



The Ultima® X Series Gas Monitors

[EXtreme Design . . . Ultimate Features]

ULTIMA® X SERIES
GAS MONITORS

Ultima XE	LCD Display; Explosion-Proof Stainless Steel Enclosure
Ultima XA	LCD Display; General-Purpose Plastic Enclosure



Ultima® X Series Gas Monitors

MSA's Ultima X Series Gas Monitors are microprocessor-based transmitters, engineered with the customer in mind.



Ultima XE
Explosion-Proof
316 Stainless Steel



Ultima XA
Water- and
Corrosion-
Resistant All-
Purpose Plastic

The latest mechanical and electrical technologies offer a state-of-the-art design for any gas detection need. The Ultima X Series Gas Monitors, available in both stainless steel and plastic enclosure housings, provide continuous monitoring of hazardous gases. Advanced sensing technologies monitor against the threat of combustible and toxic gases and for oxygen deficiency, utilizing catalytic, electrochemical and infrared gas detection methods.

X Factors

1 Sensor Disconnect Under Power

MSA's proprietary feature allows for sensor change-out without declassifying a hazardous area. (Patent Pending)

2 Interchangeable Smart Sensors

Pre-calibrated sensor modules are ready for installation out of the box. Sensors can be replaced in the field without the use of tools. The unit quickly recognizes the new sensor type and reconfigures alarm and relay settings to optimize the new sensor.

3 State-of-the-Art Display

Liquid crystal display conveniently alternates between sensor reading and gas type and features scrolling messaging, indicating ongoing diagnostic checks such as sensor "end-of-life" condition.

4 World-Class Design

Engineering efforts feature a single-board design for ultimate reliability and serviceability. The multiple-entry mounting enclosure has been designed to be separate from the electronics and sensor, allowing for problem-free installation and servicing.

5 Onboard LEDs and Relays

Optional "quick-check" LEDs and four relay outputs allow for increased indication of alarm and fault conditions. "Quick-check" LEDs, viewable from afar, indicate NORMAL (green) and ALERT (red) status conditions. Field-programmable alarm levels and normally energized/de-energized, normally opened/closed and latching/non-latching relay functions offer three levels of alarm and a fault.

With a number of new and exciting features, the Ultima X Series Gas Monitors are suitable for indoor and outdoor applications in virtually any type of industry including offshore, refineries, chemical and petrochemical facilities, steel mills, water and wastewater plants, mining, and general industry.



Ultima XE Gas Monitor



Ultima XA Gas Monitor

Installation and Operation

Installation is both simple and flexible. The Ultima XE Gas Monitor offers multiple enclosure entries for left, right, top or bottom wiring feed. Two-piece field-wiring connectors make wiring installations easy.

The Ultima X Series Gas Monitors operate in diffusion mode, with factory-calibrated sensors ready to perform immediately after installation. The monitors are also available for remote sensing applications, where installations require the sensor be separated from the electronics, up-to 100 feet.

Ultima X Series Gas Monitors, can operate completely stand-alone with a large LCD display, optional “quick-check” LEDs and four relay outputs (three alarm and one fault), or connected with a standard 4-20mA output to a control system (PLC, DCS, etc.).

Calibration

As with all gas monitors, Ultima X Series Gas Monitors must be calibrated periodically with the gas of interest to ensure proper operation. The calibration process offers time and date stamping, along with selectable lockout of output signal during calibration.

The Ultima X smart sensor module contains all calibration information within the module. Calibration can be done in the field with the sensor module connected to the transmitter or in a shop area by disconnecting the sensor module and calibrating with another base unit. This remote calibration method does not require shutting down power or any other system interruptions.

The Ultima X Series Gas Monitors reduce the possibility of human error when performing calibration. Simply activate the calibration mode and follow the instructions on the LCD display. Instructions will detail when to apply zero and span gas. The Ultima X Series Gas Monitors automatically make any adjustments. There’s no guesswork– the actual gas readout is displayed during calibration.

Two types of calibration communication devices are available for the Ultima X Series Gas Monitors. The Ultima Monitor’s calibrator and controller both provide a digitally encoded signal for non-intrusive calibration and access to advanced features. This eliminates tools as well as the need to open the enclosure during set-up and calibration.



Calibrator

The Ultima Monitor Calibrator offers the industry's simplest method of calibration—an easy-to-use, three-button device that allows calibration and address-change of the Ultima X Series Monitor.

Controller

The Ultima Monitor Controller provides complete access to all features through its full-function keypad.

