



HDO Series

Precision compensated pressure sensors

FEATURES

- 10 mbar to 5 bar, absolute, gage or differential pressure
- Calibrated and temperature compensated
- High impedance for low power applications
- Small SMD packages
- RoHS compliant
- Sensortech PRO services

MEDIA COMPATIBILITY

To be used with non-corrosive, non-ionic working fluids such as clean dry air, dry gases and the like.



SPECIFICATIONS

Maximum ratings

Supply voltage V_s +20 V_{DC}

Lead specifications

Average preheating temperature gradient 2.5 K/s
Soak time ca. 3 min
Time above 217°C 50 s
Time above 230°C 40 s
Time above 250°C 15 s
Peak temperature 260°C
Cooling temperature gradient -3.5 K/s

Temperature ranges

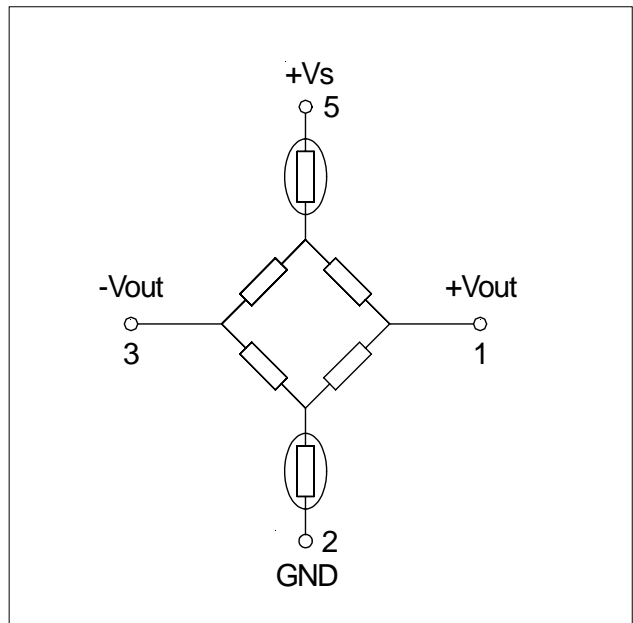
Compensated 0 ... 50 °C
(0 ... 70 °C on request)

Operating -40 ... 85 °C

Storage -40 ... 125 °C

Humidity limits (non-condensing) 0 ... 100% RH

EQUIVALENT CIRCUIT





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PRESSURE RANGES SPECIFICATIONS¹

| Part number | Operating pressure | Proof pressure ¹¹ | Burst pressure ¹² | Full-scale span ² | | |
|------------------|--------------------|------------------------------|------------------------------|---|---------|----------|
| | | | | Min. | Typ. | Max. |
| HDOM010...P | 0...10 mbar | 100 mbar | 150 mbar | 19.7 mV | 20.0 mV | 20.3 mV |
| HDOM020...P | 0...20 mbar | 100 mbar | 150 mbar | 24.7 mV | 25.0 mV | 25.3 mV |
| HDOM050...P | 0...50 mbar | 250 mbar | 500 mbar | 19.7 mV | 20.0 mV | 20.3 mV |
| HDOM100...P | 0...100 mbar | 250 mbar | 500 mbar | 19.7 mV | 20.0 mV | 20.3 mV |
| HDOM200...P | 0...200 mbar | 1 bar | 1.4 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOM500...P | 0...500 mbar | 1 bar | 1.4 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB001A...P | 0...1 bara | 3 bara | 5 bara | 89.1 mV | 90.0 mV | 90.9 mV |
| HDOB001(D,G)...P | 0...1 bar | 3 bar | 5 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB002...P | 0...2 bar | 4 bar | 6 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB005...P | 0...5 bar | 7 bar | 7 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOM010...H | 0...10 mbar | 100 mbar | 150 mbar | 19.5 mV | 20.0 mV | 20.5 mV |
| HDOM020...H | 0...20 mbar | 100 mbar | 150 mbar | 24.5 mV | 25.0 mV | 25.5 mV |
| HDOM050...H | 0...50 mbar | 250 mbar | 500 mbar | 19.37 mV | 20.0 mV | 20.63 mV |
| HDOM100...H | 0...100 mbar | 250 mbar | 500 mbar | 19.37 mV | 20.0 mV | 20.63 mV |
| HDOM200...H | 0...200 mbar | 1 bar | 1.4 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOM500...H | 0...500 mbar | 1 bar | 1.4 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB001A...H | 0...1 bara | 3 bara | 5 bara | 86.85 mV | 90.0 mV | 93.15 mV |
| HDOB001(D,G)...H | 0...1 bar | 3 bar | 5 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB002...H | 0...2 bar | 4 bar | 6 bar | Specifications available on request. Please contact Sensortronics. | | |
| HDOB005...H | 0...5 bar | 7 bar | 7 bar | Specifications available on request. Please contact Sensortronics. | | |

