

HIGH ACCURACY PRESSURE TRANSDUCERS



PX409/PXM409 Series

Imperial and Metric

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
- ✓ Gauge, Absolute, Compound, Barometric, Vacuum Pressures

Metric Ranges Available

PX419-015GV,
shown actual size.

PX429-030GV,
shown actual size.

RUGGEDIZED DESIGN
For Aerospace,
Automotive, Test and
Industrial Applications

**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 inH₂O and
Standard Ranges: 5 to 5000 psi
Metric Ranges: 25 mbar to 345 bars
Gage, Absolute, Compound, Barometric,
Vacuum 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 inH₂O**
- ✓ **All Stainless Steel Wetted Parts**
- ✓ **Fast Response Time**
- ✓ **Solid State Reliability and Stability**
- ✓ **Gage, Absolute, Compound,**
Barometric, Vacuum Pressures
- ✓ **300% Proof Pressure Minimum**

OMEGA 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

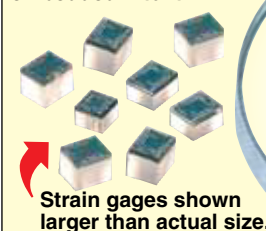
PX419-100GI, features mini-DIN termination.

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.



Strain gages shown larger than actual size.

Strain gage shown magnified 500%



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.

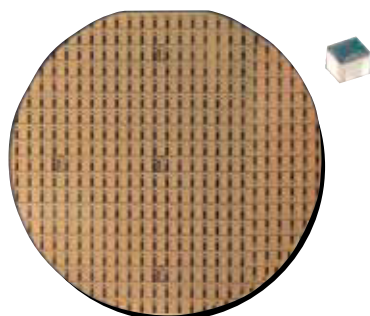
The most popular ranges and configurations are stocked for immediate delivery. All others typically have a very short lead-time.

