

# P900 Series

## Premium Performance Strain Gauge

Schaevitz® P900 Series Strain Gauge Pressure Transducers are premium grade sensors that provide highly precise measurement of absolute, vented gauge, or sealed gauge pressures over wide temperature ranges.

Standard versions of this transducer use a 17-4 pH stainless steel diaphragm to sense pressure (Inconel versions are available for operation in highly corrosive environments). The deflection of the diaphragm is transferred to a double cantilever beam by a force transfer rod. Strain in the beam, and therefore, input pressure is measured by four foil strain gauges.

An all-welded construction provides high reliability and stability. Capable of sensing extremely small changes of applied pressure, the transducers are relatively insensitive to vibration, attitude, and shock.

The P900 Series Pressure Sensors are available in a range of electrical inputs and outputs. Zero and span potentiometers are available as a special option with the P940, P950, P960, and P990 models. Non-standard pressure ranges are available in all models of the P900 Series.



### Features

- High overload capability**
- Operation in high temperatures**
- Shock and vibration resistant**
- 2-wire, 4-20 mA option: Intrinsic safety approval to E Exia IIC T4 ( $T_{amb}=60^{\circ}C$ ) BASEEFA, CENELEC EN50-020**

### Applications

- Hydraulic pressure monitoring**
- Torpedo depth sensing**
- Vehicle brake system monitoring**
- Military and commercial aircraft**

**Specifications by Model** All specifications are at 77° F (25°C) unless otherwise noted

Series	P900	P940	P950	P960	P980	P990
Model Number	P901/904	P941/4	P951/4	P961/4	P981/4	P991/4
<b>Input Voltage</b>	10 VDC (12 V max)	10 VDC	11-18 VDC	18-32 VDC	10-36 VDC	±15 VDC
<b>Current (mA)</b>	13	20	20	20	–	20
<b>Output at 25°C (F.R.O.)</b>	900	940	950	960	980	990
<b>Full Range Output (±1%)</b>	20 mV	5 VDC	2.5 VDC	5 VDC	4-20 mA	5 VDC
<b>Impedance (ohms)</b>	1000 ±5%	<10	<10	<10	Load resist. 1300 max. at 36 VDC	<10
<b>Current (mA max)</b>	–	5	5	5	–	5
<b>Frequency Response</b>	Approx. 2.5 kHz to 40 kHz for .7 bar	1 kHz	1 kHz	1 kHz	100 Hz	1 kHz
<b>Combined Thermal Zero &amp; Sensitivity Shift</b>						
% F.R.O./°F	±0.008	±0.008	±0.008	±0.008	±0.008	±0.008
% F.R.O./°C	±0.015	±0.015	±0.015	±0.015	±0.015	±0.015
<b>Residual Unbalance</b>						
% F.R.O.	±1	±1	±1	±1	±1	±1
<b>Weight (gm)</b>						
<b>Connector Version</b>	4.4 (125)	5.1 (145)	5.1 (145)	5.1 (145)	5.1 (145)	5.1 (145)
<b>Cable Version</b>	5.6 (160)	6.3 (180)	6.3 (180)	6.3 (180)	6.3 (180)	6.3 (180)

Select P900 models, when correctly installed, are CE certified to comply with the EMC Directive 89/336/EEC Generic Standards for Residential, Commercial, Light Industrial and Industrial Environments.



**P900 Series Foil Strain Gauge**  
Pressure Ranges: 0-0.7 to 0-700 bar  
(0-10 to 0-10,000 psi)  
Accuracy:  $\leq \pm 0.10\%$  F.R.O.

