



BTL7-abcde-Mnnnn-fg-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

0 = 1 μ m (configurable / only with c = 1)
1 = 1 μ m
2 = 5 μ m
3 = 10 μ m
4 = 20 μ m
5 = 40 μ m
6 = 100 μ m
7 = 2 μ m
8 = 50 μ m

e Interface characteristic 3

B = Synchronous mode
- = Asynchronous mode

Mnnnn Nominal length (4-position)

M0500 = metric in mm
(M0025...M1016: with 8 mm rod diameter)
(M0025...M7620: with 10.2 mm rod diameter)

f Form factor

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
140 = MS, 10-pin
147 = M16x0.75 connector with 7 pins

for cable (length in meters):
02, 05, 10, 15, 20, 30, 50, 100

Magnetostrictive Sensors

BTL7 -Y/Z- Series - SSI

BALLUFF

Basic features

Approval/Conformity	I = S, KA: CE + UKCA + cULus + WEEE I = FA: CE + UKCA + WEEE
Magnets, number (factory setting)	1
Magnets, number max.	cd ≠ 10: 1 cd = 10: 2

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)	500 V DC

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.	≤ 15 ppm/K at 50% of nominal stroke 500mm

Functional safety

MTTF (40 °C)	102 a
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Interface

Interface	SSI
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Material

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

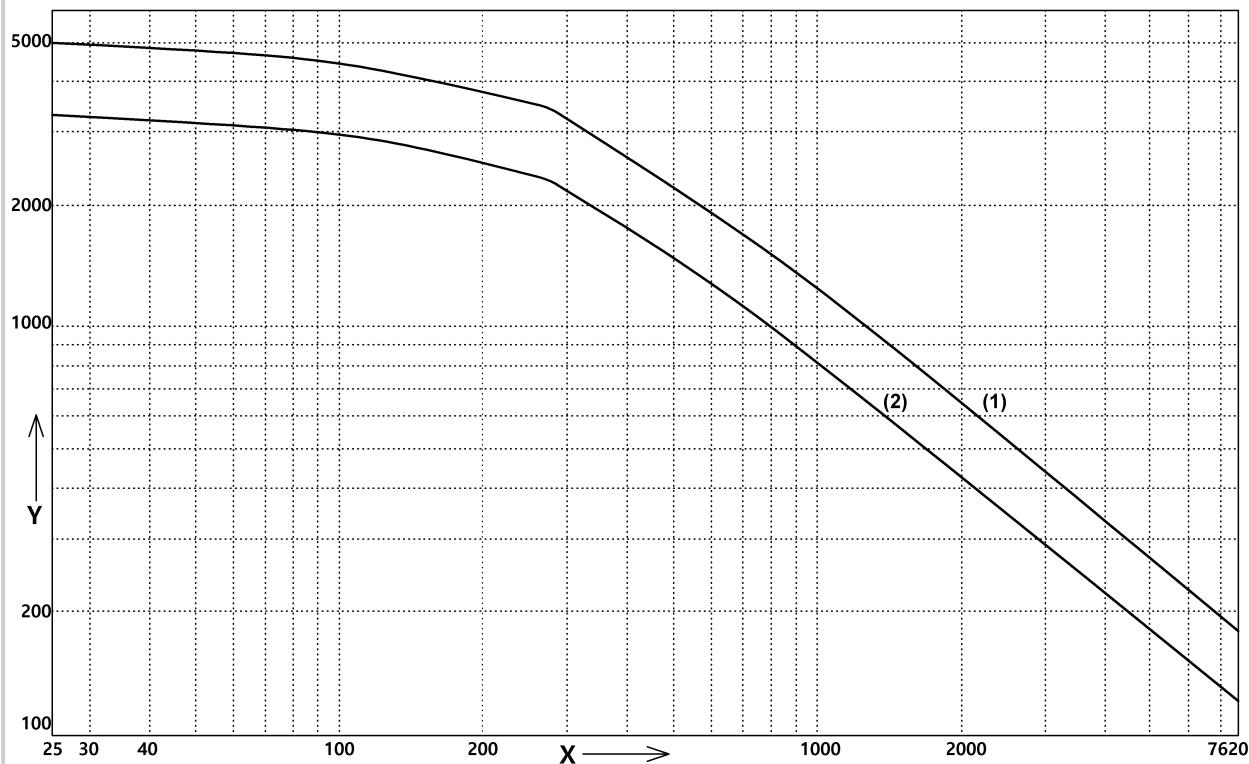
Mechanical data

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

