



INTEGRATED SENSING SYSTEMS

MassSense® Gas Density Meter

Integrated Sensing Systems (ISS) is a proven leader with over 20 years of experience with MEMS vibrating silicon technology. Our MassSense® Gas Density Meter or GDM revolutionizes the measurement of gas density with its small integral packaging and sensitive measuring capabilities. The heart of the GDM is a patented* silicon sensing tube that vibrates at a very high frequency, above 20 kHz, which eliminates the impact of environmental vibrations on the gas density measurement. Silicon sensing tube technology is lighter and stronger than traditional metal sensing technology. A temperature sensor is closely integrated into the sensor for accurate and fast temperature compensation of the density measurement. The result is an instrument that can detect even the slightest changes in gas density with the industry leading performance specifications. An absolute pressure is included on every GDM. Installation in a process is normally on a controlled flow bypass slipstream. An internal orifice in the GDM directs a small portion of the bypass gas flow through the vibrating detector.

Features

- **Approved for Hazardous Locations & IP67 Sealed**
The GDM has ATEX and UL approvals for hazardous process environments and is in compliance with ISO/IEC 80079-34 and ISO 9001 Quality Management Systems.
- **In-Line, Real Time**
The small internal volume of the silicon sensor and high-speed digital processing results in very fast gas density detection. This is important in those applications where accurate speed measurement is crucial.
- **Low Power Consumption**
The GDM's, 400 mW, power consumption makes the instrument ideal for portable and remote applications. The instrument can be powered using a small solar panel, external battery, or power adapter.
- **Advanced Measurement Capabilities**
Using gas density, gas pressure and temperature, it can be programmed to calculate gas properties such as specific gravity, average molecular weight, hydrocarbon gas heating value and binary gas concentration.
- **Unmatched Resolution and Sensitivity**
A GDM resolves gas density to 0.000001 g/cc and has an accuracy of 0.0001 g/cc.



The GDM is the only product in the world that measures small changes of Hydrogen in Nitrogen at low pressures in real-time.

Applications

Gas Quality Measurement: Natural Gas

Density measurement provides the composition and quality of gases. In a natural gas measurement this is valuable to understand the potential heating value of the flow.

Propane-Air Blending

A back-up for natural gas is a requirement in many industrial processes. Propane (LPG) can be blended with air to make a synthetic gas that can be burned in natural gas burners. The specific gravity of this blend is an indication of the heating value. GDM is an ideal solution for monitoring and controlling this blend.

Binary Gas Concentration

The concentration sensitivity to the binary gas blends is a function of the difference in molecular weight of the two species. GDM is used to measure the density of the gas to determine the concentration as feedback to the blending control system.

Refinery Fuel Gas Measurement

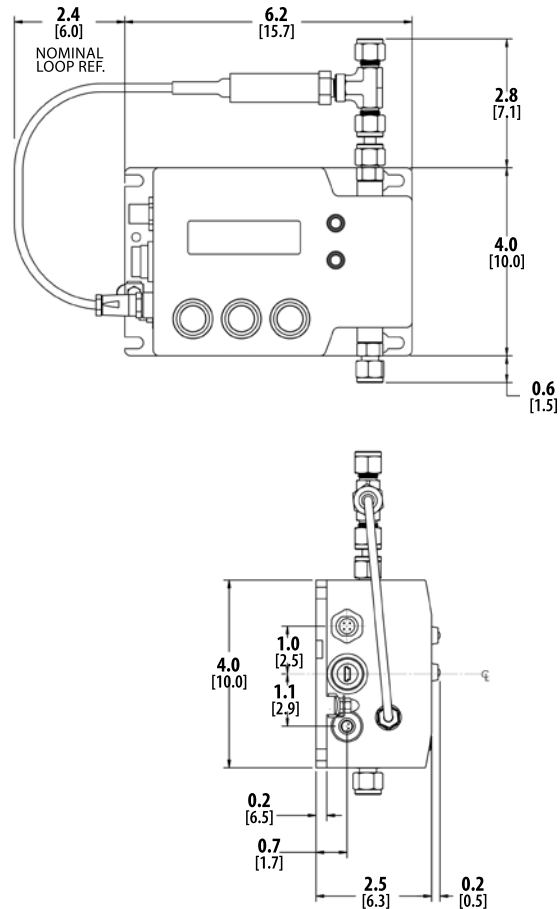
Gas specific gravity can be used to monitor the potential heating value of the hydrogen rich streams found in refinery and chemical process waste gases. Measurement speed is important, because a slug of hydrogen can destroy burners in mere seconds. The GDM response time of less than one second can detect a rapid change in gas density.

High Performing, In-Line Gas Density Measurement with Unmatched Value

Specifications

GENERAL	
Gas Density Range	0 - 0.03 g/cc
Resolution	Density: 0.000001 g/cc
Accuracy	Analog Density: +/- 0.1% of full scale Digital Density: 0.0001 g/cc Temperature: 0.6 F (0.3 C)
Repeatability	0.00001 max g/cc
Pressure	Max: 300 psig (21.7 bar) standard DP Range: 0.1 - 3.5 psid
Flowrate	Max: 3 SLPM
Operating Temperature	-4 to 140 F (-20 to 60 C)
Sample Rate	100 mS
Fittings	5/16 straight thread, o-ring seal; standard fitting 1/4" Swagelok® compression
Flowpath Orifice	0.05" (0.127 cm) standard, 0.076" (0.193 cm) optional
Mounting	(4) 1/4" 20 UNC (M6) bolts
Materials	Housing: painted aluminum Wetted parts: SS, Silicon, High Performance Epoxy, Glass
Dimensions	6.2" x 2.5" x 4" (15.7 cm x 6.3 cm x 10 cm)
Weight	2.5 lb (1135 g)
POWER	
Supply	8 - 30 VDC, optional USB 5VDC
Consumption	400 mW
OUTPUT	
Digital	RS-232, RS-485, USB
Analog	(2) 4-20 ma, optional
OTHER OPTIONS	
Display	2x16 standard character, adjustable LCD backlight
Environmental	IP67 sealed
Memory	2Gb internal data logger
Modbus	RTU slave
Cert	Calibration cert NIST
Advanced Density	Allows measuring concentration or reference density calculated to a standard temperature.
APPROVALS	
	CE 0539 Ex II 1G Ex ia IIC T4 -20°C ≤ Ta ≤ +60°C Ex ia IIC T4 Ga -20°C ≤ Ta ≤ +60°C UL CL. I DIV. 1 Group ABCD T4 -20°C ≤ Ta ≤ +60°C Class I, Zone 0, AEx ia IIC T4 20°C ≤ Ta ≤ +60°C EMC EN 61326-1:2006

Dimensions Inches [cm]



Order Information

The Gas Density Meter (GDM) includes: ISS Software, 1/4" Swagelok compression fittings (5/16 straight thread, viton o-ring).

See HOW TO ORDER guide for complete product selections.

GDM: 0.076" orifice standard, 0.050" optional

180003 Rev C



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