

7/H

MX6

with

pump

- 24 "Plug-and-Play" fieldreplaceable 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<sup>™</sup> 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.



And a color display is more than eve-catching. It allows the user to step through instrument settings and functions with an intuitive menu and the instrument's fiveway 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<sup>™</sup> and iNet<sup>®</sup>.

# 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:** -20°C to 55°C (-4°F to 131°F)

ODEDATING HUMIDITY DANCE.

15% to 95% non-condensing (continuous)				
MEASURING RANGES:				
SENSOR		RANGE	RESOLUTION	
CATALYTIC B	EAD			
Combustible	Gas	0-100% LEL	1%	
Methane		0-5% vol	0.01%	
ELECTROCH	EMICAL			
Ammonia		0-500 ppm	1	
Carbon Mor	oxide	0-1,500 ppm	1	
Carbon Mor	oxide (High Range)	0-9,999 ppm	1	
Carbon Mon	oxide/Hydrogen low	0-1,500 ppm	1	
Chlorine	• •	0-50 ppm	0.1	
Chlorine Dic	xide	0-1 ppm	0.01	
Carbon Mor	ioxide/	CO: 0-1,500 ppm	1	
Hydrogen S	ulfide (COSH)	H <sub>2</sub> S: 0-500 ppm	0.1	
Hydrogen		0-2,000 ppm	1	
Hydrogen C	hloride	0-30 ppm	0.1	
Hydrogen C	yanide	0-30 ppm	0.1	
Hydrogen S	ulfide	0-500 ppm	0.1	
Nitric Oxide		0-1,000 ppm	1	
Nitrogen Dic	xide	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 Dioxid	le	0-150 ppm	0.1	
INFRARED				
Hydrocarbor	าร	0-100% LEL	1%	
Methane (%	vol)	0-100% vol	1%	
Methane (%	LEL)	0-100% LEL	1%	
Carbon Diox	kide	0-5% vol	0.01%	
PHOTOIONIZ	ATION			
VOC		0-2,000 ppm	0.1	
CERTIFICAT				
	Class I Groups A B C	D.TA. Class II. Groups	EG: AEx is d IIC TA	
CSA: Class I, Cloups A, B, C, D, T4, Class II, Cloups T, C, ALX II C IIC T4				
MSHA.	CER30 Part 22 Intri	nsically safe for metha	ne/air mixtures	
	Ex ia IIC T4 Ga / Ex i	a I Ma: IP65 (IP64 nu	mp version):	
, (i <b>L</b> )(.	Equipment Group and	Category: II 1G / I M1	(I M2 w/IR sensor)	
IECEx:	FCFx: Fx ia IIC T4 Ga / Fx ia I (Fx ia d I w/IR sensor)			
ANZEX: Ex ia s Zone 01, IP64 Asp. IP65 Dif. Ex ia s Zone 0 IIC T4			s Zone 0 IIC T4	
INMETRO: BR - Ex ia d IIC T4 Gb				
GOST-R	PBExiadI X / 1Exiad	IICT4 X		
KOSHA:	Ex d ia IIC T4			

MX6 without pump

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

China Ex: Ex ia d I/IIC T4 China CPC: Metrology Approval

#### 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 *MX*6 online with the MX6 instrument builder. www.indsci.com/MX6builder.aspx

COMMON INSTRUMENT CONFIGURATIONS	
PART NO.	DESCRIPTION
MX6-K1230201	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Ext. Li-ion
MX6-K123R111	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , PID, Li-ion, Pump
MX6-L1230111	MX6 - LEL (Methane), CO, H <sub>2</sub> S, O <sub>2</sub> , Li-ion, Pump
MX6-M103Q211	MX6 - Methane, CO, O <sub>2</sub> , CO <sub>2</sub> IR, Ext. Li-ion, Pump
MX6-MDH34211	MX6 - Methane, NO, CO high range, O <sub>2</sub> , NO <sub>2</sub> , Ext. Li-ion, Pump
MX6-K1235111	MX6 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , Li-ion, Pump
MX6-KJ635101	MX6 - LEL (Pentane), CO/H <sub>2</sub> S, NH <sub>3</sub> , O <sub>2</sub> , SO <sub>2</sub> , Li-ion
MX6-MH23Q201	MX6 - Methane, CO high range, H <sub>2</sub> S, O <sub>2</sub> , CO <sub>2</sub> , Ext. Li-ion
COMMON INE	DUSTRY CONFIGURATIONS
MX6-KJ53R211	MX6 - LEL, CO/H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub> , PID, Ext. Li-ion, Pump Petroleum Refining
MX6-K103Q211	MX6 - LEL, CO, O <sub>2</sub> , CO <sub>2</sub> , Ext. Li-ion, Pump Brewing/Bottling/Wineries
MX6-KJ835101	MX6 - LEL, CO/H2S, O <sub>2</sub> , SO <sub>2</sub> , ClO <sub>2</sub> , Li-ion Pulp/Paper
MX6-K673R211	MX6 - LEL, O₂, NH₃, Cl₂, PID, Ext. Li-ion, Pump HazMat
MX6-M1030401	MX6 - CH <sub>4</sub> (%), CO, O <sub>2</sub> , Li-ion (MSHA/AUS) Mining
MX6-M1D34401	MX6 - CH <sub>4</sub> (%), CO, O <sub>2</sub> , NO <sub>2</sub> , NO, Li-ion Ext. (MSHA/AUS) Mining (Diesel Applications)





- 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<sup>®</sup> 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<sup>®</sup> 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 <sup>™</sup> for MX6
	Ordering Information
	B = number of iGas <sup>®</sup> Readers
	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<sup>™</sup> 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<sup>®</sup>

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

#### MEASURING RANGES:

Combustible Gases:	0-100% LEL in 1% increments
Methane (CH <sub>4</sub> ):	0-5% of vol. in 0.01% increments
Oxygen ( $\dot{O}_2$ ):	0-30% of vol. in 0.1% increments
Carbon monoxide (CO):	0-1,000 ppm in 1 ppm increments
Hydrogen sulfide ( $\dot{H}_2S$ ):	0-500 ppm in 0.1 ppm increments
Nitrogen dioxide (NO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments
Sulfur dioxide (SO <sub>2</sub> ):	0-150 ppm in 0.1 ppm increments
\ =/	

