

# HIGH ACCURACY PRESSURE TRANSDUCERS

TRODEKS®

## PX409 Series

PX409-100GV,  
shown actual size.

- ✓ 0.08% BSL Includes Linearity Hysteresis and Repeatability
- ✓ Broad Temperature Compensation Range -29 to 85°C (-20 to 185°F)
- ✓ 5-Point NIST Traceable Calibration Included
- ✓ Outputs:
  - mV/V
  - 0 to 5 V or 0 to 10 V
  - 4 to 20 mA
- ✓ 10 in-H<sub>2</sub>O to 5000 psi Ranges

**RUGGEDIZED DESIGN**  
For Aerospace,  
Automotive, Test and  
Industrial Applications

PX419-015GV,  
shown actual size.

PX429-030GV,  
shown actual size.

**Differential  
Pressure Models**

**Most Popular  
Models in Stock for  
Fast Delivery**

# SOLID STATE PIEZORESISTIVE DESIGN

## WITH HIGH TEMP. PERFORMANCE FOR INDUSTRY, AUTOMOTIVE, TEST, AND AEROSPACE APPLICATIONS

**mV/V, 0 to 5 Vdc, 0 to 10 Vdc, 4 to 20 mA Outputs**

**Low Pressure: 10 inH<sub>2</sub>O and**

**Standard Ranges: 5 to 5000 psi**

**Metric Ranges: 25 mbar to 345 bars**

**Gage or Absolute Pressure**

### PX409 Series



- ✓ High Accuracy  $\pm 0.08\%$  BSL Includes Linearity, Hysteresis, and Repeatability
- ✓ Broad Temperature Compensated Range -29 to 85°C (-20 to 185°F)
- ✓ Premium Temperature Performance Span:  $\pm 0.5\%$  Over Compensated Range
- ✓ 5-Point NIST Traceable Calibration Included
- ✓ Digital Dynamic Thermal Compensation Across Temperature and Pressure Range
- ✓ Low Pressure Ranges from 10 inH<sub>2</sub>O
- ✓ All Stainless Steel Wetted Parts
- ✓ Fast Response Time
- ✓ Solid State Reliability and Stability
- ✓ Gage and Absolute Pressures
- ✓ 300% Proof Pressure Minimum

TRODEKS piezoresistive pressure transducers have a proven record in high performance commercial and aerospace applications for over 25 years. The piezoresistive process uses strain gages molecularly embedded into a highly stable silicon wafer. The silicon wafer is diced into individual die which each contain a full strain gage bridge. The die is mounted in a sealed chamber protected from the environment by glass to metal seals and a stainless steel diaphragm.

A small volume of silicone oil transfers the pressure from the diaphragm to the strain bridge. The construction provides a very rugged transducer with exceptional accuracy, stability and thermal effects. A unique design ruggedizes the transducers by providing secondary fluid containment in the event of a diaphragm rupture.

At our state-of-the-art facilities, automated test equipment performs pressure and temperature cycling on 100% of the PX409 transducers. The transducers are then calibrated using extremely high accuracy equipment and a 5-point NIST traceable calibration certificate that is included with each transducer. To obtain their high accuracy and stability, the PX409 Series use state-of-the-art digital mapping of the temperature, pressure and output performance of the silicon sensor in conjunction with a custom ASIC to provide dynamic thermal compensation across the

All models shown actual size.

PX409-050GV, features cable termination.

**0.08% Accuracy**

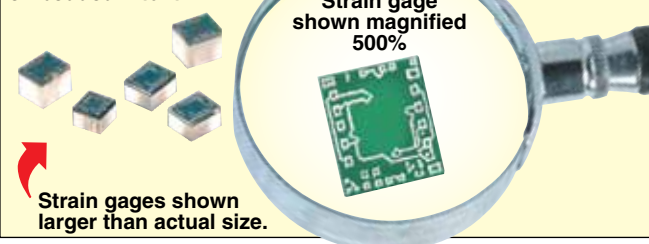
PX419-100GI, features mini-DIN termination.

PX429-015GI, features twist-lock termination.

