Gas Detection and Monitoring Solutions FOR LIFE

INDUSTRIAL SCIENTIFIC

The Gas Detection People

Vol 8 NO 1

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. Thank you.

Justin McElhattan
President and Chief Executive Officer

Quality Assurance
- ISO9001-2000 Quality System 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, France, Germany and China
- Offices in many countries throughout the world
- Distribution network established worldwide
- Established international accounts – references available

Ease of Use and Serviceability
- 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
- 548.64 sq. meter in-house lab is unique to the industry

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 for our help desk and your nearest location.

2 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:

		Traditional Purchase	iNet InSite	iNet	ALSS
		Gas Detectors and Accessories	iNet DS Docking Stations and iNet Control	Gas Detection as a Service	Accenture Life Safety Solution
Reliable Equipment					
Every worker needs robust, reliable gas detectors and docking stations to keep them safe in hazardous environments.	Gas Detectors	✔		✔	✔
	Gas Detector Accessories	✔		✔	✔
	Calibration Gas	Purchase separately**	Purchase separately**	Purchase separately**	Purchase separately**
	iNet DS Docking Stations		✔	✔	✔
Safe Behavior					
Gas detectors are completely ineffective if used improperly. Visibility into alarm events and unsafe behaviors provides teams the data needed to take the corrective and preventive actions that keep them safe.	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		✔	✔	✔
Painless Service					
Gas detection isn't core to most businesses, yet it requires significant time and money as instruments require regular maintenance and repairs. Cost-effective, timely and painless service is required to keep instruments in working condition and ready to protect.	Hosted, In-The-Cloud Software		✔	✔	✔
	Remote Installation & Training		✔	✔	✔
	Automatic Gas Detector & Software Upgrades		✔	✔	✔
	Auto Replenishment of Calibration Gas**		✔	✔	✔
	Calibration Gas Cylinder Monitoring		✔	✔	✔
	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			✔	✔
	Onsite Installation			✔*	✔*
	Onsite Training			✔*	✔*
	Man Down Alerts				✔
	Monitor/worker location tracking				✔
	Real-time data collection				✔

*Onsite installation and onsite training are optional for 1-5 docking stations and are included in installations with more than 5 docking stations.
**Calibration gas supply is not included in the pricing of any of our solutions. Industrial Scientific's Calibration Gas Auto Replenishment Program is optional with both iNet and iNet InSite.

Don't Buy Gas Detectors

Subscribe to Gas Detection as a Service

iNet® - Gas Detection as a Service ..... EN 4
iNet InSite ..... EN 7
Accenture Life Safety Solution ..... EN 8
iNet DS ..... EN 10
DS2 Docking Station™ ..... EN 12
MX6 iBrid™ Multi-Gas Monitor ..... EN 14
Ventis™ MX4 Multi-Gas Monitor ..... EN 16
Ventis™ Slide-On Pump ..... EN 19
Tango™ TX1 Single Gas Monitor ..... EN 20
GasBadge® Pro Single Gas Monitor ..... EN 22
BM25 Transportable Multi-Gas Area Monitor ..... EN 24
T40 Rattler™ ..... EN 26
Product Availability ..... EN 27
Portable Instrument Sensor Options ..... EN 28
Replacement Sensors ..... EN 29
Sampling Probes ..... EN 30
Sampling and Calibration Equipment ..... EN 31
Regulators ..... EN 32
Calibration Gas Cross Reference Chart ..... EN 33
Rental and Service Options ..... EN 40
Training ..... EN 42
Reference Library ..... EN 44
Photolonization Detector (PID) Reference Chart ..... EN 50
Ordering Information ..... EN 52

CERTIFICATIONS

Agency	Multi-Gas Monitors			Single-Gas Monitors		
	MX6 iBrid™	Ventis™ MX4	BM25	Tango™ TX1	GasBadge® Pro	T40 Rattler™
UL	■	■		■	■	■
MSHA	■	■		(Pending)		
CSA	■	■	■	■	■	■
ANZEx	■	■			■	■
ATEX	■	■	■	■	■	■
IECEx	■	■	■	■	■	■
GOST (Russia)	■	■				
INMETRO	■	■		(Pending)	■	
China Ex	■	■			■	■
China MA		■				■
China CPC	■	■				■
KOSHA	■	■			■	

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

RELIABLE EQUIPMENT

Don't Buy Gas Detectors

Subscribe to Gas Detection as a Service

iNet® keeps people safe by providing visibility into alarms, exposure and usage. It keeps gas detectors working without costly and time-consuming maintenance. And you don't have to buy the gas detectors when you subscribe to iNet. Instead, you receive Gas Detection as a Service.

How Gas Detection as a Service Works

1. Operators dock gas detectors owned by Industrial Scientific.

2. Docking Stations perform bump tests, calibrations and record-keeping.

3. iNet Control provides visibility into your gas detection program via the Web.

4. iNet e-mails real-time alerts and status reports.

5. When iNet detects a problem, Industrial Scientific rushes a replacement gas detector to you.

iNet customers reduce their instrument fleet by an average of 20% by limiting downtime.

iNet gives you help from The Gas Detection People

Gas detection is probably not core to what you do. But, it's all that we do. It's what we love to do. With iNet, we can help you to:

- Overcome staffing shortages
- Increase productivity

iNet® gives you a safer workplace

On average, gas detectors in the iNet fleet go into high alarm once every ten days. Do you know how many high alarms your facility had? iNet gives you information and tools to fix problems before they happen. For example, iNet increases safety by helping you to:

- Use data more effectively
- Boost equipment reliability
- Prove compliance

iNet gives you cost savings

The purchase price is only part of a gas detector's total cost. You have to maintain it. You have to wait for it to be serviced. iNet eliminates unnecessary costs. Specifically, iNet helps you to:

- Optimize your fleet size
- Cut unnecessary ownership and maintenance costs
- Increase productivity
- Standardize your equipment training

iNet Control

Keeps You Informed ... Puts You in Control

iNet Control is the first hosted software for managing gas detector fleets. This service is included with every iNet subscription and provides visibility into alarms, maintenance and usage. Users may view trend graphs or sensor-level detail for each gas detector. iNet Control also allows users to compare the health of their gas detection program to industry averages.

Detailed views identify the source of potential problems so you can take action, and save lives.

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

134,350,000,000 +	Datalog Readings
11,530,000 +	Alarm Events
97,772 +	Gas Detectors
13,343 +	Docking Stations
4,688 +	Customer Sites
10 +	Years of Experience

Customers in Australia, Belgium, Canada, China, Denmark, Finland, France, Germany, Iceland, Indonesia, Ireland, Latvia, Netherlands, New Zealand, Norway, Poland, Portugal, Qatar, Russia, Singapore, Sweden, Switzerland, Taiwan, United Kingdom and United States.

As of June 2013

iNet™ Customers

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

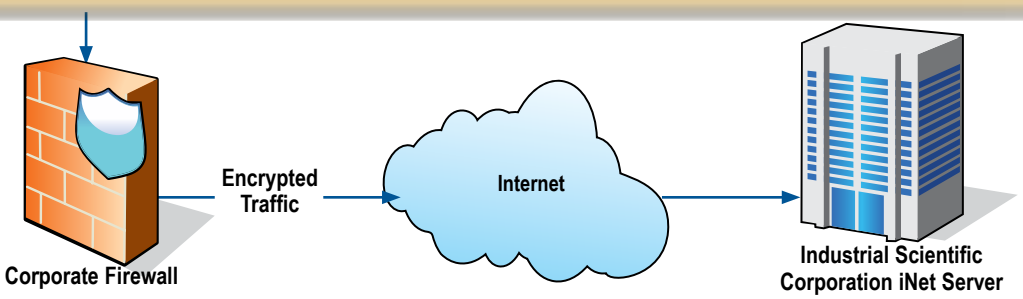
INET INFRASTRUCTURE

iNet DS
- Docks portable instruments
- Installed in multiple locations
- Data transferred directly to iNet
- Encrypted traffic via SSL
- Managed via iNet Control

iNet Control
- Manage gas detector fleet
- Supports multiple users and permission levels
- Access from any computer

CUSTOMER LAN NETWORK

iNet DS Uploads
- Operates seamlessly with corporate firewall



INET READY DETECTORS

http://www.indsci.com/products/multi-gas-detectors/mx6/

http://www.indsci.com/products/multi-gas-detectors/ventis/

http://www.indsci.com/products/single-gas-detectors/GasBadgePro/

http://www.indsci.com/products/single-gas-detectors/tangoTX1/

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 or InSite subscription, a new cylinder of gas will automatically be sent when iNet Control detects a low gas cylinder.

iNet READY

Look for this Symbol on All Compatible Instrument Pages

Do you prefer to own and maintain your own equipment?

iNet® InSite is your solution to a safer workplace.

iNet InSite is a plug-and-play docking station solution that provides the critical data and analytics needed to keep your people safer. With a fixed monthly subscription to iNet InSite, users can:

- Receive the iNet DS docking stations at no additional cost
- Configure and manage their gas detection fleet with unlimited access to iNet Control, a web-based application accessible from any PC web browser
- Gain practical insight into their gas detection program using trends, performance metrics and custom reports

iNet Control

With iNet InSite, users can configure and manage their gas detection fleet via iNet Control, a Web-based application accessible from any PC Web browser. Users can:

- Schedule calibrations, bump tests, instrument firmware upgrades and other automatic events
- Set up alarm thresholds and other custom settings
- View trends, performance metrics and custom reports to gain practical insight into their gas detection program

iNet DS

Using the iNet DS docking station, iNet InSite eliminates the need for onsite server and software installation, as well as manual upgrades and tedious maintenance tasks. The docking station connects directly to the Internet via an Ethernet interface. The iNet DS mobile kit, including a carrying case, 3G router, 12V truck charging cable and Ethernet cable enables mobile functionality for on-the-go workers, as well as convenient transportation of the docking station and all its accessories.

ORDERING INFORMATION		
EXAMPLE: iNet DS for Ventis™ for 48 months	18108918	-48
INET DS and INSTRUMENT	**BASE**	**-XY**
iNet DS for MX6 iBrid™	18108917	
iNet DS for Ventis™ MX4	18108918	
iNet DS for GasBadge® Pro	18108915	
iNet DS for Tango™ TX1	18109201	
LENGTH OF CONTRACT		
12-month contract		-12
24-month contract		-24
36-month contract		-36
48-month contract		-48

BASE-XY (XY = Term of contract in months)

NOTES: Calibration gas and regulators must be purchased separately

The 3G/4G Wireless Router is only available to customers in USA, Canada, and UK.

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.

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			

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.

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_2S)
- Carbon monoxide (CO)
- Lower explosive limit (LEL) hydrocarbon gases
- Sulfur dioxide (SO_2)
- Nitrogen dioxide (NO_2)
- Oxygen (O_2)

Potential 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, mining 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 usingvoice 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
http://www.indsci.com/solutions/accenture-life-safety-solution/

iNet DS

- Mobile operation with the iNet® DS mobile kit
- Automatic instrument firmware upgrades
- Seamless gas detector fleet configuration and management
- Automatic calibration, bump tests and recordkeeping
- Fleet-wide instrument and alarm settings management

The iNet® DS docking station is the gateway to automated bump testing, calibration, instrument diagnostics and record keeping, and provides the data interface to iNet Control, the industry's only cloud solution for management of gas detector data and programs.

It requires no software or computer hardware installation or maintenance at the customer site, and connects directly to the Internet via an Ethernet interface.

Previously only available as part of a subscription to iNet or iNet InSite, the new purchase option provides an ideal solution for end users who prefer to own their equipment, but are challenged with gaining the necessary visibility into their overall gas detection program to improve the safety of their employees.

The iNet DS docking station purchase includes a 1, 2, 3 or 4-year subscription to iNet InSite which includes unlimited user access to iNet Control. The subscription is invoiced in full at the time of delivery. When the initial iNet InSite subscription term is complete, the service can be renewed separately or the docking station can continue to be used as a stand-alone calibration and bump test station.

For on-the-go end users, the iNet DS Mobile Kit allows for the docking station to be used in a mobile environment.

To learn more about the docking station and the mobile kit, visit
www.indsci.com/inetds

SPECIFICATIONS

MONITORS SUPPORTED:
MX6 iBrid™, Ventis™ MX4, GasBadge® Pro and Tango™ TX1

CASE:
Impact-resistant composite with radio frequency interference (RFI) protection

DIMENSIONS:
24.8 cm x 16.3 cm x 22.9 cm (9.75" h x 6.40" w x 9.00" d)

INPUT:
115/230 VAC, 50/60 Hz. 12 VDC

OPERATING TEMPERATURE:
0ºC to +50ºC (32º F to +122ºF)

COMMUNICATION:
10/100bT Ethernet support, RJ-45 Category 5 connection; USB port for printer

DISPLAY:
128 x 64 Dot Matrix LCD – Multilingual modes allow selections in English, Spanish, French and German languages

PUMP FLOW RATE:
500 ml/minute @ 80" H_2O

GAS INPUTS:
3 separate inputs with one reserved for fresh air or zero gas, on each iNet DS.

The iNet DS mobile kit includes a carrying case, 3G router, and 12V truck charging cable. It is ideal for on-the-go employees who work in mobile environments and require a means of remotely maintaining their instruments using the iNet DS docking station. This one-of-a-kind solution is also beneficial to customers facing onsite IT hurdles that prevent docking stations from being connected to a corporate network.

It is designed to house the docking station while connected to a gas cylinder and 3G router*. The router enables the docking station to be connected to the Internet allowing for data uploading to iNet following automatic calibration, recordkeeping, diagnostics, firmware upgrades and battery recharging. The mobile kit also includes a 12V truck charging cable which powers the docking station.

The iNet DS mobile kit may be purchased with all four components (carrying case, 3G router, 12V truck charging cable, 5' Ethernet cable) or individually.

iNet DS Pelican® Carrying Case

ORDERING INFORMATION		
EXAMPLE: iNet DS for Ventis™ purchase with 12 months of iNet InSite	18108918-P	-12
INET DS	**BASE**	**-XY**
iNet DS for MX6 iBrid™	18108917-P	
iNet DS for Ventis™ MX4	18108918-P	
iNet DS for Tango™ TX1	18109201-P	
iNet DS for GasBadge® Pro	18108915-P	
LENGTH OF INSITE		
12-month subscription		-12
24-months subscription		-24
36-months subscription		-36
48-months subscription		-48

ACCESSORIES	
PART NO.	**DESCRIPTION**
18109125	iNet DS Pelican® Carrying Case
18109210	iNet DS Mobile Kit
iNet DS Mobile Kit Individual Parts	
18109203	iNet DS Carrying Case
17154813	3G/4G Wireless Router
18109217	12V Truck Charging Cable
17113887	Ethernet Cable, 5' (Cat5E network cable

BASE-XY (XY = Term of subscription in months)

NOTES:

- Calibration gas and regulators must be purchased separately.
- The 3G/4G Wireless Router is only available to customers in USA, Canada, and UK
- The user is responsible for subscribing to a suitable 3G data plan. For a list of compatible service providers for router model CTR35, visit www.cradlepoint.com.