#### **CERTIFICATIONS:**

UL:	Class I, Division 1, Groups A B C D, T4; Zone 0,
	AEx ia IIC T4
	Class II. Groups F G (Carbonaceous & Grain dust):
	IP66; IP67
ATEX:	Ex ia IIC T4 Ga and Ex ia I Ma;
	Equipment Group and Category II 1G and I M1; IP66; IP67
IECEx:	Ex ia IIC T4 Ga; IP66; IP67
CSA:	Class I, Division 1, Groups A B C D, T4; Ex d ia IIC T4
	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 <sub>2</sub> S, O <sub>2</sub> , Li-ion, Desktop charger, Black
VTS-K1232111y0z	Ventis with pump - LEL, CO, H <sub>2</sub> S, O <sub>2</sub> , Extented Li-ion, Desktop Charger, Safety Orange
VTS-K1031100y1z	Ventis - LEL, CO, O <sub>2</sub> , Li-ion, Desktop charger, soft case, Black
VTS-K1032110y1z	Ventis with pump - LEL, CO, O <sub>2</sub> , Extended Li-ion, desktop charger, soft case, Black
VTS-K5231101y0z	Ventis - LEL, SO <sub>2</sub> , H <sub>2</sub> S, O <sub>2</sub> , Li-ion, desktop charger, Safety Orange
VTS-K1431100y1z	Ventis - LEL, CO, NO <sub>2</sub> , O <sub>2</sub> , Li-ion, Desktop charger, soft case, Black
VTS-K1432111y0z	Ventis with pump - LEL, CO, NO <sub>2</sub> , O <sub>2</sub> , Extended Li-ion, desktop charger, Safety Orange

VENTIS MX4 BATTERY KIT MATRIX				
EXAMPLE: VTSB-101 - Ventis MX4 Li-ion Battery Kit, Black, UL/CSA/ATEX/IECEx	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.

	SDACE	KITS	with		
CONFINED	SFACE	<b>NII J</b>		INTERGR	

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

- x = Instrument Color: 0 = Black, 1 = Safety Orange y = Agency Certification: 1 = UL/CSA, 2 = ATEX/IECEX/INMETRO, 3 = MSHA, 4 = ANZEX, = = OUNT EX : - = OCET D / COLORET K = - KOSUA
- 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<sub>2</sub>S, and O<sub>2</sub> sensors, Ventis Slide-on Pump, 110 VAC desktop charger for each rechargeable instrument ordered (max of 2), calibration cup and tubing with T-fitting, dust filter/ water stop, 10 feet of sample tubing, 34 liter cylinder of calibration gas, manual regulator, rugged hard plastic carrying case.



#### CONFINED SPACE KITS WITH SLIDE-ON PUMP

PART NO.	DESCRIPTION	
VKVSP4-ABCDEF	Ventis Confined Space Kit with Ventis Slide-on Pump (LEL, CO, $H_2S$ , $O_2$ )	
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 <sub>2</sub> S, O <sub>2</sub> , Orange, Li-ion Ventis Battery, Li-ion Pump Battery, UL/CSA, English	
VKVSP4-L01111	Ventis Confined Space Kit - LEL (Methane), CO, H <sub>2</sub> S, O <sub>2</sub> , Black, Li-ion Ventis Battery, Li-ion Pump Battery, UL/CSA, English	
VKVSP4-K11211	Ventis Confined Space Kit - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Orange, Li-ion Ventis Battery, Ext. Range Li-ion Pump Battery, UL/CSA, English	

# 

ACCESSORIES



PART NO.	DESCRIPTION
18108630-0BC	DS2 Docking Station <sup>™</sup> for Ventis <sup>™</sup> MX4
	Ordering Information
	B = number of iGas <sup>®</sup> Readers: 0 – none
	1 = 1 iGas Reader
	2 = 2 iGas Readers
	C = Power cord Option (U – US, 1 – UK, 2 – EU, 3 – AUS, 4 – ITA, 5 – DEN, 6 – SWZ)
18108631-AB	V•Cal <sup>™</sup> Calibration Station
	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
	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 <sub>2</sub> )
17134479	Replacement sensor, hydrogen sulfide (H <sub>2</sub> S)
17134487	Replacement sensor, carbon monoxide (CO)
17134495	Replacement sensor, combustible gas (LEL/CH <sub>4</sub> )
1/134503	Replacement sensor, nitrogen dioxide (NO <sub>2</sub> )
17143595	Replacement sensor, sultur dioxide (SU <sub>2</sub> )
17 1483 13-1	CSA/ATEX/IECEX/INMETRO/KOSHA/GOST-R/GOST-K
17148313-2	Replacement extended range Li-ion battery pack, MSHA
1/148313-3	Replacement extended range Li-ion battery pack, CHINA
1/148313-4	Replacement extended range Li-ion battery pack, ANZEx
1/150608	Keplacement Alkaline battery pack
1/152828-01	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



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 multigas 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 @ 20°C Rechargeable extended-range lithium-ion battery Pack - 36 hours @ 20°C Replaceable AAA alkaline battery pack - 10 hours @ 20°C

#### PUMP FAULT ALARMS:

Ultra-bright LEDs Loud audible alarm (90 dB at 30 cm)

#### **IP RATING:**

Third-party certified IP67

#### **CERTIFICATIONS:**

ATEX:	Ex ia I Ma and Ex ia IIC T4 Ga;
	Equipment Group and Category: I M1 and II 1G
CSA:	Class I, 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 LANGUA	AGE					
English, French, Spanish, German, Chinese					1	
Italian, Polish, Czech, Portugese, Russian					2	



VTSB-201 EXTENDED RANGE LITHIUM-ION 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.

