

Magnetostrictive Sensors
BTL7 -K- Series - Analog voltage

BALLUFF



BTL7-abcd-Mnnnn-fg-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

10 = 2 outputs, each 1 x rising/falling

Mnnnn Nominal length (4-position)

M0500 = metric in mm

(M0025...M1016: for rod diameter 8 mm)

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

f Style

K = Compact rod, plug-in flange 18h6, for O-Ring

g Form factor characteristic

8 = Rod diameter 8 mm

- = Rod diameter 10.2 mm

l Connection type

SR = Connector

K = Cable out radial (PUR)

F = Cable out radial (PTFE)

m Connection type characteristic 1

for connector:

32 = M16x0.75 connector with 8 pins

115 = M12x1 connector with 8 pins

for cable (length in meters):

02, 05, 10, 15, 20, 30

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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	100 mA
Inrush current	≤ 500 mA/10 ms
Operating voltage Ub	10...30 VDC
Output current max.	5 mA
Output current max.	5 mA
Output signal adjustable	using programming inputs
Overvoltage protection	Ub up to 36 V
Switch-on delay max.	nnnn < 1525: 600 ms nnnn ≥ 1525: 1000 ms
Voltage-proof up to (GND to housing)	500 V AC

Environmental conditions

Ambient temperature	-40...85 °C
Cable temperature, fixed routing	I = K: -40 °C ... 90 °C I = F: -40 °C ... 200 °C
Cable temperature, flexible routing	I = K: -5 °C ... 90 °C
EN 55016-2-3, Radiation	For industrial and residential use
EN 60068-2-27, Continuous shock	150 g, 2 ms
EN 60068-2-27, Shock	150 g, 6 ms
EN 60068-2-6, Vibration	20 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	I = S: IP67 with connector I = K: IP68
Relative humidity	≤ 90 %, non-condensing
Storage temperature	-40...100 °C
Temperature coefficient typ.	≤ 30 ppm/K at 50% of nominal stroke 500mm

Functional safety

MTTF (40 °C)	72 a
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General data

Approval/Conformity	I = K: CE + cULus + EAC + WEEE I = F: CE + EAC + WEEE
Magnets, number (factory setting)	1
Magnets, number max.	1

Material

Cable flame-resistant	I = K, F: IEC 60332-1
Cable jacket, material	I = K: PUR I = F: PTFE
Housing material	Stainless steel (1.4305)
Material flange	Stainless steel (1.4404) Stainless steel (1.4429) Stainless steel (1.4435) Stainless steel (1.4571)
Protection tube material	Stainless steel (1.4571)

Mechanical data

Installation length from contact surface	nnnn + 100 mm
Pressure rating max.	g ≠ 8: 600 bar g = 8: 250 bar
Pressure rating, note	when installed in hydraulic cylinder
Speed detectable max.	10 m/s
Tightening torque max.	3.5 Nm

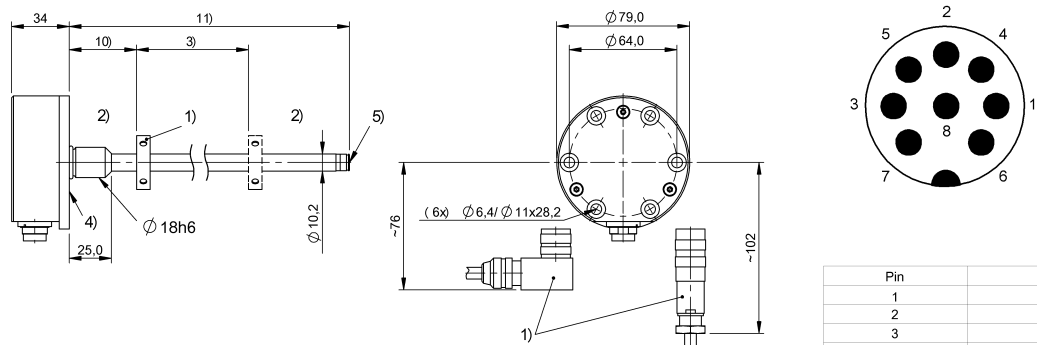
Output/Interface

Interface	Analog, voltage
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Range/Distance

Linearity deviation	nnnn = 0025...0500: ± 50 µm nnnn = 0501...5500: ± 0.01% FS nnnn > 5500: ± 0.02% FS
Measuring length	25...7620 mm
Repeat accuracy	± 10 µm
Sampling frequency max.	nnnn = 0050...0250: 4000 Hz nnnn = 0251...0600: 2000 Hz nnnn = 0601...1300: 1000 Hz nnnn = 1301...2700: 500 Hz nnnn = 2701...5500: 250 Hz nnnn > 5500: 180 Hz

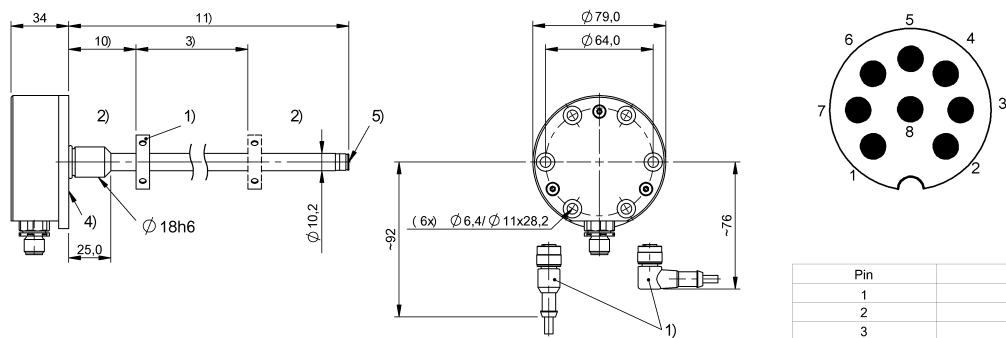
BTL7-A510-Mxxxx-K-SR32



Pin	
1	NC
2	0V
3	10...0 V
4	La
5	0...10 V
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
- 10) Null point
- 11) Installation length

BTL7-G510-Mxxxx-K-SR115



Pin	
1	0V (Pin 3)
2	0V (Pin 5)
3	10...-10 V
4	La
5	-10...10 V
6	GND
7	+24 V DC
8	Lb

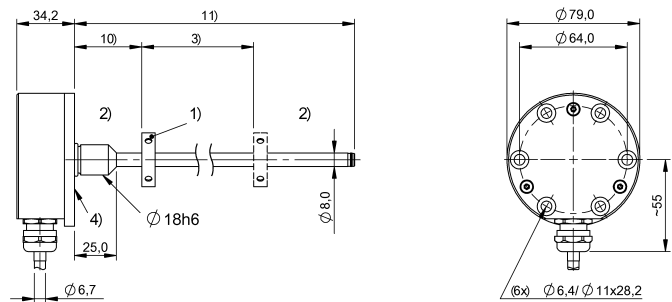
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- 4) Mounting surface
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- 10) Null point
- 11) Installation length

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BTL7-A510-Mxxxx-K8-Kxx



colour	
YE	NC
GY	0 V
PK	10...0 V
RD	La
GN	0...10 V
BU	GND
BN	+24 V DC
WH	Lb

- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 10) Null point
- 11) Installation length