



BTL7-abcde-Mnnnn-fh-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 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
9 = 0.5 μ m

e Interface characteristic 3

D = Synchronous / configurable

Mnnnn Nominal length (4-position)

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

f Form factor

TK = plug-in flange 18h6,, for O-Ring

h Redundancy

2 = 2 times redundant
3 = 3 times redundant

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

for cable (length in meters):
02, 05, 10

Magnetostrictive Sensors BTL7 -TK- 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.	nnnn < 90: 1 nnnn > 89: 2

Display/Operation

Error value	d = 1: all bits = 0 d = 7: all bits = 0 d = 9: 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	150 mA per unit
Inrush current	≤ 500 mA/10 ms per unit
Operating voltage Ub	10...30 VDC
Output signal adjustable	with software tool
Overvoltage protection	Ub up to 36 V
Switch-on delay max.	600 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	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	IP67
Relative humidity	≤ 90 %, non-condensing
Storage temperature	-40...102 °C
Temperature coefficient typ.	≤ 30 ppm/K

Functional safety

MTTF	h = 2: 69 a h = 3: 39 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, Anodized
Housing material	Aluminium, Anodized
Housing material, surface protection	Anodized
Material flange	1.4404 stainless steel
Protection tube material	1.4571 stainless steel

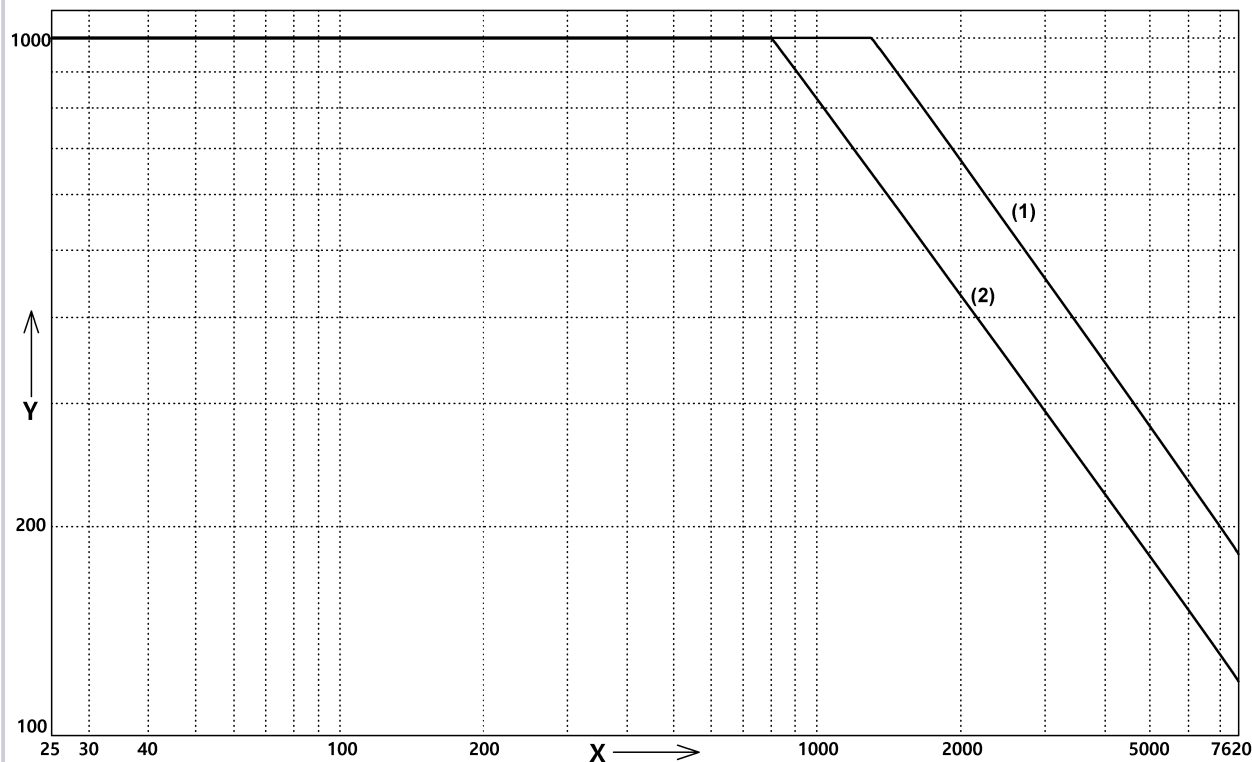
Mechanical data

Installation length from contact surface	nnnn + 100 mm
Pressure rating max.	250 bar
Pressure rating, note	when installed in hydraulic cylinder
Speed detectable max.	10 m/s
Tightening torque max.	9 Nm

