Industrial Pressure Transducers

Standard Industrial (S Model)
Explosion-Proof (E Model)
Intrinsically Safe (T Model)

Features

- Accuracy ≤ 0.5 % of span limit point calibration (0.25 % of span best fit straight line)
- Broad selection of pressure ranges, engineering units in psi, bar, MPa, kg/cm², and kPa. Pressure references: gauge (vacuum, positive, compound) and absolute
- Available with a variety of electrical connections and output signals
- Available with a variety of process connections including flush diaphragm and Swagelok® tube adapter
### Features

Swagelok industrial pressure transducers provide electronic monitoring of system pressure for general industrial applications, including hazardous locations.

- Stainless steel construction with robust, compact design that resists pressure spikes, shock, and vibration
- Variety of pressure ranges, process connections, electrical connections, and output signals for system versatility
- Thin film and piezoresistive sensor technology for repeatability, reliability, and stability
- Temperature-compensated to ensure accuracy and long-term stability when exposed to temperature variations
- Available in flush diaphragm version for use with viscous fluids and slurries.
- Wiring protection against reverse polarity and short circuit on the instrument side

### Performance Data—All Models

<table>
<thead>
<tr>
<th></th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Long-Term Stability</th>
<th>Response Time</th>
<th>Shock Resistance</th>
<th>Vibration Resistance</th>
<th>Temperature Coefficients (TC) in Compensated Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 0.5 % LPC (0.25 % BFSL), including nonlinearity, hysteresis, zero-point and full-scale error, measured in accordance with IEC 61298-2</td>
<td>≤ 0.1 % of span</td>
<td>≤ 0.2 % of span per year</td>
<td>≤ 1 ms with internal diaphragm connection; ≤ 10 ms with flush diaphragm connection</td>
<td>1000 g (600 g for field case models) in accordance with IEC 60068-2-27 (mechanical shock)</td>
<td>20 g (10 g for field case models) in accordance with IEC 60068-2-6 (vibration under resonance)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pressure ranges equal to or less than 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa): ≤ 0.4 % of span per 18°F (10°C) change on zero point. Pressure ranges higher than 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa): ≤ 0.2 % of span per 18°F (10°C) change on zero point. ≤ 0.2 % of span per 18°F (10°C) change on span within compensated temperature range from 32 to 176°F (0 to 80°C)</td>
</tr>
</tbody>
</table>

### Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
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<th>E Model</th>
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<tr>
<td><strong>Wetted</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal diaphragm (25 bar [362 psi, 2.5 MPa, 25.5 kg/cm², 2500 kPa] and lower pressure range)</td>
<td>316 SS</td>
<td></td>
<td></td>
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<tr>
<td>Internal diaphragm (over 25 bar [362 psi, 2.5 MPa, 25.5 kg/cm², 2500 kPa] pressure range)</td>
<td>AISI S13800</td>
<td>Elgiloy®</td>
<td>AISI S13800</td>
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<tr>
<td>Process connection, flush diaphragm</td>
<td>316 Ti</td>
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<td></td>
</tr>
<tr>
<td>Flush diaphragm, O-ring</td>
<td>Buna N</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonwetted</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transducer body</td>
<td>316 SS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush diaphragm internal fluid, piezoresistive sensor internal fluid</td>
<td>Synthetic oil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Calibration

Every Swagelok pressure transducer is factory calibrated to ensure conformance to its stated accuracy.
# Model Selection Guide

