

STAND-ALONE CUSTOM GAS SENSORS with 4-20mA output.....

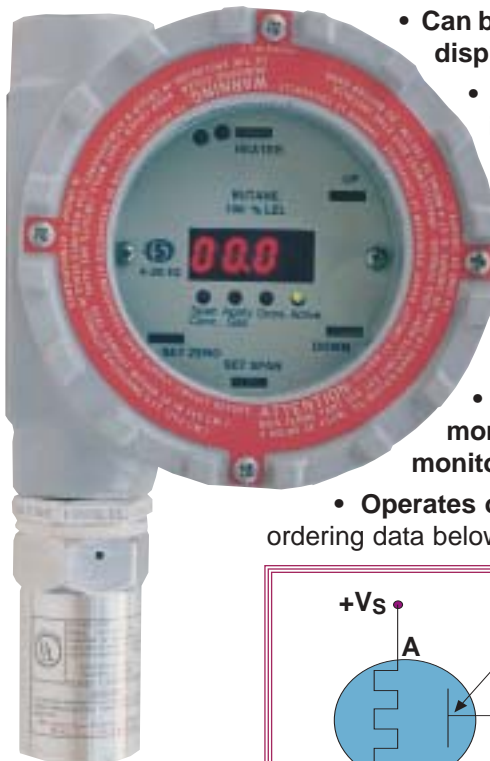
Monitor for any Gas and Range Listed on Facing Page (Select One)

- Detect either toxic or explosive gases, as low as several PPM and as high as 100% LEL
- Long life expectancy, typically ten years or more with a three year warranty
- Calibration interval: 30 days to six months, depending on application
- Temperature range: -40 to 140°F
- Sensor cabling can be run thousands of feet to monitor anywhere in your facility

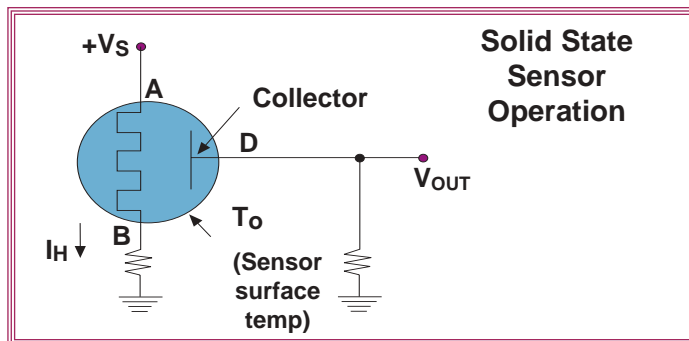
Explosion-proof housing Class 1, Division 1, Groups A-D

Sensor Installation Guidelines

- A) As a general rule, sensors should be installed at the points from which the gas is most likely to leak and/or accumulate
- B) The number of sensors required for an application depends on a number of factors including plant layout, air flow pattern, & type of gas to be monitored. Gas sensors are similar to smoke detectors, meaning they will only detect gas which directly contacts the sensor.
- C) Sensors must not be exposed directly to water or steam
- D) Gases have different densities; some are lighter than air while others are heavier. However, this does not mean that sensors should be installed on the floor or ceiling. Gases disperse easily and develop a concentration gradient, which means that a gas heavier than air will still be detected several feet off the ground. An important point is that sensors must be accessible for calibration and maintenance, so they should be located where they can easily be reached.



- Can be ordered with or without LED digital display on sensor face
- Analog 4-20mA signal can be tied into inhouse data systems, PLC's, portable dataloggers, or use as a stand-alone system
- Although there is no relay included, an accessory loop alarm (3A relay) is optionally available to activate alarm setpoint and control remote devices
- Not designed for in-line or process monitoring. Use only for ambient room monitoring and personnel protection
- Operates on 14-24 VDC (loop power supply from ordering data below)



A solid state sensor consists of two electrodes embedded into a solid state metal oxide material. The presence of gas changes the resistance of the material, with the magnitude of change directly related to the gas concentration. The resistance change, and hence the gas concentration, is measured through the sensors corresponding electronic circuitry. The sensor is kept at a specific operating temperature by applying a 'heater' voltage to it. The choice of heater voltage is critical in determining the response characteristics of the sensor. By varying this voltage and by using different materials and processing techniques, sensors can be made which are more sensitive to one gas or group of gases.