Features include:

- * Sets alarm levels
- * Changes span-gas value
- * Displays date of last calibration

Specifications (for both Ultima XE and Ultima XA, unless otherwise noted)

Gas Types	Combustibles, oxygen and toxics
Temperature Range	-40°C to +60°C (-40°F to +140°F) (typical - range on some models may differ)
Drift	
Zero Drift	<5% / year, typical
Span Drift	<10% / year, typical
Noise	<1% Full Scale
Accuracy	
Repeatability	±1% Full Scale or 2ppm, typical
Linearity	±2% Full Scale or 2ppm (O ₂ , CO) ±3% Full Scale (<50% LEL combustibles) ±5% Full Scale (>50% LEL combustibles) ±10% Full Scale or 2ppm (non-CO toxics)
Response Times	
T ₂₀ oxygen and toxics	<12 sec. (typically 6 sec.)
T ₅₀ oxygen and toxics	<30 sec. (typically 12 sec.)
T ₅₀ combustibles	<8 sec.
T ₉₀ combustibles	<20 sec.
Humidity	15%-95% RH, non-condensing
Sensor Life	
Oxygen and Toxics	2 years typical
Combustibles	3 years typical
Replacement warranty	1 year
Power Input	7-30VDC (oxygen and toxics) 7-30VDC @ 450mA maximum (combustibles)
Wiring Requirements	
Combustibles	3-wire
Oxygen and Toxics	2-wire; no LEDs or relays
Oxygen and Toxics	3-wire; LEDs and/or relays
Signal Output	4-20mA 2-wire current sink 4-20mA 3-wire current source
Relay Contacts	
Rating	5amp @ 220VAC; 5amp @ 30VDC
Alarm Type	energized/de-energized, normally-opened/closed, upscale/downscale, latching/non-latching
Fault Type	energized, normally-opened/closed, upscale/downscale, latching/non-latching
Conduit Entries	
Ultima XE	Four entries, 3/4 inch NPT or 25mm
Physical	
Ultima XE	316 stainless steel; 10.4lbs. (4.7kg) 6.312" W x 3.911" D x 10.280" L (160.33 x 99.34 x 261.11mm)
Ultima XA	Polycarbonate; 1.5lbs. (0.68kg) 5.125" W x 2.974" D x 9.423" L (130.18 x 75.54 x 239.34mm)
Approval Ratings	
Ultima XE	UL 1203 Class I, Div. 1, Groups B, C, & D CSA C22.2-30 Class I, Div. 1, Groups B, C, & D (oxygen and toxics) CSA C22.2-30 Class I, Div. 1, Groups B, C, & D (combustibles pending) CE Low Voltage Directive: 73/23/EEC (pending) CE EMC Directive: 89/336/EEC (pending) CE ATEX Directive: 94/9/EC EEx d IIC T6 (TAMB -40°C to +60°C) (DMT pending)
Ultima XE remote sensor	UL 1203 Class I, Div. 1, Groups A, B, C, & D CSA C22.2-30 Class I, Div. 1, Groups A, B, C, & D (oxygen and toxics) CSA C22.2-30 Class I, Div. 1, Groups A, B, C, & D (combustibles pending) CE EMC Directive: 89/336/EEC (pending) CE ATEX Directive: 94/9/EC EEx d IIC T4 (TAMB -40°C to +60°C) (DMT pending)
Ultima XA	Nema4X rating (pending) CE Low Voltage Directive: 73/23/EEC (pending) CE EMC Directive: 89/336/EEC (pending)





The Ultima[®] XIR Gas Monitor

[Infrared technology for combustible gas detection]

The Ultima XIR Gas Monitor is a microprocessor-based, infrared point gas detector for continuous monitoring of combustible gases and vapors. Designed around a rugged, 316 stainless steel enclosure, the Ultima XIR Monitor is the latest sensor to be launched in the Ultima X Series of Gas Monitors.

The Ultima XIR Monitor operation is based on dual-wavelength, heated-optics technology, providing definitive compensation for temperature, humidity and aging effects. The IR technology offers excellent long-term stability, eliminates the need for frequent calibrations and reduces overall cost of ownership.

