



GAS DETECTION AND  
MONITORING SOLUTIONS  
**FOR LIFE**



**INDUSTRIAL  
SCIENTIFIC**

# WELCOME TO INDUSTRIAL SCIENTIFIC

Since being founded in 1985, Industrial Scientific has sought to make a contribution to this world by helping people return home from work at the end of the day...alive. We recognize that, at any given time, hundreds of thousands of people are betting their lives on the collective work we do as a company.

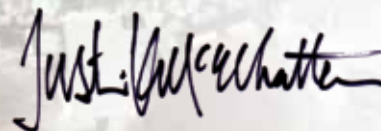
That being said, it is important to know what drives your supplier of gas detection equipment and solutions. Here at Industrial Scientific, we are driven by three things.

The first is Our Mission – *Preserving human life on, above, and below the Earth. Delivering highest quality, best customer service...every transaction, every time.* What we do – preserving human life – shapes our expectations towards the output. It must be of highest quality and exceed the expectations of our customers. We invest aggressively in capital equipment and business systems to ensure this. We partner with the best suppliers we can find. We don't let anything out of our factories that we wouldn't bet our own lives on.

The second is our Employees First business philosophy. We believe good performance is the result of doing the right things for employees first, customers second and shareholders third. Only when we have the best people in the world, working with the best tools, can we truly deliver the best performance for our customers. If we serve our customers well, we will thrive as a company. It all starts, though, with the individuals designing, building and selling the solutions you and your people bet your lives on. We will not compromise by serving you with anything but the best people.

Lastly, we are driven by our independence. Industrial Scientific was a publicly-traded company from 1993 to 1999. As a public company, we felt our mission and business philosophy were in opposition to the demands of Wall Street and outside shareholders. As a private company, we have been able to reinvest in our people and our systems, and make decisions with a better long-term focus. We actively work to keep Industrial Scientific strong and independent.

If you are a current customer, thank you for your business and partnership. If not, I hope to have the opportunity to demonstrate what the great people of Industrial Scientific are capable of doing to help you create a safer workplace. If I can ever be of any assistance, please do not hesitate to contact me directly at +1-412-490-1842 or at [jmcelhattan@indsci.com](mailto:jmcelhattan@indsci.com). Thank you.



Justin McElhattan  
President and Chief Executive Officer



## WHY INDUSTRIAL SCIENTIFIC?

### Quality Assurance

- ISO 9001 Quality System Certified
- ISO 14001 Environmental Management System (EMS) Certified
- OHSAS 18001 Occupational Health and Safety Assessment Specification Certified
- CSA – Category Certified
- Third Party Certifications – for intrinsic safety, susceptibility to electromagnetic and radio frequency interference, ingress protection and performance

### Global Presence

- Manufacturing facilities in USA and China
- Offices in many countries throughout the world
- Distribution network established worldwide
- Established international accounts – references available

### Ease of Use and Serviceability

- Simple, one-button operation and calibration on most monitors
- Microprocessor-controlled operation
- Easy sensor replacement and calibration in the field
- Local servicing available through authorized distributors

### Environmentally Friendly

- Complete recycling process for returned and decommissioned instruments
- Recycling program for sensors, PC boards and batteries
- Compliant with WEEE and RoHS

### Durability and Reliability

- Superior Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) shielding

### State-of-the-Art Product Testing Laboratory

- Tests simulate harsh industrial environments for product design verification
- Rigorous testing for RFI, EMI, water and dust ingress, vibration and drop effects, temperature and humidity
- Ensures product reliability and durability

### Flexible Programs

- On-site product demonstrations
- Training courses available at corporate headquarters or customer's site
- Interactive computer-based and Web-based training
- Variety of options for purchase and after sale service

Industrial Scientific's Global Gas Detection and Monitoring Solutions are application oriented for every customer we serve.

### Customer Applications

- Oil & Natural Gas Producers
- Diversified Manufacturers
- Utilities
- Petroleum or Ethanol Refiners
- Chemical Manufacturers
- Municipalities
- Metal Producers
- Mines
- Fire Rescue
- Construction
- Aviation
- Agriculture or Farming
- Pharmaceutical Manufacturers
- Pulp and Paper Manufacturers
- Food And Beverage Production
- Service Providers
- . . . and others

### Need the best solution for your application?




Visit [www.indsci.com](http://www.indsci.com) for our help desk and your nearest location.



# THREE KEYS TO AN EFFECTIVE GAS DETECTION PROGRAM

Industrial Scientific knows it's simply not enough to arm every worker in hazardous environments with a gas detector. Even the most reliable monitor cannot keep workers truly safe in the field if it is improperly used or poorly maintained.

**Successful gas detection programs include the following:**

	<b>Traditional Purchase</b>	<b>DSX DOCKING STATION Cloud-connected</b>	<b>iNet</b>	<b>ALSS</b>
	<b>Gas Detectors and Accessories</b>	<b>DSXi Docking Station and iNet Control</b>	<b>Gas Detection as a Service</b>	<b>Accenture Life Safety Solution</b>
 <b>Reliable Equipment</b>				
Gas detectors	✓		✓	✓
Gas detector accessories	✓		✓	✓
Calibration gas	Purchase separately**	Optional**	Optional**	Optional**
DSX™ Docking Stations		✓	✓	✓
 <b>Safe Behavior</b>				
iNet Control		✓	✓	✓
Automatic calibration		✓	✓	✓
Automatic bump (function) testing		✓	✓	✓
Print / save certificates & documentation		✓	✓	✓
Configurable alerts & reports		✓	✓	✓
Equipment group management & visibility		✓	✓	✓
Alarm analysis		✓	✓	✓
Mobile / offline operation		✓	✓	✓
Gas detector program performance index		✓	✓	✓
 <b>Painless Service</b>				
Hosted, In-The-Cloud Software		✓	✓	✓
Remote installation & training		✓	✓	✓
Automatic gas detector & software upgrades		✓	✓	✓
Auto replenishment of calibration gas**		✓	✓	✓
Calibration gas cylinder monitoring		✓	✓	✓
Onsite installation		✓*	✓*	✓*
Onsite training			✓*	✓*
Fleet & sensor monitoring			✓	✓
Proactive instrument exchange			✓	✓
Factory-certified instrument service			✓	✓
Replacement & repair parts included			✓	✓
No labor or shipping fees			✓	✓
Dedicated iNet support team			✓	✓
Multi-language live support			✓	✓
Flexible fleet sizing			✓	✓
Discounted instrument rental services			✓	✓
Discounted calibration gas			✓	✓
Gas detector setup support at launch			✓	✓
Fixed monthly costs			✓	✓
Man down alerts			✓	✓
Monitor / worker location tracking			✓	✓
Real-time data collection			✓	✓



\* Onsite installation and onsite training are optional for iNet. Onsite installation is optional for DSXi Cloud-connected.  
 \*\* Industrial Scientific's Calibration Gas Auto Replenishment Program is optional with both iNet and DSXi Cloud-connected.

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**CERTIFICATIONS**

Agency	Multi-Gas Monitors				Single-Gas Monitors		
	MX6 iBrid™	Ventis™ Pro Series	Ventis™ MX4	Radius™ BZ1	Tango™ TX1	GasBadge® Pro	T40 Rattler™
UL	•	•	•	•	•	•	•
MSHA	•	•	•				
CSA	•	•	•	•	•	•	•
ANZEx	•	•	•			•	•
ATEX	•	•	•	•	•	•	•
IECEX	•	•	•	•	•	•	•
GOST (Russia)	•		•		•		
INMETRO	•	•	•		•	•	
China Ex	•		•		•	•	
China MA	•		•		•		
China CPC	•		•				
KOSHA	•		•		•	•	
MED			•				
SANS 1515			•				

Certain limits apply to the number of sensor configurations. Call for details.



## Imagine iNet

### Subscribe to Gas Detection as a Service

You're plenty busy focusing on the things that matter to your business. Amid your daily tasks is the hefty responsibility of ensuring your people are kept safe from hazardous gases and that they go home at the end of each day. Buying your fleet of gas detectors was easy, but then the challenges came.

#### What challenges do you face in your program?

- What is your process for regularly maintaining and servicing your gas detector fleet?
- How do you maintain accurate records reflecting your gas detection program?
- Do you know how your instruments are being used in the field; what your workers are exposed to; and at what levels they're exposed?

### HOW GAS DETECTION AS A SERVICE WORKS



iNet is a subscription-based gas detection program designed to give you peace of mind that your equipment is properly maintained and proactively serviced; that you are able to provide required records on demand with minimal effort; and that your people are kept safe from hazardous gases.



### ✓ Instrument Maintenance

- Schedule instrument bump tests and calibrations to occur automatically
- Get automatic firmware updates
- Receive replacement units from Industrial Scientific when iNet detects a malfunctioning instrument in your fleet

### ✓ Recordkeeping

- Produce required records on demand
- Eliminate the prone-to-error task of manually maintaining records

Instrument ID	Model	Location	Status	Calibration Date	Next Calibration Due	Alerts	Details
80121210	DMN	CINCE 1	Ready	2017-08-01	2017-09-01	0	100%
80121211	DMN	CINCE 2	Ready	2017-08-01	2017-09-01	0	100%
80121212	DMN	CINCE 3	Ready	2017-08-01	2017-09-01	0	100%
80121213	DMN	CINCE 4	Ready	2017-08-01	2017-09-01	0	100%
80121214	DMN	CINCE 5	Ready	2017-08-01	2017-09-01	0	100%
80121215	DMN	CINCE 6	Ready	2017-08-01	2017-09-01	0	100%
80121216	DMN	CINCE 7	Ready	2017-08-01	2017-09-01	0	100%
80121217	DMN	CINCE 8	Ready	2017-08-01	2017-09-01	0	100%
80121218	DMN	CINCE 9	Ready	2017-08-01	2017-09-01	0	100%
80121219	DMN	CINCE 10	Ready	2017-08-01	2017-09-01	0	100%

### ✓ Field Visibility

- Understand how your instruments are being used in the field and the risks your team faces
- Use data to proactively correct poor use behavior

## Gas Detection as a Service is proven ...

985,700,000,000 + Datalog Readings  
 33,600,000 + Alarm Events  
 209,300 + Gas Detectors  
 24,700 + Docking Stations  
 9,400 + Customer Sites  
 13 + Years of Experience

Customers in Australia, Belgium, Brazil, Brunei, Canada, China, Denmark, Finland, France, Germany, Iceland, Indonesia, Ireland, Italy, Japan, Korea, Latvia, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Puerto Rico, Qatar, Russia, Singapore, Spain, South Africa, Sweden, Switzerland, Taiwan, Thailand, Tunisia, United Kingdom, United States.

As of January 2017

## iNet<sup>TM</sup> Customers

Oil & Natural Gas Producers  
 Diversified Manufacturers  
 Utilities  
 Petroleum or Ethanol Refiners  
 Chemical Manufacturers  
 Municipalities  
 Steel Producers  
 Mines  
 Service Providers  
 ... and others

**PAINLESS SERVICE**  
**SAFE BEHAVIOR**  
**RELIABLE EQUIPMENT**

The DSX™ Docking Station easily maintains the gas detectors that keep your people safe in hazardous environments.



- Know that your gas detectors are ready for use every day, every shift, without the burden of manual maintenance routines.
- Stop worrying about calibration gas and let DSX monitor and order replacement gas cylinders when you need them.
- Effortlessly manage your fleet, data, and software updates from any web-enabled device.

The DSX is a three-in-one hardware platform that easily transitions from a standalone gas detector maintenance station (standalone mode), to a feature-rich fleet management system accessible from any mobile browser or web-enabled PC, anywhere in the world (cloud-connected mode). In addition, it provides a local server mode option that addresses the needs of users who choose the docking station functionality but prefer to maintain all information on their own server due to network connection or data storage restrictions.

With the use of an in-field enabled activation key the DSX Standalone will go from basic instrument charging, bump test, calibration, and record keeping functionality to cloud-based instrument fleet configuration, management, and data storage capabilities – all in a single piece of equipment.

In all modes, the DSX provides easy bump testing and calibration of instruments, automated record keeping, auto detection of gas type used and expiration date upon connecting the cylinder to the docking station, and automated instrument wake-up and instrument battery charging. Whether you manage one gas monitor or an entire fleet, the DSX provides superior cost-savings and flexibility.

### Where do you want your data?

Choose the out-of-the-box solution that best fits your needs.



**DSX**  
Standalone

**DSXi**  
Cloud-connected

**DSX-L**  
Local Server



A simple out-of-the-box gas detector maintenance and record-keeping station that requires no PC or network connection.



Cloud-based record storage, fleet management, and automated maintenance and notification solution.



Server-based record storage, fleet management, and automated maintenance and custom data reporting.



## ORDERING INFORMATION

## PHYSICAL SPECIFICATIONS

## WARRANTY

Two-year warranty – DSX (Standalone) and DSX-L (Local Server)  
Guaranteed For Life™ Program\*\* – DSXi (Cloud-connected)

## INSTRUMENTS SUPPORTED

GasBadge Pro, MX6 iBrid, Tango TX1, Ventis MX4, Ventis Pro Series, SafeCore

## DIMENSIONS

GasBadge Pro, Tango TX1: 22.7 x 16.9 x 27.3 cm (8.92 x 6.65 x 10.75 in)  
Ventis MX4, Ventis Pro Series: 24.9 x 16.9 x 27.3 cm (9.83 x 6.65 x 10.75 in)  
MX6 iBrid: 25.3 x 16.9 x 27.3 cm (9.96 x 6.65 x 10.75 in)  
SafeCore: 27.3 x 16.9 x 29.2 cm (10.75 x 6.65 x 11.5 in)

## GAS INLETS

3-Port Version: One "fresh" air port, two calibration gas ports  
6-Port Version: One "fresh" air port, five calibration gas ports (for Ventis, MX6 iBrid, and SafeCore only)

## PUMP FLOW RATE

1.2 SCFH (550 mL/min)

## COMMUNICATION

10 / 100 Ethernet support, RJ-45 Category 5 Connection

## DISPLAY

128 x 64 Dot Matrix LCD – Multilingual modes  
English, Spanish, French, German and Portuguese\*\*\*

## PERFORMANCE SPECIFICATIONS

## OPERATING TEMPERATURE RANGE

0 °C to 50 °C / 32 °F to 122 °F

## OPERATING HUMIDITY RANGE

0% to 80% relative humidity (RH) up to 30 °C (86 °F), decreasing linearly to 50% RH at 50 °C (122 °F)

## EXTERNAL POWER SUPPLY RATINGS

Supply voltage: 100-240 VAC / 12 VDC  
Frequency range: 50-60 Hz  
Current rating: 5A

To learn more about the  
DSX Docking Station visit  
[www.indsci.com/dsx](http://www.indsci.com/dsx)

## DSX COMPARISON CHART

	 Standalone	 Cloud-connected	 Local Server
Record Storage	USB	Cloud	PC, Server
Bump and Cal	✓	✓	✓
Print Certificates	✓	✓	✓
6-Ports (Optional)	✓	✓	✓
Reports		✓	✓
Fleet Management		✓	✓
Event Scheduling		✓	✓
Email Alerts		✓	
Auto Software Updates		✓	
Auto Cal Gas Replenishment (Optional)		✓	
Price	\$	\$\$	\$\$\$
Software	Not Applicable	Included	Included

## PART NO. | DESCRIPTION

INSTRUMENT CONFIGURATIONS	
18109327-ABC	Ventis™ MX4, Ventis™ Pro Series
18109329-ABC	MX6 iBrid™
18109330-ABC	Tango™ TX1
18109331-ABC	GasBadge® Pro
18109396-ABC	SafeCore® Module
-ABC	A – DSX Mode:
	0 = DSX Standalone
	1 = DSXi Cloud-connected
	2 = DSX-L Local Server
	B – Number of Gas Inlet Ports:
	3 = 3 Ports
	6 = 6 Ports (for Ventis, MX6 iBrid, & SafeCore only)
	C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK

## KITS\*

18109400	DSX Standalone Kit: Tango TX1 (H <sub>2</sub> S)
18109401	DSX Standalone Kit: Ventis MX4, Ventis Pro Series (LEL, CO, H <sub>2</sub> S, O <sub>2</sub> )
18109404	DSXi Cloud-connected Kit: Tango TX1 (H <sub>2</sub> S)
18109405	DSXi Cloud-connected Kit: Ventis MX4, Ventis Pro Series (LEL, CO, H <sub>2</sub> S, O <sub>2</sub> )

## ACCESSORIES

18109406	DSX to DSXi Activation Certificate
18105684	iGas® Reader
18105924	5-Port Gas Regulator Manifold Clamp
18105932	6-Port Gas Regulator Manifold
17154813	3G / 4G Router
17113887	Ethernet Cable, 5 ft (Cat5E network cable)
17113895	Ethernet Cable, 10 ft (Cat5E network cable)
17113903	Ethernet Cable, 25 ft (Cat5E network cable)
17113945	5-Port Ethernet Hub

\***DSX Docking Station Kits Include:** Choice of Standalone or Cloud-connected 3-port DSX Docking Station, 116L calibration gas (appropriate mix) with demand flow regulator with iGas® pressure switch, North American power cord, USB storage device (Standalone only).

\*\*Specific terms of the Guaranteed for Life™ Program are included with all products and are available upon request.

\*\*\*DSX-L (Local Server) does not support Portuguese.

## AUTO REPLENISHMENT

The calibration gas auto replenishment program is the most efficient way for customers to manage their calibration gas usage and needs. For those who elect to have the program as part of their iNet subscription, a new cylinder of gas will automatically be sent when iNet Control detects a low gas cylinder.



## Helping Achieve High Performance Safety using Intelligent Industrial Mobility

*Drawing on the combined capabilities and experience of Accenture, AeroScout, Cisco and Industrial Scientific, the Accenture Life Safety Solution is a comprehensive approach of services, technologies and processes (see Figure 1)—which is differentiated from other safety solutions on the market by its breadth and innovative capabilities.*

### Accenture Life Safety Solution Works

Employees wear a single, multi-gas detector (within 10 inches of their breathing zone) that is able to detect multiple gases (see Figure 2). If abnormal levels of gas are detected, similar to traditional solutions, the device immediately alerts the employee. However, with the innovative Accenture Life Safety Solution, the device also simultaneously transmits the gas-level information and personnel location over a wireless infrastructure using an integrated Wi-Fi tag located in the Industrial Scientific device to control board operators. Until recently, wireless networks have been unable to provide reliable coverage, limiting the ability to determine an individual's exact location in the plant. Accenture has been able to demonstrate that this is now possible based on an actual refinerywide deployment. The gas detection information is sent to a control room that continuously monitors abnormal condition alarms 24 hours a day, 7 days a week. Additionally, the software indicates a separate alert if the individual either activates the panic button or exhibits lack of motion ("man down"). In the case of lack of motion, a local alert occurs first. The individual has the opportunity to acknowledge the alert and, if left unanswered, the alert is sent to the central control board operator.

Once alarms are wirelessly transmitted, the control room operator can pinpoint the location of the employee in danger within very close proximity of their exact location. If rescue is required, the control board operator is able to advise the rescue team, not only of the location of the individual, but also of the environmental conditions in that area before they enter.

**Figure 1.** Accenture Life Safety Solution built by strong capabilities and years of experience.

Accenture	AeroScout	Cisco	Industrial Scientific
Industry-specific experience	Exciter hardware	Wireless infrastructure	iNet™ - Gas Detection as a Service
Integrated business processes	Integrated Wi-Fi tags		Multi-gas detector
Project management	Operator interface		
Unprecedented, design process			

Workers outside plant "boundaries" can also be covered with the wireless solution. Many plants have operators that need to go outside the plant to operate other remote facilities such as water intake facilities and tank farms. The Accenture Life Safety Solution is able to provide these personnel with the same coverage as if they were in the plant through a combination of Wi-Fi, global positioning systems and cellular communications within vehicles.

One of the most important features of the Accenture Life Safety Solution is assurance that all alarms get reported. When an alarm is sent to the control board, workflow is triggered through the automatic creation of an incident in the incident tracking system.

**Figure 2.** Gases available in a single, multi-gas detector.

- Hydrogen sulfide (H<sub>2</sub>S)
- Carbon monoxide (CO)
- Lower explosive limit (LEL) hydrocarbon gases
- Sulfur dioxide (SO<sub>2</sub>)
- Nitrogen dioxide (NO<sub>2</sub>)
- Oxygen (O<sub>2</sub>)



## Benefits of a comprehensive approach to safety

The Accenture Life Safety Solution can help safety and operations managers—in industries such as oil and gas, chemicals, petrochemicals, metals, utilities and others—deliver more comprehensive and effective safety programs, including:

- Improved 24x7 safety monitoring and timely responses

### For the individual:

- A gas detector alarms with abnormal exposure.
- A lack-of-motion sensor triggers when left unacknowledged.
- There is a “panic button” on the device.
- The alarm goes to the control board operator or others, as required. For the broader plant workforce:
- Gas-level monitoring is continuous and automatic, and thus notifies the rescue team of the environmental conditions before they enter the area.
- The automatic reporting helps to prevent placing other plant personnel at risk if an individual fails to report alerts.
- Greater and more accurate safety incident reporting
- Improved compliance through personnel location monitoring
- Optimized and more effective mustering procedures
- Ability to drive safety operational process improvement

## Wireless solution for higher plant performance

Accenture uses a well-refined wireless network design approach for accurate location detection. With a location-based design, numerous workforce efficiency opportunities are possible to extend the return on the initial investment. Potential opportunities include:

- Improved contractor management and better maintenance planning
- Workforce enablement of handhelds, tablets and ruggedized notebooks
- Enablement of other technical benefits:
  - Expansion of radio systems by using voice over internet protocols (VoIP) technology.
  - Improvement of operator rounds and the transmission of local field information in real time.
  - Installation of wireless video cameras for fence line surveillance.
  - Establishment of lower-cost video collaboration methods through the reduced installation costs of underground hard wires for video cameras.
  - Installation of motion sensors on the fence line to enhance security measures.
  - Deployment of mobile video in the field to transmit continuous video feed to the control room and emergency control centers (ECC).

To learn more about the Accenture Life Safety Solution, visit

[www.indsci.com/solutions/accenture-life-safety-solution/](http://www.indsci.com/solutions/accenture-life-safety-solution/)



MX6 with pump



- 24 "Plug-and-Play" field-replaceable sensors including PID and Infrared options
- Simple, user-friendly, customizable menu-driven navigation
- Optional integral sampling pump with strong 30.5 meter (100 feet) sample draw
- Up to 6 gases monitored simultaneously
- Full-color graphic LCD is highly visible in a variety of lighting conditions
- Five-way navigation button
- Powerful, 95 dB audible alarm
- Durable, concussion-proof overmold

Get ready to see hazardous levels of oxygen, toxic and combustible gas, and volatile organic compounds (VOCs) like never before.

