

Fixed Gas Monitor, Stand-Alone, Single Gas Indoor Installation

SPECIFICATION

Description

The BeaconMedaes Fixed Gas Monitor Series, with its microprocessor-based system, features a high quality stand-alone controller providing all of the necessary hardware for the continuous monitoring of a different of toxic and combustible gases. This unit is primarily geared towards providing alarm activated relays for simple applications such as cylinder storage rooms.

The FGM Series employs the best sensing technologies available: infrared, electrochemical and pellistor cells. These quality components provide virtually instantaneous detection of targeted gases and deliver long-term trouble-free operation.

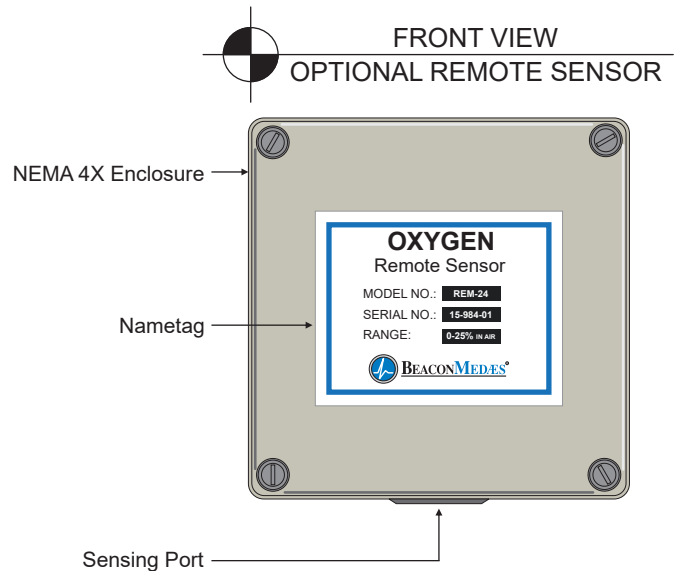
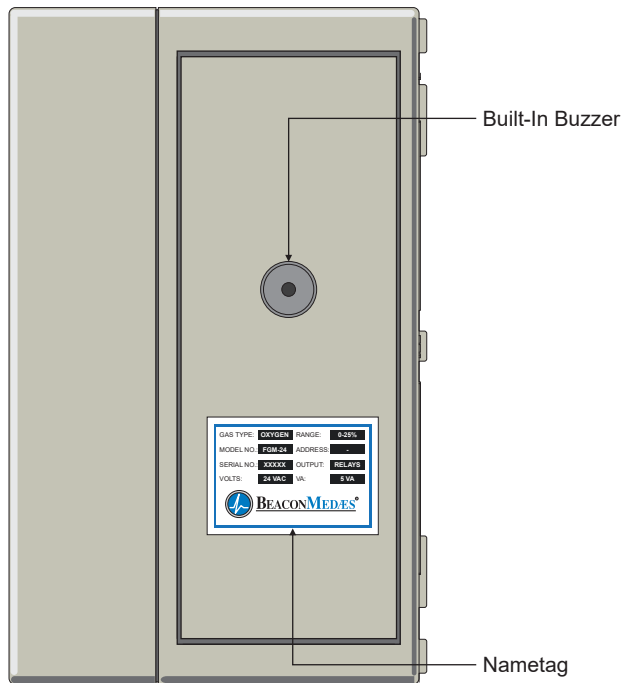
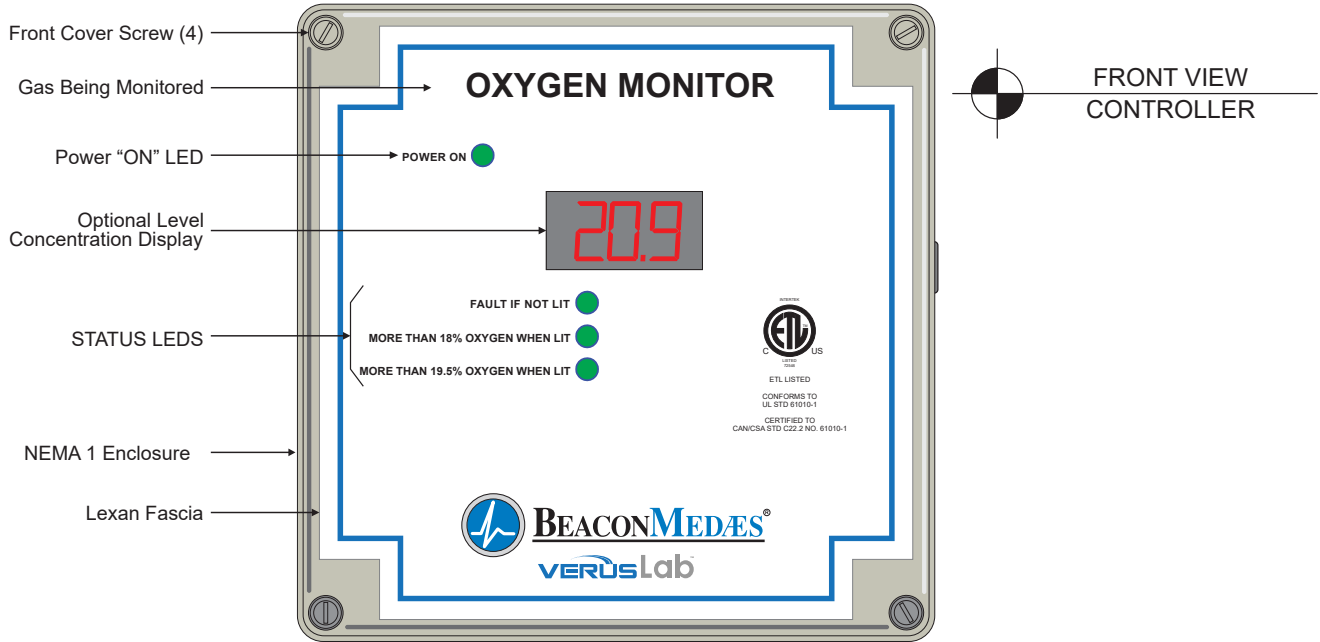
Specific Gravity and Location of Sensing Elements

