

### FEATURES

- 0 - 50 ppm range H<sub>2</sub>S
- 0.2 ppm resolution
- High temperature +90 °C operation
- Fast response time (t<sub>90</sub>)
- Solid state technology
- Designed for continuous operation
- Leak-proof - no internal electrolyte
- Not affected by dry or low humidity environments
- Not affected by exposure to many VOCs and solvents
- 2.5 V bridge voltage
- 200 mA maximum current
- Can be supplied in certified flameproof housing



### APPLICATIONS

- Chemical plants and refineries
- Well head sites
- Mud-logging operations
- Drilling rigs and platforms
- Gas collection and distribution facilities
- Oil and gas production platforms
- Sulfur removal and recovery facilities
- Wastewater treatment facilities
- H<sub>2</sub>S based heavy water production facilities

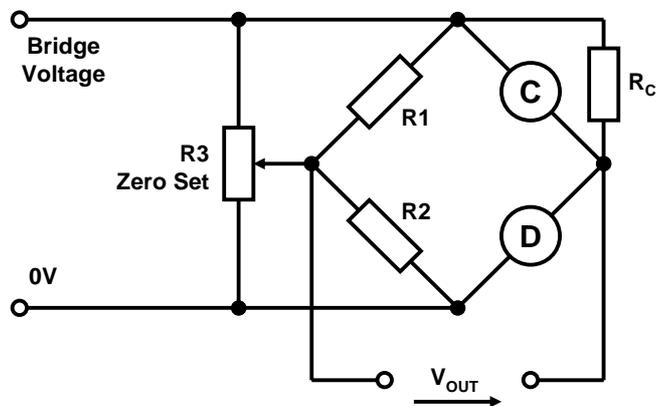
### GENERAL DESCRIPTION

The VQ101HT is a solid state sensor pair for the detection of hazardous levels of hydrogen sulfide in air. It consists of two elements, a detector and a matched compensator that is used to minimise the effect of temperature. The device has a life of many years, when protected from abuse and has several advantages over electrochemical cell technology. It can operate continually at ambient temperatures up to +90 °C and is unaffected by low humidity environments.

### ORDERING INFORMATION

Part no. .... VQ101HT

### RECOMMENDED OPERATING CIRCUIT



### Circuit Notes

1. R<sub>1</sub> = R<sub>2</sub> = 1 kΩ. This value is arbitrary and should be reduced if a low impedance load is applied to V<sub>OUT</sub> (for example a moving coil voltmeter).
2. R<sub>3</sub> = 50 kΩ. This is adjusted to set the zero.
3. The detector element, D (green insulator) and compensator element, C (brown insulator) are supplied as a matched pair, complete with a 250 mW axial leaded trimming resistor, R<sub>C</sub> (minimum value 39 Ω). The trimming resistor should be connected across the compensator element as shown. This resistor is supplied by e2v but must be mounted on the customer's PCB. No resistor is supplied when devices are already well matched.
4. V<sub>OUT</sub> is negative for the VQ101HT

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Template: DF764388A-3

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## OPERATING & STORAGE RATINGS

**Note:** Stresses beyond the ratings listed below may cause permanent change or damage to the gas sensor.

Operating temperature.....-40 to +90 °C  
 Storage temperature.....-40 to +90 °C  
 Shelf life (in supplied containers)..... 12 months  
 Humidity.....0 - 95% RH (non-condensing)  
 Pressure ..... 90 to 110 kPa  
 Required oxygen concentration  
 (see note 1).....>10% by volume  
 Bridge voltage supply ..... 2.5 ±0.1 V  
 Operating condition.....continuous  
 Operating range..... 0 - 50 ppm H<sub>2</sub>S  
 Maximum overload ..... 100 ppm H<sub>2</sub>S

## PERFORMANCE SPECIFICATION

All values are using the recommended circuit at 20 °C ambient with a 1 hour minimum stabilisation time after initial switch on (unless otherwise stated).

Current consumption ..... 200 mA max  
 Response shape  
 (see note 2)..... pseudo logarithmic: see graph  
 Resolution.....0.1 ppm (0 - 10 ppm)  
 0.2 ppm (10-50 ppm)  
 Initial zero (in air) ..... ±30 mV

Response (10 ppm H<sub>2</sub>S / balance air, 500 ml/min flow rate):  
 net output signal..... -15 to -25 mV  
 T<sub>90</sub> time..... <30 s (typical <15 secs in e2v flowblock)

Temperature effect (see note 3):  
 zero (mV/°C) ..... < -0.3 mV/°C  
 zero (H<sub>2</sub>S ppm/°C) ..... < +0.05 ppm/°C  
 net sensitivity..... < -1.2% of Net signal /°C (as mV)  
 net sensitivity..... < -1.3% of net signal °C (as ppm H<sub>2</sub>S)

Long-term drift:  
 zero (H<sub>2</sub>S ppm) ..... <3 ppm over 6 months  
 sensitivity (mV) ..... <2% mV/month

