

# Industrial Pressure Transducers

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



## Features

- Accuracy  $\leq 0.5\%$  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/cm<sup>2</sup>, and kPa. Pressure references of compound, gauge, or 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

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## Materials of Construction

Component	S Model	E Model	T Model
<b>Wetted</b>			
Internal diaphragm (25 bar [362 psi, 2.5 MPa, 25.5 kg/cm <sup>2</sup> , 2500 kPa] and lower pressure range)	316 SS		
Internal diaphragm (over 25 bar [362 psi, 2.5 MPa, 25.5 kg/cm <sup>2</sup> , 2500 kPa] pressure range)	AISI S13800	Elgiloy®	AISI S13800
Process connection, flush diaphragm	316 Ti		
Flush diaphragm, O-ring	Buna N		
<b>Nonwetted</b>			
Transducer body	316 SS		
Flush diaphragm internal fluid, piezoresistive sensor internal fluid	Synthetic oil		

## 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

<b>Accuracy</b>	≤ 0.5 % LPC (0.25 % BFS), including nonlinearity, hysteresis, zero-point and full-scale error, measured in accordance with IEC 61298-2
<b>Repeatability</b>	≤ 0.1 % of span
<b>Long-Term Stability</b>	≤ 0.2 % of span per year
<b>Response Time</b>	≤ 1 ms with internal diaphragm connection; ≤ 10 ms with flush diaphragm connection
<b>Shock Resistance</b>	1000 g (600 g for field case models) in accordance with IEC 60068-2-27 (mechanical shock)
<b>Vibration Resistance</b>	20 g (10 g for field case models) in accordance with IEC 60068-2-6 (vibration under resonance)
<b>Temperature Coefficients (TC) in Compensated Temperature Range</b>	Pressure ranges equal to or less than 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm <sup>2</sup> , 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/cm <sup>2</sup> , 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)

## Calibration

Every Swagelok pressure transducer is factory calibrated to ensure conformance to its stated accuracy.

## Model Selection Guide

Models	S Model Standard Industrial		E Model Explosion-Proof		T Model Intrinsically Safe	
Approvals	CE and CSA®		FM® and CSA		FM and CSA	
Diaphragm Type	Internal	Flush	Internal	Flush	Internal	Flush
Application	Wide variety of general industrial applications	Slurries, crystallizing, or high-viscosity media	In hazardous locations requiring explosion-proof design	Slurries, crystallizing, or high-viscosity media requiring explosion-proof design	In hazardous areas requiring intrinsically safe system design	Slurries, crystallizing, or high-viscosity media in hazardous areas requiring intrinsically safe design
Pressure Range	See <b>Pressure Range Designators</b> , page 10.					
Vacuum psi to...	15 000 psi	8000 psi	15 000 psi	8000 psi	15 000 psi	8000 psi
Vacuum bar to...	1000 bar	600 bar	1000 bar	600 bar	1000 bar	600 bar
Vacuum MPa to...	100 MPa	60 MPa	100 MPa	60 MPa	100 MPa	60 MPa
Vacuum kg/cm <sup>2</sup> to...	1000 kg/cm <sup>2</sup>	600 kg/cm <sup>2</sup>	1000 kg/cm <sup>2</sup>	600 kg/cm <sup>2</sup>	1000 kg/cm <sup>2</sup>	600 kg/cm <sup>2</sup>
Vacuum kPa to...	100 000 kPa	60 000 kPa	100 000 kPa	60 000 kPa	100 000 kPa	60 000 kPa
Pressure Reference	Gauge, absolute, compound					
Output Signal	4 to 20 mA 0 to 5 V 0 to 10 V		4 to 20 mA 1 to 5 V		4 to 20 mA	
Options	See <b>Options</b> , page 14.					
Special cleaning ASME B40.1 Level IV	✓		✓		✓	
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 <sup>2</sup> , 25 kPa])	✓	✓	–	–	✓	✓
11-Point Certificate of Calibration traceable to DKD, EN 10204 3.1	✓	✓	✓	✓	✓	✓
General Material Certificate of Compliance, EN 10204 2.2	✓	✓	✓	✓	✓	✓
Material Test Certificate, EN 10204 3.1, heat code traceable	✓	✓	✓	✓	✓	✓
Certificate of Accuracy, EN 10204 2.2	✓	✓	✓	✓	✓	✓
EPDM or fluorocarbon FKM/FPM O-rings	–	✓	–	✓	–	✓
Integral cooling element (–4 to 302°F [–20 to 150°C])	–	✓	–	–	–	✓
Mounted cooling element (–40 to 302°F [–40 to 150°C] or –40 to 392°F [–40 to 200°C])	✓	–	–	–	✓	–
Alloy C-22 flush diaphragm (for pressure ranges ≥ 0.25 bar [3.6 psi, 0.025 MPa, 0.25 kg/cm <sup>2</sup> , 25 kPa])	–	✓	–	✓	–	✓
Cable lengths 9 ft (2.7 m), 16 ft (4.9 m), 32 ft (9.8 m)	✓	✓	–	–	✓	✓
Cable lengths 10 ft (3.0 m), 20 ft (6.1 m), 30 ft (9.1 m)	–	–	✓	✓	–	–
Display	See <b>Accessories</b> , page 14.					

