Fixed Gas & Flame **Detection**

Product Range Overview

MSA
The Safety Company

*Because every life has a **purpose...***

Permanent Gas Detection **Systems**

Monitoring of gases and vapours in plants and large areas is necessary in all branches of industry. Directives and regulations covering the protection of plant and personnel require suitable gas detection equipment.

When personnel monitoring is not available or suitable, permanently installed detection systems (detectors and controllers) are used for continuous monitoring. These permanent detectors are strategically positioned to optimise detection coverage and can initiate a variety of safety related actions in the event of a gas alarm.

Examples of appropriate actions are the activation of audible/visual alarms or ventilation/ extraction systems and shutting down of plant equipment.

According to the ATEX manufacturer directive 94/9/EC and the user directive 1999/92/EC any gas detection system if used as a safety related device to reduce the risk of explosion has to be performance approved. The EC type test certificate for the product must then show compliance to EN 60079-29-1 or EN 50104. For more details on standards and regulations please see page 6.

MSA provides a complete range of products with full ATEX approval that can be used as safety related devices. For complete ATEX compliance choose MSA.

About MSA and **General Monitors**

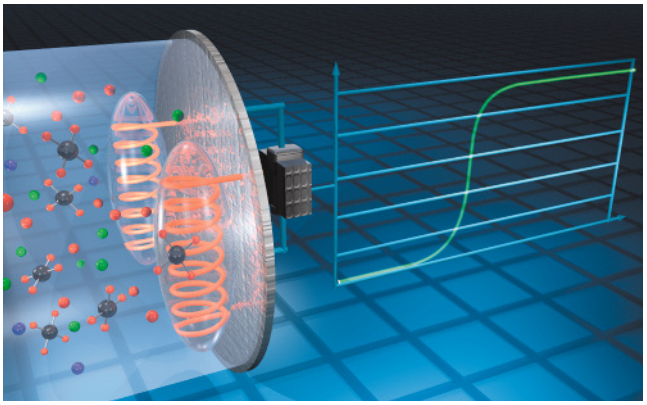
Over 100 years of experience and capability in comprehensive safety solutions have made MSA a modern and forward-looking company for the protection of people, facilities, and the environment. MSA is one of the few suppliers of fixed gas and flame detection (FGFD) measurement technology that develops and manufactures a complete range of products and integrates them into safety solutions.

With the acquisition of General Monitors in September 2010, the MSA FGFD product portfolio expanded even further. As two unmatched experts in gas and flame detection joined forces, we are proving that the right mix of durable products and innovative technology can increase safety while driving operational efficiency.

Together MSA and General Monitors have the widest range of sensing technologies for gas and flame detection. We can create solutions that will not only provide worker safety and protect facilities, but will also decrease overall cost of ownership. While our customers still have access to the great products and service that they have come to rely on in the past, they now have access to so much more: superior service, improved support, a wider range of technology, and unique solutions enhanced by the combined strength of MSA and General Monitors.

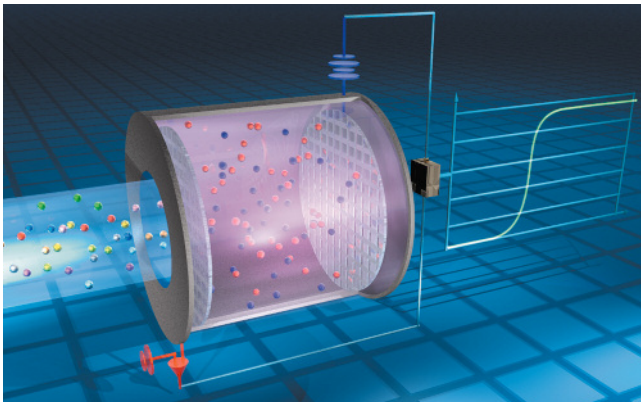
General Monitors
by MSA

Catalytic Combustion



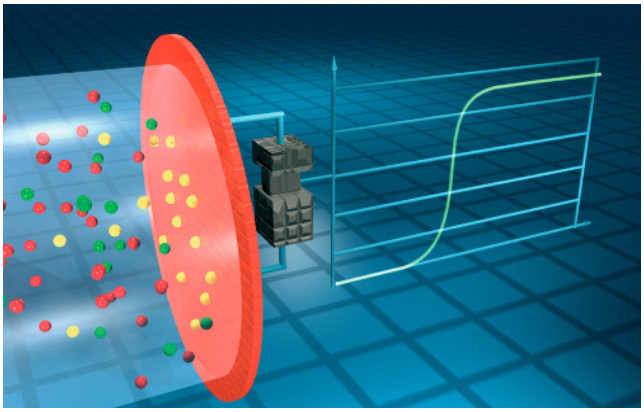
The measurement principle behind this technology is based on catalytic combustion of the measured gas or vapours in air up to the Lower Explosive Limit (LEL) of the gas. The sensor consists of a pair of matched elements (PELEMENTS), a detector and compensator. The detector comprises a coil of platinum wire inside a small bead of catalytic material. The compensator is similar but does not contain a catalyst and therefore does not respond to gas. Combustible gases are oxidised only on the detector element, where the heat generated increases its resistance, producing a signal proportional to the concentration of combustible gas. The compensator helps to compensate for changes in ambient temperature, pressure and humidity which affect both elements equally.