Specification notes:

1. Reference conditions: supply voltage, $V_s = 12V_{DC}$; $T_A = 25^\circ C$; common mode line pressure = 0 bar; pressure applied to high pressure port.
2. Span is the algebraic difference between the output voltage at full scale pressure and the output at zero pressure. Span is ratiometric to the supply voltage.
3. Hysteresis is the maximum output difference at any point within the operating pressure range for increasing and decreasing pressure.
4. Maximum error band of the offset voltage and the error band of the span, relative to the $25^\circ C$ reading.
5. Maximum difference in output at any pressure within the operating pressure range and temperature within 0 to $+50^\circ C$ after:
 - a) 100 temperature cycles, 0 to $+50^\circ C$.
 - b) 1.0 million pressure cycles, 0 psi to full scale span.
6. Input impedance is the impedance between V_s and ground.
7. Output impedance is the impedance between + and - outputs.
8. This is the common mode voltage of the output arms for $V_s = 12 V_{DC}$.
9. Response time for a zero to full scale span pressure step change, 10 to 90 % rise time.
10. Long term stability over a one year period.
11. Proof pressure is the maximum pressure which may be applied without causing durable shifts of the electrical parameters of the sensing element.
12. Burst pressure is the maximum pressure which may be applied without causing damage to the sensing element or leaks to the housing.



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PERFORMANCE CHARACTERISTICS¹

All HDO...P devices (Prime Grade)

| Characteristics | Min. | Typ. | Max. | Unit |
|--|--------|------|-------|-----------------|
| Zero pressure offset | -0.25 | 0 | +0.25 | mV |
| Combined linearity and hysteresis ³ | | ±0.1 | ±0.25 | %FSO |
| Temperature effects (0...50 °C) ⁴ | Offset | ±0.2 | ±0.5 | mV |
| | Span | ±0.4 | ±1.0 | %FSO |
| Repeatability ⁵ | | ±0.2 | ±0.5 | |
| Input impedance ⁶ | | >12 | | kΩ |
| Output impedance ⁷ | | 4.0 | | |
| Common mode voltage ⁸ | 4.8 | 6.0 | 7.2 | V _{DC} |
| Response time ⁹ | | 100 | | μsec |
| Long term stability of offset and span ¹⁰ | | ±0.1 | | mV |

All HDO...H devices (High Grade)

| Characteristics | Min. | Typ. | Max. | Unit |
|--|-----------------------|------|-------|-----------------|
| Zero pressure offset | devices up to 20 mbar | 0 | +0.75 | mV |
| | all other devices | -0.5 | +0.5 | |
| Combined linearity and hysteresis ³ | | ±0.2 | ±1.0 | %FSO |
| Temperature effects (0...50 °C) ⁴ | Offset | ±0.2 | ±1.0 | mV |
| | Span | ±0.4 | ±2.0 | %FSO |
| Repeatability ⁵ | | ±0.2 | ±0.5 | |
| Input impedance ⁶ | | >12 | | kΩ |
| Output impedance ⁷ | | 4.0 | | |
| Common mode voltage ⁸ | 4.8 | 6.0 | 7.2 | V _{DC} |
| Response time ⁹ | | 100 | | μsec |
| Long term stability of offset and span ¹⁰ | | ±0.1 | | mV |



