

# BTE5000 / PTE5000 / PTU5000 Series

## Precision differential pressure transmitters



### FEATURES

- 25 mbar to 10 bar, 0.3 to 150 psi differential pressure
- 1...6 V or 4...20 mA output<sup>12</sup>
- Precision temperature compensated and calibrated
- Rugged aluminium housing
- Female 1/8" BSP and 1/8" NPT fittings

### MEDIA COMPATIBILITY

Pressure inlet:

Non-corrosive, non-ionic media such as air, dry gases and the like

Housing:

Aluminium, protection class IP 67 (according to DIN EN 60529, NEMA 6)<sup>1</sup>



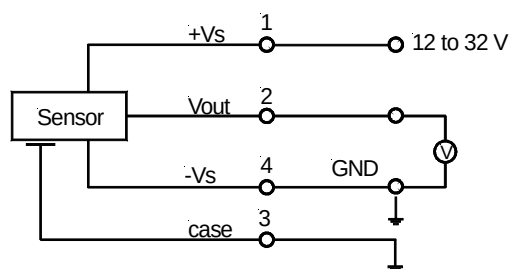
### SPECIFICATIONS<sup>10,11</sup>

#### Maximum ratings

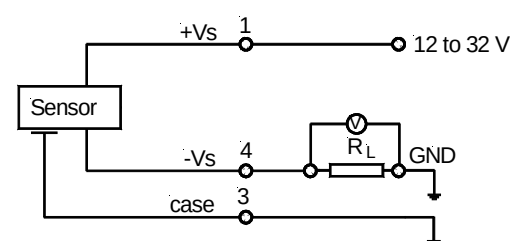
|                                                     |                    |
|-----------------------------------------------------|--------------------|
| Supply voltage                                      | 12...32 V          |
| Output current BTE(M)/PTE/PTU5...D1...              |                    |
| Source                                              | 20 mA              |
| Sink                                                | 10 mA              |
| Output current BTE(M)/PTE/PTU5...D4...              | 30 mA              |
| Temperature limits                                  |                    |
| Storage                                             | -40...85 °C        |
| Operating                                           | -25...85 °C        |
| Compensated                                         | 0...70 °C          |
| Proof pressure <sup>2</sup>                         |                    |
| BTEM5x025... / PTx5000.3...                         | 0.35 bar / 5 psi   |
| BTEM5x070..., BTEM5x350... / PTx5001..., PTx5005... | 1.4 bar / 20 psi   |
| all others                                          | 2 x rated pressure |
| Pressure at any port <sup>3</sup>                   |                    |
| BTEM5x025... / PTx5000.3...                         | 3.5 bar / 50 psi   |
| all others                                          | 12 bar / 175 psi   |

### ELECTRICAL CONNECTION

#### 1...6 V output version



#### 4...20 mA output version



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### COMMON PERFORMANCE CHARACTERISTICS<sup>8</sup>

| Characteristics                             |        |                                                                               | Min. | Typ.                                 | Max.                                 | Unit    |
|---------------------------------------------|--------|-------------------------------------------------------------------------------|------|--------------------------------------|--------------------------------------|---------|
| Thermal effects<br>(0 to 70°C) <sup>6</sup> | Offset | all ≤ 70 mbar / 1 psid devices<br>all 350 mbar / 5 psid devices<br>all others |      | ±0.025<br>±0.008<br>±0.005<br>±0.001 | ±0.125<br>±0.040<br>±0.025<br>±0.045 | %FSO/°C |
|                                             | Span   |                                                                               |      |                                      |                                      |         |
| Non-linearity and hysteresis <sup>4</sup>   |        |                                                                               |      | ±0.2                                 | ±1                                   | %FSO    |
| Long term stability <sup>5</sup>            |        |                                                                               |      | ±0.2                                 |                                      |         |
| Output noise (0 ≤ f ≤ 1 kHz)                |        |                                                                               |      | 0.04                                 |                                      |         |
| Response time (10 to 90 %)                  |        |                                                                               |      | 1                                    |                                      | ms      |