<table>
<thead>
<tr>
<th>Models</th>
<th>S Model</th>
<th>E Model</th>
<th>T Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Industrial</td>
<td>Explosion-Proof</td>
<td>Intrinsically Safe</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE and CSA®</td>
<td>FM® and CSA</td>
<td>FM and CSA</td>
</tr>
<tr>
<td>Diaphragm Type</td>
<td>Internal</td>
<td>Internal</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
</tr>
<tr>
<td>Application</td>
<td>Wide variety of general</td>
<td>Slurries, crystallizing, or high-viscosity media</td>
<td>Slurries, crystallizing, or high-viscosity media requiring explosion-proof design</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>See Pressure Range Designators, page 1006.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum psi to...</td>
<td>15 000 psi</td>
<td>8000 psi</td>
<td>15 000 psi</td>
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<tr>
<td></td>
<td>8000 psi</td>
<td>8000 psi</td>
<td>8000 psi</td>
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<tr>
<td>Vacuum bar to...</td>
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<td>1000 bar</td>
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<td>600 bar</td>
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<td>600 bar</td>
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<tr>
<td>Vacuum MPa to...</td>
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<td>60 MPa</td>
<td>100 MPa</td>
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<td>60 MPa</td>
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<td>60 MPa</td>
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<tr>
<td>Vacuum kg/cm² to...</td>
<td>1000 kg/cm²</td>
<td>600 kg/cm²</td>
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<td>600 kg/cm²</td>
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<td>600 kg/cm²</td>
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<tr>
<td>Vacuum kPa to...</td>
<td>100 000 kPa</td>
<td>60 000 kPa</td>
<td>100 000 kPa</td>
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<tr>
<td></td>
<td>60 000 kPa</td>
<td>60 000 kPa</td>
<td>60 000 kPa</td>
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<tr>
<td>Pressure Reference</td>
<td>Gauge (vacuum, positive, compound) and absolute</td>
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<td></td>
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<tr>
<td>Output Signal</td>
<td>4 to 20 mA</td>
<td>0 to 5 V</td>
<td>4 to 20 mA</td>
</tr>
<tr>
<td></td>
<td>0 to 10 V</td>
<td>1 to 5 V</td>
<td>4 to 20 mA</td>
</tr>
<tr>
<td>Options</td>
<td>See Options, page 1010.</td>
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<tr>
<td>Special cleaning</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ASME B40.1 Level IV</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Accuracy ≤ 0.25 % LPC of span (0.125 % BFSL) for pressure ranges ≥ 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa)</td>
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<td>✓</td>
<td>—</td>
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<td>T11-Point Certificate of Calibration traceable to DKD, EN 10204 3.1</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>General Material Certificate of Compliance, EN 10204 2.2</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Material Test Certificate, EN 10204 3.1, heat code traceable</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Certificate of Accuracy, EN 10204 2.2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>EPDM or fluorocarbon FKM/FPM O-rings</td>
<td>—</td>
<td>✓</td>
<td>—</td>
</tr>
<tr>
<td>Integral cooling element (−4 to 302°F [−20 to 150°C])</td>
<td>—</td>
<td>✓</td>
<td>—</td>
</tr>
<tr>
<td>Mounted cooling element (−40 to 302°F [−40 to 150°C] or −40 to 392°F [−40 to 200°C])</td>
<td>✓</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Alloy C-22 flush diaphragm (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa])</td>
<td>—</td>
<td>✓</td>
<td>—</td>
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<tr>
<td>Cable lengths 9 ft (2.7 m), 16 ft (4.9 m), 32 ft (9.8 m)</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
</tr>
<tr>
<td>Cable lengths 10 ft (3.0 m), 20 ft (6.1 m), 30 ft (9.1 m)</td>
<td>—</td>
<td>—</td>
<td>✓</td>
</tr>
<tr>
<td>Display</td>
<td>See Accessories, page 1010.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
S Model: Standard Industrial

The Swagelok S model is engineered for use in a wide variety of general industrial applications such as machine control, process control, laboratory and testing equipment, and hydraulics and pneumatics.

- Adjustable zero and span

Output Signals
- 4 to 20 mA
- 0 to 5 V (dc)
- 0 to 10 V (dc)

Electrical Connectors
- 4-pin circular (IP67/NEMA 4)
- Bendix MIL plugs (IP67/NEMA 4)
- Direct-wire zero and span adjustable (IP67/NEMA 4) or nonadjustable (IP68/NEMA 6)
- L-plugs (IP65/NEMA 5)

Process End Connections

Internal Diaphragm Type
- Swagelok tube adapter
- Tapered threads: male NPT and PT (ISO 7/1)
- Straight threads: EN (RG) and PF (RJ)

Flush Diaphragm Type
- EN flush diaphragm

Temperature Ratings

Without Integral Cooling Element
- Media: –22 to 212°F (–30 to 100°C)
- Ambient: –4 to 176°F (–20 to 80°C)
- Storage: –40 to 212°F (–40 to 100°C)
- Compensated range: 32 to 176°F (0 to 80°C)

With Integral Cooling Element (Flush Diaphragm Process Connection Only)
- Media: –4 to 302°F (–20 to 150°C)
- Ambient: –4 to 176°F (–20 to 80°C)
- Storage: –4 to 212°F (–20 to 100°C)

Electrical Data
- Power supply:
  - 10 to 30 V (dc) for 4 to 20 mA and 0 to 5 V (dc) output signals
  - 14 to 30 V (dc) for 0 to 10 V output signal

Approvals/Compliance
- CE conformity:
  - Pressure Equipment Directive—97/23/EC
- CSA (Canada and U.S.A.) approval: Class 2252-01
S Model: Standard Industrial

Ordering Information

Build an S Model transducer ordering number by adding the designators as shown below.

PTI - S - NG160 - 1 5 AO - E

A Pressure Range
See pages 1006 and 1007.