The MX6 iBrid™ is more than an intelligent hybrid of Industrial Scientific's best monitoring technologies. It's the first gas monitor to feature a full-color LCD display screen.

The display improves safety with clear readings in low-light, bright-light or anywhere in between. Whether the work is outside, inside or underground, it's easy to see what gas hazards lurk in the immediate work environment.



MX6 without pump

And a color display is more than eye-catching. It allows the user to step through instrument settings and functions with an intuitive menu and the instrument's five-way navigation button. It even supports the option of on-board graphing for easily interpreted direct readings and recorded data.

Plus, the MX6 iBrid is our most rugged instrument ever. It is compatible with our DSX™ Docking Station and iNet™.

## SPECIFICATIONS\*

### INSTRUMENT WARRANTY

Guaranteed For Life™ Program\*\*

### CASE MATERIAL

Lexan/ABS/Stainless Steel w/protective rubber overmold

### DIMENSIONS

135 x 77 x 43 mm (5.3 x 3.05 x 1.7 in) – without pump  
167 x 77 x 56 mm (6.6 x 3.1 x 2.2 in) – with pump

### WEIGHT

409 g (14.4 oz) typical – without pump; 511 g (18.0 oz) typical – with pump

### DISPLAY/READOUT

Color Graphic Liquid Crystal Display

### POWER SOURCE/RUNTIMES

Rechargeable, Extended-Range Lithium-ion (Li-ion) Battery Pack  
(36 hours) – without pump

Replaceable AA Alkaline Battery Pack (10.5 hours) – without pump

### OPERATING TEMPERATURE RANGE

-20 °C to 55 °C (-4 °F to 131 °F)

### OPERATING HUMIDITY RANGE

15% to 95% non-condensing (continuous)

### MEASURING RANGES

Sensor	RANGE	RESOLUTION
<b>CATALYTIC BEAD</b>		
Combustible Gas	0-100% LEL	1%
Methane	0-5% vol	0.01%
<b>ELECTROCHEMICAL</b>		
Ammonia	0-500 ppm	1
Carbon Monoxide	0-1,500 ppm	1
Carbon Monoxide (High Range)	0-9,999 ppm	1
Carbon Monoxide/Hydrogen low	0-1,500 ppm	1
Chlorine	0-50 ppm	0.1
Chlorine Dioxide	0-1 ppm	0.01
Carbon Monoxide/ Hydrogen Sulfide (COSH)	CO: 0-1,500 ppm H <sub>2</sub> S: 0-500 ppm	1 0.1
Hydrogen	0-2,000 ppm	1
Hydrogen Chloride	0-30 ppm	0.1
Hydrogen Cyanide	0-30 ppm	0.1
Hydrogen Sulfide	0-500 ppm	0.1
Nitric Oxide	0-1,000 ppm	1
Nitrogen Dioxide	0-150 ppm	0.1
Oxygen	0-30% vol	0.1%
Phosphine	0-5 ppm	0.01
Phosphine (High Range)	0-1,000 ppm	1
Sulfur Dioxide	0-150 ppm	0.1
<b>INFRARED</b>		
Hydrocarbons	0-100% LEL	1%
Methane (% vol)	0-100% vol	1%
Methane (% LEL)	0-100% LEL	1%
Carbon Dioxide	0-5% vol	0.01%
<b>PHOTOIONIZATION</b>		
VOC	0-2,000 ppm	0.1

### CERTIFICATIONS

UL:	Class I, Division 1, Groups A B C D T4; Class II, Groups F G; Class I, Zone 0, AEx ia d IIC T4 (or AEx ia d IIC T4 w/ IR sensor)
CSA:	Class I, Groups A B C D T4; Ex d ia IIC T4
MSHA:	CFR30, Part 22, Intrinsically safe for methane/air mixtures
BFE:	Permissible for PA Bituminous Underground Mines
ATEX:	Ex ia IIC T4 Ga; II 1G (or Ex d ia IIC T4 Gb w/ IR sensor); Ex ia I; Equipment Group and Category: I M1 / II 1G
IECEX:	Ex ia I (Ex ia d I w/IR sensor); Ex ia IIC T4 Ga; Ex d ia IIC T4 Gb
ANZEx:	Ex ia s Zone 0 I, IP64; Ex ia s Zone 0 IIC T4
INMETRO:	Ex ia IIC T4 Ga
EAC:	PBExiadl X; 1ExiadIIC T4 X
KC:	Ex d ia IIC T4
China Ex:	Ex ia d I/IIC T4
China CPC:	Metrology Approval
CMA:	Approval for Mining Products; CH <sub>4</sub> , O <sub>2</sub> , CO, CO <sub>2</sub>
KIMM:	Ex d ia IIC T4
MDR:	Registration of Plant Design; CH <sub>4</sub> , O <sub>2</sub> , CO, H <sub>2</sub> S, NO <sub>2</sub>

\* These specifications are based on performance averages and may vary by instrument

\*\* Specific terms of the Guaranteed For Life™ Program are included with all products and are available upon request.

## ORDERING INFORMATION

## SPECIFICATIONS\* (CONTINUED)

## SUPPLIED WITH MONITOR

Universal charger, nylon carrying case, belt clip, calibration cup, wrist strap, manual, quick start guide, dust filter/water stop (with pump), sample tubing (with pump).

## LANGUAGE OPTIONS

English, Portuguese, French, Indonesian, Spanish, Russian, German, Polish, Italian, Czech, and Dutch

Build and price your MX6 online with the MX6 instrument builder.

[www.indsci.com/MX6builder.aspx](http://www.indsci.com/MX6builder.aspx)

## COMMON INSTRUMENT CONFIGURATIONS

PART NO.	DESCRIPTION
MX6-K1230201	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Ext. Li-ion
MX6-K123R211	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , PID, Ext. Li-ion, Pump
MX6-L1230211	MX6 - LEL (Methane), CO, H <sub>2</sub> S, O <sub>2</sub> , Ext. Li-ion, Pump
MX6-M103Q211	MX6 - Methane, CO, O <sub>2</sub> , CO <sub>2</sub> IR, Ext. Li-ion, Pump
MX6-MDH34211	MX6 - Methane, NO, CO high range, O <sub>2</sub> , NO <sub>2</sub> , Ext. Li-ion, Pump
MX6-K1235211	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Ext. Li-ion, Pump
MX6-KJ635201	MX6 - LEL (Pentane), CO/H <sub>2</sub> S, NH <sub>3</sub> , O <sub>2</sub> , SO <sub>2</sub> , Ext. Li-ion
MX6-MH23Q201	MX6 - Methane, CO high range, H <sub>2</sub> S, O <sub>2</sub> , CO <sub>2</sub> , Ext. Li-ion

## COMMON INDUSTRY CONFIGURATIONS

MX6-KJ53R211	MX6 - LEL, CO/H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Ext. Li-ion, Pump Petroleum Refining
MX6-K103Q211	MX6 - LEL, CO, O <sub>2</sub> , CO <sub>2</sub> , Ext. Li-ion, Pump Brewing/Bottling/Wineries
MX6-KJ835201	MX6 - LEL, CO/H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , ClO <sub>2</sub> , Ext. Li-ion Pulp/Paper
MX6-K673R211	MX6 - LEL, O <sub>2</sub> , NH <sub>3</sub> , Cl <sub>2</sub> , PID, Ext. Li-ion, Pump HazMat
MX6-M1030501	MX6 - CH <sub>4</sub> (%), CO, O <sub>2</sub> , Ext. Li-ion (MSHA/AUS) Mining
MX6-M1D34501	MX6 - CH <sub>4</sub> (%), CO, O <sub>2</sub> , NO <sub>2</sub> , NO, Ext. Li-ion (MSHA/AUS) Mining (Diesel Applications)



The DSX™ Docking Station easily maintains the gas detectors that keep your people safe in hazardous environments.

- Know that your gas detectors are ready for use every day, every shift, without the burden of manual maintenance routines.
- Stop worrying about calibration gas and let the DSX monitor and order replacement gas cylinders when you need them.
- Effortlessly manage your fleet, data, and software updates from any web-enabled device.



Choice of MX6 monitor, universal charger, nylon carrying case, belt clip, calibration cup, wrist strap, maintenance tool, manual, quick start guide, calibration tubing, dust filter/water stop (with pump), calibration fitting (with pump), sample tubing (with pump), calibration gas (appropriate mix) with regulator, spare replaceable cell alkaline battery pack, rugged Pelican® case.

## OPTIONAL ACCESSORIES

PART NO.	DESCRIPTION
MX6KIT-0000R211	MX6 Kit - PID, Ext. Li-ion, pump
MX6KIT-K1230211	Confined Space Kit, 4-gas with pump
MX6KIT-K123R211	Confined Space Kit, 4-gas/PID with pump
18109329-ABC-ABC	DSX™ Docking Station for MX6 A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports 6 = 6 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
18106765	SP6 Motorized Sampling Pump Module
18107086	MX6 Datalink assembly – software included
18106971	MX6 Replacement battery charger
18107094	MX6 Battery charger/Datalink, universal
18107011	MX6 Battery charger, 12V
18107136	MX6 Battery charger, 5-unit
18107243	MX6 Truck-mount charger, 12V
18107250	MX6 Truck-mount charger, (hard-wired)
17131038-2	Rechargeable Li-ion ext. battery pack (UL/CSA/ATEX/IECEX/INMETRO/GOST-R/KOSHA)
17131038-5	Rechargeable Li-ion ext. battery pack (MSHA/AUS)
17131046-3	Alkaline battery pack (UL/CSA/ATEX/IECEX/INMETRO/GOST-R/KOSHA)
17131046-6	Alkaline battery pack, MSHA/AUS
18106856-0	MX6 without pump hard leather carrying case
18106856-1	MX6 without pump hard leather case without display
18106880-0	MX6 with pump hard leather carrying case
18106880-1	MX6 with pump hard leather case without display
18106831	Nylon carrying case, supplied with MX6 without pump
18106864	Nylon carrying case, supplied with MX6 with pump
17095746	MX6/iTX Maintenance Tool
17128489	Calibration Cup, MX6 iBrid™
17153749	MX6 Screen Protector, 10 Pack
17153760	MX6 Screen Protector, 100 Pack



- Flexible sensor configurations detect up to five gases
- See gas readings and alarms from connected peers using LENS™ Wireless
- With integral pump for confined spaces or without integral pump for personal protection
- Custom start-up messages, alarm action messages, and acknowledgeable gas alerts
- Man-down alarm and dedicated panic button
- User and site tracking with iAssign™ Technology
- Rugged IP68 dust and water rating and Guaranteed for Life™ warranty
- Compatible with most Ventis™ MX4 accessories
- Dock overdue and maintenance reminders
- iNet® and docking station ready

### What Gases Will You Need to Monitor?

DETECTION CAPABILITIES	VENTIS™ PRO4	VENTIS™ PRO5
Simultaneous Gases	Four	Five
O <sub>2</sub>	✓	✓
LEL/CH <sub>4</sub>	✓	✓
CO	✓	✓
H <sub>2</sub> S	✓	✓
SO <sub>2</sub>	✓	✓
NO <sub>2</sub>	✓	✓
CO/H <sub>2</sub> Low	✓	✓
HCN	✓	✓
NH <sub>3</sub>		✓
CO/H <sub>2</sub> S		✓
CO <sub>2</sub> /HC IR		✓
CO <sub>2</sub> /CH <sub>4</sub> IR		✓

## Raise the Bar on Worker Safety With the Ventis Pro Series

Stop carrying multiple instruments to meet your gas detection needs. The Ventis™ Pro Series with LENS™ Wireless has you covered whether you need unique four-gas or expanded five-gas sensor options—all in the most configurable multi-gas monitors on the market.

### SPECIFICATIONS\*

#### WARRANTY

Guaranteed for Life™. Warranted for as long as the instrument is supported by Industrial Scientific Corporation (excludes sensors, batteries, and filters). O<sub>2</sub>, LEL, CO, and H<sub>2</sub>S sensors warranted for three years. All other sensors warranted for two years. Pumps and batteries are warranted for two years.

#### KEYPAD

Two buttons for operation. Dedicated panic button.

#### DATA LOG

At least 3 months at 10-second intervals

#### EVENT LOGGING

60 alarm events

#### INGRESS PROTECTION

IP68 (submersion 1.5 meters for 1 hour)

#### CASE MATERIAL

Polycarbonate with protective rubber overmold

#### DIMENSIONS

104 x 58 x 36 mm (4.1 x 2.3 x 1.4 in) without pump

172 x 67 x 65 mm (6.8 x 2.6 x 2.6 in) with pump

#### WEIGHT

200 g (7.05 oz), typical without pump

390 g (13.76 oz), typical with pump

#### TEMPERATURE RANGE

-40 °C to 50 °C (-40 °F to 122 °F) \*\*

#### HUMIDITY RANGE

15%-95% non-condensing (continuous)

#### WIRELESS

Optional LENS™ Wireless, proprietary mesh network

Frequency: ISM license-free band (2.4 GHz)

Max Peers: 25 devices per network group

Range: 100 m (300 ft) line of sight, face-to-face

Encryption: AES-128

Approvals: FCC Part 15, IC, CE/RED, others†

#### DISPLAY/READOUT

Backlit liquid crystal display (LCD)

#### POWER SOURCE/RUN TIME

Rechargeable lithium-ion battery pack with LEL

(12 hours typical @ 20 °C) – without pump

Rechargeable extended-range lithium-ion battery pack with LEL

(23 hours typical @ 20 °C) – without pump

(18 hours typical @ 20 °C) – with pump

Rechargeable lithium-ion battery pack with IR

(36 hours typical @ 20 °C) – without pump

Rechargeable extended-range lithium-ion battery pack with IR

(72 hours typical @ 20 °C) – without pump

(32 hours typical @ 20 °C) – with pump

Test drive the Ventis Pro with the  
**INSTRUMENT SIMULATOR**  
[www.indsci.com/VentisProSimulator](http://www.indsci.com/VentisProSimulator)

**SPECIFICATIONS\*****ALARMS**

Four visual alarm LEDs (two red, two blue);  
95 decibel (dB) audible alarm at a distance of 10 cm (3.94 in);  
Vibration alarm

**SENSORS**

Combustible Gases/Methane – Catalytic Bead  
O<sub>2</sub>, CO, CO/H<sub>2</sub> low, H<sub>2</sub>S, HCN, NH<sub>3</sub>, NO<sub>2</sub>, PH<sub>3</sub>, SO<sub>2</sub> – Electrochemical  
CH<sub>4</sub>, CO<sub>2</sub>/HC, CO<sub>2</sub>/CH<sub>4</sub> – Infrared

**MEASURING RANGES****CATALYTIC BEAD**

Combustible Gases: 0-100% LEL in 1% increments  
Methane (CH<sub>4</sub>): 0-5% of vol in 0.01% increments

**ELECTROCHEMICAL**

Ammonia (NH<sub>3</sub>): 0-500 ppm in 1 ppm increments  
Carbon Monoxide (CO): 0-2,000 ppm in 1 ppm increments  
Carbon Monoxide (CO/H<sub>2</sub> low): 0-1,000 ppm in 1 ppm increments  
Carbon Monoxide/Hydrogen Sulfide:  
CO: 0-1,500 ppm in 1 ppm increments  
H<sub>2</sub>S: 0-500 ppm in 0.1 ppm increments  
Hydrogen Sulfide (H<sub>2</sub>S): 0-500 ppm in 0.1 ppm increments  
Hydrogen Cyanide (HCN): 0-30 ppm in 0.1 ppm increments  
Nitrogen Dioxide (NO<sub>2</sub>): 0-150 ppm in 0.1 ppm increments  
Oxygen (O<sub>2</sub>) (Standard/Long-Life): 0-30% of vol in 0.1% increments  
Phosphine (PH<sub>3</sub>): 0-10 ppm in 0.01 ppm increments  
Sulfur Dioxide (SO<sub>2</sub>): 0-150 ppm in 0.1 ppm increments

**INFRARED**

Methane (CH<sub>4</sub>) 0-5% vol in 0.01% increments  
5-100% vol in 0.1% increments  
Carbon Dioxide/Combustible:  
CO<sub>2</sub>: 0-5% vol in 0.01% increments  
LEL: 0-100% LEL in 1% increments  
Carbon Dioxide/Methane:  
CO<sub>2</sub>: 0-5% vol in 0.01% increments  
CH<sub>4</sub>: 0-5% vol in 0.01% increments  
CH<sub>4</sub>: 5-100% vol in 0.1% increments

**CERTIFICATIONS:**

UL: Class I, Division 1, Groups A, B, C, and D, in the Temperature Class T4  
Class II, Division 1, Groups E, F, and G, in the Temperature Class T4  
Class I, Zone 0, AEx ia IIC, in the Temperature Class T4  
Class I, Zone 1, AEx d ia IIC, in the Temperature Class T4, with IR sensor

ATEX: Equipment Group and Category II 1G, Ex ia IIC, with the protection category Ga, in the Temperature Class T4  
Equipment Group and Category II 2G, Ex d ia IIC, with the protection category Gb, in the Temperature Class T4, with IR sensor

IECEX: Class I, Zone 0, Ex ia IIC, with the protection technique Ga, in the Temperature Class T4  
Class I, Zone 1, Ex d ia IIC, with the protection technique Gb, in the Temperature Class T4, with IR sensor

CSA: Class I, Division 1, Groups A, B, C, and D, in the Temperature Class T4  
Class I, Zone 1, Ex d ia IIC, in the Temperature Class T4

MSHA: 30 CFR Part 22; Permissible for underground mines

INMETRO: Ex ia IIC T4 Ga, -40 °C ≤ Ta ≤ 50 °C  
Ex d ia IIC T4 Gb with IR Sensor, -20 °C ≤ Ta ≤ 50 °C with IR Sensor

ANZEx: Ex ia I Ma/Ex ia IIC T4 Ga, -40 °C ≤ Ta ≤ 50 °C  
Ex d ia I Mb/Ex d ia IIC T4 Gb with IR sensor, -20 °C ≤ Ta ≤ 50 °C with IR sensor

See [www.indsci.com/ventispro](http://www.indsci.com/ventispro) for all certifications.

**SUPPLIED WITH MONITOR:**

Calibration Cup (Ventis), Sample Tubing (Ventis with pump), Reference Guide

**REFERENCE GUIDE LANGUAGE:**

English, French, Spanish, German, Italian, Dutch, Portuguese, Polish

\*These specifications are based on performance averages and may vary by instrument.  
\*\* Operating temperatures above 50 °C (122 °F) may cause reduced instrument accuracy. Operating temperatures below -20 °C (-4 °F) may cause reduced instrument accuracy and affect display and alarm performance. See Product Manual for details.

† See [www.indsci.com/wireless-certifications](http://www.indsci.com/wireless-certifications) for country-specific wireless approvals and certifications.


**Experience the Power of the Connected Worker**

LENS™ Wireless is the first gas detection solution that allows personal monitors and area monitors to share gas readings and alarms with one another. Now when a gas hazard, man-down, or panic situation causes an instrument to alarm, all peers in the connected group will instantly be notified of the hazard and the person in danger. When seconds matter, you can rely on help from workers nearby, rather than a control room or call center hundreds of miles away.



## Start Communicating with LENS WIRELESS

Learn More at [www.indsci.com/LENS](http://www.indsci.com/LENS)

**Simplify Gas Detection for Your Users**

Communicate key safety information to your team, simplify the user's response when an instrument goes into alarm, and reduce nuisance alarms and false evacuations thanks to customizable text options.

**Demand More Flexibility From Your Gas Detector**

Stop carrying multiple devices to meet your gas detection needs. The Ventis Pro4 and Ventis Pro5 offer a variety of sensor options with flexible slot positions to help you detect combustible and toxic gases across a range of applications.

**Alert Others in Emergency Situations**

Save precious time in emergency situations by quickly alerting nearby workers when someone is in distress or has lost consciousness.

**Depend on a Rugged Design**

Keep your instruments in the field, not the shop, thanks to an all-new overmold design and Guaranteed for Life™ warranty.

**Track Instruments & Alarms**

Address recurring alarms, identify hazards, and improve asset management by assigning users and sites to each gas monitor in real time with iAssign™ Technology.

## How Will You Maintain Your Ventis Pro4?



SELECT A MONITOR	MONITOR PART #	DOCKING STATION	CALIBRATION GAS 116L	DEMAND FLOW REGULATOR
Ventis Pro4 – LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Li-ion, Desktop Charger, Safety Orange	VP4-K12Y1101yww	18109327-131	18109157	18105841
Ventis Pro4 with Pump – LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Extended Li-ion, Desktop Charger, Black	VP4-K12Y2110yww	18109327-131	18109157	18105841
Ventis Pro4 – LEL (Pentane), SO <sub>2</sub> , H <sub>2</sub> S, O <sub>2</sub> , Li-ion, Desktop Charger, Safety Orange	VP4-K52Y1101yww	18109327-131	18109234	18105841
Ventis Pro4 – LEL (Pentane), CO, NO <sub>2</sub> , O <sub>2</sub> , Li-ion, Desktop Charger, Safety Orange	VP4-K14Y1101yww	18109327-131	18109236	18105841
Ventis Pro4 – LEL (Pentane), CO, HCN, O <sub>2</sub> , Li-ion, Desktop Charger, Safety Orange	VP4-K1BY1101yww	18109327-131	18109157 18109085	18105841 x2
Ventis Pro4 with Pump – LEL (Pentane), CO, HCN, O <sub>2</sub> , Extended Li-ion, Desktop Charger, Safety Orange	VP4-K1BY2111yww	18109327-131	18109157 18109085	18105841 x2

y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX, 3 = MSHA, 9 = INMETRO | w= Wireless: 0 = Non-wireless, 1 = Wireless  
z = Language for included Reference Guide: 1 = EN, 2 = FR, 3 = ES, 4 = DE, 5 = IT, 6 = DU, 7 = PT, A = PL

## How Will You Maintain Your Ventis Pro5?



SELECT A MONITOR	MONITOR PART #	DOCKING STATION	CALIBRATION GAS 116L	DEMAND FLOW REGULATOR
Ventis Pro5 with Pump – LEL (Pentane), CO/H <sub>2</sub> S, SO <sub>2</sub> , O <sub>2</sub> , Extended Li-ion, Desktop Charger, Safety Orange	VP5-KJ5Y2111yww	18109327-131	18109234	18105841
Ventis Pro5 – LEL (Pentane), CO/H <sub>2</sub> S, NO <sub>2</sub> , O <sub>2</sub> , Li-ion, Desktop Charger, Safety Orange	VP5-KJ4Y1101yww	18109327-131	18109157 18109084	18105841 x2
Ventis Pro5 with Pump – LEL (Pentane), CO/H <sub>2</sub> S, NH <sub>3</sub> , O <sub>2</sub> , Extended Li-ion, Desktop Charger, Black	VP5-KJ6Y2110yww	18109327-131	18109157 18109081	18105841 x2
Ventis Pro5 with Pump – CO <sub>2</sub> /LEL IR, CO, H <sub>2</sub> S, O <sub>2</sub> , Extended Li-ion, Desktop Charger, Black	VP5-U12Y2110yww	18109327-131	18109188 18102913 and 18101584 both - (103L)	18105841 x3

y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX, 3 = MSHA, 9 = INMETRO | w= Wireless: 0 = Non-wireless, 1 = Wireless  
z = Language for included Reference Guide: 1 = EN, 2 = FR, 3 = ES, 4 = DE, 5 = IT, 6 = DU, 7 = PT, A = PL

Charts show most common configurations. To build your custom order, visit our online instrument builder or contact your local distributor.