# 20

**iNei** 

# SINGLE GAS MONITOR

#### SPECIFICATIONS

#### **INSTRUMENT WARRANTY:**

Three year warranty which does not include battery, sensors and filters. CO and H<sub>2</sub>S 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<sub>2</sub>S, NO<sub>2</sub>, SO<sub>2</sub> - Electrochemical sensor technology

#### SENSOR MEASURING RANGES:

Carbon Monoxide (CO):	0 to 1,000 ppm in 1 ppm increments
Hydrogen Sulfide (H <sub>2</sub> S):	0.0 to 200.0 ppm in 0.1 ppm increments
Nitrogen Dioxide (NO2):	0.0 to 150.0 ppm in 0.1 ppm increments
Sulfur Dioxide (SO <sub>2</sub> ):	0.0 to 150.0 ppm in 0.1 ppm increments
BATTERY PACK: 3.6 V Primary lithium-thionyl on nonrechargeable; always on;	chloride (Li-SOCl2); 1.5AH, 2/3AA; replaceable; 3 year run time depending on operating conditions
DATALOGGING: 3 months at 10-second inte	ervals
EVENTLOGGING:	
60 alarm events	

#### CERTIFICATIONS

INGRESS PROTECTION:

- -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

 The range is waraneed to be need from detects 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 a dispersive reserves. display and alarm performance.



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.

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<sup>™</sup> 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 <sub>2</sub> S		
TX1-4	Tango TX1, NO <sub>2</sub>		
TX1-5	Tango TX1, SO <sub>2</sub>		
ACCESSOR	IES		
18109249-ABC	DS2 Docking Station™ for Tango™ TX1 Ordering Information		
	B = number of iGas <sup>®</sup> 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		



# **DualSense<sup>™</sup> 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<sup>\*</sup>.

# **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.

\*Based on iNet data

# DualSense<sup>™</sup> Technology Increases Gas Detector Reliability



# 22 GASBADO



- Interchangeable "smart" sensors monitor oxygen or any one of many toxic gases
- One year datalogging capacity (minimum)
- Standard STEL and TWA
- Docking Station<sup>™</sup> 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<sub>2</sub>S, O<sub>2</sub>, NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, CI<sub>2</sub>, CIO<sub>2</sub>, PH<sub>3</sub>, HCN, H<sub>2</sub>, CO/H<sub>2</sub> Null

#### MEASURING RANGES:

CO:	0-1,500 ppm in 1 ppm increments
H <sub>2</sub> S:	0-500 ppm in 0.1 ppm increments
O <sub>2</sub> :	0-30% by volume in 0.1% increments
NO <sub>2</sub> :	0-150 ppm in 0.1 ppm increments
SO <sub>2</sub> :	0-150 ppm in 0.1 ppm increments
NH <sub>3</sub> :	0-500 ppm in 1 ppm increments
Cl <sub>2</sub> :	0-100 ppm in 0.1 ppm increments
CIO <sub>2</sub> :	0-1 ppm in 0.01 ppm increments
PH₃:	0-10 ppm in 0.01 ppm increments
HCN:	0-30 ppm in 0.1 ppm increments
H <sub>2</sub> :	0-2,000 ppm in 1 ppm increments

# DISPLAY:

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

#### ALARMS:

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

# BATTERY RUNTIME:

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

#### 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 14	10°F), typical
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#### 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 (H2S)
18100060-2S*	GasBadge <sup>®</sup> Pro – Hydrogen Sulfide (H <sub>2</sub> S)
18100060-3	GasBadge <sup>®</sup> Pro – Oxygen (O <sub>2</sub> )
18100060-4	GasBadge <sup>®</sup> Pro – Nitrogen Dioxide (NO <sub>2</sub> )
18100060-5	GasBadge <sup>®</sup> Pro – Sulfur Dioxide (SO <sub>2</sub> )
18100060-6	GasBadge <sup>®</sup> Pro – Ammonia (NH <sub>3</sub> )
18100060-7	GasBadge <sup>®</sup> Pro – Chlorine (Cl <sub>2</sub> )
18100060-8	GasBadge <sup>®</sup> Pro – Chlorine Dioxide (ClO <sub>2</sub> )
18100060-9	GasBadge <sup>®</sup> Pro – Phosphine (PH <sub>3</sub> )
18100060-B	GasBadge® Pro – Hydrogen Cyanide (HCN)
18100060-C	GasBadge <sup>®</sup> Pro – Hydrogen (H <sub>2</sub> )
18100060-G	GasBadge <sup>®</sup> Pro – Carbon Monoxide/Low Hydrogen Interference (CO/H <sub>2</sub> Null**)
OPTIONAL A	CCESSORIES
18106302-ABC	GasBadge <sup>®</sup> Pro DS2 Docking Station™
	Ordering Information
	B = number of iGas <sup>®</sup> 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 <sup>®</sup> Neck Lanyard w/Safety Release
18106484	GasBadge <sup>®</sup> 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 <sub>2</sub> )
17124983-1	Replacement sensor, Carbon Monoxide (CO)
17124983-G**	Replacement sensor, Carbon Monoxide (H <sub>2</sub> NULL**)
17124983-2	Replacement sensor, Hydrogen Sulfide (H <sub>2</sub> S)
17124983-5	Replacement sensor, Sulfur Dioxide (SO <sub>2</sub> )
17124983-7	Replacement sensor, Chlorine (Cl <sub>2</sub> )
17124983-8	Replacement sensor, Chlorine Dioxide (ClO <sub>2</sub> )
17124983-6	Replacement sensor, Ammonia (NH <sub>3</sub> )
17124983-4	Replacement sensor, Nitrogen Dioxide (NO <sub>2</sub> )
17124983-D	Replacement sensor, Nitric Oxide (NO)
17124983-B	Replacement sensor, Hydrogen Cyanide (HCN)
17124983-9	Replacement sensor, Phosphine (PH <sub>3</sub> )
17124983-C	Replacement sensor, Hydrogen

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

\*\* Low Hydrogen Interference



- Stand-alone Instrument Docking Stations (IDS) available for use with all GasBadge<sup>®</sup> 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





# GasBadge<sup>®</sup> Datalink

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

# 24 BM25



# 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.

# TRANSPORTABLE MULTI-GAS **AREA MONITOR**

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

**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 <sub>2</sub> S: 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

\* Available for BM25 (6514842) only

\*\*Available for BM25A (6514872) only

† 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 (BM25 A 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





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.