B Output Signal
1 = 4 to 20 mA
2 = 0 to 5 V (dc)
3 = 0 to 10 V (dc)

C Electrical Connector
1 = 4-pin circular connector, M12 x 1 (IP67/NEMA 4)
2 = Direct-wire 4 ft (1.5 m) flying lead (IP67/NEMA 4)
3 = Bendix 4-pin MIL plug (IP67/NEMA 4)
5 = L-plug, PG9 cable gland, DIN EN175301-803 (IP65/NEMA 5)
6 = L-plug, 1/2 in. NPT female conduit, DIN EN175301-803 (IP65/NEMA 5)
7 = Direct-wire 4 ft (1.5 m) flying lead (IP68/NEMA 6) zero and span nonadjustable
8 = Bendix 6-pin MIL plug (IP67/NEMA 4)

D Process End Connection

Internal Diaphragm Type
AO = 1/4 in. male NPT
AP = 1/2 in. male NPT
AQ = 1/4 in. Swagelok tube adapter
BG = 3/8 in. Swagelok tube adapter
AR = 1/2 in. Swagelok tube adapter
AS = 6 mm Swagelok tube adapter
BH = 10 mm Swagelok tube adapter
AT = 12 mm Swagelok tube adapter
AV = G1/4B EN (1/4 RG)
AW = G1/2B EN (1/2 RG)
AX = G1/4B PF (1/4 RJ)
AZ = G1/2B PF (1/2 RJ)
BD = R1/4 PT (1/4 ISO 7 taper)
BE = R1/2 PT (1/2 ISO 7 taper)

Flush Diaphragm Type
BV = G1/2B EN flush diaphragm
BJ = G1B EN flush diaphragm

① Refers to cooling element process connection when ordering mounted cooling element (designator R or S).
② Can be used with Swagelok RG adapter fittings.
③ Can be used with Swagelok RJ adapter fittings.

E Options (See pages 999 and 1010.)

For multiple options, add designators in alphabetical order.

A = Special cleaning, ASME B40.1 Level IV
B = Accuracy ≤ 0.25 % LPC of span (0.125 % BFSL) (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa])
C = 11-Point Certificate of Calibration traceable to DKD, EN 10204 3.1
D = General Material Certificate of Compliance, EN 10204 2.2
E = Material Test Certificate, EN 10204 3.1, heat code traceable
F = Certificate of Accuracy, EN 10204 2.2
R = Mounted cooling element, –40 to 302°F (–40 to 150°C) (3 fins)
S = Mounted cooling element, –40 to 392°F (–40 to 200°C) (5 fins)
T = 9 ft (2.7 m) cable
Y = 16 ft (4.9 m) cable
Z = 32 ft (9.8 m) cable

Flush Diaphragm Type Only

U = Integral cooling element (2 fins) (requires process end connection
BV or BJ and EPDM or fluorocarbon FKM/FPM O-ring [option W or X])
V = Alloy C-22 flush diaphragm (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa]; requires process end connection
BV or BJ)
W = EPDM O-ring
X = Fluorocarbon FKM/FPM O-ring

① Available only with positive pressure ranges ≥ 0.40 bar [5.8 psi, 0.04 MPa, 0.41 kg/cm², 40 kPa]; not available with process end connections BV or BJ; not available with options R, S, U, W, or X. When ordered with a piezoresistive sensor range, a halocarbon fluid is included; for oxygen applications, maximum media temperature is 140°F (60°C).

② Available only with process end connections AP and AW; transducer-to-cooling element connection is G1/2B EN (1/2 RG). Cooling element is not field removable.

③ Available only with direct-wire electrical connectors; select electrical connector 2 or 7.
E Model: Explosion-Proof

The Swagelok E Model is specifically designed to meet durability and performance demands of industrial applications where explosion-proof ratings are required, such as wellhead monitoring, refining, petrochemical, offshore oil and gas, and gas measurement.

Features
- Resistant to pressure spikes, vibration, and moisture intrusion to IP67/NEMA 4X

Output Signals
- 4 to 20 mA
- 1 to 5 V (dc)

Electrical Connectors
- 1/2 in. male NPT conduit with 6 ft (1.8 m) shielded cable (IP67/NEMA 4X)

Process End Connections

Internal Diaphragm Type
- Swagelok tube adapter
- Tapered threads: male NPT and PT (ISO 7/1)
- Straight threads: EN (RG))

Flush Diaphragm Type
- EN flush diaphragm

Temperature Ratings
- Media:
  - -22 to 212°F (~30 to 100°C)
  - Ambient:
  - -22 to 212°F (~30 to 100°C)
  - Storage:
  - -40 to 221°F (~40 to 105°C)
  - Compensated range:
  - 32 to 176°F (0 to 80°C)

Electrical Data
- Power supply:
  - 10 to 30 V (dc) for 4 to 20 mA output signal
  - 6 to 30 V (dc) for 1 to 5 V (dc) output signal

Approvals/Compliance
- CSA (Canada and U.S.A.) and FM:
  - Class I, Division 1, Groups A, B, C, D
  - Class II/III, Division 1, Groups E, F, G
- Temperature class:
  - T6 at maximum ambient 140°F (60°C)
  - T4 at maximum ambient 221°F (105°C)
E Model: Explosion-Proof

Ordering Information
Build an E Model transducer ordering number by adding the designators as shown below.

```
PTI - E - NG160 - 1 9 AQ - AE
```

A Pressure Range
See pages 1006 and 1007.