DS2 DOCKING STATION™

- Automates instrument calibration, record-keeping, diagnostics and recharging
- Stand-alone Instrument Docking Stations (IDS)
- Link up to 100 IDSs
- Dock hundreds of instruments
- Multilingual display
- One centralized database

U.S. Patent #6,442,639
International Patent #WO0182063

iNet READY

The DS2 Docking Station™ provides the ultimate flexibility for managing your gas monitors wherever you use them. Ethernet connectivity enables you to link up to 100 stand-alone Instrument Docking Stations (IDSs) from anywhere in your facility and relay the data back to one central database for total instrument management. A graphical user interface tool allows an administrator to view operations on each Docking Station from a network computer, making it easy to track instruments, print reports, set events and change parameters for any location. The DS2 gives you all of the benefits of consistent automated calibration, record keeping, battery recharging, and instrument diagnostics for your monitors to limit your liabilities and safety hazards.

Each individual IDS features a multilingual display, three status LEDs, a keypad and an audible alarm to provide important instrument details at a single glance. The DS2, which can be easily grouped into 'clusters' of up to 5 units to share calibration gas, also offers optional iGas® capability to automatically identify calibration gas cylinder concentrations, lot numbers, and expiration dates on the system. Whether you manage one gas monitor or an entire fleet, the DS2 provides superior cost-savings and flexibility.

SPECIFICATIONS

COMPATIBLE MONITORS SUPPORTED:
MX6 iBrid™, Ventis™ MX4, GasBadge® Pro, Tango™ TX1

CASE:
Impact-resistant composite with radio frequency interference (RFI) protection

DIMENSIONS:
24.8 cm x 16.3 cm x 22.9 cm (9.75" h x 6.40" w x 9.00" d)

INPUT:
115/230 VAC, 50/60 Hz. 12 VDC

OPERATING TEMPERATURE:
0ºC to +50ºC (32º F to +122ºF)

COMMUNICATION:
10bT Ethernet support, RJ-45 category 5 connection

DISPLAY:
128 x 64 Dot Matrix LCD – Multilingual modes allow selections in English, Spanish, French and German languages

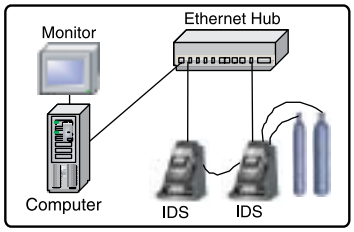
PUMP FLOW RATE:
500 ml/minute @ 80" H_2O

GAS INPUTS:
3 separate inputs on each IDS. Ability to share up to 14 discrete gases for calibration when IDSs are clustered together.

DS2 COMPUTER REQUIREMENTS (MIN):
For 1-8 IDS units: Dedicated Pentium III, 800 MHz, 256 MB RAM, 4GB available disk space, Windows® 2000 Professional, Windows® XP Professional operating system, one Cat5E Ethernet network adapter, fixed IP address

For 9-100 IDS units: Dedicated Pentium III, 800 MHz, 256 MB RAM, 4GB available disk space, Windows® 2000 Standard Server, Windows® 2003 Server operating system, one Cat5E Ethernet network adapter, fixed IP address

SMALL INSTALLATION SCENARIO

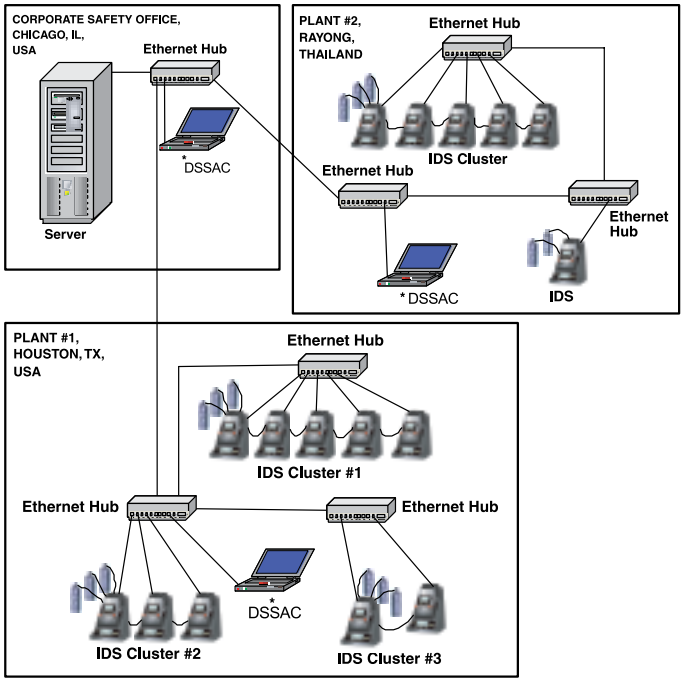


SINGLE-LOCATION COMPANY

Illustrates one DS2 installation on a stand-alone Ethernet, with 2 IDSs in a cluster sharing 2 cylinders of calibration gas.

Instrument data is available at the local level.

LARGE INSTALLATION SCENARIO



MULTI-LOCATION COMPANY

Illustrates multiple IDS cluster installations at multiple sites all tied together on a common company Ethernet, sharing a common database. Each cluster of IDSs share calibration gas. Instrument data can be accessed at the plant level as well as by the corporate safety office.

PART NO.	DESCRIPTION
18106724-ABC	DS2 Instrument Docking Station (IDS) for MX6 iBrid™
18108630-ABC	DS2 Instrument Docking Station (IDS) for Ventis™ MX4
18109249-ABC	DS2 Instrument Docking Station (IDS) for Tango™ TX1
18106302-ABC	DS2 Instrument Docking Station (IDS) for GasBadge® Pro
-ABC	B = Quantity of iGas® Reader:
	0 = None
	1 = 1 iGas® Reader
	2 = 2 iGas® Readers
	3 = 3 iGas® Readers
	C = Power Cord: 0 = US, 1 = UK, 2 = EU, 3 = AUS, 4 = ITA, 5 = DEN, 6 = SWZ
18106543-5	MX6 iBrid/DS2 Laptop Turnkey System+
18106543-8	Ventis MX4/DS2 Laptop Turnkey System+
18109261	Tango/DS2 Laptop Turnkey System+
18106543-4	GasBadge Pro/DS2 Laptop Turnkey System+
17113978	DS2 PC with Windows® Server OS++
17153596-EUR-FR	DS2 Server, European, French Version++
17153596-EUR-EN	DS2 Server, European, English Version++
18105684	iGas® Reader
18105841	Demand Flow Regulator w/ iGas® Pressure Switch (for 58L, 103L and 34L aluminum cylinders)
18105866	Demand Flow Regulator, 600 CGA w/ iGas Pressure Switch (for 34L steel cylinders)
18105833	Demand Flow Regulator, 590 CGA w/ iGas Pressure Switch (for 552L cylinders)
18105858	Demand Flow Regulator, 330 CGA w/ iGas Pressure Switch (for 650L cylinders)
18102509	Demand Flow Regulator, 5/8 UNF (for 58L, 103L and 34L aluminum cylinders)
18103564	Demand Flow Regulator, 600 CGA (for 34L steel cylinders)
18103549	Demand Flow Regulator, 590 CGA (for 552L cylinders)
18103556	Demand Flow Regulator, 330 CGA (for 650L cylinders)
18105924	5-Port Gas Regulator Manifold
17113929	4-Port Ethernet Router, Cable/DSL
17113937	4-Port Ethernet Wireless Router
17113887	Ethernet Cable, 5' (Cat5E network cable)
17113895	Ethernet Cable, 10' (Cat5E network cable)
17113903	Ethernet Cable, 25' (Cat5E network cable)
17113911	Ethernet Crossover Cable, 5' (Cat5E network cable)
17113945	5-Port Ethernet Hub
17113952	16-Port Ethernet Hub
17113960	24-Port Ethernet Hub

+ Includes (1) DS2, Computer (installed software: Windows® 7, DSS and DSSAC), monitor, keyboard, mouse, 5-port Ethernet hub and cables.

++ Includes keyboard and mouse. Monitor and DS2 not included.

iNet READY

Look for this Symbol on All Compatible Instrument Pages

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 DS2 Docking Station™ and iNet®.

SPECIFICATIONS*

INSTRUMENT WARRANTY:
Warranted for as long as the instrument is supported by Industrial Scientific Corporation

CASE MATERIAL:
Lexan/ABS/Stainless Steel w/protective rubber overmold

DIMENSIONS:
135 mm x 77 mm x 43 mm (5.3" x 3.05" x 1.7") – without pump
167 mm x 77 mm x 56 mm (6.6” x 3.1” x 2.2”) – 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/RUN TIMES:
Rechargeable Lithium-ion (Li-ion) Battery Pack (24 hours) – without pump
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:
-20ºC to 55ºC (-4ºF to 131ºF)

OPERATING HUMIDITY RANGE:
15% to 95% non-condensing (continuous)

MEASURING RANGES:

SENSOR	RANGE	RESOLUTION
CATALYTIC BEAD		
Combustible Gas	0-100% LEL	1%
Methane	0-5% vol	0.01%
ELECTROCHEMICAL		
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_2S: 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
INFRARED		
Hydrocarbons	0-100% LEL	1%
Methane (% vol)	0-100% vol	1%
Methane (% LEL)	0-100% LEL	1%
Carbon Dioxide	0-5% vol	0.01%
PHOTOIONIZATION		
VOC	0-2,000 ppm	0.1

CERTIFICATIONS:

UL:	Class I, Groups A,B,C,D T4; Class II, Groups F,G; AEx ia d IIC T4
CSA:	Class I, Groups A,B,C,D T4; Ex d ia IIC T4
MSHA:	CFR30, Part 22, Intrinsically safe for methane/air mixtures
ATEX:	Ex ia IIC T4 Ga / Ex ia I Ma; IP65 (IP64 pump version); Equipment Group and Category: II 1G / I M1 (I M2 w/IR sensor)
IECEx:	Ex ia IIC T4 Ga / Ex ia I (Ex ia d I w/IR sensor)
ANZEx:	Ex ia s Zone 0 I, IP64 Asp., IP65 Dif. Ex ia s Zone 0 IIC T4
INMETRO:	BR - Ex ia d IIC T4 Gb
GOST-R:	PBExiadI X / 1ExiadIICT4 X
KOSHA:	Ex d ia IIC T4
China Ex:	Ex ia d I/IIC T4
China CPC:	Metrology Approval

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

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

COMMON INSTRUMENT CONFIGURATIONS	
PART NO.	**DESCRIPTION**
MX6-K1230201	MX6 - LEL (Pentane), CO, H_2S, O_2, Ext. Li-ion
MX6-K123R111	MX6 - LEL (Pentane), CO, H_2S, O_2, PID, Li-ion, Pump
MX6-L1230111	MX6 - LEL (Methane), CO, H_2S, O_2, Li-ion, Pump
MX6-M103Q211	MX6 - Methane, CO, O_2, CO_2 IR, Ext. Li-ion, Pump
MX6-MDH34211	MX6 - Methane, NO, CO high range, O_2, NO_2, Ext. Li-ion, Pump
MX6-K1235111	MX6 - LEL (Pentane), CO, H_2S, O_2, SO_2, Li-ion, Pump
MX6-KJ635101	MX6 - LEL (Pentane), CO/H_2S, NH_3, O_2, SO_2, Li-ion
MX6-MH23Q201	MX6 - Methane, CO high range, H_2S, O_2, CO_2, Ext. Li-ion
COMMON INDUSTRY CONFIGURATIONS	
MX6-KJ53R211	MX6 - LEL, CO/H_2S, O_2, SO_2, PID, Ext. Li-ion, Pump Petroleum Refining
MX6-K103Q211	MX6 - LEL, CO, O_2, CO_2, Ext. Li-ion, Pump Brewing/Bottling/Wineries
MX6-KJ835101	MX6 - LEL, CO/H2S, O_2, SO_2, ClO_2, Li-ion Pulp/Paper
MX6-K673R211	MX6 - LEL, O_2, NH_3, Cl_2, PID, Ext. Li-ion, Pump HazMat
MX6-M1030401	MX6 - CH_4 (%), CO, O_2, Li-ion (MSHA/AUS) Mining
MX6-M1D34401	MX6 - CH_4 (%), CO, O_2, NO_2, NO, Li-ion Ext. (MSHA/AUS) Mining (Diesel Applications)

DS2 DOCKING STATION™

- Stand-alone operation
- Link up to 100 IDS modules – dock thousands of instruments
- Automatic instrument calibration, record keeping, diagnostics and recharging
- Utilizes one central database
- Multilingual display
- iNet® compatible

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
18106724-ABC	DS2 Docking Station™ for MX6 **Ordering Information** B = number of iGas® Readers 0 – none 1 = 1 iGas Reader 2 = 2 iGas Readers 3 = 3 iGas Readers C = Power cord option (0 – US, 1 – UK, 2 – EU, 3 – AUS, 4 – ITA, 5 – DEN, 6 – SWZ)
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)
17131038-1	Rechargeable Li-ion battery pack (UL/CSA/ATEX/IECEx/INMETRO/GOST-R/KOSHA)
17131038-2	Rechargeable Li-ion ext. battery pack (UL/CSA/ATEX/IECEx/INMETRO/GOST-R/KOSHA)
17131038-4	Rechargeable Li-ion battery pack (MSHA/AUS)
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

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 DS2 Docking Station.