## Will You Use the Ventis Pro to Monitor Confined Spaces?

### Ventis Pro Series Confined Space Kits

**Include:** Ventis Pro Series instrument with integral pump, desktop charger, reference guide, calibration tubing with T-fitting, dust filter/water stop, sample tubing, calibration gas (appropriate mix) with manual regulator, and rugged hard plastic case.



x = Instrument Color: 0 = Black, 1 = Safety Orange  
y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX, 3 = MSHA, 9 = INMETRO  
w = Wireless: 0 = Non-wireless, 1 = Wireless  
z = Documentation Language: 1 = EN, 2 = FR, 3 = ES, 4 = DE, 5 = IT, 6 = DU, 7 = PT, A = PL

### CONFINED SPACE KITS WITH INTEGRAL PUMP

PART NO.	DESCRIPTION
V4K-K123211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>
V4K-KG23211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), CO/H <sub>2</sub> low, H <sub>2</sub> S, O <sub>2</sub>
V4K-K103211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), CO, O <sub>2</sub>
V4K-K003211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), O <sub>2</sub>
V4K-K023211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), H <sub>2</sub> S, O <sub>2</sub>
V4K-K1B3211xyww	Ventis Pro4 Confined Space Kit – LEL (Pentane), CO, HCN, O <sub>2</sub>
V5K-KJ53211xyww	Ventis Pro5 Confined Space Kit – LEL (Pentane), CO/H <sub>2</sub> S, SO <sub>2</sub> , O <sub>2</sub>
V5K-KJ43211xyww	Ventis Pro5 Confined Space Kit – LEL (Pentane), CO/H <sub>2</sub> S, NO <sub>2</sub> , O <sub>2</sub>
V5K-KJ63211xyww	Ventis Pro5 Confined Space Kit – LEL (Pentane), CO/H <sub>2</sub> S, NH <sub>3</sub> , O <sub>2</sub>





## ACCESSORIES

PART NO.	DESCRIPTION
VPP-0011	Ventis Pro Series Pump, No Battery, Black, UL/CSA, English
VPP-2011	Ventis Pro Series Pump, Lithium-ion Extended Range Battery, Black, UL/CSA, English
VPP-0111	Ventis Pro Series Pump, No Battery, Safety Orange, UL/CSA, English
VPP-2111	Ventis Pro Series Pump, Lithium-ion Extended Range Battery, Safety Orange, UL/CSA, English
18109327-ABC	DSX™ Docking Station for Ventis™ Series (MX4, Pro) A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports 6 = 6 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
18108631-AB	V•Cal™ Calibration Station A = Instrument type: 0 = Ventis, 1 = Ventis with pump B = Power cord: 0 = US, 1 = UK, 2 = EU, 3 = AUS, 4 = ITA, 5 = DEN, 6 = SWZ
18107664-ABC	V•Cal™ 6-Unit Calibration Station AB = Number of Ventis (A) and Ventis with pump (B) Instruments 06 = 0 Ventis and 6 Ventis with pump 33 = 3 Ventis and 3 Ventis with pump 60 = 6 Ventis and 0 Ventis with pump C = Power cord: 0 = Universal with US, UK, EU, AUS Plug adapters
17155306-1	Replacement sensor, Ventis Pro4/5, carbon monoxide, 6 series
17155306-2	Replacement sensor, Ventis Pro4/5, hydrogen sulfide, 6 series
17155304-2	Replacement sensor, Ventis Pro4/5, hydrogen sulfide, 4 series
17155304-3	Replacement sensor, Ventis Pro4/5, oxygen (O <sub>2</sub> ), 4 series
17155306-4	Replacement sensor, Ventis Pro4/5, nitrogen dioxide, 6 series
17155306-5	Replacement sensor, Ventis Pro4/5, sulfur dioxide (SO <sub>2</sub> ), 6 series
17155306-6	Replacement sensor, Ventis Pro5, ammonia (NH <sub>3</sub> ), 6 series
17155306-B	Replacement sensor, Ventis Pro4/5, hydrogen cyanide (HCN), 6 series
17155306-G	Replacement sensor, Ventis Pro4/5, carbon monoxide/low hydrogen interference (CO/H <sub>2</sub> low), 6 series
17155306-J	Replacement sensor, Ventis Pro5, carbon monoxide/hydrogen sulfide (COSH), 6 series
17155304-J	Replacement sensor, Ventis Pro5, carbon monoxide/hydrogen sulfide (COSH), 4 series
17155304-K	Replacement sensor, Ventis Pro4/5, LEL (Pentane), 4 series catalytic

PART NO.	DESCRIPTION
17155304-L	Replacement sensor, Ventis Pro4/5, LEL (Methane), 4 series catalytic
17155304-M	Replacement sensor, Ventis Pro4/5, CH <sub>4</sub> (0-5% vol), 4 series catalytic
17155304-U	Replacement sensor, Ventis Pro5, carbon dioxide/hydrocarbon (CO <sub>2</sub> /HC), 4 series IR
17155304-V	Replacement sensor, Ventis Pro5, carbon dioxide/methane (CO <sub>2</sub> /CH <sub>4</sub> ), 4 series IR
17156919	Dualsense pack, Ventis Pro5, carbon monoxide/hydrogen sulfide (COSH), 6 series
17156920	Dualsense pack, Ventis Pro4/5, oxygen (O <sub>2</sub> ), 4 series
17156848	Ventis Pro5 Nameplate, Blue
17156849	Ventis Pro5 Nameplate, Yellow
17156850	Ventis Pro5 Nameplate, Green
17156851	Ventis Pro4 Nameplate, Blue
17156852	Ventis Pro4 Nameplate, Yellow
17156853	Ventis Pro4 Nameplate, Green
17156945-0	Replacement Ventis Pro4/5 Integral Pump Door, Black
17156945-1	Replacement Ventis Pro4/5 Integral Pump Door, Orange
18109435	External dust barrier kit, Ventis Pro (10 pack) (Includes 10 each of the dust barriers for the upper sensors, lower sensors, and speaker)
18109436	Sensor barrier assembly, Ventis Pro (Includes gasket and membrane for both upper and both lower sensors)
18109417	iAssign Tag, Standard (10 pack)
18109418	iAssign Tag, Waterproof (10 pack)
18109419	iAssign Tag, All Weather Outdoor (10 pack)
18109420	iAssign Tag, Keychain (10 pack)
18109434	iAssign Tag, Sample Pack (1 each of the 4 tag types)
18109494	LENS Wireless Twenty-instrument upgrade card
18109493	LENS Wireless Five-instrument upgrade card
18109492	LENS Wireless One-instrument upgrade card

For a list of all  
**ACCESSORIES**  
 visit: [www.indsci.com/ventispro](http://www.indsci.com/ventispro)



Ventis Slide-on-Pump available. See page 19.



Configured for your safety, the highly configurable and iNet-compatible Ventis™ MX4 takes your gas detection program to the next level.

- Configure for diffusion applications or with an integral sampling pump for sample draw applications
- Detect from one to four gases with a wide range of sensor options
- Gain visibility of the instrument in darker environments with a tough, "Safety Orange" overmold
- Realize true portability with multi-gas protection in single-gas size
- Utilize the diffusion monitor for 20 hours with a rechargeable lithium-ion extended range battery pack
- Discover a better way to do gas detection when operating the Ventis on iNet®

Introducing the Ventis MX4 — a compact, multi-gas monitor available in both aspirated and diffusion versions. Both highly configurable and iNet compatible, the Ventis meets your gas detection needs with ease. It is the ideal instrument for monitoring one to four gases in confined spaces and nearly any other potentially hazardous environment.

This lightweight instrument is available with a bright "safety orange" overmold providing visibility in darker environments. An extended range lithium-ion battery pack provides up to 20 hours of continuous monitoring when using the diffusion version. Best of all, the Ventis is compatible with iNet and our DSX™ Docking Station.

Build and price your Ventis online with the Ventis MX4 instrument builder.

[www.indsci.com/ventisbuilder](http://www.indsci.com/ventisbuilder)

## SPECIFICATIONS\*

### INSTRUMENT WARRANTY

Two-year warranty, including sensors and battery

### CASE MATERIAL

Polycarbonate w/ protective rubber overmold

### DIMENSIONS

103 x 58 x 30 mm (4.1 x 2.3 x 1.2 in) - Ventis lithium-ion battery version

172 x 67 x 66 mm (6.8 x 2.6 x 2.6 in) - Ventis with pump lithium-ion battery version

### WEIGHT

182 g (6.4 oz) – Ventis, lithium-ion battery version

380 g (13.4 oz) – Ventis with Pump, lithium-ion battery version

### TEMPERATURE RANGE

-20 °C to 50 °C (-4 °F to 122 °F) \*\*

### OPERATING HUMIDITY RANGE

15%-95% non-condensing (continuous)

### DISPLAY/READOUT

Backlit Liquid Crystal Display (LCD)

### POWER SOURCE/RUNTIME

Rechargeable lithium-ion battery pack

(12 hours typical @ 20 °C) - Ventis

Rechargeable extended-range lithium-ion battery pack

(20 hours typical @ 20 °C) - Ventis

(12 hours typical @ 20 °C) - Ventis with pump

Replaceable AAA alkaline battery pack

(8 hours typical @ 20 °C) - Ventis

(4 hours typical @ 20 °C) - Ventis with pump

### ALARMS

Ultra-bright LEDs, loud audible alarm (95 dB at 30 cm), and vibrating alarm

### SENSORS

Combustible gases/methane - Catalytic Bead

O<sub>2</sub>, CO/H<sub>2</sub>, CO, H<sub>2</sub>S, NO<sub>2</sub>, SO<sub>2</sub> - Electrochemical

### MEASURING RANGES

Combustible Gases:	0-100% LEL in 1% increments
Methane (CH <sub>4</sub> ):	0-5% of vol in 0.01% increments
Oxygen (O <sub>2</sub> ):	0-30% of vol in 0.1% increments
Carbon monoxide (CO):	0-1,000 ppm in 1 ppm increments
Carbon monoxide (CO/H <sub>2</sub> low):	0-1,000 ppm in 1 ppm increments
Hydrogen sulfide (H <sub>2</sub> S):	0-500 ppm in 0.1 ppm increments
Nitrogen dioxide (NO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments
Sulfur dioxide (SO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments

### CERTIFICATIONS

UL:	Class I, Division 1, Groups A B C D, T4; Zone 0, AEx ia IIC T4 Class II, Groups F G (Carbonaceous & Grain dust); IP66; IP67
ATEX:	Ex ia IIC T4 Ga and Ex ia I Ma; Equipment Group and Category II 1G and I M1; IP66; IP67
IECEX:	Ex ia IIC T4 Ga; IP66; IP67
CSA:	Class I, Division 1, Groups A B C D, T4; Ex d ia IIC T4
ANZEX:	Ex ia s Zone 0 I/IIC T4; IP66; IP67
InMetro:	Ex ia IIC T4 Ga; IP66; IP67
KC:	Ex d ia IIC T4
MSHA:	30 CFR Part 22; Permissible for underground mines; Li-ion versions only
BFE:	Permissible for PA Bituminous Underground Mines
China Ex:	Ex ia IIC T4 Ga; Ex ia d I Mb
China CMC:	Metrology approval
CMA:	Approved for Underground Mines with CO, H <sub>2</sub> S, O <sub>2</sub> and CH <sub>4</sub> (Note: Diffusion w/ 17144453 pack only)
China KA:	Approved for Underground Mines with CO, H <sub>2</sub> S, O <sub>2</sub> and CH <sub>4</sub>
EAC:	PBExdial X / 1ExdialICT4 X
MED:	Portable Multi-Gas Detector; Category 2 (MED 96/98/EC; MED 2012/32/EU Marine Directive) Li-Ion only; Charger/docking station accessories; category 1
SANS:	SANS 1515-1; Type A; Ex ia I/IIC T4 IP66/67; Li-Ion only
TIIS:	Ex ia IIC T4 X
KIMM:	Ex d ia IIC T4

\*These specifications are based on performance averages and may vary by instrument.

\*\*Operating temperatures above 50 °C (122 °F) may cause reduced instrument accuracy. Operating temperatures below -20 °C (-4 °F) may cause reduced instrument accuracy and affect display and alarm performance. See Product Manual for details.

## ORDERING INFORMATION

### SPECIFICATIONS\* (Continued)

#### SUPPLIED WITH MONITOR

Calibration Cup (Ventis), Sample Tubing (Ventis with pump), Ventis MX4 Reference Guide

#### REFERENCE GUIDE LANGUAGE

English (1), French (2), Spanish (3), German (4), Italian (5), Dutch (6), Portuguese (7), Russian (9), Polish (A), Czech (B), Chinese (C), Danish (D), Norwegian (E), Finnish (F), Swedish (G), Japanese (J)

**Build and price your Ventis online with the Ventis MX4 instrument builder.**

[www.indsci.com/ventisbuilder](http://www.indsci.com/ventisbuilder)

### MOST COMMON INSTRUMENT CONFIGURATIONS

PART NO.	DESCRIPTION
VTS-K1231100y0z	Ventis - LEL, CO, H <sub>2</sub> S, O <sub>2</sub> , Li-ion, Desktop charger, Black
VTS-K1232111y0z	Ventis with pump - LEL, CO, H <sub>2</sub> S, O <sub>2</sub> , Extended Li-ion, Desktop Charger, Safety Orange
VTS-K1031100y1z	Ventis - LEL, CO, O <sub>2</sub> , Li-ion, Desktop charger, soft case, Black
VTS-K1032110y1z	Ventis with pump - LEL, CO, O <sub>2</sub> , Extended Li-ion, desktop charger, soft case, Black
VTS-K5231101y0z	Ventis - LEL, SO <sub>2</sub> , H <sub>2</sub> S, O <sub>2</sub> , Li-ion, desktop charger, Safety Orange
VTS-K1431100y1z	Ventis - LEL, CO, NO <sub>2</sub> , O <sub>2</sub> , Li-ion, Desktop charger, soft case, Black
VTS-K1432111y0z	Ventis with pump - LEL, CO, NO <sub>2</sub> , O <sub>2</sub> , Extended Li-ion, desktop charger, Safety Orange

### VENTIS MX4 BATTERY KIT MATRIX

**EXAMPLE:** VTSB-101 - Ventis MX4 Li-ion Battery Kit, Black, UL/CSA/ATEX/IECEX/EAC/MED/SANS 1515

DESCRIPTION	Base	Battery	Color	Approvals
Ventis MX4 Battery Kit	VTSB-			

#### Select options below in addition to base price

Lithium-ion		1		
Lithium-ion extended range (required for units with a pump)		2		
Alkaline		3		

#### COLOR

Black			0	
Safety Orange			1	

#### CERTIFICATIONS

UL/CSA/ATEX/IECEX/EAC(GOST-R/GOST-K)/KC(KOSHA)/MED/SANS 1515				1
MSHA*				2
China Ex / China MA**				3
ANZEx				4
INMETRO				5
China KA**				C
TIIS				D

Battery kits include: Battery pack, battery cover with appropriate label and screws.  
 \* Alkaline Battery Kit is not MSHA approved  
 \*\* Lithium-ion and Lithium-ion Extended Range Battery Kits are not CHINA MA or CHINA KA approved



**Ventis Confined Space Kits Include:** Choice of Aspirated Ventis MX4 monitor, universal charger, soft carrying case, reference guide, calibration tubing, dust filter/water stop, calibration fitting, sample tubing, calibration gas (appropriate mix) with regulator, rugged carrying case.

### CONFINED SPACE KITS WITH INTERGRAL PUMP

PART NO.	DESCRIPTION
VK-K123211xy1z	Ventis Confined Space Kit - LEL, CO, H <sub>2</sub> S, O <sub>2</sub>
VK-K103211xy1z	Ventis Confined Space Kit - LEL, CO, O <sub>2</sub>
VK-K023211xy1z	Ventis Confined Space Kit - LEL, H <sub>2</sub> S, O <sub>2</sub>
VK-K003211xy1z	Ventis Confined Space Kit - LEL, O <sub>2</sub>

x = Instrument Color: 0 = Black, 1 = Safety Orange  
 y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX, 3 = MSHA, 4 = ANZEx, 5 = China Ex, 7 = EAC(GOST-R/GOST-K), 8 = KC(KOSHA), 9 = INMETRO, A = MED, D = TIIS  
 z = Language for included Reference Guide: 1 = EN, 2 = FR, 3 = ES, 4 = DE, 5 = ITA, 6 = DUT, 7 = PT, 9 = RUS, A = POL, B = CZE, C = CN, D = DAN, E = NOR, F = FIN, G = SWE, J = JPN

### Ventis Confined Space Kits with Slide-on Pump

**Include:** Ventis with LEL, CO, H<sub>2</sub>S, and O<sub>2</sub> sensors, Ventis Slide-on Pump, 110 VAC desktop charger for each rechargeable instrument ordered (max of 2), calibration cup and tubing with T-fitting, dust filter/water stop, 10 feet of sample tubing, 34 liter cylinder of calibration gas, manual regulator, rugged hard plastic carrying case.



### CONFINED SPACE KITS WITH SLIDE-ON PUMP

PART NO.	DESCRIPTION
VKVSP4-ABCDEF	Ventis Confined Space Kit with Ventis Slide-on Pump (LEL, CO, H <sub>2</sub> S, O <sub>2</sub> )

A = LEL Sensor Calibration: K = Pentane, L = Methane  
 B = Instrument Color: 0 = Black, 1 = Safety Orange  
 C = Monitor Battery: 1 = Lithium-ion, 2 = Extended Range Lithium-ion, 3 = Alkaline  
 D = Pump Battery: 1 = Lithium-ion, 2 = Extended Range Lithium-ion  
 E = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX, INMETRO = 9  
 F = Documentation Language: 1 = EN, 2 = FR, 3 = ES, 4 = DE, 5 = ITA, 6 = DUT, 7 = PT, 9 = RUS, A = POL, B = CZE, C = CN, D = DAN, E = NOR, F = FIN, G = SWE

### COMMON CONFIGURATIONS OF CONFINED SPACE KITS WITH SLIDE-ON PUMP

VKVSP4-K1121	Ventis Confined Space Kit - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Orange, Li-ion Ventis Battery, Li-ion Pump Battery, ATEX/IECEX, English
VKVSP4-L01121	Ventis Confined Space Kit - LEL (Methane), CO, H <sub>2</sub> S, O <sub>2</sub> , Black, Li-ion Ventis Battery, Li-ion Pump Battery, ATEX/IECEX, English
VKVSP4-K11221	Ventis Confined Space Kit - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Orange, Li-ion Ventis Battery, Ext. Range Li-ion Pump Battery, ATEX/IECEX, English

**ACCESSORIES**



**18108631-00**  
V-Cal with Ventis instrument\*  
(\*monitor not included)

**18108631-10**  
V-Cal with Ventis with pump instrument\*  
(\*monitor not included)



**18108191**  
Ventis Charger



**18108650-0**  
6-Unit Charger



**18108209**  
Charger/Datalink



**18107763**  
Printer

**18108653**  
Truck-mount charger,  
hard wired

**18108651**  
Automotive charger

**18108652**  
Truck-mount charger,  
with plug

**18108811**  
Ventis with pump  
hard carrying case  
with display

**18108175**  
Ventis without pump  
soft carrying case,  
Li-ion battery

PART NO.	DESCRIPTION
18109327-ABC -ABC	DSX™ Docking Station for Ventis MX4, Ventis Pro Series A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports, 6 = 6 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
18109406	DSXi Cloud-Connected Activation Certificate
18105684	iGas® Reader
18108631-AB	V•Cal™ Calibration Station A = Instrument Type: 0 = Ventis, 1 = Ventis with pump B = Power cord: 0 = US, 1 = UK, 2 = EU, 3 = AUS, 4 = ITA, 5 = DEN, 6 = SWZ
18107664-ABC	V•Cal™ 6 Unit Calibration Station AB = Number of Ventis (A) and Ventis with pump (B) Instruments 06 = 0 Ventis and 6 Ventis with pump 33 = 3 Ventis and 3 Ventis with pump 60 = 6 Ventis and 0 Ventis with pump C = Power cord: 0 = Universal with US, UK, EU, AUS plug adapters
18107763	Serial data dot matrix printer for V•Cal™ – 5 volts powered by the Cal Station
18108191	Single-unit charger
18108209	Single-unit charger/Datalink
18108651	Single-unit Automotive charger, 12VDC
18108652	Single-unit truck-mount charger, 12VDC, with Plug
18108653	Single-unit truck-mount charger, 12VDC, hard wired
18108650-A	6-Unit Charger – A = Power Cord: 0 = US, 1 = UK, 2 = EU, 3 = AUS, 4 = ITA, 5 = DEN, 6 = SWZ
18108950	Ventis External battery charge adaptor
18108175	Ventis without pump, soft carrying case, Li-ion battery
18108183	Ventis without pump, soft carrying case, extended range battery
18108813	Ventis without pump, hard carrying case with display, Li-ion battery
18108814	Ventis without pump, hard carrying case with display, extended range batteries
18108810	Ventis with pump soft carrying case
18108811	Ventis with pump hard carrying case with display
17134461	Replacement sensor, oxygen (O <sub>2</sub> )
17134479	Replacement sensor, hydrogen sulfide (H <sub>2</sub> S)
17134487	Replacement sensor, carbon monoxide (CO)
17155564	Replacement sensor, carbon monoxide/low hydrogen interference (CO/H <sub>2</sub> low)
17134495	Replacement sensor, combustible gas (LEL/CH <sub>4</sub> )
17134503	Replacement sensor, nitrogen dioxide (NO <sub>2</sub> )
17156917	Replacement sensor, combustible gas (%LEL/CH <sub>4</sub> )*
17143595	Replacement sensor, Sulfur Dioxide (SO <sub>2</sub> )
17156979	Replacement sensor, combustible gas (%LEL/Isobutane C <sub>4</sub> H <sub>10</sub> )*
17148313-1	Replacement extended range Li-ion battery pack, UL/CSA/ATEX/ IECEX/INMETRO/KC/EACMED/SANS 1515/TIIS
17148313-2	Replacement extended range Li-ion battery pack, MSHA
17148313-3	Replacement extended range Li-ion battery pack, China Ex
17148313-4	Replacement extended range Li-ion battery pack, ANZEx
17150608	Replacement Alkaline battery pack
17152828-01	Ventis Conversion Kit, Ventis with pump to Ventis, Black, UL/CSA/ ATEX/IECEX/EAC/KC
17152828-04	Ventis Conversion Kit, Ventis with pump to Ventis without pump, Black, ANZEx
17152828-11	Ventis Conversion Kit, Ventis with pump to Ventis, Safety Orange, UL/ CSA/ATEX/IECEX/EAC/KC
17152828-14	Ventis Conversion Kit, Ventis with pump to Ventis without pump, Safety Orange, ANZEx
17153750	Screen protector, 10 pack
17153759	Screen protector, 100 pack
17152395	Internal Dust Filter/Water Stop for Ventis with pump

\* For use with the DSX Standalone.