B Output Signal
1 = 4 to 20 mA
4 = 1 to 5 V (dc)

C Electrical Connector
9 = 1/2 in. male NPT conduit with
6 ft (1.8 m) shielded cable (IP67/ NEMA 4X)

D Process End Connection
Internal Diaphragm Type
AO = 1/4 in. male NPT
AP = 1/2 in. male NPT
AQ = 1/4 in. Swagelok tube adapter
BG = 3/8 in. Swagelok tube adapter
AR = 1/2 in. Swagelok tube adapter
AS = 6 mm Swagelok tube adapter
BH = 10 mm Swagelok tube adapter
AT = 12 mm Swagelok tube adapter
AV = G1/4B EN (1/4 RG)\(^\text{①}\)
AW = G1/2B EN (1/2 RG)\(^\text{①}\)
BD = R1/4 PT (1/4 ISO 7 taper)
BE = R1/2 PT (1/2 ISO 7 taper)
Flush Diaphragm Type
BV = G1/2B EN flush diaphragm
BJ = G1B EN flush diaphragm

\(^\text{①}\) Can be used with Swagelok RG adapter fittings.

E Options (See pages 999 and 1010.)
For multiple options, add designators in alphabetical order.
A = Special cleaning, ASME B40.1 Level IV
C = 11-Point Certificate of Calibration traceable to DKD, EN 10204 3.1
D = General Material Certificate of Compliance, EN 10204 2.2
E = Material Test Certificate, EN 10204 3.1, heat code traceable
F = Certificate of Accuracy, EN 10204 2.2
T = 10 ft (3.0 m) cable
Y = 20 ft (6.1 m) cable
Z = 30 ft (9.1 m) cable
Flush Diaphragm Type Only
V = Alloy C-22 flush diaphragm (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa]; requires process end connection BV or BJ)
W = EPDM O-ring
X = Fluorocarbon FKM/FPM O-ring
\(^\text{①}\) Available only with positive pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa]; not available with process end connections BV or BJ; not available with options W or X. When ordered with a piezoresistive sensor range, a halocarbon fluid is included; for oxygen applications, maximum media temperature is 140°F (60°C).
**Output Signal**
- 4 to 20 mA

**Electrical Connectors**
- 4-pin circular (IP67/NEMA 4)
- Bendix MIL plugs (IP67/NEMA 4)
- Direct-wire zero and span adjustable (IP67/NEMA 4) or nonadjustable (IP68/NEMA 6)
- L-plugs (IP65/NEMA 5)
- Field case, M20 × 1.5 gland or female NPT conduit (IP67/NEMA 4X)

**Process End Connections**

**Internal Diaphragm Type**
- Swagelok tube adapter
- Tapered threads: male NPT and PT (ISO 7/1)
- Straight threads: EN (RG) and PF (RJ)

**Flush Diaphragm Type**
- EN flush diaphragm

**Temperature Ratings**

**Without Integral Cooling Element**
- Media:
  - –4 to 221°F (–20 to 105°C)
- Ambient:
  - –4 to 221°F (–20 to 105°C)
- Storage:
  - –4 to 221°F (–20 to 105°C)
- Compensated range:
  - 32 to 176°F (0 to 80°C)

**Maximum Load Equations**
Milliampere output signal, 2-wire
- Supply: $V (\text{V}) = 10 \text{ V}^{(\circ)}$ to 30 V
- Maximum load: $RI (\Omega) = \left( V [\text{dc}] - 10 \text{ V}^{(\circ)} \right) / 0.02 \text{ A}$
  - (Length of flying lead in meters $\times 0.14 \Omega / \text{m}$)

**Approvals/Compliance**
- CSA (Canada and U.S.A.) and FM intrinsically safe:
  - Class I Division 1, Groups A, B, C, and D
  - Class II, Division 1, Groups E, F, and G
  - Class III Division 1
  - Class I, Zone 0, Group IIC AExia
  - Temperature class:
    - T6 at maximum ambient 140°F (60°C)
    - T5 at maximum ambient 176°F (80°C)
    - T4 at maximum ambient 221°F (105°C)
T Model: Intrinsically Safe

Ordering Information

Build an T Model transducer ordering number by adding the designators as shown below.

\[
\text{PTI - T - AG160 - 17 AS - A}
\]

**A** Pressure Range
See pages 1006 and 1007.

**B** Output Signal
1 = 4 to 20 mA

**C** Electrical Connector
1 = 4-pin circular connector, M12 × 1 (IP67/NEMA 4)
2 = Direct-wire 4 ft (1.5 m) flying lead (IP67/NEMA 4)\(^\circ\)
3 = Bendix 4-pin MIL plug (IP67/NEMA 4)
5 = L-plug, PG9 cable gland, DIN EN175301-803 (IP65/NEMA 5)
6 = L-plug, 1/2 in. NPT female conduit, DIN EN175301-803 (IP65/NEMA 5)
7 = Direct-wire 4 ft (1.5 m) flying lead (IP68/NEMA 6)
8 = Bendix 6-pin MIL plug (IP67/NEMA 4)