**Stock Delivery for most Ranges!**

### PX409 SERIES SILICON WAFER TECHNOLOGY

PX409 Series uses a highly stable silicon wafer which is micro-machined to precision tolerances and then has strain gages molecularly embedded into it.



temperature and pressure parameters. The inherent stability of the piezoresistive core provides excellent long term stability, repeatability and very low thermal effects at the price of much lower performance transducers. Standard features of the PX409 Series also include protective features built into the electronics and the pressure element. Reverse polarity, EMC, and power supply fluctuation protection are standard on all models. Intrinsically Safe and CSA ratings are optional.

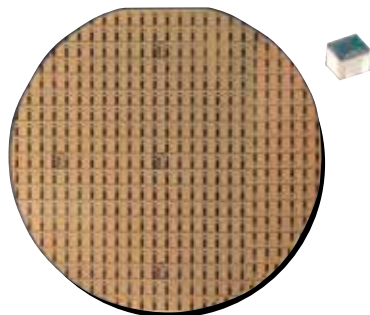
The most popular ranges and configurations are stocked for immediate delivery. All others typically have a very short lead-time.

# HIGH ACCURACY PRESSURE TRANSDUCERS

## PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

**EXCEPTIONAL PERFORMANCE  
0.08% STATIC ACCURACY**

**Micro-Machined Silicon**

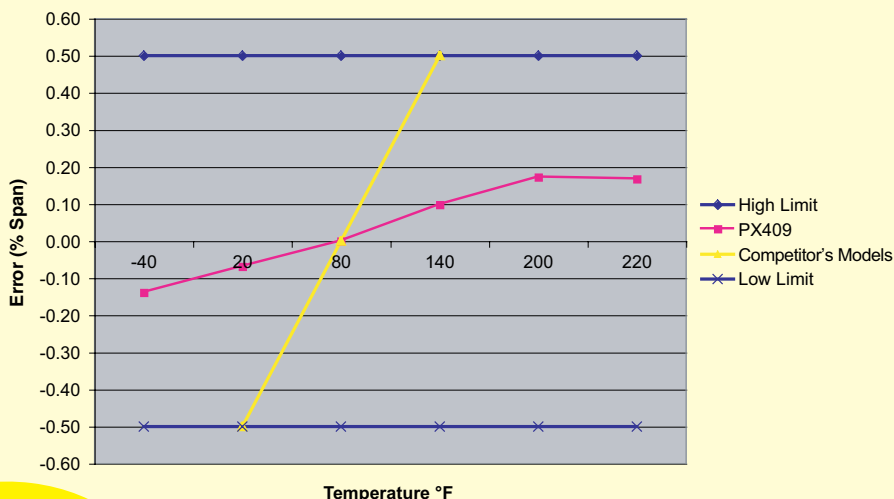


**5-Point NIST Traceable  
Calibration Certificate**



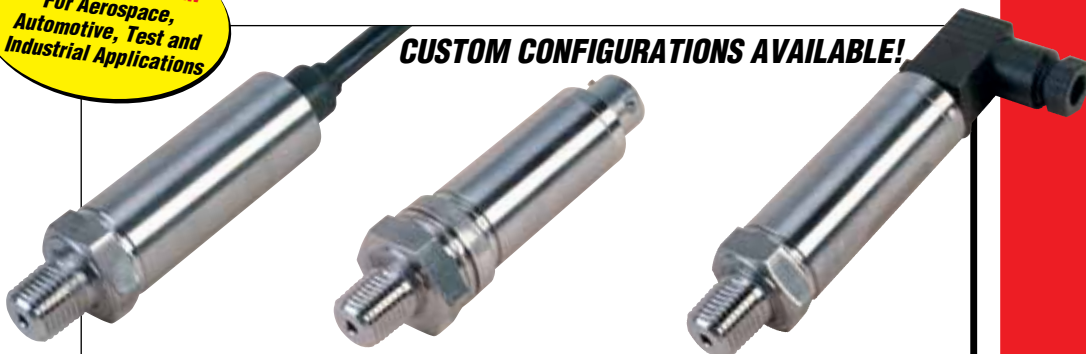
**Thermal Effects -29 to 85°C (-20 to 185°F)**

