

Smart Automation and Monitoring System
Magnetostrictive Sensors
BTL C1 - Rod BN/ZN - IO-Link

BALLUFF



BTL abcdef-nnnn-ghijklmo-pqrstu

BTL

Magnetostriuctive linear position sensor

a Mounting

B = Metric fastening thread M18x1.5

Z = Inch threads 3/4"-16UNF

b Housing geometry

N = Width across flats 41; length 34 mm; axial connection

c Detailed design 1

C = Rod diameter 10.2 mm; Stainless steel 1.4404

d Detailed design 2

A = Screw plug; zero point 30 mm; with O-ring

E = Screw plug; zero point 50.8 mm; with O-ring

ef Special design feature

00 = none

nnnn Measuring range

0500 = Specification in mm

(0025 ... 4000)

g Performance class

C = Platform C, Level 2

h Version Performance class

1

i Supply voltage

2 = 18 ... 30 V

j Interface group

N = Networking

k Interface type

L = IO-Link

l Characteristic Interface 1

2 = V1.1, COM2

3 = V1.1, COM3

m Characteristic Interface 2

A = 1 x position

(Smart Sensor Profile Legacy, 4 bytes)

B = 1 x position, 1 x speed

(Smart Sensor Profile Legacy, 8 bytes)

C = 2 x position

(Smart Sensor Profile Legacy, 8 bytes)

D = 2 x position, 2 x speed

(Smart Sensor Profile Legacy, 16 bytes)

G = 1 x position, status bits

(Smart Sensor Profile Ed. 2, 6 bytes)

o Characteristic Interface 3

0 = none

p Cable/leads

0 = no cable/leads

qr Cable length

00 = no cable/leads

s Connector type

S = single connector

tu Connector model

04 = connector, M12, 4-pin

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Basic features

Approval/Conformity	CE UKCA cULus WEEE
Magnets, number max.	2 minimum separation between magnets 65 mm.

Electrical connection

Polarity reversal protected	Ub up to 30 V DC
Short-circuit protection	Signal output against GND and against 30 V DC

Electrical data

Current consumption max. at 24 V DC	60 mA
Error value	0x7FFFFFFC
Inrush current	≤ 3 A/0.5 ms
Operating voltage Ub	18...30 VDC
Overvoltage protection	Ub up to 36 V DC
Switch-on delay max.	300 ms
Voltage-proof up to (GND to housing)	500 V DC

Environmental conditions

Ambient temperature	-40...85 °C
EN 55016-2-3, Radiation	For industrial and residential use
EN 60068-2-27, Continuous shock	50 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 3
EN 61000-4-6, High-frequency fields	Severity Level 3
EN 61000-4-8 Magnetic fields	Severity Level 4
IP rating	IP67, IP69K with connector
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)	176 a
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Interface

Data format	32-bit signed
IO-Link Profil IDs	m = G: 0x000B SSP3.2 0x0031 BLOB FW-Update 0x4000 Identification and Diagnosis m = A, B, C, D: 0x0001 SSP0 0x0031 BLOB FW-Update
Interface	IO-Link 1.1
Process data, Master – Device	0 bytes
Prozess data, Device – Master	m = A: 4 Byte m = B, C: 8 Byte m = D: 16 Byte m = G: 6 Byte

Material

Cover material	1.4404 stainless steel
Material flange	Stainless steel (AISI 316 / V4A)
Protection tube material	Stainless steel (AISI 316 / V4A)

Mechanical data

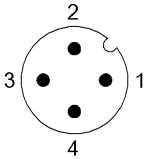
Installation length from contact surface	d = A: n + 90 mm d = E: n + 111 mm
Pressure rating max.	450 bar
Pressure rating, note	when installed in hydraulic cylinder maximum pressure: 750 bar (10 x 1 min)
Speed detectable max.	10 m/s
Tightening torque max.	75 Nm

Range/Distance

Linearity deviation	± 50 µm
Measuring length	25...4000 mm
Null point	d = A: 30 mm d = E: 50.8 mm
Repeat accuracy	≤ ± 10 µm
Resolution, position	5 µm
Sampling frequency max.	nxxx = 25...1270: 1000 Hz nxxx = 1271...2650: 500 Hz nxxx = 2651...4000: 250 Hz

Connector Diagram

stu = S04: M12 connector, 4-pin



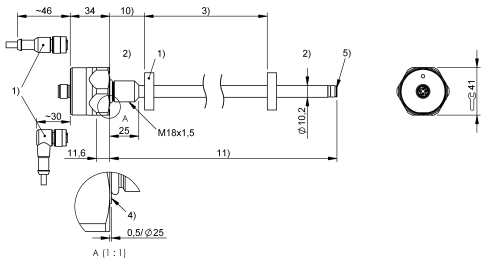
Wiring diagramm

M12 connector, 4 pole

Pin	
1	L+ (18...30V)
2	n.c.
3	L- (GND)
4	C/Q (communication line)

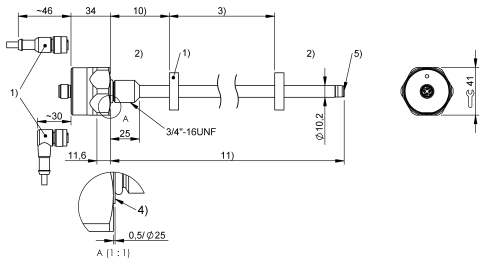
Product View

a = B: mounting M18 thread + stu = S04: M12x1 connector



- 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

a = Z: mounting 3/4 inch thread + stu = S04: M12x1 connector



- 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