Hydrogen Safety Sensor

HSS-440

**Fast and flexible**

The AppliedSensor HSS-440 Hydrogen Safety Sensor is a highly selective, fast-responding sensor that enables the safe use of hydrogen gas. Based on advancements in Field Effect (FE) technology, the HSS-440 Hydrogen Safety Sensor offers reduced power consumption and increased packaging flexibility.

The HSS-440 is suitable for automotive hydrogen safety applications and offers CAN bus electrical interface with standard MQS six-pin connector. Self testing at start-up together with error handling assures high safety integrity during operation. Short start-up time enables intermitted mode of operation to minimize current drain.

**Highly sensitive and selective**

The HSS-440 incorporates a heated field-effect transistor with a catalytic metal gate stack as the gas-sensing layer. Hydrogen molecules interact with the gate, thereby changing characteristics of the transistor. The heated transistor also measures the thermal conducting properties of the gas complementing the field-effect signal. Sensor signals are processed in a microprocessor providing hydrogen concentration output.

AppliedSensor’s unique design and careful processing of the gate stack result in superior sensor properties including high speed of response and excellent selectivity as well as a detection range that covers the lower explosion limit of hydrogen gas.

**Low cross sensitivity**

Unlike sensors that have severe cross sensitivity to a variety of combustible gases, AppliedSensor’s FE technology ensures that the HSS-440 Hydrogen Safety Sensor is highly selective to hydrogen gas without interference from background gases or water vapor.

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**Key Benefits**

- High sensitivity to hydrogen gas
- Low cross sensitivity
- Fast response time
- Low power consumption
- Long term stability and reliability
- Long lifetime

**Applications**

- Detection of hydrogen gas leaks in automotive cabin ceiling, under the hood of the engine compartment or beneath the trunk lid of hydrogen-powered vehicles
- Detection of hydrogen gas in and around hydrogen fueling stations
HSS-440 Specifications

Target gas: Hydrogen
Concentration range: 0-4.4% H₂ in air
Accuracy: +/- 3000 ppm
Speed of response (t₉₀): < 2 seconds
Speed of recovery: < 10 seconds
Cross-sensitivity: No detection towards HC, H₂S, N₂, CO, CO₂, NOₓ, H₂O
Humidity influence, not detectable
Start-up time: 1 second
Self test/Error handling: Developed in accordance to IEC 61508 (SIL2)
Expected lifetime: 10 years or 5500 operating hours

Electrical
Supply voltage: 9V – 16V
Supply current: 75mA typical
Can Interface: Version 2.0 ISO 11898
Programmable CAN ID: Yes
Connector: MQS 6-pin
ESD/Reverse polarity: Yes

Environmental
Operation temperature range: -40 -> +110° C
Storage temperature range: -50 -> +125° C
Humidity: 0-5% Absolute Humidity
Pressure: 70-130 kPa
EMC: Automotive
ATEX: Zone 2
Shock: Automotive
Vibration: Automotive
Operating Environment: Using the sensor in a PEM fuel cell exhaust environment or any other humid or potentially acidic environment can reduce the lifetime of the sensor.

Mechanical
Dimensions (LxWxH): 82.2 mm x 42 mm x 17.3 mm
Weight: 50g
Material: PBT +30% GF
Gas filter membrane: Pall SUPOR 450R, 0.45 µm
IP code: IP67

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