SPECIFICATIONS*

INSTRUMENT WARRANTY:
Two- year warranty, including sensors and battery

Case Material:
Polycarbonate w/ protective rubber overmold

DIMENSIONS:
103 mm x 58 mm x 30 mm (4.1” x 2.3” x 1.2”) - Ventis lithium-ion battery version
172 mm x 67 mm x 66 mm (6.8” x 2.6” x 2.6”) - 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

OPERATING TEMPERATURE RANGE:
-20°C- 50°C (-4°F-122°F)

OPERATING HUMIDITY RANGE:
15%-95% non-condensing (continuous)

DISPLAY/READOUT:
Backlit Liquid Crystal Display (LCD)

POWER SOURCE/RUN TIME:
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 Diffusion
O_2, CO, H_2S, NO_2, SO_2 - Electrochemical

MEASURING RANGES:

Combustible Gases:	0-100% LEL in 1% increments
Methane (CH_4):	0-5% of vol. in 0.01% increments
Oxygen (O_2):	0-30% of vol. in 0.1% increments
Carbon monoxide (CO):	0-1,000 ppm in 1 ppm increments
Hydrogen sulfide (H_2S):	0-500 ppm in 0.1 ppm increments
Nitrogen dioxide (NO_2):	0-150 ppm in 0.1 ppm increments
Sulfur dioxide (SO_2):	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 C22.2 No. 152 for %LEL reading only
ANZEx:	Ex ia s Zone 0 I/IIC T4; IP66; IP67
INMETRO:	Ex d ia IIC T4 Gb; IP66; IP67
KOSHA:	Ex d ia IIC T4
MSHA:	30 CFR Part 22; Permissible for underground mines; Li-ion versions only
PA-DEP:	Permissible for PA Bituminous Underground Mines
CHINA EX:	Ex ia d IIC T4 Gb
CHINA CMC:	Metrology approval
CHINA MA:	Approved for underground mines; diffusion (without pump) standard Alkaline version only
GOST- K:	PBExdial X / 1ExdialICT4 X
GOST-R:	PBExdial X / 1ExdialICT4 X

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

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)

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MOST COMMON INSTRUMENT CONFIGURATIONS

PART NO..	DESCRIPTION
VTS-K1231100y0z	Ventis - LEL, CO, H_2S, O_2, Li-ion, Desktop charger, Black
VTS-K1232111y0z	Ventis with pump - LEL, CO, H_2S, O_2, Extented Li-ion, Desktop Charger, Safety Orange
VTS-K1031100y1z	Ventis - LEL, CO, O_2, Li-ion, Desktop charger, soft case, Black
VTS-K1032110y1z	Ventis with pump - LEL, CO, O_2, Extended Li-ion, desktop charger, soft case, Black
VTS-K5231101y0z	Ventis - LEL, SO_2, H_2S, O_2, Li-ion, desktop charger, Safety Orange
VTS-K1431100y1z	Ventis - LEL, CO, NO_2, O_2, Li-ion, Desktop charger, soft case, Black
VTS-K1432111y0z	Ventis with pump - LEL, CO, NO_2, O_2, 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	VTSB-	1	0	1
DESCRIPTION	**Base**	**Battery**	**Color**	**Approvals**
Ventis MX4 Battery Kit	VTSB-			
Select options below in addition to base price				
Lithium-ion		1		
Lithium-ion extended Li-ion (required for units with a pump)		2		
Alkaline		3		
COLOR				
Black			0	
Safety Orange			1	
CERTIFICATIONS				
UL/CSA/ATEX/IECEx/INMETRO/ GOST-R/GOST-K/KOSHA				1
MSHA*				2
CHINA EX / CHINA MA**				3
ANZEx				4

Battery kits include: Battery pack, battery cover with appropriate label and screws.
* Alkaline Battery Kit is not MSHA approved
** Alkaline and Lithium-ion Extended Range Battery Kits are not CHINA MA 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_2S, O_2
VK-K103211xy1z	Ventis Confined Space Kit - LEL, CO, O_2
VK-K023211xy1z	Ventis Confined Space Kit - LEL, H_2S, O_2
VK-K003211xy1z	Ventis Confined Space Kit - LEL, O_2

x = Instrument Color: 0 = Black, 1 = Safety Orange
y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEx/INMETRO, 3 = MSHA, 4 = ANZEx, 5 = CHINA EX, 7 = GOST-R/GOST-K, 8 = KOSHA
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

Ventis Confined Space Kits with Slide-on Pump Include: Ventis with LEL, CO, H_2S, and O_2 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_2S, O_2)

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
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-K11111	Ventis Confined Space Kit - LEL (Pentane), CO, H_2S, O_2, Orange, Li-ion Ventis Battery, Li-ion Pump Battery, UL/CSA, English
VKVSP4-L01111	Ventis Confined Space Kit - LEL (Methane), CO, H_2S, O_2, Black, Li-ion Ventis Battery, Li-ion Pump Battery, UL/CSA, English
VKVSP4-K11211	Ventis Confined Space Kit - LEL (Pentane), CO, H_2S, O_2, Orange, Li-ion Ventis Battery, Ext. Range Li-ion Pump Battery, UL/CSA, English

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

18108652 TRUCK-MOUNT CHARGER, WITH PLUG

18108651 AUTOMOTIVE CHARGER

18108811 VENTIS WITH PUMP HARD CARRYING CASE WITH DISPLAY

18108175 VENTIS WITHOUT PUMP SOFT CARRYING CASE, LI-ION BATTERY

PART NO.	DESCRIPTION
18108630-0BC	DS2 Docking Station™ for Ventis™ MX4 **Ordering Information** B = number of iGas® Readers: 0 – none 1 = 1 iGas Reader 2 = 2 iGas Readers 3 = 3 iGas Readers C = Power cord Option (0 – US, 1 – UK, 2 – EU, 3 – AUS, 4 – ITA, 5 – DEN, 6 – SWZ)
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	MX4 External battery charge adaptor
18108175	Ventis without pump, soft carrying case, Li-ion battery
18108183	Ventis without pump, soft carrying case, extended range batteries
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_2)
17134479	Replacement sensor, hydrogen sulfide (H_2S)
17134487	Replacement sensor, carbon monoxide (CO)
17134495	Replacement sensor, combustible gas (LEL/CH_4)
17134503	Replacement sensor, nitrogen dioxide (NO_2)
17143595	Replacement sensor, sulfur dioxide (SO_2)
17148313-1	Replacement extended range Li-ion battery pack, UL/CSA/ATEX/IECEx/INMETRO/KOSHA/GOST-R/GOST-K
17148313-2	Replacement extended range Li-ion battery pack, MSHA
17148313-3	Replacement extended range Li-ion battery pack, CHINA
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/INMETRO/GOST-R/GOST-K/KOSHA
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/INMETRO/GOST-R/GOST-K/KOSHA
17152828-14	Ventis conversion kit, Ventis with pump to Ventis without pump, Safety Orange, ANZEx
17153750	MX4 screen protector, 10 pack
17153759	MX4 screen protector, 100 pack
17152395	Internal Dust Filter/Water Stop for Ventis with pump

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

www.indsci.com/ventisbuilder

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 mm x 81 mm x 68 mm (5.6" x 3.2" x 2.7") - Lithium-ion battery version
143 mm x 81 mm x 85 mm (5.6" x 3.2" x 3.3") - Extended-range lithium-ion battery version
143 mm x 81 mm x 73 mm (5.6" x 3.2" x 2.9") - 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-50°C (-4°F-122°F)

OPERATING HUMIDITY RANGE:
15%-95% non-condensing (continuous)

POWER SOURCE/RUN TIME:
Rechargeable lithium-ion battery pack - 18 hours @ 20ºC
Rechargeable extended-range lithium-ion battery Pack - 36 hours @ 20ºC
Replaceable AAA alkaline battery pack - 10 hours @ 20ºC

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, Division 1, Group A B C D, T4 Exia; Ex ia IIC T4
IECEx:	Ex ia IIC T4 Ga
UL:	Class I, Division 1, Groups A B C D, T4; Class I, Zone 0, AEx ia IIC T4 Ga; Class II, Group F G (Carbonaceous and Grain Dust)

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

VENTIS SLIDE-ON PUMP - MODEL# VSP MATRIX					
EXAMPLE: 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
BATTERY	
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
PUMP ACCESSORIES	
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.

By wearing the Tango™ TX1, workers will be the safest single gas monitor users in the world. A 3-year runtime and patent pending DualSense™ Technology increases worker safety, regardless of bump test frequency, while reducing overall costs. Let the Tango show you why two is better than one.

PART NO.	DESCRIPTION
INSTRUMENT CONFIGURATIONS	
TX1-1	Tango TX1, CO
TX1-2	Tango TX1, H_2S
TX1-4	Tango TX1, NO_2
TX1-5	Tango TX1, SO_2
ACCESSORIES	
18109249-ABC	DS2 Docking Station™ for Tango™ TX1 **Ordering Information** B = number of iGas® Readers: 0 – none 1 = 1 iGas Reader 2 = 2 iGas Readers 3 = 3 iGas Readers C = Power cord Option (0 – US, 1 – UK, 2 – EU, 3 – AUS, 4 – ITA, 5 – DEN, 6 – SWZ)
17154367	Replacement battery
17155161	Replacement sensor, Carbon Monoxide, 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

SPECIFICATIONS

INSTRUMENT WARRANTY:
Three year warranty which does not include battery, sensors and filters. CO and H_2S sensors are warranted for 3 years from the initial purchase date. All other sensors are warranted for 2 years from the initial purchase date.

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"); Vibration alarm

DIMENSIONS:
99 x 51 x 35 mm (3.9" x 2.0" x 1.4")

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_2S, NO_2, SO_2 - Electrochemical sensor technology

SENSOR MEASURING RANGES:

Carbon Monoxide (CO):	0 to 1,000 ppm in 1 ppm increments
Hydrogen Sulfide (H_2S):	0.0 to 200.0 ppm in 0.1 ppm increments
Nitrogen Dioxide (NO_2):	0.0 to 150.0 ppm in 0.1 ppm increments
Sulfur Dioxide (SO_2):	0.0 to 150.0 ppm in 0.1 ppm increments

BATTERY PACK:
3.6 V Primary lithium-thionyl chloride (Li-SOCl2); 1.5AH, 2/3AA; replaceable; nonrechargeable; always on; 3 year run time depending on operating conditions

DATALOGGING:
3 months at 10-second intervals

EVENTLOGGING:
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
IECEx	Ex ia I Ma, Ex ia IIC T4 Ga
UL (C-US)	Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; T4; Exia, Class I, Zone 0, AEx ia IIC T4

-20°C TO +50°C (-4°F TO +122°F)

CSA	Ex ia IIC; Class I, Groups A B C D; T4
China	Ex Ex ia IIC T4 Ga
INMETRO	Ex ia IIC T4 Ga

PENDING:

MSHA	Permissible Gas Monitor
KOSHA	Ex ia IIC T4 Ga
China MA	Safety Certificate of Approval for Mining Products

These specifications are based on performance averages and may vary by instrument.
* The Tango is warranted to be free from defects in material and workmanship under normal and proper use and service for 3 years from the initial purchase date.
† 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 patent pending AlarmAmp™. The Tango's alarm is louder than that of any other single gas instrument on the market.

DualSense™ Technology

The Tango incorporates revolutionary patent pending DualSense Technology which includes two of the same type sensor for the detection of 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. Until Tango, that required a bump test of the instrument before each day's use. DualSense Technology ensures that regardless of your current bump test policy, you will be significantly safer with the Tango than with any other single gas instrument on the market today*.

*Based on iNet data

New Bump Test Recommendation

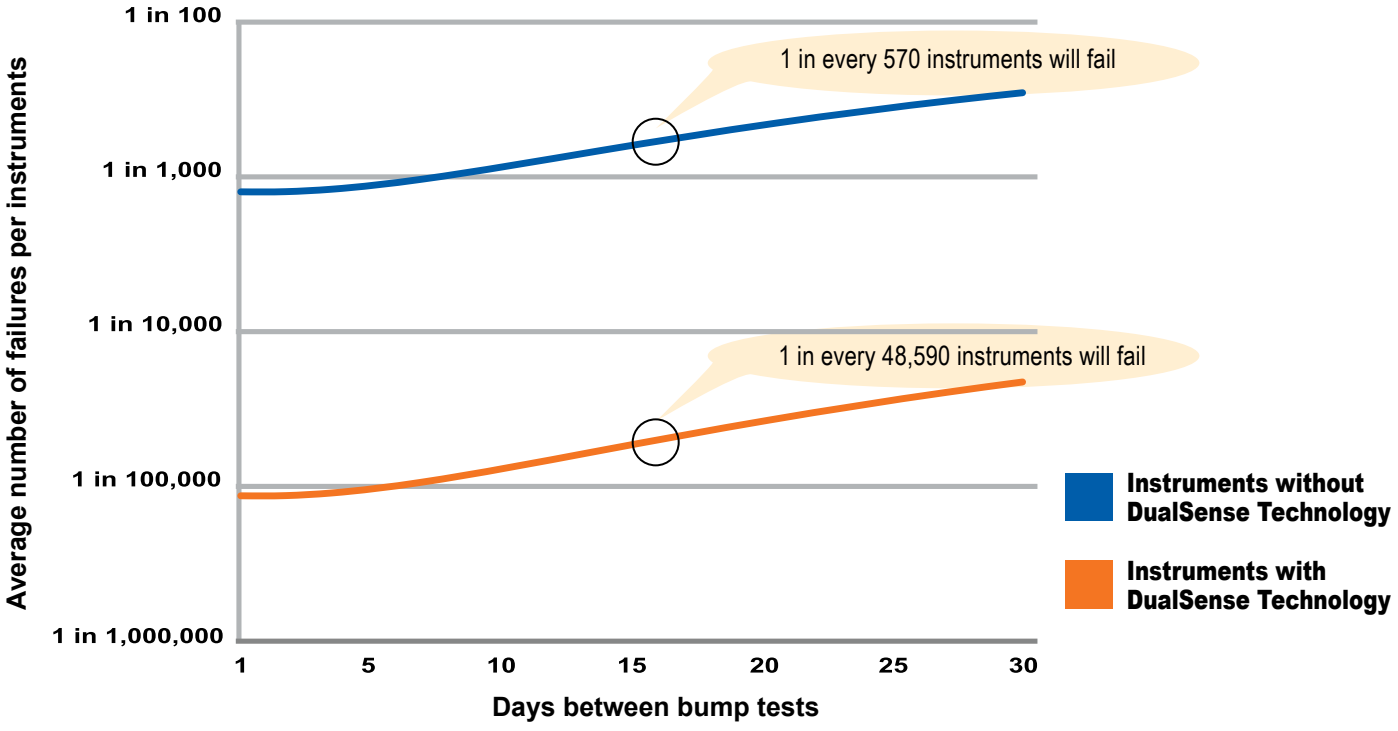
Instruments without DualSense Technology:
Based on the data in the chart, Industrial Scientific recommends that a bump (functional) test be performed prior to each day's use for all instruments without DualSense Technology. If conditions do not permit daily testing, bump tests may be done less frequently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



GasBadge® Pro

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
- Docking Station™ compatible
- HbCO detection option available

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.

http://www.indsci.com/GasBadgePro/

SPECIFICATIONS

INSTRUMENT WARRANTY:
Warranted for as long as the instrument is supported by Industrial Scientific Corporation.

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

DIMENSIONS:
9.4 cm x 5.08 mm x 2.79 mm (3.7" x 2" x 1.1")

WEIGHT:
85 g (3 oz.)

