

# BTEL5000 / PTUL5000 Series

## Precision very low differential pressure transmitters

### FEATURES

- 1 to 10 mbar, 1 to 10 "H<sub>2</sub>O differential pressure
- High level output, 1...6 V or 4...20 mA (2-wire connection)
- 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) respectively NEMA 6<sup>1</sup>

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

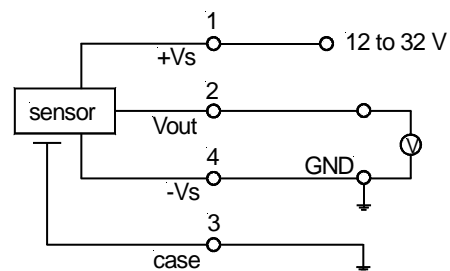
#### Maximum ratings

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

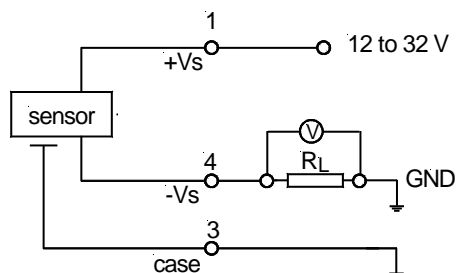


### ELECTRICAL CONNECTION

#### 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	
Operating pressure	BTEL5001...	0		1	mbar	
	BTEL5P01...	-1		1		
	BTEL5002...	0		2		
	BTEL5P02...	-2		2		
	BTEL5005...	0		5		
	BTEL5P05...	-5		5		
	BTEL5010...	0		10		
	BTEL5P10...	-10		10		
	PTUL5001...	0		1	"H <sub>2</sub> O	
	PTUL5P01...	-1		1		
	PTUL5002...	0		2		
	PTUL5P02...	-2		2		
	PTUL5005...	0		5		
	PTUL5P05...	-5		5		
PTUL5010...	0		10			
PTUL5P10...	-10		10			
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>	BTEL/PTUL5...01D...		±0.5			
	all others		±0.2			
Thermal effects (0 to 50°C) <sup>6</sup>	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	

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

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

Characteristics		Min.	Typ.	Max.	Unit
Zero pressure offset <sup>7</sup>	BTEL/PTUL50...D1...	0.9	1.0	1.1	V
	BTEL/PTUL5P...D1...	3.4	3.5	3.6	
Full scale span <sup>8</sup>	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	
Power supply rejection	Offset		0.05		%FSO/V
	Span		0.03		
Power consumption			60		mW

**4...20 mA output versions** (unless otherwise noted  $V_s = 15\text{ V}$ ,  $t_{amb} = 25^\circ\text{C}$ ,  $R_L = 100\ \Omega$ , 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	
Power supply rejection	Offset		0.05		%FSO/V
	Span		0.03		
Power consumption ( $I_L = 20\text{ mA}$ )			260		mW

### ELECTROMAGNETIC CAPABILITY<sup>10</sup>

	Test conditions	Criterion	Interference
Radiated, radio frequency electromagnetic field immunity (RFI)	EN61000-4-3: Grade 3 10 V/m, 80 MHz to 1000 MHz 80 % AMC (1 kHz)	A	<1 % FSO
Electrical fast transient / burst immunity (EFT)	EN61000-4-4: Grade 3 $\pm 2\text{ kV}$	B	<1 % FSO
Electrostatic discharge immunity test (ESD)	EN61000-4-2: Grade 4 $\pm 8\text{ kV}$ , contact discharge	B	<1 % FSO
Immunity to conducted disturbances induced by radio-frequency fields	EN61000-4-6: Grade 3 0,15 to 80 MHz 10 V, 80 % AMC (1 kHz)	A	<1 % FSO

