

Magnetostrictive Sensors  
BTL B1 - Rod BN/ZN - Analog

**BALLUFF**



**BTL abcdef-nnnn-ghijklmo-pqrstu**

**BTL**

Magnetostrictive position measuring system

**a mounting**

B = Metric mounting thread M18x1.5  
Z = inch thread 3/4"-16UNF

**b Housing geometry**

N = Width across flats 41; length 34mm; axial connection.

**c Detail design 1**

C = rod diameter 10.2mm; stainless steel 1.4404

**d Detail design 2**

A = threaded plug; zero point 30mm; with O-ring  
E = threaded plug; zero point 50.8mm; with O-ring

**ef special design feature**

00 = None

**nnnn measuring range**

0500 = specification in mm  
(0025 ... 4000)

**g Performance class**

B = Platform Basic, Level 1

**h Version Performance class**

1

**i Supply voltage**

5 = 10 ... 30 V

**j Interface group**

A = Analog

**k Specification interface 1**

A = 0 ... 10 V increasing from mechanical zero point  
1 = 10 ... 0 V falling from mechanical zero point  
E = 4 ... 20 mA increasing from mechanical zero point  
5 = 20 ... 4 mA falling from mechanical zero point

**l Specification interface 2**

0 = no second output signal

**m configuration signals**

1 = signal 1= position

**o Optional configuration**

0 = None

**p Cable/Lead**

0 = Without cable/stranded wire

**qr Cable length**

00 = Without cable / stranded wire

**s connector type**

S = Single connector

**tu Connector type**

92 = Plug, M12, 5 pole

# Magnetostrictive Sensors

## BTL B1 - Rod BN/ZN - Analog

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### Basic features

Approval/Conformity	CE UKCA cULus WEEE
Magnets, number (factory setting)	1
Magnets, number max.	1

### Electrical connection

Polarity reversal protected	Ub up to 30 V DC
Short-circuit protection	Signal output against GND and against 30 V DC

### Electrical data

Current consumption max. at 24 V DC	k = A, 1: 60 mA k = E, 5: 80 mA
Inrush current	≤ 3 A/0.5 ms
Operating voltage Ub	10...30 VDC
Output signal adjustable	no
Overvoltage protection	Ub up to 36 V DC
Switch-on delay max.	500 ms
Voltage-proof up to (GND to housing)	500 V DC

### Environmental conditions

Ambient temperature	-40...75 °C
EN 55016-2-3, Radiation	For industrial and residential use
EN 60068-2-27, Continuous shock	50 g, 2 ms
EN 60068-2-27, Shock	100 g, 6 ms
EN 60068-2-6, Vibration	12 g, 10...2000 Hz
EN 61000-4-2, ESD	Severity Level 3
EN 61000-4-3, RFI	Severity Level 3
EN 61000-4-4, Burst	Severity Level 3
EN 61000-4-5, Surge	Severity Level 2
EN 61000-4-6, High-frequency fields	Severity Level 3
EN 61000-4-8 Magnetic fields	Severity Level 4
IP rating	IP67, IP69K with connector
Relative humidity	≤ 90 %, non-condensing
Storage temperature	-40...85 °C
Temperature coefficient typ.	≤ 30 ppm/K at 50% of nominal stroke 500mm

### Functional safety

MTTF	k = A, 1: 168 a k = E, 5: 136 a
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### Interface

Interface	k = A, 1: Analog, voltage k = E, 5: Analog, current
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### Material

Cover material	1.4404 stainless steel
Material flange	Stainless steel (AISI 316 / V4A)
Protection tube material	Stainless steel (AISI 316 / V4A)

### Mechanical data

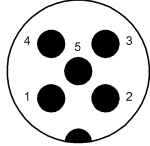
Installation length from contact surface	d = A: n + 90 mm d = E: n + 111 mm
Pressure rating max.	450 bar
Pressure rating, note	when installed in hydraulic cylinder maximum pressure: 750 bar (10 x 1 min)
Speed detectable max.	10 m/s
Tightening torque max.	75 Nm

### Range/Distance

Linearity deviation	n n n n = 0050...0500: ± 200 µm n n n n > 0500: ± 0.04% FS
Measuring length	25...4000 mm
Null point	d = A: 30 mm d = E: 50.8 mm
Repeat accuracy	n n n n ≤ 0500: ≤ ± 10 µm n n n n > 0500: ≤ ± 0.002% FS
Resolution, position	k = A, 1: 183 µV at least 4 µm k = E, 5: 351 nA at least 4 µm
Sampling frequency max.	n n n n = 25...1270: 1000 Hz n n n n = 1271...2650: 500 Hz n n n n = 2651...4000: 250 Hz

### Connector Diagramm

stu = S92: M12 male, 5-pin



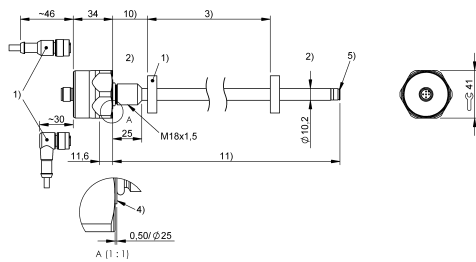
### Wiring diagramm

M12 plug, 5 pole / 1 output

Pin	Signal
1	+UB
2	Output 1
3	GND
4	NC
5	0 V

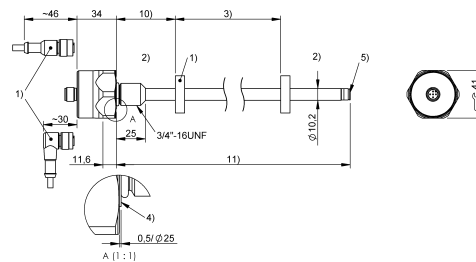
### Product View

**a = B: Mounting M18 thread**



- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 10) Null point
- 11) Installation length

**a = Z: mounting 3/4 inch thread**



- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 10) Null point
- 11) Installation length