



BTL7-abcd-Mnnnn-f-ij-lm

**BTL7**

Magnetostrictive linear position sensor Generation 7

**a Interface**

P = Digital pulse interface

**b Operating voltage**

5 = 10 ... 30 V

**c Interface characteristic 1**

1 = Digital start/stop interface

**d Interface characteristic 2**

1 = DPI/IP communication interface

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

M0500 = metric in mm

(M0025...M7620: with 10.2 mm rod diameter)

**f Form factor**

J = Flange 18h6

**i Variant**

DEX = Ignition protection category "d" / pressure-proof encapsulation

**j Variant characteristic**

C = float plug

**l + m connection type + connection type characteristic 1**

TA12 = Clamp with 1/2"-14 NPT (cable entry)

## Basic features

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approval/Conformity  | CE<br>CSA<br>IECEX<br>WEEE<br>UKCA<br>CCC Ex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Ex marking           | ATEX: II 1/2GD<br>Ex db IIC T6 Ga/Gb<br>Ex ta IIIC T85°C Da IP68<br>Tamb -50°C to +70°C<br><br>II 1/2GD<br>Ex db IIC T5 Ga/Gb<br>Ex ta IIIC T100°C Da IP68<br>Tamb -50°C to +80°C<br>IECEX: Ex db IIC T6 Ga/Gb<br>Ex ta IIIC T85°C Da IP68<br>Tamb -50°C to +70°C<br><br>Ex db IIC T5 Ga/Gb<br>Ex ta IIIC T100°C Da IP68<br>Tamb -50°C to +80°C<br>NEC: Class I, Division 1, Groups ABCD<br>Class II, Division 1, Groups EFG<br>Class III<br>Enclosure Type 4X/6P<br>Class I, Zone 1, AEx d IIC T* Ga/Gb<br>Ex d IIC T* Gb<br>IP68 -50 °C to +70 °C (T6) or -50 °C to +80 °C (T5)<br>CCC: Ex db IIC T6/T5 Ga/Gb, Ex ta IIIC T85°C/T100°C Db<br>Ex db IIC T6/T5 Ga/Gb, Ex ta IIIC T85°C/T100°C Da |
| Magnets, number max. | 16<br>minimum separation between magnets 65 mm.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 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  | 120 mA                                                     |
| Inrush current                       | nnnn < 1525: ≤ 500 mA/10 ms<br>nnnn ≥ 1525: ≤ 500 mA/25 ms |
| Operating voltage Ub                 | 10...30 VDC                                                |
| Output signal adjustable             | no                                                         |
| Overvoltage protection               | Ub up to 36 V                                              |
| Switch-on delay max.                 | nnnn < 1525: 100 ms<br>nnnn ≥ 1525: 500 ms                 |
| Voltage-proof up to (GND to housing) | 1000 V DC                                                  |

## Environmental conditions

|                                     |                                           |
|-------------------------------------|-------------------------------------------|
| Ambient temperature                 | -40...80 °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                           | IP68                                      |
| Relative humidity                   | ≤ 90 %, non-condensing                    |
| Storage temperature                 | -50...85 °C                               |
| Surface temperature max.            | 85 °C                                     |
| Temperature coefficient typ.        | ≤ 15 ppm/K at 50% of nominal stroke 500mm |

## Functional safety

|              |       |
|--------------|-------|
| MTTF (40 °C) | 102 a |
|--------------|-------|

## Interface

|           |               |
|-----------|---------------|
| Interface | Digital pulse |
|-----------|---------------|

## Material

|                          |                        |
|--------------------------|------------------------|
| Material flange          | 1.4404 stainless steel |
| Protection tube material | 1.4571 stainless steel |