Electrochemical



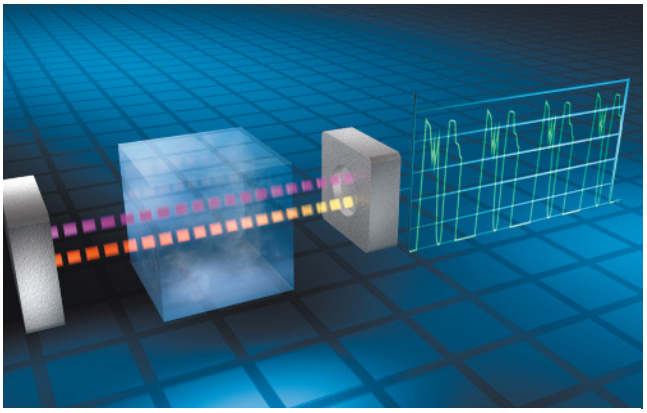
Electrochemical sensors are typically used to detect toxic gases in the ppm range. Electrodes separated by electrolytes are enclosed in a small plastic housing and are connected to an external electronic circuit. Gas diffuses into the sensor through a permeable membrane and a small current is generated by an electrochemical reaction. Since the rate of gas entry into the sensor is controlled by diffusion of the gas through the permeable membrane, the current is proportional to the gas concentration.

MOS – Metal Oxide Semiconductor



Solid state sensors are based on the electronic conductivity effects when gases are adsorbed onto a semiconductor surface. In fact, this is a thin metal-oxide film deposited on a silicon slice. The process of production is similar to the one used for fabricating semiconductors; hence the name metal oxide semiconductor (MOS) for which they are commonly known. Adsorption of the gas on the oxide surface, followed by catalytic oxidation, results in a change of electrical resistance of the oxide material. The surface of the sensor is heated to a constant temperature to speed up the rate of reaction and to reduce the effects of ambient temperature changes. Resistance changes are converted into an electrical signal proportional to the concentration of the gas.

Infrared Absorption



Many gases absorb infrared light at certain wavelengths. The absorption spectrum is distinctive for each gas in question. Infrared Open Path and the Point Technology from MSA use electronically-modulated IR radiation sources at two different wavelengths. One wavelength is typical for the gas to be measured, while there is no infrared absorption by atmospheric gases for the other wavelength.
The signals from both detectors are electronically amplified and fed into a microprocessor that conditions the signals and produces an output signal proportional to the gas concentration.

Photo-acoustics

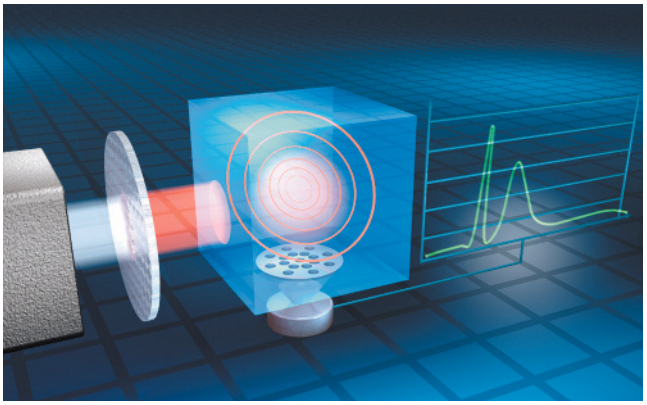
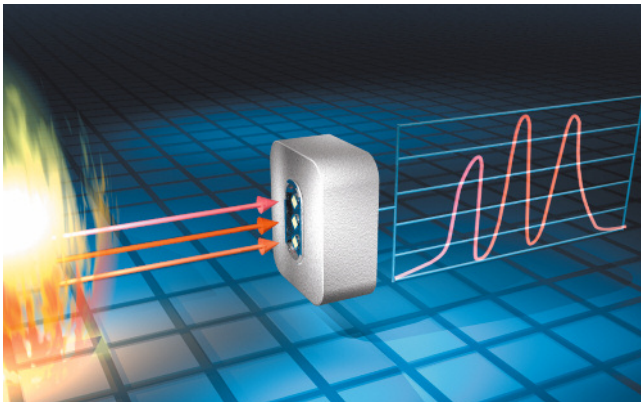


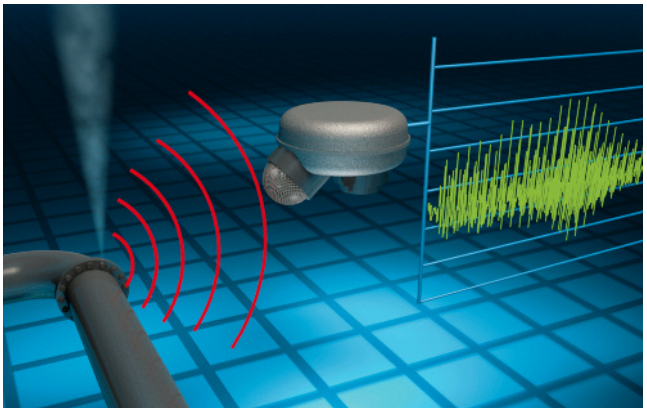
Photo-acoustic sensor technology was developed by MSA for the detection of toxic or combustible gases at very low concentrations. A gas sample is introduced into the measurement chamber and the sample is exposed to a specific wavelength of pulsed infrared light. If the sample contains the gas in question, it will absorb an amount of infrared light proportional to the concentration of gas present.
The gas molecules heat and cool as they absorb the pulsed infrared energy. The pressure changes resulting from the heating and cooling of the molecules are measured by a sensitive microphone located inside the photo-acoustic infrared monitor.