SENSORS:
CO, H_2S, O_2, NO_2, SO_2, NH_3, Cl_2, ClO_2, PH_3, HCN, H_2, CO/H_2 Null

MEASURING RANGES:

CO:	0-1,500 ppm in 1 ppm increments
H_2S:	0-500 ppm in 0.1 ppm increments
O_2:	0-30% by volume in 0.1% increments
NO_2:	0-150 ppm in 0.1 ppm increments
SO_2:	0-150 ppm in 0.1 ppm increments
NH_3:	0-500 ppm in 1 ppm increments
Cl_2:	0-100 ppm in 0.1 ppm increments
ClO_2:	0-1 ppm in 0.01 ppm increments
PH_3:	0-10 ppm in 0.01 ppm increments
HCN:	0-30 ppm in 0.1 ppm increments
H_2:	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

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

HUMIDITY RANGE:
0-99% RH (non-condensing), typical

IP RATING:
Third-party certified IP64

CERTIFICATIONS:

UL/cUL:	Class I, 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
ANZEx:	Ex ia I/IIC T4
INMETRO:	BR - Ex ia IIC T4
China Ex:	Ex ia I/IIC T4
KOSHA:	Ex ia I/IIC T4

SUPPLIED WITH MONITOR:
Attached suspender clip, calibration adapter and tubing, and operating instructions

PART NO.	DESCRIPTION
18100060-1	GasBadge® Pro – Carbon Monoxide (CO)
18100060-1S*	GasBadge® Pro – Carbon Monoxide (CO)
18100060-2	GasBadge® Pro – Hydrogen Sulfide (H_2S)
18100060-2S*	GasBadge® Pro – Hydrogen Sulfide (H_2S)
18100060-3	GasBadge® Pro – Oxygen (O_2)
18100060-4	GasBadge® Pro – Nitrogen Dioxide (NO_2)
18100060-5	GasBadge® Pro – Sulfur Dioxide (SO_2)
18100060-6	GasBadge® Pro – Ammonia (NH_3)
18100060-7	GasBadge® Pro – Chlorine (Cl_2)
18100060-8	GasBadge® Pro – Chlorine Dioxide (ClO_2)
18100060-9	GasBadge® Pro – Phosphine (PH_3)
18100060-B	GasBadge® Pro – Hydrogen Cyanide (HCN)
18100060-C	GasBadge® Pro – Hydrogen (H_2)
18100060-G	GasBadge® Pro – Carbon Monoxide/Low Hydrogen Interference (CO/H_2 Null**)
OPTIONAL ACCESSORIES	
18106302-ABC	GasBadge® Pro DS2 Docking Station™ **Ordering Information** A = Wireless Option (currently unavailable) 0 – none B = number of iGas® Readers 0 – none 1 = 1 iGas Reader 2 = 2 iGas Readers 3 = 3 iGas Readers C = Power Cord Option (0 – US, 1 – UK, 2 – EU, 3 – AUS, 4 – ITA, 5 – DEN, 6 – SWZ)
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® Plus/Pro
18106674	Breath Sampler for GasBadge® Pro Monitor
17123019	Lithium Battery, 3V, GasBadge® Pro
17124983-3	Replacement sensor, Oxygen (O_2)
17124983-1	Replacement sensor, Carbon Monoxide (CO)
17124983-G**	Replacement sensor, Carbon Monoxide (H_2 NULL**)
17124983-2	Replacement sensor, Hydrogen Sulfide (H_2S)
17124983-5	Replacement sensor, Sulfur Dioxide (SO_2)
17124983-7	Replacement sensor, Chlorine (Cl_2)
17124983-8	Replacement sensor, Chlorine Dioxide (ClO_2)
17124983-6	Replacement sensor, Ammonia (NH_3)
17124983-4	Replacement sensor, Nitrogen Dioxide (NO_2)
17124983-D	Replacement sensor, Nitric Oxide (NO)
17124983-B	Replacement sensor, Hydrogen Cyanide (HCN)
17124983-9	Replacement sensor, Phosphine (PH_3)
17124983-C	Replacement sensor, Hydrogen

* GasBadge Pro with U.S. standard alarms in stock for immediate shipping

** Low Hydrogen Interference

DS2 DOCKING STATION™

- Stand-alone Instrument Docking Stations (IDS) available for use with all GasBadge® Pro gas monitors
- Link up to 100 IDS modules – dock thousands of instruments
- Graphical user interface to monitor facility-wide network
- Automatic instrument calibration, record keeping, diagnostics and recharging
- Utilizes one central database
- Multilingual display

Nylon Carrying Case

GASBADGE® DATALINK

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

BM25

TRANSPORTABLE MULTI-GAS AREA MONITOR

The BM25 packs the benefits of a fixed system area monitor into a rugged and transportable instrument.

It was designed to detect one to five gases for mobile or temporary work applications, team protection, area surveillance, or places where fixed detection systems are not suitable.

- Tough, drop resistant case stands up in the harshest environments
- Powerful, noticeable alarms (103 dB @ 1m, 360° LEDs) to keep your people safe
- Long lasting battery (up to 170 hours) prolongs deployment in the field
- Easy to move and setup (weighs less than 15 lbs.)
- "Plug and Play" sensors for simple maintenance
- Over four work months of datalogging capacity
- Intrinsically safe
- Aspirated version available with sample draw of 30m (100 ft.)*

The BM25 is durable and versatile. It is suitable for a wide range of industries including refineries and pharmaceutical production. Applications include turnaround work sites, rig overhauls and fence-line surveillance.

* Available for BM25 (6514842) only
**Available for BM25A (6514872) only

SPECIFICATIONS†

INSTRUMENT WARRANTY:
Two-year warranty, excluding consumables (sensors, filters, etc.)

CASE MATERIAL:
Impact resistant polycarbonate

DIMENSIONS:
470 mm x 180 mm x 190 mm (16.7" x 7.1" x 7.5")

WEIGHT:
6.8 kg (15 lbs)

ALARMS:
103 dB @ 1 meter, Ultrabright LED beacon visible 360 degrees

POWER SOURCE:
NiMH; **Run Time:** 170 hours maximum operating time, 100 hours typical
Recharge Time: 4.5 hours

OPERATING TEMPERATURE RANGE:
-20ºC to 50ºC (-4ºF to 122ºF)

OPERATING HUMIDITY RANGE:
15%-95% non-condensing (continuous)

SENSORS:
Combustible Gas – Catalytic Bead
Oxygen and Toxic Gases – Electrochemical
CO_2 – Infrared
Methane, Propane, Butane, Isobutane, LPG, Ethanol, Pentane – Infrared*
VOC – PID*

MEASURING RANGES:

SENSOR	RANGE	RESOLUTION
Catalytic Bead		
Combustible Gas	0-100% LEL	1%
Methane	0-5% vol	0.01%
ELECTROCHEMICAL		
Carbon Monoxide	0-1,000 ppm	1
Carbon Monoxide (High Range)	0-2,000 ppm	1
Oxygen	0-30% vol	0.1%
Hydrogen Sulfide	0-100 ppm	1
Nitrogen Dioxide	0-30 ppm	0.1
Sulfur Dioxide	0-30 ppm	0.1
Chlorine	0-10 ppm	0.1
Chlorine Dioxide	0-3 ppm	0.1
Carbon Monoxide/	CO: 0-500 ppm	1
Hydrogen Sulfide (COSH)	H_2S: 0-200 ppm	1
Hydrogen	0-2,000 ppm	1
Hydrogen Chloride	0-30 ppm	0.1
Hydrogen Cyanide	0-30 ppm	0.1
Ammonia	0-1,000 ppm	1
Nitric Oxide	0-300 ppm	1
Phosphine	0-1 ppm	0.01
Arsine	0-1 ppm	0.01
Silane	0-50 ppm	0.1
Ethylene Oxide	0-30 ppm	0.1
INFRARED		
Methane (% vol)*	0-100% vol	1%
Methane (% LEL)*	0-100% LEL	1%
Propane (% LEL)*	0-100% LEL	1%
Butane (% LEL)*	0-100% LEL	1%
Isobutane (% LEL)*	0-100% LEL	1%
LPG (% LEL)*	0-100% LEL	1%
Ethanol (% LEL)*	0-100% LEL	1%
Pentane (% LEL)*	0-100% LEL	1%
Carbon Dioxide	0-5% vol	0.1%
PHOTOIONIZATION DETECTOR		
VOC*	0-2,000 ppm	1

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

SPECIFICATIONS continued

DISPLAY:
Graphic liquid crystal display w/backlight

DATALOGGING CAPACITY:
700 hours with 5 gases

CERTIFICATIONS:
ATEX : II 1G/ Ex ia IIC T4 Ga; I M1 / Ex ia I Ma
Or (when used with IR flameproof sensor)
II 2G/ Ex ia d IIC T4 Gb; I M2 Ex ia d I Mb
IECEx : Ex ia IIC T4 / Ex ia I (BM25 without IR sensor)
Ex ia d IIC T4 / Ex ia I (BM25A without IR sensor)
or (when used with IR flameproof sensor)
Ex ia d IIC T4 / Ex ia d I (BM25 and BM25A)
CSA**: Class I, Groups A,B,C,D T4; Ex ia d IIC T4;
C22.2 No. 152 (excluding aspirated, XP IR and PID sensor configurations)

SUPPLIED WITH MONITOR:
Instruction manual, calibration adapter, universal input charger, maintenance tool.

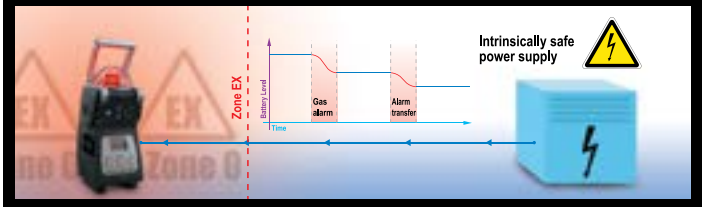
* Available for BM25 (6514842) only
**Available for BM25A (6514872) only

http://www.indsci.com/BM25/

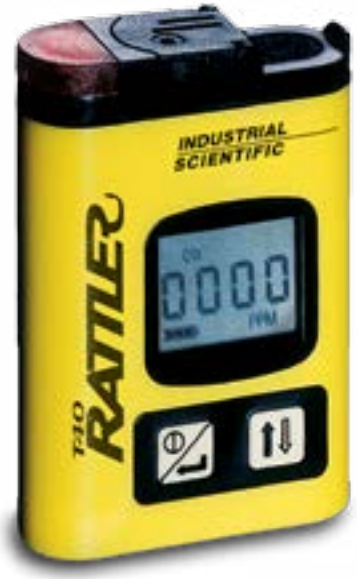
Multiple units can be grouped using optional alarm transfer kits. This protects larger areas by transferring alarms from one BM25 to the next. An intrinsically safe trickle charger is also available for long-term area monitoring in classified zones.

Alarm transfer and safety perimeter

Trickle charge for long term area monitoring



COMMON INSTRUMENT CONFIGURATIONS	
PART NO.	**DESCRIPTION**
6514872-K12300	BM25 - LEL (Pentane), CO, H_2S, O_2
6514842-K12301	BM25 - LEL (Pentane), CO, H_2S, O_2, Pump*
6514872-K00000	BM25 - LEL (Pentane)
6514872-L00000	BM25 - LEL (Methane)
6514872-010000	BM25 - CO
6514872-020000	BM25 - H_2S
6514872-000300	BM25 - O_2
6514872-K02350	BM25 - LEL (Pentane), H_2S, O_2, SO_2
6514872-K03J50	BM25 - LEL (Pentane), O_2, CO/H_2S, SO_2
6514842-K003R0	BM25 - LEL (Pentane), O_2, PID*
6514872-0103Q0	BM25 - CO, O_2, CO_2
6514872-K0D3J0	BM25 - LEL (Pentane), NO, O_2, CO/H_2S
6514872-K04J50	BM25 - LEL (Pentane), NO_2, CO/H_2S, SO_2
6514872-K67300	BM25 - LEL (Pentane), NH_3, Cl_2, O_2
OPTIONAL ACCESSORIES	
WLOGUSB	BM25 Datalink Adapter Kit (Software w/USB Adapter Cable)
6321388	BM25 Tripod
6315862	BM25 Alarm Transfer Kit (Cable length = 25 m)
6315863	BM25 Alarm Transfer Kit (Cable length = 50 m)
6315864	BM25 Alarm Transfer Kit (Cable length = 100 m)
6311085	BM25 Intrinsically Safe Trickle Charge Kit (Cable length = 25 m): one IS power supply and wiring arrangements
6311089	BM25 Intrinsically Safe Trickle Charge Kit (Cable length = 50 m): one IS power supply and wiring arrangements
6311093	BM25 Intrinsically Safe Trickle Charge Kit (Cable length = 100 m): one IS power supply and wiring arrangements and wiring arrangements



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_2S 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 mm x 58 mm x 19 mm (3.375" x 2.3" x .75")

WEIGHT:
98 g (3.5 oz.)

SENSORS:
CO, H_2S – 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:	EEx ia IIC T4; Equipment Group and Category II 2G
IECEx:	Ex ia IIC T4
ANZEx:	Ex ia IIC T4

PART NO.	DESCRIPTION
18105247	T40 Rattler – Hydrogen Sulfide (H_2S)
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.

The T40 Rattler's compact design allows it to fit comfortably in a shirt pocket, a tool belt or on a hard hat.

http://www.indsci.com/t40/

Industrial Scientific Corporation is committed to continually developing new products that provide our customers with new capabilities, improvements, and enhancements to meet their ever evolving needs in portable gas detection instruments. To best focus these development efforts, we must periodically streamline our product offerings so that we can continue to provide our customers with the highest quality product and services. Industrial Scientific remains deeply committed to supporting our customers' evolving portable gas detection needs while providing the highest quality instruments, customer service, and support available in the industry today.

For our older products, we will continue to make every effort possible to provide repair services, replacement components, and spare parts for as long as reasonably possible for our discontinued products. The chart below identifies the types of support levels available and timeframes for the identified portable instruments.

