

Portable Instrument SELECTION GUIDE



MSA Mission Statement

That men and women may work in safety and that they, their families and their communities may live in health throughout the world.

Our vision is to be the leading innovator and provider of quality safety and instrument products and services that protect and improve people's health, safety and the environment.

To provide satisfaction of customer needs through the efforts of motivated, involved, highly trained employees dedicated to continuous improvement in quality, service, cost, value, technology and delivery.

Advanced Technology

Advanced technology in research and development as well as manufacturing helps us to improve creativity, respond quickly to your changing needs, and combine traditional value with constant product enhancement. Our innovative New Product Development process focuses on designing and developing instruments based on customer input. By listening to the voice of the customer throughout the product development process, we are able to ensure MSA instruments meet user needs.

Our products are tested with state-of-the-art computer equipment at every manufacturing step, to ensure the highest quality possible. Although our facilities and equipment are new, we are still committed to the old-fashioned values of helping and supporting our customers. MSA field sales representatives and distributors are thoroughly trained in the use and application of our products. Our applications and inside sales departments are prepared to provide technical and customer service assistance. After the sale, we support our customers with the best repair and service organization in the industry. Building on our experience, we continue to fulfill our leadership role in the medical, instrumentation and control industries by developing high-quality products to solve our customers' monitoring needs.

Award-Winning Customer Service

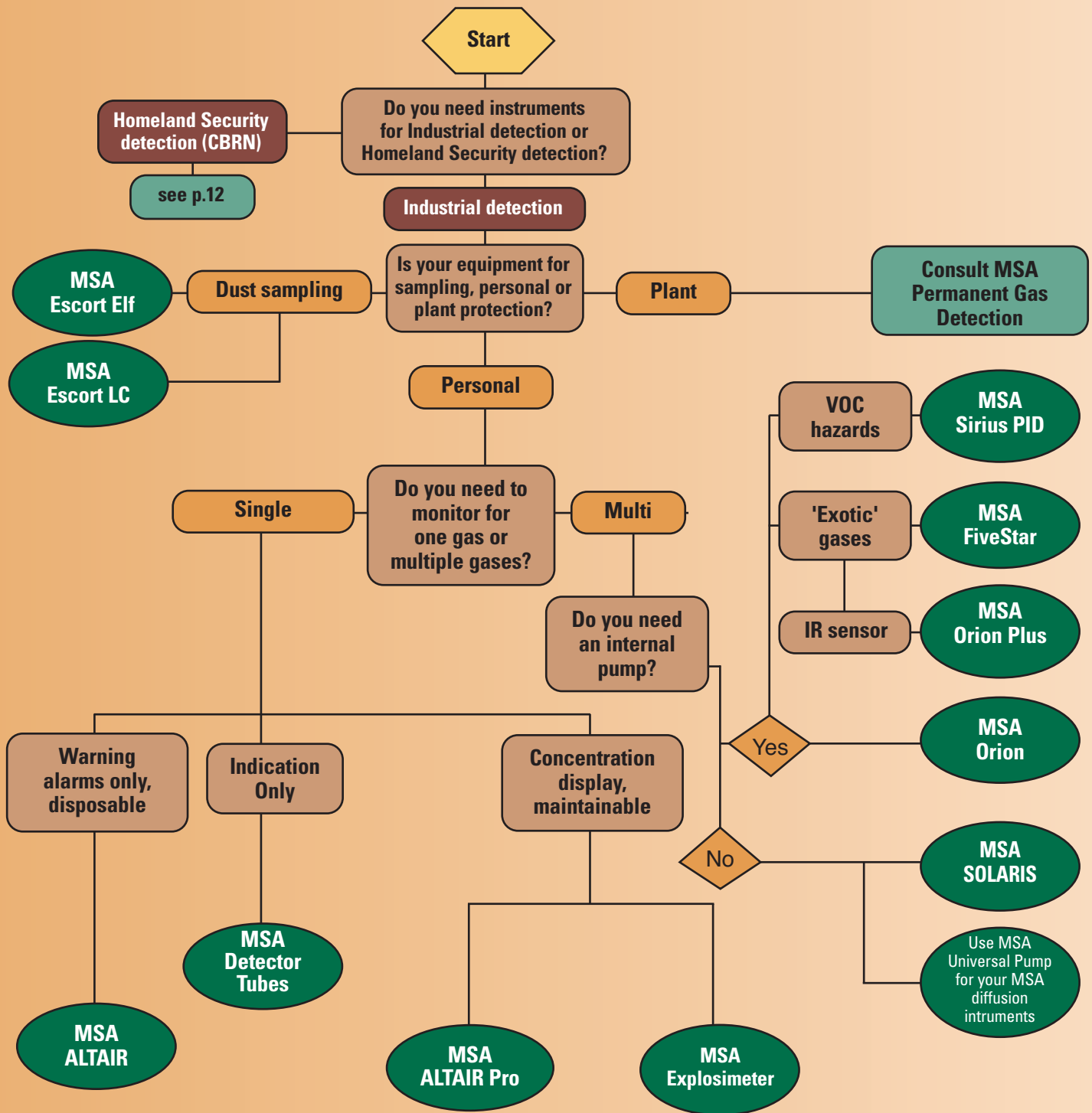
Finding the right instrument for your needs doesn't have to be difficult if your first decision is to choose MSA. This selection guide is designed to simplify your gas detection decision-making process. It is just one example of MSA's commitment to providing superior customer service. With MSA, you also have access to the most dedicated and highly trained staff of portable detector selection experts. We encourage you to use them. If you have additional questions at any point in the selection process or need assistance with an application not listed in this guide, simply call our Customer Service Team at 1-800-MSA-2222 (for International Customer Service call 1-412-967-3354). In addition to technical expertise, they can also provide you with product data sheets or the number of your local MSA distributor.

Purpose of Guide

This guide is designed to quickly and easily help you identify the portable gas detection solution to your specific needs. To assist in this process, it identifies some of the atmospheric hazards that are commonly found in various industries.

The information in this guide is not intended to be all-inclusive in scope or content and is not to be used as a substitute for a comprehensive hazards assessment. Contact MSA for more detailed information. Failure to follow this warning can result in serious personal injury or death.