## 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:
  - EMC Directive—2004/108/EC tested in accordance with EN 61 326-1:2006 and EN 61 326- 2-3:2006
  - 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.

A    B C D E  
 PTI - S - NG160 - 1 5 AO - E

#### **A** Pressure Range

See pages 10 and 11.

#### **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 × 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<sup>①</sup>
- 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)<sup>②</sup>
- AW = G1/2B EN (1/2 RG)<sup>①②</sup>
- AX = G1/4B PF (1/4 RJ)<sup>③</sup>
- AZ = G1/2B PF (1/2 RJ)<sup>③</sup>
- 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 3 and 14.)

For multiple options, add designators in alphabetical order.

- A** = Special cleaning, ASME B40.1 Level IV<sup>①</sup>
- 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<sup>2</sup>, 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)<sup>②</sup>
- S** = Mounted cooling element, -40 to 392°F (-40 to 200°C) (5 fins)<sup>②</sup>
- T** = 9 ft (2.7 m) cable<sup>③</sup>
- Y** = 16 ft (4.9 m) cable<sup>③</sup>
- Z** = 32 ft (9.8 m) cable<sup>③</sup>

#### **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/cm<sup>2</sup>, 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/cm<sup>2</sup>, 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.

A    B C D    E  
 PTI - E - **NG160** - 1 9 **AQ** - **AE**

#### **A** Pressure Range

See pages 10 and 11.

#### **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)<sup>①</sup>

**AW** = G1/2B EN (1/2 RG)<sup>①</sup>

**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

<sup>①</sup> Can be used with Swagelok **RG** adapter fittings.

#### **E** Options (See pages 3 and 14.)

For multiple options, add designators in alphabetical order.

**A** = Special cleaning, ASME B40.1 Level IV<sup>①</sup>

**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  $\geq 0.25$  bar [3.6 psi, 0.025 MPa, 0.25 kg/cm<sup>2</sup>, 25 kPa]; requires process end connection **BV** or **BJ**)

**W** = EPDM O-ring

**X** = Fluorocarbon FKM/FPM O-ring

<sup>①</sup> Available *only* with positive pressure ranges  $\geq 0.25$  bar (3.6 psi, 0.025 MPa, 0.25 kg/cm<sup>2</sup>, 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).

## T Model: Intrinsically Safe

The Swagelok T Model is engineered for use in industrial pressure measurement applications where intrinsically safe ratings are required, such as hazardous environments or media, including gases, vapors and dust. Products are approved as intrinsically safe, FM and CSA, when used with an intrinsically safe associated apparatus.

- Adjustable zero and span
- Available in a field-case version for use in corrosive or washdown environments



### 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)

### Electrical Data

- Power supply: 10 V (11 V for field-case versions) to 30 V (dc)

#### Maximum Load Equations

Milliampere output signal, 2-wire

- Output: 4 to 20 mA
- Supply:  $V$  (dc) = 10 V<sup>①</sup> to 30 V
- Maximum load:  $RI$  ( $\Omega$ )  
 $= (V$  [dc]  $- 10$  V<sup>①</sup>)  $\div 0.02$  A  
 $-$  (Length of flying lead in meters  $\times 0.14$   $\Omega$ /m)

① 11 V for field-case version.