Flame Detection



Most flame detectors identify flames by so-called optical methods like ultraviolet (UV) and infrared (IR) spectroscopy. Flames are generally fueled by hydrocarbons, which, when supplied with oxygen and an ignition source, produce heat, carbon dioxide and other products of combustion. The reaction is characterized by the emission of visible, UV and IR radiation. Flame detectors are designed to detect the absorption of light at specific wavelengths, allowing them to discriminate between real flames and false alarms.
MSA uses flame detectors based on UV/IR or multi-spectrum IR technology. Both technologies are based on line-of-sight detection of the radiation emitted in the UV, visible and IR spectral bands by flames.

Ultrasonic



The ultrasonic acoustic gas leak detection technology detects leaks from pressurized gas systems by sensing the airborne ultrasound produced by the escaping gas. This means that the ultrasonic gas leak detectors detect gas leaks at the speed of sound in a detection radius up to 20 meters.
Unlike conventional gas detection methods (point or open path gas detection) the ultrasonic gas leak detectors do not have to wait for the gas to accumulate into a potentially dangerous gas cloud and come into physical contact with the detectors. They instantaneously raise an alarm if a leak is detected.
The ultrasonic acoustic gas leak detector picks up the leak without being affected by conditions such as changing wind directions, gas dilution, and the direction of the gas leak – conditions relevant for most outdoor gas installations.

Explosion protection is extremely important when dealing with flammable gases and vapours. The devices and assemblies that are to be used in this area therefore constitute a risk minimisation measure. As electrical equipment, industrial gas detection devices must fulfil at least the applicable requirements for operating in potentially explosive areas. Within the European Union, this is regulated by using the relevant harmonised European Directives (94/9/EC and 1999/92/EC). Correspondence with other globally accepted standards must also be ensured during the construction of the electrical equipment.

CE MARKING

Placing CE mark declares that product conforms to all applicable directives adopted by the EEA (European Economic Area). Unlike ATEX approval, the manufacturers are responsible for ensuring their product's conformance to these directives which were developed using IEC and Cenelec standards.

ATEX

ATmosphere EXplosible is French for potentially explosive atmospheres. According to ATEX manufacturer directive 94/9/EC (ATEX 95) and user directive 1999/92/EC (ATEX 137) the electrical safety of all electronic gas detectors and personal monitors used in potentially explosive atmospheres must be tested and marked "ATEX" (EN 60079-0 et seq.).
If the gas detection system (detectors and controller) or personal monitor for flammable gases and vapours is used as a safety device "with a measuring function for explosion protection" it must be performance approved by a notified body in addition to the "ATEX" marking.

Performance Approval

Performance Approval

According to the ATEX manufacturer directive 94/9/EC and the ATEX user directive 1999/92/EC any gas detection system (detectors and controller) and any personal monitor for flammable gases, if used as safety device to reduce the risk of explosion, has to be performance approved. Performance approval is also required if the oxygen content of the air during inertisation or the concentration of toxic gas needs to be measured. The EC type test certificate must then show compliance at least to EN 60079-29-1, EN 50104, EN 45544 and EN 50271.
Flame detectors are not subject to this performance approval. However, approval in accordance with EN 54-10 can be carried out for these.

SIL – Safety Integrity Level

SIL
Safety Integrity Level

According to directives 94/9/EC and 1999/92/EC (ATEX) only certification of electrical safety and possibly performance approval are required for gas detection devices. The production of an explosion protection plan for individual existing operating conditions may require measures that go beyond the ATEX requirements to be taken for stationary gas detection devices. The purpose of this additional safety evaluation is to minimise the risk in all applications where erroneous behaviour will result in danger to the safety of persons, the environment and property. Four values are defined as Safety Integrity Levels (SIL). The higher the integrity level, the greater the reliability of a functional circuit. Gas detection devices can only achieve levels SIL1 to SIL3.
Products used in safety systems must show a considerably degree of hardware and software reliability so that non-detectable errors can only occur with extremely low probability. The benchmark for this safety-related evaluation of systems is the IEC/EN 61508 standard, which is also used for risk assessment in international process control engineering. This certification, which concerns system safety, defines the requirements of the availability of the safety function and the failure probability of the system that is under examination, as is required in process control engineering.
As an application-independent basic standard EN 61508 only describes the general requirements for components and complete systems with safety functions. Therefore it's inadequate for gas detection devices which also have to fulfil other safety criteria. For this reason EN 50271 and EN 50402 for gas detection devices also apply in this case.

	47K	PrimaX I	PrimaX P	PrimaX IR	ULTIMA MOS-5	ULTIMA MOS-5E	ULTIMA XL	ULTIMA XT	ULTIMA XE	ULTIMA XIR	ULTIMA OPIR-5	CHILLGARD RT	CHEMGARD	CHILLGARD M100
Detection Principle														
Catalytic combustion sensor	■		■				■	■	■					
Electrochemical sensor		■	■				■	■	■					
Semiconductor sensor					■	■								
Infrared sensor				■			■			■	■	■	■	■
Flammable Gases														
0–100% LEL	■		■	■			■	■	■	■				
0–100% Vol										■				
0–5% LEL·m											■			
O_2														
Oxygen (O_2)		■	■				■	■	■					
Toxic Gases														
Ammonia (NH_3)		■	■					■	■			See next page	See next page	See next page
Arsine (AsH_3)							■	■	■					
Bromine (Br_2)								■	■					
Carbon Monoxide (CO)		■	■				■	■	■					
Carbon Dioxide (CO_2)										■				
Chlorine (Cl_2)		■	■					■	■					
Chlorine Dioxide (ClO_2)								■	■					
Diborane (B_2H_6)								■	■					
Ethylene Oxide (ETOX)							■	■	■					
Fluorine (F_2)								■	■					
Germane (GeH_4)								■	■					
Hydrogen (H_2)		■	■				■	■	■					
Hydrogen Cyanide (HCN)		■	■						■					
Hydrogen Sulphide (H_2S)		■	■		■	■	■	■	■					
Hydrogen Chloride (HCl)		■	■					■	■					
Nitrogen Oxide (NO)		■	■				■	■	■					
Nitrogen Dioxide (NO_2)		■	■				■	■	■					
Phosphine (PH_3)							■	■	■					
Silane (SiH_3)							■	■	■					
Sulphur Dioxide (SO_2)		■	■				■	■	■					
Features														
Built-in display		■	■		■	■			■	■	■	■	■	
mV output (passive detector)	■													
4–20 mA output		■	■	■	■	■	■	■	■	■	■	■	■	■
Relays			■		■				■	■	■	■	■	
HART		■	■	■	■		■	■	■	■	■			
Modbus					■	■					■			
Hazardous area (ATEX)	■	■	■	■	■	■	■		■	■	■			

