

BTEL5000 / PTUL5000 Series

Precision very low differential pressure transmitters

FEATURES

- 1 to 10 mbar, 1 to 10 inH₂O differential pressure
- 1...6 V or 4...20 mA output
- 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 working fluids such as air, dry gases and the like

Housing:

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



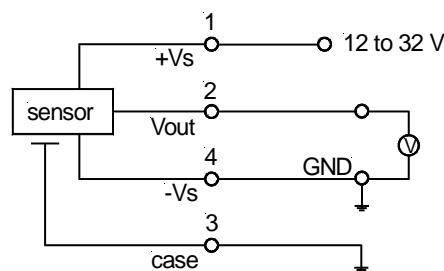
SPECIFICATIONS¹²

Maximum ratings

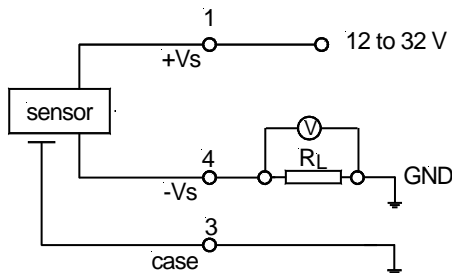
| | |
|-----------------------------------|----------------------------------|
| Supply voltage ¹¹ | 12...32 V |
| Output current | |
| BTEL/PTUL5...D1... | |
| Source | 20 mA |
| Sink | 10 mA |
| BTEL/PTUL5...D4... | 30 mA |
| Temperature limits | |
| Storage | -40...100°C |
| Operating | -25...85°C |
| Compensated | 0...50°C |
| Proof pressure ² | |
| BTEL/PTUL5...01D... | 250 mbar / 100 "H ₂ O |
| BTEL/PTUL5...02D... | 250 mbar / 100 "H ₂ O |
| all others | 350 mbar / 150 "H ₂ O |
| Pressure at any port ³ | |
| BTEL/PTUL5...01D... | 500 mbar / 200 "H ₂ O |
| BTEL/PTUL5...02D... | 500 mbar / 200 "H ₂ O |
| all others | 750 mbar / 300 "H ₂ O |

ELECTRICAL CONNECTION

1...6 V output version



4...20 mA output version



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COMMON PERFORMANCE CHARACTERISTICS⁹

| Characteristics | | Min. | Typ. | Max. | Unit |
|---|---------------------|-----------------------------------|-------|-------|---------|
| Position sensitivity | | | 0.5 | | %FSO/g |
| Non-linearity and hysteresis ⁴ | | | ±0.1 | ±0.25 | %FSO |
| Output noise (0 < f < 1 kHz) | | | 0.04 | | |
| Long term stability ⁵ | BTEL/PTUL5...01D... | | ±0.5 | | |
| | all others | | ±0.2 | | |
| Thermal effects (0 to 50°C) ⁶ | Offset | BTEL5...01D... | ±0.08 | ±0.16 | %FSO/°C |
| | | BTEL5...02D.../ PTUL5...01D... | ±0.04 | ±0.10 | |
| | | all others | ±0.02 | ±0.06 | |
| | Span | | ±0.04 | ±0.08 | |
| Response time (10 to 90 %) | | | 1 | | ms |

INDIVIDUAL PERFORMANCE CHARACTERISTICS⁹

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

| Characteristics | | Min. | Typ. | Max. | Unit |
|-----------------------------------|---------------------|------|------|------|----------|
| Zero pressure offset ⁷ | BTEL/PTUL50...D1... | 0.9 | 1.0 | 1.1 | V |
| | BTEL/PTUL5P...D1... | 3.4 | 3.5 | 3.6 | |
| Full scale span ⁸ | BTEL/PTUL50...D1... | 4.9 | 5.0 | 5.1 | |
| | BTEL/PTUL5P...D1... | 2.4 | 2.5 | 2.6 | |
| Full scale output | | | 6.0 | | |
| Output impedance | | | | 50 | Ω |
| Power supply rejection | Offset | | 0.05 | | %FSO/V |
| | Span | | 0.03 | | |
| Power consumption | | | 60 | | mW |

