

# BTEL5000 / PTUL5000 Series

## Precision very low differential pressure transmitters

### FEATURES

- 1 to 10 mbar, 1 to 10 inH<sub>2</sub>O 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)<sup>1</sup>



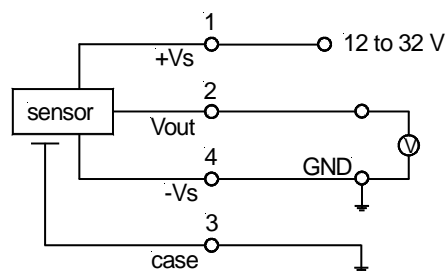
### SPECIFICATIONS<sup>12</sup>

#### Maximum ratings

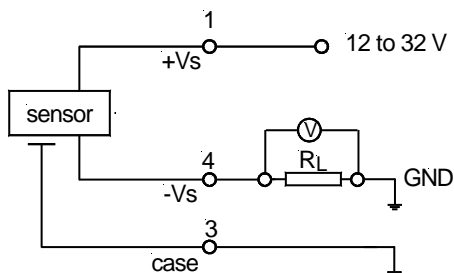
Supply voltage <sup>11</sup>	12...32 V
Output current	
BTEL/PTUL5...D1...	
Source	20 mA
Sink	10 mA
BTEL/PTUL5...D4...	30 mA
Temperature limits	
Storage	-40...85 °C
Operating	-25...85 °C
Compensated	0...50 °C
Proof pressure <sup>2</sup>	
devices up to 5 mbar/2 inH <sub>2</sub> O	250 mbar/100 inH <sub>2</sub> O
all others	500 mbar/200 inH <sub>2</sub> O
Common mode pressure	700 mbar/280 inH <sub>2</sub> O

### ELECTRICAL CONNECTION

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



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



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### COMMON PERFORMANCE CHARACTERISTICS<sup>9</sup>

Characteristics	Min.	Typ.	Max.	Unit
Position sensitivity		0.5		%FSO/g
Non-linearity and hysteresis <sup>4</sup>		±0.1	±0.25	%FSO
Output noise (0 < f < 1 kHz)		0.04		
Long term stability <sup>5</sup>		±0.5		
Thermal effects (0 to 50°C) <sup>6</sup> Offset	devices up to 5 mbar/2 inH <sub>2</sub> O	±0.04	±0.13	%FSO/°C
	all other devices	±0.02	±0.05	
Span	devices up to 5 mbar/2 inH <sub>2</sub> O	±0.04	±0.10	
	all other devices	±0.02	±0.04	
Response time (10 to 90 %)		1		ms

### INDIVIDUAL PERFORMANCE CHARACTERISTICS<sup>9</sup>

**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 <sup>7</sup>	BTEL/PTUL50...D1...	0.95	1.0	1.05	V
	BTEL/PTUL5P...D1...	3.45	3.5	3.55	
Full scale span <sup>8</sup>	BTEL/PTUL50...D1...	4.95	5.0	5.05	
	BTEL/PTUL5P...D1...	2.45	2.5	2.55	
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)

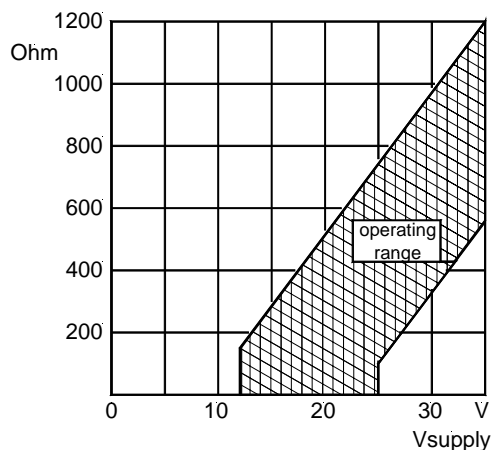
Characteristics	Min.	Typ.	Max.	Unit	
Zero pressure offset <sup>7</sup>	BTEL/PTUL50...D4...	3.9	4.0	4.1	mA
	BTEL/PTUL5P...D4...	11.9	12.0	12.1	
Full scale span <sup>8</sup>	BTEL/PTUL50...D4...	15.9	16.0	16.1	
	BTEL/PTUL5P...D4...	7.9	8.0	8.1	
Full scale output		20.0			
Output impedance			0.1	Ω	
Power 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 CAPABILITY<sup>10</sup>

	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:

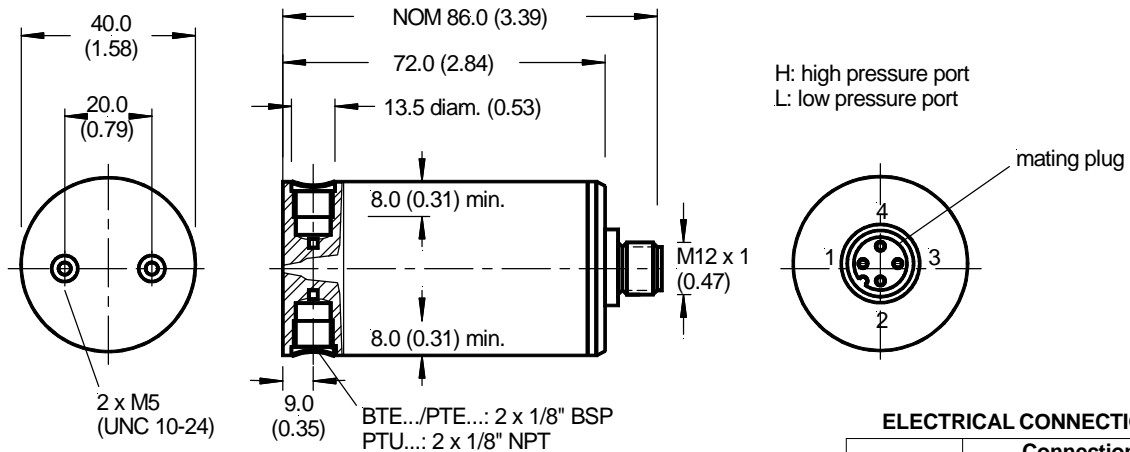
1. IP 67 protection for BTEL/PTUL5...A is given with locked connector only.
2. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
3. This is the highest pressure which can be applied to any port at any time. At the same time the differential pressure 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

