

Magnetostrictive Sensors
BTL7 -TK- Series - Analog current

BALLUFF



BTL7-abcd-Mnnnn-fh-lm

BTL7

Magnetostrictive linear position sensor Generation 7

a interface

C = Current output 0 ... 20 mA

E = Current output 4 ... 20 mA

b Operating voltage

5 = 10 ... 30 V

c + d Interface characteristic 1 + 2

04 = 1 output rising, configurable

05 = 1 output falling, configurable

Mnnnn Nominal length (4-position)

M0500 = metric in mm

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

f Form factor

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

h Redundant

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

135 = M16x0.75 connector with 6 pins

for cable (length in meters):

02, 05, 10, 15, 20

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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
Load resistance RL max.	500 Ohm
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...100 °C
Temperature coefficient typ.	≤ 20 ppm/K at 50% of nominal stroke 500mm

Functional safety

MTTF	h = 2: 33 a h = 3: 17 a
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General data

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

Material

Cable flame-resistant	I = KA, FA: IEC 60332-1
Cable jacket, material	I = KA: PUR I = FA: PTFE
Cover material	Aluminum, Anodized
Housing material	Aluminum
Housing material, surface protection	Anodized
Material flange	Stainless steel (1.4404)
Protection tube material	Stainless steel (1.4571)

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

Output/Interface

Interface	Analog, current
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Range/Distance

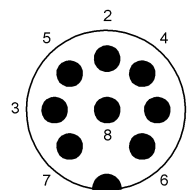
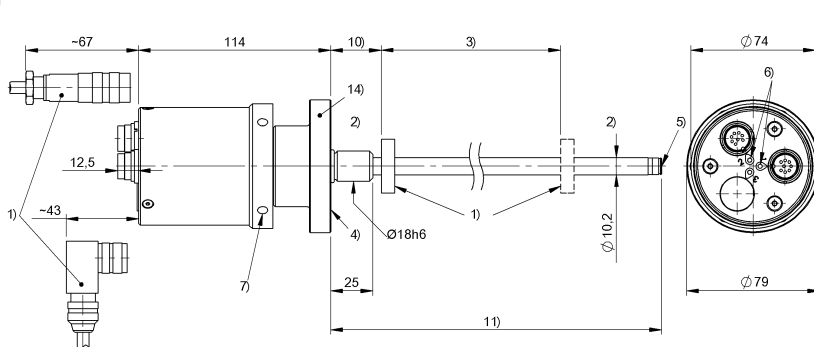
Linearity deviation	nnnn = 0050...0500: ± 200 µm nnnn > 0500: ± 0.04% FS
Measuring length	25...7620 mm
Repeat accuracy	± 5 µm
Sampling frequency max.	nnnn = 0050...1200: 500 Hz nnnn = 1201...5000: 250 Hz nnnn = 0601...1300: 1000 Hz

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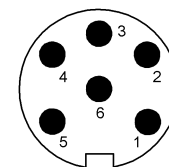
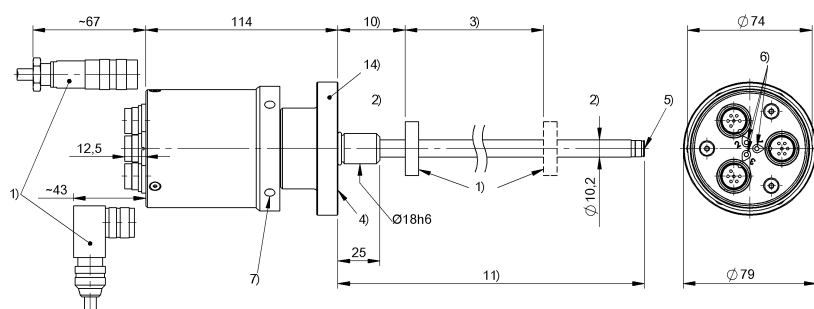
BTL7-E504-Mxxxx-TK2-S32



Pin	
1	4...20 mA
2	0 V
3	NC
4	La
5	NC
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
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 14) not installed

BTL7-C505-Mxxxx-TK3-S135



Pin	
1	20...0 mA
2	0 V
3	La
4	Lb
5	+24 V DC
6	GND

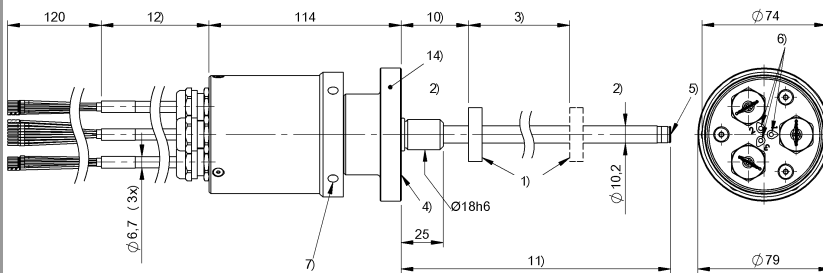
- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 14) not installed

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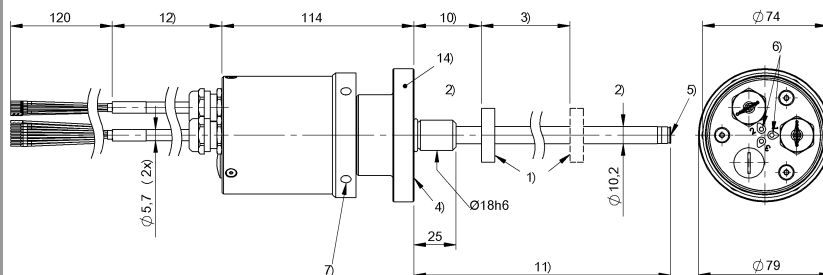
BTL7-E505-Mxxxx-TK3-KAxx



colour	
YE	20...4 mA
GY	0 V
PK	NC
RD	La
GN	NC
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
- 5) Internal threads M4x4/6 deep
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 12) Cable length
- 14) not installed

BTL7-C504-Mxxxx-TK2-FAxx



colour	
YE	0...20 mA
GY	0 V
PK	NC
RD	La
GN	NC
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
- 5) Internal threads M4x4/6 deep
- 6) LED function indicator
- 7) Ø6.1 for hook wrench Ø74
- 10) Null point
- 11) Installation length
- 12) Cable length
- 14) not installed