

Inductive Proximity Sensors

Namur Sensors

The use of NAMUR sensors and switching amplifiers enables non-contact sensing to be performed within a hazardous area. By locating the sensors inside the hazardous area and the switching amplifier outside, intrinsically safe switching systems can be accomplished.

These Factory Mutual Approved devices may be used in Class I, II and III, Division 1, Group A-G hazardous locations when the recommended installation is followed. Only the sensors and amplifiers listed on the installation drawing are Factory Mutual Approved. In addition, any of the Factory Mutual Approved devices shown may be used with Factory Mutual approved devices from another manufacturer provided the entity parameters listed are met.

Contents

Selection Charts

Part Numbers

Standard

DC 3-/4-Wire Tubular

DC 3-/4-Wire Block

AC 2-Wire Tubular

AC/DC 2-Wire Tubular

AC/DC 2-Wire Block

DC 2-Wire Tubular

Specialty

Welding Sensors
– Factor 1
– Weld Immune

Proximax®

SteelFace™

Proxinox®

High Temp

Ultralinear™

Namur

Large Housing

Ring Sensors

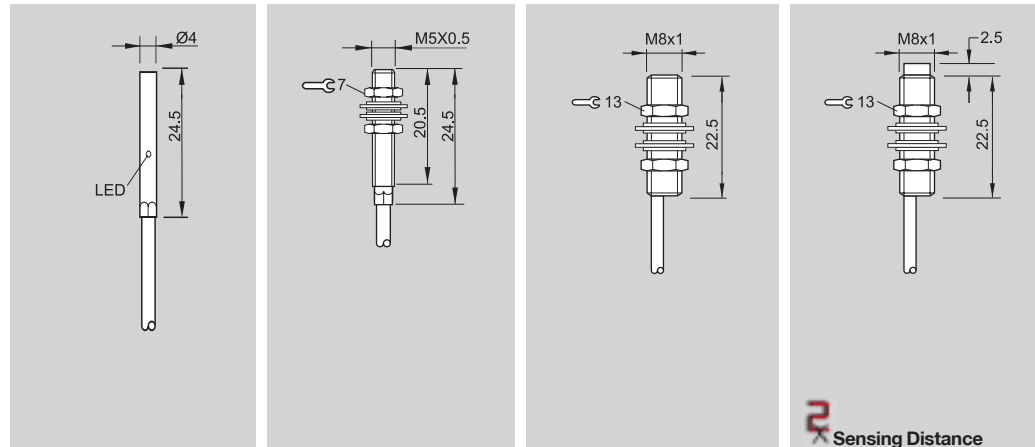
Connectors

Accessories

Technical Reference

Part Number Index

Housing size	Ø 4 mm	M5x0.5	M8x1	M8x1
Mounting	flush	flush	flush	non-flush
Rated operating distance s_n	0.8 mm	0.8 mm	1.2 mm	2.5 mm
Assured operating distance s_a	0...0.65 mm	0...0.65 mm	0...0.95 mm	0...2 mm



Ordering code	BES 516-3007-E2-N-	BES 516-3005-F0-N-	BES 516-324-E2-N-	BES 516-383-E2-N-
Supply voltage U_B^*	7.7...9.0 Vdc	7.7...9.0 Vdc	7.7...9.0 Vdc	7.7...9.0 Vdc
Frequency of operating cycles f	≤ 2000 Hz	≤ 2000 Hz	≤ 2000 Hz	≤ 1000 Hz
Recommended connector				

* Output current changes if supply voltage is 5...24 Vdc (= no NAMUR-conditions). Please consult factory for correct resistor value.

NAMUR sensors per DIN 19234 consist generally of an oscillator, which is damped by the approach of metal, and a demodulator.

The electrical sensor is influenced by metal objects approaching the sensing surface, resulting in an electrical signal output. The output signal is a change in output current.

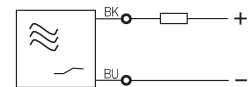
NAMUR sensors (DIN 19 234/DIN VDE 0165) may be used in conjunction with appropriate switching amplifiers (see pg. 1.139) for intrinsically safe applications in explosive areas of the zone 1 or 2. The switching amplifier, however, must be installed outside of the explosion areas.

