

Magnetostrictive Sensors
BTL7 -Y/Z- 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

1 = 20 ... 28 V

5 = 10 ... 30 V

c + d Interface characteristic 1 + 2

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

10 = 2 outputs, 1x each 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

Y = Inch threads 3/4"-16UNF, for flat seal

Z = Inch threads 3/4"-16UNF, for O-Ring

g Form factor characteristic

8 = Rod diameter 8 mm

- = Rod diameter 10.2 mm

l Connection type

S = Connector

KA = Cable (PUR)

FA = Cable (PTFE)

m Connection type characteristic 1

for connector:

32 = M16x0.75 connector with 8 pins

115 = M12x1 connector with 8 pins

135 = M16x1 connector with 6 pins

140 = MS, 10-pin

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	150 mA
Inrush current	nnnn < 1525: ≤ 500 mA/10 ms nnnn ≥ 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 m = 135: Setting aid
Overvoltage protection	Ub up to 36 V
Switch-on delay max.	nnnn < 1525: 600 ms nnnn ≥ 1525: 800 ms
Voltage-proof up to (GND to housing)	500 V AC

Environmental conditions

Ambient temperature	-40...85 °C
Cable temperature, fixed routing	I = KA: -40 °C ... 90 °C I = FA: -40 °C ... 200 °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	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 AND m ≠ 140: IP67 with connector I = S AND m = 140: IP65 with connector I = KA, FA: 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)	98 a
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General data

Approval/Conformity	nnnn ≤ 500: I = S, KA: CE + cULus + EAC + GL + WEEE I = FA: CE + EAC + GL + WEEE nnnn > 500: I = S, KA: CE + cULus + EAC + WEEE I = FA: CE + EAC + WEEE
Magnets, number (factory setting)	1
Magnets, number max.	cd ≠ 10: 1 cd = 10: 2

Material

Cable flame-resistant	I = KA, FA: IEC 60332-1
Cable jacket, material	I = KA: PUR I = FA: PTFE
Cover material	Aluminum, Die-cast, nickel plated
Housing material	Aluminum
Housing material, surface protection	Anodized
Material flange	Stainless steel (1.3960)
Protection tube material	Stainless steel (1.4571)

Mechanical data

Installation length from contact surface	nnnn + 111 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.	100 Nm

Output/Interface

Interface	Analog, voltage
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Range/Distance

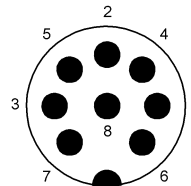
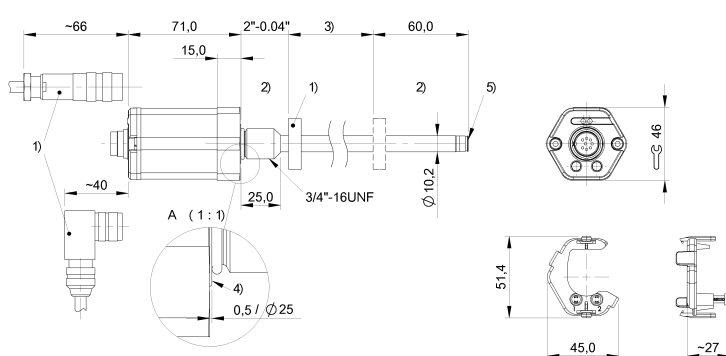
Linearity deviation	nnnn = 0050...0500: ± 50 µm nnnn = 0501...5500: ± 0.01% FS nnnn > 5500: ± 0.02% FS
Measuring length	25...7620 mm
Repeat accuracy	± 10 µm
Sampling frequency max.	nnnn = 0050...0250: 4000 Hz nnnn = 0251...0600: 2000 Hz nnnn = 0601...1300: 1000 Hz nnnn = 1301...2700: 500 Hz nnnn = 2701...5500: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

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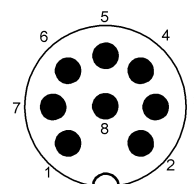
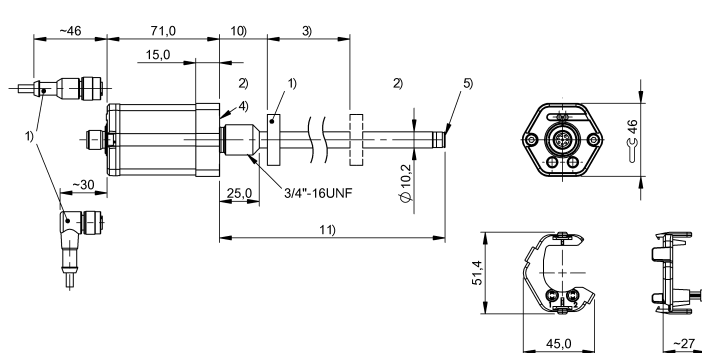
BTL7-A501-Mxxxx-Z-S32



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

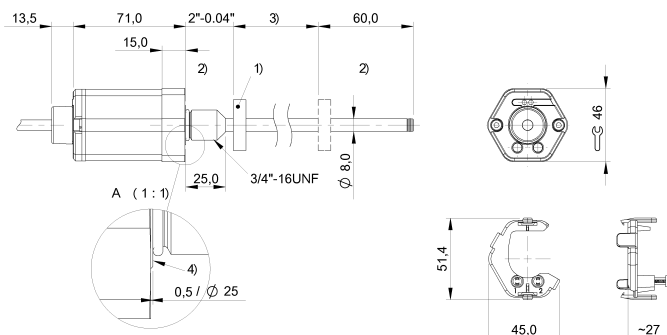
BTL7-G510-Mxxxx-Y-S115



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

- 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

BTL7-A510-Mxxxx-Z8-KAxx



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