COMMON INSTRUMENT CONFIGURATIONS					
PART NO.	PART NO. DESCRIPTION				
6514872-K12300	BM25 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub>				
6514842-K12301	BM25 - LEL (Pentane), CO, H <sub>2</sub> S, O <sub>2</sub> , Pump*				
6514872-K00000	BM25 - LEL (Pentane)				
6514872-L00000	BM25 - LEL (Methane)				
6514872-010000	BM25 - CO				
6514872-020000	BM25 - H <sub>2</sub> S				
6514872-000300	BM25 - O <sub>2</sub>				
6514872-K02350	BM25 - LEL (Pentane), H <sub>2</sub> S, O <sub>2</sub> , SO <sub>2</sub>				
6514872-K03J50	BM25 - LEL (Pentane), O <sub>2</sub> , CO/H <sub>2</sub> S, SO <sub>2</sub>				
6514842-K003R0	BM25 - LEL (Pentane), O <sub>2</sub> , PID*				
6514872-0103Q0	BM25 - CO, O <sub>2</sub> , CO <sub>2</sub>				
6514872-K0D3J0	BM25 - LEL (Pentane), NO, O <sub>2</sub> , CO/H <sub>2</sub> S				
6514872-K04J50	BM25 - LEL (Pentane), NO <sub>2</sub> , CO/H <sub>2</sub> S, SO <sub>2</sub>				
6514872-K67300	0 BM25 - LEL (Pentane), NH <sub>3</sub> , Cl <sub>2</sub> , O <sub>2</sub>				
OPTIONAL A	CCESSORIES				
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				

18101840

Instrument and Accessory Case w/Foam Insert, black

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.

Product Available		No longer available;	Batteries, sensors, and filters available:	All parts and service subject to
Toddci		Service/Repair and all replacement parts available	Service/Repair subject to parts availability	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
	Γ	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
VAILA	ABLE AG	CESSORIES		ATX612
140 MULTI-	-GAS MONITOR	R OPTIONAL ACCESSORIES		ATX620
PART NO.		DESCRIPTION		LTX310
7092941	Metal Belt Clip			LTX312
7107582	Suspender Clip			TMX410
3106070	CO Breath Sam	pler for M40		TMX412
7108622	Calibration Cup,	M40		BP2000
I•CAL™ O	PTIONAL ACCI	ESSORIES		MDU420
7119843	Replacement Ca	able for M•Cal to PC Interface,		CDU440
	6' Null Modem F	/F		T82
7118118	Replacement Po	wer Supply		DS1000
140-KI I- FR0000	M•Cal <sup>™</sup> Accesse calibration gas c	ory Kit (demand flow regulator, vlinder tubing)		TX2000
		,		MX2000 *
TX MULTI-0	GAS MONITOR	OPTIONAL ACCESSORIES		BM22/BM22+ *
PART NO.		DESCRIPTION		MX21/MX21+ *
7153290	Rechargeable Li	ithium-ion (Li-ion) Battery Pack - MSHA		C2000
7153303	Rechargeable L	ithium-ion (Li-ion) Battery Pack -		CK2000
70000-0	UL/CSA/ATEX//	AUS		LKD100
/089376	Keplaceable Ce	ell Alkaline Battery Pack - AUS/MSHA		TX418
			TX11	
ISCELLA	NEOUS BATTE	RIES / CHARGING ACCESSORIES		OX10
PART NO.		DESCRIPTION		EX10
7025305	Ni-Cad Battery Pa	ck. CD211		RX500
OPTIONAL	CASES FOR M	IONITORS		* Limited battery/sensor availability
8100628	Detachable Should	der Strap for Leather Cases		
7051487	High Impact Carry	Case, Dust/Water Tight (Pelican®)		

# 28 PORTABLE INSTRUMENT SENSOR OPTIONS

SENSOR		MULTI-GAS MONITORS			SINGLE-GAS MONITORS			
		Ventis™ MX4	MX6 iBrid™	BM25	GasBadge <sup>®</sup> Pro	Tango™ TX1	T40 Rattler	
OXYGEN (O <sub>2</sub> )		•	٠	•	•			
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 <sub>3</sub> )			•	•	•			
ARSINE (ASH <sub>3</sub> )				•				
CARBON MONOXIDE (CO)		•	•	•	•	•	•	
CARBON MONOXIDE (CO HIGH)			•	•				
CO/H <sub>2</sub> LOW			•		•			
CO/H <sub>2</sub> S (COSH)			•	•				
CHLORINE (Cl <sub>2</sub> )			•	•	•			
CHLORINE DIOXIDE (CIO <sub>2</sub> )			•	•	•			
ETHYLENE OXIDE (ETO)				•				
HYDROGEN (H <sub>2</sub> )			•	•	•			
HYDROGEN CHLORIDE (HCI)			•	•				
HYDROGEN CYANIDE (HCN)			•	•	•			
HYDROGEN SULFIDE (H <sub>2</sub> S)		•	•	•	•	•	•	
METHANE (0-5% VOL) - CATALYTIC BEAD	[HP]	• **	• **					
NITRIC OXIDE (NO)			•	•				
NITROGEN DIOXIDE (NO <sub>2</sub> )		•	•	•	•	•		
PHOSPHINE (PH <sub>3</sub> )			•	•	•			
PHOSPHINE HIGH (0-1,000 PPM)			•					
SILANE (SIH <sub>4</sub> )				•				
SULFUR DIOXIDE (SO <sub>2</sub> )		•	•	•	•	•		
INFRARED				• 				
CARBON DIOXIDE (CO2) - (IR)	[HP]		•	•				
HYDROCARBONS (0-100% LEL) - (IR)	[HP]		•	•				
METHANE (0-100% VOL) - (IR)	[HP]		•	•				
METHANE (CH <sub>4</sub> %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)
- $\overline{\Delta}$  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)

