



1) Sealing ring



### Basic features

Application	Position monitoring in short stroke hydraulic cylinders
Approval/Conformity	CE UKCA cULus WEEE
Basic standard	IEC 60947-5-2 IEC 60947-5-7
Measuring principle	Ultrasound
Operating mode	SIO Mode IO-Link Mode
Secondary features for condition monitoring	Internal temperature monitoring
Series	BFD

### Display/Operation

Display	1x tricoloured - LED
Function indicator	yes

### Electrical connection

Bending radius min., fixed cable	12 mm
Bending radius min., flexible cable	12 mm
Cable diameter D	3.4 mm ±0.1 mm
Cable length L	0.3 m
Conductor cross-section	0.14 mm <sup>2</sup>
Connection	M12x1-Male, 4-pin, A-coded
Connection type	Cable with connector, 0.3 m, TPU
Number of conductors	4
Polarity reversal protected	yes
Short-circuit protection	yes

### Electrical data

Current draw max.	130 mA
Load resistance RL max. (Analog I)	500 ohms
Load resistance RL min. (Analog V)	2 kOhm
No-load current I <sub>o</sub> max. at U <sub>e</sub>	25 mA
Operating voltage U <sub>b</sub>	10...30 VDC
Rated insulation voltage U <sub>i</sub>	24 V DC
Rated operating voltage U <sub>e</sub> DC	24 V
Ready delay t <sub>v</sub> max.	0.2 s
Ripple max. (% of U <sub>e</sub> )	10 %
Ultrasonic Frequency	2000 kHz

## Environmental conditions

Ambient temperature	0...85 °C
EN 60068-2-27, Shock	30 g, 11 ms
EN 60068-2-6, Vibration	30 g, 10...2000 Hz
IP rating	IP67
Relative humidity	≤ 90 %, non-condensing
Storage temperature	-20...85 °C

## Functional safety

MTTF (40 °C)	308 a
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## Interface

Analog output	Analog, voltage/Analog, current selectable 4...20 mA/0...10 V
Baud rate	COM3 (230,4 kBaud)
Interface	IO-Link 1.1
Process data IN	6 bytes
Process data OUT	0 bytes
Process data cycle min.	1.4 ms
Switching output	Pin 2: PNP/NPN/push-pull NO/NC Pin 4: Push-pull NO/NC

## Material

Gasket, material	NBR
Housing material	1.4104 stainless steel PBT
Material jacket	TPU
Sealing ring, standard	DIN 3869-18-NBR

## Remarks

For reliable operation, the sensor must have direct contact with the fluid.  
 Ensure that the hydraulic circuit is free of air before operating the measuring system.  
 For safe and reliable operation, prepare the mechanical connection of the hydraulic cylinder according to the instructions.  
 The sensor is functional again after the overload has been eliminated.  
 For additional information, refer to user's guide.  
 For more information about MTTF and B10d see MTTF / B10d Certificate

Indication of the MTTF- / B10d value does not represent a binding composition and/or life expectancy assurance; these are simply experiential values with no warranty implications. These declared values also do not extend the expiration period for defect claims or affect it in any way.

## Mechanical data

Burst pressure	455 bar
Dimension	Ø 30 x 30.9 mm
Mounting connection	M18x1
Pressure rating max.	350 bar
Pressure rating, note	oil pressure rated
Sealing ring, size	20.9 × 15.7 × 1.5 mm
Size	Screw design
Tightening torque max.	62 Nm
Tightening torque min.	58 Nm
Weight	78 g

## Range/Distance

Measuring range	0...80 mm
Measuring rate max.	500 Hz (digital) 1000 Hz (analog)
Non-linearity max.	±250 µm
Repeat accuracy	± 50 µm
Resolution	≤ 12 bits
Resolution analog	12 Bit
Resolution digital	1 µm
Temperature drift max.	5 %

## Connector Drawings



## Wiring Diagrams (Schematic)