Span Error: 100 psig



**RUGGEDIZED DESIGN  
For Aerospace,  
Automotive, Test and  
Industrial Applications**

**CUSTOM CONFIGURATIONS AVAILABLE!**



### Common Specifications Gage and Absolute Pressure

**Approvals:** RoHS compliant

**Minimum Isolation Between Case  
and Output Terminations:**

100M  $\Omega$  @ 50 Vdc

**Pressure Cycles:** 1 million, minimum

**Long Term Stability (1-Year):**  $\pm 0.1\%$   
FS typical

**Shock:** 50 g, 11 ms half sine, vertical  
and horizontal axis

**Vibration:** 5-2000-5 Hz, 30 minute  
cycle, Curve L, Mil-Spec 810 figure  
514-2-2, vertical and horizontal axis

**Bandwidth:** DC to 1 kHz typical

**Response Time:** <1 ms

**CE Compliant:**

**Emissions:** IEC550022 Class B

**Electrostatic Discharge Immunity:**  
IEC61000-4-2

**EM Field Immunity:** IEC61000-4-3

**EFT Immunity:** IEC61000-4-5

**Surge Immunity:** IEC61000-4-5

**Conducted RF:** IEC61000-4-6

**Rate Power Frequency Magnetic**

**Field:** IEC61000-4-8

**Electrical Termination:**

**PX409:** Integral 2 m (6') cable

**PX409C:** Integral 2 m (6') cable  
with 1/2 NPT conduit fitting

**PX419:** mini-DIN

**PX429:** Twist lock

**Environmental Protection:**

**PX409:** IP67

**PX409C:** IP67

**PX419:** IP65

**PX429:** IP65

**Overpressure Gage Pressure:**

10 inH<sub>2</sub>O: 10 times span

1 psi: 6 times span

2.5 to 1000 psi: 4 times span

1500 to 5000 psi: 7250 psi  
maximum

**Overpressure Absolute Pressure:**

5 psia: 6 times span

2.5 psia to 1000 psia: 4 times span

1500 to 5000 psia: 10,000 psi  
maximum

**Secondary Containment**

**Gage/Diff/Vac/Compound:**

10 inH<sub>2</sub>O to 5 psi: To 1000 psi

15 to 1000 psi: To 3000 psi

1500 to 5000 psi: To 10,000 psi

**Absolute/Barometric:**

5 to 1000 psi: To 6000 psia

1500 to 5000 psi: To 10,000 psia

**Wetted Parts:** 316 SS

**Pressure Port:** 1/8-18 NPT male

**Weight:** 115 to 200 gm (4 to 7 oz)  
depending upon configuration



# mV/V OUTPUT

## HIGH PERFORMANCE PRESSURE TRANSDUCERS

### PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

**100 mV Output**  
**0-10 inH<sub>2</sub>O to 0-5000 psi**  
**25 mb to 345 bar**

PX409-100GV,  
shown actual size.

## PX409 Series



PX419-015GV,  
shown actual size.

**Stock Delivery for  
most Ranges!**



PX429-015GV,  
shown  
actual size.

## mV/V Specifications

**Output:** mV/V, 100 mV @ 10 Vdc  
(Ratiometric 5 to 10 Vdc)

**Supply Voltage:** 10 Vdc  
(5 mA @ 10 Vdc)

**Input/Output Resistance:** 5000 Ω  
±20% typical

**Accuracy (Combined Linearity,  
Hysteresis and Repeatability):**  
±0.08% BSL maximum

**Zero Balance:** ±0.5% FS typical  
1% max (1% typical, 2% maximum  
for 2.5 psi and below)

**Span Setting:** ±0.5% FS typical 1%  
maximum (1% typical, 2% maximum for  
2.5 psi and below) Calibrated in vertical  
direction with fitting down

