

Magnetostrictive Sensors
BTL7 -J-DEXC- Series - Analog Voltage

BALLUFF



BTL7-abcd-Mnnnn-f-ij-lm

BTL7

Magnetostrictive linear position sensor Generation 7

a Interface

A = Voltage output 0 ... 10 V

G = voltage output -10 ... 10 V

b Operating voltage

5 = 10 ... 30 V

c + d Interface characteristic 1 + 2

01 = 2 outputs, each 1 x rising/falling settable/
programmable

10 = 2 outputs, each 1 x rising/falling

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)

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Basic features

Approval/Conformity	CE CSA IECEX WEEE UKCA CCC Ex
Ex marking	ATEX: II 1/2GD Ex db IIC T6 Ga/Gb Ex ta IIIC T85°C Da IP68 Tamb -50°C to +70°C II 1/2GD Ex db IIC T5 Ga/Gb Ex ta IIIC T100°C Da IP68 Tamb -50°C to +80°C IECEX: Ex db IIC T6 Ga/Gb Ex ta IIIC T85°C Da IP68 Tamb -50°C to +70°C Ex db IIC T5 Ga/Gb Ex ta IIIC T100°C Da IP68 Tamb -50°C to +80°C NEC: Class I, Division 1, Groups ABCD Class II, Division 1, Groups EFG Class III Enclosure Type 4X/6P Class I, Zone 1, AEx d IIC T* Ga/Gb Ex d IIC T* Gb IP68 -50 °C to +70 °C (T6) or -50 °C to +80 °C (T5) PESO: Ex d IIC T6 Ga/Gb CCC: Ex db IIC T6/T5 Ga/Gb, Ex ta IIIC T85°C/T100°C Db Ex db IIC T6/T5 Ga/Gb, Ex ta IIIC T85°C/T100°C Da
Magnets, number (factory setting)	1
Magnets, number max.	cd ≠ 10: 1 cd = 10: 2

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
Inrush current	nrrn < 1525: ≤ 500 mA/10 ms nrrn ≥ 1525: ≤ 500 mA/25 ms
Operating voltage Ub	10...30 VDC
Output current max.	5 mA
Output current max.	5 mA
Output signal adjustable	cd ≠ 01: Setting aid and programming inputs cd = 01: Setting aid and software tool
Overvoltage protection	Ub up to 36 V
Switch-on delay max.	nrrn < 1525: 600 ms nrrn ≥ 1525: 800 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.	≤ 30 ppm/K at 50% of nominal stroke 500mm

Functional safety

MTTF (40 °C)	98 a
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Interface

Interface	Analog, voltage
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Material

Material flange	1.4404 stainless steel
Protection tube material	1.4571 stainless steel

Mechanical data

Installation length from contact surface	nrrn + 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

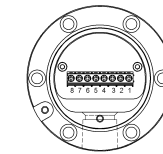
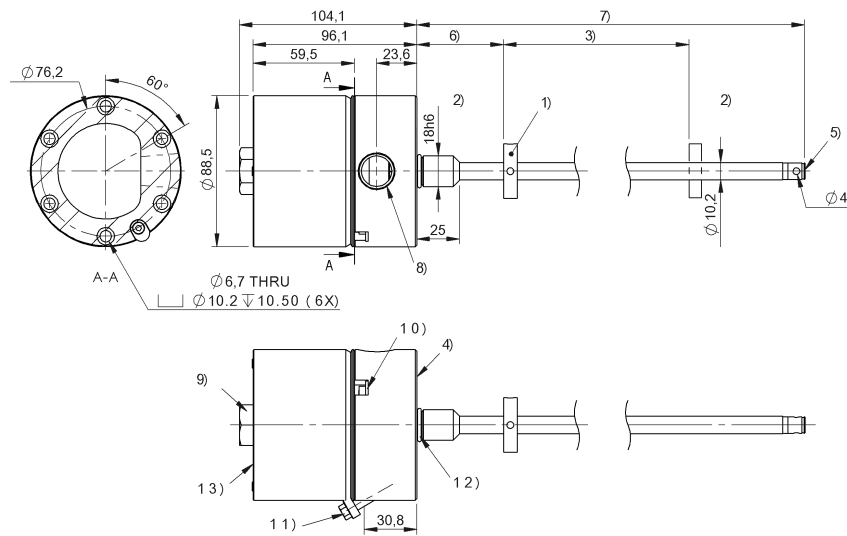
Range/Distance

Linearity deviation	nrrn = 0050...0500: ± 50 µm nrrn = 0501...5500: ± 0.01% FS nrrn > 5500: ± 0.02% FS
Measuring length	25...7620 mm
Repeat accuracy	± 10 µm
Sampling frequency max.	nrrn = 0050...0250: 4000 Hz nrrn = 0251...0600: 2000 Hz nrrn = 0601...1300: 1000 Hz nrrn = 1301...2700: 500 Hz nrrn = 2701...5500: 250 Hz nrrn > 5500: 180 Hz

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BTL7-A501-Mxxxx-J-DEXC-TA12



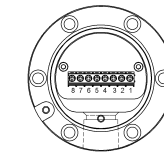
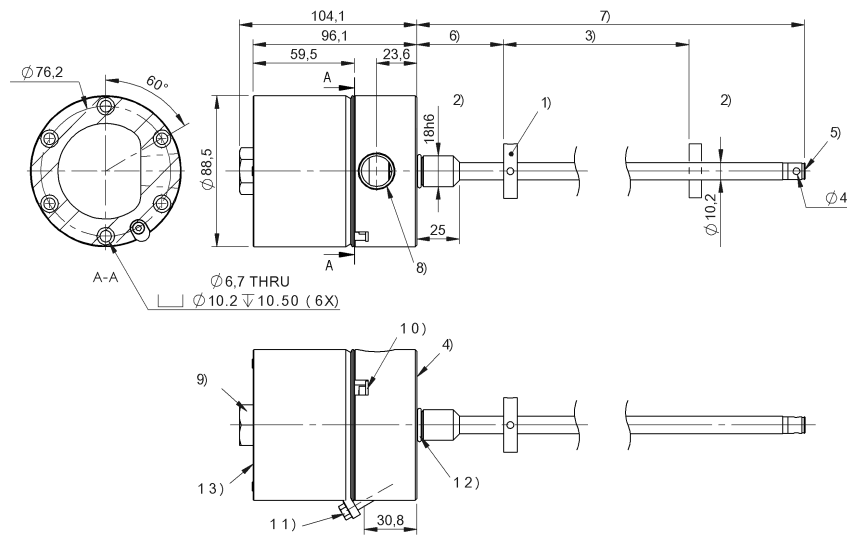
Pin	
1	NC
2	0V
3	10...0 V
4	GND
5	+10...30 V DC
6	0...10 V
7	La
8	Lb

- 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) 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

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BTL7-G510-Mxxxx-J-DEXC-TA12



Pin	
1	NC
2	0V
3	10...-10 V
4	GND
5	+10...30 V DC
6	-10...10 V
7	La
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