The Ventis™ Slide-on Pump is ideally suited for operators that wear their gas monitor primarily for personal protection but occasionally require a pump for confined space entries. Available in black or safety orange and powered by its own battery pack, the slide-on pump is compatible with the Ventis MX4 and MX4 iQuad™ multi-gas monitors.

## SPECIFICATIONS\*

### INSTRUMENT WARRANTY

Two-year warranty, excluding consumables (i.e. - filters)

### CASE MATERIAL

Polycarbonate with protective rubber overmold

### SAMPLE DRAW CAPABILITY

Up to 15.2 meters (50 feet)

### DIMENSIONS

143 x 81 x 68 mm (5.6 x 3.2 x 2.7 in) – Lithium-ion battery version

143 x 81 x 85 mm (5.6 x 3.2 x 3.3 in) – Extended-range lithium-ion battery version

143 x 81 x 73 mm (5.6 x 3.2 x 2.9 in) – Alkaline battery version

### WEIGHT

270 g (9.5 oz) – Lithium-ion battery version

316 g (11.2 oz) – Extended-range lithium-ion battery version

284 g (10.0 oz) – Alkaline battery version

### OPERATING TEMPERATURE RANGE

-20 °C to 50 °C (-4 °F to 122 °F)

### OPERATING HUMIDITY RANGE

15%-95% non-condensing (continuous)

### POWER SOURCE/RUN TIME

Rechargeable lithium-ion battery pack – 18 hours @ 20 °C

Rechargeable extended-range lithium-ion battery pack – 36 hours @ 20 °C

Replaceable AAA alkaline battery pack – 10 hours @ 20 °C

### PUMP FAULT ALARMS

Ultra-bright LEDs

Loud audible alarm (90 dB at 30 cm)

### IP RATING

Third-party certified IP67

### CERTIFICATIONS

ATEX:	Ex ia I Ma and Ex ia IIC T4 Ga; Equipment Group and Category: I M1 and II 1G
CSA:	Class I, Groups A B C D T4; Ex ia IIC T4
IECEx:	Ex ia IIC T4 Ga
UL:	Class I, Groups A B C D T4; Class I, Zone 0, AEx ia IIC T4; Class II, Group F G
INMETRO:	Ex ia I Ma / Ex ia IIC T4 Ga

## VENTIS SLIDE-ON PUMP - MODEL# VSP MATRIX

<b>EXAMPLE:</b> 18109162-1111 - Ventis Slide-on Pump, Lithium-ion Battery Pack, Orange, UL/CSA, EN-FR-SP-DE-CN	18109162-	1	1	1	1
DESCRIPTION	Base	Battery	Color	Approvals	Language
Ventis Slide-on Pump Base	18109162-				

### Select options below in addition to base price

#### BATTERY

Lithium-ion battery pack		1		
Lithium-ion extended range battery pack		2		
Alkaline battery pack		3		

#### COLOR

Black			0	
Safety Orange			1	

#### APPROVALS

UL/CSA				1
ATEX/IECEx				2

#### PUMP ASSEMBLY KIT GUIDE LANGUAGE

English, French, Spanish, German, Chinese					1
Italian, Polish, Czech, Portugese, Russian					2

**17134453-01**  
Lithium-ion  
Battery Kit



**VTSB-201**  
Extended  
Range Lithium-ion  
Battery Kit



**17151184-11**  
Extended Range  
Lithium-ion Battery cover



**17154577-11**  
Alkaline  
Battery Kit

PART NUMBER	DESCRIPTION
<b>BATTERY</b>	
17134453-XY	Lithium-ion battery kit
17148313-Y	Extended range lithium-ion battery pack
17151184-XY	Cover, Extended range lithium-ion
17154577-XY	Alkaline battery kit
<b>PUMP ACCESSORIES</b>	
18109207-10	Urethane sample tubing kit 3.048 meters (10 feet)
17154853-5	Exhaust filter (5 pack)
17154581-5	Audible alarm filter (5 pack)

**NOTE:** Charger is not included with the Ventis Slide-on Pump. The Ventis Slide-on Pump uses the standard Ventis chargers (18108191, 18108209, 18108651, 18108652, 18108653, 18108650-A) shown on the previous page.

"X" denotes color where 0=black and 1=orange.

"Y" denotes approvals where 1 = ATEX, CSA, IECEx, and UL.

\*All specifications are based on a typical instrument and typical performance of the instrument. As such, they are subject to vary.



By wearing the Tango™ TX1, workers will be the safest single gas monitor users in the world. Patented DualSense® Technology increases worker safety, regardless of bump test frequency, while reducing overall costs. Let the Tango TX1 show you why two is better than one.

PART NUMBER	DESCRIPTION
<b>INSTRUMENT CONFIGURATIONS</b>	
TX1-1	Tango TX1, CO
TX1-2	Tango TX1, H <sub>2</sub> S
TX1-4	Tango TX1, NO <sub>2</sub>
TX1-5	Tango TX1, SO <sub>2</sub>
TX1-G	Tango TX1, CO/H <sub>2</sub> low
<b>ACCESSORIES</b>	
18109330-ABC -ABC	DSX™ Docking Station for Tango™ TX1 A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
18109406	DSXi Cloud-Connected Activation Certificate
18105684	iGas® Reader
17154367	Replacement battery
17155161	Replacement sensor, Carbon Monoxide, pack of two
17155823	Replacement sensor, Carbon Monoxide/low Hydrogen interference (CO/H <sub>2</sub> low), pack of two
17155164	Replacement sensor, Hydrogen Sulfide, pack of two
17155162	Replacement sensor, Nitrogen Dioxide, pack of two
17155163	Replacement sensor, Sulfur Dioxide, pack of two
18109171	Soft nylon case, Black
18109239	Soft nylon case, Orange
18109218	Dust barrier kit, 5 pack
18109230	Water barrier kit, 5 pack
18109238	CalCup and tubing kit
17120908	Belt clip
17154915-0	AlarmAmp™, Black
17154915-1	AlarmAmp™, Safety Orange
17154916	Black nameplate
17154917	Green nameplate
17154918	Yellow nameplate
17154919	Blue nameplate
17154920	White nameplate

## SINGLE GAS MONITOR

### SPECIFICATIONS\*

#### INSTRUMENT WARRANTY

Guaranteed for Life™. Warranted for as long as the instrument is supported by Industrial Scientific Corporation (excludes sensors, batteries, and filters). CO and H<sub>2</sub>S sensors are warranted for three years. All other sensors are warranted for two years.

#### DISPLAY

Segment liquid crystal display (LCD)

#### KEYPAD

Two buttons

#### CASE MATERIALS

Case top: Polycarbonate with a protective rubber overmold  
Case bottom: Conductive polycarbonate

#### ALARMS

Three strobe-emitting visual alarm LEDs (two red; one blue); 100 decibel (dB) audible alarm at a distance of 10 cm (3.94 in); Vibration alarm

#### DIMENSIONS

99 x 51 x 35 mm (3.9 x 2.0 x 1.4 in)

#### WEIGHT

126.0 g (4.4 oz)

#### TEMPERATURE RANGE

-40 °C to 50 °C (-40 °F to 122 °F) \*\*

#### HUMIDITY RANGE

15%-95% Non-condensing (continuous)

#### SENSORS

CO, H<sub>2</sub>S, NO<sub>2</sub>, SO<sub>2</sub> - Electrochemical sensor technology

#### SENSOR MEASURING RANGES

Carbon Monoxide (CO): 0.0 to 1,000 ppm in 1 ppm increments  
Carbon Monoxide (CO/H<sub>2</sub> low): 0 to 1,000 ppm in 1 ppm increments  
Hydrogen Sulfide (H<sub>2</sub>S): 0.0 to 500.0 ppm in 0.1 ppm increments  
Nitrogen Dioxide (NO<sub>2</sub>): 0.0 to 150.0 ppm in 0.1 ppm increments  
Sulfur Dioxide (SO<sub>2</sub>): 0.0 to 150.0 ppm in 0.1 ppm increments

#### BATTERY PACK

3.6 V Primary lithium-thionyl chloride (Li-SOCl<sub>2</sub>); 1.5AH, 2/3AA; replaceable; non-rechargeable; always on; up to 2 year run time depending on operating conditions

#### DATA LOGGING

3 months at 10-second intervals

#### EVENT LOGGING

60 alarm events

#### CERTIFICATIONS

#### INGRESS PROTECTION

IP66; IP67

#### -40 °C to 50 °C (-40 °F to 122 °F)

ATEX: Ex ia I Ma; Ex ia IIC T4 Ga;  
Equipment Group and Category: I M1 and II 1G  
CSA : Class I, Groups A B C D T4; Ex ia IIC T4  
IECEX: Ex ia I Ma; Ex ia IIC T4 Ga  
UL (C-US): Class I, Groups A B C D T4; Class II, Groups E F G;  
Class I, Zone 0, AEx ia IIC T4

INMETRO: Ex ia I Ma; Ex ia IIC T4 Ga

#### -20 °C to 50 °C (-40 °F to 122 °F)

China Ex: Ex ia IIC T4 Ga  
CMA: Ex ia I Ma; H<sub>2</sub>S, CO  
KC: Ex ia IIC T4  
EAC: PO Ex ia I X; 0 Ex iX IIC T4 X

\* These specifications are based on performance averages and may vary by instrument.

\*\* Operating temperatures above 50 °C (122 °F) may cause reduced instrument accuracy. Operating temperatures below -20 °C (-4 °F) may cause reduced instrument accuracy and affect display and alarm performance.



### AlarmAmp™

For higher-noise environments, the Tango's alarm volume, typically 100dB at 10 cm, can be increased nearly 10dB with the addition of the optional patented AlarmAmp™. The Tango's alarm is louder than that of any other single gas instrument on the market.

Patent No. 9,000,910 – DualSense® Technology  
Patent No. 9,064,386 - AlarmAmp™

## DualSense® Technology

The Tango™ TX1, Ventis™ Pro Series, Radius™ BZ1 and SafeCore® Module incorporate revolutionary patented DualSense Technology, which includes two of the same type of sensor to detect a single gas. The two sensor readings are processed through a proprietary algorithm and displayed as a single reading to the user. DualSense Technology was developed to address the major challenge of making sure workers are always using fully functioning, reliable instruments in the field. DualSense Technology ensures that regardless of your current bump test policy, you will be significantly safer than you would be using an instrument without redundant sensors\*.

\*Based on iNet data



## New Bump Test Recommendation

### Instruments without DualSense Technology:

Based on the data in the chart, Industrial Scientific recommends that a bump (functional) test be performed prior to each day's use for all instruments without DualSense Technology. If conditions do not permit daily testing, bump tests may be done less frequently based on instrument use, exposure to gas and environmental conditions.

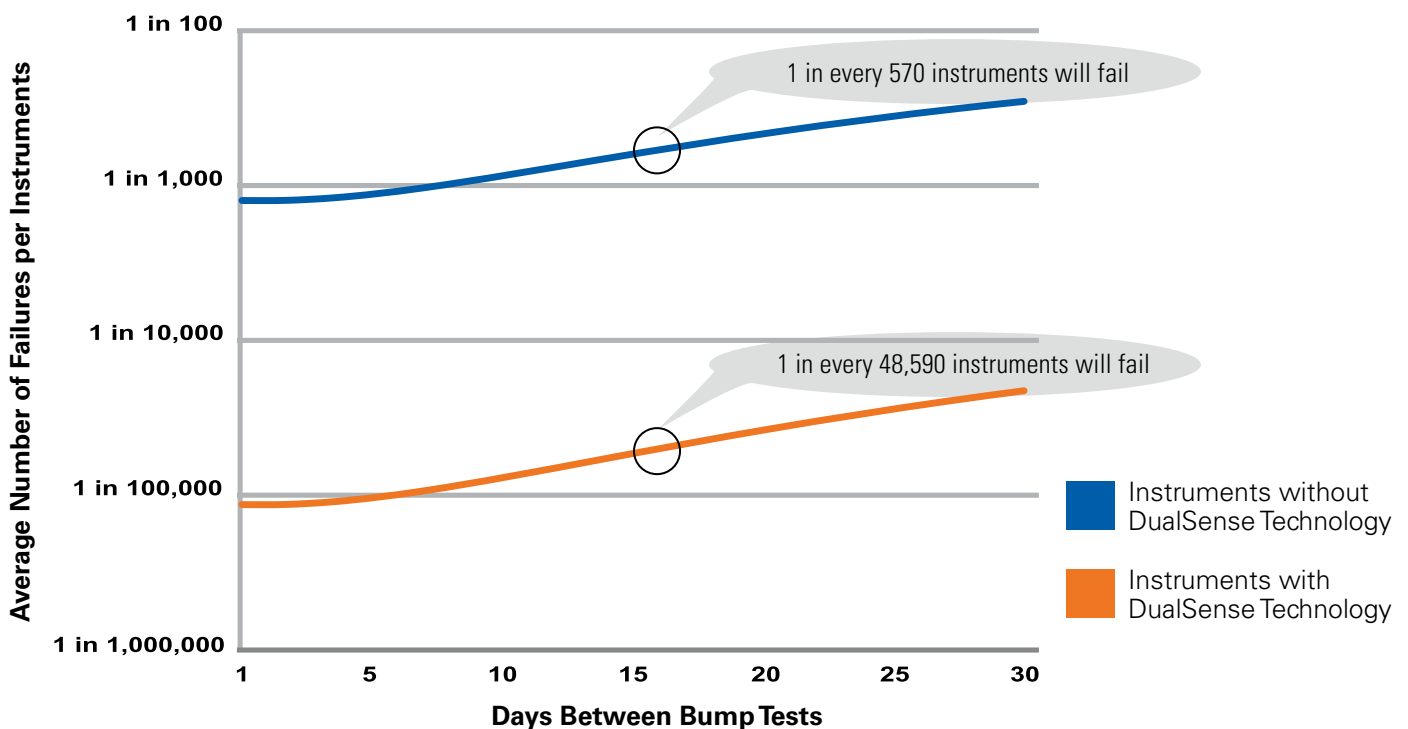
The frequency of testing of instruments without DualSense Technology is best determined by company policy or local regulatory agencies.

### Instruments with DualSense Technology:

Regardless of bump test frequency (from daily to monthly), Industrial Scientific's instruments with DualSense Technology are safer than traditional instruments without the technology. The frequency of bump testing for instruments with DualSense Technology is best determined by company policy or local agencies based upon regulatory, environmental and other company-specific factors.

These conclusions and recommendations are based on field data, safe work procedures, industry best practices and regulatory standards to ensure worker safety.

## DualSense® Technology Increases Gas Detector Reliability



## DOCKABLE SINGLE GAS MONITOR



- Interchangeable “smart” sensors monitor oxygen or any one of many toxic gases
- One year datalogging capacity (minimum)
- Standard STEL and TWA
- DSX™ Docking Station compatible



Built to Industrial Scientific's highest quality and reliability standards, GasBadge® Pro provides a lifetime of gas hazard protection with more features than any other single gas monitor available. Interchangeable “smart” sensors enable the GasBadge Pro to be quickly adapted to monitor unsafe levels of oxygen or any one of the following toxic gases: carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, chlorine, chlorine dioxide, phosphine, ammonia, hydrogen cyanide and hydrogen.

GasBadge Pro communicates directly via an infrared interface to optional accessories like the Docking Station™, Datalink and infrared printer to further simplify and automate calibration, function (bump) testing and data downloading. Standard STEL and TWA readings, and datalogging of up to one year of survey data are featured along with an event-logger that records the past 15 alarm events.

Housed in a rugged enclosure, the monitor is immune to RF, water resistant and extremely durable. A protective concussion-proof overmold protects the unit from extreme abuse in a variety of harsh industrial environments. Its simple and intuitive four-button navigation allows easy access to setup, operation and calibration functions.

### SPECIFICATIONS\*

#### INSTRUMENT WARRANTY

Guaranteed for Life™: Instrument is warranted for as long as supported by Industrial Scientific Corporation (excluding sensors, batteries, and filters). CO, H<sub>2</sub>S, and O<sub>2</sub> sensors are warranted for 2 years. All other sensors warranted for 1 year.

#### CASE

Rugged, water-resistant polycarbonate shell with protective concussion proof overmold. RFI resistant.

#### DIMENSIONS

9.4 x 5.08 x 2.79 mm (3.7 x 2 x 1.1 in )

#### WEIGHT

85 g (3 oz)

#### SENSORS

CO, H<sub>2</sub>S, O<sub>2</sub>, NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, Cl<sub>2</sub>, ClO<sub>2</sub>, PH<sub>3</sub>, HCN, H<sub>2</sub>, CO/H<sub>2</sub> low

#### MEASURING RANGES

CO:	0-1,500 ppm in 1 ppm increments
H <sub>2</sub> S:	0-500 ppm in 0.1 ppm increments
O <sub>2</sub> :	0-30% by vol in 0.1% increments
NO <sub>2</sub> :	0-150 ppm in 0.1 ppm increments
SO <sub>2</sub> :	0-150 ppm in 0.1 ppm increments
NH <sub>3</sub> :	0-500 ppm in 1 ppm increments
Cl <sub>2</sub> :	0-100 ppm in 0.1 ppm increments
ClO <sub>2</sub> :	0-1 ppm in 0.01 ppm increments
PH <sub>3</sub> :	0-10 ppm in 0.01 ppm increments
HCN:	0-30 ppm in 0.1 ppm increments
H <sub>2</sub> :	0-2,000 ppm in 1 ppm increments

#### DISPLAY

Custom LCD with graphical icons for easy use  
Segmented display for direct gas readings  
Backlight for low light conditions  
“Go/No Go” display mode  
Peak reading indication

#### ALARMS

User selectable low and high alarms  
Ultra-bright LEDs, loud audible alarm (95 dB) and vibrating alarm

#### BATTERY RUNTIME

User replaceable 3V, CR2 Lithium battery, 2,600 hour run time, typical

#### DATA LOGGING

1 year continuous storage of data

#### EVENT LOGGER

Continually on. Logs last 15 alarm events, stamping how long ago the event occurred, the duration of the event, and the peak reading seen during the event. Event-logger can be viewed on PC or printed directly from the instrument to an infrared printer.

#### TEMPERATURE RANGE

-40 °C to 60 °C (-4 °F to 140 °F), typical

#### HUMIDITY RANGE

0-99% RH (non-condensing), typical

#### IP RATING

Third-party certified IP64

#### CERTIFICATIONS

UL:	Class I, Division 1, Groups A B C D T4; Class II, Groups E F G
CSA:	Class I, Groups A B C D T4; Ex ia IIC T4
ATEX:	Ex ia I / Ex ia IIC T4; Equipment Group and Category I M1/II 1G
IECEX:	Ex ia I/IIC T4
INMETRO:	Ex ia IIC T4
ANZEx:	Ex ia I/IIC T4
China Ex:	Ex ia I/IIC T4
KC:	Ex ia I/IIC T4
CMA:	Ex ia I

#### SUPPLIED WITH MONITOR

Attached suspender clip, calibration adapter and tubing, and operating instructions

\* These specifications are based on performance averages and may vary by instrument.

\*\*Specific terms of the Guaranteed for Life™ Program are included with all products and are available upon request.



## ORDERING INFORMATION

PART NUMBER	DESCRIPTION
18100060-1	GasBadge Pro – Carbon Monoxide (CO)
18100060-2	GasBadge Pro – Hydrogen Sulfide (H <sub>2</sub> S)
18100060-3	GasBadge Pro – Oxygen (O <sub>2</sub> )
18100060-4	GasBadge Pro – Nitrogen Dioxide (NO <sub>2</sub> )
18100060-5	GasBadge Pro – Sulfur Dioxide (SO <sub>2</sub> )
18100060-6	GasBadge Pro – Ammonia (NH <sub>3</sub> )
18100060-7	GasBadge Pro – Chlorine (Cl <sub>2</sub> )
18100060-8	GasBadge Pro – Chlorine Dioxide (ClO <sub>2</sub> )
18100060-9	GasBadge Pro – Phosphine (PH <sub>3</sub> )
18100060-B	GasBadge Pro – Hydrogen Cyanide (HCN)
18100060-C	GasBadge Pro – Hydrogen (H <sub>2</sub> )
18100060-G	GasBadge Pro – Carbon Monoxide/Low Hydrogen Interference (CO/H <sub>2</sub> Low*)

## OPTIONAL ACCESSORIES

18109331-ABC	GasBadge® Pro DSX™ Docking Station A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
18109406	DSXi Cloud-Connected Activation Certificate
18105684	iGas® Reader
18106260	GasBadge® Datalink - Software included
17121963	GasBadge® Neck Lanyard w/Safety Release
18106484	GasBadge® Pro Nylon Carrying Case
18106492	GasBadge® Pro 2-unit Nylon Carrying Case
17124504	Replacement water/dust sensor barriers (5 count)
17124033	Calibration Cup, GasBadge® Pro
17123019	CR2 Lithium Battery, 3V, GasBadge® Pro
17124983-3	Replacement sensor, Oxygen (O <sub>2</sub> )
17124983-1	Replacement sensor, Carbon Monoxide (CO)
17124983-G**	Replacement sensor, Carbon Monoxide (H <sub>2</sub> low**)
17124983-2	Replacement sensor, Hydrogen Sulfide (H <sub>2</sub> S)
17124983-5	Replacement sensor, Sulfur Dioxide (SO <sub>2</sub> )
17124983-7	Replacement sensor, Chlorine (Cl <sub>2</sub> )
17124983-8	Replacement sensor, Chlorine Dioxide (ClO <sub>2</sub> )
17124983-6	Replacement sensor, Ammonia (NH <sub>3</sub> )
17124983-4	Replacement sensor, Nitrogen Dioxide (NO <sub>2</sub> )
17124983-B	Replacement sensor, Hydrogen Cyanide (HCN)
17124983-9	Replacement sensor, Phosphine (PH <sub>3</sub> )
17124983-C	Replacement sensor, Hydrogen

\* Low Hydrogen Interference



**DSX™**  
DOCKING STATION

The DSX™ Docking Station easily maintains the gas detectors that keep your people safe in hazardous environments.

