

Potential industries and applications for methane detection:

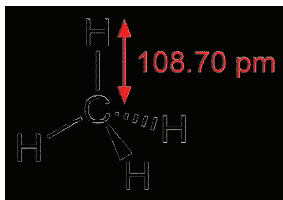
- Coal Mining
- Oil and Gas Extraction
- Petrochemical Refining
- Chemical Production
- Power Generation
- Fleet Parking Garages and Service Bays
- Fertilizer Production

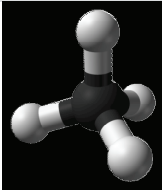
Methane (CH₄) is the principal component (97%) of natural gas. Methane is a colorless, odorless gas, which is lighter than air. It is formed by the decomposition of organic carbons under anaerobic conditions. Methane is abundant in nature and thus a desirable fuel. However, since it is a gas at normal temperature and pressure, it is difficult to transport from its source. It is generally transported in bulk by pipeline or liquefied natural gas (LNG) carriers.

Natural gas is found with other fossil fuels, in coal beds, as methane clathrates, and is created by methanogenic organisms in marshes, bogs, and landfills. It is an important fuel source, a major feedstock for fertilizers, and unfortunately a potent greenhouse gas.

Methane gas is flammable and therefore should be monitored in enclosed or underground spaces such as mines or power plant. It also poses the danger of asphyxiation, as it displaces oxygen. Also carbon monoxide is a byproduct of methane, so proper ventilation is critical.

Methane (CH₄)





General	
Systematic Name	Methane
Other Names	Methyl hydride Marsh Gas biogas
Molecular Formula	CH ₄
Appearance	Colourless gas
CAS Number	74-82-8
Properties	
Molar Mass	16.042 g/mol
Vapour Density	
Melting Point	-182.5 °C, -297 °F
Boiling Point	-161.6 °C, -259 °F
Hazards	
ACGIH-TLV	
Time Weighted Value (TWW)	Short Term Exposure Limit (STLV)
N/A	N/A
OSHA-PEL	
Permissible Exposure Limit - Time Weighted Average (TWA)	Permissible Exposure Limit (PEL)
N/A	N/A
NIOSH	
Permissible Exposure Limit - Time Weighted Average	Immediately Dangerous to Life or Health
N/A	N/A
Highly Flammable	
Lower Explosive Limit	Upper Explosive Limit
5% Vol. in Air	15% Vol. in Air

Industrial Applications

Power generation

Natural gas is often used to generate electricity by means of gas turbines and steam turbines. Most grid-peaking power plants and some off-grid engine generators use natural gas. Recently, methane from coal mines has been successfully converted to electricity.

Transportation

Compressed natural gas is a cleaner alternative to other automobile fuels such as gasoline or diesel fuel.

Fertilizers

Natural gas is a major feedstock for the production of ammonia, via the Haber process, for use in producing fertilizers.

Chemical Industry

Methane is the feedstock of choice in the chemical industry for the production of hydrogen, methanol, acetic acid, and acetic anhydride. Other chemicals derived from methane include acetylene, and the chloromethanes (chloromethane, dichloromethane, chloroform, and carbon tetrachloride).

Syngas Production

Synthetic gas, or syngas, is a gas mixture containing varying amounts of carbon monoxide and hydrogen. It can be produced by steam reforming of natural gas or liquid hydrocarbons to produce hydrogen, or by the gasification of coal, biomass, and in some types of waste-to-energy gasification facilities.

The name comes from its use as an intermediate in creating synthetic natural gas (SNG) and for producing ammonia or methanol. Syngas is also used as an intermediate in producing synthetic petroleum for use as a fuel or lubricant via the Fischer-Tropsch process.



Conspec's CX Series is an economical choice for methane gas monitoring. The CX Series is a simple, "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 Methane	Electrochemical: 0 - 100% LEL, 0 - 100% Vol. Infrared: 0-100% LEL, 0-5% Vol.
Sensor Type	Electrochemical, Infrared
Keypad	9-Button Infrared Remote Control
Modes	2 (Normal & Calibration)
Display	Two-Line, 8-Character Alphanumeric LCD Display
Status LEDs	3 LEDs, 4 Status
Alarms	2 User-Defined



Conspec's new Smart Head Gas Monitoring System monitors, records, and stores data, 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 Methane	Electrochemical: 0-100% LEL, 0-100% Vol. Infrared: 0-100% LEL, 0-5% Vol.
Sensor Type	Electrochemical, Infrared
Keypad	4-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