Portable Instrument Selection Quick Guide



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Combustible Gas Detection Instruments Features

	PORTABLE INSTRUMENTS	Combustible Gases			Combustible Gases, O ₂ & Toxic Gases						
		Explosimeter® Combustible Gas Indicator	Gascope® Combustible Gas Indicator	Tankscope® Combustible Gas Indicator	FiveStar® Alarm	Orion® Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius® Multigas Detector	Solaris® Multigas Detector	Watchman® Multigas Monitor
Number of Gases Detected		1	1	1	5	4	4	5	4+VOC	4	5
Number of Sensors Available		1	1	1	11	4	4	>20	5	5	7
Sensor Options	Combustible Gases	•	•	•	•	•	•	•	•	•	•
	High-Range Methane Detection		•					•			
	Oxygen				•	•	•	•	•	•	•
	IR Combustible Gas							•			
	IR Carbon Dioxide							•			
					And up to two (or three for FiveStar) of the following:						
	Ammonia				•			•			
	Carbon Monoxide				•	•	•	•	•	•	•
	Chlorine				•			•			
	Chlorine Dioxide				•			•			
	Hydrogen Cyanide							•			
	Hydrogen Sulfide				•	•	•	•	•	•	•
	Nitric Oxide				•						•
	Nitrogen Dioxide				•			•		•	•
	Ozone							•			
	Phosgene							•			
	Phosphine				•			•			
	Sulfur Dioxide				•			•			•
	Features	Analog Display	•	•	•						
Digital Display					•	•	•	•	•	•	•
Alarms (Audible & Visual)					•	•	•	•	•	•	•
Vibrating Alarm										•	
Hand Held		•	•		•	•	•	•	•	•	•
Pocket Sized										•	
Hands-Free Operation					•	•	•	•	•	•	•
Memory Storage/Datalogging & Data Downloading					•	•	•	•	•	•	•
Datatagging					•						•
High RF Protection					•	•	•	•	•	•	•
Multi-lingual Display					•			•			•
Remote Alarm											•
Lockalarm™ Circuit					•	•		•	•	•	•
One-Button Calibration					•	•	•	•	•	•	
Smart Sensors					•						
Pressure Compensated O ₂					•	•	•	•	•	•	•

Toxic Gas & Oxygen Detection Instruments Features

		PORTABLE INSTRUMENTS			Toxic Gases			Combustible Gases, O ₂ & Toxic Gases				
		ALTAIR® Single-Gas Detector	ALTAIR Pro Single-Gas Detector	Detector Tubes*	FiveStar Alarm	Orion Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius Multigas Detector	Solaris Multigas Detector	Watchman Multigas Monitor	
Number of Gases Detected		1	1	1	5	4	4	5	4+VOC	4	5	
Number of Sensors Available		3	10	*	11	4	4	>20	5	5	7	
Sensor Options	Toxic—IDLH	●	●	●	●	●	●	●	●	●	●	
	Toxic—Non-IDLH	●	●	●	●	●	●	●	●	●	●	
	Volatile Organic Compounds (VOCs)			●					●			
	Combustible Gases				●	●	●	●	●	●	●	
	Oxygen	●	●		●	●	●	●	●	●	●	
	Carbon Dioxide			●				●				
		And up to two (or three for FiveStar) of the following:										
	Chemical Warfare Agents (CWAs)			●								
	Toxic Industrial Chemicals (TICs)			●				●				
	Ammonia		●	●	●			●				
	Carbon Monoxide	●	●	●	●	●	●	●	●	●	●	
	Chlorine		●	●	●			●				
	Chlorine Dioxide		●	●	●			●				
	Hydrogen Cyanide		●	●	●			●				
	Hydrogen Sulfide	●	●	●	●	●	●	●	●	●	●	
	Nitric Oxide			●	●						●	
	Nitrogen Dioxide		●	●	●			●		●	●	
	Ozone			●				●				
	Phosgene			●				●				
	Phosphine		●	●	●	●		●				
Sulfur Dioxide		●	●	●	●		●			●		
Features	Digital Display	●	●		●	●	●	●	●	●	●	
	Alarms (Audible & Visual)	●	●		●	●	●	●	●	●	●	
	Vibrating Alarm	●	●							●		
	Hand Held	●	●	●	●	●	●	●	●	●	●	
	Pocket Sized	●	●	●						●		
	Hands-Free Operation	●	●		●	●	●	●	●	●	●	
	Memory Storage/Datalogging and/or Data Downloading	●	●		●	●	●	●	●	●	●	
	Datatagging				●						●	
	High RF Protection	●	●		●	●	●	●	●	●	●	
	Multi-lingual Display				●			●			●	
	Remote Alarm										●	
	Lockalarm™ Circuit				●	●		●	●	●	●	
	Patented Button™ Sensors	●	●						●	●		
	One-Button Calibration	●	●		●	●	●	●	●	●		
	Smart Sensors				●							
Pressure Compensated O ₂				●	●	●	●	●	●	●		

* Detector tubes are available for the detection of over 170 gases. Contact MSA's Customer Service Center for a complete list.

VOC Detection Instruments Features		VOCs, Combustible & Toxic Gases & O₂	
		PORTABLE INSTRUMENTS	Sirius Multigas Detector
Number of Gases Detected			*
Gases Detected	Combustible Gases		●
	Toxic—IDLH		●
	Toxic—Non-IDLH		●
	Oxygen		●
	Chlorine		●
	Chlorine Dioxide		●
	Hydrogen Sulfide		●
	Phosphine		●
	Acetone		●
	Benzene		●
	Chlorobenzene		●
	Cyclohexane		●
	Heptane		●
	Hexane		●
	Methyl Isobutyl Ketone (MIBK)		●
	Methyl Tetrabutyl Ether (MTBE)		●
	Octane		●
	Propylene		●
	Toluene		●
	Trichloroethane		●
Many Other VOCs		●	
Features	Digital Display		●
	Alarms (Audible & Visual)		●
	Hand Held		●
	Memory Storage/Datalogging & Data Downloading		●

Dust & Particulate Sampling Pumps Features		VOCs, Combustible & Toxic Gases & O₂		
		PORTABLE INSTRUMENTS	Escort ELF® Sampling Pump	Escort® LC Sampling Pump
Features	Internal Secondary Calibration Standard		●	
	Timer		●	
Sampling Cassettes	Coal Dust Sampling		●	●
	Silica General Purpose		●	●
	Asbestos		●	●

* Instrument is pre-programmed for direct readings of 100 VOCs. Over 400 VOCs are potentially detectable. For a complete list, contact MSA's Customer Service Center.

Note: Detector tubes and sorbent tubes can also be used to identify specific VOCs.

