



DCXL10DS



Pressure Sensors: Measurement Type: Differential, Signal Conditioning: Unamplified; Pressure Range: ± 10.0 in H₂O; Port Style: Barbed

Actual product appearance may vary.

Features

- Available in differential pressure ranges
- Position sensitivity to ± 5 mV/g
- Temperature compensated to 0 °C to 50 °C [32 °F to 122 °F]
- Combined linearity and hysteresis error < ± 0.25 % span

Potential Applications

- Medical instrumentation
- HVAC
- Industrial instrumentation
- Environmental controls

Description

The SURSENSE™ line of ultra low pressure sensors is based upon a proprietary, patented technology designed to reduce all output offset or common mode errors. These sensors utilize a silicon, micromachined sensing element that features a unique stress concentration-enhanced structure to provide a highly stable linear output that is proportional to applied pressure. Output offset errors due to changes in temperature, warm-up, long term stability and position sensitivity have all been significantly reduced when compared to conventional sensors. The DCXL-DS Series sensors provide a precision calibrated, ratiometric mV output with SURSENSE-enhanced stability. Each sensor features calibrated offset, full scale span and thermal error calibration to ensure the highest possible accuracy for flow pressure measurement. These highly stable sensors feature an industry-standard, ported package with improved stress isolation for printed circuit board mount applications. The housing design incorporates a snap together cover and housing leading to improved quality and performance.

Product is patented by US patent 6023978.

| Product Specifications | |
|------------------------|--|
| Measurement Type | Differential, Vacuum Gage, Gage |
| Signal Conditioning | Unamplified |
| Pressure Range | ± 10.0 in H ₂ O |
| Maximum Overpressure | 5 psi |
| Supply Voltage | 3.0 Vdc min., 12.0 Vdc typ., 16.0 Vdc max. |
| Compensated | Yes |
| Output Calibration | Yes |
| Termination | PCB |
| Port Style | Barbed |

| | |
|-------------------------------|---|
| Package Style | Honeywell DI-DCXL |
| Typical Sensitivity | 2 mV/in H ₂ O |
| Full Scale Span | 20 mV typ. |
| Null Offset | 0 mV typ. |
| Null Shift over Temperature | -150 •V min., +150 •V max. |
| Span Shift Over Temperature | -200 •V min., 200 •V max. |
| Linearity, Hysteresis Error | 0.05 % Span typ. |
| Operating Temperature Range | -25 °C to 85 °C [-13 °F to 185 °F] |
| Compensated Temperature Range | 0 °C to 50 °C [32 °F to 122 °F] |
| Storage Temperature Range | -40 °C to 125 °C [-40 °F to 257 °F] |
| Media Compatibility | Ports 1 and 2: Dry gases only. Media must be compatible with epoxy-based adhesive, silicon, silicone, gold, nylon and alumina. |
| UNSPSC Code | 411121 |
| UNSPSC Commodity | 411121 Transducers |
| Availability | Global |
| Series Name | DCXL-DS |

SERIES
DCXL

PACKAGE TYPE
S - SNAP

PRESSURE RANGE
01, 05, 10, 20, 30 IN H₂O

PRESSURE REFERENCE
D - DIFFERENTIAL AND GAGE

CATALOG LISTINGS

| |
|----------|
| DCXL01DS |
| DCXL05DS |
| DCXL10DS |
| DCXL20DS |
| DCXL30DS |

- NOTES**
- 1 REFERENCE CONDITIONS (UNLESS OTHERWISE NOTED): SUPPLY VOLTAGE, V_s = 12 Vdc, T_A = 25°C, COMMON MODE LINE PRESSURE = 0 PSIG. PRESSURE MEASUREMENTS ARE WITH PRESSURE APPLIED TO PORT 2
 - 2 SHIFT IS RELATIVE TO 25°C
 - 3 SHIFT IS WITHIN THE FIRST HOUR OF EXCITATION APPLIED TO THE DEVICE
 - 4 LINEARITY IS DETERMINED USING BEST STRAIGHT LINE CURVE FIT THROUGH ZERO, 1/2 FULL SCALE, AND FULL SCALE; HYSTERESIS IS MECHANICAL ONLY
 - 5 GAGE AND DIFFERENTIAL USE "D" SUFFIX. PRODUCT IS THE SAME
 - 6 SPAN IS THE ALGEBRAIC DIFFERENCE BETWEEN OUTPUT END POINTS OF OFFSET AND OUTPUT AT STATED PRESSURE
 - 7 PRESSURE RANGE DEPICTS THE FULL SCALE PRESSURE OF THE SENSOR
 - 8 FS REPRESENTS THE OUTPUT VALUE AT FULL SCALE PRESSURE