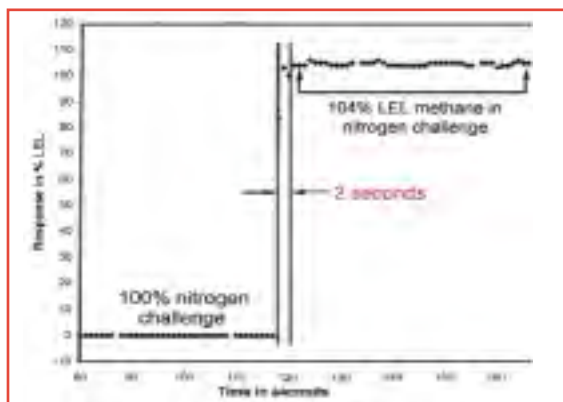
Features

- * 316 stainless steel explosion-proof, multiple-entry-mounting enclosure.
- * Field-selectable algorithms for a variety of hydrocarbon-based gases.
- * LCD display with scrolling messaging.
- * Single-board design for ultimate reliability and easy, no-tool servicing.
- * 4-20mA output.
- * Optional "quick-check" LEDs for increased product visibility.
- * Optional field-programmable relays feature three alarm levels and one fault.
- * "Fail to Safety" operation.

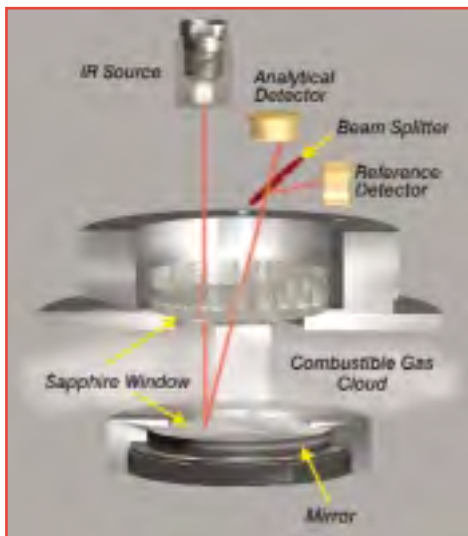
Benefits

- * No-gas calibration. A zero adjustment is all that is required for full calibration.
- * Extremely fast speed of response.
- * Designed without a sintered disk for optimum performance in the harsh, offshore environment.
- * Operates over extended temperature ranges.
- * Immune to poisoning.
- * Sensor life not reduced by exposure to gas.
- * Automatic compensation for humidity and temperature changes.
- * No moving parts, jumpers, switches or pots.
- * Operates in high-gas and low-oxygen environments.





Extremely Fast Speed of Response ($T_{90} < 2$ sec.)



Principles of IR Technology

The Ultima XIR Gas Monitor uses an electronically modulated source of infrared energy and two detectors that convert the infrared energy into electrical signals. Each detector is sensitive to a different range of wavelengths in the infrared portion of the spectrum.

The source emission is directed through a window in the main enclosure into an open volume. A mirror at the end of this volume, protected by a second window, directs the energy back through the window in the main enclosure and onto the detectors.

The presence of a combustible gas in the open volume will reduce the intensity of the source emission reaching the analytical detector but not the intensity of the source emission reaching the reference detector. The microprocessor monitors the ratio of these two signals and correlates this to a %LEL combustible reading.



Ultima XIR Accessories

Specifications:

Gas Types and Ranges	Combustible gases & vapors; 0-100% LEL
Temperature Range	-40°C to +60°C (-40°F to +140°F)
Stability	±2% Full Scale/year
Accuracy	
Repeatability	±1% Full Scale
Linearity	±2% Full Scale (≤50% LEL) ±5% Full Scale (>50% LEL)
Response Time (without the sensor guard)	
T_{90}	<2 sec.
Humidity	0%-95% RH, non-condensing
Sensor Warranty	2 years
Power Input	7-30VDC @ 750mA maximum
Wiring Requirements	3-wire
Signal Output	4-20mA 3-wire current source
Relay Contact Rating	5amp @ 230VAC; 5amp @ 30VDC
Conduit Entries	Four entries, 3/4" NPT
Physical	316 stainless steel;
Approval Ratings	UL 1203 Class I, Div. 1, Groups B, C, & D; Class II, Div. 1, Groups E, F, & G; Class III CSA C22.2-30 Class I, Div. 1, Groups B, C, & D (pending) Class II, Div. 1, Groups E, F, & G (pending) Class III (pending) CSA C22.2 No. 152 Combustible Gas Performance (pending) CE Low Voltage Directive: 73/23/EEC (pending) CE EMC Directive: 89/336/EEC (pending) CE ATEX Directive: 94/9/EC II 2G EEx d IIc T5 (T_{amb} -40°C to +60°C) (DMT pending)

Ordering Information

All Ultima X Series Gas Monitors are manufactured using MSA's Assemble-To-Order (ATO) process. For further information on the Ultima X Series Gas Monitors, see Datasheet 07-2051.

Offices and representatives worldwide

