TOTAL GROUP

SAFETY & EQUIPMENT GUIDE

How to Choose a Portable Gas Detector for Your Worksite

Practical equipment guidance for industrial teams.

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General information only. Confirm site-specific equipment decisions, applicable requirements, and manufacturer instructions before purchase or use.

Choose a portable gas detector by matching its sensors, sampling method, approvals, alarms, and maintenance support to the hazards identified for the specific worksite and task. The decision should follow a documented hazard assessment, not a default detector configuration. CCOHS and Ontario guidance both connect instrument choice to the hazards identified in the assessment.
A detector is one part of a site's risk-control approach. It does not make an area safe, authorize work, or replace controls, a work procedure, or emergency planning. A qualified reviewer should approve the final site-specific selection after considering applicable jurisdictional requirements and the manufacturer's instructions.

1 Key Takeaways

- Start with the documented hazards that exist or could arise during the planned work; do not begin with a generic "standard" monitor.
- Match the sensor list, measurement range, response characteristics, and known limitations to the gases, vapours, and oxygen conditions identified.
- Choose worker-worn, area, or pumped remote-sampling capability based on where the hazard may be and how the assessment says it must be evaluated.
- Confirm environmental limits and any required hazardous-location approval before treating a device as suitable for the site.
- Purchase the maintenance capability with the instrument: test gas, equipment or service, trained personnel, records, and a repair path.

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2 Start with the assessed hazard profile

The first question is not “Which detector is most common?” It is “What atmospheric hazards do this task and location present?” A documented assessment should consider hazards already present and those reasonably foreseeable from the planned work. In confined-space guidance, CCOHS identifies toxic gases, flammable or explosive gases or vapours, and oxygen deficiency or enrichment as atmospheric conditions that may require testing. CCOHS

The assessment may consider task-specific sources of change, including process contents, combustion, equipment emissions, inerting or purging, chemicals, battery charging, biological decomposition, hot work, line breaking, leaks, and emergencies. Treat this as a planning prompt, not an exhaustive list or a work procedure.

OSHA’s atmospheric-testing appendix states that equipment used to evaluate potentially hazardous atmospheres should have sufficient sensitivity and specificity for the hazards that may exist or arise. That is why detector selection should begin with the site and task, then move to sensors and sampling. OSHA Appendix B

3 Match sensors to the actual gases and oxygen conditions

A portable monitor can be single-gas or multi-gas, but a multi-gas configuration is not automatically suitable for every toxic gas, process, or exposure concern. Match the sensor list to the hazards identified: toxic gases, combustible gases or vapours, and oxygen conditions where applicable. The equipment must be appropriate for the assessment rather than selected only because it covers familiar categories. Ontario’s atmospheric-testing guidance

Verify the target gases, whether selective measurement or measurement of a group parameter is required, and substances that may cause cross-sensitivity or interference in the manufacturer documentation. These are core selection questions in the Dräger gas-detection handbook.

For combustible-gas monitoring, calibration gas matters. OSHA explains that combustible-gas instruments read a percentage of the lower explosive limit for the calibrated gas; where another gas is being monitored, manufacturer correction information and competent interpretation may be needed. OSHA Technical Manual This is one reason not to assume that a combustible-gas reading means the same thing across different gases or applications.

4 Choose personal, area, or pumped sampling based on the hazard location

The potential hazard’s location helps determine the monitoring approach. A worker-worn monitor can support breathing-zone monitoring, a portable unit can support area checks, and a compatible pump/probe/tubing configuration may allow remote sampling while the user remains outside a hazardous area. OSHA describes diffusion and active, pumped sampling modes. OSHA Technical Manual

This is not a direction to enter, test, or clear a confined space. Where an atmosphere may be stratified, the sampling approach and test duration need to reflect the task-specific plan and at least the manufacturer-specified instrument response time. OSHA Appendix B A qualified reviewer should determine whether a personal monitor, an area-monitoring approach, or remote sampling is appropriate.

5 Compare sensor performance before extra features

Review manufacturer documentation for the target gas, range, response time, specificity, cross-sensitivities or interferences, calibration-gas requirements, and environmental limits. Ontario identifies

detection principle, specificity, interferences, range, response time, and calibration requirements as selection factors. Government of Ontario

Where more than one substance may be present, document the monitor's limitations in the qualified review; a specification sheet alone does not show suitability.

6 Confirm environmental and classified-area fit

Check operating and storage temperature/humidity limits, particulate exposure, battery runtime, and conditions that could affect performance. OSHA cautions that environmental conditions, contaminants, high target-gas concentrations, and other factors can affect direct-reading monitor performance or calibration. OSHA's testing-and-calibration bulletin

If work may occur in a hazardous or classified location, do not use "intrinsically safe" as a generic description. For U.S. locations, OSHA requires equipment approval for the location class and the ignitable or combustible properties present. 29 CFR 1910.307 Verify the site requirement against the device's exact listing or marking; Canadian requirements may differ by jurisdiction.