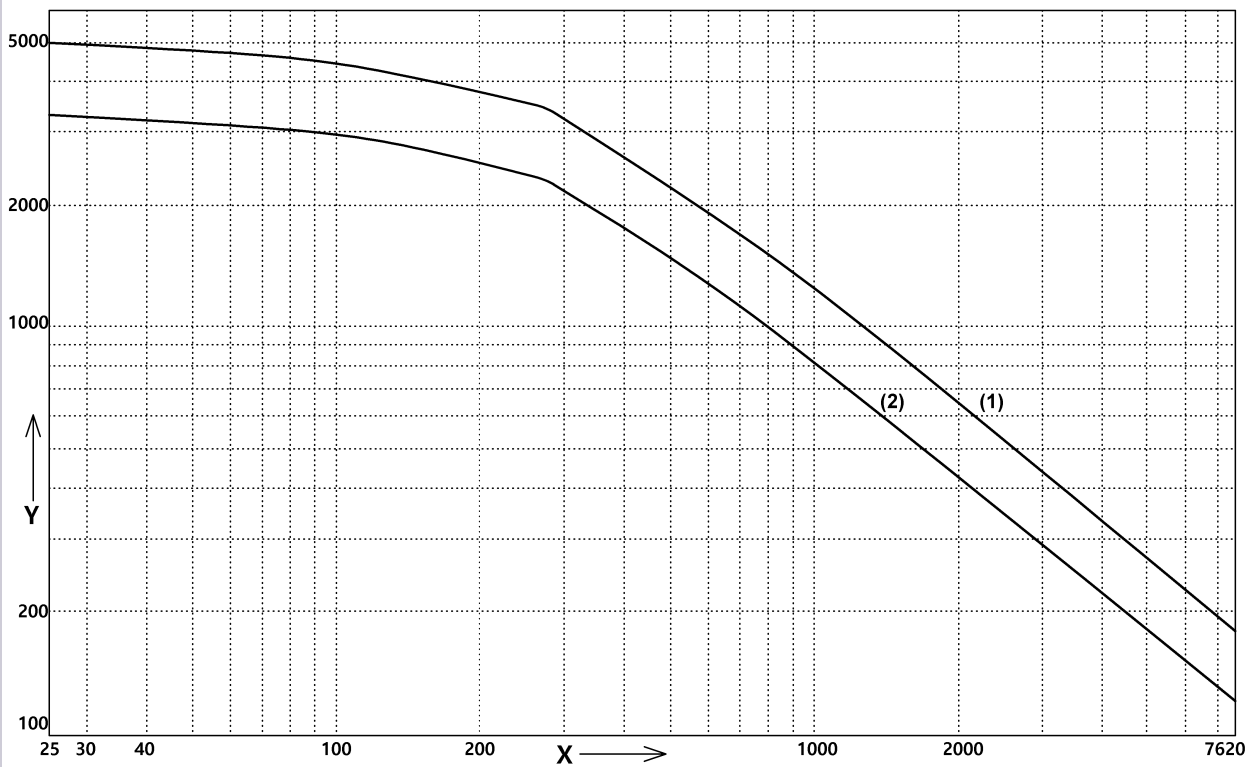
## Mechanical data

|                                          |                                      |
|------------------------------------------|--------------------------------------|
| Installation length from contact surface | nnnn + 128 mm                        |
| Pressure rating max.                     | 600 bar                              |
| Pressure rating, note                    | when installed in hydraulic cylinder |
| Speed detectable max.                    | 10 m/s                               |
| Tightening torque max.                   | 3.5 Nm                               |

## Range/Distance

|                         |                                                        |
|-------------------------|--------------------------------------------------------|
| Linearity deviation     | nnnn = 0025...5500: ± 50 µm<br>nnnn > 5500: ± 0.02% FS |
| Measuring length        | 25...7620 mm                                           |
| Repeat accuracy         | ≤ ± 5 µm                                               |
| Sampling frequency max. | See illustration for measuring frequency               |

Characteristic Diagram



fA,min: 62,5 Hz

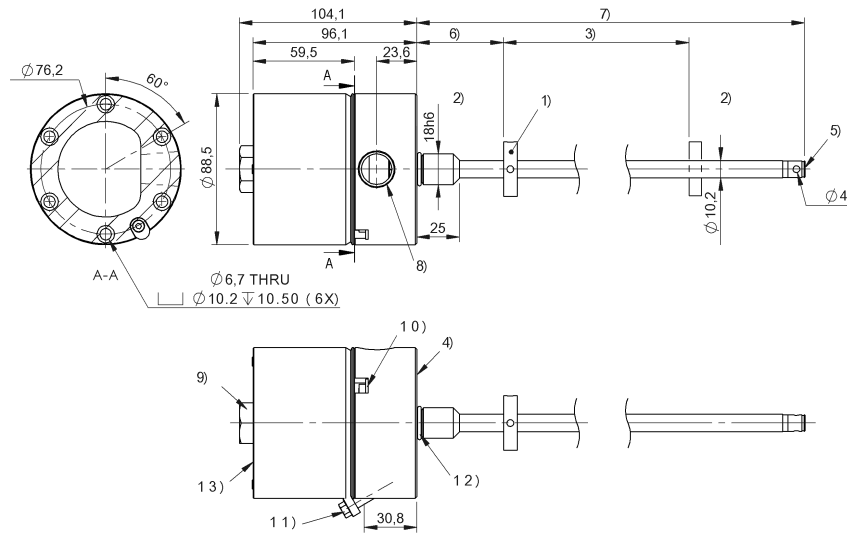
1) 1 magnet

2) 2...16 magnets

x: Nominal length [mm]

y: fA,max Hz

BTL7-P511-Mxxxx-J-DEXC-TA12



| Pin |               |
|-----|---------------|
| 1   | INIT +        |
| 2   | START/STOP +  |
| 3   | INIT -        |
| 4   | GND           |
| 5   | +10...30 V DC |
| 6   | START/STOP -  |
| 7   | Not Used      |
| 8   | Not Used      |

- 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) Null point
- 7) Installation length
- 8) 1/2" - 14 NPT (cable entry)
- 9) 15/16" or 24 mm wrench
- 10) External Housing GND
- 11) Cover fastening screw
- 12) O-ring
- 13) Part label, metal