## Common Specifications

### Pressure Ranges

**High (psi)** ..... 0-75; 100; 150; 200; 250; 350; 500; 750; 1000; 1500; 2200; 3500; 5000; 7500; 10,000  
**(bar)** ..... 0-5; 7; 10; 15; 25; 35; 50; 70; 100; 150; 200; 250; 350; 500; 700;  
**Medium (psi)** ..... 0-10; 15; 20; 25; 35  
**(bar)** ..... 0-0.7; 1.0; 1.5; 1.7; 2.5

### Pressure References

**High Pressure Range** .... Vented gauge<sup>1</sup>: 0-75 to 0-350 psi  
Absolute and sealed gauge: 0-75 to 0-10,000 psi  
**Medium Pressure Range** .. Vented gauge<sup>1</sup> and absolute: 0-10; 15; 20; 25; 35 psi (0-0.7; 1.0; 1.5; 1.7; 2.5 bar)

**Pressure Limit** .....  $\geq 5x$  full range pressure or 12,000 psi (830 bar), whichever is less. Will not cause a zero offset exceeding 0.04% FRO (recoverable within a few hours)

**Burst Pressure** .....  $\geq 20x$  full range pressure or 22,000 psi (1,520 bar), whichever is less

**Pressure Media** ..... Liquids or gases compatible with 17-4 pH and 17-7 pH stainless steel or Inconel 625

**Shunt Calibration** ..... 80%  $\pm 5\%$  full range pressure (not fitted in P980 Series)

### Combined Nonlinearity, Hysteresis

**and Nonrepeatability** .... High Range:  $< \pm 0.10\%$  F.R.O. (BSL); Medium Range:  $< \pm 0.20\%$  F.R.O. (BSL)

### Temperature Range

**Operable** ..... -65°F to 250°F (-54°C to 120°C)

**Compensated** ..... 32°F to 212°F (0°C to 100°C)

**Storage** ..... -65°F to 300°F (-54°C to 150°C)

### Humidity

**Connector Version** ..... 95% Relative humidity

**Cable Version** ..... Immersible to IP67 (fluid must not enter the ends of the cable)

**Acceleration Response** .... Above 500 psi (35 bar)  $\pm 0.02\%$  F.R.O./g; below 500 psi (35 bar)  $\pm 0.10\%$  F.R.O./g

**Vibration** ..... Surpasses MIL STD810C Method 514-2 Curve L and EUROCAE ED 14A/RTCA 160A

**Shock** ..... 1000 g for 5 msec will not damage the sensor

**EMC** ..... The P940, P950, P960 and P980 and P990 Series are CE marked, and when correctly installed comply with the EMC Directive 89/336/EEC Generic Standards for Residential Commercial, Light Industrial and Industrial environments. Note: The P980 Series when used in Intrinsic Safety applications does not comply with the Industrial environment directive.