Range/Distance

Linearity deviation	d = 1, 2, 3, 7: nnnn = 25...5500: ± 30µm d = 4, 5, 6, 8 nnnn = 25...5500: ± 2 LSB 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

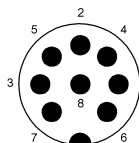
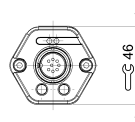
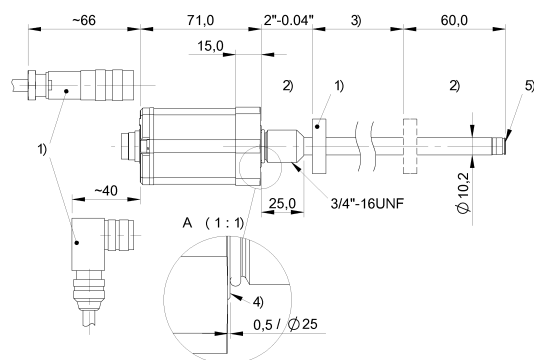
1) 1 magnet

2) 2...16 magnets

x: Nominal length [mm]

y: fA,max Hz

BTL7-S510x-Mxxxx-Z-S32



PIN	
1	+Clk
2	+Data
3	-Clk
4	La
5	-Data
6	GND
7	10...30 V DC
8	Lb

1) not included in scope of delivery

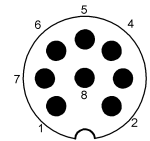
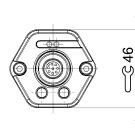
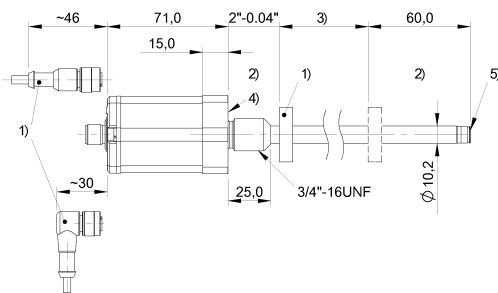
2) Non-usable area

3) Nominal length = Measuring length

4) Mounting surface

5) Internal threads M4x4/6 deep

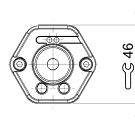
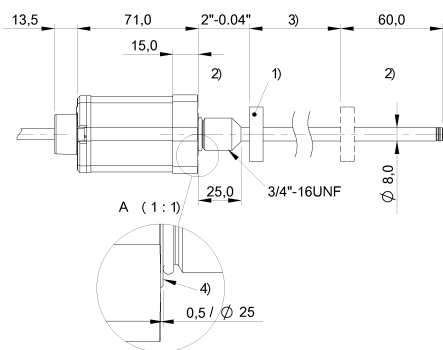
BTL7-S5xxx-Mxxxx-Y-S115



PIN	
1	+Clk
2	+Data
3	-Clk
4	NC
5	-Data
6	GND
7	10...30 V DC
8	NC

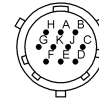
- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep

BTL7-S5xxx-Mxxxx-Z8-KAxx



PIN	
YE	+Clk
GY	+Data
PK	-Clk
RD	NC
GN	-Data
BU	GND
BN	10...30 V DC
WH	NC

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

[illegible]

PIN	
A	+Data
B	+Clk
C	-Clk
D	10...30 V DC
E	NC
F	GND
G	NC
H	NC
J	-Data
K	NC

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