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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 <sub>5</sub> H <sub>12</sub> )	17134495		17124975-K					
%LEL / METHANE (CH <sub>4</sub> )	17134495	17050788	17124975-L	17105719		6313969**		
						6313888*		
METHANE (CH <sub>4</sub> 0-5%)	17134495		17124975-M					
ELECTROCHEMICAL STANDA	ARD							
CARBON MONOXIDE (CO)	17134487	17112160	17124975-1	17101064	17101080	6313787	17155161^	17124983-1
CARBON MONOXIDE (CO HIGH)			17124975-H			6313826		
CARBON MONOXIDE (H <sub>2</sub> LOW)			17124975-G		17101072			17124983-G
CARBON MONOXIDE / HYDROGEN SULFIDE (CO/H <sub>2</sub> S)			17124975-J		17101106	6313823		17124983-C
HYDROGEN SULFIDE (H <sub>2</sub> S)	17134479	17112152	17124975-2	17101114	17101130	6313788	17155164^	17124983-2
OXYGEN (O <sub>2</sub> )	17134461	17117730	17124975-3	17101213		6313780		17124983-3
NITROGEN DIOXIDE (NO <sub>2</sub> )	17134503		17124975-4	17101163	17101171	6313801	17155162^	17124983-4
SULFUR DIOXIDE (SO <sub>2</sub> )	17143595		17124975-5	17101197	17101205	6313822	17155163^	17124983-5
ELECTROCHEMICAL EXOTIC	S							
AMMONIA (NH <sub>3</sub> )			17124975-6		17100900	6313800		17124983-6
ARSINE (ASH <sub>3</sub> )						6313811		
CHLORINE (Cl <sub>2</sub> )			17124975-7	17101247		6313809		17124983-7
CHLORINE DIOXIDE (CIO <sub>2</sub> )			17124975-8	17101049		6313841		17124983-8
ETHYLENE OXIDE (ETO)						6313821		
HYDROGEN (H <sub>2</sub> )			17124975-C	17100967		6313803		
HYDROGEN CHLORIDE (HCI)			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 <sub>3</sub> HIGH)			17124975-E					
PHOSPHINE (PH <sub>3</sub> )			17124975-9	17101023		6313810		17124983-9
SILANE (SIH <sub>4</sub> )						6313808		
INFRARED								
CARBON DIOXIDE (CO <sub>2</sub> )			17124975-Q			6313818		
HYDROCARBONS			17124975-P			Varies call for detail		
METHANE (CH <sub>4</sub> 0-100% Vol)			17124975-N			6314092*		
METHANE (CH <sub>4</sub> 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

# **30 SAMPLING PROBES**



Т

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
- C) Inline Dust Filter for iSP/
- (d) Dilution Tube
- (e) Quick Disconnect Fitting, Female
- (f) Replacement Filters (Package of 5)
- (g) Internal Dust Filter/WaterStop
- for MX6/ATX Series
- (h) Quick Disconnect Fitting, Male, Threaded
- (i) Luer Fitting, Male, 1/8" or 3/16" Barb
- (j) Quick Disconnect Fitting, Male, 1/8" Barb
- (k) Quick Disconnect Fitting, Male, 3/16" Barb

#### ADDITIONAL REMOTE SAMPLING EQUIPMENT

PART NO.	DESCRI	IPTION				
18102277	(a) Inline High Capacity Water Stop					
17057803	Replacement Gortex Filter Inser	rt for 18102277				
17027152	(b) Dust Filter/Water Stop for M	lotorized Sampli	ing Pumps			
17050908	(c) Inline Dust Filter for iSP/SP4	402/SP202/SP10	00 Pumps			
17041740	(d) Dilution Tube (for use w/San	npling Pumps)				
17050688	(e) Quick Disconnect Fitting, Fe	male				
17024597	(f) Replacement Filter for iSP, S	SP402, SP202, S	SP100 Pumps			
17024191	(f) Replacement Filters (Packag	je of 5)				
17058157	(g) Internal Dust Filter/WaterSto	op for MX6/ATX	Series			
17051611	(h) Quick Disconnect Fitting, Ma	ale, Threaded				
17048273	(i) Luer Fitting, Male, 3.175 mm	(1/8") Barb				
17050698	(i) Luer Fitting Male, 4.7625 mm	n (3/16") Barb				
17050689	(j) Quick Disconnect Fitting, Ma	le, 3.175 mm (1	/8") Barb			
17050775	(k) Quick Disconnect Fitting, Ma	ale, 4.7625 mm	(3/16") Barb			
17062498	Replacement Inlet Filter Assem	bly for ATX Serie	es			
17067034	ATX Right Angle Inlet Swivel Fit	tting				
17051319	Dust Filter/WaterStop for Docki	ing Station Fres	h Air Inlet			
17051701	Replacement Probe Fitting for 1	18101386				
17113168	SP40 Water Barrier					
17119553	iSP Filter Guard					
18102418	3.048 m (10') Sample Tube w/l	nline Filter				
17136540	SP6 Filter Cap (used w/181051	155-X)				
Probe Tu	bing Kits for use with 18	101386 prol	be			
18108043	(o) Probe Tubing Kit for MX6/Ve (Not for use with Cl <sub>2</sub> , ClO <sub>2</sub> , HCl	entis – Urethane , or PID sensors	:			
18102257	Probe Tubing Kit for iTX, 300/40 (Not for use with Cl <sub>2</sub> , ClO <sub>2</sub> , HCl	00 Series – Uret or PID sensors	hane			
18108093	Probe Tubing Kit for MX6/Ventis (For use with all sensors)	s – Teflon lined	/			
18108077	Probe Tubing Kit for iTX, 300/40 (For use with all sensors)	00 Series – Teflo	on lined			
Universal	Urethane Sample Tubing	g Kit with Du	st Filter/Water Stop			
PART NO.	LENGTH	PART NO.	LENGTH			
18109207-10	) 3 m / 10 ft	18109207-60	18.3 m / 60 ft			
18109207-20	) 6.1 m / 20 ft	18109207-70	21.3 m / 70 ft			
18109207-30	) 9.1 m / 30 ft	18109207-80	24.4 m / 80 ft			
18109207-40	) 12.2 m / 40 ft	18109207-90	27.4 m / 90 ft			
18109207-50	15.2 m / 50 ft 18109207-100 30.5 m / 100 ft					

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

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

 (I) 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)



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MISCELL	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	(I) 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)					



#### 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



(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



(I) 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)

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

REGULAT	ORS
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

# CALIBRATION GAS 33

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.