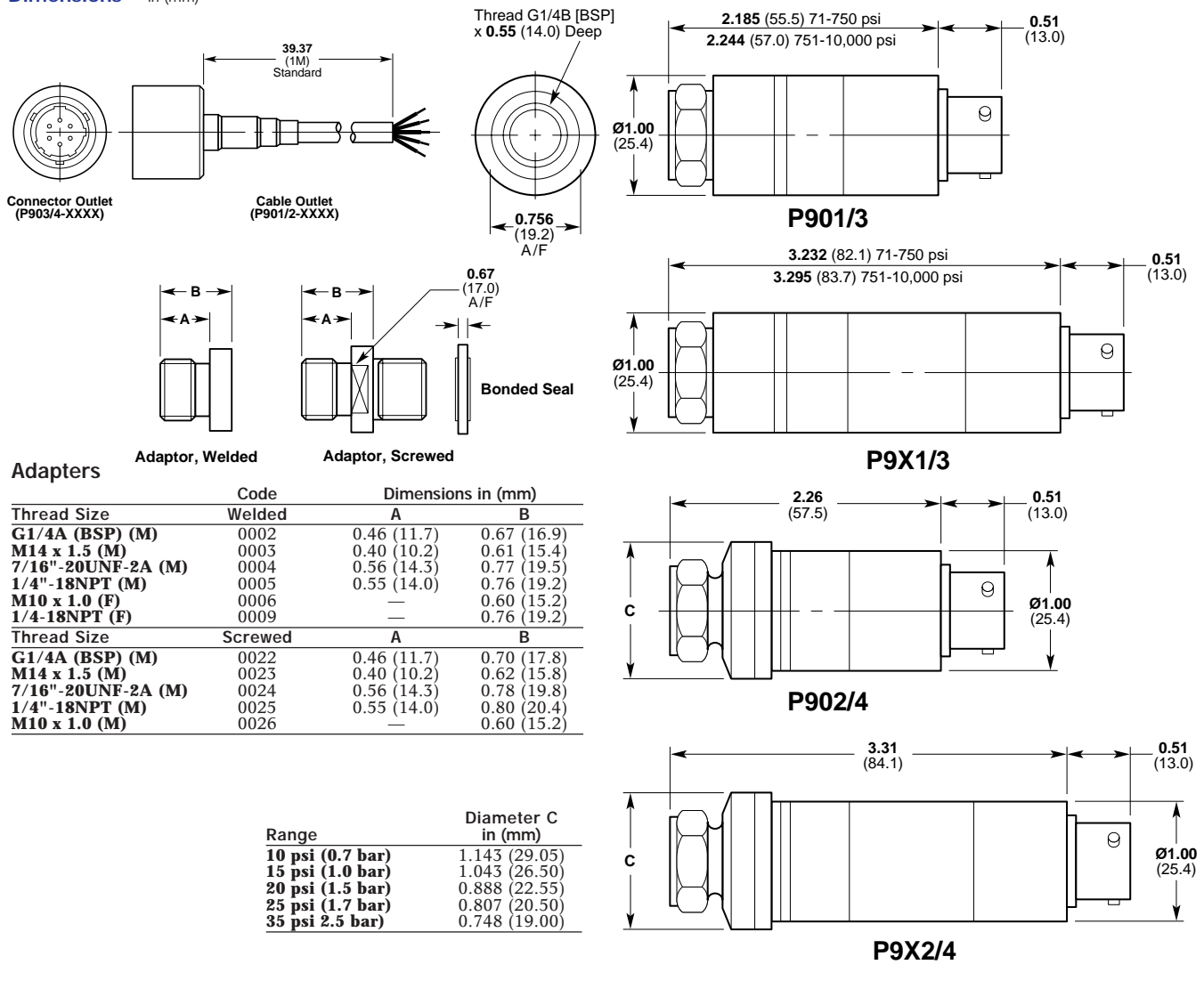
**Insulation Resistance** ..... 500 Mohm at 50 VDC at 25°C

<sup>1</sup> Vented gauge units must only be used in dry, noncorrosive environments and will breathe through the cable vent tube or hole in the 6-way receptacle.

# P900 Series

## Premium Performance Strain Gauge

### Dimensions in (mm)



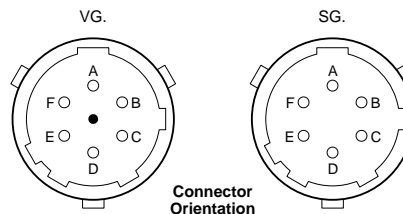
### Connections

Cable	Connector <sup>2</sup>
<b>Red<sup>1</sup></b>	Pin A <sup>1</sup> Excitation (+)
<b>White</b>	Pin D Excitation (-) <sup>4</sup>
<b>Yellow</b>	Pin B Output (+)
<b>Blue<sup>1,3</sup></b>	Pin C <sup>1,3</sup> Output (-) <sup>4</sup>
<b>Violet</b>	Pin E } 80% shunt calibration <sup>5</sup>
<b>Grey</b>	Pin F }

Note: Screen is connected to the case for CE marked units.  
Screen is **not** connected to the case for optional IS units (P980).  
IS certification revokes CE certification.

- 2-wire transmitter connections
- Vented gauge units must breathe through the receptacle (mating connector must have a vent hole)
- 0 Volt P990 series
- Connected internally for P940, P950, P960 Series (3-wire)
- Shunt calibration not fitted to P980 Series