### 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 IP65
  - Entity parameters:
    - $V_{\max}$  = 30 V (dc)
    - $I_{\max}$  = 100 mA at  $T_{\text{amb}} \leq 85^{\circ}\text{C}$
    - $I_{\max}$  = 87 mA at  $T_{\text{amb}} > 85^{\circ}\text{C}$
    - $P_i$  = 1 W
    - $C_i$  = 22 nF ( $\pm 0.2$  nF/m for flying leads)
    - $L_i$  = 0 mH ( $\pm 2$   $\mu\text{H}$ /m for flying leads)
- CSA (Canada and U.S.A.) and FM nonincendive:
  - Class I, Division 2, Groups A, B, C, and D
  - Class II, Division 2, Groups F and G
  - Class III, Division 2
  - Field wiring parameters:
    - $V_{\max}$  = 30 V (dc)
    - $I_{\max}$  = 100 mA at  $T_{\text{amb}} \leq 85^{\circ}\text{C}$
    - $I_{\max}$  = 87 mA at  $T_{\text{amb}} > 85^{\circ}\text{C}$
    - $P_i$  = 1 W
    - $C_i$  = 22 nF ( $\pm 0.2$  nF/m for flying leads)
    - $L_i$  = 0 mH ( $\pm 2$   $\mu\text{H}$ /m for flying leads)
- 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.

A
B
C
D
E  
 PTI - T - **AG160** - 1 7 **AS** - **A**

#### **A** Pressure Range

See pages 10 and 11.

#### **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)<sup>①</sup>

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<sup>①</sup>

8 = Bendix 6-pin MIL plug (IP67/NEMA 4)

**A** = Field case, M20 × 1.5 plastic cable gland, screw terminals (IP67/NEMA 4X)

**B** = Field case, M20 × 1.5 nickel-plated brass cable gland, screw terminals (IP67/NEMA 4X)

**C** = Field case, M20 × 1.5 stainless steel cable gland, screw terminals (IP67/NEMA 4X)

**D** = Field case, 1/2 in. female NPT stainless steel conduit, screw terminals (IP67/NEMA 4X)

<sup>①</sup> Ambient temperature 176°F (80°C) maximum.

#### **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)<sup>①</sup>

**AW** = G1/2B EN (1/2 RG)<sup>①</sup>

**AX** = G1/4B PF (1/4 RJ)<sup>②</sup>

**AZ** = G1/2B PF (1/2 RJ)<sup>②</sup>

**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

<sup>①</sup> Can be used with Swagelok **RG** adapter fittings.

<sup>②</sup> Can be used with Swagelok **RJ** adapter fittings.

#### **E** Options (See pages 3 and 14.)

For multiple options, add designators in alphabetical order.

**A** = Special cleaning, ASME B40.1 Level IV<sup>①</sup>

**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<sup>2</sup>, 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)<sup>②</sup>

**S** = Mounted cooling element, -40 to 392°F (-40 to 200°C) (5 fins)<sup>②</sup>

**T** = 9 ft (2.7 m) cable<sup>③</sup>

**Y** = 16 ft (4.9 m) cable<sup>③</sup>

**Z** = 32 ft (9.8 m) cable<sup>③</sup>

#### **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<sup>2</sup>, 25 kPa]; requires process end connection **BV** or **BJ**)


**W** = EPDM O-ring

**X** = Fluorocarbon FKM/FPM O-ring

<sup>①</sup> Available *only* with positive pressure ranges ≥ 0.25 bar (3.6 psi, 0.025 MPa, 0.25 kg/cm<sup>2</sup>, 25 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).

<sup>②</sup> 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.

<sup>③</sup> Available *only* with direct-wire electrical connectors; select electrical connector **2** or **7**.