**D** Process End Connection

- **Internal Diaphragm Type**
  - \(\text{AO} = 1/4\) in. male NPT
  - \(\text{AP} = 1/2\) in. male NPT
  - \(\text{AQ} = 1/4\) in. Swagelok tube adapter
  - \(\text{BG} = 3/8\) in. Swagelok tube adapter
  - \(\text{AR} = 1/2\) in. Swagelok tube adapter
  - \(\text{AS} = 6\) mm Swagelok tube adapter
  - \(\text{BE} = 1/2\) in. ISO 7 taper

- **Flush Diaphragm Type**
  - \(\text{BV} = \text{G1/2B EN flush diaphragm}
  - \(\text{BJ} = \text{G1B EN flush diaphragm}

\(^\circ\) Can be used with Swagelok \(\text{RG}\) adapter fittings.
\(^2\) Can be used with Swagelok \(\text{RJ}\) adapter fittings.

**E** Options (See pages 999 and 1010.)

For multiple options, add designators in alphabetical order.

- **A** = Special cleaning, ASME B40.1 Level V\(^3\)
- **B** = Accuracy ≤ 0.25 % LPC of span (0.125 % BFSL) (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm\(^2\), 25 kPa])
- **C** = 11-Point Certificate of Calibration traceable to DKD, EN 10204 3.1
- **D** = General Material Certificate of Compliance, EN 10204 2.2
- **E** = Material Test Certificate, EN 10204 3.1, heat code traceable
- **F** = Certificate of Accuracy, EN 10204 2.2
- **R** = Mounted cooling element, –40 to 302°F (–40 to 150°C) (3 fins)
- **S** = Mounted cooling element, –40 to 392°F (–40 to 200°C) (5 fins)\(^2\)
- **T** = 9 ft (2.7 m) cable\(^2\)
- **Y** = 16 ft (4.9 m) cable\(^3\)
- **Z** = 32 ft (9.8 m) cable\(^3\)

**Flush Diaphragm Type Only**

- **U** = Integral cooling element (2 fins)
- **V** = Alloy C-22 flush diaphragm (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm\(^2\), 25 kPa]; requires process end connection \(\text{BV}\) or \(\text{BJ}\)
- **W** = EPDM O-ring
- **X** = Fluorocarbon FKM/FPM O-ring

\(^1\) Available only with positive pressure ranges ≥ 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm\(^2\), 25 kPa); not available with process end connections \(\text{BV}\) or \(\text{BJ}\); not available with options **R**, **S**, **U**, **W**, or **X**. When ordered with a piezoresistive sensor range, a halocarbon fluid is included; for oxygen applications, maximum media temperature is 140°F (60°C).

\(^2\) Available only with process end connections **AP** and **AW**; transducer-to-cooling element connection is G1/2B EN (1/2 RG). Cooling element is not field removable.

\(^3\) Available only with direct-wire electrical connectors; select electrical connector 2 or 7.

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**The surface temperature of the T model transducer and cooling element must not exceed the maximum ambient temperature required for the intrinsically safe application.**
# Pressure Range Designators—All Models

## psi

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<tr>
<th>Pressure Range Designator</th>
<th>Over-pressure Rating</th>
<th>Burst Rating</th>
<th>Sensor Type</th>
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</table>

1 Minimum for G1/2 EN flush diaphragm; maximum for G1B EN flush diaphragm.

2 Minimum for E model.

3 Maximum for 3/8 and 1/2 in.; 10 and 12 mm Swagelok tube adapter.

4 Maximum for G1/2B EN flush diaphragm.

5 Maximum for G1/2B EN flush diaphragm.

## bar

<table>
<thead>
<tr>
<th>Pressure Range Designator</th>
<th>Over-pressure Rating</th>
<th>Burst Rating</th>
<th>Sensor Type</th>
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<tr>
<td>AG1000</td>
<td>1 500</td>
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</table>

0.25 AA2.5                  | 2                    | 2.4          | Piezoresistive |

0.4 AA4                     | 2                    | 2.4          | Piezoresistive |

0.6 AA6                     | 4                    | 4.8          | Piezoresistive |

1 AA1                      | 5                    | 6            | Piezoresistive |

1.6 AA1.6(1)               | 10                  | 12           | Piezoresistive |

2.5 AA2.5                  | 10                  | 12           | Piezoresistive |

4 AA4                      | 17                  | 20.5         | Piezoresistive |

6 AA6                      | 35                  | 42           | Piezoresistive |

10 AA10                    | 35                  | 42           | Piezoresistive |

16 AA16                    | 80                  | 96           | Piezoresistive |

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1 Minimum for G1/2 EN flush diaphragm; maximum for G1B EN flush diaphragm.

