

Potential industries and applications for carbon monoxide detection:

- Mining
- Metals Refineries
- Steel Mills
- Methane Refineries
- Diesel Fuel Refineries
- Coal-Fired Power Plants
- Natural-Gas-Fired Power Plants
- Chemical Refineries
- Meat Processing Plants
- Parking Garages
- Automotive Service Bays
- Car Wash Facilities
- Small Enclosed Spaces


Carbon monoxide (CO) is a colorless, odorless and tasteless gas which is slightly lighter than air. Carbon monoxide is produced from the partial oxidation of carbon-containing compounds. So it is present whenever any fuel such as gas, oil, kerosene, wood, or charcoal is burned. It forms when there is insufficient oxygen to produce carbon dioxide (CO₂), such as when operating a stove or an internal combustion engine in an enclosed space.

At high concentration levels it can kill a person in minutes. At moderate levels it can cause severe headaches, dizziness, weakness, confusion, nausea and or fainting—even death if these levels persist for a long time. Low levels can cause shortness of breath, mild nausea, and mild headaches, and may have longer-term health effects. on your health. Since many of these symptoms are similar to those of the flu, food poisoning, or other illnesses, CO may go undetected.

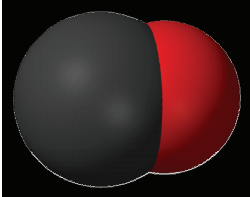
The long-term effects of breathing in carbon monoxide can affect memory, brain function, behavior and cognition. It can also cause permanent damage to other major organs, such as the heart.

CO monitoring can serve not only as an important safeguard against CO poisoning but also can warn of a fire before any smoke is seen. Therefore, it is a key to fire prevention in coal-fired power plants.

Carbon Monoxide (CO)



112.8 pm



General	
Systematic Name	Carbon Monoxide
Other Names	Carbonous Oxide Carbonyl
Molecular Formula	CO
Appearance	Colourless, Odourless gas
CAS Number	630-08-0
Properties	
Molar Mass	28.010 g/mol
Vapour Density	1.145 g/L @ 25 °C
Melting Point	-205 °C, -337 °F
Boiling Point	-191.5 °C, -313 °F
Hazards	
ACGIH-TLV	
Time Weighted Value (TWW)	Short Term Exposure Limit (STLV)
25ppm	NE
OSHA-PEL	
Permissible Exposure Limit- Time Weighted Average (TWA)	Permissible Exposure Limit (PEL)
50ppm	200ppm
NIOSH	
Permissible Exposure Limit- Time Weighted Average	Immediately Dangerous to Life or Health
35ppm	1200ppm

Industrial Applications

Coal-Fired Power Plants

A proactive approach to fire prevention focuses not so much on detecting smoke, which indicates fire, but rather on monitoring CO, which indicates the *potential* for fire.

Chemical Industry

Carbon monoxide has many applications in bulk chemicals manufacturing. Large quantities of aldehydes are produced by the hydroformylation reaction of alkenes, carbon monoxide, and H₂. Hydroformylation is coupled with the Shell Higher Olefin Process to give precursors to detergents. In the Monsanto process, CO and methanol react in the presence of a homogeneous rhodium catalyst and hydroiodic acid to give acetic acid. This process is responsible for most of the industrial production of acetic acid.

Methanol Production

Methanol is produced through the hydrogenation of carbon monoxide.

Diesel Fuel Production

The hydrogenation of CO is coupled to C-C bond formation, as in the Fischer-Tropsch process, whereby CO is hydrogenated to produce liquid hydrocarbon fuels. This technology allows coal or biomass to be converted to diesel fuel.

Nickel Refining

The Mond Process, or Carbonyl Process is a technique used by to extract and purify nickel by converting nickel oxides (nickel combined with oxygen) into pure nickel. This process exploits the fact that CO complexes with nickel readily and reversibly to give nickel carbonyl. No other element forms a carbonyl compound under such mild conditions used in the process.

Meat coloring

Carbon monoxide is used in modified atmosphere packaging systems, mainly to keep meat or fish looking fresh. The CO combines with myoglobin to form carboxymyoglobin, a bright, cherry red pigment. This stable red color can persist much longer than in normally packaged meat. Typical concentrations of CO used in such facilities range from 0.4% to 0.5%.



