



Molecular Property Spectrometer™ MPS™ Methane Gas Sensor

OVERVIEW

NevadaNano's MPS Methane Gas Sensor provides quick and accurate detection of methane across a variety of industries—from the oil and gas supply chain to safety applications. The smart sensor is intrinsically safe, robust, and extremely poison-resistant. It has built-in environmental compensation and self-testing for fail-safe operation. Sensor readings are output on a standard digital bus or industry-standard analog output – no added electronics are required. With a 5-year lifetime and no calibration required, the MPS Methane Gas Sensor delivers industry-leading performance and a low cost of ownership.

PERFORMANCE

Range	500 - 1,500 ppm
Resolution	1 ppm
Calibration	Factory calibrated

ENVIRONMENTAL OPERATING RANGE

Temperature	- 40 to 75 °C
Humidity	0 to 100 %RH
Pressure	80 to 120 kPa



FEATURES

- Built-in environmental compensation
- Inherently poison-resistant
- No calibration required
- 5+ year lifetime
- Low power — 29 mW average
- Intrinsically safe
- ATEX/IS certified
- Built-in self-test for fail-safe operation

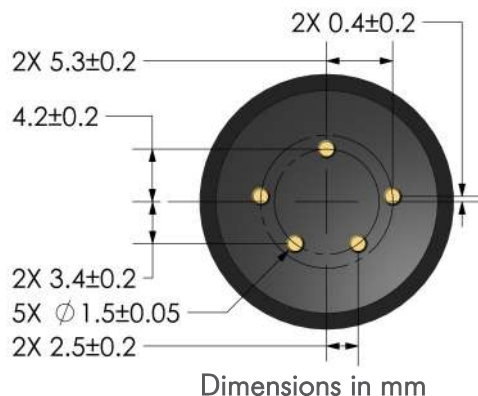
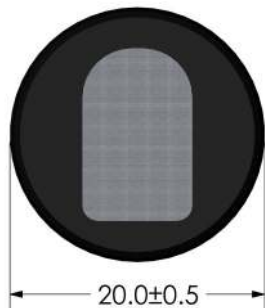
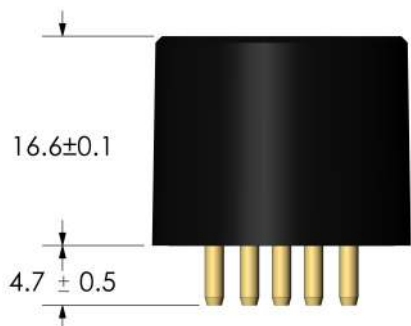
OPERATING PRINCIPLE

The Molecular Property Spectrometer (MPS) Methane Gas Sensor's transducer is a micro-machined membrane with an embedded Joule heater and resistance thermometer. The MEMS transducer is mounted on a PCB and packaged inside a rugged enclosure open to ambient air. Presence of methane causes changes in the thermodynamic properties of the air/gas mixture that are measured by the transducer. Sensor data are processed by patent-pending algorithms to report accurate concentrations.

SPECIFICATIONS ARE PRELIMINARY AND SUBJECT TO CHANGE WITHOUT NOTICE.

SM-DS-0005-07

MECHANICAL



Dimensions 16.6 mm (H) x 20.0 mm (D)

Mass 8.0 ± 0.5 grams

Body material Ultem PEI

ELECTRICAL

Operating voltage 3.3 - 5.0 ±5% VDC

Current consumption

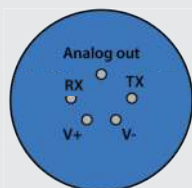
Average

8.9 mA

Operating Range

5.0-21.0 mA

5-pin
Digital Input/Output



Communication: UART

Logic level: 3.3 V

Baud rate: 38,400. 8 data, 1 stop bits. No parity

RX Data Input : Do not exceed 3.6 V

Input High Voltage (V_{IH}) = 2.0 V minimum

Input Low Voltage (V_{IL}) = 0.85 V maximum

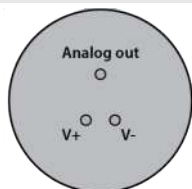
TX Data Output : Source / Sink 4 mA maximum

Output High Voltage (V_{OH}) = 2.45 V minimum

Output Low Voltage (V_{OL}) = 0.45 V maximum

Programmable Analog out (optional)

5-pin or 3-pin
Analog Output



Standard analog output configuration is shown on page 3.