HOW TO ORDER SENSORS

SELECT GAS and RANGE FROM PAGE 373

Combustible: Any % LEL Scale (0-100%) ONLY

Toxic 1: Any green colored ppm range

Toxic 2: Any black colored ppm range

Category	Model	LED Display	
Combustible (0-100%LEL)	SM95SC	No	
	420iQSC	Yes	
Toxic 1	SM95ST1	No	
	420iQST1	Yes	
Toxic 2	SM95ST2	No	
	420iQST2	Yes	

65012051X Loop Power. 24VDC with socket. 115VAC operation

CAL8000 Portable Cal Kit. Includes calibration gas, tubing and regulator. Must specify gas and range.....

18232 Loop Powered Alarm. Provides 3A relay setpoint off 4-20mA output of sensor.....

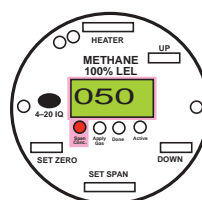
MT4115WHVNS Strobe/Horn Alarm. 115 VAC powered. Only use with alarm above.....

DiALERT1 Automatic Phone Dialer. Activated by single contact closure. Dials up to ten different numbers to notify key personnel of potential problems in your own voice recorded message. 115VAC powered with NiCad battery backup. Only use with alarm above.....

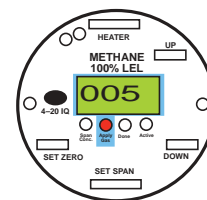
Quick and Easy Field Calibration

(Auto calibration only applies to LED digital models)

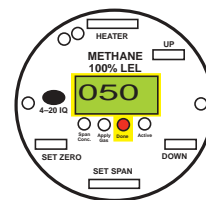
- Does not require the removal of the sensor housing for calibration, which is especially important in hazardous or explosive environments
- Simple, one-man automatic calibration. No potentiometers to adjust and no covers to remove; it's as easy as 1,2,3...



1. Select calibration gas concentration.



2. Apply calibration gas.



3. Wait for "Done" LED to illuminate.

CHOOSE GAS AND RANGE FROM THIS TABLE

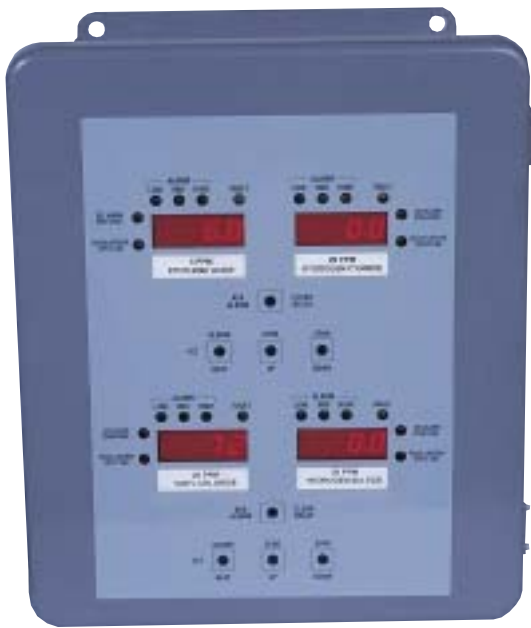
Select One Gas and Range (PPM or %LEL) for each Sensor / Transmitter

Range Color-Coded by Sensor Type:

Blue = Combustible %LEL Green = Category 1 Toxic PPM Black = Category 2 Toxic PPM