ELECTRICAL SPECIFICATIONS

| PARAMETER | PRESSURE RANGE (in H ₂ O) | MIN | NOM | MAX | UNITS |
|--|--------------------------------------|-------|-------|-------|-------|
| OFFSET VOLTAGE | ALL | -0.50 | 0.00 | +0.50 | mV |
| SPAN (P ₂ > P ₁) | 01 | 9.00 | 10.00 | 11.00 | mV |
| | 05, 10, 20, 30 | 19.00 | 20.00 | 21.00 | |
| TEMPERATURE EFFECT ON OFFSET (0°C-50°C) | 01 | --- | --- | ±.250 | mV |
| | 05, 10, 20, 30 | --- | --- | ±.150 | |
| TEMPERATURE EFFECT ON SPAN (0°C-50°C) | 01, 05 | --- | --- | ±.200 | mV |
| | 10, 20, 30 | --- | --- | ±.150 | |
| | 01 | --- | --- | --- | |
| OFFSET WARM-UP SHIFT | 01 | --- | .100 | --- | mV |
| | 05, 10, 20, 30 | --- | .050 | --- | |
| OFFSET POSITION SENSITIVITY (±1g) | 01 | --- | .050 | --- | mV |
| | 05, 10 | --- | .010 | --- | |
| | 20, 30 | --- | .005 | --- | |
| OFFSET LONG TERM DRIFT (ONE YEAR) | 01 | --- | .200 | --- | mV |
| | 05, 10, 20, 30 | --- | .100 | --- | |
| COMBINED LINEARITY AND MECHANICAL HYSTERESIS ERROR | ALL | --- | --- | 0.25 | mV |
| | 01 | --- | --- | --- | |
| INPUT RESISTANCE | 01 | --- | 4.5 | --- | kΩ |
| | 05, 20 | --- | 10 | --- | |
| | 10 | --- | 13 | --- | |
| | 30 | --- | 12 | --- | |
| OUTPUT RESISTANCE | 01, 05, 10, 30 | --- | 1.5 | --- | kΩ |
| | 20 | --- | 2 | --- | |