Conspec's CN Series is an economical choice for carbon monoxide gas monitoring. The CN Series is a simple and "smart" gas detector. An industry standard 4-20mA analog output signal. Can be connected to any existing PLC, DCS, or EMS system.

Specifications:

Mechanical

Enclosure	NEMA 4x
Dimensions	4.5" x 5" x 4"
Weight	1 ¼ lbs.
Mounting	4 holes
Conduit Entry	One (3/4" cable grip)

Environmental

Operating Temperature	-4°F - 120°F (-20°C - 50°C)
Temperature Compensation	Full Temperature Range
Operating Humidity	10% - 90% RH Non-condensing

Electrical

Operating Voltage	12-24VDC
Cable Requirements	3 Conductor 18 AWG Suggested
Current Consumption	50mA full scale
Output Signal	Linear 4-20mA, RS-485 (optional)

System

Sensor Ranges Carbon Dioxide	0-50ppm, 0-100ppm, 0-500ppm, 0-1000ppm
Sensor Type	Electrochemical
Keypad	Nine-Button Infrared Remote Control
Modes	2 (Normal & Calibration)
Display	Two-Line, 8-Character Alphanumeric LCD
Status LEDs	3 LEDs, 4 Status
Alarms	2 User Defined



Conspec's CX Series is an economical choice for carbon monoxide gas monitoring. The CX Series is a simple and "smart" gas detector designed for use in hazardous or classified locations. An industry standard 4-20mA analog output signal. Can be connected to any existing PLC, DCS, or EMS system.

Specifications:

Mechanical

Enclosure	Explosion Proof UL Listed Class 1 Div. 1 or 2 Groups B, C & D
Dimensions	4.5" x 5" x 4"
Weight	4 lbs.
Mounting	Conduit Mounted
Conduit Entry	One (3/4" cable grip)

Environmental

Operating Temperature	-4°F - 120°F (-20°C - 50°C)
Temperature Compensation	Full Temperature Range
Operating Humidity	10% - 90% RH Non-condensing

Electrical

Operating Voltage	12-24VDC
Cable Requirements	3 Conductor 18 AWG Suggested
Current Consumption	50mA full scale
Output Signal	Linear 4-20mA, RS-485 (optional)

System

Sensor Ranges Carbon Dioxide	0-50ppm, 0-100ppm, 0-500ppm, 0-1000ppm
Sensor Type	Electrochemical
Keypad	9 Button Infrared Remote Control
Modes	2 (Normal & Calibration)
Display	Two-Line, 8-Character Alphanumeric LCD
Status LEDs	3 LEDs, 4 Status
Alarms	2 User Defined



Conspec's new Smart Head Gas Monitoring System monitors, records, and stores data, and warns and advises if replacement is needed.

Conspec's Smart Head Single-Channel Monitor and Smart Head Multi-Channel Controller are smarter than your average monitors, because they are digital, yet simpler and more reliable.

Specifications:

Mechanical

Enclosure	NEMA 4x
Dimensions	7.5" x 5" x 3"
Weight	3 ½ lbs.
Mounting	Plate Mounted, 6 holes for suspension; grooves for slot mounting
Conduit Entry	One (3/4" cable grip)

Environmental

Operating Temperature	-4°F - 120°F (-20°C - 50°C)
Temperature Compensation	Full Temperature Range
Operating Humidity	10% - 90% RH Non-condensing

Electrical

Operating Voltage	12-24VDC
Cable Requirements	4 Conductor 18 AWG Suggested
Current Consumption	50mA full scale
Output Signal	RS-485; 4 Open-Collector Digital Output, Linear 4-20mA (Single-Channel only); HART (Optional).

System

Sensor Ranges Carbon Dioxide	0-50ppm, 0-100ppm, 0-500ppm, 0-1000ppm
Sensor Type	Electrochemical
Keypad	Four-Button Keypad or Infrared Remote Control
Modes	2 (Normal & Calibration)
Display	3.5" LCD Display
Status LEDs	4 LEDs, 4 Status
Alarms	3 User Defined