HIGH ACCURACY PRESSURE TRANSDUCERS

PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

EXCEPTIONAL PERFORMANCE
0.08% STATIC ACCURACY

Micro-Machined Silicon

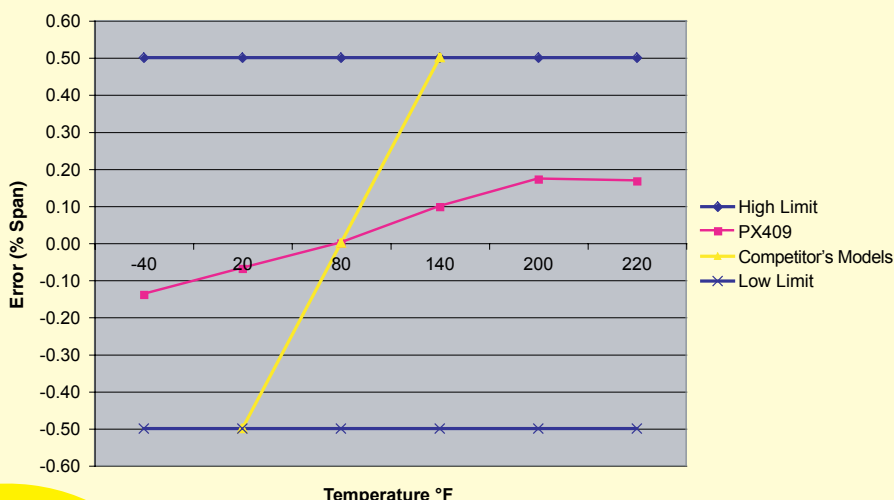


**5-Point NIST Traceable
Calibration Certificate**



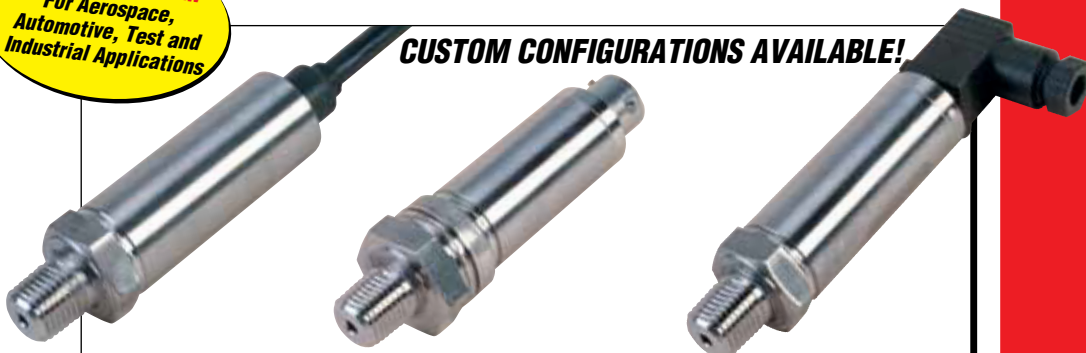
Thermal Effects -29 to 85°C (-20 to 185°F)

Span Error: 100 psig



RUGGEDIZED DESIGN
For Aerospace,
Automotive, Test and
Industrial Applications

CUSTOM CONFIGURATIONS AVAILABLE!



Designed to be quickly customized to meet your exacting specifications, often with fast delivery. Custom variables are available including custom fittings, accuracies, ranges, calibrations, pressure units, thermal specifications, vibration, operating temperature and compensated range. Contact OMEGA Pressure Engineering for more details.

Common Specifications

Approvals: RoHS compliant

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

100M Ω @ 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: IEC61000-4-4

Surge Immunity: IEC61000-4-5

Conducted RF: IEC610000-4-6

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

PX459: M12 Connector

Environmental Protection:

PX409: IP67

PX409C: IP67

PX419: IP65

PX429: IP65

PX459: IP65

Mating Connectors:

PX419: CX5302

PX429: PT06F10-6S

OUTPUT SPECIFICATIONS

mV/V

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

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

Input/Output Resistance: 5000 Ω

$\pm 20\%$ typical

Amplified Voltage 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

4 to 20 mA

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)]

Secondary Containment

Gage/Diff/Vac/Compound:

10 inH₂O 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: 1/4-18 NPT male

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

HIGH PERFORMANCE PRESSURE TRANSDUCERS

PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE

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

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

Power Requirements:

Millivolt: 5 to 10 Vdc (2 mA @ 10 Vdc)

Amplified Voltage: 5 to 10 Vdc
(2 mA @ 10 Vdc)

Current Loop: 9 to 30 Vdc
[max loop res = [(Vs-9) x 50]
9 to 20 Vdc above 105°C (229°F)]

CE Compliant: Meets industrial
emission and immunity standard
EN61326

FOR GAGE , ABSOLUTE AND COMPOUND PRESSURE:

Gauge and Absolute Range:

Low Pressure: 10 inH2O

Standard Ranges: 5 to 5000 psi

Metric Ranges: 25 mbar to 345 bars

Compound Range:

±10 inH2O to ±15 psi (±25 to ±1034
mbar)

Overpressure Gage Pressure:

10 inH2O: 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

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)

Burst Pressure:

10 inH2O to 15 psi: 1000 psi

FOR BAROMETRIC PRESSURE:

Omega's PX409 series electronic barometers features all Stainless steel construction, which makes them ideal for harsh industrial environments. Their high operating temperature, broad compensated range, and excellent temperature compensation allow stable readings in applications with fluctuating temperatures commonly found where barometric pressure must be monitored.