- Know that your gas detectors are ready for use every day, every shift, without the burden of manual maintenance routines.
- Stop worrying about calibration gas and let the DSX monitor and order replacement gas cylinders when you need them.
- Effortlessly manage your fleet, data, and software updates from any web-enabled device.



**Nylon  
Carrying Case**

**GASBADGE®**  
DATALINK

- Instantly download alarm events and instrument details
- Quickly and easily configure instrument preferences





**RADIUS**<sup>™</sup> BZ1



When it comes to choosing equipment to protect your worksite from gas hazards, rely on the Radius<sup>™</sup> BZ1 Area Monitor. No other area monitor protects your workers longer in the field with less setup, user training, and time in the shop.

- Detect up to seven gases using 15 sensor options including PID
- Longest running area monitor with a typical run time of 7 days (168 hours)
- Intrinsic safety external power supply can extend battery run time to over 1 month
- Ultra-bright blue and red lights and attention-grabbing alarms with distinctive tones
- Audible alarms sound at 108 dB at 1 m to cut through high-noise environments
- Largest display of any area monitor on the market
- Intuitive text-based navigation and configuration
- Customizable alarm action messages such as "EVACUATE" or "VENTILATE"
- LENS<sup>™</sup> Wireless enables communication between area monitors and Ventis<sup>™</sup> Pro Series personal monitors
- All-weather sensor deployment and 360-degree gas path for more accurate detection
- DualSense<sup>®</sup> Technology increases worker safety by using two sensors to detect the same gas
- iNet<sup>®</sup> and DSX<sup>™</sup> Docking Station ready

Test drive the Radius BZ1 with the  
**INSTRUMENT SIMULATOR**  
[www.indsci.com/radius-simulator](http://www.indsci.com/radius-simulator)

#### SPECIFICATIONS\*

##### WARRANTY

Two-year warranty, including sensors and battery

##### KEYPAD

Three buttons

##### DATA LOG

At least 3 months at 10-second intervals

##### EVENT LOGGING

60 alarm events

##### INGRESS PROTECTION

IP66

##### CASE MATERIAL

Impact-resistant polycarbonate alloys

##### DIMENSIONS

29 x 29 x 55 cm (11.5 x 11.5 x 21.5 in)

##### WEIGHT

7.5 kg (16.5 lb)

##### TEMPERATURE RANGE

-20 °C to 55 °C (-4 °F to 131 °F)

##### HUMIDITY RANGE

15%-95% non-condensing (continuous)

##### DISPLAY/READOUT

11.2 cm (4.4 in) monochrome backlit graphical liquid crystal display (LCD)

##### POWER SOURCE/RUN TIME

Rechargeable nickel-metal hydride (NiMH) battery pack

7 days (168 hours) typical @ 20 °C, without pump, with wireless

3.5 days (84 hours) typical @ 20 °C, with pump, with wireless

30 days (720 hours) typical @ 20 °C, electrochemical sensors only, without pump, with wireless

≤8 hour recharge time

##### ALARMS:

108 decibel (dB) at 1 m (3.3 ft) redundant audible alarms

Redundant, visual alarm LEDs (red and blue)

##### SENSORS

Up to 6 sensors (catalytic bead, photoionization detector, and electrochemical)

Up to 7 simultaneous readings



## ORDERING INFORMATION

## SPECIFICATIONS\* (Continued)

## MEASURING RANGES

CATALYTIC BEAD	
Combustible Gases:	0-100% LEL in 1% increments
ELECTROCHEMICAL	
Ammonia (NH <sub>3</sub> ):	0-500 ppm in 1 ppm increments
Carbon Monoxide (CO):	0-1,500 ppm in 1 ppm increments
Carbon Monoxide (CO High Range):	0-9,999 ppm in 1 ppm increments
Carbon Monoxide (CO/H <sub>2</sub> Low):	0-1,000 ppm in 1 ppm increments
Carbon Monoxide/Hydrogen Sulfide:	CO: 0-1,500 ppm in 1 ppm increments H <sub>2</sub> S: 0-500 ppm in 0.1 ppm increments
Chlorine (Cl <sub>2</sub> ):	0-50 ppm in 0.1 ppm increments
Hydrogen (H <sub>2</sub> ):	0-2,000 ppm in 1 ppm increments
Hydrogen Sulfide (H <sub>2</sub> S):	0-500 ppm in 0.1 ppm increments
Hydrogen Cyanide (HCN):	0-30 ppm in 0.1 ppm increments
Nitrogen Dioxide (NO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments
Oxygen (O <sub>2</sub> ):	0-30% vol in 0.1% increments
Sulfur Dioxide (SO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments

## PHOTOIONIZATION

Volatile Organic Compounds (10.6 eV): 0-2,000 ppm in 0.1 ppm increments

## PUMP

Optional integral pump, up to 30.48 m (100 ft) sample draw

## WIRELESS

Optional LENS™ Wireless, proprietary mesh network  
 Frequency: ISM license-free band (2.4 GHz)  
 Max Peers: 25 devices per network group  
 10 independent, configurable network groups  
 Range: 300 m (~1,000 ft) line of sight  
 Encryption: AES-128  
 Approvals: FCC Part 15, IC, CE/RED, others\*\*

## CERTIFICATIONS

UL: Class I, Division 1, Groups A, B, C, and D; T4  
 Class 1 Zone 0 AEx da ia IIC T4 Ga1  
 CSA: Class I, Division 1, Groups A, B, C, and D; T4  
 C22.2 No. 152 applies only to %LEL thermo-catalytic reading  
 ATEX: Ex da ia IIC T4 Ga, Equipment Group and Category II 1G  
 IECEx: Ex da ia IIC T4 Ga

## SUPPLIED WITH MONITOR

Calibration cup (without pump), sample tubing and pump inlet water barrier (with pump), product manual, hand tool, charging power supply and region-specific cord

## REFERENCE GUIDE LANGUAGE

English, French, Spanish, German

\* These specifications are based on performance averages and may vary by instrument.

\*\* See [www.indsci.com/wireless-certifications](http://www.indsci.com/wireless-certifications) for country-specific wireless approvals and certifications.



The Radius BZ1 is available with optional LENS™ Wireless. With LENS Wireless, your instruments will connect seconds after being turned on—with no need for setup or additional infrastructure. You will instantly receive real-time gas readings from other connected instruments on the network, helping your team react faster in emergency situations.

Build and price your Radius BZ1 online  
**INSTRUMENT BUILDER**  
[www.indsci.com/radius-builder](http://www.indsci.com/radius-builder)



**SAFE CORE**®

With the Radius BZ1, all critical technology pieces such as sensors, software, pumps, and wireless, live inside the patent-pending SafeCore® Module. Smart sensors are positioned face down to prevent the elements from interfering with gas readings, resulting in fewer false alarms.

The module slides out from the Radius Base for easy docking and automated maintenance, ensuring that your sensors are always ready to provide accurate gas detection.



**RADIUS**™  
BZ1

The Radius Base is made of a durable, weather-resistant plastic. The base has built-in audio and visual alarms that grab workers attention, even in high-noise environments. A large battery keeps the unit working as long as you do, and side-grip handles help make the base easy to move from location to location.

It is easier than ever to keep your area monitors running in the field. The SafeCore Module and Radius Base work together to provide maximum gas detection ability, while simplifying maintenance of your area monitors.



Jump-start your gas detection program by selecting the appropriate monitor configuration, docking station, calibration gas, and regulator.

## How Will You Maintain Your Radius BZ1?



SELECT THE SENSORS	PUMP	WIRELESS	MONITOR PART #	DOCKING STATION	CALIBRATION GAS 116L	DEMAND FLOW REG.
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>			BZ1-K123000x0y	18109396-13z	18109157	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>		✓	BZ1-K123000x1y	18109396-13z	18109157	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>	✓		BZ1-K123001x0y	18109396-13z	18109157	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>	✓	✓	BZ1-K123001x1y	18109396-13z	18109157	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>			BZ1-K123500x0y	18109396-13z	18109234	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>		✓	BZ1-K123500x1y	18109396-13z	18109234	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>	✓		BZ1-K123501x0y	18109396-13z	18109234	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>	✓	✓	BZ1-K123501x1y	18109396-13z	18109234	18105841
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID			BZ1-K1235R0x0y	18109396-13z	18109234, 18102939 (103L)	18105841 x2
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID		✓	BZ1-K1235R0x1y	18109396-13z	18109234, 18102939 (103L)	18105841 x2
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID	✓		BZ1-K1235R1x0y	18109396-13z	18109234, 18102939 (103L)	18105841 x2
LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID	✓	✓	BZ1-K1235R1x1y	18109396-13z	18109234, 18102939 (103L)	18105841 x2

x = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX | y = Language: 1 = EN, 2 = FR, 3 = ES, 4 = DE | z = Power Cord: 1 = North America, 2 = European, 3 = Australia, 4 = UK

## What Accessories Best Fit Your Needs?

### CHECKLIST

- Docking Stations
- Extra Modules or Bases
- Accessory Labels for Asset Management
- Probes
- Sample Tubes
- Replacement Sensors
- Filters
- Intrinsic Safety External Power Supply

For a List of All Accessories, visit  
**THE RADIUS BZ1 PRODUCT PAGE**  
[www.indsci.com/radius](http://www.indsci.com/radius)

Intrinsic  
Safety External  
Power Supply



PART NO.	DESCRIPTION
<b>MOST COMMON INSTRUMENT CONFIGURATIONS</b>	
BZ1-K12300x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>
BZ1-K12300x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Wireless
BZ1-K12300x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , with Pump
BZ1-K12300x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Wireless, with Pump
BZ1-K12350x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>
BZ1-K12350x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Wireless
BZ1-K12350x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , with Pump
BZ1-K12350x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Wireless, with Pump
BZ1-K1235R0x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID
BZ1-K1235R0x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Wireless
BZ1-K1235R1x0y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, with Pump
BZ1-K1235R1x1y	Radius BZ1, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Wireless, with Pump
SC1-K12300x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>
SC1-K12300x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Wireless
SC1-K12300x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , with Pump
SC1-K12300x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Wireless, with Pump
SC1-K12350x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>
SC1-K12350x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Wireless
SC1-K12350x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , with Pump
SC1-K12350x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Wireless, with Pump
SC1-K1235R0x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID
SC1-K1235R0x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Wireless
SC1-K1235R1x0y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, with Pump
SC1-K1235R1x1y	SafeCore Module, LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Wireless, with Pump

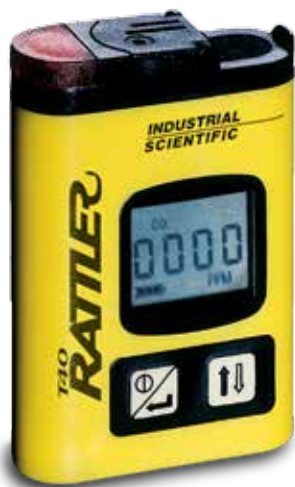
x = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEx  
y = Language: 1 = EN, 2 = FR, 3 = ES, 4 = DE

#### ACCESSORIES

18109431-AB	Radius BZ1 Base (Without SafeCore) A = Approvals: 1 = UL/CSA, 2=ATEX/IECEx B = Language: 1 = English, 2 = French, 3 = Spanish, 4 = German
18109388-1A	Intrinsic Safety External Power Supply A = Power Cord Type: 1 = North America, 2 = Europe, 3 = Australia, 4 = UK
17156261	50m Replacement Intrinsic Safety Cable
17155932	Intrinsic Safety Power Port Dust Cap
18109444	Speaker Grill
18109445	Speaker Dust Filter (Pack of 2)
18109442	Alarm Muffler (Pack of 2)
17155923	Charging Power Supply (Without Power Cord)
17155000	Power Cord (North America)
17155003	Power Cord (Europe)
17155001	Power Cord (Australia)
17155005	Power Cord (UK)
18109498	Calibration Cup and Tubing Kit
17155934	Charging Port Dust Cap
17155932	Intrinsic Safety Power Port Dust Cap
18109448	Boot

PART NO.	DESCRIPTION
<b>ACCESSORIES (continued)</b>	
17155915-A	Printed Manual: A = Language, where 1 = English, 2 = French, 3 = Spanish, 4 = German
18109396-ABC-ABC	DSX™ Docking Station for SafeCore® Module A – DSX Mode: 0 = DSX Standalone 1 = DSXi Cloud-connected 2 = DSX-L Local Server B – Number of Gas Inlet Ports: 3 = 3 Ports; 6 = 6 Ports C – Power Cord Type: 1 = North America, 2 = EU, 3 = AUS, 4 = UK
17156650-1	Replacement Sensor, SafeCore, Carbon Monoxide (CO)
17156650-2	Replacement Sensor, SafeCore, Hydrogen Sulfide (H <sub>2</sub> S)
17156650-3	Replacement Sensor, SafeCore, Oxygen (O <sub>2</sub> )
17156650-4	Replacement Sensor, SafeCore, Nitrogen Dioxide (NO <sub>2</sub> )
17156650-5	Replacement Sensor, SafeCore, Sulfur Dioxide (SO <sub>2</sub> )
17156650-6	Replacement Sensor, SafeCore, Ammonia (NH <sub>3</sub> )
17156650-7	Replacement Sensor, SafeCore, Chlorine (Cl <sub>2</sub> )
17156650-B	Replacement Sensor, SafeCore, Hydrogen Cyanide (HCN)
17156650-C	Replacement Sensor, SafeCore, Hydrogen (H <sub>2</sub> )
17156650-G	Replacement Sensor, SafeCore, Carbon Monoxide/Hydrogen Low (CO/H <sub>2</sub> low)
17156650-H	Replacement Sensor, SafeCore, Carbon Monoxide (CO) High
17156650-J	Replacement Sensor, SafeCore, Carbon Monoxide/Hydrogen Sulfide (CO/H <sub>2</sub> S)
17156650-K	Replacement Sensor, SafeCore, LEL, Pentane
17156650-L	Replacement Sensor, SafeCore, LEL, CH <sub>4</sub>
17156650-R	Replacement Sensor, SafeCore, PID (VOCs)
18109472	DualSense Pack, SafeCore, Carbon Monoxide (CO)
18109473	DualSense Pack, SafeCore, Hydrogen Sulfide (H <sub>2</sub> S)
18109474	DualSense Pack, SafeCore, Oxygen (O <sub>2</sub> )
18109475	DualSense Pack, SafeCore, Nitrogen Dioxide (NO <sub>2</sub> )
18109476	DualSense Pack, SafeCore, Sulfur Dioxide (SO <sub>2</sub> )
18109486	DualSense Pack, SafeCore, Carbon Monoxide/Hydrogen Low (CO/H <sub>2</sub> low)
18109488	DualSense Pack, SafeCore, Carbon Monoxide/Hydrogen Sulfide (CO/H <sub>2</sub> S)
18109489	DualSense Pack, SafeCore, LEL, Pentane
18109490	DualSense Pack, SafeCore, LEL, CH <sub>4</sub>
17134701	Sensor Plug
17156465	Backup Battery
17155888	Sensor Collar
18109446	Module Cover
17156771	SafeCore Nameplate
17156983	Hand Tool
18109455	Pump Inlet Water Barrier (Pack of 3)
18109447	Pump Bottom Dust Filter (Pack of 2)



**SINGLE GAS MONITOR**

The T40 Rattler™ is a low-cost, maintenance-free single gas monitor designed to protect personnel from dangerous hydrogen sulfide or carbon monoxide gas exposure in the most extreme conditions. Despite its compact size, the T40 Rattler includes features usually found only in larger multi-gas monitors – including a large, liquid crystal display (LCD), internal vibrating alarm, audible/visual alarms and simple push-button operation.

The monitor continuously displays ambient CO or H<sub>2</sub>S readings in PPM and will alert the user when gas concentrations exceed the preset low or high levels. Added features include adjustable alarm setpoints, calibration gas values, and choice of text-only display selected by the user through a simple, push-button routine. The T40 Rattler also has a peak/hold feature to show the highest reading during a shift and includes a patented flip-cap calibration adapter for quick and simple calibration. The T40 Rattler operates for up to 1,500 hours on a single “AA” battery (included) and is covered by a two-year warranty from the date of manufacture.

**SPECIFICATIONS****INSTRUMENT WARRANTY**

Two-year warranty from the date of shipment.

**CASE**

High visibility, impact-resistant composite with radio frequency interference (RFI) protection.

**DIMENSIONS**

86 x 58 x 19 mm (3.375 x 2.3 x .75 in)

**WEIGHT**

98 g (3.5 oz)

**SENSORS**

CO, H<sub>2</sub>S – Electrochemical

**MEASURING RANGES**

Carbon Monoxide: 0-999 ppm in 1 ppm increments

Hydrogen Sulfide: 0-500 ppm in 1 ppm increments

**ALARMS:**

Adjustable low and high alarm setpoints

**POWER SOURCE (RUNTIME)**

Replaceable “AA” alkaline battery (approx. 1,500 hours typical)

**TEMPERATURE RANGE**

-20 °C to 50 °C (-4 °F to 122 °F) typical

**HUMIDITY RANGE**

15 to 95% RH typical

**CERTIFICATIONS**

UL and cUL:	Class I, Groups A B C D T4
CSA:	Ex ia IIC T4
ATEX:	Ex ia IIC T4; Equipment Group and Category II 2G
IECEX:	Ex ia IIC T4 Ga
ANZEx:	Ex ia IIC T4
CMA:	Approved for Underground Mines with CO
China Ex:	Ex ia IIC T4; Ex ia I
China CMC:	Metrology Approval

PART NUMBER	DESCRIPTION
18105247	T40 Rattler – Hydrogen Sulfide (H <sub>2</sub> S)
18105254	T40 Rattler – Carbon Monoxide (CO)
18105874	T40 Nylon Carrying Case

**All Rattler T40 Monitors Include:** Battery (installed), additional battery, maintenance tool and instruction manual.

[www.indsci.com/t40/](http://www.indsci.com/t40/)



SENSOR	MULTI-GAS MONITORS				SINGLE-GAS MONITORS		
	Ventis MX4	Ventis Pro Series	MX6 iBrid	SafeCore	GasBadge Pro	Tango TX1	T40 Rattler
OXYGEN (O <sub>2</sub> )	•	•	•	•	•		
LEL SENSOR (%LEL) - CATALYTIC BEAD [HP]	•★ [HP1]	•★ [HP1]	•★ [HP2]	•★ [HP2]			
AMMONIA (NH <sub>3</sub> )		•	•	•	•		
ARSINE (ASH <sub>3</sub> )							
CARBON MONOXIDE (CO)	•	•	•	•	•	•	•
CARBON MONOXIDE (CO HIGH)			•	•			
CO/H <sub>2</sub> LOW		•	•	•	•		
CO/H <sub>2</sub> S (COSH)		•	•	•	•		
CHLORINE (Cl <sub>2</sub> )			•	•	•		
CHLORINE DIOXIDE (ClO <sub>2</sub> )			•		•		
ETHYLENE OXIDE (ETO)							
HYDROGEN (H <sub>2</sub> )			•	•	•		
HYDROGEN CHLORIDE (HCl)			•				
HYDROGEN CYANIDE (HCN)		•	•	•	•		
HYDROGEN SULFIDE (H <sub>2</sub> S)	•	•	•	•	•	•	•
METHANE (0-5% VOL) – CATALYTIC BEAD [HP]	•★ [HP1]	•★ [HP1]	•★ [HP2]				
NITRIC OXIDE (NO)			•				
NITROGEN DIOXIDE (NO <sub>2</sub> )	•	•	•	•	•	•	
PHOSPHINE (PH <sub>3</sub> )		• (Pro5)	•		•		
PHOSPHINE HIGH (0-1,000 PPM)			•				
SILANE (SiH <sub>4</sub> )							
SULFUR DIOXIDE (SO <sub>2</sub> )	•	•	•	•	•	•	
<b>INFRARED</b>							
CARBON DIOXIDE (CO <sub>2</sub> ) [HP]			•□ [HP2]				
CARBON DIOXIDE/HYDROCARBONS (CO <sub>2</sub> /HC) [HP]		•□ [HP1]					
CARBON DIOXIDE/METHANE (CO <sub>2</sub> /CH <sub>4</sub> ) [HP]		•□ [HP1]					
HYDROCARBONS (0-100% LEL) [HP]			•□ [HP2]				
METHANE (0-100% vol) [HP]		•□ [HP1]	•□ [HP2]				
METHANE (0-100 %LEL) [HP]			•□ [HP2]				
<b>PHOTOIONIZATION</b>							
PID FOR VOCS (VOLATILE ORGANIC COMPOUNDS) [HP]			•	• [HP2]			

**NOTES:**

• Sensor Not Available

- Sensor Available
- Maximum of one Infrared (IR) Sensor per instrument
- ★ Factory calibrated to Pentane (typically) or Methane (optionally)

[HP1] Maximum of one High Power Sensor per instrument

[HP2] Maximum of two High Power Sensors per instrument, but just one IR sensor (MX6 iBrid)

