

## P900



- Field proven rugged construction
- High overpressure capability
- High reliability for demanding environments
- Application specific customization
- Excellent media compatibility
- Shock and vibration resistant

### DESCRIPTION

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.

For parts requiring RoHS compliance, please contact factory.

### 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 (Tamb=60°C) BASEEFA, CENELEC EN50-020

### APPLICATIONS

- Hydraulic Pressure Monitoring
- Torpedo Depth Sensing
- Vehicle Brake System Monitoring
- Military and Commercial Aircraft

# P900

## PERFORMANCE SPECS

| Series   | P900                                       | P910                                       | P940      | P950      | P960      | P970      | P980                                  | P990      |
|--|--|--|-----------|-----------|-----------|-----------|---------------------------------------|-----------|
| Model Number                                   | P901/904                                   | P911/4                                     | P941/4    | P951/4    | P961/4    | P971/4    | P981/4                                | P991/4    |
| Input Voltage                                  | 10VDC<br>(12 V max)                        | 10VDC<br>(12 V max)                        | 10VDC     | 11-18VDC  | 18-32VDC  | 15-36VDC  | 10-36VDC                              | ±15VDC    |
| Current Consumption(mA)                        | 13   | 30   | 20        | 20        | 20        | 20        | -                                     | 20        |
| Full Range Output (±1%)                        | 20mV                                       | 20mV                                       | 5VDC      | 2.5VDC    | 5VDC      | 10VDC     | 4-20mA                                | 5VDC      |
| Impedance (ohm)                                | 1000 ±5%                                   | 350  | <10       | <10       | <10       | <10       | Load Resist.<br>1300 max. at<br>36VDC | <10       |
| Current (mA max)                               | -  | -  | 5         | 5         | 5         | 5         | -                                     | 5         |
| Frequency Response                             | Approx. 2.5 kHz<br>to 40 kHz for .7<br>bar | Approx. 2.5<br>kHz to 40 kHz<br>for .7 bar | 1 kHz     | 1 kHz     | 1 kHz     | 1 kHz     | 100 Hz                                | 1 kHz     |
| Combined Thermal –<br>Zero & Sensitivity Shift |  |  |           |           |           |           |                                       |           |
| % F.R.O./°F                                    | ±0.008                                     | -  | ±0.008    | ±0.008    | ±0.008    | ±0.008    | ±0.008                                | ±0.008    |
| % F.R.O./°C                                    | ±0.015                                     | ±0.007                                     | ±0.015    | ±0.015    | ±0.015    | ±0.015    | ±0.015                                | ±0.015    |
| Residual Unbalance                             |  |  |           |           |           |           |                                       |           |
| % F.R.O.                                       | ±1   | ±1   | ±1        | ±1        | ±1        | ±1        | ±1                                    | ±1        |
| Weight oz (gm)                                 |  |  |           |           |           |           |                                       |           |
| Connector Version                              | 4.4 (125)                                  | 4.4 (125)                                  | 5.1 (145) | 5.1 (145) | 5.1 (145) | 5.1 (145) | 5.1 (145)                             | 5.1 (145) |
| Cable Version                                  | 5.6 (160)                                  | 5.6 (160)                                  | 6.3 (180) | 6.3 (180) | 6.3 (180) | 6.3 (180) | 6.3 (180)                             | 6.3 (180) |

## COMMON SPECIFICATIONS

### Pressure Ranges

|                     |   |
|---------------------|---|
| <b>High (psi)</b>   | 0-75, 100, 150, 200, 250, 350, 500, 750, 1000, 1500, 2200, 3500, 5000, 7500, 10,000 |
| <b>(bar)</b>        | 0-5, 7, 10, 15, 25, 35, 50, 70, 100, 150, 200, 250, 350, 500, 700                   |
| <b>Medium (psi)</b> | 0-10, 15, 20, 25, 35  |
| <b>(bar)</b>        | 0-0.7, 1.0, 1.5, 1.7, 2.5   |
| <b>DIN (bar)</b>    | 1, 1.6, 2.5, 4, 6, 10, 16, 25, 40, 60, 100, 160, 250, 400, 600                      |

### Pressure References

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

20 x 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% ±5% full range pressure (not fitted in P980 Series)

### Combined Non-linearity, Hysteresis and Non-repeatability

High Range: <±0.10% F.R.O. (BSL); Medium Range: <±0.20% F.R.O. (BSL)

