

Magnetostrictive Sensors
BTL C1 - Rod BN/ZN - Analog

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BTL abcdef-nnnn-ghijklmo-pqrstu

BTL

Magnetostrictive position measuring system

a mounting

B = Metric mounting thread M18x1.5

Z = inch thread 3/4"-16UNF

b Housing geometry

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

c Housing detail 1

C = rod diameter 10.2mm; stainless steel 1.4404

d Housing detail 2

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

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

ef Special construction property

00 = none

nnnn Measuring range

0500 = metric in mm

(0025 ... 4000)

g Performance Class

C = Platform C, Level 2

g Performance Class version

1

i Power supply

5 = 10 ... 30 V

j Interface-Group

A = Analog

k Characteristic Interface 1

A = 0 ... 10 V increasing from mechanical zero point

1 = 10 ... 0 V falling from mechanical zero point

E = 4 ... 20 mA increasing from mechanical zero point

5 = 20 ... 4 mA falling from mechanical zero point

l Characteristic Interface 2

0 = no second output signal

A = 0 ... 10 V increasing from mechanical zero point

1 = 10 ... 0 V falling from mechanical zero point

E = 4 ... 20 mA increasing from mechanical zero point

5 = 20 ... 4 mA falling from mechanical zero point

m Configuration of signals

1 = Signal 1 = Position, 1 Magnet fix

2 = Signal 1&2 = Position, 1 Magnet fix

4 = Signal 1&2 = Position, FMM*

B = Signal 1&2 = Position, FMM* (+ IO-Link)

C = Signal 1&2 = Position, 1 Magnet fix (+ IO-Link)

* = Flexible Magnet Mode

o Optional configuration

0 = none

p Cable/leads

0 = without cable / leads

C = cable PUR

qr Cable length

00 = without cable / leads

A2 = 2 m

A5 = 5 m

B0 = 10 m

B5 = 15 m

C0 = 20 m

s Connector type

0 = no connector

S = Single plug

tu Connector version

15 = Male, M12, 8-pin

32 = Male, M16, 8-pin

35 = Male, M16, 6-pin

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Basic features

Approval/Conformity	CE UKCA cULus WEEE
Magnets, number (factory setting)	1
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	k = A, 1 AND l = A, 1 AND m = 2, 4: 70 mA k = A, 1 AND l = A, 1 AND m = B, C: 80 mA k = E, 5 AND l = E, 5 AND m = B, C: 110 mA
Inrush current	≤ 3 A/0.5 ms
Operating voltage Ub	10...30 VDC
Output signal adjustable	m = 1, 2, 4: - m = B, C: with Softwaretool
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
Cable temperature, fixed routing	-40 °C...90 °C
Cable temperature, flexible routing	-5 °C...90 °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 2
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	k = A,1: m = 1, 2, 4: 168 a m = B, C: 128 a k = E, 5: m = 1, 2, 4: 136 a m = B, C: 101 a
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Interface

Interface	k = A, 1: Analog, voltage k = E, 5: Analog, current
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Material

Cable flame-resistant	IEC 60332-1
Cable jacket, material	PUR
Cover material	1.4404 stainless steel
Material flange	Stainless steel (AISI 316 / V4A)
Protection tube material	Stainless steel (AISI 316 / V4A)

Mechanical data

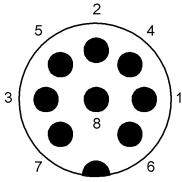
Installation length from contact surface	d = A: n + 90 mm d = E: n + 111 mm
Pressure rating max.	450 bar
Pressure rating, note	when installed in hydraulic cylinder maximum pressure: 750 bar (10 x 1 min)
Speed detectable max.	10 m/s
Tightening torque max.	75 Nm

Range/Distance

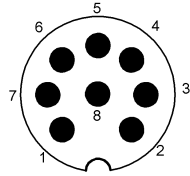
Linearity deviation	n n n n = 0050...0500: ± 60 μm n n n n ≥ 0500: ± 0.012% FS
Measuring length	25...4000 mm
Null point	d = A: 30 mm d = E: 50.8 mm
Repeat accuracy	n n n n ≤ 0500: ≤ ± 10 μm n n n n > 0500: ≤ ± 0.002% FS
Resolution, position	k = A, 1: 183 μV at least 4 μm k = E, 5: 351 nA at least 4 μm
Sampling frequency max.	n n n n = 25...1270: 1000 Hz n n n n = 1271...2650: 500 Hz n n n n = 2651...4000: 250 Hz

Connector Diagramm

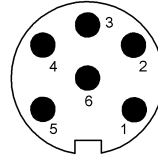
stu = S32: M16 connector, 8 pole



stu = S15: M12 connector, 8 pole



stu = S35: M16 connector, 6 pole



Wiring diagramm

M16 connector, 8 pole / voltage

Pin	Signal
1	NC
2	0 V
3	Output 2
4	C/Q (communication line)
5	Output 1
6	GND
7	+UB
8	NC

M16 connector, 8 pin / current

Pin	Signal
1	Output 1
2	0 V
3	Output 2
4	C/Q (communication line)
5	NC
6	GND
7	+UB
8	NC