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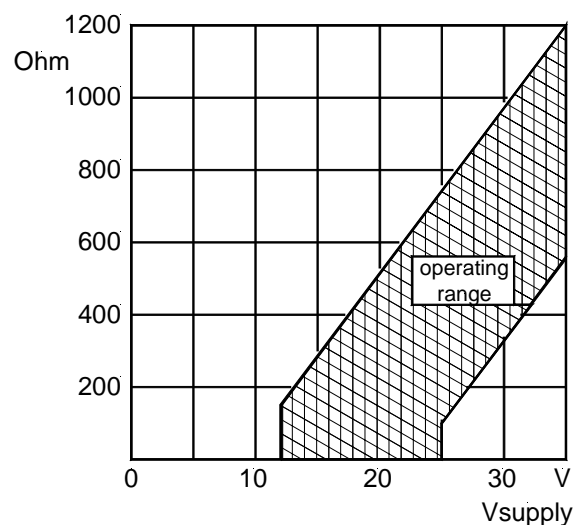
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### Specification notes:

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 EN61000-6-2, April 1999.
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 89/336/EEC.

### LOAD LIMITATION

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

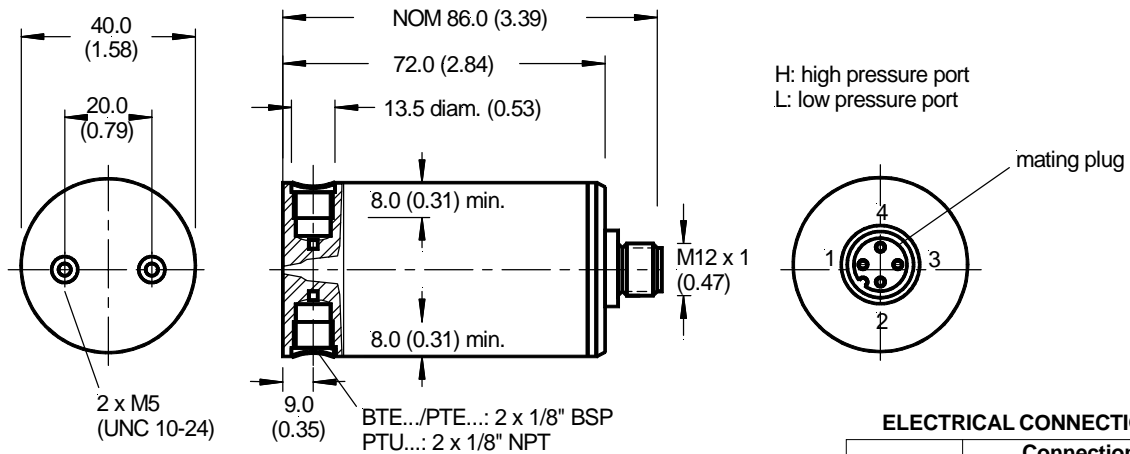


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### OUTLINE DRAWING

#### Connector version

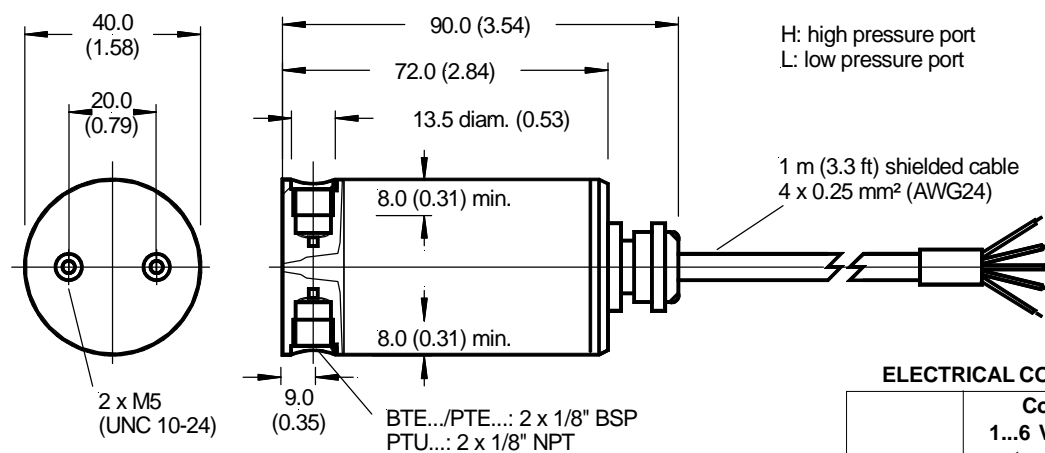


mass: typ. 170 g  
dimensions in mm (inches)