Note: "zero" voltage and sensitivity slope can be configurable between 0.04 and 2.9 V, including rising or falling V/ppm.



Contact NevadaNano for details.

SELF-DIAGNOSTICS

The MPS Methane Gas Sensor automatically performs dozens of built-in tests every 2 seconds to ensure fail-safe operation. The MPS alerts the user of any sensor failure or status alert. For additional information on how to interpret and handle detected faults, refer to the MPS Methane Gas Sensor User Manual at:

www.nevadanano.com/downloads

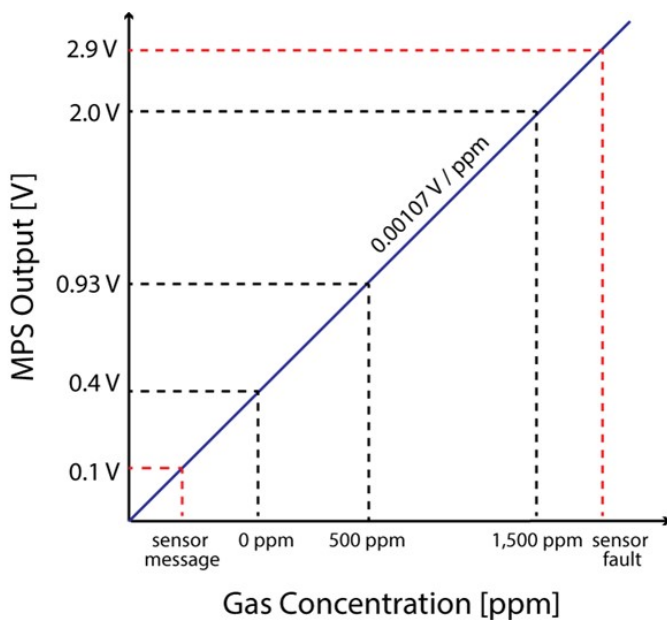
CERTIFICATION

Test Standard	IEC 60079-0:2017 IEC 60079-11:2011	EN 60079-0:2018 EN 60079-11:2012	FM 3600:2018 FM 3610:2018	CSA 22.2 60079-0:19 CSA 22.2 60079-11:14
Protection Categories	Ex ia IIC Ga Ex ia IIIC Da Ta = -40°C to 75°C	 II 1 G  III 1 D Ta = -40°C to 75°C	Class I, Division 1, Group A,B,C,D Class II and III, Division 1, Group E,F,G Class I, Zone 0 AEx ia IIC Ga Zone 20 AEx ia IIIC Da Ta = -40°C to 75°C	Class I, Division 1, Group A,B,C,D Class II and III, Division 1, Group E,F,G Class I, Zone 0 Ex ia IIC Ga Zone 20 Ex ia IIIC Da Ta = -40°C to 75°C

For additional information on certifications, refer to the MPS Hazardous Locations User Guide here: www.nevadanano.com/downloads

ANALOG OUTPUT CONFIGURATION

The plot below shows the standard analog output configuration of the MPS Methane Gas Sensor.



PART NUMBER ORDERING GUIDE

Please refer to the following table below when ordering the MPS Methane Gas Sensor. When ordering a MPS S4 Evaluation Kit, please specify the MPS Methane Gas Sensor part number to be evaluated.



Manufacturer Part Number	Description
MPS005-S40501-EX	MPS Methane Gas Sensor, S4, 5-Pin, UART
MPS005-S40505-EX	MPS Methane Gas Sensor, S4, 5-Pin, UART + Analog Out
MPS005-S40305-EX	MPS Methane Gas Sensor, S4, 3-Pin, Analog Out + Auto Start



Manufacturer Part Number	Description
MPS999-S40000-99	MPS S4 Evaluation Kit

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