CHEMGARD Application Table

Measuring Range 0–1000 ppm:
ACETALDEHYDE, ACRYLONITRILE, AMMONIA, ACROLEIN, 1,3 BUTADIENE, CHLOROFORM, CYCLOPENTANE, 1,2 DICHLOROETHANE, DIETHYL ETHER, DIFLUOROMETHANE, DIMETHYLAMINE, ETHYL ACETATE, ETHYLENE, HEXAFLUOROPROPYLENE, HEXAFLUORO 1,3, BUTADIENE, ISOHEXANE, METHANOL, METHYL FLUORIDE, METHYL IODIDE, MIBK, METHYL METHACRYLATE, METHYLENE CHLORIDE, METHYLENE FLUORIDE, METHYL N-PROPYL KETONE, MONOMETHYLAMINE, NITROGEN TRIFLUORIDE, NITROUS OXIDE, OCTAFLUORO- BUTANE, OCTAFLUOROPROPENE, PENTANE, PERCHLOROETHYLENE, PMVE, PROPANAL, N-PROPANOL, PROPYLENE OXIDE, TETRACHLOR- METHANE, TETRAHYDROFURAN, TETRAFLUOROETHYLENE, 1,1,1 TRICHLOROETHANE, 1,1,2 TRICHLORO-ETHANE, TRICHLOROETHYLENE, TRIETHYLAMINE, VINYL ACETATE, VINYL CHLORIDE, 0-XYLENE, M-XYLENE, P-XYLENE, XYLENES

Other Measuring Ranges	10 ppm	100 ppm	1000 ppm	1% vol.	10% vol.	100% vol.	100% LEL
ACETONE	■	■	■	■			■
ACETONITRILE				■			
BENZENE				■			
BUTANE			■	■			■
1-BUTYL ACETATE			■	■	■		
CARBON DIOXIDE		■	■	■	■		
CARBON MONOXIDE			■	■	■	■	
DIMETHYL ETHER				■			
ETHANE			■				■
ETHANOL			■	■			
ETHANOLAMINE				■			
ETHYLENE OXIDE			■	■	■		
HEPTANE			■	■			■
HEXANE			■	■	■		■
HEXENE				■			
ISOBUTANE			■	■			■
ISOPENTANE			■	■			■
ISOPROPANOL			■	■			■
JP-8 (as Hexane)			■	■			
MEK			■				■
METHYL CHLORIDE				■	■		
METHYL FORMATE			■	■	■	■	■
2-PROPANOL			■	■		■	■
PROPANE			■	■			■
SULPHUR HEXAFLUORIDE			■	■			
TOLUENE			■	■			
VINYL FLUORIDE			■	■	■		

CHILLGARD RT & CHILLGARD M-100 Application Table

Measuring Range 0–1000 ppm	CHILLGARD RT	CHILLGARD M-100
Ammonia	■	
R11	■	■
R12	■	
R13	■	
R22	■	■
R113	■	
R114	■	
R123	■	■
R124	■	
R125	■	
R1234yf	■	

Measuring Range 0–1000 ppm	CHILLGARD RT	CHILLGARD M-100
R134A	■	■
R152a	■	
R402A	■	
R404A	■	■
R407c	■	■
R410a		■
R500	■	
R502	■	
R507	■	
R508B	■	

The above-mentioned configurations for CHEMGARD, CHILLGARD RT and CHILLGARD M-100 are approved according to CE mark standards.

IECEx

The IECEx Scheme is an international certification scheme covering equipment that meet the requirements of international standards; most notably IEC 60079.

CSA INTERNATIONAL

CSA International is an organization that provides performance testing in agreement with national and international standards. CSA tests products to meet standards directed by the American National Standards Institute (ANSI), Underwriters Laboratories (UL), and Canadian Standards Association (CSA).

UNDERWRITERS LABORATORIES (UL)

Underwriters Laboratories (UL) is both a Standard Developing Organization and Nationally Recognised Testing Laboratory (NRTL) that develops standards and performs testing to ensure products are safe for use in hazardous environments in USA.

FACTORY MUTUAL (FM)

The Factory Mutual Approvals Division determines the safety and reliability of equipment, materials, or services utilized in hazardous locations in USA. FM certifies to NEC (National Electrical Code) standards for hazardous locations.

CCCF

Mandatory certification system for fire protection products including flame detectors and explosive gas detectors for China. The certification system is operated by the China Certification Center for Fire Products Ministry of Public Security (CCCF).

