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SenseH$_2$™ Hydrogen Sensor
Key Technical Specifications

Features

- High sensitivity and selectivity to hydrogen
- Fast response and recovery times
- Immune to signal saturation
- Compact and robust design
- Waterproof automotive grade connector
- 1.0 to 4.5V output, spans 0.2 to 4.0% H_2 in air (5 to 100% LFL)

Overview

Designed for hydrogen monitoring, this ceramic sensor exhibits a highly sensitive, selective, and rapid response to the presence of hydrogen in ambient air. It reliably measures H_2 concentrations over a wide range of temperature and humidity variation and provides a repeatable response, even in the presence of other combustible gases. Additionally, the NTM Sensors' SenseH$_2$™ is immune to signal saturation upon continuous exposure to low levels of hydrogen, and recovers rapidly and completely upon hydrogen removal.

System Components

Sensor: The sensor element employs a chemi-resistive ceramic technology, which provides accurate and reliable hydrogen detection.

Electronics package: The sensor provides a simple interface with a ratio-metric voltage output (1 to 4.5 VDC; 500mV increments), calibrated to detect up to 4% H_2 in air (100% of the LFL). Diagnostic states (< 1V, >4.5V) are provided to indicate error conditions. Microprocessor-based heater control ensures stable operation, in temperatures ranging from –20 to 80 C. The compact, rugged design and waterproof connector enable use of the SenseH$_2$™ in a range of application conditions. Mating connectors can be provided for ease of installation.

WARNING: The SenseH$_2$^{tm} *is* not a stand alone safety device and does not provide protection from hydrogen explosion. The 1 to 4.5 V output signal, quantifying the hydrogen concentration in air, is intended to be an input to customer safety system, enabling audible alarms, system shutdown, ventilation, or other measures to ensure safe handling and use of hydrogen gas.

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WARNING

THIS DEVICE SENSES THE PRESENCE OF HYDROGEN. IT DOES NOT PREVENT FIRES OR EXPLOSIONS.

THIS DEVICE IS NOT A STAND-ALONE SAFETY DEVICE AND SHOULD BE INCORPORATED INTO A PROPER SAFETY SYSTEM.

IF SENSOR RESPONDS, THERE IS A RISK OF COMBUSTION OR EXPLOSION. TO AVOID INJURY,

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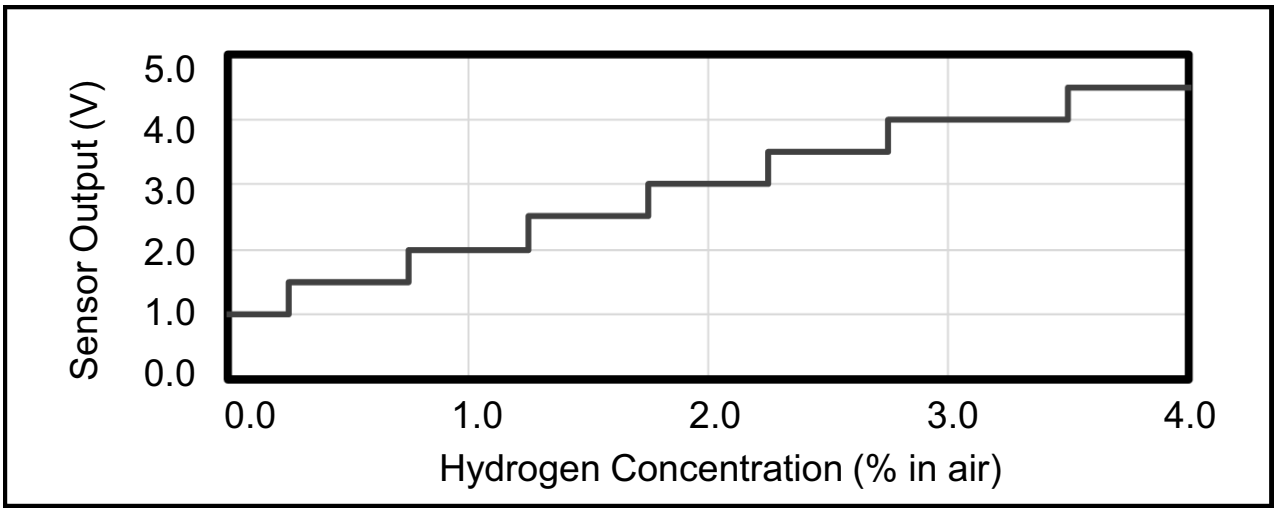
Table of Typical Characteristics:

Metric	Min	Max	Units
Characteristics:			
H_2 range (in air)	0.2	4.0	%
Voltage input	12	24	Vdc
Output (sensing range)	1	4.5	Vdc @ 50mA
Error state (output signal)	0.0	0.75	Vdc
Error state (output signal)	5.0	5.0	Vdc
Power consumption	0.2	0.3	A
Response time (T90)	—	5	Sec.
Recovery time (T10)	—	5	Sec.
Environmental Conditions:			
Ambient temperature	-20	80	C
Relative humidity	5	95	%R.H.

Typical Calibration:



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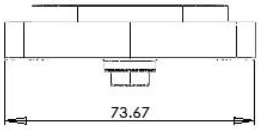
Installation Guidelines:

▪ Hydrogen has a low molecular weight and is very buoyant. To ensure detection of hydrogen, the sensor must be mounted above the source of the potential hydrogen leak.
▪ The sensor should be mounted such that the sensing element is facing toward the source of the potential hydrogen leak.
▪ The sensor should be mounted in a position to minimize exposure to liquids and particulate matter that may obstruct diffusion of hydrogen gas to the active sensing component.

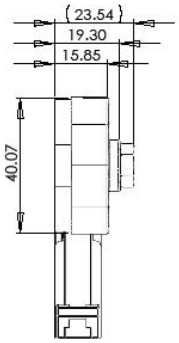
Intended Uses:

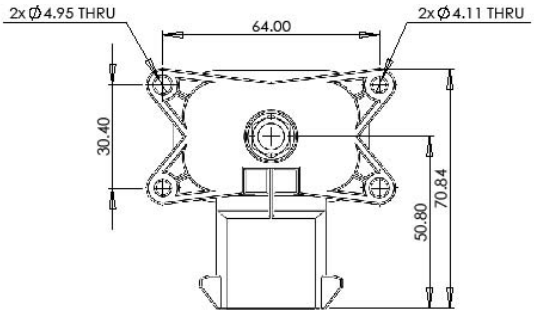
▪The SenseH_2™ is intended for use as a hydrogen gas detector in the range of 0.2 to 4% hydrogen in air.

▪Typical applications include: Stationary fuel cells , Fuel cell powered forklift trucks, Hydrogen refueling stations, Hydrogen generation (electrolyzer) systems, On-site fuel reforming systems, Uninterruptible power supply (UPS) systems monitoring, Telecom systems monitoring, or Laboratory monitoring.

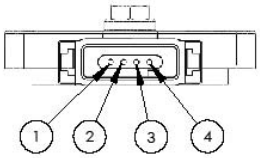


Connector	Deutsch DTM04-4P (waterproof)
Mating connector	Deutsch DTM06-4S
Sensor packaging	TO-8 header w/SS flame arrestor
Electronics	Potted PCB in ABS plastic casing





Pin	Symbol	Function
1	SIG+	Output Signal (+)
2	SIG-	Output Signal Ground
3	PWR-	Input Power Ground
4	PWR+	Input Power (+)



Wire Pin Out

Dimensions in mm

Hydrogen Sensor
Revision B

rev 100407

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Reliable, Quantitative, No False Positives, Insensitive to Humidity, High Selectivity, Rapid Response & Recovery

Hydrogen Sensor

Designed for HYDROGEN MONITORING, this chemi-resistive ceramic sensor exhibits a highly sensitive, selective, and rapid response to the presence of hydrogen in ambient air. It reliably measures hydrogen concentration levels over a wide range of temperature and humidity, measuring 0.2% ~ >4.0% of H_2

SenseH$_2$™ provides a repeatable and stable response to low levels of hydrogen, even in the presence of CO, CH_4 and VOCs. A key feature is the quick response and recovery time. This sensor is the first product in the NTM Sensors' advanced technology portfolio.

