



BTL7-abcde-Mnnnn-f-ij-lm

BTL7

Magnetostrictive linear position sensor Generation 7

a interface

S = SSI

b Operating voltage

5 = 10 ... 30 V

c Interface characteristic 1

0 = 24 bits, binary, rising
 1 = 24 bits, gray, rising
 2 = 24 bits, binary, falling
 3 = 24 bits, gray, falling
 6 = 25 bits, binary, rising
 7 = 25 bits, gray, rising
 8 = 25 bits, binary, falling
 9 = 25 bits, gray, falling
 A = 26 bits, binary, rising
 B = 26 bits, gray, rising
 C = 26 bits, binary, falling
 D = 26 bits, gray, falling

d Interface characteristic 2

1 = 1 µm
 2 = 5 µm
 3 = 10 µm
 4 = 20 µm
 5 = 40 µm
 6 = 100 µm
 7 = 2 µm
 8 = 50 µm

e Interface characteristic 3

B = Synchronous mode
 - = Asynchronous mode

Mnnnn Nominal length (4-position)

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

f Style

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)

Magnetostrictive Sensors

BTL7 -J-DEXC- Series - SSI

BALLUFF

Display/Operation

Error value	cd = 10: all bits = 0 d = 1: all bits = 0 d = 7: all bits = 0 otherwise: only bits 2 ²¹ = 1
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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 nnnn ≥ 1525: ≤ 500 mA/25 ms
Operating voltage Ub	10...30 VDC
Output signal adjustable	cd ≠ 10: no cd = 10: with software tool
Overvoltage protection	Ub up to 36 V
Switch-on delay max.	nnnn < 1525: 100 ms 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
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General data

Approval/Conformity	CE CSA IECEX EAC WEEE
Ex marking	ATEX: II 1/2GD Ex d IIC T6 Ga/ Gb Ex t IIIC T85°C Da IP68 -50°C ≤ Ta ≤ +70°C II 1/2GD Ex d IIC T5 Ga/Gb Ex t IIIC T100°C Da IP68 -50°C ≤ Ta ≤ +80°C EAC: 1 Ex d IIC T6 Ga/Gb X Ex ta IIIC T85°C Da X IP68 -50°C ≤ Ta ≤ +70°C 1 Ex d IIC T5 Ga/Gb X Ex ta IIIC T100°C Da X IP68 -50°C ≤ Ta ≤ +80°C IECEX: Ex d IIC T6 Ga/Gb Ex t IIIC T85°C Da IP68 Tamb -50°C to +70°C Ex d IIC T5 Ga/GbEx t 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)
Magnets, number (factory setting)	1
Magnets, number max.	cd ≠ 10: 1 cd = 10: 2

Material

Material flange	Stainless steel (1.4404)
Protection tube material	Stainless steel (1.4571)

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

Output/Interface

Interface	SSI
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Magnetostrictive Sensors
BTL7 -J-DEXC- Series - SSI

