

## FEATURES

- **Reliable Bonded Foil Strain Gage Technology**
- **Gage, Sealed Gage, Absolute, Vacuum or Compound Pressure**
- **Wide Variety of Pressure Connection Options**
- **Rugged Stainless Steel Construction**
- **0-50 thru 0-10,000 psi Pressure Ranges**
- **3 or 4-Wire Amplified Voltage Output, 4-20 mA Current Loop, 1-2mV/V Nominal**

### SPECIAL OPTIONS AVAILABLE:

- 316L and Monel<sup>®</sup> Wetted Material
- Deep Submersible
- High Pressure Option- up to 60,000 psig
- Low Power Operation
- Pharmaceutical/Biotechnical Options





# P100 Series

## P100 Series

### OVERVIEW

The P100 Series pressure transducer is designed for a wide variety of industrial type applications requiring a high output signal combined with high reliability, durability and accuracy.

They are designed to withstand temperature, shock and vibration.

### FEATURES

- 3 or 4-wire amplified voltage output, 4-20 mA current loop, 1-2mV/V optional
- Reverse polarity protection
- EMI/RFI filter protection
- Field adjustable span and zero



## APPLICATIONS

- Vehicle Test Stands
- Stamping Presses
- Laboratory Testing
- Hydraulic Hammers
- Rock Trenchers
- Analyzers
- Aircraft Engine Test Stands
- Off Road Vehicles
- Oil Wells
- Fluid Measurement in Pharmaceutical/Biotechnical facilities



## TECHNOLOGY

The P100 Series features bonded foil strain gage technology, considered one of the most durable and abuse-resistant technologies available today. The bonded foil strain gage transducer measures pressure when a fluid is introduced into a simple low volume chamber (port), where it acts against the diaphragm. Proportional to the applied pressure, the resistance change is conditioned by internal circuit devices to produce the transducer's output.



## SPECIFICATIONS

|  |   |
|--|---|
| <b>MODEL:</b>  | P115<br>P125<br>P150  |
| <b>PRESSURE RANGE:</b>   | 0-50 psi thru 0-10,000 psi<br>0-3 bar thru 0-700 bar<br>special options may limit or expand pressure range.   |
| <b>OUTPUT RANGE:</b>   | 0-5 VDC $\pm 0.5\%$ * (Type A, B, C, L)<br>1-2 mV/V nominal (Type M)<br>1-5 VDC $\pm 0.5\%$ * (Type D)<br>4-20 mA (Type T) (P115 $\pm 0.5\%$ , P125 $\pm 1.0\%$ )*<br>* all outputs $\pm 2.0\%$ for P150                          |
| <b>ZERO BALANCE:</b><br>(Field-Adjustable $\pm 5\%$ typical, except M circuit type)                                      | $\pm 0.5\%$ (P115)<br>$\pm 1.0\%$ (P125, P150)<br>$\pm 2.0\%$ (Type M circuit types only)   |
| <b>STATIC ERROR BAND:</b><br>(BSL - Nonlinearity, Hysteresis, and Nonrepeatability combined)<br>BSL - Best Straight Line | $\pm 0.15\%$ FSO (P115)<br>$\pm 0.25\%$ FSO (P125)<br>$\pm 0.50\%$ FSO (P150)   |
| <b>NONREPEATABILITY:</b>   | $\pm 0.1\%$ FSO (P115, P125)<br>$\pm 0.2\%$ FSO (P150)  |
| <b>THERMAL ZERO SHIFT:</b>   | $\pm 0.005\%$ FSO/ $^{\circ}$ F (P115)<br>$\pm 0.009\%$ FSO/ $^{\circ}$ C<br>$\pm 0.01\%$ FSO/ $^{\circ}$ F (P125)<br>$\pm 0.018\%$ FSO/ $^{\circ}$ C<br>$\pm 0.02\%$ FSO/ $^{\circ}$ F (P150)<br>$\pm 0.036\%$ FSO/ $^{\circ}$ C |
| <b>THERMAL SENSITIVITY SHIFT:</b>  | $\pm 0.005\%$ / $^{\circ}$ F (P115)<br>$\pm 0.009\%$ / $^{\circ}$ C<br>$\pm 0.01\%$ / $^{\circ}$ F (P125)<br>$\pm 0.018\%$ / $^{\circ}$ C<br>$\pm 0.02\%$ / $^{\circ}$ F (P150)<br>$\pm 0.036\%$ / $^{\circ}$ C                   |
| <b>OPERATING TEMPERATURE RANGE:</b>  | -40 $^{\circ}$ F to 185 $^{\circ}$ F<br>-40 $^{\circ}$ C to 85 $^{\circ}$ C   |
| <b>COMPENSATED TEMPERATURE RANGE:</b>  | 0 $^{\circ}$ F to 160 $^{\circ}$ F<br>-20 $^{\circ}$ C to 70 $^{\circ}$ C   |