Warranty (see note 4) ..... 1 year

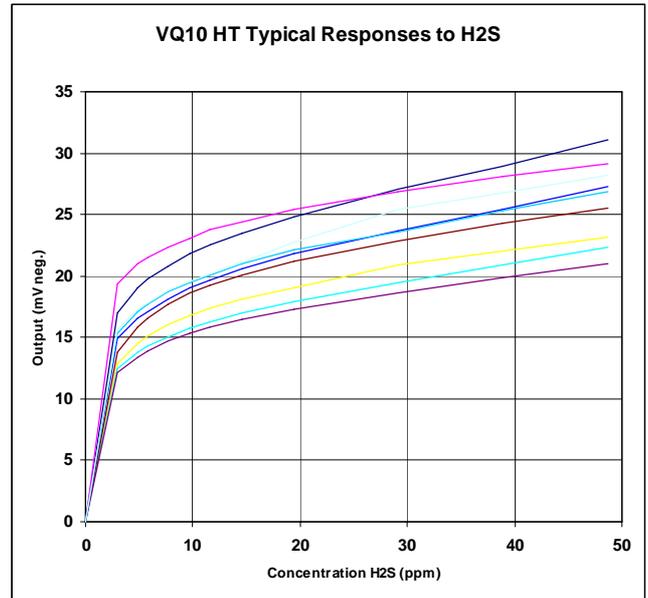
## NOTES

1. Sensor zeros can be significant below 10% O<sub>2</sub>, >1ppm H<sub>2</sub>S at 2% O<sub>2</sub>.
2. Curve fitting is recommended, ideally with 3 or more calibration points; see application note. Calibration will be required within the customer's instrument.
3. Temperature compensation may be required for optimum performance particularly at temperatures >40 °C.
4. Design target of 3 years.

## TYPICAL PERFORMANCE CHARACTERISTICS

### RESPONSE TO H<sub>2</sub>S

Typical responses are shown for a number of sensors.

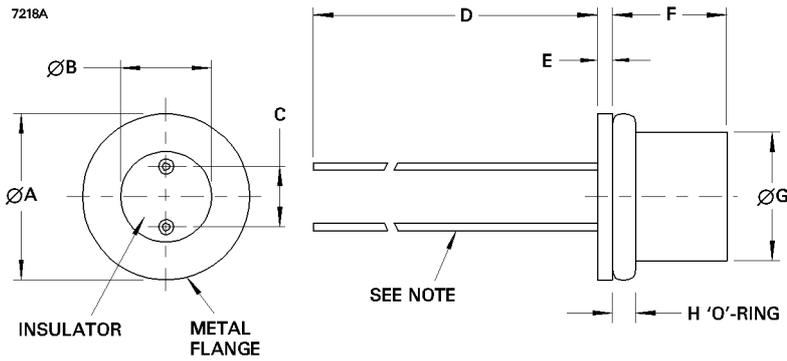


### CROSS-SENSITIVITY TO OTHER GASES

| Gas             | Concentration (ppm) | Sensor Response (as ppm H <sub>2</sub> S) |
|-----------------|---------------------|---|
| Methane         | 10,000              | <3  |
| Hydrogen        | 10,000              | <10                                       |
| Ethanol         | 50                  | <7  |
| Carbon Monoxide | 300                 | <2  |

## MECHANICAL DATA

### OUTLINE (All dimensions without limits are nominal)

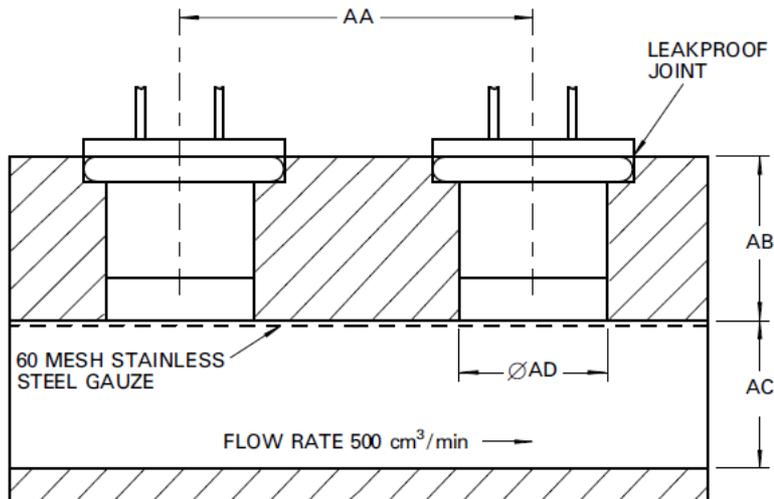


| Ref | Millimetres  |
|-----|--------------|
| A   | 11.05 ± 0.25 |
| B   | 6.10 ± 0.25  |
| C   | 3.56 ± 0.13  |
| D   | 40.0         |
| E   | 1.0          |
| F   | 5.84 ± 0.51  |
| G   | 8.2 max      |
| H   | 1.5          |

### Outline Notes

1. The wire comprises a single strand, 0.5 mm diameter.
2. For handling of VH101HT observe guidelines in Pellistor Application Note 7, "Handling of e2v Pellistor Gas Sensors"
3. The beads of this device run at high temperatures. If the device is to be operated in an atmosphere where there is any likelihood of flammable vapours being present, it must be mounted behind a suitable flame arrestor.
4. Further information on product safety and material content are contained in the Product Safety Datasheet.

### RECOMMENDED MOUNTING ARRANGEMENTS



| Ref | Millimetres |
|-----|-------------|
| AA  | 19.05 max   |
| AB  | 9.53 ± 0.13 |
| AC  | 8.33 ± 0.13 |
| AD  | 8.2 min     |
| AE  | 19.05 max   |
| AF  | 9.53 ± 0.13 |
| AG  | 8.2 min     |

