Lockout Specification | BW Clip
Maintenance-free single gas detector

The gas detector must satisfy the following.

Physical Specifications	
Size (d x w x h)	Physical detector size shall be no larger than 1.6 x 2.0 x 3.4 inches / 4.1 x 5.0 x 8.7 cm, including alligator clip.
Weight	Weight of detector shall be no more than 3.2 oz. / 92 g, including alligator clip.
Case Material	Case material shall be composed of a two-shot plastic mold which includes (a) a clear polycarbonate substrate interior and (b) a thermoplastic elastomer conductive over-mold, available in highly visible safety yellow.
Handling	Detector shall be equipped with a stainless steel high-tension clip that will easily attach to a pocket, lapel or belt.
Carrying Attachments	Available carrying attachments shall include neck and harness straps, and an optional non-conductive hard hat clip.
Accessories Available	The following detector accessories must be available: • An automated instrument management system, such as IntelliDoX, for bump testing, event downloading, firmware updates and device configuration, including hibernation. The management system must indicate Pass/Fail for each test. • A hibernation case that eliminates need for computer or IR enabled hibernation • Replacement stainless steel alligator clip • All carrying attachments described above

User Interfaces	
Visual Display	The detector must have an LCD (liquid crystal display) that advises: • Gas type monitored • Continuous readout of life remaining in months, then days, then hours • Alarm level encountered: low or high, including level as ppm or %vol concentration • Alarm setpoints: low and high • Peak (maximum) alarm exposure and time in hours since peak alarm occurred • Optional real-time clock • Optional display of gas reading during alarm including level as ppm or %vol concentration

Display Symbols (icons)	The detector's LCD shall also include icons that clearly advise: • Alarm type and alarm level encountered • Life-ended warning • Diagnostic or notification warning • Bump test reminder • Sensor zero due (daily reminder that applies to oxygen detectors)
Keypad	One-button operation must: • Activate the detector • Display alarm setpoints • Display peak gas exposures • Display required detector maintenance functions (hibernation, sensor zero) There shall be no requirement to access hidden switches for any detector operation.

Monitoring Capability

Configurations	The gas detector must be available in a single gas model that continuously monitors for hydrogen sulfide, carbon monoxide, oxygen or sulfur dioxide, as applicable.
Gases Detected and Measuring Specifications	Gases measured, measuring ranges, technique shall equal:

Gases	Measuring Range	Sensor Type
Hydrogen Sulfide	0-100 ppm	Electrochemical
Carbon Monoxide	0-300 ppm	Electrochemical
Oxygen	0-25.0 %	Electrochemical
Sulfur Dioxide	0-100 ppm	Electrochemical

Sensor Type	The detector's sensors must be gas-specific electrochemical sensors.

Detector Power

Run Time	Two year detectors must operate continuously for two years (24 months) given a maximum of 2 minutes of alarm per day in normal use. Three year detectors must operate continuously for three years (36 months) given a maximum of 1 minute of alarm per day in normal use. The detector shall not require battery charging or replacement during its operational life. Life-ending warning must occur at least eight hours prior to termination of the detector's operational life.
Battery Test	The battery must be automatically tested at least every day.

Environmental

Operating Temperature Range	Normal operation, hydrogen sulfide:	-40 to +50 °C / -40 to +122 °F
	Normal operation, carbon monoxide:	-30 to +50 °C / -22 to +122 °F
	Normal operation, oxygen:	-20 to +50 °C / -4 to +122 °F
	Normal operation, sulfur dioxide:	-30 to +50 °C / -22 to +122 °F
	Internal vibrating option operates to:	-15 to +50 °C / +5 to +122 °F
Humidity	5-95% RH (non-condensing) continuous 0-99% (non-condensing) for shorter exposures of 1 hour or less	

Maintenance

Zero-maintenance	The detector shall not require maintenance during the detector's operational life: no battery charging, no battery or sensor replacement.
Calibration Frequency	Calibration shall not be required during the detector's operational life.
Oxygen Detectors	On demand, the oxygen detector must be capable of performing a sensor zero in a clean atmosphere (20.9% O_2).
Sensor	The detector shall not require sensor replacement during its operational life.
Battery	The detector shall not require battery replacement or charging during its operational life.