**Certain limits apply to the number of sensor configurations.**



GAS	MULTI GAS MONITORS				SINGLE GAS MONITORS	
	Ventis MX4	Ventis Pro Series	MX6 iBrid	SafeCore	Tango TX1	GasBadge Pro
<b>CATALYTIC BEAD</b>						
%LEL / ISOBUTANE (C <sub>4</sub> H <sub>10</sub> )	17156979†					
%LEL / PENTANE (C <sub>5</sub> H <sub>12</sub> )	17134495	17155304-K	17124975-K	17156650-K 18109489 <sup>^</sup>		
%LEL / METHANE (CH <sub>4</sub> )	17134495 17156917††	17155304-L	17124975-L	17156650-L 18109490 <sup>^</sup>		
METHANE (CH <sub>4</sub> 0-5%)	17134495	17155304-M	17124975-M			
<b>ELECTROCHEMICAL STANDARD</b>						
CARBON MONOXIDE (CO)	17134487	17155306-I	17124975-1	17156650-1 18109472 <sup>^</sup>	17155161 <sup>^</sup>	17124983-1
CARBON MONOXIDE (CO HIGH)			17124975-H \$330.00	17156650-H		
CARBON MONOXIDE (H <sub>2</sub> LOW)	17155564	17155306-G	17124975-G	17156650-G 18109486 <sup>^</sup>	17155823 <sup>^</sup>	17124983-G
CARBON MONOXIDE / HYDROGEN SULFIDE (CO/H <sub>2</sub> S)		17155306-J (6 series) 17155304-J (4 series) 17156919 <sup>^</sup>	17124975-J	17156650-J 18109488 <sup>^</sup>		17124983-C
HYDROGEN SULFIDE (H <sub>2</sub> S)	17134479	17155306-2 (6 series) 17155304-2 (4 series)	17124975-2	17156650-2 18109473 <sup>^</sup>	17155164 <sup>^</sup>	17124983-2
OXYGEN (O <sub>2</sub> )	17134461	17155304-3 17156920 <sup>^</sup>	17124975-3	17156650-3 18109474 <sup>^</sup>		17124983-3
NITROGEN DIOXIDE (NO <sub>2</sub> )	17134503	17155306-4	17124975-4	17156650-4 18109475 <sup>^</sup>	17155162 <sup>^</sup>	17124983-4
SULFUR DIOXIDE (SO <sub>2</sub> )	17143595	17155306-5	17124975-5	17156650-5 18109476 <sup>^</sup>	17155163 <sup>^</sup>	17124983-5
<b>ELECTROCHEMICAL EXOTICS</b>						
AMMONIA (NH <sub>3</sub> )		17155306-6	17124975-6	17156650-6		17124983-6
CHLORINE (Cl <sub>2</sub> )			17124975-7			17124983-7
CHLORINE DIOXIDE (ClO <sub>2</sub> )			17124975-8	17156650-7		17124983-8
HYDROGEN (H <sub>2</sub> )			17124975-C			
HYDROGEN CHLORIDE (HCl)			17124975-A			
HYDROGEN CYANIDE (HCN)		17155306-B	17124975-B	17156650-C		17124983-B
NITRIC OXIDE (NO)			17124975-D			
PHOSPHINE (PH <sub>3</sub> HIGH)			17124975-E	17156650-B		
PHOSPHINE (PH <sub>3</sub> )			17124975-9			17124983-9
<b>INFRARED</b>						
CARBON DIOXIDE (CO <sub>2</sub> )			17124975-Q			
COMBUSTIBLE GAS			17124975-P			
CARBON DIOXIDE / COMBUSTIBLE (CO <sub>2</sub> /LEL)		17155304-U				
CARBON DIOXIDE / METHANE (CO <sub>2</sub> /CH <sub>4</sub> )		17155304-V				
METHANE (CH <sub>4</sub> 0-100% vol)			17124975-N			
METHANE (CH <sub>4</sub> 0-100% LEL)			17124975-S			
<b>PHOTOIONIZATION</b>						
PID (VOCs)			17124975-R	17156650-R		

<sup>^</sup> Dual sensors are packaged in random pairs | <sup>†</sup> For use with the DSX Standalone to calibrate %LEL (Isobutane) | <sup>††</sup> For use with the DSX Standalone to calibrate %LEL (Methane)



(c) 18101386 6' Extendible Stainless Steel Probe

Shown:

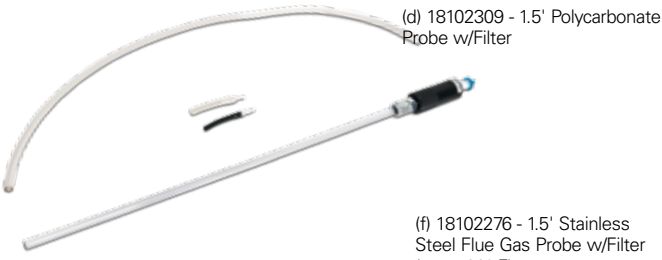
- not extended
- partially extended
- fully extended



(d) 18102309 - 1.5' Polycarbonate Probe w/Filter

(a) 18102111 - 4.5' Folding Probe w/Tubing

- Shown:
- fully extended
  - folded with case



(f) 18102276 - 1.5' Stainless Steel Flue Gas Probe w/Filter (to 1,500° F)

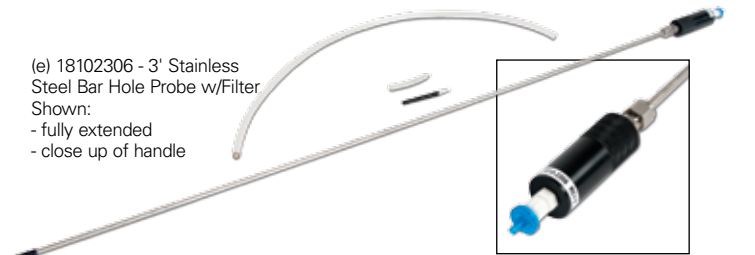
(b) 18101428 - 4' Polycarbonate Probe w/Tubing



(h) 18103309 Aluminum Coiled Probe (800-900° F)

(e) 18102306 - 3' Stainless Steel Bar Hole Probe w/Filter

- Shown:
- fully extended
  - close up of handle



## SAMPLING PROBES

PART NO.	DESCRIPTION
18102111	(a) 4.5' Folding Probe w/Tubing
18101428	(b) 4' Polycarbonate Probe w/Tubing
18101386	(c) 6' Extendible Stainless Steel Probe
18102309	(d) 1.5' Polycarbonate Probe w/Filter
18102306	(e) 3' Stainless Steel Bar Hole Probe w/Filter
18102276	(f) 1.5' Stainless Steel Flue Gas Probe w/Filter (to 1,500 °F)
18102246	(g) 3' Extendible Probe w/Teflon Tubing Insert
18103309	(h) Aluminum Coiled Probe (800-900 °F) (not pictured)
18104299	(i) 3' Polycarbonate Probe w/High Capacity Filter

18104299 (i) 3' Polycarbonate Probe w/ High Capacity Filter



## MX6 PROBE ADAPTERS - \*17136540 filter cap is required.

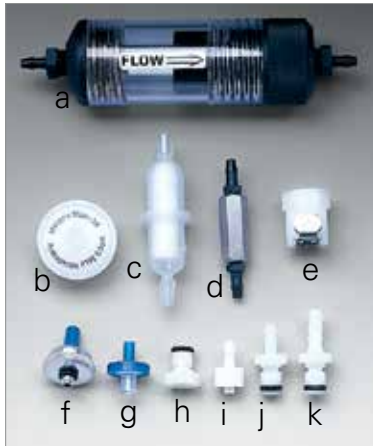
Extention Table:	18105155 MX6 Inlet Probe Adapter*
0 = 1/8" Female NPT Connection	18105155-0
1 = 1/8" Hose Barb Fitting	18105155-1
2 = Female Quick Connect Coupling	18105155-2
3 = 8" Teflon Probe	18105155-3
4 = 10" Stainless Steel Probe	18105155-4
5 = 18" Polycarbonate Probe	18105155-5

18102246 (g) 3' Extendible Probe w/Teflon Tubing Insert

- shown:
- fully extended
  - not extended



Adequate air flow is critical for proper remote sampling. All filters should be replaced when dirt or water inhibits air flow. Quick disconnect fittings allow easy, no-fuss connection to secure tubing to sampling pumps.



- Additional Remote Sampling Equipment:
- (a) Inline High Capacity Water Stop
  - (b) Dust Filter/WaterStop for Docking Station Fresh Air Inlet
  - (c) Inline Dust Filter for iSP/SP402/SP202/SP100 Pumps
  - (d) Dilution Tube
  - (e) Quick Disconnect Fitting, Female
  - (f) Replacement Filters (Package of 5)
  - (g) Internal Dust Filter/WaterStop for MX6/ATX Series
  - (h) Quick Disconnect Fitting, Male, Threaded
  - (i) Luer Fitting, Male, 1/8" or 3/16" Barb
  - (j) Quick Disconnect Fitting, Male, 1/8" Barb
  - (k) Quick Disconnect Fitting, Male, 3/16" Barb

### ADDITIONAL REMOTE SAMPLING EQUIPMENT

PART NO.	DESCRIPTION
18102277	(a) Inline High Capacity Water Stop
17057803	Replacement Gortex Filter Insert for 18102277
17027152	(b) Dust Filter/Water Stop for Motorized Sampling Pumps
17050908	(c) Inline Dust Filter 10 micron, w/adaptors for MX6, Ventis, VSP pumps
17041740	(d) Dilution Tube (for use w/Sampling Pumps)
17050688	(e) Quick Disconnect Fitting, Female
17024597	(f) Replacement Filter for iSP, SP402, SP202, SP100 Pumps
17024191	(f) Replacement Filters (Package of 5)
17058157	(g) Internal Dust Filter/WaterStop for MX6/ATX Series
17051611	(h) Quick Disconnect Fitting, Male, Threaded
17048273	(i) Luer Fitting, Male, 3.175 mm (1/8") Barb
17050698	(i) Luer Fitting Male, 4.7625 mm (3/16") Barb
17050689	(j) Quick Disconnect Fitting, Male, 3.175 mm (1/8") Barb
17050775	(k) Quick Disconnect Fitting, Male, 4.7625 mm (3/16") Barb
17051319	Dust Filter/WaterStop for Docking Station Fresh Air Inlet
17051701	Replacement Probe Fitting for 18101386
17136540	SP6 Filter Cap (used w/18105155-X)

### Probe Tubing Kits for use with 18101386 probe

18108043	(o) Probe Tubing Kit for MX6/Ventis – Urethane (Not for use with Cl <sub>2</sub> , ClO <sub>2</sub> , HCl, or PID sensors)
18108093	Probe Tubing Kit for MX6/Ventis – Teflon lined (For use with all sensors)

### Universal Urethane Sample Tubing Kit with Dust Filter/Water Stop

PART NO.	LENGTH	PART NO.	LENGTH
18109207-10	3 m / 10 ft	18109207-60	18.3 m / 60 ft
18109207-20	6.1 m / 20 ft	18109207-70	21.3 m / 70 ft
18109207-30	9.1 m / 30 ft	18109207-80	24.4 m / 80 ft
18109207-40	12.2 m / 40 ft	18109207-90	27.4 m / 90 ft
18109207-50	15.2 m / 50 ft	18109207-100	30.5 m / 100 ft

NOTE: Not for use with Cl<sub>2</sub>, ClO<sub>2</sub>, HCl, or PID Sensors

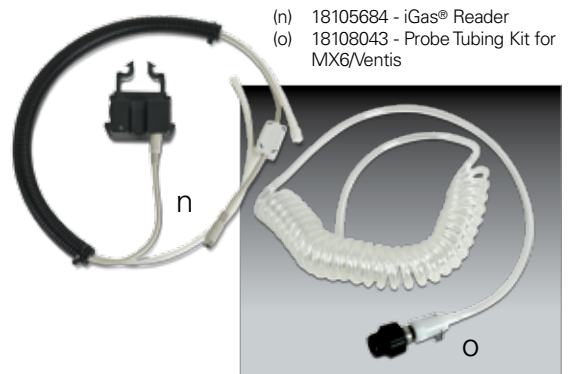
For best results, use only Industrial Scientific calibration equipment for regular instrument calibration and maintenance.



- (l) 17037961 - Carrying Case for 2 Cylinders (58 L)
- (m) 17124348 Wall/Desk Mount Cylinder Holder for use with 34, 58, 116 and 552 liter cylinders. (cylinder not included)

### MISCELLANEOUS CALIBRATION EQUIPMENT

PART NO.	DESCRIPTION
18105684	(n) iGas® Reader
17041807	Calibration Log, (tablet of 50 sheets)
17045873	Calibration Label
17056326	Bump Cylinder Adapter for CO Breath Sampler
17037961	(l) Carrying Case for 2 Cylinders (58/103 L)
18100149	Carrying Case for 2 Cylinders (34 L) w/0.5 LPM Regulator
17154096	Carry Case for 2 Cylinder (116L)
17124348	(m) Wall/Desk Mount Cylinder Holder
17113275	Cylinder Recycling Tool (58L, 103L steel)
17113283	Cylinder Recycling Tool (34L)



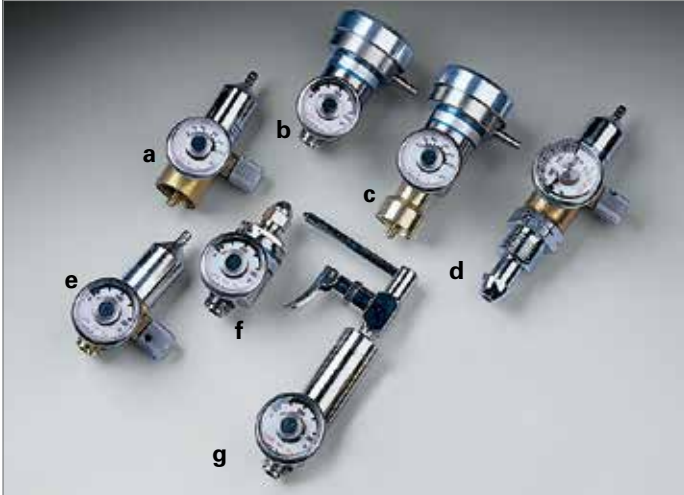
- (n) 18105684 - iGas® Reader
- (o) 18108043 - Probe Tubing Kit for MX6/Ventis

### Universal Teflon Lined Sample Tubing Kit with Dust Filter/Water Stop

PART NO.	LENGTH	PART NO.	LENGTH
18109206-20	6.1 m / 20 ft	18109206-70	21.3 m / 70 ft
18109206-30	9.1 m / 30 ft	18109206-80	24.4 m / 80 ft
18109206-40	12.2 m / 40 ft	18109206-90	27.4 m / 90 ft
18109206-50	15.2 m / 50 ft	18109206-100	30.5 m / 100 ft

NOTE: For use with all sensors

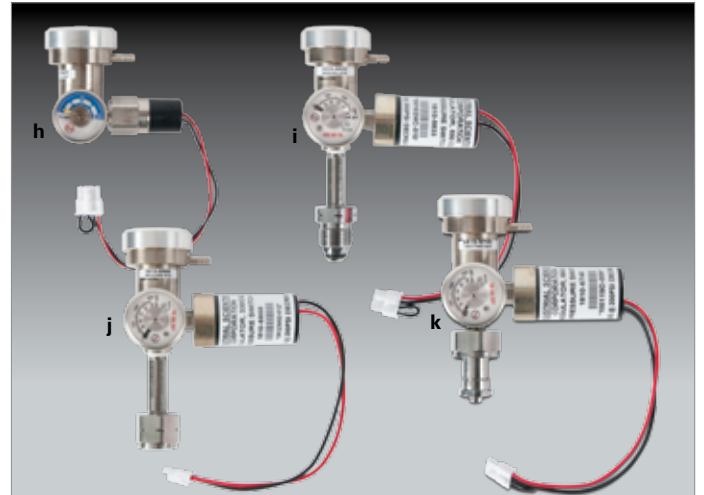
Regulators provide the proper flow rate for calibrating your Industrial Scientific instrument. Always make certain to use the appropriate regulator for the application as recommended in the Instruction Manual.



- (a) 18100933 - 34 L Regulator (1/2 L/min flow)
- (b) 18102509 - 58/103 L Demand Flow Regulator
- (c) 18103564 - 34 L Demand Flow Regulator
- (d) 18102260 - 552 L Regulator (1/2 L/min flow)
- (e) 18100883 - 58/103 L Regulator (1/2 L/min flow)
- (f) 18102155 - 58/103 L Ammonia Regulator
- (g) 18103580 - 58/103 L Bump Test Regulator



MX6 DSX shown with a Demand Flow Regulator (18105841) and cylinder connected to an iGas® Reader (18105684).



- (h) 18105841 - 58/103/34L Demand Flow Regulator w/iGas Pressure Switch
- (i) 18105833 - 552L Demand Flow Regulator, 590 CGA w/iGas Pressure Switch
- (j) 18105858 - 650L Demand Flow Regulator, 330 CGA w/iGas Pressure Switch
- (k) 18106740 - Demand Flow Regulator, 660 CGA w/iGas Pressure Switch



- (l) 18105924 - 5-port Clamp-on Gas Manifold

## REGULATORS

PART NO.	DESCRIPTION
18100933	(a) 34L Regulator (1/2L/min flow)
18102509	(b) 58/103L Demand Flow Regulator (and 34L Aluminum Cylinders)
18103564	(c) 34L Demand Flow Regulator, CGA 600
18103549	552L Demand Flow Regulator, CGA 590
18103556	650L Demand Flow Regulator, CGA 330
18104158	Demand Flow Regulator, CGA 660
18106708	Demand Flow Regulator, CGA 705
18102260	(d) 552L Regulator (1/2 L/min flow), CGA 590
18100883	(e) 58/103L Regulator (and 34L Aluminum Cylinders) (1/2 L/min flow)
18102155	(f) 58/103L Ammonia Regulator (1 L/min flow)
18103580	(g) 58/103L Bump Test Regulator w/Trigger
18103374	650L Regulator (1/2L/min flow), CGA 330
18104695	Regulator w/Bump Test Trigger, CGA 330
18104356	Regulator w/Bump Test Trigger, CGA 590
18105924	5-port Clamp-on Gas Manifold

## DEMAND FLOW REGULATORS

PART NO.	DESCRIPTION
18105841	(h) 58/103/34L Demand Flow Regulator w/iGas 150 PSI Pressure Switch
18109244	(h) 58/103/34L Demand Flow Regulator w/iGas 250 PSI Pressure Switch
18105866	34L Demand Flow Regulator, 600 CGA w/iGas 150 PSI Pressure Switch
18109243	34L Demand Flow Regulator, 600 CGA w/iGas 250 PSI Pressure Switch
18105833	(i) 552L Demand Flow Regulator, 590 CGA w/iGas 200 PSI Pressure Switch
18109241	(i) 552L Demand Flow Regulator, 590 CGA w/iGas 500 PSI Pressure Switch
18105858	(j) 650L Demand Flow Regulator, 330 CGA w/iGas 200 PSI Pressure Switch
18109242	(j) 650L Demand Flow Regulator, 330 CGA w/iGas 500 PSI Pressure Switch
18106740	(k) Demand Flow Regulator, 660 CGA w/iGas 200 PSI Pressure Switch
18109246	(k) Demand Flow Regulator, 660 CGA w/iGas 500 PSI Pressure Switch
18106757	Demand Flow Regulator, 705 CGA w/iGas Pressure Switch
18101766	58/103L Regulator (1 L/min flow)

Calibration gas cylinders from Industrial Scientific are manufactured with the highest quality standards. Each cylinder has NIST-traceable blend techniques and undergoes analytical leak testing. The cylinders include certified component concentrations and have clearly marked lot numbers and expiration dates.



Industrial Scientific's calibration gas cylinders are available in a variety of sizes and concentrations, including convenient multi-gas blends or single gas cylinders.

Use the following chart to order replacement cylinders.

To view a complete listing, visit our online calibration gas cross reference chart at

[www.indsci.com/cal-gas](http://www.indsci.com/cal-gas)

#### DEMAND FLOW REGULATORS

PART NO.	DESCRIPTION	Vol	0.5LPM Regulator	Demand Flow	w/ iGas Pressure Switch
18109173	CYL, 18% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841
18109174	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.5% Methane	103L	18100883	18102509	18105841
18109413	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.5% Methane	625L	18102260	18103549	18105833
18109165	CYL, 100 ppm CO, 18% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841
18109410	CYL, 100 ppm CO, 18% O <sub>2</sub> , 25% LEL Pentane	625L	18102260	18103549	18105833
18109156	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	58L	18100883	18102509	18105841
18109158	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841
18109160	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	650L	18103374	18103556	18105858
18109155	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841
18109157	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841
18109159	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858
18109412	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	625L	18102260	18103549	18105833
18109185	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 2.0% (40% LEL) Methane	58L	18100883	18102509	18105841
18109251	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 2.0% (40% LEL) Methane	116L	18100883	18102509	18105841
18109250	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841
18109232	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841
18109220	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841
18109234	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841
18109233	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858
18109324	CYL, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841
18102151	CYL, 25 ppm Ammonia (NH <sub>3</sub> )	58L	18100883	18102509	18105841
18106658	CYL, 25 ppm Ammonia (NH <sub>3</sub> )	650L	n/a	n/a	18106740
78103868	CYL, 50 ppm Ammonia (NH <sub>3</sub> )	58L	18100883	18102509	18105841
18102913	CYL, 2.5% Carbon Dioxide (CO <sub>2</sub> )	103L	18100883	18102509	18105841
18104208	CYL, 5.0% Carbon Dioxide (CO <sub>2</sub> )	103L	18100883	18102509	18105841
18102230	CYL, 50 ppm Carbon Monoxide (CO)	103L	18100883	18102509	18105841
18102163	CYL, 100 ppm Carbon Monoxide (CO)	103L	18100883	18102509	18105841
18109408	CYL, 100 ppm Carbon Monoxide (CO)	625L	18102260	18103549	18105833
18102302	CYL, 250 ppm Carbon Monoxide (CO)	103L	18100883	18102509	18105841

**NOTE:** Calibration gas cylinder expiration times vary due to gas type. Please contact Industrial Scientific for detailed information.