Gas	Full Scale Ranges	Gas	Full Scale Ranges
Acetic Acid	100, 200 ppm	Hydrogen Cyanide	20, 50, 100, 1000, 10000 ppm
Acetone	100, 200, 500, 1000, 5000 ppm, %LEL	Hydrogen Fluoride	20, 50, 100, 200, 500 ppm
Acetonitrile	100, 1000 ppm	Hydrogen Sulfide	5, 20, 50, 100, 300, 1000 ppm
Acetylene	50 ppm, %LEL, 3% by volume	Isobutane	%LEL
Acrolein	50 ppm	Isobutylene	%LEL
Acrylic Acid	100, 500 ppm	Isopentane	1000 ppm
Acrylonitrile	100, 200, 500 ppm, %LEL	Isoprene	%LEL
Allyl Chloride	200, 500 ppm, %LEL	Isopropanol	200, 500, 1000, 10000 ppm, %LEL
Ammonia	100, 200, 500, 1000, 2000, 5000 ppm, 5% by volume, %LEL	JP 4	1000 ppm, %LEL
Anisole	100 ppm	JP 5	1000, 2500, 5000 ppm, %LEL
Arsenic Pentafluoride	5 ppm	Kerosene	%LEL
Arsine	1, 10 ppm	Methane	100, 200, 500, 1000, 1500, 2000, 5000 ppm, 2% by volume, 100% 200%LEL
Benzene	50, 75, 100, 1000 ppm, %LEL	Methanol	200, 500, 1000, 2000, 5000 ppm, %LEL
Boron Trichloride	500 ppm	Methyl Acrylate	60 ppm
Bromine	20 ppm	Methyl Bromide	20, 50, 60, 100, 500 ppm
Butadiene	50, 100, 3000 ppm, %LEL	Methyl Butanol	%LEL
Butane	400, 1000 ppm, 100%, 200%LEL	Methyl Cellosolve	%LEL
Butanol	1000 ppm, %LEL	Methyl Chloride	100, 300, 2000, 10000 ppm, %LEL
Butene	%LEL	Methyl Ethyl Ketone	100, 500, 1000, 4000 ppm, %LEL
Butyl Acetate	100 ppm, %LEL	Methyl Hydrazine	5 ppm
Carbon Disulfide	50, 100 ppm, 5% by volume	Methyl Isobutyl Ketone	200, 500, 2000 ppm, 50%, 100%LEL
Carbon Monoxide	50, 100, 200, 500, 1000, 5000 ppm, 5% by volume, %LEL	Methyl Methacrylate	100 ppm, %LEL
Carbon Tetrachloride	50, 100, 1000 ppm	Methylene Chloride	20, 100, 500, 1000, %LEL
Cellsolve Acetate	100 ppm	Mineral Spirits	200, 3000 ppm
Chlorine	4, 5, 10, 20, 30, 50, 100, 200 ppm	Monochlorobenzene	%LEL
Chlorine Dioxide	10, 20 ppm	Monoethylamine	30, 100, 1000 ppm
Chlorobutadien	%LEL	Morpholine	500 ppm
Chloroethanol	200 ppm	Naphtha	1000 ppm, %LEL
Chloroform	50, 100, 200 ppm	Nitric Oxide	20, 50 ppm
Chlorotrifluoroethylene	%LEL	Nitrogen Dioxide	20, 50, 100 ppm
Cumene	%LEL	Nitrogen Trifluoride	50, 500, 1000ppm
Cyanogen Chloride	20 ppm	Nonane	2000 ppm
Cyclohexane	100 ppm, %LEL	Oxygen	25% by volume
Cyclopentane	50 ppm	Ozone	3 ppm
Deuterium	50%, 100% LEL	Pentane	2000, 100 ppm, %LEL
Diborane	10, 50 ppm	Perchloroethylene	200, 1000, 2000, 20000 ppm
Dibromoethane	50 ppm	Phenol	100 ppm
Dibutylamine	100% LEL	Phosgene	50 ppm
Dichlorobutene	1% by volume	Phosphine	3, 5, 10, 20, 30, 50 200 ppm
Dichloroethane	50, 100 ppm, %LEL	Phosphorus Oxychloride	200 ppm
Dichlorofluoroethane	100, 1000 ppm	Phosphorus Pentafluoride	5 ppm