PORTABLE GAS DETECTORS OLDER PRODUCT AVAILABILITY & SUPPORT SUMMARY

Product Available	No longer available; Service/Repair and all replacement parts available	Batteries, sensors, and filters available; Service/Repair subject to parts availability	All parts and service subject to parts availability
	MX4 iQuad	1-Apr-2014	1-Jan-2016
	M40-M	1-Apr-2014	1-Jan-2016
	iTX	1-Jan-2016	1-Jan-2016
	M40	1-Jan-2015	1-Jan-2016
	MCAL	1-Jan-2015	1-Jan-2016
GasBadge Plus	1-Oct-2013	N/A	1-Apr-2015
	OX2000	1-Jan-2014	1-Jan-2016
	GDP2000	1-Jan-2014	1-Jan-2016
	EX2000	1-Jan-2014	1-Jan-2016
	EX2000C	1-Jan-2014	1-Jan-2016
	C1100	1-Jan-2014	1-Jan-2016
	MX2100	1-Jan-2014	1-Jan-2016
			MG140
			ATX612
			ATX620
			LTX310
			LTX312
			TMX410
			TMX412
			BP2000
			MDU420
			CDU440
			T82
			DS1000
			TX2000
			MX2000 *
			BM22/BM22+ *
			MX21/MX21+ *
			C2000
			CK2000
			LKD100
			TX418
			TX11
			OX10
			EX10
			RX500

* Limited battery/sensor availability

AVAILABLE ACCESSORIES

M40 MULTI-GAS MONITOR OPTIONAL ACCESSORIES	
PART NO.	**DESCRIPTION**
17092941	Metal Belt Clip
17107582	Suspender Clip
18106070	CO Breath Sampler for M40
17108622	Calibration Cup, M40
M•CAL™ OPTIONAL ACCESSORIES	
17119843	Replacement Cable for M•Cal to PC Interface, 6' Null Modem F/F
17118118	Replacement Power Supply
M40-KIT-DFR0000	M•Cal™ Accessory Kit (demand flow regulator, calibration gas cylinder, tubing)

ITX MULTI-GAS MONITOR OPTIONAL ACCESSORIES	
PART NO.	**DESCRIPTION**
17153290	Rechargeable Lithium-ion (Li-ion) Battery Pack - MSHA
17153303	Rechargeable Lithium-ion (Li-ion) Battery Pack - UL/CSA/ATEX/AUS
17089376	Replaceable Cell Alkaline Battery Pack - UL/CSA/ATEX/AUS/MSHA

MISCELLANEOUS BATTERIES / CHARGING ACCESSORIES	
PART NO.	**DESCRIPTION**
17025305	Ni-Cad Battery Pack, CD211
OPTIONAL CASES FOR MONITORS	
18100628	Detachable Shoulder Strap for Leather Cases
17051487	High Impact Carry Case, Dust/ Water Tight (Pelican®)
18101840	Instrument and Accessory Case w/Foam Insert, black

PORTABLE INSTRUMENT SENSOR OPTIONS

SENSOR	MULTI-GAS MONITORS			SINGLE-GAS MONITORS		
	Ventis™ MX4	MX6 iBrid™	BM25	GasBadge® Pro	Tango™ TX1	T40 Rattler
OXYGEN (O_2)	•	•	•	•		
LEL SENSOR (%LEL) - CATALYTIC BEAD [HP]	• ★	• ★	• △			
	and up to two of the following	up to five sensors	and up to two of the following	or any of the following		
AMMONIA (NH_3)		•	•	•		
ARSINE (ASH_3)			•			
CARBON MONOXIDE (CO)	•	•	•	•	•	•
CARBON MONOXIDE (CO HIGH)		•	•			
CO/H_2 LOW		•		•		
CO/H_2S (COSH)		•	•			
CHLORINE (Cl_2)		•	•	•		
CHLORINE DIOXIDE (ClO_2)		•	•	•		
ETHYLENE OXIDE (ETO)			•			
HYDROGEN (H_2)		•	•	•		
HYDROGEN CHLORIDE (HCl)		•	•			
HYDROGEN CYANIDE (HCN)		•	•	•		
HYDROGEN SULFIDE (H_2S)	•	•	•	•	•	•
METHANE (0-5% VOL) - CATALYTIC BEAD [HP]	• ★★	• ★★				
NITRIC OXIDE (NO)		•	•			
NITROGEN DIOXIDE (NO_2)	•	•	•	•	•	
PHOSPHINE (PH_3)		•	•	•		
PHOSPHINE HIGH (0-1,000 PPM)		•				
SILANE (SIH_4)			•			
SULFUR DIOXIDE (SO_2)	•	•	•	•	•	
INFRARED						
CARBON DIOXIDE (CO2) - (IR) [HP]		• □	•			
HYDROCARBONS (0-100% LEL) - (IR) [HP]		• □	•			
METHANE (0-100% VOL) - (IR) [HP]		• □	•			
METHANE (CH_4 %LEL) - (IR) [HP]		• □	•			
PHOTOIONIZATION						
PID FOR VOCS (VOLATILE ORGANIC COMPOUNDS) [HP]		•	•			

NOTES:

- Sensor Not Available
- • Sensor Available
- □ Maximum of one Infrared (IR) Sensor per instrument (MX6)
- △ Factory calibrated to Methane
- ★ Factory calibrated to Pentane (typically) or Methane (optionally)
- ★★ Maximum of one Catalytic Bead Sensor per instrument
- [HP] Maximum of two High Power Sensors per instrument, but just one IR sensor (MX6)

Certain limits apply to the number of sensor configurations.

	MULTI GAS MONTIORS						SINGLE GAS MONITORS	
GAS	VENTIS™ MX4	M40	MX6 IBRID™	ITX™ (SMALL)	ITX™ (BIG)	BM25	TANGO™ TX1	GASBADGE® PRO
CATALYTIC BEAD								
%LEL / PENTANE (C_5H_{12})	17134495		17124975-K					
%LEL / METHANE (CH_4)	17134495	17050788	17124975-L	17105719		6313969** 6313888*		
METHANE (CH_4 0-5%)	17134495		17124975-M					
ELECTROCHEMICAL STANDARD								
CARBON MONOXIDE (CO)	17134487	17112160	17124975-1	17101064	17101080	6313787	17155161^	17124983-1
CARBON MONOXIDE (CO HIGH)			17124975-H			6313826		
CARBON MONOXIDE (H_2 LOW)			17124975-G		17101072			17124983-G
CARBON MONOXIDE / HYDROGEN SULFIDE (CO/H_2S)			17124975-J		17101106	6313823		17124983-C
HYDROGEN SULFIDE (H_2S)	17134479	17112152	17124975-2	17101114	17101130	6313788	17155164^	17124983-2
OXYGEN (O_2)	17134461	17117730	17124975-3	17101213		6313780		17124983-3
NITROGEN DIOXIDE (NO_2)	17134503		17124975-4	17101163	17101171	6313801	17155162^	17124983-4
SULFUR DIOXIDE (SO_2)	17143595		17124975-5	17101197	17101205	6313822	17155163^	17124983-5
ELECTROCHEMICAL EXOTICS								
AMMONIA (NH_3)			17124975-6		17100900	6313800		17124983-6
ARSINE (ASH_3)						6313811		
CHLORINE (Cl_2)			17124975-7	17101247		6313809		17124983-7
CHLORINE DIOXIDE (ClO_2)			17124975-8	17101049		6313841		17124983-8
ETHYLENE OXIDE (ETO)						6313821		
HYDROGEN (H_2)			17124975-C	17100967		6313803		
HYDROGEN CHLORIDE (HCl)			17124975-A	17100934		6313804		
HYDROGEN CYANIDE (HCN)			17124975-B	17100926		6313805		17124983-B
NITRIC OXIDE (NO)			17124975-D	17100892	17100884	6313802		17124983-D
PHOSPHINE (PH_3 HIGH)			17124975-E					
PHOSPHINE (PH_3)			17124975-9	17101023		6313810		17124983-9
SILANE (SIH_4)						6313808		
INFRARED								
CARBON DIOXIDE (CO_2)			17124975-Q			6313818		
HYDROCARBONS			17124975-P			Varies call for detail		
METHANE (CH_4 0-100% Vol)			17124975-N			6314092*		
METHANE (CH_4 0-100% LEL)			17124975-S			6314064*		
PHOTOIONIZATION								
PID (VOCs)			17124975-R			6313998*		

* Available for BM25 (6514842) only
**Available for BM25A (6514872) only
^ Tango sensors are packaged in random pairs

(c) 18101386 6' Extendible Stainless Steel Probe
Shown:
- not extended
- partially extended
- fully extented

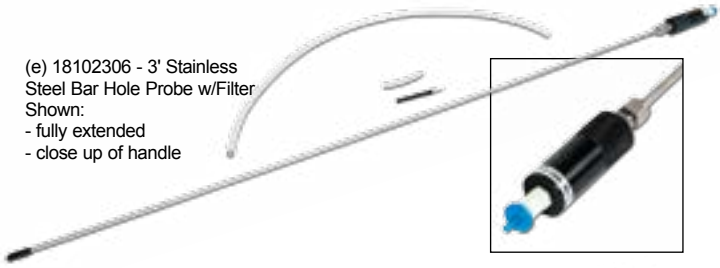
(a) 18102111 - 4.5'
Folding Probe w/Tubing
Shown:
- fully extended
- folded with case

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

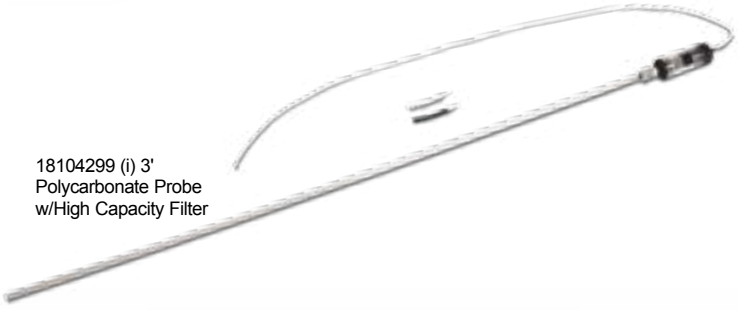
(b) 18101428 - 4'
Polycarbonate Probe
w/Tubing

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

(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



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

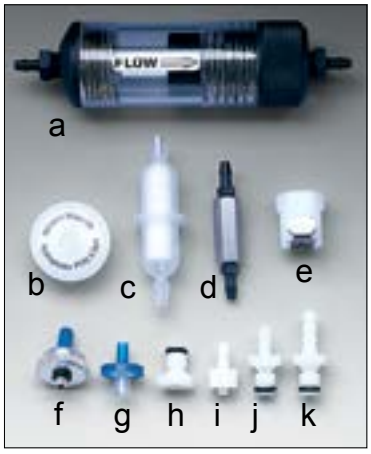
SAMPLING PROBES	
PART NO.	**DESCRIPTION**
18102111	(a) 4.5' Folding Probe w/Tubing
18101428	(b) 4' Polycarbonate Probe w/Tubing
18101386	(c) 6' Extendible Stainless Steel Probe
18102309	(d) 1.5' Polycarbonate Probe w/Filter
18102306	(e) 3' Stainless Steel Bar Hole Probe w/Filter
18102276	(f) 1.5' Stainless 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

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

Extention Table:	**18105155** MX6 Inlet Probe Adapter*	**18105064** MX6 High Capacity Filter Adapter*
0 = 1/8" Female NPT Connection	18105155-0	18105064-0
1 = 1/8" Hose Barb Fitting	18105155-1	18105064-1
2 = Female Quick Connect Coupling	18105155-2	18105064-2
3 = 8" Teflon Probe	18105155-3	18105064-3
4 = 10" Stainless Steel Probe	18105155-4	18105064-4
5 = 18" Polycarbonate Probe	18105155-5	18105064-5

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

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)

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 for iSP/SP402/SP202/SP100 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
17062498	Replacement Inlet Filter Assembly for ATX Series
17067034	ATX Right Angle Inlet Swivel Fitting
17051319	Dust Filter/WaterStop for Docking Station Fresh Air Inlet
17051701	Replacement Probe Fitting for 18101386
17113168	SP40 Water Barrier
17119553	iSP Filter Guard
18102418	3.048 m (10') Sample Tube w/Inline Filter
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_2, ClO_2, HCl, or PID sensors)
18102257	Probe Tubing Kit for iTX, 300/400 Series – Urethane (Not for use with Cl_2, ClO_2, HCl, or PID sensors)
18108093	Probe Tubing Kit for MX6/Ventis – Teflon lined (For use with all sensors)
18108077	Probe Tubing Kit for iTX, 300/400 Series – Teflon lined (For use with all sensors)

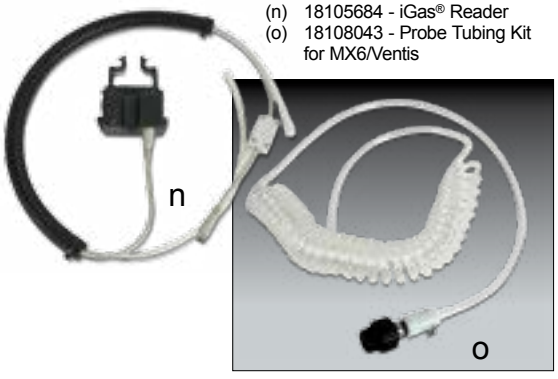
Universal Urethane Sample Tubing Kit with Dust Filter/Water Stop

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_2, ClO_2, HCl, or PID Sensors

MISCELLANEOUS CALIBRATION EQUIPMENT

PART NO.	DESCRIPTION
18109208	Tubing, Urethane, 3/16 ID, 3.048 m / 10 ft
18105684	(n) iGas® Reader
17041807	Calibration Log, (tablet of 50 sheets)
17050734	Calibration Log, TMX, LTX, STX, (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)
17116096	Calibration Tubing Assembly with "T" Fitting (For use when calibrating a monitor with pump using a positive flow regulator)



(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
18109206-10	3 m / 10 ft	18109206-60	18.3 m / 60 ft
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 iNetDS 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 kits come equipped with everything necessary to keep your gas monitors operating accurately and reliably. Kits contain certified NIST-traceable span gases for safe, reliable instrument calibration. Calibration cups and tubing are supplied with the instrument and are not included in the kit. Complete kits are available for all installed sensors and include:

- Convenient carrying case
- Non-refillable cylinders
- Flow regulator

Calibration gas cylinders and kits are available in a variety of sizes and concentrations, including convenient multi-gas blends or single gas cylinders. Use the following chart to order complete kits or replacement cylinders. To view a complete listing, visit our online calibration gas cross reference chart at

http://www.indsci.com/Calibration-Gas-Cross-Reference-Chart/

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 or InSite subscription, a new cylinder of gas will automatically be sent when iNet Control detects a low gas cylinder.

