P2100 Series

Differential Pressure Transducer

The P2100 series of transducers is designed for differential pressure measurement of wet and/or corrosive fluids. There is a range of models with full range pressure from 10 psi D to 3,500 psi D. Common line pressures up to 5000 psi can be accommodated with minimal effect on the output and each port is equipped with overpressure protection (up to 5 times range on P1). A selection of electrical outputs is available from 20 mV to 4-20 mA two wire the latter having the option of BASEEFA approval.

The P21X1 to P21X4 series is designed for use with fluids which can deposit some form of residue within a cavity and therefore the pressure ports can be removed for cleaning.

The P21X6 to P21X9 series is an all welded construction with the wetted ports made from Hasteloy C-276. This instrument is designed to handle highly corrosive fluids but also has applications where size and weight are at a premium.

Features

- ❑ ***Differential measurement of corrosive fluids***
- ❑ ***Bi-directional differential pressure (calibrated option)***
- ❑ ***High overload protection in either direction***
- ❑ ***Low and high level output***
- ❑ ***Removable pressure ports***
- ❑ ***2 wire 4-20 mA option BASEFA and CENELEC approval class EEx ia IIc T4 (T_{amb}=60°C)***

Environmental (all models)

Temperature Compensated Range	32°F to 185°F (0°C to 85°C)
Operating Temperature Range	
High Range	-22°F to 248°F (-30 to 120°C)
Medium Range	-5°F to 212°F (-20 to 100°C)
Storage Temperature	-22°F to 266°F (-30 to 130°C)
Humidity	
Cable Outlet	Immersible to 100 ft (30.5 m)
Connector Outlet	95% relative humidity
Mechanical Natural Frequency	
High Range	Approx. 4 kHz for 75 psi (5.0 bar) up to 15 kHz for 1000 psi (70 bar)
Medium Range	Approx. 2 kHz for 10 psi (0.7 bar) up to 3.0 kHz for 25 psi (1.7 bar)
Steady Acceleration and Linear Vibration	≤0.5% F.R.O./g for 10 psi (0.7 bar) decreasing to less than 0.02% F.R.O./g for 500 psi (35 bar) and above. Frequency range 0-2 kHz at 20g max. limited to 8mm double amplitude
Shock	1000g for 5 milliseconds in any axis will not damage the sensor.
Altitude	-150 feet to +70,000 feet without damage
Insulation Resistance	500 Megohms at 50 VDC @ 25°C

Specifications by Model @ 77°F (25°C)

Model Number	P2101/9	P2141/9	P2151/9	P2161/9	P2181/9	P2191/9
Input Voltage	10 VDC (12 V max)	10 VDC (12 V max)	11-18 VDC	18-36 VDC	10-36 VDC	±15 VDC
Resistance	350 ohm ±5%					
Current	30 mA	30 mA	30 mA	35 mA	—	+30/-2 mA
Output						
Unidirectional						
0-0.7 bar	20mV to 25mV	0-2.5V ±2%	0-2.5V ±2%	0-2.5V ±2%	16 mA ±2%	—
0-1 bar & above	25mV ±2%	0-2.5V ±2%	0-2.5V ±2%	0-2.5V ±2%	(4-20 mA) ±2%	0-5V ±2%
Bidirectional						
±0.7 bar	±10mV min.	±2.5V ±2%	±2.5V ±2%	±2.5V ±2%	4-20 mA ±2%	—
±1 bar & above	±12.5mV ±2%	±2.5V ±2%	±2.5V ±2%	±2.5V ±2%	(16 mA) ±2%	±5V ±2%
Resistance (ohm)	350 ±5%	<10	<10	<10	—	<10
Current mA (max)	10 mA	5 mA	5 mA	5 mA	—	5 mA
Load Resistance					0 at 10V to 1300 ohm at 36V	
Residual Unbalance(FRO)	±2%	±2%	±2%	±2%	±2%	±2%
Accuracy: Combined Non-Linearity Hysteresis and Non-Repeatability	±0.35% FRO (BSL) Each port separately on BD option					
Thermal Zero Shift	≤±0.015% FRO/°C ≤±0.015% FRO/°C of total BD output on BD option	≤±0.02% FRO/°C ≤±0.02% FRO/°C of total BD output on BD option				
Thermal Sensitivity Shift	≤±0.015% FRO/°C ≤±0.15% FRO/°C of total BD output on BD option	≤±0.02% FRO/°C ≤±0.02% FRO/°C of total BD output on BD option				
Weight oz (gm)						
P21X1/4	35.7 (1000)	35.7 (1000)	35.7 (1000)	35.7 (1000)	35.7 (1000)	35.7 (1000)
P21X6/9	18.9 (530)	18.9 (530)	18.9 (530)	18.9 (530)	18.9 (530)	18.9 (530)