Dichloropentadiene	50 ppm	Picoline	%LEL
Dichlorosilane	10, 50, 100 ppm	Propane	100, 1000 ppm, %LEL
Diesel Fuel	50 ppm, %LEL	Propylene	100, 200, 1000, 5000 ppm, %LEL
Diethyl Benzene	%LEL	Propylene Oxide	100 ppm, %LEL
Diethyl Sulfide	10 ppm	Silicon Tetrachloride	1000 ppm
Difluorochloroethane	%LEL	Silicon Tetrafluoride	1000 ppm
Difluoroethane (152A)	%LEL	Silane	10, 20, 50 ppm
Dimethyl Ether	%LEL	Styrene	100, 200, 300 ppm, %LEL
Dimethylamine (DMA)	30, 50, 100, 500 ppm	Sulfur Dioxide	50, 100, 500 ppm
Epichlorohydrin	50, 100, 500, 1000 ppm	Tetrahydrofuran	200, 300, 1000 ppm, %LEL
Ethane	1000 ppm, %LEL	Tetraline	100 ppm
Ethanol	200, 1000, 2000 ppm, %LEL	Toluene	50, 100, 500, 2000, 5000 ppm, %LEL
Ethyl Acetate	200, 500, 1000, 2000 ppm, %LEL	Toluene Diisocyanate	15 ppm
Ethyl Benzene	200 ppm, %LEL	Trichloroethane	50, 100, 500, 1000 ppm, 1% by volume
Ethyl Chloride	100, 1000 ppm, %LEL	Trichloroethylene	50, 100, 200, 500, 1000, 2000 ppm, %LEL
Ethyl Chlorocarbonate	1% by volume	Triethylamine	100 ppm
Ethyl Ether	100, 1000 ppm, %LEL	Trifluoroethanol	25, 100 ppm
Ethylene	100, 500, 1000, 1200 ppm, %LEL	Trimethylamine	50 ppm
Ethylenediamine	500, 1000 ppm	Turpentine	%LEL
Ethylene Oxide	5, 20, 50, 75, 100, 200, 1000, 3000 PPM	Tungsten Hexafluoride	50 ppm
Fluorine	20, 100 ppm	Vinyl Acetate	40, 100, 1000 ppm, %LEL
Formaldehyde	15, 50, 100, 500, 1000 ppm, 1% by volume	Vinyl Chloride	20, 50, 100, 200, 500, 1000, 4000, 10000 ppm, %LEL
Freon 11	1000, 2000, 5000 ppm	Vinylidene Chloride	50 ppm
Freon 12	1000, 2000, 3000 ppm	Xylene	100, 200, 300 1000 ppm, 1% by volume
Freon 22	100, 200, 500, 1000, 2000 ppm	Acetylene in Nitrogen	1% by volume, %LEL
Freon 113	100, 200, 500, 1000, 2000 ppm, 1% by volume	Ammonia in Nitrogen	50, 100, 400, 500, 1000 ppm
Freon 114	1000, 2000, 20000 ppm	Butane in Nitrogen	%LEL
Freon 502	1000 ppm	Carbon Disulfide in Nitrogen	50, 500 ppm
Gasoline	100, 1000, 2000, 20,000 ppm, %LEL	Carbon Monoxide in Nitrogen	500, 3000 ppm
Germane	10, 50 ppm	Cyclohexane in Nitrogen	300 ppm
Heptane	1000 ppm, %LEL	Hydrogen in Nitrogen	100, 500, 1000 ppm, 1% by volume, %LEL
Hexane	50, 100, 500, 2000, 3000 ppm, %LEL	Hydrogen Chloride in Nitrogen	50, 100, 200 ppm
Hexene	%LEL	Hydrogen Sulfide in Nitrogen	100 ppm
Hydrazine	5, 10, 20, 100, 1000 ppm, 1% by volume	Isobutane in Nitrogen	50% LEL
Hydrogen	50, 100, 200, 500, 1000, 2000, 5000 ppm, 5% by volume, %LEL	Methane in Nitrogen	50% LEL
Hydrogen Bromide	50 ppm	Pentane in Nitrogen	1000 ppm
Hydrogen Chloride	20, 50, 100, 200, 500, 1000 ppm		