 **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

Pressure Range		Designator	Over-pressure Rating	Burst Rating	Sensor Type
Minimum	Maximum				
<b>psi Gauge Reference</b>					
Vacuum -30 in Hg	0	NC0	72	87	Piezoresistive
	30	NC30 <sup>①</sup>	140	170	
	60	NC60	140	170	
	100	NC100	140	170	
	160	NC160	500	600	
	200	NC200	500	600	
	300	NC300	500	600	
0	5	NG5 <sup>②</sup>	72	87	Piezoresistive
	10	NG10	72	87	
	15	NG15	72	87	
	25	NG25	72	87	
	30	NG30 <sup>①</sup>	72	87	
	50	NG50	140	170	
	60	NG60	240	290	
	100	NG100	240	290	
	160	NG160	500	600	
	200	NG200	500	600	
	250	NG250	500	600	
	300	NG300	500	600	
	400	NG400	1 160	1 390	
	500	NG500	1 160	5 800	
	600	NG600	1 740	7 970	
	750	NG750	1 740	7 970	
	1 000	NG1000	2 900	11 600	
	1 500	NG1500	4 640	14 500	
	2 000	NG2000	4 640	14 500	
	3 000	NG3000	7 250	17 400	
5 000	NG5000 <sup>③</sup>	11 600	24 650		
8 000	NG8000 <sup>④</sup>	17 400	34 800		
10 000	NG10K <sup>⑤</sup>	21 750	43 500		
15 000	NG15K	21 750	43 500		
<b>psi Absolute</b>					
0	15	NA15	72	87	Piezoresistive
	25	NA25 <sup>①</sup>	72	87	
	50	NA50	140	170	
	100	NA100	240	290	
	250	NA250	500	600	
	500	NA500	1 160	5 800	
<b>psi Absolute</b>					
<b>bar</b>					
Pressure Range		Designator	Over-pressure Rating	Burst Rating	Sensor Type
Minimum	Maximum				
<b>bar Gauge Reference</b>					
Vacuum -1	0	AC0	1	2	Piezoresistive
	0.6	AC.6 <sup>①</sup>	4	4.8	
	3	AC3	17	20.5	
	5	AC5	35	42	
	9	AC9	35	42	
	15	AC15	80	96	
	25	AC25	50	250	
0	0.1	AG.1	1	2	Piezoresistive
	0.16	AG.16	1.5	2	
	0.25	AG.25	2	2.4	
	0.4	AG.4 <sup>②</sup>	2	2.4	
	0.6	AG.6	4	4.8	
	1	AG1	5	6	
	1.6	AG1.6 <sup>①</sup>	10	12	
	2.5	AG2.5	10	12	
	4	AG4	17	20.5	
	6	AG6	35	42	
	10	AG10	35	42	
	16	AG16	80	96	
	25	AG25	50	250	
	40	AG40	80	400	
	60	AG60	120	400	
	100	AG100	200	800	
	160	AG160	320	1 000	
	250	AG250	500	1 200	
	400	AG400 <sup>③</sup>	800	1 500	
	600	AG600 <sup>④⑤</sup>	1 200	1 500	
1 000	AG1000	1 500	3 000		
<b>bar Absolute</b>					
0	0.25	AA.25	2	2.4	Piezoresistive
	0.4	AA.4	2	2.4	
	0.6	AA.6	4	4.8	
	1	AA1	5	6	
	1.6	AA1.6 <sup>①</sup>	10	12	
	2.5	AA2.5	10	12	
	4	AA4	17	20.5	
	6	AA6	35	42	
	10	AA10	35	42	
16	AA16	80	96		

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**

Pressure Range		Designator	Over-pressure Rating	Burst Rating	Sensor Type	
Minimum	Maximum					
<b>MPa Gauge Reference</b>						
Vacuum -0.1	0	MC0	0.1	0.2	Piezoresistive	
	0.06	MC.06	0.4	0.48		
	0.15	MC.15 <sup>①</sup>	1	1.2		
	0.3	MC.3	1.7	2		
	0.6	MC.6	3.5	4.2		
	0.9	MC.9	3.5	4.2		
	1.5	MC1.5	8	9.6		
	2.5	MC2.5	5	25		
0	0.04	MG.04 <sup>②</sup>	0.2	0.24	Piezoresistive	
	0.06	MG.06	0.4	0.48		
	0.1	MG.1	0.5	0.6		
	0.16	MG.16 <sup>①</sup>	1	1.2		
	0.25	MG.25	1	1.2		
	0.4	MG.4	1.7	2		
	0.6	MG.6	3.5	4.2		
		1	MG1.0	3.5	4.2	
		1.6	MG1.6	8	9.6	
		2.5	MG2.5	5	25	
		4	MG4	8	40	Metal thin film
		6	MG6	12	40	
		10	MG10	20	80	
		16	MG16	32	100	
	25	MG25	50	120		
	40	MG40 <sup>③</sup>	80	150		
	60	MG60 <sup>④⑤</sup>	120	150		
	100	MG100	150	300		

**kg/cm<sup>2</sup>**

Pressure Range		Designator	Over-pressure Rating	Burst Rating	Sensor Type	
Minimum	Maximum					
<b>kg/cm<sup>2</sup> Gauge Reference</b>						
Vacuum -1	0	CC0	1	2	Piezoresistive	
	0.6	CC.6	4	4.8		
	1	CC1	5	6		
	1.6	CC1.6 <sup>①</sup>	10	12		
	3	CC3	17	20.5		
	4	CC4	17	20.5		
	5	CC5	35	42		
	9	CC9	35	42		
	15	CC15	80	96		
	25	CC25	50	250		
0	0.6	CG.6	4	4.8	Piezoresistive	
	1	CG1	5	6		
	1.6	CG1.6 <sup>①</sup>	10	12		
	2.5	CG2.5	10	12		
	4	CG4 <sup>②</sup>	17	20.5		
	6	CG6	35	42		
	10	CG10	35	42		
		16	CG16	80	96	Metal thin film
		25	CG25	50	250	
		40	CG40	80	400	
		60	CG60	120	400	
		100	CG100	200	800	
		160	CG160	320	1 000	
		250	CG250	500	1 000	
	400	CG400 <sup>③</sup>	800	1 500		
	600	CG600 <sup>④⑤</sup>	1 200	1 500		
	1 000	CG1000	1 500	3 000		