Basic Operational Features

Event Logging	The detector must record and transmit gas alarm events encountered and the time elapsed since the event occurred. Data transmission shall be wireless to a docking station. A minimum of the last 35 events must be stored.
Continuous Operation	The detector must be continuously ON without the ability to turn OFF during its operational life. Hibernation mode shall be the only exception to continuous operation.
Hibernation Mode	Two year H_2S and CO detectors must support hibernation mode via a case accessory or docking module. When in hibernation mode the detector must not provide gas detection or alarms and must be in a low power state. Hibernation must extend the service life for these detectors up to an additional 12 months, not to exceed 24 months of actual operating time.
Peak (Max) Exposures	The detector must record and display, on demand, the peak exposure to gas (in ppm or %) encountered during the last 24 hour monitoring period and time elapsed (in hours and minutes) since that exposure occurred.

Alarm Events	The detector must record and download a hard copy record via a docking module for the last 35 alarm events encountered. Information shall include: gas monitored, alarm level (in ppm or %) encountered, alarm duration in minutes and seconds, time elapsed since each alarm event occurred, life remaining and cumulative alarm time.
Detector Activation	The detector must have one-button activation. ON function must: • Test the battery • Display the current alarm setpoints • Provide a full function self-test of sensor integrity, circuitry integrity and alarm activation • On initial activation, precondition the battery and sensor, as appropriate
Safety Shutdown	The detector must have an automatic safety shutdown mode to prevent unsafe usage. Detector must turn off either if self-test fails, battery test fails, or if detector is not manually turned off within 8 hours of the life-ended alarm.
Detector Status Advise	The detector must — upon activation and on demand thereafter — analyze and test its own operational status and provide alarm advice of any malfunction.
Full function Self-test	The detector must automatically run a self-test at least every 24 hours. The self-test must test sensor, battery and circuitry integrity. Detector must advise self-test fail status.

Detector Alarms	
Alarms and Types	The detector must simultaneously display visual alarms, audible alarms and vibrator alarms and warn in the event of a gas alarm condition, sensor fault or detector status alarm.
Gas Alarms	The detector must be equipped with two (2) factory set gas alarm levels: low and high. Also, for exposures above the detector's measuring range an OL (over limit) alarm and advice must be provided.
Visual Alarms	The detector must be equipped with three flashing alarm bars visible from all angles. LCD must provide positive clear alarm notification as to which alarm level has been exceeded (LOW or HIGH).
Audible Alarm	The detector must be equipped with a variable pulsed audible alarm that shall be rated at 95 dB.
Vibrator Alarm	The detector must be equipped with an internal vibrator alarm for high noise areas.
Alarm Setpoints	The detector alarm setpoints shall be displayed on startup and on-demand at any time. Alarm setpoints shall be factory-set to default values and shall be adjustable both prior to and after activation by using a docking module.

Certifications and Approvals

Intrinsic Safety	The detector must be certified to the following standards: **UL** Classified by UL to both US and Canadian Standards as intrinsically safe for Class I, Division 1, Group A, B, C, D and Class I, Zone 0, Group IIC. **ATEX** CE 0539 II 1G Ex ia IIC T4 Ga IP66/67 DEMKO 14 ATEX 1356 **CE** European Conformity **EC Declaration of Conformity** **IECEx** Ex ia IIC T4 Ga IP66/67 IECEx UL 14.0063 **Inmetro (Brazil), KCS (Korean Safety)** and **ABS (American Bureau of Shipping)** based on **IECEx** approval
Standards	UL 913 8th Edition UL 60079-0:2013, UL 60079-11:2013 CSA C22.2 No. 157-92:2012, CSA C22.2 No. 60079-0:2011, CSA C22.2 No. 60079-11:2014 EN 60079-0:2012 +A11:2013, EN 60079-11:2012 EN 60079-26:2007 IEC 60079-0:2011 IEC 60079-11:2011 IEC 60079-26:2006
Manufacturing Approval	The detector manufacturers must be certified compliant with ISO 9001:2000 provisions.
RFI/EMI Protection	RFI/EMI protection must comply with EMC directive 89/336/EEC.

Ingress Protection

IP Rating	The zero-maintenance single gas detector must be rated to IP66/67 standards.

Warranty

Warranty	Warranty must be for the operational life of the detector (2 or 3 years), including sensor and battery, plus 1 year shelf life for toxic gas detectors or 6 month shelf life for oxygen detectors. Two year H_2S and CO detectors shall be covered for up to an additional 12 months when hibernation mode is used; limited by a total of 24 months of detector operation.