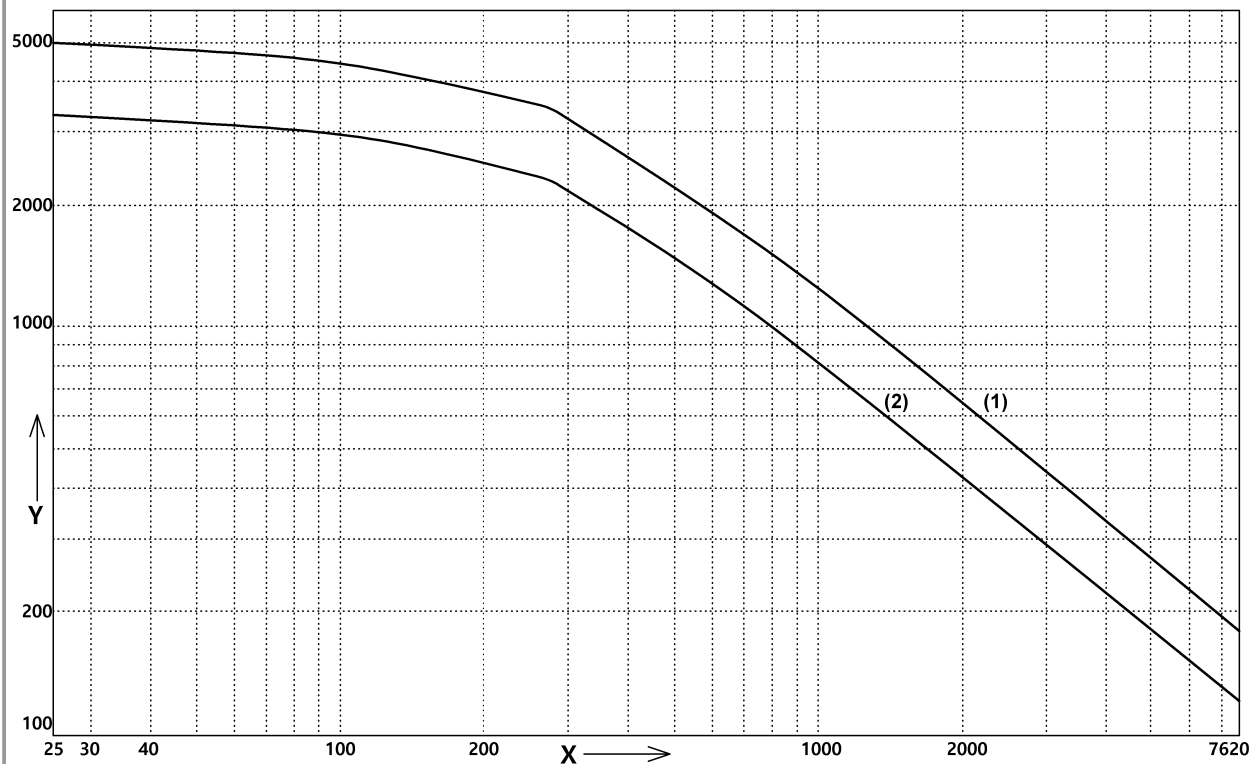


Range/Distance

Linearity deviation	d = 1, 2, 3, 7: nnnn = 50...5500: $\pm 30\mu\text{m}$
	d = 4, 5, 6, 8 nnnn = 50...5500: $\pm 2\text{ LSB}$
	nnnn > 5500: $\pm 0.02\% \text{ FS}$

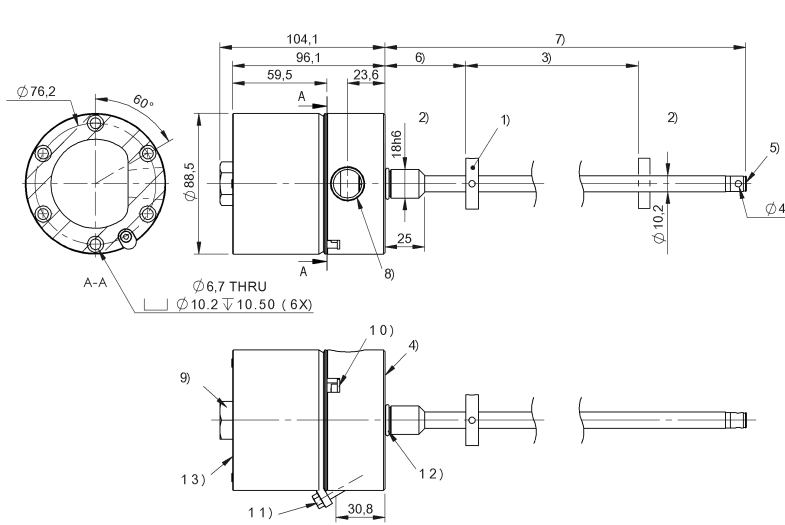
Measuring length	25...7620 mm
Repeat accuracy	$\leq \pm 5\mu\text{m}$
Sampling frequency max.	See illustration for measuring frequency

Characteristic Diagram



fA,min: 62,5 Hz
1) 1 magnet
2) 2...16 magnets
x: Nominal length [mm]
y: fA,max Hz

BTL7-S5xxx-Mxxxx-J-DEXC-TA12



Pin	
1	CLK+
2	DATA+
3	CLK-
4	GND
5	+10...30 V DC
6	DATA-
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