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Pressure Measurement & Control

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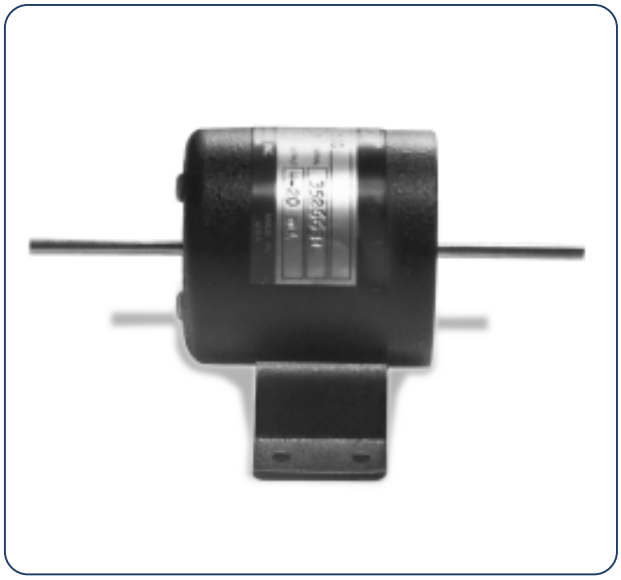


# Type 229

## BARATRON® GENERAL PURPOSE DIFFERENTIAL PRESSURE TRANSMITTER

The MKS Type 229 Baratron® General Purpose Differential Transmitter offers a reliable, accurate, inexpensive solution to measuring low differential pressures.

The all-metal sensor employed in the 229 Differential is the same sensor used in the popular Type 223, with the addition of 2-wire, 4 to 20 mA circuitry. Operating on the variable capacitance technique, the 229 sensor contains a tensioned metal diaphragm, one side of which is exposed to the gas whose pressure is to be measured (Px side). The other side (reference or Pr) is adjacent to an electrode assembly which is terminated in another like port. The diaphragm deflects with changing differential pressure, causing a capacitance change between the diaphragm and the adjacent electrode assembly. This capacitance change via the 229's signal conditioner is converted into a 4 to 20 mA output, linear with pressure, and calibrated against a pressure standard.

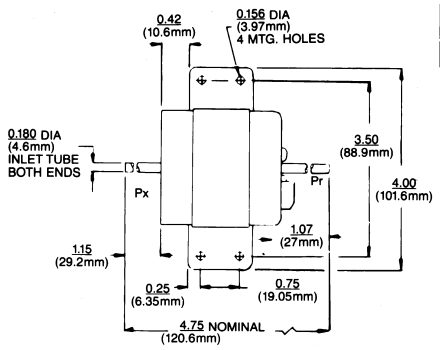
An external power supply (24-32 VDC) is required to operate the 229.

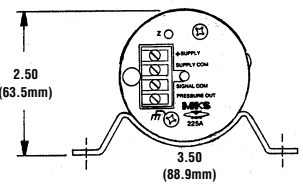
## Features & Benefits

- All-metal sensor eliminates handling problems associated with glass, mercury, and liquid gauges
- Usable resolution of 1 part in 10,000 — minimizes the number of transmitters required to cover a wide range of pressures
- Designed for use with two-wire, 4 to 20 mA input/output signals
- Three levels of accuracy to meet your specific process control requirements
- Can be calibrated for either uni- or bidirectional applications

# Specifications and Ordering Information

| | |
|---|---|
| **Full Scale Ranges** | |
| Standard | 0.2, 1, 10, 100, 1000 mmHg |
| Optional | 0.2, 1, 10, 100, 1000 $cmH_20$<br>0.1, 0.25, 0.5, 5, 50, 500 $inH_20$ (For 0.25 $inH_20$ F.S. range, consult factory for ordering code.) |
| **Resolution** | 0.01% of F.S. |
| **Accuracy** | 0.5% of F.S., bidirectional or unidirectional<br>0.3% of F.S., bidirectional or unidirectional<br>0.3% of Reading |
| **Temperature Coefficients** | |
| Zero | For 0.5% of F.S. accuracy: 0.1% of F.S./°C<br>For 0.3% of F.S. accuracy: 0.05% of F.S./°C<br>For 0.3% of Reading accuracy: 0.05% of F.S./°C |
| Span | 0.04% of Reading/°C |
| **Ambient Operating Temperature** | 0° to 50°C |
| **Maximum Overpressure** | 120% of F.S. or 20 psi (140 kPa), whichever is greater<br>(For Full Scale ranges less than 1000 mmHg, the following restrictions apply: if high pressure is on the Px side of the sensor, the maximum differential overpressure allowable is 120% of F.S. or 20 psi, whichever is greater; if high pressure is on the Pr side of the sensor, the maximum differential overpressure allowable is 120% of F.S.) (Consult factory for higher Pr overpressure protection.) |
| **Maximum Line Pressure** | 40 psig (275 kPa) |
| **Materials Exposed to Gases** | |
| Px side | Inconel® |
| Pr side | Inconel, Ceramic, Palladium, Stainless Steel, Glass |
| **Volume** | Px side: 1.3 cc  Pr side: 9.8 cc |
| **Fittings** | 3/16" (4.6 mm) tubulation (Consult factory if other fittings are required.) |
| **Input/Output** | 2-wire, 4-20 mA from 24-32 VDC power supply, into <500 Ω load.<br>Bidirectional calibrations: output is 4 mA at negative Full Scale to 20 mA at positive Full Scale (4 mA = -F.S., 12 mA = 0 ΔP,  20 mA = +F.S.)<br>Unidirectional calibrations: output is 4 mA at 0 to 20 mA at positive Full Scale (4 mA = 0 ΔP, 20 mA = +F.S.) (Other ranges or outputs available by special order; consult factory.) |
| **Electrical Connector** | Screw terminal barrier strip |




## Dimensional Drawing —

*Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).*

| Ordering Code Example: 229HD-00010AAB | Code | Configuration |
|---|---|---|
| **Type 229** | 229HD | 229HD |
| **Pressure Range Full Scale** | | |
| 0.2 mmHg or $cmH_20$ / 0.1 $inH_20$ | 000.2 | 00010 |
| 1 mmHg or $cmH_20$ / 0.5 $inH_20$ | 00001 | |
| 10 mmHg or $cmH_20$ / 5 in $H_20$ | 00010 | |
| 100 mmHg or $cmH_20$ / 50 in $H_20$ | 00100 | |
| 1000 mmHg or $cmH_20$ / 500 $inH_20$ | 01000 | |
| (Specify required engineering unit on order.) | | |
| **Fittings** | | |
| 3/16" OD (4.6 mm) tube | A | A |
| **Accuracy** | | |
| Standard: ±0.5% of F.S., bidirectional or unidirectional | A | A |
| Optional: ±0.3% of F.S., bidirectional or unidirectional | B | |
| Optional: ±0.3% of Rdg, unidirectional only | C | |
| **Calibration** | | |
| Bidirectional | B | B |
| Unidirectional | U | |
| (For bidirectional calibration, output is 4 mA for F.S. pressure and 20 mA for +F.S. pressure.) | | |

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Bulletin 229DIFF-9/02