#### 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	NC	NC
green	Vout	NC
yellow	-Vs	-Vs

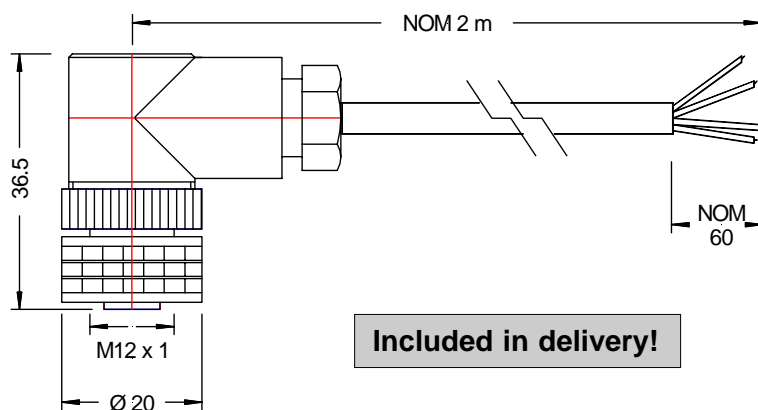
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### RECOMMENDED CABLE/CONNECTOR ACCESSORY

for connector version

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

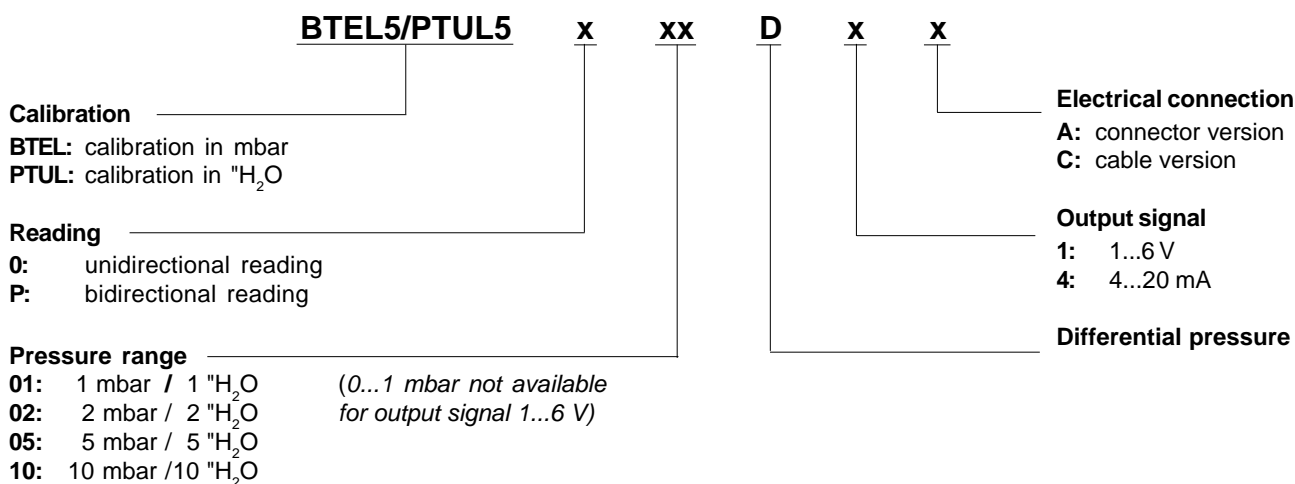


#### PIN CONNECTION

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

dimensions in mm

### ORDERING INFORMATION



**Note:** Other pressure ranges and options are widely available. Please contact your nearest Sensortechinics sales representative.

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