CALIBRATION GAS CROSS REFERENCE CHART

PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					150 PSI Trip Pressure	250 PSI Trip Pressure
18102303	CYL, 500 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18106914	CYL, 25 ppm H_2S, 50 ppm CO, 18% O_2, 32.4% LEL Methane	58L	18100883	18102509	18105841	18109244
18105262	CYL, 50 ppm CO, 25 ppm H_2S, 20.9% O_2, 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18109101	CYL, 50 ppm CO, 25 ppm H_2S, 20.9% O_2, 50% LEL Methane	116L	18100883	18102509	18105841	18109244
18105122	CYL, 50 ppm CO, 18% O_2, 50% LEL Propane	103L	18100883	18102509	18105841	18109244
18102243	CYL, 50 ppm CO, 19% O_2, 2.5% Methane	103L	18100883	18102509	18105841	18109244
18104448	CYL, 50 ppm CO, 19% O_2, 25% LEL Pentane	34L	18100933	18103564	18105866	
18104463	CYL, 50 ppm CO, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18104455	CYL, 50 ppm CO, 19% O_2, 50% LEL Pentane	103L	18100883	18102509	18105841	18109244
18100719	CYL, 50 ppm Carbon Monoxide	34L	18100933	18103564	18105866	
18100750	KIT, 50 ppm Carbon Monoxide	34L	18100933			
18102230	CYL, 50 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18101063	CYL, 300 ppm Carbon Monoxide	34L	18100933	18103564	18105866	
18109183	CYL, 250 ppm CO, 25 ppm H_2S, 18% O_2, 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18108035	CYL, 250 ppm CO, 25 ppm H_2S, 19% O_2, 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18102324	CYL, 250 ppm CO, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18102302	CYL, 250 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18101493	CYL, 25 ppm Carbon Monoxide	34L	18100933	18103564	18105866	
18106005	CYL, 25 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18109181	CYL, 200 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102343	CYL, 200 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18105825	CYL, 200 ppm CO, 75 ppm H_2S, 15% O_2, 25% LEL Methane (Bump Gas)	11L				
18109216	CYL, 200 ppm CO, 75 ppm H_2S, 15% O_2, 50% LEL Methane (Bump Gas)	11L				
18101352	CYL, 200 ppm Carbon Monoxide	34L	18100933	18103564	18105866	
18102301	CYL, 125 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18109232	CYL, 100 ppm CO, 25 ppm H_2S, 10 ppm SO_2, 18% O_2, 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109156	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 2.5% Methane	58L	18100883	18102509	18105841	18109244
18109158	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109227	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 12.5% LEL Methane	58L	18100883	18102509	18105841	18109244
18109226	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Methane	58L	18100883	18102509	18105841	18109244
18109185	CYL, 100 ppm CO, 25 ppm H_2S, 2.5% CO_2, 18% O_2, 40% LEL Methane	58L	18100883	18102509	18105841	18109244
18109192	CYL, 100 ppm CO, 25 ppm H_2S, 18% O2, 50% LEL Methane	34L	18100883	18102509	18105841	18109244
18109234	CYL, 100 ppm CO, 25 ppm H_2S, 10 ppm SO_2, 18% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109220	CYL, 100 ppm CO, 25 ppm H_2S, 5 ppm SO_2, 18% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109222	CYL, 100 ppm CO, 25 ppm H_2S, 5 ppm SO_2, 18% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109191	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	34L	18100883	18102509	18105841	18109244
18109155	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109157	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109177	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 50% LEL Propane	58L	18100883	18102509	18105841	18109244
18109188	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 50% LEL Propane	116L	18100883	18102509	18105841	18109244
18109214	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2 25% LEL Isobutane (Low PSI)	52L	18100883	18102509	18105841	18109244
18102242	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2.5% Methane	58L	18100883	18102509	18105841	18109244
18102275	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2.5% Methane	58L	18100883			
18109080	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2.5% Methane	116L	18100883	18102509	18105841	18109244

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

PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					150 PSI Trip Pressure	250 PSI Trip Pressure
18109138	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2.5% Methane	116L	18100883			
18105536	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 50% LEL Methane	34L	18100883	18102509	18105841	18109244
18109182	CYL, 100 ppm CO, 2.5% CO_2, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18107995	CYL, 100 ppm CO, 2.5% CO_2, 25 ppm H2S, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18103937	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	34L	18100883	18102509	18105841	18109244
18102187	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102189	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883			
18103432	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane w/ DFR	58L		18102509		
18109077	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109137	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	116L	18100883			
18109139	KIT, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane w/ DFR	116L		18102509		
18106179	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 50% LEL Propane	58L	18100883	18102509	18105841	18109244
18105635	CYL, 100 ppm CO, 50 ppm H_2S, 16% O_2, 50% LEL Methane (Bump Test)	34L	18103580	18102509		
18103143	CYL, 100 ppm CO, 50 ppm H_2S, 16% O_2, 50% LEL Methane (Bump Test)	58L	18103580	18102509		
18109103	CYL, 100 ppm CO, 50 ppm H_2S, 16% O_2, 50% LEL Methane (Bump Test)	116L	18103580	18102509		
18105676	CYL, 100 ppm CO, 15% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109175	CYL, 100 ppm CO, 18% O_2, 2.0% (40% LEL) Methane	103L	18100883	18102509	18105841	18109244
18109184	CYL, 100 ppm CO, 5 ppm NO_2, 18% O_2, 2.5% Methane	58L	18100883	18102509	18105841	18109244
18109164	CYL, 100 ppm CO, 10 ppm SO_2, 18% O_2, 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109174	CYL, 100 ppm CO, 18% O_2, 2.5% Methane	103L	18100883	18102509	18105841	18109244
18109178	CYL, 100 ppm CO, 5 ppm NO_2, 18% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109236	CYL, 100 ppm CO, 5 ppm NO_2, 18% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109165	CYL, 100 ppm CO, 18% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109190	CYL, 100 ppm CO, 18% O_2, 25% LEL Pentane	34L	18100933	18103564	18105866	18109243
18109176	CYL, 100 ppm CO, 2.5% CO_2, 18% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109251	CYL, 100 ppm CO, 25 ppm H_2S, 2.5% CO_2, 18% O_2, 2.0% (40% LEL) Methane	116L	18100883	18102509	18105841	18109244
18109250	CYL, 100 ppm CO, 25 ppm H_2S, 2.5% CO_2, 18% O_2, .35% (25% LEL) Pentane	116L	18100883	18102509	18105841	18109244
18107847	CYL, 100 ppm CO, 19% O_2, 2.0% (40% LEL) Methane	103L	18100883	18102509	18105841	18109244
18108571	CYL, 100 ppm CO, 5 ppm NO_2, 19% O_2, 2.5% Methane	58L	18100883	18102509	18105841	18109244
18102165	CYL, 100 ppm CO, 19% O_2, 2.5% Methane	103L	18100883	18102509	18105841	18109244
18102270	KIT, 100 ppm CO, 19% O_2, 2.5% Methane	103L	18100883			
18101246	CYL, 100 ppm CO, 19% O_2, 2.5% Methane	34L	18100933	18103564	18105866	18109243
18101287	KIT, 100 ppm CO, 19% O_2, 2.5% Methane	34L	18100933			
18108548	CYL, 100 ppm CO, 2.5% CO_2, 19% O_2, 2.5% Methane	103L	18100883	18102509	18105841	18109244
18106781	CYL, 100 ppm CO, 5 ppm NO_2, 19% O_2, 25% LEL Methane	58L	18100883	18102509	18105841	18109244
18103473	CYL, 100 ppm CO, 2.5% CO_2, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18103317	KIT, 100 ppm CO, 2.5% CO_2, 19% O_2, 25% LEL Pentane (DFR)	103L		18102509		
18104521	CYL, 100 ppm CO, 5% CO_2, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18104539	KIT, 100 ppm CO, 5% CO_2, 19% O_2, 25% LEL Pentane (DFR)	103L		18102509		
18106773	CYL, 100 ppm CO, 5 ppm NO_2, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18101576	CYL, 100 ppm CO, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18101568	KIT, 100 ppm CO, 19% O_2, 25% LEL Pentane w/ Zero Grade Air	103L	18100883			
18102269	KIT, 100 ppm CO, 19% O_2, 25% LEL Pentane	103L	18100883			
18101253	CYL, 100 ppm CO, 19% O_2, 25% LEL Pentane	34L	18100933	18103564	18105866	18109243

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CALIBRATION GAS CROSS REFERENCE CHART

PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					150 PSI Trip Pressure	250 PSI Trip Pressure
18101295	KIT, 100 ppm CO, 19% O_2, 25% LEL Pentane w/ Zero Grade Air	34L	18100933			
18102665	CYL, 100 ppm Carbon Monoxide (Bump Gas)	11L				
18100701	CYL, 100 ppm Carbon Monoxide	34L	18100933	18103564	18105866	18109243
18100743	KIT, 100 ppm Carbon Monoxide	34L	18100933			
18102163	CYL, 100 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18102162	KIT, 100 ppm Carbon Monoxide	103L	18100883			
18102970	CYL, 10 ppm Hydrogen Sulfide	58L	18100883	18102509	18105841	18109244
18102304	CYL, 125 ppm Hydrogen Sulfide	58L	18100883	18102509	18105841	18109244
18109179	CYL, 25 ppm H_2S, 5 ppm SO_2, 18% O2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109180	CYL, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102241	CYL, 25 ppm H_2S, 19% O_2, 2.5% Methane	58L	18100883	18102509	18105841	18109244
18102274	KIT, 25 ppm H_2S, 19% O_2, 2.5% Methane	58L	18100883			
18109092	CYL, 25 ppm H_2S, 19% O_2, 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109142	KIT, 25 ppm H_2S, 19% O_2, 2.5% Methane	116L	18100883			
18106807	CYL, 25 ppm H_2S, 5 ppm SO_2, 19% O_2, 25% LEL Methane	58L	18100883	18102509	18105841	18109244
18104331	CYL, 25 ppm H_2S, 19% O_2, 40% LEL Methane	58L	18100883	18102509	18105841	18109244
18102186	CYL, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102188	KIT, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	58L	18100883			
18109083	CYL, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18101279	KIT, 19% O_2, 25% LEL Pentane, 25 ppm H2S, 103L	103L/58L	18100883			
18106799	CYL, 25 ppm H_2S, 5 ppm SO_2, 19% O_2, 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102764	CYL, 25 ppm H_2S, 19% O_2, 50% LEL Propane	58L	18100883	18102509	18105841	18109244
18104984	CYL, 25 ppm Hydrogen Sulfide	34L	18100883	18102509	18105841	18109244
18100859	CYL, 25 ppm Hydrogen Sulfide	58L	18100883	18102509	18105841	18109244
18100842	KIT, 25 ppm Hydrogen Sulfide	58L	18100883			
18109078	CYL, 25 ppm Hydrogen Sulfide	116L	18100883	18102509	18105841	18109244
18109135	KIT, 25 ppm Hydrogen Sulfide	116L	18100883			
18102988	CYL, 40 ppm Hydrogen Sulfide	58L	18100883	18102509	18105841	18109244
18109096	CYL, 40 ppm Hydrogen Sulfide	116L	18100883	18102509	18105841	18109244
18102245	CYL, 50 ppm Hydrogen Sulfide	58L	18100883	18102509	18105841	18109244
18109090	CYL, 50 ppm Hydrogen Sulfide	116L	18100883	18102509	18105841	18109244
18109209	CYL, 500 ppm Hydrogen Sulfide	116L	18100883	18102509	18105841	18109244
18109237	CYL, 75ppm H_2S, 200 ppm SO_2, 15% O_2, 25% LEL Methane	11L				
18109167	CYL, 5 ppm SO_2, 18% O_2, 2.5% Vol. Methane	58L	18100883	18102509	18105841	18109244
18109173	CYL, 18% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109189	CYL, 18% Oxygen	34L	18100933	18103564	18105866	18109243
18100289	CYL, 19% Oxygen	34L	18100933	18103564	18105866	18109243
18101238	CYL, 19% O_2, 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18100271	CYL, 20.9% Oxygen	34L	18100933	18103564	18105866	18109243
18100693	CYL, Zero Grade Air (20.9% Oxygen)	34L	18100933	18103564	18105866	18109243
18101584	CYL, Zero Grade Air (20.9% Oxygen)	103L	18100883	18102509	18105841	18109244
18100206	CYL, 1% Methane	34L	18100933	18103564	18105866	18109243
18108001	CYL, 2.0% Methane	103L	18100883	18102509	18105841	18109244
18107284	CYL, 2.0% Methane	34L	18100883	18102509	18105841	18109244

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PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					150 PSI Trip Pressure	250 PSI Trip Pressure
18100214	CYL, 2.5% Methane	34L	18100933	18103564	18105866	18109243
18101303	KIT, 2.5% Methane	34L	18100933			
18101378	CYL, 2.5% Methane	103L	18100883	18102509	18105841	18109244
18105114	CYL, 10% LEL Methane	34L	18100933	18103564	18105866	18109243
18102312	CYL, 99% Methane	34L	18100933	18103564	18105866	18109243
18102491	KIT, 99% Methane	34L		18103564		
18104778	CYL, 99% Methane (Aluminum)	34L	18100883	18102509	18105841	18109244
18105106	CYL, 1,000 ppm Methane	34L	18100933	18103564	18105866	18109243
18105098	CYL, 500 ppm Methane	34L	18100933	18103564	18105866	18109243
18102234	CYL, 12% LEL Pentane	103L	18100883	18102509	18105841	18109244
18101162	CYL, 25% LEL Pentane	34L	18100933	18103564	18105866	18109243
18101261	KIT, 25% LEL Pentane	34L	18100933			
18100164	CYL, 25% LEL Propane	34L	18100933	18103564	18105866	18109243
18103762	CYL, 25% LEL Propane	103L	18100883	18102509	18105841	18109244
18100172	CYL, 50% LEL Propane	34L	18100933	18103564	18105866	18109243
18105593	CYL, 25 ppm Ammonia	34L	18100883	18102509	18105841	18109244
18102151	CYL, 25 ppm Ammonia	58L	18100883	18102509	18105841	18109244
18102147	KIT, 25 ppm Ammonia	58L	18100883			
18109081	CYL, 25ppm Ammonia	116L	18100883	18102509	18105841	18109244
78103868	CYL, 50 ppm Ammonia	58L	18100883	18102509	18105841	18109244
18102913	CYL, 2.5% Carbon Dioxide	103L	18100883	18102509	18105841	18109244
18108118	CYL, 3% Carbon Dioxide	103L	18100883	18102509	18105841	18109244
18103218	CYL, 5.0% Carbon Dioxide	34L	18100933	18103564	18105866	18109243
18103275	KIT, 5.0% Carbon Dioxide	34L		18103564		
18104208	CYL, 5.0% Carbon Dioxide	103L	18100883	18102509	18105841	18109244
18106153	CYL, 1,000 ppm Carbon Dioxide	103L	18100883	18102509	18105841	18109244
18106146	CYL, 300 ppm Carbon Dioxide	103L	18100883	18102509	18105841	18109244
18106252	CYL, 10 ppm Nitrogen Dioxide	58L	18100883	18102509	18105841	18109244
18105452	CYL, 25 ppm Nitrogen Dioxide	34L	18100883	18102509	18105841	18109244
18101477	CYL, 25 ppm Nitrogen Dioxide	58L	18100883	18102509	18105841	18109244
18101469	KIT, 25 ppm Nitrogen Dioxide	58L	18100883			
18104976	CYL, 5 ppm Nitrogen Dioxide	34L	18100883	18102509	18105841	18109244
18102219	CYL, 5 ppm Nitrogen Dioxide	58L	18100883	18102509	18105841	18109244
18102238	KIT, 5 ppm Nitrogen Dioxide	58L	18100883			
18101220	CYL, 10 ppm Sulfur Dioxide	58L	18100883	18102509	18105841	18109244
18109079	CYL, 10 ppm Sulfur Dioxide	116L	18100883	18102509	18105841	18109244
18101212	KIT, 10 ppm Sulfur Dioxide	58L	18100883			
18104992	CYL, 5 ppm Sulfur Dioxide	34L	18100883	18102509	18105841	18109244
18102222	CYL, 5 ppm Sulfur Dioxide	58L	18100883	18102509	18105841	18109244
18109086	CYL, 5 ppm Sulfur Dioxide	116L	18100883	18102509	18105841	18109244
18102239	KIT, 5 ppm Sulfur Dioxide	58L	18100883			
18105734	CYL, 5 ppm Benzene	103L	18100883	18102509	18105841	18109244
18105700	CYL, 5 ppm Butadiene	34L	18100933	18103564	18105866	18109243
18102806	CYL, 2 ppm Chlorine	58L	18100883	18102509	18105841	18109244

