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GAS DETECTION 101

A gas monitor, also referred to as a gas detector, is a device that detects the presence of gas in an area. The device has sensors in it that are programmed to detect the presence of specific gasses. If that type of gas is detected, the gas detector will alert the user via an alarm. The most common sensors used in at-height, industry, and construction are:

Combustible (LEL): Combustible (LEL), or combustible lower exposure level sensors, are designed to detect and monitor combustible hydrocarbon gases in the air. The most common combustible gasses are: Methane, Butane, High Hydrogen Content (HHC), Nonane, Propane and Hydrogen.

Oxygen: Oxygen sensors are essential for situations where having accurate oxygen measurements could prevent injury or death. Not all areas have safe oxygen levels, especially when in confined spaces.

Toxic: Toxic sensors are pretty self-explanatory, but they measure the levels of toxic gasses. The most common toxic gasses are: Carbon Monoxide (CO), Hydrogen Sulfide (H2S), Nitrogen Dioxide (NO2) and Sulfur Dioxide (SO2).

The way the sensors work varies depending on the type of sensor the manufacturer used. The most common types of sensors are:

Electrochemical Sensors: Most commonly used for toxic gas detection. These sensors use electrodes to send signals when gas is detected.

MOS (Metal Oxide Semiconductors): Most commonly used for toxic gasses – carbon monoxide in particular. Metal oxide semiconductors use a gas sensitive film that triggers when the levels of gas become toxic.

Catalytic Sensors: Most modern gas monitors use catalytic sensors. Catalytic sensors have a platinum treated wire coil that heats up when exposed to gasses due to oxidation. When the resistance of the wire is changed, due to the heat generated by oxidation, a circuit detects this change and triggers the warning.

IR (Infrared Sensors): This type of sensor uses a series of transmitters and receivers. The transmitters emit a light. If the receiver cannot "see" the light because of gas being in the way it triggers the warning.

Exposure Limits: The exposure limit of toxic gasses are determined and defined by multiple sets of standards. Time-weighted average (TWA) indicates the exposure limits as it pertains to a 10-hour workday during a 40-hour workweek. A short-term exposure limit (STEL) is a 15-minute period of average exposure that should not be exceeded during a workday. Immediately Dangerous to Life and Health (IDLH) refers to the airborne concentration from which a worker could escape without injury or irreversible health effects.

Carbon Monoxide: Highly toxic, colorless and odorless gas.
Exposure Limits: (TWA) 40mg/m^3/35ppm
(IDLH) 1380mg/m^3/1200ppm

Hydrogen Sulfide: Colorless gas with characteristic odor of rotten eggs.
Exposure Limits: (TWA) 7mg/mm^3/5ppm
(STEL) 14mg/mm^3/10ppm
(IDLH) 140mg/mm^3/100ppm

Nitrogen Dioxide: A brown gas with pungent odor.
Exposure Limits: (STEL) 1.88mg/m^3/1ppm
(IDLH) 37.6mg/m^3/20ppm

Sulfur Dioxide: Colorless gas with pungent odor.
Exposure Limits: (TWA) 5mg/mm^3/2ppm
(STEL) 13mg/mm^3/5ppm
(IDLH) 262mg/mm^3/100ppm