

# Specifications

## GasAlertMicroClip X3 Specifications

The instrument must satisfy the following:

Physical Specifications	
<b>Size (h x w x d)</b>	Physical size shall be no larger than 4.4 x 2.4 x 1.2 in. / 11.3 x 6.0 x 3.2 cm
<b>Weight</b>	Weight of instrument shall be no more than 6.3 oz. / 179 g, including alligator clip.
<b>Case Material</b>	Case material shall be rugged, impact-resistant, non-corrosive composite material that will prevent spark generation and shall be available in highly visible safety yellow or black.
<b>Integral Boot</b>	The instrument shall be equipped with a built-in concussion-proof boot.
<b>Vibrator Alarm</b>	The detector shall be equipped with an internal vibrator alarm for high noise areas.
<b>Handling</b>	Unit shall easily attach to pocket or belt.
<b>Carrying Attachments</b>	Unit shall be equipped with a high-tension stainless steel alligator clip.
<b>Accessories</b>	The following accessories must be available: <ul style="list-style-type: none"><li>• A manual aspirator pump with sampling hose or probe</li><li>• A vehicle charger</li><li>• Confined space entry kits in a hard-sided carrying case</li><li>• Automatic Test and Calibration Station that shall:<ul style="list-style-type: none"><li>○ Bump test and calibrate instruments in the field without requiring use of a desktop PC or laptop</li><li>○ Be fully portable and available in a variety of portable kit options</li><li>○ Provide simultaneous management of up to 6 instrument docking modules</li><li>○ Include battery and 110-240 VAC line power options</li><li>○ Include software for downloading, evaluating and archiving monitoring results</li></ul></li></ul>
User Interfaces	
<b>Display Type</b>	Large alphanumeric LCD (Liquid Crystal Display) type display with simultaneous and continuous readouts for each gas monitored in ppm, %LEL and % v/v values, as applicable, showing the real-time gas concentrations present. Digits not to be less than 0.260 in. / 6.50 mm high.
<b>Display Symbols (Icons)</b>	Gas alarm icons will clearly identify alarm type, gas hazard and alarm level encountered, low battery condition, instrument status, safe display, stealth, and calibration steps.
<b>Keypad/Switches</b>	One-button operation must: activate the detector; run the self-test; display alarm setpoints; display peak gas exposures and clears them; calibrate and zero. There shall be no requirement to access hidden switches for any instrument operation.

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Monitoring Capability																			
<b>Configurations</b>	The gas detector must be available in 1, 2, 3, or 4 gas models that continuously and simultaneously monitor for oxygen, combustible/methane gases, hydrogen sulfide, carbon monoxide as applicable.																		
<b>Gases Detected and Measuring Specifications</b>	<table border="1"> <thead> <tr> <th>Gases</th> <th>Standard Measuring Range</th> <th>In Increments of:</th> </tr> </thead> <tbody> <tr> <td>Hydrogen Sulfide</td> <td>0-100 ppm H<sub>2</sub>S</td> <td>1 ppm</td> </tr> <tr> <td>Carbon Monoxide</td> <td>0-500 ppm CO</td> <td>1 ppm</td> </tr> <tr> <td>Oxygen</td> <td>0-30.0 % O<sub>2</sub></td> <td>0.1 %</td> </tr> <tr> <td>Methane</td> <td>0-5% v/v methane</td> <td>0.1% methane</td> </tr> <tr> <td>Combustible gases</td> <td>0-100% LEL</td> <td>1.0% LEL</td> </tr> </tbody> </table>	Gases	Standard Measuring Range	In Increments of:	Hydrogen Sulfide	0-100 ppm H <sub>2</sub> S	1 ppm	Carbon Monoxide	0-500 ppm CO	1 ppm	Oxygen	0-30.0 % O <sub>2</sub>	0.1 %	Methane	0-5% v/v methane	0.1% methane	Combustible gases	0-100% LEL	1.0% LEL
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<b>Sensor Type</b>	Sensors must be plug-in.																		
<b>Longer Life</b>	The catalytic (combustible/methane) sensor should not be affected by common sulfur compounds, such as H <sub>2</sub> S.																		
Instrument Power																			
<b>Battery Type and Run Time</b>	Lithium-polymer rechargeable battery pack. The run time of a new instrument shall not be less than 18 hours at room temperature. The run time shall not be less than 12 hours at any time over 3 years of use in a temperature range between -4°F to +122°F (-20°C to +50°C)																		
<b>Rechargeable Choices</b>	A Vac (110 to 240) line charger, 12 Vdc (vehicle) charger and 12 Vdc / 24 Vdc cable must be available.																		
<b>Charge Time</b>	Typical charge time for rechargeable batteries shall not be more than 6 hours per battery.																		
Environmental																			
<b>Temperature Range</b>	Normal operation: -4 to +122 °F / -20 to +50 °C																		
<b>Humidity</b>	0-95% RH (non-condensing) continuous																		
<b>Ingress Protection</b>	IP 68																		
Calibration																			
<b>Automatic Calibration</b>	Calibration must be fully automatic with Auto Zero and Auto Span functions. Instrument must advise as each automatic function takes place and when to apply gas. Calibration span levels must be "User Settable".																		
<b>Calibration Diagnostics</b>	Equipped with calibration diagnostics protection that ensures a valid calibration, the detector must check the ambient air and the calibration gas. If either does not meet expected values, the detector will refuse calibration and automatically exit the procedure, retaining all previous values.																		