## CALIBRATION GAS CROSS REFERENCE CHART

PART NO.	DESCRIPTION	Vol	DEMAND FLOW REGULATORS		
			0.5LPM Regulator	Demand Flow	w/ iGas Pressure Switch
18105007	CYL, 10 ppm Chlorine (Cl <sub>2</sub> )	34L	18100883	18102509	18105841
18101758	CYL, 10 ppm Chlorine (Cl <sub>2</sub> )	58L	18100883	18102509	18105841
18109082	CYL, 10 ppm Chlorine (Cl <sub>2</sub> )	116L	18100883	18102509	18105841
18106955	CYL, 10 ppm Chlorine (Cl <sub>2</sub> )	650L	18103374	18103556	18105858
18103481	CYL, 50% LEL Hydrogen (H <sub>2</sub> )	103L	18100883	18102509	18105841
18102154	CYL, 10 ppm Hydrogen Chloride (HCl)	58L	18100883	18102509	18105841
18106963	CYL, 10 ppm Hydrogen Chloride (HCl)	650L	18103374	18103556	18105858
18100859	CYL, 25 ppm Hydrogen Sulfide (H <sub>2</sub> S)	58L	18100883	18102509	18105841
18109078	CYL, 25 ppm Hydrogen Sulfide (H <sub>2</sub> S)	116L	18100883	18102509	18105841
18106633	CYL, 25 ppm Hydrogen Sulfide (H <sub>2</sub> S)	650L	18103374	18103556	18105858
18108670	CYL, 50 ppm Hydrogen Sulfide (H <sub>2</sub> S)	58L	18100883	18102509	18105841
18102152	CYL, 10 ppm Hydrogen Cyanide (HCN)	58L	18100883	18102509	18105841
18105809	CYL, 10 ppm Isobutylene	103L	18100883	18102509	18105841
18102939	CYL, 100 ppm Isobutylene	103L	18100883	18102509	18105841
18109407	CYL, 100 ppm Isobutylene	625L	18102260	18103549	18105833
18101378	CYL, 2.5% Methane (CH <sub>4</sub> )	103L	18100883	18102509	18105841
18106252	CYL, 10 ppm Nitrogen Dioxide (NO <sub>2</sub> )	58L	18100883	18102509	18105841
18101477	CYL, 25 ppm Nitrogen Dioxide (NO <sub>2</sub> )	58L	18100883	18102509	18105841
18101220	CYL, 10 ppm Sulfur Dioxide (SO <sub>2</sub> )	58L	18100883	18102509	18105841
18109079	CYL, 10 ppm Sulfur Dioxide (SO <sub>2</sub> )	116L	18100883	18102509	18105841
18105817	CYL, 10 ppm Sulfur Dioxide (SO <sub>2</sub> )	650L	n/a	n/a	18106740
18102222	CYL, 5 ppm Sulfur Dioxide (SO <sub>2</sub> )	58L	18100883	18102509	18105841
18101584	CYL, Zero Grade Air (20.9% Oxygen)	103L	18100883	18102509	18105841
18109409	CYL, Zero Grade Air (20.9% Oxygen)	625L	18102260	18103549	18105833

**STOP WORRYING ABOUT CALIBRATION GAS.**

The optional auto replenishment program provides an efficient way to manage your calibration gas usage and needs. New cylinders will be shipped to you when you need them.

**NOTE:** Calibration gas cylinder expiration times vary due to gas type. Please contact Industrial Scientific for detailed information.

Industrial Scientific provides more than just the highest quality gas detection instruments and accessories. We also offer rental and convenient maintenance and repair solutions. Our ongoing commitment to customers is to provide them reliable gas detection equipment that is consistently prepared to keep workers safer in potentially hazardous environments.

## RENTAL

Industrial Scientific's rental service is ideal for customers who need gas detection equipment for short-term situations such as turnarounds, outages, special projects, emergencies, and more. Several Industrial Scientific instruments are available for rent with flexible rental period options ranging from weeks, to months, to longer term.

### Gas detectors arrive ready to use ...

- Guaranteed reliable out of the box
- Fully inspected
- Certified calibrated to NIST standards
- Chargers are supplied at no cost with all rechargeable gas monitors

There are many advantages for customers to rent from Industrial Scientific. As an iNet customer, you are eligible for additional rental benefits as well. This is Industrial Scientific's way of ensuring that you have the complete package when it comes to your gas detections needs.

### Here are just some of the features and benefits to our rental program:

- Fast Service – Most orders can ship the same day the order is placed.
- Factory Serviced – Each gas detector was serviced and calibrated by factory trained technicians to NIST traceable gas.
- Pre-Paid Return Shipping – Free FedEx shipping labels are included with each order to expedite returns and save on shipping costs.



- Availability – Over 5,000 portable gas detection products are available including the MX6 iBrid, Ventis MX4, Ventis Pro Series, Radius BZ1, GasBadge Pro, and Tango TX1 monitors. Docking stations and other accessories are available as well.
- Variety – From multi-gas monitors with integral pumps for confined space entry to single gas personal monitors, we have a wide variety of gas monitor types and sensors to fit your application.
- Flexibility – Both weekly and monthly rates are available to fit your short-term rental need.

### As an iNet customer, you automatically receive these additional features and benefits:

- As an iNet customer, you will receive a discount off the regularly published rental rates
- ISC Rental Tag – "ISC Rental" will appear in the "User" field on your iNet Control software which will make it easy to distinguish the rental units from your existing iNet fleet monitors – therefore increasing organization.
- Monitoring Service – The rental equipment is monitored by iNet. The reporting and alerting features of iNet will also give you in-depth visibility into the usage of your rental equipment like it does with your existing iNet fleet.
- Exchange Service – When iNet detects an instrument failure, an exchange monitor is sent out immediately to replace the monitor that failed. Since the rental units will be monitored by iNet, customers will no longer need to worry about servicing their rental monitors as well.
- Customized Settings – We pre-set the alarm and display settings of the rental units to match your custom settings within your existing iNet fleet. This will save you time in the set-up process and help to ensure that the monitors are compliant to your company's recommendations.

To learn more, email: [rental@indsci.com](mailto:rental@indsci.com)  
or visit [www.indsci.com/rental/](http://www.indsci.com/rental/)

## SERVICE OPTIONS

### REPAIR SOLUTIONS

Industrial Scientific designs and manufactures the highest quality gas detection equipment in the industry. To ensure your instruments remain at their highest quality over time, Industrial Scientific provides preventive maintenance and repair solutions through its mobile service programs and regional service centers.



### MAINTENANCE SOLUTIONS

Industrial Scientific's products are manufactured to provide unparalleled reliability and designed to be simple for the user to maintain. With Industrial Scientific's docking station solutions and extended warranty program, you can be sure your equipment is maintained to factory standards and is consistently in optimum working condition.



Does your instrument need repair go to our service-repair form to start the process.

[www.indsci.com/services/repair/](http://www.indsci.com/services/repair/)

### START-UP AND COMMISSIONING SERVICES SOLUTIONS

- Docking station set up and software installation
- Employee instruction

The same company that manufactures your quality gas detection equipment can provide commissioning services. Industrial Scientific's Start-up and Commissioning Services will quickly have your gas detection program up and running while eliminating the need for you to reassign employees or search for specialized technicians to perform commissioning procedures. Our expertly trained technicians ensure that your systems are installed correctly and in proper operating order; we even provide the necessary training so that employees are never left guessing about proper maintenance tasks. Our Commissioning Services are easily customized to your company's specific needs, giving you the flexibility to create a program that works with your employees, resources and budget.

With Commissioning Services for the DSX™ Docking Station, customers receive:

- All hardware installations and connections
- Operational testing
- Basic end-user training

Contact your local distributor or Industrial Scientific for a customized quote for your specific start-up and commissioning needs.



*"The main objective of our Training Department is to provide a complete, expedient program that allows you to increase your safety awareness.*

*We work with you to develop a plan that corresponds to your specific needs. Our specialists will be happy to meet with you and guide you through the training process with a program that far exceeds your expectations."*



### TRAINING SERVICES:

How does an electrochemical sensor work? What do I need to know if I work with toxic gases? How will new regulations impact my daily activities? How can proper maintenance make it easier to use my instruments and save money? Industrial Scientific's training department can answer all of these questions, and more.

Industrial Scientific holds training workshops designed specifically to make gas detection easier for its users. The courses are led by a team of Industrial Scientific trainers who are experts in instrument use, regulations, fire prevention, hazardous materials and confined spaces.

These workshops provide participants the skills needed to identify potential hazards that may exist in their workplace including the characteristics of gases. The calibration and maintenance of gas detection equipment are also covered.

#### Whom are these courses designed for?

- Safety and health professionals
- Firefighters and emergency responders
- Contractors

### FACE TO FACE TRAINING:

#### GAS DETECTION MADE EASY PROGRAM:

Whether you are a novice or have years of gas detection experience, GDME training courses are for you. Instruments from Industrial Scientific are provided to participants for use during the training sessions.

#### Hazardous gases

Instruction in commonly used gases, their properties and effects; Overview of gases specific to confined spaces and hazards related to oxygen and to combustible and toxic gases.

#### Use of instruments in confined spaces

Overview of applicable laws; Instruction in the use of gas detection instruments in compliance with government regulations.

#### Sensor technology

Instruction on how the instruments work; Description of catalytic bead sensors, electrochemical sensors, infrared sensors, and more.

#### Presentation of the instruments

Overview of the entire range of Industrial Scientific's portable instruments and docking stations; Description of each monitor's set of features.

#### Calibration and maintenance

Instruction in all aspects of calibration and maintenance – the most important component of a safe, reliable gas detection program; Provides the knowledge and skills needed to manage your instruments including troubleshooting and sensor replacement.

#### Hands-on activities

Learning by doing – Conduct instrument testing and calibration using instruments provided in the training or using your own Industrial Scientific monitors; Participants in our Gas Detection Made Easy™ courses have the opportunity to receive a certificate of qualification, required by certain regulatory standards and earned by passing the course exam.





## COURSE OFFERINGS

Participants in our Gas Detection Made Easy™ courses have the opportunity to receive a certificate of competency. More than just a certificate of your attendance, you must pass a test to earn this "Certificate of Competency" required by certain regulatory standards.

### End User Training Classes

- Portable Instrument Operations Level Training
- Portable Instrument Technician Level Training
- iNet Control Training
- Confined Space Metering Training
- Gas Detection for the First Responder
- On-site Custom Courses
- T3 - Train the Trainer

### Distributor Training Classes

- Distributor Basic Training
- Distributor Portable Instrument Sales Training
- Distributor Fixed Instrument Sales Training

Visit [www.indsci.com/training](http://www.indsci.com/training) to learn more.

PART NO.	DESCRIPTION
17046848	Confined Space Booklet (English)
16000029	Gas Detection Made Easy™ (Class Book)

### ONLINE TRAINING

Our online training courses transform the classroom experience into an online format. These courses combine videos, lectures and recommended readings in practical modules that can be accessed 24/7. This format allows students to learn at their own pace. Visit [www.indsci.com/online-training/](http://www.indsci.com/online-training/) to learn more.

The current list of products covered by our online training is as follows:

DS2 Docking Station	GasBadge Pro
iNet Control	Radius BZ1
DSX Docking Station	Ventis Pro Series
MX4 iQuad	Ventis MX4
MX6 iBrid	Tango TX1



### ONLINE VIDEO TRAINING

Industrial Scientific's Free Online Video Training allows the end user to learn at their own pace. Videos are chaptered so that the end user can hone in on the elements that are important to them.

ATX612 (English)	ATX620 (English)
LTX312 (English)	iTX (English)
M40 (English)	M40 (Francais)
M40 (Espanol)	MG140 (English)
MX6 iBrid (English)	MX6 iBrid (Francais)
MX6 iBrid (Espanol)	Ventis MX4 (English)
Ventis MX4 (French)	Ventis MX4 (Spanish)
Ventis MX4 (German)	Ventis MX4 (Chinese)
Ventis MX4 (Portuguese)	Ventis Pro Series (English)
MX4 iQuad (English)	MX4 iQuad (Francais)
MX4 iQuad (Deutsch)	MX4 iQuad (Espanol)
MX4 iQuad (Chinese)	T40 Rattler (English)
TMX412 (English)	Radius BZ1

### GENERAL GAS EDUCATION

Get to know the basics of gas detection. Review detailed information about toxic gas hazards, sensor technologies and reference materials.



Each day, Industrial Scientific Corporation receives hundreds of phone calls requesting information on everything from exposure limits to the definition of intrinsic safety. Remember, anytime you have a question involving monitoring or safety, simply call 00800 - WORKSAFE (00800 - 96757233) or visit our website at [www.indsci.com](http://www.indsci.com).

## GLOSSARY OF OCCUPATIONAL SAFETY AND HEALTH TERMS

**dB: Decibel** – A unit used to measure the relative power of sound. A 3 dB increase in sound output power represents a doubling of the perceptible volume.

**eV: Electron Volt** – A measurement of energy equal to the amount of energy it takes to move 1 electron through 1 volt of potential.

**IDLH: Immediately Dangerous to Life and Health** – The maximum concentration of gas (in ppm) from which a worker could escape within 30 minutes without experiencing any escape-impairing or irreversible health effects.

**LEL/LFL: Lower Explosive Limit/Lower Flammable Limit** – The minimum concentration at which a gas will explode. A common unit of measurement is a percent of the LEL.

**mA: Milliamp** – A unit of electric current expressed in amperes. 4-20 mA signals are commonly used analog signals in industrial electronics, where 4 represents the lowest value, for instance 0 ppm, and 20 represents the maximum, for instance, 999 ppm.

**PEL: Permissible Exposure Limit** – Level of gas (in ppm) a worker can be exposed to 8 hours a day/40 hours a week for the rest of their life with no long term health effects.

**PID: Photolization Detector** – An instrument that utilizes ultra-violet light energy to ionize and detect the presence of an unknown gas or vapor.

Our customer service representatives helped us pull together a library of the questions we're asked most often. Use this section as a quick reference when you have a question. And, if you don't find your answer here, give us a call. There's never a charge for a question.

**ppm: Part Per Million** – A common unit of measurement for toxic gases. This term literally means one part out of one million possible parts.

**TLV-STEL: Short Term Exposure Limit** – The average amount of gas (in ppm) a worker can be exposed to in a 15 minute period with no long term health effects. This may occur 4 times a shift with one hour between 15 minute exposures.

**TLV-TWA: Time Weighted Average** – The average amount of gas (in ppm) a worker can be exposed to over a certain time period. This time is defined as 8 hours to represent a normal work day.

**TLV: Threshold Limit Value** – A term used to signify limits in gas exposure. TLV is used as a prefix for TWA and STEL.

**UEL/UFL: Upper Explosive Limit/Upper Flammable Limit** – The maximum concentration at which a gas will explode.

**VAC: Volts Alternating Current** – An electric current that reverses direction at regular intervals.

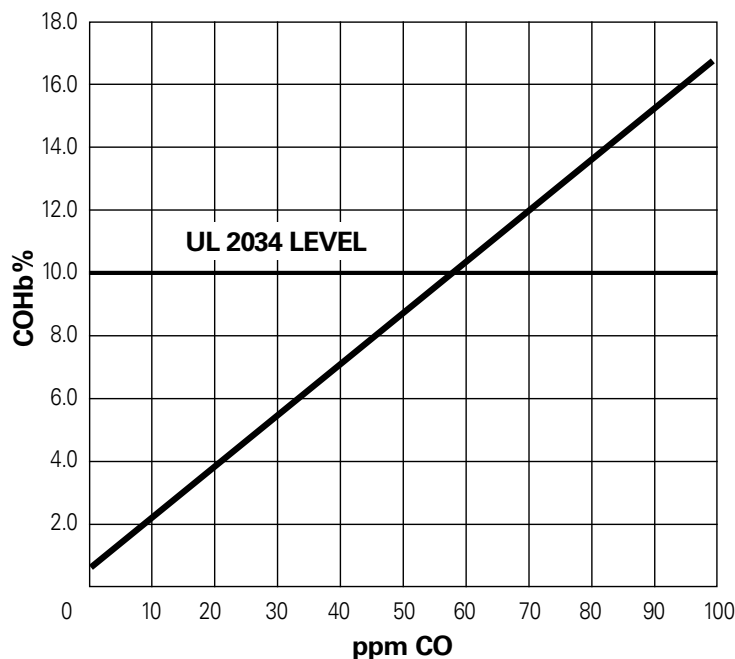
**VDC: Volts Direct Current** – An electric current of constant direction.

**VOC: Volatile Organic Compound** – Any compound containing carbon, except methane, that can be readily vaporized.

## LOWER EXPLOSIVE LIMITS OF COMBUSTIBLE GASES

The following are the lower explosive limits of selected gases which should be useful:

Acetone	2.5% of volume	Hydrogen	4.0% of volume
Acetylene	2.5% of volume	Isopropyl Alcohol (Isopropanol)	2.0% of volume
Benzene	1.2% of volume	Methane	5.0% of volume
Butane	1.9% of volume	Methyl Alcohol (Methanol)	6.0% of volume
Butyl Alcohol (Butanol)	1.4% of volume	Methyl Ethyl Ketone	1.4% of volume
Diethyl Ether	1.9% of volume	n-Pentane	1.4% of volume
Ethane	3.0% of volume	Propane	2.1% of volume
Ethyl Alcohol (Ethanol)	3.3% of volume	Propylene	2.0% of volume
Ethylene	2.7% of volume	Styrene	0.9% of volume
Ethylene Oxide	2.7% of volume	Toluene	1.1% of volume
Hexane	1.1% of volume	Xylene	1.1% of volume



The carboxyhemoglobin level is a measure of the amount of Carbon Monoxide which has been absorbed into the blood stream. The chart converts the amount of Carbon Monoxide measured in the exhaled breath to the percentage carboxyhemoglobin level in the blood. The UL 2034 level (10% carboxyhemoglobin) depicted on the chart shows the average carboxyhemoglobin concentration after a fifteen minute exposure to 400 ppm Carbon Monoxide. At this exposure level, the average person will begin to experience the symptoms of Carbon Monoxide poisoning.

## WEIGHT OF VARIOUS GASES COMPARED TO AIR

### The following gases are lighter than air:

Acetylene	Ammonia
Carbon Monoxide	Ethylene
Hydrogen	Hydrogen Cyanide
Methane	

### The following gases are heavier than air:

Argon	Butane
Carbon Dioxide	Chlorine
Ethane	Hexane
Hydrogen Chloride	Hydrogen Sulfide
Methyl Ethyl Ketone	Methyl Mercaptan
Nitrogen Dioxide	Nitrous Oxide
Oxygen	Phosphine
Sulfur Dioxide	Propane

## INTRINSIC SAFETY

### What is intrinsic safety?

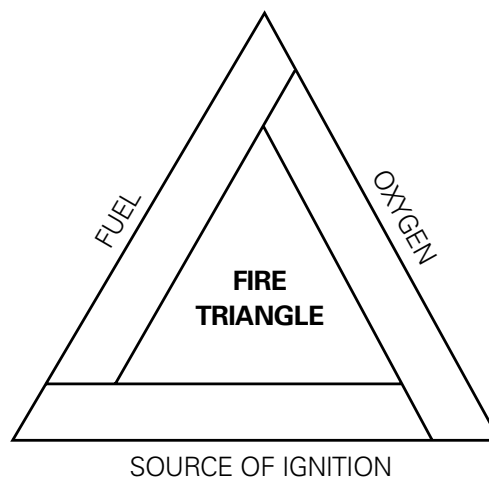
Intrinsic safety is a design technique applied to electrical equipment and wiring for hazardous locations. The technique is based on limiting energy, electrical and thermal, to a level below that required to ignite a specific hazardous atmospheric mixture.

### How is intrinsic safety defined?

Intrinsically safe equipment and wiring shall not be capable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a flammable or combustible atmospheric mixture in its most easily ignitable concentration.

### Who verifies intrinsic safety?

Equipment is tested and certified for intrinsic safety by independent third party agencies, such as Underwriters Laboratories (UL), Canadian Standards Association (CSA), Factory Mutual Research Corporation (FM) and the Mine Safety and Health Administration (MSHA). Independent testing ensures that your gas monitoring equipment is not only designed to be intrinsically safe, but meets all required standards for intrinsic safety.



Ref: R. Stahl – Intrinsic Safety Primer ©1988

### National Electrical Code Article 504-2 Definition of an Intrinsically Safe Circuit © 1996

A circuit in which any spark or thermal effect is incapable of causing ignition of a flammable or combustible material in air under prescribed test conditions.

## LEL CORRELATION FACTORS

The following chart outlines LEL correlation factors for combustible gas sensors.

## CALIBRATION GAS

	CALIBRATION GAS							
	Acetone	Acetylene	Butane	Hexane	Hydrogen	Methane	Pentane	Propane
Acetone	1.0	1.3	1.0	0.7	1.7	1.7	0.9	1.1
Acetylene	0.8	1.0	0.7	0.6	1.3	1.3	0.7	0.8
Ammonia	0.5	0.7	0.5	0.4	0.9	0.8	0.4	0.5
Benzene	1.1	1.5	1.1	0.8	1.9	1.9	1.0	1.2
Butane	1.0	1.4	1.0	0.8	1.8	1.7	0.9	1.1
Ethane	0.8	1.0	0.8	0.6	1.3	1.3	0.7	0.8
Ethanol	0.9	1.1	0.8	0.6	1.5	1.5	0.8	0.9
Ethylene	0.8	1.1	0.8	0.6	1.4	1.3	0.7	0.9
Hexane	1.4	1.8	1.3	1.0	2.4	2.3	1.2	1.4
Hydrogen	0.6	0.8	0.6	0.4	1.0	1.0	0.5	0.6
Isopropanol	1.2	1.5	1.1	0.9	2.0	1.9	1.0	1.2
Methane	0.6	0.8	0.6	0.4	1.0	1.0	0.5	0.6
Methanol	0.6	0.8	0.6	0.5	1.1	1.1	0.6	0.7
Pentane	1.2	1.5	1.1	0.9	2.0	1.9	1.0	1.2
Propane	1.0	1.2	0.9	0.7	1.6	1.3	0.8	1.0
Styrene**	1.3	1.7	1.3	1.0	2.2	2.2	1.1	1.4
Toluene	1.3	1.6	1.2	0.9	2.1	2.1	1.1	1.3
Xylene	1.5	2.0	1.5	1.1	2.6	2.5	1.3	1.6
JP-4							1.2	
JP-5							0.9	
JP-8							1.5	

Example:

The instrument has been calibrated on methane and is now reading 10% LEL in a pentane atmosphere. To find actual % LEL pentane, please multiply by the number found at the intersection of the methane column (calibration gas) and the pentane row (gas being sampled) ... in this case, 1.9. Therefore, the actual % LEL pentane is 19% (10 x 1.9).

\* Calibration gases available from Industrial Scientific.

\*\* Values shown are theoretical and have not been verified through calibration gas testing.