The location of the sensing elements is determined by the weight of the target gas relative to air. This "weight factor" is called specific gravity. The specific gravity of air is equal to one (1); Sg = 1. Gases having a specific gravity less than to one are lighter than air; the sensing element has to be located within 18" from the ceiling. Conversely, gases with a specific gravity greater than one are heavier than air and require sensing element location within 18" from the floor. It is recommended to install sensing elements of gases with a specific gravity close to one (Sg-1) at eye level.

Radius of Coverage of Sensing Elements

The radius of coverage of one sensing element is roughly 20 feet. The distribution of sensing elements is also guided by the line of sight of the sensing element. Another way to determine sensing element locations is to analyze the air movement in a facility and locate the sensing elements where they can sense their target gases. This type of analysis has to be done by experts.

Sensor Location	
Gas [Specific Gravity = Sg]	Height of Sensing Element
Acetylene [Sg: 0.899]	Eye Level (Breathing Zone)
Ammonia [Sg: 0.58]	18" Below Ceiling
Carbon Dioxide [Sg: 1.519]	18" Above Floor
Carbon Monoxide [Sg: 0.967]	Eye Level (Breathing Zone)
Chlorine [Sg: 2.49]	18" Above Floor
Hydrogen / Deuterium [Sg: 0.07 / 0.139]	18" Below Ceiling
Hydrogen Sulfide [Sg: 1.176]	Eye Level (Breathing Zone)
Methane/ Natural Gas [Sg: 0.554]	18" Below Ceiling
NOX (NO & NO₂) [Sg: 1.037]	Eye Level (Breathing Zone)
Oxygen Enrichment [Sg: 1.104]	Eye Level (Breathing Zone)
Oxygen Depletion [Sg: 1.104]	Eye Level (Breathing Zone)
Propane / LPG [Sg: 1.522]	18" Above Floor