EAC

Mandatory certification to new common Technical Regulations for Eurasian Economic Union establishes the compliance of a product, imported into the Russian Federation, Republic of Kazakhstan, Republic of Belarus, Republic Armenia, Kyrgyz Republic. This covers Technical Regulations for equipment for use in explosive hazardous area (TP TC 012/2011), low voltage equipment (TP TC 004/2011) and electromagnetic compatibility (TP TC 020/2011). Applicable GOST standards will be used to confirm the product compliance to these Technical Regulations.

Pattern Approval Certification of Measuring Instruments

The measuring accuracy (performance) of gas detectors and controllers is certified by an obligatory Pattern Approval Certification of Measuring Instruments in individual countries: Russian Federation, Republic of Kazakhstan, Republic of Belarus.

Technical Regulation on Requirements for Fire Protection of Russian Federation

Mandatory certification for flame controllers and fire detectors, based on standard for Fire detection and fire alarm systems GOST R 53325-2012.

INMETRO

National Institute of Metrology, Quality and Technology certifies among the others the products for hazardous area in Brazil.

Detectors

47K Series

Cost effective passive catalytic sensors to detect potentially hazardous concentrations of flammable gas and vapour in air up to 100% LEL.
Available as Standard (ST), Poison Resistant (PRP), High Temperature (HT) versions with a complete range of accessories and junction boxes to meet virtually all industrial applications.
Series 47K sensors used in combination with MSA Controllers fully meet the requirements of ATEX Directive 94/9/EC, including performance approval, and being SIL 2 capable they can be used as part of a safety related system.

For more information, please see leaflet 07-240.2.

ATEX ⟨Ex⟩ II 2G Ex d IIC T3/T4/T6, II 2D Ex tD A21 IP6X T85°C/T135°C/T200°C
including performance approval, SIL 2
EAC, performance approval in RU, KZ, BY

47K Series

PrimaX I

The PrimaX I gas transmitter detects a wide range of toxic gases and oxygen using an electrochemical sensor technology.
Innovative enclosure design, ease of use, fast installation and being suitable for both indoor and outdoor installations make the PrimaX I transmitter your choice for versatile gas detection. The large display with clear plain text provides information at a glance. Calibration is easily performed using the built-in keypad or via HART digital protocol. The plug-in replacement sensors and an integral backplate enable fast and easy installation.
PrimaX I comes as general purpose or intrinsically safe design in a robust anti-static, reinforced nylon housing with standard 4–20 mA output and optional HART capability. SIL 2 compliance is approved by TUV.

For more information, please see leaflet 07-710.2.

ATEX ⟨Ex⟩ II 1G Ex ia IIC T4 Ga, II 2D Ex ia IIIC T130 °C Db IP54, SIL 2
HART registered
IECEx, UL, INMETRO, EAC, performance approval in RU, KZ, BY

PrimaX I

PrimaX P

The PrimaX P gas transmitter is suited to a wide range of indoor and outdoor applications for the detection of combustible gases (catalytic combustion sensor), toxic gases or oxygen (electrochemical sensors).
The PrimaX P features an innovative custom designed enclosure with integral 4-way keypad for ease of use. The large LCD with clear plain text provides information at a glance and the additional LEDs give a clear status indication. The plug-in replacement sensors and an integral backplate enable fast and easy installation.
PrimaX P comes as flameproof design in a coated aluminium enclosure with standard 4–20 mA output and optional HART and relays capability. SIL 2 compliance is approved by TUV.

For more information, please see leaflet 07-710.2.

ATEX ⟨Ex⟩ II 2G Ex d ia [ia] IIC T4 Ga, II 2D Ex tb ia [ia] IIIC T130 °C Db IP67
including performance approval, SIL 2, HART registered
IECEx, UL, CSA, CCCF, INMETRO, EAC, performance approval in RU, KZ, BY

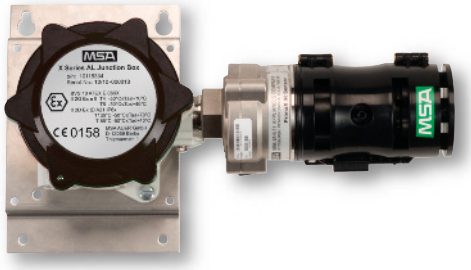
PrimaX P

PrimaX IR

The PrimaX IR offers hydrocarbon detection in LEL range using infrared absorption technology through the patent-pending PrimaX IR dual source design. A redundant IR source provides reliability and uninterrupted monitoring should a source failure occur. The 316 stainless steel, IP67-rated, rugged housing protects the PrimaX IR from environmental extremes.
Standard 4–20 mA output with HART capability offers user-friendly set-up, calibration diagnostics, and maintenance. A unique environmental guard with patent-pending clamshell design provides convenient installation in tight locations.

For more information, please see leaflet 07-715.2.

ATEX ⟨Ex⟩ II 2G Ex d IIC T4 Gb, II 2D Ex tb IIIC T130°C Db IP67, SIL 2
IECEx, CCCF, INMETRO, EAC, performance approval in RU, KZ, BY



PrimaX IR

ULTIMA® MOS-5 and ULTIMA® MOS-5E

ULTIMA MOS-5 and MOS-5E detect ppm levels of hydrogen sulphide (H_2S), providing status indication and alarm outputs. Their performance is based on their metal oxide semiconductor sensor with unique technical parameters. High tolerance for a broad range of temperatures, humidity levels, as well as short-term high H_2S concentrations and very low cross sensitivity to common gases make these detectors ideal for installation in harsh environments.
The ULTIMA MOS-5 provides analogue 4–20 mA and 3 relay outputs in a stainless steel housing. The ULTIMA MOS-5E incorporates analogue 4–20 mA and three open collector outputs in an aluminum housing. HART and Modbus communication enable complete status and control capability in the control room.