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

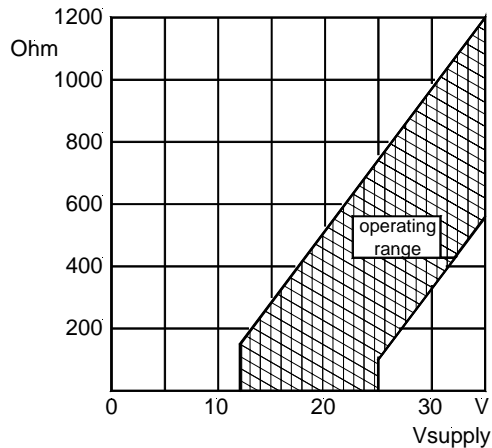
| Characteristics | | Min. | Typ. | Max. | Unit |
|--|---------------------|------|------|------|----------|
| Zero pressure offset ⁷ | BTEL/PTUL50...D4... | 3.9 | 4.0 | 4.1 | mA |
| | BTEL/PTUL5P...D4... | 11.9 | 12.0 | 12.1 | |
| Full scale span ⁸ | BTEL/PTUL50...D4... | 15.9 | 16.0 | 16.1 | |
| | BTEL/PTUL5P...D4... | 7.9 | 8.0 | 8.1 | |
| Full scale output | | | 20.0 | | |
| Output impedance | | | | 0.1 | Ω |
| Power supply rejection | Offset | | 0.05 | | %FSO/V |
| | Span | | 0.03 | | |
| Power consumption ($I_L = 20\text{ mA}$) | | | 260 | | mW |

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LOAD LIMITATION

4...20 mA output version



ELECTROMAGNETIC CAPABILITY¹⁰

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

Specification notes:

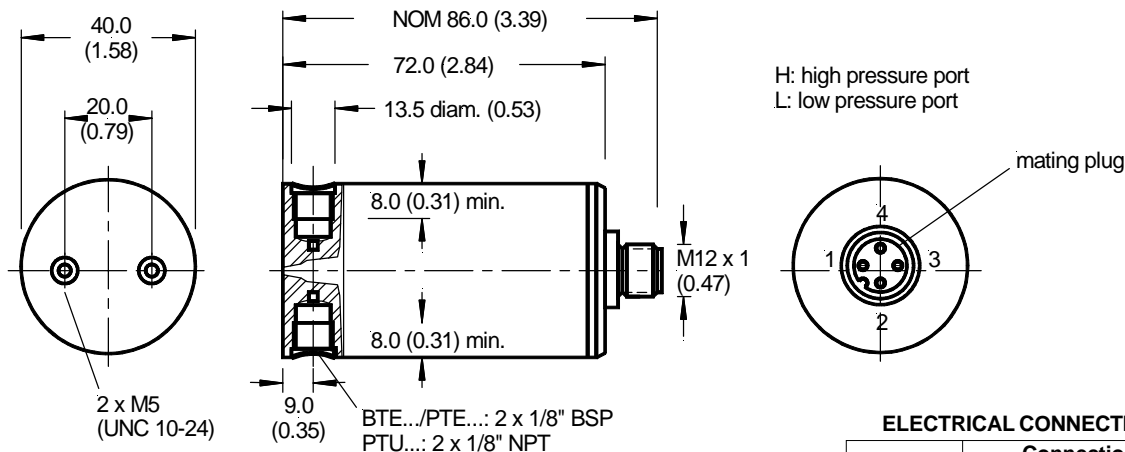
1. IP 67 protection for BTEL/PTUL5...A is given with locked connector only.
2. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
3. This is the highest pressure which can be applied to any port at any time. At the same time the differential pressure between the ports H and L must not exceed the maximum proof pressure.
4. Non-linearity refers to the **Best Straight Line** fit measured for offset, full scale span and 1/2 full scale span.
5. Long term stability is the change in output after one year or 1 million pressure cycles.
6. Thermal effects tested and guaranteed from 0...50 °C relative to 25°. All specifications shown are relative to 25°C.
7. Calibrated after minimum 3 minutes warm-up time.
8. Full scale span is the algebraic difference between the positive full scale output and zero pressure offset.
9. Higher pressure applied to port H.
10. Test are in accordance with EN 61000-6-2.
11. The minimum supply voltage is directly proportional to the load resistance seen by the transmitter. For more details see the load limitation diagram.
12. CE-labelling is in accordance with 2004/108/EC.