### Temperature Range

|                    |  |
|--------------------|--|
| <b>Operable</b>    | -65°F to 250°F (-54°C to 120°C) <b>P91X</b> : -65°F to 300°F (-54°C to 150°C)                                |
| <b>Compensated</b> | 32°F to 212°F (0°C to 100°C) <b>P91X</b> : -65°F to 250°F (-54°C to 120°C) or -4°F to 176°F (-20°C to +80°C) |
| <b>Storage</b>     | -65°F to 300°F (-54°C to 150°C)  |

### Humidity

95% Relative humidity

### Connector Version

Immersible to IP67 (fluid must not enter the ends of the cable)

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

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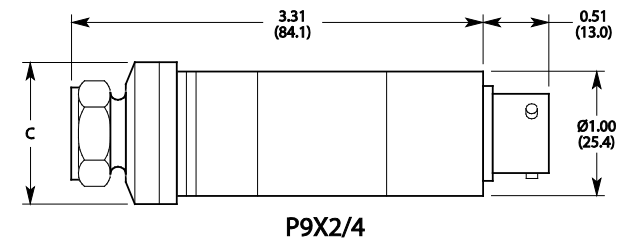
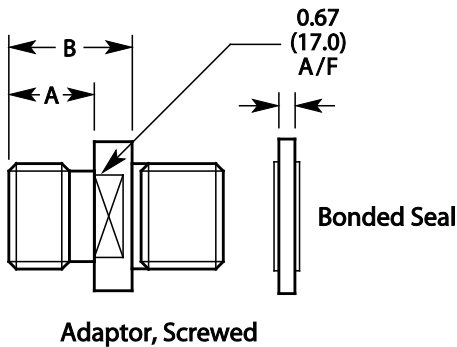
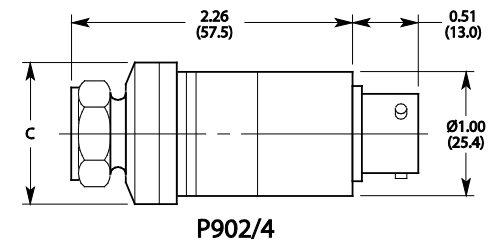
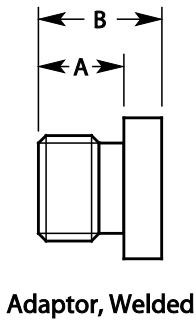
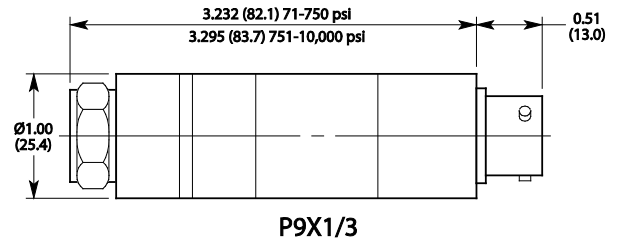
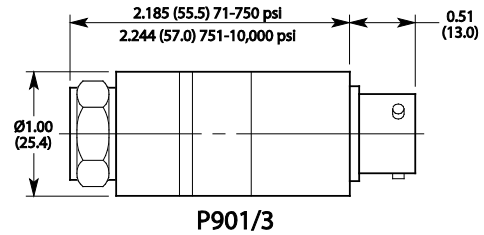
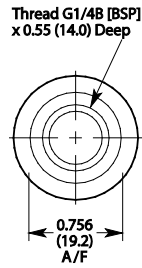
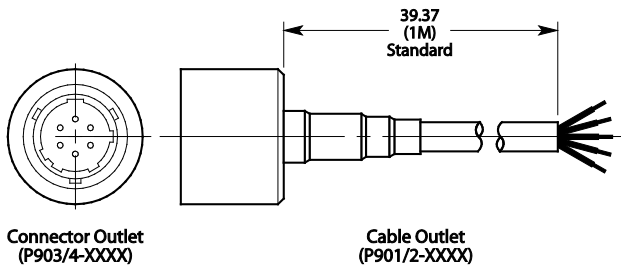
environments. Note: The P980 Series when used in Intrinsic Safety applications does not comply with the Industrial environment directive.