MAXIMUM RATINGS

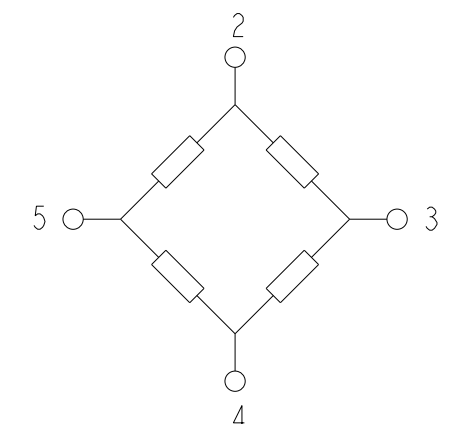
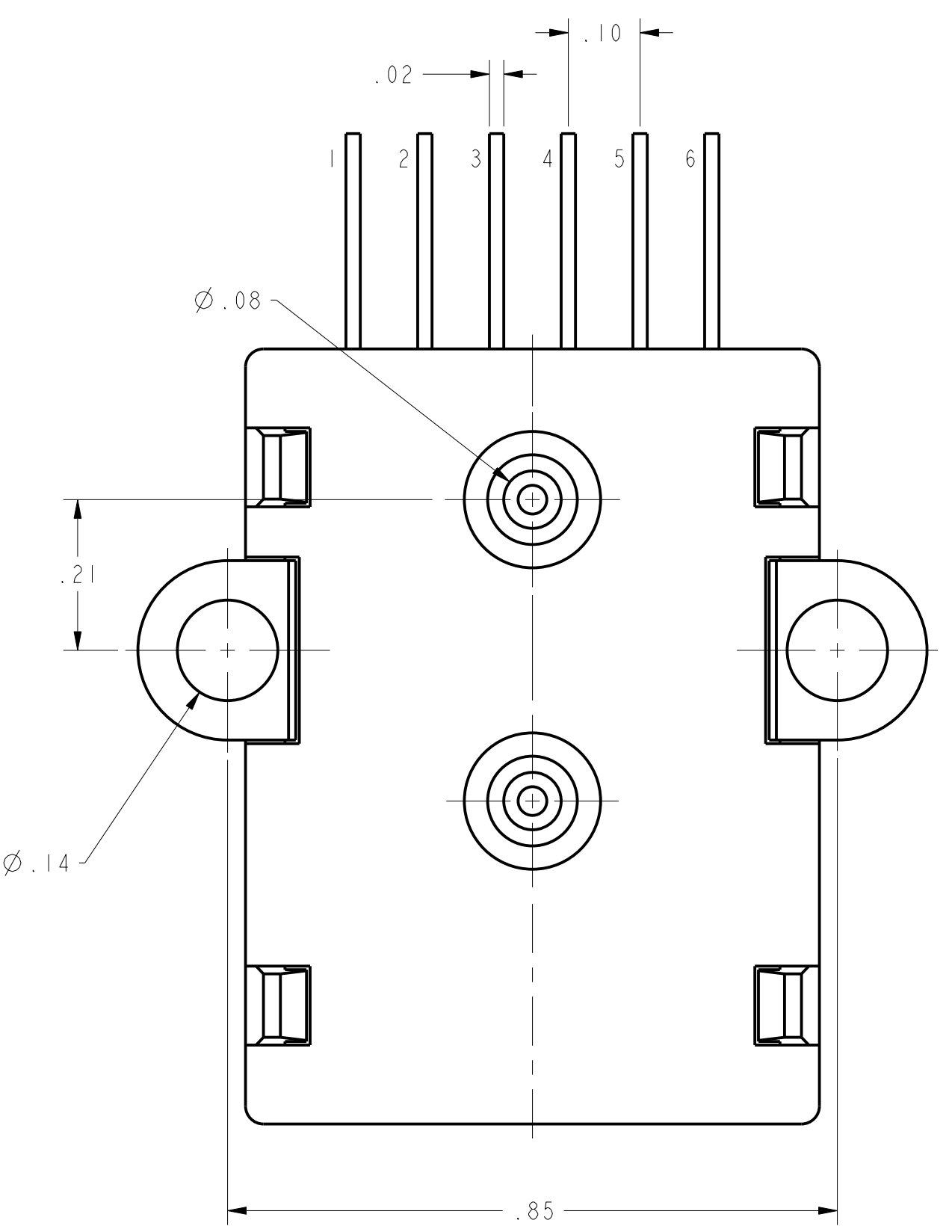
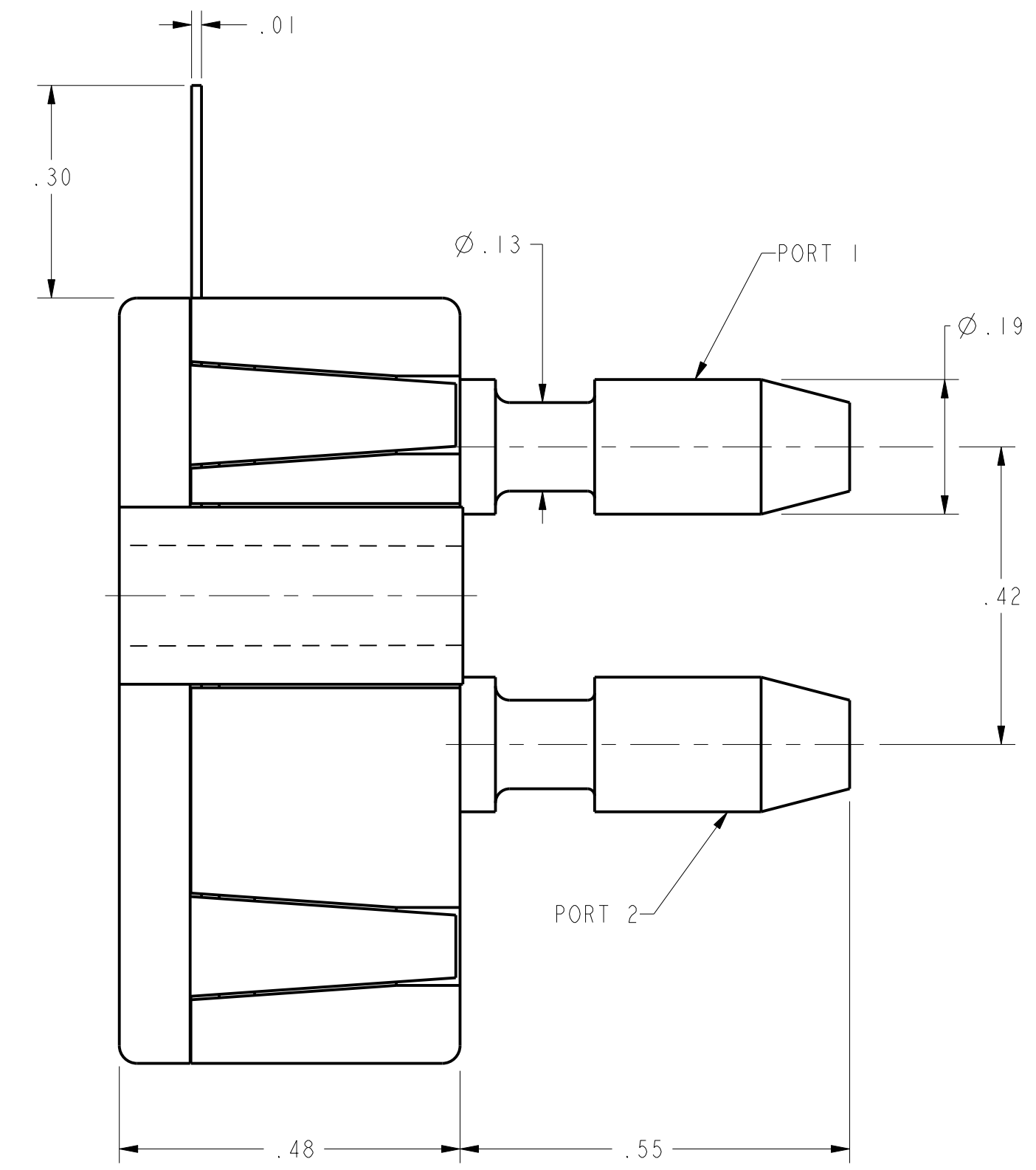
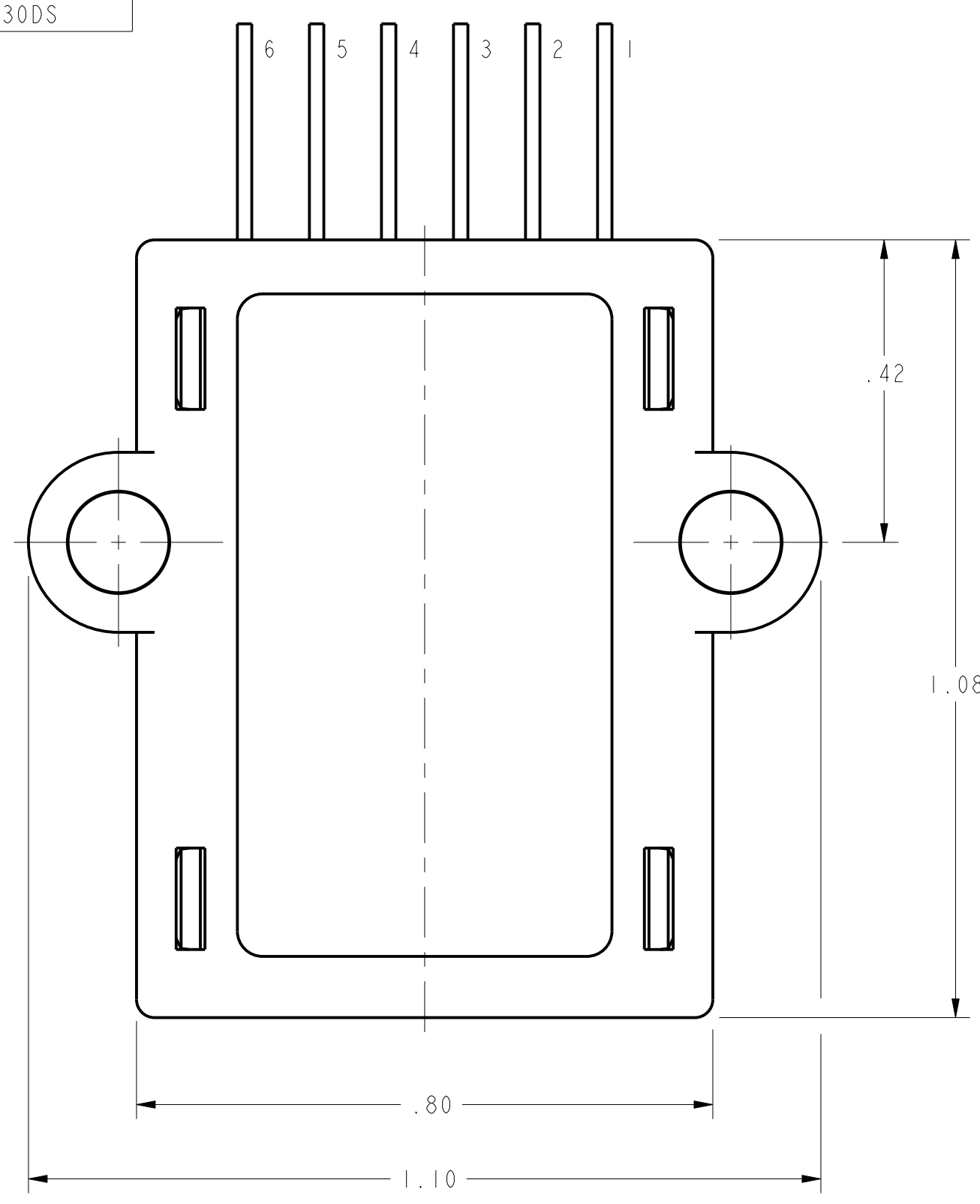
| PARAMETER | PRESSURE RANGE (in H ₂ O) | MIN | MAX | UNITS |
|-------------------------------------|--------------------------------------|-----|-----|-------|
| OPERATING TEMPERATURE RANGE | ALL | -25 | 85 | °C |
| STORAGE TEMPERATURE | ALL | -40 | 125 | °C |
| PROOF PRESSURE (VERIFIED BY TEST) | ALL | --- | 5 | PSI |
| BURST PRESSURE (VERIFIED BY DESIGN) | 01 | --- | 7 | PSI |
| | 05, 10 | --- | 10 | |
| | 20 | --- | 15 | |
| | 30 | --- | 25 | |
| EXCITATION VOLTAGE | ALL | 0 | 16 | V |
| COMMON MODE PRESSURE | ALL | --- | 50 | PSIG |