7 Set alarms, plan monitoring, and buy maintenance support

Alarm configuration, response actions, communication expectations, and stop-work or evacuation steps belong in the site's qualified process. This article does not prescribe universal alarm setpoints because they depend on the hazard, instrument, worksite, manufacturer guidance, and sometimes the applicable jurisdiction.

Continuous monitoring, data logging, connectivity, and alarm visibility can support a work plan when the assessed risk calls for them; they do not replace controls, competent interpretation, or a site procedure. Determine monitoring frequency and records through the applicable work plan and regulatory context. WorkSafeBC's confined-space rules address pre-entry, additional, and continuous testing in defined circumstances and should not be generalized beyond that jurisdiction and context. WorkSafeBC Part 9

A reliable selection includes the maintenance system, not just the instrument. Confirm access to appropriate test gas, required accessories, equipment or service, trained personnel, records, and a repair or sensor-replacement pathway. Manufacturer instructions govern the device-specific process.

A bump test, also called a function check, confirms that challenge gas reaches the sensors and that alarms operate. It does not establish measurement accuracy. A calibration check compares instrument response with test gas, while full calibration adjusts readings to a known concentration. OSHA makes this distinction, as does Dräger's bump-test explanation.

If a device does not pass a bump test or calibration check, OSHA says it should be fully calibrated before use; if it does not pass full calibration, remove it from service and contact the manufacturer. Follow the manufacturer's instructions and employer program for the device. OSHA

8 Portable Gas Detector Selection Checklist

Use this as a documentation prompt, not as approval to buy or deploy a device.

- [ ] The current hazard assessment identifies expected gases, vapours, oxygen conditions, and potential atmospheric changes.
- [ ] The proposed sensors, ranges, response characteristics, and limitations have been compared with those hazards.
- [ ] Cross-sensitivities, interferences, and calibration-gas considerations have been reviewed in the manufacturer documentation.

- [ ] The sampling method is suitable for where the potential hazard may be, including any need for remote sampling.
- [ ] Environmental limits, handling conditions, battery needs, and any classified-area requirement have been checked.
- [ ] Alarm settings, communications, and response actions are addressed through the site's qualified process.
- [ ] The site has an appropriate maintenance plan, test resources or service, trained personnel, records, and a repair path.
- [ ] Manufacturer instructions, applicable jurisdictional requirements, and qualified reviewer approval have been documented.

9 FAQs

9.1 Is a four-gas detector right for every job?

No. A multi-gas monitor may combine oxygen, combustible-atmosphere, and selected toxic-gas sensors, but suitability depends on the task's actual hazards. Match the sensor list and performance characteristics to the documented assessment. OSHA Technical Manual CCOHS

9.2 What is the difference between a bump test and calibration?

A bump test verifies sensor response and alarm function when challenge gas is applied; it does not determine measurement accuracy. Calibration compares or adjusts the instrument response against a known concentration according to the relevant process and manufacturer instructions. OSHA

9.3 When might a pumped detector be needed?

A pumped configuration may be relevant when the task-specific assessment calls for remote sampling with a probe and tubing while the user remains outside a hazardous area. The need depends on the hazard location, sampling method, and instrument response characteristics. OSHA Technical Manual OSHA Appendix B

9.4 Why does the calibration gas matter?

A combustible-gas instrument is calibrated to a reference gas, and its response can differ for another gas. Manufacturer correction information and competent interpretation may be needed. OSHA Technical Manual

> **Limitations and qualified review:** This article provides general information only. It is not legal advice, a work procedure, a site assessment, engineering advice, or a substitute for manufacturer instructions. It does not determine regulatory compliance, establish alarm setpoints or test intervals, authorize entry or work, or replace site-specific hazard controls and emergency planning. Requirements vary by work type and jurisdiction; CCOHS advises readers to consult the legislation that applies to their situation and jurisdiction. CCOHS

Total Group can help your team discuss documented hazards, constraints, and maintenance support before a detector decision. Explore Gas Detection or contact Total Group to discuss your requirements with a qualified reviewer.

10 References

1. Canadian Centre for Occupational Health and Safety — Confined Space: Atmospheric Testing
2. Government of Ontario — Atmospheric Testing, Guideline for Working in Confined Spaces

3. Occupational Safety and Health Administration — 29 CFR 1910.146 Appendix B: Procedures for Atmospheric Testing
4. Occupational Safety and Health Administration — Calibrating and Testing Direct-Reading Monitors
5. WorkSafeBC — OHS Regulation Part 9: Confined Spaces
6. WorkSafeBC — OHS Guidelines Part 9: Confined Spaces
7. Occupational Safety and Health Administration — OSHA Technical Manual, Section II, Chapter 3: Personal Protective Equipment
8. Occupational Safety and Health Administration — 29 CFR 1910.307: Hazardous (Classified) Locations
9. Dräger — An Introduction to Gas Detection Technology
10. Dräger — Bump Testing a Gas Detector

Qualified Total Group review is required before Shopify publication.