**Operating Temperature Range:**  
-45 to 121°C (-49 to 250°F)

**Compensated Temperature:**  
**Ranges >5 psi:** -29 to 85°C  
(-20 to 185°F)

**Ranges ≤ 5 psi:** -17 to 85°C  
(0 to 185°F)

**Thermal Effects Zero**  
**(Over Compensated Range):**

**Ranges >5 psi:** ±0.5% span

**Ranges ≤5 psi:** ±1.0% span

**Thermal Effects Span**  
**(Over Compensated Range):**

**Ranges >5 psi:** ±0.5% span

**Ranges ≤5 psi:** ±1.0% span

## To Order

RANGE		2 m (6') CABLE TERMINATION	MINI-DIN TERMINATION	TWIST-LOCK TERMINATION
psi	bar			
mV/V OUTPUT, GAGE PRESSURE RANGES				
10 in-H <sub>2</sub> O	25 mb	PX409-10WGV	PX419-10WGV	PX429-10WGV
1	69 mb	PX409-001GV	PX419-001GV	PX429-001GV
2.5	172 mb	PX409-2.5GV	PX419-2.5GV	PX429-2.5GV
5	345 mb	PX409-005GV	PX419-005GV	PX429-005GV
15	1.0	PX409-015GV	PX419-015GV	PX429-015GV
30	2.1	PX409-030GV	PX419-030GV	PX429-030GV
50	3.4	PX409-050GV	PX419-050GV	PX429-050GV
100	6.9	PX409-100GV	PX419-100GV	PX429-100GV
150	10.3	PX409-150GV	PX419-150GV	PX429-150GV
250	17.2	PX409-250GV	PX419-250GV	PX429-250GV
500	34.5	PX409-500GV	PX419-500GV	PX429-500GV
750	51.7	PX409-750GV	PX419-750GV	PX429-750GV
1000	69	PX409-1.0KGV	PX419-1.0KGV	PX429-1.0KGV
1500	103	PX409-1.5KGV	PX419-1.5KGV	PX429-1.5KGV
2500	172	PX409-2.5KGV	PX419-2.5KGV	PX429-2.5KGV
3500	241	PX409-3.5KGV	PX419-3.5KGV	PX429-3.5KGV
5000	345	PX409-5.0KGV	PX419-5.0KGV	PX429-5.0KGV
mV OUTPUT, ABSOLUTE PRESSURE RANGES				
5	345 mb	PX409-005AV	PX419-005AV	PX429-005AV
15	1.0	PX409-015AV	PX419-015AV	PX429-015AV
30	2.1	PX409-030AV	PX419-030AV	PX429-030AV
50	3.4	PX409-050AV	PX419-050AV	PX429-050AV
100	6.9	PX409-100AV	PX419-100AV	PX429-100AV
150	10.3	PX409-150AV	PX419-150AV	PX429-150AV
250	17.2	PX409-250AV	PX419-250AV	PX429-250AV
500	34.5	PX409-500AV	PX419-500AV	PX429-500AV
750	51.7	PX409-750AV	PX419-750AV	PX429-750AV
1000	69	PX409-1.0KAV	PX419-1.0KAV	PX429-1.0KAV

**Ordering Examples:** PX409-1.0KGV, mV output, 1000 psi gage pressure range,  
2 m (6') cable termination. PX429-015AV, mV output, 15 psi absolute pressure, twist lock  
termination, PT06F10-6S, mating twist lock connector (sold separately), and  
DP25B-S, 4-digit meter, system with meter.  
(See page B-25h for information on meters).

# 0 TO 5 Vdc OUTPUT

## HIGH PERFORMANCE PRESSURE TRANSDUCERS

### PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

**0 to 5 Vdc Output**  
**0-10 inH<sub>2</sub>O to 0-5000 psi**  
**25 mb to 0-345 bar**

#### PX409 Series



PX409-100G5V,  
shown actual size.

PX419-100G5V,  
shown actual size.

**Stock Delivery for  
most Ranges!**



PX429-015G5V,  
shown actual size.

#### Amplified Voltage Output Specifications

##### Output:

**0 to 5 Vdc Supply Voltage:**

10 to 30 Vdc @ 10 mA

**0 to 10 Vdc Supply Voltage:**

15 to 30 Vdc @ 10 mA

**Accuracy (Combined Linearity,  
Hysteresis and Repeatability):** ±0.08%  
BSL maximum

**Zero Balance:** ±0.5% FS typical 1%  
maximum (1% typical, 2% maximum for  
2.5 psi and below)

**Span Setting:** ±0.5% FS typical 1%  
maximum (1% typical, 2% maximum for  
2.5 psi and below). Calibrated in vertical  
direction with fitting down