**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.

**Total Thermal Error Band (P91X only)** -20°C to +80°C <±0.4% FRO Typical, <±0.6% FRO Maximum  
-54°C to +120°C <±0.7% FRO Typical, <±1.0% FRO Maximum

## DIMENSIONS



# P900

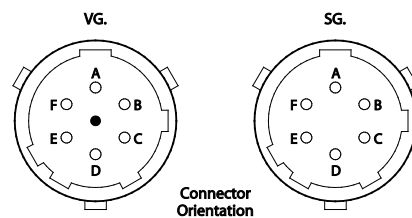
## ADAPTERS

| Code<br>Thread Size | Dimensions in (mm)    |             |                |
|---------------------|-----------------------|-------------|----------------|
|                     | Welded                | A           | B 1/4" BSP (F) |
| G1/4A (BSP) (M)     | 0002                  | 0.46 (11.7) | 0.67 (16.9)    |
| M14 x 1.5 (M)       | 0003                  | 0.40 (10.2) | 0.61 (15.4)    |
| 7/16"-20UNF-2A (M)  | 0004                  | 0.56 (14.3) | 0.77 (19.5)    |
| 1/4"-18NPT (M)      | 0005                  | 0.55 (14.0) | 0.76 (19.2)    |
| M10 x 1.0 (F)       | 0006                  | —           | 0.60 (15.2)    |
| 1/4-18NPT (F)       | 0009                  | —           | 0.76 (19.2)    |
| Thread Size         | Screwed               | A           | B              |
| G1/4A (BSP) (M)     | 0022                  | 0.46 (11.7) | 0.70 (17.8)    |
| M14 x 1.5 (M)       | 0023                  | 0.40 (10.2) | 0.62 (15.8)    |
| 7/16"-20UNF-2A (M)  | 0024                  | 0.56 (14.3) | 0.78 (19.8)    |
| 1/4"-18NPT (M)      | 0025                  | 0.55 (14.0) | 0.80 (20.4)    |
| M10 x 1.0 (M)       | 0026                  | —           | 0.60 (15.2)    |
| Range               | Diameter C<br>in (mm) |             |                |
| 10 psi (0.7 bar)    | 1.143 (29.05)         |             |                |
| 15 psi (1.0 bar)    | 1.043 (26.50)         |             |                |
| 20 psi (1.5 bar)    | 0.888 (22.50)         |             |                |
| 25 psi (1.7 bar)    | 0.807 (20.50)         |             |                |
| 35 psi (2.5 bar)    | 0.748 (19.00)         |             |                |

## CONNECTIONS

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

### Connector Orientation



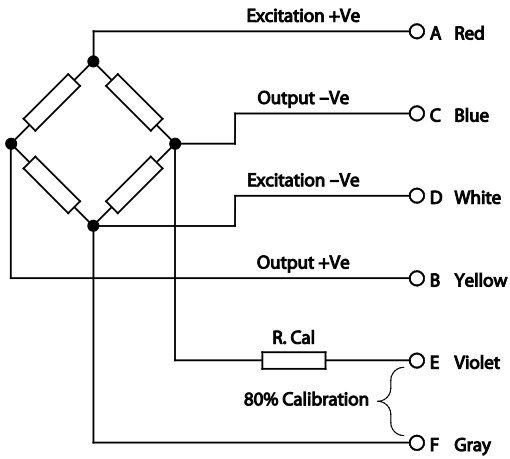
**Note:** Screen is connected to the case for CE marked units.  
Screen is not connected to the case for optional IS units (P980).  
IS certification revokes CE certification.

- 2-wire transmitter connections
- Vented gauge units must breathe through the receptacle (mating gauge 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

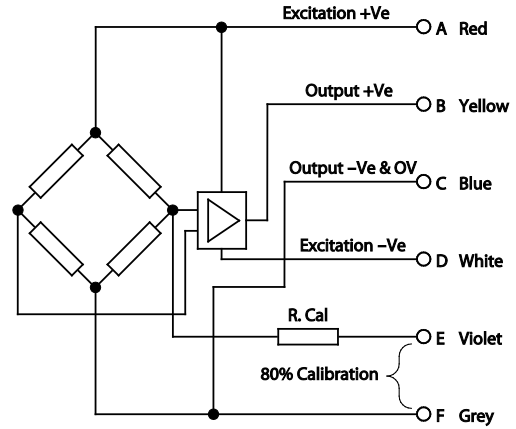
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## WIRING