# Specifications

## Basic Operational Features

<b>Instrument Activation</b>	One-button activation. ON function must: <ul style="list-style-type: none"><li>• Test the battery and advise condition</li><li>• Display the current alarm set points</li><li>• Provide a full function self-test of sensor integrity, circuitry integrity and alarm activation</li><li>• Automatically calibrate the oxygen sensor</li><li>• Automatically zero H<sub>2</sub>S, CO and LEL sensors</li><li>• Advise when the next calibration is due in days, or advise the number of days overdue</li></ul>
<b>Inadvertent Shut-off</b>	Unit must not be able to be turned OFF accidentally and will incorporate a timed off function that provides audible/visual/vibration OFF indications.
<b>Peak Exposures</b>	Records peak (maximum) exposure to gases encountered and must display the reading on demand.
<b>Accumulated Exposures</b>	Records both TWA (time-weighted average) to toxic gases based on an 8-hour workday and STEL (short-term exposure limit) to toxic gases based on a 5-15 minute user-selectable work period. (STEL period is adjustable.) Must display readings on demand.
<b>Confidence Beep</b>	Confidence beep must be a user selectable option.
<b>IntelliFlash (Compliance Flash)</b>	IntelliFlash verifies operation and compliance to both the user and supervisor.
<b>Instrument Status Advise</b>	The detector must constantly analyze and test its own operational status and provide alarm advice of any malfunction.
<b>Backlight</b>	Backlight automatically illuminates the display in all alarm conditions (auto with time-out) and can be reactivated on demand with a button press.
<b>Adjustable Options</b>	The unit shall be equipped with user options for the following functions: <ul style="list-style-type: none"><li>• Adjust STEL period (5-15 minutes in 1 minute intervals)</li><li>• Set calibration span levels and due date</li><li>• Toggle ON/OFF: confidence beep, oxygen auto-calibration at start-up, Auto-zero LEL, CO and H<sub>2</sub>S on start-up, latching alarms, "SAFE" display function (does not display gas concentrations unless readings change), stealth mode for silent operations, Force calibration when calibration overdue, Calibration lockout: calibration must be invoked via IR, mandatory bump test option, bump test reminder</li><li>• Multi-language LCD selection in English, French, German, Portuguese and Spanish</li><li>• Select combustible gases measurement: 0-100% LEL (Lower Explosive Limit) or Methane gas 0-5.0% v/v</li><li>• Alarm setpoint disable (set to zero for off).</li><li>• Calibration due date (1 to 365 days, or set to zero for off)</li><li>• User-settable confidence beep</li><li>• Individual sensor enable/disable.</li></ul>
<b>Auto Zero Protection</b>	Must be able to activate Auto Zero at any time. To ensure a valid Auto Zero, the instrument will first test the ambient air for background interfering gas before proceeding with the Auto Zero function.

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Instrument Alarms	
<b>Alarms and Type</b>	Simultaneous visual display alarms, audible alarms and vibrator alarms must warn in the event of a gas alarm condition, sensor fault or instrument status alarm.
<b>Number of Gas Alarms</b>	Must be equipped with four (4) user-settable alarm levels, including instant low, instant high, TWA (Time- weighted average) and STEL (short-term exposure limit). Also, will include an OL (over limit) alarm.
<b>Visual Alarms</b>	Instrument must be equipped with at least three flashing alarm bars easily visible from multiple angles. The backlight must light in all alarm conditions. LCD must provide positive clear alarm advice as to which alarm level and type has been exceeded (instant LOW, instant HIGH, TWA, STEL and/or over limit).
<b>Audible Alarm</b>	Instrument must be equipped with one variable pulsed audible alarm that shall be rated at 95+ dB.
<b>Vibrator Alarm</b>	Instrument must be equipped with an internal vibrator alarm for high noise areas.
<b>Alarm Set points</b>	Alarm set points must be adjustable. The current alarm set points shall be displayed each time on start-up.
<b>Over Limit Exposure Protection</b>	For exposures above the instrument's measuring range for the combustible sensor, the instrument will provide an over limit latching alarm that must be acknowledged.
<b>Low Battery Warning</b>	Must be equipped with low battery audible and visual alarms.
Datalogging	
<b>Recorded</b>	All events and occurrences.
<b>Data Storage Period</b>	With a default 15-second sampling rate interval the storage capacity will be 16 hours.
<b>Compatibility</b>	Data must be compatible for use with standard office programs, such as Excel and Access.
Event Logging	
<b>Recorded</b>	Must record the last 10 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.

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Certifications and Approvals	
<b>Intrinsic Safety</b>	Instrument must be certified by the following standards: <ul style="list-style-type: none"> <li>• Approved by CSA to both U.S. and Canadian Standards CAN/CSA C22.2 No. 157 and C22.2 152 ANSI/UL - 913 and ANSI/ISA - 12.13.01 Part 1 CSA Class I, Division 1, Group A, B, C, and D</li> <li>• ATEX: CE 0539 g II 1 G Ex ia IIC T4 Ga Sira 13ATEX2330 EN 60079-0, EN 60079-11, and EN 60079-26</li> <li>• IECEx: Ex ia IIC T4 Ga IECEx CSA 05.0015 IEC 60079-0, IEC 60079-11, IEC 60079-26</li> <li>• EAC Certificate: RU C-GB.ГБ05.B.01115</li> </ul>
<b>Manufacturing Approval</b>	The instrument must be certified compliant with ISO 9001 provisions.
<b>RFI/EMI Protection</b>	RFI/EMI protection must comply with EMC directive 2004/108/EC
Warranty	
<b>Warranty</b>	Three-year full, non-prorated warranty including instrument, sensors and battery. <i>Battery is guaranteed to have 12 hour runtime during warranty period under normal operating temperature of 4°F / -20°C to 122°F / 50°C.</i>
Expected Lifetime	
<b>Expected Lifetime</b>	Instrument and all sensors should have an expected lifetime of 5 years when used within normal operating conditions and maintained in accordance to the manufacturer's instructions.