### INDIVIDUAL PERFORMANCE CHARACTERISTICS<sup>8</sup>

**1...6 V output versions** ( $V_S = 15\text{ V}$ ,  $t_{\text{amb}} = 25^\circ\text{C}$ ,  $R_L > 100\text{ k}\Omega$ , com. mode pressure = 0)

| Characteristics              |                                      |  | Min.       | Typ.       | Max.       | Unit     |
|------------------------------|--------------------------------------|--|------------|------------|------------|----------|
| Zero pressure offset         | BTE(M)5P... / PTx5P...<br>all others |  | 3.4<br>0.9 | 3.5<br>1.0 | 3.6<br>1.1 | V        |
|                              |                                      |  |            |            |            |          |
| Full scale span <sup>7</sup> | BTE(M)5P... / PTx5P...<br>all others |  | 2.4<br>4.9 | 2.5<br>5.0 | 2.6<br>5.1 |          |
| Full scale output            |                                      |  |            | 6.0        |            |          |
| Power supply rejection       | Offset                               |  |            | 0.05       |            | %FSO/V   |
|                              | Span                                 |  |            | 0.03       |            |          |
| Output impedance             |                                      |  |            |            | 50         | $\Omega$ |
| Power consumption            |                                      |  |            | 60         |            | mW       |

**4...20 mA output versions** ( $V_S = 15\text{ V}$ ,  $t_{\text{amb}} = 25^\circ\text{C}$ ,  $R_L = 100\text{ }\Omega$ , com. mode pressure = 0)

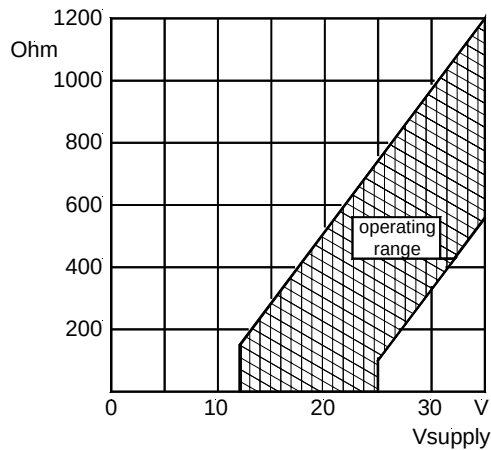
| Characteristics                            |                                      |  | Min.        | Typ.        | Max.        | Unit     |
|--------------------------------------------|--------------------------------------|--|-------------|-------------|-------------|----------|
| Zero pressure offset                       | BTE(M)5P... / PTx5P...<br>all others |  | 11.9<br>3.9 | 12.0<br>4.0 | 12.1<br>4.1 | mA       |
|                                            |                                      |  |             |             |             |          |
| Full scale span <sup>7</sup>               | BTE(M)5P... / PTx5P...<br>all others |  | 7.9<br>15.9 | 8.0<br>16.0 | 8.1<br>16.1 |          |
| Full scale output                          |                                      |  |             | 20.0        |             |          |
| Power supply rejection                     | Offset                               |  |             | 0.05        |             | %FSO/V   |
|                                            | Span                                 |  |             | 0.03        |             |          |
| Output impedance                           |                                      |  |             |             | 0.1         | $\Omega$ |
| Power consumption ( $I_L = 20\text{ mA}$ ) |                                      |  |             | 260         |             | mW       |

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### LOAD LIMITATION

4...20 mA output versions



### ELECTROMAGNETIC CAPABILITY<sup>9</sup>

|                                                                      | Test conditions                                               | Criterion | Interference |
|----------------------------------------------------------------------|---------------------------------------------------------------|-----------|--------------|
| Radiated, radio frequency electromagnetic field immunity (RFI)       | EN61000-4-3: 10 V/m, 80 to 1000 MHz<br>80 % AMC (1 kHz)       | A         | <1 %FSO      |
| Electrical fast transient / burst immunity (EFT)                     | EN61000-4-4: ±2 kV                                            | B         | <1 %FSO      |
| Electrostatic discharge immunity test (ESD)                          | EN61000-4-2: ±4 kV, contact discharge<br>±8 kV, air discharge | B         | <1 %FSO      |
| Immunity to conducted disturbances induced by radio-frequency fields | EN61000-4-6: 0.15 to 80 MHz<br>10 V, 80 % AMC (1 kHz)         | A         | <1 %FSO      |

