



ULTIMA XE



ULTIMA XIR

# The ULTIMA X Series Gas Monitors

[ The ultimate Solution ]

The ULTIMA X Series Gas Monitors are microprocessor-based, point gas detectors/transmitters for continuous monitoring of combustible and toxic gases and oxygen deficiency. Housed in a rugged, 316 stainless steel explosion proof enclosure, the ULTIMA XE and XIR (Infra Red) offer state of the art design.

Advanced sensing technologies utilising

- catalytic
- electrochemical
- infrared

gas detection methods provide solutions for any gas detection need.

The XIR technology, based on dual wavelength heated optics, offers excellent long-term stability, eliminates the need for frequent calibrations and reduces the overall cost of ownership.

The ULTIMA X Series Gas Monitors are suitable for indoor and outdoor applications in virtually any industry including offshore.

They can operate completely stand-alone or connected with a standard 4–20 mA output to a control system (PLC, DCS etc.).

## Features & Benefits

- 316 stainless steel explosion-proof, multiple-entry-mounting enclosure
- Advanced LCD display with detailed scrolling messages, not error codes
- 4–20 mA Output
- Field-selectable algorithms for a variety of hydrocarbon based gases (XIR only)
- Single-board design for ultimate reliability and easy, no-tool servicing
- Optional “quick-check” LED’s for increased product visibility
- Optional field-programmable relays feature three alarm levels and one fault
- “Fail to Safety” Operation (XIR only)
- Interchangeable smart sensors: no reconfiguration required (not XIR sensor)
- Sensor replacement under power without declassifying a hazardous area (not XIR sensor)
- XIR version designed without a sintered disc for optimum performance in the harsh, offshore environment
- Remote sensor option
- XIR sensor is immune to poisoning
- Automatic compensation for humidity and temperature changes
- No moving parts, Jumpers, switches or pots
- All calibration and adjustments made using non-invasive Calibrator or Controller
- ULTIMA X Series Gas Monitors are supplied with a CD containing User Manual, installation diagrams and video and Quick Start up Guide

## Hazards

ULTIMA X Series Gas Monitors can protect against the following hazards

- Combustible atmosphere
- Oxygen deficiency
- Toxic atmosphere
- Gas leaks

## Applications

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
- General industry



# Display



- Large 1/2" high characters
- Highly visible coloured LED's for "Normal" and "Alert" indication
- In normal operation LCD alternates between gas reading and gas type



- In fault condition alert LED is on and LCD has scrolling text message to identify fault



- When gas alarm is triggered ALERT LED flashes and LCD displays alarm and gas concentration

## ULTIMA X Factors

### • Sensor Disconnect Under Power

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

### • 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 monitor quickly recognises the new sensor type and reconfigures alarm and relay settings to optimise the new sensor.

### • State-of-the-Art Display

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

### • World-Class Design

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.

### • Onboard LED's and Relays

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

## Calibrator

The ULTIMA Calibrator offers the industries simplest method of calibration. An easy to use 3 button device that allows calibration and address change of the ULTIMA X series Gas monitor.



## Controller

The ULTIMA Controller provides complete access to all features through its full function keypad.

Features include:

- Intrinsically safe
- Set/display alarm levels
- Set/display span gas value
- Set/display Ultima range
- Display last date of calibration
- Display minimum, maximum and average gas readings

# Specifications (for ULTIMA XE and XIR unless otherwise stated)

<b>Gas Types:</b>	Combustibles, oxygen and toxics
<b>Temperature Range:</b>	-40 °C to +60 °C (-40 °F to +140 °F) (typical – some models may differ)
<b>Drift:</b>	
Zero Drift	<5% / year, typical
Span Drift	<10% / year, typical
<b>Noise:</b>	<1% Full Scale
<b>Accuracy:</b>	
Repeatability	±1% Full Scale or 2 ppm, typical
Linearity	±2% Full Scale or 2 ppm (O <sub>2</sub> , CO) ±3% Full Scale (<50% LEL combustibles) ±5% Full Scale (>50% LEL combustibles) ±10% Full Scale or 2 ppm (non-CO toxics)
<b>Response Times:</b>	
T <sub>20</sub> oxygen and toxics	<12 seconds (typically 6 seconds)
T <sub>50</sub> oxygen and toxics	<30 seconds (typically 12 seconds)
T <sub>50</sub> combustibles	<8 seconds
T <sub>90</sub> combustibles	<20 seconds
T <sub>90</sub> XIR	<2 seconds (without sensor guard)
<b>Humidity:</b>	15%–95% RH, non-condensing
<b>Sensor Life:</b>	
Oxygen and Toxics	2 years typical
Combustibles	3 years typical
Replacement warranty	1 year
<b>Power Input:</b>	7–30 Vdc (oxygen and toxics) 7–30 Vdc @ 450 mA maximum (combustibles) 7–30 Vdc @ 750 mA maximum (XIR)