Combustible Gas Detection Instruments Features

	PORTABLE INSTRUMENTS						Multigas Instruments						Detector Tubes	Personal Sampling Pumps		Calibration Gas & Accessories				
	ALTAIR Single-Gas Detector	ALTAIR Pro Single-Gas Detector	Explosimeter Combustible Gas Indicator	Gascope Combustible Gas Indicator	Tankscope Combustible Gas Indicator	FiveStar Alarm	Orion Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius Multigas Detector	Solaris Multigas Detector	Watchman Multigas Monitor	Detector Tubes	Escort ELF Sampling Pump	Escort LC Sampling Pump	Pump Calibration Check Gas	Calibration Check Kits	TIM® System	Galaxy® Automated Test System	
Gases	Combustible Gases			●	●	●	●	●	●	●	●	●				●	●	●	●	
	O ₂ (Deficiency/Enrichment)	●	●				●	●	●	●	●	●				●	●	●	●	
	Ammonia—NH ₃		●				●		●	●			●			●	●	●	●	
	Carbon Dioxide—CO ₂							●					●			●	●	●	●	
	Carbon Monoxide—CO	●	●				●	●	●	●	●	●	●			●	●	●	●	
	Chlorine—Cl ₂		●				●		●	●			●			●	●	●	●	
	Chlorine Dioxide—ClO ₂		●				●		●	●			●							
	Formaldehyde—CH ₂ O												●							
	Hydrogen Cyanide		●						●											
	Hydrogen Sulfide—H ₂ S	●	●				●	●	●	●	●	●	●				●	●	●	●
	Nitric Oxide—NO						●					●	●				●	●	●	
	Nitrogen Dioxide—NO ₂		●				●		●		●	●	●				●	●	●	
	Ozone								●				●							
	Phosgene								●				●							
	Phosphine—PH ₃		●				●		●				●			●	●	●	●	
	Sulfur Dioxide—SO ₂		●				●		●			●	●			●	●	●	●	
	Dust													●	●					
	Volatile Organic Compounds									●			●							
	IR Detection								●											
	Chemical Warfare Agents (CWA)												●							
Toxic Industrial Chemicals (TIC)												●								

MSA Portable Instrument Approvals

	MET	MSHA	PADEP	UL	Canada	Europe	Australia	ETL
ALTAIR Single-Gas Detector				●	●	●	●	
ALTAIR Pro Single-Gas Detector				●	●	●	●	
Escort ELF Sampling Pump		●	●	●		●		
Escort LC Sampling Pump				●				
Explosimeter Combustible Gas Indicator				●				
FiveStar Alarm	●	●	●	●	●	●	●	
Gascope Combustible Gas Indicator	●							
Orion Multigas Detector				●	●	●	●	
Orion G Multigas & Leak Detector				●	●	●		
Orion Plus Multigas Detector				●	●	●	●	
Sirius Multigas Detector				●	●	●		
Solaris Multigas Detector		●	●	●	●	●	●	
Tankscope Combustible Gas Indicator	●							
Watchman Multigas Monitor	●			●	●	●		

Multigas Instruments

Multigas detectors are used primarily to monitor immediate hazards. They can be used for both continuous and intermittent gas detection.

MSA offers a full line of multigas instrument accessories, including batteries, chargers, pumps, sample lines and probes.

Features

MSA's multigas detectors are equipped with the following features:

- Audible & visual alarms
- One-button calibration
- Peak readings
- STEL & TWA
- Lockalarm feature (instrument automatically locks in the alarm mode when the gas exposure level exceeds 100% LEL)
- Continuous pumped operation (as an add-on for some instruments)
- Rechargeable or alkaline battery pack option

FiveStar Alarm

Rugged, reliable 5-gas detection at your fingertips



- Sensors available: O₂, CO, Cl₂, ClO₂, H₂S, NO, NO₂, PH₃, SO₂, NH₃ and combustible gas
- Autocalibration
- Smart sensors
- Pressure-compensated oxygen
- High levels of RFI protection
- Multilingual display
- Weather-resistant
- World's leading poison-tolerant combustible sensor
- Battery gas gauge
- Fast charger option
- Up to 20 hours of use with optional NiMH battery
- 2-year sensor warranty for most sensors

(For more complete information, see Bulletin 0816-06.)

Orion Multigas Detector

The standard for reliability, ease of use and durability



- Detects up to 4 gases including O₂, CO, H₂S, and combustible gas
- Simple, intuitive 2-button operation
- Rugged construction
- Large display with great contrast
- Internal pump
- 16-hr run time in pumped mode
- NiMH or alkaline batteries
- Galaxy System compatible
- IP54-rated
- Sensors are easy to change
- Also available: Orion Plus IR Detector (with infrared CO₂ sensor), Orion Fire (for the fire service) and Orion FX Multigas Detectors (for fast detection of aromatic hydrocarbons).

(For more complete information, see Bulletin 08-16-27.)

Solaris Multigas Detector

Small Size, Small Price...Big Features, Big Value



- Simultaneously detects up to 4 gases: combustible gas, O₂, CO, and H₂S or NO₂.
- Affordable, reliable, easy-to-use, and designed to withstand rough use in the harshest environments.
- IP 65-rated.
- One of the smallest, lightest 4-gas monitors available.
- World-class triple alarm system.
- Versatile, easy-to-read display.
- Alpha-numeric message bar easily guides users.
- Simple, intuitive 1-button calibration.
- Rechargeable lithium ion battery provides 14+ hours of continuous operation and fully recharges in less than 4 hours.
- Easy calibration; Galaxy System compatible.
- Optional powered sampling pump.
- Also available: Solaris Fire (for the fire service) and Solaris FX (for fast detection of aromatic hydrocarbons).

(For more complete information, see Bulletin 0816-50.)

Sirius Multigas Detector

One PID, 4 Gases...Detects Hundreds of Chemicals



- Simultaneously detects O₂, CO, H₂S, combustible gas, and hundreds of VOCs, including direct readings of 100 pre-programmed gases.
- Offers tremendous flexibility in a reliable, durable, easy-to-use unit.
- User-friendly software
- Superior, proprietary PID sensor design (patent-pending) reduces maintenance.
- Loud, attention-grabbing double-alarm system.
- Interchangeable lithium-ion and alkaline battery packs allow non-stop operation.
- Easy calibration; Galaxy System compatible.
- Long-term storage kit ensures that unit is working properly in case of an emergency.

(For more complete information, see Bulletin 0803-10.)



Watchman Multigas Monitor

Designed to withstand the most demanding environments

- Monitors up to 4 gases including O₂, CO, H₂S, NO, NO₂, SO₂ and combustible gas
- Extremely durable
- High RFI protection
- 14-hour battery run time as standard feature
- Remote alarm

(For more complete information, see Bulletin 08-02-39.)

Orion G Multigas & Leak Detector

Detects gas leaks at appliances, flues and underground pipes



- Multi-functional flexibility; indoor, outdoor and underground
- Measures low-level leaks, 0-100% LEL, 0-100% by volume, O₂, CO and H₂S (any combination)
- Fast response, intrinsically safe leak sensor
- Ergonomic design that fits snugly in hand
- Long-life NiMH or alkaline batteries (interchangeable)
- Large display, with great contrast for quick, easy readings
- Bar-hole probe filter trap designed to keep out water and dust

(For more complete information, see Bulletin 0816-42.)

