



## BTL7-abcd-Mnnnn-fh-i-lm

### BTL7

Magnetostrictive linear position sensor Generation 7

#### a Interface

C = Current output 0 ... 20 mA  
E = Current output 4 ... 20 mA

#### b Operating voltage

5 = 10 ... 30 V

#### c + d Interface characteristic 1 + 2

04 = 1 output rising, configurable  
05 = 1 output falling, configurable

#### Mnnnn Nominal length (4-position)

M0500 = metric in mm  
(M0025...M7620: with 10.2 mm rod diameter)

#### f Form factor

TB = Mounting threads M18x1.5, for O-Ring

#### h Redundancy

2 = 2 times redundant  
3 = 3 times redundant

#### i Variant

NEX = Ignition class "nA" and "tb"

#### l Connection type

S = Connector  
KA = Cable (PUR)

#### m Connection type characteristic 1

for connector:  
32 = M16x0.75 connector with 8 pins

for cable (length in meters):  
02, 05, 10, 15, 20

# Magnetostrictive Sensors

## BTL7 -TB-NEX- Serie - Analog Strom

# BALLUFF

### Basic features

|                                   |                                                                                                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approval/Conformity               | CE<br>UKCA<br>IECEX<br>WEEE                                                                                                                                      |
| Ex marking                        | ATEX: II 3 G Ex nA IIC T4 Gc<br>II 2 D Ex tb IIIC T135°C Db IP6x<br>-40°C ≤ Ta ≤ +60°C<br>IECEX: Ex nA IIC T4 Gc<br>Ex tb IIIC T135°C Db IP6x -40°C ≤ Ta ≤ +60°C |
| Magnets, number (factory setting) | 1                                                                                                                                                                |
| Magnets, number max.              | 1                                                                                                                                                                |

### Electrical connection

|                             |                       |
|-----------------------------|-----------------------|
| Polarity reversal protected | Ub up to 36 V         |
| Short-circuit protection    | to GND and to 36 V DC |

### Electrical data

|                                      |                         |
|--------------------------------------|-------------------------|
| Current consumption max. at 24 V DC  | 150 mA per unit         |
| Inrush current                       | ≤ 500 mA/10 ms per unit |
| Load resistance RL max.              | 500 Ohm                 |
| Operating voltage Ub                 | 10...30 VDC             |
| Output signal adjustable             | with software tool      |
| Overvoltage protection               | Ub up to 36 V           |
| Switch-on delay max.                 | 600 ms                  |
| Voltage-proof up to (GND to housing) | 500 V AC                |

### Environmental conditions

|                                     |                                           |
|-------------------------------------|-------------------------------------------|
| Ambient temperature                 | -40...60 °C                               |
| Cable temperature, fixed routing    | I = KA: -40 °C ... 90 °C                  |
| Cable temperature, flexible routing | I = KA: -5 °C ... 90 °C                   |
| EN 55016-2-3, Radiation             | For industrial and residential use        |
| EN 60068-2-27, Continuous shock     | 100 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                                      |
| Relative humidity                   | ≤ 90 %, non-condensing                    |
| Storage temperature                 | -40...70 °C                               |
| Temperature coefficient typ.        | ≤ 20 ppm/K at 50% of nominal stroke 500mm |

### Functional safety

|      |                            |
|------|----------------------------|
| MTTF | h = 2: 33 a<br>h = 3: 17 a |
|------|----------------------------|

### Interface

|           |                 |
|-----------|-----------------|
| Interface | Analog, current |
|-----------|-----------------|

### Material

|                                      |                        |
|--------------------------------------|------------------------|
| Cable flame-resistant                | I = KA: IEC 60332-1    |
| Cable jacket, material               | I = KA: PUR            |
| Cover material                       | Aluminium, Anodized    |
| Housing material                     | Aluminium, Anodized    |
| Housing material, surface protection | Anodized               |
| Material flange                      | 1.4404 stainless steel |
| Protection tube material             | 1.4571 stainless steel |

### Mechanical data

|                                          |                                                   |
|------------------------------------------|---------------------------------------------------|
| Installation length from contact surface | nnnn + 90 mm                                      |
| Pressure rating max.                     | nnnn = 25...2000: 600 bar<br>nnnn > 2000: 300 bar |
| Pressure rating, note                    | when installed in hydraulic cylinder              |
| Speed detectable max.                    | 10 m/s                                            |
| Tightening torque max.                   | 100 Nm                                            |

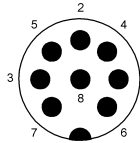
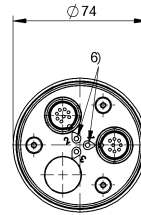
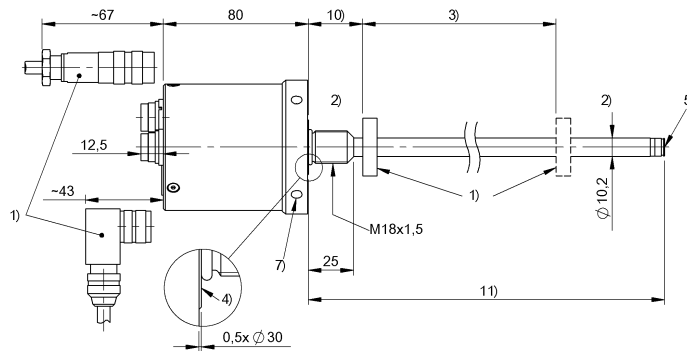
### Range/Distance

|                         |                                                                                         |
|-------------------------|-----------------------------------------------------------------------------------------|
| Linearity deviation     | nnnn = 0050...0500: ± 200 µm<br>nnnn > 0500: ± 0.04% FS                                 |
| Measuring length        | 25...7620 mm                                                                            |
| Repeat accuracy         | ± 5 µm                                                                                  |
| Sampling frequency max. | nnnn = 0050...1200: 500 Hz<br>nnnn = 1201...5000: 250 Hz<br>nnnn = 0601...1300: 1000 Hz |