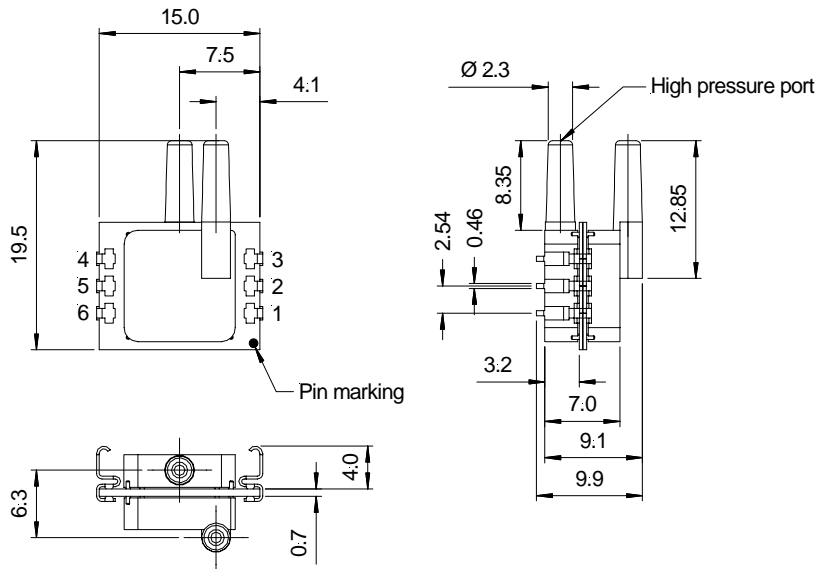
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PHYSICAL DIMENSIONS AND ELECTRICAL CONNECTIONS

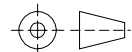
Different housing options are available on request. Please contact Sensortronics.

HDO...E... (SMD, 2 ports same side)



| Pin | Connection |
|-----|------------|
| 1 | +Vout |
| 2 | GND |
| 3 | -Vout |
| 4 | N / C |
| 5 | +Vs |
| 6 | N / C |

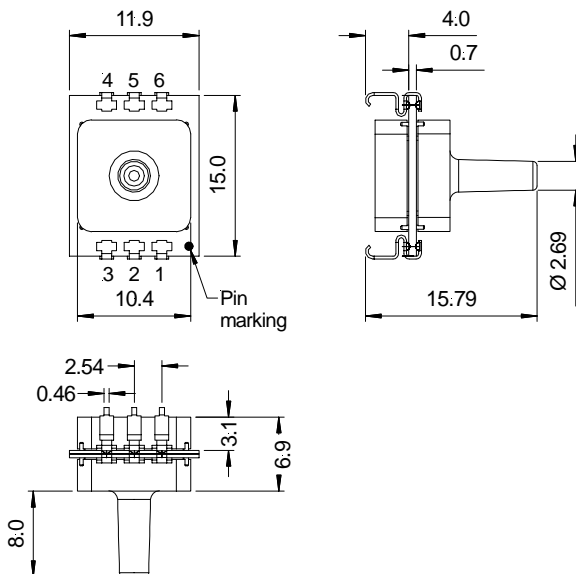
Note:
The polarity indicated is for pressure applied to high pressure port (forward gage).



third angle projection

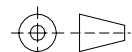
dimensions in mm

HDO...Y... (SMD, 1 port axial)



| Pin | Connection |
|-----|------------|
| 1 | +Vout |
| 2 | GND |
| 3 | -Vout |
| 4 | N / C |
| 5 | +Vs |
| 6 | N / C |

Note:
Pressure port is in forward gage configuration



third angle projection

dimensions in mm



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ORDERING INFORMATION

| Options | Series | Pressure range | | Pressure mode | | Housing | | Porting | | Grade | |
|-----------------|------------|----------------|----------|-----------------------------|--------------|--|-------------------|------------------------|---|----------|---|
| | | HDO | M010 | 10 mbar | A* | Absolute | E* | SMD, 2 ports same side | 8 | Straight | H |
| | | M020 | 20 mbar | D | Differential | | | | | | P |
| | | M050 | 50 mbar | G | Gage | Y** | SMD, 1 port axial | | | | |
| | | M100 | 100 mbar | | | | | | | | |
| | | M200 | 200 mbar | | | | | | | | |
| | | M500 | 500 mbar | | | | | | | | |
| | | B001 | 1 bar | | | | | | | | |
| | | (B001A) | 1 bara | | | | | | | | |
| | | B002 | 2 bar | | | | | | | | |
| | | B005 | 5 bar | | | | | | | | |
| | | | | * only available from 1 bar | | * standard for differential devices, "D" | | | | | |
| | | | | | | ** standard for absolute and gage devices, "A" and "G" | | | | | |
| Example: | HDO | M100 | | G | | Y | | 8 | | P | |

Note: Devices highlighted in grey are preferred stock items

Sensortech PRO services:

- Extended guarantee period of 2 years
- Custom product modifications and adaptations even for small quantities
- Advanced logistics models for supply inventory and short delivery times
- Technical support through application engineers on the phone or at your site
- Traceability of each sensor through serial numbers on request
- No product specification changes without customer notification
- No product obsolescence without very early prior notice
- Fastest possible technical response for design and QA engineers
- Long term product availability for your spares and service needs
- ... plus other services on request

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