**Operating Temperature Range:**  
-45 to 115°C (-49 to 240°F)

**Compensated Temperature:**

**Ranges >5 psi:** -29 to 85°C  
(-20 to 185°F)

**Ranges ≤5 psi:** -17 to 85°C (0 to 185°F)

**Thermal Effects Zero**

**(Over Compensated Range):**

**Ranges >5 psi:** ±0.5% span

**Ranges ≤5 psi:** ±1.0% span

**Thermal Effects Span**

**(Over Compensated Range):**

**Ranges >5 psi:** ±0.5% span

**Ranges ≤5 psi:** ±1.0% span

#### To Order

RANGE		2 m (6') CABLE TERMINATION	MINI-DIN TERMINATION	TWIST-LOCK TERMINATION
psi	bar			
0 to 5 Vdc OUTPUT, GAGE PRESSURE RANGES				
10 in-H <sub>2</sub> O	25 mb	PX409-10WG5V	PX419-10WG5V	PX429-10WG5V
1	69 mb	PX409-001G5V	PX419-001G5V	PX429-001G5V
2.5	172 mb	PX409-2.5G5V	PX419-2.5G5V	PX429-2.5G5V
5	345 mb	PX409-005G5V	PX419-005G5V	PX429-005G5V
15	1.0	PX409-015G5V	PX419-015G5V	PX429-015G5V
30	2.1	PX409-030G5V	PX419-030G5V	PX429-030G5V
50	3.4	PX409-050G5V	PX419-050G5V	PX429-050G5V
100	6.9	PX409-100G5V	PX419-100G5V	PX429-100G5V
150	10.3	PX409-150G5V	PX419-150G5V	PX429-150G5V
250	17.2	PX409-250G5V	PX419-250G5V	PX429-250G5V
500	34.5	PX409-500G5V	PX419-500G5V	PX429-500G5V
750	51.7	PX409-750G5V	PX419-750G5V	PX429-750G5V
1000	69	PX409-1.0KG5V	PX419-1.0KG5V	PX429-1.0KG5V
1500	103	PX409-1.5KG5V	PX419-1.5KG5V	PX429-1.5KG5V
2500	172	PX409-2.5KG5V	PX419-2.5KG5V	PX429-2.5KG5V
3500	241	PX409-3.5KG5V	PX419-3.5KG5V	PX429-3.5KG5V
5000	345	PX409-5.0KG5V	PX419-5.0KG5V	PX429-5.0KG5V
0 to 5 Vdc OUTPUT, ABSOLUTE PRESSURE RANGES				
5	345 mb	PX409-005A5V	PX419-005A5V	PX429-005A5V
15	1.0	PX409-015A5V	PX419-015A5V	PX429-015A5V
30	2.1	PX409-030A5V	PX419-030A5V	PX429-030A5V
50	3.4	PX409-050A5V	PX419-050A5V	PX429-050A5V
100	6.9	PX409-100A5V	PX419-100A5V	PX429-100A5V
150	10.3	PX409-150A5V	PX419-150A5V	PX429-150A5V
250	17.2	PX409-250A5V	PX419-250A5V	PX429-250A5V
500	34.5	PX409-500A5V	PX419-500A5V	PX429-500A5V
750	51.7	PX409-750A5V	PX419-750A5V	PX429-750A5V
1000	69	PX409-1.0KA5V	PX419-1.0KA5V	PX429-1.0KA5V

**Note:** To order with 0 to 10 Vdc output, change "5V" to "10V" no extra charge.

**Ordering Examples:** PX409-1.0KG5V, 5 V output, 1000 psi gage pressure range,  
2 m (6') cable termination. PX429-015A5V, 5 V output, 15 psi absolute pressure, twist lock  
termination, PT06F10-6S, mating twist lock connector (sold separately), and  
DP25B-E, 4-digit meter, system with meter.  
(See page B-25h for information on meters).

# 4 TO 20 mA OUTPUT

## HIGH PERFORMANCE PRESSURE TRANSMITTERS

### PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

**4 to 20 mA Output**  
**0-10 inH<sub>2</sub>O to 0-5000 psi**  
**25 mb to 0-345 bar**

### PX409 Series



PX409-100GI,  
shown actual size.



PX419-100GI,  
shown actual size.

**Stock Delivery for  
most Ranges!**



PX429-015GI,  
shown actual  
size.

### 4 to 20 mA Specifications

**Output:** 4 to 20 mA

**Supply Voltage:** 9 to 30 Vdc  
 maximum loop res  $\Omega = (V_s - 9) \times 50$   
 [9 to 20 Vdc above 105°C (229°F)]

**Accuracy (Combined Linearity,  
Hysteresis and Repeatability):**  $\pm 0.08\%$   
 BSL maximum

**Zero Balance:**  $\pm 0.5\%$  FS typical  
 1% maximum (1% typical, 2% maximum  
 for 2.5 psi and below)

**Span Setting:**  $\pm 0.5\%$  FS typical 1%  
 maximum (1% typical, 2% max for 2.5 psi  
 and below). Calibrated in vertical direction  
 with fitting down