For more information, please see leaflets 07-481.2 and 07-482.2.

ATEX ⟨Ex⟩ II 2GD EEx d IIB+H_2 T5, SIL 2 and SIL 3, IP66
HART registered (ULTIMA MOS-5)
ATEX ⟨Ex⟩ II 2G EEx d e m IIC T4, SIL 3, IP66/67 (ULTIMA MOS-5E)
FM, CSA, EAC, performance approval in RU, KZ, BY


ULTIMA MOS-5

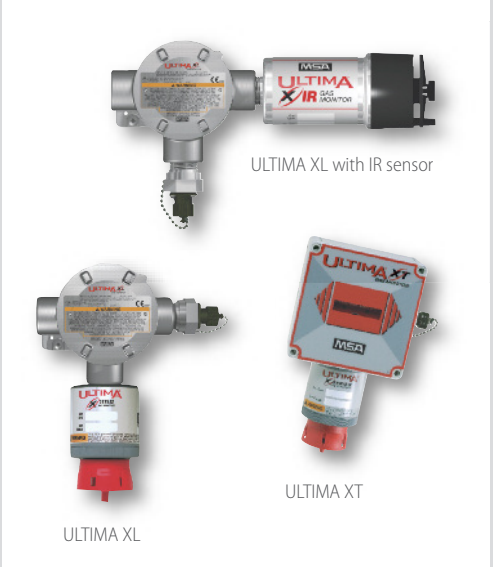

ULTIMA MOS-5E

ULTIMA® XL/XT Series

The cost-effective fixed installation gas monitors ULTIMA XL and XT with HART field communications protocol use well proven catalytic, electrochemical and infrared technologies for detection of combustible and toxic gases and for oxygen deficiency. The interchangeable smart sensors can be changed under power without declassifying a hazardous area.
With the non-display ULTIMA XL/XT gas monitors the user has multiple calibration options: the handheld HART communicator, a controller or laptop which communicates via a dedicated HART Software and local internal LEDs and push-buttons.
ULTIMA XL is explosion-proof with a stainless steel enclosure, while ULTIMA XT uses a general purpose, water and corrosion resistant polycarbonate housing.

For more information, please see leaflet 07-704.2.

ATEX ⟨Ex⟩ II 2 (2) G Ex d (ib) IIC T6, II 3 (2) G Ex nA (ib) IIC T6, IP66 (ULTIMA XL)
IECEx, FM, INMETRO, EAC, performance approval in RU, KZ, BY

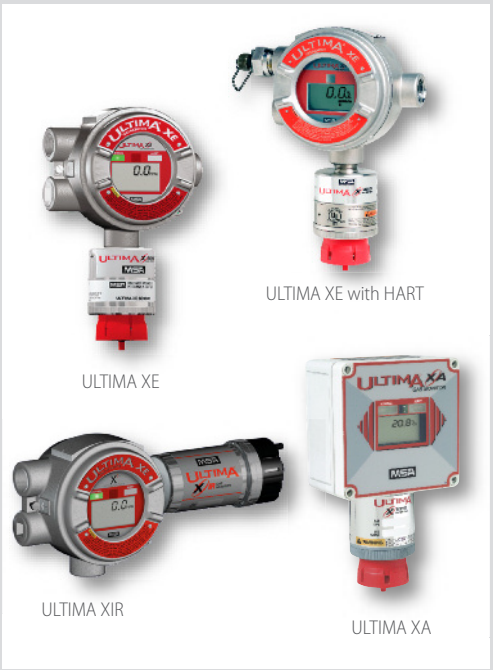


ULTIMA® X Series

The ULTIMA XE and XIR provide continuous monitoring of combustible and toxic gases and oxygen deficiency using catalytic, electrochemical and infrared sensor technologies. They are suitable for almost all applications in virtually any type of industry.
A large easy to read LCD shows the gas reading and gas type as well as clear text status messages. The ULTIMA X series is powered from 24 VDC with a 4–20 mA output signal and optional on board status LED's and/or output relays. Smart sensor technology allows sensor disconnect and replacement under power in hazardous locations.
ULTIMA XE gas monitors are also available with HART field communications protocol.
The ULTIMA XA comes in a rugged plastic general purpose enclosure. It is available with 4–20 mA analogue output or with optional HART protocol.

For more information, please see leaflets 07-703.2 and 07-705.2.

ATEX ⟨Ex⟩ II 2G EEx d IIC T4, including performance approval
SIL 2 (ULTIMA XE)
ATEX ⟨Ex⟩ II 2G EEx d IIC T5/T6, including performance approval
SIL 2 (ULTIMA XIR)
IECEx, FM, UL, CSA, CCCF, INMETRO, EAC, performance approval in RU, KZ, BY



FlameGard 5 Series

Designed with advanced ultraviolet (UV) and infrared (IR) sensing technology, the FlameGard 5 Series represents the state-of-the-art in secure flame monitoring.
The FlameGard 5 MSIR, a multi-spectral infrared detector designed to detect hydrocarbon fires, features breakthrough Neural Network Technology (NNT) for reliable discrimination between actual flames and nuisance false alarm sources within a distance of up to 70 m.
FlameGard 5 UV/IR is designed to detect hydrocarbon fires within 15 m, FlameGard 5 UV/IR-H_2 is optimized to detect hydrogen based flames, and FlameGard 5 UV/IR-E with stainless steel housing and Ex e wiring compartment enables high level of resistance in harsh environments. The FlameGard 5 Series flame detectors provide standard 4–20 mA output with optional relays or HART and Modbus digital communication. Suitable for a wide range of applications in the production, transport and processing.