#### Specification notes:

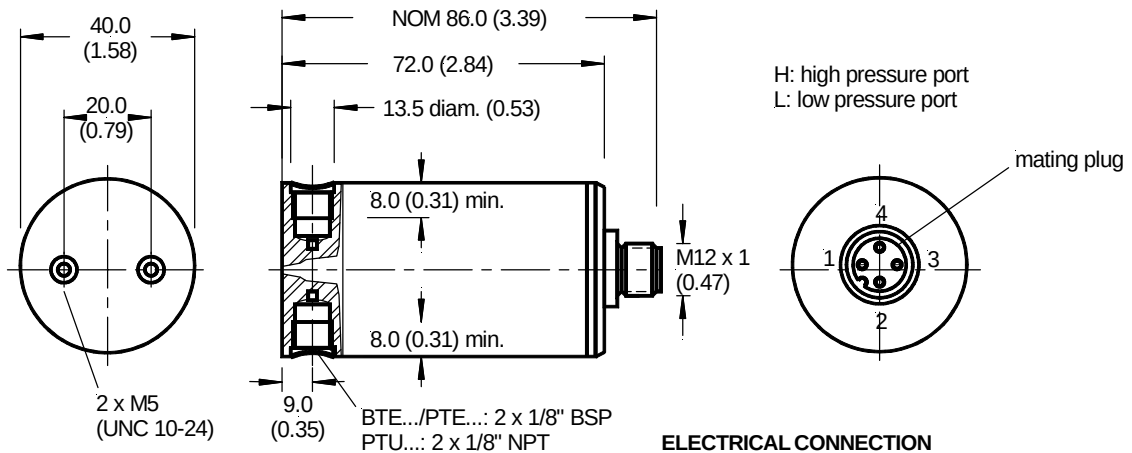
- IP 67 protection for BTE(M)5...A / PTx5...A is given with locked connector only.
- Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- This is the highest pressure which can be applied to any port at any time. At the same time the differential pressure between the ports H and L must not exceed the maximum proof pressure.
- Non-linearity refers to the **Best Straight Line** fit measured for offset, full scale span and 1/2 full scale span.
- Long term stability is the change in output after one year or 1 million pressure cycles.
- Thermal effects tested and guaranteed from 0 - 70 °C relative to 25°. All specifications shown are relative to 25°C.
- Full scale span is the algebraic difference between the positive full scale output and zero pressure offset.
- Higher pressure applied to port H.
- Test are in accordance with EN 61000-6-2.
- CE-labelling is in accordance with 2004/108/EC.
- The pressure transmitters must not be used as safety accessories according to article 1, 2.1.3 of the directive 97/23/EC.
- 0...10 V square rooting output signal on special request.

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### OUTLINE DRAWING

#### Connector version



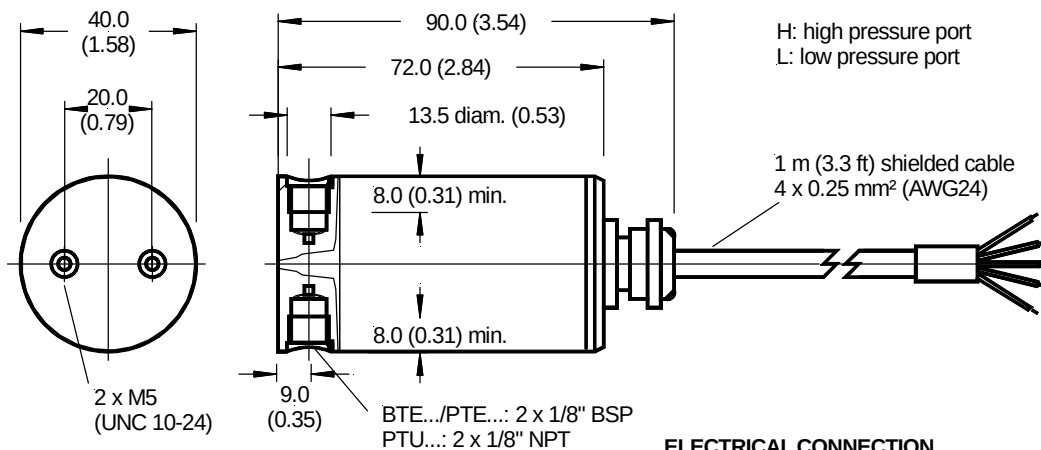
mass: typ. 170 g

#### ELECTRICAL CONNECTION

| Pin | Connection     |                  |
|-----|----------------|------------------|
|     | 1 - 6 V output | 4 - 20 mA output |
| 1   | +Vs            | +Vs              |
| 2   | Vout           | NC               |
| 3   | case           | case             |
| 4   | -Vs            | -Vs              |

dimensions in mm  
(inches)