**Operating Temperature Range:**  
 -45 to 115°C (-49 to 240°F)

**Compensated Temperature:**

**Ranges >5 psi:** -29 to 85°C (-20 to 185°F)

**Ranges  $\leq 5$  psi:** -17 to 85°C (0 to 185°F)

**Thermal Effects Zero  
(Over Compensated Range):**

**Ranges >5 psi:**  $\pm 0.5\%$  span

**Ranges  $\leq 5$  psi:**  $\pm 1.0\%$  span

**Thermal Effects Span  
(Over Compensated Range):**

**Ranges >5 psi:**  $\pm 0.5\%$  span

**Ranges  $\leq 5$  psi:**  $\pm 1.0\%$  span

### To Order

RANGE		2 m (6') CABLE TERMINATION	MINI-DIN TERMINATION	TWIST-LOCK TERMINATION
psi	bar			
4 to 20 mA OUTPUT, GAGE PRESSURE RANGES				
10 in-H <sub>2</sub> O	25 mb	PX409-10WGI	PX419-10WGI	PX429-10WGI
1	69 mb	PX409-001GI	PX419-001GI	PX429-001GI
2.5	172 mb	PX409-2.5GI	PX419-2.5GI	PX429-2.5GI
5	345 mb	PX409-005GI	PX419-005GI	PX429-005GI
15	1.0	PX409-015GI	PX419-015GI	PX429-015GI
30	2.1	PX409-030GI	PX419-030GI	PX429-030GI
50	3.4	PX409-050GI	PX419-050GI	PX429-050GI
100	6.9	PX409-100GI	PX419-100GI	PX429-100GI
150	10.3	PX409-150GI	PX419-150GI	PX429-150GI
250	17.2	PX409-250GI	PX419-250GI	PX429-250GI
500	34.5	PX409-500GI	PX419-500GI	PX429-500GI
750	51.7	PX409-750GI	PX419-750GI	PX429-750GI
1000	69	PX409-1.0KGI	PX419-1.0KGI	PX429-1.0KGI
1500	103	PX409-1.5KGI	PX419-1.5KGI	PX429-1.5KGI
2500	172	PX409-2.5KGI	PX419-2.5KGI	PX429-2.5KGI
3500	241	PX409-3.5KGI	PX419-3.5KGI	PX429-3.5KGI
5000	345	PX409-5.0KGI	PX419-5.0KGI	PX429-5.0KGI
4 to 20 mA ABSOLUTE PRESSURE RANGES				
5	345 mb	PX409-005AI	PX419-005AI	PX429-005AI
15	1.0	PX409-015AI	PX419-015AI	PX429-015AI
30	2.1	PX409-030AI	PX419-030AI	PX429-030AI
50	3.4	PX409-050AI	PX419-050AI	PX429-050AI
100	6.9	PX409-100AI	PX419-100AI	PX429-100AI
150	10.3	PX409-150AI	PX419-150AI	PX429-150AI
250	17.2	PX409-250AI	PX419-250AI	PX429-250AI
500	34.5	PX409-500AI	PX419-500AI	PX429-500AI
750	51.7	PX409-750AI	PX419-750AI	PX429-750AI
1000	69	PX409-1.0KAI	PX419-1.0KAI	PX429-1.0KAI

**Ordering Examples:** PX409-1.0KGI, 4 to 20 mA output, 1000 psi gage pressure range, 2m (6') cable termination. PX429-015AI, 4 to 20 mA output, 15 psi absolute pressure, twist lock termination, PT06F10-6S, mating twist lock connector (sold separately), and DP25B-E, 4-digit meter, system with meter.  
 (See B-25h for information on meters).