Orion Plus IR Detector

Versatile and durable to meet all your needs



- Detects up to 5 gases including NH₃, NO₂, O₂, CO, H₂S, Cl₂, PH₃, SO₂, O₃, ClO₂, COCl₂ and combustible gas
- * IR sensor for butane, propane, ethylene, methane or carbon dioxide
- Echem, catalytic & IR sensors even for the toughest requirements
- Large, easy to read display
- Truly simple, intuitive one hand operation
- NiMH or alkaline batteries for extended operation time
- Integrated pump

(For more complete information, see Bulletin 0816-68.)

Single-Gas Instruments

Single-gas detectors are an economical way to monitor for a specific single gas. MSA toxic gas indicators can be used for continuous monitoring of CO, O₂, or H₂S. MSA combustible gas indicators can be used to measure methane, pentane, and many other combustible gases.



ALTAIR Pro Single-Gas Detector

Innovative ALTAIR Pro Single and Multigas Detectors for toxic gas and oxygen detection with replaceable sensor and battery display gas concentration or percent oxygen on a large, clear, backlit LCD. The ALTAIR Pro Single-Gas Detector provides worry-free performance and stands up to the roughest handling in even the toughest industrial environments. Its rubberized armor housing and one-button operation provide the durability and simplicity you expect from MSA.

ALTAIR Single-Gas Detector

The ALTAIR Single-Gas Detector provides maintenance-free monitoring of carbon monoxide, hydrogen sulfide or oxygen. A 2-year lifespan, coupled with the unit's high performance, results in one of the most cost-effective monitors on the market.

- Advanced design offers superior dust and water protection and high resistance to RFI
- Rubberized housing and one-button operation provide durability and ease of use
- Triple-alarm system features two bright LEDs, piercing audible alarm and vibrating alarm
- Automatic recording of last 25 alarm events
- To read data or change alarm set points simply connect unit to an MSA infrared adapter using built-in IR communication port

(For more complete information, see Bulletin 0800-31.)

- Ease-of-use (1-button operation)
- Distinctive alarm system
- Alarm check, bump check, fresh air zero, and calibration made easy
- Easily-replaceable, commercially-available battery
- Replaceable sensors
- Built-in IR communication (event & data-logging)
- Rugged design
- Water- and dust-resistance



Also available:

- ALTAIR® Pro CO Fire for the fire service
- ALTAIR® Pro CO Steel with hydrogen-resistant sensor and software that prevents disabling of alarms by users
- ALTAIR® Pro O₂-R Oxygen Remote Detector for remote sampling

(For more complete information, see Bulletin 0802-33.)

Explosimeter Combustible Gas Indicator

Combustible detection with
simple analog operation

- Detects and measures concentrations of combustible gases or vapors in the air
- Can be used in the immediate environment or for remote sampling of confined spaces
- Easy-to-read analog display
- Hand-held

*(For more complete information,
see Bulletin 08-00-03.)*



Gascope Combustible Gas Indicator

Dual-range combustible gas
detector

- Detects, measures, and pinpoints leaks of combustible gases and vapors
- Wide detection range allows for readings above the UEL
- Dual-detection range gives readings in both % LEL and % by volume
- Easy-to-read analog display

*(For more complete information,
see Bulletin 08-01-04.)*



Tankscope Combustible Gas Indicator, Model 62T

For combustible gas detection in
inerted environments

- Specifically designed to detect combustible gas levels in inerted shipboard oil holds
- Easy-to-read analog display
- Very simple to use

*(For more complete information,
see Bulletin 0804-29-MC.)*



Chemical, Biological, Radiological or Nuclear (CBRN) Detection



SAW MiniCAD™ mk II Chemical Warfare Agent Detector

The SAW MiniCAD mk II Detector is a personal, lightweight, solid-state chemical agent detector for simultaneous detection of trace levels of nerve and blister agents. The MiniCAD Detector is highly selective to these agents and is extremely resistant to false alarms. It operates from either standard off-the-shelf lithium batteries or a rechargeable battery pack using proven SAW (Surface Acoustic Wave) sensor technology. System and alarm status are displayed by LEDs and an audible alarm.

- Fully automated operation.
- Compact, lightweight, portable.
- LED and audible alarms
- Solid state, surface acoustic wave microsensor array detector
- Quick warm-up: 2 minutes
- 60-second cycle time
- Records data
- Requires no user maintenance
- 5-year shelf-life

(For more complete information, see Bulletin 0805-20.)

HAZMATCAD™ Hazardous Material Chemical Agent Detector and HAZMATCAD Plus™ Detector with Selected Toxic Industrial Chemicals

Reliable CWA detection in easy-to-use handheld devices

- Use surface acoustic wave (SAW) technology to detect and classify trace amounts of chemical warfare agents (CWAs), including nerve and blister agents.
- Can be configured to detect phosgene or hydrogen cyanide.
- HAZMATCAD Plus Detector detects both CWAs and selected toxic industrial chemicals (TICs) for multiple threat-detection capabilities.
- Ruggedly constructed, compact and lightweight.
- Extremely easy to use, requiring no prior training. Single key press begins automatic sampling and analysis.
- Audible and visual alarms.
- Self-diagnostic check during rapid warm-up.
- Alphanumeric display with LED alarms.
- 8–12 hour operation with rechargeable lithium ion batteries.
- Vapor diffusion check source verifies system performance.
- RS-232 and IrDA communication ports, stores up to 8 hours of data.
- Inlet design protects against dust and particulate.



(For more complete information, see Bulletins 0815-25 and 0815-27.)

SAFESITE® Multi-Threat Wireless Detection System

The SAFESITE Multi-Threat Wireless Detection System simultaneously monitors and wirelessly communicates the presence of up to 6 potential threats, including chemical warfare agents (CWA), gamma radiation, volatile organic compounds (VOC), toxic industrial chemicals (TIC), combustible gas and oxygen deficiency.

The SAFESITE System components consist of the SAFEMTX™ Multi-Threat Detector, the SAFECOM™ Command Center and the SAFECOM™ Belt-Bridge with Sirius Wireless Interface. The system can be installed permanently (wired or wireless) for continual monitoring or deployed as a portable system.

The SAFEMTX Multi-Threat Detector uses multi-sensing technologies to detect up to 6 potential threats; helping first responders, law enforcement and government agents reduce the risk of exposure and facilitate consequence management. The SAFEMTX Detector also offers GPS location technology, pumped flow, horn, beacon, interchangeable smart sensors for maximum flexibility, a display lock-out panel which hides the display during monitoring, and internal diagnostics to identify signal strength during system deployment. Power options allow for lithium ion or alkaline batteries, as well as AC power and 12 VDC vehicle connection.