For more information, please see leaflets 07-471.2, 07-472.2, 07-473.2 and 07-475.2.

ATEX ⟨Ex⟩ II 2G Ex d IIC T5 Gb, II 2D Ex tb IIIC T100 °C Db, SIL 3
HART registered (MSIR, UV/IR)
IECEx, FM, CSA
ATEX ⟨Ex⟩ II 2G Ex d e IIC T4/T5 Gb, II 2D Ex tb IIIC T135 °C /100 °C Db, IP6X (UV/IR-E)
EAC, Russian Fire Approval

ULTIMA® OPIR-5

The ULTIMA OPIR-5 open path hydrocarbon gas transmitter provides continuous monitoring of methane and propane gas concentrations based on advanced infrared sensor technology features. The dual detection range enables sensitivity to both small (ppm•m) and large (LEL•m) gas leaks.
The ULTIMA OPIR-5 includes continuous self-check monitoring for fail to safe operation. Automatic gain control compensates for dirty optics, rain, and fog. The result is precision accuracy with exceptional reliability in harsh environments and improved false alarm rejection with an optical path length of up to 150 m. Standard analogue output 4–20 mA with HART capability, relays and RS485 Modbus allow to connect ULTIMA OPIR-5 to standard industrial controllers.

For more information, please see leaflet 07-483.2.

ATEX ⟨Ex⟩ II 2G D Ex d IIB+H_2 T4 Gb, II 2D Ex tb IIIC T135 °C Db IP66/67
SIL 3, HART registered
IECEx, FM, CSA, EAC, performance approval in RU, KZ, BY

OBSERVER-i

The OBSERVER-i is the world's first ultrasonic gas leak detector equipped with Artificial Neural Network (ANN) real-time broadband acoustic sound processing technology. Used to detect leaks from high-pressure systems with a maximum coverage radius of 28 metres, the OBSERVER-i responds to the airborne ultrasound generated from gas releases in open ventilated areas, where traditional methods of detection may be difficult.
The Senssonic™ patented self-test ensures failsafe operation and a three digit LED display showing actual ultrasonic level value (in dB) and alarm indication. Standard 4–20 mA output with HART capability and output relays can control additional action in case of alarm or fault condition.

For more information, please see leaflet 07-493.2

ATEX ⟨Ex⟩ Ex d ia IIB+H_2 Gb T6, Ex tb IIIC T85°C Db (Ta = –40°C to +60°C)
EAC

Controllers

9010/9020 SIL

The control system 9010/9020 SIL provides maximum flexibility, simple operation, high reliability and superb performance at considerably reduced costs. In combination with the large range of MSA gas sensors, the 9010/9020 SIL excels in a variety of industrial applications there could be a presence of dangerous gas concentrations.
The 9010 SIL control module processes signals from one gas sensor while the 9020 SIL processes signals from two independent gas sensors.

For more information, please see leaflet 07-518.2.

ATEX ⟨Ex⟩ II (1)G (2)G, SIL 2
FM, CCCF, EAC, performance approval in RU, KZ

9010/9020 SIL

GasGard XL

The GasGard XL is a multi-channel wall mount controller for monitoring toxic, oxygen and flammable gases in industrial plants. It can be easily configured to accept up to eight remote gas sensors, depending on the number of individual plug-in input cards installed. The large, easy-to-read, multi-language LCD graphic display allocates real time information on target gas levels and events, allowing full system diagnosis, supported by individual LEDs per channel, relays and internal buzzer.

For more information, please see leaflet 07-515.2.

ATEX ⟨Ex⟩ II (1)G (2)G, SIL 2
CSA, CCCF, EAC, performance approval in RU, KZ, BY

GasGard XL

SUPREMATouch

SUPREMATouch is a gas and fire warning system for large area measuring and monitoring in industries and small or medium size plants. It can be used with a wide range of detectors including flammable and toxic gas, oxygen, smoke, fire and heat and manual call points.
The SUPREMATouch includes a large colour touchscreen display for easier and user-friendly operation, enhanced processing power and addressable fire and detector capability. Latest hardware and software technology permits simple planning, installation, configuration, integration and operation.
The compact, modular design of the SUPREMATouch allows it to be economically tailored for each application and be extended and adapted any time to meet changing sensor and alarm requirements.
Designed around standard industrial 19" racks, SUPREMATouch provides signal processing for up to 256 inputs and 512 outputs and the ability to distribute the system over up to 8 racks using satellites to minimise installation cost.

For more information, please see leaflet 07-500.2.

ATEX ⟨Ex⟩ II (1)G (2)G, SIL 3
CSA, CCCF, EAC, performance approval in RU, KZ, BY

SUPREMATouch

CHILLGARD RT

The CHILLGARD RT is a single or multipoint gas warning system suitable for all industrial refrigeration systems or chillers be it production or research operations, food cold storage or meat packing operations. It allows precise monitoring of the smallest refrigerant concentrations and detection of leak locations.
The instrument works for months with very little deviation from the zero point. Due to its excellent detector stability, unlike other products, the zero point adjustment can be reduced to once a year.
The CHILLGARD RT generates the signals required to initiate audible and visible alarms.