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CALIBRATION GAS CROSS REFERENCE CHART

PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					150 PSI Trip Pressure	250 PSI Trip Pressure
18103697	CYL, 5 ppm Chlorine	58L	18100883	18102509	18105841	18109244
18105007	CYL, 10 ppm Chlorine	34L	18100883	18102509	18105841	18109244
18101758	CYL, 10 ppm Chlorine	58L	18100883	18102509	18105841	18109244
18101741	KIT, 10 ppm Chlorine	58L	18100883			
18103127	CYL, 25% LEL Hexane	103L	18100883	18102509	18105841	18109244
18102249	CYL, 40% LEL Hexane	34L	18100933	18103564	18105866	18109243
18107987	CYL, 500 ppm Hexane	103L	18100883	18102509	18105841	18109244
18100453	CYL, 25% LEL Hydrogen	34L	18100933	18103564	18105866	18109243
18100461	CYL, 50% LEL Hydrogen	34L	18100933	18103564	18105866	18109243
18103481	CYL, 50% LEL Hydrogen	103L	18100883	18102509	18105841	18109244
18102905	CYL, 50 ppm Hydrogen	34L	18100933	18103564	18105866	18109243
18103945	CYL, 100 ppm Hydrogen	34L	18100933	18103564	18105866	18109243
18102996	CYL, 500 ppm Hydrogen	103L	18100883	18102509	18105841	18109244
18103010	CYL, 1,000 ppm Hydrogen	103L	18100883	18102509	18105841	18109244
18102154	CYL, 10 ppm Hydrogen Chloride	58L	18100883	18102509	18105841	18109244
18102148	KIT, 10 ppm Hydrogen Chloride	58L	18100883			
18102152	CYL, 10 ppm Hydrogen Cyanide	58L	18100883	18102509	18105841	18109244
18102149	KIT, 10 ppm Hydrogen Cyanide	58L	18100883			
18105809	CYL, 10 ppm Isobutylene	103L	18100883	18102509	18105841	18109244
18107292	CYL, 100 ppm Isobutylene	34L	18100883	18102509	18105841	18109244
18106591	CYL, 100 ppm Isobutylene	34L	18100933	18103564	18105866	18109243
18102939	CYL, 100 ppm Isobutylene	103L	18100883	18102509	18105841	18109244
18104554	CYL, 500 ppm Isobutylene	103L	18100883	18102509	18105841	18109244
18102244	CYL, 100% Nitrogen	103L	18100883	18102509	18105841	18109244
18102248	CYL, 100% Nitrogen	34L	18100933	18103564	18105866	18109243
18102153	CYL, 25 ppm Nitric Oxide	58L	18100883	18102509	18105841	18109244
18102150	KIT, 25 ppm Nitric Oxide	58L	18100883	18102509	18105841	18109244
18104398	CYL, 1.0 ppm Phosphine	34L	18100883	18102509	18105841	18109244
18104059	CYL, 1.0 ppm Phosphine	58L	18100883	18102509	18105841	18109244
18107797	CYL., 5 PPM Phosphine	58L	18100883	18102509	18105841	18109244
18107805	CYL., 5 PPM Phosphine	34L	18100883	18102509	18105841	18109244
18105726	CYL, 100 ppm Toluene	34L	18100933	18103564	18105866	18109243

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PART #	DESCRIPTION	VOL.	0.5LPM Regulator	DEMAND FLOW REGULATORS		
				Demand Flow	w/ iGas Pressure Switch	
					200 PSI Trip Pressure	500 PSI Trip Pressure
18109195	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 2% Methane	650L	18103374	18103556	18105858	18109242
18109231	CYL, 100 ppm CO, 25 ppm H_2S, 10 ppm SO_2, 18% O_2, 2.5% Methane	650L	18103374	18103556	18105858	18109242
18109160	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 2.5% Methane	650L	18103374	18103556	18105858	18109242
18109198	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 50% LEL Methane	4,000L	18103374	18103556	18105858	18109242
18109233	CYL, 100 ppm CO, 25 ppm H_2S, 10 ppm SO_2, 18% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18109221	CYL, 100 ppm CO, 25 ppm H_2S, 5 ppm SO_2, 18% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18109194	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	4,000L	18103374	18103556	18105858	18109242
18109159	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18109197	CYL, 100 ppm CO, 25 ppm H_2S, 18% O_2, 25% LEL Propane	650L	18103374	18103556	18105858	18109242
18108050	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2% Methane	650L	18103374	18103556	18105858	18109242
18104091	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 2.5% Methane	650L	18103374	18103556	18105858	18109242
18105411	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 50% LEL Methane	4,000L	18103374	18103556	18105858	18109242
18105403	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	4,000L	18103374	18103556	18105858	18109242
18103366	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18107219	CYL, 100 ppm CO, 25 ppm H_2S, 19% O_2, 25% LEL Propane	650L	18103374	18103556	18105858	18109242
18109172	CYL, 100 ppm CO, 5 ppm NO_2, 18% O_2, 2.5% Methane	650L			18106740	18109246
18109199	CYL, 100 ppm CO, 18% O_2, 2.5% Methane	4,000L	18103374	18103556	18105858	18109242
18109187	CYL, 100 ppm CO, 18% O_2, 2.5% Methane	552L	18102260	18103549	18105833	18109241
18109186	CYL, 100 ppm CO, 2.5% CO_2, 18% O_2, 25% LEL Pentane	552L	18102260	18103549	18105833	18109241
18109235	CYL, 100 ppm CO, 5 ppm NO_2, 18% O_2, 25% LEL Pentane	650L			18106740	18109246
18109161	CYL, 100 ppm CO, 18% O_2, 25% LEL Pentane	552L	18102260	18103549	18105833	18109241
18108308	CYL, 100 ppm CO, 5 ppm NO_2, 19% O_2, 2.5% Methane	650L			18106740	18109246
18109147	CYL, 100 ppm CO, 5 ppm SO_2, 19% O_2, 2.5% Methane	650L			18106740	18109246
18105445	CYL, 100 ppm CO, 19% O_2, 2.5% Methane	4,000L	18103374	18103556	18105858	18109242
18102259	CYL, 100 ppm CO, 19% O_2, 2.5% Methane	552L	18102260	18103549	18105833	18109241
18103671	CYL, 100 ppm CO, 2.5% CO_2, 19% O_2, 25% LEL Pentane	552L	18102260	18103549	18105833	18109241
18102258	CYL, 100 ppm CO, 19% O_2, 25% LEL Pentane	552L	18102260	18103549	18105833	18109241
18103101	CYL, 100 ppm Carbon Monoxide	552L	18102260	18103549	18105833	18109241
18109193	CYL, 250 ppm CO, 25 ppm H_2S, 18% O_2, 50% LEL Methane	650L	18103374	18103556	18105858	18109242
18108019	CYL, 250 ppm CO, 25 ppm H_2S, 19% O_2, 50% LEL Methane	650L	18103374	18103556	18105858	18109242
18104265	CYL, 250 ppm CO, 19% O_2, 2.5% Methane	552L	18102260	18103549	18105833	18109241
18104125	CYL, 250 ppm Carbon Monoxide	552L	18102260	18103549	18105833	18109241
18109163	CYL, 25 ppm H_2S, 18% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18107227	CYL, 25 ppm H_2S, 19% O_2, 25% LEL Pentane	650L	18103374	18103556	18105858	18109242
18109132	CYL, 25 ppm Hydrogen Sulfide	4,000L	18103374	18103556	18105858	18109242
18106633	CYL, 25 ppm Hydrogen Sulfide	800L	18103374	18103556	18105858	18109242
18102320	CYL, Zero Grade Air (20.9% Oxygen)	552L	18102260	18103549	18105833	18109241
18106658	CYL, 25 ppm Ammonia	650L			18106740	18109246
18105882	CYL, 10 ppm Nitrogen Dioxide	650L			18106740	18109246
18107730	CYL, 25 ppm Nitrogen Dioxide	650L			18106740	18109246
18105817	CYL, 10 ppm Sulfur Dioxide	650L			18106740	18109246
18108126	CYL, 5 ppm Sulfur Dioxide	650L			18106740	18109246
18107722	CYL, 25 ppm Nitric Oxide	650L			18106740	18109246
18107375	CYL, 100 ppm Isobutylene	552L	18102260	18103549	18105833	18109241
18107839	CYL, 10 ppm Hydrogen Cyanide	650L			18106740	18109246
18106963	CYL, 10 ppm Hydrogen Chloride	650L	18103374	18103556	18105858	18109242
18106955	CYL, 10 ppm Chlorine	650L	18103374	18103556	18105858	18109242

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

RENTAL AND SERVICE OPTIONS

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, MX4, iTX, GasBadge Pro, and Tango TX1 monitors. DS2 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.

Email: rental@indsci.com
or visit www.indsci.com/rental/ to learn more.

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.

Extended Warranty Program

These Extended Warranty Programs are designed to provide the End User with additional warranty coverage after their initial product warranty has expired. These plans are all inclusive and are designed to provide consistent maintenance costs for the length of the program.

PART NO.	DESCRIPTION
Extended Warranty Programs for the MX6 Multi-Gas Monitor Requires purchase at the time of the sale.	
1800-MX6-EXW	2 Year Extended Warranty, MX6 all sensor options except PID sensor*; This plan does not cover the SP6 sampling pump or the PID sensor.
1800-MX6-EXWA	2 Year Extended Warranty, MX6 with sampling pump and all sensor options except PID sensor; This plan does not cover the PID sensor.
1800-MX6-EXWPA	2 Year Extended Warranty, MX6 all sensor options including PID and sampling pump; This plan covers all sensor options and the SP6 sampling pump.
18006724-EXW	3 Year Extended Warranty, MX6 DS2*. This plan does not cover iGas Readers.
Extended Warranty Program for the MX4 Ventis Requires purchase within the first six months of instrument ownership.	
1800-VTS-EXW1	1 Year Extended Warranty, Ventis without Pump
1800-VTS-EXWA1	1 Year Extended Warranty, Ventis with Pump
1800-VTS-EXW2	2 Year Extended Warranty, Ventis without Pump
1800-VTS-EXWA2	2 Year Extended Warranty, Ventis with Pump
18008631-EXW	2 Year Extended Warranty, Single-Unit V-Cal, Ventis
18007664-EXW	2 Year Extended Warranty, 6-Unit V-Cal, Ventis
18008630-EXW	2 Year Extended Warranty, Ventis DS2
Extended Warranty Program for the GasBadge Pro Monitor Requires purchase at the time of the sale.	
18000060-EXW	2 Year Extended Warranty, GasBadge Pro all sensors
18006302-EXW	3 Year Extended Warranty, GasBadge Pro DS2; This plan does not cover iGas Readers
Extended Warranty Program for the CalPlus Stations Requires purchase at the time of the sale.	
18006344-EXW	3 Year Extended Warranty, CalPlus only
18006344-EXWP	3 Year Extended Warranty, CalPlus with printer

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

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 DS2 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 increases your awareness about safety. We work with you to develop a training plan that corresponds to the specific needs of your organization's gas detection program. Our specialists are happy to guide you through the training process with a program that far exceeds your expectations."

- Customer Operations, Training

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.

GDME
GAS DETECTION MADE EASY

- **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 diffusion 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.

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** to learn more.

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/** to learn more.

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

- DS2 Docking Station
- iNet DS
- M40
- Ventis MX4
- Tango TX1
- GasBadge Pro
- iTX
- MX4 iQuad
- MX6 iBrid

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

GENERAL GAS EDUCATION

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

THE ASK DAVE BLOG

The Ask Dave blog is an improvement to our popular email question and answer feature. The new blog format brings Dave's extensive knowledge about gas detection to more end users, safety professionals and to those who are interested in learning more about gas detection.

- **View the Ask Dave Blog – http://www.askdaveblog.com/**
- **Follow Dave on twitter – http://twitter.com/#!/IndSci_AskDave**

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 1-412-788-4353, or visit our Web site at www.indsci.com.

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.

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

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.

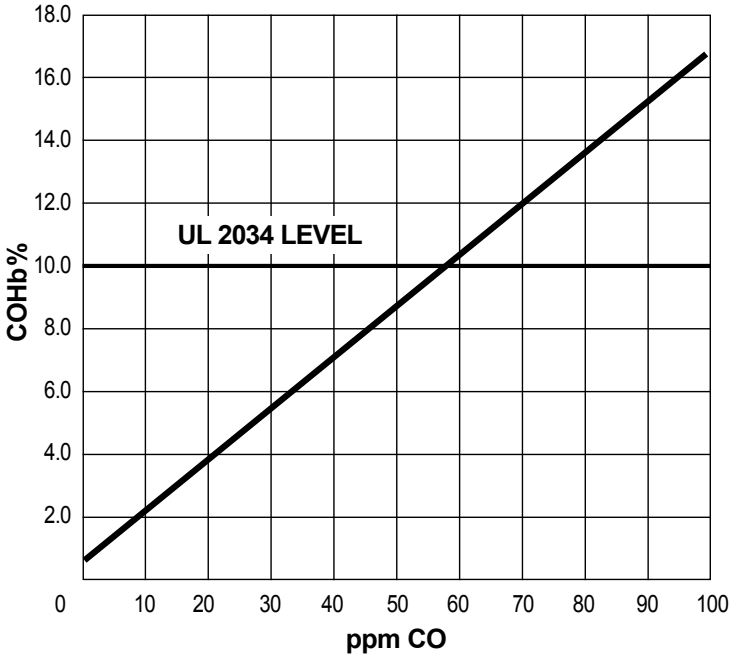
VDC: Volts Direct Current – An electric current of constant direction.