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# 34 CALIBRATION GAS CROSS REFERENCE CHART

				DEMAND FLOW REGULATORS		
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pres	sure Switch
			Regulator	Flow	150 PSI Trip Pressure	250 PSI Trip Pressure
18102303	CYL, 500 ppm Carbon Monoxide	103L	18100883	18102509	18105841	18109244
18106914	CYL, 25 ppm H <sub>2</sub> S, 50 ppm CO, 18% O <sub>2</sub> , 32.4% LEL Methane	58L	18100883	18102509	18105841	18109244
18105262	CYL, 50 ppm CO, 25 ppm H <sub>2</sub> S, 20.9% O <sub>2</sub> , 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18109101	CYL, 50 ppm CO, 25 ppm H <sub>2</sub> S, 20.9% O <sub>2</sub> , 50% LEL Methane	116L	18100883	18102509	18105841	18109244
18105122	CYL, 50 ppm CO, 18% O <sub>2</sub> , 50% LEL Propane	103L	18100883	18102509	18105841	18109244
18102243	CYL, 50 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	103L	18100883	18102509	18105841	18109244
18104448	CYL, 50 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane	34L	18100933	18103564	18105866	
18104463	CYL, 50 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18104455	CYL, 50 ppm CO, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 18% O <sub>2</sub> , 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18108035	CYL, 250 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 50% LEL Methane	58L	18100883	18102509	18105841	18109244
18102324	CYL, 250 ppm CO, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102343	CYL, 200 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18105825	CYL, 200 ppm CO, 75 ppm H <sub>2</sub> S, 15% O <sub>2</sub> , 25% LEL Methane (Bump Gas)	11L				
18109216	CYL, 200 ppm CO, 75 ppm H <sub>2</sub> S, 15% O <sub>2</sub> , 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 <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109156	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	58L	18100883	18102509	18105841	18109244
18109158	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109227	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 12.5% LEL Methane	58L	18100883	18102509	18105841	18109244
18109226	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Methane	58L	18100883	18102509	18105841	18109244
18109185	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 40% LEL Methane	58L	18100883	18102509	18105841	18109244
18109192	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O2, 50% LEL Methane	34L	18100883	18102509	18105841	18109244
18109234	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109220	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109222	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109191	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	34L	18100883	18102509	18105841	18109244
18109155	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109157	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109177	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 50% LEL Propane	58L	18100883	18102509	18105841	18109244
18109188	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 50% LEL Propane	116L	18100883	18102509	18105841	18109244
18109214	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> 25% LEL Isobutane (Low PSI)	52L	18100883	18102509	18105841	18109244
18102242	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	58L	18100883	18102509	18105841	18109244
18102275	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	58L	18100883			
18109080	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841	18109244

				DEMAND FLOW REGULATORS		
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pres	sure Switch
			Regulator	Flow	150 PSI Trip Pressure	250 PSI Trip Pressure
18109138	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	116L	18100883			
18105536	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 50% LEL Methane	34L	18100883	18102509	18105841	18109244
18109182	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18107995	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 25 ppm H2S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18103937	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	34L	18100883	18102509	18105841	18109244
18102187	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18102189	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883			
18103432	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane w/ DFR	58L		18102509		
18109077	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109137	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	116L	18100883			
18109139	KIT, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane w/ DFR	116L		18102509		
18106179	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 50% LEL Propane	58L	18100883	18102509	18105841	18109244
18105635	CYL, 100 ppm CO, 50 ppm H <sub>2</sub> S, 16% O <sub>2</sub> , 50% LEL Methane (Bump Test)	34L	18103580	18102509		
18103143	CYL, 100 ppm CO, 50 ppm H <sub>2</sub> S, 16% O <sub>2</sub> , 50% LEL Methane (Bump Test)	58L	18103580	18102509		
18109103	CYL, 100 ppm CO, 50 ppm H <sub>2</sub> S, 16% O <sub>2</sub> , 50% LEL Methane (Bump Test)	116L	18103580	18102509		
18105676	CYL, 100 ppm CO, 15% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109175	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.0% (40% LEL) Methane	103L	18100883	18102509	18105841	18109244
18109184	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	58L	18100883	18102509	18105841	18109244
18109164	CYL, 100 ppm CO, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	116L	18100883	18102509	18105841	18109244
18109174	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.5% Methane	103L	18100883	18102509	18105841	18109244
18109178	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18109236	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18109165	CYL, 100 ppm CO, 18% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109190	CYL, 100 ppm CO, 18% O <sub>2</sub> , 25% LEL Pentane	34L	18100933	18103564	18105866	18109243
18109176	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18109251	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 2.0% (40% LEL) Methane	116L	18100883	18102509	18105841	18109244
18109250	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , .35% (25% LEL) Pentane	116L	18100883	18102509	18105841	18109244
18107847	CYL, 100 ppm CO, 19% O <sub>2</sub> , 2.0% (40% LEL) Methane	103L	18100883	18102509	18105841	18109244
18108571	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 19% O <sub>2</sub> , 2.5% Methane	58L	18100883	18102509	18105841	18109244
18102165	CYL, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	103L	18100883	18102509	18105841	18109244
18102270	KIT, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	103L	18100883			
18101246	CYL, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	34L	18100933	18103564	18105866	18109243
18101287	KIT, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	34L	18100933			
18108548	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 19% O <sub>2</sub> , 2.5% Methane	103L	18100883	18102509	18105841	18109244
18106781	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Methane	58L	18100883	18102509	18105841	18109244
18103473	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18103317	KIT, 100 ppm CO, 2.5% CO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane (DFR)	103L		18102509		
18104521	CYL, 100 ppm CO, 5% CO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18104539	KIT, 100 ppm CO, 5% CO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane (DFR)	103L		18102509		
18106773	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883	18102509	18105841	18109244
18101576	CYL, 100 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane	103L	18100883	18102509	18105841	18109244
18101568	KIT, 100 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane w/ Zero Grade Air	103L	18100883			
18102269	KIT, 100 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane	103L	18100883			
18101253	CYL, 100 ppm CO, 19% O <sub>2</sub> , 25% LEL Pentane	34L	18100933	18103564	18105866	18109243

