antrumX™
Airflow that Makes Sense

CARBON MONOXIDE SENSING

DESCRIPTION

The Sensor Pack monitors multiple air quality parameters across 16 zones, independently reporting on each. Each sensor pack contains sensors for air velocity, temperature, humidity, and pressure. With a reference to clean air, it cancels sensor drift, ensuring more accurate and consistent data compared to standard wall-mounted solutions. All required sensors for a specific application are pre-installed in one sensor pack, making calibration effortless through a tool-free replacement process.

WHY

Monitoring for carbon monoxide (CO) is critical because it's an odorless, colorless gas that can be extremely harmful when inhaled. CO is produced by the incomplete combustion of carbon-based fuels such as gas, oil, coal, and wood. It competes with oxygen in the bloodstream, preventing oxygen from reaching vital organs and tissues, which can lead to CO poisoning.

Health and Safety: High concentrations of carbon monoxide can be harmful to humans. Exposure to CO can lead to symptoms like dizziness, headaches, nausea, and in severe cases, it can even be fatal. Monitoring helps ensure that CO levels remain within safe limits, protecting the health of individuals who use or work in the facility.

Compliance with Regulations: Many safety regulations and building codes require monitoring for carbon monoxide in enclosed spaces, including parking structures, to maintain safe environments for occupants and to comply with legal standards.

Early Detection of Issues: Monitoring systems provide early detection of elevated CO levels, allowing for prompt investigation and intervention if there's a problem with vehicle emissions, ventilation systems, or any other source contributing to increased CO levels within the facility.

Optimizing Ventilation: Monitoring CO levels helps determine if ventilation systems are effectively removing CO from indoor spaces. It ensures that adequate fresh air is brought in and that exhaust systems are efficiently removing contaminants, preventing CO buildup.

Monitoring CO for demand-controlled ventilation involves using carbon monoxide levels as indicators to regulate the amount of fresh air brought into a space. By tracking carbon monoxide levels, ventilation systems can be adjusted or activated as needed to ensure sufficient fresh air circulation and reduce CO concentration to safe levels. This method optimizes ventilation by responding dynamically to actual needs rather than relying on fixed schedules, potentially reducing energy consumption while ensuring adequate air quality based on real-time conditions.

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HOW IT WORKS

The sensor uses solid polymer electrochemical technology which is based on the principle of electrochemical catalytic reaction caused by the target gas. This reaction leads to an electrical signal that is directly proportional to the gas concentration. The sensor is composed of three catalytic electrodes, a solid electrolyte, and gas diffusion holes. The gas reaches the working electrode of the sensor through the diffusion holes, an electrochemical redox reaction occurs on the porous micro-surface of the electrode, the solid electrolyte conducts electron transfer, and generates a current signal as an output. The current signal is used to characterize the gas concentration.

SPECIFICATIONS

Parameter	Value	Units
Technology	ElectroChemical	
Range	0–1,000	ppm
Humidity Range	15–95	%
Resolution	0.1	ppm
Accuracy	± 5	% (FS)
Response[1]	30	s
Recovery[1]	120	s
Overload	1,000	ppm
Calibration	2	Year(s)

1. T90

CROSS SENSITIVITY

Gas[1]	Formula	Concentration (ppm)	Response (ppm)
Ammonia	NH_3	50	0
Chlorine	Cl_2	1	0
Ozone	O_3	50	0
Hydrogen	H_2	1000	500
Hydrogen Sulfide	H_2S	50	0
Hydrogen Cyanide	HCN	50	0
Nitrogen Dioxide	NO_2	10	0
Sulfur Dioxide	SO_2	10	0
Benzene	C_6H_6	986.5	0
Ethanol	C_2H_6O	104.2	0
Ethylene Oxide	C_2H_4O	14.4	0
Methane	CH_4	3%/vol	0
Acetylene	C_2H_2	1%/vol	0
Formaldehyde	CH_2O	1	0
Isobutene	C_4H_8	300	0
Methylene Chloride	CH_2Cl_2	30	0

1. Table is not complete for all gases, and the sensor may be sensitive to other gases