Be careful not to drop the monitor and also check for water, as there is a risk of lowering the monitor into the water and damaging the monitor.

This method can make it difficult to know what readings the monitor obtained, and where, during the test. The monitor will keep track of peak readings, so one needs to scroll through the readings to evaluate the peak data in the readings.

## Attached Pump Method

Most monitors accept a detachable pump option. The pump is either battery-operated or uses a hand squeeze pump to draw a sample.

If the pump breaks, there is still a working gas monitor, and it can be reverted to the rope method. Since the monitor is in the operator's hand for this method, there is much less risk of dropping it into the space. Reading can also be read in real-time, so there is no need to scroll for peak readings.

However, it is very difficult to get a hand-squeezed sample. The hand-squeezed sample still needs to be taken at various layers of the remote test. Consider that the pump may need to be squeezed up to 30 times on a ten-foot hose to draw up enough air for a sample test.

A battery pump also requires patience. They require that the sample tube be left at each layer for many seconds in order to get an accurate sample.

In both sample methods, if the filters are not set properly, water can be sucked up into the monitor. Note that pumps draw air from the area of least resistance. So if tubing or filters are clogged, the pump can draw air from the monitor location and not the end of the sample tubing. This will result in faulty test readings.

All pumps require additional maintenance. Particulate and water filters need changing and constant checking. Batteries need replacement and charging. All pumps can fail or break at some capacity.

## Internal Pump Method

Some gas monitors can be purchased with a built-in internal pump.

With an internal pump, there is less risk of dropping the equipment into a confined space because they are also in the operator's hand. Readings can be seen in real-time. There is no need to scroll through results either for this method.

If the pump fails in this method, it is likely the monitor will not be usable at all. It will not work as a diffusion monitor in this case, but it does depend on the monitor being used. If the monitor can still be used in diffusion mode, it will likely not be able to be calibrated. A monitor that cannot be calibrated is not safe to use.

The internal pump method also has the same concerns as the attached pump method.

It is always safer to use a [confined space rescue](#) provider as a resource for confined space rescue and technical rescue support.

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