SAFEMTX Multi-Threat Detector

The SAFESITE System combines state-of-the-art detection technology with advanced wireless communication capabilities to provide superior preventative and counter-measure solutions for:

- Homeland security
- Emergency response
- Public events
- Building protection
- Mass transportation centers
- Perimeter monitoring
- Hazardous response
- Port surveillance
- Confined space monitoring

SAFECOM Command Center



The **SAFECOM** Command Center receives mission-critical information from the SAFEMTX Detectors and permits this crucial and wide-ranging data to be converted quickly into practical information for rapid decision-making through an uncomplicated graphical user interface.

- Manages up to four systems with 16 SAFEMTX Detectors per system, integrating SAFEMTX data, including:
 - Gas readings
 - Relative CWA threat level
 - Radiation dose rate
 - Alarm status
 - GPS location
 - Battery run time
 - RF signal strength
 - Fault conditions
 - SAFEMTX min, max, and average values

- Through the SAFECOM Command Center, alarms are identified with both visual and audible alarms. Alarms can then be acknowledged and silenced, detectors can be enabled and disabled, event logs and event log history can be viewed, plus units can be customized to suit the specific deployment scenario.
- Maps SAFEMTX Detectors through GPS technology, specific address inputs or click-and-drag icons onto images.
- Is also a TCP/IP hub, allowing all information to be placed on a network for remote viewing.
- SAFECONFIG Software works with the SAFECOM Command Center or SAFECONNECT Belt-Bridge, enabling configuration of any SAFEMTX Detector as a repeater. This added capability maximizes deployment range and ensures maximum signal strength without the need to move units.

(For more complete information, see Bulletin 07-2067.)

SAFECONNECT Belt-Bridge with Sirius Wireless Interface

The SAFECONNECT Belt-Bridge works with the Sirius Detector for integration into the MSA SAFESITE Multi-Threat Detection System.

- Offers up to 2 miles of wireless communication plus an updated Graphical User Interface (GUI) which provides all mission-critical information in one uncomplicated format.

The Sirius Wireless Interface features an IR link which gathers the information from the Sirius Multigas Detector (PID, CO, H₂S, O₂ and combustible gases) and then sends the information to the SAFECONNECT Belt-Bridge via Bluetooth technology.

The SAFECONNECT Belt-Bridge converts the signal from the Sirius Wireless Interface and transmits the information plus GPS location back to the SAFECOM Command Center via a 1 watt, spread spectrum, frequency hopping, 900 MHz radio.



SAFECONNECT Belt-Bridge with Sirius Wireless Interface

The SAFECOM Command Center receives the 900 MHz signal from the SAFECONNECT Belt-Bridge and converts it to practical information for rapid decision making. The SAFESITE System can display simultaneous information from the SAFEMTX Detectors and the Sirius Multigas Detector for complete coverage.

(For more complete information, see Bulletin 07-2124.)

Instrument Calibration

Galaxy Automated Test System

Extremely Easy to Use

- Standard web browser accessibility for data retrieval and reporting
- Industry-standard memory card available for simple data retention
- System does not require a computer or network interface
- Minimal training needed

Versatile and Expandable

- Up to 10 systems can be interconnected
- Instrument charging option available
- Optional battery pack available for remote use

Durable, Innovative Design

- Wireless- or wired-network interface available
- Inventive system door also functions as dust cover
- Guaranteed to work in the harshest environments
- In-line gas cylinder holster available; keeps the work area clean and orderly

Value-Driven Performance

- All-inclusive, 2-year warranty
- High quality, cost-effective solution
- Very low total cost of ownership

Available for the following MSA portable instruments:

- Altair Single-Gas detector
- Orion Multigas Detector
- Sirius Multigas Detector
- Solaris Multigas Detector

(For more complete information, see Bulletin 0800-27.)



ALTAIR QuickCheck™ Station

The MSA ALTAIR QuickCheck Station is designed to quickly and economically test MSA ALTAIR and ALTAIR Pro Single Gas Detectors, verifying instrument response to gas (bump-check) as well as the functionality of the alarms.

- Instruments self-record the time, date, and results of the test in their built-in event logs.
- ALTAIR Detector records 25 events.
- ALTAIR Pro Detector records 50 events.
- Available in manual and automatic versions.
- Quick, easy and economical bump checks.
- Verification of instrument's total alarm functionality.
- Tests and results recorded in instrument's event log.

(For more complete information, see Bulletin 0803-15.)

Calibration Accessories

Regulators

MSA offers a complete line of regulators to accurately match gas delivery to instrument flow requirements. Three types of regulators are available: fixed flow, matched flow and demand.



Calibration Kits

A complete line of calibration kits is available for instrument calibration. Kits include all necessary tubing and adapters, regulators and calibration instructions. Calibration kits are housed in a heavy-duty plastic case, complete with a molded insert to house all accessories, regulators and calibration cylinders.



Test Kits

Squirt® Gas Bump Test Kits are available for testing the operation of an instrument before each use. Kits are equipped with all necessary tubing, adapters and squirt gas cylinder in a handy carrying case.



Calibration Cylinders

MSA offers a complete line of calibration gas to support all of your instrument calibration needs. Calibration gas is supplied in 6 cylinder sizes, ranging from 11-liter squirt gas for bump testing to 552-liter cylinders for large-volume users.

Each cylinder is shipped with an individual copy of an MSDS and a Certificate of Analysis, ensuring an exact calibration for both MSA and non-MSA instruments. For your convenience, reactive gases have an expiration date listed on each cylinder.



MSA calibration cylinders are recyclable. Contact MSA Customer Service for additional details.

Detector Tubes & Sampling Pumps

Detector tubes are an inexpensive way to perform a quick atmospheric check. Sampling pumps and cassettes are particularly suited for monitoring chronic hazards related to dust, fibers and particulate.

Detector Tubes

- Available for the detection of over 170 gases and vapors

The MSA Kwik-Ref™ Detector Tube CD-ROM Database lists all tubes available, along with facts on chemical reaction and color changes, interferences, cross-sensitivities, and more.

(For more complete information, see Bulletin 0800-02-MC.)



Detector Tube Pumps

MSA offers both manual and automatic detector tube pumps.



Escort ELF Sampling Pump

State-of-the-art electronic laminar flow sensor provides constant flow control in a compact, lightweight sampling pump

- For personal and area sampling
- Compact & lightweight
- Timer
- Engineered for use in hostile environments
- Can be used with many types of sample collection media, including filter discs, charcoal tubes & other sorbent tubes.