**kPa**

Pressure Range		Designator	Over-pressure Rating	Burst Rating	Sensor Type	
Minimum	Maximum					
<b>kPa Gauge Reference</b>						
Vacuum -100	0	JC0	100	200	Piezoresistive	
	60	JC60 <sup>①</sup>	400	480		
	300	JC300	1 700	2 000		
	500	JC500	1 700	2 000		
	900	JC900	3 500	4 200		
	1 500	JC1500	8 000	9 600		
0	40	JG40 <sup>②</sup>	200	240	Piezoresistive	
	60	JG60	400	480		
	100	JG100	500	600		
	160	JG160 <sup>①</sup>	1 000	1 200		
	250	JG250	1 000	1 200		
	400	JG400	1 700	2 000		
	600	JG600	3 500	4 200		
		1 000	JG1000	3 500	4 200	Metal thin film
		1 600	JG1600	8 000	9 600	
		2 500	JG2500	5 000	25 000	
		4 000	JG4000	8 000	40 000	
		6 000	JG6000	12 000	40 000	
		10 000	JG10K	20 000	80 000	
		16 000	JG16K	32 000	100 000	
	25 000	JG25K	50 000	120 000		
	31 500	JG31.5K	50 000	120 000		
	40 000	JG40K <sup>③</sup>	80 000	150 000		
	60 000	JG60K <sup>④⑤</sup>	120 000	150 000		
	100 000	JG100K	150 000	300 000		

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.

### Dimensions

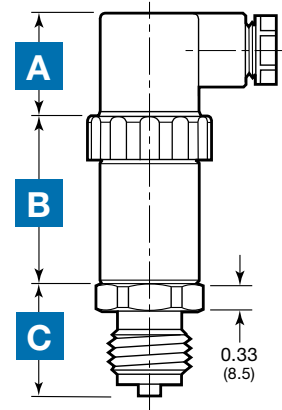
Choose electrical connector, body type, and process end connection, and add together for overall height of transducer.