Common Specifications

		P21X1/4	P21X6/9
Pressure Ranges			
Medium	**psi**	10; 15; 25; 35	10; 15; 25; 35
	bar	0.7; 1.0; 1.5; 2.5	0.7; 1.0; 1.5; 2.5
High Range	**psi**	75; 100; 150; 250; 500; 1000; 2000; 3500	75; 100; 150; 250; 500; 1000
	bar	5; 7; 10; 20; 35; 70; 150; 250	5; 7; 10; 20; 35; 70
Line Pressure		3500 psi (250) bar max. standard 5000 psi (350 bar) option	1500 psi (100 bar) max.
Zero Shift with Line Pressure		±1.0% per 1000 psi (70 bar) Nominal Individual calibration given. BD options nominally ±1% of combined BD output.	
Differential Pressure Limit			
P1		5x rated pressure or 3750 psi (260 bar) whichever is less	5x rated pressure or 1500 psi (100 bar) whichever is less
P2		2 x rated pressure or 3750 psi (260 bar) whichever is less	2 x rated pressure or 1500 psi (100 bar) whichever is less
Differential Burst Pressure			
P1		≥10 x rated pressure or 5000 psi (350 bar) whichever is less	10 x rated pressure or 2500 psi (170 bar) whichever is less
P2		≥6 x rated pressure or 4000 psi (275 bar) whichever is less	
Pressure Media		Liquids or gases compatible with A1S1300, 17-4 & 17-7 SS and Nitrile "O' rings	Liquid or gases compatible with Inconel 625 and Hastelloy C-276
Sensitivity Imbalance		P2 = P1 ±2.5% (±1% per 1000 psi) (70 bar) Full Range Pressure	
Zero Shift with Alternating Full Fange Pressure Cycling (BD)		±0.25% FRO on P1 (±0.5% FRO on P2)	
Shunt Calibration (not P218x)		80% ±5% full range pressure	

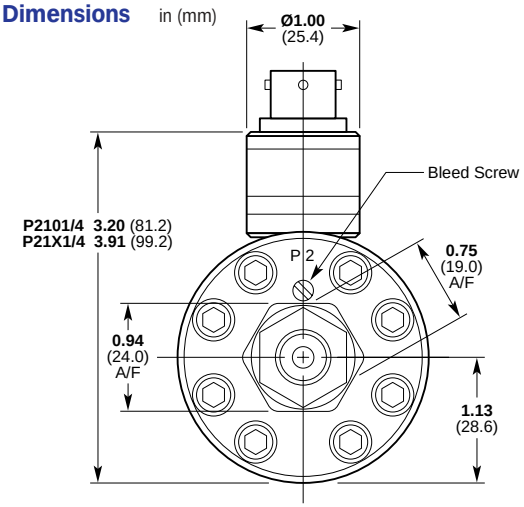
CHAEVITZ SENSORS

P2100 Series

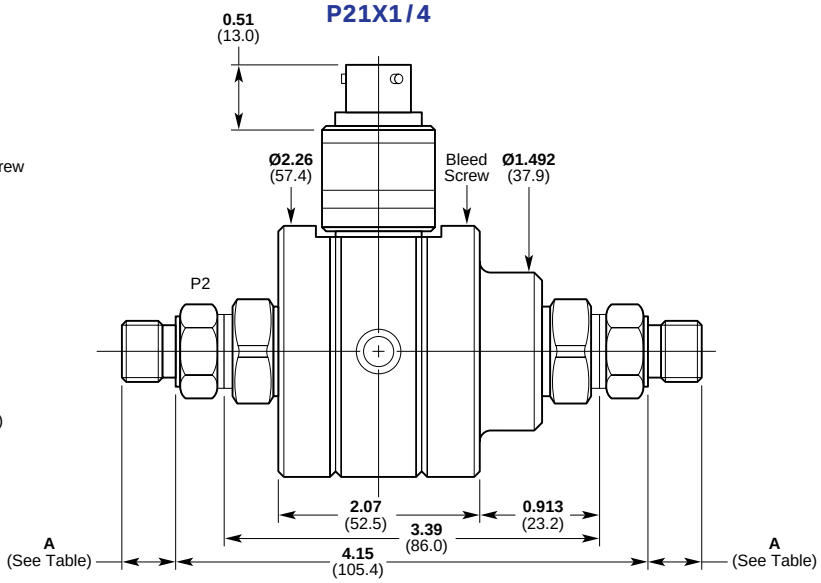
Differential Pressure Transducer Type

Dimensions

in (mm)



P21X1/4



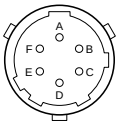
P21X1/4 Adapters

Thread Size	Code	A in	A (mm)
1/4" (BSP) (F)	0001	0.46	(11.9)
1/4" (BSP) (M)	0002	0.45	(11.7)
M14 x 1.5 (M)	0003	0.40	(10.2)
7/16"-20UNF-2A (M)	0004	0.55	(14.2)
1/4"-18NPT (M)	0005	0.55	(14.2)
M10 x 1.0 (F)	0006	0.38	(9.9)
1/4"-18NPT (F)	0007	0.56	(14.4)