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OUTLINE DRAWING

Connector version

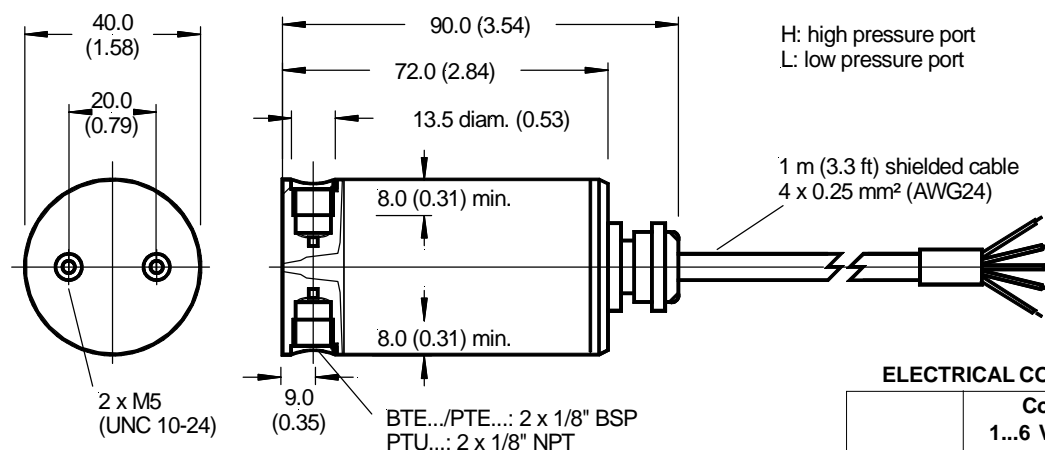


mass: typ. 170 g
 dimensions in mm (inches)

H: high pressure port
 L: low pressure port

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

Cable version



mass: typ. 220 g
 dimensions in mm (inches)

H: high pressure port
 L: low pressure port

1 m (3.3 ft) shielded cable
 4 x 0.25 mm² (AWG24)

| | 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 |

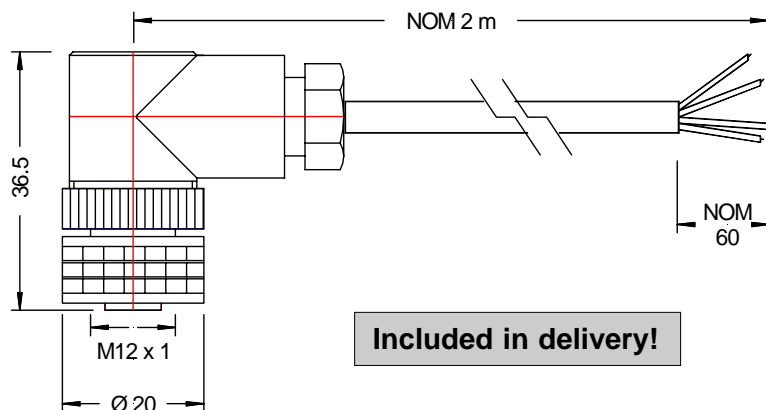
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RECOMMENDED CABLE/CONNECTOR ACCESSORY

for connector version

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

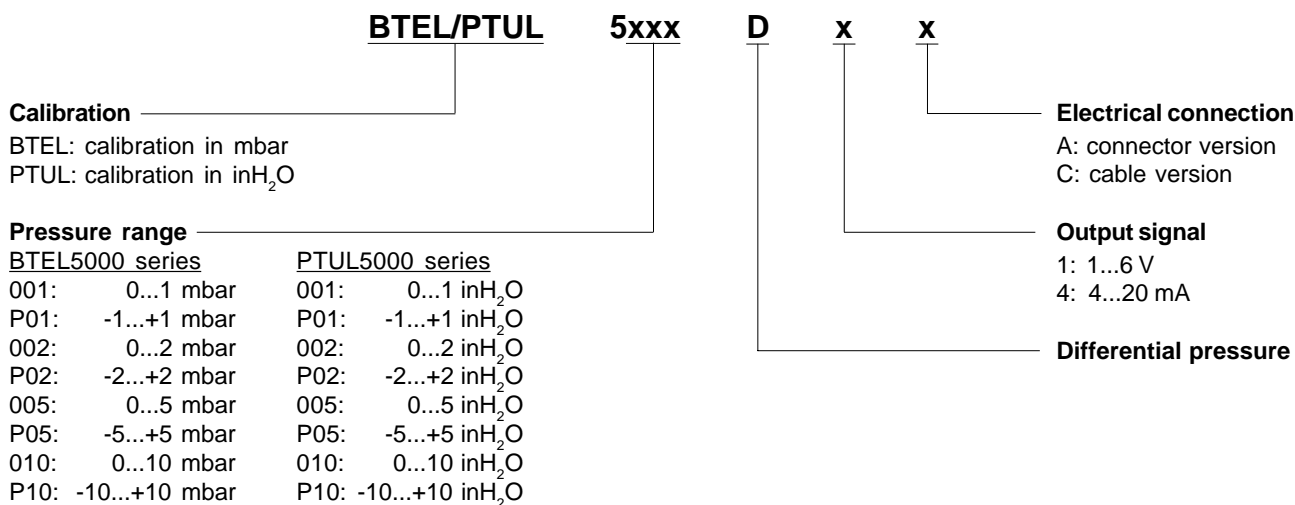


PIN CONNECTION

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

dimensions in mm

ORDERING INFORMATION



Note: 0...1 mbar devices not available with 1...6 V output signal

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

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