#### Cable version



mass: typ. 220 g

#### ELECTRICAL CONNECTION

|        | Connection     |                  |
|--------|----------------|------------------|
|        | 1 - 6 V output | 4 - 20 mA output |
| bare   | case/shield    | case/shield      |
| brown  | +Vs            | +Vs              |
| white  | NC             | NC               |
| green  | Vout           | NC               |
| yellow | -Vs            | -Vs              |

dimensions in mm  
(inches)

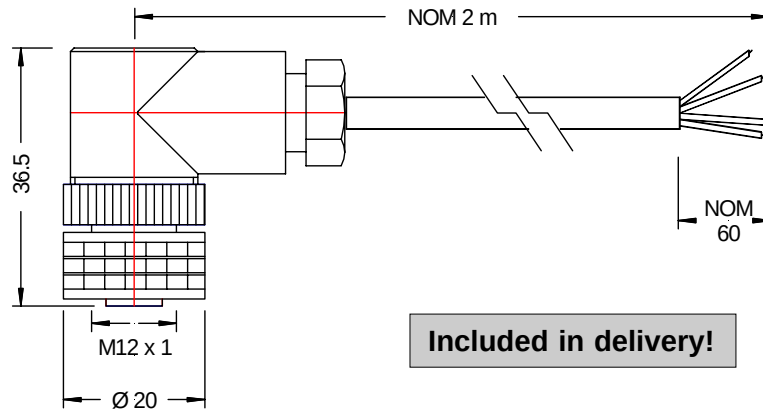
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### RECOMMENDED CABLE/CONNECTOR ACCESSORY

for connector version

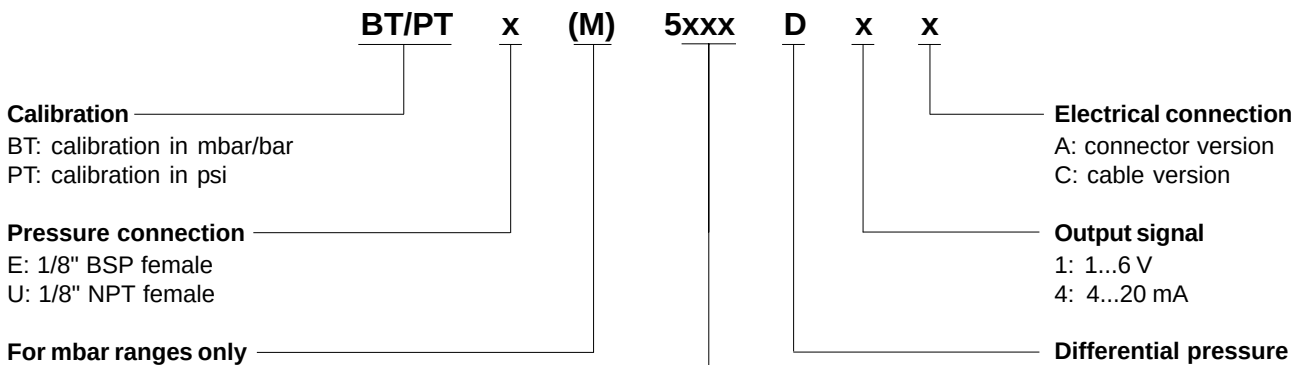
Order number **ZK000101**, other cable length on special request



#### PIN CONNECTION

| Pin | Flying lead end |
|-----|-----------------|
| 1   | brown           |
| 2   | green           |
| 3   | white + shield  |
| 4   | yellow          |

### ORDERING INFORMATION



| BTE5000 series         | PTE/PTU5000 series |
|------------------------|--------------------|
| 0025: 0...25 mbar      | 000.3: 0...0.3 psi |
| P025: -25...+25 mbar   | 001: 0...1 psi     |
| 0070: 0...70 mbar      | P01: -1...+1 psi   |
| P070: -70...+70 mbar   | 005: 0...5 psi     |
| 0350: 0...350 mbar     | P05: -5...+5 psi   |
| P350: -350...+350 mbar | 015: 0...15 psi    |
| 001: 0...1 bar         | P15: -15...+15 psi |
| P01: -1...+1 bar       | 030: 0...30 psi    |
| 002: 0...2 bar         | 100: 0...100 psi   |
| 005: 0...5 bar         | 150: 0...150 psi   |
| 010: 0...10 bar        |                    |

Other pressure ranges and options are widely available. Please contact First Sensor.

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