<b>Wiring Requirements:</b>	
Combustibles (incl. XIR)	3-wire
Oxygen and Toxics	2-wire; no LED's or relays
Oxygen and Toxics	3-wire; LED's and/or relays
<b>Signal Output:</b>	4–20 mA 2-wire current sink 4–20 mA 3-wire current source
<b>Relay Contacts:</b>	
Rating	5 amp @ 220 Vac; 5 amp @ 30 Vdc
Alarm Type	normally energised/de-energised, SPDT, upscale/downscale, latching/ non-latching
Fault Type	normally energised, SPDT, non-latching
<b>Conduit Entries:</b>	Four entries, 3/4 inch NPT or 25 mm
<b>Physical:</b>	
Weight	4.7 kg
Dimensions	160.3 W x 99.3 D x 261.1 L mm
Material	316 Stainless Steel
<b>Approvals:</b>	
ULTIMA XE/XIR	CE Low Voltage Directive: 73/23/EEC
ULTIMA XE/XIR and Remote Sensor	CE ATEX Directive: 94/9/EC CE EMC Directive: 89/336/EEC EN 50 270 Type 2 EN 50 081-1
ULTIMA XE	II 2G EEx d IIC T4 -40 °C ≤ Ta ≤ +60 °C
ULTIMA XIR	II 2G EEx d IIC T5/T6 -40 °C ≤ Ta ≤ +60 °C T5 -40 °C ≤ Ta ≤ +50 °C T6
EC-Type Examination Certificate:	DMT 02 ATEX E 202 X
<b>Warranty:</b>	24 months on all components including IR sensor (does not include catalytic or electrochemical sensor)

## List of Combustible Gases, Catalytic Sensor

Compound	Group	Compound	Group	Compound	Group
Acetaldehyde	2	Dimethoxyethane	2	Methyl Acetate	2
Acetic Acid	2	Dioxane (1, 4)	2	Methyl Ethyl Ketone	2
Acetone	2	Ethane	1	Methyl Isobutyl Ketone	2
Acetylene	1	Ethanol	2	Methyl Methacrylate	2
Acrolein	2	Ether. Diethyl	2	Methyl Propane (2)	1
Acrylonitrile	2	Ether. Dimethyl	2	Methyl t-Butyl Ether	2
Amyl alcohol	2	Ethyl Acetate	2	Pentane (iso)	2
Benzene	2	Ethyl Acrylate	2	Pentane (n)	2
Butadiene (1, 3)	1	Ethyl Benzene	2	Pentene	2
Butane (iso)	1	Ethylene	1	Propane	1
Butane (n)	1	Ethylene Oxide	1	Propanol (iso)	2
Butanol (iso)	2	Gasoline	2	Propanol (n)	2
Butanol (n)	2	Heptane	2	Propyl Acetate	2
Butene-1	1	Hexane	2	Propylene	1
Butene-2	1	Hexene	2	Propylene Oxide	2
Butyl Acetate (n)	2	Hydrogen	1	Styrene	2
Butyl Acrylate	2	Isoprene	2	Tetrahydrofuran	2
Butylene	1	JP-4	2	Toluene	2
Butyraldehyde	2	Methane	1	Xylene	2
Cyclohexane	2	Methanol	2		