See technical section for proper mounting of the 2x long range sensors.

Technical Data

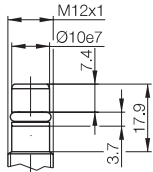
Nominal voltage U_n	8.2 Vdc
Supply voltage U_B per DIN 19 234*	7.7...9.0 Vdc
Ripple of power supply	≤ 15 %
Output current per DIN 19 234	undamped ≥ 4.0 mA damped ≤ 1.0 mA
Effective resistance R_v in the control circuit	550...1100 Ω
Nominal resistance	1000 Ω
Load resistance between sensor and amplifier	0...50 Ω
Output function	normally-closed (NC)
Output signal:	current change (no trigger):
"On"-signal	≥ 1.8 mA (switching amplifier BES 516-607..)
"Off"-signal	≤ 1.5 mA (switching amplifier BES 516-607..)
total undamped	≥ 4.0 mA
total damped	≤ 1.0 mA
Self capacitance of the sensor	≤ 30 nF
Inductance of the oscillator coil	≤ 1 mH
Switching hysteresis H	≤ 20 %
Degree of protection per DIN 40 050	IP 67
Ambient temperature range T_a	-25...+70 °C

Protected against polarity reversal to $U_B = 9.0$ V.



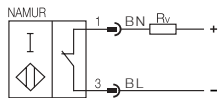
Output function NC

M12x1 flush 1.5 mm 0...1.1 mm	M12x1 flush 2 mm 0...1.6 mm	M12x1 non-flush 4 mm 0...3.2 mm	M18x1 flush 5 mm 0...4 mm	M30x1.5 flush 10 mm 0...8.0 mm
BES 516-300-S266-S 4*	BES 516-325-E3-N-	BES 516-356-E3-N-	BES 516-326-E3-N-	BES 516-327-E3-N-
7.7...9.0 Vdc ≤ 1000 Hz C04-AEL-00-VY-050M	7.7...9.0 Vdc ≤ 1000 Hz	7.7...9.0 Vdc ≤ 500 Hz	7.7...9.0 Vdc ≤ 500 Hz	7.7...9.0 Vdc ≤ 300 Hz

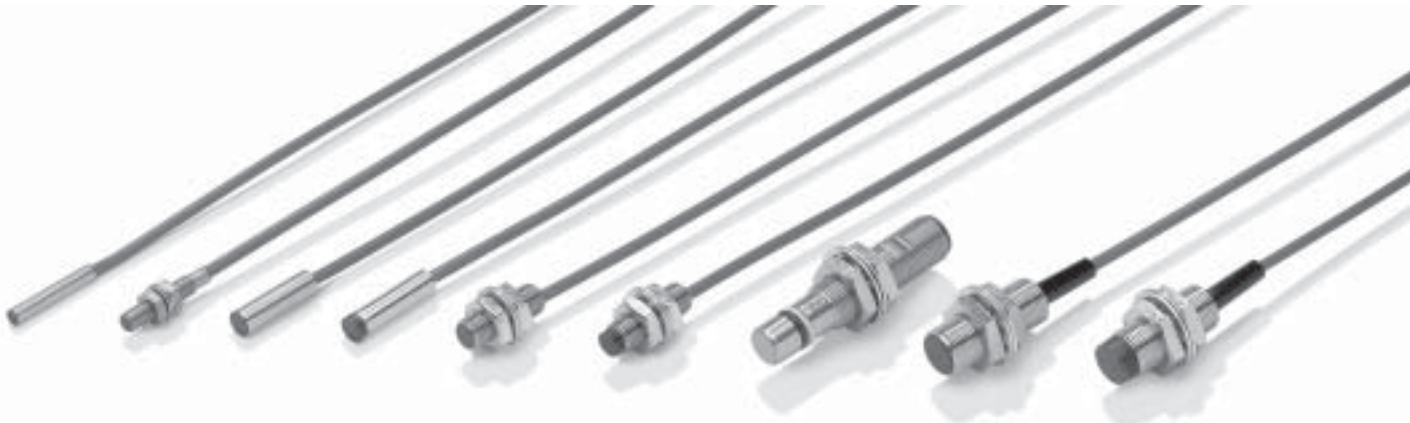


* See page 4.49 for mounting dimensions and tolerances.