For more information, please see leaflet 07-523.2.

CHILLGARD RT

CHILLGARD M-100

The CHILLGARD M-100 refrigerant sensor is designed to detect the presence of the most common halogenated refrigerants in cold storage facilities, mechanical equipment rooms and other refrigerant applications.
This compact sensor can be mounted almost anywhere to detect potential leaks of halogenated refrigerants. Easy installation ensures fast and practical integration into existing automated systems.

For more information, please see leaflet 07-526.2.

CHILLGARD M-100

CHEMGARD

The CHEMGARD gas monitor can monitor more than 60 gases in the TLV range, such as hydrocarbons, solvents, alcohols, alkanes and toxics.
The photoacoustic infrared sensing technology provides precise, low cost and high performance monitoring. It is extremely stable and highly selective to the gas of interest and can operate for months with virtually no zero drift.
An optional multi point sequencer can be included in the CHEMGARD to allow either 4 or 8 points to be sampled. The monitor provides 3 freely adjustable alarm levels and relay outputs for each alarm level.

For more information, please see leaflet 07-524.2.

CHEMGARD

Fire and Gas Detection **System**

The graphic below shows a typical Fire and Gas System with various types of inputs and outputs. Each system is tailored to your specific project requirements to provide a safe and cost-effective solution. The performance approved systems assure compliance with the latest EN norms, including EN 60079-29-1, EN 50104, EN 61508, EN 50402, EN 50271 and EN 50270.

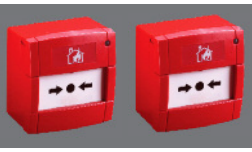
Control System

Passive Gas Detectors
Detectors with mV output via MPI module in 3 or 5 wire connection

Gas Transmitters, Open-Path, Flame and Ultrasonic Detectors
Detectors with standardised 4–20 mA output via MCI module

Non Adressable Fire Detectors
Up to 20 detectors on one line via MFI input module

Manual Alarm Call Points
Using MSI input module



Remote Alarm Acknowledgement and Reset
Separate digital inputs reserved for remote alarm acknowledgement and reset and cabinet key lock switch function

Solid State Relays
16 (8) separate relays per MRO-SSR module with very fast switching action of low current signals (designed to control PLC digital)

Exchangeable Relays
16 (8) exchangeable relays per MRO module for switching horns, beacons and actuators

Analogue Outputs
8 separate analogue outputs 4–20 mA per MAO module (max. 256)

RS 232

Direct Printer Output
To print events according to preset schedule

RS 232/USB

SUPREMA Calibration Software
Allows automatic or one -man calibration, saving maintenance time and costs

RS 232/USB

SUPREMA Manager
Windows based software for easy SUPREMA configuration, parametrisation and calibration

Modbus RTU,
Modbus TCP/IP

Profibus DP

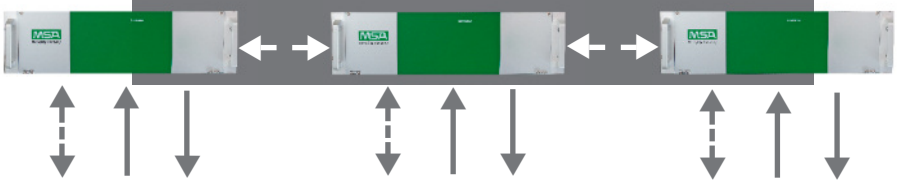
Connection to DCS or SCADA Visualisation
Provides information about SUPREMA status, measured data and state of digital outputs to any standard DCS or HIM/SCDA software

Ethernet TCP/IP

Addressable Fire Detectors
Connection to Advanced Electronics MX4000 fire panels via MBC20-AdvEl module provides information about up to 64 addressable fire detectors and/or manal alarm call points

CAN Bus

SUPREMA Satellites
Truly distributed system using satellites connected via dual CAN Bus with redundant communication. Every satellite can connect analogue input/output modules, relay modules as well as digital communication gateway



Made-to-Measure Safety

The SUPREMATouch provides a flexible control system that can be customised to the user's desired safety requirements. The modular system allows I/O (Input/Output) connections to be rail or back plane mounted and be configured as desired and adapted to meet each specific monitoring task without programming skills using the multilingual touch screen.

The SUPREMATouch is capable of controlling all system functions, including inhibiting I/O, alarm activation, analogue output signals, handling I/O faults, manage a voting allocation of status signals and switched outputs, control of annunciation panels and devices such as fans and dampers.

The SUPREMATouch certified safety related architecture complies with EN 61508, EN 50402 and EN 50271 requirements and provides a safety function for single or redundant system configuration.

The SUPREMATouch digital bus technology ensures reliable communication between racks and provides the flexibility of being able to have up to 8 racks per system located at distances up to 5000 m apart. This ensures system wiring is minimized and overall system costs are as low as possible.

The SUPREMATouch system can be linked with addressable fire panels via Ethernet, creating a true fire and gas detection system.

The SUPREMATouch system also interfaces to other systems (DCS, SCADA) using a digital communication (Modbus, Profibus). Web access or automatic transmission of E-Mails on selected events can be also provided.

MSA **Service**

Professional, Reliable & Responsive

Alongside the extensive range of top quality products, MSA also provides a high level of customised service.

MSA's comprehensive and versatile range of services ensures that your equipment and systems will always be reliable, economical and ready for use. MSA is always at your service to provide you with the support you need, when you need it.

- Project Planning & Development
- Installation & Commissioning
- System Modification
- Maintenance
- Repair & Service
- Training

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