Ranges:

0 to 32, 16 to 32 or 26 to 32 inHg
0 to 1100, 550 to 1100, 880 to 1100 hPa

Output:

Millivolt: 10 mV/V (100 mV @ 10 Vdc)
Amplified Voltage: 0 to 5 Vdc or 0 to 10 Vdc @ 10 Vdc)
Current Loop: 4 to 20 mA

Operating Temperature Range:

-45 to 121°C (-49 to 250°F) [-45 to 115°C (-49 to 240°F) for voltage or current outputs]

Compensated Temperature:

Ranges: 0 to 32 inHg
-29 to 85°C (-20 to 185°F)

Ranges: 16 to 32, 26 to 32 inHg
-18 to 85°C (0 to 185°F)

Proof Pressure: 400% of span inHg
Burst Pressure: 1000 psia

FOR VACUUM PRESSURE:

OMEGA's PX490 Series high accuracy uni-directional Vacuum range (negative gage pressure) models have all stainless steel wetted parts and welded construction and premium temperature compensation which makes them suitable for use in tough industrial environments. Vacuum models measure negative gage pressure with increasing output for increasing negative pressure.

Ranges:

-10 inH₂O to -15 psi
0 to -70 mbar, 0 to 1 bar, 0 to 350 bar

Operating Temperature Range:

-45 to 121°C (-49 to 250°F) [-45 to 115°C (-49 to 240°F) for voltage or current outputs]

Compensated Temperature:

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

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

Proof Pressure (positive direction):

10 inH₂O: 10 times full scale

1 psi: 6 times full scale

2.5 psi and Higher : 4 times full scale (Negative direction 4 times or 1 atmosphere whichever is greater) scale

Burst Pressure:

10 inH₂O to 15 psi: 1000 psi

OPTION DESCRIPTIONS

Electrical Termination	PX409 for 3 m Cable
	PX419 for mini-DIN
	PX429 for Twist-lock (mating connector sold separately)
	PX459 for M12 Connector (mating connector sold separately)
Range (Examples of range per unit per type. Please View All Models for all available ranges per pressure type. Explore Configurator for Custom Ranges)	10W for Imperial Pressure 0 to 10 in H ₂ O
	001 for Imperial Pressure 0 to 1 psi
	030 for Imperial Pressure 0 to 30 psi
	750 for Imperial Pressure 0 to 750 psi
	1.0K for Imperial Pressure 0 to 1000 psi
	32B for Imperial Barometric (Absolute Pressure) 0 to 32 inHg
	025H for Metric Pressure 0 to 25 mbar
	001B for Metric Pressure 0 to 1 bar
	350B for Metric Pressure 0 to 350 bar
	16H for Metric Barometric (Absolute Pressure) 550 to 1100 mBar
	1,100H for Metric Barometric (Absolute Pressure) 0 to 1100 hPa
Pressure Type	G for Gage
	A for Absolute
	B for Barometric
	V for Vacuum
	CG for Compund
Output Signal	V for 10mV/V
	5V for 0 to 5 V Output
	10V for 0 to 10 V Output
	I for 4 to 20 mA Output