Mounting Diagram



- For mounting brackets & accessories see section 7.



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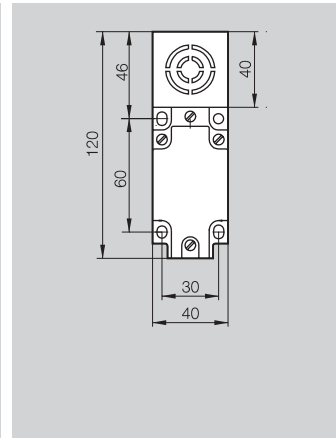
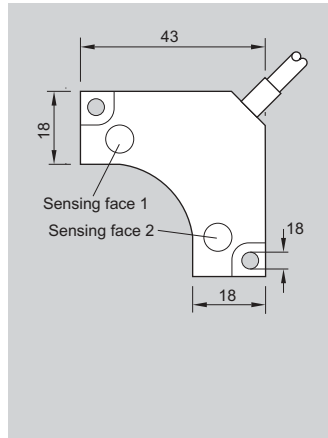
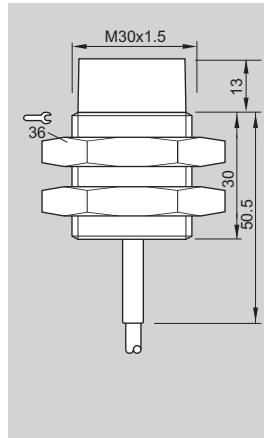
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Housing size	M30x1.5	Double switch	40x40x120 Unisensor
Mounting	non-flush	flush	flush
Rated operating distance s_n	15 mm	4 mm	15 mm
Assured operating distance s_a	0...12.0 mm	0...3.2 mm	0...12.0 mm



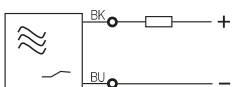
Ordering code	BES 516-362-E3-N-	BES 517-300-S 287-N-	BES 517-132-M3-N
Supply voltage U_B^*	7.7...9.0 Vdc	7.7...9.0 Vdc	7.7...9.0 Vdc
Frequency of operating cycles f	≤ 100 Hz	≤ 500 Hz	≤ 100 Hz

* Output current changes if supply voltage is 5...24 Vdc (= no NAMUR-conditions). Please consult factory for correct resistor value.