**MAX. SAFE EXPOSURE TEMPERATURE:**

+250°F, +125°C

**EMI FILTERS:**  
(Min. Insertion Loss)

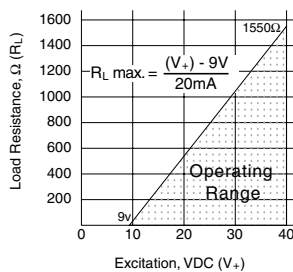
10 MHz 5dB  
1 GHz 40dB

**ELECTRICAL PROTECTION:**

Reverse Polarity on Input  
Overvoltage Protection  
Clamping Diodes on Signal

**EXCITATION:**

15 to 32 VDC (Type A)  
9 to 28 VDC (Type B, C, D)  
4 to 28 VDC (Type L)  
5 to 18 VDC (Type M)  
9 to 40 VDC at the transducer (Type T)



**Important Note: T type circuit 4-20 mA has an over-scale limit of 34mA**

**CURRENT CONSUMPTION:**  
(Typical)

13 mA (Type A, B, C, D)  
1 mA (Type L)  
VEXC/350 (Type M)  
4-20 mA (Type T)

**RESOLUTION:**

Continuous

**NATURAL FREQUENCY:**

Approximately 6 KHz for 50 psi range rising to  
approx. 230 KHz for 10,000 psi range

**RISE TIME: (10-90%)**

Less than 1 ms typical

**PROOF PRESSURE:**

3 times rated pressure or  
20,000 psi, whichever is less

**BURST PRESSURE:**

5 times rated pressure or  
25,000 psi, whichever is less

**MATERIAL:** (sensor/housing)

15-5 PH S.S. / 300 series S.S.

**WEIGHT:**

Approximately 3.5 oz. or 100 g

**IDENTIFICATION:**

Each transducer is labeled with model, range,  
serial #, connections, manufacturer &  
country of origin



# P100 Series

P100 Series

## MODEL CHART

| 1 Model                 |   |
|-------------------------|---|
| P115                    | P100 Series with $\pm 0.15\%$ SEB* BSL**                    |
| P125                    | P100 Series with $\pm 0.25\%$ SEB BSL                       |
| P150                    | P100 Series with $\pm 0.50\%$ SEB BSL                       |
| 2 Circuit               |   |
| A                       | 0-5 VDC Signal Output (Differential, Exc = 15-32)           |
| B                       | 0-5 VDC Signal Output (Differential, Exc = 9-28)            |
| C                       | 0-5 VDC Signal Output (Single Ended)                        |
| D                       | 1-5 VDC Signal Output (Single Ended)                        |
| L                       | 0-5 VDC Signal Output (Single Ended, Low Current)           |
| M                       | 1-2 mV/V Nominal Signal Output                              |
| T                       | 4-20 mA Signal Output                                       |
| 3 Pressure Connection   |   |
| B                       | 7/16-20 37° male MS33656-4 (for 1/4" tube)                  |
| C                       | 7/16-20 female MS33649-4 (for 1/4" tube)                    |
| G                       | 7/16-20 SAE female MS16142(SH) (for 1/4" tube)              |
| H                       | 1/4-18 NPT female   |
| I                       | 1/4-18 NPT male   |
| J                       | 1/8-27 NPT male   |
| K                       | 1/2-20 UNF male   |
| L                       | Female 3/4-16 UNF by 5/8 deep with 60° cone seal connection |
| M                       | Female 3/4-16 UNF by 3/8 deep with 60° cone seal connection |
| P                       | 1/2-18NPTmale   |
| S                       | Special pressure connection                                 |
| T                       | 1/4-28 Flow-Thru  |
| V                       | 1/4" VCR™ fitting (female)                                  |
| W                       | 1/4" VCR™ fitting (male)                                    |
| 4 Electrical Connection |   |
| A                       | PTIH-10-6P (mate #80002, sold separately)                   |
| B                       | PCIH-10-6P (mate #80001, sold separately)                   |
| C                       | Cable 1 meter 24 or 28 AWG PVC (circuit dependent)          |
| D                       | Cable 1 meter 22 or 24 AWG Teflon® (circuit dependent)      |
| F                       | Flying Leads 1 meter 24 AWG Teflon®                         |
| I                       | Mini-Hirschmann DIN 43650-C, included                       |
| S                       | Special Electrical Connection                               |