### Connector Orientation

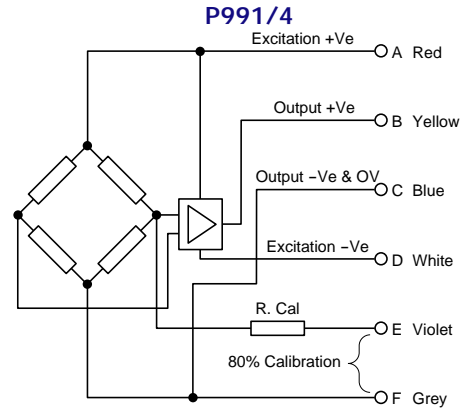
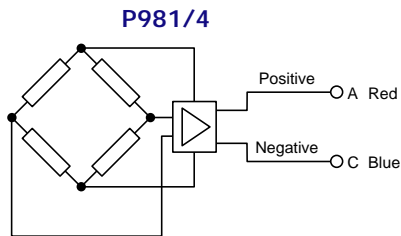
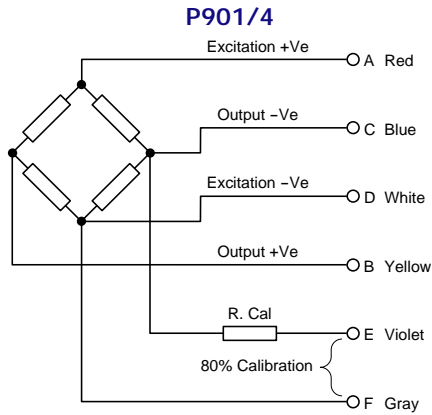


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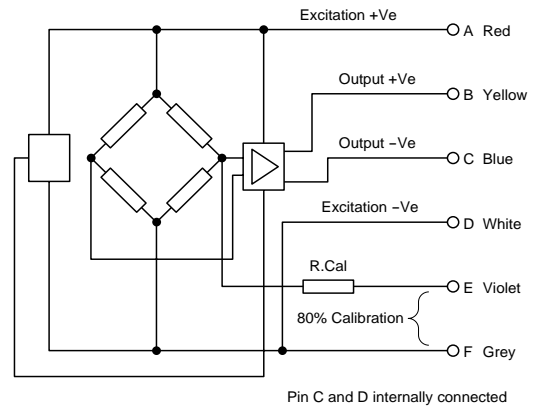


**P900 Series Foil Strain Gauge**  
 Pressure Ranges: 0-0.7 to 0-700 bar  
 (0-10 to 0-10,000 psi)  
 Accuracy:  $\pm 0.10\%$  F.R.O.

**Wiring**



**P941/4, P951/4 and P961/4**



**How to Order**

Specify by transducer excitation, electrical interface, pressure port, pressure range, units, and pressure reference. Example: P961-0005-10 bar A signifies a pressure transducer with 0 to 5 VDC output operating from 18-32V, cable outlet and 1/4 inch-18 NPT male pressure port, ranged 0 to 10 bar, with an absolute pressure reference.

Model Number Code P9

**Input/Output**  
 0 – 20 mV output  
 4 – 5 V output (10 V supply)  
 5 – 2.5 V output (11-18 V supply)  
 6 – 5 V output (18-32 V supply)  
 8 – 4-20 mA output (10-36 V supply)  
 9 – 5 V output ( $\pm 15$  V supply)

**Intrinsic Safety**  
 0 – Non IS  
 9 – IS (P980 only)

**Adaptor**  
 0 – Welded  
 2 – Screw in

**Unit**  
 B: bar  
 P: psi

**Pressure Reference**  
 A: absolute  
 SG: sealed gauge  
 VG: vented gauge

**Cable/Connector**  
 (Please reference to selected pressure range)  
 1 – High Range – cable outlet  
 2 – Medium Range – cable outlet  
 3 – High Range – connector outlet  
 4 – Medium Range – connector outlet

Corrosion resistant pressure transducers are available with wetted parts manufactured from Inconel 625 – consult factory for specifications.

**Pressure Port**  
 1 – 1/4 in BSP female  
 2 – 1/4 in BSP male  
 3 – M14 x 1.5 male  
 4 – 7/16 in 20 UNF 2A male  
 5 – 1/4 in 18 NPT male (taper)  
 6 – 10 x 1 mm Arsero Ermeto female  
 9 – 1/4 in 18 NPT female

**Pressure Range**  
 (Enter full scale pressure range without units)  
 High (psi) 0-75; 100; 150; 200; 250; 350; 500; 750; 1000; 1500; 2200; 3500; 5000; 7500; 10,000  
 (bar) 0-5; 7; 10; 15; 25; 35; 50; 70; 150; 200; 250; 350; 500; 700  
 Medium (psi) 0-10; 15; 20; 25; 35  
 (bar) 0.7; 1.0; 1.5; 1.7; 2.5