2 Minimum for E model.

3 Maximum for 3/8 and 1/2 in.; 10 and 12 mm Swagelok tube adapter.

4 Maximum for G1/2B EN flush diaphragm.

5 Maximum for 1/4 in. and 6 mm Swagelok tube adapter and 1/4 in. NPT.
### MPa

<table>
<thead>
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<th>Pressure Range</th>
<th>Designator</th>
<th>Over-pressure Rating</th>
<th>Burst Rating</th>
<th>Sensor Type</th>
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</table>

#### Piezoresistive

- Minimum for G1/2 EN flush diaphragm; maximum for G1B EN flush diaphragm.
- Minimum for E model.
- Maximum for 3/8 in. and 1/2 in.; 10 and 12 mm Swagelok tube adapter.
- Maximum for G1/2B EN flush diaphragm.
- Maximum for 1/4 in. and 6 mm Swagelok tube adapter and 1/4 in. NPT.

### kPa

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Designator</th>
<th>Over-pressure Rating</th>
<th>Burst Rating</th>
<th>Sensor Type</th>
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</table>

#### Piezoresistive

- Minimum for G1/2 EN flush diaphragm; maximum for G1B EN flush diaphragm.
- Minimum for E model.
- Maximum for 3/8 in. and 1/2 in.; 10 and 12 mm Swagelok tube adapter.
- Maximum for G1/2B EN flush diaphragm.
- Maximum for 1/4 in. and 6 mm Swagelok tube adapter and 1/4 in. NPT.
Dimensions
Choose electrical connector, body type, and process end connection, and add together for overall height of transducer.
Dimensions, in inches (millimeters), are for reference only and are subject to change.

**Electrical Connector**

**Body**

**Process End Connection**

<table>
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<tr>
<th>Body Style</th>
<th>Model Accuracy</th>
<th>A in. (mm)</th>
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<tbody>
<tr>
<td>Plug</td>
<td>≤ 0.5 %</td>
<td>1.77 (45.0)</td>
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<tr>
<td></td>
<td>≤ 0.25 %</td>
<td>2.56 (65.0)</td>
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<tr>
<td>Direct-wire</td>
<td>zero and span</td>
<td>1.52 (38.5)</td>
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<tr>
<td></td>
<td>nonadjustable</td>
<td>2.13 (54.0)</td>
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</table>
**Process End Connection**

- **1/4 in. Male NPT and R1/4PT (ISO 7/1 Taper)**
- **1/2 in. Male NPT and R1/2PT (ISO 7/1 Taper)**
- **1/4 in. and 6 mm Swagelok Tube Adapter**
- **3/8 in. and 10 mm Swagelok Tube Adapter**
- **1/2 in. and 12 mm Swagelok Tube Adapter**

- **G1/4B EN (1/4 RG)**
- **G1/2B EN (1/2 RG)**
- **G1/4B PF (1/4 RJ)**
- **G1/2B PF (1/2 RJ)**

- **G1/2B EN Flush Diaphragm**
- **G1B EN Flush Diaphragm**
- **G1/2B EN Flush Diaphragm with Integral Cooling Element (2 Fins)**
- **G1B EN Flush Diaphragm with Integral Cooling Element (2 Fins)**

- **1/2 in. Male NPT with Mounted Cooling Element —40 to 302°F (~−40 to 150°C) (3 Fins)**
- **1/2 in. Male NPT with Mounted Cooling Element —40 to 392°F (~−40 to 200°C) (5 Fins)**
- **G1/2B EN with Mounted Cooling Element —40 to 302°F (~−40 to 150°C) (3 Fins)**
- **G1/2B EN with Mounted Cooling Element —40 to 392°F (~−40 to 200°C) (5 Fins)**
Options
Options are specified in transducer ordering numbers as shown in Ordering Information for each model.

EPDM and Fluorocarbon FKM/FPM O-Rings
EPDM or fluorocarbon FKM/FPM O-rings are available for flush diaphragm-type transducers. FKM is the designation for fluorinated elastomers as defined in ASTM D1418; FPM is the international designation defined in ISO/DIN 1629.

Alloy C-22 Diaphragm
An alloy C-22 diaphragm is available for flush diaphragm-type transducers with pressure ranges equal to or higher than 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm², 25 kPa).

Cables
Optional cable lengths are available. See Ordering Information for lengths available for each transducer model.

Cooling Elements
Cooling elements extend the temperature ratings of pressure transducers.

Integral cooling elements (option designator U) have two cooling fins and are available on S and T model transducers with flush diaphragms.

Mounted cooling elements (option designators R and S) have three and five cooling fins, respectively, and are available on S and T model transducers with internal diaphragms.

See the graph below for cooling element selection information.