(For more complete information, see Bulletin 0810-38-MC.)



Escort LC Sampling Pump

A durable and economical sampling pump providing regulated flow for many types of sample collection media

- For personal and area sampling
- Compact & lightweight
- Timer
- Engineered for use in hostile environments
- Can be used with many types of sample collection media, including filter discs, charcoal tubes & other sorbent tubes.

(For more complete information, see Bulletin 0804-01.)

Sampling Pump Accessories

MSA sampling pump accessories include filter media, a cyclone assembly, preweighed filter cassettes, filter holder assemblies, impingers, the Gemini® Twin-Port Sampler, sorbent tubes, and calibrators.

(For more complete information, see Bulletin 0809-01.)



Gases/Hazards & Industries		Gases/Hazards																		
		Toxic Gases																		
		Combustible Gases	O2 Deficiency/Enrichment	Ammonia	Carbon Dioxide	Carbon Monoxide	Chlorine	Chlorine Dioxide	Formaldehyde	Gamma Radiation	Hydrogen Cyanide	Hydrogen Sulfide	Nerve/Blister Agents	Nitric Oxide	Nitrogen Dioxide	Ozone	Phosgene	Phosphine	Sulfur Dioxide	Dust & Particulate
Agriculture		●	●	●	●					●		●	●		●	●				
Asbestos Abatement																			●	
Aviation	●	●			●														●	●
Chemical	●	●	●		●	●				●	●				●			●	●	●
Construction	●	●			●						●								●	●
Fire Service	●	●		●	●	●				●	●								●	●
Food & Beverage Processing		●	●	●	●						●						●			
Foundries	●	●			●						●							●	●	
HazMat	●	●	●		●	●		●			●						●	●		
Heavy Manufacturing	●				●															●
Homeland Security	●	●	●			●	●		●	●	●	●	●	●		●	●	●		●
Iron & Steel	●	●			●					●	●		●	●		●		●	●	●
Mining	●	●		●	●					●	●		●	●					●	
Nuclear	●	●			●															
Oil & Gas/Petrochemical	●	●	●		●						●								●	●
Paper & Pulp						●	●				●							●	●	●
Pharmaceutical	●	●	●			●		●			●					●		●	●	●
Sand Blasting																			●	
Sanding & Grinding																			●	
Semiconductor			●			●							●	●			●			●
Shipyard/Marine	●	●		●	●						●								●	
Spray Painting	●							●											●	●
Utilities	●	●		●	●						●		●	●				●		
Water & Wastewater Treatment	●	●	●		●	●					●				●			●		
Welding	●	●			●								●	●	●				●	

Monitoring Categories

COMBUSTIBLE GASES

- Acetone (C₃H₆O)
- Benzene (C₆H₆)
- Butane (C₄H₁₀)
- Ethylene (C₂H₄)
- Heptane (C₇H₁₆)
- Hexane (C₆H₁₄)
- Hydrogen (H₂)
- Isobutane (C₄H₁₀)
- Methane (CH₄)
- Pentane (C₅H₁₂)
- Toluene (C₇H₈)
- Propane (C₃H₈)

TOXIC GASES

- Ammonia (NH₃)
- Carbon Dioxide (CO₂)
- Carbon Monoxide (CO)
- Chlorine (Cl₂)
- Chlorine Dioxide (ClO₂)
- Hydrogen Cyanide (HCN)
- Hydrogen Sulfide (H₂S)
- Nitric Oxide (NO)
- Nitrogen Dioxide (NO₂)
- Ozone (O₃)
- Phosphine (PH₃)
- Sulfur Dioxide (SO₂)
- Phosgene (COCl₂)

Instruments & Industries

			Single-Gas Instruments					Multigas Instruments						Detector Tubes, Sampling Pumps & Calibration		
			ALTAIR Single-Gas Detector	ALTAIR Pro Single-Gas Detector	Explosimeter Combustible Gas Indicator	Gascope Combustible Gas Indicator	Tankscope Combustible Gas Indicator	FiveStar Alarm	Orion Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius Multigas Detector	Solaris Multigas Detector	Watchman Multigas Monitor	Calibration Check Gas	Detector Tubes
Application/Task		Gas/Hazard														
Agriculture	Chillers	NH ₃		●				●			●				●	●
	Silos/confined space	CO ₂		●						●	●				●	●
	Forklift operation	CO	●	●				●	●	●	●	●	●	●	●	●
	Fumigant	H ₂ S	●	●				●	●	●	●	●	●	●	●	●
	Silos/confined space	NO						●					●	●	●	●
	Silos/confined space	NO ₂		●				●		●			●	●	●	●
	Silos/confined space	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●	●	●
	Insecticide for fumigation	PH ₃		●				●		●				●	●	●
Asbestos Abatement	Asbestos fibers & lead dust	Dust & Particulate														●
Aviation	Engine repair & maintenance	CO	●	●				●	●		●	●	●	●	●	●
		Combustible Gases			●	●		●	●	●	●	●	●	●	●	●
	Confined space	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●	●	●
	Jet fuel vapors, solvents	VOCs							●		●				●	●
Chemical	Drying, milling & blending operations	Dust & Particulate		●												●
	General leak detection	CO	●	●				●		●	●	●	●	●	●	●
		Cl ₂		●				●		●				●	●	●
		NH ₃						●	●	●				●	●	●
		H ₂ S	●	●				●	●	●	●	●	●	●	●	●
		NO						●					●	●	●	●
		NO ₂		●				●		●			●	●	●	●
	Confined space, liquid nitrogen carriers/storage, reactor work, tank maintenance, inspection tunnels	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●	●	●
		SO ₂		●				●		●			●	●	●	●
Organic synthesis operations, liquid-solid separation, cleaning agents	VOCs							●		●				●	●	
Construction	Vehicle emissions (diesel exhaust), generators, digging operations, trenching	CO	●	●				●	●		●	●	●	●	●	●
	Trenching, underground construction	Combustible Gases			●			●	●	●	●	●	●	●	●	●
	Underground construction, excavation, demolition, oil mist sampling	Dust & Particulate														●
	Digging operations, underground construction	H ₂ S	●	●				●	●	●	●	●	●	●	●	●