Standard Configuration
Oxygen Depletion Monitor Shown


Sensing Element, Detection Ranges & Alarm Levels			
Gas [Sensing Element]	Full Scale Range	First Alarm Level Factory Default	Second Alarm Level Factory Default
Acetylene [Catalytic Beads]	0-100% LEL	0.625% in Air (25% LEL)	1.25% in Air (50% LEL)
Ammonia [Electrochemical Cell]	0-100 ppm	25 ppm (TLV-TWA)	35 ppm (TLV-STEL)
Carbon Dioxide [Non-Dispersive InfraRed]	0-50,000 ppm	5,000 ppm (TLV-TWA)	30,000 ppm (TLV-STEL)
Carbon Monoxide [Electrochemical Cell]	0-500 ppm	25 ppm (TLV-TWA)	35 ppm (TLV-STEL)
Chlorine [Electrochemical Cell]	0-10 ppm	0.5 ppm (TLV-TWA)	1 ppm (TLV-STEL)
Hydrogen [Catalytic Beads]	0-100 % LEL	1% in Air (25% LEL)	2% in Air (50% LEL)
Hydrogen Sulfide [Electrochemical Cell]	0-50 ppm	10 ppm (TLV-TWA)	15 ppm (TLV-STEL)
Methane/ Natural Gas [Catalytic Beads]	0-100 % LEL	1.25% in Air (25% LEL)	2.5% in Air (50% LEL)
NOX (NO & NO₂) [Electrochemical Cell]	0-10 ppm	3 ppm (TLV-TWA)	5 ppm (TLV-STEL)
Oxygen Enrichment [Electrochemical Cell]	0-25% in Air	19.5% (Low Level)	23.5% (High Level)
Oxygen Depletion [Electrochemical Cell]	0-25% in Air	19.5% (Low Level)	18% (Very Low Level)
Propane / LPG [Catalytic Beads]	0-100% LEL	0.5% in Air (25% LEL)	1% in Air (50% LEL)

Threshold Limit Value - Time Weighted Average (TLV-TWA)

Refers to the time-weighted average concentration for a normal 8 hour workday and a 40 hour workweek to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Threshold Limit Value - Short Term Exposure Limit (TLV-STEL)

TLV-STEL is the maximum concentration of a substance for (a) a continuous 15-minute exposure period, (b) for a maximum of 4 such periods per day, (c) with at least one 60-minute exposure-free period between two exposure periods, and (d) provided the daily TL-TWA is met.

Lower Explosive Limit (LEL)