# 36 CALIBRATION GAS CROSS REFERENCE CHART

				DEMAND FLOW REGULATORS		
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pres	sure Switch
			Regulator	Flow	150 PSI Trip Pressure	250 PSI Trip Pressure
18101295	KIT, 100 ppm CO, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 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 <sub>2</sub> S, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	116L	18100883			
18106807	CYL, 25 ppm H <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 19% O <sub>2</sub> , 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 <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	58L	18100883			
18109083	CYL, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	116L	18100883	18102509	18105841	18109244
18101279	KIT, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 200 ppm SO <sub>2</sub> , 15% O <sub>2</sub> , 25% LEL Methane	11L				
18109167	CYL, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Vol. Methane	58L	18100883	18102509	18105841	18109244
18109173	CYL, 18% O <sub>2</sub> , 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 <sub>2</sub> , 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

				DEMAND FLOW REGULATORS		
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pres	sure Switch
			Regulator	Flow	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

# 38 CALIBRATION GAS CROSS REFERENCE CHART

				DEMAND FLOW REGULATORS		
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pres	sure Switch
			Regulator	Flow	150 PSI Trip	250 PSI Trip
					Pressure	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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		DEN								
PART #	DESCRIPTION	VOL.	0.5LPM	Demand	w/ iGas Pressure Switch					
			Regulator	Flow	200 PSI Trip Pressure	500 PSI Trip				
18109195	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2% Methane	650L	18103374	18103556	18105858	18109242				
18109231	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	650L	18103374	18103556	18105858	18109242				
18109160	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 2.5% Methane	650L	18103374	18103556	18105858	18109242				
18109198	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 50% LEL Methane	4,000L	18103374	18103556	18105858	18109242				
18109233	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 10 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858	18109242				
18109221	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 5 ppm SO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858	18109242				
18109194	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	4,000L	18103374	18103556	18105858	18109242				
18109159	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858	18109242				
18109197	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Propane	650L	18103374	18103556	18105858	18109242				
18108050	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2% Methane	650L	18103374	18103556	18105858	18109242				
18104091	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 2.5% Methane	650L	18103374	18103556	18105858	18109242				
18105411	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 50% LEL Methane	4,000L	18103374	18103556	18105858	18109242				
18105403	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	4,000L	18103374	18103556	18105858	18109242				
18103366	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858	18109242				
18107219	CYL, 100 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 25% LEL Propane	650L	18103374	18103556	18105858	18109242				
18109172	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 18% O <sub>2</sub> , 2.5% Methane	650L			18106740	18109246				
18109199	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.5% Methane	4,000L	18103374	18103556	18105858	18109242				
18109187	CYL, 100 ppm CO, 18% O <sub>2</sub> , 2.5% Methane	552L	18102260	18103549	18105833	18109241				
18109186	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	552L	18102260	18103549	18105833	18109241				
18109235	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 18% O <sub>2</sub> , 25% LEL Pentane	650L			18106740	18109246				
18109161	CYL, 100 ppm CO, 18% O <sub>2</sub> , 25% LEL Pentane	552L	18102260	18103549	18105833	18109241				
18108308	CYL, 100 ppm CO, 5 ppm NO <sub>2</sub> , 19% O <sub>2</sub> , 2.5% Methane	650L			18106740	18109246				
18109147	CYL, 100 ppm CO, 5 ppm SO <sub>2</sub> , 19% O <sub>2</sub> , 2.5% Methane	650L			18106740	18109246				
18105445	CYL, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	4,000L	18103374	18103556	18105858	18109242				
18102259	CYL, 100 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	552L	18102260	18103549	18105833	18109241				
18103671	CYL, 100 ppm CO, 2.5% CO <sub>2</sub> , 19% O <sub>2</sub> , 25% LEL Pentane	552L	18102260	18103549	18105833	18109241				
18102258	CYL, 100 ppm CO, 19% O <sub>2</sub> , 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 <sub>2</sub> S, 18% O <sub>2</sub> , 50% LEL Methane	650L	18103374	18103556	18105858	18109242				
18108019	CYL, 250 ppm CO, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 50% LEL Methane	650L	18103374	18103556	18105858	18109242				
18104265	CYL, 250 ppm CO, 19% O <sub>2</sub> , 2.5% Methane	552L	18102260	18103549	18105833	18109241				
18104125	CYL, 250 ppm Carbon Monoxide	552L	18102260	18103549	18105833	18109241				
18109163	CYL, 25 ppm H <sub>2</sub> S, 18% O <sub>2</sub> , 25% LEL Pentane	650L	18103374	18103556	18105858	18109242				
18107227	CYL, 25 ppm H <sub>2</sub> S, 19% O <sub>2</sub> , 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				
1810//22	UYL, 25 ppm Nitric Oxide	650L	40400000	40400540	18106/40	18109246				
1010/3/5	CYL, IUU ppm Isobutylene	552L	18102260	18103549	10105833	18109241				
1810/839	UTL, TU ppm Hydrogen Cyanide	650L	40400074	40400550	10105750	10109246				
10100903		650L	101033/4	10103050	10100000	10109242				
10100922		1 00UL	101033/4	10100000	10102020	10109242				

# 40 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.

# 

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 Requires purchase a	Programs for the MX6 Multi-Gas Monitor t 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 Requires purchase w	Program for the MX4 Ventis ithin 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 Requires purchase a	Program for the GasBadge Pro Monitor t 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 Requires purchase a	Program for the CalPlus Stations t the time of the sale.							
18006344-EXW	3 Year Extended Warranty, CalPlus only							
18006344-FXWP	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



#### GAS DETECTION MADE EASY PROGRAM:

Whether you are a novice or have years of gas detection experience, GDME training courses are for

you. Instruments from Industrial Scientific are provided to participants for use during the training sessions.