Instruments & Industries

		Single-Gas Instruments					Multigas Instruments						Detector Tubes, Sampling Pumps & Calibration				
		ALTAIR Single-Gas Detector	ALTAIR Pro Single-Gas Detector	Explosimeter Combustible Gas Indicator	Gascope Combustible Gas Indicator	Tankscope Combustible Gas Indicator	FiveStar Alarm	Orion Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius Multigas Detector	Solaris Multigas Detector	Watchman Multigas Monitor	Calibration Check Gas	Detector Tubes	Sampling Pumps	
<i>Application/Task</i>		<i>Gas/Hazard</i>															
Construction	Diesel exhaust	NO					●						●	●	●		
		NO ₂		●			●			●				●	●		
	Confined spaces, trenching, underground construction	O ₂ Deficiency/Enrichment	●	●			●	●	●	●	●	●		●	●		
		CO ₂								●				●	●		
Fire Service	Confined space entry (rescue)	CO ₂							●					●	●		
	Overhaul, home calls (furnace leaks), trenching	CO	●	●			●	●	●	●	●	●	●	●	●		
	Underground construction, trenching	Combustible Gases			●	●	●	●	●	●	●	●	●	●	●		
		Dust & Particulate														●	
		H ₂ S	●	●			●	●	●	●	●	●	●	●	●	●	
	Confined space entry (rescue), underground construction	O ₂ Deficiency/Enrichment	●	●			●	●	●	●	●	●	●	●	●	●	
Food & Beverage Processing	Refrigeration facilities & cold storage	NH ₃		●			●		●					●	●		
	Breweries & wineries, carbonated beverage bottling, fermentation tanks, refrigeration facilities, baking facilities	CO ₂							●					●	●		
	Forklifts	CO	●	●			●	●	●	●	●	●	●	●	●		
		H ₂ S	●	●				●	●	●	●	●	●	●	●	●	
	Confined space, packaging or gassing foods	O ₂ Deficiency/Enrichment	●	●			●	●	●	●	●	●	●	●	●	●	
		PH ₃		●			●		●					●	●		
Foundries	Furnace operation, coremaking, metal preparation & pouring	CO	●	●			●	●	●	●	●	●	●	●	●		
		Combustible Gases			●	●	●	●	●	●	●	●	●	●	●		
	Mold preparation, casting cleaning, furnace changing, cleaning & finishing process	Dust & Particulate														●	
	Coremaking	H ₂ S	●	●			●	●	●	●	●	●		●	●		
		NO					●						●	●	●		
		NO ₂		●			●		●				●	●	●		
		SO ₂		●			●		●				●	●	●		
	Confined space	O ₂ Deficiency/Enrichment	●	●			●	●	●	●	●	●	●	●	●	●	

Instruments & Industries

		Single-Gas Instruments					Multigas Instruments						Detector Tubes, Sampling Pumps & Calibration		
		ALTAIR Single-Gas Detector	ALTAIR Pro Single-Gas Detector	Explosimeter Combustible Gas Indicator	Gascope Combustible Gas Indicator	Tankscope Combustible Gas Indicator	Five Star Alarm	Orion Multigas Detector	Orion G Multigas & Leak Detector	Orion Plus IR Detector	Sirius Multigas Detector	Solaris Multigas Detector	Watchman Multigas Monitor	Calibration Check Gas	Detector Tubes
Application/Task	Gas/Hazard														
HazMat	HazMat response	NH ₃		●				●		●	●			●	●
		CO	●	●			●	●	●	●	●	●	●	●	●
		Cl ₂		●			●		●					●	●
		Combustible Gases			●	●	●	●	●	●	●	●	●	●	
		Formaldehyde													●
		H ₂ S	●	●			●	●	●	●	●	●	●	●	●
		PH ₃		●			●		●					●	●
		SO ₂		●			●		●				●	●	●
		VOCs								●				●	●
	Confined space, underground construction, trenching	O ₂ Deficiency/Enrichment	●	●			●	●	●	●	●	●	●		
Heavy Manufacturing	Manufacturing process emissions, forklift & crane operations	various gases							●					●	
Iron & Steel	Blast furnace operation & maintenance, coke oven & converter operation, furnace & gas pipeline leaks, coking operations	CO	●	●			●	●	●	●	●	●	●	●	●
		Combustible Gases			●	●	●	●	●	●	●	●	●	●	
	Handling of coal & ore, coke manufacturing, furnace maintenance	Dust & Particulate													●
	Coking operations	H ₂ S	●	●			●	●	●	●	●	●	●	●	●
		SO ₂		●			●		●			●	●	●	●
	Welding	NO					●					●	●	●	●
		NO ₂		●			●		●			●	●	●	●
	Confined space	O ₂	●	●			●	●	●	●	●	●	●	●	●
Motor maintenance & cleaning, coke oven emissions	VOCs							●		●				●	
Mining	Confined space	"Black Damp" O ₂ Deficiency					●		●	●	●		●		
	Mechanized coal cutting	"Fire Damp" (Combustible Gases)					●		●	●	●		●		
	Mining process	"Stink Damp" (H ₂ S)					●		●	●	●		●	●	
	Result of combustion (fire), diesel-powered machinery, confined space, blasting	"White Damp" (CO)					●		●	●	●		●	●	
		CO ₂							●				●	●	

Instruments & Industries

			Single-Gas Instruments					Multigas Instruments						Detector Tubes, Sampling Pumps & Calibration		
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Application/Task		Gas/Hazard														
Mining	Drilling, blasting & cutting, coal transportation, mechanized mining	Dust & Particulate														●
	Diesel exhaust	NO						●							●	●
	Diesel-powered machinery, blasting	NO ₂		●				●		●					●	●
Nuclear	Confined space	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●	●	
Oil & Gas/ Petroleum	Petroleum refining	NH ₃		●				●		●				●	●	
	Incomplete combustion, conversion, coking, general processing, leak detection	CO	●	●				●	●	●	●	●	●	●	●	
	Conversion processes, isomerization, leak detection, catalytic reforming, treatment processes	Combustible Gases			●	●	●	●	●	●	●	●	●	●	●	
	Heavy hydrocarbon processing (coking)	Dust & Particulate														●
	Refining process, general leak detection, treatment processes, crude separation, drilling rigs	H ₂ S	●	●				●	●	●	●	●	●	●	●	●
	Confined space, tank-cleaning operations, enclosed buildings or structures	O ₂	●	●				●	●	●	●	●	●	●	●	
	Refining process, process stream sample collection, general plant operations	VOCs								●		●		●	●	●
Paper & Pulp	Paper production (bleaching)	Cl ₂		●				●		●				●	●	
		ClO ₂		●						●					●	
	Wood preparation, pulping, wood dust sampling	Dust & Particulate														●
	Chemical pulping, Kraft pulping	H ₂ S	●	●						●					●	
		SO ₂		●						●					●	
	Paper production (coating & drying)	VOCs								●		●		●	●	●
Pharmaceutical	Manufacturing	NH ₃		●				●		●				●	●	
		Cl ₂		●				●		●				●	●	
		Combustible Gases			●	●		●	●	●	●	●	●	●	●	
		Formaldehyde														●
		H ₂ S	●	●				●	●	●	●	●	●	●	●	●
		SO ₂		●				●		●				●	●	
	Drying, milling & blending operations	Dust & Particulate														●
	Chemical synthesis, tank-cleaning, enclosed buildings or structures	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●	●	
	Organic synthesis, liquid-solid separation, compounding, granulating & tablet-coating operations, drying & packaging	VOCs									●			●	●	