Features & Benefits

- High sensitivity to H_2 yet insensitive to CO and CH_4
  - *providing a reliable signal without false positives*
- Insensitive to humidity and temperature variation
  - *allowing use in widely varying environments*
- Linear and repeatable response to H_2 concentration
  - *allowing measurement of discrete H_2 levels*
- Rapid response and recovery times
  - *allowing measurement of transient leaks without false positive*
- Watertight 4 pin connector
  - *simple and common interface to external components*
- Built in diagnostics, short circuit, open circuit, and unit operating LED indicator
  - *facilitates ease of use*
- Durable and stable for long term operation

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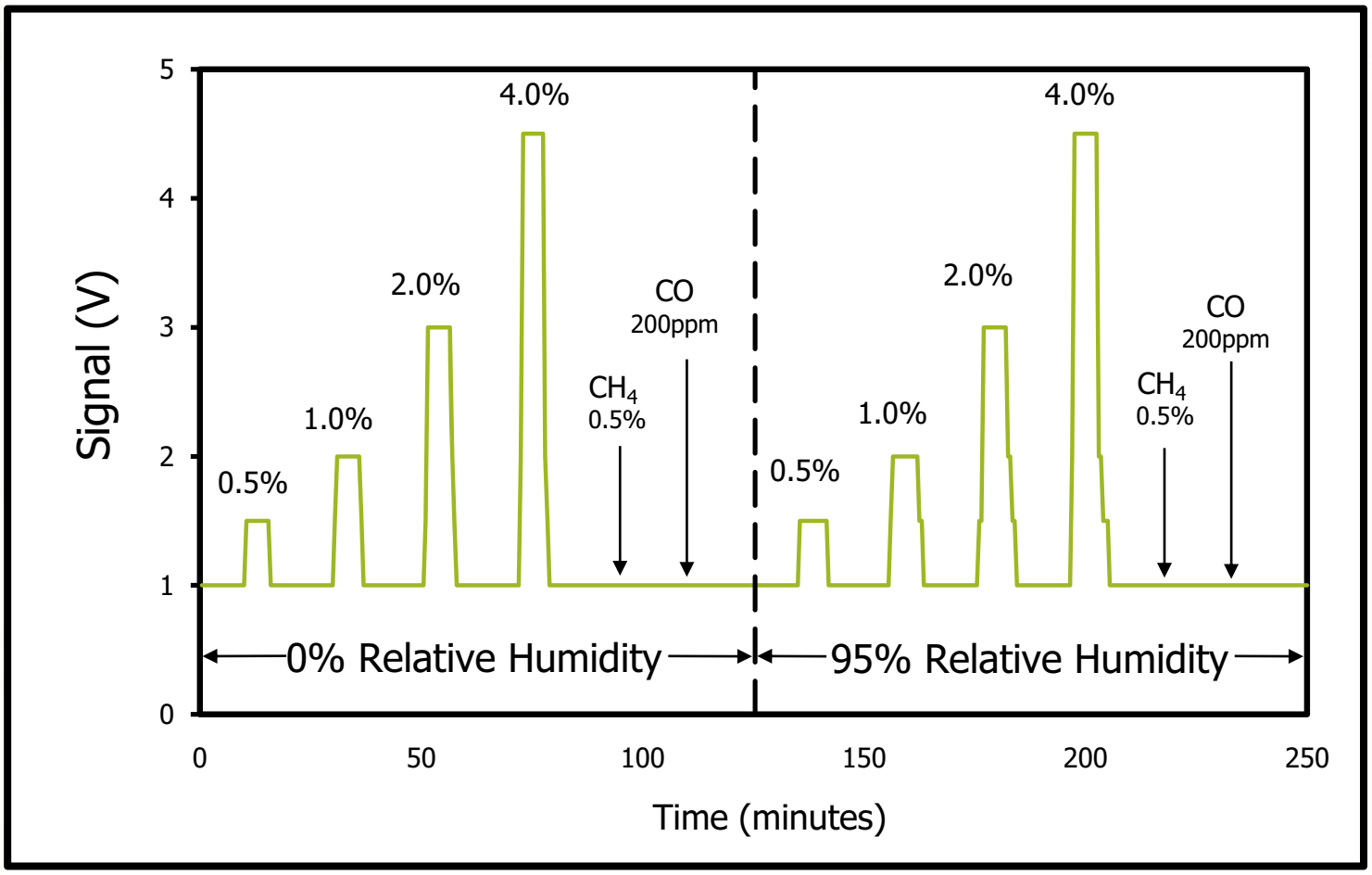
Key Characteristics:



Applications Where Our Sensors Excel:

- Hydrogen fuelled back-up power systems
- PEM motive applications, including Fork-lifts and refueling stations
- Any hydrogen monitoring application where high sensitivity and quick response are required

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