Cooling Element Ratings—Media vs Ambient Temperature

<table>
<thead>
<tr>
<th>Media Temperature, °C</th>
<th>Ambient Temperature, °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>260</td>
</tr>
<tr>
<td>220</td>
<td>240</td>
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</tr>
<tr>
<td>0</td>
<td>20</td>
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</tbody>
</table>

Examples: For an ambient temperature of 150°F (65°C) and a media temperature of 250°F (121°C), cooling elements U, R, and S would be suitable.
For an ambient temperature of 150°F (65°C) and a media temperature of 350°F (176°C), only cooling elements R and S would be acceptable.

Accessories
Attachable Indicator Display
This LCD, 4-digit digital display attaches directly to S model transducers using an L-plug connector and 4 to 20 mA output signals. The display provides local readout of system pressure with simultaneous signal transmission.

Features
- Retrofits to transducers already in use
- Adjustable and programmable with flush-mounted keys below the front cover
- Rugged, compact plastic case meets IP65
- CE conformity to 89/336/EEC
- Integrated self-diagnosing circuit monitoring

Performance
- Accuracy: 0.2% of span ± 1 digit
- Scale adjustment: manually programmed, menu driven

Display
- Range: –1999 to 9999
- Pickup rate: 5/s
- 4-digit LCD, 0.40 in. (10.2 mm) high

Housing
- Material: ABS plastic

Electrical Data
- Input/output signal: 4 to 20 mA
- Voltage drop: 3 V
- Maximum current rating: 40 mA
- Power supply: supplied by the 4 to 20 mA loop
Remote Panel-Mount Display

The Swagelok compact remote panel meter digital indicator can accept many types of signal inputs and requires a supply voltage of 9 to 28 V (dc). The panel meter is fully user adjustable and programmable. The user-adjustable digital filtering improves readability during rapid pressure changes.

Temperature Rating
- Ambient: 32 to 122°F (0 to 50°C)
- Storage: −22 to 176°F (−30 to 80°C)
- Influence on display: 0.1 % per 18°F (10°C)

Ordering Number
PTI-PM

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Features
- Two programmable switching outputs
- Ingress protection IP54
- Alarm delay
- User-programmable
- EASYbus interface, galvanically isolated
- CE conformity to 89/336/EEC

Input Signals
- 0 to 20 mA, 4 to 20 mA
- 0 to 1 V, 0 to 2 V, 0 to 10 V
- 0 to 50 mV

Power Supply
- 9 to 28 V (dc)
- Current consumption: Maximum 30 mA (without alarm output and EASYBus interface)

Display
- Type: LED, 4 digits, 0.40 in. (10.2 mm) high
- Range: −1999 to 9999
- Refresh rate: 100 readings per second
- Decimal point: freely programmable
- Accuracy: 0.2 % of span ± 1 digit

Switching Outputs
- Number: Two individually adjustable
- Function: Minimum/maximum adjustable by setting hysteresis
- Adjustable: Within configured measurement range
- Hysteresis: Adjustable
- Response time: ≤ 20 ms
- Accuracy: Actual value by means of digital control
- Contacts: Two separate transistor switching outputs (selectable switching mode)
- Low-side (NPN) or High-side (PNP) or Push Pull
  - Low-side: Maximum 28 V/1 A
  - High-side: Maximum power supply (Ub/200 mA)

Ordering Number
PTI-AI

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Temperature Rating
- Operating −4 to 122°F (−20 to 50°C)
- Storage −22 to 158°F (−30 to 70°C)

Wiring
- Screw terminals, maximum wire cross-section 1.5 mm², two separate terminal blocks—one for power, switching output, transducer, and one for EASYbus interface

Input Signals
- 0 to 1 mA, 0 to 10 mA
- 0 to 50 mV

Power Supply
- 9 to 28 V (dc)
- Current consumption: Maximum 30 mA (without alarm output and EASYBus interface)

Display
- Type: LED, 4 digits, 0.40 in. (10.2 mm) high
- Range: −1999 to 9999
- Refresh rate: 100 readings per second
- Decimal point: freely programmable
- Accuracy: 0.2 % of span ± 1 digit

Switching Outputs
- Number: Two individually adjustable
- Function: Minimum/maximum adjustable by setting hysteresis
- Adjustable: Within configured measurement range
- Hysteresis: Adjustable
- Response time: ≤ 20 ms
- Accuracy: Actual value by means of digital control
- Contacts: Two separate transistor switching outputs (selectable switching mode)
- Low-side (NPN) or High-side (PNP) or Push Pull
  - Low-side: Maximum 28 V/1 A
  - High-side: Maximum power supply (Ub/200 mA)

Ordering Number
PTI-PW

Temperature Rating
- Operating −4 to 122°F (−20 to 50°C)
- Storage −22 to 158°F (−30 to 70°C)

Wiring
- Screw terminals, maximum wire cross-section 1.5 mm², two separate terminal blocks—one for power, switching output, transducer, and one for EASYbus interface