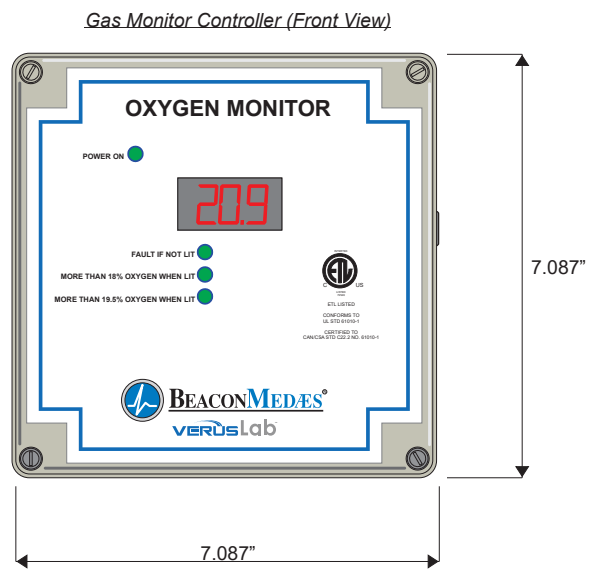
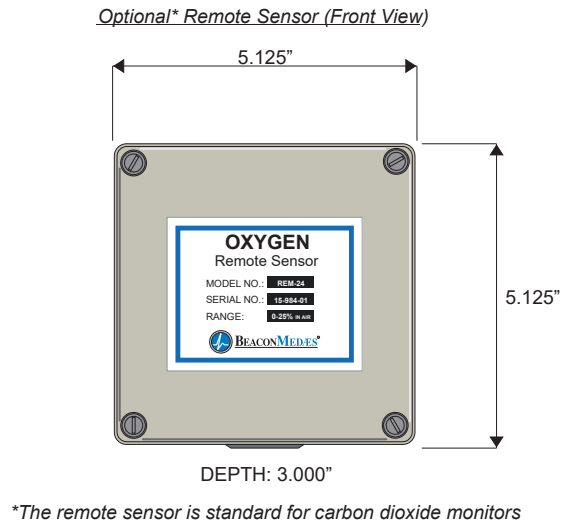
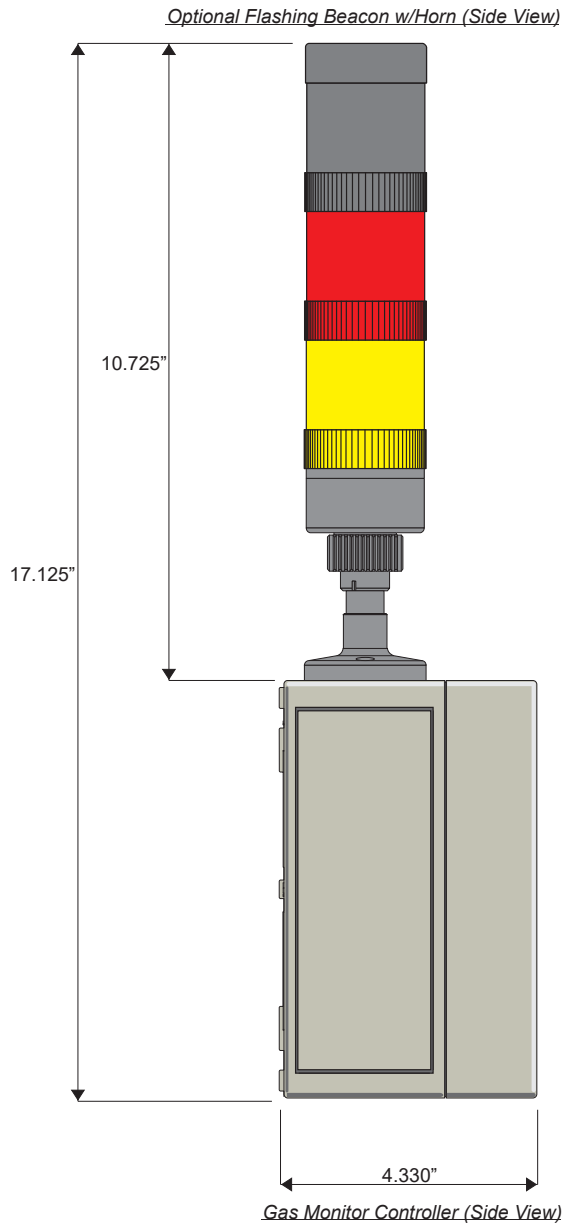
The minimum concentration of a particular combustible gas or vapor necessary to support its combustion in normal ambient air. Below this level, the mixture is too lean to burn.

Specification Table

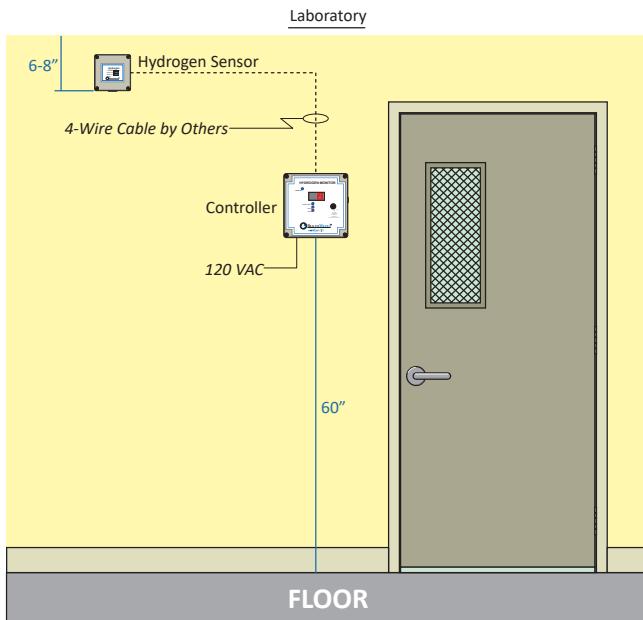
Technical Specification		
Gases Detected		Refer to Ordering Information
Sensor Technology	Carbon Dioxide Oxygen Toxic Gases Flammable Gases	Non-Dispersive Infrared Electrochemical Cell Electrochemical Cell Catalytic Pellistor
Sensing Method		Diffusion
Power Requirements		24 VAC, 110 VAC, 240 VAC 50/60 Hz
Output Relay Rating		SPDT relay, Dry Contact Rating 3 Amp @ 120 VAC inductive
Optional Analog Output		One of the following: 4-20 mA, 0-1 VDC, 0-5 VDC, 0-10 VDC
Operating Temperature		-4°F to 120°F (-20°C to 50°C)
Humidity Range		15-90% Relative Humidity
Accuracy	Non-Dispersive Infrared Electrochemical Cells Catalytic Pellistor	+/- 2% of calibrated value +/- 5% of calibrated value +/- 1% of calibrated value as Methane
Repeatability		2% of Signal
Response Time (90%)		20-40 Seconds
Expected Sensor Lifetime	Infrared (Carbon Dioxide) Oxygen (Electrochemical) Toxic Gases (Electrochemical) Flammable Gases (Catalytic Pellistor)	10 Years 1-2 Year* 2 Years* 3 Years
Enclosure	Rating Color Installation	Nema 1 Light Grey (RAL 7035) Surface Mounting
Approvals	Canada United States	CAN/CSA C22.2 No. 61010-1:2004 ANSI/UL 61010-1:2004
Audible Alarm		65 dBa at 3 feet