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

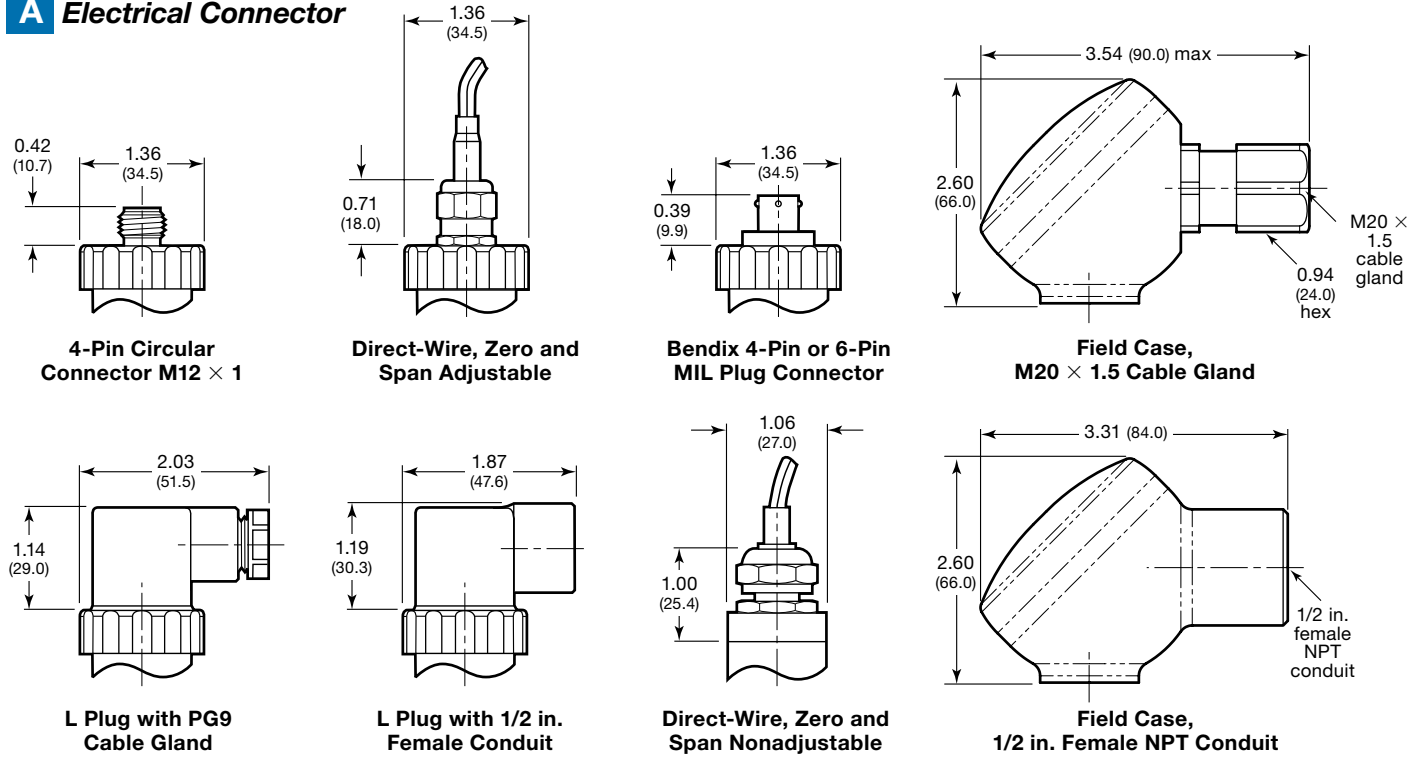
### Electrical Connector

### Body

### Process End Connection

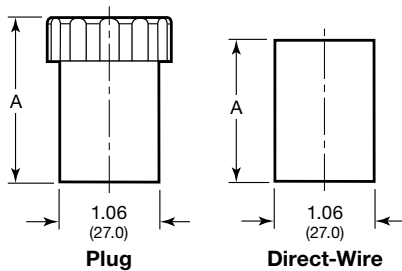


### A Electrical Connector



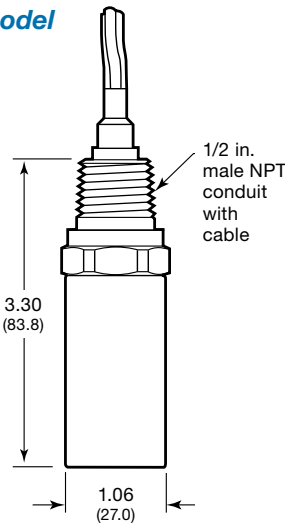
### B Body

#### S Model

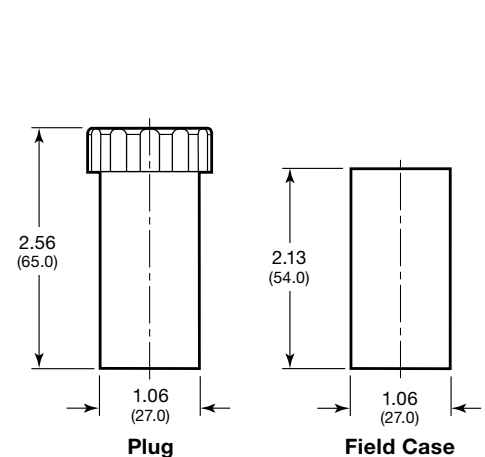


Body Style	Model Accuracy	A in. (mm)
Plug	≤ 0.5 %	1.77 (45.0)
	≤ 0.25 %	2.56 (65.0)
Direct-wire zero and span nonadjustable	≤ 0.5 %	1.52 (38.5)
	≤ 0.25 %	2.13 (54.0)

