



### Basic features

<b>Additional features</b>	Function monitoring
<b>Approval/Conformity</b>	CE EAC WEEE
<b>Basic standard</b>	IEC 60947-5-2

### Display/Operation

<b>Function indicator</b>	no
<b>Power indicator</b>	no

### Electrical connection

<b>Connection</b>	M12x1-Male, 4-pin, A-coded
<b>Polarity reversal protected</b>	yes
<b>Protection against device mix-ups</b>	yes
<b>Short-circuit protection</b>	yes

### Electrical data

<b>Load capacitance max. at Ue</b>	0.15 $\mu$ F
<b>Min. operating current I<sub>m</sub></b>	1 mA
<b>No-load current I<sub>o</sub> max., damped</b>	25 mA
<b>No-load current I<sub>o</sub> max., undamped</b>	25 mA
<b>Operating voltage U<sub>b</sub></b>	20...30 VDC
<b>Output resistance R<sub>a</sub></b>	Open collector
<b>Rated insulation voltage U<sub>i</sub></b>	75 V DC
<b>Rated operating current I<sub>e</sub></b>	130 mA
<b>Rated operating voltage U<sub>e</sub> DC</b>	24 V
<b>Rated short circuit current</b>	100 A
<b>Ready delay t<sub>v</sub> max.</b>	50 ms
<b>Residual current I<sub>r</sub> max.</b>	80 $\mu$ A
<b>Ripple max. (% of U<sub>e</sub>)</b>	15 %
<b>Switching frequency</b>	300 Hz
<b>Utilization category</b>	DC -12
<b>Voltage drop static max.</b>	2.5 V

### Environmental conditions

<b>Ambient temperature</b>	-25...70 °C
<b>Contamination scale</b>	3
<b>EN 60068-2-27, Shock</b>	Half-sinus, 30 gn, 11 ms
<b>EN 60068-2-6, Vibration</b>	55 Hz, amplitude 1 mm, 3x30 min
<b>Protection degree</b>	IP67

### Functional safety

<b>MTTF (40 °C)</b>	990 a
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Inductive Sensors  
**BES 113-356-SA6-S4**  
Order Code: BES02MC

**BALLUFF**

**Material**

Housing material	Brass, nickel plated
Material sensing surface	PA 12
Surface protection	nickel plated

**Mechanical data**

Dimension	Ø 12 x 91.5 mm
Installation	non-flush
Size	M12x1
Tightening torque	10 Nm

**Output/Interface**

Switching output	PNP normally open (NO)
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**Range/Distance**

Assured operating distance Sa	2.9 mm
Hysteresis H max. (% of Sr)	15.0 %
Rated operating distance Sn	3.7 mm
Real switching distance sr	3.7 mm
Repeat accuracy max. (% of Sr)	5.0 %
Temperature drift max. (% of Sr)	10 %
Tolerance Sr	-10 %/+20 %

**Remarks**

Max. cable length: 50 m.

Test pulses  $\leq 0.5$  ms typ. 160 Hz are superimposed on the output signal which are missing when there is a fault (single fault) in the sensor.

The sensor is functional again after the overload has been eliminated.

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.

**Connector Drawings**



**Wiring Diagrams**