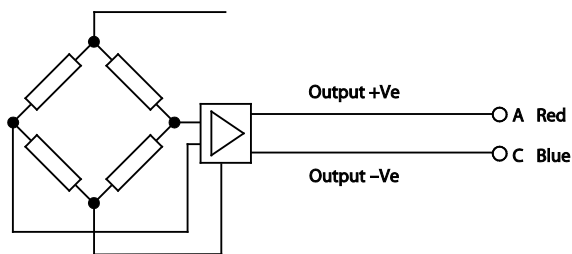
P901/9, P910/9



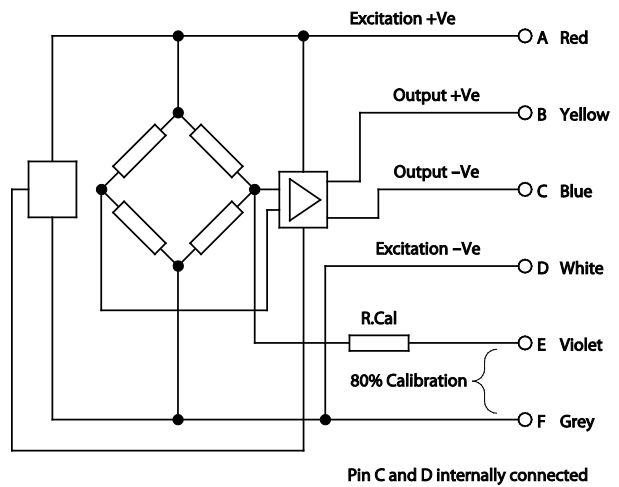
P991/9



P981/9

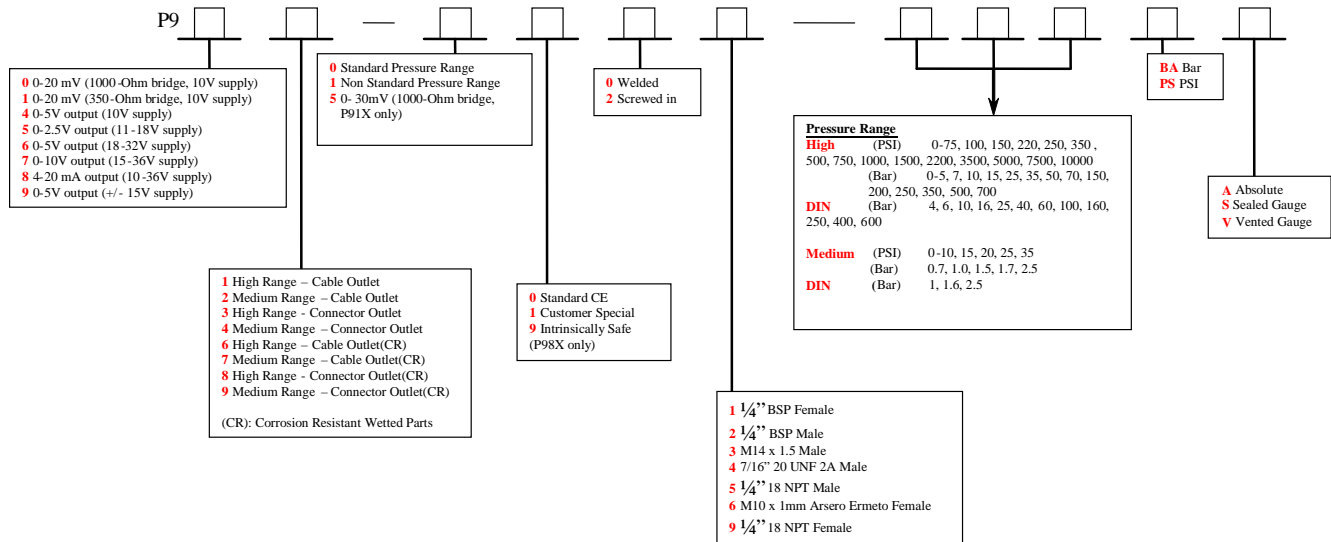


P941/9, P951/9, P961/9, P971/9



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## ORDERING INFORMATION



Examples: P963-0025-150PSS = 0 to 5V output from 18 to 32V supply, connector outlet, screwed in 1/4" NPT port, 150 psi sealed gauge  
 P914-0001- 2.5BAA = 20mV output, connector outlet, welded 1/4" BSP female port, 2.5 bar absolute

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