\*SEB: Static Error Band

\*\*BSL: Best Straight Line

Teflon® is a registered trademark of E.I. DuPont Company

Monel® is a registered trademark of the INCO family of companies

VCR™ Swagelok Company

| 5 Common Options / Modifications*** |  |
|-------------------------------------|--|
| 004                                 | Shunt Calibration  |
| 005                                 | Shunt Calibration (80% + 1%)   |
| 009                                 | 2.5 - 12.5 VDC FSO (D circuit)   |
| 017                                 | 0-10 VDC FSO (C Circuit)   |
| 066                                 | 0-10 VDC FSO +80% shunt  |
| 071                                 | Integral snubber (male threads only)   |
| 108                                 | AMP connector assy w/ 1 ft. cable  |
| 121                                 | Fresh Water Deep Submersible connector & housing                                     |
| 143                                 | 1/4" Tube stub, 4" length  |
| 178                                 | 1-6 VDC FSO (D Circuit)  |
| 180                                 | Monel® alloy K-500 sensor wetted parts   |
| 220                                 | 316L SS Sensor, + 0.5% SEB BSL   |
| 321                                 | 316L wetted parts, 0-10 VDC signal output  |
| 384                                 | Salt Water Deep Submersible connector & housing with 316L and/or Monel® wetted parts |
| 534                                 | 316L wetted parts, 5 ft. cable length  |
| 539                                 | 1/4" Tube stub, 1" length  |
| 583                                 | BVCO 1/4" Female   |
| 584                                 | BVCO 1/4" Male   |
| 670                                 | 1/4" Tube stub, 2" length  |
| 95097                               | Nose Protector<br>Required mating connector  |
| ###                                 | Additional cable lengths/types   |
| ###                                 | Special wiring (specify)   |
| 6 Pressure Range                    |  |
| min.                                | 0 - 50 psi (0 - 3 bar)   |
| < >                                 | we accommodate any range in between  |
| max.                                | 0 - 60,000* psi (0 - 4,137* bar)   |
| compound and vacuum available       |  |
| 7 Units                             |  |
| psi                                 | 50 psi thru 60,000 psi   |
| bar                                 | 3 bar thru 4,137 bar   |
| kg/cm <sup>2</sup>                  | 3 kg/cm <sup>2</sup> thru 4,219 kg/cm <sup>2</sup>                                   |
| KPa                                 | 300 KPa thru 413,700 KPa   |
| in Hg                               | 100 in Hg thru 121,951 in Hg   |
| other                               | consult factory  |
| 8 Pressure Reference                |  |
| gage                                | Reference to local atmospheric pressure  |
| absolute                            | Reference to a vacuum  |
| sealed                              | Reference to standard atmospheric pressure at sea level                              |

\*\*\*Some options require a minimum order

quantity, please consult factory

\*Max. range varies with pressure fitting, consult factory

# HOW TO ORDER

Trans Metrics' P100 Series model numbers are constructed as a series of numbers and letters that identify the accuracy, electrical circuit, pressure connection, electrical connection, and any options or features which may be unique to a particular pressure transducer.

The model number below features **1** a P100 Series pressure transducer with P115 specifications, **2** 0-5 VDC output, **3** 7/16-20 female thread and **4** a PTIH-10-6P electrical connection. Any other options selected **5** would be assigned a three (3) digit number which would be added to the end of the model number.

Pressure selections should be specified including the **6** pressure range, **7** units and **8** pressure reference.