MEDIA CAPABILITY, WETTED MATERIALS
(APPLY CLEAN DRY AIR ONLY)

| | |
|------------------------|--|
| PRESSURE PORT 2 (HIGH) | SILICON DIAPHRAGM, GLASS FILLED NYLON, AND ALUMINA CERAMIC |
| PRESSURE PORT 1 (LOW) | SILICON DIAPHRAGM, GLASS FILLED NYLON, AND ALUMINA CERAMIC |

PRESSURE COMPATIBILITY:
MEASURES DIFFERENTIAL OR GAGE PRESSURE AND VACUUM. PRESSURE MAY BE APPLIED TO PORT 1 OR PORT 2. FOR PRESSURE TO PORT 1 THE OUTPUT POLARITY IS REVERSED. VACUUM MAY BE APPLIED TO EITHER PORT 1 OR PORT 2. FOR VACUUM TO PORT 2 THE OUTPUT POLARITY IS REVERSED

RATIOMETRIC OUTPUT:
THE OUTPUT VOLTAGE OF THE SENSOR IS RATIOMETRIC, PROPORTIONAL, TO THE EXCITATION VOLTAGE. FOR THIS MODEL SENSOR ALL SPECIFICATIONS WILL CHANGE PROPORTIONALLY TO ANY CHANGES IN THE EXCITATION VOLTAGE. THE EXCITATION MAY VARY BETWEEN 3 TO 16 VOLTS. ALL SPECIFICATIONS WILL NOMINALLY BE CHANGED BY A RATIO OF V_{EXCITATION}/12.0 VOLTS. FOR EXAMPLE: IF THE EXCITATION VOLTAGE IS 5.0 VOLTS THEN BOTH THE FULL SCALE OUTPUT VOLTAGE AND THE OFFSET VOLTAGE WOULD BE 5/12TH THE SPECIFIED VALUE



EQUIVALENT CIRCUIT

PIN OUT

| | |
|---|----------------------|
| 1 | NC |
| 2 | +V _{SUPPLY} |
| 3 | +V _{OUTPUT} |
| 4 | -V _{SUPPLY} |
| 5 | -V _{OUTPUT} |
| 6 | NC |

| | | | | | |
|---|--|---|-----------------------------|-----------------------------------|--------|
| DESIGN UNITS: INCH TOLERANCES UNLESS NOTED: | DRAWN: BM 21APR05 CHECK: AK 21APR05 | <p>Honeywell</p> <p>TITLE: PRESSURE SENSOR</p> <p>INTERPRET PER ASME Y14.5M-1994 OTHER HONEYWELL ENGINEERING STANDARDS MAY APPLY.</p> | SIZE: D TYPE: I | DRAWING NAME: DCXL SERIES CHART 2 | REV: A |
| NO PLACE .x ± 0.040 ONE PLACE .x ± 0.030 TWO PLACE .xx ± 0.015 THREE PLACE .xxx ± 0.005 FOUR PLACE .xxxx ± 0.0005 ANGLES x ± 3 | THIS DRAWING COVERS A PROPRIETARY ITEM AND IS THE PROPERTY OF HONEYWELL. THIS DRAWING IS NOT TO BE COPIED OR USED WITHOUT THE PERMISSION OF HONEYWELL. | | SCALE: 5:1 SHEET: 1 OF 1 | | |