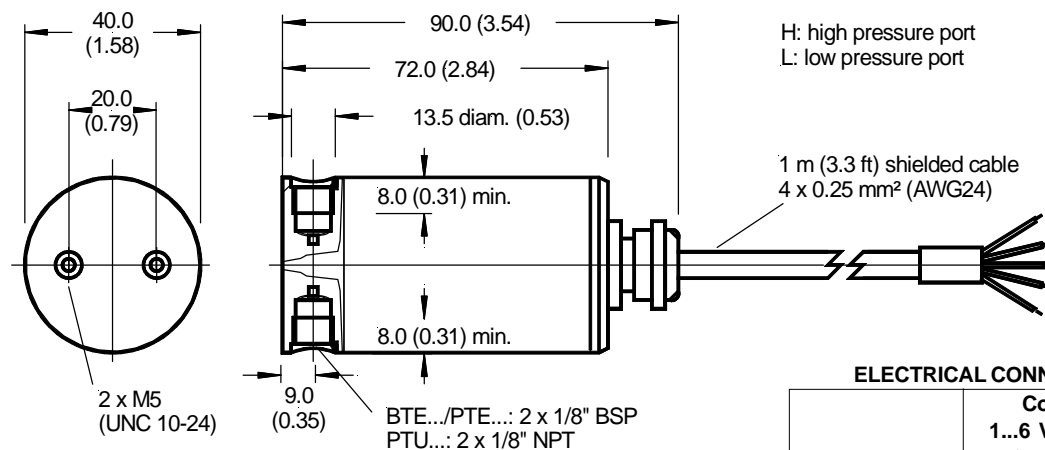


mass: typ. 170 g  
dimensions in mm (inches)

#### ELECTRICAL CONNECTION

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)

#### ELECTRICAL CONNECTION

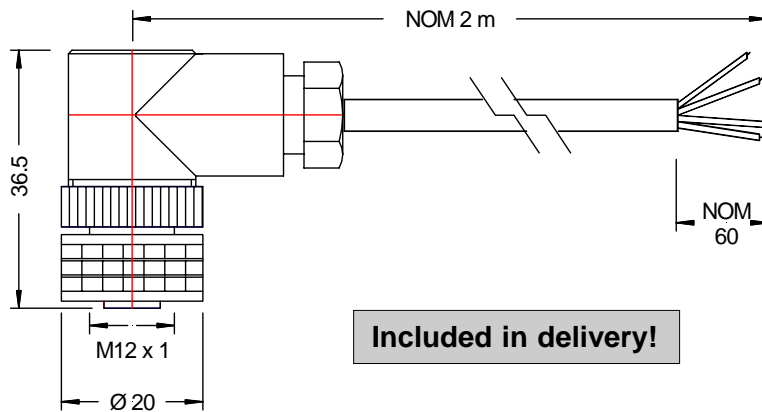
	Connection	
	1...6 V output	4...20 mA output
bare	case/shield	case/shield
brown	+Vs	+Vs
white or orange	NC	NC
green	Vout	NC
yellow	-Vs	-Vs

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### RECOMMENDED CABLE/CONNECTOR ACCESSORY

for connector version (Order number ZK000104-2, other cable lengths on special request)



#### PIN CONNECTION

Pin	Flying lead end
1	brown
2	green
3	orange + shield
4	yellow

**Included in delivery!**

dimensions in mm

### ORDERING INFORMATION

Series/Pressure range		Pressure mode		Output signal		Electrical connection	
<b>BTEL5001</b>	0...1 mbar	<b>D</b>	Differential	<b>1</b>	1...6 V	<b>A</b>	Connector version
<b>BTEL5P01</b>	-1...+1 mbar				(not available for 0...1 mbar devices)		<b>C</b>
<b>BTEL5002</b>	0...2 mbar			<b>4</b>	4...20 mA		
<b>BTEL5P02</b>	-2...+2 mbar						
<b>BTEL5005</b>	0...5 mbar						
<b>BTEL5P05</b>	-5...+5 mbar						
<b>BTEL5010</b>	0...10 mbar						
<b>BTEL5P10</b>	-10...+10 mbar						
<b>PTUL5001</b>	0...1 inH <sub>2</sub> O						
<b>PTUL5P01</b>	-1...+1 inH <sub>2</sub> O						
<b>PTUL5002</b>	0...2 inH <sub>2</sub> O						
<b>PTUL5P02</b>	-2...+2 inH <sub>2</sub> O						
<b>PTUL5005</b>	0...5 inH <sub>2</sub> O						
<b>PTUL5P05</b>	-5...+5 inH <sub>2</sub> O						
<b>PTUL5010</b>	0...10 inH <sub>2</sub> O						
<b>PTUL5P10</b>	-10...+10 inH <sub>2</sub> O						

Example: **BTEL5P01D4A**

Devices highlighted in grey are preferred items.

For all other devices MOQ may apply.

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

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