#### E Model

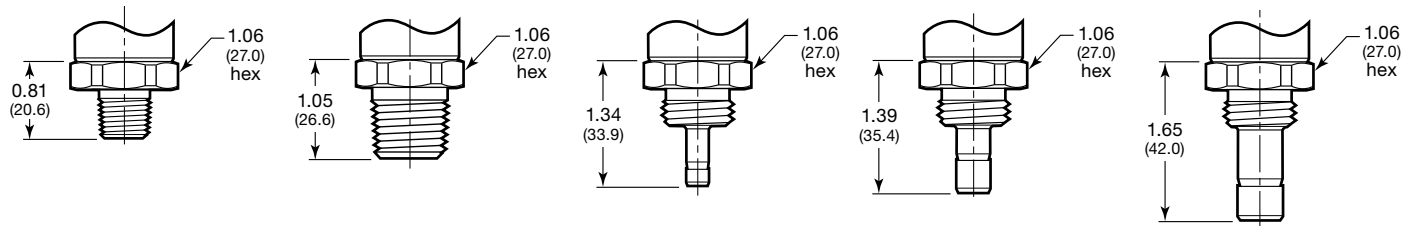


#### T Model



**Dimensions**

**C Process End Connection**



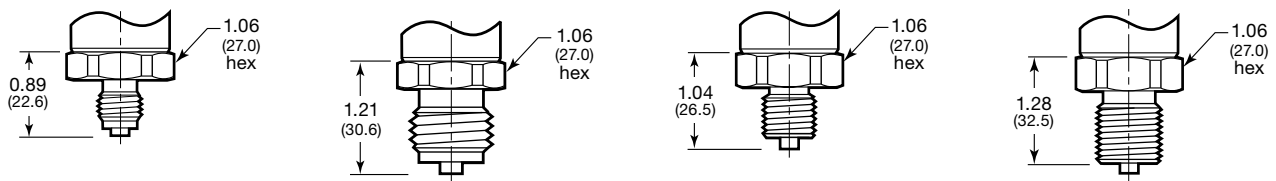
**1/4 in. Male NPT and R1/4PT (ISO 7/1 Taper)**