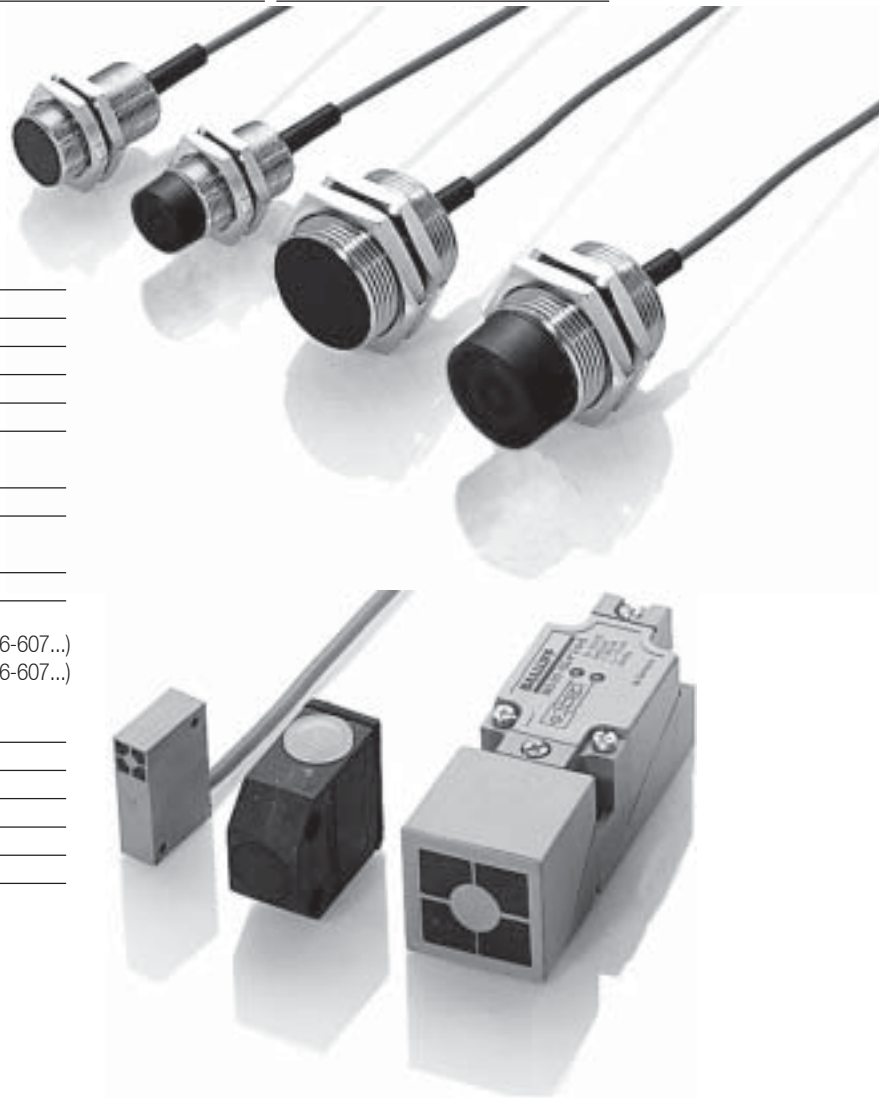
Technical Data

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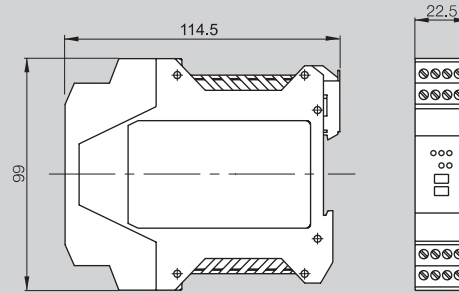
Output function NC



Switching Amplifier

for Namur sensors

2 channel



Ordering Code	BARTEC 17-584D-220D/0000	BARTEC 17-584D-230D/0000
Input	NAMUR-Specification	
Output circuit	Relay contact SPST (2 channel)	
	Switching voltage 250 Vac/100 Vdc	
	Switching current 5 A AC/2 A DC	
	Switching capacity 100 VA/50W	
	mechanical life 10 million cycles (max. 20 Hz)	
Function reversal	Via switches	
Power consumption	120 Vac, 2.2 VA per channel/230 V AC, 2.2 VA per channel	
Ambient temperature	-20...+60°C	
Relative humidity	non-condensing	
Conformity	EN 50014:1997 and EN 50020:1994	
Designation	Ex II (1) GD [EEExia] IIC	
Safety relevant data	TUV 02 ATEX 1911	
	$U_o \leq 10.5 V$	
	$I_k \leq 26 mA$	
	$P_o \leq 67 mW$, linear	
UL approval	yes	

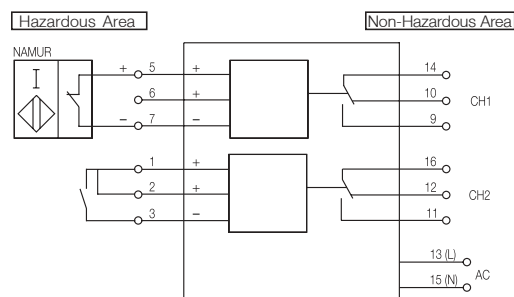
Other models available, consult factory.

See EC Type Examination for additional data.

The isolation amplifier with 2/942 relay output serves as the interface between electrical signals from the Ex area and the non-Ex-area (safe area).

The input signals from NAMUR sensors, mechanical contacts or opto-couplers are converted at the outputs through relay switching contacts. Input, output and auxiliary power circuits are galvanically isolated for safety.

Wiring Diagram



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