# HIGH ACCURACY PRESSURE TRANSDUCERS

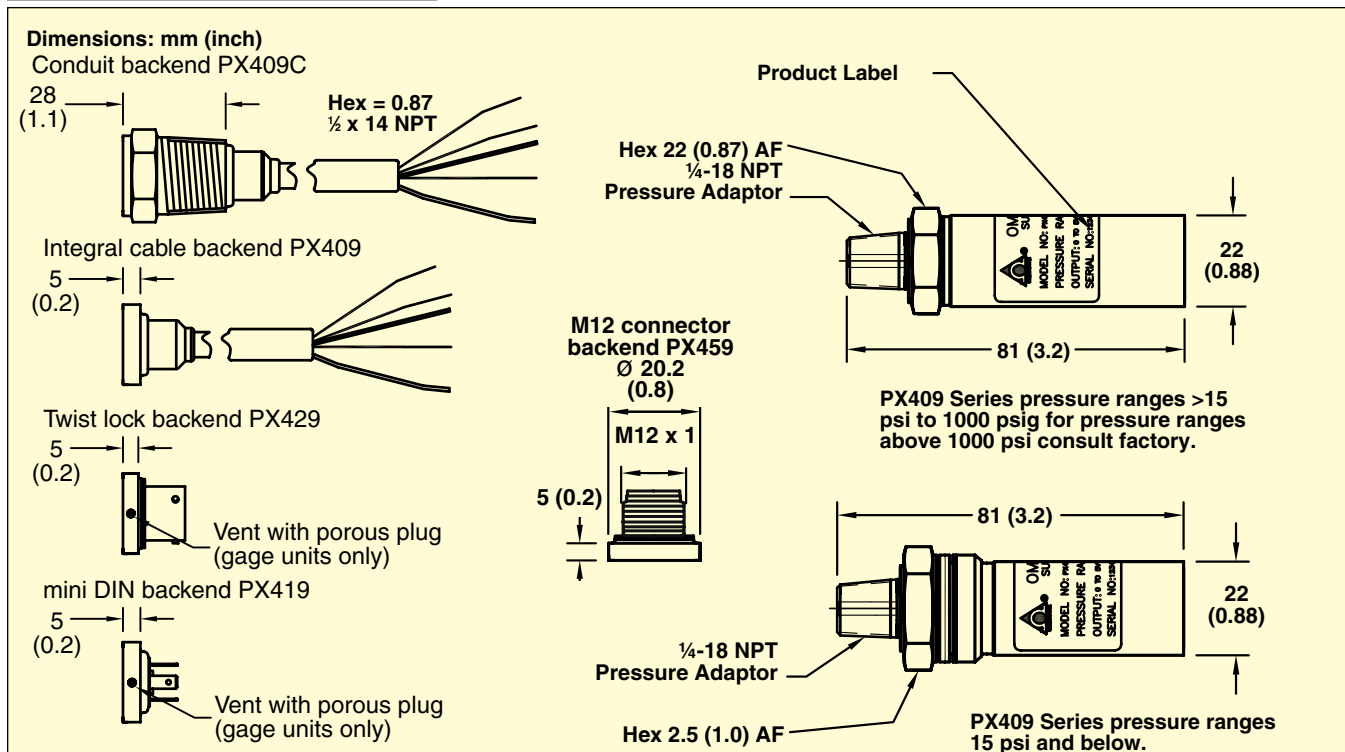
## PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE



PX409 CABLE CONNECTION			
COLOR	mV	5/10V	mA
Black	- EXC	Common	- Supply
White	+ SIG	+ Output	NC
Green	- SIG	NC	NC
Red	+ EXC	+ EXC	+ Supply

PX419 and PX459 PIN OUT			
PIN	mV	5/10V	mA
1	+ EXC	+ EXC	+ Supply
2	- EXC	Common	- Supply
3	+ SIG	+ Output	NC
4	- SIG	NC	NC

PX429 TWIST LOCK PINOUT			
PIN	mV	5/10V	mA
A	+ EXC	+ EXC	+ Supply
B	- EXC	Common	- Supply
C	+ SIG	+ Output	NC
D	- SIG	NC	NC
E	NC	NC	NC
F	NC	NC	NC



METERS	
MODEL NO.	DESCRIPTION
DP41-S	6-digit high accuracy (0.005%) strain meter for use with mV/V output models
DP41-E	6-digit high accuracy (0.005%) process meter for use with voltage and current output models
DP41-B	6-digit high accuracy (0.005%) universal meter for use with voltage and current output models also accepts thermocouple and RTD inputs
DP25B-S	4-digit precision strain meter for use with mV/V output models
DP25B-E	4-digit precision process meter for use with voltage and current output models
ACCESSORIES	
CX5302	Extra mini-DIN connector for PX419 Series
PT06F10-6S	Mating twist lock connector for PX429 Series
PS-4G	Pressure snubber for air/gaseous media
PS-4E	Pressure snubber for water or light oils
PS-4D	Pressure snubber for dense liquids (motor oil)