Range/Distance

Linearity deviation	d = 1, 2, 3, 7, 9: nnnn = 25...2000: ± 60 µm nnnn = 2001...5500: ± 200 µm d = 4, 5: nnnn = 25...2000: ± 4 LSB nnnn = 2001...5500: ± 200 µm d = 6, 8: nnnn = 25...5500: ± 4 LSB nnnn > 5500: ± 0.04% FS
Measuring length	25...7620 mm
Null point	40 mm
Repeat accuracy	≤ ± 5 µm
Sampling frequency max.	See illustration for measuring frequency

Characteristic Diagram



fA,min: 62,5 Hz

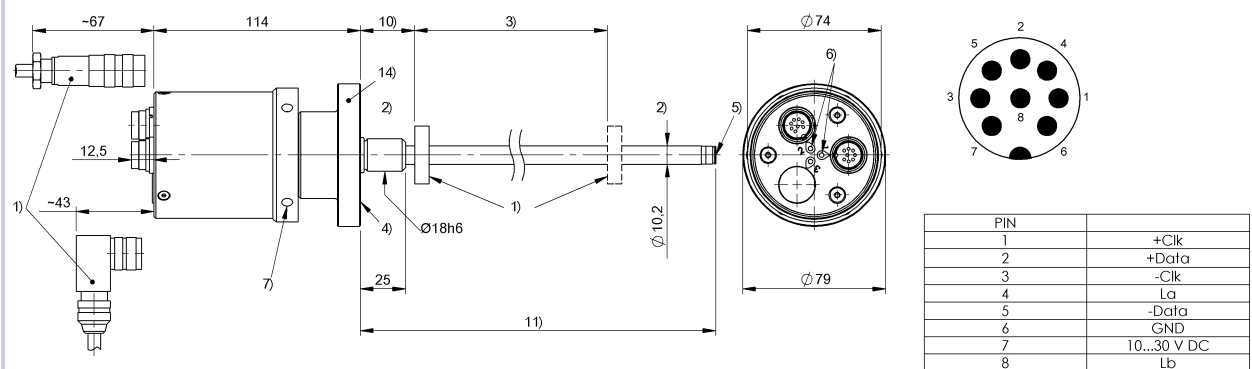
1) 1 magnet

2) 2 magnets

x: Nominal length [mm]

y: fA,max Hz

BTL7-S5xxD-Mxxxx-TK2-S32



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) LED function indicator

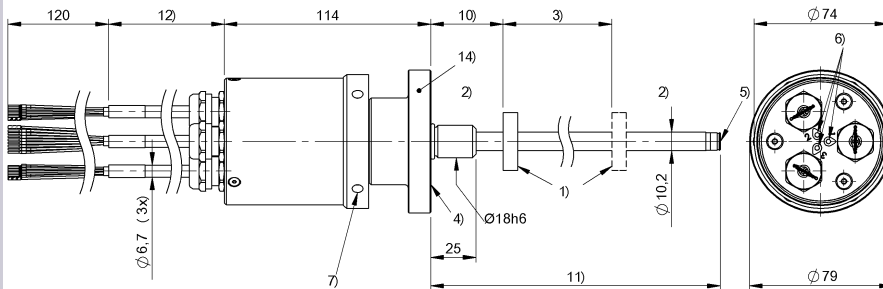
7) Ø6.1 for hook wrench Ø74

10) Null point

11) Installation length

14) not installed

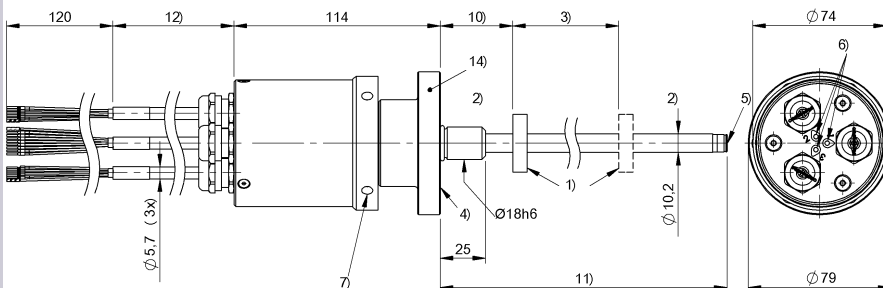
BTL7-S5xxD-Mxxxx-TK3-KAxx



PIN	
YE	+Clk
GY	+Data
PK	-Clk
RD	La
GN	-Data
BU	GND
BN	10...30 V DC
WH	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) LED function indicator
- 7) $\varnothing 6.1$ for hook wrench $\varnothing 74$
- 10) Null point
- 11) Installation length
- 12) Cable length
- 14) not installed

BTL7-S5xxD-Mxxxx-TK3-FAxx



PIN	
YE	+Clk
GY	+Data
PK	-Clk
RD	La
GN	-Data
BU	GND
BN	10...30 V DC
WH	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) LED function indicator
- 7) $\varnothing 6.1$ for hook wrench $\varnothing 74$
- 10) Null point
- 11) Installation length
- 12) Cable length
- 14) not installed