Input Signals
- 0 to 1 mA, 0 to 10 mA
- 0 to 50 mV

Power Supply
- 9 to 28 V (dc)
- Current consumption: Maximum 30 mA (without alarm output and EASYBus interface)

Display
- Type: LED, 4 digits, 0.40 in. (10.2 mm) high
- Range: −1999 to 9999
- Refresh rate: 100 readings per second
- Decimal point: freely programmable
- Accuracy: 0.2 % of span ± 1 digit

Switching Outputs
- Number: Two individually adjustable
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- Low-side (NPN) or High-side (PNP) or Push Pull
  - Low-side: Maximum 28 V/1 A
  - High-side: Maximum power supply (Ub/200 mA)
Accessories

Cooling Elements
Thread-on cooling element adapters are available for use with G1/2B EN (1/2 RG) process connections on S model transducers only. These cooling adapters increase the media temperature ratings.

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1/2B EN (1/2 RG), 302°F (150°C) media, 86°F (30°C) ambient (3 fins)</td>
<td>PTI-CE150-AW</td>
</tr>
<tr>
<td>G1/2B EN (1/2 RG), 392°F (200°C) media, 86°F (30°C) ambient (5 fins)</td>
<td>PTI-CE200-AW</td>
</tr>
<tr>
<td>1/2 in. male NPT, 302°F (150°C) media, 86°F (30°C) ambient (3 fins)</td>
<td>PTI-CE150-AP</td>
</tr>
<tr>
<td>1/2 in. male NPT, 392°F (200°C) media, 86°F (30°C) ambient (5 fins)</td>
<td>PTI-CE200-AP</td>
</tr>
</tbody>
</table>

Weld Adapters
Field-installed weld adapters with factory machined mating ports are available for the G1/2B EN and G1B EN flush diaphragm process connections.

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1/2B EN flush diaphragm weld adapter</td>
<td>PTI-WA-BV</td>
</tr>
<tr>
<td>G1B EN flush diaphragm weld adapter</td>
<td>PTI-WA-BJ</td>
</tr>
</tbody>
</table>

Cables and Connectors

<table>
<thead>
<tr>
<th>Mating Connector</th>
<th>Ordering Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bendix, 9 ft (3 m) cable, 4-wire, UL listed①</td>
<td>PTU-MC-1</td>
</tr>
<tr>
<td>Bendix, no cable, 4-pin</td>
<td>PTU-MC-2</td>
</tr>
<tr>
<td>M12 × 1, 6 ft (2 m) cable, straight, 4-wire</td>
<td>PTU-MC-3</td>
</tr>
<tr>
<td>M12 × 1, 16 ft (5 m) cable, straight, 4-wire</td>
<td>PTU-MC-4</td>
</tr>
<tr>
<td>M12 × 1, 6 ft (2 m) cable, 90° angled, 4-wire</td>
<td>PTU-MC-5</td>
</tr>
<tr>
<td>M12 × 1, no cable, straight, 4-pin</td>
<td>PTU-MC-6</td>
</tr>
<tr>
<td>M12 × 1, no cable, 90° angled, 4-pin</td>
<td>PTU-MC-7</td>
</tr>
<tr>
<td>M12 × 1, 6 ft (2 m) cable, straight, 5-wire, UL listed①</td>
<td>PTU-MC-8</td>
</tr>
<tr>
<td>M12 × 1, 16 ft (5 m) cable, straight, 5-wire, UL listed①</td>
<td>PTU-MC-9</td>
</tr>
<tr>
<td>M12 × 1, 6 ft (2 m) cable, 90° angled, 5-wire, UL listed①</td>
<td>PTU-MC-10</td>
</tr>
<tr>
<td>M12 × 1, 16 ft (5 m) cable, 90° angled, 5-wire, UL listed①</td>
<td>PTU-MC-11</td>
</tr>
<tr>
<td>M12 × 1, no cable, straight, 5-pin</td>
<td>PTU-MC-12</td>
</tr>
<tr>
<td>M12 × 1, no cable, 90° angled, 5-pin</td>
<td>PTU-MC-13</td>
</tr>
<tr>
<td>M12 × 1 male, no cable, 90° angled, 4-pin</td>
<td>PTU-MC-14</td>
</tr>
<tr>
<td>M12 × 1, 32 ft (10 m) cable, 90° angled, 4-wire, UL listed①</td>
<td>PTU-MC-15</td>
</tr>
</tbody>
</table>

① UL style 2164/1061, temperature rating 176°F (80°C).
② UL style 20549/1061, temperature rating 176°F (80°C).

Caution: Do not mix or interchange parts with those of other manufacturers.
About this document

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DeviceNet—TM ODVA
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Grafoil—TM GraTech International Holdings, Inc.
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Siliconert—TM Silcotek Corporation
Simriz—TM Freudenberg-NOK
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