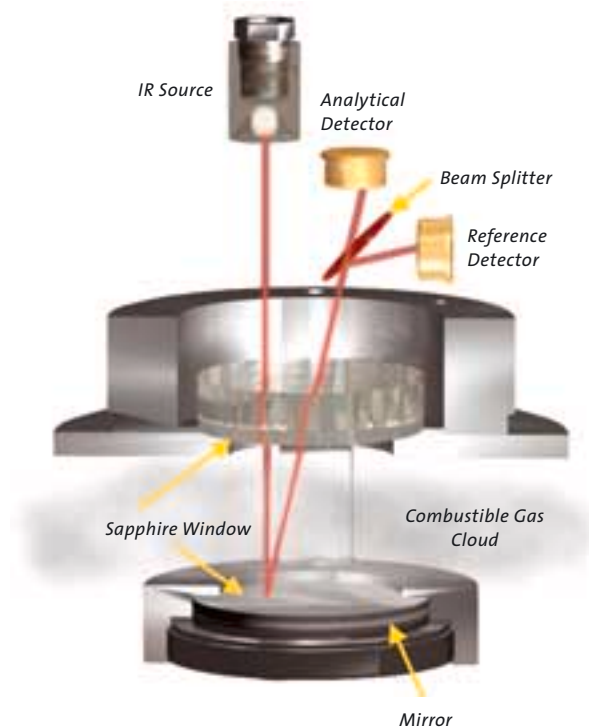
## List of Combustible Gases, IR Sensor

Compound	Group	Compound	Group
Acetone	3	IsoButanol	4
Butadiene (1, 3)	3	IsoPropanol	4
Butane	3	MEK	4
Butyl Acetate	4	Methane	3
Cyclohexane	4	Methanol	4
Cyclopentane	4	Methyl Formate	4
Dimethyl Ether	3	Pentane	4
Ethane	3	Propane	3
Ethanol	4	Propyl Acetate	4
Ethyl Acetate	4	Propyl Alcohol	4
Ethylene	4	Propylene	3
Ethylene Oxide	3	Propylene Oxide	4
Heptane	4	Toluene	4
Hexane	4	Xylenes	4
IsoButane	3		



## Installation and Operation

The ULTIMA X Series Gas Monitors offer multiple enclosure entries for left, right, top or bottom wiring entry. The monitors are also available for remote sensing applications, where installations require the sensor to be separated from the electronics by up to 30 metres. 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 the workshop by disconnecting the sensor module and calibrating with another base unit. This remote calibration method does not require switching off power to the monitor.



## IR Technology

An electronically modulated source of infrared energy and two detectors convert the infrared energy into electrical signals. Each detector is sensitive to a different range of wavelengths in the infrared spectrum. The source emission is directed through a window in the main enclosure into an open volume. A mirror, protected by a second window, directs the energy back into 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 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.

# Ordering Information

Please choose from the options to create your ULTIMA X

	Cable Gland Thread Type		
	3/4" NPT	25 mm metric	
<b>Enclosure Type</b>			
Enclosure.....	.....10044380.....	.....10044382.....	<input type="text"/>
Enclosure with connection terminals.....	.....10044381.....	.....10044383.....	
<b>Gas Type</b>			
IR Sensor for Combustible Gases, Group 3*.....	.....10044425.....	.....10044449.....	<input type="text"/>
IR Sensor for Combustible Gases, Group 4*.....	.....10044426.....	.....10044450.....	
Catalytic Sensor for Combustible Gases, Group 1*.....	.....10044423.....	.....10044447.....	
Catalytic Sensor for Combustible Gases, Group 2*.....	.....10044424.....	.....10044448.....	
Oxygen 0-10%.....	.....10044366.....	.....10044436.....	
Oxygen 0-25%.....	.....10044367.....	.....10044438.....	
Carbon Monoxide 0-100 ppm.....	.....10044364.....	.....10044433.....	
Carbon Monoxide 0-500 ppm.....	.....10044365.....	.....10044434.....	
Arsine 0-2 ppm.....	.....10044428.....	.....10044452.....	
Hydrogen Cyanide 0-50 ppm.....	.....10044422.....	.....10044446.....	
Diborane 0-50 ppm.....	.....10044431.....	.....10044455.....	
Hydrogen 0-1000 ppm.....	.....10044432.....	.....10044456.....	
Hydrogen Sulphide 0-10 ppm.....	.....10044368.....	.....10044440.....	
Hydrogen Sulphide 0-50 ppm.....	.....10044369.....	.....10044442.....	
Hydrogen Sulphide 0-100 ppm.....	.....10044420.....	.....10044444.....	
Germane 0-3 ppm.....	.....10044430.....	.....10044454.....	
Nitric Oxide 0-100 ppm.....	.....10044421.....	.....10044445.....	
Phosphine 0-2 ppm.....	.....10044427.....	.....10044451.....	
Silane 0-25 ppm.....	.....10044429.....	.....10044453.....	
<b>LED/Relay Options</b>			
No LED's and no relays, 2-wire output (available only for toxic gases, not for combustibles).....	.....10044388.....	.....10044388.....	<input type="text"/>
No LED's and no relays, 3-wire output.....	.....10044386.....	.....10044386.....	
LED's and no relays, 3-wire output.....	.....10044385.....	.....10044385.....	
Relays and no LED's, 3-wire output.....	.....10044387.....	.....10044387.....	
LED's and relays, 3-wire output.....	.....10044384.....	.....10044384.....	
<b>Installation Options</b>			
Mounting Brackets.....	.....697281.....	.....697281.....	<input type="text"/>
Parts for remote sensor installation.....	.....10044457.....	.....10044458.....	
<b>Controlling &amp; Calibration</b>			
Controller.....	.....10044459.....	.....10044459.....	<input type="text"/>
Calibrator.....	.....10044470.....	.....10044470.....	

This is only an excerpt. More options and accessories on request.  
\*See specifications on page 4

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