**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**

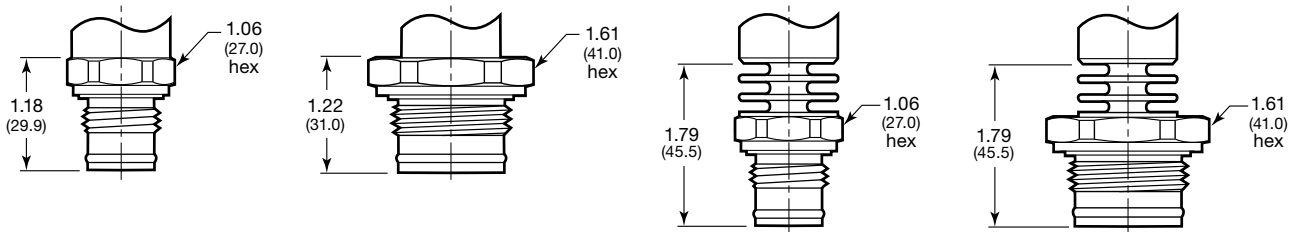


**G1/4B EN (1/4 RG)**

**G1/2B EN (1/2 RG)**

**G1/4B PF (1/4 RJ)**

**G1/2B PF (1/2 RJ)**

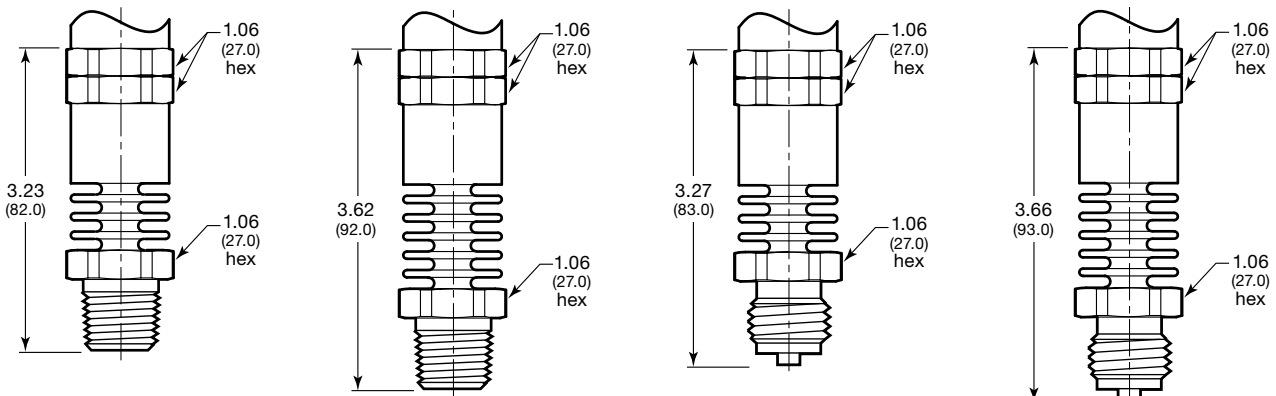


**G1/2B EN Flush Diaphragm**

**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)**

**G1/2 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/cm<sup>2</sup>, 25 kPa).

### Cables

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

## Cooling Elements

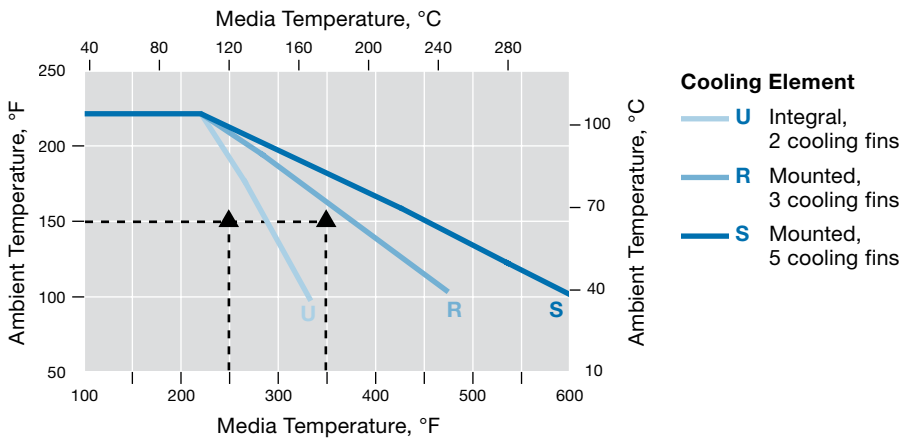
Cooling elements extend the temperature ratings of pressure transducers.

**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



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  $\pm$  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

## Accessories



### 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

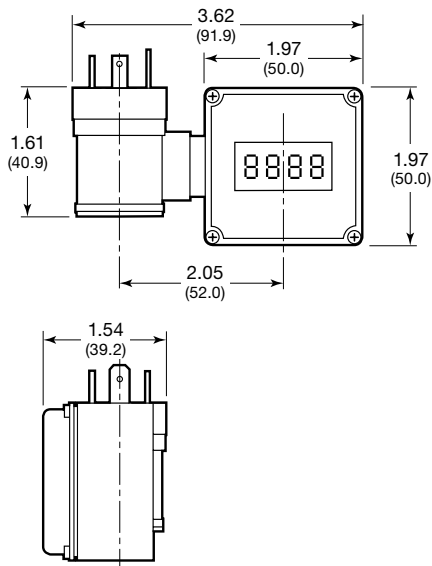
- Ambient: 32 to 122°F (0 to 50°C)
- Storage: -22 to 176°F (-30 to 80°C)
- Influence on display: 0.1 % per 18°F (10°C)

#### Ordering Number

PTI-AI

#### Dimensions

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



#### Features

- Two programmable switching outputs
  - Ingress protection IP54<sup>①</sup>
  - Alarm delay
  - User-programmable
  - EASYbus interface, galvanically isolated
  - CE conformity to 89/336/EEC
- <sup>①</sup> Front protection IP65 when properly installed in panel by using the provided seals.

#### 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<sup>①</sup>
- <sup>①</sup> < 0.3 % of span ± 1 digit accuracy.

#### Power Supply

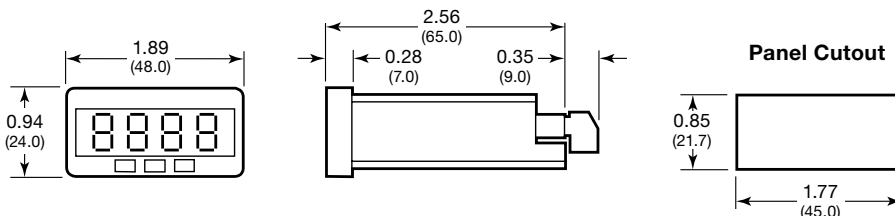
- 9 to 28 V (dc)
- Current consumption: Maximum 30 mA (without alarm output and EASYBus interface)

#### 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

#### 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 mm<sup>2</sup>, two separate terminal blocks—one for power, switching output, transducer, and one for EASYbus interface

#### 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 (U<sub>b</sub>/200 mA)

#### Ordering Number

PTI-PM

## 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.



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

### 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.



Description	Ordering Number
G1/2B EN flush diaphragm weld adapter	PTI-WA-BV
G1B EN flush diaphragm weld adapter	PTI-WA-BJ

### Cables and Connectors



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

<sup>①</sup> UL style 2164/1061, temperature rating 176°F (80°C).

<sup>②</sup> UL style 20549/1061, temperature rating 176°F (80°C).

#### Safe Product Selection

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.**

**Caution: Do not mix or interchange parts with those of other manufacturers.**

### Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.

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