# Magnetostrictive Sensors BTL7-TB-NEX- Serie - Analog Strom

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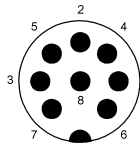
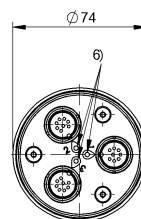
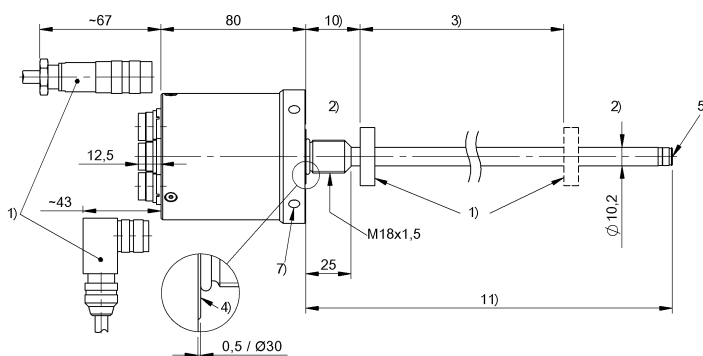
## BTL7-E504-Mxxxx-TB2-NEX-S32



| Pin |           |
|-----|-----------|
| 1   | 4...20 mA |
| 2   | 0 V       |
| 3   | NC        |
| 4   | La        |
| 5   | NC        |
| 6   | GND       |
| 7   | +24 V DC  |
| 8   | Lb        |

- 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
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length

## BTL7-C505-Mxxxx-TB3-NEX-S32



| Pin |           |
|-----|-----------|
| 1   | 20...0 mA |
| 2   | 0 V       |
| 3   | NC        |
| 4   | La        |
| 5   | NC        |
| 6   | GND       |
| 7   | +24 V DC  |
| 8   | Lb        |

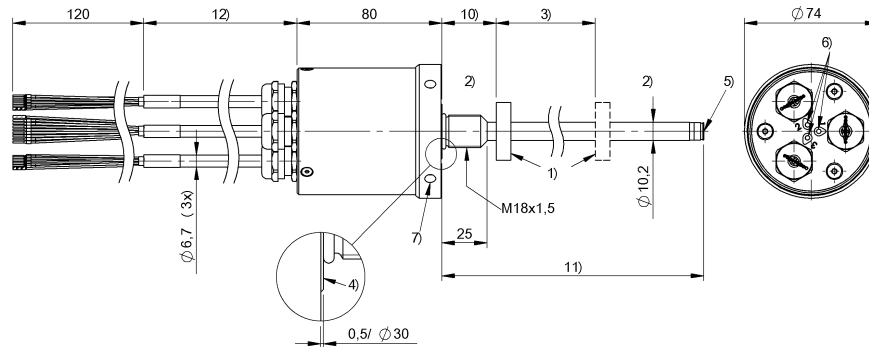
- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length

# Magnetostrictive Sensors

## BTL7 -TB-NEX- Serie - Analog Strom

# BALLUFF

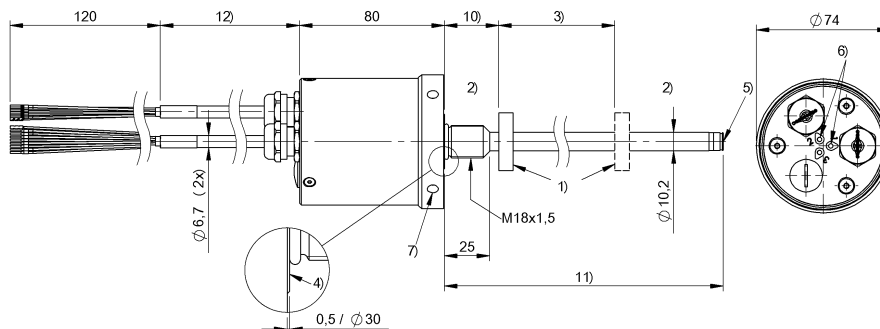
### BTL7-E505-Mxxxx-TB3-NEX-KAxx



| colour |           |
|--------|-----------|
| YE     | 20...4 mA |
| GY     | 0 V       |
| PK     | NC        |
| RD     | La        |
| GN     | NC        |
| BU     | GND       |
| BN     | +24 V DC  |
| WH     | Lb        |

- 1) not included in scope of delivery
- 2) Non-usable area
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- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 12) Cable length

### BTL7-C504-Mxxxx-TB2-NEX-KAxx



| colour |           |
|--------|-----------|
| YE     | 0...20 mA |
| GY     | 0 V       |
| PK     | NC        |
| RD     | La        |
| GN     | NC        |
| BU     | GND       |
| BN     | +24 V DC  |
| WH     | Lb        |

- 1) not included in scope of delivery
- 2) Non-usable area
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- 4) Mounting surface
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- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 12) Cable length