Does your application call for a gas not listed here? Give us a call! For toxic gases, the typical range is three to five times the TLV (Threshold Limit Value) concentration. For combustible gases, the typical range is 0 – 100% LEL (Lower Explosive Limit)



TOXIC & COMBUSTIBLE GAS CONTROL SYSTEMS

- Digital display of gas concentration for each sensor channel
- Low, mid and high alarm 3A relays with corresponding LED's
- Weatherproof enclosure
- Automated calibration - Simply apply, gas and intelligent controller makes all the necessary calibration adjustments (with sensor / transmitter local digital display option)
- Sensor housings (not controller) explosion proof, Class 1, Division 1, Group A-D

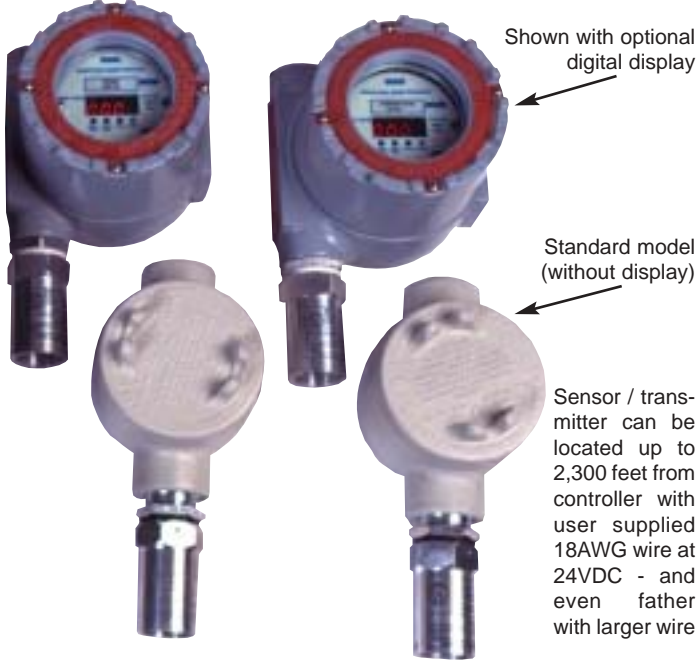
See page 373 to select gas and range from over 150 toxic and combustible gases for each sensor / transmitter

NEMA 4 Enclosure (1 to 4 sensors)

- Built-in diagnostic functions to help diagnose and troubleshoot the control unit. One button is all that is required to access the six main diagnostic functions
- Three sensors available to measure over 150 different gases
- LED displays provide easy viewing in low light

DISPLAYS AND RELAYS

- √ Three separate LED's indicate low, mid and high gas concentration levels
- √ Three 3A relays and one fault relay common to all channels are provided to trigger external alarm devices (Single channel controller only has two alarm relays)
- √ Relays can be fail safe, latching, or reset on acknowledge
- √ Optional configuration for each relay to be independent for each individual sensor
- √ Alarm setpoints fully adjustable over 0-100% of full scale
- √ Optional 4-20mA output (linearized) per channel



Sensor / transmitter can be located up to 2,300 feet from controller with user supplied 18AWG wire at 24VDC - and even farther with larger wire

How To Order Controller (includes one to four sensors)

- 1 Select desired number of sensors
- 2 Select gas(es) and range(s) from table listing on page 373
- 3 Select model number from table below

Cabinet Specifications

Case size: 13.6 H x 11.5 W x 5.0" D
Power: 120VAC/220VAC switchable
Installation: Weatherproof NEMA 4 (non-hazardous areas for cabinet only)

Number of standard sensors included	Combustible Gases Readout in % LEL		Toxic Gases (PPM Ranges) Category 1		Toxic Gases (PPM Ranges) Category 2	
	Model		Model		Model	
1	LC100SC		LC100ST1		LC100ST2	
2	MP2022SC		MP2022ST1		MP2022ST2	
3	MP2043SC		MP2043ST1		MP2043ST2	
4	MP2044SC		MP2044ST1		MP2044ST2	
1 or 2	MP220EXC (Explosion proof)		MP220EXST1 (Explosion proof)		MP220EXST2 (Explosion proof)	

Calibration

One kit is required for each different type of gas sensor. Analyzer performs zero and span calibrations automatically
CAL8000 Portable Cal Kit. Must specify gas and range. Includes cal gas, regulator, and tubing.....
iS8001 Additional Cal Gas Bottle. Must specify gas and range. 0.44 liter. Each bottle performs approximately 90 calibrations.....

Options

iS3 Special Calibration. For any gas or range not listed in table on page 349.....
iS24 Power. 24 VDC. In lieu of 115 VAC.....
iS420 Non-Isolated Output. 4-20mA.....
iSiQ Local Digital Display. On sensor face.....
 * Rack mount models optionally available. Please call on all applications over four sensors for a quotation.