Instruments & Industries

			Single-Gas Instruments						Multigas Instruments						Detector Tubes, Sampling Pumps & Calibration		
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Application/Task		Gas/Hazard															
Sand Blasting	General operations	Dust & Particulate														●	
	Sanding & Grinding	Grinding operations, manufacture of paints & glass, routine maintenance activities, construction, demolition														●	
Semiconductor	Manufacturing	NH ₃		●				●		●				●	●		
		Cl ₂		●				●		●				●	●		
		NO						●					●	●	●		
		NO ₂		●				●		●			●	●	●		
	As doping agent in manufacturing, diffusion and ion implementation, chemical vapor deposition	PH ₃		●				●		●				●	●		
	Lithography, etching, oxidation, metallization, assembly & testing	VOCs									●					●	
Shipyard/Marine	Confined space	CO ₂								●				●	●		
	Combustion	CO	●	●				●	●	●	●	●	●	●	●		
	Oil trans-shipment (combustible gas sampling in an inert environment)	Combustible Gases			●	●	●		●	●	●	●		●			
	Construction & repair (abrasive blasting operations, cutting & grinding, burning, heating)	Dust & Particulate														●	
	Tank emissions	H ₂ S	●	●				●	●	●	●	●	●	●	●		
	Confined space, storage tanks, cargo holds	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●			
Spray Painting	General operations	Dust & Particulate														●	
	Use of water-based paint	Formaldehyde													●		
	Use of solvent-based paint	VOCs									●			●	●		
Utilities	Home furnace leaks	CO	●	●				●	●	●	●	●	●	●	●		
	Gas service safety survey and leak detection, throughout processes	Combustible Gases (CH ₄)			●	●	●	●	●	●	●	●	●	●			
	Throughout processes	H ₂ S	●	●				●	●	●	●	●	●	●	●		
	Fossil fuel power plants	NO						●					●	●	●		
		NO ₂		●				●		●			●	●	●		
		SO ₂		●				●		●			●	●	●		
Confined space throughout processes	O ₂ Deficiency/Enrichment	●	●				●	●	●	●	●	●	●				

Instruments & Industries

		Single-Gas Instruments					Multigas Instruments					Detector Tubes, Sampling Pumps & Calibration				
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<i>Application/Task</i>		<i>Gas/Hazard</i>														
Water & Wastewater Treatment	Processing	NH ₃														
		•	•													
		•	•													
		•	•													
	Digester process, sewer work	CO ₂														
		•	•													
	Incinerators, stagnant gas in urban sewer system	CO														
		•	•													
	Processing															
	Digester process, throughout process	Combustible Gases (CH ₄)		•	•	•	•	•	•	•	•	•	•	•	•	•
Sewer work, throughout process	H ₂ S		•	•												
	•	•														
Sewer treatment/maintenance, confined space, throughout process	O ₂		•	•												
	•	•														
Dechlorination process	SO ₂		•	•												
	•	•														
Welding	Confined space welding, arc air cutting, digester process flux- & gas-shielded arc welding, metal cutting & flame gouging, gas pressure welding	CO		•	•											
		•	•													
	Thermite arc & stud welding, laser welding & chilling, arc air cutting, digester process electric resistance welding, gas pressure welding, metal cutting & flame gouging	Combustible Gases		•	•	•	•	•	•	•	•	•	•	•	•	•
		•	•													
		Dust & Particulate														
		NO														
		•	•													
Arc welding & cutting, stud welding, arc air cutting, gas pressure welding, metal cutting & flame gouging	NO ₂		•	•												
	•	•														
Confined space welding, electron beam welding	O ₂ Deficiency/Enrichment		•	•	•	•	•	•	•	•	•	•	•	•	•	
	•	•														
Arc welding & cutting, stud welding, arc air cutting, electric resistance welding	Ozone															
	•	•														

Exposure Limits Terms and Abbreviations

IDLH (Immediately Dangerous to Life and Health)* – The maximum concentration level of a substance (gas) from which a worker could escape within 30 minutes without developing immediate, severe or irreversible health effects, or other escape-impairing symptoms. IDLH levels are measured in ppm (parts per million). * As defined by NIOSH (National Institute for Occupational Safety and Health).

PEL (Permissible Exposure Limit) – An airborne concentration of contaminant that most workers can be exposed to repeatedly in a normal 8-hour day, in a 40-hour week, without adverse health effect. PEL levels are measured in ppm (parts per million) and are established by OSHA.

PPM (Parts Per Million) – The most common unit of measurement for toxic gases. "10,000 parts per million" gas concentration equals 1% by volume.

TLV (Threshold Limit Value)* – Refers to the airborne concentration of substances to which most workers can be repeatedly exposed over a working lifetime without adverse effects.

* As defined by ACGIH (American Conference of Governmental Industrial Hygienists).

There are three categories of TLVs:

TLV – TWA (Time Weighted Average) – This is the average amount of gas that a worker can be repeatedly exposed to in a normal 8-hour day, in a 40-hour week, without adverse health effects.

TLV – STEL (Short Term Exposure Limit) – The gas concentration to which most workers can be continuously exposed for a 15-minute time period without suffering adverse health effects that would impair self-rescue or worker safety. This limit should not be repeated more than 4 times per day and there should be at least 60 minutes between individual STEL exposure periods.

TLV – C (Ceiling) – The highest gas concentration to which workers may be exposed. Ceiling TLVs should never be exceeded and they take precedence over all TWAs and STELs.

LEL (Lower Explosive Limit) – The lowest concentration of a gas or vapor that will ignite and sustain combustion. "% LEL" is a common unit of measurement in combustible gas detection.

UEL (Upper Explosive Limit) – The maximum concentration at which a gas will sustain combustion.

Oxygen Deficient Atmosphere – An atmosphere containing less than 19.5% oxygen by volume. (Possesses a risk of insufficient oxygen for breathing.)

Oxygen Enriched Atmosphere – An atmosphere containing more than 25% oxygen by volume. (Possesses an increased risk of explosion.)

Cross-Sensitivity

Since sensor output is driven by chemical reactions, there are circumstances where gases other than those being monitored will cause a reading on the instrument display. This is known as "cross-sensitivity". Users should be aware of this potential when selecting an instrument. For more information consult the instrument technical manual or MSA's Customer Service Center.



Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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