**Electrochemical cells/sensors have limited lifetime which is determined by their exposure to the gas they are detecting. Electrochemical cells are not covered under warranty should they deplete prior to their expected lifetime.*

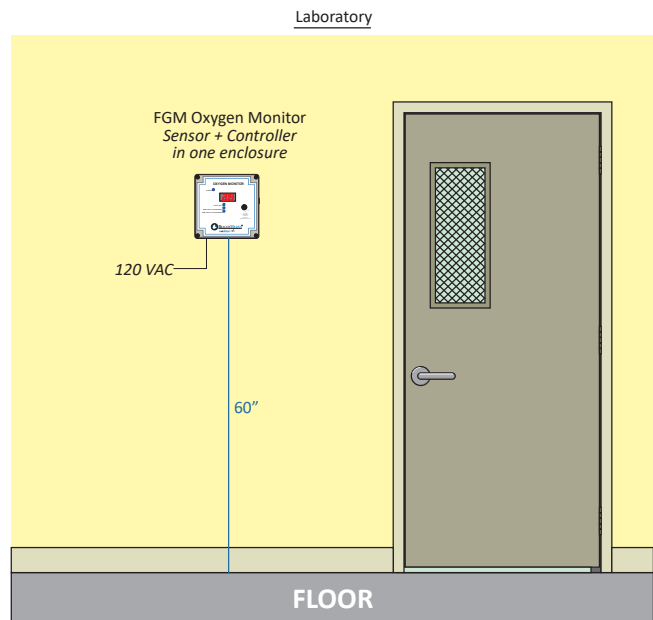
Dimensions



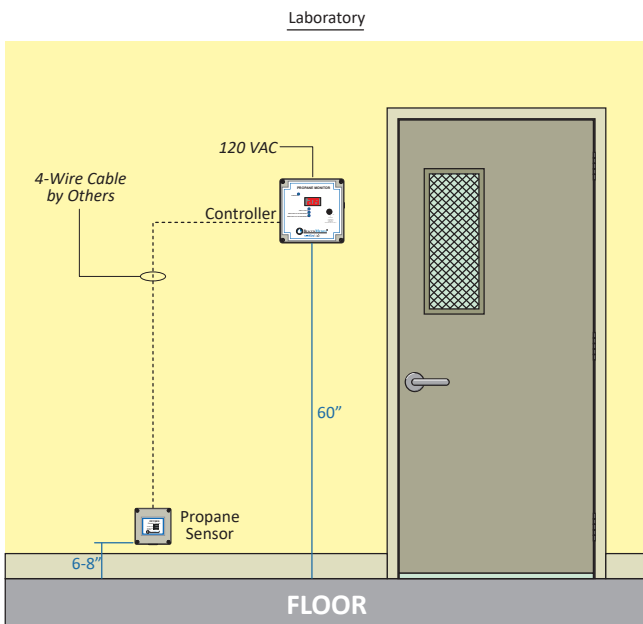
Installation Examples



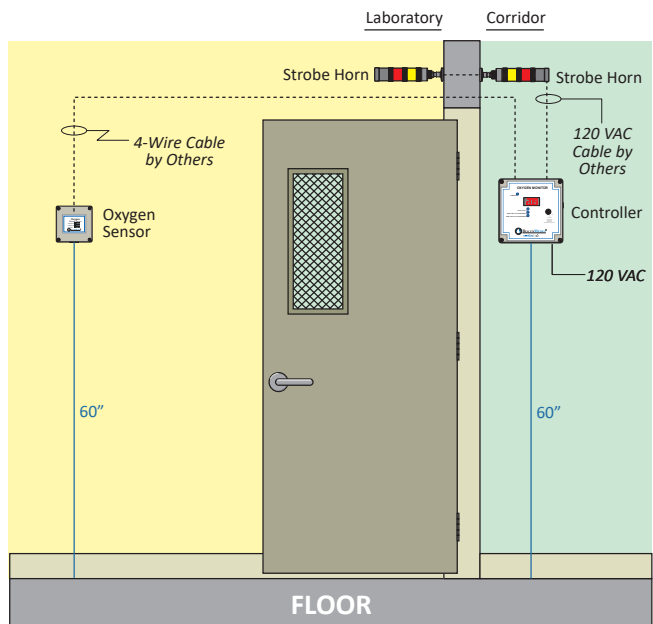
Typical setup for low density gases ($S_g < 1$)



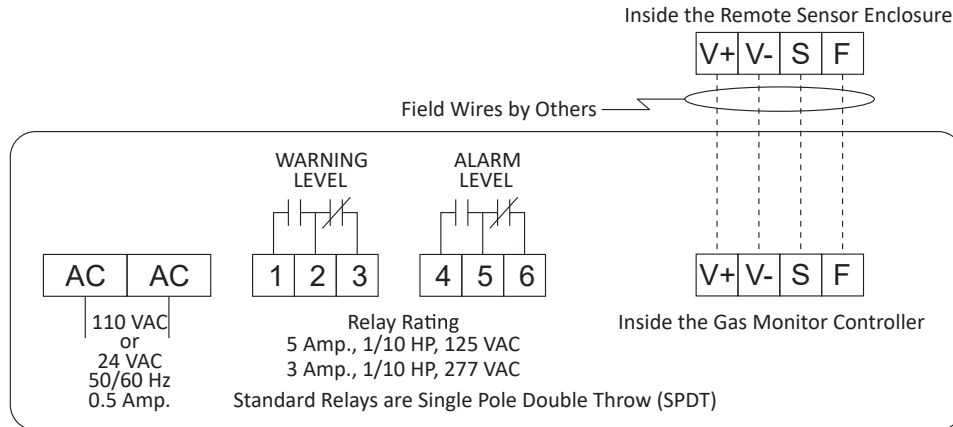
Suggested installation for oxygen monitoring



Installation example of sensor and controller locations for high density (heavy) gases ($S_g > 1$)



Oxygen monitoring with remote sensor and audio/visual alarm (audible/visual alarm devices sold separately)

Wiring

Ordering Information

FGM - - - -

A B C D

BeaconMedaes FGM Series Model Number Chart			
Variable	Definition	Allowable Value	Description
A	Gas Detected	C ₂ H ₂ NH ₃ CO CO ₂ CL ₂ H ₂ H ₂ S CH ₄ NOX O ₂ C ₃ H ₈	Acetylene Ammonia Carbon Monoxide Carbon Dioxide Chlorine Hydrogen Hydrogen Sulfide Methane NO & NO2 Oxygen Propane
B	Line Voltage	24 120 240	24 VAC 120 VAC 240 VAC
C	Output Signal	3 Relays 4 Relays 4-20 mA 0-1 VDC 0-5 VDC 0-10 VDC	3R 4R 420 001 005 010
D	Options	RS LCD SFBH DPDT	Remote Sensor Local Display Stackable Beacon w/Horn Double Pole Double Throw Relay