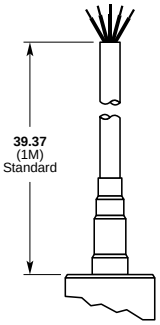
P21X6/9

P21X6/9 Adapters

Thread Size	Code	A in	A (mm)
1/4" (BSP) (F)	0001	0.46	(11.9)
1/4" (BSP) (M)	0002	0.47	(11.7)
M14 x 1.5 (M)	0003	0.55	(14.2)
7/16"-20UNF-2A (M)	0004	0.54	(14.0)



Connector Orientation



Connections

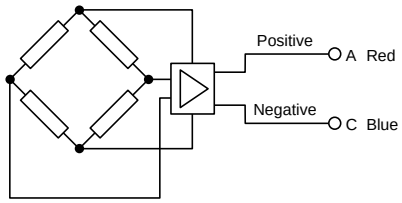
Cable	Connector[2]	
Red[1]	Pin A[1]	Excitation (+)
White	Pin D	Excitation (-)
Yellow	Pin B	Output (+)
Blue[1,2]	Pin C[1,2]	Output (-)
Violet	Pin E	} 80% shunt calibration
Grey	Pin F	

[1] 2-wire transmitter connections

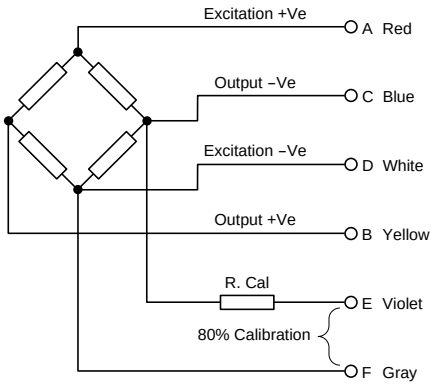
[2] 0 Volt P219X, P218X series

Wiring

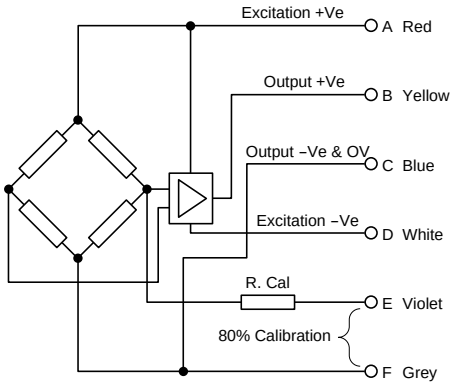
P2181/9



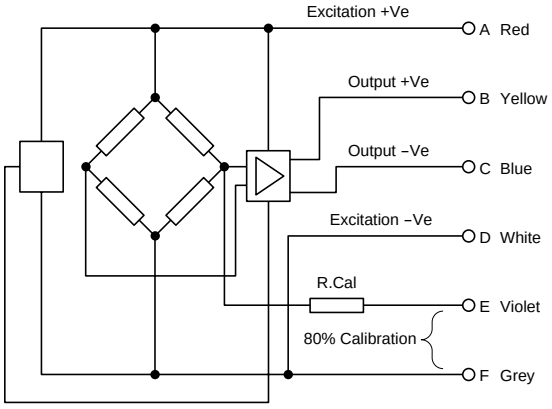
P2101/9



P2191/9



P2141/9, P2151/9 and P2161/9



Designation and Ordering Information

Specify by transducer Type number, coding, pressure range and UD or BD (UD = Unidirectional, BD = Bidirectional)

Example: P2101-0022, 0-10 bar UD signifies "Pressure transducer, cable outlet and 1/4 BSP male screw in pressure adapter, with metal/nitrile rubber bonded seal, ranged 0-10 bar UD with 0-25mV output from 10 VDC supply.

Type No. & Code P21 ☐ ☐ — **0** ☐ ☐ ☐ ☐ ☐ ☐

0 – 25mV output
4 – 2.5V output (10V supply)
5 – 2.5V output (11-18V supply)
6 – 2.5V output (18-32V supply)
8 – 4-20 mA output (10-36V supply)
9 – 5V output (+15.0-15V supply

Intrinsic Safety
0 – Non IS
9 – IS (P2180 only)

0 – Welded adaptor
2 – Screw in adapter

Unit
B: bar
P: psi

Pressure Reference
UD: uni-directional
BD: bi-directional

1 – High range – cable outlet
2 – Medium range – cable outlet
3 – High range – connector outlet
4 – Medium range – connector outlet
6 – High range – cable outlet with Inconel wetted parts
7 – Medium range – cable outlet with Inconel wetted parts
8 – High range – connector outlet with Inconel wetted parts
9 – Medium range – connector outlet with Inconel wetted parts

1 1/4 BSP female
2 1/4 BSP male
3 14 x 1.5 male*
4 7/16 in–20 UNF 2A male*
5 1/4 in–18 NPT male*
6 10 x 1 mm Arsero* Ermeto female
9 1/4 in 18 NPT female*
*Inconel only to special order

Pressure Range
(Enter full scale pressure range without units)

High	(bar)	0-5; 7; 10; 20; 35; 70; 150; 250
	(psi)	0-75; 100; 150; 250; 500; 1000; 2000; 3500
Medium	(bar)	0.7; 1.0; 1.5; 2.5
	(psi)	0-10; 15; 25; 35