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

The following gases are heavier than air:

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

INTRINSIC SAFETY

What is intrinsic safety?

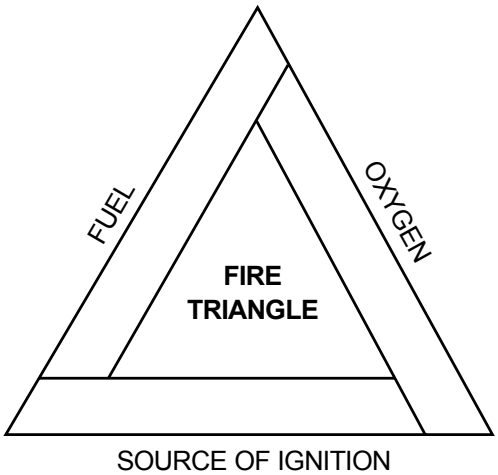
Intrinsic safety is a design technique applied to electrical equipment and wiring for hazardous locations. The technique is based on limiting energy, electrical and thermal, to a level below that required to ignite a specific hazardous atmospheric mixture.

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 flam mable 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 a 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.

GAS BEING SAMPLED	LEL (% vol)	CALIBRATION GAS					
		Butane	Hexane	* Hydrogen	* Methane	* Pentane	* Propane
Acetone	2.5%	1.00	0.70	1.70	1.70	0.90	1.10
Acetylene	2.5%	0.70	0.60	1.30	1.30	0.70	0.80
Benzene	1.2%	1.10	0.80	1.90	1.90	1.00	1.20
Butane	1.9%	1.00	0.58	1.78	1.67	0.83	1.03
Ethane	3.0%	0.80	0.60	1.30	1.30	0.70	0.80
Ethanol	3.3%	0.89	0.52	1.59	1.49	0.74	0.92
Ethylene	2.7%	0.80	0.60	1.40	1.30	0.70	0.90
Hexane	1.1%	1.71	1.00	3.04	2.86	1.42	1.77
Hydrogen	4.0%	0.56	0.33	1.00	0.94	0.47	0.58
Isopropanol	2.0%	1.10	0.90	2.00	1.90	1.00	1.20
Methane	5.0%	0.60	0.35	1.06	1.00	0.50	0.62
Methanol	6.0%	0.60	0.50	1.10	1.10	0.60	0.70
Nonane	0.8%	2.22	1.30	3.95	3.71	1.84	2.29
Pentane	1.4%	1.21	0.71	2.15	2.02	1.00	1.25
Propane	2.1%	0.97	0.57	1.72	1.62	0.80	1.00
Styrene	0.9%	1.30	1.00	2.20	2.20	1.10	1.40
Toluene	1.1%	1.53	0.89	2.71	2.55	1.26	1.57
Xylene	1.1%	1.50	1.10	2.60	2.50	1.30	1.60
JP-4	—	—	—	—	—	1.20	—
JP-5	—	—	—	—	—	0.90	—
JP-8	—	—	—	—	—	1.50	—

NOTE: The table above provides the LEL for select combustible gases*. It also provides correlation factors that help the safety technician and instrument operator determine the actual percentage LEL when the sample gas differs from the gas that was used to calibrate the unit.

For example, if the unit reads 10% LEL in a pentane atmosphere, and was calibrated to methane, the actual percentage LEL is determined as follows:

1. Locate the table cell where the sample gas (pentane) intersects with the calibration gas (methane).
2. Multiply the cell's value (2.02) by the unit's LEL reading (10%) to calculate the actual concentration of 20.2% LEL.

* The combustible gas list is not a comprehensive list of all combustible gases that can be detected by the MX6. For additional information about combustible gas detection and the MX6, contact the ISC Technical Service department (see the manual section, Contact Information).

SENSOR CROSS INTERFERENCE TABLE

GAS	SENSOR: Carbon Monoxide	Hydrogen Sulfide	Sulfur Dioxide	Nitrogen Dioxide	Chlorine	Chlorine Dioxide	Hydrogen Cyanide	Hydrogen Chloride	Phosphine	Nitric Oxide	Hydrogen	Ammonia
Carbon Monoxide	100	2	1	0	0	0	0	0	0	0	20	0
Hydrogen Sulfide	5	100	1	-40	-3	-25	400	60	25	10	20	130
Sulfur Dioxide	0	10	100	0	0	0	—	40	—	0	0	+70
Nitrogen Dioxide	-20	-20	-100	100	12	—	-120	—	—	30	0	0
Chlorine	-10	-20	-25	90	100	20	-20	6	-10	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	0	0	2	0	0	100	0	15	0	0
Phosphine	—	—	—	—	—	-100	425	300	100	—	—	—
Nitric Oxide	10	1	1	0	—	—	-40	—	—	100	30	50
Hydrogen	60	0.05	0.5	0	0	0	0	0	0	0	100	0
Ammonia	0	0	0	0	0	0	0	0	0	0	0	100

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_3
Arsine	AsH_3
Benzene	C_6H_6
Bromine	Br_2
Carbon Dioxide	CO_2
Carbon Monoxide	CO
Chlorine	Cl_2
Chlorine Dioxide	ClO_2
Ethylene Oxide	ETO
Fluorine	F_2
Hydrogen	H_2
Hydrogen Bromide	HBr
Hydrogen Chloride	HCl
Hydrogen Cyanide	HCN

Hydrogen Fluoride	HF
Hydrogen Sulfide	H_2S
Methane	CH_4
Nitric Acid	HNO_3
Nitric Oxide	NO
Nitrogen	N_2
Nitrogen Dioxide	NO_2
Oxygen	O_2
Ozone	O_3
Phosgene	$COCl_2$
Phosphine	PH_3
Silane	SiH_4
Sulfur Dioxide	SO_2
Sulfuric Acid	H_2SO_4

HAZARDOUS GASES FOUND IN COMMON INDUSTRIAL ENVIRONMENTS

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

Ammonia: NH_3
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_2
Colorless, odorless gas
PEL/TWA: 5,000.0 ppm STEL: 30,000.0 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
OSHA PEL/TWA: 50.0 ppm NIOSH PEL/TWA: 35.0 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_2
Green-yellow gas with a pungent, irritating odor
PEL/TWA: 0.5 ppm STEL: 1.0 ppm
IDLH: 30.0 ppm
- Pulp and Paper Mills
- Water Treatment Plants
- Swimming Pools and Chlorinization Plants
- Nuclear Reactors

Chlorine Dioxide: ClO_2
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_2
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
OSHA PEL/TWA: 5.0 ppm STEL: N/A
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
OSHA PEL/TWA: 10.0 ppm ACGIH PEL/TWA: 4.7 ppm
STEL: 4.7 ppm IDLH: 50.0 ppm
LEL: 5.6% of volume
- Gold Plating Industries
- Precious Metal Mining and Recovery
- Nylon Manufacturing

Hydrogen Sulfide; H_2S
Colorless toxic gas with a strong odor of rotten eggs
PEL/TWA: 10.0 ppm STEL: 15.0 ppm
IDLH: 100.0 ppm LEL: 4.0% of volume
TWA value by the ACGIH: 1 ppm
STEL value by the ACGIH: 5 ppm
- 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: 25.0 ppm STEL: N/A
IDLH: 100.0 ppm
- Diesel Emissions
- Underground Mining
- Agriculture – Silos
- Semiconductor Plants

Nitrogen Dioxide: NO_2
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_3
Colorless, blue gas with a very pungent odor
PEL/TWA: 0.1 ppm STEL: 0.3 ppm
IDLH: 5.0 ppm
- Wastewater Treatment Plants
- Power Generation
- Welding

Phosphine: PH_3
Colorless gas, garlic-like odor
PEL/TWA: 0.3 ppm STEL: 1.0 ppm
IDLH: 5.0 ppm LEL: 1.79% of volume
- Pesticides-Agricultural Fumigant
- Doping Agent

Sulfur Dioxide: SO_2
Colorless toxic gas with a pungent odor
PEL/TWA: 2.0 ppm STEL: 5.0 ppm
IDLH: 100.0 ppm
STEL value by the ACGIH: 0.25 ppm
- Pulp and Paper Mills
- Coal Fired Generation Stations
- Water Treatment
- Circuit Board (Etching) Industry

INDUSTRY	HAZARDOUS GAS																
	Combustible Gases	O_2 Deficient /Enrichment	Ammonia (NH_3)	Carbon Dioxide (CO_2)	Carbon Monoxide (CO)	Chlorine (Cl_2)	Chlorine Dioxide (ClO_2)	Hydrogen (H_2)	Hydrogen Chloride (HCl)	Hydrogen Cyanide (HCN)	Hydrogen Sulfide (H_2S)	Nitric Oxide (NO)	Nitrogen Dioxide (NO_2)	Ozone (O_3)	Phosphine (PH_3)	Sulfer Dioxide (SO_2)	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																	

PHOTOIONIZATION DETECTOR (PID) REFERENCE CHART

VOLATILE ORGANIC COMPOUNDS DETECTED BY A PID <10.6 eV

10.6 eV lamp

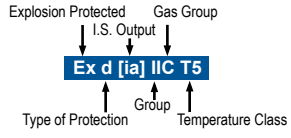
Acetaldehyde
(Acetic acid)
Acetic anhydride
Acetone
Acrolein
Acrylamide
Allyl alcohol
Allyl chloride
Allyl glycidyl ether
Allyl propyl disulfide
Amino pyridine
Amyl acetate
Aniline
Benzene
Benzyl chloride
Bromoform
Butadiene
Butoxyethanol
Butyl acetate
Butyl alcohol
Butyl mercaptan
Butylamine
Butyl glycidyl 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
Diisopropylanmine
Dimethylamine
Dimethylaniline
Dimethylformamide
Dimethylhydrazine
Dimethyloacetamide
Dimethylphthalate
Dinitrotoluene
Dinitro cresol
Dinitro analine
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

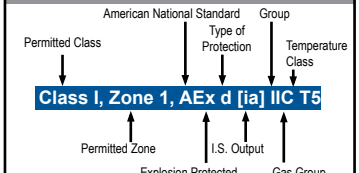
Acetonitrile
Carbon dioxide
Carbon monoxide
Ethane
Freons
Hydrogen
Hydrogen bromide
Hydrogen chloride
Hydrogen cyanide
Hydrogen fluoride
Methane
Nitric acid
Nitrogen
Oxygen
Ozone
Sulfur dioxide
Water

Ex Marking

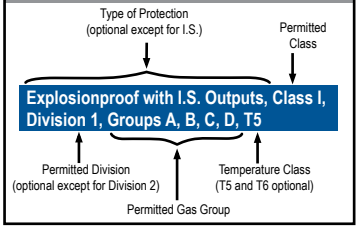
IEC



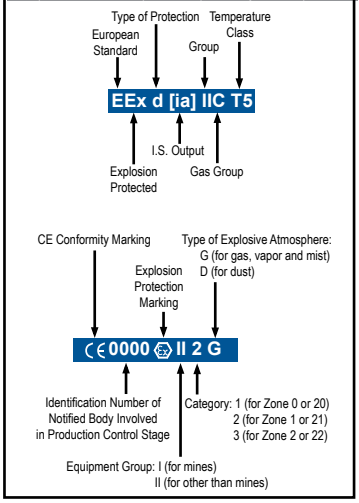
U.S. NEC®505



U.S. NEC®500



EU (Directive 94/9/EC) – ATEX (from July 1, 2003)



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®

Types of Protection

Type of Protection	Code	Permitted Use	Standard	Protection Principle
Increased Safety	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	
Non-Incendive	(NI)	Class I, Div 2	FM 3611	
Non-Sparking	AEx nA	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nA	Zone 2	EN 50 021	
	Ex nA	Zone 2	IEC 60079-15	
Explosionproof	(XP)	Class I, Div 1	FM 3615	Contain the explosion and extinguish the flame
Flameproof	AEx d	Class I, Zone 1	FM 3600 (ISA 12.22.01*)	
	EEx d	Zone 1	EN 50 018	
	Ex d	Zone 1	IEC 60079-1	
Powder-Filled	AEx q	Class I, Zone 1	FM 3600 (ISA 12.25.01*)	
	EEx q	Zone 1	EN 50 017	
	Ex q	Zone 1	IEC 60079-5	
Enclosed Break	AEx nC	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nC	Zone 2	EN 50 021	
	Ex nC	Zone 2	IEC 60079-15	
Intrinsic Safety	(IS)	Class I, Div 1	FM 3610†	Limit energy of sparks and surface temperature
	AEx ia	Class I, Zone 0	FM 3610†	
	AEx ib	Class I, Zone 1	FM 3610†	
	EEx ia	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	
Note 1: For associated intrinsically safe apparatus suitable for installation in a hazardous area, the symbols for the type of protection ia or ib are enclosed within square brackets, for example, AEx d[ia] IIC T4. *Note 2: For associated intrinsically safe apparatus not suitable for installation in a hazardous area, both the symbol Ex /AEx /EEx and the symbol for the type of protection ia or ib are enclosed within the same square brackets, for example, [AEx ia] IIC; In this case, a temperature class is not included.*				
Limited Energy	AEx nA	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nA	Zone 2	EN 50 021	
	Ex nA	Zone 2	IEC 60079-15	
	EEx nL	Zone 2	EN 50 021	
	Ex nL	Zone 2	IEC 60079-15	
Pressurized	Type X	Class I, Div 1	FM 3620	Keep flammable gas out
	Type Y	Class I, Div 1	FM 3620	
	Type Z	Class I, Div 2	FM 3620	
	EEx p	Zone 1	EN 50 016	
	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	
Restricted Breathing	AEx nR	Class I, Zone 2	FM 3600 (ISA 12.12.02)	
	EEx nR	Zone 2	EN 50 021	
	Ex nR	Zone 2	IEC 60079-15	
Encapsulation	AEx m	Class I, Zone 1	FM 3600 (ISA 12.23.01*)	
	EEx m	Zone 1	EN 50 028	
	Ex m	Zone 1	IEC 60079-18	
Oil Immersion	AEx o	Class I, Zone 1	FM 3600 (ISA 12.16.01*)	
	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

Classification of Gases and Vapours into EXPLOSION GROUPS and TEMPERATURE CLASSES

	T1	T2	T3	T4	T5
I	Methane				
IIA	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	Acetylaldehyde Ethylether	
II B	Coal gas (lighting gas)	Ethylene			
II C	Hydrogen	Acetylene			Carbon disulphide

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 ANSI/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_2)	Class I/ Group B
Ethylene	Group IIB	Class I/ Group C
Propane	Group IIA	Class I/ Group D
Methane	Group I*	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
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				

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

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