HIGH ACCURACY PRESSURE TRANSDUCERS

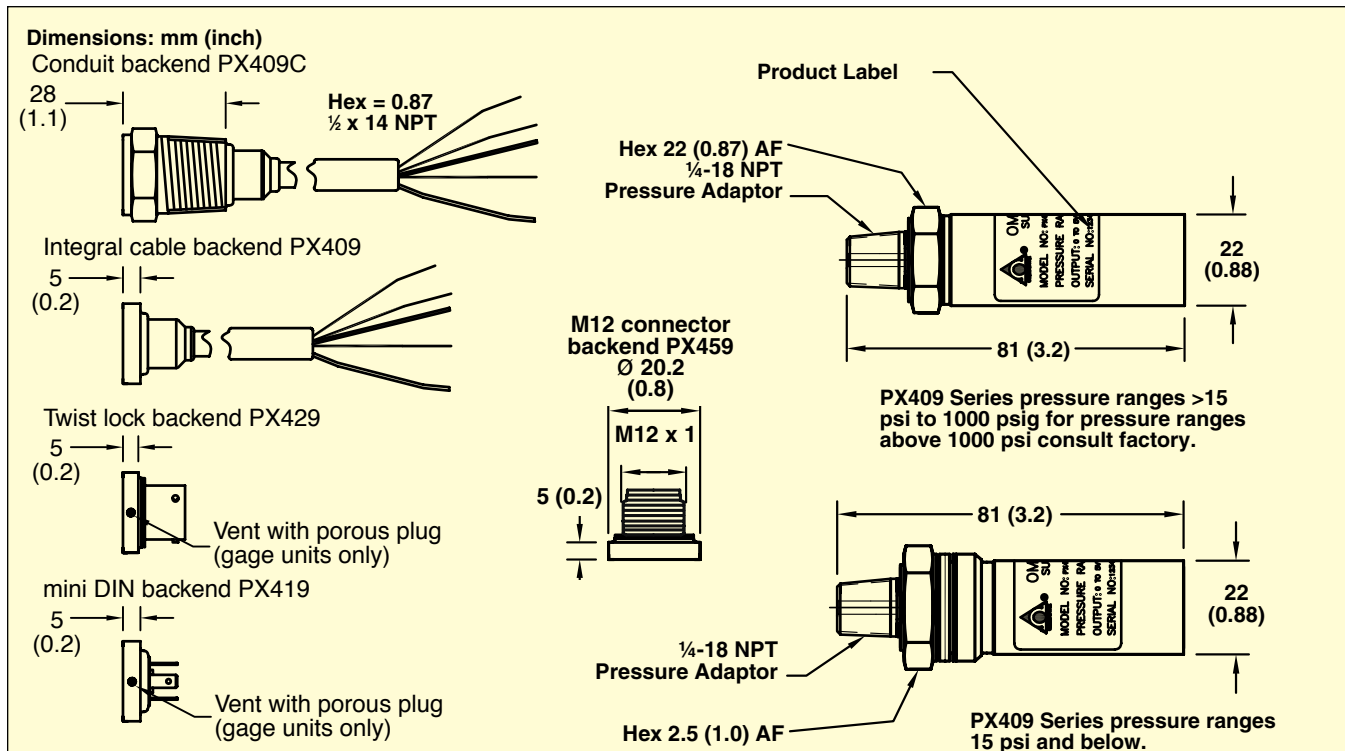
PIEZORESISTIVE DESIGN WITH HIGH TEMPERATURE PERFORMANCE



PX409 and PX409C 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
MIL-26482-I 10-6P	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)
M12C-PVC-4-S-F-5	PVC cable, straight 4-pin M12 female connector one end, flying leads one end, 5m (16.4') long, fits, PX459
M12C-PVC-4-R-F-5	PVC cable, right angled 4-pin M12 female connector one end, flying leads one end, 5m (16.4') long, fits PX459
-MB	Mounting bracket, factory installed

COMPATIBLE METER

4-Digit Precision Meter

DP25B



- ✓ mV, V, mA, Strain Gage Inputs
- ✓ Full Process Unit Scaling
- ✓ Built-In Transducer Power

PATENTED



DP25B, shown close to actual size.

Process and Strain Models

Because they accept a wide range of DC voltage and current inputs, the DP25-B-E strain meters can handle most process and strain applications. Features include easy front-panel scaling to virtually any engineering units, a remote tare function for weighing applications, and a hardware lockout to prevent unauthorized changes in setup. In addition, the DP25B-E meters feature built-in excitation in 4 user-selectable voltages, which makes them compatible with most transducers and transmitters.

To Order

MODEL NO	DESCRIPTION
DP25B-E	Voltage/current input with excitation
DP25B-S	mV input in excitation

Comes complete with operator's manual.

Ordering Examples: DP25B-E, voltage/current input meter for use with 0 to 5 V, 0 to 10 V, 4 to 20 mA output PX409 Series transducers. DP25B-S, mV input meter for use with mV/V output PX409 Series transducers.