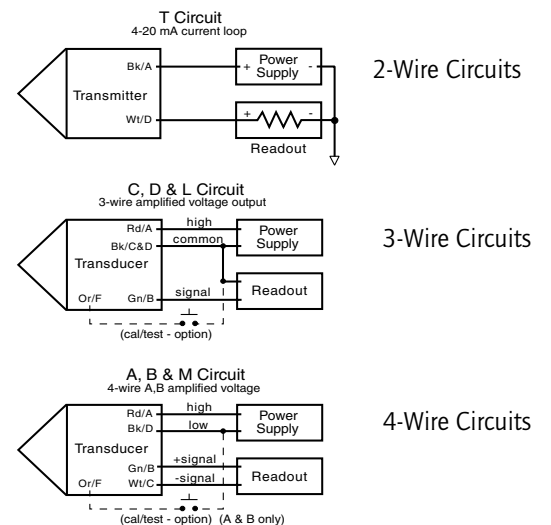
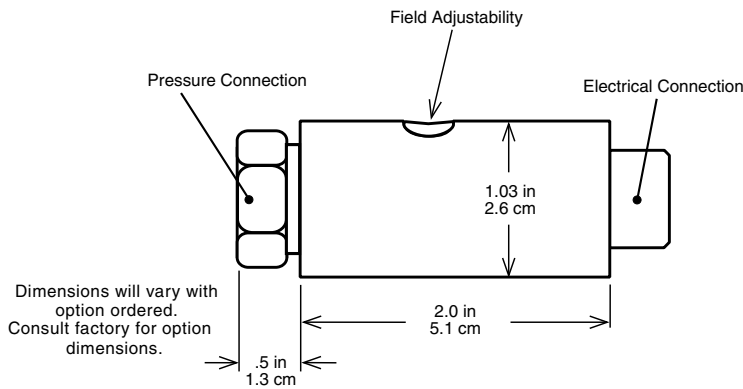
## Example:

### Model Range

|                     |                 |                        |                          |            |                   |            |                       |
|---------------------|-----------------|------------------------|--------------------------|------------|-------------------|------------|-----------------------|
| <b>P115</b>         | <b>C</b>        | <b>G</b>               | <b>A</b>                 | <b>004</b> | <b>100</b>        | <b>psi</b> | <b>g</b>              |
| Series/<br>Accuracy | Circuit<br>Type | Pressure<br>Connection | Electrical<br>Connection | Options    | Pressure<br>Range | Units      | Pressure<br>Reference |
|                     | <b>2</b>        | <b>3</b>               | <b>4</b>                 | <b>5</b>   | <b>6</b>          | <b>7</b>   | <b>8</b>              |

| Option Availability for Transducer Types |   |               |                                       |  |                      |                       |                      |
|--|---|---------------|---------------------------------------|--|----------------------|-----------------------|----------------------|
| P100                                     | Industrial                                | Low Power     | High Pressure                         | Pharmaceutical/<br>Biotechnical                        | Deep<br>Submersible  | Monel Wetted<br>Parts | 316L Wetted<br>Parts |
| 1<br>Model                               | P115/P125/P150                            |               |                                       |  |                      |                       | P150                 |
| 2<br>Circuit Type                        | A, B, C, D, L, M, T                       | L             | A, B, C, D, L, M, T                   | A, B, C, D, L, M, T                                    |                      |                       |                      |
| 3<br>Pressure<br>Connection              | B, C, G, H, I, J, K, P, T, V, W           |               | L (0-60,000 psi),<br>M (0-40,000 psi) | S, T, V, W   | B, C, G, H, I        | G, H                  |                      |
| 4<br>Electrical<br>Connection            | A, B, C, D, F, I                          |               |                                       |  | S                    | A, B, C, D, F, I      |                      |
| 5<br>Options/<br>Modifications           | 004, 005, 009, 017,<br>066, 071, 178      | 004, 005, 071 | 004, 009, 017, 066, 178               | 004, 005, 017, 066,<br>143, 178, 539, 583,<br>584, 670 | 121, 384, 95097      | 180                   | 220, 321, 534        |
| 6<br>Pressure<br>Range                   | 0-50 to 0-10,000 psi                      |               | 0-10,000 to 60,000 psi                | 0-50 psi (0-3 bar) to<br>varies with fitting           | 0-50 to 0-10,000 psi | 0-50 to 10,000 psi    | 0-50 to 5,000 psi    |
| 7<br>Units                               | psi, bar, kg/cm <sup>2</sup> , KPa, in Hg |               |                                       |  |                      |                       |                      |
| 8<br>Pressure<br>Reference               | gage, absolute, sealed                    |               |                                       |  |                      |                       |                      |

# DIMENSIONAL AND CIRCUIT DRAWINGS



## RECOMMENDED PRACTICES AND WARNINGS

Trans Metrics recommends careful consideration of the following factors when specifying and installing Trans Metrics pressure units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and max. temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to proof pressure or max. temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at proof pressure or maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where dangerous runaway conditions could result.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection.
- Unit must not be altered or modified after shipment. Consult Trans Metrics if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

## LIMITED WARRANTY OF REPAIR AND REPLACEMENT

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (F.O.B. Trans Metrics); provided, however, that this warranty applies only to equipment found to be so defective within a period of 12 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives.

EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE

## LIABILITY LIMITATION

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE IMPUTED TO SELLER IS LIMITED TO THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED HEREIN. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

*Trans Metrics specifications subject to change without notice.*

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