## SENSOR CROSS INTERFERENCE TABLE

		SENSOR											
		Carbon Monoxide	Hydrogen Sulfide	Sulfur Dioxide	Nitrogen Dioxide	Chlorine	Chlorine Dioxide	Hydrogen Cyanide	Hydrogen Chloride	Phosphine	Nitric Oxide	Hydrogen	Ammonia
GAS	Carbon Monoxide	100	1	1	0	0	0	0	0	0	0	20	0
	Hydrogen Sulfide	5	100	1	-40	-3	-25	10	300	25	10	20	25
	Sulfur Dioxide	0	5	100	0	0	0	—	40	—	0	0	-40
	Nitrogen Dioxide	-5	-25	-165	100	45	—	-70	—	—	30	0	-10
	Chlorine	-10	-20	-25	10	100	60	-20	6	-20	0	0	-50
	Chlorine Dioxide	—	—	—	—	20	100	—	—	—	—	—	—
	Hydrogen Cyanide	15	10	50	1	0	0	100	35	1	0	30	5
	Hydrogen Chloride	3	0	5	0	2	0	0	100	0	15	0	0
	Phosphine	—	—	—	—	—	-100	425	300	100	—	—	—
	Nitric Oxide	25	1	1	5	—	—	-5	—	—	100	30	0
	Hydrogen	22	0.03	0.5	0	0	0	0	0	0	0	100	0
	Ammonia	0	0	0	0	0	0	0	0	0	0	0	100
	Acetylene	150	<1	15	<1	—	—	—	—	—	<1	—	—

The table above reflects the percentage response provided by the sensor listed across the top of the chart when exposed to a known concentration of the target gas listed in the left hand column. Note: This table is given as a guide only and is subject to change.

— No data available

## COMMON CHEMICAL NAMES AND SYMBOLS

Ammonia	NH <sub>3</sub>	Hydrogen Fluoride	HF
Arsine	AsH <sub>3</sub>	Hydrogen Sulfide	H <sub>2</sub> S
Benzene	C <sub>6</sub> H <sub>6</sub>	Methane	CH <sub>4</sub>
Bromine	Br <sub>2</sub>	Nitric Acid	HNO <sub>3</sub>
Carbon Dioxide	CO <sub>2</sub>	Nitric Oxide	NO
Carbon Monoxide	CO	Nitrogen	N <sub>2</sub>
Chlorine	Cl <sub>2</sub>	Nitrogen Dioxide	NO <sub>2</sub>
Chlorine Dioxide	ClO <sub>2</sub>	Oxygen	O <sub>2</sub>
Ethylene Oxide	ETO	Ozone	O <sub>3</sub>
Fluorine	F <sub>2</sub>	Phosgene	COCl <sub>2</sub>
Hydrogen	H <sub>2</sub>	Phosphine	PH <sub>3</sub>
Hydrogen Bromide	HBr	Silane	SiH <sub>4</sub>
Hydrogen Chloride	HCl	Sulfur Dioxide	SO <sub>2</sub>
Hydrogen Cyanide	HCN	Sulfuric Acid	H <sub>2</sub> SO <sub>4</sub>

## HAZARDOUS GASES FOUND IN COMMON INDUSTRIAL ENVIRONMENTS

(All values listed are established by HSE unless otherwise noted.)

### Ammonia: NH<sub>3</sub>

*Colorless toxic gas with a pungent suffocating odor*

PEL/TWA: 25.0 ppm                      STEL: 35.0 ppm  
IDLH: 300.0 ppm                      LEL: 15.0% of volume

- Fertilizer Plants
- Water and Wastewater Treatment Plants
- Refrigeration Facilities and Cold Storage
- Semiconductor Industry

### Carbon Dioxide: CO<sub>2</sub>

*Colorless, odorless gas*

PEL/TWA: 5,000.0 ppm                      STEL: 15,000.0 ppm  
IDLH: 40,000.0 ppm

- Breweries and Wineries
- Carbonated Beverage Bottling Plants
- Food Processing Plants
- Landfills

### Carbon Monoxide: CO

*Colorless, odorless gas – most abundant toxic gas*

PEL/TWA: 30.0 ppm                      STEL: 200.0 ppm  
IDLH: 1,200.0 ppm                      LEL: 12.5% of volume

- Fire Fighting
- Steel Mills
- Mining and Minerals
- Parking Garages

### Chlorine: Cl<sub>2</sub>

*Green-yellow gas with a pungent, irritating odor*

PEL/TWA: 0.5 ppm                      STEL: 0.5 ppm  
IDLH: 30.0 ppm

- Pulp and Paper Mills
- Water Treatment Plants
- Swimming Pools and Chlorination Plants
- Nuclear Reactors

### Chlorine Dioxide: ClO<sub>2</sub>

*Red-yellow or orange-green, irritating odor*

PEL/TWA: 0.1 ppm                      STEL: 0.3 ppm  
IDLH: 5.0 ppm

- Pulp and Paper Mills
- Wastewater Treatment Plants

### Hydrogen: H<sub>2</sub>

*Colorless, odorless gas*

PEL/TWA: No limit set by OSHA                      STEL: N/A  
IDLH: No limit set by NIOSH                      LEL: 4% by volume

- Chemical Manufacturing
- HazMat Operations
- Power Generation

### Hydrogen Chloride: HCl

*Colorless to slight yellow corrosive gas with a pungent, irritating odor*

PEL/TWA: 1.0 ppm                      STEL: 5.0  
LEL: 12.5% of volume                      IDLH: 50.0 ppm

- Vinyl Production
- Cotton Production
- Petroleum and Gas Wells
- Steel Manufacturing

### Hydrogen Cyanide: HCN

*Colorless toxic gas with a bitter, almond-like odor*

PEL/TWA: N/A                      STEL: 10.0 ppm  
IDLH: 50.0 ppm                      LEL: 5.6% of volume

- Gold Plating Industries
- Precious Metal Mining and Recovery
- Nylon Manufacturing

### Hydrogen Sulfide: H<sub>2</sub>S

*Colorless toxic gas with a strong odor of rotten eggs*

PEL/TWA: 5.0 ppm                      STEL: 10.0 ppm  
IDLH: 100.0 ppm                      LEL: 4.0% of volume

- Oil Fields and Refineries
- Mining and Metals Industries
- Paper Mills and Leather Tanneries
- Water Treatment and Sewer Maintenance

### Nitric Oxide: NO

*Colorless toxic gas*

PEL/TWA: 100.0 ppm                      STEL: N/A  
IDLH: 100.0 ppm

- Diesel Emissions
- Underground Mining
- Agriculture – Silos
- Semiconductor Plants

### Nitrogen Dioxide: NO<sub>2</sub>

*Reddish-brown toxic gas with a pungent odor*

PEL/TWA: 3.0 ppm                      STEL: 5.0 ppm  
IDLH: 20.0 ppm

- Boilers and Furnaces
- Diesel Emissions
- Underground Mining
- Semiconductor Plants

### Ozone: O<sub>3</sub>

*Colorless, blue gas with a very pungent odor*

PEL/TWA: N/A                      STEL: 0.2 ppm  
IDLH: 5.0 ppm

- Wastewater Treatment Plants
- Power Generation
- Welding

### Phosphine: PH<sub>3</sub>

*Colorless gas, garlic-like odor*

PEL/TWA: 0.1 ppm                      STEL: 0.2 ppm  
IDLH: 5.0 ppm                      LEL: 1.79% of volume

- Pesticides-Agricultural Fumigant
- Doping Agent

### Sulfur Dioxide: SO<sub>2</sub>

*Colorless toxic gas with a pungent odor*

PEL/TWA: 2.0 ppm                      STEL: 5.0 ppm  
IDLH: 100.0 ppm

- Pulp and Paper Mills
- Coal Fired Generation Stations
- Water Treatment
- Circuit Board (Etching) Industry

## GAS HAZARDS BY INDUSTRY

## HAZARDOUS GAS

INDUSTRY	HAZARDOUS GAS																
	Combustible Gases	O <sub>2</sub> Deficient /Enrichment	Ammonia (NH <sub>3</sub> )	Carbon Dioxide (CO <sub>2</sub> )	Carbon Monoxide (CO)	Chlorine (Cl <sub>2</sub> )	Chlorine Dioxide (ClO <sub>2</sub> )	Hydrogen (H <sub>2</sub> )	Hydrogen Chloride (HCl)	Hydrogen Cyanide (HCN)	Hydrogen Sulfide (H <sub>2</sub> S)	Nitric Oxide (NO)	Nitrogen Dioxide (NO <sub>2</sub> )	Ozone (O <sub>3</sub> )	Phosphine (PH <sub>3</sub> )	Sulfur Dioxide (SO <sub>2</sub> )	Volatile Organic Compounds (VOCs)
AGRICULTURE	•	•	•	•	•						•	•	•		•		
AVIATION	•	•		•	•												
CHEMICAL	•	•	•		•	•		•	•		•	•	•			•	
CONSTRUCTION	•	•			•						•	•	•				
ELECTRIC UTILITIES	•	•			•						•			•		•	
FIRE SERVICE	•	•		•						•	•						
FOOD & BEVERAGE PROCESSING	•	•	•	•	•				•	•	•				•		
GAS UTILITIES	•	•			•						•						
HazMat	•	•	•		•	•		•	•	•	•				•	•	
IRON & STEEL PRODUCTION	•	•			•					•	•	•	•			•	
MANUFACTURING	•				•				•								
MARINE SHIPYARD	•	•		•	•						•						
MINING	•	•		•	•					•	•	•	•				
OIL & GAS PRODUCTION	•	•	•		•						•						
PETROCHEMICAL	•	•	•		•						•						
PAPER & PULP	•	•			•	•	•				•					•	
PHARMACEUTICAL /RESEARCH LABS	•	•	•			•			•		•					•	
POWER PLANTS	•	•			•			•			•					•	
PUBLIC WORKS	•	•			•						•	•	•	•		•	
WATER /WASTEWATER TREATMENT	•	•	•		•	•					•			•		•	•
WELDING	•	•			•				•			•	•	•			

## VOLATILE ORGANIC COMPOUNDS DETECTED BY A PID&lt;10.6 eV

**10.6 eV lamp**

Acetaldehyde  
(Acetic acid)  
Acetic anhydride  
Acetone  
Acrolein  
Acrylamide  
Allyl alcohol  
Allyl chloride  
Allyl glycidyl ether  
Allyl propyl disulfide  
Amino pyridine  
Amyl acetate  
Aniline  
Benzene  
Benzyl chloride  
Bromoform  
Butadiene  
Butoxyethanol  
Butyl acetate  
Butyl alcohol  
Butyl mercaptan  
Butylamine  
Butyl glycidyl ether  
Butyl toluene  
Camphor vapor  
Carbon disulfide  
Chloroacetaldehyde  
Chloroacetophenone  
Chlorobenzene  
Chloromethyl methyl ether  
Chloronitropropane  
Chloroprene  
Chrysene  
Cresol  
Crotonaldehyde  
Cumene  
Cyclohexane  
Cyclohexanol  
Cyclohexanone  
Cyclohexene  
Cyclopentadiene  
Di-ethylhexyl phthalate  
Diacetone alcohol  
Diazomethane  
Dibutylphthalate  
Dichlorobenzene  
Dichloro ethyl ether  
Dichloroethylene  
Dichlorvos  
Diesel  
Diethylamino ethanol  
Diethylamine  
Diglycidyl ether  
Diisobutyl ketone  
Diisopropylamine

Dimethylamine  
Dimethylaniline  
Dimethylformamide  
Dimethylhydrazine  
Dimethyloacetamide  
Dimethylphthalate  
Dinitrotoluene  
Dinitro cresol  
Dinitro aniline  
Dinitro benzene  
Dioxane  
Diphenyl  
Dipropylene glycol methyl ether  
(Epichlorohydrin)  
(Ethanol)  
Ethanolamine  
Ethoxyethyl acetate  
Ethyl acetate  
Ethyl acrylate  
Ethyl amyl ketone  
Ethyl benzene  
Ethyl bromide  
Ethyl butyl ketone  
Ethyl ether  
Ethyl mercaptan  
Ethyl silicate  
Ethylamine  
Ethylene dibromide  
Ethylenediamine  
Ethyleneimine  
Furfural  
Furfuryl alcohol  
Gasoline  
Glycidol  
Heptane  
Hexane  
Hexanone  
Hexone  
Hexylacetate  
Hydroquinone  
Isoamyl acetate  
Isobutyl acetate  
Isobutyl alcohol  
Isophorone  
Isopropyl acetate  
Isopropyl alcohol  
Isopropyl ether  
Isopropylamine  
Isopropyl glycidyl ether  
JP 4, 6, 8  
Ketene  
Mesityl oxide  
Methyl acetate  
Methyl acetylene  
Methyl acrylate  
Methyl amyl ketone

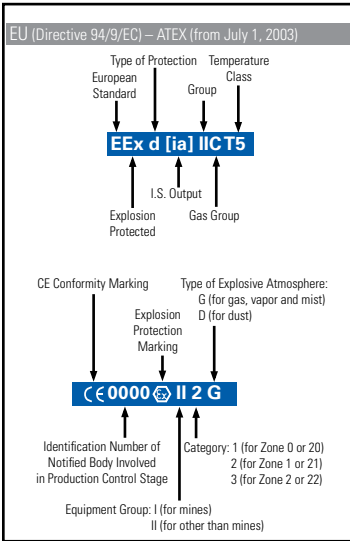
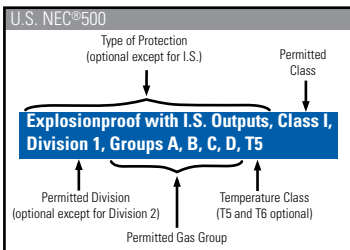
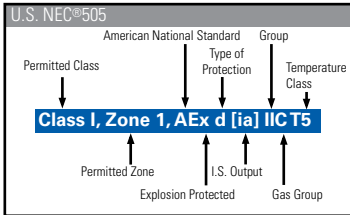
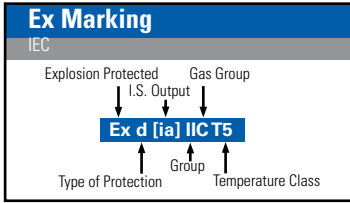
Methyl bromide  
Methyl cellosolve acetate  
Methyl ethyl ketone  
Methyl hydrazine  
Methyl iodide  
Methyl mercaptan  
Methyl methacrylate  
Methyl styrene  
Methylamine  
Methylcyclohexane  
Methylcyclohexone  
Methylcyclohexanol  
Monomethylaniline  
Morpholine  
Naphthalene  
Naphthylamine  
Nitroaniline  
Nitrobenzene  
Nitromethane  
Nitrosodimethylamine  
Nitrotoluene  
Octane  
Pentaborane  
Pentane  
Pentanone  
Perchloroethylene  
Phenol  
Phenyl ether  
Phenylene diamine  
Phenylhydrazine  
Propyl acetate  
Propyl alcohol  
Propylene dichloride  
Propylene imine  
Propylene oxide  
Pyridine  
Quinone  
Stibine  
Stoddard solvent vapor  
Styrene  
Terphenyls  
Tetrachloroethylene  
Tetrachloronaphthelene  
Tetrahydrofuran  
Tetramethyl lead  
Toluene  
Toluidine  
Toner fluid vapor  
Trichloroethylene  
Triethylamine  
Turpentine vapor  
Vinyl chloride  
Vinyl toluene  
White spirit  
Xylene

**Not Detected by a PID**

Acetonitrile  
Carbon dioxide  
Carbon monoxide  
Ethane  
Freons  
Hydrogen  
Hydrogen bromide  
Hydrogen chloride  
Hydrogen cyanide  
Hydrogen fluoride  
Methane  
Nitric acid  
Nitrogen  
Oxygen  
Ozone  
Sulfur dioxide  
Water



# GUIDE TO HAZARDOUS LOCATIONS



### Types of Protection

Type of Protection	Code	Permitted Use	Standard	Protection Principle
<b>Increased Safety</b>	AEx e	Class I, Zone 1	FM 3600 (ISA 12.16.01 *)	No arcs, sparks or hot surfaces
	EEx e	Zone 1	EN 50 019 (until July 2006) or EN 60079-7	
	Ex e	Zone 1	IEC 60079-7	
<b>Non-Incendive (NI)</b>	(NI)	Class I, Div 2	FM 3611	Contain the explosion and extinguish the flame
<b>Non-Sparking</b>	AEx nA	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nA	Zone 2	EN 50 021	
<b>Explosionproof</b>	Ex nA	Zone 2	IEC 60079-15	Limit energy of sparks and surface temperature
	(XP)	Class I, Div 1	FM 3615	
	<b>Flameproof</b>	AEx d	Class I, Zone 1	
<b>Powder-Filled</b>	EEx d	Zone 1	EN 50 018	Keep flammable gas out
	Ex d	Zone 1	IEC 60079-1	
	AEx q	Class I, Zone 1	FM 3600 (ISA 12.25.01 *)	
<b>Enclosed Break</b>	EEx q	Zone 1	EN 50 017	Keep flammable gas out
	Ex q	Zone 1	IEC 60079-5	
	AEx nC	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
<b>Intrinsic Safety (IS)</b>	EEx nC	Zone 2	EN 50 021	Keep flammable gas out
	Ex nC	Zone 2	IEC 60079-15	
	AEx ia	Class I, Div 1	FM 3610†	
<b>Limited Energy</b>	AEx ib	Class I, Zone 0	FM 3610†	Limit energy of sparks and surface temperature
	EEx ia	Class I, Zone 1	FM 3610†	
	EEx ib	Class I, Zone 0	EN 50 020/39	
	EEx ib	Zone 1	EN 50 020/39	
	Ex ia	Zone 0	IEC 60079-11	
	Ex ib	Zone 1	IEC 60079-11	
	AEx nA	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nA	Zone 2	EN 50 021	
<b>Pressurized</b>	Ex nA	Zone 2	IEC 60079-15	Keep flammable gas out
	EEx nL	Zone 2	EN 50 021	
	Ex nL	Zone 2	IEC 60079-15	
	Type X	Class I, Div 1	FM 3620	
	Type Y	Class I, Div 1	FM 3620	
	Type Z	Class I, Div 2	FM 3620	
<b>Restricted Breathing</b>	EEx p	Zone 1	EN 50 016	Keep flammable gas out
	EEx nP	Zone 2	EN 50 021	
	Ex px	Zone 1	IEC 60079-2	
	Ex py	Zone 1	IEC 60079-2	
	Ex pz	Zone 2	IEC 60079-2	
	Ex nZ	Zone 2	IEC 60079-15	
<b>Encapsulation</b>	AEx nR	Class I, Zone 2	FM 3600 (ISA 12.12.02)	Keep flammable gas out
	EEx nR	Zone 2	EN 50 021	
	Ex nR	Zone 2	IEC 60079-15	
<b>Oil Immersion</b>	AEx m	Class I, Zone 1	FM 3600 (ISA 12.23.01 *)	Keep flammable gas out
	EEx m	Zone 1	EN 50 028	
	Ex m	Zone 1	IEC 60079-18	
<b>Oil Immersion</b>	AEx o	Class I, Zone 1	FM 3600 (ISA 12.16.01 *)	Keep flammable gas out
	EEx o	Zone 1	EN 50 015	
	Ex o	Zone 1	IEC 60079-6	

\*Also shall comply with ISA 12.00.01 † Based on ISA 12.02.01

### Area Classification

	Flammable Material Present Continuously	Flammable Material Present Intermittently	Flammable Material Present Abnormally
IEC/EU	Zone 0 (Zone 20 - dust)	Zone 1 (Zone 21 - dust)	Zone 2 (Zone 22 - dust)
U.S. NEC®505	Zone 0	Zone 1	Zone 2
NEC®500	Division 1	Division 1	Division 2

IEC classification per IEC 60079-10  
EU classification per EN 60 079-10  
U.S. classification per ANS/NFPA 70 National Electric Code (NEC) Article 500 or Article 505

### Explosion Groups

Typical Gas/Dust/Fiber	U.S. (NEC®505) IEC EU	U.S. (NEC®500)
Acetylene	Group IIC	Class I/ Group A
Hydrogen	(Group IIB + H <sub>2</sub> )	Class I/ Group B
Ethylene	Group IIB	Class I/ Group C
Propane	Group IIA	Class I/ Group D
Methane	Group *	Mining*
Metal Dust	None	Class II/ Group E
Coal Dust	None	Class II/ Group F
Grain Dust	None	Class II/ Group G
Fibers	None	Class III

\*Not within scope of NEC. Under jurisdiction of MSHA.

### Temperature Class

Maximum Surface Temperature	U.S. (NEC®505) IEC EU	U.S. (NEC®500)
450° C	T1	T1
300° C	T2	T2
280° C		T2A
260° C		T2B
230° C		T2C
215° C		T2D
200° C	T3	T3
180° C		T3A
165° C		T3B
160° C		T3C
135° C	T4	T4
120° C		T4A
100° C	T5	T5
85° C	T6	T6

### Ingress Protection (IP) Codes

First Number	Second Number
Protection Against Solid Bodies	Protection Against Liquid Bodies
0 No protection	No protection
1 Objects greater than 50 mm	Vertically dripping water
2 Objects greater than 12 mm	75° to 90° dripping water
3 Objects greater than 2.5 mm	Sprayed water
4 Objects greater than 1 mm	Splashed water
5 Dust-protected	Water jets
6 Dust-tight	Heavy seas
7	Effects of immersion
8	Indefinite immersion

### Approximate U.S. Enclosure Type Equivalent to IPXX

Type	IP	Type	IP	Type	IP
1	10	3S	54	6 and 6P	67
2	11	4 and 4X	55	12 and 12K	52
3	54	5	52	13	54
3R	14				

### Acronyms

**ATEX** – Atmosphère Explosible  
**CENELEC** – European Committee for Electrotechnical Standardization  
**EU** – European Union  
**IEC** – International Electrotechnical Commission  
**I.S.** – Intrinsically Safe  
**MSHA** – Mine Safety and Health Administration  
**NEC®** – National Electric Code®

### Classification of Gases and Vapours into EXPLOSION GROUPS and TEMPERATURE CLASSES

	T1	T2	T3	T4	T5
<b>I</b>	Methane				
<b>IIA</b>	Acetone Ethane Ammonia Benzol (pure) Acetic acid Methane (natural gas) Methanol Propane Toluene	Ethanol i-Amyl acetate n-Butane n-Butyl alcohol	Benzene Diesel fuel Aircraft fuel Heating oil n-Hexane	Acetaldehyde Ethylether	
<b>II B</b>	Coal gas (lighting gas)	Ethylene			
<b>II C</b>	Hydrogen	Acetylene			Carbon disulphide

Ref: • FM Approvals – Expert Guide to Hazardous Locations © 2004 FM Global Technologies LLC  
• R. STAHL Inc. – Explosive Facts

## CUSTOMER SERVICE

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**Fax:** +44 (0)1625 521916  
**Email:** info@eu.indsci.com  
**Website:** www.indsci.co.uk

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## AFTER-SALE SUPPORT

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### Warranty Registration

A warranty registration card is delivered with each instrument. This registration is a valuable step to ensure validation of warranty coverage. Or if you prefer, register your products online at [www.indsci.com/warranty](http://www.indsci.com/warranty).

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