M16 connector, 6 pole / voltage

Pin	Signal
1	Output 1
2	0 V (Output 1)
3	Output 2
4	0 V (Output 2)
5	+UB
6	GND

M16 connector, 6 pole / current

Pin	Signal
1	Output 1
2	0 V
3	NC
4	NC
5	+UB
6	GND

M12 connector, 8 poles

Pin	Signal
1	0 V (Output 2)
2	0 V (Output 1)
3	Output 2
4	C/Q (communication line)
5	Output 1
6	GND
7	+UB
8	NC

Cable outlet axial

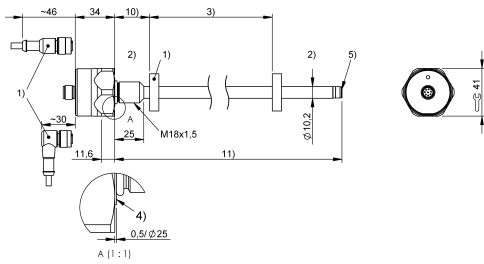
Colour	Signal
GY	0 V
PK	Output 2
GN	Output 1
BU	GND
BN	+UB
WH	C/Q (communication line)

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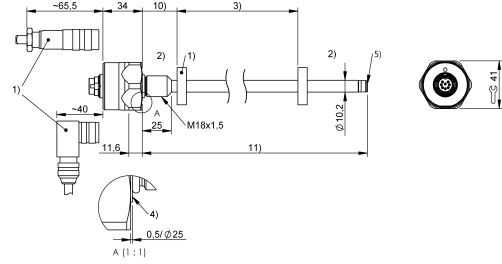
Product View

a = B: mounting M18 thread + stu = S15: M12x1 connector 8 pole



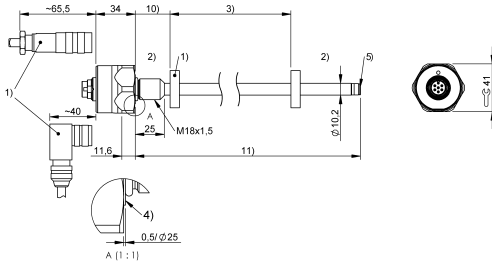
- 1) not included in scope of delivery
- 2) Non-usable area
- 3) Nominal length = Measuring length
- 4) Mounting surface
- 5) Internal threads M4x4/6 deep
- 10) Null point
- 11) Installation length

a = B: mounting M18 thread + stu = S32: M16x1 connector 8-pole



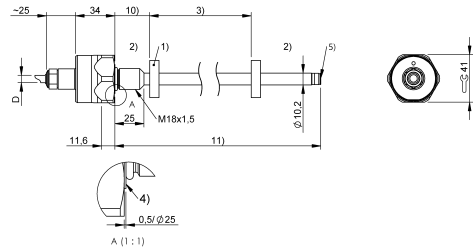
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a = B: mounting M18 thread + stu = S35: M16x1 connector 6-pin



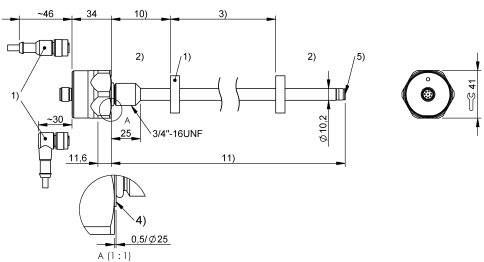
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a = B: mounting M18 thread + p = C: cable PUR



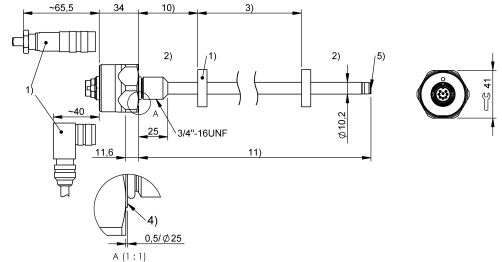
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a = Z: mounting 3/4 inch thread + stu = S15: M12x1 connector 8-pin



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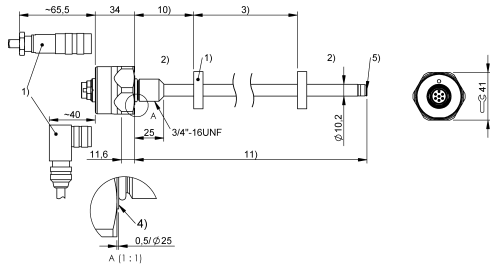
a = Z: mounting 3/4 inch thread + stu = S32: M16x1 connector 8-pin



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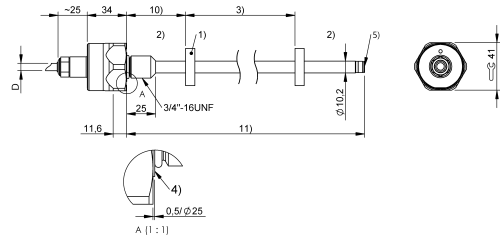
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a = Z: mounting 3/4 inch thread + stu = S35: M16x1 connector 6-pin



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