#### Hazardous gases

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

Use of instruments in confined spaces

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

Sensor technology

Instruction on how the instruments work; Description of catalytic 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<sup>™</sup> 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	GasBadge Pro
iNet DS	iTX
M40	MX4 iQuad
Ventis MX4	MX6 iBrid
Tango TX1	





# ONLINE VIDEO TRAINING

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

ATX612 (English) 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 (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

44 REFERENCE LIBRARY

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 Acetylene Benzene Butane Butyl Alcohol (Butanol) Diethyl Ether Ethane Ethyl Alcohol (Ethanol) Ethylene Ethylene Oxide Hexane 2.5% of volume 2.5% of volume 1.2% of volume 1.9% of volume 1.4% of volume 3.0% of volume 3.3% of volume 2.7% of volume 2.7% of volume 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	Butane									
Carbon Dioxide	Chlorine									
Ethane	Hexane									
Hydrogen Chloride	Hydrogen Sulfide									
Methyl Ethyl Ketone	Methyl Mercaptan									
Nitrogen Dioxide	Nitrous Oxide									
Oxygen	Phosphine									
Sulfur Dioxide	Propane									

# INTRINSIC SAFETY

#### What is intrinsic safety?

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

#### How is intrinsic safety defined?

Intrinsically safe equipment and wiring shall not be capable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a 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.



SOURCE OF IGNITION

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.

			CALIBRATION GAS											
		LEL (% vol)	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						
D	Ethylene	2.7%	0.80	0.60	1.40	1.30	0.70	0.90						
2	Hexane	1.1%	1.71	1.00	3.04	2.86	1.42	1.77						
Ĕ	Hydrogen	4.0%	0.56	0.33	1.00	0.94	0.47	0.58						
SA	Isopropanol	2.0%	1.10	0.90	2.00	1.90	1.00	1.20						
Ċ	Methane	5.0%	0.60	0.35	1.06	1.00	0.50	0.62						
Z	Methanol	6.0%	0.60	0.50	1.10	1.10	0.60	0.70						
Ш	Nonane	0.8%	2.22	1.30	3.95	3.71	1.84	2.29						
S	Pentane	1.4%	1.21	0.71	2.15	2.02	1.00	1.25						
S	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											
		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	
S	Chlorine Dioxide	_	_	_	_	20	100	_		_	_	_	_	
GA	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	

# SENSOR CROSS INTERFERENCE TABLE

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

- No data available

# **COMMON CHEMICAL NAMES AND SYMBOLS**

Ammonia	NH <sub>3</sub>
Arsine	AsH <sub>3</sub>
Benzene	C <sub>6</sub> H <sub>6</sub>
Bromine	Br <sub>2</sub>
Carbon Dioxide	CO <sub>2</sub>
Carbon Monoxide	CO
Chlorine	Cl <sub>2</sub>
Chlorine Dioxide	CIO <sub>2</sub>
Ethylene Oxide	ETO
Fluorine	F <sub>2</sub>
Hydrogen	H <sub>2</sub>
Hydrogen Bromide	HBr
Hydrogen Chloride	HCI
Hydrogen Cyanide	HCN

Hydrogen Fluoride	HF
Hydrogen Sulfide	H <sub>2</sub> S
Methane	CH <sub>4</sub>
Nitric Acid	HNO <sub>3</sub>
Nitric Oxide	NO
Nitrogen	N <sub>2</sub>
Nitrogen Dioxide	NO <sub>2</sub>
Oxygen	O <sub>2</sub>
Ozone	O <sub>3</sub>
Phosgene	COCI <sub>2</sub>
Phosphine	PH <sub>3</sub>
Silane	SiH <sub>4</sub>
Sulfur Dioxide	SO <sub>2</sub>
Sulfuric Acid	H <sub>2</sub> SO <sub>4</sub>

# HAZARDOUS GASES FOUND IN COMMON INDUSTRIAL ENVIRONMENTS

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

STEL: 30,000.0 ppm

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

Colorless toxic gas with a pungent suffocating odorPEL/TWA: 25.0 ppmSTEL: 35.0 ppmIDLH: 300.0 ppmLEL: 15.0% of volume

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

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

Colorless, odorless gas PEL/TWA: 5,000.0 ppm 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<sub>2</sub>

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: CIO<sub>2</sub>**

Red-yellow or orange-green, irritating odor PEL/TWA: 0.1 ppm STEL: 0.3 ppm IDLH: 5.0 ppm

- Pulp and Paper Mills
- Wastewater Treatment Plants

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

Colorless, odorless gas PEL/TWA: No limit set by OSHA STEL: N/A IDLH: No limit set by NIOSH LEL: 4% by volume • Chemical Manufacturing

- HazMat Operations
- Power Generation

#### Hydrogen Chloride: HCI

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 • Vinvl 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<sub>2</sub>S

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 IDLH: 100.0 ppm

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

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

Reddish-brown toxic gas with a pungent odor PEL/TWA: 3.0 ppm STEL: 5.0 ppm IDLH: 20.0 ppm • Boilers and Furnaces

- · Bollers and Furnaces
- Diesel Emissions
- Underground Mining
- Semiconductor Plants

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

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<sub>3</sub>

Colorless gas, garlic-like odorPEL/TWA: 0.3 ppmSTEL: 1.0 ppmIDLH: 5.0 ppmLEL: 1.79% of volume• Pesticides-Agricultural Fumigant

Doping Agent

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

Colorless toxic gas with a pungent odor PEL/TWA: 2.0 ppm STEL: 5.0 ppm IDLH: 100.0 ppm STEL value by the ACGIH: 0.25 ppm

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

ilos Plants

STEL: N/A

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

# **VOLATILE ORGANIC COMPOUNDS DETECTED BY A PID <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 Butvl 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 Ethvl 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 Hydroguinone 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 Hvdroaen Hydrogen bromide Hydrogen chloride Hydrogen cyanide Hydrogen fluoride Methane Nitric acid Nitrogen Oxygen Ozone Sulfur dioxide Water

# **GUIDE TO HAZARDOUS LOCATIONS**



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

51

lammable

Material

Present

Zone 2

dust)

(Zone 22

Zone 2

Division 2

U.S. (NEC®500)

Class I/

Group A

Class I/

Group B

Class I/

Group C

Group D

Class I/

Mining\*

Class II/

Group E

Class II/

Group F

Class II/

Group G

Class III

U.S

Τ1

Т2

T2A

T2B

T<sub>2</sub>C

T2D

Т3

T3A

Т3В

тзс

Т4

T4A

Τ5

Т6

Туре

IP

67

54

(NEC®500)

Abnormal